



International Conference
on
**Science : Emerging Scenario &
Future Challenges (SESFC-2017)**

Organized By
Him Science Congress Association
Himachal Pradesh, India

01-02, July, 2017

Atal Bihari Vajpayee Institute of Mountaineering and Allied
Sports, Manali, Himachal Pradesh



Souvenir





Him Science Congress Association

Promoting Excellence in Sciences



**Acharaya Devvrat
Hon'ble Governor,
Himachal Pradesh**

Message

Acharya Devvrat
Governor
Himachal Pradesh



आचार्य देवव्रत
राज्यपाल
हिमाचल प्रदेश

संदेश

मुझे यह जानकर हार्दिक प्रसन्नता हो रही है कि हिमाचल प्रदेश हिम साईंस कांग्रेस एसोसिएशन द्वारा अटल बिहारी वाजपेयी पर्वतारोहण एवं संबद्ध खेल संस्थान, मनाली में 1 और 2 जुलाई, 2017 को "विज्ञान : उभरता परिदृश्य और भविष्य की चुनौतियां" विषय पर अंतरराष्ट्रीय सम्मेलन का आयोजन किया जा रहा है।

यह विज्ञान का युग है। विश्व स्तर पर विज्ञान के नये-नये आविष्कारों ने जीवन को नये आयाम दिए हैं। विकास के हर क्षेत्र में आ रहे क्रान्तिकारी बदलाव वैज्ञानिक सोच का ही परिणाम हैं। विज्ञान के हर नए अनुसंधान के साथ मानव जीवन अधिक सरल बनता चला जा रहा है और यही सबसे बड़ी चुनौती बन गई है। मानव आज विज्ञान पर निर्भर हो गया है और उसके बगैर एक कदम चलना मुश्किल नजर आता है। विज्ञान का उतना ही उपयोग सार्थक है जो मानव जाति के उत्थान में काम आए। नैतिक पतन और सुरक्षा सबसे बड़ी चुनौती है, जिसपर चिंतन करने की आवश्यकता है।

मुझे विश्वास है कि देश-दुनिया से आए विशेषज्ञों का अनुभव और शोध पत्र इस दिशा में नया चिंतन पैदा करेगा, जो हम सबके लिए सहायक सिद्ध होगा।


(देवव्रत)

VIRBHADRA SINGH
CHIEF MINISTER



ELLERSLIE
HIMACHAL PRADESH
SHIMLA-171 002.

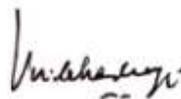
MESSAGE

It gives me immense pleasure to know that the Him Science Congress Association (HSCA) is organizing International Conference on the theme 'Science, Emerging Scenario and Future Challenges' on 1-2 July, 2017 at Manali in Kullu District.

Science refers to pursuing knowledge and Himachal has significant potential for further development through the use of science. This conference would provide an opportunity to the delegates from all over the country to deliberate and share their views on emerging trends and future challenges of science. Such conferences contribute significantly in giving new dimension to such endeavours in building a strong and healthy society.

I hope the conference would be attended by experts in the discipline from across the country to benefit the budding professionals and update their knowledge in the field.

I send my best wishes for the grand success of the Conference.



(Virbhadra Singh)



Prof. P. K. Khosla
Chief Patron &
Vice Chancellor, Shoolini University

MESSAGE

I am glad to know that Him Science Congress Association (HSCA) is organizing an **International Conference on Science: Emerging Scenario and Future Challenges (SESFC-2017)** on July 01-02, 2017 at Atal Bihari Vajpayee Institute of Mountaineering and Allied Sports, Manali (H.P).

Shoolini University of Biotechnology and Management Sciences is fast emerging as a leader in imparting high quality education in Life Sciences in the country. The University endeavours to provide elite human capital to the industry in coming years. Schoolini University is committed to its mission to be amongst 200 global Universities by 2022. The patents filed by the University (43 patents) and its h-index (h-26) speak volumes of its achievements.

Academic events such as National/International Conferences on Science would definitely serve the purpose of our pursuit for attaining excellence in generating competent human capital. The International Conference would provide a platform for meeting and sharing latest views in science and technology and fine-tuning our research and educational programmes

I extend my best wishes for a grand success of this International Conference being organized by Him Science Congress Association.

(P.K.KHOSLA)



Prof Nagesh Thakur
Professor & Chief Patron

Message

I am delighted to pen greetings to this truly significant International Conference being organised by **Him Science Congress Association, Himachal Pradesh (India)** on theme **“Science: Emerging Scenario and Future Challenges”** at Manali, Himachal Pradesh from 1st July to 2nd July 2017.

In everyday life, we relished the science and technology that made our life more easy and comfortable. The scenario of scientific education in India is rapidly changing fast with time. We are in compelling era where scientific information are shared for the benefit of society and environment globally. Conferences are one of the ways to interact and adopt new approaches for the development keeping in mind the futuristic needs.

The conference will provide science-to-science and science-to-industry platform for knowledge exchange through keynote, plenary presentations and specialised thematic sessions and fine tuning our research and educational programmes. I extend my good wishes for the success of the conference. I am sure that it will provide an excellent opportunity to the youngsters to deliberate on theme of conference.

Prof. Nagesh Thakur



Dr Deepak Pathania
President, HSCA

Message

Dear all. It is my proud privilege to join you all in celebrating the efforts of the Him Science Congress (HSCA). The Association was founded in August, 2012 under the HP Societies Registration Act, 2006, with a mission to debate and disseminate the research achievements of the scientists. During the short period of time of its formation the Association has achieved significant milestones; and the organization of the present international conference on the theme, *Science: Emerging Scenario and Future Challenges (SESFC-17)* would certainly add one more feather to its cap.

We are all engaged in serious research in our respective fields and do not often get time to interact, in person, with each other. Organization of such scientific conclaves provides us the opportunity to brainstorm different issues of interest and also to chalk out the plans for future. The present international conference is being organized in Manali in Himachal Pradesh. You will agree with me that Manali is one of the finest tourism destinations in the world. I am sure, that while we will have fruitful technical sessions, we all will also enjoy the serene natural surroundings of the venue (Atal Bihari Vajpayee Institute of Mountaineering and Allied Sports, Manali), ski slopes of Solang and trekking in the majestic Parvati valley.

I would like to take this opportunity to express my gratitude to all delegates and sponsors of the conference for their wholehearted support for success of the conference. I also wish to thank the Organizing Committee and the Programme Committee for their diligent work. I am confident that while the conference will provide a platform for the exchange of knowledge and expertise in different fields of science, it will also come out with roadmap for further promoting interest in science, particularly in the hilly state of Himachal Pradesh.

The Organizing Committee looks forward for a scintillating academic get-together at Manali.

Him Science Congress Association, Himachal Pradesh



Him Science Congress Association (HSCA) has been registered under the HP Societies Registration Act, 2006 (Reg. No. 566/2012) on dated 28th April, 2012. Association has accomplished many scientific achievements since its inception. Annually Association is organizing conferences/seminars and inspirational deliberation to the school students in various parts of Himachal Pradesh. Every annual event is attended by vast number of scientists from different national and international institutions. Previous conferences were sponsored by various funding agencies such as DST, DRDO, ISRO, BRNS, SJVN and Himachal Tourism. Association has sponsored Children Science Congress organized by Department of Science & Technology and some other national conferences as well. The 2nd annual national conference was organized at Himalayan Forest Research Institute, Shimla. All the dignitaries appreciated the efforts of HSCA in grooming the science of Himachal Pradesh. The key note lecture was delivered by Prof. Kyu-Tek Park, Executive Vice President, The Korean Academy of Science and Technology (KAST). Professor Yang-Sup Bae, Division of Life Sciences, Incheon National University, South Korea the eminent speaker shared his research on insect biodiversity of E. Asia. First International Conference on Science: Emerging Scenario and Future Challenges was held at Dharamshala during 11-12th June 2016 in Dharamshala. Prof. (Dr.) H.C. Swart from University of the Free State, Bloemfontein, South Africa and Prof. (Dr.) Griselda Barrera Galland from Instituto de Química, Universidade Federal do Rio Grande do Sul, Brasil, delivered the key note address. Association has honored few scientists with Fellow Awards in the area of Chemical and Life Sciences for their outstanding contribution. Association offered ten best presentation awards in each field of sciences to instigate the researchers. HSCA has also offered young scientist awards to few early stage researchers in different fields. Association has initiated awareness campaign among the youth of the state regarding importance of scientific research viz a viz environment and sustainability.

VISION STATEMENT

-  To advance Sciences in Himachal Pradesh.
-  To organize annual congress in Himachal Pradesh.
-  To organize workshops and seminars for the teacher of Colleges and Schools.
-  To publish scientific journals on competitive research on basic and applied aspects.
-  Awards of excellence for contributions in the field of scientific research and development
-  To organize of activities for proper exploitation of scientific development
-  To motivate and aware the school students about the advances and scopes of latest research.
-  Institution of awards in recognition of excellence in different fields of science for research promotion
-  Awards of excellence for contributions in the field of scientific research and development.
-  To nurture scientific temperament and awareness among the masses.

About the conference

*SESFC 2017 is the 5th Conference in the series on a common theme 'Science' organized by Him Science Congress association, Himachal Pradesh, India. **The conference is being organized in the picturesque city of Manali in the lap of mighty ranges of The Himalayas.** It will provide opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration.*

The main aim of the conference is to present and share current researches being carried out in the different research area for scientists, scholars, engineers and students from the universities all around the World. Herein we will discuss the developments in science fundamentals and generate awareness among scientists, researchers and civilians for emerging world's problems and role of science in mitigation.

It is a great pleasure for the organizers to welcome scientific community from all over India and the world. It is of immense importance for scientists and innovators with great minds to meet for realizing our goals of human welfare and sustainable development. As our Prime Minister Narender Singh Modi truly said that the world has progressed because of human instinct to enquire and explore for knowledge but also to address human challenges.

We need to address innovation and exploration as a goal of our science to solve environmental, health and other human problems. And innovation in approach is the responsibility of the scientific sector and the academia.

In a world full of resource constraints and competing claims, we have to be smart, original and innovative enough in our scientific approach so that world may shift from health and hunger to energy and economy.

We welcome all the delegates.

Organizing Committee

	Chief Patrons	
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	Co-Conveners	
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Mr. Arush Sharma	Mr. Ajay Kumar	Mrs. Anu Sharma
Dr. Shikha Sharma	Ms. Manita Thakur	Dr. Dolly Rana



EU legislation, programs and international activities in the area of the environment protection

M. Panayotova and V. Panayotov

University of Mining and Geology, Sofia, Bulgaria

Prof. Marinela Panayotova is working as Head, of department of Chemistry, at University of Mining and Geology Bulgaria. She has been working on ground water composition, marine environment, extraction corrosion, heavy metal pollution and remediation. She has been one of pioneer in the environmental monitoring, protection and has expensive knowledge of international protocols, legislation and United Nations conventions. She has earned various prestigious awards and has published a high number of research papers and articles in journals of high repute.

India is working hard in the fields of the environment protection, meeting the consumption needs of its citizens in a sustainable way, and economy development. European Union is a world leader in the areas of the environment protection, environmental science and technology, efficient and sustainable use of resources. Enhanced scientific and trade relationships between India and EU in all areas of our life are of mutual interest. Prosperous scientific, economic and cultural relations and cooperation between different nations can be achieved only on the basis of the mutual respect for values and laws, which means to be familiar with them. This paper presents EU work and legislation in the areas of the environment protection with emphasis on: general principles and basic framework; climate change and the environment; biodiversity, nature and soil; water protection and management; air and noise pollution; resource efficiency and waste; sustainable consumption and production. EU international activities, flagship initiatives, regulations, directives, resolutions and research programs relevant to the above-mentioned areas are introduced.

Keywords: EU, environment protection, Climate change



Influence of Graphene Oxide as Dispersed Phase in Cement Mortar Matrix composite, its impact on Crystal Patterns of Cement Hydrates and Effect on Mechanical, Micro structural and Crystallization behavior

N.C. Kothiyal

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Jalandhar – 144011 (Punjab) India

Dr. N. C. Kothiyal is working as Professor in Department of Chemistry, Dr B R Ambedkar National Institute of Technology, Jalandhar. His current areas of research are Polycyclic aromatic Hydrocarbons , Photolytic & Biodegradation Behavior, Heavy Metal Pollutants there detection, determination and recovery using Nano adsorbents and Ion exchangers, Isolation and Characterization of Bioactive compounds from medicinally important plants and Synthetic Ion exchange biomass based charcoal .He has obtained his Ph.D from ISB, Dhanbad. He has been a Member Projects Review Committee, Uttarakhand State Council of Science & Technology, Dehradun, Uttarakhand, 2008 and 2009. He has received many honors and awards as Best Paper Award" Estimation of Polycyclic Aromatic Hydrocarbons (PAH's) in Diesel- Biodiesel Blend by GC Technique Ist International Conference on New Frontiers in Biofuels, 18-19 January, 2010, Delhi Technological University (DTU), New Delhi. He chaired "Industrial Waste Minimization and Resource Recovery" session on January 21, 2006 "International Workshop on R & D Frontiers in Water and Waste water Management. He has handled various research projects and has high number of publications in journals of high repute. He has been a resource person for various International conferences, symposiums and committees.

In present investigation, Graphene Oxide (GO) was prepared using oxidative treatment of graphite by Hummer's Method. Graphene oxide synthesized (GO_a) was characterized by FTIR, SEM/EDS, TEM, XRD, TGA and AFM. Size-reduction of GO_a (14 nm sheet thickness and 900 nm average sheet size) was done using planetary ball milling, which produced GO_b with 3 nm sheet thickness and 100 nm average sheet size. Effectiveness of GO_a and GO_b nanosheets at different dosages (by wt% of cement) in improvement of mechanical strength of cement mortar matrix was evaluated and was explained on basis of microstructural analysis using FE-SEM observations as well as crystallization patterns using XRD patterns of GO-Cement Nanocomposites (GO-CNCs). Well- defined crystal growths of cement hydrates were observed as revealed by FE-SEM micrographs and crystal patterns were found to be dependent upon factors such as type of GO nanosheets, concentration of GO and curing time. It was observed that addition of 1% GO_a by wt. of cement enhanced compressive strength of composites by a maximum of 63% , whereas size-reduced GO_b (1% by wt. of cement) promoted better crystalline structures with the maximum strength enhancement of 86%. Present research work aims to enhance GO reactivity by increasing its exfoliation and its count by mechanical milling and to exploit it as a low-cost dispersed phase having different sheet thicknesses and sheet sizes for strength enhancement of Cementitious matrix by regulating crystal patterns and microstructural features.



In-vivo pharmacological and enzymatic assay of the *Eucalyptus globules* leaf extracts

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Dr Vishnu Prasad Pandey is working at Department of Chemical Science and Engineering at Kathmandu University. His research includes the identification of new natural product from plants and actinomycetes species. He is exploring the medicinal herbs/plant and microbial diversity in Nepal in search of new natural products. He graduated with PhD degree in Chemical and Biological Engineering from Seoul National University and received postdoctoral training from Department of Chemistry at University of British Columbia. He studied the cytochrome P450s enzyme for regio-specific hydroxylation of iso-flavonoids. The research covered the screening of P450s enzymes for iso-flavonoids biotransformation, host development as well as the engineering P450s . He has been instrumental in establishment of KS B&W center at Kathmandu University for industrialization of Natural Resources of Nepal The World Academy of Science in collaboration with Nepal Academy of Science honor the 2015 TWAS award in Chemistry for the contribution in the research. He won best presentation award at Fall international Symposium of Korean Society of Bio science and Biotechnology (KSBB), Jeju South Korea 2008.

There is increase in interest to determine the pharmacological value of locally available green biomass. In this paper we have investigated anti-ulcer, anti-inflammatory, analgesic, anti- diarrhea, anti-microbial and enzymatic assay of *Eucalyptus globules* available in tropical region of Nepal. Physical characterization of the non-volatile component revealed the higher yield of 16.92% in aq. ethanol expediting the use of aq. ethanol as a better alternative. Further use of crude extract revealed 33.89% (IC₅₀ = 1.44 µg/ml) of α-amylase inhibition by methanol extract and 33.87% (IC₅₀ = 3119.909 µg/ml) lipase inhibition by aq. ethanol extract presenting the potency to be used in medical as well in food industry successfully. 44.44% protective ratio towards ulcer was shown by the methanol extract whereas 54.58% anti-inflammatory activity was shown by the aq. ethanol extract. The effectiveness of the extract was further enhanced by the presence of 62.54% motility and best analgesic property at 180 min of the exposure of the extract orally. Also, the minimal inhibitory concentration (MIC) was found to be 1mg/m in methanol extract while MIC for 50% ethanol extract was 2mg/ml. Concluding the fact of presence of higher free radical quenching compounds along with the components altering the physiological activity supplemented with the higher polyphenol groups. DPPH analysis revealed 601.8 µg/ml IC₅₀ value in case of methanol and 1279.58 µg/ml IC₅₀ value in aq. ethanol extract. Statistical analysis using PASW Statistics 18 revealed the significance in 95% confidence Level. Result showed that *Eucalyptus globules* can be a best candidate for pharmacological activity, anti-oxidant activity and enzyme inhibition activity as well as anti-microbial activity.



Key note address

**Ply Wood like Structure of Fish Scale revealed by Scanning Electron
Microscope**

M. L. Sharma¹, Ravneet², Gaurav Sharma³

1 CIL/SAIF, Panjab University, Chandigarh

2. Department of Zoology Panjab University, Chandigarh

3. FEI Company, Netherland

Prof M L Sharma has been Scientist In-charge EM Facility CIL, Panjab University, Chandigarh and superannuated in November 2006 after putting 39 years service. Technical (electron microscopy) consultant to Dr. Reddy Laboratory, Hyderabad Technical (electron microscopy) consultant to (Hitachi, Japan) M/S Forvision Pvt Ltd, Hyderabad. Technical member on panel of many national institutions like FRI Dehradun, IMTECH, Chandigarh, CSIO, Chandigarh, IHBT Palampur Developed EM sample handling material for novice in electron microscopy Technical training in cryo SEM, JEOL Datum, Tokyo Training in Cryo-Ultra-Microtomy for TEM conducted by Leica, Netherland Technical Training Cryo UM Tucson AZ, (US), He won Indira Gandhi Shiromani Award, 24 November, 2014 Bharat 'Jyoti Award, 10th June, 2013, Glory of India Gold Medal, 10th June 2013 Rajiv Gandhi Excellence Award & Certificate of Excellence ,24th August 2013 and Two time best EM micrograph awardees 9Electron Microscope society of India 2003 & 2004, (EMSI)

Natural biological growth and manmade structures often share the same specifications and design constraints: structural support, lightweight or protection against specific threats. In this context, the fish scale being an extended part of the epidermal layer of the skin but act as a external protective layer which saves fish from external enemies and also reduce water resistance. The fish scale does not have blood circulatory system in it and presumed to be a dead tissue but it grows with the growth of the fish. The Fishery scientists have used fish scale to determine fish growth and age, pollution indicator and taxonomically character. The material scientists are probing formation of bio-materials due to its biomimetic properties The present fish scale cross sectional scanning electron microscope study reveals its internal arrangement, which is unique in its structural designing and architect. Non conventional methodology is used in sample preparation. The fish scale subjected to liquid nitrogen temperature freezing to keep it hard and brittle. The liquid nitrogen frozen fish scale is subjected to broken into two half with the help of freeze forceps and loaded on slanting specimen stubs. The scale cross-sectional face was sputtered with gold to make it conductive. The scale is viewed under scanning electron microscope at different magnifications. The structure of fish scales is characterized by a large variety of shape, size and properties in order to achieve particular functions. This particularity, shared by most biological materials, ensures that the structure provides both a structural and protective support for the animal. The mechanics of fish scale materials and structure, will provide us in future to explore a fundamental basis into the bio-inspired design of thin, protective structures (such as body armors, exoskeletons or protection for morphing flexible structures).



Invited Talk

Scientific Studies and Challenges in Antarctica

Pawan Kumar Bharti

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Dr. Pawan Kumar 'Bharti', M.Sc., Ph.D., PGDISM, FASEA, FANSF has completed his education from Gurukula Kangri University, Haridwar (Uttarakhand), India. He has more than 10 years of research experience in Limnology, Water pollution, EIA & Antarctic Environment. He has worked as Lecturer (Adhoc) in Vidyalaya Vibhaag, Gurukula Kangri University, Haridwar from Feb 2005 to Dec 2007. Dr. Bharti has written/edited more than 80 Books, >100 articles in national/international journals, proceedings/compendium, newsletters and books and 4 patents on his credit. He has written many Hindi articles and scientific poems in popular magazines. He has launched his 2 Hindi poem collections in 2012 & 2015. Dr. Bharti is the fellow, founder member and life member of several scientific/academic societies. He has received ASEA Fellow Award (2006), Vigyan Kavya Ratna (2008), Haridwar Kavya Ratna (2009), Bharat Excellence Award (2013), ANSF Fellow Award (2014), Best Research Award (2015), Limca Book Record (2016), Young Scientist Award (2017) and few other awards in the field of scientific activities & literature. He is in the advisory/editorial board of 25 International Journals. Dr. Dr. Bharti was the member of 30th ISEA of MoES, Gov. of India during 2010-11. Dr. Bharti has been nominated 'Man of the Year' by IBC, Cambridge, England and his biography has been published in 'Who's Who in the World' 32nd Edition, USA. His is a Limca book of record holder and has visited South Africa, Antarctica, UAE, Bhutan and Nepal. Presently, he is working as Scientist in Shriram Institute for Industrial Research, Delhi, India.

Antarctica is the coldest continent on the earth. The Indian Ocean, Pacific Ocean and Atlantic Ocean surround the continent. Antarctic continent covers 10% of the earth surface and has a surface area of nearly 14 million square kilometer. It also has 70% of the world's fresh water resources in the form of ice sheets. Thick ice sheets cover the whole continent (almost 98%). As a result of the environmental conditions, the remaining (2%) fraction without ice cover is basically the barren soil and rocks.

Many countries have set up scientific research stations in Antarctica. There are about 65 scientific research stations in summer and 30 research stations in winter, which are currently operating for scientific investigations. India has two permanent scientific research stations in the Antarctica located in Schirmacher Oasis in Central Dronning Maud Land and in Larsemann Hills, East Antarctica. However, the activities due to operation and maintenance of the research station in Antarctica have impacts on the Antarctic environment.

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

Key words: Antarctic Environment, environmental monitoring, Impact assessment, environmental components, Larsemann Hills.



HIM SCIENCE CONGRESS ASSOCIATION, HIMACHAL PRADESH
International Conference
On
Science: Emerging Scenario and Future Challenges
(SESFC 2017)

ABVIMAS, Manali, Himachal Pradesh, 01-02, July 2017

Abstracts
Section A: Chemical Sciences

POSTER PRESENTATIONS

Abstract Number	Title of Paper	Authors	Address
CS01	Effect of Carbohydrates on the Critical Micelle Concentration of Synthesized 12-2-12 Gemini Surfactant in aqueous medium at various temperatures	<u>Kailash Singh</u> , <u>Vivek Sharma</u> and <u>Suvarcha Chauhan</u> *	Department of Chemistry, Himachal Pradesh University, Summer Hill, Shimla-171005
CS02	Micellization and Thermodynamic Behaviour of surfactants in aqueous solutions of Amikacine Sulphate (Antibiotic drug) at Various Temperatures: Conductometric Studies	S. Chauhan* and <u>Poonam Chaudhary</u>	Department of Chemistry, Himachal Pradesh University, Summer Hill, Shimla-171005
CS03	Comparison of Solvation Behavior of Xanthine Drugs in Aqueous Solutions of NaCl and MgCl ₂ at T = (288.15 to 318.15) K: Volumetric, Viscometric and Spectroscopic Approach.	<u>Aashima Beri</u> , <u>Parmpaul K. Banipal</u> , <u>Tarlok S. Banipal</u>	Department of Chemistry, Guru Nanak Dev University, Amritsar 143005,
CS04	Thermotransport properties of Glycine and Glycylglycine in aqueous Tartaric acid at different temperatures: Volumetric, Acoustic and Viscometric studies.	Shashi Kant Lomesh* and <u>Abhishek Thakur</u>	Department of Chemistry, Himachal Pradesh University, Shimla 171005, India
CS05	One-pot synthesis and antiproliferative activity studies of some new pyrazolyl-dibenzo[b,e][1,4]diazepinones	<u>Gaurangkumar C. Brahmhatt</u> , ^a Tushar R. Sutariya, ^a <u>Bhagyashri D. Parmar</u> , ^a <u>Narsidas J. Parmar</u> , ^a <u>Irene Lagunes</u> , ^b <u>Jose M. Padro n</u> , ^b <u>Rajni Kant</u> , ^c <u>Vivek K. Gupta</u> , ^c	^a Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar-388120, Dist. Anand, Gujarat, India. ^b BioLab, Instituto Universitario de Bio-Orgánica "Antonio González" (IUBO-AG), Centro de Investigaciones Biológicas de Canarias (CIBICAN), Universidad de La Laguna, C/Astrofísico Francisco Sánchez 2, 38206 La Laguna, Spain. ^c Department of Physics, University of Jammu, Jammu Tawi 180 006, India.
CS06	Imidazo[1,5-a]pyridine based Ru(III) complexes as biological active agent	<u>Darshana N. Kanthecha</u> and <u>Mohan N. Patel</u> *	Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar-388 120, Gujarat, India
CS07	Facial synthesis of Cobalt Sulphide Nanoparticles: their characterization and applications	S.B.Kalia*, <u>Gunjan</u>	Department of Chemistry, Himachal Pradesh University, Shimla 171005, India.

CS08	Studies On Monthly Variations In Physico-Chemical Parameters Of River Bhagirathi In Uttarkashi, Uttarakhand, India	Suresh Kumar	Department Of Chemistry, Pt. L.M.S. Govt. (Pg) College, Rishikesh, Dehradun
CS09	Thermo-transport properties of antibiotic drug Minocycline Hydrochloride in water and aqueous Manitol solution at different temperatures.	<u>Nisha Sharma</u> and Shashi Kant Lomesh	Department of chemistry, Himachal Pradesh University, Shimla-171005 (H.P.) India
CS10	Spectroscopic studies to examine the effect of Sodium Chloride on the interactions of Ciprofloxacin Hydrochloride with conventional surfactants	<u>Rupinder Kaur</u> , Parampaul K. Banipal, Tarlok S. Banipal*	Department of Chemistry, Guru Nanak Dev University, Amritsar 143005, Punjab, India
CS11	Polymeric compound (chitosan derivative) study of Anticholesterol properties	<u>Reena Tondwal</u> and Man Singh	School of Chemical Sciences, Central University of Gujarat, Gandhinagar -382030, India
CS12	Special effect of 1-butyl-3-methylimidazolium bromide on the extraction of bioactive compounds from Pinus species by using microwave	Pooja kumari, Usha Gupta and Jatinder Singh Aulakh	Department of Chemistry, Punjabi University Patiala - 147002, India
CS13	Innovative Cellulose Derivatives for As(V) and Fe(III) Removal From Aqueous Environment	VishalPriya*, <u>Aman Meenakshi</u> , <u>Sonali</u> , Isha, Sulenderlata	Department of Chemistry Sri Sai University, Palampur (H.P.)
CS14	Optimization of the indole – pyrimidine – chrysin hybrid as the lead molecule for anti-inflammatory drugs	Jagroop Kaur and Palwinder Singh	Department of Chemistry, Guru Nanak Dev University, Amritsar-143005, India
CS15	Rational Design, Synthesis and working of a Tri-ligating Receptor: Removal of Cyanide from Cytochrome c Oxidase	Sukhmeet Kaur and Palwinder Singh*	Department of Chemistry, Guru Nanak Dev University, Amritsar-143005, India
CS16	One-pot synthesis and antiproliferative activity studies of some new pyrazolyl-dibenzo[b,e][1,4]diazepinones	<u>Gaurangkumar C. Brahmabhatt</u> , ^a Tushar R. Sutariya, ^a Bhagyashri D. Parmar, ^a Narsidas J. Parmar, ^{*a} Irene Lagunes, ^b Jose´ M. Padro´n, ^b Rajni Kant, ^c Vivek K. Gupta, ^c	^a Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar-388120, Dist. Anand, Gujarat, India. ^b BioLab, Instituto Universitario de Bio-Orgánica ‘‘Antonio Gonza´lez’’ (IUBO-AG), Centro de Investigaciones Biome´dicas de Canarias (CIBICAN), Universidad de La Laguna, C/Astrofi´sico Francisco Sa´nchez 2, 38206 La Laguna, Spain. ^c Department of Physics, University of Jammu, Jammu Tawi 180 006, India.
CS17	Polyvinylpyrrolidone Capped Bis(4-Methylpiperazine- 1-Carbodithioic Acid) Zinc(II) Acetate: A New Nano-Coordination Complex for Biological Applications	Manjeet Sharma and Shashi Bala Kalia	Department of Chemistry, Himachal Pradesh University-Shimla ,SummerHill
CS18	Physico-chemical and spectroscopic studies of polyhydroxy solute in CTAB(aq) solutions	Sonika _____Arti, Parampaul K. Banipal*, Tarlok S. Banipal	Department of Chemistry, Guru Nanak Dev University, Amritsar 143 005, India
CS19	Green and expeditious one-pot synthesis of bioactive 3, 4-	H. M. Patel ¹ , Vivek K.	Department of Chemistry, Sardar Patel University,

	dihydropyrimidin-2(1H)-one derivatives using non-commercial β -ketoesters via the Biginelli reaction.	Gupta ² and <u>M. G. Sharma</u> ^{1*}	Vallabh Vidyanagar 388 120, Gujarat, India ² Post-Graduate Departments of Physics & Electronics, University of Jammu, Jammu Tawi-180006, India
CS20	Synthesis of 4H - chromene derivatives of 2-(4-substituted) phenyl-N-allyl-indole and their biological evaluation	* <u>Pratibha Prasad</u> ¹ and Manish P. Patel ²	Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar 388120, Gujarat, India
CS21	Synthesis and identification of novel 1,2,4-triazole based quinoline derivatives as a new class of antimicrobial and antituberculosis agent.	* <u>Pratik G. Shobhashana</u> ¹ and Manish P. Patel ²	Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar 388120, Gujarat, India
CS22	A Review On Uses Of Nanocapsules In Drug Delivery	Sunil Kumar ¹ , <u>Nidhi</u> ² , Manish Kumar ² , Deepika Kaushal ²	¹ Department of Chemistry, Govt. Degree College, Khundian, H. P., India ² Department of Chemistry, Sri Sai University, Palampur, H. P., India
CS23	Synthesis and Electrical Conductance Studies of 2,4-Dihydroxybyphenyl-Ethylenediamine-Formaldehyde Copolymer	<u>Santosh P. Chakole</u> and Wasudeo B. Gurnule [*]	[*] Department of Chemistry, Kamla Nehru Mahavidyalaya, Sakkardara Square, NAGPUR – 440 024 (M. S.) INDIA.
CS24	Preparation, Charaterization and Ion-Exchange Properties of 2-Hydroxyacetophenone- Melamine- Formaldehyde Copolymer Resin-IV	W. B. Gurnule ^{1*} and R. H. Gupta ²	^a Department of Chemistry, Kamla Nehru College, Sakkardara, Nagpur 440010, Maharashtra, India ^b Department of Chemistry, Laxminarayan Institute of Technology, Rastrasant Tukdoji Maharaj Nagpur University, Nagpur 440010, Maharashtra, India.
CS25	Investigation of Photo-catalytic Degradation of Co-doped SnO ₂ Annealed at Different Temperatures.	<u>Sunaina Negi</u> & Prianka Sharma	School of Basic & Applied Sciences, Maharashtra Agrasen University, Baddi, INDIA
CS26	Bi-functional CeO ₂ nano-flakes: Synthesis, characterization and applications	<u>Kuldeep Negi</u> [*] , M.S. Chauhan and Manoj Kumar	Department of Chemistry, H.P. University, Gyan Path, Summer Hill, Shimla -5
CS27	Investigation of molecular interactions between antibiotic drug Doxycycline Hyclate and Aqueous Galactitol solutions at different temperatures by Volumetric and Acoustic methods.	Shashi Kant Sharma, <u>Vikas Nathan</u>	Dept of Chemistry, Himachal Pradesh University, Summerhill, SHIMLA
CS28	Fabrication of CaO Nps/Mps by chemical route	Meena kumari singh , Amit Agarwal, Anshul Agarwal [*]	FET, Department of Chemistry, Agra College, Agra.
CS29	Comparative study of Thermally stable fluorescence polyamides Consuming Coumarin in its Backbone	¹ <u>Dr.Dilip Vasava</u> , ² Mrs.(Dr). S. K. Patel	¹ Department of Chemistry, School of Sciences, Gujarat University, Navrangpura Ahmedabad 380009, Gujarat, India. ² Department of Chemistry, VNSGU, Surat, Gujarat, India.
CS30	Preparation Of Organometaliic Compounds By Solid-Solid Interaction Between Nickel And Sodium Salts Of Saccharides.	<u>B. Pareek</u>	Applied science department, SDDIET Barwala

CS31	Amphiphilic block copolymers micelles for drug delivery vehicles	<u>Tejas P. Joshi</u>	Department of Chemistry (DST-FIST Sponsored Dept.), M.K. Bhavnagar University, Bhavnagar-364 002, Gujarat, India
CS32	Synthesis And Characterization Of Schiff Base Of Acetyl Hydrezone Derivatives Of Resorcin[4]Arene	Jinal A. Gajjar, <u>Hitesh M. Parekh</u>	Department of chemistry, Gujarat University, Navrangpura, Ahmedabad 380009, India
CS33	A prospective material for gas sensing: Nanostructured BN/SnO ₂ composite	<u>Bikramjeet Singh</u> ¹ and Akshay Kumar ^{1*}	¹ Department of Nanotechnology, Sri Guru Granth Sahib World University, Fatehgarh Sahib, 140406, Punjab
CS34	Fabrication of tragacanth gum based nanogel for controlled release of ampicillin	<u>Chetna Verma</u> ^a , Susheel Kalia, Sawdeep Sood, Poonam Negi ^b and Deepak Pathania ^{a*}	^a School of Chemistry, Shoolini University, Solan, Himachal Pradesh- 173212 ^a School of Pharmaceutical Sciences, Shoolini University, Solan, Himachal Pradesh- 173212
CS35	Synthesis, characterization of gelatin-Zr(IV) phosphate composite ion exchanger : Separation of heavy metal ions	<u>Manita Thakur</u> ^a , Manjula Gautam ^b and Deepak Pathania ^{a*}	^a School of Chemistry, Shoolini University, Solan 173212, Himachal Pradesh, India ^b School of Biotechnology, Shoolini University, Solan 173212
CS36	Enhanced photocatalytic degradation of polyromantic pollutants under solar irradiations by mesoporous carbon/ZnFe ₂ O ₄ nanocomposite	<u>Arush Sharma</u> ^a , Deepak Pathania ^{a*} , Zia-Mahmood Siddiqi ^b , B S Rathore ^c	^a School of Chemistry, Shoolini University, Solan-173212, Himachal Pradesh, India ^b Jubail University College, P.O.Box10074, Jubail Industrial City 31961, Kingdom of Saudi Arabia ^c Govt College Nalagarh, India
CS37	Guar gum-poly(itaconic acid) Based Conducting Superabsorbents for High Performance Applications	<u>Reena Sharma</u> ¹ , Susheel Kalia ² and Balbir S. Kaith	¹ School of Chemistry, Shoolini University of Biotechnology and Management Sciences, Solan - 173212, Himachal Pradesh, India ² Department of Chemistry, Army Cadet College Wing, Indian Military Academy, Dehradun – 248007 (UK) India ³ Department of Chemistry, Dr. B.R. Ambedkar National Institute of Technology, Jalandhar – 144 011(Punjab) India
CS 38	Gg-ZnSe-WO ₃ nano-junction for degradation of endocrine disruptor via adsorption, catalysis and ozonation	<u>Sunil Kumar, Anu Kumari, Amit Kumar</u> [*] , Pooja Dhiman	School of Chemistry, Shoolini University, Solan, Himachal Pradesh, India-173229 Department of Physics, IEC University, Solan, India
CS 39	Surface modification of cellulose fibre	<u>Ashvinder rana</u> ¹ , Archana Sharma	Department of chemistry: Sri Sai University, Palampur
CS 40	Polyvinylpyrrolidone Capped Bis(4-Methylpiperazine-1-Carboxylic Acid) Zinc(II) Acetate: A New Nano-Coordination Complex for Biological Applications	<u>Manjeet Sharma</u> and Shashi Bala Kalia	Department of Chemistry, Himachal Pradesh University-Shimla
CS 41	Studies on Ion Association and Solvent Interaction-Conductance of Glycine and Diglycine in Water and in Aqueous Solutions of Citric acid at Different Temperatures	Shashi Kant Lomesh [*] and <u>Dinesh Kumar</u>	Department of Chemistry, Himachal Pradesh University, Shimla 171005, India.
CS42	Photocatalytic reduction of CO ₂ into fuels by novel carbon based nano-heterojunction	<u>Ajay Kumar</u> ^a Amit Kumar ^{a*} , Mu Naushad ^b Anamika ^a , Preeti ^a	^a School of Chemistry, Shoolini University, Solan, Himachal Pradesh, India-173229 ^b Department of Chemistry, College of Science, Building#5, King Saud University, Riyadh, Saudi Arabia-11451
CS43	Fabrication, Characterization and Applications of Novel Trimetallic Nanocomposites	Gaurav Sharma ^{a*} , Sangeeta Bhogal ^a , Amit Kumar ^a , Mu Naushad ^b , Inamuddin ^{b,d}	^a School of Chemistry, Shoolini University, Solan- 173212, Himachal Pradesh, India ^b Department of Chemistry, College of Science, King Saud University, Bld.#5, Riyadh, Saudi Arabia

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CS44	Nanocomposite Hydrogels and their Applications	Gaurav Sharma ^a , Bharti Thakur ^a , Mu. Naushad ^b	^a School of chemistry, Shoolini University, Solan-173212, Himachal Pradesh, India ^b Department of Chemistry, College of Science, King Saud University, Bld.#5, Riyadh, Saudi Arabia
ORAL PRESENTATIONS			
CS45	Comparative study of Thermally stable fluorescence polyamides Consuming Coumarin in its Backbone	<u>Dr.Dilip Vasava</u> , ² Mrs.(Dr). S. K. Patel	¹ Department of Chemistry, School of Sciences, Gujarat University, Navrangpura Ahmedabad 380009, Gujarat, India. ² Department of Chemistry, VNSGU, Surat, Gujarat, India
CS46	Synthesis Of Enantiomerically Pure C ₄ -Symmetric Tetramethoxy-Resorcin[4]Arene	<u>Hitesh M. Parekh</u>	Department Of Chemistry, School Of Sciences, Gujarat University, Navrangpura, Ahmedabad 380009 India
CS47	H Activation Of 1, 4- Dione And Ethyl Benzene Over Robust And Magnetically Recoverable Fe ₃ O ₄ Nanoparticles	<u>Dilip V. Vasava</u> *	Department Of Chemistry, School Of Sciences, Gujarat University, Ahmedabad, India E- Mail: Dilipvasava20@Gmail.Com, Fax: +91 79 26308545; Mob.No: +91 9913275906
CS48	Development Of Surrogate Approaches For The Synthesis Of β-Carboline Based Molecular Hybrids And Natural Product Mimics	<u>Virender Singh</u>	Department Of Chemistry, Dr. B R Ambedkar National Institute Of Technology, Jalandhar 144011, India Email:- Singhv@Nitj.Ac.In
CS49	The Outlook Of Zeolite-Y Entrapped Transition Metal Complexes As Heterogeneous Catalysts: Synthesis, Spectral And Catalytic Aspects	<u>Chetan K. Modi*</u> , Ravi Vithalani, Dikin Patel	¹ Applied Chemistry Department, Faculty Of Technology & Engineering, The Maharaja Sayajirao University Of Baroda, Vadodara-390 001, Gujarat, India
CS50	Dna Binding And <i>In Vitro</i> Cytotoxicity Studies Of Newly Synthesized Oxidovanadium(Iv) Complexes Of Nitro Substituted Benzohydroxamate Ligands As Prospective Vanadodrug Compounds	Neeraj Sharma*, Manjula Sharma, Vineet Kumar Choudhary And <u>Abhishek Kumar*</u>	E-Mail: <u>Neerajsharma Univ@Yahoo.Co.In</u> Abhigoldn9@Gmail.Com Fax: +91 177-2830775
CS51	Uv Absorption, Mechanical And Optical Behavior Of Zinc Oxide Containing Poly (Vinyl Alcohol - G – Acrylonitrile) Nanocomposites Films	<u>Shikha Chouhan</u> * A.K. Bajpai & Ravi Katare	Bose Memorial Research Laboratory, Department Of Chemistry, Govt. Autonomous Science College, Jabalpur 482001, India Email: <u>Shikhachouhan90@Gmail.Com</u>
CS52	A Study On Molar Conductance Of Oxalic Acid And Its Salts In Binary Aqueous Mixtures Of Dioxane At Different Temperatures.	<u>Dr. Mohinder Kumar</u>	Assistant Professor In Chemistry, Govt. Post Graduate College Sarkaghat Distt. Mandi (Himachal Pradesh). Email: <u>Mguleria5@Gmail.Com</u>

CS53	Synthesis Of Nickel Oxide Quantum Dots Using Chemical Methods	Sunil Kumar ¹ , Madhurika Mahajan ³ , Alpana Thakur ^{3,4} , Neha Rana ²	¹ department Of Chemistry, Govt. Degree College, Khundian, H. P., India ² department Of Chemistry, Sri Sai University, Palampur, H. P., India ³ department Of Physics, Mcm Dav College, Kangra, H. P., India ⁴ department Of Physics, Himachal Pradesh University, Shimla, H. P., India
CS54	Synthesis Characterization And Application Of Bare And Doped Cobalt Oxide Nanoparticles	Sunil Kumar ¹ , Rajesh Bhardwaj ³ , <u>Atul Soni</u> ²	¹ Department Of Chemistry, Govt. Degree College, Khundian, H. P., India ² department Of Chemistry, Sri Sai University, Palampur, H. P., India ³ department Of Physics, Govt. Degree College, Khundian, H. P., India *E
CS55	Modulation Of Physico-Chemical Properties Of Polyhydroxy Solutes In Aqueous Gamma-Amino Butyric Acid: Volumetric And Spectroscopic Approach	<u>Kamaljeet Kaur</u> ^A , Parampaul K. Banipal ^{A*} , Tarlok S. Banipal ^A	^A Department Of Chemistry, Guru Nanak Dev University, Amritsar 143005,
CS56	Densimetric And Viscometric Studies Of Saccharides In Aqueous Lanthanide Chloride Solutions At 298.15 K.	Pallavi Sohal ^A , Parampaul K. Banipal ^A , <u>Kamaljeet Kaur</u> ^A , Garima ^A , Tarlok S. Banipal ^A	^A department Of Chemistry, Guru Nanak Dev University, Amritsar 143 005,
CS57	Effect Of Solid Ionic Conductors On Solid State Dye Sensitized Solar Cells Substituted With Charge Donor Molecules	* <u>Jyoti Prasad</u> , Jayraj V. Vaghasiya And Saurabh S. Soni	Department Of Chemistry Sardar Patel University, Vallabh Vidyanagar, 388120, Gujarat (India)
CS58	Effect Of Surface Active Ionic Liquid Concentration On The Conformation Of Hemoglobin	<u>Rajni Vashishat</u> ¹ And Rakesh Kumar Mahajan ^{1*}	¹ Department Of Chemistry, Ugc-Centre For Advanced Studies, Guru Nanak Dev University, Amritsar-143005
CS59	Hantzsch-Pyridine Synthesis Based On Heterocyclic Moiety Via Multi-Component Reaction And Their Microbial Studies	Mayank G. Sharma ¹ , Vivek K. Gupta ² And <u>Hitendra. M. Patel</u> ^{1*}	¹ Department Of Chemistry, Sardar Patel University, Vallabh Vidyanagar-388 120, Gujarat, India. ² Post-Graduate Departments Of Physics & Electronics, University Of Jammu, Jammu Tawi-180006, India
CS60	C- H Activation Of 1, 4- Dione And Ethyl Benzene Over Robust And Magnetically Recoverable Fe ₃ O ₄ Nanoparticles	<u>Dilip V. Vasava</u>	Department of Chemistry, School of Sciences, Gujarat University, Ahmedabad, India

Effect of Carbohydrates on the Critical Micelle Concentration of Synthesized 12-2-12 Gemini Surfactant in aqueous medium at various temperatures

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Abstract

Electrical conductivities (κ) of a cationic surfactant, 12-2-12 Gemini Surfactant, Ethanediyl-1,2-bis(dimethyldodecylammonium bromide (0.2 to 2.0) mmol·kg⁻¹ in the absence and presence of 0.01 mol·kg⁻¹ aqueous solutions of carbohydrates (Fructose, Maltose and Raffinose) have been measured over a wide range of temperature (283.15 to 313.15) K. From the conductivity versus surfactant concentration plots, critical micellar concentration (CMC) of 12-2-12 Gemini Surfactant has been determined. Each plot showed a linear variation in the κ values with respect to increased surfactant concentration both in the pre-micellar and post-micellar regions. The conductivity values increases with an increase in surfactant concentration; the plot of which showed a kink at CMC. The CMC values, degree of ionization (α) and thermodynamic parameters such as standard Gibbs free energy ΔG_m^o , enthalpy ΔH_m^o , and entropy (ΔS_m^o) of micellization have been calculated from the conductivity measurements at different temperatures. Fluorescence probe studies have also been employed to calculate CMC values. The results have been discussed in terms of hydrophobic interactions between the surfactant and carbohydrates in the aqueous medium.

Keywords: Conductivity, Fluorescence, 12-2-12 Gemini Surfactant, Fructose, Maltose, Raffinose, Critical micelle concentration.

Micellization and Thermodynamic Behaviour of surfactants in aqueous solutions of Amikacine Sulphate (Antibiotic drug) at Various Temperatures: Conductometric Studies

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Abstract

The conductometric measurements were employed to get information regarding the interaction between the surfactants and additives in the system. In this present work the micellization and interaction of surfactants i.e. Cetyltrimethylammonium bromide ($0.1-2 \text{ mmol}\cdot\text{kg}^{-1}$) and Dodecyltrimethylammonium bromide ($1-30 \text{ mmol}\cdot\text{kg}^{-1}$) in aqueous solutions of different percentages of amikacine sulphate ($0.001, 0.05, 0.01 \text{ mol}\cdot\text{kg}^{-1}$) have been measured at temperature range $20-40^\circ\text{C}$ with interval of 5°C . The *CMC* values will be determined from the plots of κ versus [surfactants]. The critical micelle concentration (*CMC*) values and thermodynamic parameters such as standard Gibbs free energy ΔG_m^o , enthalpy ΔH_m^o , and entropy (ΔS_m^o) of micelle formation have been calculated from the conductivity measurements at different temperatures. Thermodynamic data has provided the evidences for a significant contribution of the size of hydrophobic part of drug towards micellization. The varying size (hydrophobic part) as well as the hydrophilic part may be the principal factor in determining the thermodynamics of micellization of studied surfactants in aqueous solutions of drug.

Keywords: Micellization, Critical Micelle Concentration (*CMC*), Standard Gibbs free energy ΔG_m^o , Enthalpy ΔH_m^o , and Entropy (ΔS_m^o).

Comparison of Solvation Behavior of Xanthine Drugs in Aqueous Solutions of NaCl and MgCl₂ at $T = (288.15 \text{ to } 318.15) \text{ K}$: Volumetric, Viscometric and Spectroscopic Approach.

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ABSTRACT

The densities (ρ), Viscosities (η) and ¹H nuclear magnetic resonance (NMR) studies for caffeine, theophylline and theobromine in water and in aqueous solutions of 0.10, 0.25, 0.50, 0.75 and 1.00 mol·kg⁻¹ sodium chloride and magnesium chloride over a temperature range $T = (288.15 \text{ to } 318.15) \text{ K}$ and at $p = 101.325 \text{ kPa}$ have been carried out using vibrating-tube digital densimeter, micro-Ubbelohde type capillary viscometer and Bruker (AVANCE-III, HD 500MHz) NMR spectrometer, respectively. From the density and viscosity data, apparent molar volume ($V_{2,\phi}$), partial molar volume at infinite dilution ($V_{2,\phi}^\circ$), viscosity B -coefficient, corresponding transfer ($\Delta_{tr}V_{2,\phi}^\circ$ and $\Delta_{tr}B$) and other related parameters (partial molar expansibilities, interaction coefficients, dB/dT and $B/V_{2,\phi}^\circ$) have been calculated. The trends in $\Delta_{tr}V_{2,\phi}^\circ$ and $\Delta_{tr}B$ parameters suggest that hydrophilic-ionic interactions dominant initially, but these interactions descend gradually with increasing molalities of electrolytes. The expansibilities and dB/dT data show the structure-breaking behavior of theophylline and theobromine in water and in aqueous solutions of electrolytes. However, behavior of caffeine is exceptional. These studies indicate the decrease in solubilization of xanthine drugs with increasing molalities of MgCl₂ solutions. But the solvation is more in MgCl₂ than NaCl. The increase in chemical shift (δ) values with increasing molalities of NaCl also signifies the predominance of solute-cosolute interactions over the dehydration process. Dehydration effect over the solute-cosolute interactions. The results have further been discussed. In case of MgCl₂, this type of behavior may be understood in terms of predominance of and rationalized in terms of various interactions.

Thermotransport properties of Glycine and Glycylglycine in aqueous Tartaric acid at different temperatures: Volumetric, Acoustic and Viscometric studies.

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Thermotransport properties like density, ultrasound velocity and viscosity of glycine, glycylglycine in water and in 0.2, 0.4, 0.6, and 0.8 mol kg⁻¹ aqueous tartaric acid solution as a function of concentration at different temperatures ranging from 298.15 to 318.15 K have been determined. These data have been utilized to calculate apparent molar volume, isentropic compressibility and viscosity B-coefficient values of the studied solutions. The viscosity coefficients A and B have been determined from the Jones-Dole equation. The limiting apparent molar volumes (Φ_v^0) and experimental slopes (S_v) derived from the Mason equations have been interpreted in terms of solute-solute and solute-solvent interactions. From the volumetric and viscometric data, the structural effects of glycine, glycylglycine in tartaric acid solution has been discussed. Glycine and Glycylglycine in aqueous solutions exhibits structure-breaking behaviour. The results were explained in terms of structure making and structure breaking properties. The transfer volumes of amino acid and peptide from water to aqueous solutions of tartaric acid are positive and may be regarded as a result of a dominant solute-co-solute interactions.

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One-pot synthesis and antiproliferative activity studies of some new pyrazolyl-dibenzo[b,e][1,4]diazepinones

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Abstract

A one-pot, three-component synthesis of some new 11-[5-(chloro/Ar-(oxy/sulfanyl)-pyrazolyl)-dibenzo[b,e][1,4]diazepinones has been demonstrated, by the reaction of 5-pyrazolone-4-carbaldehyde with cyclic diketones and aromatic diamines, catalyzed by indium chloride, in acetonitrile at room temperature. The method is highly efficient, and allows all desired products to access in high yields with an excellent purity requiring a simple and easy workup. All heterocycles are characterized by IR, ¹H NMR, and ¹³C NMR spectral data, including the single crystal X-ray diffraction study of compound 16b. Many of these heterocycles revealed a good anti-proliferative activity, when they were screened against a panel of six representative human solid tumour cell lines.

Imidazo[1,5-a]pyridine based Ru(III) complexes as biological active agent

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Abstract

A series of imidazo[1,5-a]pyridine based Ru(III) complexes of type $[\text{Ru}(\text{L}^{1-5})_2\text{Cl}_2]\text{PF}_6$ have been synthesized and characterized by elemental analysis, conductance measurements, electronic spectroscopy, thermogravimetric analysis (TGA), electron paramagnetic resonance (EPR), fourier transform infrared (FT-IR) spectroscopy and liquid chromatography mass spectroscopy (LC-MS). An octahedral geometry around ruthenium has been suggested using EPR and electronic spectral analysis. Absorption titration and viscosity measurement study of the complexes have been carried out for their interaction with Herring Sperm (HS) DNA. The studies suggest the classical intercalative mode of binding. The DNA binding also confirmed theoretically using a molecular docking study of the Ru(III) complexes and suggests an intercalation binding mode between the complex and nucleotide base pairs. The *in vitro* cytotoxicity of the complexes have been examined with a brine shrimp bioassay using *Artemia cyst*. *In vivo* cytotoxicity against *S. pombe* cells at a cellular level have been carried out to study of cellular level cytotoxicity of the synthesized compounds. Result indicates that the metal complexes show better activity against *S. pombe* cells compared to the ligands. The complexes have been screened for their *in vitro* antibacterial activity against two Gram^(+ve) and three Gram^(-ve) microorganisms. DNA extraction was carried out from *S. pombe* cells to study the DNA cleavage by agarose gel electrophoresis. Smearing of DNA in agarose gel suggests that complexes exhibit toxicity at cellular level and break the DNA from nucleus to express their toxic effect.

CS07

Facial synthesis of Cobalt Sulphide Nanoparticles: their characterization and applications

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Abstract

Novel HDA capped CoS NPs i.e CoS.2HDA obtained by thermolysis of precursors, viz. [Co(MorphcdtH)₂](CH₃COO)₂ and [Co(4-RPipzdtH)₂](CH₃COO)₂, (R = M, Et, P) as well as carbodithioic acid capped CoS NPs, viz. CoS.2(MorphcdtH) and CoS.2(4-RPipzdtH), (R= M, Et, P) synthesized via chemical precipitation in methanol-toluene medium. It was characterized by EDS, DLS, FE-SEM, XRD, NMR, FTIR, UV-visible and HRTEM spectroscopic studies. Elemental composition given by EDS was in accordance with theoretical values. Particle size observed from DLS and XRD was in the range 20 nm to 8 nm. Formation of CoS NPs was also evident from FTIR and ¹H NMR spectra. Catalytic efficacy was checked for conversion of benzaldehyde to benzoic acid and yield of product was found in accordance with theoretical value. Photocatalytic dye degradation activity for congo red, methyl red and methylene blue were 100% in time span of 2 hours at pH 7. Antibacterial activity was checked against *Staphylococcus epidermidis*, *Pseudomonas aeruginosa* and *Escherichia coli*.

CS08

Studies On Monthly Variations In Physico-Chemical Parameters Of River Bhagirathi In Uttarkashi, Uttarakhand, India

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Abstract

The Bhagirathi is one of the most important parent rivers of the mighty Ganga. It originates from the Gaumukh Glacier (3812m asl) and travels for about 205 Km of rhithronic zone that provides key characteristic to the river profile. River Bhagirathi passes through Gangotri, Harsil, Uttarkashi and Chinyalisaur to meet River Alaknanda at Devprayag (472 m asl). Thereafter the river is called the Ganga.

In order to determine the quality of its water for public use, recreation and other purposes, the six parameters like temperature, Dissolve oxygen, pH, free carbon dioxide, Total alkalinity

and pH were determined. The physico-chemical parameters like temperature ranges from 4 °C to 21 °C, dissolved oxygen in between 6.0 mg l⁻¹ to 13.4 mg l⁻¹, free carbon dioxide ranges from 1.1 mg l⁻¹ to 2.82 mg l⁻¹, alkalinity ranges from 7.2 mg l⁻¹ to 8.1 mg l⁻¹, pH ranges from 7.2 to 7.8.

Key words: Water quality, physico-chemical parameter, River Bhagirathi

CS09

Thermo-transport properties of antibiotic drug Minocycline Hydrochloride in water and aqueous Manitol solution at different temperatures.

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Abstract

Measurements of density (ρ), and ultrasonic velocity (u) of one of the most widely prescribed antibiotic drug Minocycline Hydrochloride (MH) have been carried for binary drug/water system and ternary drug/water/Manitol system at three different temperatures viz. 305.15K, 310.15K, and 315.15K. From these experimentally measured quantities, different parameters have been evaluated which throw light on the structural rearrangement of these solutions. The precise density results are used to evaluate the apparent molar volume, partial molar volume ϕ_v^o , partial molar expansibility ϕ_E^o , transfer volume $\Delta_{tr}\Phi_v^o$ and the Hepler's constant. The ultrasonic speed is used to measure the adiabatic compressibility, intermolecular free length (L_f), and specific acoustic impedance (Z). The structure making/breaking behavior of MH in water and aqueous Manitol system is determined on the basis of Hepler's equation. The UV spectra for MH in water and aq. Manitol system stand in support of molecular interactions between drug and Manitol.

CS10

Spectroscopic studies to examine the effect of Sodium Chloride on the interactions of Ciprofloxacin Hydrochloride with conventional surfactants

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Abstract

Interactions of ciprofloxacin hydrochloride (CF) with sodium dodecyl sulfate (SDS) and hexadecyl trimethylammonium bromide (HTAB) have been studied in aqueous as well as in aqueous NaCl medium by using spectroscopic techniques. The UV-visible spectra of CF have been recorded as a function of surfactant concentration ranging from pre-micellar region to post-micellar region in aqueous medium as well as in the presence of 10 mM NaCl solution. UV-visible studies were used to calculate partition coefficient (K_x), binding constant (K_b), free energy of partition ((ΔG_x^0)) and free energy of binding ((ΔG_b^0)) in the post-micellar region. The presence of NaCl increases the binding of CF to both the surfactant micelles. This leads to enhancement of hydrophobic interactions for both the surfactants and thus CF supported ionic micelle formation is much favored in the presence of NaCl. Proton NMR studies have been performed in aqueous and NaCl solution to determine the locus of solubilization of CF within micelle

CS11

Polymeric compound (chitosan derivative) study of Anticholesterol properties

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Abstract

A study of polymeric compound with anticholesterol properties, for treating cardiovascular disease was done. Functionalization of chitosan (CHI) with biocompatible amino acid, methionine (MET) was through using a 1 : 1 ratio of CHI and MET, in acidified medium at RT followed by 72 h. Functionalized chitosan (FCHI) formed by removal of water and Sulphonated functionalized chitosan (SFCHI) formed by homogenous sulphonation of FCHI confirmed through FTIR and further characterized by SEM and DLS for their morphological and particle size respectively. The amide bond stretching frequency was appeared for FCHI, respectively absent or with low intensity in CHI elucidating development of amide bond between $-NH_2$ of

CHI and –COOH of MET via condensation. A strong stretching of sulphur in SFCHI was appeared, confirms sulphonation. FCHI and SFCHI illustrated different surface morphology from CHI. SFCHI has functionality which assistances to give anticholesterol properties for their impending use in cardiovascular disease. Effects of CHI, FCHI and SFCHI were tested by anticholesterol test.

Keywords: Chitosan; Methionine; Sulphonation; Anticholesterol.

CS12

Special effect of 1-butyl-3-methylimidazolium bromide on the extraction of bioactive compounds from Pinus species by using microwave

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Abstract

Several plants contain bio-active compounds, but the quality and safety related problems of extraction of bio-active compounds have been a challenging task for the researchers. Various organic solvents are used for extraction but due to their high volatility and toxic nature they have hazardous effects. Nowadays a new types of solvents called designer solvents or ionic liquids are used for extraction purposes. Ionic liquids are the combination of organic cation and inorganic anion. An ionic liquid based Microwave assisted approach for the extraction and determination of bio-active compounds will be developed. Microwave assisted extraction (MAE) is a latest method due to its reduced solvent consumption and less extraction time. It is one of the main trends of green chemistry. 1-butyl-3-methylimidazolium bromide was synthesized conventionally as well as by microwave assisted approach and comparison was done. This ionic liquid was assessed for extraction efficiency and conventional method was also used for extraction of bioactive compounds from Pinus species.

Innovative Cellulose Derivatives for As(V) and Fe(III) Removal From Aqueous Environment

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Impurity of ground water with arsenic and iron is a serious problem in the entire world. A vital necessities is to develop an extremely operative and predominantly capable sorbent material for the removal of heavy metals simultaneously in both arsenic and iron from the contaminated water. But in natural water As(V) and Fe(III) are present in a non-ionic form which causes a excessive challenge to eliminate at a moderately low concentration. In this context the green thiolated cellulose with a high density of strong arsenic chelating ($-SH$) groups have been developed via thiourea reagent under radiation conditions and have been active for the removal of As(V) and Fe(III). The sorption study supported sorption at 100ppm for As(V) and Fe(III) via the thioimer, respectively. The synthesized cellulose thioimer even proved efficient in sorption of As(V) at 50ppm and purified water below the WHO mentioned revealing limit. The As(V) and Fe(III) sorption mechanism on the surface of thiolated cellulose has also been confirmed by UV, FTIR, SEM and EDX.

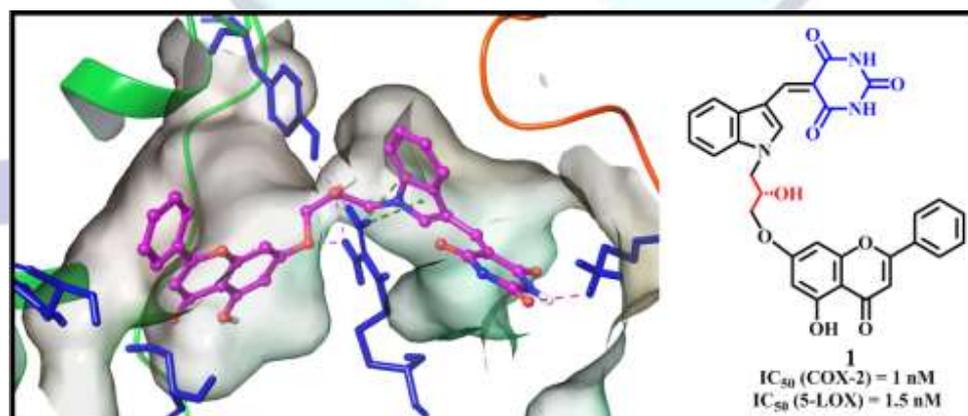
Key words : As(V) ,Thioimer, EDX and adsorption

Optimization of the indole – pyrimidine – chrysin hybrid as the lead molecule for anti-inflammatory drugs

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By using the multi-target-directed drug designing strategy, a highly promising anti-inflammatory agent capable to inhibit cyclooxygenase-2 (COX-2) and lipoxygenase (5-LOX) enzymes of arachidonic acid metabolic pathway is developed. The strategic design of the molecules; linking together indole, chrysin and barbituric acid (pharmacophores of different medicinal agents) through propanol and methine moieties, was based on the results of molecular docking and molecular dynamics studies. The title compound **1** exhibited IC_{50} 1 nM and 1.5 nM for COX-2 and 5-LOX, respectively. The results of UV-vis spectral studies and isothermal titration calorimetry experiments indicated appreciable interactions of the compound with these two cellular targets. Further, the in-vivo investigations on Swiss Albino mice using capsaicin induced paw lickings and dextran induced inflammation models showed that these compounds possess appreciable analgesic and anti-inflammatory activities. The details of all the experiments including those in support of mode of action of the compound with its cellular targets will be presented.



Rational Design, Synthesis and working of a Tri-ligating Receptor: Removal of Cyanide from Cytochrome c Oxidase

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Abstract

Cyanide, one of the most toxic anions, when exceeds its permissible level of 1.9 μM results in inhibition of mitochondrial electron transport chain (ETC), thus causes the blockage of cellular respiration. Although many methods for detecting cyanide anion have been proposed, only two cyanide receptors- hydroxocobalamin and nitrile/thiosulfate, have been practically applied as antidotes for cyanide poisoning. A compound containing syringaldehyde and oxindole (chart 1) was designed and synthesized. The structure of the compound was elucidated with the help of various 1D and 2D NMR experiments which confirmed the *E*-configuration at the olefinic groups of part A and part B, and *Z*-configuration at olefinic group of fragment C (Figure 1a). The compound was evaluated for its ability to bind with cyanide using UV-vis spectroscopy. The enzyme immunoassay confirmed the capability of the compound to free cytochrome c oxidase (cellular target of cyanide) from cyanide by forming complex with CN^- (Figure 1b). The rationale for the design of the molecule, its synthesis, response to CN^- and removal of cyanide from the aqueous medium as well as bonded to Cyt c will be presented.

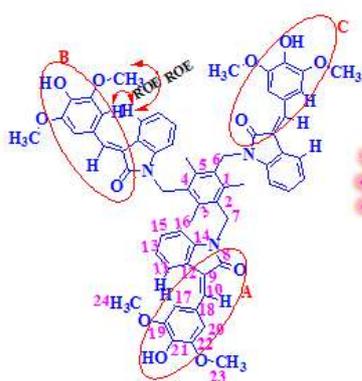


Figure 1a

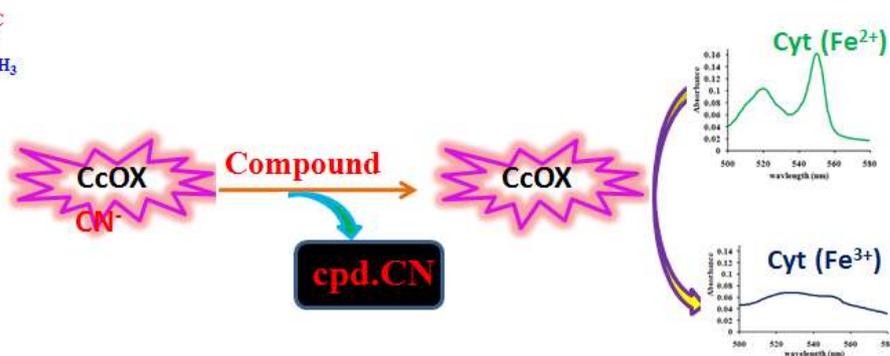


Figure 1b

Chart 1

One-pot synthesis and antiproliferative activity studies of some new pyrazolyl-dibenzo[*b,e*][1,4]diazepinones

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Abstract

A one-pot, three-component synthesis of some new 11-[5-(chloro/Ar-(oxy/sulfanyl)-pyrazolyl)-dibenzo[*b,e*][1,4]diazepinones has been demonstrated, by the reaction of 5-pyrazolone-4-carbaldehyde with cyclic diketones and aromatic diamines, catalyzed by indium chloride, in acetonitrile at room temperature. The method is highly efficient, and allows all desired products to access in high yields with an excellent purity requiring a simple and easy workup. All heterocycles are characterized by IR, ¹H NMR, and ¹³C NMR spectral data, including the single crystal X-ray diffraction study of compound 16b. Many of these heterocycles revealed a good anti-proliferative activity, when they were screened against a panel of six representative human solid tumour cell lines.

Polyvinylpyrrolidone Capped Bis(4-Methylpiperazine- 1-Carbodithioic Acid) Zinc(II)

Acetate: A New Nano-Coordination Complex for Biological Applications

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Abstract

A New polyvinylpyrrolidone capped nano coordination complex $[\text{Zn}(4\text{-MPipzcdtH})_2](\text{CH}_3\text{COO})_2 \cdot 2\text{PVP}$ (4-MPipzcdtH = 4-methylpiperazine-1-carbodithioic acid and PVP = Polyvinylpyrrolidone) has been obtained by simple chemical route in methanol - toluene medium. It was further characterized by EDAX, DLS, TEM, XRD, NMR, FTIR and UV-visible studies. Particle size observed from DLS, TEM and XRD was in the range 10-53 nm. TG showed single step decomposition corresponding to 81 % weight loss and 19 % as final residue due to zinc oxide. UV-visible spectrum gave sharp peak at 258 nm. Formation of nano $[\text{Zn}(4\text{-MPipzcdtH})_2](\text{CH}_3\text{COO})_2 \cdot 2\text{PVP}$ was evident from FTIR and ^1H NMR spectra. Antibacterial activity was checked against *Staphylococcus epidermidis* and *Klebsiella pneumoniae* and MIC was found to be 50 $\mu\text{g/ml}$. Lipsase activity against steapsin lipase decreased from 31.83 to 5.18 $\mu\text{mol/ml/min}$ in concentration range 1-7 mg. As synthesized nano coordination complex was tested at 0.1 % and 0.05 % concentrations against *M. perniciosa* affecting *Agaricus bisporus* and exhibited potential antifungal activity.

CS18

Physico-chemical and spectroscopic studies of polyhydroxy solute in CTAB(aq) solutions

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Abstract:

To investigate the molecular interactions of polyhydroxy solutes with cetyltrimethylammonium bromide (CTAB) surfactant, we have measured the densities and viscosities of (+)-D-xylose, xylitol, (-)-L-sorbose, D-sorbitol, (+)-D-glucose, (+)-D-maltose in $(4.0 \text{ to } 12.0) \cdot 10^{-4} \text{ mol} \cdot \text{kg}^{-1}$ CTAB_(aq) solutions at (298.15, 308.15 and 318.15) K. The density data have been utilized to evaluate partial molar volumes (V_2°) and their transfer ($\Delta_t V_2^\circ$) values at infinite-dilution. The viscosity data were analysed using the Jones-Dole equation and further used to calculate the viscosity *B*-coefficients and transfer *B*-coefficients, $\Delta_t B$. The kosmotropic/chaotropic behavior of the polyhydroxy solutes were analysed using the signs and magnitude of $(\partial^2 V_2^\circ / \partial T^2)_P$ and

dB/dT coefficients. It has been observed that the positive $\Delta_t V_2^\circ$ and $\Delta_t B$ values increase with increasing CTAB concentration. 1H NMR spectroscopic studies for polyhydroxy solutes were also carried out in $m_B = (4.0 \text{ to } 12.0) \cdot 10^{-4} \text{ mol}\cdot\text{kg}^{-1}$ CTAB solutions. 1H NMR spectroscopic results show more downfield shift in ternary (polyhydroxy solute + CTAB + 9:1 (w/w) H_2O + D_2O) solutions than in pure CTAB solution, thereby suggesting the predominance of hydrophilic-ionic interactions over hydrophobic-ionic interactions.

CS19

Green and expeditious one-pot synthesis of bioactive 3, 4-dihydropyrimidin-2(1H)-one derivatives using non-commercial β -ketoesters via the Biginelli reaction.

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Abstract:

Dihydropyrimidinones (DHPMs) are important class of heterocyclic compounds due to their biological importance. In this series, we report a greener approach for the synthesis of biologically active 3, 4-dihydropyrimidin-2(1H)-one derivatives via one pot Multicomponent reaction. In the presence of Ceric Ammonium Nitrate (CAN) as Catalyst, we received a good amount of yield from the Heterocyclic aldehyde, 2-moles of 1, 3-dione derivatives and urea/thiourea at ambient temperature and shorter time. All compounds were evaluated for their microbial studies. The X-ray structures of some compounds were studied.

CS20

Synthesis of 4H - chromene derivatives of 2-(4-substituted) phenyl-N-allyl-indole and their biological evaluation

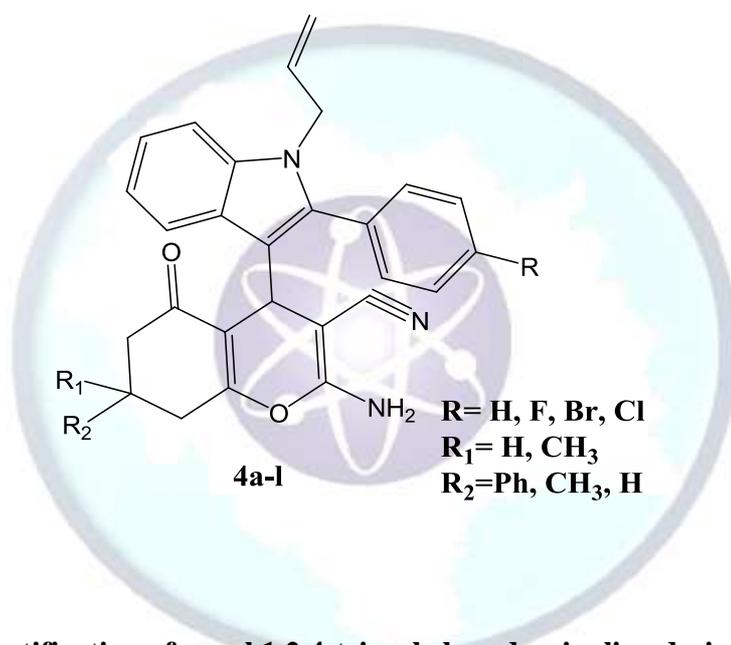
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Abstract

A new series of indole-based 4*H* - chromene derivatives **4a-l** has been synthesized by one pot cyclocondensation reaction of 2-(4-substituted)-phenyl-*N*-allyl-indole-3-carbaldehydes **1a-d**; active methylene malononitrile **2**; and different Michael donors **3a-c** in absolute ethanol. Easy experimental procedure of the reaction leads to excellent yield of chromene derivatives. All the compounds were screened against a representative panel of bacteria and fungi. Some of the compounds are found to be equipotent or more potent than that of standard drugs.



CS21

Synthesis and identification of novel 1,2,4-triazole based quinoline derivatives as a new class of antimicrobial and antituberculosis agent.

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Abstract:

A new series of 1,2,4-triazole based quinoline derivative **8(a-l)**, has been synthesized by chloro amine coupling reaction using K₂CO₃ as a catalyst. The imperative features of this method are easy experimental procedure, high yield, reduce reaction time. The identity of all the compounds

has been established by ^1H NMR, ^{13}C NMR, FTIR and elemental analysis. The synthesized compounds were evaluated for their antibacterial, antifungal and antitubercular activities.

CS22

A Review On Uses Of Nanocapsules In Drug Delivery

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Abstract

Advances in the field of nanotechnology have given push to various fields including the field of drug and medicines. Antimicrobial nanomaterials and drug carrier nanomaterials were actively explored in the field of drug and medicines. To deliver a drug at sustained or controlled rate to the specific site of action always has been the major challenge for drug delivery. The use of nanocapsules has proven useful to meet this challenge. Various synthetic techniques involved in the synthesis of nanocapsules have been discussed. The use of prepared nanocapsules to load different types of drugs has also been reviewed. It was found that on utilizing nanocapsules the release mechanism can be controlled for any of delayed release, immediate release, extended release modified release, or targeted release.

Keywords: Nanocapsules, polymer, drug delivery, targeted release.

CS23

Synthesis and Electrical Conductance Studies of 2,4-Dihydroxybyphenyl-Ethylenediamine-Formaldehyde Copolymer

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Abstract

Copolymers were synthesized by condensation of 2,4-dihydroxybiphenyl and ethylenediamine with formaldehyde in the presence of 2 M HCl as catalyst with varied molar ratios of reacting monomers. The electrical properties of 2,4-DBEF-I, 2,4-DBEF -II, 2,4-DBEF -III and 2,4-DBEF -IV copolymers were measured over a wide range of temperature (303-423 K). From the electrical conductivity of these copolymers, activation energies of electrical conduction have been evaluated and values lies in the range $3.35 \times 10^{-20} - 6.15 \times 10^{-20}$ J/K. The plots of $\log \sigma$ vs $10^3/T$ are found to be linear over a wide range of temperature, which indicate that the Wilson's exponential law $\sigma = \sigma_0 \exp(-\Delta E/kT)$ is obeyed. On the basis of above studies, these copolymers can be ranked as semiconductors.

When a voltage is applied to a thin film of these copolymers then they have been emitted light. This remarkable property of these copolymers may be used to make a wide range of semiconducting electronic devices such as transistors, light emitting diodes, solar cells and even lasers which can be manufactured by much simpler way than conventional inorganic semiconductors.

CS24

Preparation, Characterization and Ion-Exchange Properties of 2-Hydroxyacetophenone-Melamine- Formaldehyde Copolymer Resin-IV

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Abstract

Copolymer resin 2-HAMF has been synthesized by the condensation of 2-hydroxyacetophenone and melamine with formaldehyde in 2:1:4 molar ratio in presence of 2M hydrochloric acid as catalyst. The newly synthesized copolymer resin has been characterized by UV-visible, IR and proton NMR spectral studies. The copolymer 2-HAMF proved to be a selective chelating ion exchange polymer for certain metals. Chelating ion-exchange properties of this polymer were studied for Fe^{3+} , Cu^{2+} , Ni^{2+} , Co^{2+} , Zn^{2+} , Cd^{2+} and Pb^{2+} ions. A batch

equilibrium method has been employed in the study of the selectivity of metal-ion uptake involving the measurements of the distribution of a given metal ion between the copolymer sample and a solution containing the metal ion. The study was carried out over a wide pH range and in media of various ionic strengths. The polymer showed higher selectivity for Fe^{3+} , Cu^{2+} , Ni^{2+} than for Co^{2+} , Zn^{2+} , Cd^{2+} and Pb^{2+} ions. Study of distribution ratio as a function of pH indicates that the amount of metal ion taken by resin increases with the increasing pH of the medium.

The quantitative separation of metal ions from binary Cd(II) - Pb(II) and ternary Zn(II)-Cu(II)- Ni(II) synthetic mixture were done by batch equilibrium method. The constitute of brass were also analyzed by selective sorption on column at optimized distribution coefficient values.

CS25

Investigation of Photo-catalytic Degradation of Co-doped SnO_2 Annealed at Different Temperatures.

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Abstract:- Annealing temperature plays a very crucial role in the surface morphology, optical & photocatalytic properties of Co doped SnO_2 . $\text{Sn}_{1-x}\text{Co}_x\text{O}_2$ samples have been chemically synthesized with low Co concentration ($\leq 1\%$). The X-ray diffraction (XRD), and scanning electron microscopy (SEM), are used to characterize these samples. The XRD pattern shows the tetragonal rutile structure. The crystallite size and the average particle size increases with increase in annealing temperature. The optical measurements revealed that the nanometric size of the materials influences the energy band gap values. The photo-catalytic activity of the Co-doped SnO_2 nanoparticles have been studied in the degradation of methylene blue. It shows that the cobalt doped SnO_2 nanoparticles annealed at 450°C act as a highly suitable photo catalyst.

Bi-functional CeO₂ nano-flakes: Synthesis, characterization and applications

Kuldeep Negi*, M.S. Chauhan and Manoj Kumar

*Department of Chemistry, H.P. University, Gyan Path, Summer Hill, Shimla -5**Email: mohinderc11@gmail.com***Abstract**

Cerium oxide nanostructures (CeO₂) were synthesized using solution combustion synthesis (SCS), where fuel for the ignition in synthesis reaction was tartaric acid. Herein, we set about two distinct properties of as-synthesised nanostructures, viz. dye degradation and chemical sensing. As-synthesized CeO₂ nanostructures were characterized by using various techniques such as FTIR, FESEM, EDAX, Powdered X-Ray Diffraction (PXRD) and UV-Visible spectroscopy. Characterization results showed that as-synthesized nanostructures were pure and crystalline, having flakes like structures in nanometre range, contains only cerium and oxygen. As-synthesized nanostructure for photocatalytic degradation of Rhodamine B dye (2.08×10^{-5} M) was performed under UV irradiation, and 88% of dye was degraded in only 220 minutes. Further, as synthesized CeO₂ nanostructures were also used for the sensing of picric acid, whose limit of detection were found to be 1.46 μ M. In Short, we introduced here a material which can potentially be used in photocatalysis and chemical sensing.

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Investigation of molecular interactions between antibiotic drug Doxycycline Hyclate and Aqueous Galactitol solutions at different temperatures by Volumetric and Acoustic methods.

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Dept of Chemistry, Himachal Pradesh University, Summerhill, SHIMLA

Email ID drsklomesh@rediffmail.com and vikasnathan2@gmail.com



Abstract

The volumetric and acoustic parameters have been used to study the behaviour of antibiotic drug Doxycycline Hyclate (DH) in aqueous Galactitol solutions at different temperatures. The volumetric and acoustic methods were used to investigate the molecular interactions in Doxycycline Hyclate-water system and Doxycycline Hyclate - water-Galactitol system. The Density (ρ) and ultrasonic velocity (u) of Doxycycline Hyclate in water and in (0.1, 0.2 and 0.4) mol·kg⁻¹ aqueous solutions of galactitol have been measured at (305.15, 310.15 and 315.15 K) temperatures and atmospheric pressure. The density data was analysed with the help of Masson's equation. The positive value of (Φ_v^0) for DH indicates solute-solvent interactions. The solute-solute interactions are determined from S_v values in water galactitol system at different temperatures. The ultrasonic velocity of DH in water and water-galactitol system were used to determine adiabatic compressibility (β), intermolecular free length (L_f), and specific acoustic impedance (Z). The structure making/breaking behaviour of DH in water and water galactitol system is determined on the basis of Hepler's equation.

Fabrication of CaO Nps/Mps by chemical route

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Abstract:

Nanoparticles are a new class of compounds having diameter less than 100 nm. These nanoparticles show various physical and chemical properties that differ markedly from those of bulk materials due to their small size. They show many applications such as pigments, cosmetics, solar cells gas sensors photocatalyst to decompose organic pollutants present in water. As well as used in treatment of cancer cells because the nanoparticles kills only the cancer cells without killing the other vegetative cells ,in this way nano medicine are superior than others therapies . They bear large surface area and pore size between 2 – 50 nm thus these features make them a good adsorbent. CaO is versatile compound because of its wide application in our study we fabricated CaO Nps / Mps using Ca(OH) as a precursor . It is further characterized by TEM SEM and XRD study in our work we found that the CaO powder fabricated by this method found to be more effective than normal CaO powder with respect to drying effect due to small size of nanosize CaO.

Key words: Nanosize CaO, TEM , XRD

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Comparative study of Thermally stable fluorescence polyamides Consuming Coumarin in its Backbone

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Abstract: A series of thermally stable polyamides have been synthesized consuming heterocyclic ring named as coumarin by well-known polycondensation reaction. Ten polyamides were synthesized taking different aliphatic-aromatic diols in the chain having s-triazine ring as

main moiety. The polyamides were synthesized by polycondensation of 6-(N-Piperidiny)-2,4-bis-(7-Hydroxy-Coumarin-3-carbonyl Chloride)-1,3,5-triazine [PCCT] and 6-(N-Morpholino)-2,4-bis-(7-Hydroxy-Coumarin-3-carbonyl Chloride)-1,3,5-triazine [MCCT] with aromatic diamines. The color and solubility of synthesized polyamides were observed in different solvents. It was interesting to study the effect of different solvents (ethanol, methanol, CCl₄, hexane) for the series of polyamides based on coumarin because they are sensitive in different environment. The polyamides show inherent viscosity ranging from 0.402- 0.709 dl g⁻¹ in DMF at 25°C. The synthesized polyamides were characterized by 1H-NMR, FT-IR, TGA, DSC and fluorescence spectra. From the well-known methods, it is found that fluorescence is very simple and non-destructive technique, very sensitive, selective and specific as well as coumarin molecules are fluorescent and they show different absorption and emission spectra at different temperature. The thermal stability of the sample PHA-2 showed it degrades slowly and total 85% weight loss at 600°C. The fluorescence spectrum of PHA-5 indicates broadened emission range between 190-520nm and peak was recorded at 295nm. The measured data indicated that synthesized aromatic fluorescent polyamides were used in various fields as smart polymer machines, fluorescent chemo sensor, fluorescent molecular thermometers, fluorescent imaging and many more.

Key Words: polyamides, s-Triazine, diamines, fluorescence.

CS30

Him Science Congress Association
**Preparation Of Organometallic Compounds By Solid-Solid Interaction Between Nickel
And Sodium Salts Of Saccharides.**

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Abstract

Co-ordination behaviour of Ni in +2 oxidation state was studied by taking sodium salts of saccharides as ligands. As a results of solid-solid reaction, compounds of Ni²⁺ with dextrose, fructose, lactose and starch in 1:6, 1:4 and 1:1 ratio were prepared. Physical properties were studied and possible structure of compound formed suggested.

Key Words : Dextrose, Fructose, Lactose, Starch, Nickel.

CS31

Amphiphilic block copolymers micelles for drug delivery vehicles

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Abstract:

Amphiphilic block copolymers (ABCs) have been used widely in pharmaceutical applications. One of the most widely used drug delivery systems is the self assembly of ABCs carriers in micelle forms in aqueous environment. ABCs micelles have been the focus of research for the last many decades. Block copolymers have low toxicity and due to their nontoxic properties and surface-activity they have found application in the areas of biomaterials, protein separation, drug delivery and cardiovascular therapeutics and as industrially important surfactants. Research in the field has been increasingly focused on achieving enhanced stability of the micellar assembly, prolonged circulation times and controlled release of the drug for optimal targeting.

Keywords: Amphiphilic block copolymers, micelle, surfactant and cmc

Him Science Congress Association

CS32

Synthesis And Characterization Of Schiff Base Of Acetyl Hydrezone Derivatives Of Resorcin[4]Arene

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Abstract

In the present era, many research groups are attracted towards supramolecular chemistry because of its wide application.¹ Supramolecular chemistry is famous as host and guest chemistry. Resorcin[4]arene are important class of supramolecular chemistry, because of eight hydroxyl

group are present at upper rim of molecule, which act as best active site for substituting of different functional groups.²

Here we report the synthesis and characterization of acetylhydrazone derivative of resorcin[4]arene. The targeted compounds were purified by column chromatography and characterized using ¹H-NMR, Mass and IR spectroscopy. The synthesised resorcin[4]arene derivatives prefer the rccc boat conformation. Antimicrobial activities are investigated for the targeted compounds and the results show good to moderate activity as compare to standard drugs.

1. Martinez et al, Fullerene Sci. Technol., 2000, **8**, 475.
2. Reinhoudt et al, Tetrahedron, 1996, **52**, 2663.

CS33

A prospective material for gas sensing: Nanostructured BN/SnO₂ composite

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Abstract: In recent years, researchers focus their attention for development a cost effective material for lithium batteries, sensing and catalysis field has become a major area of interest for researchers. This paper report synthesis of BN/SnO₂ nanocomposite using a facile reflux method. SnO₂ nanoparticles are incorporated into as synthesized BN sheets in order to prevent aggregation. Due to high electrical conductivity, high optical transparency and chemical sensitivity, metal oxide SnO₂ become a significant candidate in this composite for gas sensing application.

Keywords: BN/SnO₂, reflux method.

Fabrication of tragacanth gum based nanogel for controlled release of ampicillin

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Abstract

In this work, maleic acid (MA) monomer was grafted onto tragacanth gum (TG) in the presence of N, N¹-methylene-bis-acrylamide (MBA) and potassium persulphate as cross linker and initiator, respectively at prominent reaction conditions using microwave radiations. The nanogel was characterized by Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM) etc. Morphological difference was observed using Scanning electron microscopy. FTIR results established the grafting of maleic acid onto tragacanth gum backbone. TEM analysis revealed the nano size of the hydrogel. XRD technique predicted the partial crystalline nature of the nanogel. The nanogel was used for controlled release of ampicillin. The release study of the drug was investigated in buffer solution of varying pH values (2.2, 7.4, 9.4 and distilled water). The results indicated the higher drug release at pH 2.2 with Non- fickian diffusion mechanism. Tragacanth gum-g-poly (maleic acid) nanogel was also studied for their antibacterial activity against *E.Coli*.

Keywords: Gum tragacanth, maleic acid, antimicrobial, targeted drug release

Synthesis, characterization of gelatin-Zr(IV) phosphate composite ion exchanger : Separation of heavy metal ions

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Abstract

Gelatin-Zr(IV) phosphate composite (GT/ZPC) was synthesized by sol-gel method. The composite was characterised by different techniques viz. Fourier transform infrared spectroscopy (FTIR), thermogravimetric analysis (TGA), X-ray powdered diffraction (XRD), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The ion exchange capacity (IEC) of GT/ZPC was observed better (1.04 meq g^{-1}) than its inorganic counterpart (0.64 meq g^{-1}). The pH studies revealed the monofunctional nature of material with one inflection point. The distribution studies confirmed the highly selective of materials for Cd^{2+} . The environmental applicability of GT/ZPC has been investigated for binary separations of metal ions using column method. Cd^{2+} was effectively removed from synthetic mixtures of metal ions (Zn^{2+} , Pb^{2+} , Ni^{2+} , Co^{2+} and Cu^{2+}).

Keyword: Gelatin, nanocomposite, ion exchanger, distribution coefficient, metal ions.

CS36

Enhanced photocatalytic degradation of polyromantic pollutants under solar irradiations by mesoporous carbon/ ZnFe_2O_4 nanocomposite

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Abstract

In present work, we elucidates the photo degradation of noxious naphthalene (NPH) and 2-naphthol (2-NPH) from aqueous phase under solar irradiations. The carbon/ ZnFe_2O_4 (C/ZF) nanocomposite was synthesized by co-precipitation technique. The various instrumental techniques have been used to study the chemical composition and morphology of nanocomposite. The XRD, HRTEM and SAED results showed the nano-crystalline structure of AC/ZF composite. The results were studied using high resolution mass spectrometry (HRMS) and UV-visible spectrophotometry. The higher degradation rate of 88.41% and 94.81% were recorded for NPH and 2-NPH by AC/ZF nanocomposite under coupled adsorption-

photocatalysis (A/P). The admirable photocatalytic degradation of pollutants were mainly ensued due to mesoporous nature of nanocomposite and strongly improved charge separation efficiency of AC/ZF over ZF nanoparticles. Thus, our findings might exposed a novel, cost-effective and efficient photoactive material for the photo-degradation of aromatic pollutants from aqueous system.

CS37

Guar gum-poly(itaconic acid) Based Conducting Superabsorbents for High Performance Applications

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Abstract

Guar gum-based conducting hydrogels possessing biodegradability and antibacterial activity were developed by two-step free-radical aqueous polymerization method. Conductivity was introduced with polyaniline (PANI) chains incorporated within the crosslinked network of Guar-gum-poly(itaconic acid) superabsorbent. The material properties of the synthesized samples were characterized using FTIR spectroscopy, thermal analysis and scanning electron microscopy techniques. Results showed that synthesized samples exhibited the best antibacterial activity against Gram-positive bacteria. Synthesized samples were found to be effective in removal of toxic methylene blue (MB) dye from waste water. The adsorption kinetics of biodegradable superabsorbents has been described by using pseudo first and pseudo second order kinetics models. Furthermore, application of hydrogels to improve the water retention properties of different soils was studied for agricultural purpose.

Keywords: Guar gum, Conducting adsorbents, PANI, MB adsorption, Antibacterial activity, biodegradation.

CS38

Gg-ZnSe-WO₃ nano-junction for degradation of endocrine disruptor via adsorption, catalysis and ozonation

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Abstract:

Development of novel nano-heterojunctions with high efficiency has been in progress for for removal of organic contaminants from waste water. Herein we report synthesis of ZnSe-WO₃ nano-hetero-assembly stacked on Gum Ghatti (ZWG) for degradation of endocrine disruptor bisphenol A. We achieve a Z-scheme photocatalyst with a higher charge flow and visible absorption. A symbiose of adsorption and photoatalysis has been studied with effect of adsorption in photo-degradation process. The hetero-assembly has a high surface area, stability and reduced carrier recombination. The results have been analyzed by scavenger effect, mass spectrometry, kinetics and total organic carbon (TOC) analysis. Degradation pathway has also been predicted.

CS39

Surface modification of cellulose fibre

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Abstract

In this paper morphological transformation of cotton fibre by grafting co-polymerization with methyl methacrylate(MMA) using ceric ammonium nitrate(CAN) and nitric acid(HNO₃) as an initiator, under optimized reaction condition. Graft co-polymerization by this monomer to characterized by using x-ray powder diffraction(XRD),thermo-gravimetric analysis(TGA),differential gravimetric analysis(DTA),scanning electron microscopy(SEM) and fourier transformer infra red spectroscopy(FTIR) technique and compare with their percentage grafting. The fibre was found to undergo morphological transformation on grafting that affected its properties.

Keywords: Graft copolymerization, Monomer, Initiator, Cotton fibre.

CS40

**Polyvinylpyrrolidone Capped Bis(4-Methylpiperazine- 1-Carbodithioic Acid) Zinc(II)
Acetate: A New Nano-Coordination Complex for Biological Applications**

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Abstract

A New polyvinylpyrrolidone capped nano coordination complex [Zn(4-MPipzcdtH)₂](CH₃COO)₂.2PVP (4-MPipzcdtH = 4-methylpiperazine-1-carbodithioic acid and PVP = Polyvinylpyrrolidone) has been obtained by simple chemical route in methanol - toluene medium. It was further characterized by EDAX, DLS, TEM, XRD, NMR, FTIR and UV-visible studies. Particle size observed from DLS, TEM and XRD was in the range 10-53 nm. TG showed single step decomposition corresponding to 81 % weight loss and 19 % as final residue due to zinc oxide. UV-visible spectrum gave sharp peak at 258 nm. Formation of nano [Zn(4-MPipzcdtH)₂](CH₃COO)₂.2PVP was evident from FTIR and ¹H NMR spectra. Antibacterial activity was checked against *Staphylococcus epidermidis* and *Klebsiella pneumoniae* and MIC was found to be 50 µg/ml. Lipsase activity against steapsin lipase decreased from 31.83 to 5.18 µmol/ml/min in concentration range 1-7 mg. As synthesized nano coordination complex was

tested at 0.1 % and 0.05 % concentrations against *M. pernicioso* affecting *Agaricus bisporus* and exhibited potential antifungal activity.

CS41

Studies on Ion Association and Solvent Interaction- Conductance of Glycine and Diglycine in Water and in Aqueous Solutions of Citric acid at Different Temperatures

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Abstract

The conductance of glycine and diglycine has been measured in the concentration range of (0.01-0.12) mol kg⁻¹ in aqueous and aqueous binary mixtures containing citric acid (0.1 mol kg⁻¹) at different temperatures (298.15-313.15 K). The conductance data in all cases have been computed by Shedlovsky equation to obtain Λ_0m and K_A . Based upon the composition dependence of Walden product, the influence of the citric acid on the solvation of ions has been discussed. The values of the association constants, K_A , are used to obtain various thermodynamic parameters for the association process in the solution.

CS42

Photocatalytic reduction of CO₂ into fuels by novel carbon based nano-heterojunction

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Abstract

In this work we report designing of a novel carbon based metal free photocatayst for reduction of CO₂ into fuels. Herein we synthesize waste derived biochar supported grapheme oxide and carbon nitride nano assembly for the photocatalytic reduction of gaseous CO₂ into methane, oxygen and Carbon monoxide. We achieve a high reduction of CO₂ with highest evolution of O₂ followed by CO and CH₄. The concentration of gases was measured through a gas chromatograph equipped to a stainless steel ga reactor. Due to the flow of charge carriers from the CB of C₃N₄ to the Fermi level of GO the recombination is stopped with higher photoactivity. In addition due to affinity of char for CO₂ the facilitation of reduction occurs.

CS43

Fabrication, Characterization and Applications of Novel Trimetallic Nanocomposite

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Abstract:

Greener microwave method has been explored for fabrication of trimetallic nanocomposite. The morphological analysis of trimetallic nanocomposite was performed using Fourier transform infrared spectroscopy, X-ray diffraction, scanning electron microscopy and transmission electron microscopy. The band gap of synthesized trimetallic nanocomposite was investigated using UV–visible spectroscopy.

The adsorptional/photocatalytic activity of the trimetallic nanocomposite was studied for the removal of a organic pollutants under solar light irradiation. The investigation revealed that the trimetallic nanocomposite behaves differently under both conditions i.e., adsorption and

photocatalysis. The trimetallic nanocomposite effectively inhibits the growth of *E. Coli* and *Pseudomonas* bacteria.

Keywords: Trimetallic nanoparticles, Nanocomposite, Pollutants, Antimicrobial activity

CS44

Nanocomposite Hydrogels and their Applications

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Abstract

Nanocomposite Hydrogels are 3-dimensional structure materials having hydrophilic polymer chains. These are crosslinked to form matrices with high water retention. Including tunable physical, chemical, biological properties, high biocompatibility and versatility in fabrication, hydrogels have promising applications in several fields such as drug delivery, wound dressing, soil conditioning, antibacterial activity, tissue engineering, photocatalysis and adsorption etc. Nanocomposite hydrogels are temperature responsive and shows swelling behavior because of association and dissociation of H-bonding within polymer matrix. Swelling increases at low temperature and at high temperature they collapsed. Thus, nanocomposite hydrogels show excellent swelling at room temperature. Swelling is responsible for dimensional change, which cause drastic change in rheological properties. The nanocomposite hydrogels with natural or synthetic origin exhibit many characteristics such as hydrophilicity, gelation, swellability, porosity, mechanical strength, biocompatibility and biodegradability. Addition of different crosslinkers between monomers form covalent bonds permanently which cause changes in configuration and introduce high stability than ionic bonds, hydrophobic forces and hydrogen bonds. Their synthesis includes synthetic reactions such as free radical polymerization, condensation polymerization, enzymatic reactions, gamma polymerization and grafting etc.

Keywords: Nanocomposite hydrogels, biocompatibility, swellability, biodegradability

Comparative study of Thermally stable fluorescence polyamides Consuming Coumarin in its Backbone

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Abstract: A series of thermally stable polyamides have been synthesized consuming heterocyclic ring named as coumarin by well-known polycondensation reaction. Ten polyamides were synthesized taking different aliphatic-aromatic diols in the chain having s-triazine ring as main moiety. The polyamides were synthesized by polycondensation of 6-(N-Piperidiny)-2,4-bis-(7-Hydroxy-Coumarin-3-carbonyl Chloride)-1,3,5-triazine [PCCT] and 6-(N-Morpholino)-2,4-bis-(7-Hydroxy-Coumarin-3-carbonyl Chloride)-1,3,5-triazine [MCCT] with aromatic diamines. The color and solubility of synthesized polyamides were observed in different solvents. It was interesting to study the effect of different solvents (ethanol, methanol, CCl₄, hexane) for the series of polyamides based on coumarin because they are sensitive in different environment. The polyamides show inherent viscosity ranging from 0.402- 0.709 dl^g⁻¹ in DMF at 25°C. The synthesized polyamides were characterized by 1H-NMR, FT-IR, TGA, DSC and fluorescence spectra. From the well-known methods, it is found that fluorescence is very simple and non-destructive technique, very sensitive, selective and specific as well as coumarin molecules are fluorescent and they show different absorption and emission spectra at different temperature. The thermal stability of the sample PHA-2 showed it degrades slowly and total 85% weight loss at 600°C. The fluorescence spectrum of PHA-5 indicates broadened emission range between 190-520nm and peak was recorded at 295nm. The measured data indicated that synthesized aromatic fluorescent polyamides were used in various fields as smart polymer machines, fluorescent chemo sensor, fluorescent molecular thermometers, fluorescent imaging and many more.

Key Words: polyamides, s-Triazine, diamines, fluorescence.

Synthesis of enantiomerically pure C_4 -symmetric tetramethoxy-resorcin[4]arene

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The chemistry of cavitands continues to be widely studied and has provided a diverse range of molecular assemblies that have been used for variety of purposes. Resorcin[4]arenes are easily prepared from resorcinol and aldehydes as three-dimensional macrocycles, which have been employed for various purposes in supramolecular chemistry. Due to the synthetic ease by which these compounds can be obtained range of derivatizing reactions have been performed on these molecular scaffolds. Although considerable effort has been made in the synthesis of inherently chiral resorcin[4]arenes, in the majority of published examples the products have been obtained as racemates, which have resolution with advanced techniques such as chiral HPLC. Thus, only relatively small amounts of optically pure materials have been available for use in other investigations.

Enantiomerically pure resorcin[4]arenes have been prepared *via* the Mannich reaction employing an excess of formaldehyde and chiral amine or α -amino alcohol to render either 1,3-oxazine or 1,3-oxazolidine derivatives. Amino acids have also been used for this purpose with great success. The inherently chiral tetramethoxy-resorcin[4]arenes are a subclass of these macrocycles first described by McIlldowie *et al.*, where asymmetry originates not from a chiral center but the topology of the nonplanar structure. Using BF_3 .etherate as a Lewis acid catalyst the reaction of 3-alkoxyphenols with aldehydes renders these tetraalkoxy-resorcin[4]arenes in generally good yields.

Due to the significance of these macrocyclic species and their potential applications we decided to try and improve on the synthetic methods for this family of compounds. We choose a variety of aldehydes to ensure that the method was widely applicable. In the process we created a novel set of tetramethoxy-resorcin[4]arene carbamate derivatives.¹

1. H. M. Parekh *et al.*, *Eur. J. Org. Chem.*, **2014**, 4600-4609.

C- H Activation Of 1, 4- Dione And Ethyl Benzene Over Robust And Magnetically Recoverable Fe₃O₄ Nanoparticles

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Abstract: Heterogeneous catalysis was environmentally benign, economical, practical, and efficient processes for catalyst separation and reuse purpose. Since heterogeneous catalysis have been very important in the chemical community as a part of economic, safety, and environmental point of view. In recent years, Fe₃O₄ nanoparticles (magnetite nanoparticle) have attracted the attention of researchers. Here we were developed an efficient methodology for the C-H activation of 1,4-diones and ethyl benzene for the synthesis of 3-phenethyl-2,4-diones. The reaction conditions were optimized for maximum yield (86 %) of 3-phenethyl-2,4-diones. The generality of the protocol was examined using several substituted 1,4-diones and ethyl benzene derivatives. Here the developed protocol was sustainable for the synthesis of 3-phenethyl-2,4-diones derivatives. The strategy of magnetic separation is typically more effective than filtration or centrifugation. Magnetic separation of the catalyst is simple, economical and promising for industrial applications.

Key words: Fe₃O₄ nanoparticles, heterogeneous catalyst, C-H activation, 3-phenethyl-2,4-diones, green approach.

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Development of Surrogate Approaches for the Synthesis of β-Carboline Based Molecular Hybrids and Natural Product Mimics

Virender Singh

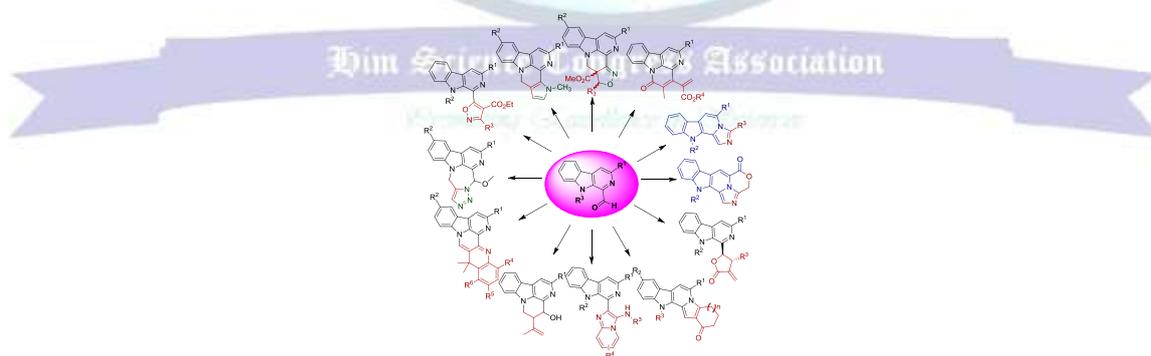
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β-Carboline containing alkaloids are ubiquitously present in nature including plants, marine organisms, insects, mammals including human tissues and body fluids. These alkaloids

are constitutionally a large group of indole alkaloids with different level of aromaticity. This class of alkaloids is especially known to intercalate with DNA and display activities against cancer, CNS and infectious disorders. Owing to their immense significance, synthesis of a variety of β -carboline derivatives has been a subject of intense research. Out of several subclasses of β -carboline-based alkaloids, one subclass contains additional D-ring. For example canthine, canthin-6-one, tuboflavin, maxomine, arborescidine and so on. Though there exist several elegant strategies for the synthesis of this molecular framework, we have developed a surrogate approach for the Diversity-oriented synthesis of this skeleton. It was envisaged that 1-formyl-9H- β -carboline (an alkaloid (Kumujian C) isolated from picrasama quassoids) may serve as a universal precursor for obtaining β -carboline-derivatives containing D-ring.

In this context, we have engineered an efficient, scalable and economic approach for obtaining 1-formyl-9H- β -carbolines. This precursor has been demonstrated to be a useful substrate for the synthesis of highly functionalized canthinone and canthine derivatives using the Morita-Baylis-Hillman reaction. This chemistry has been extended to develop a facile synthesis of harmicine and homofascaplysin mimics and β -carboline-fused isoxazoles, isoxazoline, pyrrole and triazole derivatives. In another approach decarboxylative oxidation and oxidative amination were explored for the synthesis of β -carboline-fused imidazole derivatives. Also GBB MCR was explored for the DOS of β -carboline C- and C-3 tethered imidazopyridine derivatives. The results of these studies shall be presented and discussed.



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Adv. Synth. Catal. **2017**, *359*, 1-15; (f) Devi, N.; Singh, D.; Kaur, G.; Mor, S.; Malakar, C. C.; Singh, V. *New Journal of Chemistry*, **2017**, *41*, 1082-1093; (g) Singh, D.; Devi, N.; Kumar, V.; Malakar, C. C.; Mehra, S.; Rawal, R. K.; Kaith, B. S.; Singh, V. *RSC Adv.* **2016**, *2016*, *6*, 88066-88076.

CS49

**The outlook of zeolite-Y entrapped transition metal complexes as heterogeneous catalysts:
synthesis, spectral and catalytic aspects**

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Abstract

Transition metal [M = VO (IV) and/or Cu (II)] complexes with Schiff base ligand, (Z)-2-((2-hydroxybenzylideneamino)phenol (H₂L) have been entrapped in the super cages of zeolite-Y by Flexible Ligand Method. Synthesized materials have been characterized by preferential physico-chemical techniques such as inductively coupled plasma optical emission spectrometry (ICP-OES), elemental analyses (CHN), fourier transmission infrared spectroscopy (FTIR), electronic and UV-reflectance spectra, Brunauer-Emmett-Teller (BET) surface area measurements, scanning electron micrographs (SEMs), X-ray diffraction patterns (XRD) and thermogravimetric analysis (TGA). The catalytic competence of zeolite-Y entrapped transition metal complexes was examined in Baeyer-Villiger (BV) oxidation of cyclopentanone using 30% H₂O₂ as an oxidant beside neat complexes to check the aptitude of heterogeneous catalysis over the homogeneous system. The effect of experimental variables such as mole ratio of substrate to an oxidant, amount of catalyst, reaction time, varying oxidants and solvents on the conversion of cyclopentanone was also tested. Under the optimized reaction conditions, one of the zeolite-Y entrapped transition metal complex viz. [VO(L)H₂O]-Y [where L = (Z)-2-((2-hydroxybenzylideneamino)phenol)] was found to be a potential contender by providing 80.22% conversion of cyclopentanone, and the selectivity towards δ -valerolactone was 83.56%.

DNA Binding and *In Vitro* Cytotoxicity Studies of Newly Synthesized Oxidovanadium(IV) Complexes of Nitro Substituted Benzohydroxamate ligands as Prospective Vanadodrug Compounds

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Abstract

There has been considerable research interest in the design of new bioactive molecules which can interact with DNA through recognition, binding, modification, cleavage and cross-linking finding potential as DNA-targeted drugs. In this context, the oxidovanadium (IV) complexes of composition $[\text{VO}(\text{HL}^{1,2})_2]$ (I and II) (where $\text{HL}^1 = 3\text{-NO}_2\text{C}_6\text{H}_4\text{CONHO}$] and $\text{HL}^2 = 3,5\text{-(NO}_2)_2\text{C}_6\text{H}_3\text{CONHO}$) have been synthesized by the reactions of $\text{VOSO}_4 \cdot 5\text{H}_2\text{O}$ with bimolar amounts of potassium 3-nitrobenzohydroxamate (KHL^1) and 3,5-dinitrobenzohydroxamate (KHL^2) in aqueous methanolic medium, characterized by elemental analyses, molar conductivity, molecular weight determination, magnetic measurements, IR, UV-VIS and mass spectral techniques. The bonding of hydroxamate ligands through carbonyl and hydroxamic oxygens (O,O coordination), mononuclearity and distorted square-pyramidal geometry around vanadium has been deduced. The binding of complexes I and II with calf thymus (ctDNA) studied by UV-Vis spectroscopy has shown hypochromism and small red (bathochromic) and blue (hypsochromic) shifts respectively relative to respective free complex ascribed to intercalative mode involving their stacking interactions with DNA base pairs. The different behaviour of II from I is indicative of the fact that binding of bulky ligand (HL^2) offers a conformation that hampers its interaction with DNA. The intrinsic binding constants (K_b) calculated by Benesi-Hildebrand equation of varied magnitude 1.8×10^4 and $7.8 \times 10^{-1} \text{ mol}^{-1}$ for I and II respectively are suggestive of efficient DNA binding with I. The *in vitro* cytotoxicity of complexes studied on L20 mammalian transformed cell line by MTT assay has also shown complex I to be more cytotoxic (less % cell viability) establishing thereby I to be plausible better vanadodrug compound than II.

UV absorption, Mechanical and Optical Behavior of Zinc Oxide Containing Poly (vinyl alcohol - g – acrylonitrile) Nanocomposites films**Shikha Chouhan* A.K. Bajpai & Ravi Katare***Bose Memorial Research Laboratory, Department of Chemistry, Govt. Autonomous Science College, Jabalpur 482001, India**Email: shikhachouhan90@gmail.com***Abstract**

UV absorption, mechanical and optical properties of PVA-g-PAN/ZnO nanocomposite films prepared by free radical graft copolymerization of acrylonitrile on to PVA and subsequent in situ precipitation of ZnO nanoparticles into the polymer matrix are reported in this abstract. The nanocomposites were characterized by various analytical methods such as FTIR, Raman spectroscopy, DSC, SEM and AFM etc. The size of the crystallites and extent of crystallinity were ascertained by XRD analysis. The SEM with EDX showed that the ZnO nanoparticles were uniformly dispersed within the host co-polymer matrix. TEM results clearly indicated that the size of zinc oxide nanoparticles varied in the range 10–30 nm. The UV-absorption properties of so prepared films were also studied using UV-visible absorption spectroscopy. UV absorption, transmittance and reflection spectra of nanocomposites suggest that small amounts of ZnO in the composite films are get high UV shielding above 95% UV absorption, 4% reflection and only 1% transmittance. The results reveal an excellent UV absorption at around 380 nm by nanocomposite films. These results supported to prepared nanocomposite film may be useful for UV protecting devices for defense, high altitude places, UV protecting crème for skin and other possible applications also. PL measurements reveal the existence of defects in the synthesized nanocomposites films.

Keywords: Nanocomposites; Polymers; UV absorption; X-ray, ZnO, Nanocomposites

A study on Molar Conductance of Oxalic Acid and its Salts in Binary Aqueous Mixtures of Dioxane at different temperatures.

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Abstract

Molar conductance of oxalic acid and its salts viz. ammonium oxalate, sodium oxalate and potassium oxalate in binary aqueous mixtures of dioxane is measured at five different temperatures (298.15K, 303.15K, 308.15K, 313.15K, 318.15K). The data have been analyzed by using Onsager's equation and the relationship deduced by Arrhenius and Ostwald to obtain Λ_m^0 and K_A . The obtained parameters have been interpreted in terms of solute-solute and solute-solvent interactions. The structure making/breaking capacity is determined from the temperature coefficient of Walden product. The negative temperature coefficient of Walden product indicates that the oxalic acid and its salts act as structure breakers in binary aqueous mixtures of dioxane. The values of association constant K_A are used to obtain the standard thermodynamic quantities, such as ΔG^0 , ΔH^0 and ΔS^0 , for the association process in the solution.

Key words: Molar conductance, association constant, Walden product, structure breaker.

Him Science Congress Association

Synthesis of Nickel Oxide Quantum Dots Using Chemical Methods

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Abstract:

The stable and crystalline phase of NiO quantum dots were directly synthesized by chemical precipitation method. The effect of surfactants on the structural and optical properties of nanoparticles was studied by employing different surfactants for the synthesis. The prepared nanoparticles were characterized using FTIR and UV–visible spectroscopy. The optical properties of the prepared nanoparticles were investigated by UV–visible spectroscopy. The observed particle sizes were closer to the Bohr exciton radius as obtained by XRD as well as TEM analysis. The surface morphology of the nanoparticles was also studied using SEM analysis.

Keywords: Nickel oxide, Band Gap, XRD, Bohr exciton.

CS54

Synthesis Characterization and Application of Bare and Doped Cobalt Oxide Nanoparticles

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Abstract:

In the present work Cobalt oxide (CoO) nanoparticles were synthesized by chemical precipitation method using sodium dodecyl sulphate (SDS) as capping agent. The synthesized nanoparticles were subjected for characterization using FTIR, TEM, XRD and UV-VIS spectroscopy. Band gap for CoO nanoparticles was calculated using UV-VIS spectroscopy and was obtained as 4.4 eV. Average crystallite size of CoO was also calculated using Debye Scherrer relation. Synthesized nanoparticles showed excellent Antifungal activity against activity against *C. albicans*.

Keywords: Cobalt oxide, Band Gap, antifungal, SDS

CS55

Modulation of physico-chemical properties of polyhydroxy solutes in aqueous gamma-amino butyric acid: Volumetric and spectroscopic approach

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Abstract

Volumetric and spectroscopic studies may be useful in understanding the physico-chemical properties of polyhydroxy solutes in the presence of γ -amino butyric acid (γ -ABA) which show considerable relevance to food and pharmaceutical industries. Apparent molar volumes of some polyhydroxy solutes were determined in (0.05 to 0.50) mol kg⁻¹ aqueous solutions of γ -amino butyric acid (γ -ABA) at various temperatures. Standard state partial molar volumes at infinite-dilution and their corresponding volumes of transfer, expansibilities, and interaction coefficients have also been evaluated. These parameters have been discussed in terms of various types of interactions using co-sphere overlap model suggested by Gurney. NMR spectra for γ -ABA ($m_B = 0.10$ mol kg⁻¹) show more upfield shift in ternary system [polyhydroxy solute + γ -ABA + {9:1 (w/w) H₂O + D₂O}], hence suggesting that hydrophobic interactions prevail between solute and γ -ABA molecules.

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CS56

Impact of temperature on the development of *Tetranychus urticae* and *Eotetranychus lewisi* on strawberry

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Abstract

The two-spotted spider mite, *Tetranychus urticae* Koch is a key pest of strawberry. At present, Lewis mite, *Eotetranychus lewisi* (McGregor) is emerging as a problem on strawberry in southern California. For the efficient management of both mite species on strawberry, knowledge of biology of pest is utmost important. The development and population densities of mites are very sensitive to weather conditions. Out of all weather parameters, temperature is a significant factor which has direct relation with the pest population levels in means of growth and its fecundity. Therefore, the current study was conducted to investigate the effect of temperature on the biology of *T. urticae* and *E. lewisi* on strawberry under laboratory conditions at Department of Entomology, University of California, Davis, USA. The studies revealed that the incubation period of both the mite species on strawberry increased with decreasing temperature. The immature development of both the mites on strawberry was found to be faster at 20 and 25 °C as compared to 15°C. The total time taken for the development of *T. urticae* and *E. lewisi* was found to be decreased with increase in temperature. The maximum fecundity of both the mites was observed at 25°C as compared to other two temperatures. The life cycle of *E. lewisi* was completed in 30.00 days at 15°C but *T. urticae* required more days (35.40 days) to complete its development at same temperature. The fecundity was more in case of *T. urticae* on strawberry as compared to *E. lewisi*. Therefore, strawberry was found to be more suitable host for *T. urticae*. Although, *E. lewisi* develops faster at lowest temperature as compared to *T. urticae* and successfully completed its life cycle on strawberry at all temperatures. Thus, *E. lewisi* can become a major pest of strawberry in near future along with *T. urticae*. Our results showed that temperature is a portentous component that can affect the development and reproduction of both the mites on strawberry.

CS57

Effect Of Solid Ionic Conductors On Solid State Dye Sensitized Solar Cells Substituted With Charge Donar Molecules

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Abstract

Globalization of the world with several others essential means has affected the daily life of each individual. Due to the nature of the humankind for utilizing the various energy resources to fulfill their day to day lifestyle. These natural resources are found abundantly on the earth in efficient amount. Among all the available natural resources, solar energy is one of the promising and abundant in nature. Solar cell which convert solar energy in to electrical energy, is in demand to fulfill the current energy demands. As a candidate of third generation solar cell, Dye Sensitized Solar Cells (DSSCs) received great attention since the first report by Prof. M. Gratzel. Electrolyte is one of the important component of DSSC as they play important role in stability and efficiency of the device. Due to leakage and high evaporation rate of organic solvent based electrolytes, scientists across the globe are looking for an effective, efficient solid state electrolytes for DSSC devices.

Here, in we report solid organic ionic conductors (SOICs) containing strong electron donor moieties. These SOICs are based on imidazolium and benzimidazolium iodide salt substituted with phenothiazine/phenoxazine donors. Due high conductivity, strong hole transporting and pore filling properties, these SOICs are used as solid electrolytes in solid state DSSCs (ss-DSSCs). All the SOICs were characterized using ¹H-NMR, raman, UV-visible spectroscopies, cyclic voltammetry and hole transport measurements. The photovoltaic parameters for all ss-DSSCs devices are obtained from various techniques like I-V, impedance spectroscopy, IPCE etc. Overall more than 5.5% power conversion efficiency are obtained in devices based on phenoxazine substituted imidazolium/benzimidazolium iodide. All the devices showed photo-stability up to atleast for 600 hr.

CS58

Effect of Surface Active Ionic Liquid Concentration on The Conformation of Hemoglobin

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Abstract

Influence of varying concentration of surface active ionic liquids (SAILs), 1-dodecyl-3-methylimidazolium chloride [C₁₂mim][Cl] and 1-hexyl-3-methylimidazolium dodecylsulfate [C₆mim][SDS] on the interaction and properties of human haemoglobin (Hb) has been studied in aqueous medium through various techniques like surface tension, UV-vis spectroscopy, fluorescence spectroscopy, isothermal titration calorimetry (ITC) and dynamic light scattering (DLS). The interactional behavior of SAILs toward Hb at the air/solution interface is investigated and various interfacial and thermodynamic parameters have also been calculated. The conformational changes in Hb upon interacting with SAILs have been illustrated from UV-visible measurements in combination with fluorescence spectroscopy. These results indicate that at lower concentration [C₆mim][SDS] monomer form stronger Hb-[C₆mim][SDS] monomer complex as compared to [C₁₂mim][Cl] whereas at higher concentration [C₁₂mim][Cl] denature Hb more and induces the heme to be released from hydrophobic pocket of Hb. The enthalpy changes were also investigated by using isothermal titration calorimetry (ITC). The dynamic light scattering (DLS) measurements revealed the effect of SAILs on the hydrodynamic diameter (*D_h*) of Hb.

CS59

Hantzsch-pyridine synthesis based on heterocyclic moiety via Multi-component reaction and their microbial studies

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Abstract

The Hantzsch reaction is a simplest and most reasonable methods for the development of biologically and pharmacologically active 1,4-dihydropyridine derivatives. We prepared it from the heterocyclic aldehydes, ammonium acetate and different β- ketoester at ambient temperature using L-proline in ethanol. It is proved to be a very efficient catalyst for the multicomponent reaction. The obtained products were confirmed by the ¹H-NMR, ¹³C-APT, IR and Mass

spectroscopy. All Compounds were screened for their microbial studies and some of the single crystals studies were reported.

CS60

C- H Activation Of 1, 4- Dione And Ethyl Benzene Over Robust And Magnetically Recoverable Fe₃O₄ Nanoparticles

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Abstract: Heterogeneous catalysis was environmentally benign, economical, practical, and efficient processes for catalyst separation and reuse purpose. Since heterogeneous catalysis have been very important in the chemical community as a part of economic, safety, and environmental point of view. In recent years, Fe₃O₄ nanoparticles (magnetite nanoparticle) have attracted the attention of researchers. Here we were developed an efficient methodology for the C-H activation of 1,4-diones and ethyl benzene for the synthesis of 3-phenethyl-2,4-diones. The reaction conditions were optimized for maximum yield (86 %) of 3-phenethyl-2,4-diones. The generality of the protocol was examined using several substituted 1,4-diones and ethyl benzene derivatives. Here the developed protocol was sustainable for the synthesis of 3-phenethyl-2,4-diones derivatives. The strategy of magnetic separation is typically more effective than filtration or centrifugation. Magnetic separation of the catalyst is simple, economical and promising for industrial applications.

Key words: Fe₃O₄ nanoparticles, heterogeneous catalyst, C-H activation, 3-phenethyl-2,4-diones, green approach.

Section B: Physical Sciences & Materials Science

POSTER PRESENTATIONS

Abstract Number	Title of Paper	Authors	Address
PS01	Reduction in CO ₂ Emission in a Solar Steam Cooking Plant in Himalayan Region: With and Without Preheated Water	<u>Ankit Gupta</u> , Raja Sekhar Y and Rajesh Kumar	¹ School of Mechanical Engineering, Department of Thermal and Energy, VIT University, Vellore-632014, Tamil Nadu, India ^{*2} School of Physics and Materials Science, Shoolini University, Bajhol, Solan-173 212, Himachal Pradesh, India
PS02	Ferromagnetism in MoS ₂ Nanosheets	Anjali Rani & <u>Prianka Sharma</u>	School of Basic & Applied Sciences, Maharaja Agrasen University, Baddi, INDIA
PS03	Synthesis And Characterization Of Soft Z-Type Hexa Nanoferrites For Microwave Antenna Miniaturization	<u>Anita Manhas</u> and M. Singh	Department Of Physics, HPU, Shimla-171005, H.P., India.
PS04	Analyzing various properties of Lead Free Na _{0.5} Bi _{0.5} TiO ₃ -CoFe ₂ O ₄ particulate composite	<u>Shilpa Thakur*</u> , Kusum Parmar, Khemraj Sharma and N.S.Negi	Department of physics, Himachal Pradesh University, Shimla (H.P.) India
PS05	Spectral and magnetic properties of Germanene quantum dots using first principle study	<u>Sushila Devi^a</u> , Munish Sharma ^a , P. K. Ahluwalia ^a , Shyam Chand ^b	^a Physics Department, Himachal Pradesh University, Shimla, Himachal Pradesh, India 171005 ^b University Institute of Information Technology, Himachal Pradesh University, Shimla, Himachal Pradesh, India 171005
PS06	Phase transition in one-dimensional hydrogen bonded ferroelectric crystals	<u>Aanchal Rawat</u> and Trilok Chandra Upadhyay	Department of Physics, HNB Garhwal University Srinagar (Garhwal) Uttarakhand-246174
PS07	Some Inequalities between Moment Values of Continuous Probability Distributions	<u>Sita Ram Sharma</u>	Department of Applied Sciences, Chitkara University, Solan (H. P.), INDIA
PS08	Structural and Electrical Properties of Al/n-TiO ₂ /p-Si/Al Heterostructures	<u>Arvind Kumar</u> , Ankush Vij ¹ , K.K. Sharma, Ashwani Kumar ³ , Subhash Chand and Ravi Kumar ²	Department of Physics, National Institute of Technology, Hamirpur-177005 (HP), India ¹ Department of Applied Physics, Amity School of Applied Sciences, Amity University Haryana ² Centre for Materials Science and Engineering, National Institute of Technology, Hamirpur-05(HP), India ³ Government collage Bilaspur-174001(HP), India
PS09	Dielectric behaviour of Ferroelectric Diglycine Nitrate and Triglycine Fluoberyllate Crystals	Prabhat Chandra Khanduri and Trilok Chandra Upadhyay	Physics Department, HNB Garhwal University, Srinagar Garhwal
PS10	Terrestrial Influence Of Coronal Mass Ejection	Goldi Prabha Sharma ¹ , <u>Babita Chandel²</u>	1 MSC (Physics) Student, Department of Applied Sciences, AP Goyal Shimla University, H.P., India

			2. Babita Chandel Assistant Professor, Department of Applied Sciences, AP Goyal Shimla University, H.P. India
PS11	Synthesis and Characterization of Nickel Oxide at Different Annealing Temperature	Khem Raj Sharma*, Shilpa Thakur and N.S.Negi	Department of Physics Himachal Pradesh University, Shimla (H.P) India 171005
PS12	Dark Matter: Evidences and Existence	Ashish Sharma [#] , Gazal Sharma [†] and B.C. Chauhan [‡]	Department of Physics & Astronomical Science, School of Physical & Material Sciences, Central University of Himachal Pradesh (CUHP), Dharamshala, Kangra (HP), India-176215
PS13	Structural, dielectric and multiferroic properties of particulate composites	Vidushi Karol ¹ , N.S. Negi ² , R.K. Kotnala ³ and Anshu Sharma ^{1,2}	¹ School of Basic & Applied Sciences, Maharaja Agrasen University, Baddi, Solan ² Department of Physics, Himachal Pradesh University, Shimla-171005, India ³ National Physical Laboratory, New Delhi-110012, India
PS14	Effect of Gamma Radiations on the Quality and Shelf Life of Strawberry Fruit of the Utrakhand Region	Meetu Rastogi & Prianka Sharma	School of Basic & Applied Sciences, Maharaja Agrasen University, Baddi, INDIA
PS15	Grafting of Butyl Acrylate onto Sodium Salt of Partially Carboxymethylated Sodium Alginate using Potassium Persulphate(KPS)/Ascorbic Acid(AA) as Redox Initiator	J. H. Trivedi	Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar-388120, Gujarat, India
PS16	Effect of composition on steady state and transient photoconductivity in isocoordinated In _x Sb _{30-x} Se ₇₀ (0 ≤ x ≤ 25) chalcogenide films	Shaveta Sharma ^{1,2} , Rita Sharma ¹ , Praveen Kumar ² , R. Thangaraj ¹ , K.Asokan ³ , M. Mian ¹	¹ Semiconductors Laboratory, Department of Physics, GND University, Amritsar 143005, India ² Department of Physics, DAV University, Sarmastpur, Jalandhar-144012, India ³ Material Science Division, Inter University Accelerator Centre, New Delhi-110067
PS17	Influence of Ce - Co substitution on properties of BiFeO ₃ nanoparticles via sol-gel auto combustion method.	Jyoti Sharma, A. K. Srivastava	Department of Physics, Lovely Professional University, Phagwara-144411, Punjab, India.
PS18	Growth and characterization of fMWCNTs/NiS nano composite using hydrothermal technique for DSSCs application.	Rajinder Singh, Sanjeev Kumar, Anshul Sharma, Aman Mahajan, and R. K. Bedi	Material Science Laboratory, Department of Physics, Guru Nanak Dev University, Amritsar-143005, India.
PS19	Synthesis Of Pyrite (Fes ₂) Nanostructures	Gurpreet Kaur [†] , Manjot Kaur [†] , Anup Thakur [#] , Rajni Bala [‡] and Akshay Kumar ^{†*}	[†] Advanced Functional Material Laboratory, Department of Nanotechnology, Sri Guru Granth Sahib World University, Fatehgarh Sahib-140406 Punjab, India [#] Department of Basic and Applied Sciences, Punjabi University, Patiala, Punjab [‡] Department of Mathematics, Punjabi University, Patiala, Punjab
PS20	Structural properties of F-doped NiO nanostructures	Kulwinder Singh ¹ , Manjeet Kumar ²	¹ Advanced Functional Materials Lab., Department of Nanotechnology,

		<u>Manpreet Kaur</u> ¹ and <u>Akshay Kumar</u> ^{1*}	Sri Guru Granth Sahib World University, Fatehgarh Sahib-140 407, Punjab, India ² Department of Electrical Engineering, Incheon National University, Incheon- 406772, South Korea
PS21	B ₄ C/SnO ₂ nano composite photocatalysis studies: an overview and future prospects	<u>Paviter Singh</u> ¹ , <u>Harpreet Kaur</u> ¹ and <u>Akshay Kumar</u> ^{*1}	¹ Advanced Functional Materials Lab., Department of Nanotechnology, Sri Guru Granth Sahib World University, Fatehgarh Sahib-140 407, Punjab, India
PS22	Dark Matter: Evidences and Existence	<u>Ashish Sharma</u> [#] , <u>Gazal Sharma</u> [‡] and <u>B.C. Chauhan</u> [†]	Department of Physics & Astronomical Science, School of Physical & Material Sciences, Central University of Himachal Pradesh (CUHP), Dharamshala, Kangra (HP), India-176215
PS23	Effect of In incorporation on Structural, optical and electrical Properties of In_xSb_{20-x}Ag₁₀Se₇₀ (0≤x≤20) thin films	<u>Rita Sharma</u> ¹ , <u>S. Sharma</u> , <u>P. Kumar</u> ² , <u>R. Thangaraj</u> and <u>M.Mian</u>	¹ Semiconductors Laboratory, Department of Physics, GND University, Amritsar 143005, India ² Department of Physics, DAV University, Sarmastpur, Jalandhar-144012, India
PS 24	Synthesis and Characterization of Vanadium Tellurite Glasses	<u>Amarjot Kaur</u> , <u>Amandeep Kaur</u> , <u>Ramandeep Kaur</u> and <u>Atul Khanna</u>	Sensors and Glass Physics Laboratory, Department of Physics, Guru Nanak Dev University, Amritsar
PS 25	Study of Ni_{0.5}Cd_{0.5}Fe₂O₄/Mg_{0.9}Cd_{0.1}Fe₂O₄ nanoparticles incorporated by Sol-gel auto combustion Techniques.	<u>Virender Singh</u> ^{1*} , <u>Pratap Brijesh Kumar</u> ² , <u>Shivani</u> ¹ , <u>Isha</u> ¹ and <u>Mahavir Singh</u>	1 School of Physics, Shoolini University, Bajhol, Solan, India. 2 Department of Physics, RKMB, College, Shimla. 3 Department of Physics, Himachal Pradesh University, Shimla.
PS 26	Structural and Ferroelectric Properties of Calcium doped Barium Titanate	<u>Aanchal Singh</u> [*] , <u>Mandeep Singh</u> and <u>Anupinder Singh</u> and <u>Lakhwant Singh</u>	Multifunctional Materials Laboratory, Department Of Physics, Guru Nanak Dev University, Amritsar, Punjab,

			143005, India
PS27	Structural Properties of ZnO-V₂O₅ Based Varistor Systems Doped with Fe₂O₃	Jasvir Singh*, Shubham Bhagat, Shivani Sharma, Sandeep Sharma and Ravi Chand Singh.	Department of Physics, Guru Nanak Dev University, Amritsar 143005, India
PS28	Study of Dispersion parameters and Optical Band Gap in Ge₂₀-S_{80-x}-Ga_x Thin Films	Anjali Rana ¹ and Raman Sharma ¹	1Department of Physics, Himachal Pradesh University, Shimla-171005, India
PS29	Theoretical study of phase transition in hydrogen bonded Cesium dihydrogen arsenate crystal	Deepali Raturi and Trilok Chandra Upadhyay	Department of Physics, H.N.B. Garhwal University, Srinagar(Garhwal) Uttarakhand 246174, India
ORAL PRESENTATIONS			
PS30	Temperature dependence of soft mode frequency, dielectric constant and loss tangent of ammonium iron alum	<u>Anubhuti Mangain</u> and Trilok Chandra Upadhyay	Department of Physics, H.N.B. Garhwal University, Srinagar (Garhwal) Uttarakhand 246174, India
PS31	Neutrino mixing angles predicted in the light of a Quark-Lepton Complementarity Model	<u>Gazal Sharma[#], Ashish Sharma[†]</u> and B.C. Chauhan [‡]	Department of Physics & Astronomical Science, School of Physical & Material Sciences, Central University of Himachal Pradesh (CUHP), Dharamshala, Kangra (HP), India-176215
PS32	Apparitions of The Valid N_c Limit For The Baryonic Sector	Navjot Hothi	Department of Physics, University of Petroleum & Energy Studies, Dehradun-248007, Uttarakhand, India.
PS33	Elusive Particle Neutrinos & Double Beta Decay	Prianka Sharma	School Of Basic & Applied Sciences, Maharaja Agrasen University
PS34	Development Of Wear Resistant Aluminium Matrix Composite By Spray Forming Technique	<u>Kamalpreet Kaur[*]</u> ^A , O.P. Pandey ^B	^A Physics Department, University Of Petroleum And Energy Study, Dehradun, Uk, India ^B School Of Physics And Materials Science, Thapar University, Patiala 147 004, Punjab, India

PS01

Reduction in CO₂ Emission in a Solar Steam Cooking Plant in Himalayan Region: With and Without Preheated Water

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Abstract

A study on the reduction of CO₂ emission from a 500 persons' solar steam cooking plant fixed on girl's hostel of Shoolini University, Solan (HP) has been performed and noticed that one commercial LPG cylinder has been saved on daily basis reducing 17,217.42 kg of CO₂ emission per year. According to UNCDM, it will earn 17.2 carbon credits for the University. Further to increase the performance of the plant, preheated water from flat plate collector was supplied to the plant. This enabled steam formation inside heat pipe one hour prior to normal winter days' hours. 500 L of hot water was additionally supplied to curb jaundice outbreak. Use of preheated water for steam generation saved another half commercial LPG cylinder, which in turn has reduced 8,608.71 kg of CO₂ emission, earning 8.6 more carbon credits. The total reduction in CO₂ emission has been found 25,826.13 kg per year and earnings of 25.8 carbon credits to the University. These earned carbon credits may be redeemed as per global carbon credit rules.

Keywords

ANN, Scheffler, Receiver, Preheating, carbon credits, UNCDM etc.

PS02

Ferromagnetism in MoS₂ Nanosheets

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Abstract

Graphene-like two-dimensional (2D) transition metal dichalcogenides (TMDCs) have been attracting a wide range of research interests. Molybdenum disulfide (MoS_2) is one of the most typical TMDCs. Its particular direct band gap of 1.8 eV in monolayer and layer dependence of band structure tackle the gapless problems of graphene, thus making it of scientific and industrial importance. We report the effect of different solvents on the magnetic properties of MoS_2 measured at room temperature. Single crystals of MoS_2 display ferromagnetism superimposed onto large temperature-dependent diamagnetism and ferromagnetism observed persists from 10K up to room temperature. We attribute the existence of ferromagnetism partly to the presence of zigzag edges in the magnetic ground state at the grain boundaries. Since the magnetic measurements are relatively insensitive to the interlayer coupling, these results are expected to be valid in the single layer limit.

PS03

**Synthesis And Characterization Of Soft Z-Type Hexa Nanoferrites
For Microwave Antenna Miniaturization**

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Abstract

In wireless communication industry especially mobile communication, increased demand for miniaturized, highly efficient and wide band antenna etc, has accelerated the new research areas of the antenna technology. Multi-functional mobile devices require a large number of radio frequency (RF) components, including antennas in the limited space. Accordingly, the size of antenna needs to be reduced without any performance degradation. In response to this, we presented here the methodical investigation on structural and Magnetic properties of pure Co₂Z, Ba₃Co₂Fe₂₄O₄₁ sample and Sr doped Co₂Z i.e. Ba_{3-x}Co₂Sr_xFe₂₄O₄₁ (where x= 0.5 ~2.0) samples synthesized by the Sol-gel auto combustion method. The X-ray diffraction (XRD) analysis of pure and doped samples clearly indicate the formation of pure Z-phase. The Field emission scanning electron microscope (FESEM) micrographs show the surface images of pure and doped samples calcinated at 1200 °C for 5 h. All the samples show that the grains are uniformly and densely distributed over the surface of the samples. The Energy dispersive X-ray (EDX)

spectroscopy analysis was done in order to determine the chemical compositions on the surface of the samples to support our observations on the structure of the hexa nanoferrites. The magnetic properties were measured using vibrating sample magnetometer (VSM) at room temperature with a maximum field upto 20 kOe. The hysteresis curves of all the prepared samples exhibit typical characteristics of soft ferrites with low coercivity. Further studies on electromagnetic microwave measurement is under processing.

Keywords: *Co2Z-Type Hexa Nanoferrites, Sr Doped, Sol -Gel Auto Combustion Method, XRD, Z Phase, FESEM, EDX and VSM.*

PS04

Analyzing various properties of Lead Free $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3\text{-CoFe}_2\text{O}_4$ particulate composite

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Abstract

Due to strong magnetoelectric coupling effect (ME) multiferroic materials are worthy candidate for many applications such as in storage devices and sensors. Sodium Bismuth Titanate (NBT) shows good ferroelectric properties at room temperature and considering as promising lead free material for piezoelectric and pyroelectric properties. CoFe_2O_4 (CFO) is a ferromagnetic material having high value of saturation magnetization, coercivity and magnetostriction coefficient. Lead free $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$ (NBT) and CoFe_2O_4 (CFO) powders have been prepared by conventional sol-gel and metallo – organic chemical solution methods respectively. The lead free 50NBT-50CFO multiferroic particulate composite was prepared by mixing NBT and CFO powders in required stoichiometric concentration. The structural properties were studied by using X-ray diffractometer (XRD) which confirmed the coexistence of rhombohedral perovskite phase of NBT and cubic spinal phase of CFO in the particulate composite without any impurity phase. The micro-structural study has been carried out by using scanning electron microscopy (SEM). The current-voltage (I-V) characteristics were studied by using Keithley 2611 Source Meter. The magnetic properties were also investigated by magnetization vs. magnetic field (M-H) hysteresis

loop. The M-H loops confirmed the ferromagnetic nature of CFO as well as 50NBT-50CFO composite sample.

PS05

Spectral and magnetic properties of Germanene quantum dots using first principle study

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Abstract

The DFT computations are performed with the help of SIESTA package by employing the generalised gradient approximation with Perdew-Burke-Ernzsh exchange correlation functional. We are reporting here a method of formation of Germanene quantum dots from Germanene flakes and we form two configurations-armchair and zigzag with passivation of hydrogen atoms. To study the spectral properties we performed computation for density of states and HOMO-LUMO are analysed with density functional theory to know the band structure. From the results, it is inferred that Germanene quantum dots are a wide band gap semiconductor and spin polarisation calculations show that these quantum dots are non-magnetic. Different trends are observed for the three cases at various configurations.

Keywords: First principles computations, Germanene quantum dots, band structures, magnetic properties

PS06

Phase transition in one-dimensional hydrogen bonded ferroelectric crystals

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Abstract:

We studied the phase transition in one dimensional hydrogen bonded order-disorder ferroelectrics. Lead hydrogen phosphate (PbHPO_4) crystal is a representative of the one dimensional hydrogen bonded class of ferroelectric crystals. Lead hydrogen phosphate has a one-dimensional network of hydrogen bonds linking the PO_4 groups into one-dimensional chains along the c -direction i.e. the PO_4 groups in PbHPO_4 are connected only with two neighbouring groups. This unique feature of lead hydrogen phosphate makes it the best model compound for studying the phase transition mechanism in hydrogen bonded crystals. It is ferroelectric at room temperature. It undergoes phase transition from ferroelectric phase to paraelectric phase at 310K (27°C), which also makes it an important crystal of its group. It shows a large temperature shift in T_c ($310\text{K} \rightarrow 452\text{K}$) when the hydrogen atoms are replaced by deuterium atoms in it i.e. isotope effect. Using Green's function technique we obtained expressions for shift, width, soft mode frequency, dielectric constant and tangent loss for this crystal. By fitting values of various model parameters appearing in the expressions we obtained temperature variation of these quantities. We compared the theoretical values with experimental values of others. Both results agree well with each other.

PS07

Some Inequalities between Moment Values of Continuous Probability Distributions

Him Science Congress Association
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Some inequalities for the mean and standard deviation of continuous probability distributions are presented here in this paper and their geometrical significance has also been discussed. It has been shown that the inequalities obtained in this paper are better than the inequalities obtained in [3]. Also the results given in [1] which claims better bounds for results obtained in [3] have been discussed and shown inappropriate results.

PS08

Structural and Electrical Properties of Al/n-TiO₂/p-Si/Al Heterostructures

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Abstract

Single-phase rutile type pure titanium dioxide (TiO₂) thin films were grown on single crystal p-Si wafer by pulsed laser deposition (PLD) technique to fabricate heterojunction diodes. X-ray diffraction study showed that the texture of the film is tetragonal with a strong (210) plane as a preferred direction and grain size 43.3nm. High purity vacuum evaporated aluminum metal was used to make contacts to the n-TiO₂ and p-Si, respectively. The current–voltage (*I*-*V*) characteristics of Al/n-TiO₂/p-Si/Al structure were determined by using thermionic emission (TE) diffusion mechanism over the range 80-300K which shows strong temperature dependence. The equivalent Schottky barrier height and diodes ideality factor were determined by fitting of measured *I*-*V* data in thermionic emission diffusion equation. The evaluation of the experimental *I*-*V* data revealed a non-linear increase of the zero bias barrier height for the inhomogeneous Al/n-TiO₂/p-Si/Al Schottky barrier. The barrier height decreases and the ideality factor increases as the temperature decreases and the activation energy plot shows non-linear behavior due to the Gaussian distribution of barrier heights at interface.

Keywords: *I*-*V* characteristics, Al/n-TiO₂/p-Si/Al heterostructure, Barrier height, Ideality factor, *C*-*V* characteristics

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PS09

Dielectric behaviour of Ferroelectric Diglycine Nitrate and Triglycine Fluoberyllate Crystals

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Ferroelectric materials have got promising applications because of their use in fabricating capacitors, memory devices, transducers etc. Diglycine nitrate (DGN) and triglycine fluoberyllate (TGFB) both are ferroelectric crystals which belong to TGS family. Transition temperature for DGN crystal is 206 K and for TGFB crystal is 373 K. We have studied dielectric behaviour of these two crystals with the help of double-time temperature dependent Green's function and modified pseudo-spin lattice coupled mode (PLCM) model. PLCM model is modified by adding third and fourth order phonon anharmonic interaction terms and extra spin lattice coupling terms. Expressions for shift, width, soft mode frequency, dielectric constant and loss tangent have been obtained. Fitting the values of model parameters in expressions for soft mode frequency, dielectric constant and loss tangent, temperature dependences of these quantities in the vicinity of transition temperature have been obtained for both crystals. Theoretical results compared well with experimental results of others.

PS10

Terrestrial Influence of Coronal Mass Ejection

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Abstract:

A geomagnetic storm is a temporary disturbance of the Earth's magnetosphere caused by a solar wind shock wave of magnetic field that interacts with the Earth's magnetic field. The increase in the solar wind pressure initially compresses the magnetosphere. The solar wind's magnetic field interacts with the Earth's magnetic field and transfers an increased energy into the magnetosphere. During the main phase of a geomagnetic storm, electric current in the magnetosphere creates a magnetic force that pushes out the boundary between the magnetosphere and the solar wind. Coronal mass ejection (CME) is one of the main constraints that leads to the geomagnetic disturbances. In present paper we had selected the data of the years (2012-2016) of 24th solar cycle for analysis and its influences on the equatorial ring current and geomagnetic field. Analysis show that the fifteen cases of geomagnetic disturbances are observed which have the value of disturb storm time (Dst) greater than $<- 100$ nT. Out of these fifteen cases four are reinforced by CME and rest are due to the other parameters as solar energetic particle, solar flares and solar prominences. Present paper is focused on CME only and first CME event was on 7th March 2012 at universal time 00:24 UTC with solar wind speed 2684 km/s having location N17E27 on sun's surface creates the equatorial ring current disturbance on 9th March 2012 with Dst value -145 nT. Second CME event was on 12th July 2012 at time 16:48 UTC with solar wind speed 885 km/s having location S15W01 on sun's surface creates the equatorial ring current disturbance on 15th July 2012 with Dst value -139 nT. Third CME event was on 15th March 2013 at time 07:12 UTC with solar wind speed 1063 km/s having location N11E12 on sun's surface creates the equatorial ring disturbance on 17th March 2013 with Dst value -132 nT. Fourth CME event was on 21st June 2015 at universal time 02:36 UTC with solar wind speed 1366 km/s having location N12E13 on sun's surface create the equatorial ring current disturbance on 23rd June 2015 with Dst value -204 nT. Hence CME events create the equatorial ring current disturbance within the two or three days and significant influence on earth's magnetic field.

KEYWORDS: Coronal Mass Ejection, Disturbed storm time, equatorial ring current and geomagnetic field and solar wind .

PS11

Synthesis and Characterization of Nickel Oxide at Different Annealing Temperature

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Abstract.

Most of the research work in diluted magnetic semiconductors (DMS) is carried out upon the n-type semiconductors such as ZnO, TiO₂ etc. Recently researchers are showing their keen interest in p-type semiconductors to form p-n junction in spintronic devices. Nickel Oxide (NiO) is such a promising candidate and a well known antiferromagnetic p-type semiconductor having Neel temperature ($T_N \sim 523\text{K}$). NiO can be treated as Mott-Hubbard insulator having wide energy band gap ($E_g \sim 3.6$ to 4.0eV). Now a day's NiO based materials are strongly preferred for lithium based batteries, storage devices, optoelectronic devices, hydrogen sensors and resistive switching devices, smart windows, and ultra capacitors. Nickel oxide has been synthesized by solution combustion technique. The nickel oxide powder was annealed at 600°C and 1000°C for 2 hrs. Structural properties were examined by X-ray diffractometer (XRD), which confirmed the purity and cubic phase of nickel oxide. XRD data reveals the increase in crystallite size and decrease in full width half maxima (FWHM) as the annealing temperature increases. Electrical properties were observed by the Keithley 2611 System source-meter. Dielectric study has been carried out by using Wayne Kerr 6550B. Microstructural properties were analysed by the field emission scanning electron microscope (FE-SEM). Magnetic properties of NiO powder were studied by vibrating sample magnetometer (VSM). It is observed that structural, electrical, dielectric and magnetic properties of NiO particulates are improved with increasing annealing temperature.

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Spreading Goodwill in Science

PS12

Dark Matter: Evidences and Existence

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Abstract

Ever-since the dawn of civilization man has been fascinated by the stars, planets and other heavenly objects, and wondering what essentially the magnificent Universe was made up of. Interestingly enough so far we have learnt that our Universe is almost completely dark. At present, the existence and identity of Dark Matter (DM) is considered to be the most elusive puzzle in world of astroparticle physics and cosmology. A number of evidences have been accumulated in support of existence of DM on theoretical and observational basis that lead towards the proposal of a wide varieties of Beyond Standard Model (BSM) DM candidates. The previous data from various experiments and the recent one from PLANCK have shown that universe is made up of around 68.3% of Dark Energy, 26.8% of DM and 4.9% of ordinary matter. The nature of the DM remains one of the most important open questions in science and there are many efforts that are ongoing to resolve it. The hunt for the DM is multi-prolonged and interdisciplinary, involving cosmology and astrophysics, particle physics, direct and indirect detection experiments and searches at particle colliders. In this paper, we discussed and presented how the study of DM can unfold several unknown mysteries of the Universe, which would help us to throw some light on how the Universe evolved after Big Bang and the structure formation of present Universe. Dark matter physics also has the potential to look into new unknown fundamental physics and many new unknown symmetries of Nature that might predict new particles still beyond our conception

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Promoting Excellence in Science

PS13

Structural, dielectric and multiferroic properties of particulate composites

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Today, every feature of modern technology is permeated by ferroelectric and ferromagnetic materials. Ferroelectric materials with spontaneous polarization are being widely used in sensing applications and memory devices (FeRAMS). On the other hand, ferromagnetic materials with switchable magnetization are widely used in magnetic data storage. The combination of two or more “ferroic” properties in the same phase give rise to new class of materials, are known as multiferroics. There has been renewed interest towards such multiferroic materials due to their promising technological applications in the multifunctional devices such as sensors, transducers, memories and spintronics. In the present work, we have synthesized particulate composites using metal organic decomposition (MOD) chemical method. The crystalline structures of particulate composites reveal the coexistence of both the ferrite and ferroelectric phases and intermediate phases have been observed in the XRD patterns. The micrographs have shown dense, homogeneous and fine grained textures for all the composites without any inter-diffusion of the constituent phases. The room temperature dielectric properties of substituted composites show normal dielectric dispersion with frequency. The room temperature magnetic properties of particulate composites show ferromagnetic behavior with well defined M-H curves. All the composites exhibit typical ferroelectric hysteresis loops indicating the presence of spontaneous polarization. The composites exhibit both magnetic and ferroelectric ordering at room temperature. The co-existence of ferroelectric and ferromagnetic properties together at room temperature suggests the possibility to explore new series of composites based on CZFMO for their use in device applications.

Keywords: Composite, MOD, magnetic, ferroelectric properties.

PS14

**Effect of Gamma Radiations on the Quality and Shelf Life of Strawberry Fruit of the
Uttarakhand Region**

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Abstract

The aim of this study is to investigate the effect of gamma radiations on the quality and shelf life of strawberries in the range of 0.3- 1.5 kGy radiation doses. The irradiated strawberries were stored in ambient (temperature 25 +/- 2°C, RH 70 %) and refrigerated (3 +/-1°C, RH 80%) conditions. In samples treated with dose 1.2-1.5 kGy no decay was recorded up to 9 days of ambient conditions. Under refrigerated conditions, strawberry samples of unirradiated and irradiated in the range of 0.3-0.9 kGy started decaying after 14 days of storage. No decay was observed in the samples treated with 1.2-1.5 kGy up to 28 days of refrigerated storage. Dose of 1.2 kGy was significantly effective in reducing the weight loss and in maintaining the higher overall acceptability under both the storage conditions compared to the other treatments. This dose also proved effective in retention of significantly higher levels of total sugars compared to the other treatments. Thus, it was established that irradiating strawberries with dose of 1.2 kGy can prove beneficial in facilitating the marketing of the fruit to distant places other than the local markets, thereby benefiting the growers.

PS15

Alginate using Potassium Persulphate(KPS)/Ascorbic Acid(AA) as Redox Initiator

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Abstract:

Unreported graft copolymer of poly ethyl methacrylate (EMA) with Sodium salt of partially Carboxymethylated Sodium Alginate (Na-PCMSA) was synthesized by using Potassium Persulphate/Ascorbic Acid as a redox initiator, in an aqueous medium. The optimal reaction conditions for affording maximum percentage of grafting were evaluated by successively varying various reaction parameters such as concentrations of nitric acid, ceric ammonium nitrate, monomer (EMA) as well as reaction time, temperature and amount of substrate. The optimal reaction conditions for ceric induced grafting were : Na-PCMSA = 1.0 g (dry basis); [KPS] = $20 \times 10^{-3} \text{ mol.L}^{-1}$; [AA] = $20 \times 10^{-3} \text{ mol.L}^{-1}$; [BA] = 0.148 mol.L^{-1} ; Time = 3 h; Temperature = 45°C and Total Volume = 150 mL. At optimum grafting reaction conditions, the maximum values of the grafting yields achieved were %G = 250.40 and %GE = 68.31. The spectroscopic (FTIR), scanning electron microscopy (SEM) are used to characterize the samples.

The synthesized graft copolymer, Na-PCMSA-g-PBA which may find its potential application as a metal adsorbent.

Keywords: Sodium salt of partially carboxymethylated sodium alginate, Graft copolymerization, Potassium Persulphate/Ascorbic acid, Butyl acrylate, IR and SEM.

PS16

Effect of composition on steady state and transient photoconductivity in isocoordinated $In_xSb_{30-x}Se_{70}$ ($0 \leq x \leq 25$) chalcogenide films

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Abstract

The study of steady state and transient photocurrent measurement provide important information about the charge generation and recombination phenomena in various semiconducting systems for photo-sensor device applications. In the present work, the composition dependent analysis of photocurrents was studied for thermally evaporated Se-rich $In_xSb_{30-x}Se_{70}$ ($0 \leq x \leq 25$) films of average thickness 800 nm. The initial rise of photocurrent sharply to approach a steady state value during illumination and fast decay to a constant persistent current after stopping the illumination has been observed. The photosensitivity is found to decrease with an increase in indium concentration and increase with light intensity for all the samples. The intensity dependence of photocurrent obeys the power law with the value of the exponent varies from $\gamma = 0.67$ to 0.5 with the increase in indium concentration. The decay of photocurrent has been fitted with stretched exponential fit for different compositions along with at different illuminations. The value of decay time constant and dispersion parameter is found to increase initially for $x=5$ and then decreases for other compositions. These results are important for the development of low cost photo absorbers for solar cell applications and visible region responsive photo sensor devices.

Keywords: Chalcogenides, thin films, photosensitivity, recombination and relaxation processes.

PS17

Influence of Ce - Co substitution on properties of BiFeO₃ nanoparticles via sol-gel auto combustion method.

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Abstract:

In present study, Ce - Co substituted bismuth ferrite ($\text{Bi}_{1-x}\text{Ce}_x\text{Fe}_{1-x}\text{Co}_x\text{O}_3$; $x = 0.00, 0.02$ and 0.04) nanoparticles were synthesized via sol-gel auto – combustion method. The structural and magnetic properties of powder samples have been investigated using X ray diffraction (XRD), using X ray diffraction (XRD), Fourier Transform Infra-red spectroscopy (FT-IR), Mossbauer spectroscopy and vibrating sample magnetometer (VSM). The synthesized materials are found to have structural distortion in the rhombohedral R3c structure as observed by X-ray diffraction (XRD). In all samples, there was a negligible second phase, i.e. Fe rich compounds $\text{Bi}_2\text{Fe}_4\text{O}_9$. Fourier transform infra-red spectra of $\text{Bi}_{1-x}\text{Ce}_x\text{Fe}_{1-x}\text{Co}_x\text{O}_3$ ($x = x = 0.00, 0.02$ and 0.04) contain two peaks between $440\text{-}590\text{ cm}^{-1}$. The presence of two strong peaks between 440 cm^{-1} to 590 cm^{-1} , attribute to bending and stretching of Fe-O bond, is the characteristic of the octahedral FeO_6 group in perovskite structure. All samples showed sextet with minor doublets lead to superparamagnetic nature and weak ferromagnetism. The presence of weak doublet along with a sextet pattern in Mossbauer spectra indicate the secondary phase. Also, M-H loops of these materials demonstrate that Ce - Co doping in BiFeO_3 enhances retentivity, coercivity and saturation magnetization. Due to soft magnetic nature of Ce-Co doped BiFeO_3 , it can be suitable for storage device applications.

Keywords: Multiferroic properties; Mossbauer spectroscopy; Magnetic properties.

PS18

Growth and characterization of fMWCNTs/NiS nano composite using hydrothermal technique for DSSCs application.

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Abstract

The present work involves the preparation and characterization of NiS nanoparticles and fMWCNTs/NiS nano composite using hydrothermal technique for different temperatures. XRD technique has been used to investigate the formation of NiS nanoparticles and fMWCNTs/NiS nano composite. SEM and EDX investigations reveal the formation of NiS nano particles and NiS decorated MWCNTs. Raman Spectroscopy and FTIR study confirms the attachment of NiO nano particles at the side walls of MWCNTs. BET analysis shows that N_2 adsorption amount near P/P_0 progressively decreases in case of nickel sulfide decorated fMWCNTs as compared to fMWCNTs.

PS19

Synthesis of Pyrite (FeS₂) Nanostructures

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Abstract

Iron disulfide FeS₂ nanostructures were synthesized using a facile hydrothermal method using inexpensive iron and sulfur precursors. This paper reveals the discussion about the synthesis method for the growth of FeS₂. The effect of different synthesis process parameters on the performance of iron pyrite material is a matter of concern. Nonhazardous, economical and soil lavish mineral iron disulfide is used in diverse fields such as from photovoltaic devices to

seeding treatment in agriculture field. This work further demonstrates the phase pure iron disulfide nanostructures and their use for photovoltaic applications.

Keywords: Iron sulphide, hydrothermal

PS20

Structural properties of F-doped NiO nanostructures

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Abstract:

Nanostructured metal oxide semiconductors possess unique structural, electrical, optical and magnetic properties due to larger surface to volume ratio and quantum confinement. In present work, co-precipitation method has been employed for the synthesis of NiO nanostructures. The influence of F (1%, 3% and 5%) doping on structural properties of NiO nanostructures has been studied in details. The structural properties such as phase, crystallinity, texture and crystallite size are studied using X -ray Diffraction (XRD). XRD results confirmed the face centered cubic crystal structure of the synthesized samples. The crystallite size is varied between 35 nm to 20 nm with F content.

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Creating Excellence in Science

PS21

B₄C/SnO₂ nano composite photocatalysis studies: an overview and future prospects

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Abstract

B₄C/SnO₂ nanocomposite has been a focus research interest due to synergistic effect of metal oxide nanoparticles incorporation in B₄C. This paper provides comprehensive results regarding photo-catalysis studies. XRD studies revealed phase formation and phase identification of material. The results show that B₄C/ SnO₂ composite degrade the dye to a significant mark of its initial value in 20 min. The as synthesized composite is a promising candidate for removal of toxic dyes from water using commercial dye (NRH-Novacron Red Huntsmen).

PS22

Dark Matter: Evidences and Existence

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Abstract

Ever-since the dawn of civilization man has been fascinated by the stars, planets and other heavenly objects, and wondering what essentially the magnificent Universe was made up of. Interestingly enough so far we have learnt that our Universe is almost completely dark. At present, the existence and identity of Dark Matter (DM) is considered to be the most elusive puzzle in world of astroparticle physics and cosmology. A number of evidences have been accumulated in support of existence of DM on theoretical and observational basis that lead towards the proposal of a wide varieties of Beyond Standard Model (BSM) DM candidates. The previous data from various experiments and the recent one from PLANCK have shown that universe is made up of around 68.3% of Dark Energy, 26.8% of DM and 4.9% of ordinary matter. The nature of the DM remains one of the most important open questions in science and there are many efforts that are ongoing to resolve it. The hunt for the DM is multi-prolonged and interdisciplinary, involving cosmology and astrophysics, particle physics, direct and indirect detection experiments and searches at particle colliders. In this paper, we discussed and presented how the study of DM can unfold several unknown mysteries of the Universe, which would help us to throw some light on how the Universe evolved after Big Bang and the structure formation of present Universe. Dark matter physics also has the potential to look into new unknown fundamental physics and many new unknown symmetries of Nature that might predict new particles that still beyond our conception.

Effect of In incorporation on Structural, optical and electrical Properties of $\text{In}_x\text{Sb}_{20-x}\text{Ag}_{10}\text{Se}_7$ ($0 \leq x \leq 20$) thin films

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Many physical properties the chalcogenide systems strongly depends upon the composition and type of impurity added. In this work, structural and optical properties of thermally evaporated $\text{In}_x\text{Sb}_{20-x}\text{Ag}_{10}\text{Se}_7$ ($0 \leq x \leq 20$) chalcogenide films were studied. Bulk polycrystalline granules were used for the deposition of thin films. XRD studies reveal the amorphous character of the as-prepared films. FESEM images reveal a change in irregular trend in the morphological structures with composition. The EDS spectra show the composition of the as-prepared films is in stoichiometric with the bulk samples. Raman Spectroscopy shows the occurrence of Sb-Se and Sb-Sb bond vibrations for AgSbSe_2 structural units and In-Se bond vibrations in AgInSe_2 structural units. The optical transmittance and reflectance measurements were used to calculate the absorption coefficient and the indirect optical band gap is found to increases with indium content. The change in film morphology and change in the concentration of molecular units have been used to discuss optical properties with the increase in indium content. The electrical properties, by measurements of DC conductivity, intensity dependence of photoconductivity and IV characteristics, have been studied to give up the valuable information about the transport mechanism of the charge carriers and the type of charge carriers in $\text{In}_x\text{Sb}_{20-x}\text{Ag}_{10}\text{Se}_7$ ($0 \leq x \leq 20$) thin films.

Synthesis and Characterization of Vanadium Tellurite Glasses

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Abstract: V₂O₅-TeO₂ glasses containing 10 to 50 mol% V₂O₅ were prepared by melt quenching technique and characterized by X-ray diffraction, density and Raman spectroscopy. XRD confirms the amorphous nature of vanadium tellurite glasses. The densities of the glasses decrease from 5.21 g cm⁻³ to 3.96 g cm⁻³ while the molar volume increases from 30.99 cm³mol⁻¹ to 43.07 cm³mol⁻¹ with increasing the concentration of V₂O₅ from 10 to 50 mol%. Raman spectroscopy confirms the presence of both TeO₄ and TeO₃ structural units and leads the conversion of TeO₄ → TeO₃.

Study of Ni_{0.5}Cd_{0.5}Fe₂O₄/ Mg_{0.9}Cd_{0.1}Fe₂O₄ nanoparticles incorporated by Sol-gel auto combustion Techniques.

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Abstract

Sol-gel autocombstion synthesized cadmium doped Ni/Mg ferrites nanoparticles were investigated for structural properties. The particle sizes are found to be in the range of 14nm and 30 nm, respectively. For Mg_{0.9}Cd_{0.1}Fe₂O₄, the lattice constant “a ” is calculated as 0.7613Å for (311) plane and for Ni_{0.5}Cd_{0.5}Fe₂O₄ the lattice constant is found to be in the range of 8.29 Å. The structural parameters viz. volume, X-ray density (ρ) are 6.28 (Å)³, 0.4412 g/cm³ and 571.39(Å)³ and 5.52g/cm³ for Cd-Mg and Cd-Ni samples, respectively. XRD study reveals that nanoferrites are of the crystalline nature with space group fd3m. Transmission Electron Microscopy (TEM)

techniques confirm the crystalline size. In addition to this, the Energy Dispersive X-Ray (EDAX) plots gives the evidence of Ni²⁺, Cd²⁺, Fe³⁺ ions present in the synthesized nanoferrites samples. Also, the distance between magnetic ions at tetrahedral (L_a) and octahedral (L_b) sites was also calculated, and has values 3.295 Å, 2.7 Å and 3.59 Å and 2.9 Å, respectively.

PS26

Structural and Ferroelectric Properties of Calcium doped Barium Titanate

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Abstract

Ferroelectrics, represent an important class of perovskite material with technological applications ranging from electronic ceramic to constituents in optical devices. Barium Calcium Titanate (BCT) is of special interest among widely investigated ferroelectric materials, since it is purely ferroelectric and shows significant variation in its physical and structural properties with respect to Ca substitution. It also has very large nonlinear optical and electro-optic coefficients, leading to its utility in designing nonlinear optical devices and thus is a promising lead free ceramic.

Well-crystallised single phase $Ba_{1-x}Ca_xTiO_3$ (where $x= 0.05, 0.10, 0.15$) powders were synthesised by conventional solid state reaction route. The X-ray diffraction (XRD) studies confirmed that the samples crystallised in tetragonal phase. The lattice parameters were determined by the leball analysis using fullprof software package. The surface morphology of the samples was investigated using Scanning electron microscopy (SEM). P-E hysteresis loops at room temperature were measured to study the ferroelectric properties. The results of structural, surface morphological and ferroelectric findings of these samples will be presented in detail.

PS27

Structural Properties of ZnO-V₂O₅ Based Varistor Systems Doped with Fe₂O₃

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Abstract

In this study ZnO–V₂O₅ varistor system doped with different Fe₂O₃ concentrations are prepared by using high energy ball mill and sintered at 900°C for 4 h. V₂O₅ help to reduce the sintering temperatures of ZnO ceramics systems. Fe₂O₃ enhance the grain size and grain growth of the varistor systems as confirmed from the FESEM micrographs. XRD analysis of samples confirms the presence of only two phases, ZnO phase as a main phase and Zinc-Vanadium oxide as a minor phase and there is no phase present corresponding to Iron. Presence of only Zn, V, O and Fe are confirmed from XRD and EDX data. Rietveld refinements has been used for lattice parameter calculations.

PS28

Study of Dispersion parameters and Optical Band Gap in Ge₂₀-S_{80-x}-Ga_x Thin Films

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Abstract

The dispersion parameters such as single oscillator energy (E_o), dispersive energy (E_d) and static refractive index (n_0) of Ga doped ternary thin films are studied in terms of Wemple-DiDomenico (WDD) single oscillator approach, optical band gap is determined from Tauc's extrapolation method and is found to decrease with an increase in Ga content. Tanaka's relation is found valid for the films under study.

Keywords: Thin film, single oscillator energy, Static refractive index and optical band gap.

PS29

Theoretical study of phase transition in hydrogen bonded Cesium dihydrogen arsenate crystal

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Abstract

Cesium dihydrogen arsenate (CsH₂AsO₄, CDA) undergoes ferroelectric transition at 145.5K. On deuteration transition temperature T_c of CDA crystal shifts to 223K, shows a large isotope effect. The lattice parameters are $a=7.9852\text{\AA}$, $b=7.9852\text{\AA}$, $c=7.8928\text{\AA}$ and $\beta=90^\circ$. This

crystal is orthorhombic in FE phase and tetragonal in paraelectric phase. Below T_c , space group of this crystal change from $I\bar{4}2d$ (body centered tetragonal) to $Fdd2$ (face centered orthorhombic).

It is used as a commercialized non-centrosymmetric crystal for the frequency up conversion, OPO or electro-optic modulation. Though it is isostructural to KH_2PO_4 crystal but has a slightly different value of dielectric constant, due to a higher sensitivity to the electric field component along the z -axis. CDA crystal belongs to Hydrogen-bonded ferroelectrics. Hydrogen bond is a special chemical bond in which a hydrogen atom H is located between two electro-negative atoms (or ions). Hydrogen has two equilibrium positions and it tunnels in anyone of them. Neutron diffraction study of CsH_2AsO_4 crystal by Mattauch et al¹ reveals that in the ferroelectric phase, at T_c-1K the $[AsO_4]^-$ tetrahedron is significantly deformed and an almost complete proton ordering is found. Ordering of all such protons in one situation, results in ferroelectric phase transition. Gridnev and Kravchenko² have done ferroelectric study of CsH_2AsO_4 crystal. Ganguli et al³ have done theoretical study on these crystals but they have not considered third-order phonon anharmonic term and decoupled correlations at early stage.

The pseudospin-lattice coupled mode model with third and fourth order phonon anharmonic interactions terms as well as four spin coupling term is used, in the present paper. The double-time thermal Green's function method and Dyson's equation, expressions for normal mode frequency, dielectric constant, loss tangent and spontaneous polarization have been derived. By fitting model values of physical quantities, temperature variation of ferroelectric mode frequency, dielectric constant, loss tangent and spontaneous polarization have been calculated. Theoretical results are compared with experimental results of others^{4,5}. These show a good agreement. Numerical calculation can be done for other crystals such as RbH_2PO_4 , RbH_2AsO_4 , and KH_2AsO_4 in similar manner.

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PS30

Temperature dependence of soft mode frequency, dielectric constant and loss tangent of ammonium iron alum

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Abstract

Ammonium iron alum, $(\text{NH}_4)\text{Fe}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ is ferroelectric below 88K. Below 88K, it is cubic while above 88K it is paraelectric. In AFeSD alum NH_4^+ group gives rise to order-disorder type of mechanism in proton subsystem associated with these groups. This is assumed to be responsible for the ferroelectric phase transitions in several alums. Due to order-disorder character of the ammonium group in AFeSD, the H-bonds associated with these groups undergo some kind of ordering. It then becomes possible to apply pseudospin model similar to the case of KDP system, after suitable modification.

By modified pseudospin-lattice coupled mode model with the addition of third-and fourth-order phonon anharmonic interactions terms and extra spin-lattice term AFeSD alum has been studied using double-time temperature dependent Green's function method, expressions for soft mode frequency, dielectric constant and loss tangent have been obtained. Model values of various quantities in the expressions are fitted. The temperature dependence of above quantities have been calculated. Theoretical results have been compared with experimental results of Pepinsky et al, are in agreement is observed.

PS31

Neutrino mixing angles predicted in the light of a Quark-Lepton Complementarity Model

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Abstract

The recent non-zero value of the reactor mixing angle (θ_{13}^{pmns}) from various experiments (Daya Bay, RENO, etc...) was in strong agreement with our previous work using a quark-lepton complementarity (QLC) model that predicted the value as $\theta_{13}^{pmns} = (9^{+1}_{-2})^\circ$. The successful validation provided us a motivation to obtain predictions for the most unsettled neutrino mixing parameter i.e. atmospheric mixing angle (θ_{23}^{pmns}). We parameterized the non-trivial correlation between CKM and PMNS mixing matrices in QLC model as $V_c = U_{ckm} \cdot \psi \cdot U_{pmns}$, where ψ is a diagonal phase matrix. Monte Carlo simulations are used to estimate the texture of V_c and we obtained a quite constrained limit for $\text{Sin}^2 \theta_{23}^{pmns} = (0.4235^{+0.0032}_{-0.0043})^\circ$ that is narrower to the existing ones. We have also predicted the value of θ_{23}^{pmns} for normal as well as inverted neutrino mass hierarchies. The value of θ_{23}^{pmns} obtained for two cases are about 1.3σ away from each other, implying the better precision in data can give us a strong hint for the type of neutrino mass

hierarchy. Recently, our value for θ_{23}^{pmns} (normal hierarchy) is in agreement to the value provided by NoVA experiment in USA. In this paper, we summarized the predictions of QLC model along with its future aspects that can help us in solving many unsettled issues of neutrino physics

PS32

Apparitions of The Valid N_c Limit For The Baryonic Sector

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Abstract

Latest computational techniques have revealed the fact that the large number of colours (N_c) limit for the mesonic sector has far reaching consequences, whereas baryonic sector displays various inbuilt adversities. This analysis evidently reveals the fact that $N_c=3$ is the true limit for the baryons. I have scrutinized two different approaches for this very purpose and both exploit the Quantum Chromodynamics (QCD) phase diagram. A clear association can be developed between the 330 MeV mass quanta (which proposes to be the ultimate baryonic building block) and the value of the quark chemical potential at the $N_c=3$ constraint. This itself proposes to be an evidence of the existence of the quanta and also endorses the legitimacy of the $N_c =3$ bound. An unambiguous connection between the bag constant and the N_c parameter again gives authenticated boost to the fact that $N_c=3$ is the valid limit for the baryonic sector. A sound theoretical background for the mesonic sector does favour the fact the $N_c \rightarrow \infty$ limit is an approximation of the $N_c= 3$ limit and $N_c \rightarrow \infty$ limit is a mathematically valid theory. However, for this theory to be universal the authority of the $N_c \rightarrow \infty$ approach should not be restricted only to the mesonic sector but should also include the baryonic sector, which at present it does not seem to be capable of.

Elusive Particle Neutrinos & Double Beta Decay

Prianka Sharma

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Abstract

The continuous energy distribution of electrons in β -decay proved to be a great puzzle, although the maximum energy of the distribution corresponds to that expected from the mass difference of the parent and the daughter. But there is an apparent failure to conserve linear and angular momentum in β -decay. This difficulty was eliminated by assuming the existence of an additional particle called *Neutrino*. *Neutrino remains a puzzle*. Neutrinos are weakly interacting neutral particles. The neutrino is the only elementary particle, whose basic properties are not known till today. The oscillatory property of neutrino indicate its massive nature which is contrary to the assumption of no mass by Standard Model of particle physics. Thus, Standard Model needs modification and neutrinos can well serve the windows to such theories beyond Standard Model. Efforts are going on collectively worldwide to understand these ghost particles as much is yet to be known.

Development Of Wear Resistant Aluminium Matrix Composite By Spray Forming Technique

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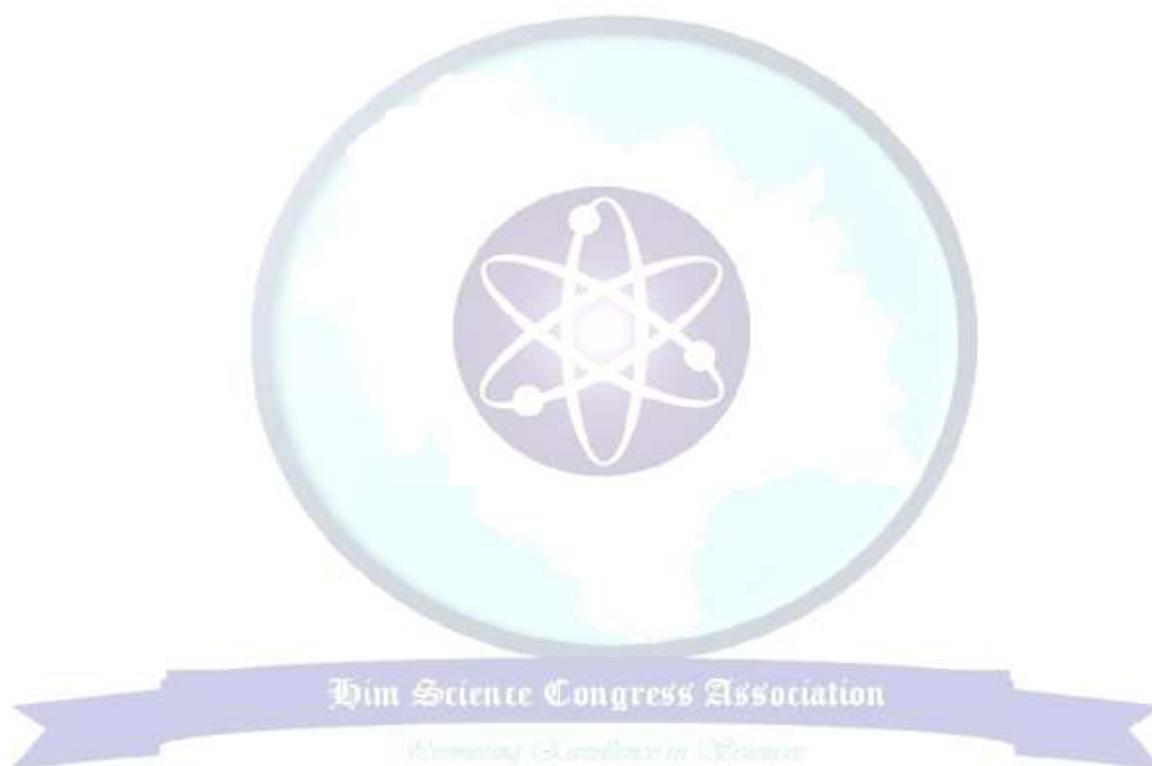
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Abstract

Spray forming technique is one of the advance processes to develop materials exhibiting better properties as compared to conventional materials. In the present work, light weight Al-Si composites of near eutectic composition have been used as base material for developing the composites. During spray forming, SiC particulates have been injected in the atomization region to develop composites. The microstructural refinement inherent in the spray forming process with proper bonding of ceramic particles enhances the hardness and wear properties of spray

formed composites. The addition of the immiscible element Sn in the base Al-alloy exhibits better properties. The wear tests of the developed composites have been done at different loads and temperatures. The wear mechanism is analyzed from the microstructural analysis of wear tracks and debris. The composite containing 10 wt.% Sn offers better wear resistance even at the higher load and temperature condition. The dominating wear mechanism is found to be oxidative wear in this composite.



Section C: Life Sciences & Medical Sciences

POSTER PRESENTATIONS

Abstract Number	Title of Paper	Authors	Address
LS01	Genetic analysis of three scheduled caste populations of Punjab, North West India: A study based on RFLP markers	<u>Prabhjot Kaur</u> and S.M.S. Chahal	Department of Human Genetics, Punjabi University, Patiala 147002, Punjab
LS02	Rauvolfia serpentina L. Benth. ex Kurz.: Therapeutic and Phytochemical Aspects: Review	Radha ^a *, Devendra Kumar Pandeyb	Department of Biotechnology, Lovely Professional University, Phagwara, Punjab, India
LS03	Plant Diversity and Soil Carbon Storage in Forestry Plantations on Moderately Alkali Soils in Northern Haryana	<u>Ekta Bhalla</u> ¹ and S.R. Gupta ²	¹ Department of Bioscience, Arni University, Kathagarh, Indora-176401 (H.P) India ² Department of Botany, Kurukshetra University, Kurukshetra – 136119 (Haryana) India
LS04	Physico-chemical analysis of soil associated with Spilanthes acmella Murr. an important medicinal plant of Shivalik Hills of Himachal Pradesh	Menaka Thakur, Babina Rana, Sujata Bhattacharya	School of Biological Sciences, Shoolini University Solan 173212
LS05	Relevance Of New Taxonomic Attributes In Subfamily Culicinae (Culicidae: Diptera) From Punjab	D. S. Malik, <u>Shikha Panwar</u> * and Jenia Singh	Department of Zoology & Environmental Science, Gurukula Kangri University, Haridwar (U.K.)
LS06	Allelic variation of Dopamine Receptor Gene DRD2 (rs1800497, rs1079597 and rs1800498) in four scheduled caste populations of Punjab, North-West India	Isha* and S.M.S. Chahal	Department of Human Genetics, Punjabi University, Patiala (Punjab)
LS07	Biochemical basis of laboratory selected fenazaquin resistant strain of Tetranychus urticae Koch	Rakesh Kumar Sharma*, Manmeet Brar Bhullar & Manjeet Kaur Sangha**	Department of Entomology, Punjab Agricultural University, Ludhiana-141004, Punjab, **Department of Biochemistry, Punjab Agricultural University, Ludhiana-141004, Punjab, India
LS08	Immobilization of purified alkaline pectin lyase from Bacillus cereus in calcium alginate	Pooja Kohli, Ashwant Singh and Reena Gupta*	Department of Biotechnology, Himachal Pradesh University, Summer Hill Shimla-171005, INDIA
LS09	High dose of gamma sterilising radiation reduces the reproductive performance and life span of male moths, Spodoptera litura (Fabr.)	Sarita Yadav ¹ , Kulbhushan Thakur ²	¹ Department of Biosciences, ARNI University, Indora-Kathgarh, H.P, India. ² Division of Entomology, IARI, New Delhi, India.
LS10	An improved four pan Jaggery making plant for agro based cottage industry of rural India	S. Singh, Arya P.K.* , Kumar S, Thakre G.D., Jain A.K.	¹ Tribology & Combustion Division, CSIR-Indian Institute of Petroleum Dehradun-248005, India
LS11	Preliminary Feeding of Honeybee in Indora (H.P.) Condition	Indu Kumari ¹ & Rajesh Kumar ²	2. Assistant Professor and Principal Investigator- Project H. P. State Council for Science Technology & Environment, Shimla 1, 2 Department of Bioscience, School of Basic Science Arni University, Kangra (H.P.)

LS12	Ecological studies on the riverine habitat of brown trout, <i>Salmo trutta fario</i> L. in River Asiganga in Uttarakhand	Babita Bantwan	Department of Zoology, SPRC PG College, Bahadradab, Haridwar
LS13	Gamma-Irradiation Effect On Cellular Architecture Of Mice Biceps Muscle	Anupam Pundir And Sushma Sharma	Department of Biosciences, Himachal Pradesh University, Summerhill, Shimla-171005, India
LS14	Studies on extracellular chitinase produced by <i>Chitinophaga</i> sp. S165	Sonia Shrama ^{1*} , Dr Ramandeep kaur ²	Department of Biotechnology, Guru Nanak Dev University Amritsar Department cum NCHGSR, Panjab University, Chandigarh
LS15	Mammary derived growth inhibitor participates in Antibacterial response.	<u>Ambica Baru</u> ¹ , Chandra Devi ¹ , Kanika Gupta ² , Nilambra Dogra ¹ , Ashok Kumar ² and Tapas Mukhopadhyay ^{1*}	National Centre for Human Genome Studies and Research, North Campus, Sector-14, Panjab University, Chandigarh, India-160014 Centre for Systems Biology and Bioinformatics, South Campus, Sector-25, Panjab University, Chandigarh, India-160025
LS16	Seed germination behaviour of <i>Dodonaea viscosa</i> (L.) Jacq. From Kangra (Himachal Pradesh)	Tanu priya*, Shashi Sharma*	Department of Biosciences, Himachal Pradesh University, Summer Hill, Shimla-171005, India
LS17	Anti-cancer potential of novel strains of Myxobacteria	Arun Kumar Yadav ^{1*} , Dr. Ramandeep Kaur ²	¹ Department of Biotechnology, Guru Nanak Dev University, Amritsar, Punjab, India. ² Department cum National Center for Human Genome studies and Research, Panjab University, Chandigarh, India.
LS18	Evaluation of insecticidal potential of isothiocyanates in hexane extract of <i>Eruca sativa</i> against <i>Spodoptera litura</i> (Lepidoptera) and <i>Bactrocera cucurbitae</i> (Diptera)	Shallina Gupta ^{1*} , Nalini Singh Chauhan ¹ , Abhay Punia ¹ , Rohit Arora ² , Saroj Arora ² , and Satwinder Kaur Sohal ¹	¹ Department of Zoology, Guru Nanak Dev University, Amritsar-143005, India ² Department of Botanical and Environmental Sciences, Guru Nanak Dev University, Amritsar-143005, India
LS19	Renoprotective And Antihyperglycemic Effects Of <i>Tinospora Cordifolia</i> Stem On Alloxan Induced Diabetic Mice	Arti Rana*, Sushma Sharma	Department of Biosciences, Himachal Pradesh University, Summer Hill,
LS20	Murine Lung Ultrastructural Studies and Pulmonary Oxidative Stress after Cigarette Smoke Exposure	Pankaj Mehta and Sushma Sharma	Department of Biosciences, Himachal Pradesh University, Shimla-171005, H.P., India
LS21	Study On Biopesticidal Efficacy Of <i>Ageratum Conyzoides</i> Linnaeus And <i>Berberis Lycium</i> Linnaeus Against <i>Callosobruchus Maculatus</i> (Fabricius)	D.R. Thakur* and Poonam Kumari	Department of Biosciences, Himachal Pradesh University, Shimla, Himachal Pradesh, 171005, India
LS22	Study On Biopesticidal Efficacy Of <i>Ageratum Conyzoides</i> Linnaeus And <i>Berberis Lycium</i> Linnaeus Against <i>Callosobruchus Maculatus</i> (Fabricius)	D.R. Thakur* and Poonam Kumari	
LS23	Administration In Mouse Model.	Sanjay Kumar Narang And Sushma Sharma*	Assistant professor Department of Zoology Govt. College Bilaspur, H.P. 174001
LS24	Studies of Nematodes Associated with Okra (<i>Abelmoschus</i>)	Sonia Rathore	Department Of Zoology, Govt College

	esculentus (Linn) Moench) in District Bilaspur, Himachal Pradesh		Bilaspur, H.P. Pin-174001.
LS25	Microbial-biodiversity loss due to forest fire in the Pine grown regions of Himalayas	Divya Mittal and Adesh K. Saini	Laboratory of gene regulation Shoolini University of Biotechnology and Management Sciences, Department of Biotechnology, Bajhol, Solan, H.P.
LS26	Evaluation of anticancer potential of Pinus roxburghii needles	Reena Kumari and Reena V Saini	^a Animal Biotechnology lab, Department of Biotechnology, Shoolini University.
LS27	Ethnomedicinal uses of Khair (Acacia catechu Willd.) in District Jaipur, Rajasthan, India.	Baljeet kaur	Department of Botany, DAV college, Jalandhar, Punjab
LS28	Heavy metals: Source, Problems and Solutions	Reetu Yadav *, Seema Bhaduria,	Department of Botany, R.B.S. College Agra, Uttar Pradesh, India
LS29	New techniques of bio-fertilizers & vermin-technology for Organic Foods and Farming	Jaswant Ray ¹ , Amit Kumar ² , Pawan K. Bharti ³ , B .K. Aggarwal ⁴	¹ Department of Zoology, Mewar University, Chittorgarh, Rajasthan ² Department of Toxicology, Springfield Science Pvt. Ltd., Ludhiana-141002 Punjab. ³ Society for Environment Health Awareness of Nutrition & Toxicology, Delhi-110007 ⁴ Department of Zoology, SSN College, University of Delhi, Alipur, Delhi
LS30	Enhanced anticancer immune responses of peripheral blood lymphocytes by biopolymer/inorganic oxide nanocomposite (PEC-GG-ZnO)	Isha Sahotah, Reena V Saini	^a Animal Biotechnology lab, Department of Biotechnology, Shoolini University.
LS31	Quantification of Indole alkaloids in Rauwolfia serpentina and Rauwolfia tetraphylla using HPTLC method	Radha ^a *, Devendra Kumar Pandey ^b	^a School of Biological Sciences, Shoolini University, Solan, Himachal Pradesh, India ^b Department of Biotechnology, Lovely Professional University, Phagwara, Punjab, India
LS32	Functionalization of Polyurethane for Development of Antimicrobial Catheter	Manali Somani, Sadiya Anjum, Samrat Mukhopadhyay, Bhuvanesh Gupta	Bioengineering Laboratory, Department of Textile Technology, Indian Institute of Technology, New Delhi-110016, India
LS33	In-vitro immunomodulation of fish macrophages by bacterial lipopolysaccharide and macrophage activating factor derived from T-cells of Labeo rohita	Abhishek Awasthi ^{1*} , Kailash Chandra Yadav ¹ Parikshit Sharma and Gaurav Rathore ²	¹ Department of Life Sciences, Maharaja Agrasen University, Solan (H.P), India. ² Fish Health Management Division, National Bureau of Fish Genetic Resources, Lucknow (U.P), India
LS34	Exotic and native peregrine earthworm species in the Western Himalayas: diversity, distribution and effects of forest fire on earthworm species richness and abundance	Shakoor Ahmed ¹ and Jatinder M. Julka ²	School of Biological & Environmental Sciences, Shoolini University of Biotechnology & Management Sciences, Solan 173 212, HP, India
LS35	Arbuscular Mycorrhizal Fungal Diversity Associated With <i>Catharanthus Roseus</i> Along An Altitudinal Gradient In Shimla Hills	Babina Rana, Sujata Bhattacharya* and Menaka Thakur	Shoolini University, Post Box No.9, Head Post Office, Solan (HP) 173212, India

ORAL PRESENTATIONS

LS37	Role of genitalia in the identification of butterflies of the genus <i>Maniola</i> Schrank (Lepidoptera : Nymphalidae) from North West Himalaya	Narender Sharma	Zoological Survey of India Northern Regional Centre, 218 Kaulagarh Road Dehradun-248 195 Email : narendersharma70@gmail.com
LS38	Ethnomedicinal uses of Khair (<i>Acacia catechu</i> Willd.) in District Jaipur, Rajasthan, India	Baljeet Kaur	Department of Botany, DAV college, Jalandhar, Punjab E- mail: bkaur_1002@yahoo.in
LS39	Ecotourism : A New Approach For Sustainable Tourism In Kullu Manali	Dr.Monika panchani	*Asso. Prof. Zoology. G.D.C. Bassa monaharipanchani@gmail.com
LS40	Antidiabetic Effects Of <i>Aloe Vera</i> On Streptozotocin Induced Diabetic Kidney Of Mice	Sushma Sharma ¹ and <u>Monika Sharma</u> ^{2*}	1 Professor; Department of Biosciences, Himachal Pradesh University, Summer Hill, Shimla-05, Himachal Pradesh, India.
LS41	Effect Of Different Waste On Biochemical Responses In Earthworm, <i>Eisenia Fetida</i>	Suman Sharma and <u>Harsimran Kaur</u> *	Department Of Zoology And Environmental Sciences Punjabi University, Patiala- 147002, Punjab, India.
LS42	Arsenic Induced Genotoxic Effects On Chromosome Structure Of Albino Mice	Suman Sharma and Anjali Singh Gill	Department Of Zoology & Environmental Sciences Punjabi University, Patiala-147002, Punjab.
LS43	Environmental Impact of Tourism in Shimla	Minakshi Sharma	Assistant Professor in Zoology College of Excellence, GDC Sanjauli, Shimla.
LS44	Impact of temperature on the development of <i>Tetranychus urticae</i> and <i>Eotetranychus lewisi</i> on strawberry	Paramjit Kaur* and Frank G. Zalom**	Department of Entomology *Punjab Agricultural University, Ludhiana - 141004, India **University of California, Davis, USA
LS45	Arsenic induced Toxicity in Ovary of Swiss Albino Mice and it's Reversal by Lycopene.	Charanjit Kaur and Anjali Singh Gill	Department of Zoology Sri Guru Teg Bahadur Khalsa College, Sri Anandpur Sahib Ropar 140124 India.
LS46	A Case Report – Demodicosis in Dog	Moneesh Thakur, Radhika Thakur, S.K. Gupta, Himalaya Sharma and Arshak Asfar	Department of Veterinary Medicine, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University, Selesih, Aizawl, Mizoram-796014
LS47	A Case Report – Electrocardiographic observations in dogs affected with chronic renal failure	Moneesh Thakur, Radhika Thakur, S.K. Gupta and Himalaya Sharma	Department of Veterinary Medicine, Faculty of Veterinary Sciences and Animal Husbandry, RS Pura, SKUAST-Jammu.
LS48	Hantzsch-pyridine synthesis based Biochemical basis of laboratory selected fenazaquin resistant strain of <i>Tetranychus urticae</i> Koch	Rakesh Kumar Sharma*, Manmeet Brar Bhullar & Manjeet Kaur Sangha**	*Department of Entomology, Punjab Agricultural University, Ludhiana-141004, Punjab, **Department of Biochemistry, Punjab Agricultural University, Ludhiana-141004, Punjab, India

Genetic analysis of three scheduled caste populations of Punjab, North West India: A study based on RFLP markers

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Abstract

In population genetic studies, DNA markers are classical tools to study the genomic affinities and differences in various populations. The present study was designed to genetically characterize the Bazigar, Sansi and Bauria scheduled caste populations of Punjab using data on three autosomal unlinked RFLP markers. A total of 654 individuals of the above mentioned scheduled caste populations were analyzed for 3 RFLP marker loci viz., ESR (PvuII), LPL (PvuII) and T2 (MspI). The statistical analysis was done using genotype data. The studied populations were found to be in Hardy–Weinberg equilibrium. The marker loci under study were polymorphic in the present populations. The average expected heterozygosity ranged from 0.4549 in the Bauria to 0.4930 in the Bazigar. The estimates of heterozygosity within population (H_S) and total heterozygosity (H_T) were high in the studied populations. The coefficient of gene differentiation (F_{ST}) among the populations varied from 0.0053 for LPL to 0.0091 for ESR. The overall gene diversity (F_{ST}) was quite low (0.0074). The inbreeding coefficient (F_{IS}) ranged from -0.0035 for T2 to 0.0365 for ESR in the present populations. Average inbreeding coefficient (F_{IS}) was found to be 0.0451. In conclusion, lesser value of F_{ST} indicated that within population variations were much higher than inter population variations. The inbreeding coefficient showed an overall 4.5% decrease in the heterozygosity in all populations. The value of genetic distance varied from 0.0059 (Bazigar-Sansi) to 0.0169 (Bazigar-Bauria) and dendrogram analysis revealed that the Bazigar and Sansi were found to be genetically closer to each other. The results of present study provided baseline data on three RFLP loci in three scheduled caste populations of Punjab.

Rauvolfia serpentina* L. Benth. ex Kurz.: Therapeutic and Phytochemical Aspects: Review**Radha^a *, Devendra Kumar Pandey^b*Department of Biotechnology, Lovely Professional University, Phagwara, Punjab, IndiaAbstract**

Genus *Rauvolfia*, belonging to the family Apocynaceae, comprises around 80 species which are distributed in tropical climatic conditions. Traditionally, *R. serpentina* (L.) Benth. ex Kurz, commonly known as *Sarpagandha*. *Rauvolfia serpentina* is an important medicinal plant in the pharmaceutical world because of its immense therapeutic properties. *Rauvolfia serpentina* is used to cure several ailments due to the presence of important alkaloids, carbohydrates, phenols, flavonoids, glycosides, phlobatannins, saponins, sterols, resins, terpenes and tannins. The plant parts, rhizome and root have been used since centuries in Ayurvedic medicines for curing a large number of ailments such as epilepsy, mental agitation, traumas, high blood pressure, anxiety, schizophrenia, sedative insomnia and insanity. The plant possess more than 50 alkaloids. The major alkaloids are ajmalicine, ajmaline, deserpidine, ajmalimine, indobine, indobinine, reserpiline, reserpine, rescinnamidine, rescinnamine, serpentine, yohimbine and serpentinine. *Rauvolfia serpentina* possess antimicrobial, antifungal, anti-inflammatory, antidiuretic, antiproliferative and anticholinergic activities. All over the world herbal medicine play significant role for primary health care. World population depends on herbal medicines because of its cultural acceptability and lesser side effects. Therefore, there is urgent need for us to find alternative, naturally available remedies for curing million's of people worldwide. Therefore the aim of present review is to evaluate the various therapeutic and phytochemical properties of *Ravwolfia serpentina*.

Keywords: *Rauvolfia serpentina*, Antihypertensive, Herbal remedy, Indole Alkaloids, Medicinal plant, Reserpine

**Plant Diversity and Soil Carbon Storage in Forestry Plantations on Moderately Alkali Soils
in Northern Haryana**

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ABSTRACT

The value of forests in sequestering carbon and reducing carbon dioxide emission to the atmosphere is being recognized increasingly worldwide. Seasonally dry forests cover more than 42% of the total area of tropical forests. These forests are considered to be highly threatened and are attracting the attention of workers for their sustainable management and conservation. Plantations are good sink of carbon to facilitate carbon store in the soil as well as in biomass. Accurate quantification of soil carbon is necessary for detection and prediction of changes in response to changing global climate. The objective of the study was to analyze plant diversity patterns and soil carbon storage in a natural and plantation forests (*Eucalyptus tereticornis*, *Prosopis juliflora*) at Saraswati Reserve Forest, Pehowa (29°59'N, 76°31'E, 247m above msl) in northern Haryana, India. The climate of the study area is tropical monsoonal and semiarid. A total of 78 species belonging to 33 families were recorded during sampling of the forest vegetation at Saraswati Reserve Forest, Kurukshetra. Tree density was 418.75 to 581.25 trees ha⁻¹ in about 25 year old tree plantations (*Eucalyptus tereticornis* and *Prosopis juliflora*), and the natural forest. The importance Value Index (IVI) was 3.54 to 235.80 trees; 9.74 to 120.3 shrubs; 2.72 to 102.25 herbs; 40.38 to 160.60 climbers. The carbon stock upto 60cm soil depth (MgC ha⁻¹) was: organic carbon 34.58 to 41.95, inorganic carbon 12.48 to 20.51. The microaggregates (250µm, 53µm and <53µm) formed a large fraction of soil aggregates and protected most of the soil organic carbon in the soil. The XRD pattern of soil clay showed the predominance of Illite, Montmorillonite, and Kaolinite, which play an important role in soil carbon stability. The forestry plantations showed large potential for carbon sequestration in the soil, which could lead to considerable mitigation, adaptation and development benefits. Presence of high species diversity and richness indicates uniqueness and potentiality of Saraswati Reserve Forest, Kurukshetra for conservation of ecosystem in totality.

Key words: Forestry plantations, Plant diversity, Importance value index, Soil carbon storage, Carbon sequestration.

LS04

Physico-chemical analysis of soil associated with *Spilanthes acmella* Murr. an important medicinal plant of Shivalik Hills of Himachal Pradesh

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Abstract

All living things directly or indirectly depends on the most important resource of the nature i.e. soil. Soil is not a dead inert matter of minerals but it is a healthy, alive and dynamic system of different micro-organisms. pH, electrical conductivity, total dissolved solid, soil moisture, soil texture, organic carbon, available nitrogen, available phosphorus and available potassium are some of the important physico-chemical properties of soil on which plant growth depends. Also, soil structure and soil chemistry directly affect the plant growth. Present study was focused to check the variation in soil associated with *Spilanthes acmella* of Shivalik hills. The soil associated with *S. acmella* from different regions of Shivalik hills was found slightly alkaline. At high pH solubility and availability of micronutrient to plants is declined. Electrical conductivity is a measure of ions present in solution which increases with the increased concentration of ions. Electrical conductivity of different study sites was normal, suitable for all the crops. Potassium is found in its mineral form and affect plants division, carbohydrate formation, translocation of sugar, various enzyme action and resistance to certain plant disease. Available potassium content was found medium in the soil of different study sites. The soil with minimum leaching is known to contain high amount of phosphorus as compared to the soil with maximum leaching. Available phosphorus content was found very high in different study sites. Organic carbon was also found medium, where as available nitrogen content was found very high. Nitrogen is most important fertilizer element that encourages above ground vegetation growth and gives a deep green color to the leaves.

LS05

LS06

**Allelic variation of Dopamine Receptor Gene DRD2 (rs1800497, rs1079597 and rs1800498)
in four scheduled caste populations of Punjab, North-West India**

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Abstract

The human dopamine D2 receptor (DRD2) is a central point of study in the fields of psychiatric disorders, alcoholic behaviours and pharmacology, being a predictable nuclear DNA marker for studying the genomic variation among populations for anthropological studies. The three sites (TaqIA, TaqIB, and TaqID) of the DRD2 gene are widely studied in various world populations. However, little work has been previously published on DRD2 gene polymorphisms in the populations of Punjab. Thus, the present study attempts to understand the genomic diversity among four scheduled caste populations (Bangala = 105, Barar = 117, Gandhila = 114 and Nat = 61) of Punjab (North West India) using three biallelic restriction fragments viz., TaqIA (rs1800497), TaqIB (rs1079597) and TaqID (rs1800498) on DRD2 gene through allele frequency distribution pattern. The results demonstrate that all the three sites were highly polymorphic in the studied population groups which were in Hardy–Weinberg equilibrium for the DRD2 loci. The frequency of B2 allele was found to vary from 0.586 (Bangala) to 0.705 (Nat). However, the Bangalas showed the highest frequency of ancestral allele A1 (0.519) and Nats showed least frequency (0.200). The D2 allele varied from 0.490 (Gandhila) to 0.667 (Bangala). The average heterozygosity for all loci in the population groups was fairly substantial ranging from 0.4138 (Nat) to 0.4728 (Gandhila). The genetic differentiation among the populations was observed to be in order of 0.0766. The overall inbreeding coefficient for the three studied loci ranged from 0.0508 to 0.1896. The UPGMA (rooted tree) based on the estimated D_A distances calculated on the basis of allele frequencies of all 3 polymorphic loci of

DRD2 showed lower genetic distance between Gandhila and Nat, though these two populations were found to be distantly related to the Barars

LS07

Biochemical basis of laboratory selected fenazaquin resistant strain of *Tetranychus urticae*

Koch

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Abstract

The Two-spotted spider mite, *Tetranychus urticae* Koch is a serious pest in many cropping systems worldwide including fruits, vegetables and ornamental plants in both closed and open area worldwide. Two-spotted spider mite (TSSM), has gained importance in view of their widespread occurrence as a pest on vegetables in Punjab. *T. urticae* has developed resistance against different group of acaricides and no biochemical studies have been conducted to assess the basis/ mechanisms of acaricide resistance in *T. urticae* populations of the Punjab State. So we investigated the mechanism of acaricide resistance in *T. urticae* through enzyme assays. Field population of *T. urticae* resistant to fenazaquin (24.65 fold) was selected with fenazaquin successively for 15 generations to develop fenazaquin resistant strain leading to 6.83 fold increase in the resistance level. There was significant increase in specific activity of the MFO enzymes in resistant strain (534.65 nmole min⁻¹ mg⁻¹ of protein) when compared to susceptible strain (166.35 nmoles min⁻¹ mg⁻¹ of protein). There was 3.21 fold higher MFO activity in resistant strain Similarly there was significant increase in GST activity by 1.40 fold in resistant strain of *T. urticae* (0.30µmoles min⁻¹ mg⁻¹ of protein) than the susceptible strain (0.21 µmoles min⁻¹ mg⁻¹ of protein).

The esterase activity was found to be 9.68 µmoles naphthol min⁻¹ mg⁻¹ of protein for fenazaquin resistant strain and it was 8.54 µmoles naphthol min⁻¹ mg⁻¹ of protein for susceptible strain when α -naphthyl acetate was used as substrate similarly esterase activity was found to be 13.87 µmoles naphthol min⁻¹ mg⁻¹ of protein for fenazaquin resistant strain and for susceptible strain it was 10.90 µmoles naphthol min⁻¹ mg⁻¹ of protein when β -naphthyl acetate was used as substrate. The fenazaquin resistant strain exhibited 1.13 and 1.27 fold higher esterase activity as

compared to the susceptible strain of *T. urticae* with α -naphthyl acetate and β -naphthyl acetate. The biochemical experiments conducted in the present study suggested that enhanced metabolic detoxification might be the major mechanism responsible for imparting resistance to fenazaquin in *T. urticae*.

LS08

Immobilization of purified alkaline pectin lyase from *Bacillus cereus* in calcium alginate

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Abstract Purified pectin lyase from *Bacillus cereus* was successfully immobilized in alginate beads with a high binding efficiency of 84.55%. The optimal immobilization was achieved using 2.5% (w/v) alginate concentration. Both free and immobilized enzyme showed optimum pH of 10.0 and temperatures of 40 and 45°C were found to be optimum for free and immobilized enzyme respectively. Pectin lyase gave maximum activity at concentration of 0.5% w/v for free and 0.75% w/v for the immobilized enzyme and relatively similar V_{\max} values were obtained for both free (3.3 $\mu\text{mol}/\text{min}$) and immobilized pectin lyase (3.6 $\mu\text{mol}/\text{min}$). The K_m for the immobilized pectin lyase (0.19 mg/ml) was slightly higher than that of the free (0.16 mg/ml) enzyme. Pectin lyase showed maximum enzyme activity in the presence of Mg^{2+} ions for free and immobilized enzyme was unaffected in the presence of metal ion. Thermal stability was not significantly altered by immobilization and thermal stability of free and immobilized pectin lyase was relatively similar at different temperatures. The immobilized pectin lyase retained almost 53% of its original activity up to 7th cycle. Furthermore, during storage at 4°C, immobilized pectin lyase retained relative activity of 79.77% and free enzyme retained 63.63% relative activity upto 35 days of storage, this indicated that the immobilization improved stability of the enzyme.

Keywords: Pectin lyase, immobilization, *Bacillus cereus*, calcium alginate, characterization.

High dose of gamma sterilising radiation reduces the reproductive performance and life span of male moths, *Spodoptera litura* (Fabr.)

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Abstract

The *Spodoptera litura* is a lepidopteran insect pest of scientific and economic importance. This insect pest is a polyphagous pest of major crops like tobacco, cotton, rice and tomato. The high reproductive potential and ability to migrate over long distances have resulted in it becoming a serious pest of many agricultural crops throughout its geographical range. The insect pest population can be controlled by suppressing its reproductive potential. The present study reports the results from a laboratory experiment in which effect of 200 Gy of gamma radiation on reproductive performance and life span of male moths were observed. When treated with 200 Gy of gamma radiation the mating percentage and copulation period observed were significantly different between treated and control groups with $p < 0.05$. Life span of adult male moths also showed a significant difference with $p < 0.0001$. Present results showed a significant variation in reproductive performance of radiation treated moths when compared to control group suggesting the effect of 200 Gy as sterilising dose of gamma radiation on mating behaviour in male moths. Survival period analysis further supports significant effects of sterilising dose of gamma radiation on longevity of male moths.

Key words: *Spodoptera litura*, Radiation, Reproductive performance, Life span.

LS10

An improved four pan *Jaggery* making plant for agro based cottage industry of rural India

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Abstract

Jaggery making is a dominant cottage industry in India engaging over 2.5 million people. A significant amount of total sugarcane produced in the country is used to manufacture about 8 million tonnes of *Jaggery* (also known as *Gur*). Conventional *Jaggery* making plants are constructed by local artisans without any technical consideration. These plants are highly polluting with heavy smoke coming out of its chimney. Besides, these plants are highly inefficient consuming high fuel (bagasse) per unit of *Gur* produced. To address the issue of pollution and to improve the performance, an improved design of *Jaggery* plant is developed and installed at a rural location. The improved plant and conventional plant is compared on the basis of *Jaggery* production, fuel consumption and emissions. Performance of the improved unit is evaluated on the basis of fuel consumed per unit of *Jaggery* produced and temperature of exhaust gases. The improved unit results in 20% increase in daily production capacity and about 38% reduction in fuel consumption. Comparison of flue gas quality shows significant improvement in fuel combustion as CO levels are reduced. Smoke no. of exhaust gases shows significant improvement. A socio-economic impact analysis is carried out to quantify the advantages of improved *Jaggery* plant in terms of generation of additional income and improved quality of life of farmers engaged in this agro based cottage industry.

Keywords: *Jaggery*, *Gur*, Bagasse, Efficiency, Emissions, Sugarcane, Farmer

LS11

Preliminary Feeding of Honeybee in Indora (H.P.) Condition

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Abstract

The shortage of bee flora, particularly during peak summer season makes the task of beekeeping more difficult and troublesome. The reserve stores of honey and pollen gets rapidly consumed during this period and overall activities of honey bees including foraging, egg laying, and brood rearing are reduced. This may lead to perishing of bee colonies. Few commercial beekeepers follow the concept of migration but it is a costly affair which small beekeepers cannot afford. To overcome dearth periods, provision of stimulative feeding may prove beneficial. In the present study which was carried out at Indora region of district Kangra (H.P.), efforts were made to feed the bees with artificially formulated diets. Diet was fed to bees on top bars in form of patties after wrapping in butter paper. Due to scanty natural bee flora, bees showed great interest towards formulated diets. Results of preliminary study revealed that all the diet formulations were consumed by the bees. However, consumption rate for diet 2 was more as compared to diet 1 and diet 3. It was observed that bees even picked up butter paper and no residue left on the top bars. Detailed investigation is going on to standardize the bee formulations so that suitable recommendations can be made for strengthening beekeeping venture in the state.

LS12

**Ecological studies on the riverine habitat of brown trout, *Salmo trutta fario* L. in
River Asiganga in Uttarakhand**

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Abstract

Brown trout (*Salmo trutta fario* L.) belonging to the Family Salmonidae have been introduced in the Garhwal Himalayan waters in the year 1910 by the Tehri State Ruler for their food and sporting qualities. The 'eyed ova' of brown trout was carried from Kashmir and stocked into Kaldyani hatchery in Uttarkashi and from there, its seed was introduced into Lake Dodital and River Asiganga.

The present study provides information on habitat ecology of brown trout, *Salmo trutta fario* in Asiganga, a highland spring fed tributary of river Bhagirathi in Uttarakhand. For habitat study, certain physico-chemical parameters, density and diversity of phytoplankton and benthos were

investigated during November 2007 to October 2008. The water temperature was recorded to be varying between 5⁰C to 21⁰C, respectively. The dissolved oxygen ranged between 7.3 mg/L to 14.3 mg/L; Free CO₂ varied between 0.3 mg/L to 2.8 mg/L and the alkalinity varied between 2.2 mg/L to 20 mg/L.

A total of forty three species of phytoplankton were recorded belonging to Chlorophyceae, Bacillariophyceae and Myxophyceae. The important genera of phytoplankton were observed as *Spirogyra* spp., *Diatoma* spp., *Epithemia* spp., *Synedra* spp., *Navicula* spp., *Nitzschia* i spp. The river supports very good density and diversity of benthic genera. A total of 19 benthic genera was identified belonging to Orders Ephemeroptera, Plecoptera, Diptera, Coleoptera and Trichoptera.

LS13

Gamma-Irradiation Effect On Cellular Architecture Of Mice Biceps Muscle

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Abstract

The objective of the present study was to evaluate the effect of gamma –radiation on mice biceps muscle. Radiation is known to produce deleterious effects on living organisms. Man may be exposed to radiation emanating from detonation of nuclear weapons, travel in outer space or nuclear vehicles, employment in nuclear power installations, utilizing radiation for therapeutic purposes. Mice showing no signs of morbidity were divided into two groups. Group I containing normal mice served as control. Group II mice were maintained under identical conditions and were irradiated with 4 gy gamma – rays. Study was performed at 7,14,21 and 28 days. Mice were sacrificed by cervical dislocation and biceps muscle was excised. Tissue was fixed in aqueous bouin's fixative , washed and dehydrated in different grades of alcohol ,cleared in xylene and embedded in paraffin wax. Thin sections were cut and subjected to haematoxylin eosin staining. Muscle sections of normal showed circular ,oval or polygonal cells with compact arrangement and subsarcolemmal disposition of nuclei. Irradiated muscle sections exhibits fiber necrosis, splitting of fibers and fibrolysis.

KEYWORDS: Gamma radiaton, Biceps muscle, Haematoxylin eosin staining, Necrosis, fibrolysis.

LS14

Studies on extracellular chitinase produced by *Chitinophaga* sp. S165

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Abstract

Chitinases (EC 3.2.1.14) are glycohydrolases that cleave β -1,4 N acetyl glucosamine linkage. They are present in wide range of organisms including bacteria, fungi, plants, insects, crustaceans, animals and humans. Chitinases are classified as endochitinase, exochitinase and chitobiase. Chitinases have gained importance due to their ability to degrade chitin cell wall in fungus and insect exoskeleton and thus are useful for biocontrol of plant pathogens. *Chitinophaga* spp. are gram negative soil borne bacteria which are also known as chitinolytic bacteria. They belong to family 'Chitinophagaceae' in the order Spingobacteriales. *Chitinophaga* are of special interest because of their potential to degrade chitin. *Chitinophaga* sp. S165 was isolated in a study to assess the microbial diversity of soil rich in organic decaying matter. *Chitinophaga* sp. S165 produces extracellular chitinase which was further studied to determine the activity at pH and temperature range. Crude enzyme was found to be optimally active at 37°C and pH 6. The chitinase was maximally induced by addition of fungal mat of *Cladosporium* sp. in the growth medium. A band of 25 kDa could be detected by zymography using glycol chitin as substrate

LS15

Mammary derived growth inhibitor participates in Antibacterial response.

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Abstract

Human MDGI/FABP3 is a member of a fatty acid binding protein (FABP), which plays an important role in fatty acids transport and lipid metabolism. Previous reviews have exhibited noteworthy role of fatty acids in the cellular immune system and a few FABPs are communicated at huge levels in immune active cells. However, the immune function of human FABP3/MDGI is not well characterized. For this reason, the human MDGI (FABP3) cDNA was sub-cloned in a bacterial expression vector pQE30. MDGI protein expression was examined on SDS-PAGE. Bright field microscopic study revealed the altered morphology of MDGI expressing bacteria and these cells were also forming aggregates. Further studies suggested that the MDGI expressing bacterial cells were releasing the cellular content such as DNA and proteins in higher amount than the controls. Interestingly, human MDGI expressing bacteria showed some level of kanamycin resistance. Therefore, bioinformatics studies were carried out and it was indicated that MDGI could interact with kanamycin as well as with ribosome inactivating protein. Structural superimposition of MDGI and type I ribosome inactivating protein showed structural similarity. Thus, the expression of human MDGI in bacterial cell could affect the protein synthesis causing cell lysis. Consequently, it appears that MDGI exerts its antimicrobial activity through translation interference.

LS16

Seed germination behaviour of *Dodonaea viscosa* (L.) Jacq. From Kangra (Himachal Pradesh)

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Abstract

Seed germination/dormancy status of high medicinal value plant namely *Dodonaea viscosa* from Kangra (Himachal Pradesh) was determined. *Dodonaea viscosa* is an economically and medicinally important plant belonging to family Sapindaceae. All plant parts are used by local populations of Kangra (H.P.). Extensive extraction from the wild has threatened this plant species. The efficacy of different physico-chemical treatments (SNP, KNO₃, mechanical scarification, hot water, boiling water and H₂SO₄) and GA₃ for dormancy removal/germination improvement was determined. Dormancy in seeds of *Dodonaea viscosa* is due to a water-impermeable seed coat (physical dormancy, PY). Thus, mechanically scarified seeds imbibed water (c. 95% increase in mass) and germinated to high percentage, whereas non-scarified seeds did not take up water. Most effective treatment was acid (H₂SO₄) scarification in combination with GA₃. Different biochemical changes during germination/dormancy removal: α -amylase activity, proline content, MDA content (an index of lipid peroxidation) and phenolic content were also determined. α -amylase activity increased by all treatments which was consistent with increase in seed germination. Thus findings, provide insight into the seed dormancy mechanism of *D. viscosa*. The data have implications for conservation and cultivation of concerned medicinal plant species.

Keywords: Medicinal plant, seed germination, Dormancy, Cultivation

LS17

Anti-cancer potential of novel strains of Myxobacteria

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Abstract

Myxobacteria are rod shaped gram-negative δ -proteobacteria that are known to have the largest genomes among bacteria. They are rich source of secondary metabolites, which places them

among the best known natural product producers. Till date, myxobacteria have yielded at least 100 distinct core structures and some 500 derivatives. Cancer is amongst the most prevalent deadly human diseases in the world and chemotherapy is the most common type of cancer treatment but successful elimination of tumor is obstructed by drug resistant cancer cells. New combined therapeutic approaches for the treatment of cancer appear to provide a feasible option to explore further for combating these challenges and the use of novel chemotherapeutic agents that exhibit higher efficacy and fewer side effects. Myxobacterial secondary metabolites are the hope for development of such novel anti-cancer drugs which may have new target sites with novel mechanism of action. Myxobacteria from soil in India have been an unexplored group. As the synthesis of a particular secondary metabolite in myxobacteria is a strain characteristic, the diversity of the newly isolated strains of myxobacteria holds immense promise to contribute to cancer therapeutics. Myxobacterial strains available in laboratory were optimized for growth in Casitone Yeast Medium. The extract of water soluble secondary metabolites was prepared from the cell free culture supernatant of the strains of *Corallocooccus* spp., *Myxococcus* spp., *Pixidicoccus* spp. and *Cystobacter* spp. The extracts were screened for *in vitro* cytotoxicity on different cell lines (cervix, pancreas, brain and bone) by Sulforhodamine B (SRB) assay. Partially purified extract of *Cystobacter* sp. S186 showed potent anticancer activities among the tested myxobacterial strains.

LS18

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LS19

Renoprotective And Antihyperglycemic Effects Of *Tinospora Cordifolia* Stem On Alloxan Induced Diabetic Mice

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Abstract

Diabetic nephropathy is amongst the most important causes of deaths in type 1 diabetic patients, of whom, 30-40% patients eventually develop end stage renal failure. *Tinospora cordifolia* commonly called Guduchi has been extensively used for its various medicinal properties. The effects of methanolic stem extract of this plant on blood glucose concentration and histopathology of kidneys was assessed. Mice were given intraperitoneal injection of alloxan monohydrate to a dose of 120 mg/kg body weight and divided into two groups with three mice in each group. First group served as control and were given distilled water. Second group were given *Tinospora* stem extract orally to a dose of 300 mg/kg body weight for a period of 28 days. Fasting blood sugar levels were determined after regular intervals and prior to dissection. A significant decrease in blood glucose levels with value 114.00 ± 8.71 mg/dl in extract administered groups was observed as compared to diabetic mice with value 183.00 ± 6.24 during the period of experiment up to 28 days stage. The histopathological studies of kidneys of diabetic mice revealed degeneration of renal architecture, but with restoration after treatment with administration of *Tinospora* extract was observed.

Key words

Diabetic nephropathy, hyperglycemia, *Tinospora cordifolia*, blood glucose.

LS20

Murine Lung Ultrastructural Studies and Pulmonary Oxidative Stress after Cigarette Smoke Exposure

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Topic: Biological Sciences

Background: For many years, it has been well known that smoking could cause lung damage. Lung cancer and chronic obstructive pulmonary disease have been two most common tobacco smoke related lung diseases. Exposure to environmental tobacco smoke (also known as passive smoking or secondhand smoke) is an important factor in indoor exposures leading to allergic and

asthmatic effects. The lung's large surface area makes it susceptible to potential adverse effects of airborne environmental agents such as cigarette smoke. Inhaled cigarette smoke reacts with airway epithelium and may induce oxidative stress. Smoke exposure enhances autophagy in mouse lung leading to emphysema. Recent studies have examined the contribution of autophagy and mitophagy to the development of lung disorders.

Objective: To determine murine lung structural alterations and oxidative stress after exposing mice to cigarette smoke in smoking chamber.

Methods: The animals were randomly distributed into the following two groups: 1) control and, 2) cigarette smoke (CS) exposed, comprising 10 animals exposed to CS at the rate of 5 cigarettes/6 days/week for 20 minutes for 56 days in a specially designed smoking chamber in lab.

Results: We studied changes in murine lung morphology and oxidative stress at 56 days from age-matched smoke-exposed and air-exposed control mice. Ultrastructural studies revealed significant changes in the lung architecture of cigarette smoke-exposed mice. Furthermore, secondhand CS exposure significantly increased the expression of oxidative stress markers.

Conclusion: Lung ultrastructural studies have demonstrated that mice exposed to cigarette smoke could induce inflammation in the airways. However, further studies are needed to explore the role of autophagy and oxidative stress in pulmonary diseases. This would help us to understand the human asthma induced in response to exposure to secondhand CS.



Study On Biopesticidal Efficacy Of *Ageratum Conyzoides* Linnaeus And *Berberis Lycium* Linnaeus Against *Callosobruchus Maculatus* (Fabricius)

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Abstract:

Present study was carried out on the two plants, *Ageratum conyzoides* Linnaeus and *Berberis lycium* Linnaeus against *Callosobruchus maculatus* (Coleoptera: Bruchidae) infesting *Vigna mungo* seeds during storage. Acetone and methanol extract of leaves and flowers of *A. conyzoides* and leaves and stem of *B. lycium* were prepared and employed at different concentrations of 5%, 10% and 20% with three replicas each. Efficacy of these extracts were observed on adult mortality, fecundity and F1 adult emergence. The present study showed that all the concentrations viz. 5%, 10% and 20% of both plants were effective in reducing fecundity, mortality and F1 adult emergence. 100% mortality was observed on 7th day on treatment at 20% concentration Of acetone extract of *Ageratum conyzoides* leaves and Acetone extract of *Berberis lycium* leaves show 100% mortality on 8th day of treatment at same concentration. Among all the extracts, 20% extract of *A. conyzoides* flower and leaves in acetone as well as in methanol was found to be most effective. All concentrations of the plant extracts applied were able to cause significant adult mortality of the bruchids. All the extract concentrations evaluated were able to repel adult bruchid from the cowpea seed. All concentrations of acetone and methanol extracts help in reducing fecundity.

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Study On Biopesticidal Efficacy Of *Ageratum Conyzoides* Linnaeus And *Berberis Lycium* Linnaeus Against *Callosobruchus Maculatus* (Fabricius)

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concentrations of 5%, 10% and 20% with three replicas each. Efficacy of these extracts were observed on adult mortality, fecundity and F1 adult emergence. The present study showed that all the concentrations viz. 5%, 10% and 20% of both plants were effective in reducing fecundity, mortality and F1 adult emergence. 100% mortality was observed on 7th day on treatment at 20% concentration Of acetone extract of *Ageratum conyzoides* leaves and Acetone extract of *Berberis lycium* leaves show 100% mortality on 8th day of treatment at same concentration. Among all the extracts, 20% extract of *A. conyzoides* flower and leaves in acetone as well as in methanol was found to be most effective. All concentrations of the plant extracts applied were able to cause significant adult mortality of the bruchids. All the extract concentrations evaluated were able to repel adult bruchid from the cowpea seed. All concentrations of acetone and methanol extracts help in reducing fecundity.

LS23

Therapeutic Potential And Implication Of B-Adrenoceptor Agonist Administration In Mouse Model.

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Him Science Congress Association

Abstract

β_2 -Adrenoceptor agonists such as fenoterol are anabolic in skeletal muscle, promote hypertrophy and have potential application for enhancing muscle repair after injury. Although traditionally used for the treatment of bronchospasm, it became apparent that some β -agonists had the ability to increase skeletal muscle mass and decrease body fat. These so-called "repartitioning effects" proved desirable for those working in the livestock industry trying to improve feed efficiency and meat quality. Not surprisingly, β -agonists were soon being used by those engaged in competitive bodybuilding and by other athletes, especially those in strength- and power-related sports. Despite their muscle anabolic properties, β -agonists have also been associated with some undesirable side effects, including increased heart rate (tachycardia) and muscle tremor, which

have so far limited their therapeutic potential. Since the early 1990s, the use of β -agonists for the purpose of enhancing sporting performance has become increasingly prevalent. In fact, many athletes are not aware of the deleterious cardiovascular effects of chronic high-dose β -agonist administration and in many cases rely on anecdotal information about these compounds from nonscientific sources. As a consequence of their muscle anabolic actions, the effects of β -agonist administration on skeletal muscle have been examined in a number of animal models (and in humans) in the hope of discovering therapeutic applications, particularly for muscle wasting conditions such as sarcopenia (age-related muscle wasting and associated weakness), cancer cachexia, sepsis, and other forms of metabolic stress, denervation, disuse, inactivity, unloading or microgravity, burns, heart failure, chronic obstructive pulmonary disease, muscular dystrophies and neuromuscular disorders. For many of these conditions, the anabolic properties of β -agonists may attenuate (or potentially reverse) the muscle wasting, muscle fiber atrophy, and associated muscle weakness. β -Agonists also have clinical significance for enhancing muscle repair and restoring muscle function after injury or following reconstructive surgery. Cardiac hypertrophy is commonly observed in mice when treated chronically with high doses of β -agonist fenoterol. In adult mice treated daily with an intraperitoneal injection of fenoterol (1.4 mg/kg) for 4 wk, cardiac hypertrophy was evident and a decrease in cardiac function was observed. The cardiac hypertrophy in fenoterol-treated mice was associated with an increase in midventricular collagen deposition. Furthermore, areas of apoptotic activity were observed in mice heart after chronic high dose administration and it is possible that similar damage can contribute to a deterioration of cardiac functions.

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LS24

**Studies of Nematodes Associated with Okra (*Abelmoschus esculentus* (Linn) Moench) in
District Bilaspur, Himachal Pradesh**

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Abstract

Nematodes are commonly called as non segmented round worm, thread worms or pin worms. Its body is elongated, cylindrical, bilaterally symmetrical and tapering towards both end. It is pseudocoelomate and dioecious with sexual dimorphism. Although currently only about 4100

have been described, their impact on human by inflicting heavy losses in agriculture is substantial. Its impact on agriculture by way of inflicting is quite substantial. In the District Bilaspur of Himachal Pradesh, in the present study on nematodes, two types of nematodes have been detected from the roots and rhizosphere of okra crop. It has been estimated that a single acre of soil from arable land may contain as many as 3,000,000,000, nematodes. These two are ectoparasitic and endoparasitic. The present study also reveals that percentage of *Helicotylenchus erythrinae* is quite high in some parts of the District of Bilaspur. Okra is susceptible to root-knot nematodes damage. If Okra is to be grown in areas prone to nematode attacks Nematicide must be sprayed prior to planting. Non chemical management of nematodes can be accomplished through the use of soil solarization, crop rotation or the use of nematodes suppressive crops.

Key words- Nematodes, Okra, *Helicotylenchus erythrinae* , Rhizosphere .

LS25

Microbial-biodiversity loss due to forest fire in the Pine grown regions of Himalayas

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Abstract

Fire, either as a natural or anthropogenic activity, influences microbial dynamics, which, in turn, affects soil fertility and leads to the deterioration of organic matter. It alters the binding capacity and erosion ability of soil in comparison to unburnt area. Here we examine the burnt as well as unburnt regions of Pine forest and we found there is loss of beneficial microflora. Therefore we want the replenishment of the beneficial microbes so that there will be an increase in the ecological succession after fire. Moreover, the introduction of microbes will improve growth of Pine saplings and prevent them from diseases. It will also improve the quality of fodder and thus improve the livelihood of families dependent on milk. If it works successfully then similar systems can be replicated in other fire affected forest areas of Indian Himalayan regions(IHR) and in the biosphere reserves where vegetation get severely affected upon fire incidents.

Evaluation of anticancer potential of *Pinus roxburghii* needles

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Abstract

Pinus roxburghii, the pine native to the Himalayas commonly known as Chir. Pine is widely used in traditional and folkloric systems of medicine. In Ayurveda, *P. roxburghii*, is prescribed as an intestinal, antiseptic, antidiabetic and antioxidant whereas traditionally it is used for eye, ear, throat and blood infections. *P. roxburghii* is a rich source of terpenoids, flavonoids, tannins and xanthones but till date there is no scientific reports on anticancer property of *P. roxburghii* needles. Therefore, we aim to extend this work using extract/fractions of *P. roxburghii* needles. Dried and crushed needles of *P. roxburghii* were defatted with petroleum ether and then extracted with chloroform, ethyl acetate and butanol by liquid-liquid fractionation. Phytochemical screening of the extract and fractions revealed that they were rich in secondary metabolites such as saponins, terpenoids, flavonoids, cardiac glycosides, phenols and phytosterols. Anticancer activity of these extract and fractions was tested against breast adenocarcinoma (MCF-7), human lung carcinoma (A549) and Ehrlich ascites carcinoma (EAC) cell lines using 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) assay. Viability assay demonstrated that the butanol fraction showed highest cytotoxicity against MCF-7 cells ($1.601 \pm 3.94 \mu\text{g/ml}$) followed by A549 cells ($\text{IC}_{50} = 56.20 \pm 1.14 \mu\text{g/ml}$) and EAC cells ($\text{IC}_{50} = 58.59 \pm 1.08 \mu\text{g/ml}$). The present study revealed that butanol fraction of *P. roxburghii* needles contain the compounds engaging specifically in fighting cancer cells leading to growth inhibition and destruction of tumor cells. However, further studies, including identification and purification of the active compounds, will need to be pursued and also need to be confirmed using *in vivo* models.

Ethnomedicinal uses of Khair (*Acacia catechu* Willd.) in District Jaipur, Rajasthan, India.

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Abstract

Plants and plants products play an important role in the tribal life of India. There is a great importance of *Acacia catechu* Willd. among the rural community of District Jaipur of State Rajasthan. It is commonly known as Khair tree. *A. catechu* is a deciduous tree of comparatively dry regions. It belongs to family Fabaceae. *A. catechu* ethnomedicinally used in snake bites, chronic diarrhea, dysentery, bleeding piles, chronic bronchitis etc by the tribal people of this area of Rajasthan. The most important product obtained from *A. catechu* is Katha. Katha is regarded as astringent, cooling and digestive and is useful in a sore throat, cough, and diarrhea. Katha is commonly used in Ayurvedic preparations since immemorial.

LS28

Heavy metals: Source, Problems and Solutions

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Abstract

The term heavy metal refers to any metallic chemical element that has a relatively high density and is toxic or poisonous at low concentrations. Heavy metals are natural components of the Earth's crust. They cannot be degraded or destroyed. Generally heavy metals in our water supply cannot be detected by sight, smell or taste. To a small extent they enter our bodies via food, drinking water and air. However, at higher concentrations they can lead to poisoning. There are serious health risks from drinking water with excessive levels of heavy metals with many of them affecting the brain. Heavy metals are dangerous because they tend to bioaccumulate. Heavy metal toxicity can result in damaged or reduced mental and central nervous functions. We can remove and detect heavy metals from drinking water efficiently with nano concept.

Key words: Heavy metals, remove and detect heavy metals, health problems, nano concept,

New techniques of bio-fertilizers & vermin-technology for Organic Foods and Farming

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Abstract

Today, Organic foods & farm products have got more value as compared to inorganic products. New generation people are becoming more aware for their health and environment. Bio-farming is sustainable and eco-friendly which enables to conserve biodiversity and to protect environment. Organic food and farming system avoids or largely excludes the use of synthetically chemicals, fertilizers, pesticides, growth regulators, and livestock feed additives. It mainly relies upon crop rotation, organic manures, bio-pesticides and integrated pest management (IPM). India is a most suitable and different origin of life in food and farming system. In this paper emphasis has been given to practice in favours of organic farming, bio-pesticides, and preparation and use of organic manures by different methods in a hygienic manner.

Keyword: Organic farming, bio-pesticides, vermin-technology, eco-friendly

Enhanced anticancer immune responses of peripheral blood lymphocytes by biopolymer/inorganic oxide nanocomposite (PEC-GG-ZnO)

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Abstract

Pectin-guar gum-zinc oxide (PEC-GG-ZnO) nanocomposite was developed and used as an immunomodulator for the first time to improve the cancer cell killing capabilities of human peripheral-blood lymphocytes (PBL). PEC-GG-ZnO nanocomposite was prepared by

nanoprecipitation technique and successful nanocomposite synthesis was confirmed by using FT-IR, XRD, HRTEM combined with SAED, EDX, and SEM. TEM images showed the polygonal shape of nanocomposite with the size range 50-70nm. The lymphocyte proliferation assay proved the immunostimulatory activity of the PEC-GG-ZnO nanocomposite which increased with the increase in concentration. Additionally, the nanocomposite displayed better immunostimulatory activity as compared to its constituents, pectin and guar gum. Moreover, we also found that nanocomposite pretreated human PBL displayed enhanced cytotoxicity towards lung adenocarcinoma (A549) and breast carcinomas (MCF-7) cells as compared to untreated PBL. The microcytotoxicity assay demonstrated that with increase in effector:target ratios from 2.5:1, 5:1, 10:1 and 20:1 there was an increase in the cancer cell killing. This study provides a novel nanocomposite with immunostimulatory activities and hence, it can serve as a promising cancer therapeutic agent.

LS31

Quantification of Indole alkaloids in *Rauwolfia serpentina* and *Rauwolfia tetraphylla* using HPTLC method

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Abstract

High performance thin layer chromatographic method (HPTLC) has been developed for the analysis of ajmalicine and reserpine in root part of two different population of *Rauwolfia serpentina* (L.) Benth ex Kurz and *Rauwolfia tetraphylla* L., Apocynaceae, collected from Uttarakhand and Punjab. High performance thin layer chromatographic HPTLC of methanolic extract of root containing indole alkaloids, i.e. ajmalicine and reserpine, was performed on TLC Silicagel 60 F254 (10 cm × 10 cm) plates with toluene : ethyl acetate : formic acid (7:2:1), as mobile phase. Quantification of the ajmalicine and reserpine was performed in the absorption–reflection mode at 268 nm. The recovery of ajmalicine and reserpine were 98.7 and 99.3 % respectively. The calibration curves were linear for both the ajmalicine and reserpine, in the range of 200–1200 ng. The method is rapid, simple and cost effective and can be used for routine analysis of ajmalicine and reserpine in different *Rauwolfia* species as well as for quality control of herbal drugs containing *Rauwolfia* species.

Keywords: High performance thin layer chromatography, Ajmalicine, Reserpine, *R. tetraphylla*, *R. serpentina*

LS32

Functionalization of Polyurethane for Development of Antimicrobial Catheter

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Abstract

Indwelling urinary catheters are medical devices utilized in both hospitals and nursing homes to relieve urinary retention and urinary incontinence. However this catheterization is accompanied by the catheter associated urinary tract infections (CAUTI) which is responsible for >40% of all episodes of nosocomial sepsis in hospitals. Antibiotics as well as surface modifications for example, hydrogels proved to be of little value in preventing CAUTI. Inherent antimicrobial catheter should be there to prevent it. Wide range of catheters is available in market, but polyurethane (PU) was adopted for the research because it is nonallergic in nature, non inflammatory, can easily be functionalized although in existing scenario antimicrobial PU catheter are not available in market. The aim of this study was the development of antimicrobial polyurethane catheter by adopting the chemical functionalization route. Alkaline hydrolysis using NaOH was used for the generation of hydrophilic functionality on PU surface. Reactant concentration, reaction time and temperature were investigated in terms of good hydrophilic functionality. Amine content was investigated by acid orange dye method

LS33

In-vitro immunomodulation of fish macrophages by bacterial lipopolysaccharide and macrophage activating factor derived from T-cells of *Labeo rohita*

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Abstract

Macrophages are one of the most primitive phagocytic cells of vertebrates and invertebrates, and are the most important cells in the immune response in fishes. These cells are the first phagocytes to encounter the pathogenic microorganisms when superficial barriers are breached and play a central role in innate and adaptive immune response in teleosts. Soluble factors released by T-lymphocytes, known as macrophage activation factor (MAF) can result in increased activity of macrophages to kill micro-organisms and tumour cells. In the present study, the production of MAF by T-cells of *Labeo rohita* (rohu), was examined following stimulation with concanavalin A (Con A) and phorbol myristate acetate (PMA). Effect of MAF and bacterial lipopolysaccharide (LPS) on important functional properties of head kidney macrophages (HKM) was also studied. The results revealed that co-stimulation of macrophages with MAF and LPS inhibited nitric oxide production but induced production of reactive oxygen species synergistically. Moreover, lysozyme activity was enhanced after co-stimulation with the MAF-containing supernatants and LPS as compared to MAF alone whereas bactericidal activity remained unaffected. The data suggest that T-cells of rohu could be stimulated to produce MAF, and MAF-activated HKM play a crucial role in the mounting of immune response.

Keywords: Macrophage activating factors, Reactive oxygen species, Nitrite Production, Bactericidal activity, Lysozyme.

LS34

Exotic and native peregrine earthworm species in the Western Himalayas: diversity, distribution and effects of forest fire on earthworm species richness and abundance

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Abstract

The Himalayan mountain systems are characterized by their fragility and susceptibility to anthropogenic degradation; which favors the extinction of native earthworm species and allows

for the colonization of exotic species. Therefore, the aim of present study was to evaluate earthworm species richness, abundance and biomass from two different forest ecosystems (Burnt pine forest and unburnt oak dominated mixed forest) in Solan district of Himachal Pradesh, India. Nine monoliths of 25 cm × 25 cm × 30 cm depth were sampled from each site at monthly intervals over a period of 2 years. Eight species belonging to four families were recorded from the study sites, Moniligastridae (*Drawida japonica*), Lumbricidae (*Aporrectodea caliginosa caliginosa*, *Aporrectodea rosea rosea*, *Octolasion tyrraeum* and *Bimastos parvus*), Octochaetidae (*Lenngaster pusillus*) and Megascolecidae (*Amyntas morrissi*, and *Amyntas corticis*). Both the forest systems had equal number of earthworm species - six in each. 100% exotic species was observed from the mixed forest where-as in pine forest 83% were exotic species and 16.66% were native peregrine species. Four species were common to both the forest ecosystems, whereas *A. caliginosa caliginosa* and *A. morrissi* were confined to mixed forest; and *L. pusillus* and *B. parvus* were confined to pine forest. *A. rosea rosea* was dominant in the mixed forest where-as in pine forest, species were more evenly distributed. Average earthworm population density and biomass was significantly high in the mixed forest (124.89 ± 11.16 individual m^{-2} and 21.86 ± 1.71 g m^{-2}) than the pine forest (11.78 ± 2.75 individual m^{-2} and 2.38 ± 0.56 g m^{-2}). The study concludes that forest fire in pine forest causes significant decline in the abundance and biomass of earthworm communities in the Western Himalayas.

Key words: Earthworms, forest fire, exotic, native peregrine

LS35

**Arbuscular Mycorrhizal Fungal Diversity Associated With *Catharanthus Roseus* Along An
Altitudinal Gradient In Shimla Hills**

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Abstract

Physiological performance of plants, particularly plant productivity and crop quality depend on the rhizospheric characteristic feature, an area of huge relevance to plants, producers, consumers and environmental health. Among the rhizosphere components, arbuscular mycorrhizae fungi (AMF) are one of the most common types of symbiotic associations between some rhizosphere microorganisms and plant roots. The present study was conducted to investigate the comparative

analysis of fungal status in rhizosphere of *Catharanthus roseus* from three selected sites in Shimla (HP). AM root colonization ranged from 53 to 63.3% and AM spore count in rhizospheric soil varied from 85 to 115. Maximum AM colonization and spore count were observed at Site-III (2300mts) i.e., 63.3 and at Site-I (2200mts) i.e., 115, respectively. Fourteen different species of AM fungi belonging to five genera i.e., *Glomus*, *Acaulospora*, *Sclerocystis*, *Endogone*, *Dentiscutata* were reported. The study confirmed the diversity of AMF in *C. roseus* along different altitude.

LS37

Role of genitalia in the identification of butterflies of the genus *Maniola* Schrank (Lepidoptera : Nymphalidae) from North West Himalaya

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The butterflies of the genus *Maniola* Schrank commonly known as “The Meadowbrowns”, are found only in the inner ranges of the North-West Himalayas. They prefer open places, especially sunny, grassy slopes and in meadows. The species of this genus are dark brown above. Forewing upperside has an unpupilled apical ocellus, usually with a prominent tawny ring, sometimes on a tawny area, or the whole disc may be tawny. Hindwing underside is dark brown, usually marked with short dark lines and specks. The general classification of this genus is still fairly confused. The species of this genus were considered under the genera *Epinephele* Huebner and *Chortobius* Guenee by early authors.

All the four species i.e., *Maniola pulchra* (Felder), *M. pulchella* (Felder), *M. lupinus* Costa and *M. devendra* (Moore) have been collected from certain localities falling within an altitudinal range varying from 1363 m to 2929 m in Dhaula Dhar Range, Pir Panjal range, Greater Himalaya. On the examination of various morphological characters, particularly the external male and female genitalia of all the species, it is revealed that all the four species are broadly conspecific and form a natural group, having its distribution only in the Himalaya. The conspecificity of variable males and females of the different species was confirmed through the genitalic studies. The structures such as the uncus, brachia, tegumen, vinculum, valvae, saccus and aedaegus of the male genitalia of all the species broadly agree with each other, and thus the

presently studied species are clearly congeneric. In the female genitalia, the signum is always present. The earlier authors have given interspecific keys for identification of species but none has used in the keys the genitalic characters which are otherwise quite consistent in different biological species. An updated key and illustrated account of the external male and female genitalia of species and their new distributional localities are discussed in the present communication.

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Ethnomedicinal uses of Khair (*Acacia catechu* Willd.) in District Jaipur, Rajasthan, India.

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Abstract

Plants and plants products play an important role in the tribal life of India. There is a great importance of *Acacia catechu* Willd. among the rural community of District Jaipur of State Rajasthan. It is commonly known as Khair tree. *A. catechu* is a deciduous tree of comparatively dry regions. It belongs to family Fabaceae. *A. catechu* ethnomedicinally used in snake bites, chronic diarrhea, dysentery, bleeding piles, chronic bronchitis etc by the tribal people of this area of Rajasthan. The most important product obtained from *A. catechu* is Katha. Katha is regarded as astringent, cooling and digestive and is useful in a sore throat, cough, and diarrhea. Katha is commonly used in Ayurvedic preparations since immemorial.

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LS39

Himachal Pradesh is rich in bio-diversity and offers a new era of nature enjoyment and learning. It also provides visitors an excellent exposure to the temperate forests. One of the tourist place of H.P. is Kullu Manali which is famous for its temples, apple orchards, natural beauty of mountains, Beas river, the annual Dussehra festival and handicrafts. All these attract lots of tourists not only from India but also from foreign countries. But at the same time increase in tourist activities can become burden if they degrade natural ecosystem. To promote sustainable tourism, which is not only environmentally compatible but also leads to economic betterment of the rural people, ecotourism is now the fastest growing sector in the tourist industry. Eco-tourism is consecrated for preserving and sustaining the diversity of natural and cultural environments and involving the local community. It accommodates and entertains visitors in a way that is

minimally intrusive or destructive to the environment and sustains and supports the native cultures. Community-based tourism is now sustainable approach for it specifically "involves and benefits local communities". Himachal Pradesh government has taken various steps for this purpose. There are many policies of Government for conservation of environment. 'Nature Parks' are also being developed to provide tourists a nature education experience. There is total Ban on polythene use in the state and practice of green tax helps in maintaining the environment free of pollution. Promotion of Home stay, easy loan facilities for recreation sports activities etc. are also part of ecotourism. Many societies are formed and contributing a lot in encouraging ecotourism but at present there is need to aware and educate the local people as well as tourists about sustainable tourism. In the present paper efforts have been made to understand the effects of overexploitation of nature in the name of tourism and aware the people about new concept of ecotourism and community tourism along with conservation of nature/environment..

KEYWORDS: Bio-diversity, Ecosystem, Ecotourism ,Conservation, Community Tourism.

LS40

**Antidiabetic Effects Of *Aloe Vera* On Streptozotocin
Induced Diabetic Kidney Of Mice**

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Him Science Congress Association

Abstract

Aloe Vera has been medicinally used throughout the history. The effects of ethanolic extract of *Aloe vera* gel on kidney was investigated in streptozotocin-induced diabetic mice. Body weight, organ weight, glucose level and glutathione activity was monitored in the kidney. The results showed that the ratio of kidney to body weight in treated animals was restored to normal as compared to the control animals while those of the diabetic mice was higher in kidney. Kidney glutathione levels were significantly lower ($p < 0.05$) in diabetic mice as compared to control which were restored towards normal in treated mice. Histological studies were carried out in kidney of mice. Significant degenerative changes were observed in diabetic mice. These degenerative changes were diminished in the diabetic animals given *Aloe vera* gel extract. *Aloe*

vera gel extract showed improvement both in histological and biochemical parameters suggesting a protective effect of *A. vera* on mild damage caused by diabetes on kidney of mice.

Key Words: *Aloe vera*, streptozotocin, kidney, diabetes, glutathione activity.

LS41

Effect Of Different Waste On Biochemical Responses In Earthworm, *Eisenia Fetida*

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Abstract

Over the last few years, the problem of efficient disposal and management of organic solid wastes has become more rigorous due to rapidly increasing population, intensive agriculture, industrialization and accumulation of excessive waste material. Various methods of disposal of organic solid wastes are currently in use; these methods are time consuming and involve high cost. Presently vermiconversion has been recommended as a preferable option to stabilize various kinds of solid wastes. Earthworms are good faunal candidates for ecotoxicological research as test organisms for the assessment of environmental impacts of pesticides and other chemical pollutants. Fly ash (FA)—a coal combustion residue of thermal power plants has been regarded as a problematic solid waste all over the world. *Parthenium hysterophorus* L. (family Asteraceae) known as congress grass, is a poisonous, pernicious, allergic and aggressive and poses a serious threat to human beings and livestock. The present study was conducted to determine the effect of fly ash and *Parthenium hysterophorus* on biochemical responses in earthworm, *Eisenia fetida*. Earthworms were allowed to grow in fly ash and *Parthenium hysterophorus* along with cow dung. The biochemical markers viz. catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (Gpx) and malonaldehyde (MDA) level were measured on 0, 15 and 30 day of exposure. The activities of superoxide dismutase (SOD), glutathione peroxidase (Gpx), catalase (CAT) and malonaldehyde (MDA) were significantly increased on 15 days and 30 days exposure. The results of the present study demonstrated that fly ash and *P. hysterophorus* induced deleterious effects to *Eisenia fetida*.

Arsenic Induced Genotoxic Effects On Chromosome Structure Of Albino Mice

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Abstract

Arsenic (As) is a toxic metalloid element that is present in air, water and soil. Inorganic arsenic tends to be more toxic than organic arsenic. The incidence of arsenic contamination of ground water used for both irrigation as well as for human consumption or industrial activities has taken the dimension of an epidemiological problem. It has been well established that inorganic arsenic is extremely toxic on acute and chronic administration. The present study is designed to study the genotoxic effects of arsenic on bone marrow cells and chromosome structure of swiss albino mice. Albino mice were divided into three groups. Group I were kept as control. Group II were administered an acute dose of arsenic trioxide 5mg/kg b.w. orally for 15 days. Group III were given an acute dose of arsenic trioxide 5mg/kg b.w. and were kept for 45 days. They were acclimatized for 15 days before administration of arsenic trioxide. The autopsies were done from all the groups at 15 and 45 days post-treatment and bone marrow was removed for chromosomal study and for calculating the mitotic index. No change in the body weight was recorded in treated groups after arsenic exposure. The study on Swiss albino mice with arsenic did confirm the genotoxic effects of arsenic through chromosomal assay as well as mitotic index.

Key Words: Arsenic (As), mitotic index and chromosomal aberrations

Environmental Impact of Tourism in Shimla

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Abstract

The study aims to assess the environmental situation arising at Shimla due to increasing pressure of tourism. Study takes up the problem of over construction of hotels, deforestation, air pollution, solid waste, water pollution and suggests some mitigating measures to lessen the load of different forms of pollutions. The hotel construction registered highest growth in this region during 80's due to the terrorism in J & K. Due to constructions of hotels, deforestation is the top most problem arising. Air pollution studies of over past 5 years show that suspended particulate matter (SPM) has crossed permissible levels at Shimla. Study of total waste generated shows that the proportion of decomposing waste is higher than that of the non-biodegradables. Indiscriminate throwing of municipal solid waste into nallahs is common practice in this tourist place as a result the water bodies are continuously being polluted. To mitigate all these problems a complete ban on further construction of large hotels need to be enforced, along with regulation of tourists and strict enforcement of emission standards for vehicles. The segregation of the waste at the source and production of biocompost from the biodegradable waste could be an important way of dealing with the solid waste

LS44

Impact of temperature on the development of *Tetranychus urticae* and *Eotetranychus lewisi* on strawberry

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Abstract

The two-spotted spider mite, *Tetranychus urticae* Koch is a key pest of strawberry. At present, Lewis mite, *Eotetranychus lewisi* (McGregor) is emerging as a problem on strawberry in southern California. For the efficient management of both mite species on strawberry, knowledge of biology of pest is utmost important. The development and population densities of mites are very sensitive to weather conditions. Out of all weather parameters, temperature is a significant factor which has direct relation with the pest population levels in means of growth

and its fecundity. Therefore, the current study was conducted to investigate the effect of temperature on the biology of *T. urticae* and *E. lewisi* on strawberry under laboratory conditions at Department of Entomology, University of California, Davis, USA. The studies revealed that the incubation period of both the mite species on strawberry increased with decreasing temperature. The immature development of both the mites on strawberry was found to be faster at 20 and 25 °C as compared to 15°C. The total time taken for the development of *T. urticae* and *E. lewisi* was found to be decreased with increase in temperature. The maximum fecundity of both the mites was observed at 25°C as compared to other two temperatures. The life cycle of *E. lewisi* was completed in 30.00 days at 15°C but *T. urticae* required more days (35.40 days) to complete its development at same temperature. The fecundity was more in case of *T. urticae* on strawberry as compared to *E. lewisi*. Therefore, strawberry was found to be more suitable host for *T. urticae*. Although, *E. lewisi* develops faster at lowest temperature as compared to *T. urticae* and successfully completed its life cycle on strawberry at all temperatures. Thus, *E. lewisi* can become a major pest of strawberry in near future along with *T. urticae*. Our results showed that temperature is a portentous component that can affect the development and reproduction of both the mites on strawberry.

LS45

Arsenic induced Toxicity in Ovary of Swiss Albino Mice and it's Reversal by Lycopene.

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Abstract: - Arsenic compound are known to induce toxicity in mammalian system. However reproductive toxicity is comparatively less expedited. Arsenic has a long environmental persistence and never loses its toxic potential. Arsenic affects the reproductive systems of female Swiss mice. In the present study, toxic effects of arsenic are observed on histopathology of ovary studied after administration of low (1mg/kg body weight) dose of arsenic trioxide to the Swiss albino mice; along with this tomato puree on arsenic induced toxicity has also been examined. A significant weight loss of ovary was also observed. Moreover, arsenic was also responsible for ovarian follicular degeneration and vacuolization in follicular cells. The results of the present

study indicated a marked effect of recovery of the follicle cells of the ovary after exposure to tomato puree with higher dose as it was dose dependent.

Key words: Arsenic (As), tomato puree, ovary and follicle.

LS46

A Case Report – Demodicosis in Dog

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Abstract

A 8 year old black coloured Labrador male dog weight around 36 Kg was presented at Teaching Veterinary Clinical Complex with a history of severe itching all over the body for past one month. Upon clinical examination revealed normal rectal temperature, variable erythema, silver grayish scaling, crusts or pruritus. Skin scrapping were taken from the affected region. Skin scrapings were boiled in 10% KOH solution for 10 minutes. Sediment examination revealed presence of cigar shaped mites suggestive of demodex species. Hence a diagnosis of demodicosis was made and was treated accordingly 3 injections of Hitek @ 0.2 mg/kg BW IM was given at weekly intervals, Tactic (12.5 %) @ 2ml in 1 litre of water in a week, Shampoo Procott BID in a month, Syrup Immunol 2 TSF BID up to 1 month was given as a supportive therapy. Clinical improvement was seen with reduction in itching and skin scrapings were negative for demodex species mites 15 days post treatment.

LS47

A Case Report – Electrocardiographic observations in dogs affected with chronic renal failure

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Abstract

The present study was conducted to investigate characteristics of electrocardiography in chronic renal failure affected dogs. Six dogs were found positive in Teaching Veterinary Clinical Complex (TVCC) F.V.Sc. & A.H. R.S. Pura, SKUAST-Jammu during the period from June 2015 to November 2015. Clinical, electrocardiographic and haemato-biochemical parameters were studied in the affected dogs. Apart from routine haemato-biochemical investigations and therapeutic interventions, a lead II ECG was recorded in a right lateral recumbency. In addition, the dogs were having a history of anorexia, dullness, depression and vomiting since last one month was suspected for chronic renal failure. On haematology & haemato-biochemical estimation, there is decrease Hb, TEC, PCV, MCHC, Phosphorus and high MCV, BUN, Creatinine and ALP level were noticed in the affected dogs. The characteristics of ECG in case of chronic renal failure, there was decrease duration of Pa, QRSa and Td. The detailed will be discussed.

LS48

Hemorrhagic Gastroenteritis (HGE) in dog – a case report

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Abstract

A 3 months old blackish brown German Shepherd pup having body weight 6 Kg brought to the Teaching Veterinary Clinical Complex with a history of diarrhea since last two days, anorexia, frequent vomiting more than five times in a day, feces comes out along with bloody discharge. No prior deworming done. On clinical examination, rectal temperature was 99°F, Heart rate 130 bpm, mucous membrane pale pinkish, STT is 2 second and CRT is 1 second recorded. On haematology examination, there is decrease level of MCV, Lymphocytes and Monocytes and markedly increase Granulocytes. Hence a diagnosis of hemorrhagic gastroenteritis was made and was treated by inj. DNS 50 ml slow I/V, inj. RL 30 ml slow I/V, inj. Ampoxin (75mg) BID for 5 days I/V infusion or I/M, inj Rumeric 1 ml I/M, Tab. Pantop D ¼ given empty stomach OD for 5 days, Sachet Lactobacilli 1 sachet TID given orally after mixing in a curd water or in a diluted milk, Syp. Zincovit ¼ tsf BID x SOS. Treatment will be given daily till dog is not recovered properly. After recovery of pup prescribed for deworming with Tab. Eazypet ½ tab PO x OD.

Section E: Environmental, Agricultural & Forest Sciences

POSTER PRESENTATIONS

Abstract Number	Title of Paper	Authors	Address
EFS01	Change in specific gravity of different non-durable wood species by using rhizome extract of <i>Acorus calamus</i> Linnaeus (sweet flag) as preservative and variation in chromium absorption, leaching and retention after preservative treatment	Bandana Dhiman and Bhupender Dutt	Wood science and Technology, Department of Forest Products, college of Forestry Dr. Y.S. Parmar, UHF, Nauni, Solan (H.P.) India.
EFS02	Status And Utilization Of Rubberwood (<i>Hevea Brasiliensis</i> Mull.Arg.) In India	<u>P P Sunny</u> ¹ , B Dutt ² , Y Y Sumthane ³	¹ Research Scholar, Department of Forest Products and Utilization, Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni (Solan) 173 230, H.P. ² Professor, Department of Forest Products and Utilization, ³ Research Scholar, Department of Forest Products and Utilization ⁴ Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni (Solan) 173 230, H.P
EFS03	Management of spider mite, <i>Tetranychus urticae</i> Koch, on brinjal under protected cultivation	Manmeet Brar Bhullar and Paramjit Kaur	Department of Entomology Punjab Agricultural University, Ludhiana -141004, India
EFS04	Biomonitoring of heavy metals in excreta of House sparrow (<i>Passer domesticus</i>) from urban area of Ludhiana, Punjab	<u>Nisha Vashishat*</u> , Tejdeep Kaur Kler and Manoj Kumar	Punjab Agricultural University, Ludhiana
EFS05	Comparison of different extraction techniques for estimation of andrographolide in <i>Andrographis paniculata</i>	Seema Sharma* and Yash Pal Sharma	Deptt. of Forests Products, University of Horticulture and Forestry, Nauni, Solan, India
EFS06	The Role Of Gum And Its Tapping Methodologies In India	Y Y Sumthane ¹ , S M Khachane ² , A U Nimkar ³	Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni (Solan) 173 230, H.P. Dr. Panjabrao Deshmukh Krishi Vidyapeeth Akola, 444 104 Maharashtra. Dr. Panjabrao Deshmukh Krishi Vidyapeeth Akola, 444 104 Maharashtra.
EFS07	The Biological properties of Bamboo Growing Soils in mid-hill conditions of HP: a Comparative Study	Yourmila Kumari and D R Bhardwaj	Dr Y S Parmar University of Horticulture and Forestry, Nauni-Solan, Himachal Pradesh 173
EFS08	Effect of borehole height and month of drilling hole on oleoresin yield in <i>Pinus roxburghii</i> Sargent	K R Sharma, Bhupender Dutt, Rajneesh Kumar, <u>Varun Attri</u> and Heena Gupta	Department of Forest Products, College of Forestry Dr Y S Parmar University of Horticulture and Forestry, Nauni, HP-173230

EFS09	Evaluation of High resin yielders of <i>Pinus roxburghii</i> Sargent	K R Sharma, Bhupender Dutt, <u>Rajneesh Kumar</u> , Varun Attri and Heena Gupta	Dr Y S Parmar University of Horticulture and Forestry, Nauni-Solan, Himachal Pradesh 173230
EFS10	Studies on <i>Pinus roxburghii</i> Sargent wood for Bending and Tensile strength from different area of Himachal Pradesh	<u>Vinay Kumar</u> and Kulwant Rai Sharma	Department of Floriculture and Landscaping Dr Y S Parmar University of Horticulture and Forestry, Nauni, Solan (H.P.) Department of Floriculture and Landscaping Dr Y S Parmar University of Horticulture and Forestry, Nauni, Solan (H.P.) Department of Forest Products,
EFS11	Organic farming: A boon for agricultural	<u>Abha sharma</u> ¹ , Vipin kumar ¹ , S.S. kherwar ¹	¹ Department of Chemistry, Agra College. Agra
EFS12	Studies On Monthly Variations In Physico-Chemical Parameters Of River Bhagirathi In Uttarkashi, Uttarakhand, India	<u>Suresh Kumar</u>	Department Of Chemistry, Pt. L.M.S. Govt. (Pg) College, Rishikesh, Dehradun

ORAL PRESENTATIONS

EFS13	Environment and Sustainable Development – Paradigm shift in socio-economic perspectives with a vision for future	<u>Dr. Anjali Dewan</u> ,	Associate Professor & Head, Department of Home Science, St. Bede's College, Shimla Email: dewananjali@rediffmail.com , Mobile: 9816116652
EFS14	Genetic variability and Genetic divergence in grain amaranth (<i>Amaranthus hypochondriacus</i> L.) germplasm with respect to seed yield and component characters	Mr. Shailendra Tiwari ^a , Dr. Naveen Chandra Pant ^a , Dr. Arun Bhatt ^b	^a Dolphin (P.G) Institute of Biomedical & Natural Sciences, Dehradun 248007, Uttarakhand. ^b Govind Ballabh Pant Engineering College, Pauri-Garhwal, Uttarakhand
EFS15	A beautiful way to improve our indoor environment	Dr. Jujhar Singh ¹ and DivyaThakur ²	¹ Department of Agriculture, S.G.T.B. Khalsa College, Sri Anandpur Sahib, Ropar, Punjab. ² School of Bioengineering and Food Technology, Shoolini University, Solan, Himachal. E mail- jujhar220@yahoo.com
EFS16	Management of spider mite, <i>Tetranychus urticae</i> Koch, on brinjal under protected cultivation	<u>Manmeet Brar Bhullar</u> and <u>Paramjit Kaur</u>	Department of Entomology Punjab Agricultural University, Ludhiana -141004, India Email: manmeet@pau.edu

Change in specific gravity of different non-durable wood species by using rhizome extract of *Acorus calamus* Linnaeus (sweet flag) as preservative and variation in chromium absorption, leaching and retention after preservative treatment

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Abstract

Higher specific gravity of wood reflects the good indication of its strength property. Specific gravity is the ratio of the density of a material divided by the density of water at 4°C which is used as a basis to standardize comparisons among species and products. Study is done with bio-preservative treatment of Sweet flag's rhizome extract with different concentration and their effect on wood specific gravity is analyzed. Then chromium used as preservative fixative and its absorptivity, leaching and retention is also observed with different preservative concentration. With the use of herbal extract of *Acorus calamus* (Sweet flag's) on wood chromium leaching to environment reduces with positive results.

Keywords :- Specific gravity, preservative, fixative, absorptivity, leaching and retention, *Acorus calamus*,

Him Science Congress Association

Ministry of Education, Government of India

EFS02

Status And Utilization Of Rubberwood (*Hevea Brasiliensis* Mull.Arg.) In India

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Abstract

Current area of India is 5, 83,000 hectares, under rubber plantations, India stands fourth in the world in the production of rubber wood, out of which 87 per cent is from small holdings. With an average of about 250 trees per hectare in the final felling stage, the average timber yield

per tree from the Indian plantations is estimated to be around 0.65 m³, out of which 40 per cent goes to branch wood. The present availability of rubber wood in the country is estimated to be 1.6 million cubic meters per year. With an annual requirement of 40 million cubic meters of timber against domestic availability of 29.25 million cubic meters, rubber wood had the potential to offer around 2 per cent of the country's timber requirement, so as to save a foreign exchange in the tune of US \$ 200 million per year and generation of direct employment in the order of 2,00,000 coupled with the environmental benefit of saving 20,000 hectares of the rain forests of the country on an annual basis. About 33 percent of the total stem wood is found available in the country for secondary processing whereas the existing industries in the country consume only about one-tenth of the available raw material. The present price of logs per tonne is around Rs. 3,400/- ; sawn timber costs about Rs. 475/- per cubic feet. The price of logs is found slowly increasing whereas the price of sawn timber remains more or less stable during the last three years. The present figure for per tree (with an average weight of 0.5 tonne) price is around Rs. 1250/-; the highest in the track record.

EFS03

Management of spider mite, *Tetranychus urticae* Koch, on brinjal under protected cultivation

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Creating Excellence in Science

Abstract

Spider mites are a major problem in cultivation of horticultural crops especially vegetables under protected conditions. Two-spotted spider mite, *Tetranychus urticae* Koch, is an extremely polyphagous pest causing severe crop damage and yield loss. In Punjab, 18.14 per cent crop loss was reported in brinjal due to the attack of *T. urticae* under field conditions. Management of mites is a serious challenge for farmers since there are evidences of development of resistance to acaricides. Hence, there is a need to develop an integrated approach for the management of *T. urticae* under protected cultivation. So, the present study was conducted to evaluate the efficacy of novel acaricides [fenazaquin (Magister 10EC), spiromesifen (Oberon

240SC), fenpyroximate 5EC (Neon 5EC)] all @ 100, 150 and 200ml/acre), horticultural mineral oil (HMO BP MAK @ 0.1, 0.15 and 0.2%) and predatory phytoseiid mite [*Neoseiulus longispinosus* (Evans) @ 10 and 15 mites/plant] along with propargite (Omite 57EC) @ 300ml/acre as standard check against *T. urticae* on brinjal under protected cultivation during August 2015. The results showed that spiromesifen, fenazaquin and fenpyroximate at low dose (100ml/acre) and propargite 57EC proved highly effective in reducing the mite population. BP MAK @ 0.2% gave good control (45-60%) up to 7 days after spray. A significant reduction in spider mite population was also observed when the phytoseiid mites were released @ 15 mites/plant. Among the acaricides, spiromesifen at all the doses, fenazaquin @ 100ml/acre and propargite @ 300ml/acre were found to be comparatively safer to the predatory mites belonging to family Stigmaeidae. Therefore, release of *N. longispinosus* @ 15 mites/plant and HMO @ 0.2% can be incorporated along with acaricides in the integrated mite management programme for the control of spider mites in protected cultivation.

EFS04

Biomonitoring of heavy metals in excreta of House sparrow (*Passer domesticus*) from urban area of Ludhiana, Punjab

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Urbanization has lead to increasing amount of pollutants which can harm the animals living in close association with human habitation. A decline in population of House sparrow (*Passer domesticus*) has been seen in last couple of decades. The aim of present study was to determine the level of different heavy metals in excreta of House sparrow collected from urban areas of Ludhiana city. The samples were collected from the natural nesting sites of House sparrow. Sixteen elements i.e. As, B, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, S and Zn were detected by ICAP-AES in the excreta samples. Among these As, Cd, B and Pb are included in the category of heavy metals which are non-essential elements and toxic whenever present. The level of As, B, Cd and Zn metals was found to be 0.066 ± 0.16 , 0.450 ± 0.08 , 0.27 ± 0.67

and 4.197 ± 0.03 ppm (near threshold level) respectively in the fecal pellets. There was significant difference in the levels of heavy metals detected in the samples. The differences in metal levels may be because of the local contamination and other pollution sources. These results suggest that the excreta of House sparrow can be used as reliable non-destructive bioindicator to assess the level of heavy metals in urban areas of Ludhiana city. Such studies may be of great significance for comparative assessment of ecological consequences of pollution.

Keywords: House sparrow, heavy metals, bioindicator, urban area

EFS05

Comparison of different extraction techniques for estimation of andrographolide in

Andrographis paniculata

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Abstract

Andrographis paniculata (Kalmegh), a member of family Acanthaceae commonly found in plains of India, Pakistan and Sri Lanka and is an important medicinal plant, which is used in various health ailments like fevers, jaundice, colic dysentery and dyspepsia and also act as hepatoprotective, bitter tonic, stomachic, immunostimulant, antidote, antimalarial agent *etc.* The medicinal value of the plant is mainly due to active components as andrographolide, deoxy-andrographolide, neoandrographolide, andrographiside, isoandrographolide *etc.* present in it. Andrographolide, a major diterpenoid present in all parts of plant exhibit broad range of pharmacological properties like hepatoprotective activity, anti-cancerous activity, antioxidant activity and anti-inflammatory activity. In the present study, extraction of *Andrographis paniculata* was done using five different extraction methods as soxhlet, reflux, cold, SAE (sonication assisted extraction) and MAE (microwave assisted extraction) in order to conclude best extraction method for extraction of major compound *i.e.* andrographolide, using HPLC-UV. The duration of extraction under each extraction method was standardised. The detailed results shall be discussed in the manuscript.

The Role Of Gum And Its Tapping Methodologies In IndiaY Y Sumthane¹, S M Khachane², A U Nimkar³

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Abstract

The gum exudes from the white or pinkish-brown bark when it is tapped or injured. The trees are often indiscriminately hacked and ruthlessly tapped causing destruction. Investigations on the best method of tapping the tree with a view to obtaining the maximum yield of the gum with the minimum of adverse effect on the health of the tree are still in progress at the Forest Research Institute, Dehradun. The method in the Damoh and Jabalpur Forest Divisions is described. Trees 0.9-1.35 m in girth are best suited for tapping. These will have two blazes, while trees over 1.35 m in girth will have 3 or 4 blazes. The initial blazes is 7.5 cm wide and 15 cm long, gradually increasing to width of 25 cm and a length of 45 cm. A sharp instrument is used for blazing, the bark should not be hammered as this prevents exudation of the gum by compressing or closing the pores. Not more than 1.5-3 mm of fresh bark need be cut and removed each time. The depth of blaze is so regulated that it just penetrates the wood. Subsequent freshening's are made in such a way that the blaze does not become larger than the maximum size mentioned already. The exudation of gum is greatest within 24 hours of blazing and continuous for a couple of days. Exudation of gum takes place all the year round but is most copious in the hot weather from April to June, just before monsoon rains start. The collection season is from September to June. Gum harvested during the rainy season is poor in quality and hence no tapping is done then. A tapping cycle of 4-5 years is generally adopted. Yield per 100 blazes is estimated to be 75-150 kg. Another authority puts the yield at 4.5 kg of gum per tree per annum.

**The Biological properties of Bamboo Growing Soils in mid-hill conditions of HP: a
Comparative Study**

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Abstract:

Bamboo can regenerate very fast without replanting and is highly effective in restoring soil. However, the impacts of bamboos on soil microbial properties differ at species level. Therefore, the present study was undertaken to quantify and to make a comparative assessment in the status of soil biological properties biological properties of soil as affected by 7 years old plantations of 7 different bamboo species viz. *Dendrocalamus asper*, *D hamiltonii*, *Bambusa tulda*, *Phyllostachys aurea*, *D strictus*, *Malocana baccifera* and *Phyllostachys bambusoides* in mid-hill condition of HP, India. The results of the study revealed significant variations in biological properties viz. Microbial count, Microbial activity and Microbial carbon biomass. The soil microbial counts (10^5 cfu g⁻¹) in bacteria (227.43), Actinomycetes (15.35) and fungi (6.12), soil microbial biomass carbon (MBC) (167.00 mg MBC/100g) were considerably higher under the soil of *Dendrocalamus asper*. The rate of CO₂ evolution was recorded to be highest under *D asper* after 48 hours whereas, lowest under *Phyllostachys bambusoides* after 24 hrs of incubation period. For the soil depths, the surface layer had shown noticeable increase in soil biological parameters as compared to subsurface soil. *D asper* plantations have improved the soil fertility and microbial activity as compared to other bamboo species in plantations.

Key Words: Bamboo; Soil microorganism; Microbial count; Microbial Biomass Carbon; Soil respiration.

Effect of borehole height and month of drilling hole on oleoresin yield in *Pinus roxburghii*

Sargent

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Abstract

The oleoresin is an important forest produce of pine forests in the world. Pine oleoresin is commercially produced from about 20 pine species in both natural and plantation forests in many developing countries. The main species of pines occurring in India are chir pine (*Pinus roxburghii* Sargent), blue pine (*Pinus wallichiana* AB Jackson), khasi pine (*Pinus kesiya* Royle ex Gordon) and neoza pine (*Pinus gerardiana* Wall). Chir pine is the principle pine, which is being commercially tapped for oleoresin in India. Various method of tapping has been adopted by different countries and a new method known as Borehole method has been recently developed. The oleoresin obtained from borehole method is of high quality as compared to other methods. Therefore, the present investigation was carried out with the objective to study the effect of borehole height and drilling month on oleoresin yield. The results elucidated that oleoresin yield is affected by the borehole height and month of boreholes drilled. The highest oleoresin yield of 422.50 g/hole/tree was obtained from the borehole drilled in the month of May (B₂) followed by June (B₃) (393.69 g/hole), March (B₁) (370.76 g/hole) and September (B₄) (269.19g/hole). The lowest oleoresin yield of 239.793 g/hole was observed from the borehole drilled in the month of October (B₅). The scrutiny of data revealed non-significant differences for borehole height where the data was found between 389.945 g/hole (T₁) and 315.881g/hole (T₂). The interaction between borehole height and month of borehole drilled was also found to be non-significant at 5 per cent level of significance. The data ranged from 159.28 g/hole/tree to 488.80 g/hole/tree.

Key words: Oleoresin yield, borehole, *Pinus roxburghii*, month of borehole drilling.

EFS09

Effect of borehole height and month of drilling hole on oleoresin yield in *Pinus roxburghii* Sargent

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Abstract

The oleoresin is an important forest produce of pine forests in the world. Pine oleoresin is commercially produced from about 20 pine species in both natural and plantation forests in many developing countries. The main species of pines occurring in India are chir pine (*Pinus roxburghii* Sargent), blue pine (*Pinus wallichiana* AB Jackson), khasi pine (*Pinus kesiya* Royle ex Gordon) and neoza pine (*Pinus gerardiana* Wall). Chir pine is the principle pine, which is being commercially tapped for oleoresin in India. Various method of tapping has been adopted by different countries and a new method known as Borehole method has been recently developed. The oleoresin obtained from borehole method is of high quality as compared to other methods. Therefore, the present investigation was carried out with the objective to study the effect of borehole height and drilling month on oleoresin yield. The results elucidated that oleoresin yield is affected by the borehole height and month of boreholes drilled. The highest oleoresin yield of 422.50 g/hole/tree was obtained from the borehole drilled in the month of May (B₂) followed by June (B₃) (393.69 g/hole), March (B₁) (370.76 g/hole) and September (B₄) (269.19g/hole). The lowest oleoresin yield of 239.793 g/hole was observed from the borehole drilled in the month of October (B₅). The scrutiny of data revealed non-significant differences for borehole height where the data was found between 389.945 g/hole (T₁) and 315.881g/hole (T₂). The interaction between borehole height and month of borehole drilled was also found to be non-significant at 5 per cent level of significance. The data ranged from 159.28 g/hole/tree to 488.80 g/hole/tree.

Key words: Oleoresin yield, borehole, *Pinus roxburghii*, month of borehole drilling

EFS10

Studies on *Pinus roxburghii* Sargent wood for Bending and Tensile strength from different area of Himachal Pradesh

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Abstract

Bending strength of wood reveals its capacity to use as a beam or similar type of situations for other uses. Tensile strength is the ability of any material to resist the stretching forces. *Pinus roxburghii* is an important commercial species of the Himalayan known for its timber, paper pulp and resin yield. “Studies on *Pinus roxburghii* Sargent populations for wood Bending and Tensile strength from different area” has been chosen to compare this mechanical property of wood with Teak taking as control. The results revealed that the highest bending strength was noticed in Banethi (0.0089kN/mm²). The lowest bending strength (0.0033kN/mm²) was observed in Nihari site. In standard Teak wood samples, a bending strength value of 0.0070 kN/mm² was observed. The maximum tensile strength was noticed in Teak (0.089kN/mm²) and among chir pine populations it was maximum in Chabbal (0.043 kN/mm²). The minimum tensile strength was observed in Malan (0.022kN/mm²).

Keywords :-*Pinus roxburghii*, bending and tensile strength, Population.

EFS11

Organic farming: A boon for agricultural

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Abstract:

Normal fertilizers are long term poison for Agriculture land. The land is become non fertilize after using chemical fertilizers over long period. Organic farming is one of the ecological and effective way for modern agriculture. In organic farming the ecological balance and biodiversity conserved and farmers become economical because they do not need the costly chemicals and

fertilizers. One of the important advantages of organic farming is that it can reduced ground water pollution. Organic farming is a combination of ancient and modern agriculture

EFS12

**Studies On Monthly Variations In Physico-Chemical Parameters Of River Bhagirathi In
Uttarkashi, Uttarakhand, India**

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Abstract

The Bhagirathi is one of the most important parent rivers of the mighty Ganga. It originates from the Gaumukh Glacier (3812m asl) and travels for about 205 Km of rhithronic zone that provides key characteristic to the river profile. River Bhagirathi passes through Gangotri, Harsil, Uttarkashi and Chinyalisaur to meet River Alaknanda at Devprayag (472 m asl). Thereafter the river is called the Ganga.

In order to determine the quality of its water for public use, recreation and other purposes , the six parameters like temperature, Dissolve oxygen, pH, free carbon dioxide, Total alkalinity and pH were determine. The physico-chemical parameter like temperature ranges from 4 °C to 21 °C, dissolved oxygen in between 6.0 mg l⁻¹ to 13.4 mg l⁻¹, free carbon dioxide ranges from 1.1 mg l⁻¹ to 2.82 mg l⁻¹, alkalinity ranges from 7.2 mg l⁻¹ to 8.1 mg l⁻¹, pH ranges from 7.2 to 7.8.

Key words: Water quality, physico-chemical parameter, River Bhagirathi

Him Science Congress Association

EFS13

Environment and Sustainable Development – Paradigm shift in socio-economic perspectives with a vision for future

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Abstract:

India is faced on one hand with environmental degradation from poverty and population pressures, and on the other, from pollution from increased activities due to economic growth and the consequent changing consumption patterns. The waste generated from consuming and producing the goods and services are in turn released back into the environment impacting it. The environment provides security for present and future generations, the health of the environment is closely connected with the health of humans, and it is economically beneficial for countries to prevent environmental degradation. The challenge therefore, in making development compatible with the environment is to restructure the economic system in a way that it will not destroy the environment as economic progress continues. Sustainable development is a socio-ecological process characterized by the fulfillment of human needs while maintaining the quality of the natural environment indefinitely. This paper deals with an approach emphasizing the need for new conceptions of global development that take cognizance of the fact that social and environmental problems are interconnected. One of today's environmental challenges is to find ways of strengthening the scientific and socio-economic perspectives to help authorities make decisions and produce sustainable development strategies with a vision for future. This is evident by its action on climate change, human health and the environment, its support for the building and maintenance of green infrastructure. The strategies will identify common goals and actions towards ensuring healthy natural environments, supporting emerging governance systems, advancing appropriate use of natural resources and building vibrant communities.

Key words: Environment, sustainable development, security, strategies, degradation, resources

Him Science Congress Association

EFS14

Genetic variability and Genetic divergence in grain amaranth (*Amaranthus hypochondriacus* L.) germplasms with respect to seed yield and component characters

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Abstract

Crop improvement and efficient utilization of plant genetic resources requires systematic understanding of the important traits. species are widely distributed with different landraces and

cultivars known to occur worldwide. Despite the potential to enhance food security and self sufficiency, effective utilization of grain amaranth as a crop is still scarce. Grain amaranth can provide self reliance in food grain production apart from meeting nutritional requirement of population as a whole. Keeping these aspects in view an experiment was conducted during Kharif season (2013) at Crop Improvement Research Block of Uttarakhand University of Horticulture and Forestry, Ranichauri Campus. 54 diverse genotypes of grain amaranth including four checks viz., Annapurna, Durga, PRA-2 and PRA-3 were selected and grown to check the genetic variability and genetic divergence in grain amaranth germplasms. The genotypes were planted in an augmented design under ranified condition. Genetic variability and genetic divergence was evaluated for different characters viz., days to 50 % flowering, duration of the crop, 1000 seed weight and seed yield per plant respectively.

Analysis of variance (ANOVA) revealed that the genotypes differed significantly ($p \leq 0.05$) for days to 50% flowering and duration of the crop. There was no significant difference ($p \leq 0.05$) among the genotypes w.r.t 1000 seed weight (g) and seed yield per plant (g). Adjusted mean for earliest flowering (63.2 days) and duration of crop (128 days) was lowest in Durga (check). Highest 1000 seed weight (i.e., 1.388 g) was observed in IC-43715 whereas maximum seed yield per plant (i.e., 46.69 g) was observed in IC-8245. The genetic divergence among the 54 genotypes was evaluated using Mahalanobis D^2 statistic. The genotypes were grouped into 8 clusters on the basis of respective evaluation. Highest inter cluster distance was observed between cluster IIIrd and VIIIth (i.e., 67.39) followed by cluster IVth and VIIth (i.e., 64.30) suggesting wide diversity among genotypes in these groups. Considering cluster mean and genetic distance, crossing between genotypes of cluster IVth (IC-82625 and IC-95247) with cluster VIIIth (Durga) were likely to recombine the genes for high seed yield and early maturity in temperate conditions (mid hills) of Uttarakhand.

EFS15

Interior Landscaping: A beautiful way to improve our indoor environment

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Abstract

Now a days, the planting area is reduced and concrete area is increased. The interior landscaping plays an important role to improve our indoor environment. Interior landscaping is to use of the plants in the built environment. In our houses, offices, hotels and even in malls, the use of interior landscaping increases day by day. Many ways are used to improve our indoor environment and beautify our interior also. These plants also decrease the level of some harmful gases which are produced inside our houses by the use of different products like perfumes, shaving creams and even through cooking. Interior plants can also be used to reduce background noise level inside buildings. These plants have many esthetic, Engineering, Architectural or functional uses. Bonsai, terrariums, dish gardens, potted plant, bottle gardens, hanging baskets, vertical gardens are mainly used to developed a beautiful and healthy environment. The successful interior landscaping depends on selection of plant, light inside the room, containers, media used for plantation, ventilation and air pollution. The selection of plant also depends upon the indoor environment and purpose for which these can be used.

EFS16

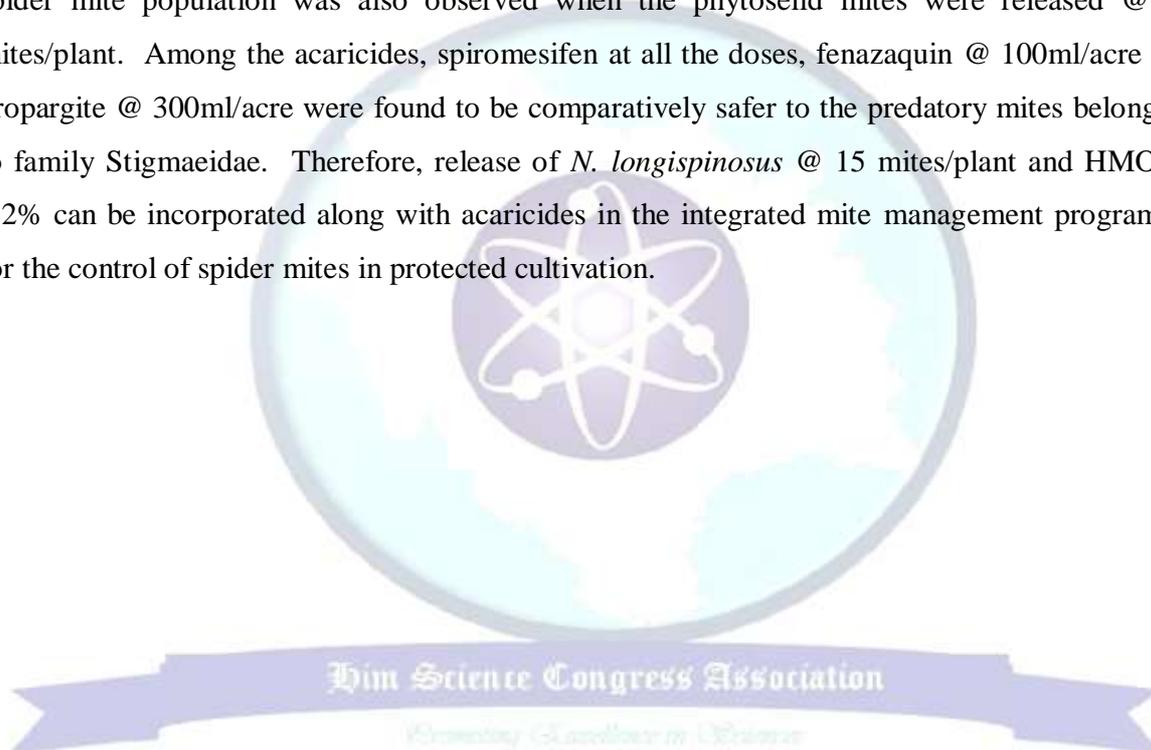
Management of spider mite, *Tetranychus urticae* Koch, on brinjal under protected cultivation

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Abstract

Spider mites are a major problem in cultivation of horticultural crops especially vegetables under protected conditions. Two-spotted spider mite, *Tetranychus urticae* Koch, is an extremely polyphagous pest causing severe crop damage and yield loss. In Punjab, 18.14 per cent crop loss was reported in brinjal due to the attack of *T. urticae* under field conditions. Management of mites is a serious challenge for farmers since there are evidences of development of resistance to acaricides. Hence, there is a need to develop an integrated approach for the management of *T. urticae* under protected cultivation. So, the present study was conducted to

evaluate the efficacy of novel acaricides [fenazaquin (Magister 10EC), spiromesifen (Oberon 240SC), fenpyroximate 5EC (Neon 5EC)] all @ 100, 150 and 200ml/acre), horticultural mineral oil (HMO BP MAK @ 0.1, 0.15 and 0.2%) and predatory phytoseiid mite [*Neoseiulus longispinosus* (Evans) @ 10 and 15 mites/plant] along with propargite (Omite 57EC) @ 300ml/acre as standard check against *T. urticae* on brinjal under protected cultivation during August 2015. The results showed that spiromesifen, fenazaquin and fenpyroximate at low dose (100ml/acre) and propargite 57EC proved highly effective in reducing the mite population. BP MAK @ 0.2% gave good control (45-60%) up to 7 days after spray. A significant reduction in spider mite population was also observed when the phytoseiid mites were released @ 15 mites/plant. Among the acaricides, spiromesifen at all the doses, fenazaquin @ 100ml/acre and propargite @ 300ml/acre were found to be comparatively safer to the predatory mites belonging to family Stigmaeidae. Therefore, release of *N. longispinosus* @ 15 mites/plant and HMO @ 0.2% can be incorporated along with acaricides in the integrated mite management programme for the control of spider mites in protected cultivation.



Section F: Others

Abstract Number	Title of Paper	Authors	Address
OS01	Nanoporous Nanofibrous Vascular Scaffold based on Electropun Gelatin for Blood Vessel Regeneration	<u>JincyJoy</u> ^{1,2} , Bhuvanesh Gupta ¹ and Alok Ray ²	¹ Bioengineering Laboratory, Department of Textile Technology, IITD, New Delhi- 110016, India ² Center for Biomedical Engineering, IITD, New Delhi- 110016, India
OS02	Dextran Based Bionanocomposite Wound Dressings for Scar Prevention	<u>Surabhi Singh</u> and Bhuvanesh Gupta	Department of Textile Technology, Indian Institute of Technology Delhi, New Delhi-110016, India
OS03	A Fascinating Route to the Development of Infection Resistant Polyester Sutures	<u>Sadiya Anjum</u> ^a , Amlan Gupta ^b , Deepika Sharma ^b , Bhuvanesh Gupta ^a	^a Bioengineering Laboratory, Department of Textile Technology, Indian Institute of Technology, New Delhi-110016, India ^b Department of Pathology, SMIMS, Sikkim Manipal University, Gangtok-737132, Sikkim, India
OS04	Preparation, characterization and in-vitro release of Thymoquinone loaded solid lipid nanoparticles	<u>Charul Rathore</u> , Poonam Negi*	School of Pharmaceutical Sciences Shoolini University of Biotechnology and Management Sciences Solan (H.P)
OS05	Recycling: Control of Environment Pollution in Textile Industries	Neelam Saini* Krishna Khambra**	I.C. College of Home Science, CCS HAU, Hisar
ORAL PRESENTATIONS			
OS06	A Fixed Point Theorem In 2-Metric Spaces	<u>Ritu Arora</u>	Gurukula Kangri Vishwavidyalaya Hardwar (Uttarakhand),
OS07	Image Recovery Problem In Geodesic Spaces	<u>Izhar Uddin</u>	Department of Mathematics, JMI, New Delhi



Nanoporous Nanofibrous Vascular Scaffold based on Electropun Gelatin for Blood Vessel Regeneration

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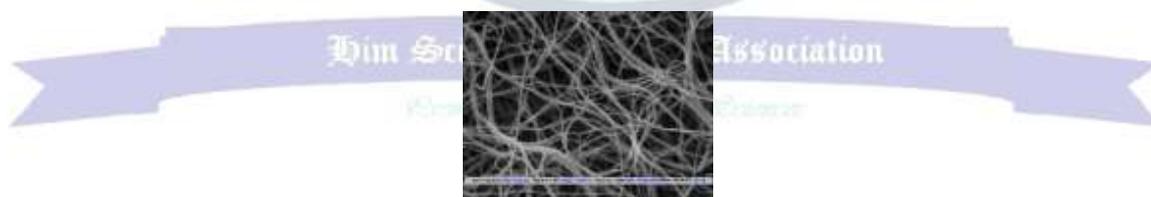
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Abstract

Electrospinning has emerged out to be a versatile and economic method to fabricate nanofibrous 2D and 3D constructs with interconnected porosity. A major advantage with electrospinning is the ability to mimic the nanofibrous architecture of the native extracellular matrix of human cells. Thereby electrospun scaffolds have found an important application in the field of tissue engineering and regenerative medicine.

We have attempted to mimic the native extracellular matrix of blood vessel using electrospun protein based vascular grafts that can improve the biocompatibility of the grafts compared to the clinically available inert grafts based on e-PTFE and Dacron. In this aspect, gelatin being the hydrolysed product of collagen contains the RGD sequences which can help in cell adherence. Hence, a novel approach in the development of nanofibrous tri-layered electrospun vascular scaffold based on gelatin hydrogels for blood vessel reconstruction has been proposed.



Electrospun Tubular Nanofibrous Trilayered Graft based Gelatin Hydrogels

The first layer is constituted by in-situ crosslinked gelatin using oxidised polysaccharide instead of conventional crosslinkers like glutaraldehyde that are toxic. PTMC has been blended with gelatin and electrospun to form the second layer. The outermost layer is constituted of a blend of gelatin and PCL to induce durability, flexibility and hydrophobicity to form a repelling layer to protein adsorption thereby preventing collagen encapsulation.

The preliminary properties investigated of the graft show reliable and comparable results to the native blood vessel in terms of mechanical properties. The nanofibrous morphology, biodegradability and the mechanical properties of the graft may support in the neovessel formation which may help in finding an alternative to the present problems associated with coronary by-pass surgery graft.

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OS02

Dextran Based Bionanocomposite Wound Dressings for Scar Prevention

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Abstract

The spontaneous wound healing in adult skin leads to the formation of epithelialized scar and scar contractures, which further results in tissue distortion and lifetime deformities. Thus, in order to address this issue, dextran nanobiocomposite dressings loaded with herbal drugs; clove oil (CO) and sandalwood oil (SO) were produced using facile solvent casting methodology that not only lead to diminished scar formation but also provided a complete solution to combat wound infections.

The current work deals with the design and development of custom made, all-herbal functional soy protein isolate nanoparticles (nanosoy) reinforced dextran based nanobiocomposite dressings for bioactive wound management. Easy to handle nanomembranes that are capable of delivering

fast, smooth and scar free wound healing were fabricated by incorporating chitosan into dextran/nanosoy matrix followed by addition of essential oils (drugs). Glycerol assisted in producing flexible membranes. Membranes were characterized using Field Emission Scanning Electron Microscopy (FESEM), Atomic Force Microscopy (AFM), X-Ray Diffraction (XRD), Raman Spectroscopy (RS) and Water Vapor Transmission Rate (WVTR).

Along with scar free healing manifested by chitosan, it possesses mild antibacterial activity. Hence, to improve the antibacterial activity of chitosan, a prerequisite to fight against infection, CO and SO were incorporated into dextran/nanosoy/glycerol/chitosan (DNG/Ch) nanodressings that can be placed directly at the wound site. Herbal dressings were topically applied onto male swiss albino mice of BALB/c strain which provided enhanced epithelialization in the terms neovascularisation, scar prevention and aesthetics at the wound area. To the best of our knowledge, there has been no previous research report on the use of dextran based nanobiocomposite wound dressings loaded with natural pharmacologically active agents for wound repair. Wounds healed completely (100% wound contraction) for the mice treated with clove oil loaded dressings after 14th post wounding day. Moreover, complete eradication of wound infection as manifested during antibacterial studies performed against *S.aureus* and *E.coli* bacterial strains has the potential to make the patient completely infection free and provide the best reconstruction for aesthetics and function. This herbal nanobiocomposite serves better over widely used synthetic antibacterial agents like silver nitrate, silver oxide and nanosilver due to non-cytotoxic nature of herbal compounds.

Him Science Congress Association

Acknowledgement: Financial support from Indian Institute of Technology Delhi is highly acknowledged.

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A Fascinating Route to the Development of Infection Resistant Polyester Sutures

Sadiya Anjum^a, Amlan Gupta^b, Deepika Sharma^b, Bhuvanesh Gupta^a

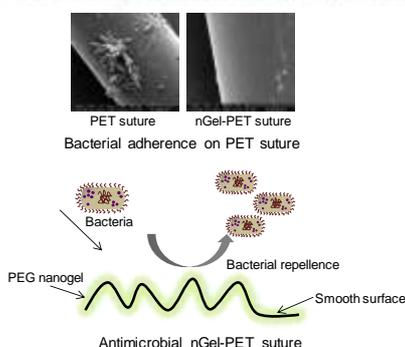
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Abstract

Suture is an integral part of the wound closure process which approximates the tissue edges for subsequent healing. However, suturing process may be accompanied by significant infection from microbes leading to the deterioration in the wound condition. Bacterial repellence in suture materials is a desirable property that can potentially improve the healing process by preventing infection. The aim of this study was the development of antimicrobial bioactive polyethylene terephthalate (PET) surgical suture by adopting the immobilization route with bioactive nanogels and other agents. Among all the nanomaterials, extensive research has been dedicated to the development of nanosilver based systems due to its high effectiveness against microbes. The nanosilver nanogel was prepared using polyethylene glycol which helps in the reduction of silver ions into nanosilver as well as stabilization of nanoparticles. Carbon dioxide plasma was used for the generation of carboxyl functionality on PET surface for the immobilization of the bioactive components. Mechanical properties, surface topography and elemental analysis were analyzed on these sutures. The cumulative release of silver from the dressing was found to be 68% of the total loading after 72 h.



The cumulative release of silver from the dressing was found to be 68% of the total loading after 72 h. Coated sutures have excellent bacteriostatic and bactericidal activity against both *E. coli* and *S. aureus*. In vivo wound healing and histopathology studies were carried out over a period of 3 d for skin wounds created on Swiss albino mice. Fast healing was observed in nanogel treated wounds without any inflammatory effects on the newly generated skin. These sutures offer improved healing along with excellent antimicrobial properties and appear to be promising material against surgical infection.

References

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OS04

Preparation, characterization and in-vitro release of Thymoquinone loaded solid lipid nanoparticles

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Abstract:

TQ is the major active constituent of *Nigella sativa* seeds having extensive therapeutic benefits in different *in vitro* and *in vivo* conditions but unluckily a hydrophobic molecule with poor bioavailability. The objective of this study was to develop, evaluate and characterize the solid lipid nanoparticles (SLNs) of Thymoquinone (TQ) and evaluate the potential of SLNs as the carrier for delivery of TQ. Thus, aiming to enhance its bioavailability, TQ-loaded SLN's were prepared by solvent injection method. Particle size and morphology of nanoparticles were analyzed by dynamic laser scattering (DLS), and transmission electron microscopy (TEM). Differential scanning calorimetry (DSC) and X-ray diffraction (XRD) studies were also

performed to characterize the modification in crystal pattern of drug and lipid. Mean particle size of TQ-loaded SLN was found to be $90.10 \pm 8.05\text{nm}$ and % entrapment of TQ-loaded SLN was found to be $80.42 \pm 3.5\%$. In-vitro release studies was performed in phosphate buffer (pH 7.4), ethanol and distilled water, using dialysis membrane. Maximum % cumulative drug release (%CDR) from the nanoparticle formulation was found to be $70 \pm 1.45\%$ in 24 h. The release data was fitted into various models and linear regression was done. The best fit model was found to be Korsmeyer–Peppas model with ($R^2 = 0.9718$), indicating sustained release of the drug from nanoformulation.

OS05

Recycling: Control of Environment Pollution in Textile Industries

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Abstract

Clothing is an important part of human life. It has been used by them for thousands of years. Clothes **provide protection from the elements, such as wind, cold, rain and strong sunlight**. People use new clothes every time and donate the old clothes to poor people. They throw the clothes as waste material called rags. Majority of textile waste comes from household sources. Textile industry is among the most essential consumer goods industry. We all need garments and other textile products such as footwear and bags etc. However, textile industry is also accused of being one of the most polluting industries. Not only production but consumption of textiles also produces waste. To counter the problem, textile industry has taken many measures for reducing its negative contribution towards environment. One of such measures is textile recycling- the reuse as well as reproduction of fibres from textile waste. Panipat city is the biggest centre of “shoddy Yarn” in the world in 1980. Shoddy is the fibrous material obtained by shredding unfelted rag or waste. Shoddy industry at panipat Haryana which utilizes these rags as raw material for making yarn and thus paves way for an eco-friendly enterprise of recycling these rags by making yarn out of it. Textile recycling is for both, environmental and economic

benefits. It avoids many polluting and energy intensive processes that are used to make textiles from fresh materials. In textile industries many chemicals are used for several finishing process like different dyes which create many hazardous pollutant, chemicals also used in dying process and other manufacturing processing so to overcome these problems textile industries are adopting recycling process by reprocessing of used articles into new form. So this is the great solution to make environment pollution free. We can say that the recycling process of used cloth is an eco friendly method.

OS06

A FIXED POINT THEOREM In 2-Metric Spaces

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9760099090(M)

Abstract.

In 1982, S. Seesa an Italian mathematician was introduced weak commutativity a pair of maps in fixed point considerations. Thereafter a number of generalizations of this notion have been obtained. Gahler was the first mathematician, who introduced the concept of 2-metric spaces and Iseki for the first time established a fixed point theorem in 2-metric space, since then a number of authors have studied the aspects of fixed point theory in the setting of 2-metric space. Especially, Murthy-Chang-Cho introduced the concepts of compatible mappings and proved coincidence point theorems and common fixed point theorem for these mappings in 2-metric space.

The purpose of this paper this paper is to obtained common fixed point theorem of weakly compatible mappings in 2-metric space.

Key words and phrases: Weakly commuting maps, compatible maps.

Image Recovery Problem in Geodesic Spaces

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Abstract.

Bregman [1] considered a sequence of iterates generated by cyclic projections and proved that it converges weakly to an element for an arbitrary initial point. Later, Kitahara and Takahashi [2] and Takahashi and Tamura [3] dealt with the problem of image recovery by convex combinations of nonexpansive retractions in a uniformly convex Banach space. This problem has been investigated by many authors via several iteration scheme in linear spaces. In this section, we study this in the setting of Geodesic spaces.

Keywords: Geodesic Spaces , Fixed point, Δ -convergence and Opial's property.

AMS Subject Classification: 54H25, 47H10.

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Poster presentations (Annexure)

EFS17	Studies on Mechanical Properties of Wood of Willow Clones	<u>Heena*</u> , <u>K R Sharma</u>	Department of Forest Products Dr. Y S Parmar University of Horticulture and Forestry Nauni Solan HP- 173230
EFS18	Bio-efficacy of <i>Alpinia galanga</i> against polyphagous pest, <i>Spodoptera litura</i> (Fabricius)	Rahul Datta ¹ , Isha saraf ² , Alka Choudhary ² , Inder Pal Singh ² , Sanehdeep Kaur ¹	1 Department of Zoology Guru Nanak Dev University Amritsar(Punjab) India- 143005 2 Department of Natural Products, National Institute of Pharmaceutical Education and Research (NIPER), S.A.S. Nagar, (Punjab) India-160062
EFS19	Evaluation Of Rodenticides For Rodent Control In Potato Crop	<u>Navdeep Kaur*</u> and <u>Neena Singla</u>	Department of Zoology, Punjab Agricultural University, Ludhiana, Punjab
LS49	Life history of <i>Callosobruchus maculatus</i> Fabricius (1775) (Coleoptera: Bruchidae) on different cultivars of <i>Vigna mungo</i> L.	Anita* and D. R. Thakur	Department of Biosciences, Himachal Pradesh University, Shimla, Himachal Pradesh, 171005, India
LS50	Phylogenetic analysis of <i>Channa striatus</i> (Bloch) and <i>Channa marulius</i> (Hamilton-Buchanan) from Harike Wetland, Punjab using Mitochondrial 12S rRNA Gene	Y.K.Rawal* and Ajashan Kaur	Department of Zoology, Panjab University, Chandigarh
LS51	Standardization of borehole height and diameter class for oleoresin tapping in <i>Pinus roxburghii</i> Sargent	K R Sharma, Bhupender Dutt, Rajneesh Kumar, Heena Gupta and Varun Attri	Dr Y S Parmar University of Horticulture and Forestry, Nauni, HP-173230
LS52	Evaluation of in-vitro anti-proliferative activity of <i>arisaema intermedium</i> lectin towards human cancer cell lines	Anu Raina	Punjabi University Patiala



Studies on Mechanical Properties of Wood of Willow Clones

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Nauni Solan HP- 173230

Abstract

Salix alba (white willow) is one of the most important willow tree among 33 species reported from northern part specially Himalayan region, in India. Willows, Sallows and Osiers form the genus *Salix*, have around 400 species of deciduous trees and shrubs, found primarily on moist soils in Cold and Temperate Regions of the Northern Hemisphere. In order to diversify the plantation of tree species with integration of agriculture crops, willow is most eco-friendly and farmer's choice. Willow is the lifeline for tribal areas of dry temperate regions of Himachal Pradesh and Jammu and Kashmir. Examination of strength properties of willow require taking into consideration many different factors of which anatomical direction and wood moisture content as well as the number and distribution of structural defects exert a strong influence on wood strength and possibilities of its application. The willow clones procured from the established trial plots by the Department of Tree Improvement, Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan (H P). The mechanical wood properties were tested in Universal Testing Machine (model: UTN-10) in the Wood Workshop. The conclusions were drawn on the basis of comparison with standard teak wood procured from the market. Among willow clones, the highest tensile strength was noticed in clone J-795 (0.073 kN/mm^2), highest bending strength was recorded in clones V-99 (0.006 kN/mm^2). Maximum compressive strength parallel to grain 0.044 kN/mm^2 was found in 131/25 clone and highest compressive strength perpendicular to grain in clone NZ-1002 (0.007 kN/mm^2) was observed.

Key words: *Salix*, deciduous, Tensile strength, bending strength and compressive strength.

Bio-efficacy of *Alpinia galanga* against polyphagous pest, *Spodoptera litura* (Fabricius)**Rahul Datta¹, Isha saraf², Alka Choudhary², Inder Pal Singh², Sanehdeep Kaur¹**¹ Department of Zoology Guru Nanak Dev University Amritsar(Punjab) India- 143005² Department of Natural Products, National Institute of Pharmaceutical Education and Research (NIPER), S.A.S. Nagar, (Punjab) India- 160062

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Abstract

Environmental health hazards posed by indiscriminate use of synthetic pesticides over the years, have necessitated the need to look for safe and environment friendly alternatives. Botanical pesticides are generally considered to be environmentally safe. In light of this the present study was conducted to explore the insecticidal potential of a medicinal plant, *Alpinia galanga* against *Spodoptera litura* (Fabricius). *S. litura* is a polyphagous pest known to cause extensive losses to a number of agriculturally important crops of Punjab. Effect of ethyl acetate extract of *A.galanga* rhizomes was evaluated on the survival and development of *S.litura*. Artificial diet was amended with different concentrations viz 500, 1000, 1500, 2000, 2500ppm of the extract and fed to 2nd instar larvae of *S. litura*. The larvae fed on diet without extract served as control. Observation were recorded on survival and development of *S.litura*. The extract exhibited strong toxic effect against *S.litura* and resulted in higher larval mortality and prolongation of development period. The mortality rate increased with the increase in concentration of the extract. The larvae suffered 67.5% mortality due to consumption of the highest concentration (2500ppm) of extract. The larvae that survived the toxic effects took 6.08 to 12.18 days more to complete their development with respect to control larvae. However, the effect was not in a dose dependent manner with maximum prolongation of overall development period at 2000ppm of the extract. Extended development period as well as morphological aberration in pupae and adults of *S. litura* would ultimately result in suppression of pest population. In conclusion these results indicate that the ethyl acetate extract of *A. galanga* can be used for development of formulations for the control of insect pests.

Evaluation Of Rodenticides For Rodent Control In Potato Crop

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Abstract

Potato (*Solanum tuberosum*) is an important food crop of the world. In Punjab state, among vegetable crops, about 87.4 ha is covered under potato production. Rodents cause considerable economic losses in staple crops, particularly tuber crops and cereals. Four blocks of potato crop I, II, III and IV each of about 1.2 ha were selected at village Nangal, Tehsil Phillaur of district Jalandhar. Each block was further consisted of three fields of almost equal size as replicates. Rodent control was carried out in block I (paper baiting with 2% zinc phosphide @ 1Kg/ha), II (paper baiting with 0.005% Bromodialone @ 1Kg/ha) and III (Paper baiting of 2% Zinc phosphide @ 1Kg/ha followed by paper baiting of 0.005% Bromodialone @ 1Kg/ha). Block IV was kept as untreated control. The pre and post-harvest live burrow census was taken from all the treated and untreated fields. Percent control success was calculated with respect to reference field as well as within the field. The incidence of pre-harvest rodent damage in treated and untreated fields was assessed. The control success in three different blocks of potato was found to be 38.70 ± 3.22 and 42.33 ± 2.96 in block I, 46.45 ± 0.75 and 49.13 ± 0.59 in block II and 57.56 ± 4.13 and 59.67 ± 3.92 in block III with respect to same and control field respectively indicating maximum control success in block III. The minimum percent potato damaged (4.00 ± 2.31) and yield loss (11.60 ± 6.94 kg/ha) was also found in block III. Thus these observations indicate that two treatments one with Zinc Phosphide (at tuber maturation stage) and other by Bromodialone (at pre-harvest stage) after interval of 15 days were maximum effective in control of rodents in potato crop.

Keywords: Potato, rodents, zinc phosphide, bromodialone

Life history of *Callosobruchus maculatus* Fabricius (1775) (Coleoptera: Bruchidae) on different cultivars of *Vigna mungo* L.

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Abstract:

Bean beetle, *Callosobruchus maculatus* F. (Coleoptera: Bruchidae), was an agricultural insect pest of Africa and Asia but presently ranged throughout the world. This species is also known as the southern cowpea weevil. The larvae of this species feed and develop exclusively on the seed of legumes (Fabaceae) hence the name bean beetle. The adults do not require food or water and spend their limited lifespan (one - two weeks) mating and laying eggs on beans. Adult male and female beetles were easily distinguished from one another by general appearance. The most distinguishing characteristic was color on the pygidium covering the abdomen and body size, length of antennae, colour and shape of pygidium. In females, pygidium was enlarged and dark in color but in male, the pygidium was smaller and lacks stripes. In the females, pygidium was elongated and antennae were small but in males, pygidium was vertical and antennae were large. Generally, females were larger in size than their male counterparts. Females laid an average of 58.25 ± 2.50 eggs and produced 50.25 ± 3.40 offsprings. Larvae grew and molted inside the host seed and adult bruchid emerged out after cutting circular window in testa of seed. Total development period completed in 42-46 days during favourable period but life cycle being so prolonged during unfavourable periods. Newly emerged insect become sexually mature 24hours after the emergence. In the present findings infested and un-infested seeds of *Vigna mungo* L. were collected from Kangra district of Himachal Pradesh. With the emergence of adult from infested sample, cultures were initiated and maintained on different genotype of *Vigna mungo* and a significant difference of the cultivars susceptibility and resistance has been noticed.

Phylogenetic analysis of *Channa striatus* (Bloch) and *Channa marulius* (Hamilton-Buchanan) from Harike Wetland, Punjab using Mitochondrial 12S rRNA Gene

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Abstract

The Family Channidae is represented by 26 species out of which 23 are found in India, however, taxonomy and phylogeny of the Channid fishes found in India has not been studied extensively using molecular techniques. In the present study, an endeavour has been made to study the phylogenetic inter-relationship of *Channa marulius* and *Channa striatus* from Harike Wetland, Punjab based on mitochondrial 12S rRNA gene sequences and their relationship with other species of *Channa* by obtaining sequences of the related species from the NCBI database.

In phylogenetic analysis using 12S rRNA, the out group species were well separated from *Channa* species. *Channa marulius* and *Channa striatus* were observed to be in one cluster along with other sequences of these two species obtained from NCBI database. This has also been confirmed by workers like Vishwanath *et al.*, 2009 who divided *Channa* into two groups, marulius group and gachua group. The marulius group comprises of *C.marulius* and *C. striata*. Our results on the basis of 12S rRNA were all similar. *Channa micropeltes*, now regarded as a separate species in South India known as *Channa diplogramma*, is found in the state of Kerala (Jayaram,2010) showed more closer relationship to *Channa striatus* (Harike) than *C.striatus* has with *C.marulius* (Harike).

The morphological similarity as seen amongst species in each group is sufficient to suggest that members of the same group are descendents from a common direct ancestral stock. Therefore, it can easily be concluded that 12S rRNA gives authentic information on the phylogeny of the species of genus *Channa*. In addition, no genetic divergence has been observed in the sequences of 12S rRNA.

Therefore, the phylogenetic analysis of *Channa* species on the basis of mitochondrial DNA sequences has been found out to be reliable.

Standardization of borehole height and diameter class for oleoresin tapping in *Pinus roxburghii* Sargent

K R Sharma, Bhupender Dutt, Rajneesh Kumar, **Heena Gupta** and Varun Attri

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Abstract

Pinus roxburghii, also known as chir pine, is commercially tapped for oleoresin in India. The oleoresin is an important forest produce of pine forests in the world and is biosynthesized as part of a defense mechanism against the major predators (mainly bark beetles and their associated pathogenic fungi). The oleoresin production of pines is not only important to oleoresin industries but it has also got immense potential to generate employment to rural people. Various methods of oleoresin tapping have been used in the past but a new method known as borehole method has been developed which is superior to other methods in improved quality and no impurities. The turpentine, rosin and other products manufactured from it will be better and fetch higher price. Therefore, the present investigation was carried out with the objective to standardize the borehole height and diameter class for oleoresin tapping. The results revealed that the oleoresin yield was significantly affected by borehole height and diameter of tree. The maximum oleoresin yield of 389.95 g/hole was recorded in T₁ (40 cm) followed T₄ (328.95 g/hole) and T₃ (321.97 g/hole) and minimum yield of 315.88 g/hole in T₂ (50 cm). Among different diameter classes, the highest oleoresin yield of 452.81 g/hole/tree was obtained from the diameter class >55 cm and diameter class 50-55 cm (412.83 g/hole/tree). The lowest oleoresin yield of 264.96 g/hole/tree was recorded from diameter class 35-40 cm. The interaction between borehole height and diameter classes was also observed to be significant at 5 per cent level of significance. The maximum oleoresin yield of 672.00 g/hole/tree was obtained from T₄ (70 cm) with diameter classes 50-55cm. The minimum oleoresin yield of 166.67 g/hole was recorded in T₄ with diameter class 35-40 cm.

Key words: Oleoresin yield, borehole, Diameter classes, height, chir pine.

Evaluation Of *In-Vitro* Anti-Proliferative Activity Of *Arisaema Intermedium* Lectin Towards Human Cancer Cell Lines

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Abstract

In our present study the *in-vitro* anti-proliferative activity of *Arisaema intermedium* lectin (AIL) was evaluated towards IMR-32, MCF-7, PC3, HeLa and A498 human cancer cell lines by MTT assay. It showed proliferation inhibition towards these cell lines in a dose dependent manner. Further effect of AIL was studied on IMR-32 cell line. Various parameters such as effect on cell morphology, mitochondrial membrane potential disruption and MDA levels were studied. The results also indicated induction of apoptosis in AIL-treated IMR-32 cells. The cells showed membrane blebbing, nuclear condensation, change in shape and detachment from the substratum. Furthermore, there was disruption of mitochondrial membrane potential, indicated by quenching of fluorescence in AIL-treated cells. MDA levels were also found to be raised in supernatant of AIL-treated cells, indicating lipid peroxidation.

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Oral presentations (Annexure)

LS11	Preliminary Feeding of Honeybee in Indora (H.P.) Condition	Indu Kumari ¹ & Rajesh Kumar ²	2. Assistant Professor and Principal Investigator- Project H. P. State Council for Science Technology & Environment, Shimla 1, 2 Department of Bioscience, School of Basic Science Arni University, Kangra (H.P.)
LS15	Mammary derived growth inhibitor participates in Antibacterial response.	<u>Ambica Baru</u> ¹ , Chandra Devi ¹ , Kanika Gupta ² , Nilambra Dogra ¹ , Ashok Kumar ² and Tapas Mukhopadhyay ^{1*}	National Centre for Human Genome Studies and Research, North Campus, Sector-14, Panjab University, Chandigarh, India-160014 Centre for Systems Biology and Bioinformatics, South Campus, Sector-25, Panjab University, Chandigarh, India-160025
LS53	In Silico Analysis of EZH2 Gene	Nisha Gautam, Satbir Kaur	Punjabi University Patiala
LS54	Histochemical localization of NOS enzyme in heart of mice after Fenoterol administration	<u>Pooja Sharma</u> , Ramesh Kumar, Sushma Sharma	Department of Bio-Sciences Summerhill HPU- Shimla, India- 171005

LS11

Preliminary Feeding of Honeybee in Indora (H.P.) Condition

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Abstract

The shortage of bee flora, particularly during peak summer season makes the task of beekeeping more difficult and troublesome. The reserve stores of honey and pollen gets rapidly consumed during this period and overall activities of honey bees including foraging, egg laying, and brood rearing are reduced. This may lead to perishing of bee colonies. Few commercial beekeepers follow the concept of migration but it is a costly affair which small beekeepers cannot afford. To overcome dearth periods, provision of stimulative feeding may prove beneficial. In the present study which was carried out at Indora region of district Kangra (H.P.), efforts were made to feed

the bees with artificially formulated diets. Diet was fed to bees on top bars in form of patties after wrapping in butter paper. Due to scanty natural bee flora, bees showed great interest towards formulated diets. Results of preliminary study revealed that all the diet formulations were consumed by the bees. However, consumption rate for diet 2 was more as compared to diet 1 and diet 3. It was observed that bees even picked up butter paper and no residue left on the top bars. Detailed investigation is going on to standardize the bee formulations so that suitable recommendations can be made for strengthening beekeeping venture in the state.

LS15

Mammary derived growth inhibitor participates in Antibacterial response.

Ambica Baru¹, Chandra Devi¹, Kanika Gupta², Nilambra Dogra¹, Ashok Kumar² and Tapas Mukhopadhyay^{1*}

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Abstract

Human MDGI/FABP3 is a member of a fatty acid binding protein (FABP), which plays an important role in fatty acids transport and lipid metabolism. Previous reviews have exhibited noteworthy role of fatty acids in the cellular immune system and a few FABPs are communicated at huge levels in immune active cells. However, the immune function of human FABP3/MDGI is not well characterized. For this reason, the human MDGI (FABP3) cDNA was sub-cloned in a bacterial expression vector pQE30. MDGI protein expression was examined on SDS-PAGE. Bright field microscopic study revealed the altered morphology of MDGI expressing bacteria and these cells were also forming aggregates. Further studies suggested that the MDGI expressing bacterial cells were releasing the cellular content such as DNA and proteins in higher amount than the controls. Interestingly, human MDGI expressing bacteria

showed some level of kanamycin resistance. Therefore, bioinformatics studies were carried out and it was indicated that MDGI could interact with kanamycin as well as with ribosome inactivating protein. Structural superimposition of MDGI and type I ribosome inactivating protein showed structural similarity. Thus, the expression of human MDGI in bacterial cell could affect the protein synthesis causing cell lysis. Consequently, it appears that MDGI exerts its antimicrobial activity through translation interference.

LS53

Silico Analysis of EZH2 Gene

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Abstract

The EZH2 is a subunit of polycomb protein that catalyzes the epigenetic regulation of chromatin. The high level of EZH2 has been reported in several cancers, hence before planning a larger population study, it is advisable to sort out the possible functional SNPs by analyzing data available in the dbSNP by using different SNP related softwares. Therefore, this study was undertaken to find out the functional nsSNPs (nonsynonymous single nucleotide polymorphisms) in EZH2. Out of the total 849SNPs analyzed, 243were nsSNPs , 67 occurred in the mRNA 3' UTR, 106 occurred in 5' UTR region and 433 occurred in intronic region. The functional analysis of 243 nsSNPs using SIFT predicted only two nsSNPs rs2302427 and rs112034331 as damaging. Further analysis by Polyphen , SNAP and I-Mutant v3.0 predicted 45 (20.16%) , 38 (15.63%) and 68 (27.98%) nsSNPs (respectively) as damaging . The damaging nsSNPs predicted by SNAP and I-Mutant v3.0 were also found to be negatively affecting the stability of the protein structure. Further the promoter prediction as a function of promoter strength was determined for polymerase II and polymerase III by promoter prediction software v2.0 and TSSG software respectively. The distribution of " transcription element binding sites" were estimated by Proscan v1.7. The polyadenylated regions of mRNA precursors of EZH2 gene and CpG sites were found by POLYAH and CpG finder software respectively. We concluded that the studied nsSNPs of EZH2 negatively affected the stability of the protein. How

exactly the stability of the protein is affected, can only be resolved by further analysis using protein modeler softwares.

LS54

Histochemical localization of NOS enzyme in heart of mice after Fenoterol administration

Pooja Sharma, Ramesh Kumar, Sushma Sharma

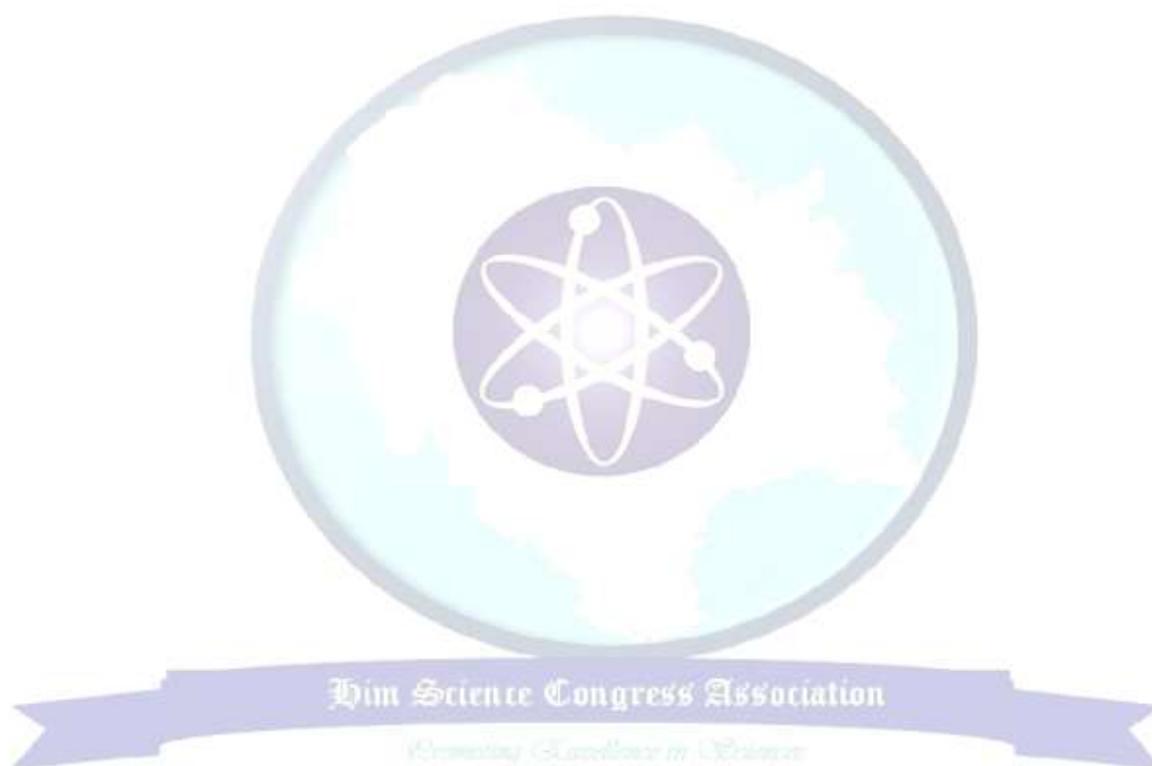
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Abstract

Fenoterol is a short-acting β_2 agonist, which also stimulates [\$\beta_1\$ receptors](#) at doses above the recommended therapeutic doses. It was widely used in [New Zealand](#) in the early 1990s but withdrawn from that market because of its association with an excess number of deaths. It is thought that the association of increased risk of death was because it was typically used in excessively large doses for severe acute asthma attacks in the absence of medical assistance. The side effects of fenoterol are typical for β_2 -adrenoceptor agonists, e.g., hypokalemia, cardiac acceleration, hypotension, and tremor. Histochemistry is a combination of chemistry and histology, in which reactions are carried out on tissue sections or similar preparations and the results examined under a microscope, with the object of combining the advantages of chemical or biochemical specificity and histological localization. Histochemistry is complementary to biochemical analysis of tissue homogenates, since histochemical techniques can give simultaneously biochemical and morphological information. Nitric oxide (NO), first identified as an endothelium-derived relaxation factor, is now recognized to be an intra- and extracellular mediator of cell function. NO produced by the constitutive isoform of nitric oxide synthase (NOS) is a key regulator of homeostasis, whereas the generation of NO by inducible NOS plays an important role in inflammation, host-defense responses, and tissue repair. NO formation is increased during inflammation (rheumatoid arthritis, and ulcerative colitis, Crohn disease), and several classic inflammatory symptoms are reversed by NOS inhibitors. The correlation of structure and biochemical function made possible by histochemical techniques is of unique value

in diagnostic and experimental pathology. The present investigation is an attempt to examine short term effects of fenoterol on the major non contractile apparatus which mainly comprises of collagen in left ventricle. The status of antioxidant enzyme nitric oxide synthase has been studied in heart tissue to find out their reserves during fenoterol induced myocardial necrosis. Myonecrosis is a pathophysiological state and during such stage status of antioxidant enzymes is a subject to change.

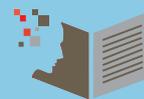




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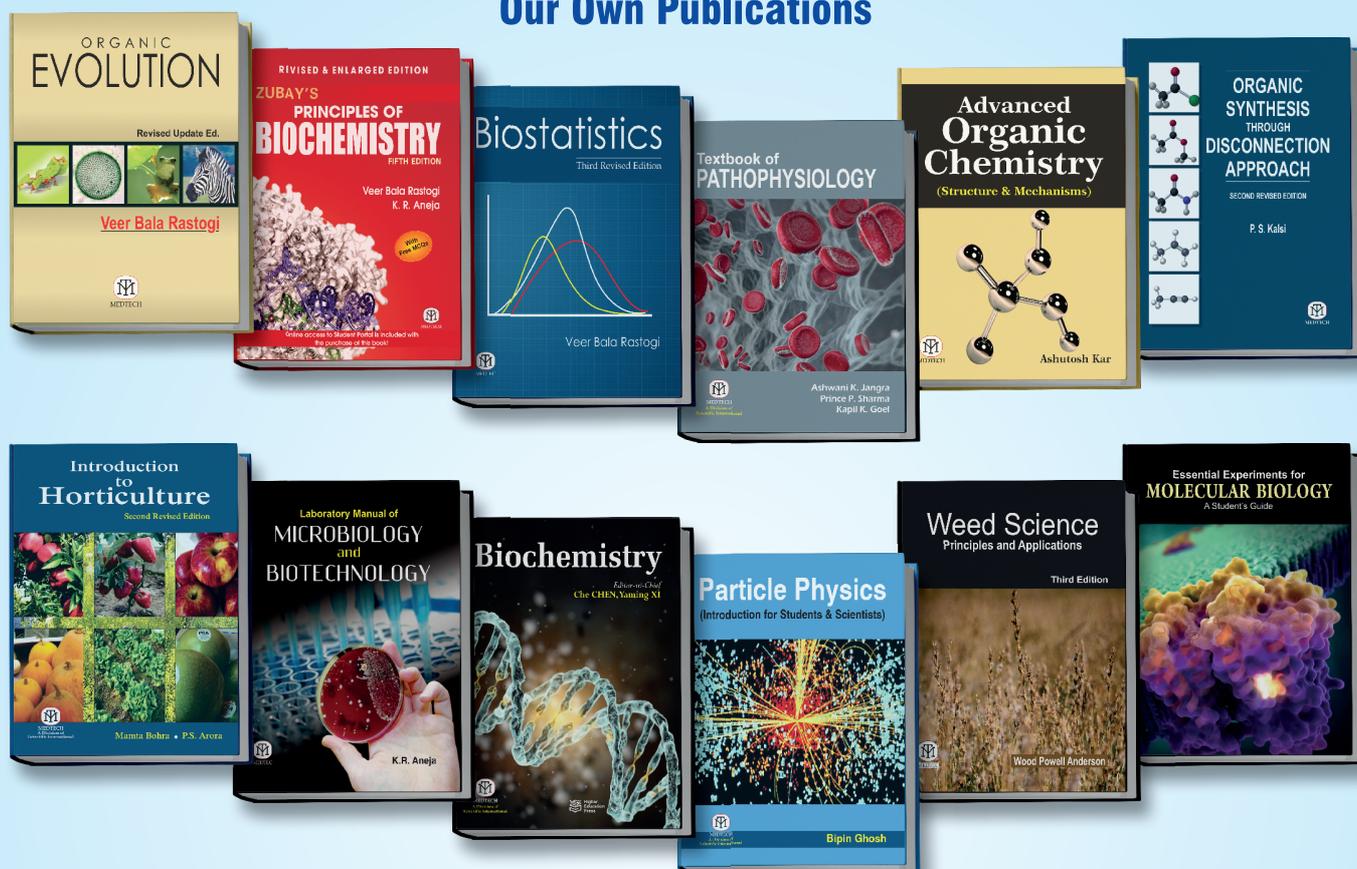
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- 412 मेगावाट रामपुर हद्दहो पावर स्टेशन, हिमाचल प्रदेश
- महाराष्ट्र में 47.6 मेगावाट की खिरकीरे पवन ऊर्जा परियोजना

- हिमाचल प्रदेश में देश का सबसे बड़ा भूमिगत 1500 मेगावाट जलविद्युत स्टेशन।
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