

**CONFERENCE PROCEEDINGS**



**Scientific and Technical Research Association (STRA)**

**ICRST (2018) XIXth International Conference on Researches in  
Science & Technology, 26-27 October 2018, Colombo**

26-27 October 2018

Conference Venue

Galle Face Hotel, Colombo, Sri Lanka

## **KEYNOTE SPEAKER**



**Dr Anoja Attanayake**

**Senior Lecturer in Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka**  
**Topic: Polyphenols in human health and disease**

### **Biography**

Dr Anoja Attanayake, Senior Lecturer in Biochemistry, Faculty of medicine, University of Ruhuna, Sri Lanka

### **Research Focus**

Bioactivity studies of medicinal plant extracts of Sri Lankan origin, isolation and characterization of antidiabetic, antihyperlipidaemic and antioxidant compounds, antidiabetic and nephroprotective mechanisms of natural products; beta cell regenerative effects in animal models and in cell cultures, discovery of acetylcholine esterase inhibitors towards the management of Alzheimer's disease.

### **Achievements**

The recipient of gold medal for the excellent performance during the post graduate study 2013, University of Ruhuna, Sri Lanka , post graduate research award of SLAAS, Sri Lanka in 2015, award for the most outstanding young researcher -2016, University of Ruhuna, Sri Lanka etc. Grant recipient, principal investigator, co- investigator of collaborative research projects, supervisor for post graduate research work, editorial member of refereed journals etc.

<p><b>Dr. Andy Ibeje</b> GICICRST1812051</p>	<p><b>Morphometric Analysis of Orammiriukwa River Basin in Imo State, Nigeria</b></p> <p><b>Dr. Andy Ibeje</b> Civil Engineering/ Faculty of Engineering, Imo State University, Owerri, Nigeria</p> <p><b>Abstract</b> Morphometry analysis of Orammiriukwa river system has been carried out using planimeter and atlas maps. The Orammiriukwa river system as defined in this study includes Rivers Orammiriukwa, Mba and Okitankwu located in Imo State of Nigeria. Morphometry parameters considered for analysis include the linear and areal aspect of the basin only. The Orammiriukwa basin covers an area of 919.979km<sup>2</sup> and is a 4<sup>th</sup> order drainage basin with mainly dendritic drainage pattern. The maximum stream frequency is in the 2<sup>nd</sup> order streams, an indication that the basin is prone to erosion. The length of the river system was evaluated as 93.45km. The length-area relation is <math>L = 8.308A^{0.1987}</math> and center of gravity of the watershed is <math>^{\circ}33^{1}N, 7^{\circ}8^{1}E</math>. The mean bifurcation ratio is 2.569 indicating that the watershed is not affected by structural disturbances. The basin has low drainage density of 0.102 indicating very less permeable subsoil and sparse vegetation. The length of the overland flow values of the basin is 4.558km, indicating that the surface runoff of the catchment is high. It is recommended that the morphometric data generated through this study are used to prioritize the Orammiriukwa watershed. <b>Keywords:</b> Basin, Drainage, Orammiriukwa, Morphometry, Watershed</p>
 <p><b>Rolando Javellonar</b> GICICRST1812052</p>	<p><b>Process Optimization In The Production Of Ilocos Chichacorn</b></p> <p><b>Rolando Javellonar</b> Faculty of Agricultural Engineering Department, College of Engineering and Technology, Romblon State University, Odiongan, Philippines</p> <p><b>R.T. Garcia</b> Project Manager, Food Processing Center, Mariano Marcos State University City of Batac 2906, Ilocos Norte, Philippines</p> <p><b>Abstract</b> The project optimized the process in chichacorn manufacturing in compliance to food safety and standards for chichacorn products. Specifically, it aimed to: a) develop an improve process in the manufacture of chichacorn; b) follow the recommended code of practice in the manufacture of chichacorn in order to comply with the PNS for chichacorn; c) conduct laboratory analysis on the finished product; and d) recommend appropriate packaging material with proper labelling.</p> <p>Although the manufacturers largely followed similar steps in processing chichacorn, each had different techniques and variation in every phase of production. The duration of first boiling varied from 1 to 8 hours and the second boiling from 2 to 10 hours; and amount of CaCO<sub>3</sub> added during first boiling varied from 11-333 g/kg corn. Sundrying of boiled corn took 8-18 hours, while frying 20 – 60 seconds. Thus, the variability in the time of preparation resulted in the</p>

	<p>differences of the quality of the finished product.</p> <p>In the developed optimized process, 1 hour of first boiling, 5 hours of second boiling, 18 hours of sundrying, and 15 seconds of dip-frying were found to be the optimum duration for each step. By adopting the optimized process, the time to complete one cycle of operation is shortened by 2.5 hours equivalent to 9.44% savings on labor cost translated into a savings of P70,367/year. Additionally, fuel wood consumption was reduced owing to shorter boiling time. Based on sensory test, chichacorn produced using the optimized process had comparable crispiness as the commercial product. Except for fat content (23.40%) and free-fatty acid (0.738% as oleic acid), other quality indicators including moisture content (1.80%), water activity (0.208), peroxide value (3.58 meq/kg fat) and aflatoxin content (none detected) of the chichacorn produced using the optimized process passed the critical level set by PNS and BFAD.</p> <p><b>Keywords:</b> process optimization, chichacorn, boiling, drying, dipping, crunchiness</p>
 <p><b>Manjunatha H V</b> GICICRST1812055</p>	<p><b>Preparation and Dielectric Studies on CoXSr1-X Fe2O4 Nano Ferrites</b></p> <p><b>Manjunatha H V</b> Department of Studies in Physics, Shridevi Post Graduate Center, Shridevi Group of Institution, Tumkur, Karnataka, India</p> <p><b>Shwetha H S</b> Department of Physics, Shridevi Post Graduate Centre, Tumkur 572 106, India</p> <p><b>Krupakara Vijay J</b> Department of Physics, Shridevi Post Graduate Centre, Tumkur 572 106, India</p> <p><b>Sangappa Y</b> Department of Studies in Physics, Mangalore University, Mangalagangothri, Mangalore 574 199, India</p> <p><b>Harish K S</b> Department of Studies in Physics, Mangalore University, Mangalagangothri, Mangalore 574 199, India</p> <p><b>Madhukumar R</b> Department of Physics, Shridevi Post Graduate Centre, Tumkur 572 106, India</p> <p><b>Abstract</b></p> <p>Nanoscale CoXSr1-X Fe2O4 (Cobalt Stransium nano ferrite) particles were prepared by combustion method using cobalt stransium nitrate as oxidizer and urea as a fuel. The composition is characterized by X-ray diffraction technique (XRD) using Cu-K<math>\alpha</math> radiation. The XRD study shows the nanocrystalline nature in the prepared ferrite samples. The crystal size is calculated from XRD data by using Scherrer equation and Dielectric studies have been undertaken over a wide range of frequencies (100Hz-5MHz) for Cobalt Stransium nanoferrites at room temperature and also tested the SEM micrographs. Dielectric properties such as dielectric loss tangent (D), dielectric constant (<math>\epsilon'</math>) and dielectric loss factor (<math>\epsilon''</math>) are found to decrease with the increase in the frequency. Observed variations are understood on the basis of Koop's phenomenological model. Further, AC conductivity of the</p>

	<p>cobalt stransium nanoferrites was found to increase with the increase in the frequency, which is understood on the basis of electron hopping model. Keywords: Nanoferrite, XRD, SEM, AC conductivity</p>
 <p><b>Shivasagar K R</b> GICICRST1812056</p>	<p><b>Design and Construction of Digital Laser Combustion Instrument and Synthesis of AgNPs</b></p> <p><b>Shivasagar K R</b> Department of Studies in Physics, Shridevi Post Graduate Center, Shridevi Group of Institution, Tumkur, Karnataka, India</p> <p><b>Srikanth</b> Department of Studies in Physics, Shridevi Post Graduate Centre, Tumkur, Karnataka – 574 199 India</p> <p><b>Gurusiddesh H</b> Department of Physics, Visvesvaraya Technological University, RRC, Belagavi-590 018, India</p> <p><b>Sangappa Y</b> Department of Studies in Physics, Mangalore University, Mangalagangotri, Mangalore - 574 199, India</p> <p><b>Krupakaravijay J</b> Department of Studies in Physics, Shridevi Post Graduate Centre, Tumkur, Karnataka – 574 199 India</p> <p><b>Madhukumar R</b> Department of Physics, Visvesvaraya Technological University, RRC, Belagavi-590 018, India</p> <p><b>Abstract</b> Our research focused on design and development of digital combustion instrument for synthesis of silver nanoparticles by laser combustion method. From this instrument we can able to control the synthesis just by giving digital input, from this instrument we can prepare more sample of linearly varying different physical variables with digital accuracy and it consume less time and power. This instrument prepare a sample in such a way that it helps to further characterization UV-Vis, XRD, and TEM.</p> <p>Keywords: Digital laser Instrument, UV-Vis, XRD, TEM</p>
 <p><b>Thrinethra SN</b> GICICRST1812057</p>	<p><b>Tuning of Optical and Mechanical Properties of PVA/ZnO thin film using Solution Casting method</b></p> <p><b>Thrinethra SN</b> Department of Physics, Shridevi Post Graduate Center, Tumkur, Karnataka, India</p> <p><b>Rohith C M</b> Department of Studies in Physics, Shridevi Post Graduate Centre, Tumkur, Karnataka – 574 199 India</p> <p><b>Lakshmeesha Rao B</b> Department of PG Studies and Research in Physics, Sri Dharmasthala Manjunatheshwara College (Autonomous), Ujire – 574 240, India</p> <p><b>Harish K S</b></p>

	<p><b>Department of Studies in Physics, Mangalore University, Mangalagangothri, Mangalore - 574 199, India</b></p> <p><b>Kirankumar B P</b> Department of Studies in Physics, Shridevi Post Graduate Centre, Tumkur, Karnataka – 574 199 India.</p> <p><b>Shivabuddi B R D</b> Department of Studies in Physics, Shridevi Post Graduate Centre, Tumkur, Karnataka – 574 199 India.</p> <p><b>Madhukumar Rg</b> Department of Studies in Physics, Shridevi Post Graduate Centre, Tumkur, Karnataka – 574 199 India.</p> <p><b>Abstract</b> The optical and mechanical properties of PVA/ZnO films. In order to study the response of PVA/ZnO based on polymer composite films. Polymer-based films of were prepared by solution casting technique at room temperature. The prepared samples were characterized by UV-Visible spectrophotometer (UV-Vis) and universal testing machine (UTM) to study the optical and mechanical properties. The recorded spectra have has been The recorded UV-Vis absorption and transmission spectra have been used to determine the optical band gap (<math>E_g</math>), refractive index (<math>n</math>), extinction coefficient (<math>k</math>), optical conductivity (<math>\sigma_{opt}</math>) and dielectric constants (<math>\epsilon^*</math>) of PVA/ZnO films. Reduction in optical band gap and increase in refractive index with increasing concentration were observed. It is also found that there is an increase in dielectric constants with increasing photon energy. The obtained results reveal that the refractive index of the PVA/ZnO films may be efficiently changed. Mechanical properties of the samples were carried out using Universal Testing Machine (UTM) Lloyd Instruments – LRX model (UK) with gauge length 50mm at room temperature. The mechanical properties like tensile strength (<math>T_s</math>), Young's modulus (MPa) increases with increase in concentration.</p> <p><b>Keywords:</b> UV-Vis, optical properties, optical band gap, mechanical properties.</p>
 <p><b>Vinod Kumar R</b> GICICRST1812058</p>	<p><b>Electrochemical Properties of Polyblend Electrolyte on Quartz Plate by Spin-Coating: Energy Storage Devices</b></p> <p><b>Vinod Kumar R</b> Department of Physics, Shridevi Post Graduate Center, Tumkur, Karnataka, India</p> <p><b>Sharanappa Chapi</b> Department of physics, Shridevi Post Graduate Center, Tumkur – 572 2106 Karnataka, India</p> <p><b>Nithish D</b> Department of physics, Shridevi Post Graduate Center, Tumkur – 572 2106 Karnataka, India</p> <p><b>Madhu B J</b> Department of Physics, K.L.E. Society, J T College, Gadag- Betegeri 582 101 - Karnataka, India</p> <p><b>Sangappa Y</b></p>

	<p><b>Department of Physics, Mangalore University, Mangalagangothri, Mangalore - 574199, India</b></p> <p><b>Harish K V</b> <b>Department of Physics, Mangalore University, Mangalagangothri, Mangalore - 574199, India</b></p> <p><b>Madhukumar R</b> <b>Department of physics, Shridevi Post Graduate Center, Tumkur – 572 2106 Karnataka, India</b></p> <p><b>Abstract</b> Preparation of polyblend electrolyte of Poly (ethylene oxide), Poly (vinyl pyrrolidone) and doped cobalt chloride at 45:45:10 wt% compositions by spin-coat technique on quartz substrate. The obtained solvent free solid polymer (PEO/PVP/CoCl<sub>2</sub>) electrolyte film of ~42 μm thin onto periodically patterned substrate. The surface morphology was carried using scanning electron microscope (SEM). The cyclic voltammogram study confirms that the polymer blend with the existence of cobalt units (Co<sup>2+</sup>) is more stable in the electrochemical environment. The studies on the electrochemical and morphological properties of polymer blend electrolyte have attracted much attention in view of their applications in electronic and optical devices, like electro-chromic display devices, fuel cells, gas sensors, solid state batteries etc.</p> <p><b>Keywords:</b> polyblend electrolyte, morphology, electrochemical properties.</p>
 <p><b>Dhanalakshmi K M</b> <b>GICICRST1812059</b></p>	<p><b>Structural, AC conductivity and Magnetic Properties studies on PANI/Co-Cr Fe<sub>2</sub>O<sub>4</sub> Nanocomposites</b></p> <p><b>Dhanalakshmi K M</b> <b>Department of Physics, Shridevi Post Graduate Center, Tumkur, Karnataka, India</b></p> <p><b>Krupakar Vijay J</b> <b>Department of Physics, Shridevi Post Graduate center, Tumkur, Karnataka – 572 106, India</b></p> <p><b>Likitha B N</b> <b>Department of Physics, Shridevi Post Graduate center, Tumkur, Karnataka – 572 106, India</b></p> <p><b>Ramya A N</b> <b>Department of Physics, Shridevi Post Graduate center, Tumkur, Karnataka – 572 106, India</b></p> <p><b>Sowmya shree P S</b> <b>Department of Physics, Shridevi Post Graduate center, Tumkur, Karnataka – 572 106, India</b></p> <p><b>Harish K S</b> <b>Department of Physics, Mangalore University, Mangalagangothri-574 199, Karnataka, India</b></p> <p><b>Madhukumar R</b> <b>Department of Physics, Shridevi Post Graduate center, Tumkur, Karnataka – 572 106, India</b></p>

	<p style="text-align: center;"><b>Abstract</b></p> <p><b>PANI/Co-Cr Fe<sub>2</sub>O<sub>4</sub></b> Nanocomposite were synthesized by solution combustion method and synthesized powder were characterized by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR) ac conductivity and Vibrating sample magnetometer (VSM) technique. The XRD results confirm the cubic spinel structure of the ferrites and crystallite size (D) found in the range of 40-50 nm. The FTIR measurements between 400 and 4000 cm<sup>-1</sup> confirmed the absorption bands in the spectrum. Dielectric studies on as prepared samples have been undertaken over a wide range of frequencies (50Hz-5MHz) at room temperature. Dielectric constant (<math>\epsilon'</math>) of all the samples found to decrease with the increase in the frequency. Further, ac conductivity of PANI/Co-Cr Fe<sub>2</sub>O<sub>4</sub> nanocomposite found to increase with the increase in the frequency. Conduction mechanism is in accordance with the electron hopping model. The magnetic properties of the synthesized samples were investigated by using vibrating sample magnetometer at room temperature. According to VSM reports the main magnetic parameters like saturation magnetization (Ms), coercivity (Hc) were found to decrease with the substitution Cr-Co content.</p> <p><b>Keywords: Nanocomposite, ac conductivity, XRD, FTIR, VSM</b></p>
<p style="text-align: center;"><b>Nura Haladu</b>  <b>GICICRST181206060</b></p>	<p style="text-align: center;"><b>Fabrication and Characterisation of Photoelectrochemical Solar Cell of Copper- Copper Sulphide (Cu/Cu<sub>2</sub>S) Electrodes</b></p> <p style="text-align: center;"><b>College of Science and Technology, Husaini Adamu Federal Polytechnic, Jigawa, Nigeria</b></p> <p style="text-align: center;"><b>ABSTRACT</b></p> <p>This paper discuss the fabrication and characterization of a photoelectrochemical (PEC) Solar cell based on a single photo-Cathode and a metal counter electrode. Copper(I)oxide was prepared by thermal oxidation of copper foils at 9320C and sulphided in a 0.05 M of Sodium sulphide (Na<sub>2</sub>S), Copper Sulphide (Cu<sub>2</sub>S) was formed and used as photo-cathode while copper foil is used as the counter electrode. Both electrodes were immersed in different concentrations of Sodium Chloride (NaCl) electrolyte containing 0.1M Ferric Chloride redox couples (Fe<sup>3+</sup>/ Fe<sup>2+</sup>) in a beaker. The cell was kept under solar illumination. When tested, the open voltage, Voc and short circuit current, Isc of 90 mV and 1025.0 <math>\mu</math>A were obtained for the best cell. The fill factor, FF, and the electrical conversion efficiency, <math>\eta</math>, of the cell were found to be 0.63 and 0.08% respectively. The values represent an improvement over the previously reported values using similar materials for both photoelectrochemical solar cells (PEC) and non PEC Solar cells.</p> <p><b>Keywords: Redox couples, Photoelectrochemical solar cell.</b></p>
 <p style="text-align: center;"><b>Atiku Muhammad</b></p>	<p style="text-align: center;"><b>Change Detection in Land-use Vegetation Covers at Wassaniya Forest Reserve of Sokoto Nigeria</b></p> <p style="text-align: center;"><b>Atiku Muhammad</b>  <b>Department of Forestry and Fisheries, Faculty of Agriculture, Kebbi State University of Science and Technology Aliero, Kebbi State, Nigeria</b></p> <p style="text-align: center;"><b>Abstracts</b></p> <p>A study was carried out at Wassaniya Forest Reserve in Sokoto State of Northern Nigeria, by the use of Landsat Multispectral Scanner (MSS) of 1986 (17-07-1986) and Landsat 8 Operational Land Imager</p>

<b>GICICRST1812062</b>	<p>Thermal Infrared Sensor (OLI-TIRS) of 2015 (0-07-2015) in order to detect the changes that occur between the vegetation land covers. The metadata reported zero cloud cover for (1986), but 1.32% was reported for (2015). Maximum likelihood supervised classification was performed with an accuracy of 86.30% which proves the results to be acceptable. Results found includes Exchanges detected between the different land use land covers (Vegetation zones). Post classification comparison was conducted from the studies, to allow predictions to be made on these changes. Changes detected were attributed largely to anthropological activities (agricultural activities, grazing, forest fires and poaching) and natural activities (sheet and gully erosion, thunder storm, land slide, and land depressions).</p>
 <p style="text-align: center;"><b>Musa Ahmed Abubakar</b> <b>GICICRST1812063</b></p>	<p style="text-align: center;"><b>Standardization and Antibacterial Activity of Persicaria minor Huds. Against Enteric Bacterial Pathogens In Johor, Malaysia</b></p> <p style="text-align: center;"><b>Musa Ahmed Abubakar</b> Department of Science Laboratory Technology, Kano State Polytechnic, Nigeria</p> <p style="text-align: center;"><b>Razauden Mohamed Zulkifli</b> Department of Health Sciences, Faculty of Biosciences and Medical Engineering, Universiti Teknologi Malaysia (UTM), 81310 UTM, Johor Bahru, Malaysia</p> <p style="text-align: center;"><b>Abstract</b></p> <p>A significant number of herbs have been utilized as dietary and phytomedicinal sources in enhancing our health. <i>Persicaria minor</i> (Huds.) Opiz known as Small water-pepper and well recognized locally in Malaysia as “daun kesum” is an edible vegetable with nutritional and medicinal benefits utilized generally by South-east Asians. The present study was conducted to evaluate the antibacterial activity of aqueous-ethanolic and aqueous extracts of <i>P. minor</i> leaves. The leaves of the plant undergone extraction based on Malaysian Standard Guidelines which is 30% aqueous-ethanol and absolute water as normally used in traditional medicine to produce the respective extract concentrates. The plant was identified and authenticated by taxonomist from Forest Research Institute of Malaysia (FRIM). Both extracts were standardized by evaluating the total protein and polysaccharide contents in which aqueous-ethanolic extract was found to possess high contents of proteins (1713.67 µg/mL) while contents of polysaccharides were high in absolute water extract (17.6 µg/mL). These measurements were used as a standard for different batch extract. The extracts were then tested against four standard strains of bacteria which are <i>Enterococcus faecalis</i> ATCC 29212, <i>Escherichia coli</i> ATCC 11229, <i>Staphylococcus aureus</i> ATCC 6538 and <i>Pseudomonas aeruginosa</i> ATCC 15442 at different concentrations using disc-diffusion test with penicillin being used as positive control and dimethylsulfoxide a carrier as negative control. Both extracts showed antibacterial activity with minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) values in the range of 50 to 100 mg/mL against <i>S. aureus</i>, <i>E. faecalis</i>, and <i>E. coli</i>, respectively with aqueous-ethanolic extract being more potent. However, none of the extracts were active against <i>P. aeruginosa</i>. Therefore, the results obtained in this research have shown the nutritional values and high potential of <i>P. minor</i> leaves to be used as natural antibacterial agent for the elimination of various bacterial diseases and infections.</p> <p><b>Keywords:</b> <i>Persicaria minor</i>; Antibacterial activity, Crude extracts, Standardization.</p>
<b>Jayasena Sandhaya Kumari</b>	<b>The New Auditors Reporting Standards and the Audit Expectation-</b>

<p><b>GICICTEL1812067</b></p>	<p><b>Performance Gap in Sri Lanka</b></p> <p><b>Jayasena Sandhaya Kumari</b>                  Department of Accounting, Faculty of Management Studies, Rajarata                  University of Sri Lanka, Sri Lanka</p> <p style="text-align: center;"><b>Abstract</b></p> <p>The value of a financial statement audit relies on society having confidence in the audit concept and function. The difference between the actual performance of auditors and society's expectations regarding their services known as the 'Audit Expectation-Performance Gap' (AEG). The criticism of auditors and even litigation against auditors for failing to meet society's expectations is clearly harmful to the accounting and auditing professions. In response to repeated observations of an AEG between financial statement users and the audit profession, the International Accounting and Assurance Standards Board (IAASB) released a revision of the International Standard on Auditing (ISA) (IAASB, 2015). The revision was undertaken in order to improve users' understanding of an audit and to align users' expectations with the actual responsibilities of the auditor and management as well as the reliability of audited financial statements (IFAC, 2008).</p> <p>Hence, the purpose of this paper is, firstly, to determine the current state of the expectation gap under the revised ISA 700 &amp; ISA 701 and, secondly, the revision to ISA 700 and the requirements of ISA 701 appear to be a significant response to the audit expectation gap. Author report the results of an experiment in which experienced practicing auditors and financial statement users. The independent sample 't' test (Mann-Whitney test) is applied to the survey groups' responses to establish whether differences in the perception of the samples by interest group respondents could be accepted as reflecting differences in the perception of the interest groups from which the samples were drawn. In each case, the test was applied to the three section questions relating to the suggested responsibility of auditors as listed in the questionnaire with a significance level of 0.05 being adopted.</p> <p>Results show strong evidence for a persistent audit expectation gap between auditors and financial statement users under the revision to ISA 700 and the requirements of ISA 701. Most notably, revision of ISAs in the audit do not result in a smaller expectation gap. Researcher findings suggest that the audit opinion alone may already signal sufficient relevant information to financial statement users. Overall, while the fact that an audit expectation gap still exists under the new ISA 700 auditor's report is in line with expectations. This observation may indicate that the explanations would need to be formulated more explicitly and clearly, or even that users' perceptions are simply not malleable by additional information and explanations in the auditor's report.</p> <p><b>Keywords:</b> Audit expectation- performance gap, ISAs</p>
<p><b>Prajakta Khule</b>  <b>GICICRST1812068</b></p>	<p><b>Formulation and Characterization of Itraconazole Topical Gel</b></p> <p><b>Prajakta Khule</b>                  Faculty of Pharmacy, SVERIS College of Pharmacy, Solapur                  University, Pandharpur, Maharashtra, India</p> <p style="text-align: center;"><b>Abstract</b></p> <p>The purpose of the present study was to formulate topical delivery of water insoluble antifungal drug Itraconazole with different gelling agents synthetic as well as natural and also increase its penetration through skin. Itraconazole is an orally or topically active antifungal</p>

	<p>agent with a wide spectrum of activity. Topical gel formulations of Itraconazole were prepared with various gelling agents in the concentration of 1% and 2%. The formulations were evaluated for physicochemical parameters including pH, spreadability, viscosity, extrudability, % drug content, skin irritation, in-vitro diffusion studies and stability studies. Skin irritation test did not show edema and erythema for any formulation. CF2 showed 96.06% drug release in five hours. It can be concluded that topical gel of Itraconazole (ITZ) was more effective and safe system for fungal infections.</p>
<p style="text-align: center;"><b>Vrunal More</b> <b>GICICRST1812069</b></p>	<p style="text-align: center;"><b>Formulation and Evaluation of Topical Gel for Psoriasis</b></p> <p style="text-align: center;"><b>Vrunal More</b> <b>Faculty of Pharmacy, SVERIS College of Pharmacy, Solapur</b> <b>University, Pandharpur, Maharashtra, India</b></p> <p style="text-align: center;"><b>Abstract</b></p> <p>Purpose of this research work was to develop and characterize a tacrolimus gel using different polymers for treatment of psoriasis. The physicochemical compatibility was confirmed between tacrolimus and other excipients by FTIR. Formulated gels were characterized for drug content uniformity, viscosity, extrudability, skin irritation study, pH, and stability. Release of tacrolimus from all formulations using dialysis membrane into a phosphate buffer pH 6.8 at 37 °C was performed. Optimized batch was selected from this characterization study. Based on the data collected, it was revealed that tacrolimus has proven to be a promising candidate for delivery through gel in treatment of psoriasis.</p>
<div style="text-align: center;">  <p><b>Oldrich Kubicek</b> <b>GICICRST1812053</b></p> </div>	<p style="text-align: center;"><b>Influence of Inactivation Methods on Pathogen Diagnostics by Means of Instrumental Methods</b></p> <p style="text-align: center;"><b>Oldrich Kubicek</b> <b>Laboratory Of Biological Monitoring And Protection, National Institute For Nbc Protection, Kamenna 71, Milin, Czech Republic</b></p> <p style="text-align: center;"><b>Šalplachta Jiří</b> <b>Institute of Analytical Chemistry of the CAS, Veveří 97, Brno 602 00, Czech Republic</b></p> <p style="text-align: center;"><b>Horká Marie</b> <b>Institute of Analytical Chemistry of the CAS, Veveří 97, Brno 602 00, Czech Republic</b></p> <p style="text-align: center;"><b>Placáková Hana</b> <b>National Institute for NBC Protection, Kamenná 71, Milín 262 31, Czech Republic</b></p> <p style="text-align: center;"><b>Lunerová Kamila</b> <b>National Institute for NBC Protection, Kamenná 71, Milín 262 31, Czech Republic</b></p> <p style="text-align: center;"><b>Abstract</b></p> <p>Mass spectrometry as an identification method for microorganisms is rapidly developing in the last years. However, this method is not suitable for detection of agents in complex matrices and it has to be preceded by clean-up procedures and particular agents concentration. In case of high-risk pathogens, such a separation methods may pose hazard for the laboratory staff. Therefore, various methods for pathogen inactivation were selected. Their influence on pre-concentration and separation of microorganisms by means of preparative and capillary isoelectric focusation was studied. Most of</p>

	<p>the disinfectant agents disrupted the cells integrity and made their following separation impossible. The most promising was freeze-dry samples inactivation using hydrogen peroxide vapor at 300 ppm concentration. Inactivation of the lyophilized bacterial agents caused only inconclusive shift of mass spectras in MALDI-TOF MS analysis, but it caused quite significant change of isoelectric point. Inactivation of bacterial spores required at least 2 hours of exposure. Increased vapor concentration caused damage of the cells. Heating up the samples up to 60 °C enabled to increase the vapor concentration and made the inactivation faster without influencing the mass spectras. Moreover, the influence of thermal inactivation of bacterial agents at 60 °C for 16 hours was studied. There was no significant change in mass spectras in MALDI-TOF MS analysis, but it did not work for sporulating bacterias. Simultaneously, the longtime of inactivation was a significant drawback. The possibilities of the detection and the identification of inactivated pathogens are an object of ongoing research.</p>
<div style="text-align: center;">  <p><b>Nanda Kumar Ghosh</b>  <b>GICICRST1812064</b></p> </div>	<p style="text-align: center;"><b>High-Tc Superconductivity (HTSC): Influence of Next-Nearest-Neighbor (NNN) Hopping and Exchange Interactions</b></p> <p style="text-align: center;"><b>Nanda Kumar Ghosh</b>          Department of Physics, University of Kalyani, Kalyani-741235, West Bengal, India</p> <p style="text-align: center;"><b>Krishanu Roy</b>          Department of Physics, University of Kalyani, Kalyani-741235, West Bengal, India</p> <p style="text-align: center;"><b>Abstract</b></p> <p>The <math>t - t' - J - J'</math> model, one of the realistic extensions of the <math>t</math>-<math>J</math> model to understand the characteristics of the high-<math>T_c</math> cuprates, has been investigated to explore hole pairing, <math>s</math>- or <math>d</math>-wave pairing mode of holes and some of the ground state properties using exact diagonalization (ED) method within an 8-site tilted square cluster. The role of the next-nearest-neighbor (NNN) antiferromagnetic exchange interaction <math>J'</math> and NNN hopping interaction has been considered. An <math>s</math>-wave superconducting phase is established. 2-hole binding energy calculation indicates that stable bound pair of holes is formed in the region <math>J'/t &gt; 0.15</math>. 4-hole binding energy clearly shows that superconducting condensation is not possible in the system. Charge gap shows a gapped behavior which decreases with NNN hopping and large <math>J'/t</math>. Spin gap curves establish a gapless behavior at small <math>t'/t</math> and <math>J'/t</math>. Also, it appears that effective exchange interaction is very much relevant in the present system.</p>
<div style="text-align: center;"> <p><b>Seong-Min Yoon</b>  <b>GICICRST1812065</b></p> </div>	<p style="text-align: center;"><b>Nonlinearity of volatility spillover effect between the U.S. and Japanese stock markets</b></p> <p style="text-align: center;"><b>Seong-Min Yoon</b>          Department of Economics, Pusan National University, Busan, South Korea</p> <p style="text-align: center;"><b>Dongmin Yeom</b>          Department of Economics, Pusan National University, Busan, Republic of Korea</p> <p style="text-align: center;"><b>Abstract</b></p> <p>This paper analyzed the nonlinearity of the spillover effect and adjustment process to the long-run equilibrium between the U.S. and Japanese stock market volatility. Unlike previous works regarding</p>

	<p>stock market volatility, this study focused on the nonlinearity between the volatilities of two stock markets using threshold vector error correction model (TVECM) with threshold cointegration. The empirical results showed that the volatility spillover effect and the adjustment process to the long-run equilibrium varied greatly depending on a regime. Furthermore, we found that observations belonging to the extreme regime are in line with historical events. These results suggest that there exists nonlinearity in the spillover effect and the adjustment process to the long-run equilibrium between the U.S. and Japanese stock market volatility.</p> <p><b>Keywords:</b> Nonlinearity, Volatility, Threshold cointegration, Spillover effect, TVECM, VIX</p>
 <p style="text-align: center;"><b>Ajath Thirega</b>  <b>GICICRST1812074</b></p>	<p style="text-align: center;"><b>Recombining Population of Sclerotinia Sclerotiorum in Upcountry Cabbage Cultivation of Sri Lanka</b></p> <p style="text-align: center;"><b>Ajath Thirega</b>  Faculty of Science, University of Kelaniya, Sri Lanka</p> <p style="text-align: center;"><b>Abstract</b></p> <p>Cabbage head rot pathogen, <i>Sclerotinia sclerotiorum</i>, population of Sri Lanka was studied for its genetic diversity and population structure as the prime step taken to determine an effective pathogen control. Genetic diversity was assessed by using mycelial compatibility groupings (MCGs) and simple sequence repeat (SSR) markers. Forty two number of isolates were paired in all possible combinations to determine the MCG. Eight SSR markers were used for amplification of 47 isolates and PCR products labelled with one of the four fluorophores were separated with capillary electrophoresis. Nine MCGs and 23 SSR haplotypes were found within the population. High genetic diversity was evident by the presence of high allelic richness (4.75) and expected heterozygosity (0.558). Moreover, three genetic clusters were detected from Bayesian clustering analysis and principle coordinates. Though the population has exhibited clonal reproduction in index of association (IA) testing recombination was found within clusters driven from the structure analysis indicated that random mating is possible among the isolates of each genetic cluster. The homothallic fungus switching from self-mating to outcrossing reported in previous studies renders high genetic dissimilarities eventually leading to develop rapid adaptation for any sort of management practices including fungicide application.</p> <p><b>Keywords:</b> genetic diversity; microsatellite marker; mycelial compatibility groupings; <i>Sclerotinia sclerotiorum</i></p>
 <p style="text-align: center;"><b>Tae Hyun Lee</b>  <b>GICICRST1812070</b></p>	<p style="text-align: center;"><b>Motion Analysis of the Water Bottle Flip</b></p> <p style="text-align: center;"><b>Tae Hyun Lee</b>  Haeumnarae, Korean Minjok Leadership Academy, Seoul, Republic of Korea</p> <p style="text-align: center;"><b>Abstract</b></p> <p>The study was started in early 2017 to analyze the widely known "bottle flip" phenomenon. Bottle flip is a half-filled water bottle that stands upright when thrown. It is difficult to analyze the motion because the distribution of fluids in a bottle is constantly changing. Thus, a parabolic motion model was constructed using the center of mass. This is because the law of conservation of angular momentum is established because the resistance of air and resistance other than gravity can be ignored. Through the statistical position mean, the center of mass and moment of inertia were induced and the model was</p>

	<p>constructed. As a result of the experiment, the correlation between the amount of oil and the distribution of location was identified.</p>
<p style="text-align: center;"><b>Mohamed Riswan Mohamed Rafeek</b> GICICRST1812073</p>	<p style="text-align: center;"><b>Controllability of Predator Prey Model</b></p> <p style="text-align: center;"><b>Mohamed Riswan Mohamed Rafeek</b> Department of Mathematics, University of Kelaniya, Colombo, Srilanka</p> <p style="text-align: center;"><b>Abstract</b></p> <p>Controlling biologically important model is a very impressive field of study. It has been widely used in pest management, chemical controlling, etc. In general, it is worthwhile to understand and control the dynamics of an existing system whose output behaves somewhat closer to the desired output rather than developing a new system which tracks the desired output. Since, it is beneficial for industries in many aspects; low cost, less time, etc. In this study we focus on stability and controllability of predator-prey model. Controllability is obtained by adding source terms as well as initial conditions to governing equations while the stability is obtained by determining the eigenvalues of the Jacobian matrix around equilibrium points. We validate the results using numerical simulations in MATLAB. These numerical results will help to track the population's curves for desired outputs.</p> <p>Consider the governing equations:</p> $\frac{dx}{dt} = ax - bxy \text{ and } \frac{dy}{dt} = -cy + dxy \dots\dots\dots(1)$ <p><math>x(0) = \alpha, y(0) = \beta</math> where <math>a</math> and <math>\beta</math> are parameters</p> <p>(i). Controlling by the source term: Let the desired output be generated by</p> $a\ln y - by = 5dx - c\ln x^3 + v.$ <p>Then controlled system for the source term is <math>\frac{dx}{dt} = ax - bxy + \tau(x, y), \frac{dy}{dt} = -cy + dxy + \varphi(x, y);</math> where</p> $\tau(x, y) = 0 \text{ and } \varphi(x, y) = -2cy + 4dxy$ <p>and <math>v</math> is a constant</p> <p>(ii) Controlling by the initial condition: Let the desired outputs be</p> $\bar{x}_1(t) = e(at - byt + \ln(\mu)) \text{ and } \bar{x}_2(t) = e(-ct + dxt + \ln(\Omega))$ <p>This desired output can be tracked by changing the initial condition in system (1)</p> $x(0) = \mu - \alpha, y(0) = \Omega - \beta.$ <p>These additional values are needed to be added to the previous initial conditions</p> <p style="text-align: center;"><b>Keywords: Lotka_volterra, Asymptotically stable</b></p>
<div style="text-align: center;">  <p><b>Hammad Saleem</b> GICICRST1812072</p> </div>	<p style="text-align: center;"><b>Biological and chemical fingerprintings of Anagallis Arvensis</b></p> <p style="text-align: center;"><b>Hammad Saleem</b> School of Pharmacy, Monash University, Malaysia, Kuala Lumpur, Malaysia</p> <p style="text-align: center;"><b>ABSTRACT</b></p> <p>Anagallis arvensis commonly known as "Scarlet Pimpernel" has been used in folklore as natural remedy for wound healing, edema, epilepsy, diuretic, diaphoretic, expectorant, rheumatism and mania. The present research is aimed to explore the antioxidant, enzyme inhibitory, cytotoxic potential and phytochemical composition of methanol and dichloromethane (DCM) extracts of A. arvensis root. Total bioactive phenolic and flavonoid contents (TPC and TFC) was determined using standard protocols, and the secondary metabolites were identified by LC/MS. DPPH, ferric reducing antioxidant power (FRAP) and total antioxidant capacity (TAC) assays were employed to assess antioxidant activity. Inhibitory potential against <math>\alpha</math>-glucosidase, urease and</p>

	<p>cholinesterases were determined spectrophotometrically, and cytotoxicity was tested using the MTT assay against four different cell lines named MDA-MB 231, MCF-7, CaSki and DU-145. Phenolic and flavonoid contents were found to be higher in methanol extract, i.e., <math>21.17 \pm 0.31</math> mg GAE/g and <math>19.07 \pm 1.21</math> mg QE/g, respectively. The same trend was found for antioxidant activities in which methanol extract exhibited higher antioxidant potential (<math>16.50 \pm 0.10</math> mg AA/g, <math>38.47 \pm 0.17</math> GAE/g for DPPH and FRAP and TAC). This high antioxidant activity can be correlated to its higher total polyphenolic bioactive contents. Both the extracts were cytotoxic towards all four cell lines with IC50 values ranging from 12.57-208.2 <math>\mu\text{g/mL}</math>. Both the extracts presented a relatively strong inhibition of <math>\alpha</math>-glucosidase and urease. LC-MS revealed the presence of well-known phenolics flavonoids and saponins e.g., methylgallate, quercetin, lanceoletin, balanitesin, etc. The obtained results shows that the <i>A. arvensis</i> root methanol and DCM extracts of possess good antioxidant, enzyme inhibition and varying cytotoxic potential which can be attributed to observed phenolic compounds. There may be present phytochemicals responsible for the inhibition of these selective enzymes of therapeutical importance and the extracts are cytotoxic in nature. Our results clearly conclude that <i>A. arvensis</i> root could be considered as a potential candidate for development of navel pharmaceuticals.</p>
 <p>BM Vishal YRSICRST1812051</p>	<p>Methods in Catalytic Hydroprocessing for Production of Jet Fuel from Biomass</p> <p>BM Vishal Department of Chemical Engineering, School of Engineering Studies, University of Petroleum &amp; Energy Studies, via Prem Nagar, Bidholi, Dehradun, India</p> <p>G Saradha Devi Department of Chemical Engineering, School of Engineering Studies, University of Petroleum &amp; Energy Studies, via Prem Nagar, Bidholi, Dehradun 248007, India</p> <p>Abstract</p> <p>Over the years, biofuels have gained considerable among the researchers and has proven to be a research hotspot. Exploring these varied generations of biofuels is important to tackle the issues with the depleting fossil fuel reserves. Another problem associated with the fossil fuels is the emissions of obnoxious sulphur and NOx compounds. Biofuels tend to minimise these emissions thereby extending the sustainability of the current technologies. Therefore, studying them in wider perspectives have become one of the key factors to have a good understanding about these fuels. Research efforts explored both direct, thermochemical conversion of whole biomass and hydrolytic fractionation for production of a hydrocarbon mixture intended to match the specifications of jet propellant 8 (JP-8). Ultimately, hydrolysis-based strategies were found to be more efficient in targeted jet fuel production since they allow high carbon yields and selective processing of C5 and C6 sugars to produce linear and branched alkanes. Though studies reported here were performed with red maple or mixed hardwoods, the overall process is adaptable to many lignocellulosic feedstock, particularly those rich in xylans (e.g., miscanthus). This study involves rigorous review of the process which is being was proposed to produce aviation fuel from biomass.</p>



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**Preparation and Evaluation of Itraconazole Emulgel for Topical Drug Delivery by using Natural Excipients**

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**Abstract**

In the last few decades there has been an exponential growth in the field of herbal medicine and excipients. The aim of the present research work was to investigate the potential of emulgel in enhancing the topical delivery of Itraconazole by using natural gelling agents. Emulgel formulations of Itraconazole were formulated using two types of gelling agents namely: Xanthan gum and gaur gum. The influence of the type of the gelling agent and the concentration of both the oil phase and emulsifying agent on the drug release from the formulated emulgel was studied by preparing various batches. The prepared formulations were evaluated for their physical appearance, viscosity, drug release, globule size, skin irritation test, antifungal activity and stability. Itraconazole cream available in market was used for comparison with prepared formulations. All the prepared emulgel showed acceptable physical properties concerning color, homogeneity, consistency, spreadability, and pH value. The result of studied revealed that the optimized batch shows 92.08% release in 5 hrs.

**Keywords:-Topical drug delivery, Emulgel, Itraconazole, Xanthan gum, Gaur gum.**

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