PROCEEDINGS

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"Towards Global Knowledge through Multidisciplinary Research"

Organized by
Faculty of Graduate Studies
University of Sri Jayewardenepura
Nugegoda, Sri Lanka

6th February 2024

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"Towards Global Knowledge through Multidisciplinary Research"

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MESSAGE FROM THE VICE-CHANCELLOR

It is my immense pleasure to provide a message for the 10th International Conference on Multidisciplinary Approaches (iCMA) - 2023, one of the flagship research events of the Faculty of Graduate Studies of the University of Sri Jayewardenepura.

I firmly believe that the theme selected for this year's conference, "Towards Global Knowledge through Multidisciplinary Research", is timely and highly significant. The prevailing conditions due to the economic crisis in the country have affected the whole nation critically. By conducting the conference physically, I hope this will be an excellent opportunity to blend the research findings into commercially valuable properties.

The University of Sri Jayewardenepura, guided by its motto, 'Vijja Uthpata than Setta' (Among all that arise, knowledge is the greatest) as quoted from the Dhammapada, has long set its path to facilitate those who seek knowledge. The University's contribution to this country's education can be traced back to its 147-year-old history when it was established as Vidyodaya Pirivena by Venerable Rev. Hikkaduwe Sri Sumangala Thero.

The diverse perspectives represented at this conference are a witness to our efforts in fostering an inclusive academic community that embraces the convergence of ideas from different areas. As a University, we play a key role in ensuring quality leaders with adequate knowledge of multidisciplinary approaches which can drive innovation in the country. In this context, the iCMA 2023 will be a challenging but exciting experience.

The Faculty of Graduate Studies has made a great effort to organize this conference for the 10th consecutive time, and is an important responsibility in uplifting this nation's research culture and output. Thus, my sincere appreciation goes to the organizing committee of the iCMA 2023 for their tireless effort in ensuring the success of this event. I wish that the iCMA 2023 be a significant event which will benefit all participants and the country.

Senior Professor M. M. Pathmalal
Vice-Chancellor
University of Sri Jayewardenepura

MESSAGE FROM THE CONFERENCE CHAIR

As the Dean of the Faculty of Graduate Studies, University of Sri Jayewardenepura and the Chair of the Organizing Committee for the 10th International Conference on Multidisciplinary Approaches (iCMA) - 2023, it brings me great joy pen this message. Since its inception in 1996, the Faculty of Graduate Studies (FGS) has made remarkable strides towards its mission of cultivating highly skilled professionals through innovative courses, excellence in teaching, and impactful research collaborations, all geared towards the betterment of our community.

FGS serves as the primary hub for postgraduate academic and research endeavors at our university. Our programs are strategically aligned with our institution's vision, blending modern technological advancements with our rich cultural and traditional heritage.

The inception of the iCMA conference by FGS is deeply rooted in its connection with nine Board of Studies, encompassing various academic and research domains within the university. By organizing the International Conference on Multidisciplinary Approaches (iCMA), we aim to provide a platform for scholars and industry experts engaged in diverse research and development endeavors to exchange knowledge and experiences, fostering both national and global progress.

The theme for this year's conference, iCMA - 2023, is "Towards global knowledge through Multidisciplinary research". The theme signifies a collaborative approach to tackling complex global challenges by integrating diverse fields, such as Science, Humanities, and Technology, this method fosters comprehensive insights and innovative solutions. Multidisciplinary research transcends traditional boundaries, encouraging cross-pollination of ideas and methodologies. It is hoped that through this holistic approach, researchers would aim to advance human understanding and contribute to sustainable development worldwide.

I extend my sincere gratitude to our esteemed Chief Guest, Senior Professor Pathmalal M. Manage, Vice-chancellor of the University, for his unwavering support in making this conference possible. I also express my appreciation to our keynote speaker, Prof. Indralal de Silva, Emeritus Professor in Demography, University of Colombo for agreeing to share his experience in this conference as the Keynote Speaker.

I warmly invite you to join us physically at the conference, where you can contribute your experiences, insights, and perspectives, enriching both your own knowledge and that of our collective community. I am confident that this conference will play a pivotal role in addressing the challenges posed by the country at the moment and contribute to making our world a better place.

Professor Rasika Perera
Conference Chair & Dean
Faculty of Graduate Studies
University of Sri Jayewardenepura

MESSAGE FROM THE KEYNOTE SPEAKER

Multidisciplinary Approach in Research: Sexual & Reproductive Health of Unmarried Youth in Sri Lanka

Welcome to the International Conference on 'Towards Global Knowledge through Multidisciplinary Research' organised by the Faculty of Graduate Studies, University of Sri Jayawardena, Sri Lanka. Most of the serious problems encountered by Sri Lanka at present require a multidisciplinary approach to find reasonable solutions. For example, sexual and reproductive health problems faced by youth in Sri Lanka undoubtedly require this approach to find reasonable and realistic solutions.

My involvement in multidisciplinary research begins with the 1994 launch of the "Sexual and Reproductive Health (SRH) Initiative in South Asia", a Special Programme in Human Reproduction (HRP) by the World Health Organization (WHO). The SRH Initiative supported research studies on a competitive basis, and it was fortunate for me to receive funding for my main study on 'Puerperal morbidity', which was largely community-based. During 1996-98, as a Takemi Fellow/Senior Fulbright Fellow at the Department of Global Health and Population, Harvard School of Public Health in Boston, I got involved in various research projects, including SRH of youth, maternal health, abortion, marriage, fertility etc. With the support of WHO and many donor agencies, I managed to publish several research articles on a wide range of topics.

After returning to Sri Lanka as a senior academic at the Faculty of Arts, University of Colombo, I have been requested to teach in many faculties including Science, Education, Management, Technology, Law, Medicine, PGIM etc. which helps to enhance my multidisciplinary research experience further. During my academic career, I was motivated to continue to work on SRH issues of youth with the support of various international agencies such as Plan International, UNFPA, World Bank, Child Fund etc. Today's presentation is based on SRH knowledge, attitudes and vulnerabilities of unmarried youth in Sri Lanka, which was supported by Child Fund Sri Lanka. The Research monograph produced with my co-researchers, who are experts in different disciplines, was a classic example of a multidisciplinary research approach. SRH encompasses a wide range of issues, including contraception, sexually transmitted infections (STIs), pregnancy, abortion, gender identity, sexual violence, mental health etc. A multidisciplinary approach allows researchers to address the complexity of these issues by drawing expertise from various fields. The SRH monograph was published in December 2020.

Further, SRH involves biological, psychological, and social dimensions. Understanding and addressing the interplay of these factors require input from diverse disciplines such as medicine, psychology, sociology, anthropology, public health, and more. In addition, youth have unique needs and experiences related to SRH. A multidisciplinary approach helps researchers to consider various aspects of a young person's life, including biological development, psychological well-being, social relationships, and cultural influences. This holistic understanding is essential to develop effective interventions and policies. Cultural norms and values play a significant role in shaping attitudes and behaviours related to SRH. Researchers from different disciplines can bring cultural sensitivity and awareness to the study, ensuring that interventions are tailored to the specific cultural context of the youth population being studied. Multidisciplinary research provides a foundation for evidence-based policy and program development. Policymakers need comprehensive data and insights from various disciplines to create effective and inclusive strategies that address the diverse needs of youth in the realm of sexual and reproductive health.

Subsequent sections of this document present a few key findings of the study related to the sexual and reproductive health knowledge and sexual behaviour of unmarried youth aged 15-24 in Sri Lanka and highlight its multidisciplinary nature. The investigation aims to identify their vulnerabilities and suggest policy directions in the complex and challenging context of their development.

Along with significant demographic changes in Sri Lanka, the youth are experiencing rapid transformations in their socio-economic and cultural surroundings, particularly amidst an ongoing economic crisis. These changes, often adverse, place them in vulnerable situations that can affect their overall well-being.

Methods in our study reflect the multidisciplinary approach. We used qualitative data collection tools like key informant interviews (KIIs), case studies (CSs), and focus group discussions (FGDs) to include the sociomedical approach in SRH research whereas, the primary survey mainly contained quantitative data to adapt the biomedical approach to SRH in youth. The survey was conducted between March 2019 and January 2020 in three conveniently selected districts (Puttalam, Hambantota, and Nuwara-Eliya), representing urban, rural, and estate sectors in Sri Lanka. The survey adopted a self-administered individual questionnaire for unmarried youth aged 15-24, with a sample size of 1,100 from the three districts, utilizing a mixed sampling method of probability and non-probability techniques. By having a multidisciplinary approach through the collaboration of medical, social and demographic expertise, methodological robustness was ensured in this large survey.

Although our study gathered detailed information on SRH of unmarried youth, the following sections highlight the key findings related to SRH knowledge and sexual behaviour only. The self-administered questionnaire provided to the participants included a diagram featuring four male reproductive organs and four female reproductive organs. Participants were asked to identify and name all eight reproductive organs - only 30% of the youth aged 15-24 were able to correctly identify all eight male and female reproductive organs. Males reported better knowledge not only about their reproductive organs but also about female reproductive organs.

Along with the advancement of age increasing proportion of unmarried males tend to engage in masturbation – the proportion increased from 60% to 74% from aged 15-19 to 20-24 groups. However, among the unmarried females in the above age groups, the corresponding figure was 25% and 20% respectively.

One of the vital questions that were raised in the study was “What is the level of sexual intercourse of these unmarried youth in this study sample?” Among the unmarried male youth aged 15-19, over 22% had experience in sexual intercourse, while 9% of female youth had the same. With the advancement of age, the proportion of unmarried male and female youth who had experienced sexual intercourse increased to 30% and 13% respectively. Compared to the previous research studies on premarital sexual exposure, among unmarried youth the present study indicates a significant increase. Thus, to safeguard the Sri Lankan youth population from vulnerable SRH outcomes, already available SRH policies that are particularly targeted to the youth need to be implemented without further delay.

Inference

A multidisciplinary approach allows for the development of comprehensive SRH education programs. By drawing on expertise from fields such as education, psychology, and public health, researchers can design interventions that not only provide information but also address the underlying factors influencing behaviour. Further, the collaboration between researchers, healthcare

professionals, educators, and community leaders could enhance the SRH knowledge and practices among youth in Sri Lanka. In summary, the issues related to sexual and reproductive health can have long-term consequences for individuals and society. A multidisciplinary approach helps identify not only immediate concerns but also understand the potential long-term impacts on the health and well-being of Sri Lankan youth.

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OP-01

A META-HEURISTIC APPROACH FOR OPTIMIZING OUTBOUND VEHICLE ROUTING AND ASSIGNMENT WITH MULTI-STACK DOORS AT PRE-DISTRIBUTION CENTRES

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Abstract

This study intends to amalgamate the *Vehicle Routing Problem* (VRP) and *Vehicle Assignment Problem* (VAP). Therefore, the objective of this study is to propose a *Genetic Algorithm* (GA) to reach a near-optimal solution to the integrated *Vehicle Routing and Assigning Problem* (VR&AP) with a multi-stack door pre-distribution centre. In the '*routing process*' of VR&AP, VRP is considered to minimize the transportation cost whereas in the '*assigning process*' of VR&AP, VAP is considered to minimize the waiting cost of the outbound vehicles. A *Mixed Integer Quadratic Programming* model is developed to solve VR&AP. The exact solutions of the small-scale instances of VR&AP are obtained by applying the *Branch and Bound* algorithm. Since VR&AP is an NP-hard problem, a meta-heuristic method is essential to solve the large-scale instances. In the proposed GA to solve the large-scale instances of VR&AP, parameters are tuned by *Taguchi method* and the initial population is generated *randomly*. In the *solution representation*, customers as the genes of the chromosomes of GA are arranged in a permutation order. *Tournament* selection, *order* crossover and *swap* mutation are considered as GA operators in addition to the *elitism* method. Two exit points: *number of population generation* and *termination count*; are set in GA to obtain the best routes. Based on these routes in ascending order of their quantities, the outbound vehicles are assigned to the doors. The numerical results reveal the feasibility of the developed model for VR&AP. It can be concluded that the accuracy of the proposed GA is nearly 1.5% deviation from the optimal solution. Furthermore, the results of large-scale instances conclude that near-optimal solutions of VR&AP can be reached in less than 4 seconds.

Keywords: meta-heuristic, multi-stack door, vehicle assignment, vehicle routing

OP-02

A LOW-COST AND SUSTAINABLE ALTERNATIVE FOR COUNTER ELECTRODE MATERIAL IN DYE-SENSITIZED SOLAR CELLS: ACTIVATED PALMYRA SHELL CHARCOAL

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Abstract

Dye-sensitized Solar Cells (DSCs) have gained interest as an efficient and cost-effective solar energy conversion device. As a result, the cost of DSCs is mostly determined by the counter electrode (CE) material. Because of the high cost and limited availability of platinum (Pt), which is commonly used as a CE material, researchers have been looking for sustainable and low-cost alternatives. Palmyra palm shells are a biological resource obtained from the Palmyra palm tree's fruit. We report activated charcoal synthesized from Palmyra palm shells that can be utilized to make DSC CEs. First, cleaned Palmyra shells were carbonized by heating at 300 °C for 30 minutes, then activated for 2 hours at 900 °C while passing steam and quenched. Finally, dried activated Palmyra shells were disc-milled to get a fine powder. Activated Palmyra shell charcoal (APSC) based CEs are prepared by spray pyrolysis with polyvinylpyrrolidone binder and isopropanol solvent. Through a series of experiments, APSC was found to be suitable for the manufacture of low-cost and efficient Pt-free DSCs. The DSC utilizing APSC CE produced an energy conversion efficiency of 5.01% using the standard N719 dye and liquid electrolyte (I^-/I_3^-), whereas the Pt-based CE achieved an efficiency of 7.04%. APSC CE had an electrical conductivity of 7.32×10^3 S m^{-1}. Due to the low electrocatalytic activity, the APSC CE-based DSC performs lower than the Pt-based DSC, although the measured efficiency of 5.01% is noteworthy for a Pt-free low-cost DSC.

Keywords: Dye-sensitized solar cells, Platinum, Activated Palmyra palm shells, Counter electrodes

OP-03

ETHICAL CONSIDERATIONS IN AI-DRIVEN UX DESIGN: BALANCING PERSONALIZATION WITH USER PRIVACY AND AUTONOMY

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Abstract

This research investigates the ethical quandaries surrounding AI-driven UX design, particularly in context-specific UX apps for social networking. The research categorizes and examines recurring ethical quandaries, emphasizing the challenging balance between personalization, user privacy, and autonomy. Data-driven personalization propels AI-powered UX, but without safeguards, it might breach user rights and privacy. The findings, which are based on a mix of literature reviews, targeted surveys, and in-depth case studies, emphasize the relevance of open data collection techniques, data minimization, and user control over data usage while retaining ownership. The study recommends a nuanced strategy that blends personalized experiences, user-centric controls, and transparent algorithms. The paper proposes strategies for decreasing filter bubbles and empowering users, such as intentional bias reduction, periodic audits, diversified data use, and user feedback platforms. Evaluating the actual implementation of ethical frameworks and standards through real-world case studies demonstrates their usefulness in addressing these difficulties. Notably, the study identifies critical research gaps and suggests potential future directions, contributing to the ongoing debate and paving the way for the development of robust ethical AI-driven UX design standards. This study contributes to the greater discussion around ethical AI-driven UX design by presenting specific findings and laying the groundwork for a responsible and user-centric digital environment. By prioritizing user satisfaction, individual rights, and societal values, these principles have the potential to create a digital future in which technology and ethics can coexist in harmony.

Keywords: Ethical AI, User Experience Design, Personalization, User Privacy, Social Media

OP-04

DEVELOPMENT OF NANOPARTICLE THIN FILMS ON GLASS SUBSTRATES FOR SURFACE-ENHANCED RAMAN SPECTROSCOPIC DETECTION OF MELAMINE IN MILK PRODUCTS

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Abstract

Milk is a vital source of essential nutrients for infants and adults, but adulteration, particularly by melamine, is a global issue. Melamine, a nitrogen-rich molecule often added to increase protein content in milk products. Existing methods involved in quantifying and detection of melamine have shown to be either less sensitive or highly sensitive yet costly and sophisticated. This research focused on the synthesis of a nanoparticle based thin film Surface Enhanced Raman Spectroscopic (SERS) substrate which could be utilized to detect melamine in commercial milk products. Hence, a highly sensitive SERS substrate was developed using the technique of self-assembly of silver nanoparticles on a solid surface. In achieving uniformity and firm binding of the silver nanoparticles, a glass slide functionalized with aminopropyltriethoxysilane (APTES), a commonly used silanizing agent was used. The unique aspect lies in the application of an APTES-modified substrate for the detection of melamine, introducing novelty to the methodology. Results showed that the developed SERS substrate to be highly sensitive towards the detection of melamine with a limit of detection of 1.7×10^{-7} kg m^{-3}. A good linear relationship between the intensity of the SERS peak at 705 cm^{-1} versus log melamine concentration was obtained for smaller concentrations with a correlation coefficient (R^2) of 0.95. Thus, the developed SERS probe was successfully utilized to detect commercial milk samples spiked with melamine, down to concentrations of 1×10^{-3} kg m^{-3}. The silver nanoparticle coated glass substrates were characterized using Fourier Transform Infrared Spectroscopy to confirm functionalization with the silane layer and the synthesized silver nanoparticles were characterized for the shape and size using scanning electron microscopy, which revealed an average particle size of 77 nm. Further optimization is needed to improve the suitability of the SERS probe developed in this work towards quantitative studies.

Keywords: SERS, silanized, self-assembly, melamine, nanoparticle

OP-05

DETERMINATION OF WATER VAPOR TRANSMISSION RATE OF DIFFERENT CEMENTITIOUS WATERPROOFING MATERIALS

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Abstract

The study is conducted to assess the water vapor transmission rate (WVTR) of diverse construction materials, such as waterproofing slurries, utilizing the cup method. The objective was to establish a standardized test procedure for determining WVTR across various construction materials and gain insights into water vapor transmission in building materials. The research adhered to the ASTM E96 standard, employing the cup method to measure independent water vapor transmission. Results indicated that WVTR is affected by temperature and relative humidity, with higher values signifying greater permeability to water vapor. Nevertheless, exceptions and challenges were identified, highlighting that materials with high WVTR may not always be optimal for specific applications. Additionally, WVTR values may change over time due to aging or environmental exposure. The cup method proved effective for consistent WVTR determination, involving weight measurements over a 24-hour period. To ensure accuracy, a load cell balance suitable for high humidity levels was employed. The study recommends incorporating WVTR testing into standard procedures for construction material testing. In the case of cementitious waterproofing slurries, focus materials were labelled as Sample Material A, Sample Material B, Sample Material C, and Sample Material D. For waterproofers, the suggested WVTR range is 0.1 to 10 g m-2 day-1, with Sample Material B and Sample Material D falling within this range. The study proposes further laboratory comparisons to validate the methodology.

Keywords: WVTR, cup method, waterproofing cement, ASTM E 96, Building Materials

OP-06

ENHANCING USER ENGAGEMENT IN SRI LANKAN MOBILE BANKING APPLICATIONS THROUGH CUSTOMIZED ICON SETS: AN EXPERIMENTAL CASE STUDY

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Abstract

Mobile applications have become integral tools for enhancing user engagement and improving customer experiences in various industries, including banking. This shift from traditional, physical banking methods to digital platforms emphasizes the significance of design elements, particularly icons, in influencing user behaviour and satisfaction within mobile banking applications. This experimental case study discusses how a set of potential customized icons can enhance the user experience within the context of Sri Lankan mobile banking applications. In order to propose a set of customized icons, the research uses an experimental design approach and user testing, both during and after the icon design process. New icons were precisely sketched after an initial phase of observation of Sri Lankan mobile banking applications. The applicability of the selected symbols for existing icons was thoroughly discussed. Upon the finalization of the sketches, the digitizing process was incorporated, whereby the refined icons were incorporated into the user interface. The final digitalized icons were used to design a variety of user interfaces in parallel. Then, a comprehensive testing was conducted to assess both usability and user satisfaction. The insights and knowledge documented in this paper extend a vital source for subsequent researchers and user interface designers, facilitating the design and refinement of icon sets customized for mobile banking applications. The findings aid in the advancement of user-centric design in Sri Lankan mobile applications through the adept integration of icons within mobile application interfaces, as well as the impact of using standardized icon sets for the entire mobile banking apps.

Keywords: User experience, Mobile banking applications, Icon design, Customize icon design

ENVIRONMENTAL POLLUTION & NATURAL RESOURCES MANAGEMENT - ORAL

OP-07

SAMPLING AND ANALYSIS OF MICROPLASTICS IN THE COASTAL AREAS OF THE WESTERN PART OF SRI LANKA

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Abstract

Microplastics (MPs) are plastic particles with a diameter of less than 5 mm. Recently, it has been determined that MPs pose a risk to the environment, with MP pollution in the marine ecosystem occurring daily. The main objective of this study was to detect the presence of MPs using appropriate techniques to collect and separate MPs from beach sediment and seawater. Herein, the data on the distribution, types, and abundance of MPs were gathered from the western coastline /South Colombo area, from Bentota Beach to Waskaduwa Beach in Sri Lanka. Samples were taken from the surface seawater and the surface beach sediment. In total, 100 samples were taken at 5 different sites. At the intertidal zone of the beach, random sampling methods were used to gather 10 samples over a 100 m stretch. Density separation was carried out using solutions of 1.2 g/cm^3 NaCl and 1.4 g/cm^3 NaBr, and samples were digested using 30% (v/v) H_2O_2. ATR-FTIR and µFTIR techniques were used to identify the types of MPs in the samples. ATR-FTIR analysis showed that the extracted plastic particles were synthetic polymers, including commonly used plastics such as PP, HDPE, LDPE, PVC, and SEBS. The highest amount (71.4%) of plastic particles identified were PE particles and the remaining were SEBS, PP, and PVC. The µFTIR analysis revealed the presence of MPs in the form of PES and PA. The MP particles isolated were different colours: black, red, grey, green, purple, and transparent. The highest level of MP contamination was found in the Bentota Beach area, and the minimum level of contamination was found in the Payagala Beach area. The findings emphasize the necessity of appropriate legislation to minimize the presence of MPs found in the marine environment and prevent the environmental impact.

Keywords: Microplastics, Western Coastal line, Sea water, Beach Sediment, FT_IR

Acknowledgment: The financial assistance of the University of Kelaniya under the grant RP/03/02/06/02/2021 and the Centre for Environment, Fisheries and Aquaculture Science (Cefas) under the Ocean Country Partnership Programme (OCPP) of the Blue Planet Fund, UK are acknowledged.

OP-08

EXTRACTION AND ISOLATION OF CASHEW NUT SHELL LIQUID (CNSL) AND STUDY INSECTICIDAL ACTIVITY FOR DEVELOPMENT OF AN INSECT REPELLENT

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Abstract

Cashew nut *(Anacardium Occidentale*) is an evergreen tropical tree native to South America. The cashew nut is encased in a 2.00 mm – 3.00 mm thick shell with a delicate honeycomb structure inside. In this honeycomb structure, a dark brown viscous liquid is contained, which is called cashew nut shell liquid (CNSL). CNSL contains cardanol, cardol, and anacardic acids like alkenyl phenolic compounds, and its derivatives are used in the polymer industry, such as epoxy resins, rubber compounding resins, laminates, and varnishes. Extraction of CNSL from cashew shells was successfully carried out by using the open pan method and CNSL was efficiently recovered at 160°C –190°C temperatures with CNSL recovery percentage at 18% - 22%. Anacardic acid was isolated from the extracted CNSL using barium hydroxide. Then CNSL was treated with liquor ammonia to separate the cardanol and cardol using hexane and ethyl acetate. All the isolated chemical compounds were characterized by using TLC. In this study, different concentration ratios (0%, 20%, 60%, 80%, 100%) of extracted CNSL and isolated cardanol, cardol, and anacardic acid were used against adult *Sitophilus granarius* for the investigation of the insect repellency. Insecticidal activity of *Sitophilus granarius* was gradually decreased with the increase of concentration ratios of extracted CNSL and other isolated chemical compounds. Results showed that CNSL has the insecticidal potential for the management of stored pests like *Sitophilus granarius*, and anacardic acid and cardanol contribute higher significant ($P<0.005$) strength for the insect repellent ability in CNSL compared to cardol.

Keywords: Cashew nut shell liquid (CNSL), Cardanol, Cardol, Anacardic acid, Insect repellency

OP-09

SURVIVABILITY OF CELLULOLYTIC BACTERIA ON MUNICIPAL SOLID WASTE VERMICOMPOST CARRIERS UNDER ULTRAVIOLET-C RADIATION

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Abstract

This study investigates the impact of Municipal Solid Waste Vermicompost (MSWV) as a carrier material on the survivability of cellulolytic bacteria exposed to Ultraviolet-C(UV-C) radiation. Due to the chemical complexity and diverse nutrients, MSWV holds the potential to be used as a carrier medium for beneficial bacteria: A consortium of two cellulolytic bacterial strains, *Nocardiopsis* sp. AKC1 and *Bacillus* sp. AKC2 was incubated into MSWV in Luria Bertani (LB) broth and subjected to UV-C bombardment under controlled conditions. A control experiment was performed without MSWV. The bombarded strains were incubated, and the changes in the cellulolytic ability were assessed by a Congo Red (CR) decolourisation assay, and the cellulolytic indices were determined. A thorough examination of the cellulolytic index data showed a clear pattern: a sudden decline in cellulolytic index percentage following 60 seconds of UV exposure from 40.2% to 3.71% (control: 34.35% to 2.11%), followed by a progressive decline from 2.11%, 1.63% and 1.17% respectively (control:0.82%.0.47 and 0.14%) within 60 second time intervals. This pattern points to possible mild defensive mechanisms provided by MSWV due to the shielding effect and intricate microbial reactions to UV light. Moreover, the cellulolytic index percentages reveal that the protection offered to UV by Municipal Solid Waste Vermicompost is insignificant compared to the control. The average of the preserved cellulolytic index percentage due to MSWV UV shielding is 2.18% compared to the control. Therefore, the research should be extrapolated to identify the optimal percentage of MSWV required to be in the inoculation media, and the precise compounds of MSWV with optimal UV -UV-shielding effect for making it industrially applicable. This research offers a significant understanding of the complex interaction between UV-irradiated MSWV and cellulolytic bacteria. The intricate nature of microbial reactions is shown by the dynamic patterns and relationships in cellulolytic indices that have been identified.

Keywords: Municipal Solid Waste Vermicompost, Cellulolytic bacteria, Ultraviolet-C radiation, Congo Red Decolourisation, Cellulolytic index

OP-10

SYNTHESIS OF POLYSTYRENE NANOPLASTICS AND EVALUATION OF THEIR EFFECTS ON SOIL FERTILITY AND PLANT GROWTH

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Abstract

Due to the abundant use of plastics in the modern world, the accumulation of plastics has become a major environmental issue. Plastics can easily enter the environment in large quantities with their heavy industrial usage. In the environment, macro-sized plastics can decompose into small fragments, including microplastics (MPs) and nanoplastics (NPs). This study has been designed to determine the effects of NPs on soil fertility and plant growth. Polystyrene (PS) was synthesized using the free radical polymerization technique and characterized by the FT-IR analysis. PS-NPs were fabricated using microemulsion polymerization (MIP) in combination with the modified non-solvent-induced phase separation (NIPS) method. SEM images and particle size analysis data have confirmed the formation of PS NPs. This novel synthesis method has produced a higher yield of nanoparticles. Pot experiments were conducted to evaluate the effect of NPs on soil fertility and plant growth under controlled environmental conditions. Lettuce (*Lactuca Sativa*) was planted as a test crop, and the following soil parameters were evaluated: soil pH, electrical conductivity (EC), total organic carbon (TOC), active carbon (POXC), soil phosphorus, and soil potentially mineralizable nitrogen (PMN). Plant growth parameters: plant height and number of leaves were taken throughout the six-week growing period, and after the growing season, fresh and dry weights of leaves and roots were obtained. Results indicated that, PS NPs have a significant impact on soil availability and soil-available phosphorus, POXC, PMN, and carbon management index (CMI). However, NPs did not impact soil pH, EC, lability index (LI), carbon pool index (CPI), or TOC. There was no significant impact of NPs on tested plant growth parameters. Further studies are required to determine the impact of NPs on the fate of soil major nutrients and soil health over multiple cropping seasons.

Keywords: Nanoplastic, plant growth, plastic, polystyrene nanoparticles, soil fertility

OP-11

IDENTIFICATION OF *E.coli* O157 STRAIN AND ANALYSIS OF PHYSICO-CHEMICAL PARAMETERS OF WATER QUALITY IN NEGOMBO LAGOON, SRI LANKA

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Abstract

Negombo Lagoon is located in the Gampaha district along the western coast of Sri Lanka. Plenty of anthropogenic activities surround the lagoon, resulting in a severe risk of entering pathogenic *Escherichia coli* (*E.coli*) to the human gastrointestinal tract. Within the cohort of pathogenic serotypes, the *E.coli* O157 strain is significant due to its capability to synthesize intimin and Shiga toxins which are causing for severe diseases including hemorrhagic colitis (HC), hemolytic uremic syndrome (HUS) in human. Contaminants from various sources contribute to water pollution in the lagoon as well. Thus this study aims to identify the presence of *E. coli* O157 strain and physico-chemical parameters in ten specific locations within the Negombo lagoon to ensure safe water quality for fishing and recreational activities. The virulent gene *eae* and *stx2* were selected for the *E coli* O157 strain screening. The amplification of *E.coli* O157 was done using an optimized PCR protocol for each gene. The chosen locations' water quality was measured following the APHA standard methods. According to the PCR results, the *eae* gene was detected in the *E.coli* isolates taken from lagoon waters near the Negombo fish market. In contrast, *stx2* was detected near the Hamilton canal and middle of the lagoon, respectively, indicating the presence of *E. coli* O157 strain. The pH, temperature, Dissolved Oxygen, and Electrical Conductivity values ranged between 7.14-8.53, 26.10-28.70°C, 5.19-6.93mg/L and 43.74-48.39 mS/cm, respectively. Further, N-nitrate, N-nitrite, N-ammonia, and total phosphate values were in the range of 3.78- 0.61 mg/L, 0.06-0.01mg/L, 0.53- 0.03mg/L and 3.81- 0.14mg/L and some values weren't within the SLSI standards which suitable for the aquatic life and ideal for bathing and recreational activities. *E. coli* O157 indicates the poor microbial water quality of the studied locations, and results showed that regular monitoring and legislation practices are essential.

Keywords: *E.coli* O157 strain, virulent genes, *eae*, *stx2*, water quality

OP-12

EXPLORING ECOLOGICAL AND SOCIETAL FUNCTIONS OF RICE-FISH FARMING IN THE AGRICULTURAL LANDSCAPE OF SRI LANKA

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Abstract

Rice-fish integration is a symbiotic farming system where fish are reared in rice fields. The information on the potential effects and benefits of the system in the Sri Lankan context is largely unknown and has yet to be discovered. Therefore, this study was accomplished with target scrutiny of societal benefits and ecological function of fish farming in the rice fields of Sri Lanka. The study followed a qualitative case study approach, including literature review and document analysis. Study findings demonstrated that ecologically, the presence of fish in the system contributes to increased nutrient levels for rice plants, simultaneously serving as a natural mechanism for weed and pest control while promoting soil ecology in rice fields. The rice plants, in turn, play a pivotal role in water purification, establishing optimal water temperature conditions, and fostering heightened aquatic diversity. Regarding Sri Lanka, Tilapia and Common Carp are recognized as culturable fish species and traditional and improved rice varieties can coexist with fish under well-managed integrated conditions. Further, rice-fish farming would emerge as a powerful tool to generate long term and short-term societal wellbeing in Sri Lanka. Long-term benefits are poverty alleviation by increasing household income, promoting social upliftment, and ensuring food security through producing nutritious and healthy foods by reducing the use of pesticides. Increased rice yield, diversified farmer income, and reduced dependency on fertilizers are the short-term benefits of fish farming in rice fields. In conclusion, the integrated rice-fish farming approach demonstrates significant potential to enhance both ecological and societal well-being when compared to traditional rice monoculture practices.

Keywords: Rice-fish integration, Ecological benefits, societal impact

HEALTH SCIENCES & NUTRITION - ORAL

OP-13

CYTOTOXICITY OF INDIGENOUS MEDICINAL PLANTS - KOTHALA HIMBUTU, KOTTAMALLI AND POLPALA - ON THE VERO KIDNEY CELL LINE: AN *In-Vitro* STUDY USING SRB ASSAY

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Abstract

Plants have medical relevance because of chemically active compounds that create defined physiological effects on the human body. Secondary metabolites identified in medicinal plants are used in the creation of indigenous medicines. A plethora of plants have been identified as medicinal agents over the ages, with antioxidant, anti-inflammatory, anti-parasitic, antibiotic, and anti-haemolytic properties. However, the safety, toxicity and the negative effects of these medicinal plants on patients have not been fully examined yet. The present study was focused on investigating the nephrotoxic effects of indigenous medicinal plants - Kothala Himbutu, Kottamalli and Polpala - on the Vero kidney cell line. Four dilution series in each (5.0, 10.0, 15.0, and 20.0 g of Kottamalli; 1.0, 2.0, 3.0, and 4.0 g of Kothala Himbutu; 3.0, 6.0, 9.0, and 12.0 g of Polpala in 125 ml of Mill-Q water) were exposed to Vero; monkey kidney epithelial cells ($5x10^3$ cells/well). Cell viability was measured using SRB assay, and the cell viability percentage and the CC_{50} values were calculated. The cell viability percentages in the cells exposed to Kottamalli, Kothala Himbutu and Polpala ranged from 69.66 to 93.33%, 76.64 to 90.98 % and 77.17 to 50.90% respectively. Significantly lower cell viability percentages were recorded in the cells exposed to positive control than in the cells exposed to the plant extracts ($p< 0.05$). Hence, the results of the present study indicated that the water extracts of the Kottamalli, Kothala Himbutu and Polpala plants do not reduce the cell viability and do not cause nephrotoxicity directly. However, further studies are needed to confirm the nephrotoxic effects of medicinal plants.

Keywords: Nephrotoxic effects, indigenous medicinal plants, Vero kidney cells, cell viability, plant extracts

OP-14

ASSESSING QUALITY OF LIFE AND ITS ASSOCIATED FACTORS AMONG PATIENTS WITH LEPROSY AT THE LEPROSY HOSPITAL, SRI LANKA

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Abstract

Leprosy persists globally with 200,000 annual cases in more than 120 countries. This study aimed to assess the Quality of Life (QOL) and associated factors among patients with leprosy at the Leprosy Hospital, in Sri Lanka. Participants were selected through simple random sampling. Data was collected using a pre-tested interviewer-administered questionnaire consisting of demographic details, quality of life (SF-36), depression levels (PHQ-9), anxiety levels (GAD-7), social stigma (EMIC), pain (Visual Analogue Scale), and activity levels (International Physical Activity Questionnaire). The study involved 150 participants, predominantly male (64.7%), with a mean age of 43.69 ± 19.17 years. Among the participants, 46% had a one-year disease duration and 56% maintained a normal weight. The results indicated that the high mean values for seven domains on the SF-36 questionnaire (excluding that of general health) reflected a commendable QOL across each domain. The mean depression score (PHQ-9) was 6.99 ± 6.99, with 51.3% reporting minimal depression, while the mean anxiety score (GAD-7) was 4.2 ± 0.19, with 66.7% experiencing minimal anxiety. Most (94.7%) reported mild pain (mean value -1.98 ± 0.72) and more than half (66.7%) expressed a moderate level of social stigma (mean value - 57.48 ± 21.71). The QOL and social stigma were associated with religion, having children, education level, and age (p-values: 0.009, 0.002, 0.034, and 0, respectively). However, no significant association was found with depression (p=0.086), anxiety (p=0.543), leprosy duration (p=0.098), or Body Mass Index (p=0.279) with QOL. In conclusion, while leprosy patients in Sri Lanka exhibit favorable QOL scores, social stigma remains a pertinent concern, necessitating targeted interventions to mitigate its impact and enhance their overall well-being.

Keywords: Leprosy, quality of life, anxiety, depression, social stigma

OP-15

BIOACTIVITIES, PROBIOTIC POTENTIAL AND FTIR-ATR MICROSTRUCTURAL CHARACTERISTICS OF SPROUTED LEGUME-BASED PROBIOTIC BEVERAGE

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Abstract

Legumes being natural sources of prebiotics and other nutrients, they can be used to develop probiotic beverages. Accordingly, a probiotic beverage was developed utilizing locally available legumes; green gram (GG), horse gram (HG), cowpea (CP), and coconut milk. The beverage was formulated with 1 g of sprouted GG powder, 4 g of sprouted HG powder, 3 g of sprouted CP powder, 4 g of white sugar and 100 ml of coconut milk. These powders were mixed with coconut milk, its filtrate was inoculated with commercial Lactic Acid Bacteria culture mix as the probiotics, incubated at 43 °C for 4½ hours and stored under refrigerated conditions. The beverage contained 1.690±0.017 mg GAE/g of total polyphenols and the antioxidant potential was 12.78±0.74 mg/ml in terms of DPPH radical scavenging activity (IC_{50} value). The spectrum obtained from FTIR (Fourier transform infrared spectroscopy) in conjunction with ATR (Attenuated total reflectance) revealed the presence of functional groups associated with moisture (3300 cm^{-1}), fat (2900-2880 cm^{-1}), protein (1550-1570 cm^{-1}), lactic acid (1127 cm^{-1}) and polysaccharides (1500–750 cm^{-1}) in the beverage. The probiotic count throughout the shelf life analysed for 10 days under refrigerated conditions was between 7-8 log CFU/mL, which was within the acceptable range. It was confirmed as a probiotic beverage since it is widely accepted that at least 6-7 log CFU/mL or g of viable probiotic cells must be present in the final product to consider it a probiotic food or beverage. The beverage stored in refrigerator for 10 days of shelf life was stable against initial oxidation and rancidity as results showed zero value of peroxide in beverage samples.

Keywords: Probiotics, Sprouted legumes, Bioactive, FTIR, Lactic acid

OP-16

HEALTH RELATED QUALITY OF LIFE AMONG PATIENTS WITH ASTHMA ATTENDING A SELECTED CHEST CLINIC IN SRI LANKA

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Abstract

Asthma results in serious shortness of breath due to chronic inflammation and narrowing of airways. It poses a significant healthcare challenge globally, whereas Sri Lanka is one of the countries with a high asthma prevalence (11.6%). Patients' non-adherence to proper asthma control may increase the risk of severe exacerbations, thereby affecting their health-related quality of life (HRQoL). There is a paucity of studies on asthma control and HRQoL among patients in Sri Lanka. Therefore, this study was conducted to assess the HRQoL among patients with asthma attending a chest clinic at a teaching hospital in Kalutara, Sri Lanka. A descriptive cross-sectional study was conducted with 200 participants using an interviewer-administered questionnaire. A validated Asthma Control Test (ACT) was used to evaluate the degree of asthma control; and for the assessment of HRQoL, a validated Asthma Quality of Life Questionnaire (AQLQ) spanning four domains - activity limitation, symptoms, emotional function and environmental stimuli. SPSS version 26 and the scoring protocol of ACT and AQLQ were used in the data analysis. Among the study participants, 56.5% were females, and the majority (51%) had uncontrolled asthma. The mean of ACT and AQLQ was 15.31±2.8 and 13.63±1.7. The participants reported severe impairment (56%) and middle impairment (44%) in asthma related quality of life. A majority indicated lower HRQoL (severe impairment) by recording high scores for activity limitations (66%), emotional dysfunction (56%) and responses to environmental stimuli (55%) on the AQLQ. This study revealed a significant association between asthma control and AQL ($P<0.05$) as well as a positive correlation ($p<0.001$). In asthmatic patients, inadequate control of asthma is linked to a diminished HRQoL. It is imperative to implement effective measures aimed at minimizing the morbidity and mortality associated with asthma. Healthcare practitioners need to prioritize the effective control of asthma to improve the HRQoL among them.

Keywords: Asthma, health, asthma control, quality of life, patients

OP-17

CASSAVA FLOUR: A POTENTIAL SUBSTITUTE FOR WHEAT FLOUR IN SELECTED FOOD PRODUCTS

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Abstract

Cassava (*Manihot esculenta*) is an important food source which holds great potential as a replacement for wheat flour in several food products. This research was conducted to assess the possibility of using cassava flour as a wheat flour substitute in cookies, biscuits, roti and parotta. The findings suggest that cassava flour extracted from MU51 cassava cultivar can be a suitable alternative to wheat flour with some notable considerations. According to the study, sieve size of 300µm was optimal for obtaining high flour yield of 31.16% while removing coarse particles. Furthermore, cassava flour exhibited lower starch hydrolysis rates than wheat flour and had a safe cyanide content of 2.43±0.17 mg kg^{-1}. According to the expert evaluation of physical parameters, cookies and biscuits with 100% cassava flour, roti with a blend of 75% cassava flour and 25% wheat flour and parotta with a blend of 25% cassava flour and 75% wheat flour were selected. Instrumental analysis found that cookies and biscuits made with 100% wheat flour and 100% cassava flour exhibit similar texture attributes and the colour attributes remained consistent. Proximate analysis showed that incorporating cassava flour improved the nutritional composition in cookies, biscuits and roti, with higher crude fibre and total ash. With respect to mineral composition, cassava flour samples had similar Zinc and Iron levels to wheat flour samples together with greater levels of Magnesium and Calcium. Copper and Manganese as well as crude protein content was higher in the control wheat flour samples. Cassava flour samples had lower antioxidant activity than control samples, yet they demonstrated acceptable activity. In conclusion, this study illustrates that cassava flour can serve as a practical substitute for wheat flour in cookies, biscuits and roti, offering satisfactory nutritional benefits.

Keywords: Cassava flour, Wheat flour, Cookie, Biscuit, Roti

OP-18

ADVERSE EFFECTS OF HANDLING SYSTEMIC ANTI-CANCER THERAPY (SACT) AMONG PHARMACISTS: AN ANALYTICAL CROSS-SECTIONAL STUDY

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Abstract

The increased prevalence of cancer demands the use of Systemic Anti-Cancer Therapy (SACT). However, the increased utilization of SACT raises concerns about occupational health safety. Pharmacists are at high risk of adverse effects due to frequent handling of SACT. The current study aimed to assess the adverse effects of handling SACT in comparison to a non-exposed group. An analytical cross-sectional study was conducted among pharmacists at the National Cancer Institute (NCI) and National Hospital, Sri Lanka (NHSL). Out of the 35 pharmacists at NCI, 33 volunteered to participate in the study; and among them, those who handle SACT at the NCI (n=13) were included as an exposure group. (Non-exposure groups consisted of the other pharmacists at NCI (n=20) and NHSL (n=43)). Fifty-item 4-point and 5-point Likert scales were used to assess the adverse effects with their frequency, severity, and distress. Data were analyzed using non-parametric measures (Mann-Whitney U test, Chi-square test) using SPSS version 25. The exposure group (n=13, 39.4%) was involved in handling SACT daily with a handling mean of 285$\pm$99 and 635$\pm$ 239 patients and SACT sample count per day, respectively. The mean experience of handling SACT was 1.75 $\pm$ 4.06 years. The exposure group experienced ocular irritation, the highest frequency of hair loss, and dizziness with increased severity and distress, as compared to the non-exposure groups. Both exposure and non-exposure groups experienced headaches. Ocular irritation (p=0.015), gastritis (p=0.029), and menstrual cycle irregularity (p=0.029) were associated with the work setting of the NCI. The prevalence of headache (p=0.000), dizziness (p=0.002), and malaise (p=0.037) were associated with the type of hospital (NCI vs NHSL). Compared to controls, pharmacists experienced a lower number of adverse effects in handling SACT, which is likely to be due to good adherence to safety measures and low-level exposure. Periodical studies are recommended to assess occupational health safety.

Keywords: Systemic Anti-Cancer Therapy (SACT), Chemotherapy, Adverse effects, Pharmacists, Occupational exposure

Acknowledgment: Medical Research Institute, National Cancer Institute, Sri Lanka

HUMANITIES & SOCIAL SCIENCES - ORAL

OP-19

PASSIVE ASPECT OF SINHALA PP INVOLITIVES

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Abstract

Although the existing literature on Sinhala involitives has alluded to the passive aspect of Sinhala involitives, a systematic analysis of the passive aspect of Sinhala involitives has not yet been established. This paper fills this gap by providing a systematic analysis of the passive aspect of Sinhala involitives. It argues for a semantic equivalence between Sinhala PP involitives and English *get* passives. Accordingly, this paper posits that Sinhala PP involitive constructions encode the speaker attitude which suppresses agency/intentionality of the human agents. Although early research into Sinhala grammar has found involitive constructions to have passive or passive-like characteristics (Chater 1815), it is in later research stronger parallels between involitives and passives have been made. Gair (1970) identifies three types of clauses, passive, inactive and involitive, which constitute the group of impersonal clauses all of which are realised with the same involitive verb form. Further, he identifies ' get + V + ed ' as a standard gloss for verbs in passive clauses and provides an ability interpretation for the structure. Inman (1993) refers to Gair's ability interpretation of passive clauses and uses it to problematize the "treatment of the semantics of the involitive purely in terms of nonvolitionality or unintentionality" (p 74). He also introduces the combination of an intentional modal base and a doxastic model base in interpreting the happenstantial modality which, he argues, is found in Sinhala involitive structures. However, the doxastic modal aspect has not been pursued in depth in his work as it was of peripheral concern to his work. In this paper, we firstly provide evidence that the Sinhala PP involitives do not yield an ability interpretation and then, provide an analysis of Sinhala PP involitives in terms of English *get* passives.

Keywords: PP-involitives, get-passives, Sinhala, English, doxastic modal

OP-20

IMPACT OF DEMOGRAPHIC AND SOCIO-ECONOMIC FACTORS ON KEY DRIVERS OF MULTIDIMENSIONAL VULNERABILITY IN SRI LANKA

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Abstract

Sri Lankan economic crisis in 2022 was one of the most severe and unprecedent economic shocks during the recent history and it was followed by various long-established internal and external faults. United Nations Development Programme (UNDP) emphasizes that this crisis has widely opened the Sri Lankan citizens to several vulnerabilities which are not addressed in policy formulation. To address this policy gap UNDP developed a national Multidimensional Vulnerability Index (MVI) for the first time in Sri Lanka. MVI results have revealed three driving factors of Sri Lanka multidimensional vulnerability (MV) as debt status, adaptive capacity to disaster and male and female years of schooling. Meantime international literature reveals that there are significant positive or negative relationships between marital status, education level, age, gender and household vulnerability or vulnerability to poverty. Therefore, this study aimed to study the impact of selected demographic and socio-economic factors such as age, gender, and employment status of the head of the household (HoH), highest education level among household members, rural or urbanity on being vulnerable in at least one of the above primary vulnerability factors. The analysis was based on the data collected through the National Citizen Survey 2023 which covered 25,042 households nationwide. A multinomial logistic regression was conducted using STATA version 12.0 as dependent and some of the independent variables were categorical. In line with the cited literature, results stressed that there is a significant impact of age, gender, and employment status of the HoH and highest education level among household members except rural/urbanity on being vulnerable with at least one of the primary factors. Therefore, these findings stressed the importance of attentive focus on impact of various demographic and socio-economic factors when formulating the national policy towards a sustainable approach to alleviate MV in Sri Lanka.

Keywords: Multidimensional Vulnerability (MV), Demographic and socio-economic factors, Economic crisis, Sri Lanka

OP-21

A STUDY ON USER EXPECTATIONS OF HISTORICALLY-THEMED VIDEO GAMES

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Abstract

Historically-themed video games are one of the most popular and successful gaming genres in the world and are considered an unorthodox mode of learning history. While developing the games with immersive and other cutting-edge technologies, the game developers collaborate with themed specialist scholars to maintain the historical authenticity of their developments. This research study aimed to explore the latest essential aspects expected by gamers (user-end) from these historically-themed video games, with extended plans to research on content development to use them as a mode of education, which will benefit the Sri Lankan context as well. Accordingly, the 'IMDb Rating site' was used to collect primary user reviews and other literary sources, including journal articles, websites, etc., as secondary data sources. The five most popular historically-themed video games were selected for the study using the purposive sampling method, namely, Assassin's Creed: Mirage (2023), God of War (2018), Ghost of Tsushima (2020), Assassin's Creed: Valhalla (2020), and Assassin's Creed IV: Black Flag (2013). A total of 397 user reviews were analysed using the Qualitative Content Analysis method with the assistance of 'QDA Miner' software. Upon the coding process, the author was able to derive 18 aspects in which the gamers are concerned regarding these historically-themed video games, under 05 categories, namely, 'Technicality', 'Story', 'Gaming Experience', 'Pricing', and 'Developer'. The results revealed that, apart from the general requirements of a video game, the users were thoroughly concerned about the 'Storyline/Plot' (27.7% code-frequency). Furthermore, 'Character Development', 'Nature of the Missions/Quests', and 'Stealth/Combat Mechanisms' were also their main concerns. Given the genre, the 'Historical Landscape/Background Context', 'Soundtracks', and 'Voice Acting' had made them captivated to the game. However, 'Research-based/Authenticity' of the historical content didn't seem to be a much concern for the users (only 1.5% code-frequency). Hence, in capitalizing on the gaming medium as an emerging mode of educating history, focusing on the users' perceptions of underlined aspects defined by the categories 'Technicality', 'Story', and 'Gaming Experience', is important for the scholars. Although 'Research-based/Authenticity' is not a considerable aspect from the perspective of the gamers, it is the role of the content developers to put more weight on that if the intention is to employ this as an orthodox mode of enhancing the knowledge of history. Since the historically-themed video games are simply testaments to the power of story-telling, the author expects to comparatively analyse the research results further with the existing locally developed historically-themed video games in Sri Lanka and develop a synopsis for potential collaborations.

Keywords: Historically-themed, Unorthodox learning, User-Expectations, Video Games

OP-22

EXPLORING EFFECTIVE DIGITAL PR STRATEGIES FOR ENHANCING SALES CONVERSION RATES ON E-COMMERCE PLATFORMS: A COMPREHENSIVE RESEARCH INVESTIGATION

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Abstract

In the contemporary landscape dominated by digital interactions, the prosperity of e-commerce platforms is contingent upon their adept utilization of Digital Public Relations (PR) strategies. As consumers increasingly turn to online platforms for their purchasing decisions, a nuanced understanding of the intricacies of Digital PR becomes imperative for businesses striving to excel in this fiercely competitive environment. Notably, extant research on Digital PR strategies in the Sri Lankan e-commerce sphere lacks a comprehensive analysis of the specific contextual factors that wield influence over the efficacy of these strategies. To address this gap, this research delves into the core Digital PR strategies employed by successful e-commerce platforms in Sri Lanka, with a specific focus on their impact on boosting sales conversion rates. Adopting a qualitative research approach, this study relies on in-depth interviews conducted with PR professionals and e-commerce platform managers. Analytical methods used for this study were thematic analysis and the themes are based on the specific contextual factors influencing the efficacy of Digital PR in the Sri Lankan e-commerce landscape. Through this methodological lens, researchers unravel the multifaceted dynamics at play, shedding light on the strategic manoeuvres that distinguish thriving e-commerce entities. The study revealed the pivotal role of certain PR strategies in optimizing e-commerce success. An intuitive website design and streamlined checkout process were crucial for enhancing user experience and reducing friction in the purchasing journey. Integration of user-generated content added authenticity and engagement. Digital PR strategies, especially storytelling articles, played a significant role in shaping the overall user experience. The integration of chatbots as PR officers emerged as a novel and impactful strategy, contributing to personalized interactions, increased user engagement, and positive influences on conversion rates. In essence, this research not only fills a critical void in the existing literature on Digital PR in the Sri Lankan e-commerce landscape but also offers valuable insights for businesses aiming to optimize their strategies for sustained success in the digital realm.

Keywords: Digital Public Relations Strategies, E-Commerce, Sales conversion rates

OP-23

INVISIBLE BARRIERS: VEDDA YOUTH AND SOCIO-ECONOMIC DISPARITIES IN A CHANGING IDENTITY LANDSCAPE

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Abstract

This research explores the complex relationship between cultural identity shifts and the persistent socio-economic challenges faced by Vedda youth in *Henanigala*, Sri Lanka. In recent decades, there has been a noticeable transformation, with many Vedda youth adopting aspects of mainstream Sinhalese culture. This study investigates the socio-economic challenges faced by Vedda youth who have adopted a Sinhalese identity and examines whether their cultural transformation has led to improved opportunities or preserved their disadvantaged status. The research used a comprehensive mixed-methods approach, combining quantitative data analysis and qualitative insights. Both types of data were collected from Vedda youth age between 15 – 29 (n=61) in *Henanigala*. Change in cultural identity landscape was evident in various facets of their life. While traditionally matrilineal, there is a shift towards patrilineal descent, reflecting broader cultural changes. This shift in descent is mirrored in changing naming patterns including the *varuga* names. Interestingly, a substantial number of young individuals choose to alter their birth names upon reaching adulthood, exhibiting complex dynamics of identity negotiation and assimilation. This study provides a multi-dimensional view of the challenges faced by Vedda youth despite their identity shift. Notably, unemployment rates are significantly high among the third and fourth children within families, reaching 55% and 57%, respectively. None of them are engaged in private or government occupations. Instead, the predominant occupations are labour-intensive work and farming. The study also sheds light on education, revealing limited opportunities for Vedda youth in *Henanigala*. A significant number of youths discontinue education after reaching grade 8 or 5, attributing this trend to economic challenges and limited prospects. Presently, they face poverty, lack of education, and marginalization, even though they expected to acquire a better social status through identity and socio-cultural shifts. In conclusion, the research emphasizes the need for holistic interventions addressing both cultural preservation and socio-economic empowerment. Policies recognizing and supporting the unique needs of Vedda youth, along with education and economic opportunities, are crucial to break the cycle of disadvantage.

Keywords: Vedda Youth, Cultural Identity Shifts, Socio-economic Challenges, Henanigala, Sri Lanka

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ශ්‍රී ලංකාවේ විශ්වවිද්‍යාලයීය කෞතුකාගාර අතරින් ශ්‍රී ජයවර්ධනපුර විශ්වවිද්‍යාලයේ පුරාවිද්‍යා කෞතුකාගාරයෙහි ඉතිහාසය හා එහි කාර්යභාරය පිළිබඳ අධ්‍යයනයක්

නෙත්තසිංහ එන්.එම්.පී., මාසකෝරාල කේ. සහ බණ්ඩාරනායකගේ ජී.එස්.

ඉතිහාස හා පුරාවිද්‍යා අධ්‍යයනාංශය, මානවශාස්ත්‍ර හා සාමාජීයවිද්‍යා පීඨය,
ශ්‍රී ජයවර්ධනපුර විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව
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සාරසංක්ෂේපය

විශ්වීය දැනුම ඒකරාශී කරගන්නා වූ විශ්වවිද්‍යාල පද්ධතිය තුළ එම දැනුම වඩාත් සුක්ෂ්ම ලෙස වර්ධනය කිරීම සඳහා කෞතුකාගාරවිද්‍යා මූලධර්ම අනුව සකස් කළ කෞතුකාගාරයක හා ඊට අනුබද්ධ පර්යේෂණාගාරයක අවශ්‍යතාව බොහෝසෙයින් වැදගත් වේ. ඉතිහාසගත තොරතුරු හෙළිදරව් කිරීමේ කාර්යභාරයේ දී කෞතුකාගාර සඳහා හිමිවනුයේ සුවිශේෂී ස්ථානයකි. එහි දී විශ්වවිද්‍යාල ආශ්‍රිත ව පවතින කෞතුකාගාර සඳහා වැදගත් ස්ථානයක් හිමිවේ. විශ්වවිද්‍යාල කෞතුකාගාර ඉගැන්වීම හා ඉගෙන ගැනීම සඳහා නිර්මාණය වූවක් වන අතර විද්‍යාර්ථීන්ගේ දැනුම වර්ධනයටත් පර්යේෂණ කටයුතු සඳහාත් මහත් උපකාරයක් සිදු කරයි. ශ්‍රී ලංකාව තුළ 1978 අංක 16 දරන විශ්වවිද්‍යාල පනත යටතේ විශ්වවිද්‍යාල 17ක් ස්ථාපිත කරන්නට යෙදී ඇති අතර ඉන් විශ්වවිද්‍යාල 09ක් තුළ මේ වනවිට විශ්වවිද්‍යාල කෞතුකාගාර 22ක් ස්ථාපිත කොට ඇත. එම කෞතුකාගාර අතරින් එකක් බවට මෙම පුරාවිද්‍යා කෞතුකාගාරය ද පත් ව පවතී. 1962 දී ශ්‍රී ජයවර්ධනපුර විශ්වවිද්‍යාලයේ ඉතිහාස හා පුරාවිද්‍යා අධ්‍යයනාංශය යටතේ පවතින පුරාවිද්‍යා කෞතුකාගාරය විද්‍යෝදය විශ්වවිද්‍යාලයේ ආරම්භක විශ්වවිද්‍යාලාධිපති (උපකුලපති) ගෞරවාර්හ වැලිවිටියේ ශ්‍රී සෝරත නාහිමියන් වහන්සේ වැඩබලන පුරාවිද්‍යා අධ්‍යයනාංශාධිපති වශයෙන් සේවය කරන කල්හි ශ්‍රී ලංකාවේ විවිධ ප්‍රදේශවලින් සොයාගත් හා පරිත්‍යාගශීලීන්ගෙන් ඒකරාශි කරගත් කෞතුක වස්තූන් තැන්පත් කිරීම සඳහා ස්ථාපිත කරන්නට යෙදී ඇත. 1962 දී සිට වසර 61ක් පුරාවට මේ දක්වා විවිධ බාධක මධ්‍යයේ මෙම කෞතුකාගාරය පවත්වාගෙන ආ අතර 2017 වර්ෂයේ සිට තවදුරටත් වර්ධනය විය. මෙම පුරාවිද්‍යා කෞතුකාගාරය කෞතුකාගාරවිද්‍යා මූලධර්ම අනුව නිර්මාණය වී පවතී ද යන්න පර්යේෂණ ගැටලුව වශයෙන් ගෙන මෙම අධ්‍යයනය සිදු කරන ලදි. පුරාවිද්‍යා කෞතුකාගාරය පිළිබඳ තොරතුරු, පුස්තකාල අධ්‍යයනයෙන් හා සම්මුඛ සාකච්ඡා මඟින් එක්රැස් කෙරුණි. පුස්තකාල අධ්‍යයනයේ දී වාර්තා, පුවත්පත්, ලිපි හා සඟරා මඟින් තොරතුරු අනාවරණය කරගනු ලැබූ අතර සම්මුඛ සාකච්ඡා හරහා එහි අතීත හා වර්තමාන තත්ත්වය පිළිබඳ ව ද තොරතුරු ලබා ගැනීමට හැකි විය. කෞතුකාගාර මූලධර්ම අනුව සංස්කෘතික කෞතුක භාණ්ඩ ප්‍රදර්ශනය, ගබඩා කිරීම හා සංරක්ෂණය ආදි වශයෙන් දැනුම එකරාශී කරන්නන් හට මෙහි දී සේවය සපයනු ලබයි. මෙහි වැඩිදියුණුව සඳහා ප්‍රමාණවත් ඉඩ ප්‍රමාණයක් ලබා දීම, අවශ්‍ය නවීන තාක්ෂණික උපකරණ සපයා දීම, සුදුසු පරිදි නඩත්තු කටයුතු සිදු කර දීම, ආරක්ෂාව සඳහා විද්‍යුත් හා සජීවී ආරක්ෂක ක්‍රමවේද සපයා දීම ආදිය උපකාරී වේ. මෙම පුරාවිද්‍යා කෞතුකාගාරය වෙනස් වන්නා වූ සමාජයට ගැළපෙන පරිදි පරිවර්තනය වන්නා වූ කෞතුකාගාරයක් වශයෙන් සැලකිය හැකි අතර ශ්‍රී ජයවර්ධනපුර විශ්වවිද්‍යාලයට එය මහඟු සම්පතක් බවට ද පත් වී ඇත.

මුඛ්‍ය පද: පුරාවිද්‍යා, විශ්වවිද්‍යාල කෞතුකාගාරය, භාණ්ඩ එකතුව, පර්යේෂණ, ප්‍රදර්ශනය

LIFE SCIENCES - ORAL

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DEVELOPMENT OF A 'TEMPLATE' CONSISTING ELECTRON-DEFICIENT OCTA-AZA MACROCYCLE AND POLYCYCLIC AROMATIC HYDROCARBON FOR TEMPLATE DIRECTED SYNTHESIS OF MECHANICALLY INTERLOCKED MOLECULES

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Abstract

Mechanically interlocked molecular architectures (MIMs) have efficiently been synthesized using a synthetic strategy called 'template directed synthesis' (TDS). In the TDS, 'donor-acceptor' complexes have been employed as 'templates' to efficiently synthesize MIMs. However, most of the 'templates' have been constructed using synthetically-challenging compounds. Therefore, this study focused on the development of a synthetically-feasible efficient 'template' for the TDS of MIMs using an electron-deficient octa-cationic octa-aza macrocycle (OAM^{8+}) and three of the selected electron-rich polycyclic aromatic hydrocarbons (PAHs), namely, naphthalene, anthracene and phenanthrene. The macrocycle, OAM^{8+} was synthesized using a [2+2] Schiff-base condensation of isophthalaldehyde (IPA) and triethylenetetramine (TETA) in the presence of lead (II) ion as a 'template', followed by the reduction of octa-aza Schiff-base macrocycle with sodium borohydride, removal of the 'template' using sulphuric acid and the protonation of macrocycle using perchloric acid. The OAM^{8+} and synthetic intermediates were characterized using spectroscopic techniques. The solution-phase characterization of host-guest complexation between OAM^{8+} and the selected PAHs in acetonitrile was carried out using fluorescence and UV-visible spectroscopy. The stoichiometry and binding constant of each combination of OAM^{8+} and PAHs were determined using the continuous variation method and dilution method, respectively. The qualitative study on complexation of OAM^{8+} and PAHs in solution exhibited a significant enhancement of fluorescence emission intensity and UV–visible absorbance values along with a red shift with respect to those of the corresponding PAH. This observation indicated a host-guest complex formation between OAM^{8+} and PAH. Each combination of OAM^{8+} and PAH complexes exhibited the 1:1 stoichiometry. Among the three PAHs studied, naphthalene exhibited the highest binding constant (K_a) of 1540.00 $dm^3\ mol^{-1}$ while anthracene demonstrated the lowest K_a value of 802.87 $dm^3\ mol^{-1}$ with OAM^{8+}. Therefore, the 1:1 host-guest complex of OAM^{8+} and naphthalene, can be used as an efficient 'template' for the TDS of MIMs.

Keywords: Cyclophanes, host-guest complexation, mechanically interlocked molecules, polycyclic aromatic hydrocarbons, template directed synthesis

OP-26

INDIVIDUAL AND COMBINED EFFECTS OF MANGO SAWDUST AND BANANA LEAVES ON THE GROWTH OF *Pleurotus Ostreatus*: AN ANALYSIS OF NUTRITION COMPOSITION AND ANTIOXIDANT ACTIVITY

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Abstract

Pleurotus ostreatus or American oyster mushrooms are the most commonly cultivated mushroom variety in Sri Lanka. These mushrooms are greatly valued for their taste and nutritional values, such as high amounts of proteins, minerals, and vitamins. They also confer health benefits such as antimicrobial, antiproliferative, anti-hypertensive, cholesterol-lowering, and antidiabetic activities. *Pleurotus* species easily grow on lignocellulosic agricultural waste substrates such as sawdust, biowaste, banana leaves, and corn cobs. In Sri Lanka, rubber sawdust is the most commonly used substrate to grow *Pleurotus ostreatus*. This study was designed to identify the best alternative substrate from 100% mango sawdust (SD), 100% banana leaves (BL) and their combinations (75% SD:25% BL, 50% SD:50% BL, and 25% SD:75% BL) for the growth of *Pleurotus ostreatus*. The fresh weight of the mushrooms and the Water Holding Capacity (WHC) of each substrate combination were measured. From the mushrooms grown on each substrate, aqueous extracts were prepared, and the following tests were carried out: Total Protein Content (TPrC) by the Lowry method, Total Carbohydrate Content (TCC) by phenol-sulphuric acid method, antioxidant activity by 2,2-diphenyl-1-picrylhydrazyl (DPPH) and phosphomolybdenum assays and Total Phenolic Content (TPC) by Folin-Ciocalteu method. All combinations reported a 100% WHC. The highest average fresh weight was recorded in 50% SD:50% BL (57g) and 25% SD:75% BL (57g). Mushrooms grown on 100% SD had the highest TPrC (9.76 mg/ml) and TPC (1.41 mgGAE/g). 75% SD:25% BL had the highest TCC (0.64 mg/ml) and TAC (0.96 mgAAE/g). 25% SD:75% BL had the lowest half maximal inhibitory concentration for DPPH (2.23%). Compared with previous studies, this study investigated the effects of unique combinations of mango sawdust and banana leaves on the growth of *Pleurotus ostreatus* for the first time. According to the obtained results on the nutritional composition, yield, and antioxidant capacity, it can be concluded that both the substrates, individually and in combination with each other, can be suggested as effective substrates for the growth of *Pleurotus ostreatus*.

Keywords: *Pleurotus Ostreatus*, mango sawdust, banana leaves, nutritional composition, antioxidant activity

OP-27

INVESTIGATION OF INVOLVEMENT OF GANGLIOSIDE GM1a IN DENGUE VIRUS INFECTION: A MOLECULAR DOCKING AND MOLECULAR DYNAMICS STUDY

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Abstract

The dengue virus (DENV) is a mosquito-borne virus threatening the world, especially in the tropics and subtropics. DENV causes around 400 million infections per year and is responsible for the loss of 1.1 million disability-adjusted life-years globally. Due to the availability of multiple serotypes, it is difficult to prepare effective vaccinations and antivirals effective against all, and research is still in its infancy. Several coreceptors and attachment factors are involved in the cellular infection of the dengue virus. One such coreceptor/attachment factor reported in the literature, which shows an increase in cellular infection of the dengue virus is the GM1a cell receptor. It is a glycosphingolipid that consists of four sugars, making the polar head and ceramide tail. This study studies the interaction between the GM1a cell receptor and domain II of the Envelope protein (E protein) of the dengue 2 serotype where there is a possible binding site. Using molecular docking studies with Autodock vina, the position of envelope protein was observed where the GM1a binds. A possible ligand-binding pocket located in domain II was observed, where the ligand-receptor interaction is stabilized via polar contacts between the ligand and the protein. The resulting structure that contained 10 H-bonds with an average bond distance of 2.760 Å was selected for the molecular dynamics study. The stability between the GM1a and the protein was further explored using molecular dynamics simulations using Gromacs molecular modeling software. Although the complex of GM1a with E protein dimer reflects stability with a simulation time of 15 ns, that time duration is insufficient to interpret a biological system. The molecular dynamics simulation needs to be further explored to observe the stability of the interactions between GM1a and E protein dimer before developing as an anti-viral target.

Keywords: Dengue virus, GM1a cell receptor, Envelope protein, Molecular docking, Molecular dynamics

OP-28

CAMERA TRAP-BASED APPROACH TO SURVEY FOREST UNDERSTORY BIRD COMMUNITIES IN SELECTED PROTECTED AREAS OF SRI LANKA

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Abstract

Camera trapping is an effective survey technique to study rare and elusive wildlife. Despite being widely used for mammal surveys, camera trapping has the potential to assist in surveying ground-dwelling bird species. The forest understory bird communities in three forested landscapes representing three different bioclimatic zones in Sri Lanka were surveyed using camera traps. The survey was designed to target the forest understory, which enabled the capturing of understory birds as well as terrestrial medium-sized, mammals. The study sites included Sinharaja Forest Reserve (SFR), Horton Plains National Park (HPNP), and Maduru Oya National Park (MONP). Camera traps were randomly deployed within predefined plots (1*1 km or 2*2 km), and the trapping effort was proportionate to the area of the study site. The survey lasted for two years, starting from January 2019, and resulted in a total sampling effort of 6717 trap days. The survey recorded 26 bird species belonging to 08 orders in MONP, 16 species (05 orders) in HPNP, and 12 species (05 orders) in SFR. SFR, with a more diverse and complex vertical forest structure, was the site with the lowest number of understory bird species despite its high overall bird diversity and richness. The Relative Diversity Index (RDI) was highest in order Passeriformes at all three sites, recording values of 70, 71.4, and 44, respectively, at SFR, HPNP, and MONP. There were 10 endemics, 6 migratory birds, and 8 globally threatened species. Most of the recorded species were primarily utilizing the forest understory for foraging. The findings of this study indicate that camera trapping can be utilized as an effective survey technique for ground-dwelling birds, and especially to capture species that are rare, elusive, and cryptic. The conservation of a wide range of bird species in the form of endemics, migratory species, and threatened species, along with their habitats, can be achieved via more studies with camera trapping. Furthermore, similar work in the future should be incorporated with comparative survey methods to analyse the effectiveness of camera trapping over other methods.

Keywords: Bird richness, diversity, elusive species, endemics, threatened species

OP-29

DISCOVERY OF THERMO-STABLE CELLULASE ENZYME CODING GENES FROM MAHA OYA HOT SPRING, SRI LANKA

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Abstract

Extremozymes can be a suitable alternative for mesophilic enzymes in a broad range of biotechnological operations. Cellulose is the most common and renewable biological carbon resource in the world. Therefore, cellulase is a key player in the enzyme industry, making it the third-largest in the global enzyme market, representing 8% of the total industrial market. Many industries such as food and beverage, pulp and paper, brewery and wine, agriculture, textile, bioconversion for value-added industrial products, and the detergent industry extensively use cellulase. The demand for cellulase is expected to increase significantly due to its use in large-scale product forms. Therefore, this study aimed to identify thermo-stable cellulase enzyme coding genes from bacteria inhabiting Maha Oya hot spring in Sri Lanka. Water samples were collected from the surface and bottom of Maha Oya hot springs. Then the temperature, Electrical Conductivity (EC), pH, and Dissolve Oxygen (DO) of the hot spring was measured, and microbial genomic DNA was extracted using the MoBio Power Water DNA extraction Kit. Shotgun metagenomic sequencing was performed on the Illumina HiSeq platform at Omega BioServices, USA. Bioinformatics analyses were conducted using MEGAHIT software for de novo metagenome assembly and FragGeneScan for the prediction of genes and proteins in Metagenome Assembled Genomes. Results indicated that temperature, EC, pH, and DO of the surface and bottom of the spring varied from 51.7 – 52.4oC, 1487 - 1507 µS/cm, 8.05 – 8.07, and 2.01 – 2.05 mg/L respectively. Egl, cwp84, pslG, yhfE, Tnr, cel, esaA, bhp, abfB, ipqP, frvX, ftsZ, pepA were the genes responsible for cellulase activity detected from the metagenomic sample. Further, stress response genes including temperature response genes, metal response genes, and toxic substances response genes were detected from the hot spring. The dominant taxonomic levels are responsible for producing α cellulase were identified as Methylocystaceae, Deinococcus-Thermus, Alphaproteobacteria, Comamonadaceae, Negativicutes, Proteobacteria, and Pseudomonas. Thus, the microbiota that inhabits the Maha Oya hot spring could provide an excellent source for industrially important thermos-stable cellulase enzymes. Furthermore, these findings will provide a platform for future work on mass-scale production of thermostable α cellulase enzyme using recombinant DNA technology.

Keywords: Hot springs, Thermo-stable Enzymes, Biotechnology, Metagenomic, Cellulase

OP-30

PLANKTON COMMUNITY STRUCTURE AND DYNAMICS IN BELLANVILA-ATTIDIYA URBAN WETLAND, SRI LANKA

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Abstract

Wetlands are unique ecosystems because they are ecotones between terrestrial and aquatic environments. Bellanvila-Attidiya marsh is one of the most significant wetlands in the urban agglomerate of Colombo, Sri Lanka. The plankton community is a fundamental component of wetland biodiversity and plays a key role in the wetland food chains. Plankton species composition within a community is a reliable indicator of water quality. The present study was conducted to determine the plankton composition and community structure of the Bellanvila-Attidiya wetland. Monthly sampling was carried out from October 2022 to September 2023 using a 55 µm plankton net in surface water at five randomly selected sampling locations in the wetland. Samples were preserved onsite, and in the laboratory, phytoplankton and zooplankton were identified to the lowest possible taxonomic level. The Shannon-Weiner diversity index (H) and Simpson's Index of Diversity (SID) were employed as diversity indices to assess the plankton diversity level. A total of 42 phytoplankton taxa were reported, with the density dominance of cyanophyta (*Microcystis* sp.) throughout the year. The phytoplankton composition was as cyanophyta (72%), bacillariophyta (8%), chlorophyta (14%), and euglynophyta (5%). A total of 29 zooplankton taxa were reported. A predominance of Copepoda (Nauplius) primarily characterized the zooplankton density throughout the year. Copepoda comprised 48% of the average zooplankton density, while rotifera (30%), protozoa (11%), cladocera (10%), and ichthyoplankton (<1%) also contributed to the zooplankton community. The highest plankton density and diversity were reported in January, while the lowest were reported in May 2023. The calculated H and SID values ranged between 2.1 to 3.3 and 0.5 to 0.8, respectively, indicating moderate to high levels of plankton diversity in the Bellanvila-Attidiya wetlands. The plankton density was significantly higher ($p<0.05$) during the Northeast-monsoon season (December-February) than during the Southwest-monsoon season (May-September). Phytoplankton density ($p<0.05$, $r=-0.5$) and zooplankton density ($p<0.05$, $r=-0.4$) had a moderate negative correlation with monthly average rainfall. Therefore, there is a significant impact of rainfall on the structure of the plankton community in Bellanvila-Attidiya wetland. Due to the possible risk of cyanobacteria blooms, necessary actions should be taken to maintain the water quality of the wetland area.

Keywords: Bellanvila-Attidiya Wetland, Diversity Indices, Phytoplankton, Rainfall, Zooplankton

MANAGEMENT, COMMERCE & INDUSTRY DEVELOPMENT - ORAL

OP-31

CHALLENGES FACED BY UNDERGRADUATES DURING CONDUCTING RESEARCH: PERSPECTIVES FROM THE UNDERGRADUATES IN MANAGEMENT STREAM OF A STATE UNIVERSITY, SRI LANKA

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Abstract

All the management-related degree programs offered by state universities have a research component either as a compulsory or optional module. Existing literature supports the idea that students' attitude towards research tends to be influenced by both positive and negative factors, which results in an overall negative attitude towards research. Understanding these attitudes will help eliminate the negative aspects of research as training in research is essential to upgrade the quality of the graduate. As the study is related to attitudes, a qualitative approach is taken as appropriate, and thematic analysis was taken as the best technique as the study focuses on identifying reasons. Thirty students from different sub-disciplines of management representing all the management faculties of public universities in the country were selected as the sample. The sampling technique used was judgmental sampling. An in-depth interview using an interview guide was the data generation method. A pilot test was carried out with five students and the topics to be covered, and the length of the interview was revised, which enhanced the quantity of data generated. The study revealed that the importance of the research training was the most mentioned positive factor and no option to choose, difficulty in finalizing a research topic, limited time to complete the study, difficulty in bearing the cost, insufficient language proficiency, knowledge, and skills to conduct research, preference for an internship, difficulty in accessing relevant literature, data, and software for data analysis were the most important challenges students had to face while carrying out research. All these except for the preference for an internship were in agreement with the existing literature on the subject. Knowing these reasons behind may help in designing systems that can address the issues as students' engagement in research studies is an important aspect of undergraduate training.

Keywords*:* attitudes, Challenges, problems, undergraduate research, researchers

OP-32

REVITALIZING SRI LANKA'S TEA INDUSTRY: STRATEGIES FOR SUSTAINABLE AND COMPETITIVE VALUE CHAINS

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Abstract

The tea industry in Sri Lanka, particularly in the Welimada region, is encountering formidable challenges that pose a threat to its sustainability. This research, which focused on 152 tea estate employees at different levels of employment, investigates the influence of Sustainable Practices (SP), Technology Integration (TI), and Market Diversification Efforts (MDE) on the Competitiveness of the Tea Value Chain (CTVC). While Sustainable Practices showed no significant relationship with Tea Value Chains (TVC), indicating the need for nuanced sustainability approaches, robust evidence supports a positive correlation between Technology Integration and TVC. Embracing modern technologies enhances efficiency and competitiveness. Similarly, a significant and positive relationship between Market Diversification Efforts and TVC underscores the strategic importance of exploring new markets and diversifying products. The study reveals internal consistency in key variables, affirming the reliability of measures. The regression model demonstrates a strong fit, with 79.2% variability in TVC explained by predictors. In conclusion, stakeholders are urged to foster technology adoption, explore innovative sustainable practices, and strategically diversify products for a sustainable and globally competitive future. This study contributes vital insights for navigating challenges faced by Sri Lanka's tea industry, preserving tradition, and fostering environmental stewardship.

Keywords: Sustainable Practices, Technology Integration, Market Diversification Competitiveness of Tea Value Chain

OP-33

BOARD CHARACTERISTICS AND FIRM PERFORMANCE OF MATERIAL FIRMS IN SRI LANKA: THE MODERATING EFFECT OF MANAGERIAL OWNERSHIP STRUCTURE

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Abstract

Due to Sri Lanka's severe economic crisis, the majority of its businesses have recently struggled to achieve remarkable performance. Therefore, it is essential to comprehend the characteristics that support the performance of the corporate sector in the difficult business climate. Several research have examined the association between board characteristics and the performance of the firm, nevertheless, none of them have particularly explored the moderating impact of the managerial ownership structure of the material companies in this nexus. In light of this, this study examines how managerial ownership structure impacts the association between board characteristics and the performance of Sri Lankan listed material companies. Return on assets is utilised to evaluate the firm performance, while board characteristics include board size, independence, gender diversity, and CEO duality. This study selects eighteen listed material companies in Sri Lanka as the sample for the research, covering the period from 2018 to 2022, depending on the availability of data. Panel data regression was employed to assess the key findings. As per the result of Hausman test panel least squares method with the random effect model is favoured over the fixed effect model. The notable findings demonstrate that material companies' firm performance is significantly and negatively correlated with board size and independence. The gender diversity on boards significantly improves the firm performance. CEO duality, nevertheless, does not have an influence on the company's performance. The managerial ownership structure moderates the association between the size of the board and the financial success of material corporations. By moderating the impact of managerial ownership structure, other variables, however, are discovered to have insignificant effects on the firm performance. This research adds to the existing literature and theories such as agency theory, and stakeholder theory by providing new insights and shows the moderating role of ownership structure on the impact of board characteristics on the firm performance of Material companies. Further, this study's results are to support managers of the firm, legislators, and regulators in determining the characteristics of the board and the ownership structure of the business.

Keywords: Board characteristics, firm performance, material firms, moderating effect, ownership structure

OP-34

CONCEPTUALIZATION OF THE MEDIATING ROLE OF LOSS AVERSION IN THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND EFFICIENCY OF SKILLS IN INVESTMENT DECISION-MAKING AMONG CSE INVESTORS

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Abstract

This paper conceptualizes the financial decision-making propelled by the emergence of behavioural finance. Within this paradigm shift, the research of personality traits has emerged as a prominent focus, underscoring their pivotal role in influencing investment decisions. This conceptual paper delves into the relationship between the Five Big Personality Traits—conscientiousness, extraversion, agreeableness, neuroticism, and openness to experience—and the efficiency of skills in investment decision-making. The efficiency of skills in investment decision-making in this context is construed as an investor's adeptness at navigating choices to maximize utility, incorporate all available information, and foresee future market changes. As behavioural finance acknowledges underlying irrationalities, attributing them to psychological biases and heuristics, the deviation from the rational investor assumption in neoclassical finance theory becomes apparent. In this regard, Kahneman and Tversky's Prospect Theory emerges as a fundamental descriptive theory for the study, attempting to uncover the subtle interplay between personality traits and investment decision-making. Specifically, the study investigates how loss aversion, a cornerstone of Prospect Theory, mediates the relationship between personality traits and the efficiency of skills in investment decision-making of CSE investors. Loss aversion, captured in Prospect Theory, posits that individuals exhibit a stronger aversion to losses than preferences for equivalent gains. This aversion can greatly impact choices in the context of investment decisions, influencing the overall efficiency of decision-making skills. The study utilizes structured questionnaires for data collection from Colombo Stock Exchange investors through convenience sampling and Structural Equation Modelling will be employed to scrutinize the acquired data, facilitating a nuanced and in-depth analysis of the relationships within the research variables. By integrating the Five Big Personality Traits and Prospect Theory into the analytical framework, this research aspires to enhance the understanding of behavioural finance, conceptualizing a more realistic portrayal of investor behaviour in the ever-changing realm of financial markets.

Keywords: personality traits, loss aversion, efficiency of skills in investment decision-making

OP-35

BUSINESS ETHICS IN CHALLENGING ENVIRONMENTS: PERCEPTIONS OF ACCOUNTING STUDENTS IN SRI LANKA AND IMPLICATIONS ON ACCOUNTING EDUCATION

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Abstract

The main objectives of this study were to assess accounting students' general perceptions of corporate ethics in challenging environments and their perspectives on the value and objectives of education in accounting ethics; to assess the perceived level of content of ethics education in the accounting curriculums of Sri Lankan tertiary education system, and to investigate whether potential differences in such perceptions depend on previous business ethics courses taken, gender, age, and work experience. The target population was accounting students pursuing degrees or/and professional accounting qualifications in Sri Lankan universities and professional accounting bodies. This study secured a sample comprising 242 responses. For the first two objectives, descriptive statistics and Mann-Whitney *U* test were employed to analyze the importance of general aspects of ethics and the objectives of accounting ethics education. The third objective was examined using mean ranking and one-sample *t*-test to evaluate the perceived level of content of accounting ethics education. Finally, multiple regression analyses were utilized to explore potential impacts on such perceptions by various factors. Results indicated that students who have taken ethics courses were more inclined to emphasize ethical considerations in accounting education, advocating for greater integration of ethics into the curriculum. The study also identified the highest and the lowest-ranked elements of ethics content in the accounting curricula. Furthermore, significant impacts on students' perceptions of the importance of accounting ethics based on gender, age, and work experience were observed. Female, older, and more experienced students exhibited stronger ethical inclinations compared to their counterparts. These findings emphasize the importance of studying ethics in challenging environments and highlight the role of ethics courses in shaping students' ethical perceptions. This study accentuated the need for expanded ethics education within accounting curricula to foster ethical awareness and decision-making among future accountants. The findings of the study are expected to have significant policy implications from empirical, practical, theoretical, and methodological viewpoints.

Keywords: Accounting Ethics, Accounting Ethics Education, Business Ethics, Ethics-challenging environments

OP-36

PERCEIVE FACTORS AFFECTING THE ACADEMIC PERFORMANCE OF ACCOUNTING UNDERGRADUATES IN SRI LANKAN STATE UNIVERSITIES

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Abstract

Amidst the contemporary challenging environment, this study examined the perceived factors affecting the academic performance of accounting undergraduates of the Sri Lankan state university system. Nineteen factors related to the university system, demographics, and other personal factors of the undergraduates were identified based on a comprehensive literature review and examined in this study. A quantitative approach was adopted, which was deemed appropriate and supported by dominant extant literature, and thereby data was collected through a self-administered structured questionnaire and 287 valid responses were secured. Descriptive statistics were used to assess the level of academic performance, and inferential statistical techniques: one-way ANOVA, independent sample t-test, correlation, and OLS multivariate linear regression analyses were performed to examine the impact of the selected factors on academic performance. The level of academic performance of accounting undergraduates in terms of their average GPA was in the range of 3.30-3.69 (within the second-class upper division). In terms of the selected factors, being a female undergraduate, having fewer distractions from senior students, commuting from boarded places, having higher engagement in extracurricular activities, prior English knowledge, prior mathematics knowledge, and following professional accounting courses had a statistically significant positive association with academic performance. However, other factors considered in this study did not indicate a significant association with the academic performance of undergraduates. The findings of this study provide insights where policymakers and academicians could make structural adjustments in terms of delivery, learning, and assessment processes. At the same time, undergraduates could enhance their academic performance by using certain strategies. This study considered a wide variety of factors as determinants of the academic performance of undergraduates contributed to the methodological and theoretical significances, and expected to fill an empirical gap, particularly observed in the local context. As for future research endeavours, the adoption of a mixed methodology and the expansion of the scope to other academic disciplines are suggested.

Keywords: Academic Performance, Accounting, Sri Lanka, State Universities

ENGINEERING, TECHNOLOGY & PHYSICAL SCIENCES - POSTER

PP-01

ANALYZING THE VARIATION OF ACOUSTIC PROPERTIES OF USED MOBILE PHONES IN SRI LANKA

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Abstract

This study investigated the variation of acoustic properties in signals received by mobile devices, focusing on the quality of microphones and speakers. The study was motivated by the economic crisis in Sri Lanka, which has made it difficult for people to afford new mobile phones. Old mobile phones can lead to wear and tear on microphones and speakers with time. The voice recording was collected with low background noise (40dB), using the sound level meter and an inbuilt recording app with a 44.1KHz sampling rate. The research was carried out utilizing 10 mobile phones of different brands. One mobile phone acted as the receiver, recording voice signals transmitted by other mobile phones acting as callers. These received voice was collected at ITI under normal environmental conditions. Results suggested that the mean Equivalent Continuous Sound Level (LAeq) of considered Apple and Sony phones was slightly equivalent to the LAeq of the original voice. The minimum and maximum LAeq values of the recorded voice of Apple iPhone 7 (-10.34 dB and 62.26 dB, respectively) and Sony Xperia XZs (-13.38 dB, 64.32 dB respectively) cover a comparable range as the original voice (-14.84 dB and 60.87 dB, respectively). Wilcoxon signed-rank test confirmed there was no significant difference between the original voice and recorded voice of Apple, Sony, and Xiaomi which means mobile phones have a good capability to capture the sound pressure level. Further, there was no significant difference between the recorded voices of Apple (iPhone 7, iPhone 8) and Sony (Xperia 05 and Xperia XZs) and the received voices from others. The study indicates that while Apple and Sony demonstrate good performance in capturing and transmitting voice with minimal differences, experience signal loss or degradation and less durability of the mic and speaker. Factors such as formant, fundamental frequency, and shimmer highlight the complexity of voice recording and transmission. This research concludes that the microphones of Apple, Sony, and Xiaomi mobile phones have good durability to recognize the human voice and Apple and Sony mobile phones can be used for voice recognition for receiving calls.

Keywords: Equivalent Continuous Sound Level (LAeq), mobile communication, noise

PP-02

PREPARATION OF A COST-EFFECTIVE BACTERIAL CONSORTIUM FOR THE TREATMENT OF SOLID WASTE LEACHATE

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Abstract

Solid-waste leachate is an effluent produced due to rainwater percolation through solid waste. Land Fill Leachate (LFL) consists of more organic matter, ammonia nitrogen, humic substances, heavy metals, and xenobiotic toxic compounds. The direct discharge of LFL causes several ecological circumstances, such as groundwater pollutants and eutrophication. However, most physiochemical LFL treatment practices are economically expensive. Therefore, the present study focuses on preparing a bacterial consortium for solid-waste leachate's effective and efficient degradation as a low-cost biological treatment. A practical bacteria consortium (A, B, C) was prepared using three potential COD-reducing bacterial isolates, and their antagonism between the species was checked using the cross-streaking method. The consortium was attached to a plastic carrier material and subsequently introduced into lab-scale bioreactors filled with 50% diluted LFL. The water quality analysis of Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Nitrate concentration ($N\text{-}NO_3^-$), Nitrite concentration ($N\text{-}NO_2^-$), Ammonium concentration ($N\text{-}NH_4^+$), and Phosphate concentration (PO_4^{3-}) in leachate was carried out over 10 days. The prepared bacterial consortium showed a reduction of 49 % and 93 % in BOD and COD, respectively, while the concentrations of ($N\text{-}NO_3^-$), ($N\text{-}NO_2^-$), (PO_4^{3-}), and ($N\text{-}NH_4^+$) showed significant reductions of 72 %, 78 %, 34 %, and 100 % respectively. The study required simple and affordable laboratory reagents and equipment, thereby being economically feasible. Thus, the study proves that the developed bacterial consortium has the potential to be a cost-effective and efficient solution for the treatment of solid-waste leachate.

Keywords: Leachate, COD, bacterial consortium, antagonism, lab-scale bioreactors

ENVIRONMENTAL POLLUTION & NATURAL RESOURCES MANAGEMENT - POSTER

PP-03

COMPARATIVE STUDY OF LEAD (II), CADMIUM (II) AND TOTAL MERCURY CONTENT IN FRESHWATER AND MARINE FISH VARIETIES IN SRI LANKA

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Abstract

Heavy metal contamination in fish is a potential threat to human health. Sri Lanka has a high consumption of fish and fishery products. Heavy metals, such as lead, cadmium, and mercury, enter the marine environment through natural and anthropogenic sources causing serious threats to humans via the perpetual consumption of fish. Lead (II), cadmium (II) and mercury are identified as major heavy metal contaminants in Sri Lankan fish. Therefore, in this study, the concentrations of lead (II), cadmium (II), and total mercury in some Sri Lankan fish varieties were studied. Fish samples were collected from randomly selected local fish markets covering different districts in Sri Lanka. Seventeen species (6 freshwater species and 11 marine species), each having four fish samples, were analyzed. Direct Mercury Analysis Method and Atomic Absorption Spectroscopy techniques were used to detect lead (II), cadmium (II), and total mercury concentrations in fish muscles. The maximum total Hg content (0.187 ± 0.007 mg kg^{-1}) was detected for Sailfish (marine) samples collected from Chilaw. Total mercury concentrations for all analyzed fish samples were below the permitted level set by European Union legislation. The highest Pb concentration (1.2405 ± 0.057 mg kg^{-1}) was detected for Thilapia fish (freshwater) samples collected from Chilaw. Only three fish types exceeded the limits of Cd, and those were Goldstripe sardinella, Sailfish, and Jumping halfbeak samples (marine) collected from Chilaw. All three samples had Cd levels above 0.069 mg kg^{-1}. Compared to marine fish, freshwater fish is concerning for regular consumption, concerning Pb levels. Hazardous levels are less for Cd than Pb, while Hg levels in both marine and freshwater fish species are at safe levels for human consumption. Factors such as habitat, food preference, size of the fish, etc., can affect the levels of heavy metals in fish, where further investigation is required to determine such connectivity.

Keywords: Mercury, Lead, Cadmium, Marine fish, Freshwater fish

PP-04

CHARACTERIZATION OF HIGH-EFFICIENCY POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) DEGRADING SOIL BACTERIA: A BIOREMEDIATION APPROACH ON NAPHTHALENE AND PHENANTHRENE

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Abstract

Polycyclic Aromatic Hydrocarbons (PAHs) are organic chemical compounds that comprise carbon and hydrogen molecules and have two or more fused benzene rings. They are frequently produced by the combustion of carbonaceous compounds and have a huge impact on environmental pollution because they tend to accumulate in the environment. The accumulated PAHs pass into the plants and eventually invade human systems via dietary sources. PAHs are highly carcinogenic and genotoxic. This study focuses on such soil contaminants as Naphthalene and Phenanthrene. The aim of this study is to isolate and identify the degradation percentages of such PAH-degrading bacteria. Initially, the bacterial population densities were calculated, and the different morphological bacterial strains were isolated. The plate assay and spectrophotometric analysis with methylene blue (MB) techniques were used to identify and evaluate the PAH degradation percentages by the selected bacterial strains. The readings less than the negative control absorbance indicated the capability of the bacteria to degrade PAH, which indicates the reduction reaction of MB in the sample. This provides credence to the hypothesis that the isolates can degrade Naphthalene and Phenanthrene. The bacterial strains SRO3-R1, SRO3-R2 I, SRO2-R10, SS2-U3, SS2-U6, SS2-U7, and SS2-U9 were capable of degrading Naphthalene above 50.68% and SRO3-R2 I, SRO3-R2 II, SRO2-R8, SS2-U2, and SS3-U5 strains were able to degrade Phenanthrene more than 50.04%. The strain SS2-U9 with a population density of 2×10^{10} CFU/mL can degrade 62.97% of Naphthalene which was the highest percentage among the other bacterial strains that can degrade Naphthalene. The strains SRO3-R2 I and SRO3-R2 II were Phenanthrene degraders that pose 71.17% and 79.47% of degradation percentages respectively. The degradation percentages were achieved after seven days of incubation period of bacterial strains in Bacto Bushnell Haas broth which was supplemented with mentioned PAHs. A high bacterial population was detected in highly contaminated soil samples with PAHs. The bacterial strains that showed the highest PAH degradation percentage can efficiently degrade Naphthalene and Phenanthrene. Therefore, these bacteria can be used as potential biological agents to remediate PAHs like pollutants from contaminated environments.

Keywords: Bioremediation, Phenanthrene, Naphthalene, Pollution, Degradation percentage

PP-05

SUSTAINABLE DEVELOPMENT OF CHEMICAL FLOCCULANTS FOR ALGAE HARVESTING

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Abstract

Microalgae, ubiquitous in various ecological environments, which holds causes both detrimental and beneficial on humans. In harvesting microalgae, coagulation-flocculation followed by sedimentation emerges as the most efficient method. This study involves the preparation of three distinct flocculants, AmC1, AmC2, and AmC3, using coconut coir through amination. AmC1 was aminated through a mannich reaction, and AmC2 and AmC3 via a nucleophilic substitution with diethylamine and ethylenediamine, respectively. Each flocculant demonstrated ideal properties by settling microalgae at the bottom of the container without introducing any colour to the medium. Through the Kjeldahl method, the amination efficiency was revealed to be 0.59% for AmC1, 6.06% for AmC2, and 15.54% for AmC3. The harvesting efficiency, measured through optical density values, was reported as 41.50% for AmC1, 55.97% for AmC2, and 71.80% for AmC3. The dosage and pH were optimised for AmC3, which displayed the highest efficacy in harvesting and amination. At a concentration of 4.0 g/L, AmC3 exhibited a harvesting efficiency surpassing 70%, which increased to over 80% at a pH level of 2.0. Application of AmC3 resulted in a constant chemical oxygen demand (COD) value of 20 mg/L before and after treatment, signifying no added chemicals during treatment. Post-treatment, reduction of the biological oxygen demand (BOD) value from 20 g/L to 16 g/L indicated decreased microalgae content. This study provides an insight into developing an environmentally friendly microalgae harvesting method holding promise for diverse applications in environmental and industrial settings.

Keywords: Microalgae, Flocculant, Coconut coir, Mannich reaction, Amination

HEALTH SCIENCES & NUTRITION - POSTER

PP-06

PHYTOCHEMICAL SCREENING AND *IN VITRO* ANTIMICROBIAL ACTIVITY OF *Plectranthus hadiensis* AGAINST BACTERIA CAUSING GASTROINTESTINAL DISEASES

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Abstract

Phytomedicines offer potent antimicrobial agents against drug-resistant microorganisms, making them an alternative to antibiotics. This study aimed to detect the *in vitro* inhibition of gastrointestinal disease-causing microorganisms by *Plectranthus hadiensis* plant extracts and screen the phytochemical compounds. Crude plant extracts were obtained with maceration using Hexane, Dichloromethane (DCM), Ethyl acetate, Acetone and Methanol solvents separately. Antimicrobial activity of plant extracts (1mg mL^{-1}) was investigated by disk-diffusion method against *Klebsiella pneumoniae* (ATCC 1706), *Escherichia coli* (ATCC 25923), and *Enterococcus faecalis* (ATCC 2912). Zone Of Inhibition (ZOI) was measured, mean ZOI was calculated and interpreted based on CLSI zone dimeter breakpoints. DCM extract of *P. hadiensis*, showed remarkable *in vitro* antibacterial activity by suppressing *E. faecalis* with the highest mean ZOI (16.667±0.577 mm). Minimum inhibitory concentrations (MIC) of DCM extract from *P. hadiensis* were determined by microbroth dilution method. *P. hadiensis* showed MIC of 1<MIC>0.5 mg mL^{-1} for *K. pneumoniae*, 0.5<MIC>0.25 mg mL^{-1} for *E. coli*, and 0.25<MIC>0.125 mg mL^{-1} for *E. faecalis*. Preliminary phytochemical analysis revealed the presence of alkaloids and terpenoids in hexane extract; alkaloids, flavonoids and saponins in DCM extract; alkaloids, flavonoids, saponins and terpenoids in ethyl acetate extract; phenols, tannins and alkaloids in acetone extract; and phenols and tannins in methanol extract. DCM extract of *P. hadiensis* was subjected to GC–MS analysis to identify the likely compounds responsible for the antimicrobial properties; fourteen compounds in *P. hadiensis* with matching percentages of more than 90% and a percentage of a total of more than 0.5 were identified. The highest percentage of the total was observed as 3-Methyl-4-isopropylphenol (9.113%). DCM was established as the most effective solvent for solubilizing antimicrobial compounds from *P. hadiensis*. Identified compound characterization has led to the development of novel drugs aimed at addressing multidrug resistance in gastrointestinal disease-causing microorganisms.

Keywords: *Plectranthus hadiensis*, Drug-resistant, Antimicrobial activity, DCM extract, GC-MS analysis

PP-07

FACTORS ASSOCIATED WITH GLYCEMIC CONTROL AMONG THE PATIENTS WITH DIABETES MELLITUS ATTENDING PRIMARY CARE HOSPITALS IN GALLE DISTRICT OF SRI LANKA

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Abstract

Diabetes Mellitus (DM) is a chronic non-communicable disease, increasingly prevalent in middle and low-income countries. The prevalence of overall pre diabetes in both urban and rural communities of Sri Lanka was documented at 11.5% in the year 2006 and the estimated diabetes prevalence for Sri Lankan community in the year 2030 is anticipated as 13.9%. Moreover, one in five adults have diabetes or pre diabetes and one third with DM remain undiagnosed in Sri Lanka. Proper glycemic control is essential to reduce long term complications. Therefore, this study was conducted to determine the glycemic control and associated factors among the patients with DM attending primary care hospitals in Galle district. A descriptive cross-sectional study was conducted with 271 patients with DM. Five (out of the forty-five) primary care hospitals in Galle district were randomly selected. The degree of glycemic control was assessed using the average of three consecutive FPG values within 6 months. FPG levels less than or equal to 130mg/dl and greater than 70mg/dl were considered as indicative of good glycemic control. Descriptive statistics and Chi-square test were used for data analysis on SPSS version 25. Among the study participants, the mean age was 66.5 (SD ± 8.3) years and 245(90.4%) were females. The FPG level was within the normal range, indicating good glycemic control, in 157(57.9%) participants. A majority (n=242, 89.3%) also reported good overall patient treatment satisfaction. Patient treatment satisfaction, marital status, family history of DM, complications of DM, medication compliance, engagement in exercises and dietary modifications were significantly associated with glycemic control ($p < 0.05$). The findings emphasize the importance of patient treatment satisfaction, healthy lifestyle and medication compliance for good glycemic control. Therefore, at primary levels healthcare professionals should pay attention to encouraging healthy lifestyle practices and improving patient treatment satisfaction in order to maintain the patients' blood glucose levels in the ideal range.

Keywords: Diabetes mellitus, Degree of control, Patient satisfaction, Glycemic control, Primary health care

PP-08

ANALYSIS OF SELECTED VIRULENCE GENES IN *proteus mirabilis* CLINICAL ISOLATES

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Abstract

Proteus mirabilis is a common urinary tract pathogen (UTIs) and is often linked to catheter-associated UTIs. *UreC, MrpA, SpeA* and *RsbA* are specific virulence genes which play a role in the pathogenicity. Despite numerous studies on UTIs and *P.mirabilis* pathogenesis, there remains a gap in knowledge regarding the prevalence of specific virulence genes in *P. mirabilis* isolates in different clinical samples. This study aimed to address this gap by detecting the virulence genes in *P. mirabilis* isolated from different clinical samples (pus, urine, wound, blood). A total of 52 molecular confirmed biofilm forming *P. mirabilis* strains were used for the study. Biofilm formation was identified by using both MTT(3-[4,5-dimethylthiazol-2-yl]-2,5diphenyltetrazolium bromide) and Crystal violet assays. Out of them, 26 were isolated from urine specimens of patients while 13, 9 and 4 isolates were from pus, wound and blood specimens respectively. They were subjected to a polymerase chain reaction to determine the presence of selected biofilm forming virulence genes. Out of the 26 *P. mirabilis* strains isolated from urine, 24(92.30%) were positive for *UreC* and *MrpA;* while 25(96.15%) were positive for *SpeA* and *RsbA* genes. Among *P.mirabilis* isolated from samples other than urine, 26(100%), 23 (88.46%), 22(84.61%) and 24(92.30%) were positive for *UreC, SpeA, RsbA* and *MrpA* genes respectively. Out of the *P. mirabilis* isolated from urine and samples other than urine, 84.61% (22/26) and 73.07% (19/26) were positive for all four genes respectively. There was a significant difference between the proportion of *UreC* gene presence ($p< 0.001$) in *P.mirabilis* strains isolated from urine. A non-significant difference was found between the proportion of the *sepA*($p= 0.298$) and *rsbA*($p= 0.158$) genes' presence in these two groups. The differences in virulence genes' presence between strains from urine and samples other than urine indicate variations in the strains' pathogenic potential and behavior.

Keywords: *Proteus mirabilis*, virulence, genes, urine, biofilms

PP-09

IN-SILICO MODELLING OF SSDNA APTAMER AND MOLECULAR DOCKING ANALYSIS WITH HUMAN SERUM ALBUMIN

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Abstract

Systematic Evolution of Ligands by Exponential Enrichment (SELEX) is an established technology for generation of synthetic DNA/RNA molecules with high affinity and specificity against various targets including whole cells and isolated proteins. Termed "aptamers" these molecules serve as alternatives to antibodies in diagnostics and therapeutics in biomedical research. The ability of aptamers to be developed against almost any target, high thermal stability, relatively high resistance to both biological and chemical degradation, and low cost of production have brought aptamers to prominence as a molecular detector. While the conventional SELEX process is both time-consuming and labour-intensive, the use of computational methods including molecular docking and molecular modelling (MD) simulations have greatly improved the outcomes of SELEX enabling identification of high affinity binders. This study attempts to explore the use of both Next Generation Sequencing (NGS) and in silico molecular docking analysis to identify Human Serum Albumin (HSA) binding ssDNA aptamers in a local setting. Conventional SELEX with a microtiter plate-based approach was followed for eight cycles and the final enriched pool was subjected to NGS. The two most common sequences were selected, and their 3-D structure of the sequence were generated using the Builder GUI menu in PyMOL 2.5.4 (http://www.pymol.org). PDB files of the target HSA were downloaded from protein data base and aptamer-protein binding identified using ZDOCK server 1 and probable binding complexes were obtained with the ZDOCK score. Further, the probability of the sequences to be an aptamer was measured using the PPAI web server 2 and the prediction scores were calculated using the optimum threshold value of 0.44 to predict the true protein-aptamer pairs. The selected sequences yielded comparable ZDOCK scores while the probability of the selected sequences of being an aptamer was identified as 0.44 for each with PPAI server predicting the sequence as a probable albumin binding aptamer.

Keywords: Aptamer, DNA, SELEX, NGS, Insilco binding

PP-10

DETECTION OF *In Vitro* ANTIMICROBIAL ACTIVITY OF EXTRUDED FLOUR FORMULATIONS DEVELOPED FROM SELECTED LOCAL GRAIN VARIETIES IN SRI LANAKA USING AGAR DISC DIFFUSION METHOD

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Abstract

Grains are rich sources of nutrients, minerals as well as other functional compounds. There is an increasing trend to utilize composite flour technology in food industry to develop foods rich in health benefits. This study aims to qualitatively analyze the antimicrobial potential of an extruded composite flour mixture developed using local grain varieties in Sri Lanka including rice, mung bean, black gram and meneri together with cinnamon powder, sesame and black seeds. This composite flour formulation was prepared using two factor factorial design and the best formulations were selected based on sensorial and nutritional properties. The best extruded samples were screened for antimicrobial properties. Agar disc diffusion assay was conducted using 100mg/ml flour extracts to determine the antimicrobial activity against gram negative (*Klebsiella pneumoniae, Escherichia coli, Salmonella enteritidis, Pseudomonas aeruginosa, Proteus vulgaris*) and positive bacteria (*Staphylococcus aureus, Listeria sp, Enterococcus faecalis*). Ethanolic extracts showed a significant antibacterial activity ($P < 0.05$) against all tested bacterial strains when compared to the water extracts. The lowest antimicrobial effect of the ethanol extract was reported against *P. vulgaris* with inhibition zones ranging from 6.24±0.05 to 8.70±0.07 mm and that of water extract was reported against *E. coli* with a diameter of 6.30±0.07 mm. Further, both ethanol and water extracts showed the highest antimicrobial effect against *S. aureus* with average inhibition zones ranging from 8.22±0.08 to 10.24±0.05 mm and 8.18±0.08 to 9.16±0.05 mm respectively. In conclusion, out of all the four tested formulations, the flour mixture with the ingredient ratio, 50(RF): 30(GF): 10(BF): 35(MF): 5(sesame seeds): 1(black seeds): 0.1(cinnamon) in grams depicted the highest zones of inhibitions against the pathogenic bacteria used in the study. Thus, the selected best formulation can be promoted as a composite flour formulation containing significant antimicrobial potential.

Keywords: Grains, composite flour mixtures, disc diffusion assay, antimicrobial activity, pathogenic bacteria

PP-11

THE PREVALENCE OF PATERNAL POSTPARTUM DEPRESSION AND ITS ASSOCIATED FACTORS DURING THE IMMEDIATE POSTNATAL PERIOD AMONG FATHERS ATTENDING THE LACTATION MANAGEMENT CENTRE AT A SELECTED HOSPITAL IN SRI LANKA

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Abstract

Parenting is a crucial lifelong commitment involving nurturing, guiding, and safeguarding children. It involves children's well-being, development, and prospects. However, the arrival of a newborn can strain parental relationships, expectations, and role changes. Therefore, it may impact psychological distress. postpartum depression (PPD) is common during the immediate postpartum period. Hence, this study investigated the prevalence of PPD and associated factors among fathers attending the Lactation Management Centre, District General Hospital, Gampaha. A cross-sectional study was conducted employing simple random sampling. The study instrument included the validated Sinhala version of the Edinburgh Postnatal Depression Scale (EPDS), General Anxiety Disorder-GAD-7 Scale, Neonatal Feeding Questionnaire, and self-constructed questions. Data analysis was performed using SPSS version 25. Among the 210 sampled individuals, fathers (average age 30.14 years) exhibited varying levels of PPD (65.7% - negative (depression not likely), 24.3% -possible, 5.7% - fairly high, 4.3% - probable). However, maternal PPD is prevalent in an increased proportion compared to fathers (negative – 44.3%, possible – 24.3%, fairly high – 20%, probable – 11.4%). The chi-square test indicated a significant association between paternal PPD with maternal PPD ($\chi^2 = 130.57$, $p = 0.00$, < 0.05). The most (71.4%) of fathers had minimal anxiety, (25.7% -mild, 2.9% -moderate). Testing the association between paternal PPD and anxiety revealed a significant relationship ($\chi^2 = 192.027$, $p = 0.00$, < 0.05). In conclusion, this study reveals notable rates of paternal and maternal PPD. Paternal PPD is associated with maternal PPD, general anxiety disorders, unplanned pregnancies, perceived baby-related stress, lack of paternity leave, insufficient income, and marital attention. However, larger case-control studies are needed for confirmation. This underscores the importance of recognizing and addressing paternal PPD, often overshadowed by maternal PPD.

Keywords: Depression, maternal post-partum depression, paternal post-partum depression, general anxiety disorder, Edinburgh Postnatal Depression Scale

PP-12

PHYTOCHEMICAL SCREENING AND *IN VITRO* ANTIBACTERIAL ACTIVITY OF *Piper longum* AND *Piper sarmentosum* ETHANOLIC EXTRACTS: A STRATEGY FOR COMBATING RESPIRATORY AND SKIN INFECTIONS

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Abstract

Discovering novel antimicrobial agents is imperative for combating infectious diseases. *Piper sarmentosum* (PS) and *Piper longum* (PL) are potential medicinal plants used in herbal medicine to address respiratory and skin disorders. Despite their traditional use, limited studies have explored their antimicrobial potential in Sri Lanka. This study aims to control microorganisms causing respiratory and skin diseases through crude ethanolic extracts (CEE) of different parts of PL and PS against bacteria responsible for respiratory and skin infections. Initial antibacterial screening of 100 mg/ml CEE against *Staphylococcus aureus*, *Streptococcus pyogenes*, and *Pseudomonas aeruginosa* was performed using a disc diffusion assay, and the results were interpreted based on the mean of the zone of inhibition (ZOI). Furthermore, the minimum inhibitory concentration (MIC) was determined through the two-fold broth dilution method. The phytoconstituents of extracts were evaluated through phytochemical screening and gas chromatography-mass spectrometry (GC-MS) analysis. The highest antibacterial activity against *S. aureus*, *S. pyogenes*, and *P. aeruginosa* was observed in PS fruit extract (ZOI: 14.67 ± 0.58 mm), PS leaf extract (ZOI: 16.67 ± 0.58 mm), and PL leaf extract (ZOI: 11.33 ± 0.58 mm), respectively. Among different extracts, PS fruit, PS leaf, and PL leaf extracts showed MIC values of 12.50 mg/ml, 3.125 mg/ml, and 25.00 mg/ml against *S. aureus*, *S. pyogenes*, and *P. aeruginosa*, respectively. The phytochemical screening of ethanolic extracts revealed the presence of Alkaloids, Terpenoids, Phenolics, Flavonoids and Saponins in the fruit and leaf extracts of PS and PL. The GC-MS analysis revealed that Myristicin and β-Caryophyllene were the predominant active components in the fruit and leaf extracts of PS, while β-Pinene and 2-Undecanone were predominant in the PL leaf extracts. The study indicates that the fruit and leaf extracts of PS and PL are promising for the discovery of antimicrobial agents against respiratory and skin infectious microorganisms.

Keywords: *Piper longum*, *Piper sarmentosum*, Antibacterial activity, MIC, Phytochemicals

PP-13

Candida SPECIES CAUSING CANDIDEMIA IN CANCER PATIENTS IN SRI LANKA

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Abstract

Candidemia, also known as *Candida* bloodstream infection, is the most common form of invasive candidiasis. Cancer patients are often immunocompromised due to various reasons, making them prone to these types of fungal infections. The aim of the study was to identify *Candida* species causing candidemia in cancer patients using *Candida* isolates collected from Apeksha Hospital, Maharagama, Sri Lanka. Initially, DNA was extracted from *Candida* isolates grown in Sabouraud dextrose broth, and isolates were identified using PCR-RFLP method. Extracted DNA were amplified using ITS1 and ITS4 universal primers to amplify the ITS regions of *Candida* isolates. Then the PCR products were digested using *Msp*I restriction enzyme and restriction patterns were observed on agarose gels. ITS1 and ITS4 primers effectively amplified ITS regions of all *Candida* isolates and clear RFLP banding patterns were observed with the *Msp*I restriction enzyme. The *Candida tropicalis* (38%) was found to be the most prevalent species that cause candidemia of cancer patients in Sri Lanka, followed by *Candida parapsilosis* (31%), *Candida albicans* (13%), *Candida glabrata* (8%), and *Candida krusei* (4%), *Candida haemulonii* (4%), and *Candida intermedia* (2%). Findings unveiled the distribution and prevalence of *Candida* species that cause candidemia in cancer patients in Sri Lanka.

Keywords: Candidemia, *Candida*, cancer patients, PCR-RFLP, immunocompromised

PP-14

PERCEIVED STRESS AND PHYSICALACTIVITY LEVEL AMONG NURSING STUDENTS IN A SELECTED COLLEGE OF NURSING, SRI LANKA

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Abstract

Nursing students often experience heightened stress due to academic and clinical demands, potentially impacting their academic performance and overall well-being. Active involvement in physical activity is crucial for reducing stress and improving the overall well-being of these students. A descriptive cross-sectional study was conducted on 150 nursing students at College of Nursing Galle. Consecutive sampling method was used to draw the sample, Data collection was carried out using a standardized self-administered questionnaire. Perceived stress was measured on a validated Perceived Stress Scale (PSS), and a validated International Physical Activity Questionnaire (IPAQ) was used to measure physical activity levels. Statistical analysis (descriptive statistics and chi-square tests) was performed on SPSS version 25. Physical activity levels were assessed using IPAQ score, categorized as low (<600 MET-minutes/week), moderate (>600 to <3000 MET-minutes/week), or high (>3000 MET-minutes/week). PSS used to measure stress, with individual scores ranging from 0 to 40. Higher scores indicate higher perceived stress, categorized as low (0-13), moderate (14-26), or high (27-40). Among the participants, a majority (94.7%, n=142) were females and the mean BMI was 21±3.88. The mean level of perceived stress was 19.88 ± 3.05. The majority (97.3%, n=146) reported a moderate level of stress. The mean level of physical activity was 260.4 MET/minutes/week, with a majority (90%, n=135) indicating a low level of physical activity. An association was found between perceived stress and physical activity level, with a statistically significant relationship (p=0.009). These results underscore the need for addressing physical activity levels in individuals experiencing moderate stress due to its potential impact on overall well-being, and the importance of interventions aimed at promoting a more active lifestyle in this population.

Keywords: Perceived stress, physical activity, level, nursing, students

PP-15

DIGITAL EVOLUTION IN NURSING IN SRI LANKA: EVALUATING COMPUTER LITERACY AND DIGITAL HEALTH PRACTICES AMONG NURSES IN SELECTED STATE HOSPITALS

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Abstract

The rapid evolution of the healthcare landscape through digital technologies has ushered in a new era of nursing practice. Therefore, assessing the capacity of nurses to embrace the transformative power of digital health is essential. This study aimed to evaluate computer literacy and digital health practices to gain insight into their competence to harness the capabilities of digital systems in nursing practice. A descriptive cross-sectional study was conducted among 350 nurses in 13 hospitals including primary, secondary and tertiary care, utilizing a validated self-administered questionnaire consisting 12 constructs under two domains (i.e., computer literacy and digital health practice). The samples were selected through simple random sampling. Data were analyzed using descriptive statistics in SPSS version 25. The majority of participants (n=297, 85%) were female with a mean age of 32 $\pm$5.6 years. Among them, 70% (n=246,) had a basic nursing diploma and 70% (n=244) were Grade III nurses. More than half (n=211, 60%) reported average proficiency in English language, whereas only 31% (n=109) had followed IT/digital health training and 24% (n=85) were in-service programs. Almost all participants (97%, n=338) reported using digital health technologies and patient registration through digital devices (91%, n=318), and communication through digital methods (91%, n=319) was widespread among them. Importantly, 88% (n=308) expressed that they were competent in using basic components and peripheral devices of computers, 69%(n=243) in using the Internet and 65%(n=229) in using MS Office applications. However, only 38% (n=118) were competent in using e-mails while a similar portion was competent in using online platforms such as Zoom, Google Meet and Teams. In conclusion, the majority of participants incorporated digital health in their workplaces with various competence levels. Expanding training to enhance digital health competence while facilitating infrastructure in practice at the national and institutional levels is suggested to address noteworthy deficits.

Keywords: Digital Health, Nurses, Computer literacy, practice, competence

PP-16

PREDICTIVE FACTORS TOWARDS ATTITUDES ON FAMILY INVOLVEMENT IN NURSING CARE: COMPARISON BETWEEN STUDENT NURSES OF TWO SELECTED SCHOOLS OF NURSING AND TRAUMA INTENSIVE CARE NURSES OF SELECTED TEACHING HOSPITAL IN WESTERN PROVINCE SRI LANKA

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Abstract

Family involvement is a vital component of patient-centered care. This descriptive cross-sectional study aimed to compare the predictive factors towards the attitudes of family involvement in care, between second-year Student Nurses (SNs) in two selected Schools of Nursing (SON) and Trauma Intensive Care Nurses (TICNs) in a selected Teaching Hospital in Sri Lanka. SNs (n = 533) from SON Kalutara and SON Colombo and TICNs (n=167) from Trauma ICU and ETU at National Hospital Sri Lanka were selected through convenience sampling method. A Families' Importance in Nursing Care – Nurses' Attitudes (FINC-NA) scale, which includes four dimensions - family as a conversational partner (Fam-CP), a coping resource (Fam- OR), a resource in nursing care (Fam -RNC), and a burden (Fam-B) - was used to collect data. Descriptive and inferential statistical analyses were performed. It was found that TICNs and SNs have similar positive attitudes toward family involvement in nursing care. Fam- CP significantly differed for male and female students ($t = -2.06$, $p=0.04$): female SNs have a higher positive attitude towards Fam-CP (M=31.06, SD =3.76) than male SNs (M 29.77, SD = 3.77). According to the linear regression model, among SNs, gender ($\beta = 3.67$, $t = 2.22$, $p < 0.03$) and the study setting ($\beta = -2.93$, $t = -3.45$, $p < 0.001$) impact on the attitude. Among TICNs, age, educational level, work setting and work experience presented a significant effect, though there was none by gender, on the attitude towards family involvement in nursing care. Cultural and regional influences on the nurses' attitudes towards family involvement are still researchable. Further research is needed on this phenomenon.

Keywords: Attitude; Family Involvement; Nursing care; Predictive factors; Sri Lanka

PP-17

KNOWLEDGE, ATTITUDES, AND ADHERENCE TO PREVENTIVE MEASURES OF ACCIDENTAL INJURIES AMONG PARENTS OF CHILDREN ADMITTED TO A SELECTED HOSPITAL IN SRI LANKA

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Abstract

Accidental injury is the leading cause of domestic child mortality and permanent impairment globally. Childhood injury is the fourth leading cause of death among children under the age of five in Sri Lanka and many of these incidences are due to not placing a high value on the use of kid protection devices by the parents. However, most of these accidents are avoidable. Hence, this study aimed to assess parental knowledge, attitudes, and adherence to childhood accidental injury preventive measures. A descriptive cross-sectional study was conducted among 382 parents whose children aged less than fourteen years were admitted to the Embilipitiya District General Hospital, Sri Lanka due to home injuries. Investigator administered pretested questionnaire consist of four sections on socio-demographic data, 09 statements on parental knowledge, 10 statements on attitudes, and 15 statements on adherence to preventive measures, was administered to the study participants. Parents' knowledge on unintentional injury prevention measures for children under 14, approximately was 63.3%. A high percentage (67%) of parents displayed a positive attitude. was However, when putting these preventive measures into practice, half (50%) of the parents showed relatively lower adherence to preventive measures. The study revealed that while parents had a good knowledge and positive attitudes on injury prevention. A gap existed in transforming the knowledge and attitudes into action, evident by low adherence scores. To promote and establish safer environments for children, it is vital to bridge the gap between parents' understanding and commitment to undertake accidental injury preventive methods. To this end, educational programs and campaigns to raise parent awareness and practices are recommended.

Keywords: Parents' knowledge, Attitudes, Adherence, Accidental injuries, Preventive measures

PP-18

METFORMIN AS A POTENTIAL ANTI-CANCER AGENT IN BREAST CANCER: LETHALITY AND *In Vitro* STUDY

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Abstract

Metformin (MET) is the most commonly used antihyperglycemic drug globally. Emerging interest in repurposing this common medication as an anticancer therapeutic is observed due to its induced apoptosis, arrest of the cell cycle, inhibition of cell proliferation and metastasis, changes in cell environment, etc. The current study is designed to identify the effects of MET using a brine shrimp lethality assay and cell viability on two breast cancer cell lines namely triple-negative MDA-MB-231 and hormone receptors positive MCF7 cells. The brine shrimp assay was performed to analyse the lethality dose (LD_{50}) of MET using concentrations 0.018-1 x 10^{-3} mol dm^{-3} with respect to the serum levels. The MDA-MB-231 and MCF7 cells were treated with MET (5-320 x 10^{-3} mol dm^{-3}) to assess the cell viability in 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay. The half-maximal inhibitory concentrations (IC_{50}) of MET for each cell line were calculated. In the brine shrimp lethality assay, significant cytotoxicity was not observed after 24 hours of incubation, however, median LD_{50} was 1.2 x 10^{-3} mol dm^{-3} and 0.9 x 10^{-3} mol dm^{-3} for 48 hours and 72 hours of incubation respectively. The LD_{50} values were more than 200 times that of the pharmacologically active serum level. The IC_{50} for MDA-MB-231 and MCF7 cell lines were 123 x 10^{-3} mol dm^{-3} and 133 x 10^{-3} mol dm^{-3} respectively within 24 hours of incubation. MET was more cytotoxic to MDA-MB-231 cells than MCF7 cells *in vitro.* Therefore, MET exerts promising cytotoxic effects against breast cancer cells *in vitro* but at comparatively higher concentrations than therapeutic doses as an anti-hyperglycaemic. This might be due to the impact of MET on cellular glucose levels and the metabolic changes it exerts on breast cancer cells. However, further studies are needed to confirm its potential mechanisms of action on breast carcinomas.

Keywords: Breast cancer, Metformin, Lethality, *In vitro*, *Anti-cancer agents*

PP-19

SCREENING FOR PROHIBITED SUBSTANCES IN SPORTS, IN SHWASAKUTARA RASA AYURVEDIC MEDICINE

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Abstract

Shwasakutara Rasa, a reputed herb mineral formulation of Ayurveda is usually prescribed as a treatment for respiratory diseases such as bronchiole asthma, lung problems, COVID-19 and to control the symptoms of dyspnoea, cough and to increase vital capacity. Thus, Shwasakutara Rasa has shown therapeutic effects similar to those of stimulants, beta -2 agonists and glucocorticoids in Western medicine. Some stimulants, all kinds of beta -2 agonists, and glucocorticoids have been included in the prohibited list of substances and methods published by the World Anti-Doping Agency. In Ayurvedic medicine, the contents are given only by the name of the plant material in their drugs, whereas in Western medicine, the contents or ingredients are provided by the names of the substances contained in their drugs. Therefore, screening of ayurvedic medicine for the presence of aforementioned substances is vital to prevent inadvertent doping in sports. This study was conducted to determine the presence of stimulants banned by the World Anti-Doping Agency (WADA) in the Shwasakutara Rasa ayurvedic medicine available in Sri Lanka. Three brands of Shwasakutara Rasa ayurvedic medicine were selected for the qualitative analysis of nine different stimulants including Amphetamine $C_9H_{13}N$, Benzylpiperazine $C_{11}H_{16}N_2$, Cathine C_9H_{13}, NO, Cocaine $C_{17}H_2NO_4$, Ethylamphetamine $C_{10}H_{15}N$, Fenproporex $C_{12}H_{16}N_2$, Hydroxyamphetamine $C_9H_{14}NO^+$, Methylendioxymethamphetamine $C_{11}H_{15}NO_2$, Methylephedrine $C_{11}H_{12}NO$. The qualitative analysis was conducted for, nine samples of Shwasakutara Rasa medicine, by using the Gas Chromatography Mass Spectrometry method. The qualitative analysis revealed that the selected stimulants banned by the World Anti-Doping Agency were not present in the tested Shwasakutara Rasa samples.

Keywords: Ayurveda, Doping, Gas Chromatography-Mass Spectrometry, Prohibited Substances in Sports, Respiratory Disorders

PP-20

CYTOTOXIC EFFECT OF GLYPHOSATE ON VERO KIDNEY CELLS: *In-vitro* EVALUATION OF NEPHROTOXICITY USING MTT ASSAY

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Abstract

Glyphosate, an organophosphorus substance, is used as a pesticide to eradicate weeds from grasses and broadleaf plants. The surface water bodies such as lakes and ponds have a slight vulnerability to photodecomposition of glyphosate. Hence, glyphosate enters the bodies of humans and animals through drinking water and eliminates from the body through urine and faeces in approximately three weeks. Furthermore, potential nephrotoxic effects of glyphosate in the body have been recorded. Vero kidney cells are widely used to test for nephrotoxicity and 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) (MTT) assay is the cytotoxicity assay which measures cell metabolic activity. The present study aimed to determine the nephrotoxic effect of glyphosate on Vero cells using MTT assay. Two commercially available glyphosate samples were used in the study. Sample number 1 was in solid form while the sample 2 was in liquid form. Four dilution series in each considering the detection in environment (0.1, 3.0, 5.0, and 10.0 mg/L) were exposed to Vero; monkey kidney epithelial cells ($5x10^3$ cells/well). Cell viability was measured using MTT assay and the cell viability percentage and the CC_{50} values were calculated. According to the results, the cell viability percentages in the cells exposed to sample 1 and 2 ranged from 68.14% to 10.73% and 75.95% to 11.66% respectively, indicating a higher effect in high concentrations. Significantly lower cell viability percentages were recorded in the cells exposed to glyphosate samples than in the cells exposed to the control ($p<0.05$). The CC_{50} values recorded for samples 1 and 2 were 1.16 mg/L and 1.74 mg/L respectively, indicating the greater effect of sample 1. Hence, the present study indicates that high concentrations of glyphosate in water may reduce cell viability and cause nephrotoxicity directly. However, further studies are needed to confirm the nephrotoxic effects of glyphosate in water.

Keywords: Glyphosate, MTT assay, nephrotoxicity, Vero cells, cytotoxic effects

HUMANITIES & SOCIAL SCIENCES - POSTER

PP-21

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සමරිසි ප්‍රජාව යනු, එක ම ලිංගික දිශානතියක් සහිත පුද්ගලයන් එකිනෙකා ලිංගික වශයෙන් ආකර්ෂණය වී, ආදර සම්බන්ධතා ඇති කරගනු ලබන පිරිසකි. සමරිසි පිරිමි සහ සමරිසි කාන්තා ලෙස ප්‍රධාන කොටස් ද්විත්වයක් ද හඳුනාගත හැක. ගෘහස්ථ ප්‍රචණ්ඩත්වය යනු යම් පුද්ගලයෙකු , තමාගේ පවුලේ සාමාජිකයන්ගෙන් හෝ තම සමීපතම පුද්ගලයන්ගෙන් යම්කිසි ගෘහස්ථ පරිසරයක දී වින්දිතභාවයට පත්වීම ලෙස හඳුනාගත හැක. ඒ අනුව සමරිසි ප්‍රජාව මුහුණ දෙන ගෘහස්ථ ප්‍රචණ්ඩත්වය හඳුනාගැනීම මෙහි ප්‍රධාන අරමුණ වී තිබේ. පර්යේෂණයට අදාළ උපඅරමුණු ලෙස සමරිසි පුද්ගලයින් මුහුණ දෙන ගෘහස්ථ ප්‍රචණ්ඩත්වයේ ස්වරූපයන් හඳුනාගැනීම, සමරිසි පුද්ගලයින් ගෘහස්ථ ප්‍රචණ්ඩත්වයට ලක්වීම කෙරෙහි බලපාන හේතු සාධක පිළිබඳ ව අවධානය යොමු කිරීම, සමරිසි ප්‍රජාව ගෘහස්ථ ප්‍රචණ්ඩත්වයෙන් වින්දිතභාවයට පත්වීම සහ ඊට එරෙහි ව එම පිරිස් දක්වන ප්‍රතිචාර පිළිබඳ ව සොයා බැලීම ආදිය පෙන්වා දිය හැක. පර්යේෂණයට අදාළ ව කොළඹ දිස්ත්‍රික්කය පාදක කරගනිමින් හිමබෝල නියැදීමේ ක්‍රමවේදය යටතේ දත්ත දායකයින් 31 දෙනෙකුගෙන් දත්ත ලබා ගැනීමට හැකි විය. විවෘත ස්වරූපයේ ප්‍රශ්න වෙත වැඩි අවධානයක් දෙමින් සකසන ලද මාර්ගගත වින්දිත සමීක්ෂණයක් මඟින් පර්යේෂණයට අදාළ ව දත්ත ලබාගැනීම සිදු කළ අතර, අපරාධවිද්‍යාත්මක දෘෂ්ටිකෝණයෙන් සහ සමාජවිද්‍යාත්මක දෘෂ්ටිකෝණය මත පදනම් වූ ගුණාත්මක දත්ත විශ්ලේෂණ ක්‍රමවේදය මගින් දත්ත විශ්ලේෂණය සිදු කරන ලදි. මෙම පර්යේෂණයේ ප්‍රධාන සොයාගැනීම් ලෙස කොළඹ දිස්ත්‍රික්කය තුළ වෙසෙන සමරිසි කාන්තා සහ සමරිසි පිරිමි ප්‍රජාව ගෘහස්ථ ප්‍රචණ්ඩත්වයට මුහුණ දෙන බව ප්‍රධාන වශයෙන්ම හඳුනාගැනීමට හැකි වූ අතර, සමස්ත දත්ත දායකයන්ගෙන් 90% මානසික හිංසනය යටතේ ද, 32% කායික හිංසනය යටතේ ද, 19% ලිංගික හිංසනය යටතේ ද ගෘහස්ථ ප්‍රචණ්ඩත්වය හමුවේ වින්දිතභාවයට පත් ව තිබෙන බව හඳුනාගැනීමට හැකි විය. නිවස තුළ පමණක් නොව බෝඩිම් කාමර, පාසල් පද්ධතිය, ඥාතීන්ගේ නිවාස වැනි ගෘහස්ථ පරිසර තත්ත්වයන් තුළ දී ද මෙම සමරිසි පිරිස් ගෘහස්ථ ප්‍රචණ්ඩත්වයට පත්වන බවත්, එහි දී සමීප සහකරුවන්, සමලිංගික හිතිකාවෙන් පෙළෙන පුද්ගලයින්, සමරිසි ප්‍රජාව සම්බන්ධයෙන් අල්ප දැනුමක් සහිත පුද්ගලයින් ආදි පිරිස් වෙතින් මෙම සමරිසි ප්‍රජාව වැඩි වශයෙන් ගෘහස්ථ හිංසනයෙන් වින්දිතභාවයට පත්වන බව හඳුනාගැනීමට හැකි විය. ගෘහස්ථ ප්‍රචණ්ඩත්වයට එරෙහි ව මෙම පර්යේෂණයට පාදක කරගත් කිසිදු දත්ත දායකයෙකු පොලිසියට පැමිණිලි කිරීම හෝ එවැනි නීතිමය ක්‍රියාමාර්ගයකට අවතීර්ණ වී නො තිබුණු අතර ඊට ප්‍රධාන හේතු සාධක වශයෙන් පොලිසියට පැමිණිලි කිරීමට යාමේ දී සමලිංගිකත්වය විහිළුවට ගනිමින් ඔවුන් ව පහත්කොට තැකීම ආදි විවිධ අපහසුතාවන්ට මුහුණ දීමට සිදු වීමත්, පුනර්වින්දිතභාවයට පත් වීමත්, සමීප සහකරුවන්ගේ බලහත්කාරය පැමත් ආදි ප්‍රධාන සාධක දත්තදායකයන් පෙන්වා දී තිබිණි. සමරිසි ප්‍රජාව සම්බන්ධයෙන් සමාජයේ පවතින අනවබෝධය, සමලිංගිකත්වය යනු මානසික ව්‍යාධිමය තත්ත්වයක්, සමලිංගික වීම පාපකර්මයක් වැනි සමරිසි ප්‍රජාව සම්බන්ධයෙන් පවුල තුළ පවතින විවිධ මිථ්‍යා මත, සමලිංගික හිතිකාව (යදපදචයදඉස්), සමරිසි ප්‍රජාව සම්බන්ධයෙන් ශ්‍රී ලංකාව තුළ ක්‍රියාත්මක වන නීති පිළිබඳ ව සමරිසි ප්‍රජාවගේ අඩු අවබෝධය වැනි තත්ත්වයන් ප්‍රධාන වශයෙන් සමරිසි පිරිස් ගෘහස්ථ ප්‍රචණ්ඩත්වයට ලක් වීම සඳහා හේතු පාදක වන බව හඳුනාගැනීමට හැකි විය. සමරිසි ප්‍රජාව සමාජයට හඳුන්වාදීමට සහ සමලිංගික හිතිකාව තුරන් කිරීමට සමාජ දැනුවත් කිරීමේ වැඩසටහන් සංවිධානය කිරීම, සමලිංගික පුද්ගලයන් පිළිබඳව ඔවුන්ගේ පවුල් තුළ තිබෙන සෘණාත්මක ආකල්පයන් ධනාත්මක කිරීමේ පවුල් උපදේශන වැඩසටහන් සංවිධානය කිරීම, සමරිසි ප්‍රජාව වින්දිතභාවයට පත්වන ගෘහස්ථ හිංසනයන් වාර්තා කිරීමට ජංගම දූරකථන ආශ්‍රිත මෘදුකාංගයක් (ඵදඉසකැ ්චචකසජ්එසදබ* හඳුන්වාදීම යන ප්‍රධාන නිර්දේශයන් ද මෙම පර්යේෂණය ආශ්‍රයෙන් ඉදිරිපත් කොට තිබේ.

මුඛ්‍ය පදඃ ගෘහස්ථ ප්‍රචණ්ඩත්වය, මානව හිමිකම් උල්ලංඝණය, වින්දිතභාවය, සමරිසි පිරිස්

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A PSYCHOLOGICAL INVESTIGATION IN TO THE IMPACT OF SINHALA-VOICED CARTOONS ON THE MINDS OF CHILDREN (WITH REFERENCE TO THE NIKAWARATIYA EDUCATION DIVISION'S HALAMBE JUNIOR HIGH SCHOOL AND THE ANAMADUWA EDUCATION DIVISION'S ANAMADUWA KANNANGARA MODEL JUNIOR HIGH SCHOOL)

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Abstract

A psychological investigation in to the impact of Sinhala-voiced cartoons on the mindsof children (with reference to the Nikawaratiya Education Division's Halabe Junior High School and the Anamaduwa Education Division's Anamaduwa Kannangara Model Junior High School) Children are the nucleus of society. Child development includes physical development as well asintellectual, linguistic, emotional and social development. The report of a survey conducted by UNESCO on the motherhood of children around the world called World Media Violence reveals that children around the world spend most of their free time watching cartoons on television. Accordingly, it is evident that they spend most of their daily life with television. Cartoon can be recognized as a highly creative medium of expression. The reason that led me to this research was the effect of Sinhala voiced cartoons on television on children. To inquire. Research problem: How do cartoons with Sinhala voices affect children's minds? The primary objective isto study in addition, how much time are children exposed to television, and what are the reasonswhy children are drawn to cartoons? Defining what is meant by the "mental influence" of cartoons and how it is measured would enhance the clarity of the study. Etc. are sub-objectivesof this. Considering the importance of the study, what are the new ideas that have influenced the proliferation of cartoons that have created many social networks in the modern era? It is important to understand and take measures to overcome them. It is of interdisciplinary importance as child psychology studies the child's mind. A sample of 100 children was selectedfrom the two schools Halamba Junior College and Anamaduwa Kannangara Model Junior College and this research was conducted with the support of parents and teachers. This confirmed that cartoons has some kind of influence on the child's mind. It has been seen to happen both positively and negatively. It can be pointed out as suggestions to provide the opportunity for the child to visit the cages under the supervision of the parents, and to pay constant attention to the child.

Keywords: cartoon eyed, cartoons, child mind, kid

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ඡායාරූප ශිල්පය තුළ චලනය හැඟවීම පිණිස වන හෙන්රි රාජකරුණාගේ නව ශිල්ප ක්‍රමය (**Dance in a Trance** ඡායාරූප එකතුව පදනම් කොටගත් විමර්ශනයකි)

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ජනලේඛන හා සංඛ්‍යාලේඛන දෙපාර්තමේන්තුව, ශ්‍රී ලංකාව
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සාරසංක්ෂේපය

කලාව යන්න මානව ශිෂ්ටාචාරයේ එක් දෘශ්‍යමාන පරාමිතියකි. නිසල කලා ලෙස හැඳින්වෙන චිත්‍ර, මූර්ති, ස්ථාපන, ඡායාරූප යන මාධ්‍යවල චලනය, වේගය, ශබ්දය බඳු සප්‍රාණික අත්විඳීම් ඉදිරිපත් කළ නොහැකි බව බොහෝ දෙනා අතර ප්‍රචලිත මතයකි. එහෙත් එකී මාධ්‍ය ව්‍යවහාරයන් විමසන කල පෙනී යන්නේ, භෞතික වශයෙන් නුවූව ද ප්‍රකාශනාත්මක වශයෙන් එකී කරුණු සන්නිවේදනය පිණිස ඊට අනන්‍ය වූ මාධ්‍ය ව්‍යාකරණ භාවිත කරන බව යි. චලනය පිළිබඳ අදහස ප්‍රකාශ කරලීම පිණිස භාවිත උපක්‍රම 06ක් නිශ්චල ඡායාරූපකරණයේ ප්‍රකාශනාත්මක ලක්ෂණ විමසා බලන විට හඳුනාගත හැකි ය. මෙම උපක්‍රම පෙර පැවති ප්‍රතිසම අවධියේ ¦ බ්කදට ැර්* පටන් නූතන අංකිත යුගය ඃසටසඒක ැර්* දක්වා මහත් පරිශ්‍රමයකින් ක්‍රියාවට නැඟී ඇති බවට නිදර්ශන හමුවේ. මෙහි දී සම්මානනීය ඡායාරූප කලාවේදී හෙන්රි රාජකරුණා චලනය පිළිබඳ දෘශ්‍ය ප්‍රකාශනය අර්ථ ගැන්වීමට හඳුන්වා දුන් ඡායාරූප උපක්‍රමය කුමක් ද? යන්න විමසා බැලීම අධ්‍යයනයේ අරමුණ වන අතර, එකී භාවිතය ඡායාරූප ශිල්පයේ සෙසු ව්‍යවහාරයන්ට අනුගත කළ හැකි ද? යන්න මෙහි පර්යේෂණ ගැටලුව වේ. චලනය පෙන්නුම් කිරීම සඳහා නිශ්චල ඡායාරූප තාක්ෂණය තුළ අතීතයේ පටන් මෙතෙක් භාවිත කෙරුණු උපාය උපක්‍රම හෙන්රි රාජකරුණාගේ ඡායාරූප ශිල්ප ක්‍රමවේදයෙහි භාවිත වන්නේ ද යන්න අන්තර්ගත විෂය විශ්ලේෂණයට ලක් කිරීම මෙහි පර්යේෂණ ක්‍රමවේදය යි. රාජකරුණාගේ හඳුන්වාදීම් අංකිත ඡායාරූප තාක්ෂණවේදයේ සංස්කරණ ක්‍රියාදාමය මත රඳා පවතින නමුදු එය විශේෂිත රූපගත කරන විධික්‍රමයක් මත පදනම් වූවකි. මෙම ක්‍රමයේ දී එක් නිමේෂයක අනාවරණය කරන ඡායාරූප දෙක බැගින් සංස්කරණය සඳහා අවශ්‍ය වන හෙයින් මෙකී කාර්යය ඡායාරූප වෘත්තිකයන්ට හා වෘත්තීය ආම්පන්නවලට සීමා වේ. එහෙයින් මෙය සොබාදහම්, ප්‍රවෘත්ති, වාර්තා යන ඡායාරූප ශානර සඳහා භාවිත කළ නොහැකි වේ. ඡායාරූප ශිල්පයේ අනෙකුත් ව්‍යවහාරයන්හි ඇති සරල කාර්යක්ෂම බව රූගතකරණයේ දී හා පිළිබිඹු සංස්කරණයේ දී මෙම ක්‍රමවේදය තුළ නොපවතින බැවින් මෙය ඡායාරූප කලාවට හා ඡායාරූප ශිල්පයේ පර්යේෂණ අවකාශයට පමණක් සීමා වන බව නිගමනය කෙරිණි.

ප්‍රමුඛ පද: අංකිත යුගය, නිසල කලාව, පිළිබිඹු සංස්කරණය, ප්‍රතිසම යුගය, හෙන්රි රාජකරුණා

PP-24

PRIVATE ENGLISH TUTORS' PERCEPTIONS ON THE FAILURES OF GOVERNMENT SCHOOL ESL LEARNERS IN SRI LANKA

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Abstract

In government schools, there is a considerable gap between the expected outcomes of English as a Second Language (ESL) learners and students' actual English proficiency levels. It is obvious that there are failures in English language teaching approaches in schools. As private English tutors are also engaging in English teaching-learning process, it is crucial to consider their perceptions on failures of government school ESL learners in Sri Lanka. Therefore, the objective of this study is to find out the perceptions of private English tutors regarding the failures of government school ESL learners in Sri Lanka. For this qualitative study, perspectives of English tutors from various cities like Ratnapura, Panadura, Kalawana, Matara, Galle, Kundasale, Welimada etc. were obtained through semi-structured virtual interviews and journal articles were the secondary data collection method. According to the findings, a variety of stakeholders, including teachers, students and the schools as institutes is responsible for the failures of ESL learners. Some of the reasons for those failures include less individual attention provided to students, students' and teachers' prejudices that English is difficult for students, embarrassments students experience throughout the years they are schooling, frequent teacher turnovers, teachers' reluctance to showcase their fluency for the benefit of the students and less use of audio-visual aids. Furthermore, the textbooks neither teach grammar systematically and sufficiently nor cover all four language skills equally, although teachers are compelled to cover the given textbooks. These findings may be crucial for the development of the English education system in the government schools in Sri Lanka.

Keywords: English as a Second Language (ESL), Private Tutors, Teaching-learning process

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නූතන ජීවන රටා හමුවේ ගුවන්විදුලි ශ්‍රාවක චර්යාව

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ජනලේඛන හා සංඛ්‍යාලේඛන දෙපාර්තමේන්තුව, ශ්‍රී ලංකාව
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සන්නිවේදන මාධ්‍ය අතර හඬ මූලික කරගත් මාධ්‍යය ගුවන්විදුලිය යි. ශ්‍රාවක චර්යාව ඉලක්ක කොටගෙන බිහිවූ ගුවන්විදුලියේ සාම්ප්‍රදායික හැඩහුරුව යටපත් ව වර්තමානයේ එය නවීන තාක්ෂණික ක්‍රමවලට අනුගත ව ගොඩනැගී ඇත. ඒ අනුව සාම්ප්‍රදායික ගුවන්විදුලි ලක්ෂණ අබිබවා යමින් නූතන ගුවන්විදුලි ශ්‍රාවක චර්යාව ද මෙකී තාක්ෂණික විපර්යාසයට ලක් වී ඇත. තාක්ෂණය සමඟ යාවත්කාලීන වන ගුවන්විදුලියේ ශ්‍රාවක චර්යාව කෙබඳු ද යන්න විමසා බැලීම මෙම පර්යේෂණයේ අරමුණ යි. නූතන ජීවන රටා හමුවේ ගුවන්විදුලි ශ්‍රාවක චර්යාවේ සිදු වී ඇති වෙනස්කම් මොනවා ද? යන්න හඳුනාගැනීම මෙහි පර්යේෂණ ගැටලුව යි. මෙහි දී ජීවත් වන ප්‍රදේශය, වයස, ස්ත්‍රී-පුරුෂ ගතිකත්වය යන විචල්‍ය මත පදනම් ව අහඹු ලෙස තෝරාගත් ග්‍රාහකයන් 200ක් වෙත ඉදිරිපත් කරන ලද ප්‍රශ්නාවලියක් මඟින් දත්ත ඒකරාශීකරණය කෙරිණි. මෙහි දී සිංහල මාධ්‍ය ගුවන්විදුලි ශ්‍රාවකයන් පමණක් ඉලක්ක කොටගෙන ඇති අතර එකී ග්‍රාහකයන්ගෙන් ලද දත්ත ඉහත විචල්‍ය සමඟ වෙන් වෙන් ව විශ්ලේෂණය කොට තරගකාරී මාධ්‍ය ක්‍රියාකාරීත්වයක් හමුවේ තවදුරටත් ගුවන්විදුලියට සවන්දීම සඳහා රුචිකත්වයක් දක්වන ශ්‍රාවක චර්යාවක් හඳුනාගත හැකි විය. නූතන ගුවන්විදුලි පරිශීලකයන් කාර්යබහුල සමාජ අවකාශයක සිට එදිනෙදා කාර්යයන්හි යෙදෙමින් ගුවන්විදුලියට සවන්දෙන බවත්, මෙකී පරිශීලකයන්ගෙන් බහුතරය ගුවන්විදුලි ප්‍රවෘත්ති සහ සංගීතමය වැඩසටහන් ශ්‍රවණය කෙරෙහි වැඩි නැඹුරුතාවක් දක්වන බවත් හඳුනාගත හැකි විය. ග්‍රාහකයන් ලබා දී ඇති දත්ත මත පදනම් ව ඔවුන් සමීප ව ඇසුරු කරන මාධ්‍ය අනුපිළිවෙළ සමාජ මාධ්‍ය, රූපවාහිනිය, ගුවන්විදුලිය සහ පුවත්පත වන අතර, සමස්තයක් ලෙස ගුවන්විදුලිය අබිබවා සමාජ මාධ්‍ය නූතන ග්‍රාහක චර්යාව කෙරෙහි ප්‍රබල බලපෑමක් සිදු කර ඇති ආකාරය තහවුරු විය. එහි දී ගුවන්විදුලියට ප්‍රවේශ වීම සඳහා ගුවන්විදුලි යන්ත්‍ර භාවිතයේ අවම අගයක් සටහන් කර ඇති අතර, ජංගම දූරකථන යෙදවුම් ඒදඉසකැ ්චච* සහ අන්තර්ජාල ප්‍රමුඛ සමාජ මාධ්‍යයේ ඉහළ අගයක් සටහන් කර තිබුණි. එසේ ම තොරතුරු දැන ගැනීම සහ විඳදනය ඉලක්ක කොටගත් ශ්‍රාවක පරාසයක ක්‍රියාකාරීත්වය ද නූතන ගුවන්විදුලි මාධ්‍යය තුළ හඳුනාගත හැකි විය.

ප්‍රමුඛ පද: ගුවන්විදුලිය, ශ්‍රාවක චර්යාව, ගුවන්විදුලි ප්‍රවෘත්ති, සංගීතමය වැඩසටහන්, සමාජ මාධ්‍ය

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IDENTIFICATION OF THE MODEL OF VOCATIONAL YOUTH WORK IN PRACTICE IN SRI LANKA

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Abstract

Vocational Youth work offers programmes to young people who need help in developing life and work skills, not only to become self-sufficient in their own communities, but also to become a human capital resource that can be called upon to modernise local economies and take them onto the next level of development expeditiously. The primary objective of the study is to examine the nature of vocational youth work practice in the practical context of Sri Lanka and identify the conclusive or incorporated youth work models in practice. There has been less previous evidence for studies which explore the local vocational youth work domain. In order to fulfil the study objective, the study utilizes a purposive sampling method with special reference to Gampaha district sectarist division (DSD). Vocational youth work practices within the Gampaha DSD were identified via the primary data collected through interviews and the secondary data extracted from documents and records. Semi-structured interviews were conducted with government officers and volunteer youth workers who practice within the Gampaha DSD. The results confirm that they follow standardized practices when offering career guidance and counselling services under the provision of vocational youth. Government officers and volunteer social workers act as professional youth workers when delivering these programmes to the youth community within the district. It was identified that the internationally recognized standards of the CASVE cycle of career counselling is the main theoretical concept utilized when delivering career counselling services. A further novel finding is that vocational youth work performed through the government institutions can be identified as a practice of 'Non- Radical Advocacy model' of youth work. The non-radical model posits that youth community lack the skills to manoeuvre through bureaucratic barriers to access opportunities and information, therefore, this model proposes strategies to provide general advice and support for young people.

Keywords: Vocational youth work, Non-Radical Advocacy Model, youth work practice, career guidance, career counselling

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ශ්‍රී ලංකාවේ බෞද්ධ ප්‍රබෝධයට දායක වූ මොහොට්ටිවත්තේ ශ්‍රී ගුණානන්ද හිමි

ඉන්ද්‍රානි ආර්.කේ.එම්.ටී.

ඉතිහාස හා පුරාවිද්‍යා අධ්‍යයනාංශය මානවශාස්ත්‍ර හා සමාජීයවිද්‍යා පීඨය,
ශ්‍රී ජයවර්ධනපුර විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව
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සාරසංක්ෂේපය

ශ්‍රී ලාංකේය සිංහල බෞද්ධයන් අතින් ගිලිහී ගිය ආගමික උරුමය නැවතත් ප්‍රකෘතිමත් කර ගැනීම සඳහා ගිහි පැවිදි බෞද්ධයන් සංවිධානය කළ ව්‍යාපාරය ජාතික බෞද්ධ පුනර්ජීවන ව්‍යාපාරය ලෙස හඳුන්වා දිය හැකිය. පැරණි ශ්‍රී ලාංකේය සමාජය බුදු දහමින් පෝෂිත වූ බැවින් රාජ්‍ය හා ආගම අතර දැඩි සබැඳියාවක් තිබුණු බව පෙනේ. යුරෝපීයන්ගේ ආගමනයත් සමඟ ලාංකිකයනට පූර්ණ විපර්යාසයකට ලක්වීමට සිදුවිය. ප්‍රථමයෙන් ම පෘතුගීසි යටතේ ප්‍රචාරය කළ කතෝලික භක්තියටත්, ප්‍රගුණ කළ සංස්කෘතියටත් ලක් වූ ලාංකේය ජනතාව ලන්දේසීන් ප්‍රචාරය කළ රෙපරමාදු ආගමට සහ අනුගමනය කළ සිරිත් විරිත්වලින් ද පීඩාවට පත් වූ බව පැහැදිලි ය. ඉංග්‍රීසීන් 1815 දී උඩරට රාජ්‍ය යටත් කර ගැනීමත් සමඟ ම සිංහල බෞද්ධ ජනතාව තවත් අසරණභාවයට පත් විය. ඉංග්‍රීසීන්ගේ මිෂනාරී අධ්‍යාපන කටයුතු වලින් දේශීය සංස්කෘතිය සමාජය මෙන් ම බෞද්ධ ආගමට ද බොහෝ සේ අකටයුතුකම් සිදු විණි. ප්‍රස්තුත කාල පරිච්ඡේදයන් තුළ විඳීමට වූ දුක්ගැහැට හේතුවෙන් නැති වී ගිය තම අයිතිවාසිකම් හා උරුමයන් යළ සහ එය තීව්‍ර කර උද්දීපනය කළ නායකයන් අතර මොහොට්ටිවත්තේ ගුණානන්ද හිමියන්ට අග්‍රස්ථානයක් හිමි වේ. ක්‍රිස්තියානි මිෂනාරී ව්‍යාපාරය හමුවේ නැති වී ගිය බෞද්ධ ප්‍රබෝධය ගුණානන්ද හිමියන් විසින් පුනර්ජීවනයට පත් කළ ආකාරය හඳුනා ගැනීම මෙම පර්යේෂණයේ අරමුණ වේ. මෙම පර්යේෂණයේ දී ප්‍රාථමික මෙන් ම ද්විතීයික මූලාශ්‍රය මඟින් දත්ත එක්රැස් කර ගුණාත්මක පර්යේෂණ ක්‍රමය යටතේ පර්යේෂණය සිදු විය. මෙසේ ඒකරාශී කරගත් දත්ත අන්තර්ගත විශ්ලේෂණය (Content Analysis) තුළ ජාතික ප්‍රබෝධය වර්ධනය වූ බව පිළිගැනීම සාධාරණය.

මුඛ්‍ය පදඃ බෞද්ධ, සිංහල, පුනරුදය, ලාංකේය, මිෂනාරි

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ගෝල්ෆේස් අරගලයේ භාවිත නිර්මාණාත්මක සන්නිවේදන එළැඹුම්

ජයවික්‍රම එච්.එන්.

ජනසන්නිවේදන අධ්‍යයන අංශය, සමාජීය විද්‍යා පීඨය, කැලණිය විශ්වවිද්‍යාලය
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සාරසංක්ෂේපය

සමාජයේ ජීවත්වීමේදී පොදුවේ ජන සමාජයක් ලෙස අත්පත් කර ගන්නා ආර්ථික, දේශපාලන හා සමාජීය වටිනාකම් පාලන තන්ත්‍රය නිසා අහිමි වී යන අවස්ථාවක දී ඒ වෙනුවෙන් නැගී සිටීමට ප්‍රජාතන්ත්‍රවාදී සමාජයක පුරවැසියන්ට අයිතියක් තිබේ. ඒ අනුව ශ්‍රී ලංකාවේ 1953 හර්තාලය, 1971 හා 1988 තරුණ නැගිටීම සිදු වූ අතර 2022 සිව්වන අරගලය වන 'ගෝල්ෆේස් අරගලය' ආරම්භ විය. 2022 වර්ෂයේ ආරම්භයේ සිටම ශ්‍රී ලංකාවේ පැවති ආර්ථික අර්බුදය නිසා ජනතාවට ඇති වූ පීඩනය හේතුවෙන් තැනින් තැන පැවැත් වූ විරෝධතා එකම අරගල භූමියක් හරහා රැගෙන ඒමට පුරවැසියන්ට සිදු විය. මෙලෙස ජනතාව එකතුවීම හේතුවෙන් ගෝල්ෆේස් පිටිය 'ගෝඨාගෝගම' නමින් අරගල භූමියක් බවට පත් විය. ගෝඨාගෝගම තුළ භාවිත කරන ලද නිර්මාණාත්මක සන්නිවේදන එළැඹුම් පිළිබඳ ව මෙම අධ්‍යයනය මඟින් සොයා බලනු ලැබී ය. ශ්‍රී ලංකාවේ මෙතෙක් ඇති වූ පුරවැසි අරගල අතර කඳවුරු බැඳගත් සුවිශේෂී අරගලයක් වන ගෝල්ෆේස් අරගලයේ භාවිත කළ නිර්මාණාත්මක සන්නිවේදන එළැඹුම්හි විශේෂතා අධ්‍යයනය කිරීම මෙහි දී අරමුණු කර ගන්නා ලදි. ගෝල්ෆේස් අරගලයට සෘජු ව දායකත්වය දැක් වූ ෆේස්බුක් ගිණුම් සහ පිටු තුළ අරගලය සම්බන්ධ නිර්මාණාත්මක ව සන්නිවේදනය පළ කළ පෝස්ටු පමණක් පරමාර්ථගත හා විනිශ්චය නියැදිය ඔස්සේ තෝරා ගන්නා ලදි. ඒ අනුව එක් රැස් කර ගත් ද්වීතීයික දත්ත ගුණාත්මක පර්යේෂණ ක්‍රමවේදය ඔස්සේ අන්තර්ගත විශ්ලේෂණයට බඳුන් කරන ලදි. න්‍යායාත්මක සහ සංකල්පීය පසුබිම ලෙස සමාජ සම්බන්ධතා න්‍යායයත්, ජන සමාජ න්‍යායයත් භාවිත කරන ලදි. මෙම පර්යේෂණයේ ප්‍රතිඵල ලෙස අරගලයේ නිර්මාණාත්මක ප්‍රකාශනයන් ලෙස සහභාගීත්ව සන්නිවේදන ක්‍රම, දෘශ්‍ය ස්වරූපයෙන් සිදු කරන ලද ක්‍රියාකාරකම් හා කලාත්මක නිර්මාණ, සංස්කෘතික උත්සව පිළිබඳ ව අනාවරණය විය. පොදු අර්ථයෙන් බලගැන්වීම, සාමූහිකත්වය හා ප්‍රායෝගිකත්වය පෙන්වීමට කටයුතු කර ඇති බවත්, ගෝඨාගෝගම ජනතාව අතර ප්‍රචලිත කිරීම සඳහා සමාජ මාධ්‍ය දායක කර ගෙන ඇති බව ද නිගමනය විය. එමඟින් නිර්මාණශීලී සන්නිවේදන එළැඹුම් වඩාත් සාර්ථක කර ගැනීමට හැකියාව ලැබී ඇති බව මෙහි දී අනාවරණය විය.

මුඛ්‍ය පද: ගෝල්ෆේස් අරගලය, නිර්මාණාත්මක සන්නිවේදන එළැඹුම්, සමාජ මාධ්‍ය

PP-29

CINEMA AS A CULTURAL COMMUNICATION MEDIUM: IN SRI LANKAN PERSPECTIVE

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Abstract

As per Bazin, Jameson, and Hall, the cinema is an influential medium for cultural communication, performing a substantial role in formatting and reproducing the values, beliefs, and identities of societies. Also, the Sri Lankan cinema is a dynamic and influential form of cultural communication, but it is essential to scrutinize its serving as a connection between different communities, fostering understanding, and contributing to cultural harmony. Therefore, this research study was conducted to find the Sri Lankan cinema's influence on both reflecting and shaping societal values, making it a potent medium for cultural expression and dialogue. The research was designed as a qualitative research and primary data were collected as the survey study. Primary data was collected primarily on convenience sampling under the non-probability sampling method under the questionnaire method. The questionnaire primarily investigated the Sri Lankan cinema as a medium, in Cultural Representation, Cultural Identity and Nationalism, and Cultural Influence and Globalization. After considering the results, the following facts are discovered as to be addressed in relation to the Cultural Communication, under the topics are aligned with Social Issues and Commentary, Language and Communication Styles, Tradition and Modernity, Cultural Memory and Heritage, and Cultural Influence on Film Styles. The conclusion of the research suggests that the Sri Lankan Cinema has the potential to be a Cultural Communication Medium and if commenced it with formal education in Sri Lanka, it would equip individuals with the knowledge needed to comprehend the complexities of the Cinema as a Cultural Communication Medium.

Keywords: Cinema, Communication, Culture, Film, Medium

PP-30

REACHING SUSTAINABLE DEVELOPMENT GOALS THROUGH INNOVATIVE INITIATIVES AT THE USJ LIBRARY

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Abstract

This study explores how a state university library can reach the United Nations' Sustainable Development Goals (SDGs) by taking the University of Sri Jayewardenepura (USJ) library and the changes it has brought about as an example. Employing a desk research approach, the investigation delved into the library's innovative initiatives and their strategic alignment with the SDGs. The USJ library has introduced many new services during the last decade. It is important to know whether these services support the achievement of SDGs as mere introduction will not help bring user satisfaction, which ultimately uplifts the social and economic conditions of the nation. The methodology involved an in-depth analysis of internal sources, such as the university website, library committee meeting minutes, annual reports, university newsletters and personal experiences. External sources, including the Internet, complemented this approach, ensuring a comprehensive understanding of the multifaceted initiatives undertaken by the USJ library. Results highlight the library's diverse services, epitomized by comprehensive research support services and the integration of extensive e-resources. Notable initiatives such as the "Conservation and Preservation of Palm Leaf Manuscripts" exemplify the commitment to Goal 15 – Life on land by preserving indigenous knowledge including local decision making on fundamental aspects of life. Enhanced services, including automated circulation and "Reaching beyond Reading"- inter-library-loan system, allow the sharing of resources and ensure that all have access to information. It showcased the library's impact on Goal 12 - Responsible Consumption and Production, extending its influence beyond traditional roles. Providing access to knowledge through e-resources supports informed research and formation on health and wellbeing (Goal 3), climate change (Goal 13), and coastal conservation (Goal 14). Laptop lending service, Scholar Bank (institutional repository), Wi-Fi facility and computer laboratory are initiatives to increase digital literacy and access to technology among users, aligning with Goals 1, 8 and 9. Embracing Goal 4- Quality Education, the library organized notable events such as "Human Library" and "English for Fun Project," fostering entrepreneurship, innovation, and partnerships vital for sustainable development. The library emerges as a dynamic agent of positive change, actively contributing to SDGs through innovative methodologies, tangible results, and ongoing commitment.

Keywords: Academic Libraries, Sustainable Development Goals, Innovative Initiatives, University of Sri Jayewardenepura Library, SDG Alignment

PP-31

ARE ESTABLISHED UNIVERSITY MUSEUMS IN SRI LANKA SUSTAINABLE?

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Abstract

University Museums are teaching museums, which facilitate the learning process of undergraduates through the collection. Museum sustainability must take into account the size of a museum's collections, its organizational structure, and its applied museum marketing strategies. Although, currently twenty-three local Universities have been established in Sri Lanka, during this research, seventeen universities which were established under university Act No.16 of 1978 were considered, only a few of them have established museums at their universities. Thus, this study was conducted to identify the factors that effect on establishing and on the sustainability of university museums. Information about university museums, their collections and administration, and their activities and programmes was gathered through the contents of university websites and by communicating with authorized staff at the university. According to information gathered, twenty-two university museums were located in departments of different faculties in 09 universities among all established local universities in Sri Lanka. Among those university museums, a few are well-organized according to the museum definition & within museology norms, and others have only small collections for specific fields. It seems to be that these university museums are propagated as interdisciplinary museums. Still, three museum curators were recruited for three museums in two universities out of all considered local universities. Other museums are administered by academic members or technical officers who have been assigned additional duty to run a museum. When curators or well experienced persons administrate the museums, they are successful in exposing the students in realms of academic study and research based on museum objects/specimens. However, the university museum collection is not directly concerned in most cases to the curricula for gaining practical knowledge. There are no proper programmes for improving awareness about the museum for undergraduates, academics staff, non-academics staff of the university and also the society. None of the university museum has conducted any outreach programmes. It is need of an hour that it should be improved for the sustainability of the university museum system with respect to the four pillars of museum sustainability i.e. natural, cultural, social, and economic environments.

Keywords: University museums, curator, sustainability, social, economic environment

PP-32

A MEDICAL ANTHROPOLOGICAL STUDY OF THE NEED AND USE OF TRADITIONAL MEDICAL REMEDIES IN SRI LANKA FOR THE FACE OF THE COVID-19 EPIDEMIC

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Abstract

The recent epidemic that created a health crisis paralyzing the entire world for a significant period was the COVID-9 epidemic. In the face of this epidemic situation, until the remedies necessary to prevent the spread of the disease and to cure the patients were found in the Western medical system, the traditional medical (TM) methods of the respective countries were used to protect the health of the people in every country of the world. The unprecedented global health crisis caused by the COVID-9 epidemic has prompted a re-evaluation of medical practices, leading to a resurgence of interest in TM methods. Sri Lanka, with its rich cultural heritage and diverse healthcare landscape, presents a unique setting to explore the intricate interplay between TM remedies and the contemporary healthcare system in the face of this global health emergency. In the face of the COVID-19 epidemic, what TM treatments did Sri Lankans use? and what is the current trend towards TM treatment? is the research problem of the study. The purpose of this study is to investigate the TM remedies used by the Sri Lankan people during the COVID-9 epidemic and the current need for those TM remedies. An exploratory research is conducted under mixed research method using qualitative and quantitative data. The two districts; Colombo and Monaragala were purposefully selected as study areas. Data were collected by interview method and observation from 40 families, 20 families each from one district under the purposive sampling method. According to the data of the study, 90% of respondents have resorted to TM treatment for the COVID-19 epidemic. These include medicines, food practices, disinfection practices, rituals, and social practices. In addition to medicines, more rituals are performed in the rural areas around Monaragala than in the urban areas of Colombo. The people of the Colombo district were more inclined towards TM medicines than rituals and other methods of treatment. Also, new trends such as the use of modern digital technology to acquire knowledge about medicines, and order and deliver traditional medicines through online systems were seen around the Colombo district.

Keywords: Traditional medicine, COVID-19, Epidemic, Medical Anthropology

PP-33

A POLITICAL ANTHROPOLOGICAL ANALYSIS ON SUSTAINABLE HISTORICAL ADMINISTRATIVE POLICIES FOLLOWED BY KING VIJAYABAHU (I) AND KING PARAKRAMABAHU (I)

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Abstract

Foreign policies reflect the international values and inner peace of the country which decide the inner and outer cultural, social, economic and political structures of a country. In fact, some of the historical Sri Lankan eras had high quality strategies as same as the foreign policies. Therefore, the following study aimed to focus mainly on the specific sustainable strategies followed by the King Vijayayabahu (i) (1111 - 1132) and the King Parakrambahu (i) (1123 - 1186) of Polonnaruwa period and identify the importance of the historical value of policies implemented by the past Sri Lankan government. The research is carried out only based on the primary written sources mainly through the historical chronicles including Mahawamsa, Deepawamsa. The interconnection between Sri Lanka and South Indian states was built through royal marriages, in King Vijayabhahu era can be identified as one of the main instances which two governments of two different nationalities get interconnected together. Furthermore, the friendly and favorable administration carried out by the King Parakrambahu was found to be as same as the policies followed up by Indian subcontinent in the same era. Those proofs convinced that the main ideology of governing Sri Lanka, with association with the "Historical Foreign Policy" in Sri Lanka has created a prosperous and sustainable country which is favorable for all the people of the nation unlike the present. Sri Lanka has been originated a rich historical and administrative heritage that has evolved over the centuries. Moreover, the facts reflected that the Sri Lanka has followed more sustainable strategies related to foreign governmental policies through marriage alliances and trading systems which have built a contemporary succession politically and economically in the country. Although currently Sri Lanka has been governed under rules and regulations which were approved by the Sri Lankan parliament, it is important to revise such policies and regulations which are favorable for public and deal with other countries since the country is undergoing an economic crisis.

Keywords: Administrative Policies, King Vijayabahu (i), King Parakrambahu (i), Sustainable, Sri Lanka

PP-34

SOCIAL CHALLENGES FACED BY DIFFERENTLY ABLED PEOPLE AND THE EFFECT OF THESE PROBLEMS ON THEIR PERSONALITY (WITH SPECIAL REFERENCE TO MILLANIYA DIVISIONAL SECRETARIAT IN KALUTARA DISTRICT, SRI LANKA)

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Abstract

Disability is defined as any limitation or absence of capability to engage activity within the typical range or manner expected of a human being. The difficulties they confront are diverse and influenced by various factors, including societal norms, cultural customs, and religious convictions. The primary objective of this study was to identify the problems experienced by disabled individuals in rural areas and examine the impact of these problems on their personality. Study areas were the Kelesgamuwa, Welikala, Venivelpitiya, and Uduvara South GN divisions in the Millaniya DS Division of Kalutara District in Western Province. Purposive sampling method was applied to identify 75 primary data contributors and 10 officials from the GN Divisions. Interviews and observations were used as the data collection methods. Facing challenges such as dropping out of education due to various obstacles, economic hardships resulting from a lack of employment opportunities and the low income of guardians, difficulties arising from family members and public spaces, negative societal attitudes contributing to marital issues and social discrimination were the issues they experienced. Unemployment (77%) was the significant obstacle for individuals with disabilities. Most of data contributors (77%) depend on the monthly government allowance. All of them complained about the lack of facilities available in public places. 45% of respondents have experienced discrimination by society specially in public places as well as in family functions. The challenges experienced by individuals affected by these issues significantly impact their self-esteem, leading to social withdrawal, anxiety, and depression ultimately affecting their personality. To address these issues, implementing counselling and awareness programs to foster positive community attitudes, coupled with initiatives aimed at improving infrastructure, transportation facilities and employment opportunities, have proven to be effective in alleviating the existing problems.

Keywords: disability, social challenges, personality, rural areas

LIFE SCIENCES - POSTER

PP-35

EXTRACTION OF FAT FROM PALMYRAH (*Borassus flabellifer* L.), FRUIT KERNEL, AND ITS CHEMICAL CHARACTERIZATION

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Abstract

Palmyrah (*Borassus flabellifer* L.), a dioecious plant belonging to the family Arecaceae, consists of three or two seeds within its fruits. Palmyrah fruit seeds (PFS) are commonly used for seedling activity and harvesting tubers. Despite their potential, many of them are remain underutilized. Hence, it is mandatory to identify the potential way to utilize PFS to minimize post-harvesting loss and environmental pollution. The study aims to investigate fat extraction from palmyrah fruit kernel and its chemical characterization. PFS was broken to obtain kernels. They were chopped, dried, and ground well. Palmyrah kernel Fat (PKF) from kernel powder was extracted using three different methods: soxhlet, maceration, and wet methods. Solubility tests for PKF were performed using solvents like water, hexane, methanol, acetone, chloroform, and ethanol. Chemical parameters, such as peroxide value, iodine value, saponification value, acid value, free fatty acid (FFA), ester value, and Glycerin percentage of PKF, were analyzed using the AOAC methods. The alpha-tocopherol in PKF was determined using the HPLC technique. The results showed Soxhlet method gave a higher yield of PKF (1.21 %) compared to maceration (0.46 %) and wet methods (< 0.05 %). Solubility tests revealed PKF's solubility in hexane and chloroform, insolubility in water, and partial solubility in methanol, acetone, and ethanol. Chemical analysis showed that PKF had a peroxide value of 2.00 Milli EqO_2/kg, an iodine value of 50.76 I_2 mg/g, a saponification value of 179.35 mg KOH/g, an acid value of 22.11 mg KOH/g, free fatty acid of 11.12 %, an ester value of 157.24 mg KOH/g, and a glycerin percentage 8.60. The alpha-tocopherol in PKF was 13.20 mg/g. Due to the low yield, mass production of *B. flabellifer L.* fruit fat may not be economically viable. However, further research is required to explore its potential for medical and dietary supplements.

Keywords: Kernal, fat, palmyra fruit, characterization, Soxhlet

PP-36

RP-HPLC BASED PIPERINE QUANTIFICATION AND COMPARATIVE ANTIOXIDANT EVALUATION OF DIFFERENT PARTS OF *Piper longum* AND *Piper sarmentosum* GROWN IN SRI LANKA

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Abstract

Piper longum, known as *"Thippili"* (PL), and *Piper sarmentosum*, referred to as *"Gas Thippili"* (PS), are two medicinal plants belonging to Piperaceae family. PL is a highly demanded herb in traditional medicine. PS is currently underutilized in Sri Lanka and tends to be utilized as a substitute for PL due to its high abundance and morphological similarities. There have been limited studies conducted on both species in Sri Lanka. Piperine is one of the major bioactive compounds in the *Piper* species. This study aimed to quantify Piperine and evaluate the antioxidant activity comparatively of different parts of PL and PS grown in Sri Lanka. Methanolic extracts were obtained from the fruits, spikes, stems, roots, and leaves of both species and subjected to Reverse-Phase High-Performance Liquid Chromatography (RP-HPLC) analysis under the mobile phase of methanol, water, and acetonitrile in 80:15:5 (v/v). IC_{50} values for antioxidant activity were investigated using the 2,2-Diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging activity model. All data were statistically evaluated using one-way ANOVA. Significant variations in Piperine content and antioxidant activities were observed among the different parts of the two species through RP-HPLC analysis and DPPH assay, respectively. The highest Piperine content among the studied plant parts was exhibited by PL spikes (18.51 ± 0.0189 mg/g), PL fruits (1.64 ± 0.0006 mg/g), and PS roots (1.31 ± 0.013 mg/g). The highest antioxidant activity among the different parts of both species was exhibited by PS leaves (IC_{50} - 131.75 ± 3.91 µg/ml), PL roots (IC_{50} - 168.33 ± 2.34 µg/ml) and PL spikes (IC_{50} - 174.32 ± 2.28 µg/ml). Based on statistical evaluation of Piperine content and antioxidant activity, PS's suitability as a substitute for PL is poor. However, PS roots and leaves could be potential sources of Piperine and natural antioxidants, respectively, for the novel herbal products of Sri Lanka.

Keywords: Antioxidant, Piperine, *Piper longum, Piper sarmentosum,* RP-HPLC

PP-37

A STUDY ON CITRIC ACID MODIFIED β-CYCLODEXTRIN AND BENZOYL END CAPPED POLY (ETHYLENE GLYCOL) INCLUSION BASED SUPRAMOLECULAR NETWORK FOR BIOMATERIALS APPLICATIONS

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Abstract

Supramolecular networks have been developed as potential biomaterials in drug delivery applications because of their tunable properties including stimuli-responsiveness. Multi-stimuli responsive supramolecular networks demonstrate relatively high drug-releasing efficiencies over single-stimuli responsive supramolecular networks. Further, the biochemical abnormalities of cancer cells, low pH, and high concentration of esterase enzyme can be used as multi-stimuli for controlled drug delivery applications in cancer treatments. Therefore, this research focused on the development of β-cyclodextrin (β-CD)- benzoyl inclusion-based multi-stimuli responsive supramolecular network using two building blocks: BB1 and BB2. Building blocks were synthesized using modified literature procedures. BB1, citric acid modified β-CD oligomer, was synthesized using a 'green' polycondensation reaction between citric acid and β-CD. BB2, benzoyl-end-capped poly(ethylene glycol) 6000 (PEG-6000), was synthesized using an esterification between benzoic acid and PEG-6000. The synthesized products were characterized using thin layer chromatography (TLC), UV-visible spectrophotometry (UV-vis) and Fourier transform infrared (FTIR) spectroscopy. Inclusion complex formation study of BB1 and BB2 in solution was carried out using UV-visible spectrophotometry. β-CD, PEG-6000, and citric acid were used as the starting materials for the syntheses of BB1 and BB2 because of their biocompatibility, water solubility, and less cytotoxicity. The characteristic –C=O and –C-O stretching vibration peaks at 1735.6 cm^{-1} and 1154.5 cm^{-1} of the FTIR spectra of BB1 evidence the formation of ester bonds. The UV-visible spectra of the 1:1 mixture of BB1 and BB2 in water demonstrate relatively high absorbance compared to the absorbance of individual BB1 and BB2 in water. This observation indicates the inclusion complex formation between β-CD in BB1 and benzoyl group in BB2. In summary, BB1 and BB2 were synthesized, purified, and characterized. β-CD of BB1 and benzoyl groups of BB2 undergoes supramolecular network formation. Optimization of the supramolecular hydrogelation conditions is currently underway to develop a biomaterial for drug delivery applications in cancer treatments.

Keywords: β-Cyclodextrin, Poly(ethylene glycol), Host-guest inclusion, Supramolecular hydrogel, Drug delivery

PP-38

THE EFFECT OF TIME, TEMPERATURE, ADDED GLUCOSE AND ASPARAGINE CONTENT ON ACRYLAMIDE FORMATION IN DHAL VADE

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Abstract

Acrylamide is a food toxicant formed during high temperature (>120 ºC) associated deep-frying, baking and roasting of foods rich with carbohydrate. Reducing sugars (RS) and the amino acid asparagine have been identified as the main precursors of acrylamide and is formed as an associated product of Maillard reactions. The International Agency for Research on Cancer has declared acrylamide as a category 2A compound, considering as a "probable human carcinogen". Acrylamide formation is affected by intrinsic as well as extrinsic factors of the food. The effect of frying time, temperature, and added asparagine and RS contents on acrylamide formation in dhal vade were analyzed in this study. The identified main raw materials of vade were analyzed for their asparagine and total RS contents ($p<0.05$). The effect of studied factors on acrylamide formation was analyzed using response surface methodology (RSM) with Box-behnken design ($p<0.05$). Main four raw materials of dhal vade: watanna dhal, curry leaves, green chili and B-onions had 12.23±0.25, 10.86±1.63, 46.50±0.70 and 154.63±16.61 g kg^{-1} (dry basis) total RS contents and 0.91±0.02, 6.67±0.04, 2.99±0.05 and 1.47±0.05 g kg^{-1} asparagine contents, respectively. Raw materials were enriched with RS, meanwhile asparagine acted as the limiting factor in acrylamide formation. According to RSM, higher the frying time, temperature and added asparagine content, higher the acrylamide formation. Frying temperature and acrylamide content had shown a strong positive correlation (0.772) while time and acrylamide had a moderate positive correlation (0.424). This claimed the fact that, time and temperature are very critical in acrylamide formation in dhal vade. The asparagine content has shown a small positive correlation (0.198) with acrylamide content while no significant correlation was shown between glucose and acrylamide content. Therefore, it is critical to use raw materials with lower acrylamide precursor contents while optimizing the frying conditions with reduced frying time and temperature.

Keywords: Acrylamide, reducing sugar, asparagine, deep-frying, temperature

PP-39

GENE EXPRESSION ANALYSIS OF *Bax, Survivin, p53* AND *KIM-1* GENES ON CYLINDROSPERMOPSIN EXPOSED VERO KIDNEY CELLS

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Abstract

Cylindrospermopsin (CYN), a cytotoxin, has been shown to cause mammal kidney damage. Cylindrospermopsin is a type of cyanotoxin with potent nephrotoxic properties. The purpose of the present study was to evaluate the gene expression analysis of *Bax*, *Survin*, *p53* and *KIM-1* genes on CYN-exposed Vero kidney cells. Cells were exposed to pure CYN at concentrations of 0, 1.0 and 10.0 µM for 24 h. Gene expression analysis of *Bax*, *Survivin*, *p53* and one kidney injury-related gene, Kidney Injury Molecule-1 (*KIM-1*), were determined by Real-Time quantitative PCR (RT-PCR). In Vero kidney cells, there was a dose-dependent significant up-regulation of *Bax* ($p<0.05$), *p53* ($p<0.05$) gene expression at higher concentrations (10 µM) of CYN, and *KIM-1*($p<0.05$) gene expression at lower (1 µM) and higher (10 µM) doses of CYN compared to the control. Survivin gene expression was downregulated at lower (1 µM) ($p<0.05$) and higher (10 µM) ($p<0.05$) CYN concentrations. According to the findings, CYN induces nephrotoxicity in the Vero kidney cell line, revealing a potential pathway for kidney damage by this cyanotoxin.

Keywords: Vero, CYN, RT-PCR, *KIM-1*, gene expression

PP-40

DIGITAL HEALTH LITERACY AMONG NURSE'S WORKING IN A SELECTED HOSPITAL IN NAWALAPITIYA, SRI LANKA

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Abstract

Integrating digital health solutions is pivotal in modern healthcare, with nurses assuming a crucial role in their implementation. In Sri Lanka, healthcare confronts challenges from non-communicable diseases (NCDs) and communicable ailments, emphasizing the importance of digital tools for enhanced healthcare delivery. However, a notable gap in assessing nurses' Digital Health Literacy (DHL) exist within hospital settings, both locally and globally. This research aimed to address this gap by evaluating DHL levels among nurses, intending to refine healthcare through tailored training. A descriptive cross-sectional study was conducted among 240 staff nurses excluding nursing officers in managerial positions at District General Hospital (DGH) Nawalapitiya. The study utilized a validated self-administered Digital Health Literacy tool by Van Der Vaart & Drossaert, 2017, for data collection. ERC approval was taken from KIU (KIU/ERC/23/073), and Director permission was received from DGH Nawalapitiya. Data was analyzed using SPSS V23. of respondents were females (91.3%), with 41.3% aged between 24 and 34 years. Educational backgrounds varied, with 55.4% holding diplomas and 44.0% possessing Bachelor of Science (BSc) degrees. Moreover, 77.9% of respondents were married. Findings revealed nurses' higher proficiency in operational skills (90.139%) and information searching abilities (81.389%) compared to other domains, with adding content scoring the lowest (70.451%). Notably, 51.3% of nurses demonstrated good DHL, while 48.8% exhibited poor DHL. Conclusions drawn from the study highlighted nurses' solid foundational skills in basic digital abilities. However, there's a need for improvement in advanced digital competencies, especially among older nursing professionals (age >34) years. Educational background (p= 0.002) and grade of nursing officer (p= 0.015) emerged as influential factors in DHL, emphasizing the necessity for ongoing training and standardized education. The findings indicate nurses' readiness to engage with digital health technology, yet targeted and continuous training initiatives are vital to enhancing their advanced skill sets.

Keywords: Digital Health Literacy, Digital competency, Nurses, Hospital Setting, Digital Health Literacy Tool

PP-41

WATER HARDNESS AND FLUORIDE STATUS OF CKDu HIGH PREVALENCE AREAS IN RAJANGANAYA, GALNEWA, MEDIRIGIRIYA AND DEHIATTAKANDIYA

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Abstract

Chronic kidney disease (CKD) is a significant health problem in the North Central Province of Sri Lanka. CKD in this area is called Chronic Kidney Disease of Unknown aetiology (CKDu). North Central, Northwestern, Uva, and Eastern provinces have been known as hotspots for CKDu, mostly among the farming communities. Several hypotheses like soil geology, pesticides, cyanotoxins, and prolonged dehydration are suggested as possible reasons for CKDu, but the exact etiology of this disease is still debatable. The synergistic effect of water hardness and fluoride has become a recent concern for CKDu. This study evaluates the level of well water hardness and fluoride in North Central Province in the wet season. Thirty well water samples were randomly collected from CKDu high prevalence areas in Rajanganaya, Galnewa, Medirigiriya and Dehiattakandiya. Water pH, conductivity, and dissolved oxygen were measured onsite, and water hardness and fluoride were measured at the laboratory following standard methods. Onsite parameters were ranged within the Sri Lankan Drinking Water Quality Standards (SLS 614: 2013). The highest water hardness was measured as 99.33±0.05 mg L^{-1} in Angamuwa, and the lowest was 29.70±0.05 mg L^{-1} in Siyabalangamuwa South. The highest fluoride level was detected as 1.50±0.00 mg L^{-1} in Galnewa, while the lowest was 0.01±0.00 mg L^{-1} in Rajanganaya and Angamuwa sampling locations. Water hardness and fluoride both were high in Medirigiriya as 99.33±0.05 mg L^{-1} and 1.08±0.00 mg L^{-1} respectively, where number of CKDu patients is also high. Thus, the study results suggest that the synergistic effect of higher levels of water hardness and fluoride in drinking water could act as one of the prominent causes of CKDu in North Central Province.

Keywords: Chronic Kidney Disease, Fluoride, North Central Province, Water hardness, Wet Season

PP-42

RAPID COMPOSTING OF MUNICIPAL SOLID WASTE USING NOVEL BACTERIAL CONSORTIUM AND EVALUATION OF HYDROLYTIC ENZYME DYNAMICS DURING COMPOSTING

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Abstract

Composting is one of the integral components of the global organic solid waste management system, leading to sustainable development. Composting is a microbial enzyme-based biochemical conversion process limited by the prolonged time requirement. The extracellular hydrolytic enzyme dynamic is one key parameter used to determine the composting efficiency and compost maturity. Therefore, the present study focuses on the composting rate of Municipal Solid Waste (MSW) using novel bacterial consortia and the evaluation of composting efficiency by using hydrolytic enzyme activity. In the study, five potential bacterial consortia were separately inoculated to the standard compost bins, which are filled with 95 kg of organic fraction of fresh MSW, and their enzyme activities were determined in terms of Cellulase, Amylase, Proteinase, and Lipase. The Cellulase and Amylase activities were determined following the standard DNS method. The Proteinase and Lipase activities were measured following the Casine hydrolysis method and tributyrin oil hydrolysis method daily. According to the results, the maximum Cellulase, Lipase, Amylase, and Proteinase activities were recorded from the C5 consortium as 10 U/mL/min, 5 U/mL/min,11 U/mL/min, and 10 U/mL/min, respectively. Further, the C5 consortium recorded overall significant ($p < 0.05$) enzymatic activity compared to the control and other treatments, indicating a faster composting rate. Additionally, the pH and temperature and bulk density dynamic patterns exhibited that the MSW composting potential within 20 ± 3 days by the C5 consortium, which contains Bacillus haynesii, Bacillus amyloliquefaciens, and Bacillus safensis, whereas the control sample was taken 110 ± 10 days to complete composting process. The findings of this study prove the potential applicability of developed consortia for effective composting of MSW.

Keywords: Bacterial consortia, Composting, Hydrolytic enzymes, Municipal Solid Waste, Waste management

MANAGEMENT, COMMERCE & INDUSTRY DEVELOPMENT - POSTER

PP-43

USE OF CLOUD-BASED PROJECT MANAGEMENT SOFTWARE BY SOFTWARE DEVELOPMENT FIRMS IN COLOMBO DISTRICT, SRI LANKA

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Abstract

Although Project Management (PM) software is offered as a cloud-based application with cloud computing advancements, it lacks studies to identify the nature of usage and satisfaction among its users. A survey study was conducted to analyse the usage of cloud-based PM software and the satisfaction with these tools among software development firms in Sri Lanka. 104 responses were received from a sample of companies registered in the Sri Lanka Association for Software Services Companies (SLASSCOM). Data was quantitatively analysed using Statistical Package for the Social Sciences (SPSS23). Findings revealed that 94 companies among 102 valid responses (92.16%) use such software and among them majority use Jira (68.9%) indicating its popularity. Satisfaction with such software was analysed based on four criteria including overall functionality, vendor services, user-friendliness, and reliability. All respondents who use cloud-based PM software are averagely satisfied with all these criteria and would recommend any other to use as well. All users have stated that they agree to the fact that this software supports managing development projects successfully and many of them (95.7%) will continue to use it in the future. While providing valuable statistical evidence about the current situation of Cloud-based PM software usage and their satisfaction in the Sri Lankan software development industry, this also provides future research directions to explore how this software impacts project success, critical success factors, and challenges of adoption. Also, future studies could be carried out to analyse brand-wise satisfaction with such software.

Keywords: cloud computing, project management software, cloud-based project management software usage, user satisfaction, software development firms

PP-44

THE EFFECT OF PERSONA AND STORYTELLING IN CHARMING ADVANCED-LEVEL (A/L) STUDENTS IN SRI LANKA

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Abstract

Despite the free education system, the nation's advanced-level(A/L) students in the science stream have difficulty choosing private tuition to pursue higher grades for the A/L examinations in Sri Lanka due to the rivalry between tutors. Hence, storytelling and persona functions have evolved into new ornaments in the (A/L) tuition marketplace to draw in students. In addition to examining how students' attitudes affect the specific impact, this study aims to determine how effective personas and storytelling are as marketing tools for science tuition teachers seeking to draw in science students. Surveys dispersed via online questionnaires were used to gather data for this investigation. The research sample consisted of 74 individuals. To look at the effects of persona, storytelling, and teachers' attraction, four hypotheses were examined under the two independent variables of persona and storytelling, the dependent variable of teachers' attraction, and the attitude of the students as a moderation variable. The association between instructors' affinity to storytelling and Ha1 was shown to be supportive. A significant correlation exists between instructors' persona and attraction (Ha2). Rejection of H04 indicates student attitudes influence the persona-attraction relationship, whereas Ha3 suggests no impact on the storytelling-attraction relationship. According to the results, persona, and storytelling are important factors in drawing students to tuition instructors. Additionally, student's attitudes have an impact on the relationship between teacher attraction and persona, whereas the former has a bigger effect on student attraction than the latter. Furthermore, the study suggests that the relationship between teacher attraction and persona—rather than the relationship between storytelling and teacher attraction—has a greater impact on students' perceptions. In conclusion, the research highlights the roles that storytelling and persona play in this attraction, with persona having a greater influence. Combining storytelling and persona can enhance marketing effectiveness, but persona should be prioritized in attracting students.

Keywords: Storytelling, Persona, Tuition, Advanced Level, Sri Lanka

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