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Faculty of Graduate Studies

ABSTRACT VOLUME

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24th INTERNATIONAL POSTGRADUATE RESEARCH CONFERENCE (IPRC) 2024

"RESEARCH AND INNOVATION FOR ECONOMIC DEVELOPMENT"

The 24th International Postgraduate Research Conference (IPRC) - 2024

"Research and Innovation for Economic Development"

Abstracts

29th November 2024

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Message from the Chairman of the University Grants Commission

Research and innovation are essential drivers of economic development in our rapidly evolving world. By addressing real-world challenges and fostering progress, research lays the groundwork for innovative solutions that propel industries, empower communities, and stimulate economic growth. The transformative power of research lies in its ability to generate new knowledge and ideas, which can be converted into impactful applications, creating jobs, enhancing productivity, and improving the quality of life.

Universities can play a pivotal role in this process, serving as the centers for creativity and critical thinking, where academics and researchers develop and refine ideas into meaningful outcomes. However, the journey from research to innovation requires a robust process of validation, peer review, and practical application. Peer review ensures that the knowledge generated is credible, while its successful application across diverse sectors indicates its value and relevance.

University students and young academics should also be a main part of the research and innovation culture of a university. The academic curriculum should not be overloaded only with theoretical knowledge. The students should be guided in the classroom towards creativity and innovation.

Through collaboration and dedication, research and innovation can become the pillars of economic resilience and societal advancement. The theme of this year's conference, 'Research and Innovation for Economic Development,' emphasizes the crucial connection between research and its role in driving sustainable economic growth forward. It encourages researchers, innovators, and academics to focus on creating knowledge and technologies that address economic challenges, foster entrepreneurship, and contribute to the global economy.

Senior Prof. N. A. K. P. J. Seneviratne
Conference Chair and
Dean of the Faculty of Graduate Studies
University of Kelaniya
Sri Lanka

Message from the Vice-Chancellor

It is with great pleasure that I welcome you to the International Postgraduate Research Conference 2024, organized by the Faculty of Graduate Studies, University of Kelaniya. The University of Kelaniya takes great pride in hosting our flagship research conference, as it is a forum for researchers and scholars to share knowledge, information, exchange experiences, to present innovative concepts and research.

This year, **I**PRC 2024 has four tracks: (1) Science, Technology, Mathematics and Medicine; (2) Accounting and Business Management; (3) Humanities and Social Sciences; and (4) Multidisciplinary Studies, combined under the theme of Research and Innovation for Economic Development.

Sri Lanka has survived the economic crisis that engulfed us in 2022, and the economy has moved from negative to positive growth rates. The country now needs to target a much higher rate of growth, ideally based on export-oriented economic development. Research and innovation can do much to support such growth, and the higher education sector has a vital role to play in this regard.

The University of Kelaniya strives to nurture the skills of critical thinking and analysis in its students by engaging them in research. The University supports the generation of new knowledge through research, the dissemination of such knowledge, and the application of research findings in our lives, whether it is through changes in policy and practice or through commercialization of new products that emerge from research. These are all ways in which the research conducted in our universities enriches the whole of our society and supports economic development.

I thank the former Dean of the Faculty of Graduate Studies, Snr**.** Prof**.** Kapila Seneviratne, the current Acting Dean / FGS Snr**.** Prof**.** Sudath Kalingamudali, the Deputy Registrar / FGS Mr Lakmal Wijeratne, the Snr**.** Assistant Bursar / FGS Ms Sathishka Gonapeenuwala, and the conference Organizing Committee, for all the hard work that they have put into organizing this event. I would also like to thank the researchers, reviewers, editors and other academics who contributed in numerous ways to ensure the success of this conference.

I wish all participants of iPRC 2024 an enjoyable day with fruitful deliberations.

Senior Prof. Nilanthi Renuka de Silva
Vice-Chancellor
University of Kelaniya
Sri Lanka

Message from the Dean of the Faculty of Graduate Studies

It is with great pleasure and honour that I welcome you to the International Postgraduate Research Conference (IPRC) 2024, organised by the Faculty of Graduate Studies (FGS) at the University of Kelaniya. IPRC holds the distinguished title of being the oldest and most pioneering research conference at the University of Kelaniya, with a legacy spanning over two decades. This milestone reflects the unwavering dedication of FGS to fostering advanced research and academic excellence.

This year, under the theme "Research and Innovation for Economic Development", IPRC 2024 emphasises the vital roles that research and innovation play in driving economic progress. Research lays the groundwork for identifying solutions to economic challenges, while innovation translates these solutions into practical applications that foster growth and improve quality of life. By uniting these concepts, IPRC 2024 broadens its scope to address critical issues and emerging ideas across diverse fields, including Commerce and Management Studies, Humanities, Multidisciplinary Studies, Social Sciences, and STEM, all in the context of economic development. This timely theme aims to inspire researchers to become catalysts for economic progress, particularly in the wake of recent global economic challenges.

I am confident that IPRC 2024 will serve as a leading platform for academics, policymakers, postgraduate students, practitioners, researchers, and even undergraduate students to share their knowledge, expertise, and high-quality research across multidisciplinary domains.

I wish all participants a productive and enriching experience at IPRC 2024..

Senior Prof. Sudath R D Kalingamudali
Acting Dean
Faculty of Graduate Studies
University of Kelaniya
Sri Lanka

Profile of the Keynote Speaker – Mr. Rajitha Kariyawasan

Executive Director: Hayleys Plc, Managing Director of Haycarb PLC., Deputy Chairman: Dipped Products (DPL) Plc/ Hayleys Fibre Plc, Director of Dipped Products PLC and Hayleys Fibre PLC., Deputy Chairman of Eco Solutions SectorBengaluru, India

Mr. Kariyawasan is a member of the Hayleys Group Management Committee and the Main Board of Hayelys PLC. He currently serves as the Managing Director of Haycarb PLC (Purification Products Sector) and Deputy Chairman of Dipped Products PLC and Hayleys Fibre Plc, two other key export manufacturing sectors of Hayleys Plc. He is a member of the Board of Sri Lanka Institute of Nanotechnology (Private) Ltd., (SLINTEC) representing Hayleys.

Mr. Kariyawasan holds a BSc Engineering (Electronics and Telecommunications) from the University of Moratuwa, Sri Lanka. Fellow Member of the Chartered Institute of Management Accountants, UK. (FCMA/CGMA). Also he is a Six Sigma (Continuous Improvement Methodology) Black Belt, certified by the Motorola University, Malaysia.

Before joining Hayleys, he held the position of Director/General Manager of Ansell Lanka (Pvt) Ltd, a leading multi-national manufacturing operation in Sri Lanka in the export of surgical & industrial gloves. He has served as the Chairman of the Manufacturing Association of Export Processing Zone, Biyagama too.

Mr. Kariyawasan has a vast experience in export manufacturing industry and in international B2B marketing. He is passionate in developing successful teams in the direction on value addition and organic growth. Has shared the knowledge at many forums/panels and has been a guest lecturer in many University and Professional events. He is a nature lover, passionate on wild life photography as a pastime.

Plenary Speaker - Ms. Chathini Uduwana

BSc (Hons) in Business Information Technology Staffordshire University UK, Masters of Business Administration Bedfordshire University UK, Chartered IT professional- UK

Chathini Uduwana is the Country Head and Vice President of Typefi Systems, a renowned global publishing automation company. In 2014, she established Typefi Systems in Sri Lanka and has since played a key role in its growth and success. She is an executive member of Typefi Global, which maintains offices in Australia, the USA, the UK, the Netherlands, and Sri Lanka. Chathini Uduwana is the Women in Tech Sri Lanka Ambassador. She has earned a Bachelor's Degree in Business Information Technology from Staffordshire University and an MBA from Bedfordshire University. Additionally, she is a Chartered IT professional (CITP).

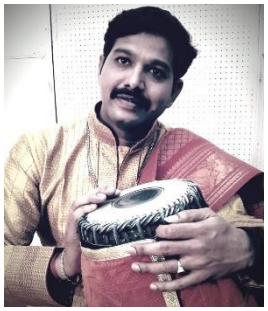
Abstract of the Plenary Session One: Bridging Boundaries: Multidisciplinary Innovation for Economic Growth

Sri Lanka stands at a transformative crossroads where research, innovation, and multidisciplinary collaboration are critical to driving sustainable economic growth. In today's interconnected world, the challenges of economic development—whether in healthcare, technology, or gender equality—require solutions that transcend traditional academic silos. By integrating diverse perspectives, we can foster innovation that propels productivity and addresses societal challenges in meaningful ways. Artificial intelligence (AI) and digital transformation present a unique opportunity to reshape sectors such as agriculture, tourism, healthcare, education, and public governance. Although Sri Lanka's AI adoption is still emerging, strategic investments aligned with the Digital Strategy 2030 could unlock immense potential. For instance, precision farming and AI-powered disease diagnostics can enhance agriculture and healthcare, respectively, while smart technologies can personalize tourism experiences and democratize education. However, the success of AI lies not only in algorithms but in how individuals, communities, and organizations adapt to new technologies—creating opportunities without deepening social divides.

My own experiences in digital transformation initiatives have underscored the importance of combining technological, social, and economic insights. Gender equality is a crucial focus, especially regarding workforce participation. Through initiatives like 'She Returns,' which supports women re-entering the workforce after maternity leave, we see how multidisciplinary research can solve real-world challenges by bridging gaps in productivity and equality. Academia plays a pivotal role in encouraging cross-disciplinary innovation. However, achieving this requires shifting from specialization to integration, breaking institutional barriers, and promoting collaboration. It is only through collective effort—where technologists, economists, sociologists, and policymakers join forces—that we can shape a prosperous future. In conclusion, Sri Lanka's path forward embraces innovation and research that transcends boundaries. Together, we can build a resilient economy driven by inclusive growth, ensuring that research not only advances knowledge but also transforms lives and creates lasting societal impact.

Plenary Speaker - Dr. B. Satyavara Prasad

Ph.D. in Music, M.A. in Karnatic Music, (Mridangam), UGC NET Passed in MusicCommission



Dr. Prasad is an Assistant Professor at Banaras University, where he has been a significant contributor to the field of music. He completed his undergraduate degree in Commerce from Andhra University, passed the UGC NET in Music in 2014 and earned his Ph.D. in Music from Banaras University in 2015. Throughout his career, Dr. Prasad has received numerous accolades, including the Bharat Gaurav Ratna Award from the International Business Council in 2016 and the U.P. Gaurav Samman from the Chandra Shekhara Foundation in 2018. With a decade of research experience, Dr. Prasad has actively participated in various workshops, seminars, and lecture demonstrations. Notable engagements of Dr. Prasad include, Lectures at Sanskriti Foundation in Hyderabad and Workshops of SNA, New Delhi, on Mridangam in 2017 & 2018. Dr. Prasad's notable performances and experiences include participating in the National Crafts Fair 2018 in Allahabad, presenting a Mridangam recital on AIR Hyderabad in 2017, and contributing to the International Seminar on Music 2012, organized by FPA at BHU. Currently, Dr. Prasad is dedicated to guiding his research scholars and students, furthering the study and practice of Mridangam and contributing to the broader world of music.

Abstract of the Plenary Session Two: Concepts In Percussion Accompaniment In South Indian Garnatic Classical Music (From Composition Varnam To Mangalam)

The art of rhythm accompaniment in carnatic music or South Indian Music is a very highly specialised and aesthetic percussive support, enhancing the beauty of the composition as well as maintaining the tempo and metric balance. A compositions rendition becomes more appealing through knowledgeable and understanding percussive embellishment, meaningful silences and pauses and exciting thrusts of speed variations, which connects the music to the high-speed solfa patterns, interspersed by melodic beat patterns known as Sarva laghu The Mridanga Vidwan, has to know a great deal about the art and science of music, the talas and the areas of creative music-pallavis etc.. Sensitivity to sound decibels, the ability to moderate the tone and volume using meetu and chapu in the right side and the dhom and guaon on the left side of the Mridangam, along with the control of the volume while accompanying the violinist. Regarding the details of accompaniment techniques, one can only give broad guidelines and each player has to perfect his own approach and style. The fundamentals of proper rhythmic (Mridangam) accompaniment may be enumerated in a concise manner as follows: 1. The Mridangam Artist has to take notice of the particular tala total number of aksharas in an avartha, the edupa or beginning of the song with reference to tala, Kalapramana (tempo) and the song movement. 2. The should also take note of the number of lines of the pallavi (first maxment) and observing each variation, interpret the some during the repetitions. This should continue through the anupallavi, Charanam, Charana Pallavi, Madhyamakala Verses and Chitta Swaras.

Plenary Speaker - Dr. Patrick McNamara

Executive Director, United States- Sri Lanka Fulbright Commission

Patrick McNamara, Ph.D., serves as Executive Director of the United States-Sri Lanka Fulbright Commission. He has worked with universities, governments, corporations, nonprofits, and foundations for over 35 years. Before joining Fulbright Sri Lanka, Patrick was at the University of Nebraska at Omaha (UNO) where he taught conflict resolution, sustainable development, and social entrepreneurship, and also served as Senior International Office He is on the governing board of Initiatives of Change, a global interfaith NGO "building trust across the world's divides." Patrick's TED Talk is Water Conflict, Water Peace. Dr. McNamara earned a Ph.D. from the School of Public Administration at UNO. His dissertation research, funded by a fellowship from the U.S. Department of Housing and Urban Development, focused on public-private partnerships to solve homelessness. He earned a M.Sc. in Conflict Analysis and Resolution from George Mason University with specializations in international and organizational dispute resolution. His B.A. in Religion is from Swarthmore College where he studied comparative religions and ethics.

Abstract of the Plenary Session Three: Transdisciplinary Research, Creativity, and Innovation for Economic Development

This is an exciting time to be in Sri Lanka. Many opportunities are present. The complex problems will be best solved with cross-cutting answers. No longer are the traditional narrow disciplines of academe sufficient. What is needed is a culture of creativity and innovation. With approaches like social entrepreneurship and new policy frameworks, Sri Lanka is positioned to play a major role in the near and further future.

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IPRC/24/15 Science, Technology, Mathematics & Medicine

Assessment of the shelf life of a tomato sauce by incorporating a combination of artificial preservatives with natural preservatives

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Tomatoes, rich in essential nutrients, are extensively cultivated in Sri Lanka, yet local tomato sauce production relies heavily on imported pulp preserved with artificial additives. This research aims to address this issue by developing a preservative strategy that enhances shelf life using a combination of natural and synthetic preservatives. The primary objectives are to evaluate the physicochemical properties of tomato sauce made from locally grown Pathma tomatoes, investigate the effects of combining preservatives, and provide recommendations to the National Institute of Post-Harvest Management. The methodology includes preparing tomato sauce using natural and artificial preservatives, followed by Sensory evaluations (using a 7-point hedonic scale). Total plate count (TPC), and yeast and mold counts (YMC) were conducted bi-weekly to evaluate shelf life and quality. Data were analyzed using the Friedman test for sensory attributes and ANOVA for microbial and physiochemical properties from MINITAB 16. This study evaluates the impact of different preservative treatments and storage conditions on the sensory qualities, color stability, total soluble solids (TSS), and microbial load of tomato sauce. Five treatments were tested: potassium sorbate at 300 mg/kg and 500 mg/kg, a natural preservative, a market sample, and a control. Sensory evaluations revealed that the market sample scored highest in color (6.2), aroma (6.0), and overall acceptance (5.8), indicating consumer preference. Color stability analysis showed that the market sample had the highest mean color value (25.36 ± 0.035) at room temperature. Natural preservatives in treatments had the highest TSS values (42.00 ± 0.00), and the highest TPC at room temperature (79.1 ± 38.2). The YMC was lowest in samples treated with both natural and artificial preservatives. The findings suggest that the choice of preservative significantly affects tomato sauce quality, with artificial preservatives maintaining better sensory and microbial stability. These results provide a basis for selecting preservative strategies to enhance product quality.

Keywords: Color stability, Microbial stability, Physiochemical properties, Sensory evaluation, Tomato sauce preservation

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IPRC/24/39 Science, Technology, Mathematics & Medicine

Quantification of protein content in *Pleurotus ostreatus* (American oyster mushroom) and optimizing methods for preservation

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Pleurotus ostreatus is one of the most used edible mushrooms in Sri Lanka, with a high protein content and numerous bioactive compounds. Maintaining the protein level of mushrooms is critical for sustaining their nutritional value. The main objective is to identify the most effective method for preserving the protein content in *P. ostreatus* mushrooms, utilizing a scientifically rigorous approach. The fresh *P. ostreatus* were collected from an agricultural farm in Mahara, Sri Lanka, and validated using morphological and structural information. Mushrooms underwent several preservation treatments, including *Aloe vera* coating, refrigeration (4°C), freezing (-18 °C), blanching with steam and blanching with hot water (100°C), oven drying (170 °C), sun drying (24 hours), dehydration, air frying, and chemical treatments such as citric acid (0.5 moldm^{-3}, 1.0 moldm^{-3}, 1.5 moldm^{-3}, 2.0 moldm^{-3}, and 2.5 moldm^{-3}) and EDTA (1 moldm^{-3}, 2 moldm^{-3}, and 3 moldm^{-3}). For each treatment, 100 g of sample and three replicants were used. The protein content was quantified using the Bradford assay and analytically compared using a one-way ANOVA test. The results revealed mushrooms coated with *A. vera* gel had the highest protein content (0.057 ± 0.002 g). Citric acid treatment (2.5 mol/dm^3) had the least protein content (0.004 ± 0.001 g). The findings concluded that *A. vera* gel proves to be efficient for preserving the protein content of fresh mushrooms after harvest. Overall, this study reveals valuable insights into the protein content of *P. ostreatus* and offers optimized preservation methods for this mushroom species. These findings have practical implications for the food industry, promoting the utilization of *P. ostreatus* as a protein-rich ingredient and improving its shelf life for widespread consumption.

Keywords: *Aloe vera, Pleurotus ostreatus*, Preservation, Protein content, Quantification

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IPRC/24/56 Science, Technology, Mathematics & Medicine

The role of miR-150 in COVID-19 as a prognostic biomarker and a key regulator of pathway dynamics during disease progression

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The COVID-19 pandemic resulting from the spread of SARS-CoV-2 infections caused a global public health crisis that significantly affected the lives of many individuals worldwide. Understanding SARS-CoV-2 host-virus interactions led to insights into disease progression and potential treatments. miR-150, a 22-nucleotide single-stranded microRNA that does not code for a protein, has been shown to regulate human genome transcripts and play a role in viral pathogenesis. This study analyzed the role of miR-150 in COVID-19 to determine its role in pathogenesis and disease progression. The miRNA sequence data from three studies were examined: GSE176498 – dataset 1, GSE166160- data set 2 from plasma samples and GSE158877- data set 3 from serum samples. Differentially expressed microRNAs were identified using the edgeR package. Genes, pathways, pathway dynamics, and protein-protein interactions were predicted using bioinformatics tools. miR-150-3p and miR-150-5p were down-regulated in all datasets, with miR-150-3p showing significant down-regulation in the first two datasets ($P < 0.05$; Log Fold Change: Data set 1: -0.3557, Data set 2: -2.7214). The area under the curve (AUC) values for miR-150-5p were 0.88, 0.58, and 0.65, while miR-150-3p exhibited AUC values of 0.74, 0.59, and 0.55 for datasets 1, 2, and 3, respectively. Pathway analysis identified immune-related pathways impacted by the downregulation of miR-150 in worsening disease outcomes. The study reveals that COVID-19 affects biological pathways such as Wnt, IFN, NF-κB, PI3K/Akt, and MAPK, with miR-150 playing a crucial role in these pathways. Our results indicate that miR-150 may serve as a potential biomarker for prognosis of severity of COVID-19 infection.

Keywords: Biomarker, COVID-19, miRNA-150, miR-150, SARS-CoV-2

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IPRC/24/58 Science, Technology, Mathematics & Medicine

Optimizing the efficiency of a probe-based duplex qPCR assay for accurate detection of normalized *PI4KA* gene copy number

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[2]North Colombo Teaching Hospital, Ragama, Sri Lanka
[3]Department of Chemistry, Faculty of Science, University of Colombo, Sri Lanka
[4]Faculty of Medicine, University of Kelaniya, Sri Lanka
[5]Genetech Molecular Diagnostic, Colombo, Sri Lanka

Quantitative PCR (qPCR) is a powerful molecular tool, and its capability to multiplex enhances its utility. However, multiplexing can reduce PCR efficiencies compared to monoplex reactions. This study aims to establish comparable PCR efficiencies for a probe-based duplex qPCR assay that quantifies *PI4KA* gene copy number relative to the reference gene *SHANK3*. Three standard curves were generated for two monoplex reactions and duplex assay with a 10-fold DNA dilution series (100 ng, 10 ng, 1 ng, and 0.1 ng) to evaluate the efficiencies in the PCR. All reactions were duplicated on the Bio-Rad CFX96 Touch™ system with previously optimized conditions. Reaction efficiencies were calculated as $10^{-1/slope}-1$ using the Bio-Rad CFX Maestro application. Each monoplex reaction demonstrated high efficiency (E=80%-110%) and a reliable correlation coefficient ($R^2 \geq 0.98$). However, in the duplex response, the efficiency of *SHANK3* amplification was observed to be compromised (E_{PI4KA}=108.5%, R^2_{PI4KA}=0.98, E_{SHANK3}=149.5%, R^2_{SHANK3}=0.86). Thus, to enhance *SHANK3* amplification in the duplex, primer concentrations for *PI4KA* (0.2-0.4 µM) were reduced relative to *SHANK3* (0.4-0.8 µM) in various combinations. Based on the results, the primer concentrations that produced the lowest combination of Cq values, *PI4KA* Forward/Reverse 0.2 /0.2 µM (Cq=22.4±0.4) and *SHANK3* Forward/Reverse 0.4 µM/0.8 µM (Cq=24.7±0.2) were selected for reconstructing the duplex PCR. The regenerated standard curve for the optimized duplex PCR showed amplification efficiencies of 98.6% (R^2=0.99) for *PI4KA* and 99.4% (R^2=0.90) for *SHANK3*. After the final optimization of the duplex PCR, the gene dose values obtained for the positive (i.e. PI4KA gene deleted; ≃0.5) and control (healthy; ≃1) samples confirmed their accuracy in detecting normalized gene doses. Although optimizing the PCR efficiency of the duplex qPCR provided a robust assay for detecting *PI4KA* copy number, further validation of the assay for precision and sensitivity is recommended before its clinical use.

Keywords: Amplification, Efficiency, Balanced amplification, *PI4KA,* Standard curves

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IPRC/24/69 Science, Technology, Mathematics & Medicine

Development of herbal tea to manage gastritis and evaluation of acid neutralizing capacity

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Gastritis is one of the most prevalent medical conditions among the world population. Developing herbal tea, the most popular beverage in Sri Lanka, is an interesting treatment for this condition. This study was conducted to assess in vitro acid neutralizing capacity of herbal tea developed from dried leaves of *Aegle marmelos*, *Desmodium triflorum* and *Centella asiatica* and to assess the influence of infusion time and temperature on the acid neutralizing capacity. Herbal tea bags (T1-T11) were prepared by incorporating different ratios of powdered dried leaves. Each tea bag was infused at a constant infusion temperature of 100^0C for 3, 5 and 7 minutes, respectively and the in vitro acid neutralizing capacity was evaluated using Fordtran's method. Infusions which showed the best capacity were evaluated for the effect of temperature by applying different temperatures: 100, 80, 60 ^{0}C at a constant time. The duration of consistent neutralization on artificial gastric acid was evaluated using the modified model of Vatier's artificial stomach for the selected infusions. The results were compared with green tea and distilled water. The results were analyzed by using one-way ANOVA. All the brew samples infused at 100° C temperature for 5 minutes expressed a significant acid neutralizing capacity ($P \leq 0.05$). The highest acid neutralizing capacity was observed for the T9 (27.10 ± 0.00 mL) and T7 (24.70 ± 0.00 mL) following 5.43 ± 0.05 and 0.73 ± 0.05 mL for green tea and distilled water, respectively. Further, the T9 showed the highest duration of consistent neutralization on artificial gastric acid of, 382.33±2.00 s, green tea and distilled water consumed only 42.00 ± 1.00 and 72 ± 1.00 s. It could be concluded that the T9 containing only *A. marmelos* has more acid neutralizing capacity with a higher duration of consistent neutralization on gastric acid than the other plant combinations, which can be due to various interactions. Infusions at 1000C temperature for 5 minutes were the best parameters to get the maximum activity to manage the gastritis.

Keywords: Acid neutralizing capacity, Fordtran's model, Gastritis, Herbal tea

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IPRC/24/71 Science, Technology, Mathematics & Medicine

Evaluation of the fitness of RNA interference (RNAi) based *Aedes aegypti* (Linnaeus) transgenic mosquitoes

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Dengue is an arboviral disease caused by the four serotypes of Dengue Virus (DENV). An innovative approach to control dengue is the development of transgenic mosquitoes by utilizing the RNA interference (RNAi) mechanism. A previous study designed and engineered a polycistronic cluster of nine synthetic small RNAs to target all four DENV serotypes into the *Aedes aegypti* genome to develop RNAi-based Transgenic Mosquitoes (TM). The genomic engineering of the construct was confirmed by the expression of a red fluorescence marker in mosquito eyes, followed by genomic PCR. This study evaluated the fitness of developed TM compared to *Ae. aegypti* Wild-type Mosquitoes (WM) at the laboratory level. Fecundity and hatchability were assessed using 40 adult female and male mosquitoes (n=40, r=3). Flight ability and longevity were evaluated using 30 female and male TM and WM (n=30, r=3). To assess the male mating success, one adult male TM or WM was mated with five female WM (r=20). The standard wing length of male and female mosquitoes was measured in both TM and WM (n=40). Data analyses were performed using IBM® SPSS statistics version 26.0 software. A significant difference was not observed for fecundity, hatchability, standard wing length, male flight ability, and male mating success in TM compared to WM (Student's t-test; $P>0.05$). However, a significant difference was observed in the flight ability of female TM compared to WM (Student's t-test; $P<0.05$). There were no significant differences in longevity of adult male TM (63.86 ± 0.85 days) compared to WM (63.60 ± 1.7 days) and adult female TM (66.03 ± 4.0 days) compared to WM (66.62 ± 2.7 days) (Student's t-test; $P>0.05$). The absence of significant differences in most fitness parameters between TM and WM indicated that this RNAi-based transgene construct has only a minor impact on the fitness of mosquitoes.

Keywords: *Aedes aegypti*, Dengue, Dengue Virus, RNA interference, Transgenic Mosquitoes

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IPRC/24/73 Science, Technology, Mathematics & Medicine

Isolation and identification of thermostable amylase enzyme producing bacteria from compost production plant in Kurunegala

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Thermostable enzymes hold significant importance in diverse industrial sectors due to their ability to withstand high temperatures. Thermostable amylase is one such enzyme frequently used in different industrial applications. Hence, it is important to isolate locally available thermostable amylase-producing bacteria to address the growing demand for thermostable amylase enzymes. This study focused on isolating and identifying thermostable amylase-producing bacteria from hot soil. The soil samples were collected from the municipal solid waste compost production plant in Sundarapola, Kurunegala (7° 30' 31.50" N, 80° 21' 9.84" E). Bacterial colonies were isolated using the standard pour plate method on Nutrient Agar (NA) medium at room temperature. The amylase-producing bacteria were identified through a starch hydrolysis test. The amylase activity of crude extracts was evaluated using the Di-nitrosalycilic acid (DNS) method. The optimum temperature and pH levels for enzyme activity were determined and the most potential bacterial candidate was identified using the 16S rRNA gene sequencing method. The soil samples were collected from a point where the temperature was about 60 °C. Of 10 morphologically different bacterial colonies isolated from the soil sample, three bacterial isolates (SP1, SP5, SP7) were positive for amylase production. The isolate SP5 showed the highest amylase activity (1.434 U ml^{-1}) at room temperature (29 °C), while SP1, identified as *Bacillus pumilus*, showed the highest amylase activity (2.282 U ml^{-1}) at the highest optimum temperature of 60 °C. The optimum pH for the amylase activity was recorded as pH 7. Given the results, the bacterial isolate *B. pumilus* isolated from Sundarapola compost production plant could be utilized in industrial settings operating under higher temperatures. Thus, further studies are recommended to optimize culture conditions and other factors for enzyme activity to use these enzymes successfully in industrial applications.

Keywords: Compost, Thermophilic bacteria, Thermostable amylase, Thermostable enzymes

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IPRC/24/74 Science, Technology, Mathematics & Medicine

Isolation and characterization of thermo-stable cellulase enzyme producing bacteria from a compost production site

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Thermophilic bacteria have altered to thrive and function in relatively hot environments. They can produce thermo-stable enzymes that survive under high temperatures typically between 50^0C – 120^0C. These enzymes are valuable in different industrial and biotechnological applications. Among other enzymes cellulase plays an important role in food, paper, fermentation and textile industries. Cellulase enzyme production has reached 12% of the global enzyme market. Therefore, this study has focused on the isolation and characterization of thermo-stable cellulase enzyme-producing bacteria. The samples were collected from compost production site at *Govijanaseva Department, Kadawatha* (GPS coordinates: 7.035695438637899, 79.96050932347872). The standard pour and streak plate methods were carried out using Nutrient Agar plates at room temperature to isolate morphologically different bacteria. Bacterial isolates were screened for the production of cellulase enzyme using CMC agar plate assay. The secondary screening for the enzyme activity was conducted using a Di-nitro salicylic acid (DNS) assay, and the effect of temperatures and pH levels on crude enzymes of cellulose producing bacterial isolates was determined. The soil sample was collected at 61 ^{0}C of temperature. Out of ten morphologically different bacterial colonies, 08 isolates (GV1, GV2, GV3, GV5, GV6, GV8, GV9 and GV10) were positive for cellulase enzyme production. Bacterial isolate: GV3 possessed the highest enzyme activity (0.38831 U ml^{-1}) at room temperature. Bacterial isolate: GV10 was shown to have the highest optimum temperature of 70 ^{0}C (enzyme activity – 0.48994 U ml^{-1}) and optimum pH 8 for cellulase enzyme activity. As per the results, the bacterial isolate GV10 has been identified as the most potential bacteria that can be successfully used in industrial settings operating under high temperatures. Further optimization of bacterial growth conditions and the effect of other factors on enzyme activity is needed to confirm the utilization of different industrial and biotechnological applications.

Keywords: Biotechnology, Compost, Thermophilic bacteria, Thermo-stable cellulose

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Association between creatinine and contrast-induced acute kidney injury in patients with type II diabetes mellitus post angiography

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The global population with type 2 diabetes mellitus (DM) is projected to increase from 460 to 700 million by 2045, significantly raising the risk of coronary artery disease (CAD). A coronary angiogram quantifies CAD severity, with contrast-induced acute kidney injury (CI-AKI) being a common adverse reaction and the third leading cause of hospital-acquired renal failure. Therefore, it is vital to assess the risk of post-angiography complications. A prospective cross-sectional cohort study was conducted by recruiting 95 patients receiving treatment for CAD at the National Hospital Sri Lanka. The study involved male and female patients aged 18 to 80 years, with data collected via an interviewer-administered questionnaire. The cohort comprised 66 men (69.47%) and 29 women (30.53%), with a mean age of 55.86 ($\pm$9.35). Among them, 51 had Type 2 DM, predominantly in the 41–60 age group. According to the Kidney Disease Improving Global Outcomes Guidelines, CI-AKI was observed in 7 out of 95 patients (7.4%) in the study. A strong correlation was found between CI-AKI and the pre-angiography serum creatinine levels (P=0.001, r= +0.441), White Blood Cell count (P=0.005, r=+0.286), duration of diabetes (P=0.001, r= +0.355) and type of diabetes treatment (P= 0.015, r= +0.297). The logistic regression model for predicting AKI based on pre-angiography serum creatinine levels has an AUC of 0.877, indicating high accuracy in distinguishing CI-AKI risk. The highest Youden's Index of the study was 0.705, indicating the optimal cutoff value of 1.085 for creatinine, which can be utilized as a biomarker to identify CI-AKI in clinical practice.

Keywords: Acute kidney injury, Coronary heart disease, Kidney disease, Type 2 diabetes

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IPRC/24/86 Science, Technology, Mathematics & Medicine

Study of the stability of the inner surface polymer coating of synthetic polyisoprene surgical gloves

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Gloves are commonly used to protect both patients and medical personnel from infectious organisms. A polymer coating is applied as a lubricant on the interior surface of the glove because synthetic medical gloves are difficult to don. White colour marks appear on the internal surface of the glove due to the destabilization of the polymer coating during manufacturing resulting in loss of product quality. To avoid this issue, destabilized coating needs to be removed frequently from the tank during the continuous manufacturing process. The stability of the polymers was observed with varying surfactant content. Polyethylene wax dispersion tends to destabilize the solutions when there is low surfactant content in the mixture. The effect of the polymers on the stability of the coating was observed with 0.1 $moldm^{-3}$ $Ca(NO_3)_2$. The coating consists of polyethylene wax dispersion and modified melamine resin, which destabilize instantly. The three polymers polyethylene wax dispersion, modified melamine resin and polyurethane need to be combined in the coating solution to maintain stability over time. The coating formulation, white polyethylene wax dispersion, was used as an anti-blocking agent to reduce the frictional properties of gloves, which caused white colour marks on the inner surface when destabilized. The existing formulation was modified to reduce polyethylene wax dispersion. Control gloves were prepared by applying the existing formulation. Sample gloves were made by applying an 80% polyethylene wax dispersion reduced formulation. Friction, physical properties, total water extractables (TWE)% and $Ca(NO_3)_2$% of samples were assessed compared to the control. The friction values of samples indicated no significant difference against the control. The average physical properties for aged and unaged samples were within specifications. The TWE% was 0.72, and $Ca(NO_3)_2$% was 0.27 of the sample, which is acceptable. The modified coating films were characterized by FTIR analysis. Future studies are necessary to conduct a shelf-life study of the modified formulation.

Keywords: Destabilization, Friction, Physical properties, Polymer coating, Synthetic gloves

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IPRC/24/101 Science, Technology, Mathematics & Medicine

From kitchen to lab: Unveiling the potency of *Allium cepa* peels in green synthesis of silver nanoparticles and assessing their antioxidant, catalytic, antibacterial, cytotoxic, and melamine detecting properties

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Onion peels are a significant portion of global kitchen waste generated from the annual production of over 107 million tonnes of onions. Despite being enriched with bioactive compounds with potential antioxidant and antimicrobial properties, this bio-waste is often discarded, presenting an environmental challenge. *Allium cepa* peels derived from local and imported onion varieties, including small onion, Bombay red, Pakistan, India, and China, were utilized in this study to synthesize silver nanoparticles (AgNPs). The AgNPs were assessed for antioxidant, catalytic, antibacterial, cytotoxic, and melamine detecting properties. AgNPs formation was confirmed by yellow to dark-brown color change and UV-Vis peak at 420-480 nm. Scanning electron microscope analysis revealed spherical AgNPs ranging from 25-85 nm. Antioxidant activity of the AgNPs was assessed through total antioxidant capacity (TAC), total flavonoid content (TFC), total phenolic content (TPC), and DPPH radical scavenging assays. The AgNPs showed higher TFC and TAC compared to the water extracts (WEs), as the one-way ANOVA revealed a significant difference between the TFC and TAC values of WEs and AgNPs ($P < 0.05$; TFC: $P = 0.001$; TAC: $P = 0.0004$). China-AgNPs exhibited the most potent antioxidant activity with an IC50 value of 1.49 mg/mL. Catalytic activity was assessed using paranitrophenol degradation with 4000ppm AgNPs, achieving complete degradation within 240 minutes. Cytotoxicity of AgNPs was evaluated using the viability of *Artemia salina* (brine shrimps) and proved to be biocompatible and non-toxic at room-temperature. AgNPs exhibited higher antibacterial activity against *Staphylococcus aureus* than *Escherichia coli* relative to WEs. Melamine was detected using three melamine concentrations and in raw milk, using China-AgNP-based colorimetric method. The China-AgNPs showed sensitivity for detecting melamine at 1-8 ppm concentrations and identified melamine adulteration in raw milk. These findings suggest an eco-friendly and convenient method for synthesizing AgNPs using onion peels with potential applications in various industries.

Keywords: *Allium cepa* peels, green synthesis, silver nanoparticles

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Paspanguwa herbal remedy potentiates antibacterial efficacy of Penicillin against Methicillin-resistant *Staphylococcus aureus*

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Paspanguwa is a traditional Sri Lankan polyherbal remedy for fever, cold, cough, headache, and body aches. With global antibacterial resistance on the rise, penicillin has lost effectiveness against many infections. Thus, this study aimed to investigate how different commercially available *Paspanguwa* formulae interact with penicillin and to identify the specific plant species within these formulae that influence this interaction. Five *Paspanguwa* formulae were purchased. Individual dried plant parts used in *Paspanguwa* were sourced from the Ayurvedic Drug Corporation of Sri Lanka. The *Paspanguwa* formulae were prepared as per package instructions. Dried plant materials (25 g each) were boiled in 200 mL of distilled water (DW) for 20 minutes and filtered. Agar well diffusion assay was employed to test antibacterial activity against methicillin-resistant *Staphylococcus aureus* (MRSA). The wells were dispensed with: 50 µL of 3.0 mg/mL penicillin solution (positive control), a mix of 25 µL of 3.0 mg/mL penicillin solution, 25 µL plant extract, 50 µL of 1.5 mg/mL penicillin (experimental control), and 50 µL of DW (negative control). Inhibition zone diameters (IZDs) were measured. The data were analyzed using one-way ANOVA with Dunnett's post-hoc test, considering $P<0.05$ statistically significant. All five *Paspanguwa* formulae showed zero IZD, yet significantly enhanced the zone of inhibition achieved by penicillin alone (9.65 ± 0.24 mm). Aqueous seed extracts of *Coriandrum sativum* (CSE; 13.64 ± 0.78 mm) and *Piper nigrum* (PNE; 13.07 ± 0.18 mm), ingredients in *Paspanguwa*, significantly enhanced the IZD of penicillin (8.55 ± 0.30 mm). However, the aqueous crude extracts alone did not inhibit MRSA growth. The minimum inhibitory concentration (MIC) of penicillin, penicillin with CSE, and penicillin with PNE were 17.58, 4.17, and 9.88 µg/mL, respectively. Thus, the extracts of CSE and PNE enhanced penicillin's antibacterial activity by 4.2 and 1.8 times, respectively. In conclusion, the *Paspanguwa* formulations significantly enhanced the antibacterial potential of penicillin against MRSA, with CSE being the ingredient responsible for the observed potentiation interaction.

Keywords: Antibacterial potentiation, *Paspanguwa*, Penicillin

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IPRC/24/110 Science, Technology, Mathematics & Medicine

Improvement of dye sensitized solar cell performance using different particle sizes of double layered TiO_2 photoanodes

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Dye-Sensitized Solar Cells (DSSCs) offer an exciting alternative to conventional p–n junction solar cells, combining low-cost & easy manufacturing and impressive device performance to revolutionize the solar energy landscape potentially. This study investigated the solar performance influence of titanium oxide (TiO_2) double layers with different particle sizes on Dye-Sensitized Solar Cells (DSSCs). The TiO_2 powder (Titanium (IV) dioxide), ethanol, and acetic acid were mixed to make TiO_2 paste. Doctor blade technique was employed to evenly spread the TiO_2 layer on indium-doped tin oxide (ITO) conducting glasses. DSSCs were created using natural grape dye and a candle soot carbon counter electrode. The solar cell devices were characterized using absorption spectra and current density - voltage (J-V) curves. Double layers of TiO_2 can enhance light absorption more than single layers. A single-layer DSSC uses TiO_2 particles of the same size, while a double-layer DSSC has two layers with TiO_2 particles of two different sizes. Double-layered DSSC exhibited a conversion efficiency of 0.09%, photocurrent density (J_{SC}) of 568 μA cm^{-2}, open circuit voltage (V_{OC}) of 0.46 V, and fill factor (FF) of 34%. J_{SC} increased significantly from 249 μA cm^{-2} to 568 μA cm^{-2}, efficiency improved from 0.03% to 0.09%, and V_{OC} increased from 0.40 V to 0.46 V, compared to the best single-layer device, which consists of small particle size. Large particle sizes in the bottom layer increase the conductivity of the films due to less grain boundaries. TiO_2 layers with small nanoparticle sizes have a large contact area. DSSCs with small particle sizes in the top layer and large particle sizes in the bottom layer can achieve better solar cell efficiency in multiple layers. This study identified combining large and small particles as an attractive approach to increase solar cell efficiency.

Keywords: Double layer, Dye-sensitized solar cells, Natural dye, Particle size

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IPRC/24/116 Science, Technology, Mathematics & Medicine

Optimization of RNA extraction method from latex of the rubber tree *Hevea brasiliensis* for gene expression analysis by RT-PCR

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High-quality nucleic acids (DNA and RNA) are fundamental for genomic/molecular research. Understanding the molecular mechanisms of rubber biosynthesis and its regulation relies on obtaining pure RNA (ribonucleic acid) for gene expression analysis. Mature leaves or limited leaf samples often present challenges in extracting high quality RNA. This study presents a precise, efficient, and reliable method for extracting pure, high-quality RNA from the latex of the rubber tree (*Hevea brasiliensis*) for gene expression analysis. Traditional methods using Trizol reagent, chloroform, or salts can introduce contaminants such as excess phenol and proteins from the latex, compromising the quality of RNA. To address this, an additional chloroform extraction step, multiple RNA washes with 95% ethanol, and a freeze- drying the RNA pellet at -20°C overnight was incorporated. The added chloroform step reduced RNA contamination with phenol or proteins from the interphase of solvents. Repeated washes with 95% ethanol effectively eliminated residual salts from the isopropanol RNA precipitation step and any remaining phenol and chloroform, further enhancing RNA purity (checked by Nano-spectrophotometer). The freezer-drying step mitigates RNA degradation due to temperature fluctuations in the working area. These modifications significantly improve the purity, quality, accuracy, and reliability of RNA quantification (the concentration and purity). The efficacy of the modified RNA extraction protocol was validated by assessing the quality, quantity and purity of the isolated RNA using Nano spectrophotometric determination (A260/A280 ratio was around 2.0 and A260/A230 ratio was around 2.0 to 2.2) and 2% agarose gel electrophoresis. The downstream applicability of the isolated RNA was further validated using quantitative reverse transcription polymerase chain reaction (qRT-PCR) for gene expression analysis of drought tolerance and *ref* gene. The study proved the suitability of a modified RNA extraction protocol to isolate RNA from rubber latex to generate accurate qRT-PCR results.

Keywords: *Hevea brasiliensis*, Latex, RNA, RNA extraction, Rubber

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IPRC/24/138 Science, Technology, Mathematics & Medicine

A preliminary study on avifaunal diversity of Manalkaadu sand dunes Jaffna, Sri Lanka

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Coastal sand dunes are generally formed near the beaches. Dune habitats serve as an ecological niche between terrestrial and marine lands and form important nature conservation sites. The Jaffna Peninsula is a key entry and exit point for avian species in Sri Lanka, with a considerable number of research documenting its bird diversity in the lagoon areas. While the coastal lagoons of Jaffna are well-studied, the avifauna inhabiting the coastal sand dunes still need to be explored. This study aims to determine the diversity of dune-dwelling and associated avifauna in the Manalkaadu sand dune area, located within the Maruthankerny Divisional Secretariat division, spreading approximately 46 km from Katkovalam to Aliyawalai within the Palk Bay coastal avifaunal zone of Sri Lanka. Data were collected from August 2022 to May 2024 across nine permanent sampling stations within the dune area and along existing roads using the point count method. Each station was visited four days per month for data collection, and bird status was evaluated according to the National Red List of Sri Lanka. Diurnal and nocturnal observations were conducted using the unaided eye and binoculars. A total of 81 bird species, representing 36 families and 14 orders, were recorded. This constitutes 15.5% of the bird species documented in Sri Lanka (522 species). The order Charadriiformes was represented by seven families and 22 species, while the order Passeriformes included 13 families and 19 species. Notably, the family *Scolopacidae* was represented by eight species, and the family Ardeidae by seven species. Additionally, 18 families were each represented by a single species. Zone restricted species of *Francolinus pondicerianus* and *Dicrurus macrocercus* were also recorded from the sand dunes. These findings highlight the significance of sand dunes in supporting bird diversity. Understanding the avian diversity within sand dune systems is essential for biodiversity conservation, habitat management, and mitigating the impacts of environmental threats.

Keywords: Coastal avifauna, Jaffna, Palk Bay Coastal avifaunal zone, Sand dunes

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IPRC/24/143 Science, Technology, Mathematics & Medicine

Application of underwater imagery and drone technology for coral reef assessment in *Kayankerni* Marine Sanctuary, Sri Lanka

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Coral reefs are vital ecosystems supporting marine life. However, they face threats from climate change, pollution, anthropogenic factors, etc. The *Kayankerni* Marine Sanctuary has rich coral biodiversity and is particularly susceptible to these pressures. This study leverages drone technology to enhance coral conservation efforts by providing high-resolution aerial imagery with field surveys. We conducted aerial surveys using DJI Phantom 4 pro drone at an altitude of 15 m to capture detailed imagery of the coral reefs. The flight path was created with the PIX4D-capture mobile application. Underwater transect surveys were performed by snorkelling to take images of coral reefs. The drone images were uploaded to the Drone Deploy website, and orthomosaic map was created with 85% side and front overlapping. Using a digital elevation model and an orthomosaic map as references, the coral cover was calculated using ArcMap 10.8 software. With the calculations out of a total area of 79428.29 m^2 in the *Kayankerni* Coral Reef, the coral cover was obtained as 13126.58 m^2. Live coral and dead coral with algae percentages were 51.75% and 33.60%, respectively. Images captured during the transect survey were further analyzed with CPCe 4.1 (Coral Point Count with Excel extension) to get data on coral diversity. Seagrasses constituted 0.16% of the observed area, while the Shannon-Wiener diversity index and Simpson's index for coral reefs were 0.77 and 0.29, referenced to CPCe 4.1. According to drone imagery, coral cover exists in 16.52% of the study area. Comparatively, the percentage of live coral was higher, and coral exhibited high level of species diversity. There was a slightly higher dominance of *Acropora sp., Echinopora sp., Porites sp.,* and *Montipora sp*. This study highlights integrating advanced remote sensing drone technology with ground-truthed assessments for better management practices and to promote sustainable conservation strategies for Sri Lankan coral reef ecosystems.

Keywords: Biodiversity indices, Drone technology, Marine sanctuary

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IPRC/24/152 Science, Technology, Mathematics & Medicine

Extending the shelf life of deodorized *Aleurites moluccana* (Thel Kekuna) oil using phenolic extract from coconut paring residue

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Aleurites moluccana nuts, known as Thel Kekuna in Sinhala, is a highly underutilized plant in Sri Lanka with great potential to produce oil loaded with numerous compounds, including omega fatty acids and antioxidants that provide health benefits. Natural pungent order is the major drawback of Thel Kekuna oil (KO), which limits its wide usage. The purpose of this study is to deodorize the KO while preserving the shelf life and antioxidant activity of the deodorized oil. The stripping with an activated alumina column was used to absorb the aromatic volatiles in the KO. The ethanolic extract of Coconut Pairing Residue (CPRE) is rich in phenolic antioxidants. Therefore, this study analyzed the effect of CPRE on reducing oxidation and extending the deodorised oil's shelf life. The KO was extracted using the Soxhlet method. The KO yield was calculated. The fatty acid profiles of the crude and stripped oils were analyzed using gas chromatography, while α-tocopherol and β-carotene levels were quantified using high-performance liquid chromatography. Total phenolic content and DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging activity were investigated. The CPRE 300 µL was added to 3 g of stripped Kekuna oil (CPRE-SKO), and a raincoat test was performed to assess the shelf life. The oil yield was 51.57 ± 0.34% dry weight basis. Palmitic acid (5.39 ± 0.14%), ∝-linolenic acid (20.16 ± 0.05%), linoleic acid (45.84 ± 0.16%) and oleic acid (28.61 ± 0.11%) were identified as the fatty acids. The ∝-tocopherol and β-carotene concentrations were quantified as 34.68 ± 0.73 mg/KO kg and 4.12 ± 0.17 mg/KO kg, respectively. The oxidative stability of the CPRE-SKO was 27.01 hours, whereas the crude oil exhibited stability for only 3.04 hours at 120^{0}C. There was no significant difference in DDPH radical scavenging activity between crude oil and CPRE-SKO ($P>0.05$). The findings suggest that CPRE can extend the shelf life of deodorized KO and enrich it with antioxidants while enhancing its palatability.

Keywords: Antioxidant activity, Coconut pairing residual extract, Shelf life, Thel Kekuna

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IPRC/24/158 Science, Technology, Mathematics & Medicine

Fungal and plant DNA extraction using cellulose based paper strip method

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The PCR is a frequently used laboratory technique. It can amplify a minimal amount of DNA in the range of picograms and even in the presence of various contaminants. Extraction of pure DNA from fungi and plants for PCR and sequencing purposes is very difficult due to their compact cell wall structure. This study aimed to check whether the impurities can be removed from the recovered DNA using the cellulose-based paper strip method and obtain clean DNA for PCR and sequencing. Three DNA extraction methods (paper strip method after cell lysis, paper strip method after organic extraction with chloroform/isoamyl alcohol step and paper strip method following organic extraction with chloroform/isoamyl alcohol step after adding phenol/chloroform/isoamyl alcohol) were compared with the classical CTAB method in terms of DNA yield (ng/mg) and the purity of DNA based on A260/280. The absorbance was taken with thermo scientific μDrop plate using the spectrophotometer. The DNA amplification was analyzed using SYBR Green-based Real-Time quantitative PCR (Step One Real-Time PCR, Applied Bio Sciences). Data were analyzed by the Krsuskal Wallis test using SPSS software. The purity of DNA from all four methods for each species did not show a significant difference ($P<0.05$). However, better PCR amplification curves were given for all species with the paper strip method following organic extraction with chloroform/isoamyl alcohol after the phenol/chloroform/isoamyl alcohol step, though this method has a low yield and purity even compared to the classical CTAB method. According to the Cq values, there is abundant target nucleic acid in the samples except those purified with paper strip method following chloroform/isoamyl alcohol. Clean DNA is produced from *Aspergillus niger* (17 ± 0.7 ng/mg), *Candida albicans* (21 ± 6.0 ng/mg) and *Plumeria rubra* (33 ± 21 ng/mg) and *Orchidaceae* (31±21 ng/mg) with the paper strip method following organic extraction with chloroform/isoamyl alcohol step after adding phenol/chloroform/isoamyl alcohol for PCR. Therefore, this method can be used as a substitute for the classical CTAB method to obtain clean DNA for PCR and sequencing purposes.

Keywords: CTAB, DNA extraction, Paper strip method, PCR.

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In-silico investigation of inhibition of TGF-β1 signalling pathway by C-glycosidic Ellagitannins, a bioactive molecule from the plant *Osbekia octandra* for their potential as a treatment option for hepatic fibrosis

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Liver fibrosis is a lethal disease caused by the activation of the canonical TGF-β1 pathway upon chronic stimulation by pro-inflammatory cytokines. Thus, the in-silico observation of potent natural compounds in the development of advanced medicines for liver fibrosis is essential. The main objective of the study was to investigate the in-silico inhibition of the TGF-β1 pathway by C-glycosidic ellagitannin bio-active molecules of the *Osbeckia octandra* plant, based on binding interactions and binding energies. Initially, the crystal structures of TGF-β1 pathway proteins, TGF-β receptor I and TGF-β receptor II, were obtained via homology modelling and subjected to binding site analysis. The structures of five different ellagitannins (ligands) Casuarinin, Casuarin, Castalegine, Vescalagine, and Epi-punicacortien A were geometrically optimized. All ligands were docked with each receptor and their binding affinities were compared with commercial drugs, Silmitasertib (for TGF-β receptor I) and ITD-1 (for TGF-β receptor II) with the best pose along with binding interactions. The TGF-β receptor I and TGF-β receptor II crystal structures were selected based on the highest GMQE values of 0.84 and 0.81, respectively. The automated docking results showed that Casuarinin, Casuarin, Castalegine, Vescalegine, and Epi-punicacortien A had binding affinities of -9.5, -9.0, -8.2, -8.3, and -9.3 kcal/mol, respectively, towards TGF-β receptor I, compared to the commercial drug Silmitasertib, which showed -10.0 kcal/mol. For TGF-β receptor II, the ligands showed binding affinities of -9.8, -9.3, -8.7, -9.0, and -8.2 kcal/mol, respectively, while ITD-1 showed a binding affinity of -8.9 kcal/mol. Since Casuarinin showed a high and comparable binding affinity towards both TGF-β receptors compared to the commercial drugs, this study suggests that Casuarinin is a potential candidate that can be further developed as an oral capsule or infusion to treat liver fibrosis.

Keywords: Ellagitannins, Liver fibrosis, In-silico

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IPRC/24/163 Science, Technology, Mathematics & Medicine

Growth inhibition of three fungal pathogens by marine macroalgal extracts: An *in vitro* study

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Increased reliance on synthetic fungicides to control crop fungal diseases has led to numerous environmental and health issues. Thus, this study aimed to investigate the antifungal activity of marine macroalgal species of *Ulva*, *Gracilaria*, and *Sargassum* from Thalpe reef against fungal pathogens, *Colletotrichum* sp., *Fusarium* sp., and *Sclerotinia sclerotiorum*. Algal extracts were obtained using ethyl acetate, chloroform and methanol. Antifungal activity was tested *in vitro* at four concentrations using poisoned plate method. Captan and dimethylsulfoxide were used as positive and negative controls, respectively and all treatments were triplicated. Fungal growth inhibitory percentages were calculated, and their significance was assessed by Kruskal-Wallis test followed by Dunn's post hoc test for comparison. Results revealed that most of the extracts were effective at 2000 ppm concentrations. However, the highest inhibition (75%) was exhibited by *Gracilaria*–chloroform extract at 1000 ppm against *S. scleritiorum,* which was significantly different from all other macroalgal x solvent x concentration (MxSxC) combinations except for 2000 ppm *Sargassum*–chloroform extract (72%). Similarly, *Gracilaria*–ethyl acetate extract at 2000 ppm demonstrated significantly higher inhibition (71.5%) against *Colletotrichum* sp. compared to all other MxSxC interactions ($P<0.05$). None of the MxSxC combinations inhibited the growth of *Fusarium* sp. more than 50%, with 2000 ppm *Ulva*-methanol extract showing the highest inhibition of 49.4%. Methanol extracts were most effective against *Fusarium* sp. *Ulva* extracts consistently increased the inhibition against tested pathogens with concentration increments. Altogether, 15 MxSxC combinations exhibited more than 50% inhibition. Overall, *Gracilaria* and *Ulva* extracts could be identified to have a significantly higher antifungal potential compared to *Sargassum.* Thus, 2000 ppm *Ulva*–methanol and *Gracilaria*–chloroform extracts can be concluded to possess the highest antifungal potential, though the bioactive compounds in these have to be identified. Further, the efficacy and feasibility of these extracts in field applications need to be investigated.

Keywords: Antifungal activity, Crude extracts, Inhibitory percentage, Marine macroalgae, Poisoned food technique

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IPRC/24/166 Science, Technology, Mathematics & Medicine

Isolation and identification of plastic, rubber and styrofoam deteriorating fungi from PVC-coated materials

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Plastics and rubber play a vital role in human lives due to their versatility and functionality. However, polymeric waste presents significant environmental and economic challenges. This study investigates the deterioration of selected polymers by some unknown fungal strains. Fungal colonies associated with a PVC-coated phone cable under room-temperature conditions were isolated and seven fungal strains (T1, T3, T7, T12, T14, P1, and P5) were selected based on the colony morphology. Low-density polyethylene (LDPE), high-density polyethylene (HDP), polyvinyl chloride (PVC), styrofoam, and natural rubber were used as test polymers. The mineral salt agar medium was used to screen the growth of the fungi, and the test material was the sole carbon source in the medium. Fungi capable of degrading the polymers were expected to display a clearance zone ('halo') around their cultures. However, no clear zones were observed. Despite this, visible growth was noticed, indicating substrate consumption. Deterioration of materials was assessed by the weight loss of the pre-weighed materials after being immersed in MSM broth cultures along with test fungi. Tests were performed in duplicate. Weight loss was expressed as mean ± SD, and the rate of biodeterioration was calculated as weight loss per unit time (mg/day). The T14 strain exhibited the highest weight loss (3.50 ± 0.71 mg/day) and the rate of biodeterioration of PVC, while the results of other materials were not notable. Fourier-transform infrared spectroscopy showed changes in the 2910-2950 cm^{-1} region, indicating asymmetrical stretching of CH_3/CH_2 groups, exhibiting alterations in the PVC material's functional groups. This research has successfully unveiled the potency of the survival of seven distinct fungal strains on materials like PVC, LDPE, HDPE, Styrofoam, and natural rubber. Furthermore, it reveals the degradability of PVC by the T14 strain, which can be further tested with an extended incubation time for more reliable results.

Keywords: Biodeterioration, fungi, plastics, polymers

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A comparative study on anomaly detection algorithms in non-stationary time series

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Anomaly detection in time series data has been a research topic for many years. Numerous algorithms have been proposed for various applications, including fraud detection, fault detection, network intrusion detection, and healthcare. However, it remains challenging, particularly when dealing with non-stationary time series that exhibit trends, seasonality, and change points, as the system behavior monitored by time series is likely to change over time, either smoothly or abruptly. There is a lack of comprehensive performance evaluation of the state-of-the-art algorithms in non-stationary time series data. This makes it difficult for users to choose an appropriate method for real-world applications. In general, anomaly detection methods are classified into different taxonomies. One taxonomy is proximity-based, clustering-based, density-based, and isolation-based methods. For this study, one method was selected from each category based on their public availability. The chosen methods are Isolation Forest (IF) for isolation-based detection, Local Outlier Factor (LOF) for proximity-based detection, Support Vector Machine (SVM) for density-based detection, and K-means clustering for clustering-based detection. These methods were tested using the Yahoo Webscope S5 dataset. The dataset was divided into four data classes: *A1, A2, A3*, and *A4*. Each data class has a set of real or synthetic web traffic metrics annotated with anomalies. Data sets with stationary time series and non-stationary time series that exhibit trends, seasonality, and change points were selected among these four classes. The performance of these methods was compared using precision, recall, f1 score, receiver operating curve (ROC), and precision-recall curve (PR-AUC). For stationary time series, the isolation forest algorithm performed well in identifying anomalies, with precision=1.00, recall= 0.94, f1 score=0.97, ROC=1.00, and PR-AUC=1.00. In non-stationary time series with seasonality, both isolation forest and local outlier factor methods outperformed other methods, with precision=1.00, recall=0.94, f1 score=0.97, ROC=1.00, and PR-AUC=1.00. The K-means clustering showed better time series results with trend, seasonality, and change points.

Keywords: Anomaly detection, Non-stationary, Time series.

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Development and evaluation of a quinazolinone derivative as a urease inhibitor for reducing nitrogen loss in agricultural soil

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Plants often can't fully utilize nitrogen from urea due to losses from volatilization, nitrification, and denitrification. This research aimed to reduce these losses by inhibiting soil bacteria urease, which slows urea breakdown into ammonia, thereby improving nitrogen availability for plant uptake. Literature indicates that quinazolinone derivatives have diverse bioactivities. In this study, a quinazolinone derivative was synthesized as a urease inhibitor, with the optimal urea-inhibitor ratio determined to maximize efficiency against soil bacterial ureases. The binding affinity of the inhibitor to *Bacillus pasteurii* (*PDB code 4UBP*) urease was assessed through molecular docking using AutoDock GOLD 5.0.3 and Discovery Studio v16.1.0.15 software. The PLP fitness (Piecewise Liner Potential) of the synthesis compound was 50.3 compared to the thiourea PLP fitness of 25.0, which was used as a standard compound. The synthesis process involved two steps. First, a benzoxazinone intermediate (IM-01) was synthesized using anthranilic acid, a benzoyl chloride, and pyridine, achieving an 80% yield. Next, (IM-01) was refluxed with hydrazine monohydrate to produce the quinazolinone derivative (Q-01). The structures of the synthesized compounds were confirmed through FTIR, ^{1}H and ^{13}C NMR, and High-Resolution Mass Spectroscopy, while the *in vitro* urease inhibitory activity of the compound (Q-01) was assessed using a modified Berthelot's spectrophotometric method. The urease required for the assay was extracted from the germinated seeds of *Macrotyloma uniflorum* (Horse gram). The IC_{50} value of (Q-01) was 17.5 ± 1.9 ppm compared to thiourea IC_{50} 14.5 ± 1.8 ppm, which was used as a standard compound ($P < 0.05$). Different ratios of (Q-01) were then mixed with a constant amount of urea to identify the optimal ratio. The pellets with the optimal 250:1 (urea: Q-01) ratio were formulated using a binder to compress the urea and inhibitor mixture. Further studies will assess the efficacy of the urea: Q-01 (250:1) pellet in soil by evaluating its impact on plant growth and microbial activity.

Keywords: Quinazoline, Urease enzyme, Urease inhibitor, Urea.

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IPRC/24/172 Science, Technology, Mathematics & Medicine

Phytochemical analysis and mosquito repellency evaluation of *Ocimum sanctum*

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Mosquito-borne diseases, such as dengue fever and zika virus present ongoing public health challenges necessitating the exploration of safer and environmentally sustainable repellent solutions. This research focuses on *Ocimum sanctum*, commonly known as holy basil, renowned for its pharmacological diversity. The study aims to elucidate its phytochemical composition and evaluate its efficacy as a natural mosquito repellent, specifically targeting *Aedes* mosquitoes. The objectives encompassed phytochemical screening using methanolic and aqueous extracts, essential oil extraction via hydro-distillation, and formulation of a repellent balm integrating *O. sanctum* essential oil with beeswax, coconut oil, glycerine, *Aloe vera* gel, emulsifying oil and preservatives. Plant materials were meticulously collected from Bandaranayake Memorial Ayurvedic Research Institute, Sri Lanka, ensuring authenticity through herbarium sheet preparation and subsequent powdering. Phytochemical screening revealed a complex profile, including alkaloids, glycosides, tannins, flavonoids, phenols, and steroids, highlighting its rich bioactive potential. Essential oil extraction yielded percentages varied between 0.0019-0.0054 v/w%, prompting Thin Layer Chromatography (TLC) for chemical fingerprinting to ensure consistency and quality control. Mosquito repellency was rigorously assessed through cage tests, demonstrating significant efficacy with reductions in mosquito populations ranging from 63.64% to 68.18% in treated areas. This underscores *O. sanctum'*s promise as an effective natural repellent. Despite challenges in optimizing essential oil yield from fresh leaves, the study provides robust evidence supporting *O. sanctum*'s role in sustainable pest management strategies. The study establishes *O. sanctum* as a promising candidate in the quest for eco-friendly solutions against mosquito-borne diseases, emphasizing its significance in scientific inquiry and practical implementation.

Keywords: Mosquito-borne diseases, Natural mosquito repellent, *Ocimum sanctum*, Phytochemical composition, Sustainable pest management.

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IPRC/24/176 Science, Technology, Mathematics & Medicine

Extraction and purification of lipase enzymes from rice bran and identification of potent natural inhibitors of rice lipases

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A significant byproduct of milling of rice is rice bran. Global production of rice bran is approximately 29.3 million tons per year. While rice bran is used as animal feed, a considerably low amount of rice bran is utilized efficiently due to its short shelf life due to rancidity resulting from high levels of lipids, lipases, and lipoxygenases. Triglycerides (lipids) have ester bonds hydrolyzed by lipase enzymes, releasing free fatty acids. Therefore, inhibiting the lipases in rice bran is a potential method for limiting lipid oxidation to prevent rancidity. In this study, three lipases found in rice bran were isolated and separated using differential protein precipitation, followed by size exclusion chromatography and ion exchange chromatography. The 45% saturation pellet was used further to separate three lipases, indicating the highest lipase activity (1.954 ± 0.025). Then, the efficiency of natural plant extracts in inhibiting the activity of isolated lipases was assessed using the Folin Ciocaltue assay. Natural plant extracts such as ethanolic extracts of leaves of *Moringa stenopetala* (drumstick), *Punica granatum* (pomegranate) and *Psidium guineense* Swartz (guava) and methanolic extracts of leaf and bark of *Cinnamomum zeylanicum* (cinnamon) on each lipase were assessed. The activity of the rice bran lipases was significantly reduced by leaf extracts of *Moringa stenopetala,* leaf and inner bark extracts of *Cinnamomum zeylanicum*, and *Psidium guineense Swartz* (P value<0.05). Among those, the highest inhibition was observed in leaf extract from *Moringa stenopetala.* Concentration as Galic Acid Equivalent (mg/mL) for Lipase 1, Lipase 2 and Thermostable lipase were 0.79 ± 0.05, 0.55 ± 0.01, 0.39 ± 0.06, respectively. The highest percentage inhibition for three lipases was obtained by leaf extract of *Moringa stenopetala.* Percentage inhibition for lipase 1, lipase 2 and thermostable lipase were 33.33%, 26.09% and 19.05%, respectively.

Keywords: Lipase inhibitors, Rice bran, Rice bran lipases.

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IPRC/24/177 Science, Technology, Mathematics & Medicine

Antioxidant effect of curry leaves (*Murraya koenigii*) powder on acrylamide mitigation in spring rolls covered with bread crumbs

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Plant extracts are rich in phenolic compounds like phenolic acids, flavonoids, and tannins, which exhibit diverse biological effects, including antioxidant and antibacterial properties. Acrylamide is a food toxicant formed through Maillard reactions in carbohydrate-rich foods at high temperature associated processing. The European Commission has set benchmark levels for the acrylamide content in different foods. Spring rolls covered with bread crumbs (SRCBC) are fried food susceptible to acrylamide formation. This study examines the antioxidant effect of newly incorporated curry leaf powder (CLP) on reducing the acrylamide formation in SRCBC and its fried oil. The CLP was incorporated into SRCBC at concentrations of 0.5, 1.0, and 2.0 %, at the expense of wheat flour. Antioxidant activities (FRAP, ABTS), flavonoid content and total phenolic content (TPC) of SRCBC significantly increased (p<0.05) with higher CLP concentrations. Sensory analysis was done by 30 semi-trained panellists and it indicated no significant differences (p<0.05) in characteristics, except for taste, aroma and texture which had improved with increased CLP content. Considering improved antioxidant and sensory properties, 1% and 2% CLP added SRCBC were selected for acrylamide content analysis. The control, 1% and 2% CLP incorporation had acrylamide contents of 511.39 ± 1.68, 388.17 ± 4.24 and 260.93 ± 5.59, respectively, showing the acrylamide reduction by 24.10% and 48.98% in 1% and 2% CLP added SRCBC and 10.48% and 9.93% in fried oil, respectively. Acrylamide content in oil showed a very strong positive and moderate positive correlation (p<0.05) with the peroxide value (r=0.855) and the acid value (r=0.522), respectively. A significant (p<0.05) reduction (34.48%) in peroxide value was observed in the 2% CLP added sample. Therefore, CLP incorporation is feasible and effective in reducing the acrylamide formation in both SRCBC and fried oil, indicating its potential as an acrylamide mitigation strategy in high-temperature food processing.

Keywords: Acrylamide, Antioxidants, Curry leaves, Maillard reactions, Total phenolic content.

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IPRC/24/179 Science, Technology, Mathematics & Medicine

Optimization of sulfuric acid electrolyte concentration for coconut shell charcoal-derived activated carbon-based supercapacitors

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Supercapacitors differ from regular capacitors due to their high capacitance values (>1F), whereas the capacitance of regular capacitors is limited to microfarad values. Various factors affect the electrochemical properties of a supercapacitor, such as electrode material, electrolyte, electrolyte concentration, and separator. Among other aqueous electrolytes like KOH and Na_2SO_4, sulfuric acid (H_2SO_4) has several advantages, including high ionic conductivity, cost-effectiveness, and ease of handling. Recent studies have focused on using biomass materials to prepare activated carbon electrodes for supercapacitors because of their renewability, low cost, and abundance. In this study, we prepared activated carbon-based supercapacitors using coconut shell charcoal and optimized the H_2SO_4 electrolyte concentration. First, charred coconut shells were heated at 900 °C for 20 minutes in a low-oxygen environment and then immediately put into a water bath for activation. Next, the activated carbon chips were dried and ground into a fine powder. Afterward, a thin layer of activated carbon suspension (0.05 g of polyvinylpyrrolidone, 10 ml of isopropyl alcohol, and 0.5 g of activated carbon powder) was deposited on two preheated titanium plates (20 × 10 × 0.45 mm) and sintered at 300 °C for 20 minutes. Then, they were immersed in 2.0 M H_2SO_4 for 2 minutes. Finally, the supercapacitor was assembled by sandwiching a medium-retention filter paper (separator) between the electrodes and wetting it with 2.0 M H_2SO_4 electrolyte. Four more supercapacitors were prepared by repeating the last three steps for 2.5 M, 3.0 M, 3.5 M, and 4.0 M H_2SO_4 concentrations. Cyclic voltammetry (5 mV s^{-1} scan rate) and galvanostatic charge-discharge analysis (1.0 A g^{-1} current density) were performed on supercapacitors, resulting in specific capacitance values of 20.17, 22.17, 29.77, 14.94, and 12.04 F g^{-1} for the 2.0 M, 2.5 M, 3.0 M, 3.5 M, and 4.0 M supercapacitors, respectively. Hence, the 3.0 M supercapacitor exhibited the highest specific capacitance of 29.77 F g^{-1} with the highest energy density of 4.14 Wh kg^{-1}, lower power density of 342.09 W kg^{-1}, and long cycle stability with a capacity retention of 69.67% after 1000 charge-discharge cycles. These results warrant that 3.0 M is the optimal H_2SO_4 electrolyte concentration for the coconut shell charcoal-derived activated carbon-based supercapacitors.

Keywords: Coconut shell charcoal-derived activated carbon, Concentration, Electrolyte, Sulfuric acid, Supercapacitor

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IPRC/24/180 Science, Technology, Mathematics & Medicine

Optimization of total anthocyanidins quantification using HPLC and selection of suitable cultivars for purple tea production

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Optimization of a protocol to extract anthocyanins and to quantify anthocyanidins present in five selected standard tea cultivars established in Tea Research Institute, *Talawakelle*, Sri Lanka, using HPLC was carried out in this study. The main aim of the present study was to evaluate the potential of tea cultivars to produce purple tea. The quantification of anthocyanidins were carried out in the fresh leaf and in processed tea samples of the five standard cultivars. The anthocyanins were extracted using acidified methanol/HCl (99:1 v/v) as the extractant. The extracted anthocyanins were further purified using C18 solid phase extraction cartridges followed by immediate acid hydrolysis using 2N HCl. Characterization of anthocyanidins were done using HPLC, and they were identified based on the retention times and the order of elution compared to the four anthocyanidin standards used in the study. Malvidin chloride was not detected in any of the five cultivars. Delphinidin chloride and cyanidin chloride were detected in all five cultivars, but pelargonidin chloride was detected only in TRI 26 and TRI 2043 cultivars. The highest anthocyanidin content, which was 0.847 mg g-1, was recorded in the fresh leaf of the TRI 5006 cultivar, and the lowest anthocyanidin content was detected in the fresh leaf of the TRI 3055 cultivar, which was 0.044 mg g^{-1}. According to the results, TRI 5006, TRI 26 and TRI 2043 are potential cultivars to produce purple tea. Therefore, the present study is useful for quantifying anthocyanins and anthocyanidins to screen suitable cultivars for the processing of purple tea.

Keywords: Anthocyanidins, Anthocyanins, Green tea, HPLC, Purple tea

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IPRC/24/205 Science, Technology, Mathematics & Medicine

Salivary miR-150-5p as a Thymus-influenced early non-invasive prognostic marker for severe dengue: A bioinformatics analysis

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MicroRNAs play important roles in regulating gene expression and cellular functions during viral infections, including dengue fever. While miR-150-5p has been identified as a circulating biomarker in blood, its potential in saliva as an early, non-invasive prognostic marker for severe dengue (SD) has yet to be explored. We analyzed multiple NCBI GEO datasets (GSE150623, GSE190749, GSE123336, GSE209670, and GSE139242) to examine miR-150-5p expression across bio-fluids. Differentially expressed genes and miRNAs were determined according to a threshold log2 fold change (logFC) > 1 and adjusted p-value (adj. p) < 0.05. We utilized mirDIP, miRDB, and TargetScanHuman to predict miR-150-5p target genes, which were cross-verified with human genes interacting with Dengue viral proteins using the DenHunt Database. The KEGG pathway analysis was performed in the NetworkAnalyst platform. Overlapping genes identified through Venn diagrams were considered as the candidate thymus-specific proteins potentially involved in dengue viral interactions. We observed significant upregulation of miR-150-5p plasma samples from SD patients compared to dengue fever patients, with logFC = 1.214798 and adj. p = 0.0368. In non-dengue samples, we found high expression in saliva compared to serum with logFC = 2.349937 and adj. P = 6.30E-05, and plasma with logFC = 2.036475 and adj. P = 0.0014. We identified 15 Specific Dengue-Related Genes (SDRGs) as miR-150-5p targets, 7 of which directly interact with dengue proteins: ANKRD12, CCNT1, CD38, CTNNB1, PDIA6, STAT1, and TNF. KEGG analysis revealed enrichment in immune pathways, such as T-cell receptor signaling, implicating miR-150-5p in the immune response to dengue. Differential expression of SDRGs revealed STAT1, overexpressed in CD4+ and CD8+ thymic T-cells. The results implicate the interplay between miR-150-5p, thymic activity, and immune response during dengue infection. These findings suggest that salivary miR-150-5p, through its regulation of immune-related genes and thymic activity, may serve as a reliable early prognostic marker for SD, warranting further clinical validation.

Keywords: Differential gene expression, microRNA, NCBI GEO, KEGG, Lymphoid organ.

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IPRC/24/206 Science, Technology, Mathematics & Medicine

Evaluation of a cellulose-based dipstick method for DNA extraction from *Leptotrombidium* mites: A comparative study

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The *Leptotrombidium* mites are vectors of *Orientia tsutsugamushi* and a significant public health threat worldwide: scrub typhus is endemic in Sri Lanka. In this respect, the need to extract DNA from the *Leptotrombidium* mites in the field is critical for rapid diagnosis and surveillance; nevertheless, this presents some difficulties, including sample degradation and lack of specialist equipment. This study aims to validate a cellulose-based dipstick method against a commercial kit for efficient DNA extraction from *Leptotrombidium* mites. The DNA extraction from samples was thus performed with three methods: the cellulose-based dipstick method, the simple heat-lysis method, and the DNeasy Blood and Tissue Kit as a commercial benchmark. Assessments of DNA quality and quantity were done spectrophotometrically. Real-time PCR was done with primers of 16S rRNA targeting *O. tsutsugamushi* DNA. Agarose gel electrophoresis was conducted for the determination of the amplification. Descriptive statistics, paired Wilcoxon signed rank tests for DNA concentration and purity ratios, and Kruskal-Wallis tests for cycle threshold values were computed from the data. The DNA concentration and the total yield were highest in the DNeasy method. The dipstick method had a DNA concentration of 0.933 ± 0.138 µg/mL, while the mean values of the DNeasy and the heat-lysis methods were 3.240 ± 0.276 µg/mL and 0.840 ± 0.035 µg/mL, respectively. The dipstick method had the most variable A260/A280 ratios at 1.773 ± 0.215, while that of the DNeasy and the heat-lysis methods were 1.496 ± 0.087 and 1.418 ± 0.000, respectively. The comparison of Ct values did not show any statistically significant difference between methods, P = 0.2697. In conclusion, the cellulose-based dipstick method performed comparably to the heat-lysis method. Despite DNA yield and purity differences, all three methods produced similar PCR results. This method encompasses simplicity in conduct, cost-effectiveness, and field applicability, showing promising further developments in on-site DNA extraction.

Keywords: 16S rRNA, Arthropods, DNA extraction, *Orientia tsutsugamushi*, Scrub typhus

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Comparative analysis of major indoor air pollutants across residences, schools, and offices in Sri Lanka

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Indoor air pollution poses significant health risks, yet comprehensive data on exposure levels in Sri Lanka remains scarce. The study aimed to determine the predominant indoor air pollutant levels in 25 residences, 11 schools, and 23 offices across six districts in Sri Lanka, selected based on their geographical proximity and activities. The methodology involved monitoring a range of pollutants, including $PM_{2.5}$, PM_{10}, HCHO, Total Volatile Organic Compounds (TVOC), O_3, CO, NO_2, and SO_2. Each monitoring session, conducted over a single day, involved eight hours of continuous sampling. Eight-hour mean values were PM2.5 (24 ± 1.53µg/m^3), PM10 (40 ± 1.63µg/m^3), HCHO (0.03 ± 0.03 mg/m^3), TVOC (0.12 ± 0.10 mg/m^3), O_3 (0.021±0.008 mg/m^3), CO (1.11 ± 1.17 mg/m^3), NO_2 (13.30 ± 6.35µg/m^3), SO_2 (33.39 ± 14.01 µg/m^3). According to the "Guidelines for Indoor Air Quality in Sri Lanka 2022", the results revealed that $PM_{2.5}$ and PM_{10} levels in residences were below the reference values of 100 µg/m^3 and 150 µg/m^3, respectively. Schools and offices showed PM10 levels within the acceptable 200 µg/m^3 limit. TVOC and CO levels across all locations were below 1 mg/m^3 and 10 mg/m^3, respectively, while SO_2 and NO_2 levels were below 200 µg/m^3. The highest mean CO_2 concentration of 692.47 ppm was observed in offices. Correlation analyses were conducted to identify potential relationships among pollutants, providing insights into their sources, pathways, and interactions within indoor environments. Statistical analyses using the Spearman rank correlation coefficient indicated strong positive correlations between $PM_{2.5}$ and PM_{10} (R = 0.99) and between TVOC and HCHO (R = 0.73), while CO_2 showed a moderate positive correlation with HCHO (0.496). Notably, there was a moderate negative correlation between RH and temperature (-0.528), and between CO_2 and temperature (-0.484). This study highlights the need for targeted interventions to improve indoor air quality in various settings in Sri Lanka.

Keywords: Comparative analysis, Indoor air quality, Pollutants, Statistical correlation

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IPRC/24/229 Science, Technology, Mathematics & Medicine

Comparative study on physicochemical properties of wild and locally farmed bee honey in Sri Lanka

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Honey is a natural, sweet, viscous material produced by honey bees either from the nectar of blossoms or from secretions of living plant parts or excretions of plant sucking insects on the living plant parts. According to sources, the major problem of honey-farming in Sri Lanka and other Asian countries is the decrement of honey quality due to excessive feeding of colonies with sugar syrup by honey farmers. This happens mainly due to the lack of nectar yielding plants. The aim of this study was to examine the differences in main physicochemical parameters between wild and locally farmed bee honey in Sri Lanka. In this study, the differences in colour, pH and conductivity were studied by physical tests with direct measurements. In contrast, moisture, ash, sugar, HMF, Nitrogen and acid insoluble ash contents were investigated using chemical tests. According to the results, average values for pH at 28°C, conductivity at 28°C, moisture, ash, sugar, HMF, Nitrogen and acid insoluble ash in locally farmed bee honey were 3.49, 0.36 mS/cm, 22.6 %, 0.08%, 73.4%, 8.49 mg/kg, 0% and 0.003% respectively while they were for wild bee honey became 3.71, 0.43 mS/cm, 75.2%, 0.08 mg/kg, 0.1% and 0.001% respectively. The colour of wild honey samples ranged from amber to light amber, while the color of locally farmed bee honey ranged from water white to light amber. According to the statistical interpretation, moisture, conductivity at 28°C, pH at 25°C, Nitrogen content and HMF content had significant differences between wild and locally cultivated samples ($P<0.05$). However, the sugar content, ash and acid insoluble ash contents showed no significant difference between the two categories ($P>0.05$). Results obtained from this study can be incorporated in developing innovative novel ideas and products related to bee honey research, especially in pharmaceuticals and food.

Keywords: Honey, Hydroxymethylfurfural, Physicochemical characteristics.

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IPRC/24/231 Science, Technology, Mathematics & Medicine

Preliminary investigation of *kshara* powder of *Erythrina variegata* used in Ayurveda Treasurer

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Kshara an alkaline caustic substance derived from ashes of medicinal plants and minerals, is a key component of indigenous Ayurvedic medicines. There are three main categories of *kshara* powders according to the potency as *Tikshana, Madhya* and *Mridu*. Accordingly, the *Erythrina variegata kshara* was prepared as the method mentioned by Acharya Sushrutha Samhita in 11th chapter of Sutra sthana. In this study, *Kshara* powder of *Erythrina variegata* was evaluated due to its medicinal value, antioxidant, anti-inflammatory and anti-microbial properties. The antioxidant property was assessed using DPPH and FRAP assays, revealing potent radical scavenging and ferric reducing capacities; results in the EC_{50} for DPPH of *Tikshana* and *Mridu* were 161.1 ppm and 206.2 ppm, respectively, with compared EC_{50} of 55.63 ppm obtained from BHT standard. The anti-inflammatory effect was evaluated using the HRBC membrane stabilization method, demonstrating IC_{50} of *Tikshana* - 443.1 ppm and IC_{50} of *Mridu* 240.3 ppm of inflammation. Further laboratory experiments were conducted under physicochemical parameters such as total Ash value, pH value (around pH 11), acid insolubility, water solubility, moisture content, identification and heavy metal analysis. Functional groups and heavy metal analysis were conducted by FTIR and ICPMS, respectively, and ensured some important functional groups and unavailability of most heavy metals, which impact human health also, confirmed that *Erythrina variegata Kshara* powders have antioxidant, anti-inflammatory and antimicrobial properties against *staphylococcus aureus, Escherichia coli, Bacillus subtills, Streptococcus pyogenes* and *proteus mirabills* (Inhibition zones ranging from 1.0 ± 1.20 cm to 3.5 ± 0.94 cm). Finally, it was confirmed that this product was successfully formulated & evaluated. Also, it can be further developed for commercialization purposes. Continuous research is recommended to elucidate the mechanisms and clinical applications of *Kshara* powders of *Erythrina variegata* to ensure the human usage.

Keywords: Anti-inflammatory, Antioxidant, Ayurveda, *Kshara, Erythrina.*

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IPRC/24/233 Science, Technology, Mathematics & Medicine

Preparation and bioactivity of Indigenous formula used as hair care oil

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Haircare mainly affects the appearance of an individual. Hair dyes are personal care products used to regain or change hair color. Even though natural products were used in ancient times, synthetic products are now highly used. However, synthetic products include artificial & harmful chemicals that affect human health upon long-term usage. Therefore, practicing natural products is important for long-term usage. In this study, a hair care oil to use as a hair dye was formulated and prepared using natural ingredients such as Sesame oil, *Eclipta prostrata, Barleria prionitis L, Gmelina asiatica L*, *Triphala, Pandanus tectorius*, *Gmelina arborea* and Iron Powder with reference to an Ayurveda book *(Thalpathe Piliyam),* here a decoction was prepared using plant materials mentioned above and was mixed with juice of *Eclipta prostrata, sesame oil* and prepared final oil of 2410 mL volume and kept for one month and after one month, oil was evaluated on antioxidant in DPPH method (IC50 value 151 - 200 ppm), anti-inflammatory in HRBC membrane stabilization method (IC50 value 249.5 - 1440 ppm) and anti-fungal properties and organoleptic properties such as color (Blue black), appearance (thick emulsion), odor (characteristic), sedimentation (none); pH value (6.80 - 6.90 ± 0.02), moisture 36.50 - 38.50 ± 0.05 (105°C), refractive index (1.465 – 1.467 (25°C), skin sensitivity(no impacts), dyeing effect, stability under physical properties; chemical properties such as acid value (2.01 - 2.05), iodine value (62.58 - 62.68), peroxide value (5.05 - 5.58) and heavy metal content. Accordingly, the above analysis confirmed the antioxidant & anti-inflammatory properties and ensured the other quality parameters of the product as well. As a result, it was concluded that this product is applicable for human hair for trials and development. However, further research is essential to develop into a commercial application.

Keywords: Antioxidant, Ayurveda, Hair dye, Human hair, Natural product

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IPRC/24/248 Science, Technology, Mathematics & Medicine

Extraction of lipase enzymes from rice bran and rapid isolation of thermostable lipase by thermal denaturation of other proteins

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Oryza sativa (rice) is a main component of the diet of almost half of people globally. Rice bran is a byproduct of milling rice. Three lipases have been reported in rice bran; Lipase I, Lipase II and thermostable lipase, all of which were reported to contribute to the short shelf life of rice bran due to rancidity. Thermostable lipase has an optimum activity at 80°C and reportedly maintains most of its secondary protein structure at 90°C. Extraction and isolation of the thermostable lipase in rice bran will add value to this byproduct of the rice industry due to potential applications in the detergent industry at high temperatures, precisely to remove lipid stains. We report rapid isolation of the thermostable lipase from rice bran by thermal denaturation of other proteins. Rice bran was defatted, and proteins were extracted using 50 mM Tris-HCl buffer at pH 8.0 before thermal denaturation of other proteins at 80°C and 100°C to isolate the thermostable lipase rapidly. The lipase concentration in the thermally denatured sample was measured using phenylacetate assay as the lipase activity assay, measuring the absorbance at 765 nm via a spectrophotometer. The protein yield in g per kg of dry weight of rice bran for thermostable lipase were 3.05 ± 0.03 and 2.7 ± 0.01 at 80 °C and 100 °C respectively. The results indicate the activity of thermostable lipase in rice bran at both temperatures.

Keywords: Lipase, Rice bran, Thermal denaturation, Thermostable lipase.

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IPRC/24/32E Science, Technology, Mathematics & Medicine

Epibrassinolide binding affinity to tomato receptor-like kinase SLLYK12 using molecular docking and dynamics simulations

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LysM receptor-like kinases (LysM-RLKs) in plants are plant-specific receptor-like kinases (RLKs) that are essential in recognizing microbial signals and initiating responses. These receptor signalling can activate different plant responses leading either to establish symbiosis with symbiotic microorganisms or to launch defence responses against microbial pathogens. Due to their crucial role in symbiosis and in governing defence responses against invading pathogens, LysM-RLKs have the potential to be used as a biological target for the sustainable management of plant diseases. . In this study, a library of phytochemicals including phenolics, flavonoids and phytohormones were screened against the tomato LysM-RLK 'SlLYK12' using molecular docking and molecular dynamics (MD) simulations. The initial SlLYK12 models were created with the Alphafold, I-TASSER, SWISS-MODEL, and trRosetta online tools. The models ranked '1' were selected from all four modelling servers for initial quality analysis as it is the 'Model 1' that shows the best quality/criteria scores devised by the modelling servers. Further quality analysis of the selected models from each modelling server was performed by online quality structure assessment tools available on the Saves server and the model proposed by trRosetta was deemed of good quality. Based on the molecular docking performed using Autodock Vina software, 24-epibrassinolide had best docking scores of -9.3 Kcal mol^{-1} as compared to Galbacin (-8.7 Kcal mol^{-1}), Quercetin (-8.3 Kcal mol^{-1}), and Traumatin 7-Oxotyphasterol (-8.2 Kcal mol^{-1}) The best conformation of 24-epibrassinolide with the best docking score was further subjected to molecular dynamics using AMBER 99 force field using md_run.mcr script of YASARA software. The MD simulation was performed for 60 ns with constant pressure and temperature during the simulation. Water molecules (0.997 g/mL density) were added with 0.9% NaCl salt to mimic physiological conditions. MD analysis revealed that after 30 ns the equilibrium was achieved, the complex remained reasonably stable, and the RMSD fluctuations were found to be within a range of 1.2–1.8 Å. The systems showed RMSF within a range of 0.3–7.6 Å. Accordingly, this study provided a strong basis for the exogenous use of the 24-epibrassinolide for an e establishment of defence responses or root endosymbiosis in plants.

Key Words: Receptor-Like Kinase, SlLYK12, LysM, Tomato, Epibrassinolide, MD simulation

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IPRC/24/27 Science, Technology, Mathematics & Medicine

Comparative analysis of deep learning architectures for image classification on Sri Lankan ayurvedic medicinal plants

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Deep learning has recently evolved into a potent tool for image classification, compared to the traditional approaches. In this study, comparisons between the performances of three prominent deep learning architectures-ResNet50, VGG19, and InceptionV3 with respect to multi-class image classification tasks pertaining to Sri Lankan Ayurvedic medicinal plants were made. Each of the models was trained using a custom diversified dataset with more than 5000+ images of four classes of commonly used medicaments in Sri Lankan ayurveda. Model accuracy and loss were recorded. This dataset contained images of four plants highly valued in Sri Lankan traditional medicine: "Curry"(*Murraya koenigii*), "Neem" (*Azadirachta indica*), "Mint"(*Mentha arvensis*), and "Rubble"(*Coleus amboinicus*). The image size for ResNet50 and VGG19 was (224, 224), and for InceptionV3, it was (299, 299), with a batch size of 32 for all models. The base models were pre-trained on ImageNet, with ResNet50 and VGG19 excluding the top layer and additional layers including GlobalAveragePooling2D and Dense layers, and InceptionV3 using similar architecture but with its specific input size requirements. The optimizer for all models was Adam, with a learning rate of $1e^{-5}$ for ResNet50 and $1e^{-4}$ for InceptionV3 and VGG19. All base model layers of ResNet50, InceptionV3 and VGG19 were frozen. Finally, VGG19, InceptionV3 and ResNet50 achieved validation accuracies reaching, 89% 86% and 80% respectively. This comparative analysis can be applied to assist in the identification, better documentation and utilization of ayurveda knowledge to ensure the safety and efficacy of traditional medicinal practice. Ayurveda and its application, when integrated with deep learning technologies, would preserve the ancient knowledge of ayurveda and result in better healthcare outcomes.

Keywords: Ayurvedic medicine, Convolutional neural networks, Deep learning, Plant leaf classification, Sri Lankan medicinal plants

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IPRC/24/130 Science, Technology, Mathematics & Medicine

Analyzing sentiments in social media comments on the global recession: Unveiling the pulse of public opinion

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Today the world is facing a serious economic crisis, and even developed countries are trying to find solutions for this economic recession. This has become a global trending topic: finding solutions to economic crises. This study aims to develop a classification model to accurately identify public comments as “solution” or “not solution” from a pre-processed data set. In this research, a sentiment analysis was done by downloading about 4000 sample comments, from specific two social media videos related to the world economic recession titled “What's Coming Is WORSE Than A Recession”. Comments were manually labeled as "solution" or "not solution." The initial 25:75 ratio was adjusted using oversampling to achieve a 40:60 ratio for balanced analysis. Using Google Collab and Python Language, data preprocessing involved noise reduction, and removal of special characters, hashtags, custom patterns, and multiple spaces. Stop words were also extracted and eliminated. Using pre-processed data, a logistic regression (LR) model and a linear support vector classifier (SVC) model were trained, and model evaluation checked by different evaluation metrics such as accuracy, confusion matrix, and classification report were used to assess the performance of the model. Both models achieved over 75% accuracy. Specifically, LR model had an accuracy of 75.1%, with precision, recall, and F1-score of 0.75, 0.72, and 0.72, respectively. The SVC model performed slightly better, with an accuracy of 76.3% and precision, recall, and F1-score of 0.76, 0.74, and 0.74, respectively. A new dataset was used to check for predicted sentiment for each comment, providing valuable insights into the sentiment of previously unseen text. Using sentimental analysis, the goal was to comprehend how people from various backgrounds view the economic recession and the remedies they suggest. This model could be used to identify public opinions about the recession and prepare for the upcoming crisis and government finance control.

Keywords: Analysis, Crises, Economic, recession, Sentimental

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IPRC/24/153 Science, Technology, Mathematics & Medicine

A privacy-preserving explainable AI framework for phishing URL detection

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In the era of artificial intelligence (AI), achieving a balance between user privacy and the interpretability of AI systems remains challenging. This paper presents a novel framework that bridges explainable artificial intelligence (XAI) with privacy-preserving (PP) methods to enhance security and trust in phishing URL detection. Phishing continues to be a major cyber threat, with the anti-phishing working group (APWG) reporting 877,536 incidents in the second quarter of 2024. The framework presents PP techniques, such as differential privacy, federated learning, and homomorphic encryption, and the techniques made available through XAI, such as SHapley Additive exPlanations (SHAP). This strategy enables the protection of these sensitive details (i.e., URLs) from exposure in both model training and prediction, while still ensuring that the inner workings of machine learning (ML) methods remain interpretable to the users. It makes use of the University of California – Irvine (UCI) Phishing Websites Dataset, which consists of 11,055 records of authentic and phishing URLs and includes 30 attributes such as IP address inclusion, URL length, and Secure Sockets Layer (SSL) certificate status. A range of ML models such as XGBoost, Random Forest, GBDT and logistic regression were developedto classify the URLs. The model accuracy, precision, and recall metrics relative to one another, were used to determine the performance level of the models. SHAP explains what, while addressing levels of explanations both types as in the global or individual level. Visual aids including force graphs and SHAP summaries would assist cybersecurity professionals in making sense of these decisions, which would ultimately enhance the interpretability of the model. This proposed framework demonstrates how the growing phishing attacks can be mitigated within reasonable limits while maintaining transparency by integrating PP techniques and XAI thereby revolutionizing the cybersecurity space.

Keywords: Explainable AI (XAI), Machine learning (ML), Phishing detection, Privacy-preserving AI

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Predictive analysis of dropouts in Information Technology higher education

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The study primarily aims to identify the key attributes that contribute to student dropouts in ICT higher education, a significant issue in educational data mining. It seeks to explore the distinct factors influencing dropout rates that have been underexplored in existing literature. To achieve this, an experimental approach was employed to create a comprehensive database for extracting relevant insights. Data was collected from five batches of students enrolled in the information technology course at a government tertiary education institute in Sri Lanka. The collected data underwent pre-processing, which involved imputing missing values, transforming data formats, and selecting relevant variables. Feature selection was carried out using correlation-based feature selection (CFS) to pinpoint subsets of attributes closely linked to dropout outcomes. Mostly used classification algorithms were evaluated based on their performance using confusion matrix metrics. After evaluating mostly used classification algorithms, this study trained multiple classification models, including Decision Tree, K-Nearest Neighbor, Naïve Bayes, and Rule-Based approaches, to identify strong relationships between dropout factors and dropout status, achieving over 86.2% accuracy. The J48 Decision Tree emerged as the most accurate algorithm for the dataset and was used to build a predictive model for student profiles. The performance of the mocel was validated using a new dataset sourced from institutional records. The dropout prediction application was implemented using the Java WEKA API and achieved 92.6% accuracy in predicting student dropouts in ICT higher education. By uncovering strong relationships between dropout factors and dropout status, the study highlights key influences, with the most significant factors being perceived course quality, prior academic qualifications, prior ICT experience, O/L results, and English proficiency score. This model can be utilized to predictively analyze student dropouts in higher education, allowing early identification of at-risk students and facilitating targeted intervention strategies.

Keywords: Classification algorithms, Data mining, Dropout

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IPRC/24/115 Science, Technology, Mathematics & Medicine

Social media anxiety detection using prompt engineering techniques

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Anxiety is the most common mental disorder, yet it receives less attention compared to other mental health issues. The exponential growth of social media has led people to share their feelings, moods, and tension through social media content, making it a good source for identifying the mental status of individuals. Analyzing social media texts provides valuable insights for screening mental issues such as anxiety. According to the literature, there are multiple approaches for the detection of anxiety via text classification like emotion analysis, sentiment analysis, topic modeling, language analysis, and deep learning-based approaches like bi-LSTM. Modern advancements in natural language processing have obtained state-of-the-art (SOTA) performance using transformer-based pre-trained language models (PLM) like PsychBERT, DisorBERT, and MentalBERT across various domains including digital mental health. These models mainly focus on depression, suicide, and stress. Fine-tuning these models for anxiety classification requires a substantial amount of computational resources and large annotated corpora. The capability to fine-tune models for specific tasks while keeping most of the PLM parameters frozen has led to significant success in parameter-efficient prompt engineering. Our approach introduces a novel framework that enhances domain-specific knowledge of PLMs for in-context learning of the detection of anxiety using crafted soft prompt templates. The data was pre-processed with PLM libraries, combined with soft templates to generate a prompt dataset, and the resulting embeddings were then used for tuning the prompt. For implementing the prompt engineering logic, a well-balanced, anxiety-annotated Reddit dataset which include 356,242 anxiety posts and 354,631 non-anxiety posts keeping the proportions of 70%, 15%, and 15% for training, validation, and testing. Our method surpasses MentalBERT SOTA performance in anxiety classification, achieving 80.5% F1 score and 81.8% accuracy, with maximum margins of 4.3% and 4.6%, respectively. Evaluation results show that the proposed method improves the ability of PLMs to classify anxiety by using prompt engineering techniques.

Keywords: Anxiety detection, digital mental health, natural language processing, social media

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Multidisciplinary Studies

IPRC/24/38 Multidisciplinary Studies

Evaluating the success of recultivation efforts in abandoned paddy lands of the low country wet zone in Sri Lanka

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The abandonment of paddy lands in the Low Country Wet Zone (LCWZ) of Sri Lanka presents a critical challenge, leading to the reduction of rice production and causing the degradation of interconnected ecosystems. Despite government recultivation programs, the region has not exhibited a substantial increase in cultivated land over time. This study evaluated the success of recultivation programs implemented from 2016 to 2020, focusing on coastal administrative districts within the LCWZ region, namely Colombo, Gampaha, Kalutara, Galle, and Matara, which have been highly subjected to abandonment. The study population included farmers who participated in programs to re-cultivate their abandoned paddy lands. Using a multi-stage random sampling method, 100 farmers were selected, with 20 farmers from two Agrarian Services Centers in each district, focusing on areas with the highest number of abandoned paddy lands. Data were collected via a semi-structured questionnaire survey. Results revealed that multiple factors drive paddy land abandonment. Seventy-three percent of farmers pointed out more than one reason for abandonment, with degraded irrigation structures, poor drainage conditions, low yields, labor shortages, lack of agricultural inputs, water scarcity, and wild animal damage being predominant reasons. Re-cultivation initiatives prioritized reconstructing and maintaining waterways, canals, and anicuts. The majority of farmers demonstrated a positive attitude towards development programs of abandoned paddy lands. However, delays in fund disbursement, challenges in securing labor and machinery, unfavorable weather conditions, and insufficient commitment and active participation from farmers have caused setbacks in re-cultivation efforts. Ninety-five percent of farmers expressed positive feedback on the quality of re-cultivation programs, though ongoing encouragement was found to be crucial for sustained participation. Financial support reached 63% of farmers, with 87% receiving assistance in the form of seed paddy and fertilizers. Challenges include poor youth involvement, implementation delays, flood damage, wildlife interference, poor soil conditions, low-quality seeds, and ineffective part-time farmer management. The study suggested a systematic design and timely implementation of re-cultivation programs coupled with strict enforcement of regulations against non-cultivating farmers along with measures to conserve active paddy lands in LCWZ.

Keywords: Abandonment, LCWZ, Paddy, Recultivation, Sri Lanka

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IPRC/24/59 Multidisciplinary Studies

Impact of green business strategies on the sustainable performance of micro, small and medium enterprises of tourism: The mediating effect of government support

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Innovative tourism concepts and sustainable business initiatives are driving significant transformation in the tourism industry. The concept of 'green' encompasses environmental accountability, economic growth, and Community Social Responsibility (CSR). Tourism service providers who lean towards the green concept prioritize green accountability while maintaining profitability. This dual focus ensures that their businesses not only thrive economically but also contribute positively to environmental sustainability and social well-being. When compared with macro-level service providers of tourism, the Micro, Small and Medium Enterprises of Tourism (MSMETs) have a greater potential to respond to the demands of inbound tourism. Currently, businesses tend to adopt Green Business Strategies (GBS) as tourists and other stakeholders pay increasing attention to sustainability of goods and services. However, enhancing the Sustainable Performance (SP) of TMSMEs remains as a challenge in developing economies. This study aimed to identify the impact of GBS on the SP of MSMETs, taking into account the mediating effect of government support. A self-administered questionnaire was employed utilizing a snowball sampling method with a sample size of 384. Structural Equation Modelling was employed to analyze data using Smart PLS software. The results revealed that GBS has a strong and significant impact on SP in terms of environmental performance and highlighted the impact on the economic and social performance of MSMETs. giving them a competitive advantage through green practices. Moreover, it was found that this relationship strengthened through the mediating effect of Government Support (GS) such as subsidies, policy reforming with sustainable reporting to monitor post-operation gains, training programs, or partnerships as a form of non-monetary assistance to sharpen the knowledge of TMSMEs. Further, this study provided insights for least developed economies to accelerate the SP of MSMETs towards achieving Sustainable Development Goals (SDGs) by adopting GS.

Keywords: Green Business Strategies (GBS), Government Support (GS), Sustainable Development Goals (SDGs), Sustainable Performance (SP), Micro, Small & Medium Enterprises of Tourism (MSMETs)

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IPRC/24/87 Multidisciplinary Studies

Does regional carbon dioxide emissions impact on regional temperature variations? An econometric analysis on South Asia

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South Asia, home to over one-fourth of the world's population is vulnerable to climate change. Given the rapid industrial growth in India, and the industrial expansion in countries of Sri Lanka, Pakistan, Bangladesh, Maldives, Bhutan, Nepal, and Afghanistan, the Carbon Dioxide Emission (CO_2E) in the region is projected to escalate further. An increase in the concentration of atmospheric carbon dioxide, a greenhouse gas, is known to increase the atmospheric temperature, an effect identified as global warming. The region is already experiencing increased atmospheric warming with frequent heatwaves and temperature extremes. The rapid warming trend in the region affects local climate dynamics affecting rainfall patterns, and soil moisture content, and cause the rise of sea levels, droughts, and flooding. With existing research focusing on cumulative CO_2E and the resulting global climate change, the primary objective of the study was to determine whether regional CO_2E impacts regional Mean Surface Temperature (MST) variations. The study utilized secondary data for all the eight countries in the region from 1993 to 2020. CO_2E measured in kilotons and MST in degrees of Celsius were obtained from the World Bank Indicators and IMF climate indicators dashboard. The stationarity of the panels was tested using the Levin-Lin-Chu test while the stability of the model was tested with Panel Vector Auto Regression. The Panel regression analysis revealed that the regional CO_2E increased the regional MST at a 99% level of significance. Additionally, seven of the eight countries in the region indicated that the local CO_2E exerts a significantly positive impact on local MST variations. The study findings underscored that the country-specific policy implications and CO_2E mitigation efforts would yield immediate positive regional and local consequences, highlighting the necessity for effective CO_2E reduction strategies.

Keywords: Carbon dioxide emissions, Mean surface temperature, Panel regression, Regional climate change, South Asia

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IPRC/24/94 Multidisciplinary Studies

Monitoring the post-exposure effectiveness of a new herbal incense stick formulation against *Aedes aegypti* and *Aedes albopictus*

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Aedes mosquitoes have a high prevalence and are responsible for the transmission of dengue fever among humans. The objective of this study was to develop a herbal incense stick (HS) formulation using mosquito-repellent plant materials and investigate the effectiveness, if any, of the HSs in reducing the population of vector mosquitoes. The effectiveness of the HSs was evaluated by monitoring their impact on the fecundity, egg hatchability, pupation, and adult emergence of *Aedes aegypti* and *Aedes albopictus*. HSs were prepared mixing extracts of *Ocimum basilicum* , *Tagetes erecta, Mentha piperita, Syzygium aromaticum, Cinnamomum verum, Salvia rosmarinus, Laurus nobilis, Cymbopogon nardus* with inactive matrix material, namely, charcoal, "patta", and sawdust. Three different herbal formulations were created making the final weight of an HS as 1.5 g. Mosquito eggs were collected using ovitraps. Twenty-five unfed adult female mosquitoes per species were exposed for 3 minutes in a glass chamber of 8000 cm^3. Their mortality was recorded 24 hours later. The surviving females were blood-fed for 2 days. They were allowed to mate with unexposed healthy males. Gravid females were isolated to measure fecundity. After 5 days, the eggs were hatched (24±2°C, 70±10% RH) to determine their hatchability. The larvae were then reared and fed until pupation and adult emergence. Counts were recorded at each stage of observation. ANOVA, Welch ANOVA, and Tukey-Kramer HSD tests were conducted. Results of the study revealed a significant effect of HS on the fecundity of the mosquitoes ($F_{3,8}$=610.13, P<0.01), and on the hatchability of eggs ($F_{3,8}$=1899, P<0.01). Transformation of larvae into pupae and pupae into adults showed no significant difference between the treatments. HS containing 45% herbal ingredients demonstrated the highest post-exposure effectiveness. The tested formulation of HS has proven to be an effective tool for reducing human-vector contact and inhibiting the development of both embryonic and post-embryonic stages of the relevant mosquito species.

Keywords: *Aedes* mosquitoes, Herbal extracts, Post-exposure, Vector control strategies

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IPRC/24/159 Multidisciplinary Studies

Extraction of starch from *Solenostemon rotundifolius* (Chinese potato) yams, and characterizing by chemical and physical modifications: As novel alternative pharmaceutical excipients

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Modified starches are developed to decrease any undesirable properties of native starches. Thus, the different kinds of modified starches are used in many industries including the pharmaceutical industry. *Solenostemon rotundifolius* (Chinese potato), locally known as *Innala,* is a tuber crop cultivated in Sri Lanka. These tuber yams contain starch over 60% w/w. . This study aimed to characterize the physicochemical properties of modified starches developed from yams of *S. rotundifolius* to assess their suitability for use as pharmaceutical excipients when compared to maize starch BP. Yams of *S. rotundifolius* were peeled, sliced, air-dried, and powdered. Starches were extracted by mixing powdered yams with distilled water, filtering, and drying the precipitate at 40 °C. Extracted yam starch was modified chemically by acetylation and physically by pre-gelatinization. The physicochemical parameters, namely, the pH, granule size, bulk, tapped and true densities, Hausner's ratio, Carr's index, angle of repose, hydration capacity, moisture sorption capacity, clarity, viscosity, infrared (IR) spectra, X-ray diffraction (XRD) and scanning electron microscopic (SEM) analyses of modified *S. rotundifolius* starches were evaluated in comparison to maize starch BP. An independent T-test was done to compare data. Acetylated starch provided a characteristic peak in the IR spectrum at 1727.36 cm^{-1} assigned to C=O assuring acetylation. No new peak formation was observed in pre-gelatinized starch. Maize starch BP and acetylated *S. rotundifolius* starch exhibited an A-type XRD pattern giving peaks at 2Θ angles 15^0, 17^0, 18^0, and 23^0. Pre-gelatinization changed the XRD pattern. Acetylated starch granules had a dome shape while maize starch granules were polyhedral in shape. Pre-gelatinized starch granules had large flat-shaped granules. All the physicochemical parameters, except Hausner's ratio and Carr's index of both acetylated and pre-gelatinized *S. rotundifolius* starches, were significantly different showing improved physicochemical properties when compared to maize starch BP ($p<0.05$). Accordingly, these modified starches of *S. rotundifolius* showed a potential to be explored further as an alternative pharmaceutical excipient.

Keywords: *Solenostemon rotundifolius,* Acetylation of starch, Pharmaceutical excipient, Pre-gelatinization of starch, Modified starch

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IPRC/24/33E Multidisciplinary Studies

Effects of technological innovations on global competitiveness and economic development

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In the contemporary era of science and technology, the connection between technological innovation and national economic development has emerged as a critical theme of inquiry. This paper explored the complicated dynamics between innovation-centric competitiveness strategies and the macroeconomic outcomes of growth and development. Through a complex analytical lens, we explored the epistemological foundations of the knowledge economy paradigm and its role in catalyzing innovation-driven competitiveness. The Schumpeterian concept of 'creative destruction' is a theoretical cornerstone that illuminates the dialectical process through which innovation simultaneously creates progress and obsolescence. We theorized that the contemporary innovation landscape is characterized by a complex interplay of incremental and radical advancements that transcend traditional dichotomies of process and product innovations. Our investigation synthesized empirical findings on patent production determinants with theoretical constructs of national innovation systems. We argued that innovation is far from a stochastic phenomenon deeply embedded in socio-economic and institutional matrices. The paper presented a holistic conceptualization of innovation as an emergent property of a complex adaptive system, a system that is characterized by diverse actors and multifaceted interactions and is capable of adapting and evolving in response to changes in its environment. Ultimately, we proposed a philosophical framework that repositions technological innovation as not merely an economic imperative but as a fundamental ontological process shaping the evolution of human societies. This perspective invited a reconsideration of innovation policies, advocating for approaches that nurture creativity and knowledge diffusion while addressing the ethical implications of rapid technological changes, such as privacy concerns, job displacement, and environmental impact.

Keywords: Technological innovation, global competitiveness, knowledge economy, creative destruction, national innovation systems

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IPRC/24/215 Multidisciplinary Studies

Refining the test items of a screening tool for Specific Learning Disorders through a Delphi survey

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Specific Learning Disorders (SpLD) are a group of conditions manifested by persistent challenges in reading, writing, and arithmetic, namely Dyslexia, Dysgraphia, and Dyscalculia respectively, affecting 5%-15% of children globally. Children with SpLD often have academic, occupational, societal and personal challenges and mental health issues impacting their families as well. However, Sri Lanka lacks an early identification program or a culturally relevant screening tool, underscoring a critical gap in its education and healthcare systems. To bridge this gap, a culturally appropriate screening tool was developed for primary school children. The initial 50-item pool was identified through a desk review, several in-depth interviews and a few focus group discussions to assess reading, writing, and arithmetic difficulties. The item pool required further refinement for face validity, age-appropriateness, usability for teachers, and time efficiency. A Delphi survey was employed to optimize the tool, drawing on expertise from national and international arenas in the fields of psychiatry, linguistics, psychology, public health, speech and language therapy, and education. The two-round Delphi process began with qualitative interviews followed by quantitative analyses of expert feedback in the first round. This was used for modification, addition, or removal of items. In the second round, experts reviewed the revised tool via email, culminating in a consensus on the final item pool. As a result, the Delphi process refined the tool to a 40-item pool, covering essential reading, writing, and arithmetic skills. This approach proved highly effective in creating a reliable and culturally relevant screening tool for SpLD in Sri Lanka. Through iterative improvements and expert contributions, the tool was refined to meet local cultural needs, making it a valuable resource for the early identification of learning disorders in primary school children in Sri Lanka, which will enable them to avoid adversities and have a better quality of life.

Keywords: Dyscalculia, Dysgraphia, Dyslexia, Learning Disability

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IPRC/24/27E Multidisciplinary Studies

Cytotoxic effect of Melittin peptide; major pain producing substance in European honeybee (*Apis mellifera*) venom on leishmaniasis parasite *Leishmania donovani*

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Melittin is a peptide in the venom of the European honeybee (*Apis melifera*). It has indicated various therapeutic effects including parasitic infections. Leishmaniasis is a parasitic disease caused by a protozoan parasite under the genus *Leishmania*. In Sri Lanka, *Leishmania donovani* is the parasite causing leishmaniasis of cutaneous origin. This study evaluates the anti-leishmanial property of melittin peptide against the *L. donovani* parasite. *L. donovani* promastigote cultures were established in M119 medium (HIMEDIA, Cat # AL189) supplemented with 20% fetal bovine serum (FBS, Sigma, Cat # F4135) at room temperature (26-30^{0}C). A standard series of Melittin peptide was prepared (30, 45, 60, 75, 90, 105, 120, 135, 150, 165 and 180 μg/mL). Cytotoxicity for each concentration was assessed using an MTT (4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay by introducing stationary phase parasites at a concentration of 2×10^6 cells/mL into each well of a 96-well flat-bottom microtiter plate. The experiment setup was repeated 12 times in each concentration for 24 and 48-hour incubation separately at room temperature (26-30^{0}C). The relative amount of formazan produced by viable cells in each well was quantified by measuring absorbance at 590 nm using an ELISA plate reader. Cell viability was assessed from the concentration-response curve, and the IC50 value was calculated. The highest toxicity was identified at 180 μg/mL at 24 h (96.28 ± 3.71%) and 48 h (96.12 ± 0.44 %) periods. However, 50% mortality of the parasites were identified at 50.25 μg/mL, and 50.50 μg/mL concentration at 24 h and 48 h periods. The results revealed that the proliferation of *L. donovani* promastigote was inhibited in a dose-dependent manner, and the IC50 value of Melittin was denoted as 50.32 mg/mL, indicating an anti-leishmanial property.

Keywords: Anti-leishmanial, IC50 value, *Leishmania donovani*, Melittin, MTT assay

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IPRC/24/29E Multidisciplinary Studies

Assessing the climate-induced vulnerability and adaptive capacity of cutaneous leishmaniasis disease in Sri Lanka

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Leishmaniasis is a neglected tropical disease in the world. Just like other vector borne disease, it is linked with climatic and associated factors. Climate change has emerged as a significant driver of health challenges globally, influencing the incidence and distribution of vector-borne diseases. Although climatic-induced vulnerability for other vector-borne diseases in Sri Lanka has been assessed, no attempt has been made to assess incidence of leishmaniasis disease. Therefore, this study was focused on assessing the climate-induced vulnerability and adaptive capacity for cutaneous leishmaniasis disease in Sri Lanka. Forty-one variables encompassing epidemiological, climatic, land-use, and socio-economic data were selected for all 25 administrative districts of Sri Lanka. These variables served as the candidates for creating three indices; exposure, sensitivity and adaptive capacity to calculate the vulnerability index. Principal component analysis (PCA) facilitated the selection and weighing of indicators within each index. The Gesellschaft für internationale susammenarbeit (GIZ) approach was used for the vulnerability assessment. Thirty-six of the initial 41 variables were retained, forming 10 indicators for the exposure index, 15 for the sensitivity index, and 11 for the adaptive capacity index. Hambantota district exhibited the highest exposure index (0.90), while Nuwara-Eliya district had the lowest (0.06). The sensitivity analysis revealed Polonnaruwa district with the highest sensitivity index (0.63) and the Colombo district with the lowest (0.34). The adaptive capacity index was highest in Colombo district (0.91) and lowest in Mullaitivu district (0.16). Overall, Polonnaruwa district had the highest vulnerability index (0.75), and Colombo district had the lowest (0.25). Districts like Anuradhapura, Polonnaruwa, and Hambantota require strengthened health facilities, enhanced disease surveillance, and intensified vector control strategies due to their heightened vulnerability to cutaneous leishmaniasis.

Keywords: Leishmaniasis, Vulnerability, Sri Lanka, Climate

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IPRC/24/30E Multidisciplinary Studies

Assessing the advocacy and perception of leishmaniasis among health staff in Sri Lanka: Evaluating adequacy for disease control, key challenges, and future directions

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Leishmaniasis remains a significant public health concern in Sri Lanka, necessitating effective surveillance and management strategies. The present study aimed to assess the level of awareness regarding leishmaniasis among different stakeholders involved in the control/surveillance program in three selected disease-high endemic districts in Sri Lanka and to identify the existing gaps in the disease notification system. A cross-sectional survey was conducted, and data were collected through self-administered questionnaires from 123 healthcare professionals who are directly involved in the leishmaniasis surveillance/control program in Anuradhapura, Polonnaruwa, and Matara districts. Information relevant to each aspect of the objectives was obtained through self-administered questionnaires. Of the participants, 78.9% (n=97) knew leishmaniasis is a notifiable disease. Most (91.8%; n=113) correctly identified *Leishmania donovani* as the causative agent, and 93.5% (n=115) knew sand flies were the vector. While 46.3% (n=57) had encountered suspected cases, only 26% (n=32) had reported them through official channels, citing barriers like the absence of notification forms and inefficient data entry systems. Preventive measures, such as wearing protective clothing (36.8%, n=97) and environmental cleaning (47.4%; n=85) were commonly mentioned. The study identified limitations in data recording, such as under-reporting (38.2%; n=47) and the lack of real-time updates (35.7%; n=44), which hinder effective disease management. Participants recommended implementing mobile-based reporting systems (56.1%; n=69) and improving the surveillance system (55.3%, n=68) to enhance the notification process. The study underscores the importance of addressing these barriers to enhance disease control strategies and mitigate the burden of leishmaniasis in Sri Lanka. Targeted interventions focused on improving knowledge, attitudes, and practices among healthcare professionals, strengthening surveillance systems, and enhancing stakeholder collaboration are essential for achieving sustainable disease prevention and control.

Keywords: Leishmaniasis, Notification, Limitations, Surveillance

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IPRC_24_28E Multidisciplinary Studies

Assessment of the quality of life of cutaneous leishmaniasis patients in Hambanthota district and patient satisfaction to treatment; A cross-sectional study

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Cutaneous leishmaniasis (CL) is a persistent public health challenge in Sri Lanka, with escalating cases necessitating effective disease control strategies. This cross-sectional study was conducted in October/ November 2023 among randomly selected patients (>16 years old) diagnosed with CL and obtaining treatment for CL at the Hambantota District general hospital in the Southern Province of Sri Lanka. Information relevant to socio-demographic status, health-care-seeking behavior, awareness regarding the disease and treatment satisfaction was obtained using an interviewer-administered questionnaire. A self-administered dermatology life quality index (DLQI) questionnaire was used to assess the impact of the disease condition on the quality of life of patients. A total of 57 patients diagnosed with CL consented to participate in the survey. Most were in the 31-55 age group (38.6%; n=22), followed by 16-30 (36.8%; n=21). The largest group consisted of students (33.3%; n=19), followed by farmers (19.3%; n=11) and individuals engaged in outdoor-based casual labor (12.3%; n=7). Only 35% (n=20) correctly identified the causative agent and 47% (n=27) identified the vector. Many participants stated that accessing the treatment facility is difficult due to the distance from their village (64.7%; n=37). The lesions of most of the patients (86%; n=49) were being treated with sodium stibogluconate, and most (77.2%; n=44) were satisfied with the treatment, stating that there was a visible reduction in the size of the lesion with treatment. However, 45.6% (n=26) complained of side effects, mainly headaches after treatment. According to the DQLI, work or study (2.18) and symptoms & feeling (1.25) domains indicated a low impact (DQLI 2-5). However, all other categories, namely, daily chores (0.95), leisure (0.86), treatment (0.68), and personal relationships (0.56), demonstrated no impact (DQLI 0-1) on the study population. The study emphasizes the need for enhanced awareness programs, improved access to rural healthcare, and measures to alleviate economic burdens.

Keywords: Cutaneous leishmaniasis, Treatment, Satisfaction, Quality of life

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IPRC/24/31E Multidisciplinary Studies

Soil contamination with parasitic helminth ova and larvae in the districts of Gampaha and Colombo in Sri Lanka; A preliminary survey

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Despite Sri Lanka's success in controlling human soil-transmitted helminthiases through mass deworming and improved sanitation, widespread soil contamination from animal excreta remains a public health risk, for toxocariasis and cutaneous larva migrans. This study aimed to determine the prevalence of parasitic helminth eggs and larval stages in soil in selected public areas of Gampaha and Colombo districts. Sampling locations were selected randomly; four sites were sampled at each location. Fifty-six soil samples were collected during May-September 2024 from parks (n=8), temples (n=4), university-grounds (n=12), roadside (n=4), school-grounds (n=12) and home-gardens (n=16). The samples were processed using the Magnesium sulphate flotation and Baermann technique for detection of helminth ova and larvae respectively. Identification of parasitic stages was based on morphological appearance under light microscopy at 40x10 magnification. Species diversity was calculated using the Shannon-Weiner diversity index and compared in wet and dry soil samples using the two sample t-test. The prevalence of parasitic helminth stages in soil samples was 37.5% (n=21). Ova of *Toxocara* spp. (n=8, 38.1%), *Ascaris lumbricoides* (n=2, 9.5%) and hookworm (n=1, 4.8%) and hookworm larvae, probable *Ancylostoma* spp. (n=10, 47.6%) were detected. Soil contamination was relatively high in temples (n=2, 50%), parks (n=3, 37.5%), and schoolgrounds (n=3, 25%). Species diversity was moderate (H'=1.56) with no significant difference between dry and wet soil samples (P=0.406; P>0.05). Contamination of soil with human and animal pathogenic parasite stages specially in public areas such as temples and children's parks indicates the risk of exposure to these pathogens while at play or walking barefoot. Regular deworming of pets and controlling stray animal populations are recommended.

Keywords: Gampaha, Colombo, Soil contamination, *Toxocara,* hookworm eggs, Ancylostoma spp. larvae

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IPRC/24/129 Multidisciplinary Studies

Efficacy of different surveillance tools for leishmaniasis vector sand flies; A comparative field-based study

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Sand flies (*Diptera: Psychodidae*) are a significant public health concern due to their role as vectors of leishmaniasis. Although leishmaniasis was declared a notifiable disease in 2008, there is no systematized surveillance program to detect the abundance of vector sand flies. Therefore, this study was aimed at evaluating the suitability of different surveillance techniques to be used in a vector surveillance program in Sri Lanka. Entomological surveys were conducted monthly from December 2023 to June 2024 in two selected MOH areas, Divulapitiya and Mirigama in Gampaha District, Sri Lanka. Surveillance techniques used in this study included cattle baited net traps (CBNT), collection by hand (HC), light traps (LT) with 6 different sources (UV, white, green, blue, red, incandescent), human-baited double net traps (HDNT) and sticky traps (ST) with 5 colors (white, green, yellow, red, black). The sand fly densities were calculated for each month as per trap densities. A one-way ANOVA was conducted to compare the effectiveness of the different traps. A total of 732 sand flies (219 females, 513 males) from 6 species were found: *Phlebotomus argentipes* (44.0%), *Sergentomyia zeylanica* (52.9%), *Sergentomyia punjabensis* (2.3%), *Sergentomyia dentata*, *Phlebotomus stantoni*, and *Sergentomyia rudnicki* (each 0.3%). Males were predominant in all traps except in HDNTs. The highest species diversity was obtained from LTs although density was higher in CBNT (18.14 per trap) followed by HC (5.15), LT (4.25), HDNT (1.3) and ST (0.18). Mean captures in trap types were significantly different ($P < 0.05$). In LT sources, UV was identified as more attractive (43.9%; n=68) and white color STs were more productive for sand fly collection (65%; n=13). In conclusion, CBNT provides a higher collection rate. The LTs may be indicative of the diversity of the sand flies in an area. This study concludes to have a combination of different techniques to determine the diversity and abundance of vector sand flies.

Keywords: Collection methods, Leishmaniasis, Sand fly, Vector surveillance

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IPRC/24/132 Multidisciplinary Studies

Clinico-epidemiological and treatment satisfaction of patients with cutaneous leishmaniasis and risk factors for disease transmission in a high disease endemic district: A cross-sectional study in Kurunegala district, Sri Lanka

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Cutaneous leishmaniasis is a disease, caused by *Leishmania* parasites. This study focused on characterizing the clinico-epidemiological and risk factors for disease transmission and treatment satisfaction in a high disease endemic setup in Sri Lanka. The study was conducted in the Polgahawela and Polpithigama MOH areas, Kurunegala. Recorded leishmaniasis cases from 2020-2023 were retrieved, and a randomly selected case-control (1:1) cohort was interviewed using an interviewer-administered questionnaire. Clinical data was obtained from the patient's records available at the visit. The demographic and socioeconomic factors associated with cutaneous leishmaniasis in both case-control groups were compared by the Chi-square test. A total of 61 patients and 61 non-patients were interviewed. Most of the patients were females (50.8%) between the ages 5-14 years (21.3%) and 55-64 (21.3%). Students were the major occupational category (29.5%) followed by housewives (26.2%). In the control group females were predominant (50.8%). Age group 35-44 years represented the higher proportion (21.3%). Housewives (29.5%) and students (21.3%) were the major occupational categories. Nodular lesion type was predominant (49.2%) having one lesion (83.6%) with < 15 mm lesion in size (80.3%) mostly on hands (42.4%) followed by face (24.2%). Most of the patients (65.6%) and healthy individuals (60.7%) had not heard of leishmaniasis (χ^2= 0.32) and had not seen a patient with similar symptoms (Test: 62.3%; Control: 67.2%). Level of awareness on causative agent (test: 1.6%; control: 3.3%; χ^2= 0.34). Knowledge of the mode of transmission by sand fly was higher among patients (Test: 78.7%; Control: 62.3%; χ^2=3.94). However, awareness of vector biting time (Test: 1.6%; Control: 1.6%) and protective measures (Test:16.4%; Control:16.4%) were poor in both groups, with no significant differences. Most patients (68.8%) had easy access to treatment, with 88.5% rating treatment satisfaction as excellent (34.4%) and good (54.1%). The findings highlight the need for improved public health education and awareness of disease prevention.

Keywords: Leishmaniasis, Risk factors, Disease awareness, Treatment satisfaction

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IPRC/24/188 Multidisciplinary Studies

A retrospective study on clinico-epidemiological characteristics of rickettsioses in Sri Lanka

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Rickettsioses, are vector-borne infections caused by intracellular bacteria of genera *Rickettsia* and *Orientia*. They cause typhus fevers or fevers of unknown origin, (FUO) in Sri Lanka. A retrospective study was conducted at the Rickettsial Disease Diagnostic and Research Laboratory, University of Kelaniya, from 2018-2023 to characterize clinico-epidemiological and hematological features of confirmed typhus fever cases {IgG antibody titres >1:128 for *O. tsutsugamushi* (kato) or *R. conorii* antigens by Immunofluorescence assay} referred to as the test and unconfirmed cases as the control groups. Clinico-epidemiological and hematological indices were retrieved from the database. Data was analyzed using chi-square tests followed by a correlation analysis between the variables using Pearson correlation. Of 1,221 referrals, 247 (20.2%) were confirmed rickettsial infections; *Rickettsia conorii* 66.7% (n=166), *O. tsutsugamushi* 30.1% (n=75), and mixed infections 3.2% (n=8). Both test and control groups were predominantly male, with male-to-female ratios of 1.33 and 1.18, respectively. Most affected were the younger population (20.6%, < 9 years and 10.8%, 10-19 years). The average duration of fever at referral was 13-14 days. Many cases (35%) occurred during January-February. The Western province, primarily Gampaha district had the most typhus infections, (67.6%, n=167) caused by *R. conorii* (n=108; 64.7%). A significant leucopenia (P=0.005), neutrophilia (P=0.0004), and an elevated erythrocyte sedimentation rate (ESR) (P=0.034) was noted in the test group. Elevated liver enzymes (ALT P=0.0001, AST P=0.0001) and urine occult blood (P=0.024) were also higher. Eschar was common in *O. tsutsugamushi* cases (33.4%; n=25) than *R. conorii* (13.3%; n=13). This study highlights the need to increase diagnostic facilities for rickettsioses which comprise one-fifth of FUO. The presence of an eschar, leucopenia, neutrophilia, an elevated liver enzyme profile and occult blood in urine are markers suggestive of a rickettsial etiology in FUOs.

Keywords: Clinico-epidemiological, Hematological, Immunofluorescence assay, Rickettsioses

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IPRC/24/240 Multidisciplinary Studies

Association between first-trimester anemia and adverse pregnancy outcomes among pregnant women attending antenatal clinics in selected healthcare institutions in Colombo district, Sri Lanka

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Anemia, a global public health issue, affects millions. Anemia in pregnancy impacts both mother and fetus, leading to maternal morbidity and adverse perinatal outcomes. This study aims to determine the association between first-trimester anemia and adverse pregnancy outcomes among pregnant women attending antenatal clinics in selected healthcare institutions in the Colombo district. The study was conducted in two phases. A longitudinal study was conducted among 900 first-trimester pregnant women, categorized into anemic and non-anemic groups based on hemoglobin level. The follow up process involved 742 participants until their first postnatal visit. Outcomes were assessed through questionnaires and secondary records. Data were analyzed using SPSS version 26.0. Significant factors were analyzed using multivariate logistic regression. Anemic women had significantly higher rates of gestational diabetes mellitus (9.2% vs. 1.9%, RR=4.41, p=0.001), maternal pyrexia (2.5% vs. 0.3%, RR=0.59, p=0.03), blood transfusions (10.3% vs. 1.1%, RR=4.73, p=0.00), and overall maternal complications (25.8% vs. 4.9%, RR=2.75, p=0.00). Additionally, anemic women had higher rates of low birth weight babies (13.9% vs. 2.2%, RR=6.38, p=0.005), PBU/NICU admissions (14.2% vs. 1.9%, RR=6.72, p=0.000), and neonatal jaundice (7.2% vs. 0.5%, RR=14.52, p=0.000), indicating significant associations between first trimester anemia and adverse maternal and neonatal outcomes. The findings reveal that anemia is associated with increased risks of gestational diabetes mellitus, maternal pyrexia, blood transfusions, and maternal complications, as well as adverse neonatal outcomes such as low birth weight, PBU/NICU admissions, and neonatal jaundice. These results highlight the importance of early detection and targeted interventions to manage anemia in pregnancy to improve maternal and neonatal health outcomes.

Keywords: Anemia, Antenatal, First-trimester, Pregnancy

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IPRC/24/242 Multidisciplinary Studies

Association between insomnia during pregnancy and postpartum depression, a cohort study from Kurunegala district, Sri Lanka

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Insomnia during the antenatal period could have long-term impacts including postpartum depression. Healthcare providers should pay more attention to psychological and emotional needs during pregnancy, to make women feel safe, comfortable, and positive about the experience. This study aims to determine the association between antenatal insomnia and postpartum depression. A prospective cohort study was conducted among 843 pregnant women in Kurunegala district, Sri Lanka. The sample was identified by using the multi-stage cluster sampling method. Three self-administered questionnaires were used including a socio-demographic characteristic questionnaire: the Edinburgh postnatal depression scale (EPDS) and the Pittsburgh Sleep Quality Index (PSQI). The mean age of the study participants was 29.2±5.3 years and including the newborns, each study participant had 0 to 5 children. In the study sample, 44.4% (n=374) were primipara. Insomnia was seen among 66.4% (n=587) of study participants during the third trimester of pregnancy. The mean global PSQI was 7.19 [SD – 3.595, 95%CI- 6.95; 7.43, SE- .124]. The prevalence of depression defined as an EPDS more than or equal to 9 was 28.8% (n=255) in the fourth week of the postpartum period. The mean EPDS score was 6.11[SD 5.107, 95%CI 5.76; 6.45]. There was a significant association between the Edinburgh postnatal depression scale score and the Pittsburgh sleep quality index score ($p<0.001$). There is a high prevalence of insomnia during the third trimester of pregnancy. Furthermore, there is a significant association between insomnia during pregnancy and postpartum depression.

Keywords: Insomnia, Postpartum depression, Pregnancy

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IPRC/24/243 Multidisciplinary Studies

Information and communication technology literacy levels among public health field workers of the Western province of Sri Lanka

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Information and communication technology (ICT) is significant in modern public health care systems. Assessment of ICT literacy among public health field workers will be a great advantage to introduce electronic public health information systems. The study aims to describe ICT literacy levels among public health field workers of the Western province of Sri Lanka and factors affecting the ICT literacy among them. This was a descriptive cross-sectional study conducted among 340 public health field workers, and multi-stage cluster sampling was used to select the sample. A pre-tested self-administered questionnaire was used to collect data. Data analysis was done using descriptive and relevant inferential statistics. A validated tool was used to analyze, and ICT literacy levels were categorized by the percentage intervals. Overall, the ICT literacy level was detected as 46.2%(n=156), while there was significant difference between the two categories, with 75.5 % (n=76) of ICT literacy demonstrated by public health inspectors (PHIs) (p=0.001). 58.3 %(n=28) of subjects with 2-5 years of experience showed good ICT literacy levels, while 52.8 %(n=113) of diploma holders and 66.7 % (n=46) of participants who were in the age group of 20-30 years showed good ICT literacy level. According to the Chi-square test, ICT literacy level was significantly associated with age, education status and work experience (p = 0.001). Public health field workers show good ICT literacy levels despite a significant difference among categories and clusters. ICT literacy levels were significantly associated with educational status, age and working experiences.

Keywords: ICT literacy, Public health field workers, Western province of Sri Lanka

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IPRC/24/245 Multidisciplinary Studies

Anatomy of thoracic duct: A cadaveric study

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Iatrogenic injuries of the thoracic duct may occur during esophagectomy resulting in chylothorax. Therefore, having a comprehensive knowledge of thoracic duct anatomy, its variations are highly beneficial. This study was designed to assess the anatomy of thoracic duct and variations through its course in the thorax. Ten (5; males and 5; females) fresh intact adult cadavers were dissected. Following the initial dissection, all of them were further sectioned sagittal in the midline and separated into the half thoracic cavities and assessed. The study was carried out in the Department of Anatomy, Faculty of medicine, Ragama, Sri Lanka from 2022 to 2024. The ethical clearance was obtained from Ethics Review Committee, Faculty of Medicine University of Kelaniya. Authors declare no conflict of interest. All our specimens, the cisterna chyli was in the retro-crural space at the level of the lower border of the 12th thoracic vertebra, in 4/10 it was at the level of L1–2 vertebrae. All were tubular structures located right to the abdominal aorta and variations of the pathway within the thoracic cavity or in its termination were not observed. The total length of the thoracic duct ranged from 39- 44 cm. Its mean transverse diameter was 2.8 mm (range: 2.1–3.8 mm SD: 0.2 mm) at the upper segment, 1.8 mm (range: 1.4–2.1 mm SD: 0.2 mm) at the middle segment, 3.7 mm (range: 3.4–4.5 mm SD: 0.3 mm) at the lower segment. Therefore, the thoracic duct is wider in diameter at its commencement but narrows at the mid-thoracic level and widens again before its termination. The mean maximum transverse diameter and length of the cisterna chyli were 4.2 mm (SD: 0.3mm) and 14.5 mm. Except for common type, variations of cisternal chyli and thoracic duct were not observed in this study. Further analysis with a large sample size is recommended.

Keywords: *Cisterna chyli,* Esophagectomy, Mediastinum, Thoracic duct, Thorax

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IPRC/24/10 Multidisciplinary Studies

ජාතික අධ්‍යාපන විද්‍යාපීඨවල ප්‍රායෝගික ගුරු පුහුණුව සඳහා මාර්ගගත ක්‍රමවේද භාවිතය භෞතික පන්ති කාමර ඉගෙනුම් ඉගැන්වීම් ක්‍රියාවලියට දක්වන දායකත්වය

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[2]වාණිජ හා කළමනාකරණ අධ්‍යයන පීඨය,කැළණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව
[3]සමාජවිද්‍යා පීඨය, කැළණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

ශ්‍රී ලංකාවේ පූර්ව සේවා ගුරුපුහුණුව ක්‍රියාත්මක කරන ජාතික අධ්‍යාපන විද්‍යාපීඨ පාඨමාලා Covid-19 වසංගතය හමුවේ මාර්ගගතව ක්‍රියාත්මක විය. මාර්ගගතව ප්‍රායෝගික ගුරුපුහුණුවෙන් අපේක්ෂිත අරමුණු , ගුරු කුසලතා සංවර්ධනයට ඇති කළ දායකත්වය මෙන්ම මුහුණ පෑ ගැටලු සහ අභියෝග අධ්‍යයනය කිරීම මූඛ්‍ය අරමුණ විය. සියනෑ ජාතික අධ්‍යාපන විද්‍යාපීඨයේ 2018/2020 අධ්‍යයන වර්ෂයේ සිංහල , ඉංග්‍රීසි මාධ්‍ය විද්‍යාව සහ ගණිතය පාඨමාලා හැදෑරූ ශික්ෂණලාභීන් 245ක් , කථිකාචාර්යභවතුන් 47කගේ සහේතුක නියැදියක් යොදා ගැණින. විවරණීය අනුක්‍රමික මිශ්‍ර පර්යේෂණ ප්‍රවේශය යටතේ සමීක්ෂණ සහ ප්‍රත්‍යක්ෂ අධ්‍යයන යොදාගැණින. න්‍යායාත්මක රාමුව ලෙස TPACK ආකෘතිය භාවිත කෙරිණ. ප්‍රමාණාත්මක දත්ත විස්තරාත්මක සංඛ්‍යාන ක්‍රමවේද සහ ගුණාත්මක දත්ත තේමා පාදකව විශ්ලේෂණයට ලක්කෙරිණි. පූර්වසේවා ගුරු පුහුණු පාඨමාලාවල ප්‍රායෝගික ගුරු පුහුණුව මාර්ගගතව ප්‍රථම වතාවට ක්‍රියාත්මක වී ඇති බවත් , කථිකාචාර්යවරුන්ට විධිමත් පූර්ව පුහුණුවක් ලැබී නොමැති බවත් අනාවරණය විය. ශික්ෂණලාභීන් න්‍යායාත්මක සහ ප්‍රායෝගික විෂය අන්තර්ගතයන් ශිෂ්‍යාකේන්ද්‍රීයව ඉගැන්වීමට ප්‍රයත්න දරා ඇත. මාර්ගගත තක්සේරුව අසීරු වුව ද ඇගයීම මෘදුකාංග භාවිතයෙන් සිදුකර ඇත. ඉගෙනුම් ආධාරක සහ ඩිජිටල් ඉගෙනුම් සම්පත් භාවිතයෙන් විෂය සංකල්ප තහවුරු කිරීම පහසුවී ඇත. ගුරු-සිසු අන්තර්සබඳතා ඵලදායිව පවත්වාගෙන යාම , විද්‍යාගාර අත්දැකීම් ලබා දීම අසීරුවිය. ඉගෙනුම්ලාභීන් සමපදස්ථයින් වීම නිසා පළමු පෙළ අත්දැකීම් නොලැබුණ ද මාර්ගගත ගුරු කුසලතා සීමාවාසී ගුරුපුහුණුවට බෙහෙවින් ඉවහල් විය. යටිතල පහසුකම් ,ස්ථාවර අන්තර්ජාල සම්බන්ධතා නොතිබීම අභියෝගාත්මක විය. TPACK ආකෘතියේ දැනුම් ප්‍රභේදවල මධ්‍යන්‍ය විශ්ලේෂණයට අනුව ශික්ෂණලාභීන්ගේ ශික්ෂණ විද්‍යාත්මක දැනුම (PK-3.5702) සහ කථිකාචාර්යවරුන්ගේ විෂය අන්තර්ගත දැනුම (CK-3.5815) ඉහළ මට්ටමක පැවතිය ද, දෙපිරිසේ ම තාක්ෂණික දැනුම (TK-3.3633ල 3.0466) අවම බව අනාවරණය විය. ප්‍රායෝගික ගුරු පුහුණුවෙන් අපේක්ෂිත ඇතැම් අරමුණු මාර්ගගතව ඉටුකර ගත නොහැකි බැවින් සමස්ත ගුරු කුසලතා සංවර්ධනයට දෙමුහුන් ක්‍රමවේදය වඩා යෝග්‍ය වනු ඇත .

මූඛ්‍ය පද: පූර්වසේවා ගුරු අධ්‍යාපනය, ප්‍රායෝගික ගුරු පුහුණුව, මාර්ගගත ප්‍රායෝගික ගුරුපුහුණුව

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Social Sciences and Humanities

IPRC/24/07 Social Sciences and Humanities

Innovations and Technological Development on Economic Growth through National Innovation System: Global South versus Global North

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Innovations and technological development have been identified as the key factors of successful economic growth. Most developed nations worldwide have achieved their economic transformation through a knowledge-driven economy. If any country is capable of innovations and technology, it can self-sustain. The best example is the rapid economic growth in East Asian countries, which was built on significant technological advances. The newly industrialized countries in East Asia, namely South Korea, Taiwan, and Singapore have achieved rapid industrial and technological development through the effectiveness of their National Innovation System (NIS). An NIS plays a significant role in uplifting the country's economy, whereasSri Lanka pays relatively less attention to NIS, technology, and innovations. The main objective of this study was to identify the factors hindering the development of an NIS. while investigating the NIS interrelated dimensions such as patent applications, expenditure on research and development (R&D), and high-tech exports. As the methodology, the study first conducted a comparative analysis with selected East Asian countries including Sri Lanka. Furthermore, using the quantitative methodology, depending on secondary data, relying on the data period from 2000-2021, the study conducted a pooled Ordinary Least Square, panel fixed effect, and random effect estimation for 20 global north countries and 22 global south countries. The model used innovations, and growth-related variables, namely, the number of patent applications, trademarks, industrial designs, and R&D. Key findings revealed that many countries of the global south failed to reach knowledge-based development because most of them did not have proper NIS. They lack technology, innovations, and knowledge, especially in high-tech industries. Instead of technological innovation-based industries, those countries still have mostly labour-intensive industries. In the case of Sri Lanka, it showed a remarkably low incidence of patent applications, trademarks, industrial designs, and R&D expenditure on high-tech exports.

Keywords: Economic growth, Global North, Global South, National innovation system (NIS)

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IPRC/24/14 Social Sciences and Humanities

An anthropological study on impact of present modernization for the obsolescence of craftsmanship of coconut leaf food canisters (with special reference to Kottawa/South *Grama Niladhari* Division)

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Adopting modern methods, tools, and social structures to advance general development, to raise living standards, and to boost economic growth may be referred to as modernization. When finding ways to live and use resources in a manner that ensures a balanced and healthy world for both current and future generations, using coconut leaves for food canisters has a potential in its own small way to be a sustainable option, which aligns with the principles of eco-friendly and biodegradable packaging. Coconut leaves can be identified as a raw material which is readily available and a renewable source in many tropical regions which has been utilized by various communities for centuries to create functional and artistic objects. The study carried out in Kottawa South *Grama Niladhari* Division in Sri Lanka where the traditional technique of making coconut leaf food canisters has become obsolesced in favor of plastic and polyethylene canisters. Investigating into the traditional techniques and identifying the sustainability and the eco-friendliness of coconut leaf canisters were the general objectives of the study while assessing the economic significance and cultural preservation were the specific objectives. The informants were identified through the snowball method. The craftsmanship prevailed mostly among women. Only twenty women could be identified as who have been making coconut leaf food canisters and that too was for their personal consumption rather than for selling. The scarcity of raw materials, the ageing of the women who know the craft, and the reluctance of the younger generation to learn and practice traditional techniques of making coconut leaf canisters were identified as the reasons for the decline of the industry. The women declared that they use coconut leaves after boiling them not only to make food containers, but also mats, and door mats for home use. Since there is an awareness in the importance of the use of eco-friendly utensils instead of polythene and plastics, which are harmful to humans as well as to the environment, the techniques of making such crafts have to remain at least as a little help to overcome economic difficulties of rural communities, empowering rural women in an eco-friendly manner.

Keywords: Coconut leaf food canisters, Eco-friendly, Sustainability, Women empowerment

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IPRC/24/16 Social Sciences and Humanities

The role of communication in the provision of library and information services in state-sector university libraries in Sri Lanka

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The communication ability of the staff is one of the most important aspects in libraries or information centers and in almost every other sector for that matter. Although communication is vital in providing library and information services, it has not often been regarded as an absolute necessity. Most library staff have not identified it as a powerful element needed for providing effective services. The objectives of this study were to identify the pattern of organizational communication in university libraries, to identify the impacts of communication in providing effective library and information services, and to find out the barriers to communication in university libraries. A survey method has been used for the study while the sample population was the library staff of state university libraries. The sample included librarians, senior assistant librarians, assistant librarians, and library information assistants working at the University of Kelaniya, the University of Sri Jayewardenepura, the University of Colombo, and the University of Moratuwa. All 152 staff members were given questionnaires and 116 responses were received. The data analysis was done using Microsoft Excel software. The showed that the information in libraries often flows from the senior staff to the junior staff. The junior staff too communicate with their superiors whenever there is a need to do so. Oral communication was the mode of communication used often in communication. Library staff had a positive perception of the importance of communication within the organization and also on providing better service to users. In handling the English language, 68.97% of the library staff faced difficulties in conveying accurate messages to the users. Efforts should be made to remove barriers against effective communication between library staff and users. Librarians and other library staff should acquire knowledge of new technology to meet users' information needs and to improve communication among themselves.

Keywords: Communication, Library and information services, Library staff, University Libraries

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IPRC/24/49 Social Sciences and Humanities

Enhancing human capital through university library outreach: Impact on teacher librarians

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This study investigated the impact of university library outreach (OR) programs on human capital development in Sri Lanka, specifically focusing on the "Online Education and School Libraries in the 21st Century" initiative at the Kuliyapitiya Zonal Education Office, a program aimed at enhancing teacher librarians' (TL) skills and knowledge on digital literacy. The study employed purposive sampling and qualitative research methods, using semi-structured interviews for data collection. The sample comprised 10 teacher librarians (TLs) selected out of 72 participants in the program. The thematic analysis examined how these initiatives contribute to TLs' professional growth and broader community development. The demographic profile revealed that 93% of the participants were qualified in Library and Information Science, 86.8% were appointed as TLs, and 77% were aged between 41-50. The impact of outreach (OR) programs on TLs' human capital development was assessed through six key themes from focus group findings, which showed significant improvements in TLs' self-confidence, skills in using digital tools and integrating ICT into daily activities. University libraries play a multifaceted role in community development. In conclusion, university libraries OR programs in Sri Lanka were found to be vital in fostering 'human capital' by improving TLs' professional skills, providing training on learning tools, and raising ICT awareness. The study recommends expanding OR programs and training mechanisms, integrating innovative ICT training, and ensuring continuous assessments to address the evolving needs of TLs and communities.

Keywords: Community development, Digital literacy, Human capital, Teacher librarians, University library outreach

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IPRC/24/50 Social Sciences and Humanities

Fostering social harmony through ethnic socialization among primary school children: A case study of an urban primary school in Kurunegala administrative district, Sri Lanka

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Sri Lanka is a religiously, ethnically, and linguistically diverse country, which has been through identity-based crisis and political rivalry. Hence, fostering and maintaining social harmony is one of the key challenges the country faces today. It has been known that the socialization agents such as the school, peers, and the family can influence the ethnic-socialization process in various ways, often infusing into school children notions about their ethnic heritage, promoting pride about their ethnicity forming ethnic identity in their minds. In this study, we explored the potential role that a school can play as an agent of ethnic socialization in fostering social harmony. Taking an urban primary school with a multi-ethnic background from Kurunegala administrative district as a case study, the nature of ethnic socialization efforts adopted by the school for fostering social harmony among primary school children was examined with a holistic qualitative approach. Data were primarily collected through open-ended interviews and focus group discussions with students and teachers and were analyzed through the thematic analysis method. Findings revealed that the school adopted diverse practices such as ceremonial performance of multi-religious and multi-cultural events aiming at promoting social harmony. Nevertheless, the primary focus of the school was found to be on conducting such cultural events just to please authorities rather than with a determination to promote social harmony. Parent-driven ethnic socialization found to have more impact on young children. A combination of school and parents-driven ethnic socialization program would positively affect the process of fostering social harmony.

Keywords: Ethnic socialization, Social harmony, Socialization agents

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IPRC/24/57 Social Sciences and Humanities

The impact of social support on challenges faced by visually impaired children

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Visually impaired children face significant challenges in daily activities due to their blindness or visual impairment. The study was grounded in the social model of disability and social support theory to explore the impact of social support on those challenges. The main objective of the study was to analyze the effects of physical, emotional, and informational support those children receive from family, schools, and peers on challenges the visually impaired children face in mobility, education, emotions, and social interactions. The study involved 47 children from Grades 6 to 11 at Ratmalana School for the Blind in Sri Lanka. Data collection included structured interviews using stratified sampling for quantitative data. Qualitative data was gathered through purposive sampling from in-depth interviews with selected children, teachers, parents, and experts. Observational methods were used to enrich further the qualitative data. Findings indicated a significant negative correlation ($r = -0.556$) between the level of challenges and the amount of social support received. Family provided the most substantial emotional and informational support, while school primarily offered physical support. Though received less frequently, peer support was found to be essential for social connections and to avoid discrimination. Children with total visual impairment encountered more mobility and social challenges than those with partial sight, with girls experiencing more mobility issues. The study highlighted gender-specific issues, particularly for girls with visual impairments, indicating a need for targeted interventions to address their distinct mobility challenges. It was concluded that enhanced social support could significantly reduce the challenges faced by visually impaired children. The findings were useful for the government and non-governmental policymakers who aim to improve the lives of visually impaired children through better support systems and inclusive practices.

Keywords: Social challenge, Social connections, Social support, Visually impaired children

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IPRC/24/63 Social Sciences and Humanities

Cataloguing Audio-Visual Materials (AVM) in Sri Lankan libraries using the MARC 21 format

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Audio-visual materials (AVM) encompass any media or content that uses both auditory and visual elements to communicate information, ideas, or stories. This includes videos, films, slideshows, presentations, animations, interactive content, and audio recordings. Integral to library and archival collections, these materials offer the users access to a rich range of cultural, historical, and educational resources. Although it is essential to keep AVM in a library in a specific order to make it possible for the library users to search for them and get them, there is no specific standardized format used for cataloguing these materials in libraries of Sri Lanka. This study was aimed to evaluate the current methods used in cataloguing AVM in Sri Lankan libraries and identify the challenges in developing a machine-readable cataloguing format for them namely to develop an effective MARC21 format for the purpose. A mixed research methodology was employed in this study, with data collected from the National Library of Sri Lanka and the Sri Lanka Broadcasting Corporation Library. It was found that the staff in libraries had no enough knowledge to catalogue AVM (100%). Bibliographic information of audio-visual media is different from source to source, and therefore, there was no proper method (100%) due to lack of appropriate format and standards for cataloguing AVM. This research created a MARC21 format for cataloguing AVM and that included fields for control numbers, physical characteristics, cataloguing sources, titles, editions, publication details, descriptive elements, content types, carriers, audio/video characteristics, series statements, notes, subjects, and added entries. This format ensures comprehensive bibliographic representation of AVM.

Keywords: Audio-visual materials, Cataloguing, Machine-readable cataloguing, MARC21

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IPRC/24/102 Social Sciences and Humanities

Technical efficiency of the state-sponsored general education

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Education is one major trajectory that the government of Sri Lanka, as a welfare state, funds with the enactment of the Free Education Act. Technical Efficiency (TE) is one main assessment applied in different organizations, especially in the education sector, to estimate the output gained compared to the input resources. This study tried to analyze the TE of state sponsored general education using the Stochastic Production Frontier model with the inefficiency effects developed by Battese and Coeli in 1995. According to this model, the TE is calculated from the given input variables. And non-input variables are used to calculate the inefficiency effect. TE is defined as the ratio between the actual output and the maximum possible output. Front 4.1 software is unique for the analysis of data with inefficiency impacts. The methodology applied was the convergence mixed methodology. Although the study population included all the grade 11 students and the grade 13 science stream students in the island, the sample included 850 male and female students chosen according to the Systematic Random Sampling method from Type 1AB fully government-owned schools spread throughout the Gampaha District of the Western Province, and the students of grade 11 and grade 13 along with their parents, relevant teachers, and the principals were picked as the primary data sources.The data collection was done using a questionnaire developed after a pilot study. The study concluded that the mean TE of state-sponsored general education was between 70% and 80% and could have room for further development. While the school resources, principals' administration, teachers' contribution, students' keenness for learning, and parents' support on their childrens' education were presented as the proven factors that influence the TE; least parents' support, weak concentration level of students during lessons, inability to cover the expected syllabi, and lack of revision coverage were highlighted as the recognized factors that influence the inefficiency.

Keywords: Technical Efficiency, State-sponsored general education, Stochastic Production Frontier Model

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IPRC/24/109 Social Sciences and Humanities

Avalokiteśvara Bodhisattva in the Buddhist tradition of art in Sri Lanka

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Avalokiteśvara is a prominent *Bodhisattva* in *Mahāyana* Buddhism venerated in the Buddhist community throughout Asia. This research was focused on the representation of *Avalokiteśvara* in Sri Lankan Buddhist tradition of art, aiming at exploring how *Avalokiteśvara* has been portrayed as a symbolic icon of *Bodhisattva* in Buddhist art. The study used intertextual analysis of *Mahāyana* texts and *Avalokiteśvara* iconography to understand his role and representation in Sri Lankan Buddhist art. The study was focused on rock cuts, stone sculptures, and metal sculptures. The research identified two types of *Avalokiteśvara* statues in Sri Lankan Buddhist art, namely *Yogi Avalokiteśvara* and *Rajakumara Avalokiteśvara*. Different seating and head designs were discovered, such as *Vīrāsana, Rājalīlasana, Bhadrasana, Lalitāsana, Jatāmakuta*, and *Kiritamakuta*. Several distinct *Yogi Avalokiteśvara*-type statues were identified in Sri Lanka, including those located in Giridara, Thiriyāya, Sithulpauva, Budhumuththeva, and Buddharuvagala. These statues were designed without upper body ornaments. In contrast, *Raja Kumara Avalokiteśvara* statues were found in complete *Raja Kumara* costumes, as seen in the Dambegoda *Selmuwa* and the Weligama *Kushtarajagala* statues. The statue of *Avalokiteśvara* in Thiriyaya was found to be designed as a sage. The country's oldest statue of *Yogi Avalokiteśvara* was found in Sithulpauva, reflecting the tendency to depict *Avalokiteśvara* as a sage. The study also explored the changes in the depiction of *Avalokiteśvara* over time, as recorded in oral tradition. It was noted how the images of *Yogi Avalokiteśvara* were initially reidentified as Lord *Nātha*. The *Avalokiteśvara* has developed a particular discipline in Buddhist art through various cultural understandings, establishing a vast range of symbolic icons of the *Bodhisattva.* Although the symbolism of *Avalokiteśvara* represented in different images of Sri Lankan Buddhist Art was unique to each of them, it was apparent that all forms bear a closely connected relationship.

Keywords: *Avalokiteśvara,* Buddhist art, Iconography, *Mahāyana* Buddhism,

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IPRC/24/112 Social Sciences and Humanities

The problems faced by the suspects remanded into custody

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Crime is defined in the Macmillan Encyclopedia of Social Sciences as "an act detrimental to the public welfare while the term 'offense' is used to refer to prohibited acts. Penal Code No. 03 of 1983 is today referred to as the Criminal Law of Sri Lanka. Those who are remanded into custody are regarded only as suspects until and unless they are sentenced by a court of law and should remain in custody until they are released or imprisoned. Keeping somebody under custody away from the family and society has a negative impact on the economy and well-being of not only the person but also the society. Hence, there is a need to evaluate the extent of that impact. Ontology was used as a realistic method while epistemology as an interpretative method. The Objectives of the research were to identify the problems faced by those who were in remand custody, to identify the causes of the problems and to make recommendations to solve those problems. Accordingly, a qualitative research was conducted using the ethnography method primarily in the Kalutara Remand Prison, Data were collected through semi-structured interviews taking male and female ratio as 16:4. Also this included 10 experts knowledgeable in prison affairs. Content analysis was applied to review theories. It was found that the people placed under remand custody had varying levels of education, wealth and social status. The main problems they were facing were congestion and lack of facilities, longevity of the stay due to delays in court hearings, mental illnesses such as stress and loneliness occur due to staying away from family and home, and being regarded as criminals before the court determines so. It was suggested to provide free legal services for those with low levels of education and income. In order to prevent the possible breakup of the family and abuse of children, it was suggested to permit communication with the families. An opportunity for them to engage in some work online and support the families was also recommended. Religious institutes would be able to play a significant role in providing advice and guidance to those under custody and their families.

Keywords: Suspects remanded into custody, Family, Kinship, Prison and Remand Prison

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IPRC/24/118 Social Sciences and Humanities

The study of the effectiveness of short-term pre-service graduate teacher training

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The quality of education depends more on the quality of teachers than on any other factor. Therefore, the demand for effective and capable teachers is paramount in the ever-evolving field of education. Short-term pre-service teacher training programs would be a feasible measure to improve the quality of aspiring teachers by training them on essential skills and knowledge. Such training programs would be instrumental in enhancing teachers' confidence in their ability to motivate students in learning. However, there is a lack of data on the effectiveness of such initiatives, notably among government teachers in Sri Lanka, making it difficult to understand the strengths and weaknesses of teachers, to know what are the areas that need continual improvement. The purpose of this study was to evaluate the effectiveness of a 30-day pre-service teacher training program held in May 2024 for graduate teachers in the Sri Jayewardenepura education zone in Sri Lanka. Experiential learning theory provided the theoretical foundation as it explains well the effectiveness of short training programs based on participants' feedback. The methods consisted of a self-administered questionnaire with a five-point Likert scale (ranging from 1 'excellent' to 5 'fair'), a cross-sectional time horizon, distribution to all the participants (92% response rate), and data analysis using descriptive statistics and an effectiveness score. Findings showed that 38% found it extremely effective, 55% effective, and 7% ineffective. Furthermore, the study identified areas for improvement in future training sessions. These findings have significant implications for enhancing teacher training programs and guiding future initiatives and will be instrumental for decision-makers at the zonal and provincial levels and at the national level in improving the effectiveness of pedagogical strategies.

Keywords: Effectiveness, Graduate teachers, Pre-service teacher training

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IPRC/24/121 Social Sciences and Humanities

Bedtime reading as a tool for improving sleep quality among university academics: A case study in Sabaragamuwa University of Sri Lanka using global PSQI

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Sleep quality and regular reading are essentials of academic life. Bedtime reading is a behavior that many humans do willingly. The Pittsburgh Sleep Quality Index (PSQI) measures subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication and daytime dysfunction. Scope of the research was limited to two academics selected from Sabaragamuwa University of Sri Lanka representing male and female and early career levels. Upon the prior consent of each participant, their sleeping patterns were monitored using smart watches. Pre- and post- sleep related data were collected throughout two consecutive months. The first month was considered as the control and PSQI during that month was recorded. The following month was considered as the test period, where respondents were asked to read a printed leisure reading book for 15-30 minutes immediately before going to sleep. To create an optimal sleep environment and a routine with minimum sleep disruptors, the participants had to maintain consistent bedtimes and wake times, avoid food, caffeinated drinks and mobile devices within an hour of going to bed, and sleep in their usual accommodations. The female respondent (R1) recorded a PSQI of 11 for the control month (pre-intervention) while the male respondent (R2) scored 15. According to the theory, global PSQI score "0" indicates "no difficulty" in sleeping and "21" representing "severe difficulties". The post-intervention PSQI scores were recorded as 4.8 and 6 for R1 and R2 respectively, showing a reduction in PSQI. The results highlighted a significant improvement in overall sleep quality and a significant decrease in sleep latency, sleep fragmentation, and daytime dysfunction, all resulted by the intervention. This non-pharmacological approach would be useful to apply as a sleep quality enhancer for academics with sleeping difficulties. Further research is needed involving higher numbers of diverse subjects with longer intervention durations.

Keywords: Bedtime reading, Pittsburgh sleep quality Index, PSQI, , Sleep quality

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IPRC/24/125 Social Sciences and Humanities

Ink on the skin: Symbolic significance of ink-expressions from the perspective of Tattoo bearers

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Tattooing is a form of skin modification practiced with a broad array of beliefs, techniques and significance over centuries around the world. Despite worldwide proliferation, acceptance, and popularity, tattoos provoke stigma-based discrimination. The tattoo culture in Sri Lanka has been fast-growing with a mix of positive and negative social responses. Hence, using a descriptive qualitative approach, this study, from the perspective of tattoo bearers, explored the intent behind acquiring a tattoo, the significance of tattoos as symbols of expression, and social responses to tattoos. The tattoo bearers (N=20) were purposively chosen from a contemporary tattoo studio in Colombo, Sri Lanka. Data was collected through semi-structured interviews that focused on demographic details, the intent of tattooing, the nature of tattoos and their symbolic meanings, and social responses to their tattoos. Thematic analysis of interviews through the lens of Symbolic Interactionism revealed that the key intents of acquiring tattoos were expressing different virtues and narratives such as loss and grief, portraying 'self' as trendy, re-correcting flaws on the skin, pleading blessings, expressing resilience and spirituality, commemorating achievements, preserving memories, and expressing intimacy Tattooing was a symbol of expressing the rites of passage, victimization, self-empowerment, self-confidence and endurance. Respondents explained a complex blend of experiences of both appreciation and condemnation of their tattoos due to lookism-based stigma against tattoos, and this varied by the gender, the nature of tattoo design, and the size and visibility of the tattoo on the body. Personal, emotional, and spiritual meanings that tattoos encompass were restrained by sensitive mainstream social values. In summary, tattoos were revealed as a way of expressing 'self-identity' in a society that often did not embrace fully the particular mode of expression.

Keywords: Tattoos, Stigma against tattoos, Symbolic significance of tattoos.

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IPRC/24/133 Social Sciences and Humanities

Evolving gender roles in Sri Lankan TV commercials: A discourse analysis of gender representation

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This study explored the evolving portrayal of gender roles in Sri Lankan television commercials, focusing on four relatively new advertisements for milk powder, washing liquids, and menstrual products. The sample selection was based on criteria including relevance to gender representation, recency, and popularity. The research tried to answer the questions concerning what the evolving gender roles in selected TV commercials were, and how the recent shifts in gender roles and stereotypical portrayals influenced societal perceptions. Discourse analysis was used as the methodology to analyze how gender roles were constructed and represented. The narratives and the speech acts were analyzed by verbal discourse analysis while the images and semiotics were analyzed by visual discourse analysis. Finally, a temporal comparison was conducted using three older TV commercials in the same product categories to identify shifts in discourse. In the past decade, these product categories have been critiqued for perpetuating traditional and biased gender stereotypes. The analysis showed that depictions of gender gradually moved from overtly traditional to more complex and diverse gendrer depictions. Earlier commercials predominantly depicted women in domestic settings and men in authoritative or professional roles. Recent advertisements, on the other hand, offered a wider range of roles for both genders. Some novel advertisements subverted traditional expectations by showing women in strong, diverse jobs while males performing household chores. This transformation reflects a larger cultural shift and growing awareness of gender equality concerns in Sri Lanka. This study added to the knowledge of gender dynamics in Sri Lankan media and provided advertisers with suggestions for promoting more inclusive and progressive gender representations. As for the limitations of the study, it could be said that the selection of commercials may have influenced by the researcher bias, and hence not reflected accurately the wider range of gender representations in Sri Lankan television commercials. Discourse analysis was also interpretative by nature, leading to a degree of subjectivity of the analysis.

Keywords: Discourse analysis, Gender roles in TV commercials

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IPRC/24/162 Social Sciences and Humanities

Prevalence and factors associated with hypertension, among government nurses at a selected hospital in Sri Lanka

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Hypertension is a major risk factor for cardiovascular disease (CVD). The prevalence of hypertension is increasing globally, especially the ageing populations, due to lifestyle risk factors such as unhealthy diets and lack of physical inactivity. Nurses are particularly at risk for hypertension due to occupation-related factors and like stress, unhealthy dietary habits, overweight, obesity, and sedentary lifestyles. This study aimed to determine the prevalence of hypertension and its associated factors among nurses working at District General Hospital Horana in Sri Lanka. A descriptive cross-sectional study was conducted among 274 nurses working at the hospital. Data were collected using a self-administered questionnaire including socio-demographic characteristics, health status and Perceived Stress Scale (PSS) to assess stress levels. Data were analyzed using SPSS v25.0. Among 274 nurses, the mean age was 45.7±8.4yrs, the majority (97.1%, n=266) were female, married (94.5%, n=259), had a monthly income >Rs 81,000.00 (72.3%,n=198) and 91.6% (n=251) had 10-19 years of work experience. A 12.3%(n=34) of the sample had hypertension and 11.2% (n=31) had diabetes. Most had a family history of diabetes (46.9%) and hypertension (57.4%). The PSS results indicated that the majority (76.9% ,n=213) had moderate stress levels (scores from 14-26 in 0-40 scale). Gender (P<0.001), level of education (P<0.001), years of experience (P<0.001), family history of diabetes and hypertension (P<0.001), sleep deprivation (P<0.001) were significantly associated with hypertention. More importantly, the stress levels did not show a significant association (P =0.317) with hypertension in the sample. The study revealed that gender, years of working, family history of the disease, and sleep deprivation significantly impacted the prevalence of hypertension among nurses at District General Hospital Horana. While most nurses experienced moderate levels of PSS it was found as not be associated with hypertension. These findings suggested a need of targeted interventions to reduce hypertension and to improve healthy sleep and overall health among nurses.

Keywords: Hypertension, Nurses, Risk factors, Stress

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IPRC/24/168 Social Sciences and Humanities

Factors associated with self-control among undergraduates of higher educational institute in Sri Lanka

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Self-control plays a crucial role in different ways of an individual's life, including health, social relationships, emotional regulation, and performance. A high level of self-control is important to lead a balanced and productive life. American Psychological Association defined self-control as "an ability to be in control of overt, covert, emotional, or physical behavior and restraining or inhibiting impulses". According to a 2011 survey among undergraduates, around 61% reported lower levels of self-regulation. The association will be visible with the discovery of the number of university students needing support to improve self-control. On the other hand, there was less evidence demonstrating factors associated with self-control in the Sri Lankan context. The present study investigated the factors affecting the self-control among undergraduates at a higher educational institute in Sri Lanka. The descriptive cross-sectional study was conducted among 335 undergraduates of KAATSU International University (KIU) using the Simple Random Sampling method. A self-administered questionnaire was used to collect the data. The 13-item Brief-Self-control Scale (BSCS) and a demographic questionnaire were utilized to assess Self-control and the demographic factors. The results were analyzed using the One Way ANOVA in IBM SPSS version 25. The 'gender', 'degree categories' and 'employment status' did not show any statistically significant differences. Yet, 'academic year' showed a statistically significant difference. In academic year, the difference between groups was statistically significant ($F(3,331) = 4.147$, $p = 0.007$). A Turkey post-hoc test discovered that there was a significant difference between 1st year and 3rd year students ($p = 0.003$). It showed that self-control among 3rd year undergraduates was significantly higher than that among 1st year undergraduates. The study concluded that there was an association between self-control and the academic year of undergraduates at KIU. Further research to develop interventions aimed at uplifting self-control among undergraduates in Sri Lanka was recommended.

Keywords: Brief self-control scale (BSCS), Self-control, Undergraduates

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IPRC/24/201 Social Sciences and Humanities

Shattering ceilings: pioneering paths to recruit and retain female employees in luxury hotels amidst language, cultural, and social hurdles

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This study delved into the multifaceted challenges encountered in recruiting and retaining women in the high-end hotel sector in Galle, Sri Lanka. Despite the significant presence of women in the hospitality industry, they remained notably underrepresented in many key positions within this locale. The objective of this research was to pinpoint the obstacles contributing to this disparity and propose feasible solutions. Employing a mixed-method approach, the study gathered insights through a web-based self-completion questionnaire to acquire quantitative data and through semi-structured interviews to gain qualitative data from 50 female employees and 20 managerial staff at five-star hotels in Galle. The sampling methods used were snowball sampling for the quantitative data and purposive sampling for the qualitative data. SPSS statistical software was utilized to analyze the quantitative data, performing comparison and correlation tests within univariate, bivariate, and multivariate analyses for both parametric and non-parametric procedures. An interpretive strategy was also employed, allowing for a more flexible approach to the prepared themes, based on the responses of each participant. The analysis revealed a range of impediments that affected women's participation preventing the development of this industry to its full potential. Key issues included barriers related to English proficiency, deeply ingrained cultural norms, persistent biases, and insufficient flexibility in work arrangements. Additionally, the women faced systemic challenges such as restrictive employment strategies, negative societal perceptions, and a lack of support from spouses and other family members. The research underscored the need for a strategic overhaul to address those issues effectively. To overcome the identified barriers, it was recommended to implement a comprehensive diversity and inclusion training programme aimed at combating bias fostering a more inclusive workplace environment, and to improve work-life balance ensuring equal opportunities for employment and training. These efforts were expected not only to benefit individual women but also to contribute to the overall growth and success of the industry in Galle.

Keywords: Employability of women, English proficiency,

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IPRC/24/221 Social Sciences and Humanities

How employment leads to the mental satisfaction of the graduates of the arts stream of studies

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The COVID- 19 pandemic and the economic crisis negatively affected the Sri Lankan society for the last few years. This has created so many problems in the daily life of the citizens. Unemployment is one of the major problems in the Sri Lankan society. In 2020, the unemployment rate in Sri Lanka was 5.4%. But, with the COVID- 19 pandemic and the economic crisis, some members of the working community lost their conventional jobs and became unemployed. With the COVID- 19 pandemic a lot of Sri Lankans have started working online and freelancing without waiting for opportunities for conventional employment. This study was conducted in July and August 2023 to analyze the current status of unemployment and the effects of employment on the mental satisfaction of the graduates of the arts stream of studies from the University of Kelaniya. A questionnaire was distributed randomly among those graduates. Responses from 50 individuals were collected and analyzed. The majority (84%) of the sample were females, while the rest were males. From the whole sample 76% of the individuals were employed while only 24% were unemployed. 56% of graduates were involved in full-time employment while the rest was involved in part-time employment. Of those part-time employees, only 22% received an income sufficient for their basic needs whereas the rest was suffering from financial difficulties. Among them, 64% were not satisfied with their income. The majority (64%) were suffering from stress resulting from their employment. According to the results, 64% of the test subjects were found to be satisfied with their employment. These results depended on their level of perception and understanding of the concept of happiness and mental satisfaction.

Keywords: Employment, Graduates, Mental satisfaction

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IPRC/24/222 Social Sciences and Humanities

Comparison of employment rates between male and female graduates from the arts stream of studies of the University of Kelaniya

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The COVID- 19 pandemic and the economic crisis negatively affected the Sri Lankan economy during the last few years. This has created so many problems in the daily life of Sri Lankan citizens. Unemployment is one of the major problems in Sri Lankan society. The unemployment rate in Sri Lanka was 5.4% in 2020. With the COVID- 19 pandemic and the economic crisis, some members of the working community lost their conventional jobs and became unemployed. There is has been a difference in unemployment rates between male and female graduates in Sri Lanka due to several possible cultural, political, and socio-economic reasons. Therefore, this study was conducted in July and August 2023 to analyze the current status of unemployment between male and female graduates of the arts stream of studies of the University of Kelaniya. A questionnaire was distributed randomly among those graduates of the University of Kelaniya. Responses from 50 individuals (25 males and 25 females) were collected and analyzed. The majority (84%) of the respondents were 25-30 years old. According to the results, all the male graduates were employed either in the government or private sector or survived on self-employment. Only 74% of females were employed. The majority (88%) of unmarried females were employed whereas only a half of the married females were employed. Even though 66% of male graduates were employed full-time, only a 54% of female graduates were employed full-time. While the majority (54%) of unmarried females were employed full-time, only 34% of married females were employed full-time. This showed a lower full-time employment among married female graduates when compared with unmarried female graduates.

Keywords: Employment rates, Female graduates, Male graduates.

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IPRC/24/223 Social Sciences and Humanities

An analysis of the financial difficulties and employment potential of the undergraduates in the Faculty of Humanities, University of Kelaniya

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With the COVID-19 pandemic and the economic crisis, the Sri Lankan society had to face a lot of problems. Not like the academic and non-academic staff members who were getting their entire salaries paid even during the crisis, the undergraduate community of the state universities of Sri Lanka had to face difficulties, and there were many reasons for those difficulties. The conventional mode of teaching and evaluation was replaced by online education. As a result, the undergraduates had to face difficulties such as the unavailability of devices like computers or smartphones for them and the high cost of internet services.. This study was conducted in July 2023 randomly collecting responses from 50 undergraduates of the Faculty of Humanities where the students are engaged in the arts stream of studies, for a questionnaire to study the financial difficulties experienced by them and the potential for employment among them. The majority (62%) of the respondents were females while the rest was males. The majority (60%) of the respondents received *Mahapola* scholarship and 30% received Bursary scholarship. As the income from those scholarships and the financial assistance given by their families were not sufficient for the studies, 44% of the respondents were engaged in some kind of employment during their tenure in the university. The majority (62%) of the employed respondents received an income of around 20,000-40,000 LKR per month as the salary. The majority (74%) of the respondents were experiencing stress due to financial difficulties. The majority (80%) of the male respondents were employed whereas only 38% of the female respondents were employed. Employment among male undergraduates was much higher than that of among females. Overall, more than one-third of the respondents (44%) were engaged in employment to overcome their financial difficulties.

Keywords: Employment, Financial difficulties, Undergraduates, University of Kelaniya.

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IPRC/24/224 Social Sciences and Humanities

Exploring information seeking behavior of students with the advancement of Information Technology: with special reference to the library of Institute of Bankers of Sri Lanka

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Information is something that should be obtained through studying, investigating and taking instructions and guidance. When information is sought, the methods used may vary from person to person. This study aimed to explore the changes of information seeking behavior of students with the advent of Information Technology. The qualitative research method was followed in this study. The sample population comprised the students who follow certificate courses, diplomas and postgraduate programs at the Institute of Bankers of Sri Lanka (IBSL). The purposive sampling method was employed in this study. 10% of students from the total student population at the IBSL were selected as the sample. A Google Form for a survey was shared via email. Observations and interviews held in the focus group were used as primary data. E-journal articles, books, e-research articles were used as secondary data. The survey method was employed as the research design of this study and data were analyzed using the computer software MS Excel. The results indicated that electronic resources were the most popular source of information. The research results revealed that the preference of using printed books has been declining with the advent of information technology. The most preferred methods of accessing information were found to be Google and othere-resources while a significant percentage of students preferred lecture notes. Concurrently the results showed that there was a growing trend to use artificial intelligence (AI) tools. The study revealed that the most popular AI tools among students were ChatGPT, Google Assistant, Gemini Chatbot and Perplexity AI in the reducing order. Furthermore, Students' reliance on AI tools was found to be influenced by several reasons. mainly the speed and efficiency, continuous availability and ease to access to diverse sources of information. Accordingly, it was recommended that the library at the IBSL should be modernized through the integration of e-resources and also by increasing the physical space to create an inviting environment for students to seek information.

Keywords: Artificial intelligence tools, Information seeking behavior, Information Technology

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IPRC/24/230 Social Sciences and Humanities

Assessing disaster preparedness in areas in Sri Lanka prone to natural disasters

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Sri Lanka is a nation frequently exposed to natural disasters such as floods, landslides, and occasional cyclones. This study explored the preparedness and awareness of natural disasters among people in areas prone to such disasters. Acknowledging the critical need for an effective disaster management, the research evaluated the success of existing disaster education and awareness programs while aiming at identifying gaps in knowledge and preparedness within these vulnerable communities. The study was driven by the questions of how well-prepared and aware the rural communities are in the face of natural disasters and what the critical factors influencing these levels of preparedness are. Employing a qualitative approach, the research integrated participatory observation, in-depth interviews, and case studies encompassing 50 households to gather insights, with a focus on two specific regions, namely 504 Kelanimulla area in the Kolonnawa Divisional Secretariat (DS) and 132A Malalpola area in the Kegalle Divisional Secretariat (KDS). Data analysis was carried out using a narrative style, grounded in ethnographic methods. The findings revealed that while there was a basic awareness of natural disasters, substantial deficiencies in preparedness existed, particularly in remote areas where access to crucial information and resources was severely limited. This underscored the urgent need for disaster preparedness programs that are not only targeted and contextually relevant but also culturally sensitive, integrating traditional local knowledge with modern disaster management practices. By doing so, the study contributed to a deeper understanding of disaster preparedness in developing countries and emphasized the essential role of community-based approaches in enhancing resilience and mitigating the impact of natural disasters on vulnerable populations.

Keywords: Disaster preparedness, Community resilience, Rural communities

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An evaluation of women's engagement in decision-making in a community welfare society in Sri Lanka

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Empowering women implies extending them the rightful authority or power to carry out tasks. Given the authority to do so, women could take part in planning and decision-making and contribute individually to development initiatives and activities. Evidence-based studies are needed to evaluate the impact of women's engagement on decision-making. The present study was an attempt to investigate the impact of women's engagement on decision-making in a community welfare society in *Grama Niladari* Division 103, Abagaswewa, in the Medirigiriya Divisional Secretariat in the Polonnaruwa Administrative District of Sri Lanka. The qualitative approach was used as the method of the research and the ethnographic method was used as the research design. The random sampling method was used for the study. The size of the sample was 100 women members of the welfare society. fFocus group discussions and participatory observations (overt approach) were used for data collection. The direct and indirect speech, narrative style, ethnographic account, and discourse analysis were used for the data analysis under the qualitative data analysis methods. 90% of female members found to be involved directly in governing their welfare events without the influence of any other party. Further, the study gathered information about the women's attitude towards the freedom they enjoyed in decision-making and having access to the leadership position. 91% of women's felt that they were having feedom in decision-making and had access to manage the events in their welfare society. The findings provided proof to conclude that women who engage in the welfare society had freedom and access to participate in decision-making at the grassroots level.

Keywords: Decision making, Empowerment, Welfare society, Women's engagement,

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IPRC/24/09 Social Sciences and Humanities

Music Iconography portrayed in South Asian Buddhist arts (based on Ajanta Buddhist caves)

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This study explores the iconographical evidence of music depicted in the Ajanta Buddhist caves and its significance in the history of Indian music. By applying descriptive and historical approaches to the iconographical evidence, the research focuses on the identification, analysis, and interpretation of the musical icons in Ajanta. The study addresses the following research question: What iconographical evidence of music is presented in the Ajanta caves, and how does it contribute to our understanding of India's musical history? The research examines the characteristics of the musical instruments in Ajanta, including their structure, playing techniques, and performance contexts, as well as comparisons with similar depictions at other locations. This study meticulously surveys literary sources and archaeological findings qualitatively. The musical instruments depicted in Ajanta can be categorized into four types: string instruments (*Tata*), such as Lutes or Veena; percussion instruments (*Avanaddha*), including Drums and Cymbals; solid instruments (*Ghana*), referring to solid or metallic instruments; and wind instruments (*Sushira*), such as Flutes and Conches. The study concludes that the Ajanta caves provide significant evidence of music during the relevant historical period, contributing to the historical evaluation of the musical instruments and offering insights into the Buddhist perspectives on music.

Keywords: Ajanta caves, Evidence of Music, History of Music, Iconography, Musical instruments

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IPRC/24/21 Social Sciences and Humanities

Implications of a Dogme lesson in the context of a Sri Lankan classroom in learning English as a second language

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The Dogme English Language Teaching (ELT) is a teaching approach with less material use. The undergraduates in the study context have an intimidating attitude towards the English language. Less research is available in Sri Lanka, evaluating the learner interest with a Dogme ELT lesson. The researcher conducted a quasi-experiment with 40 students as part of a mixed-method study, selected from a semi-government university in Sri Lanka. Both experimental and controlled groups had 20 students respectively. The researcher taught both groups for 4 days. The experimental group underwent language scaffolding with Dogme ELT with less material use. The controlled group learned the same topics, with heavy material use. The lessons scaffolded in the experimental group were:(1) Use of Prepositions, (2) American Vs British English, (3) Types of Nouns, and (4) Formality of vocabulary. After the intervention, the proficiency scores of both groups were analyzed with an independent T-test. The results were significant with a *p*-value of < .00001, claiming Dogme ELT could be effective in the Sri Lankan context. It could be stated that the students can maximize their learning potential with less material use. The researcher provided questionnaires to the students in the experimental group, enquiring their opinions towards this methodology. The findings through descriptive analysis and thematic coding of the data related to the student questionnaires revealed that the students should be free to suggest content in their syllabus, especially regarding the speaking skill. The teachers in the same department were given questionnaires to evaluate their opinions about this methodology. It was discovered that these lessons should be minimized in the classroom due to the unpredictability of emerging topics, which do not align with the objectives in the syllabus. However, in this study, a small sample was used, in an undergraduate context. It can be tested with school-level students for a longer period.

Keywords: Dogme ELT, English language teaching, Sri Lanka

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IPRC/24/35 Social Sciences and Humanities

Evaluating the impact of digital games on learning tenses: Learners' attitudes and pedagogical implications in ESL classrooms

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One of the most significant and debated issues in language education is the role of grammar instruction. The complexity of English grammar often demotivates the students from learning the language. Therefore, the educators should adopt innovative methods to teach grammar that also motivate and encourage the students. In Sri Lanka, there is a movement towards transforming the traditional paper-based education system and embracing innovative teaching strategies. Thus, the purpose of this study was to investigate the learners' attitudes regarding the impact of using digital games such as Kahoot, Quizizz and Duolingo in learning simple past, simple present and simple future tenses to intermediate ESL learners. A purposive sample of 50 grade nine ESL students of *Maliyadeva* Girls College, Kurunegala participated in the study and during the first week of intervention the tenses were taught using paper-based methods. Further, during the second week of the intervention the tenses were taught for the participants using the digital games based on tenses. A qualitative approach research design was used to answer the research question as the data were collected utilizing semi-structured interviews. Thematic analysis of semi-structured interviews revealed two main perspectives among the participants. Firstly, the learners overwhelmingly endorsed the use of digital games, citing increased motivation, creation of a learner-friendly environment, enhanced language practice, and improved interpersonal relations. The participants expressed enjoyment and found digital games effective in engaging with grammatical concepts in a meaningful and enjoyable manner. Secondly, despite these benefits, challenges such as distractions and perceived time consumption were noted, highlighting potential drawbacks. Overall, the findings underscore the positive impact of digital games on ESL learners' engagement and proficiency in tenses, suggesting their potential as a valuable pedagogical tool in language education.

Keywords: Digital games, Educational transformation, ESL learners, Grammar instruction, Pedagogical innovation

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IPRC/24/36 Social Sciences and Humanities

Female ideology through Post-Kandyan murals: Insights from the *Kathaluwa Purwaramya* perspective

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Mural paintings in Sri Lanka have long been a conduit for conveying religious, cultural, and ideological narratives. Particularly in Buddhist art, temple murals offer profound insights into the roles and the perceptions of women across various historical and cultural contexts. The *Kathaluwa Purwaramya* Temple murals, renowned for their artistic depiction of Buddhist themes, present a unique perspective on the female ideology during the Kandyan era. This study examines how the female ideology is portrayed in these murals, focusing on the perceptions of femininity, status, virtue, and societal roles. The artists at *Purwaramya* Temple utilized narratives and iconography to highlight virtues traditionally associated with women in the Sri Lankan society, such as compassion, nurturing, and moral integrity. The elaborate costumes depicted in the murals symbolize not only the esteemed status of female figures but also the societal ideals of social status during the colonial period. Intricate patterns, colors, and embellishments in the attire of female figures enhance their portrayal and reinforce their ideological significance within the Buddhist and cultural context. By analyzing the symbolic representations, compositional selections, and design elements, including costumes, this study revealed how female ideology is intricately woven into the religious and cultural fabric of the Kandyan period. These artistic expressions offer a broader understanding of how gender perspectives were visually articulated and preserved in the religious art during this era. This research employed a qualitative approach, utilizing both primary and secondary sources for data collection. Primary sources included examining temple murals and conducting interviews with art critics and historians. Secondary sources, such as books and articles on the subject, provided additional perspectives, enriching the study's findings.

Keywords: Costumes, Female ideology, Post-Kandyan tradition, Temple paintings

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IPRC/24/43 Social Sciences and Humanities

Family's influence on the integration of second-generation immigrants in *Le thé au harem d'Archi Ahmed* and *The Buddha of Suburbia*

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Postcolonial writing, centered on immigration led to the emergence of a subgenre known as "migrant literature," which focuses on the narratives of immigrant communities. These immigrants' and particularly their children's struggle to integrate into their host society is a recurrent theme in the novels of the writers like Mehdi Charef, Hanif Kureishi, etc, who are coming from migrant backgrounds. How families could influence and be involved in the integration process of the second-generation immigrants is selected as the primary objective of this research. The study focused on two migrant literature novels: the French novel, *Le thé au harem d'Archi Ahmed* (1983) by Mehdi Charef and the English novel, *The Buddha of Suburbia* (1990) by Hanif Kureishi. A comparative study was carried out to answer the question, "In the novels *Le thé au harem d'Archi Ahmed* and *The Buddha of Suburbia*, how does the family influence the integration of the second-generation immigrants?" Taking place in the 1970s in the suburbs of Paris and London, these stories revolve around the lives of two teenage boys, named Madjid and Karim, descendants from Pakistan and Algerian origins. The family situations of the two protagonists were carefully examined employing qualitative methodology and studying secondary sources. The findings of the research revealed that the integration of the two protagonists is affected by two main family-related aspects: parental roles and family culture. Due to the parents' various personality defects, their behaviors caused a significant mental disruption in their children's integration effort. Study on the family cultures indicated that these adolescents gradually assimilated into the European culture by disassociating from their parents' culture. In conclusion, the study demonstrates that the psychological stability required for a successful integration and the sense of belonging of the two adolescents are significantly affected by their families.

Keywords: Family, Immigration, Integration, Second generation

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IPRC/24/52 Social Sciences and Humanities

Navigating autonomy: The teacher's role in developing speaking skills amidst student-led AI learning

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In the era of AI-powered language models, speaking remains a skill that cannot be mastered easily. While some argue that these technologies may soon replace language teachers, their ability to effectively teach phonological features is a significant issue. This study aims to discover the teacher's role in fostering speaking skills in students amidst the self-directed learning that happens through an AI-integrated application, "SmallTalk2Me". The study collected data from 30 English language teachers in the Colombo district of Sri Lanka through structured interviews that addressed the productivity, and the impact of teacher-led speaking activities compared to student-led AI learning. The responses were based on an administered test conducted and evaluated by the participants to compare teacher-led and AI-integrated speaking activities and subsequently analyzed using thematic analysis. The study found that AI effectively supports speaking skills, whereas the teacher's guidance complements the learning process while evaluating and giving constructive feedback. Even though the teacher's feedback was rated higher in the results, AI was also considered helpful due to its accessibility and immediacy. Furthermore, the study revealed that teachers are predominantly responsible for most phonological aspects when teaching speaking, while only selected features were addressed by AI tools. The findings highlighted students' challenges when they learn to speak using AI-integrated tools while explaining how teachers could address those limitations and encourage students to practice more. The study recommends active teacher involvement to enhance speaking skills, focusing on phonological instruction and providing regular practice and constructive feedback with AI integration.

Keywords: AI learning tools, Feedback, Self-learning, Speaking skills, Teacher's role

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IPRC/24/62 Social Sciences and Humanities

Linguistics of representation of resistance: A critical discourse analysis of the academic literature on the *Aragalaya*

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This qualitative study examines the academic literature on the *Aragalaya*, a series of protest campaigns rallied against the government from March to August in 2022. This research aims to answer the questions as to how the *Aragalaya* is represented in academic literature and what linguistic strategies are used in such representations. The analysis is based on the research publications published between 2022 and 2024, discussing the thematic scope of resistance within the *Aragalaya* by Sri Lankan and foreign scholars. The study utilized critical discourse analysis (CDA) as a research approach based on Norman Fairclough's and Theo Van Leeuwen's theoretical perspectives on the representation of social actors in discourses. The representation of resistance was analyzed through ideational, interpersonal and textual functions of the language used in research publications on the *Aragalaya*. The findings of the study demonstrated that the resistance within the *Aragalaya* was predominantly represented positively by academics, endorsing the ideological standpoint of the protestors. Key linguistic strategies used in such positive representations included the signification of the *Aragalaya* through the use of positive terms such as 'non-violent', 'peaceful', 'democratic', 'inclusive', 'artistic resistance movement', legitimization of the protestors' roles and functions through transitivity processes, collectivization of the protestors and academics, functionalization of protestors as guardians of democracy and the use of modality to critique the government's role in exacerbating the economic and political crisis. The study argues that the *Aragalaya* could potentially be a critical reference point of linguistic anthropology, since the *Aragalaya* has reshaped the discourses on resistance in Sri Lanka facilitating researchers to analyze them from a critical/creative perspective.

Keywords: Academia, *Aragalaya*, Discourse, Representation, Resistance

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IPRC/24/98 Social Sciences and Humanities

Most prominently used variety of English in Sri Lankan YouTube channels: A study on vocabulary differences

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The rapid expansion of English in contemporary Sri Lanka has led to its widespread use across social media platforms, particularly on YouTube. This study investigates the varieties of English employed by Sri Lankan YouTube content, focusing on food and travel channels with regard to vocabulary. Drawing upon Kachru's Three Circles Model of World Englishes (1985), which conceptualizes the spread of English globally through inner, outer and expanding circle, this research examines the linguistic choices made by Sri Lankan content creators. The study analyzed a corpus of six Sri Lankan YouTube channels using AntConc 3.5.8, employing a mixed-methods approach combining quantitative analysis of linguistic features with qualitative assessment of contextual usage. The results revealed a significant distribution pattern: British English (BE) (71%), American English (AE) (29%), and Sri Lankan English (SLE) (15%). Key vocabulary variations were identified across different semantic fields, including footwear terminology (BE "trainers" vs. AE "sneakers"), food-related terms (AE "French fries" vs. BE "chips"), and clothing terminology (AE "underwear" vs. BE "underpants"). The predominance of BE reflected the strong colonial influence in SLE usage, while the presence of American variants indicated the growing global media influence. Notably, the 15% presence of SLE demonstrated the evolution of a distinct local variety, particularly evident in cultural descriptions and local terminology. Examples included unique food-related terms ("rice and curry", "short eats"), cooking terms ("tempering", "rice boiler"), and travel-related vocabulary ("three-wheeler", "up-country"). As Senaratne (2017) notes, social media language reflects the linguistic practices of the masses. The findings support Mendis and Rambukwella's (2020) observation that the Sri Lankans tend to use their own variety in speech, suggesting the standardization of Sri Lankan English as a distinct variety. This finding reflects Sri Lanka's position in Kachru's Outer Circle while demonstrating the dynamic interaction between the colonial legacy and the contemporary global influences in digital communication.

Keywords: Englishes, SLE, YouTube, Varieties, Vocabulary

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IPRC/24/104 Social Sciences and Humanities

The effect of using songs as lesson materials to develop speaking skills: An experimental study

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Music and speech share similar features that naturally exist in the human mind. Speech, appearing as a skill of speaking, leads to practice communicative competency. The General English syllabus introduced at the Advanced Level in Sri Lanka aimed to develop speaking proficiency with the textbook designed to develop communicative competency. However, studies indicate that oral proficiency among the Advanced Level students remains alarmingly low, especially in the Arts stream. Moreover, there is a gap in the focus on developing speaking skills among the Arts students, particularly in the use of songs as lesson materials. Furthermore, the effectiveness of this approach and the opinions of the Arts students have not been sufficiently explored. Based on this context, this study investigates the effect of using songs as lesson materials on the development of English language speaking skills and the students' opinions on the use of songs as lesson materials in speaking activities. Accordingly, 80 Advanced Level (Grade 12-Arts) students from a government school in a suburban area of Gampaha district were selected as the sample. The participants were divided into experimental and control groups. A pre-test was given to both groups, followed by a post-test after the treatment. Meanwhile, an opinion questionnaire containing a five-item Likert scale was distributed. The test results showed that there was a significant difference between the experimental and control groups' pre-test and post-test results. Additionally, the findings of the questionnaire revealed that a higher percentage of students preferred the use of songs as lesson materials for speaking activities. Therefore, it is recommended to include more song-related speaking activities in the syllabus to develop English language speaking skills and to use songs as lesson materials in delivering speaking lessons in English as a Second Language classrooms in Sri Lanka.

Keywords: Communicative competency, English as a second language classroom, Oral proficiency, Songs as lesson materials, Speaking skills

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IPRC/24/111 Social Sciences and Humanities

Impacts of mother tongue on English as a second language learning performance of primary grades students – A case study of Ampara district

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Mother tongue (L1) is acquired unconsciously from birth. English is widely used as a second language (L2). Using L1 in English as a Second Language (ESL) context is controversial due to its effect on the L2 performance. In Kalmunai Zone, the excessive L1 use at the primary level leads to poorer L2 performance. This study explored how L1 influences L2 performance in primary students in Kalmunai Zone, focusing on its impact on the four language skills. 318 students from grades 4 and 5 participated in the tests, and 24 students were interviewed. ESL teachers from six schools were given questionnaires. The study assessed L2 performance of all four language skills and examined the errors related to L1 influence. The interviews explored the impacts, and the teacher perceptions were gathered via the questionnaires. The study revealed the negative impacts of L1 in the areas of pronunciation, be verbs, sentence structure, prepositions, articles, tenses, capitalization, possessive apostrophe, consonant doubling, fricatives, short vowels and consonant clusters in each language learning skill with diverse ratio. The students substituted sounds from L1 and mispronounced complex spellings and tended to use L1 structure (SOV) in English (SVO). Therefore, this study indicated the negative impacts of L1 by highlighting the aforementioned conventions. These impacts stem from the overuse of L1 and the differences in linguistic structures between L1 and L2. Bilingual approach is recommended for the learners in Kalmunai zone, with a focus on comparative grammar instruction by addressing the key differences between L1 and L2 to reduce L1 interference in L2 performance.

Keywords: Impacts, Mother tongue (L1), Primary students, Performance, Second language learning (L2)

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IPRC/24/117 Social Sciences and Humanities

Revisiting Gottlieb's strategies to overcome non-equivalence above word-level in subtitling: A case of the movie *Sthūtiyi Nævata Enna*

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Non-equivalence articulates the difficulty of transferring the meaning between two languages. It is a pivotal issue in setting subtitles for translations. Mona Baker (1992) defines non-equivalence above word level as the problems arising at units, larger than individual words such as problems associated with the translation of idioms and collocations. The main objective of the present study is to identify and analyze the use of Gottlieb's (1992) strategies employed to overcome non-equivalence above word level in the official English subtitling of the Sinhala movie *Sthūtiyi Nævata Enna* (2010). Forty-six (46) extracts of non-equivalence at word level with their English subtitles which were categorized as per Gottlieb's strategies of addition, deletion, paraphrase, transfer, dislocation, imitation, transcription, condensation, decimation and resignation were analyzed using a descriptive and qualitative approach. The frequency of the use of each strategy was observed. Out of the ten strategies, addition, imitation and transcription have not been utilized by the subtitler to overcome non-equivalence above word level. Out of 46 extracts, paraphrase has been used 13 times and 12 extracts have been subtitled using dislocation. The strategies of transfer, condensation, decimation, deletion and resignation were used in 03, 05, 03, 03 and 02 instances respectively. Further, the researcher found three new strategies which were termed as linguistic neutralization, cultural neutralization and cultural equivalence which were used in 02, 01 and 02 instances respectively. In conclusion, the findings suggested that rather than creating the exact replication rendered in the Sinhala language, the subtitler of the selected movie preferred the adaptive strategies to sound it natural to the target audience. However, future researchers are encouraged to observe the non-equivalence in subtitling, using more movies as references to generalize the applicability of the findings.

Keywords: Non-equivalence above word level, Strategies, Subtitling

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IPRC/24/120 Social Sciences and Humanities

Task-based assessment and its impact on oral presentations of undergraduates: Insights from students' narratives

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Innovative teaching methods stimulate learners' interest in learning and assessments. In this context, task-based assessment can be utilized to benefit the learners, offering them opportunities to upgrade their oral language proficiency. As the existing literature indicates a gap in task-based assessments' effect on the oral presentation of the undergraduates, research examining the interplay between the task-based assessment and the oral presentation skills could potentially benefit both the teachers and the learners. This study presents the findings of an investigation into how task-based assessment affects the oral presentations of the undergraduates. Six third-year sports science undergraduates purposively sampled, based on their personal branding video marks constitute the sample population of this study. Six semi-structured interviews were conducted to collect data. The interviews were transcribed intelligent verbatim and analyzed using thematic narrative analysis. The participants cited previous speaking assessments as non-engaging, ineffective, and product-focused, while they perceived their experience with task-based assessment as an important change that prompted them to rethink their language learning approach and readjust their learning strategies through the exercise of autonomous learning. It has eventually resulted in individual repositioning, as the participants were often critical of the pedagogical boundaries that had limited their exposure to the contextualized use of the language. Moreover, the participants seek membership in imagined English-speaking communities of their discipline, as their need for presentation skills is predominantly driven by the desire to secure a future career. The study concludes that allowing the free exercise of autonomy within a structured task-based assessment framework assigns learners an investigative role and agency that begins with self-realization and ends in repositioning. It suggests aligning course content with the learner needs and including more explorative spoken-related tasks such as research-based group discussions, personal branding videos, and press conferences that assess their oral presentation skills in a contextually meaningful language learning setting.

Keywords: Innovative teaching, Language learning, Learner autonomy, Oral proficiency, Task-based assessment

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IPRC/24/135 Social Sciences and Humanities

An analysis of economic and cultural synergies in ancient Greek-Egyptian maritime trade

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Diplomatic relations between Greece and Egypt can be dated back to the bronze age of Greece (c. 3000 BCE). Ample literary and archaeological resources attest to the mutual relationship developed and maintained between these two nations that flourished in Europe and Africa. Their bilateral interactions were extended through mercenary support, Greek settlements in Egypt, maritime trade facilitated by Greek ports in Egypt, Athenian maritime-based economy, and close relations of Ionian islands with Egypt. Accordingly, this research investigates the intricate maritime trade networks between Greece and Egypt, focusing on the cultural and the economic exchanges that facilitated mutual growth and development specifically from the 8th to the 4th centuries BCE of Greece before the conquests of Alexander the Great. A historic method and an eclectic method under qualitative research methodology were adopted to identify the key historical recordings of Greek-Egyptian maritime activities for the analysis. The long-term economic synergies resulting from Greek-Egyptian maritime trade through the ancient port cities of Naukratis, Heracleion, and Canopus, resulted in the permanent Greek presence in Egypt. These port cities served as fundamental hubs for commerce and cultural exchange, facilitating the flow of goods, intellect, and the cultural impact between Greece and Egypt. The influx of Greek goods, such as olive oil, wine, and pottery, met with Egyptian exports like grain, papyrus, and textiles. The economic benefits of this trade were profound. The study emphasizes the importance of these ancient interactions in fostering economic development and cultural integration, laying the groundwork for future scholarly exploration of ancient maritime trade networks. In conclusion, the maritime trade between Greece and Egypt significantly contributed to the long-term economic and cultural synergies that shaped both the civilizations, exemplified by several economic and maritime agreements signed between Greece and Egypt in the 21st century CE.

Keywords: Cultural exchange, Diplomacy, Egypt, Greece, Maritime commerce.

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IPRC/24/145 Social Sciences and Humanities

Challenges faced by undergraduates in oral presentations as a formal formative assessment in the ESL classroom

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Oral presentation is a commonly used formative assessment method in the ESL classroom at the undergraduate level. However, the challenges that the Sri Lankan undergraduates face in oral presentation assessments have not been adequately explored. This research gap limits our understanding of identifying the challenges that the undergraduates face in the oral presentation assessment process in the ESL classroom and prevents us from identifying possible solutions to overcome them. Hence, the purpose of this study is to investigate the challenges faced by the undergraduates during oral presentations as a formal formative assessment in the ESL classroom. A convenience sampling method was used to select fifteen undergraduate students studying Science, Technology, Engineering, and Mathematics (STEM) subjects from both state and non-state universities located in the Colombo district, Sri Lanka for the interviews. This sampling approach allowed for the inclusion of students who were readily accessible and willing to participate, providing insight into their experiences with ESL presentations. The results of the study revealed seven main challenges in two main categories. The first category which contained the challenges related to the assessment process reported four main challenges as not having transparency in the marking process, lack of fairness in marking, lack of receiving constructive feedback and lack of having a strict structure in the assessment process. The second category which included the challenges related to students' characteristics, reported another three challenges as overcoming fear and anxiety, poor language skills and lack of collaboration in group oral presentations. One reason why the undergraduates face such challenges may be because the lecturers as assessors, conduct oral presentations solely to fulfil the assessment, rather than to emphasize the learning process which is integral to the formative assessments. In conclusion, both the undergraduates and the lecturers should prioritize the learning process of formative oral presentation assessments to enhance positive outcomes by minimizing the challenges that the undergraduates face in such assessments.

Keywords: Challenges, ESL classroom, Formative assessment, Oral presentations, Undergraduates

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IPRC/24/149 Social Sciences and Humanities

Exploring linguistic and cultural integration: A study based on the sociolinguistic experiences of Tamil-speaking undergraduates in a Sinhala-dominant university setting

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Language significantly shapes social identities and experiences, particularly in multilingual societies where dominant and minority languages coexist. In such societies, the dynamics between the dominant and the minority languages can substantially impact the students' educational and social experiences. This study addresses the critical challenge of linguistic and cultural integration faced by Tamil-speaking undergraduates at the University of Ruhuna, a Sinhala-dominant institution. The study focuses on how these students adapt to a new linguistic environment without prior knowledge of Sinhala, and how this adaptation impacts their linguistic identity, cultural integration, and academic performance. The primary aim of the study is to explore the sociolinguistic dynamics experienced by these students, particularly focusing on how their transition into a Sinhala-majority educational setting influences their language use, identity negotiation, and multilingualism. Through the use of qualitative methods with in-depth interviews and questionnaire surveys with first-language Tamil-speaking students, the study investigates the language background, the usage and the challenges faced by the students when acquiring a completely new language in their tertiary level of education. Key findings highlighted the complexities of identity negotiation, where students feel pressurized to adopt Sinhala for academic success while maintaining their Tamil heritage. Their pursuit of trilingualism (Tamil, Sinhala, and English) reflects adaptability but also illustrates the tension between language maintenance and the need for assimilation. Additionally, language anxiety, particularly regarding Sinhala proficiency, emerges as a significant challenge. The study emphasizes the importance of inclusive language policies that promote multilingualism, providing crucial support for minority language speakers. Such policies can help enhance students' academic performance and ease their cultural integration. This study is particularly relevant as it sheds light on the lived experiences of minority language speakers in higher education, contributing valuable insights for policymakers, educators, and researchers aiming to foster a more inclusive and supportive academic environment.

Keywords: Sociolinguistics, Multilingualism, Language Identity, Language shift, University of Ruhuna

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An investigation of the effectiveness of language policy and planning in licensed state banks, commercial banks and regional banks in the Gampaha district

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Language policies in banks play a crucial role in influencing both the customer service and the internal communication, particularly in multilingual contexts. These policies govern the languages employed during client interactions, in written documents, and throughout organizational communications. Thus, this study investigates the effectiveness of language management policies in financial institutions within the multilingual context of Gampaha district, Sri Lanka while addressing a gap in existing research that predominantly focuses on policy creation and implementation. By examining how language policies are translated into practice, this paper aims to assess how well these policies manage customer interactions and identify issues faced by both the employees and the customers. Cooper's (1989) framework is used to explore language policies, practices, and beliefs within banks, while Shohamy's (1996) theoretical framework is applied and extended to analyze the explicit and the implicit dimensions of the language policy and their impact on the practices and the beliefs. The study utilized a mixed-method approach, comprising semi-structured interviews with eight bank managers from two state banks, four commercial banks, and two regional banks and they were selected through purposive sampling method to ensure relevant expertise. Consequently, questionnaires were distributed to 40 randomly selected customers per bank and focus group discussions were conducted with three front-desk employees from each bank, who were also chosen via purposive sampling method. Questionnaire data was analyzed using Microsoft Excel for frequency distributions and percentages, while content analysis was conducted on interviews and focus group discussions to identify recurring themes and insights of the participants. The findings of the study indicate that most customers prefer using their first language for banking purposes, regardless of the bank. However, Tamil-speaking customers expressed dissatisfaction with the lack of Tamil-speaking employees, leading to significant comprehension difficulties. Henceforth, these findings provide insights into the strengths and the challenges of the language management within the banking sector.

Keywords: Financial institutions, Language policy, Language practices, Multi-lingual context

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Application of General Theory of Verbal Humor in subtitling Humor: A study based on fansubbing of the comedy movie *Airplane*

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Subtitling humor has become a major challenge in the field of Audio-Visual Translation as humor is deeply rooted in the culture where it is produced. Further, linguistic factors should also be considered, particularly when dealing with languages that are different in many ways as English and Sinhala. Although fansubbing has been added to the field of Translation Studies recently, it has become popular around the world despite all the challenges as there is a huge demand for fansubbed movies or TV series. However, attention must be drawn to the quality of these fansubs as a significant number of viewers are consuming them. The General Theory of Verbal Humor (GTVH) presented by Attardo and Raskin has been used as a linguistic theoretical framework to analyze humor and to evaluate the effectiveness of the strategies used by the subtitler to translate humorous texts in the comedy movie *Airplane*. The content analysis method was used to analyze data using GTVH as a metric. Subtitling strategies presented by Henrik Gottlieb have been used to explore the strategies utilized by the subtitler. English subtitles that carry the humor of the original movie and parallel Sinhalese subtitles were used as primary data. Library sources and online sources were utilized as secondary data. The findings revealed that the strategy of transfer has been often used resulting in successful transfers in humor into the Target Language as the content of the Source Texts remains unchanged in the usage of that strategy. Also, it was identified that due to the lack of awareness of using the deletion strategy, the subtitler has deliberately deleted some key elements in rendering the humor effect resulting in unsuccessful transfers. This research contributes to the field of Translation Studies by providing insights into fansubbing and practical recommendations for subtitling humor in audiovisual media.

Keywords: Audio-visual translation, Fansubbing, General theory of verbal humor, Gottlieb, Subtitling

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A study investigating speaking anxiety among sports science undergraduates of the University of Kelaniya

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The relationship between speaking anxiety and speaking performance is complex and multifaceted. The ability to communicate fluently in English is crucial for many English as a Second Language (ESL) learners because of anxiety. This study explores the relationship between speaking anxiety and performance among the first-year Sport Science ESL undergraduates at the University of Kelaniya, Sri Lanka. The primary objective of this research is to investigate the reasons for speaking anxiety and its effect on speaking performance of the first-year Sport Science ESL undergraduates at the University of Kelaniya. This study included 50 first-year undergraduates from the Sports Science Department of the Faculty of Science and the English Language Teaching Lecturer of the course English for Sciences, using purposive sampling. The data collection was performed by incorporating questionnaires, semi-structured interviews, and observations. The study was conducted using a mixed-method research approach, where the collected qualitative data using semi-structured interviews and observations were analyzed using thematic analysis, while SPSS 23.0 was used for analyzing descriptive statistics gathered from questionnaires, including frequency, means and standard deviations. Further, paired sample T-tests were used to analyze the quantitative data collected through the results of the speaking tests. As a result of the findings, it was determined that there was a lack of speaking performance due to anxiety, and the undergraduates faced challenges in developing their speaking skills, such as a lack of self-confidence, fear of making mistakes, feeling nervous, panicking, and difficulties in applying grammar and vocabulary knowledge in spontaneous speech. Thus, the research findings can be used to identify the reasons for speaking anxiety and this can be used as a guideline to reduce speaking anxiety of the Sport Science undergraduates by upgrading the English language syllabus of the Sports Science Department with more speaking activities.

Keywords: English as a second language, First year Sports Science undergraduates, Reasons for speaking anxiety, Speaking anxiety, Speaking performance

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Factors associated with medication adherence among patients receiving regular treatment for type II diabetes at Godakawela Divisional Hospital, Sri Lanka

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Type 2 diabetes mellitus (T2DM) is a non-communicable disease. Achieving good glycaemic control and preventing early complications are key goals in diabetes management, and it is heavily dependent on patient adherence to prescribed regimens. This study aimed to identify the factors associated with medication adherence among patients with T2DM. A descriptive, cross-sectional study was conducted among 175 patients with T2DM attending the medical clinic at Godakawela Divisional Hospital, Sri Lanka. A self-administered questionnaire with patient related factors and the 8-item Morisky Medication Adherence Scale (MMAS8) to assess adherence to diabetic medications was used to collect data. Data were analysed using frequencies, percentages chi square and Pearson corelation in SPSS V25.0. Most of the participants were female (77.7%, n=136), married (98.3%, n=172), educated to O/Ls (44%, n=77) and unemployed (43.4%, n=76). The mean age was 62±8.38 years. The mean duration of T2DM was 7.9±5.7 years. Only 27.4%(n=48) had a family history of diabetes. High medication adherence was reported by 7.4%(n=13) of patients, majority had medium (65.7%, n=115) and 26.9%(n=47) had low medication adherence (MMAS8 scores equalling 8, 6 to <8, or <6, were categorized as having high, medium or low adherence to therapy, respectively). Medication adherence was significantly associated with gender (P =0.009), marital status (P=0.009), regularly testing Blood Glucose levels (P =0.019), keeping blood test records(P=0.027) and having side effects to medication use (P =0.043). Further medication adherence was positively correlated with duration of living with diabetes (P =0.027). In conclusion, to improve adherence, targeted interventions should focus on educational programs focusing on the importance of regular blood glucose monitoring and record-keeping, as well as strategies to manage medication side effects. Furthermore, personalized care plans that consider the patient's duration of diabetes and age of onset can enhance adherence rates and ultimately improve the health outcomes among this population.

Keywords: Diabetes Mellitus, Factors, Medication Adherence

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IPRC/24/225 Social Sciences and Humanities

Understanding academic literacy in English Medium Instruction Degree Programs in Sri Lanka

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Sri Lanka has seen a considerable increase in the English Medium Instruction (EMI) degree programs across various subjects. This move from the traditional languages to English as the medium of instruction aims to enhance global competitiveness and ensure graduates have the skills needed to flourish in an increasingly linked world. However, despite this transformation, academic literacy in the EMI programs remains unexplored. In today's world, academic literacy, which is the enhanced skills of the students' reading and writing caliber in academic subjects, is more important, especially in the EMI degree programs. This study seeks to explore and comprehend the complexities of academic literacy in Sri Lanka's EMI degree programs. In addition, Mahawattha and Rassool, (2021) "A few academics explained that the existing 'sub-cultural', political and social situation does not allow undergraduates to progress in English". In addition, this could be a significant challenge for the future EMI degrees and their impact on the undergraduates. Further, the Sri Lankan secondary education has a huge impact on the EMI degree programs due to the significance of L1. 'Most students enter university after completing their studies in one of the vernaculars – Sinhala (78.4%) or Tamil (19.4%) (Annual School Census of Sri Lanka, 2020, p. 11as cited in Mahawattha & Rassool, 2023). Both the learners and the educators were interviewed in a semi-structured manner to learn more about their academic literacy experiences, perspectives, and obstacles in the EMI programs. Thematic analysis has been used to find common themes and patterns in the interview data. 102 medical students participated in the initial data collection and then it filtered to six at the final stage of the data collection. This research presented the results that the students who are in the EMI degree programs faced issues in the initial stages of learning but Academic writing or EMI programs helped them to be confident in their subject. This study intended to add to the current body of information about academic literacy in the EMI programs by presenting insights particular to the Sri Lankan setting. The study's findings can help guide curriculum creation, pedagogical practices, and legislative decisions intended to improve academic literacy education in the EMI degree programs.

Keywords: EMI, Pedagogy, Sri Lanka

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IPRC/24/236 Social Sciences and Humanities

Music and politics in Sri Lanka in the period of 2005-2015 (through a selection of songs)

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Sri Lanka was affected by a civil war for about thirty years from 1983 to 2009. It was among the majority Sinhalese and the largest minority Tamils. The LTTE (The Liberation Tigers of Tamil Eelam) led the fight to claim an independent state for Tamils who lived in the north and northeast of Sri Lanka. It caused many casualties and open-ended questions among civilians and in the civil society. After so many uprisings, the government was able to defeat the LTTE in 2009. The behavior of the political power, the media, and the arts was significant during the war and it can be traced with in-depth analysis of films, television, newspapers, music, and other arts. This work aims to investigate the role of music in creating a mentality among the civilians to trust one leader during 2005-2015 and further discusses how songs supported this agenda through a selection of songs published in this period. Qualitative research methods and music semiotics were used as the methodology of this research and data was collected through primary and secondary sources. Literature surveys, internet sources, music analysis, interviews, and critical observations were used for further investigations. According to the results obtained through the data analysis, it can be concluded that music played a major role in creating a political ideology in the Sri Lankan society.

Keywords: Civil war, Music industry, Political ideology, Songs

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Strategic policy framework for balancing economic development and cultural identity in Sri Lankan heritage tourism

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Balancing **economic development with cultural preservation in heritage tourism** means finding a way to grow the economy by bringing in tourists, but also keeping the special traditions and the history of a place safe. When a place wants to use its history and culture to make more money, it's important to make sure that the way they promote tourism doesn't harm their unique culture and heritage. This research explores the ways in which Sri Lanka can maintain a balance, between boosting growth and safeguarding its roots through heritage tourism. By employing a mix of research methods, including in depth case studies and statistical analysis, the study draws insights from interviews with stakeholders, literature reviews and comparisons with examples. Quantitative data analysis focused on metrics such as annual visitor statistics, the economic impact of heritage tourism on local communities, and demographic trends of tourists. For instance, the study analyzed data indicating that **approximately 60%** of tourists visit heritage sites, with these sites contributing **around 30%** to local economies. Additionally, demographic surveys revealed that **over 50%** of visitors prioritize cultural experiences in their travel decisions. Findings highlighted the role of community participation in aligning tourism initiatives with local needs promoting authenticity and nurturing a sense of ownership. Embracing tourism approaches like eco tours not only supports sustainability but also reduces environmental impact in line with global sustainable tourism trends. Lessons from Japan and Italy further endorse the effectiveness of these strategies for Sri Lanka's heritage tourism sector. The adaptive reuse of sites such as the transformation of colonial era structures in Galle Fort showcases how blending functionality with historic preservation can bring economic gains while preserving cultural heritage. Through planning, exemplified by initiatives like the Kandy City Heritage Plan, urban development projects are designed to consider implications comprehensively. Encouraging enterprises through tourism initiatives, like backing markets and family run eateries, ensures that economic advantages benefit communities while upholding traditional practices. In conclusion, the research suggests that by integrating community involvement, sustainable tourism practices, adaptive reuse of heritage sites, and strategic planning, Sri Lanka can successfully create a tourism environment that not only protects its cultural heritage but also fosters long-term economic growth. The proposed policy framework and strategies emphasize the importance of supporting local businesses and ensuring that the cultural identity of Sri Lanka remains central to its heritage tourism sector, bridging the gap between economic development and cultural preservation.

Keywords: Adaptive reuse, Community engagement, Cultural preservation, Heritage tourism, Sustainable development

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Contemporary interpretations and traditional understanding of Nirvana

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The ultimate goal of Buddhism is the attainment of Nirvana in the present life, a state often described as the cessation of rebirth. However, many followers and scholars argue that achieving Nirvana in this lifetime is something unattainable. Keown has argued that Nirvana should not be understood as a form of absolute annihilation or the complete dissolution of the self. This research comprehensively examined the concept of Nirvana in Theravada Buddhism and aimed to validate its significance empirically. Utilizing both qualitative and quantitative methods, a content analysis of *Pāli* Canon sutras was conducted. Interviews and questionnaire surveys were conducted among Buddhist communities to gather data on contemporary ideas of Nirvana. The survival of Buddhism is believed to hinge on the attainment of Nirvana; yet achieving it remains a distant prospect in modern times. Tilakaratne (1993) suggested that Nirvana can be attained in the present lifetime. According to *Sutra Pitaka* studies, Nirvana is the eradication of all unwholesome traits—greed, hatred, and delusion- and it is the end of the cycle of birth and rebirth. The Four Focuses of Mindfulness and the Eightfold Noble Path are regarded as direct routes to Nirvana. However, empirical data revealed that, while followers believe Nirvana is achievable, they lack practical knowledge on how to attain it. In conclusion, Buddha's Nirvana can be attained within the present life, yet contemporary Buddhists often lack a comprehensive understanding on how to attain it. It is recommends that Buddhists should strive to at least become a stream-enterer (Sovān), which is the initial step towards Nirvana.

Keywords: Four focuses of mindfulness, Noble eight-fold path, *Nirvana*, *Sutra pitaka*

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ඩබ්ලිව්.එල්. සුජානි සෙව්වන්දි විජේසුන්දර[1*]

[1]රජයේ චිත්‍රපට අංශය, රජයේ ප්‍රවෘත්ති දෙපාර්තමේන්තුව, නාරාහේනපිට, ශ්‍රී ලංකාව

සෝමවීර සේනානායක විසින් 1980 දශකයේ මැද (1985- 1995) කාලයේ රචිත රූපවාහිනී ටෙලි නාට්‍ය පිටපත්වල, සමකාලීන සමාජයේ පැවති නාගරික මධ්‍යම පාන්තික ගැටුම එම පිටපත භාවිතයෙන් නිර්මාණය කළ ටෙලිනාට්‍ය තුළ දී නිරූපණය වී ඇති ආකාරය මෙම අධ්‍යයනයෙන් විමසා බලයි. *යශෝරාවය, අසල්වැසියෝ* සහ *අපේ ඇත්තෝ* යන ටෙලි නාට්‍ය මේ අධ්‍යයනය සඳහා තෝරාගෙන විශ්ලේෂණය කරන ලදි. ඒ අනුව එම ටෙලි නාට්‍යවල දී නාගරික මධ්‍යම පාන්තික ගැටුම නිරූපණය කරන්නේ කෙසේද යන්න සහ එම නිරූපණයන් මෙම කාල සීමාව තුළ ශ්‍රී ලංකාවේ සමාජ-ආර්ථික අභියෝග පිළිබිඹු කරන්නේ කුමන ආකාරයෙන්ද? යන්න පර්යේෂණයේ ගැටලුවයි. අධ්‍යයනයේ අරමුණු නම් සෝමවීර සේනානායකගේ ටෙලි නාට්‍යවල මධ්‍යම පාන්තික ගැටුම් නිරූපණය කර තිබූ ආකාරය විශ්ලේෂණය කිරීම, මෙම මධ්‍යම පාන්තික අරගලය ටෙලිනාට්‍යයේ ප්‍රතිනිර්මාණය කිරීමට භාවිත කරන ආඛ්‍යාන ශිල්පීය ක්‍රම සහ තේමාත්මක අංග හඳුනා ගැනීම, 1980 ගණන්වල මැද භාගයේ ශ්‍රී ලංකාවේ සමාජ-ආර්ථික හා සංස්කෘතික රාමුවට සමගාමීව මෙම නිරූපණයන් විශ්ලේෂණය, මධ්‍යම පාන්තික ගැටලු පිළිබඳ සමකාලීන ප්‍රේක්ෂකයන්ගේ සංජානනය කෙරෙහි මෙම නිරූපණයන්ගේ බලපෑම තක්සේරු කිරීම යන කරුණුයි. අධ්‍යයනයේ දී පර්යේෂණ ක්‍රමවේදයන් කිහිපයක් භාවිත විය. යශෝරාවය, අසල්වැසියෝ අපේ ඇත්තෝ යන තෝරාගත් ටෙලිනාට්‍ය නරඹමින් එහි අන්තර්ගත විශ්ලේෂණය සිදුකරන ලදි. 1980 අග භාගයේ සමාජ-ආර්ථික තත්ත්වයන් පිළිබඳ ඓතිහාසික කරුණු ගවේෂණයක් සිදුකිරීම ද, පිටපත් රචකයා වන සෝමවීර සේනානායක සමඟ සම්මුඛ සාකච්ඡා කරමින් දත්ත එක්රැස් කිරීම ද සිදුවිය. ටෙලි නාට්‍ය අධ්‍යක්ෂවරුන් දක්වන ලද අදහස් හා ප්‍රේක්ෂක සංජානනය මැනීමට ප්‍රශ්නාවලි ක්‍රමවේදය ද යොදාගන්නා ලදි. මේ සොයාගැනීම්වලින් අවසන් නිගමනය වූ කාරණය නම් සෝමවීර සේනානායකගේ පිටපත් මගින් නිෂ්පාදිත ටෙලිනාට්‍ය නාගරික මධ්‍යම පාන්තික අත්දැකීම් ඵලදායි ලෙස නිරූපණය කරන බවයි. ඉහළ අපේක්ෂාවන්, තරුණ අසහනය, විරැකියාව සහ ඉටු නොවූ බලාපොරොත්තු යන තේමාවන් මෙම ටෙලිනාට්‍ය පිටපත් තුළ බහුල වශයෙන් සාකච්ඡා වන අතර එය එකල පැවති සමාජ-ආර්ථික අභියෝග සහ මානසික පීඩනය පිළිබිඹු කරයි. ශ්‍රී ලාංකේය ටෙලි නාට්‍ය සමකාලීන සමාජ-ආර්ථික ගැටලු නිරාවරණය වෙනුවෙන් ආඛ්‍යාන ශිල්පීය ක්‍රම භාවිත කර ඇති ආකාරයත්, රූපවාහිනිය වැනි ජනමාධ්‍යයක් තුළ සමාජ පන්ති අරගලය සියුම්ව නිරූපණය කිරීම සඳහා ටෙලිනාට්‍ය කලාව භාවිත කිරීම පිළිබඳවත් මෙහි දී සාකච්ඡා කෙරෙයි.

මුඛ්‍ය පද: රූපවාහිනිය, ලාංකේය ටෙලිනාට්‍ය, තිරපිටපත් රචනය, සමාජ ගැටලු නිරූපණය, ටෙලිනාට්‍ය අධ්‍යක්ෂණය

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සිංහල නවකතාවෙහි විද්‍යමාන පර්යේෂණාත්මක ශිල්පීය විධි (2020-2023 කාල පරාසයෙහි රචිත තෝරාගත් ස්ත්‍රී කර්තෘක නවකතා ආශ්‍රයෙන්)

එස්.බී. අනුරුද්ධිකා කුමාරි කුලරත්න[1*]

[1]සිංහල අධ්‍යයනාංශය, මානව ශාස්ත්‍ර පීඨය, කැලණිය විශ්ව විද්‍යාලය, කැලණිය

විසිඑක්වන ශතවර්ෂයෙහි ප්‍රථම හා ද්විතීය දශක ද්වයෙහි ප්‍රකාශිත සිංහල නවකතාවලින් සූචනය කෙරෙන අවධානයට නිසි ලක්ෂණයක් වන්නේ ලාංකේය ඓතිහාසික විකාශනය හා තදනුබද්ධ තේමා ඒ ඒ නවකතාරචකයන්ට අනන්‍ය ස්වායත්ත ආඛ්‍යාන රීතීන් පරිභාවිතයෙන් ප්‍රතිරූපණයෙහිලා ප්‍රදර්ශිත නිර්මාණාත්මක පරිශ්‍රමයයි. මේ පර්යේෂණයෙහි දී අපගේ අරමුණ වූයේ තෝරා ගත් ප්‍රධාන ධාරාවේ කාන්තා කර්තෘක නවකතාශ්‍රයෙන් නිරාවරණය කෙරෙන යථෝක්ත ශිල්පීය විධි තුලනාත්මක ප්‍රවේශයකින් විභාග කිරීමයි. තත් අරමුණට අනුකූල ව සිදු කෙරුණු පර්යේෂණ කටයුතුවල දී ප්‍රාථමික මූලාශ්‍රය වශයෙන් ගැණෙන මනෝහාරි ජයලත් විසින් රචිත ගිරිජා නවකතාව ද විරාජිනී තෙන්නකෝන් විසින් රචිත කැමෙලියා නවකතාව ද ගුණාත්මක පර්යේෂණ ක්‍රමවේදය යටතේ විග්‍රහයට භාජන කෙරිණි. ප්‍රාථමික මූලාශ්‍රය විශ්ලේෂණයේ දී කාන්තාවාදී සාහිත්‍ය විචාරයෙහි මූඛ්‍ය න්‍යායික ප්‍රවේශය ද, අනුපූර්ව න්‍යායික පර්යාවලෝචන ලෙස පශ්චාත් යටත් විජිතවාදී සාහිත්‍ය විචාරය සහ සමාජීය සාහිත්‍ය විචාර න්‍යාය ද යෝග්‍යාකාරයෙන් උපයුක්ත කර ගන්නා ලදී. ඉතිහාස විෂයයක නවකතා රචනය සම්බන්ධයෙන් විසි එක්වන සියවස උදාවෙහි පටන් ජනිත ව ඇති ප්‍රබෝධයට හා තත් ප්‍රස්තුතයෙහි උද්දීප්තියට ගතිශීලිත්වය සැපයූවා වූ තත්කාලීන දේශපාලන පරිස්ථිතිය පිළිබඳ ව කළ විමර්ශනයේහි දී මෙබඳු ම ප්‍රස්තුතීමය සාමාන්‍යයක් දක්වන නවකතාධාරාවක් සමකාලීන ව භාරතීය නව ප්‍රබන්ධ සාහිත්‍යහෙි ද ස්ථාපිත ව ඇති බව අනාවරණය විය. එක්බඳු නිර්මාණාත්මක ප්‍රවණතා ද්වයක නිර්ගමනයට තුඩු දුන් දක්ෂිණ ආසියාතික කලාපීය සාම්‍යය ද තුලනාත්මක ව සාකච්ඡාවට ලක් කරනු ලැබීය. කාන්තා කර්තෘක ඉතිහාස විෂයයක නවකතාවන්හි පවත්නා සමාන්තරතා හා විසදෘශ්‍යතා කවරේදැයි විද්‍යාමන වූ අතර සාපේක්ෂ ව නවකතා රචිකාවන් විසින් අනුදත් ජීවන දර්ශනාත්මක මානයෙහි මෙන් ම ඔවුන් විසින් උපයුක්ත පර්යේෂණාත්මක ශිල්පීය විධි පරිහරණයෙහි ලා දෘශ්‍යමාන නව්‍ය වූත් විචිත්‍ර වූත් ලක්ෂණ අනාවරණය කර ගැනිණි. බිල්ඩන්ග්ස් රොමෝන් නවකතා ආකෘතිය පරිභාවිතයට ගැනීමේ දී රචිකාවන් විසින් නිශ්චිතව ප්‍රදර්ශිත ප්‍රතිභා පූර්ණ කෞශල්‍යයය ද ආශ්චර්යවත් යථාර්ථවාදී රීතියට අනුගත ව ආඛ්‍යානවේදය සකසා ගැනීමේදී දේශජ හා විදේශීය කතාකලාවෙන් ලද සුපෝෂණය මත පිහිටා තත් රීතිය ස්වීකරණයෙහි ලා දැක් වූ සාමර්ථ්‍යය ද අවධානයට නිසි බව අප විසින් නිර්දේශ කරන ලදී. සිංහල නවකතා රචිකාවන් විසින් ඉතිහාස විෂයයක නවකතාකරණයට පූර්ව ව අදාළ ඓතිහාසික සන්දර්භය අළලා රචිත ද්විතීය මූලාශ්‍රය ප්‍රාමාණිකව පරිහරණය කරන ලද බව ද, විශේෂයෙන් ම යුගානුරූපී භාෂාව්‍යවහාරය කෙරෙහි සාවධාන ව ප්‍රබන්ධකරණයට ප්‍රවේශ වූ බව ද පැහැදිලි විය.

මූඛ්‍ය පද: නවකතාව, කාන්තාවාදී සාහිත්‍ය විචාරය, ශිල්ප විධි

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සිංහල-හින්දී වර්ණ සංස්ථිති පිළිබඳ තුලනාත්මක අධ්‍යයනයක්

දිමුත් දිලුම් ධනංජය විතානගේ[1*]

[1]උපශාලාධිපති, වෛද්‍ය පීඨය, කැලණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

භාෂාවක අර්ථ පූර්ණ පද නිර්මාණය වන්නේ වර්ණ එකට ගැලපීමෙනි. පූර්ණ උච්චාරණයක් සහිත වර්ණයක් අබාධිත ධ්වනියක් (ස්වරයක්) සහිත වන අතර එහි බාධිත ධ්වනි (ව්‍යංජන) එකක් හෝ වැඩි සංඛ්‍යාවක් පැවතිය හැකි ය. ඒ අනුව වර්ණය ධ්වනියට වඩා සංකීර්ණ වූ වාග්විද්‍යාත්මක ඒකකයකි. වර්ණ උච්චාරණයේ දී ප්‍රශ්වාස වාතය එකවර මුඛයෙන් පිටවන අතර මුඛ විවරය විවෘතව පවතී. එහි දී ප්‍රශ්වාස වාතය අවරෝධයට ලක්වන සෑම බාධාවක් ම ඉවත් වේ. එම බාධාව ඉවත් කෙරෙන්නේ අබාධිත ධ්වනියකින් වන බැවින් සෑම වර්ණයක ම කේන්ද්‍රය ස්වරයක් වන අතර එහි පරිධිය ව්‍යංජන ශූන්‍යයක්, එක් ව්‍යංජනයක් හෝ ව්‍යංජන කිහිපයක් විය හැකි ය. භාෂා උපාර්ජන ක්‍රියාවලියේ දී මාතෘ භාෂකයා නිවැරදි වර්චාරණ ශක්‍යතාව නිරායාසයෙන් පූරණය කරන අතර දෙවන භාෂා හෝ විදේශ භාෂා අධ්‍යාපනයේ දී කියවීමේ ප්‍රවීණතාව දියුණු කිරීම සඳහා පදවල නිවැරදි වර්ණ සංස්ථිති හඳුනාගැනීම වැදගත් වේ. ප්‍රස්තුත පර්යේෂණයේ දී හින්දී සහ සිංහල භාෂාද්වයේ භාවිත වර්ණ සංස්ථිති තුලනාත්මකව අධ්‍යයනය කෙරෙයි. එහි දී භාෂාද්වයේ එන විෂම වර්ණ සංස්ථිති තිරස්ව ඡේදනය කරමින් සමීප සහ දුරස්ථ පරිසර අධ්‍යයනය කෙරෙයි. සිංහල-හින්දී භාෂාද්වයේ භාවිත වර්ණ සංස්ථිති සමාන වන්නේ ද? සම වර්ණ සංස්ථිති සහ විෂම වර්ණ සංස්ථිති කවරේ ද? විෂම වර්ණ සංස්ථිති නිර්මාණය කෙරෙහි පාදක වූ භාෂාමය සාධක කවරේ ද? යන්න ප්‍රස්තුතයේ පර්යේෂණ ගැටලු වේ. ප්‍රස්තුත පර්යේෂණයේ දත්ත විශ්ලේෂණය ගුණාත්මක ක්‍රමවේදය මත සිදු කෙරෙයි. භාෂාද්වයක් කේන්ද්‍ර කොටගෙන සිදුවන දත්ත විශ්ලේෂණයේ දී භාෂාද්වයේ වර්ණ තුලනාත්මකව ද විග්‍රහ කෙරෙයි. භාෂාද්වයට අනන්‍ය ලෙස නිර්මාණය වී ඇති වර්ණ සංස්ථිති සම විෂම ලක්ෂණ පෙන්නුම් කරයි. සිංහල වර්ණවල අවමය තනි ධ්වනියක් වන අතර උපරිමය ධ්වනි තුනකට සීමා වේ. නමුත් හින්දී භාෂාවේ වර්ණ තනි ධ්වනියේ සිට ධ්වනි හයක් දක්වා වන උපරිමයකට යටත්ව භාවිත වේ. මේ අනුව හින්දී වර්ණ සංස්ථිති සිංහල වර්ණ සංස්ථිතිවලට සාපේක්ෂව වැඩි සංකීර්ණත්වයකින් යුතු බව නිරීක්ෂණය කෙරේ.

මුඛ්‍ය පද: ධ්වනි, වර්ණ, සංස්ථිතිය, සිංහල භාෂාව, හින්දී භාෂාව

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චීන භාෂාවෙන් කෙරෙන බෞද්ධ ධර්ම දේශනාවල සුමට යෙදුම් (Cohesive Devices) පිළිබඳ දළ විශ්ලේෂණයක්

පූජ්‍ය තෙරිපැහැ උපනන්ද හිමි[1*]

[1]ආරාධිත උපදේශක, භාෂා හා සංස්කෘතික අධ්‍යයන පීඨය, ශ්‍රී ලංකා භික්ෂු විශ්වවිද්‍යාලය, අනුරාධපුරය, ශ්‍රී ලංකාව

විදේශ භාෂාවක් ලෙස මැන්ඩරින් චීන භාෂාව හැදෑරීම නූතන ලෝකයේ ජනප්‍රිය ප්‍රවණතාවකි. සමාජ භාෂා විචලනයන් කෙරෙහි අවධානය යොමු කිරීම චීන භාෂාව උපාර්ජනයට උපකාර කෙරෙයි. වෙනත් සජීවී භාෂාවල මෙන් භාෂාව සුමට කරන යෙදුම් විශේෂයක් (Cohesive Devices) චීන භාෂා ව්‍යවහාරයෙහි දක්නට ලැබේ. මේ යෙදුම් මඟින් සනාථ කෙරෙන්නේ භාෂාවක් යනු යාන්ත්‍රික වූවක් නොව අන්තර්ග්‍රහණය පහසු කරවන වචන ක්‍රීඩාවක් බවයි. Cohesive Devices යනු ගුණාත්මක පොදු භාෂා ලක්ෂණයකි. කේ. එන්. ඕ. ධර්මදාසයන්ගේ ද්විභාෂකත්වය, භාෂාව සහ සමාජය සහ ජේ. බී. දිසානායකයන්ගේ මානව භාෂාව වැනි දේශීය මූලාශ්‍රත් M. Halliday ගේ ඉංග්‍රීසි භාෂාවේ Cohesive Devices සහ Thandar Aung ගේ ඉංග්‍රීසි ඉගෙනීමේදී Cohesive Devices භාවිතය පිළිබඳ අධ්‍යයනයක් වැනි විදේශීය මූලාශ්‍රත් මෙම යෙදුම් පිළිබඳ න්‍යායාත්මක සහ ව්‍යවහාරමය අවබෝධයක් සපයන අතර මෙම පර්යේෂණය ස්වාධීන වූවකි. වාග්විද්‍යානුකූලව Cohesive Devices භාෂාත්මක රීතියකි. බෞද්ධ ආගමික ප්‍රාස්තාවට අයත් ධර්ම දේශනය එම රීතිය භාවිත කෙරෙන අවස්ථාවකි. චීන භාෂාවේ බෞද්ධ ධර්ම දේශනා අවස්ථාවන්හි යෙදෙන සුමට යෙදුම් සමාජ වාග්විද්‍යාත්මක දෘෂ්ටිකෝණයෙන් දළ වශයෙන් විශ්ලේෂණය කිරීම පර්යේෂණ අරමුණ වන අතර සමාජ වාග්විද්‍යාවේ භාෂා අභ්‍යන්තරික මූලධර්මවල රීතිය පිළිබඳ කරුණු මත පදනම්ව විශ්ලේෂණය සිදු කිරීම පර්යේෂණ අපේක්ෂාවයි. පර්යේෂණ ගැටලුව වන්නේ, ව්‍යවහාරික චීන භාෂාවේ යෙදෙන සුමට යෙදුම්වල සුවිශේෂතා කවරේද, බෞද්ධ ආගමික ධර්ම දේශනා අවස්ථාවල ඒවායෙහි විශේෂතා ප්‍රකට වේද, චීන භාෂාව අත්පත් කර ගැනීමේ ක්‍රියාවලියේදී මේවා වැදගත් වන්නේ කෙසේද යනාදියයි. Cohesive Devices චීන භාෂා ව්‍යවහාරයෙහි සුවිශේෂී පද හෝ වාක්‍ය ඛණ්ඩ විශේෂයක් ලෙස වාග්විද්‍යාත්මකව හඳුනා ගත හැකි වීම පර්යේෂණ වැදගත්කමයි. අහඹු ලෙස තෝරා ගත් නිරීක්ෂණ ඇසුරින් කරුණු අධ්‍යයනයට පර්යේෂණය සීමා වේ. පර්යේෂණය ගුණාත්මක පර්යේෂණ ක්‍රමවේදය යටතේ සිදු කෙරෙන අතර ප්‍රස්තුතයට අදාළව චීන භාෂාව සහ සමාජ වාග්විද්‍යාවෙහි ප්‍රකරණ භාෂා විස්තර කෙරෙන ප්‍රාථමික හා ද්විතීයික මූලාශ්‍රය ඇසුරින් දත්ත රැස් කෙරෙයි. පර්යේෂණයෙහිදී, චීන භාෂාවෙහි සුමට යෙදුම් විශේෂණ සහිතව ව්‍යවහාර කෙරෙන ආකාරය වාග්විද්‍යානුකූලව සනාථ කෙරෙයි. Cohesive Devices, නුදෙක් ව්‍යවහාරික භාෂා ප්‍රභේදයක් පමණක් නොව ව්‍යවහාරයෙහි සජීවී බව මෙන්ම ගතික බව විද්‍යමාන කරන යෙදුම් විශේෂයක් ලෙසත්, භාෂා ඉගෙනුම් ඉගැන්වීම් ක්‍රියාවලියේදී විද්‍යාත්මකව හඳුනා ගැනීම චීන ව්‍යවහාරය පහසු කරන බවත් අවසාන වශයෙන් නිගමනය කෙරෙයි.

මුඛ්‍ය පද: චීන භාෂාව, බෞද්ධ ආගමික ප්‍රාස්තාව, රීතිය, සමාජ වාග්විද්‍යාව, සුමට යෙදුම්

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සිංහල කෙටිකතාවල ගතිශීලී ආඛ්‍යාන ශිල්ප විධිය පිළිබඳ විමර්ශනාත්මක අධ්‍යයනයක් (අජිත් තිලකසේනගේ තෝරාගත් කෙටිකතා කිහිපයක් ඇසුරෙනි)

ජේ.ඒ.ඩී.එස්. කවීශ්වර[1*]

[1]සිංහල අධ්‍යයනාංශය, මානවශාස්ත්‍ර පීඨය, කැලණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

කෙටිකතාවල අනුභූති ප්‍රකාශනයේදී ආඛ්‍යානයට හෝ වස්තුවට උචිත ලෙස ව්‍යුහය සකස් කෙරෙන අයුරු නිරීක්ෂණය කළ හැකිය. එය නිර්මාණකරුවාගේ අරමුණ සාක්ෂාත් කර ගැනීම සඳහා අන්තර්ගතය ඉදිරිපත් කිරීමේ මාදිලිය වෙයි. වර්තමාන සිංහල කෙටිකතාවෙහි නූතනවාදී මුද්‍රාව තැබූ ලේඛකයෙකු වශයෙන් අජිත් තිලකසේන හැඳින්විය හැකිවේ. **සතුරෝ** (1960) කෙටිකතා සංග්‍රහයෙන් ස්වකීය අනන්‍යතාව ගොඩනැඟීමට යොමු වූ ඔහු; ලේඛන හා කථන භාෂාව, අක්ෂර වින්‍යාසය ආදිය තම අරමුණ කෙරෙහිම කක්ෂගත කළේය. ප්‍රථම කෙටිකතා සංග්‍රහයෙන් චෙකෝව්යානු යථාර්ථවාදී රීතිය අනුගමනය කිරීමත් යථාර්ථවාදයට අනුකූල ආඛ්‍යාන ශිල්ප විධි භාවිතයට ගැනීමත් පෙනෙන්නට වෙයි. ඔහුගේ දෙවැනි කෙටිකතා සංග්‍රහය වන **පිටුවහල් කර සිටිද්දි** (1964) කෘතියෙන් ආඛ්‍යාන රීති හා ශිල්පීය ලක්ෂණවල ස්වාධීන භාවය ඉස්මතු කොට පෙන්වීය. 'කියන දෙයට වඩා කියන ආකාරය' කෙරෙහි තමා වැඩි අවධානයක් දක්වන බව ඔහුගේ ප්‍රකට කියමනකි. මෙය නිර්මාණයක ආඛ්‍යානවේදය පිළිබඳ දක්වන ප්‍රබල අදහසක්ය. ඔහුගේ කෙටිකතාවල ව්‍යුහාත්මක ලක්ෂණ මගින් ශිල්ප විධි රැසක් අනාවරණය කර ගත හැකි වුවද, ඒවා අතරින් වැදගත් ශිල්පීය ලක්ෂණයක් ලෙස කෙටිකතාවක ගතිශීලී භාවය හඳුන්වා දිය හැකිය. ගතිශීලී භාවය යනු; කතා වස්තුවෙහි ගලාගෙන යන සංචලනමය ස්වභාවයයි. ක්ෂණිකව වෙනස් වන නාට්‍යාකාර වර්ධනීය භාවයයි. නාට්‍යයක් රචනා වනුයේ වේදිකා නිෂ්පාදනය අරමුණු කොට බැවින් ඒ සඳහා පරිභාවිත ශිල්ප විධි ප්‍රායෝගිකත්වය මුල් කොට ගොඩ නැඟෙයි. කෙටිකතාව වැනි ලිඛිත නිර්මාණයක, නාට්‍යයක පැවිතිය යුතු ශිල්පීය ලක්ෂණයන් භාවිත කිරීමේ යෝග්‍යතාව කෙබඳුද? යන්න විමර්ශනය කිරීම මෙහි පර්යේෂණ ගැටලුවයි. ඒ සඳහා **පිටුවහල් කර සිටිද්දි** සංග්‍රහයෙන් 'හොඳ ඇයෝ', **සුන්නද්දූලිහි** (1970) 'වැද්දන් සමඟ යුද වදින්නට', **සාදයහි** (1992) 'තුන් වෙනියා', **වන්දනාව** (1996) කෘතියෙහි 'වතුර' සහ **සුසුම සහ පීඩාව** (2000) සංග්‍රයේ 'අතරමග' යන කෙටිකතා කෙරෙහි මුඛ්‍යාවධානය යොමුවෙයි. මෙකී කතාවල ගතිශීලී බව ඇති කිරීම සඳහා සිද්ධි නිරූපණයත් සංවාදවල පවතින ප්‍රබෝධමත් ස්වභාවයත් ස්වකීය අනන්‍යතාව පෝෂණය කරන අයුරු අධ්‍යයනය කිරීම පර්යේෂණයේ අරමුණයි.

මුඛ්‍ය පද: ආඛ්‍යානවේදය, ගතිශීලී භාවය, ප්‍රබෝධාත්මක සංවාද, ශිල්ප විධි

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බඹරු ඇවිත් සහ අහස්ගව්ව චිත්‍රපට මගින් නිරූපණය වන සමාජ ගැටළු පිළිබඳ විමර්ශනාත්මක අධ්‍යයනයක්

එල්.ජී.එස්.යූ. සඳරුවන්[1,2*], ආර්.එම්.එන්.යූ. බණ්ඩාර[1,2], එම්. පියුමාලි[3]

[1]නාට්‍ය, සිනමා හා රූපවාහිනී අධ්‍යයන අංශය, මානව ශාස්ත්‍ර පීඨය, කැලණිය විශ්ව විද්‍යාලය, ශ්‍රී ලංකාව
[2]ලලිත කලා අධ්‍යයන අංශය, මානව ශාස්ත්‍ර පීඨය, කැලණිය විශ්ව විද්‍යාලය, ශ්‍රී ලංකාව
[3]ජන සන්නිවේදන අධ්‍යයන අංශය, සමාජීය විද්‍යා පීඨය, කැලණිය විශ්ව විද්‍යාලය, ශ්‍රී ලංකාව

සමාජයේ පවතින කිසියම් තත්ත්වයක් හේතුවෙන් සමාජයේ සිටින බොහෝ දෙනකුගේ යහපැවැත්ම ඉෂ්ට කර ගැනීමට නොහැකි වීම සරලව ම සමාජ ගැටළුවක් ලෙස හැඳින්විය හැක. එම සමාජ ගැටළු සමාජයේ ජීවත්වන සියලුම දෙනාට සෘජුව ම හෝ වක්‍රව බලපෑම් එල්ල කළ හැක. සමාජය ආරම්භයේ සිට වර්තමානය දක්වා ම ජන සමාජයට මුහුණ පෑමට සිදු වූ ගැටළු රාශියක් ඇත. ඒවා අතර ගණිකා වෘත්තිය, දරිද්‍රතාවය, යාචක ප්‍රශ්නය, මත්ද්‍රව්‍ය භාවිතය හා විරැකියාව ප්‍රධාන වේ. එම සමාජ යථාර්ථය, ලෝක සිනමාව මගින් ද ලාංකේය සිනමාව මගින් ද නිරූපණය කරන්නට සිනමාකරුවන් උත්සුක වූහ. ශ්‍රී ලාංකික ජන සමාජයේ මතුවූ සමාජ ගැටළු ප්‍රේක්ෂකයාට ඉදිරිපත් කළ සිනමා අධ්‍යක්ෂකවරයකු ලෙස ධර්මසේන පතිරාජ හැඳින්විය හැක. එමෙන්ම සිංහල සිනමාව යොමු විය යුතු නිවැරදි මාර්ගයට යොමු කළ සිනමා අධ්‍යක්ෂකවරයකු ලෙස ධර්මසේන පතිරාජ හැඳින්විය හැක. ඔහු මිනිස් ජීවිතයට වඩාත් සමීප, යථාර්ථ රූපී අත්දැකීම් වෙත ප්‍රේක්ෂක මනස යොමු කිරීමට උත්සාහ කළේය. මෙම පර්යේෂණයේ අරමුණ වන්නේ ධර්මසේන පතිරාජ ඔහුගේ චිත්‍රපට සඳහා විෂය කරගත් සමාජ ගැටළු පිළිබඳව අධ්‍යයනය කිරීමයි. ධර්මසේන පතිරාජ විෂය කර ගත් සමාජීය ගැටළු මොනවාද යන්න මෙම පර්යේෂණයේ, පර්යේෂණ ගැටළුව වේ. මෙහිදී පර්යේෂණ ක්‍රමවේදය වශයෙන් ගුණාත්මක පර්යේෂණ ක්‍රමවේදය භාවිත කෙරුණි. ප්‍රාථමික දත්ත වශයෙන් අහස් ගව්ව හා බඹරු ඇවිත් යන චිත්‍රපට ද්විත්වය නරඹා එහි අන්තර්ගතය, අන්තර්ගත විශ්ලේෂණ ක්‍රමය ඔස්සේ විශ්ලේෂණය කෙරුණි. එමෙන් ම ද්විතීයික දත්ත ලෙස දේශීය විදේශීය ග්‍රන්ථ ද, තෘතීය දත්ත ලෙස අන්තර්ජාලය ද පරිශීලනය කෙරුණි. මෙම පර්යේෂණයේ, පර්යේෂණ ප්‍රතිඵල ලෙස එවකට පැවති දේශපාලනය, විරැකියාව, පන්ති භේදය, දරිද්‍රතාවය යන සමාජ ගැටළු මෙම චිත්‍රපට මගින් නිරූපණය කර ඇති බව අනාවරණය විය. ඒ අනුව මෙම පර්යේෂණයේ නිගමනය ලෙස විරැකියාව මගින් එවකට සිටි තාරුණ්‍යය සීමාවට පත්වන අයුරුත්, සමාජයේ පවත්නා පන්ති භේදය, දරිද්‍රතාවයෙන් පෙළෙන ජනතාවගේ ජීවන යථාර්ථය හා ඔවුන්ගේ පීඩනය මෙම චිත්‍රපට මගින් නිරූපණය කර ඇත.

මුඛ්‍ය පද: අහස් ගව්ව, ධර්මසේන පතිරාජ, බඹරු ඇවිත්, සමාජීය ගැටළු, සිනමාව

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ශ්‍රී ලංකාවේ ආර්ථික සංවර්ධනයට සහ සංස්කෘතික රාජ්‍යතාන්ත්‍රිකත්වයට උඩරට නර්තනයේ දායකත්වය

සරන්‍යා සතරසිංහ[1*]

[1]උඩරට නර්තන අධ්‍යයනාංශය, නර්තන හා නාට්‍යය කලා පීඨය, සෞන්දර්ය කලා විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

ශ්‍රී ලංකාවේ වඩාත් ගෞරවාදරයට පාත්‍ර වූ සාම්ප්‍රදායික නර්තන අංගයක් වන උඩරට නර්තනය, දිවයිනේ පොහොසත් සංස්කෘතික උරුමය මූර්තිමත් කරයි. අද්‍යතනයේ උඩරට නර්තනය සංස්කෘතික ප්‍රකාශනයක් ලෙස පමණක් නොව ශ්‍රී ලංකාවේ ආර්ථික සංවර්ධනයට සැලකිය යුතු දායකත්වයක් සපයන අතර සංස්කෘතික රාජ්‍යතාන්ත්‍රිකත්වය සඳහා මෙවලමක් ලෙසද සේවය කරයි. ශ්‍රී ලංකාවේ ආර්ථික සංවර්ධනයට සහ සංස්කෘතික රාජ්‍ය තාන්ත්‍රිකත්වයට උඩරට නර්තනයට දායක විය හැක්කේ කුමන ආකාරයෙන්ද යන්න මෙම පර්යේෂණයට මුල් වූ ගැටලුවයි. එමගින් ශ්‍රී ලංකාවේ ආර්ථිකයට උඩරට නර්තනයේ බහුවිධ දායකත්වය සහ රටේ සංස්කෘතික රාජ්‍ය තාන්ත්‍රිකභාවය ඉහළ නැංවීම සඳහා එහි කාර්යභාරය අධ්‍යයනය කෙරේ. සංචාරක හා සංස්කෘතික කර්මාන්තවලින් ලැබෙන ආර්ථික ප්‍රතිලාභ මෙන්ම ශ්‍රී ලාංකේය සංස්කෘතිය ජාත්‍යන්තරව ප්‍රවර්ධනය කිරීම සඳහා නර්තනයේ බලපෑම ඉස්මතු කිරීම අධ්‍යයනයේ අරමුණයි. මෙම අධ්‍යයනය ප්‍රාථමික සහ ද්විතීයික දත්ත මූලාශ්‍ර භාවිතා කරමින් ගුණාත්මක පර්යේෂණ සැලසුමක් භාවිතා කරයි. නර්තන ශිල්පීන්, සංස්කෘතික විශේෂඥයින්, සංචාරක වෘත්තිකයන් සමඟ සම්මුඛ සාකච්ඡා සහ ජාත්‍යන්තර නර්තන ප්‍රසංගවල මාධ්‍ය ආවරණය විශ්ලේෂණය කිරීම මගින් මූලික දත්ත රැස් කෙරේ. අධ්‍යයන සාහිත්‍ය, රජයේ වාර්තා සහ සංස්කෘතික ලේඛනාගාරවලින් ද්විතියික දත්ත රැස් කෙරේ. උඩරට නර්තනය සංචාරක ව්‍යාපාරය මගින් ආර්ථිකය සැලකිය යුතු ලෙස ඉහළ නංවන බවත්, සංස්කෘතික උත්සව සහ ප්‍රසංග සඳහා අමුත්තන් ආකර්ෂණය කර ගන්නා බවත්, එමගින් දේශීය ව්‍යාපාරවලට සහ ශිල්පීන්ට සහාය වන බවත් සොයාගැනීම් මගින් ඉස්මතු කෙරෙන අතර ජාත්‍යන්තර සංචාර සහ සංස්කෘතික හුවමාරු වැඩසටහන්වල ප්‍රදර්ශනය කෙරෙන උඩරට නර්තනයේ ගෝලීය ආකර්ෂණය ශ්‍රී ලංකාවේ සංස්කෘතික රාජ්‍ය තාන්ත්‍රිකභාවය ඉහළ නංවයි. සමකාලීන කලා ආකෘතීන් සහ මාධ්‍ය සමඟ සහයෝගීතාවයෙන් උඩරට නර්තනය වාණිජකරණය කිරීම, එහි ආර්ථික බලපෑම තවදුරටත් පුළුල් කර ඇති අතර එමගින් පුළුල් ප්‍රේක්ෂකයන්ට ප්‍රවේශ විය හැකිය. සාම්ප්‍රදායික උරුමයන් සුරැකීම පමණක් නොව ආර්ථික වර්ධනයට සහ ජාත්‍යන්තර සංස්කෘතික සබඳතා ශක්තිමත් කරන සංස්කෘතික සම්පතක් ලෙස උඩරට නර්තනයට ක්‍රියාකිරීමට ඇති හැකියාව අධ්‍යයනයෙන් අවධාරනය කරයි.

මුඛ්‍ය පද: උඩරට නර්තනය, සංස්කෘතික උරුමය , සංස්කෘතික රාජ්‍යතාන්ත්‍රිකත්වය, සංචාරක ව්‍යාපාරය, සමාජ-ආර්ථික සවිබල ගැන්වීම.

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ග්‍රීක මහා කාව්‍යයන්හි නිරූපිත යථාර්ථවාදී සාහිත්‍ය ලක්ෂණ පිළිබඳ අධ්‍යයනයක් (ඉලියඩ් හා ඔඩිසි මහා කාව්‍යයන් ඇසුරෙන්)

එච්.එම්.එස්. ඉසුරි කුමාරි[1*]

[1]සිංහල අධ්‍යයනාංශය, මානව ශාස්ත්‍ර පීඨය, කැලණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

මිථ්‍යාකතා, ජනප්‍රවාද, ජනකතා හා පුරාණෝක්ති ආදිය මුඛ පරම්පරාගතව වර්තමානය දක්වාම ව්‍යාප්ත වෙමින් පැවත ආ කතාන්දර විශේෂයක් ලෙස හැඳින්විය හැකිය. මෙම කතාන්දර වස්තු විෂය කරගනිමින් නිර්මිත සාහිත්‍යාංග අතර මහා කාව්‍යය ද විශේෂකොට සැළකීම වැදගත්ය. ක්‍රි.පූ. හත, අට සියවස්වලදී හෝමර් නම් මහා කවියා විසින් රචිත යැයි සැළකෙන ඉලියඩ් හා ඔඩිසි මහා කාව්‍යයන් ද ග්‍රීක සමාජයේ එවක පැවති පුරාණෝක්ති පදනම් කරගනිමින් නිර්මාණය කළ මහා කාව්‍යයන් ද්විත්වයකි. එම කෘතිවල සඳහන් සිදුවීම්වල සත්‍යාසත්‍යතාව කෙසේ වෙතත් සාහිත්‍ය කෘති වශයෙන් විවිධ දාර්ශනික චින්තන ධාරාවන් සමූහයකගේ පිළිබිඹුවක් ලෙස ඉලියඩ් හා ඔඩිසි මහා කාව්‍යයන් ද්විත්වය හඳුනාගත හැකිය. මෙහිදී වීර චරිත හා දේව චරිත ඔස්සේ සංකීර්ණ චරිත ලක්ෂණ මෙන්ම ඊට බලපෑම් වූ සමාජයත්, එදිනෙදා ජීවිතයත් නිරූපණය වීම, ග්‍රීසියෙහි පැවති සමාජ විෂමතාව නිරූපණය වීම ආදී යථාර්ථවාදී සාහිත්‍යයික ලක්ෂණත් ඉස්මතු වන අවස්ථා ද වේ. එබැවින් මෙම අධ්‍යයනයෙහි අරමුණ වන්නේ ඉලියඩ් හා ඔඩිසි මහා කාව්‍යයන්හි නිරූපිත යථාර්ථවාදී සාහිත්‍යයික ලක්ෂණ අධ්‍යයනය කිරීමයි. එම අරමුණ පූරණය කරගැනීමට ප්‍රාථමික දත්ත මූලාශ්‍රය හා ද්විතීයික දත්ත මූලාශය ද අධ්‍යයනයට හසුකර ගැනේ. මේ සඳහා මානවවංශ පර්යේෂණ විධික්‍රමයට අයත් වන ගුණාත්මක අධ්‍යයන ක්‍රමවේදය පර්යේෂණ ක්‍රමවේදය ලෙස භාවිත කරන අතර ඉලියඩ් හා ඔඩිසි කාව්‍යන්ගෙන් යථාර්ථවාදී සාහිත්‍ය ලක්ෂණ ඉස්මතු වන්නේද? ඒ කුමනාකාරයෙන්ද? යන්න මෙම පර්යේෂණයේ හඳුනාගත් පර්යේෂණ ගැටලු වේ. ආගම පදනම් කරගනිමින් ගොඩනැගුණු පුරාණෝක්ති බොහෝවිට යථාර්ථයෙන් දුරස් වුවද එහි ඇති චරිත හා සිද්ධි නිරූපණය ඔස්සේ එකල මිනිස් චින්තනයත්, ඔවුන් යම් යම් දේ සඳහා ක්‍රියාත්මක වූ ආකාරයත් හා ඊට සමාජය බලපෑ ආකාරයත් නිරූපණය කෙරෙන බැවින් පුරාණෝක්තිය යථාර්ථයෙන් බැහැර නොවේ. එමගින් වත්මනෙහි පවා සත්‍ය වශයෙන් විඳින්නට, අසන්නට හා දකින්නට ලැබෙන සත්තාවන් ප්‍රතිනිර්මාණය කිරීමක් ධ්වනිත වේ. මෙම පර්යේෂණය ඔස්සේ පුරාණෝක්ති විවිධ චින්තන ධාරාවන්ගේ එකතුවක් වන බවත්, එහි ප්‍රතිඵලයක් වශයෙන් නිර්මාණකරණයට මෙම පුරාණෝක්ති වස්තු බීජ කරගත් බවත්, එවැනි සාහිත්‍යාංග හුදෙක් රසවින්දනය සඳහා පමණක් ම නොව 19 වන සියවසේ දී කතිකාවතකට බඳුන් වූ යථාර්ථවාදී චින්තන ධාරාවේ මූලබීජාත්මක අවස්ථා ද නිරූපණය කර ඇති බවත් නිගමනය කළ හැකිය.

මුඛ්‍ය පද: පුරාණෝක්ති, මහා කාව්‍ය, යථාර්ථවාදී, සාහිත්‍යය

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නූතන හින්දී පද්‍ය සාහිත්‍යයේ නිරූපණය වන ඉන්දියානු සමාජයේ ආර්ථික විෂමතාවල ස්වභාවය පිළිබඳ විශ්ලේෂණාත්මක අධ්‍යයනයක්; සුමිත්‍රානන්දන් පන්ත්ගේ 'සාම්‍රාජ්‍යවාද්' සහ 'ධන්පති' පද්‍ය පන්ති ඇසුරෙන්

ඩී.පී. සිනාලි නදීපමා පතිරණ[1*]

[1]හින්දි අධ්‍යයනාංශය, මානව ශාස්ත්‍ර පීඨය, කැලණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

සමාජය යනු කාලයත් සමඟ විවිධාකාර විපර්යාස වලට මුහුණ පාන්නකි. සමාජයත් පුද්ගලයාත් අතර පවතින නොවෙනස් සබඳතාවය හේතුවෙන් සමාජයේ සිදුවන ආර්ථික, දේශපාලනික මෙන්ම සංස්කෘතික විපර්යාස ඍජුව හෝ වක්‍රව පුද්ගලයාටද බලපායි. පුද්ගලයා තුළ ඒ අනුව කලින් කලට විචාර පරිවර්තනයක් ද සිදුවේ. එකී විචාර පරිවර්තනය කලින් කලට පුද්ගලයා අතින් බිහිවන සාහිත්‍ය නිර්මාණ කෙරෙහි ද බලපායි. ඒ අනුව සමාජීයය තත්ත්ව ඉස්මතු කරනු ලබන සාහිත්‍යයක් බිහි වෙයි. සමාජයෙහි සාමාන්‍යයෙන් ආර්ථිකමය වශයෙන් සිදුවන වෙනස්කම් තුළින් බලපෑමකට ලක්වන පුද්ගලයා ඒ පිළිබඳව අදහස් සාහිත්‍යයට රැගෙන ඒමට උත්සාහ කරයි. එහි ප්‍රතිඵලයක් ලෙස ගොඩනැගුණු සමාජ යථාර්ථවාදී සාහිත්‍යයෙහි ආර්ථික විෂමතා පිළිබඳ කරුණු ඇතුළත් වීම සාමාන්‍ය කරුණකි. තත්කාලීන සමාජයේ දක්නට ලැබෙන ආර්ථික විෂමතා සාහිත්‍යය තුළින් ඉස්මතු වන්නේ, සාහිත්‍යය යනු සමාජ සංසිද්ධීන්ගේ කැඩපතක් බව පසක් කරමිනි. හින්දී සාහිත්‍යයේ ඡායාවාදී යුගය නියෝජනය කළ සුමිත්‍රානන්දන් පන්ත් ද එකල සමාජයීය පසුබිමෙන් බලපෑමකට ලක් වූ කවියකි. එම කාල සීමාව තුළදී භාරතයෙහි තිබූ බ්‍රිතාන්‍ය පාලනය හේතුවෙන් සමාජය පුරා අධිනායකවාදී යටත් විජිතමය ස්වභාවයක් පැතිර ගිය අතර ඡායාවාදී යුගය අවසාන භාගය වන විට එනම් ප්‍රගතිවාදී යුගයේ ආරම්භක අවධිය වන විට ඉන්දියානු සමාජය තුළ නව පිබිදීමක අවශ්‍යතාවයක් ඇති විය. එම අවශ්‍යතාවය හින්දී සාහිත්‍යය මාධ්‍ය කොට ගනිමින් ඉස්මතු විය. මෙම පර්යේෂණයේ අරමුණ වන්නේ, එකල සමාජයීය තත්ත්ව සුමිත්‍රානන්දන් පන්ත්ගේ කාව්‍ය වලට බලපෑ ආකාරය පිළිබඳව නිරීක්ෂණය කිරීමයි. එතුමාගේ කාව්‍ය වල ආර්ථික විෂමතා පිළිබඳ කුමන ආකාරයකට ඉස්මතුවේද යන්න අධ්‍යයනය කිරීම මෙහි ගැටලුව වන අතර ගුණාත්මක පර්යේෂණ ක්‍රමවේදයේ උද්ගාමී ප්‍රවේශ ක්‍රමය පදනම් කරගනිමින් මෙම පර්යේෂණය සිදු කරන ලදී. සුමිත්‍රානන්දන් පන්ත් ගේ 'යුග්වාණී' කාව්‍ය සංග්‍රහය මෙහි ප්‍රාථමික මූලාශ්‍රය වූ අතර සමාජ යථාර්ථවාදී කවිය හා ප්‍රගතිවාදී කවිය පිළිබඳ කරුණු ඇතුළත් විචාර ග්‍රන්ථ, පර්යේෂණ පත්‍රිකා සහ අන්තර්ජාලය ආදිය ද්විතීය මූලාශ්‍ර ලෙස යොදා ගනිමින් ගොනු කරන ලද දත්ත පාඨ විශ්ලේෂණ ක්‍රමවේදය හරහා විශ්ලේෂණය කෙරුණි. එහිදී සුමිත්‍රානන්දන් පන්ත් කවියාගේ 'යුග්වාණී' කාව්‍ය සංග්‍රහයේ ඇතුළත් 'සාම්‍රාජ්‍යවාද්' සහ 'ධන්පති' පද්‍ය පන්ති තුළින් ධනවාදයට පහර ගසමින් ඉන්දියානු සමාජයේ ආර්ථික විෂමතා විවේචනයට ලක් කොට ඇති බව නිගමනය කළ හැකිය. එමෙන්ම එතුමා අරවින්දවාදී දර්ශනය, ගාන්ධී දර්ශනය හා මාක්ස්වාදී අදහස් තුළින් බලපෑමකට ලක් වූ බව ද අවසාන වශයෙන් නිගමනය කළ හැකි විය.

මුඛ්‍ය පද: ආර්ථික විෂමතා, ඡායාවාදී, ධනවාදය, ප්‍රගතිවාදී

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වැඩිහිටි ප්‍රජාවේ ජීවන තිරසරභාවය කෙරෙහි බලපා ඇති සමාජ-ආර්ථික ගැටලු හා අභියෝග: ශ්‍රී ලංකාවේ දකුණු පළාත ඇසුරෙන්

පි.සි. හෙට්ටිආරච්චි[1*], කේ.එම්.ජී. අමරතුංග[1]

[1]සමාජවිද්‍යා අධ්‍යයනාංශය, කැලණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

වැඩිහිටි ජනගහන වර්ධනය වනාහි ගෝලීය සංසිද්ධියක් වන අතර එය සංවර්ධිත හා සංවර්ධනය වෙමින් පවත්නා සෑම රාජ්‍යක්ම මුහුණ දී ඇති සමාජ ගැටලුවකි. ශ්‍රී ලංකාව තුළ වැඩිහිටි ජනගහනය ආසියානු කලාපයේ සමහර රටවල් පවා අබිභවමින් සීඝ්‍රයෙන් වර්ධනය වෙමින් තිබේ. ලාංකේය සමාජයේ මීට අදාළව දැකිය හැකි සුවිශේෂී ගැටළුවක් නම් වැඩිහිටි ජනගහනයේ වර්ධනයට සාපෙක්ෂව සමාජ-ආර්ථික වර්ධනයක් සිදු නොවීමයි. මේ හේතුවෙන් වැඩිහිටියන් සමාජ-ආර්ථික ගැටලු හා අභියෝග රැසකට මුහුණ දී සිටිති. මෙම පර්යේෂණයේ පරමාර්ථය වුයේ වැඩිහිටි ප්‍රජාව මුහුණ දෙන සමාජ-ආර්ථික ගැටලු හඳුනාගනිමින් එම ප්‍රජාවේ ජීවන තිරසාරභාවය කෙරෙහි ගළපාගත හැකි නව ප්‍රවේශතා හා උපායමාර්ග නිර්දේශ කිරීමයි. පර්යේෂණ ක්‍රමවේදය මිශ්‍ර ක්‍රමවේදාත්මක විය. සරල සසම්භාවී නියැදි ක්‍රමය අනුව දකුණු පළාත තුළින් තෝරාගත් වැඩිහිටියන් 350ක නියැදියක් මෙම සඳහා යොදාගනු ලැබිණ. මෙහි දී අනුගමනය කළ පර්යේෂණ විධික්‍රමය සමීක්ෂණ හා ප්‍රත්‍යක්ෂීක විධික්‍රමය විය. ප්‍රාථමික හා ද්විතීක මූලාශ්‍ර භාවිතයෙන් දත්ත රැස්කිරීම සිදු විය. ප්‍රමාණාත්මක දත්ත විශ්ලේෂණය සඳහා විස්තරාත්මක සංඛ්‍යානයත්, ගුණාත්මක දත්ත විශ්ලේෂණය සඳහා තේමා හා සිද්ධි විශ්ලේෂණයත් භාවිතා විය. මෙහි දී තවදුරටත් තිරසාර ජීවිකා වෘත්තී රාමුව ගළපා ගනිමින් වැඩිහිටියන්ගේ සමාජ-ආර්ථික තත්ත්වය තක්සේරුකර ගැණුනි. පර්යේෂණ සොයාගැනීම් අනුව මූල්‍ය, සමාජ ප්‍රාග්ධන විහිනතාවයන් හේතුවෙන් වැඩිහිටි ප්‍රජාවේ ජීවන තිරසරභාවයට සෘණාත්මක බලපෑමක් සිදු වී තිබෙන බව පැහැදිලි විය. ආර්ථික අනාරක්ෂිතභාවය වැඩිහිටි ප්‍රජාවේ ප්‍රමුඛ ගැටලුව බවට පත්වී ඇත. මුළු නියැදියෙන් 35.0%ක ප්‍රතිශතයක් කිසිදු මාසික ආදායමක් නොමැති වැඩිහිටියන්ය. සමාජ ප්‍රාග්ධනය අවම වීම තුලින් වැඩිහිටියන් අතර හුදෙකලාභාවය වර්ධනය වී ඇත. භෞතික පහසුකම් හිඟය, ප්‍රවාහන දුෂ්කරතා, නව තාක්ෂණික අනවබෝධය, සෞඛ්‍ය ගැටලු යනාදී භෞතික හා මානව ප්‍රාග්ධන විහිනතාවයන් වැඩිහිටි ප්‍රජාවේ ජීවන ගැටලු තීව්‍ර කෙරෙන සාධකයන් වී ඇත. නියැදියෙන් 55.0%ක ප්‍රතිශතයක් සෞඛ්‍ය තත්ත්වය දුර්වල වැඩිහිටියන් බව තහවුරු විය. වැඩිහිටියන්ගේ සමාජ-ආර්ථික තත්ත්වය තක්සේරු කොට ගනිමින් ප්‍රාග්ධන ප්‍රවේශතා සඳහා අවකාශය සැපයෙන මැදිහත්වීම් තුළින් වැඩිහිටි ප්‍රජාවේ ජීවන තිරසරභාවය යථාර්තයක් බවට කරගැනීමට හැකියාව ලැබේ.

මුඛ්‍ය පද: ආර්ථික අනාරක්ෂිතභාවය, වැඩිහිටි ප්‍රජාව, සමාජ හුදෙකලාභවය, සමාජ-ආර්ථික ගැටළු, ජීවන තිරසරභාවය

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පැලියගොඩ මධ්‍යම මත්ස්‍ය වෙළඳ සංකීර්ණයෙහි දෛනික මත්ස්‍ය මිල හා අලෙවිය පිළිබඳ විමර්ශනාත්මක අධ්‍යයනයක්

ඩබ්.පී.ඩී.සී. ගුණවර්ධන[1*]

[1]ඉතිහාස අධ්‍යයන අංශය, පශ්චාත් උපාධි අධ්‍යයන පීඨය, කැළණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

පැලියගොඩ මධ්‍යම මත්ස්‍ය වෙළඳ සංකීර්ණය යනු ලංකාවේ ප්‍රධානතම මත්ස්‍ය තොග අලෙවි මධ්‍යස්ථානයයි. ලංකාවේ සමස්ථ මුහුදු සීමාව ආවරණය වන ආකාරයෙන් ධීවර වරායන් 30 කින් පමණ දෛනිකව සපයනු ලබන මත්ස්‍ය අස්වැන්න මෙම වෙළඳ සංකීර්ණය කරා නිකුත් වේ. ඒ යටතේ පෙබරවාරි සිට මැයි මස අවසානය දක්වා කාලය තුළ මෙම වෙළඳ සංකීර්ණයෙහි කුඩා මත්ස්‍යයන්ගේ මිල විශාල මත්ස්‍යයන්ට සාපේක්ෂව වඩාත් ඉහළ අගයක් ගනු ලබන්නේ කුමන හේතුවක් මතද යන්න මෙහි අධ්‍යයන ගැටළුවයි. එහිදී දෛනික මත්ස්‍ය මිල වෙනස් වන්නේ කෙසේද, ඊට බලපාන හේතු හා එමගින් දෛනික මත්ස්‍ය අලෙවියට සිදු කරන බලපෑම පිළිබඳ අධ්‍යයනය කිරීම මෙම පර්යේෂණයෙහි අරමුණයි. මෙම පර්යේෂණය ක්‍රියාත්මක වූයේ බලයා සහ ලින්නා යන මාළු දෙවර්ගයෙහි සැපයුම වෙනස් වීම මත අනෙකුත් මත්ස්‍ය වර්ගයන්හි දෛනික මිල වෙනස් වීම කෙරෙහි ඍජු බලපෑමක් සිදු කරන්නේය යන උපකල්පනය මතය. පර්යේෂණ ක්‍රමවේදයේදී 154 ක් වූ මුළු තොග අලෙවිසැල් සංඛ්‍යාවෙන් (සංගහනය) තෝරාගත් අලෙවිසැල් 30 නියැදියක් යටතේ දත්ත රැස් කරන ලදී. එහිදී ඍජු නිරීක්ෂණය, සම්මුඛ සාකච්ජා හා ප්‍රශ්නාවලි භාවිතයෙන් ලබාගත් දත්තයන්ට අමතරව ධීවර අමාත්‍යාංශයට අනුබද්ධිතව මෙම වෙළඳ සංකීර්ණයෙහි ස්ථාපිත කර ඇති පරිපාලන කාර්යාලය හරහා දෛනිකව ඒකරාශී කරනු ලබන මත්ස්‍ය මිල ගණන්ද යොදා ගන්නා ලදී. දත්ත විශ්ලේෂණය කිරීමේදී විස්තරාත්මක හා සංඛ්‍යානමය ක්‍රමයන් භාවිතයට ගත් අතර සංඛ්‍යානමය ක්‍රමයේදී ලබාගත් දෛනික මත්ස්‍ය මිල ගණන් Microsoft Excel මෘදුකාංගය භාවිතයෙන් විශ්ලේෂණය කරන ලදී. දත්ත විශ්ලේෂණය හරහා ලද ප්‍රතිඵල වශයෙන් දෛනික මත්ස්‍ය මිල වෙනස්වීම සහ අලෙවිය සඳහා ඉල්ලුම් සැපයුම් න්‍යාය ඍජු අන්දමින් බලපාන බවත්, මෝසම් සුළං ප්‍රවාහයෙහි වෙනස්වීම මත මත්ස්‍ය අස්වැන්නෙහි සැපයුම තීරණය වන බවත් හා මෙම වෙළඳ සංකීර්ණයෙහි වැඩිම අලෙවියක් පවතින්නේ බලයා සහ ලින්නා යන මාළු දෙවර්ගය වීමත් යන ප්‍රතිඵල හඳුනා ගත හැකි වීය. මෙම ප්‍රතිඵල ඇසුරෙන් ඉදිරිපත් කළ හැකි නිගමනය නම් වෙළඳ සංකීර්ණයෙහි දැනට පවතින ශීතාගාර පද්ධතිය වැඩි දියුණු කිරීමත් ධීවර සංස්ථාව වඩාත් සක්‍රීය මට්ටමින් මැදිහත් වී විධිමත් බෙදාහැරීමේ ජාලයක් ඇති කිරීමත් හරහා දෛනික මත්ස්‍ය මිල යම් පාලනයක් යටතට ගෙන ආ හැකි බවත්ය.

මුඛ්‍ය පද: දෛනික මත්ස්‍ය මිල, ධීවර කර්මාන්තය, පැලියගොඩ මධ්‍යම මත්ස්‍ය වෙළඳ සංකීර්ණය, මත්ස්‍ය අලෙවිය

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නූතන චිත්‍ර කතාවේ සන්නිවේදන විශේෂතා

ඒ.එම්.ටී.ඩී. අබේසිංහ[1*]

[1]මානව ශාස්ත්‍ර අධ්‍යන අංශය, රජරට විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව

චිත්‍රකතාව මාධ්‍ය රූප සන්නිවේදනයේ එක්තරා විශේෂිත ව්‍යවහාර විධියත් ලෙසත්, පුවත්පත් කලාවේ නව විශේෂාංග ප්‍රභේදයක් ලෙසත් හැඳින්විය හැකි ය. කාටුන් (*Cartoon*) සහ කැරිකේචර් (*Caricature*) නම් උපහාසාත්මක විකට රූප සම්ප්‍රදාය චිත්‍රකතාවේ බිහිවීමට බලපෑ ප්‍රධාන මාධ්‍ය ද්විත්වය යි. දේශීය චිත්‍රකතා විකාශය තුළ පුවත්පත්හි පළ වූ කතා, චිත්‍රකතා පොත් සහ චිත්‍රකතා සඳහා ම වෙන් වූ පුවත්පත් ලෙස ප්‍රභේද ත්‍රිත්වයක් නිරීක්ෂණය කළ හැකි ය. මේවායෙහි රූප රාමුවලට පහළින් අනුරූප ප්‍රකාශ සඳහන් කිරීම හෝ දෙබස් බැලූන යොදාගැනීම දැකිය හැකි ය. මුද්‍රිත මාධ්‍යයේ ජනප්‍රිය විශේෂාංගයක් වූ චිත්‍රකතාව සතු සන්නිවේදන විශේෂතා හඳුනාගැනීම මෙම අධ්‍යයනයේ අරමුණ වේ. නූතනයේ මුද්‍රිත මාධ්‍යය තුළ චිත්‍රකතා පළවීම බොහෝ සෙයින් සීමිත බව පෙනෙන්නට ඇතත්, යාවත්කාලීන වන මාධ්‍ය සන්දර්භය තුළ චිත්‍රකතාව සාම්ප්‍රදායික ස්වරූපයෙන් ඔබ්බට යමින් සමාජ මාධ්‍යයේ වරනැගී ඇත්තේ කෙසේද යන්න විමසා බැලීම මෙහි පර්යේෂණ ගැටලුව වේ. ලාංකේය මුද්‍රිත මාධ්‍යය තුළ චිත්‍රකතාවේ ආරම්භය සිදු වී යැයි සැලකෙන 1950 සිට මේ දක්වා එහි විකාසනය මෙහි දී අන්තර්ගත විෂය විශ්ලේෂණයට ලක් කෙරිණි. ඒ අනුව 70 දසකයේ චිත්‍රකතා පත්තර සහ පොත් බිහිවීමත්, 80 දසකයේ රූපවාහිනියේ ආගමනයත් චිත්‍රකතාවේ ජනප්‍රියත්වය හීන වීමට බලපෑ සාධක බව අනාවරණය විය. අන්තර්ජාල මාධ්‍ය සම්ප්‍රාප්තියෙන් පසු චිත්‍රකතාවේ ස්වරූපය වෙනස් වුව ද, ඊට සමරූපී නිර්මාණ අද්‍යතනයේ සමාජ මාධ්‍යය තුළ ජනප්‍රියව පවතී. නූතන සමාජ මාධ්‍ය චිත්‍රකතාකරණය තුළ සරල විනෝදාස්වාදය, සමාජ ප්‍රතිවිරෝධතා මුදාහැරීම, කණ්ඩායම්ගත පුද්ගල අභිලාෂ සන්තර්පනය යන සන්නිවේදන විශේෂතා අන්තර්ගත බව අධ්‍යයනයේ දී හෙළිදරව් විය. මේවායෙහි රූප හා දෙබස් ඇසුරෙන් ප්‍රකාශිත සන්නිවේදනාර්ථ සාම්ප්‍රදායික චිත්‍රකතා ආකෘතිය ඉක්මවා යමින්, නව්‍ය සන්නිවේදන විශේෂතා ප්‍රකට කරයි. සමස්තයක් ලෙස ගත් කල චිත්‍රකතාව සාම්ප්‍රදායික ආකෘතියකින් බැහැරව අද්‍යතනයේ කාලීන සමාජ තේමා මත පදනම්ව විචාරාත්මක හා උපහාසාත්මක කාර්යයක නියැලෙන බව නිගමනය කළ හැකි විය.

මුඛ්‍ය පද: කාටූනය, චිත්‍රකතාව, පුවත්පත, සන්නිවේදනය, සමාජ මාධ්‍ය

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90 දශකයේ ශ්‍රී ලාංකේය රූපවාහිනී වෙළඳ දැන්වීම්වල නොමැකෙන ජනප්‍රියත්වයට බලපෑ කරුණු/ හේතු සාධක පිළිබඳ අධ්‍යයනයක්

ජේ.ඒ. තරිඳු මාධව[1*]

[1]කළමනාකරණ සහකාර, මානවශාස්ත්‍ර පීඨය, කැලණිය විශ්වවිද්‍යාලය

ශ්‍රී ලංකාවේ 90 දශකයේ ශ්‍රී ලාංකාවේ ප්‍රදර්ශනය කළ රූපවාහිනී වෙළඳ දැන්වීම් වලට රසික ප්‍රජාව පරම්පරා ගණනකට හිමිකම් කියන අතර වසර 30 ගණකට ආසන්න කාල වකවානුවක් තුළ විවිධ සමාජ, දේශපාලනික හා සංස්කෘතික බලපෑම් වලට ලක් වුවද මේ දක්වා එම ජනප්‍රියත්වය එක හා සමානව පවත්වා ගැනීමට එම දැන්වීම් සමත් වී ඇත. එකල කුඩා පාසැල් දරුවන් ලෙසින් ළමා කාලය ගත කරමින් සිටි මෙම වෙළඳ දැන්වීම් වල ප්‍රේක්ෂකයන් අද තරුණ විය පසු කරමින් ජීවිතයේ මැද භාගයට ලංවී සිටියද තමන්ගේ ළමා කාලය රසවත් කළ 90 දශකයේ වෙළඳ දැන්වීම් ගැන ඔවුන් තුළ ඇත්තේ ඉතා රසවත් මතකයන්ය. මෙම පරීයේෂණයේ මූලික අරමුණ වන්නේ 90 දශකයේ රූපවාහිනී වෙළඳ දැන්වීම්වල අඛණ්ඩ ජනප්‍රියත්වයට තුඩු දුන් කාරණා ප්‍රේක්ෂක මතවාද පදනම් කොට විශ්ලේෂණයක් කිරීමයි. මෙම පර්යේෂණයේ නියදිය වශයෙන් 90 දශකයේ අග භාගයේ උපද ලද 25ක පමණ ප්‍රේක්ෂක පිරිසක් තෝරා ගෙන සම්මුඛ පරීක්ෂණ භාවිතයෙන් දත්ත රැස් කර ගන්නා ලදි. වෙළඳ දැන්වීම්වල කතා තේමාවන්, සංගීත කාණ්ඩ, දර්ශන තල, නිර්මාණශිලීත්වය හා සංස්කෘතිය යන වෙළඳ උපක්‍රම පිළිබඳව සම්මුඛ සාකච්ජාවේ දී අවධානය යොමු කරන ලදි. සම්මුඛ සාකච්ජාවලින් ලබාගත් දත්ත වලට අනුව 90 දශකයේ රූපවාහිනී වෙළඳ දැන්වීම් ඉතා සරල කතා තේමාවන් පදනම් කොට, ඉතා නිර්මාණශිලීව නිෂ්පාදනය කර ඇති අතර, ඉතා ප්‍රබල මානුෂිය හැඟීම් මුල් කොට නිර්මාණය කර ඇත. මීට අමතරව සංගීතය භාවිතයේ ඇති සුවිශේෂිත්වය, එනම් මතකයේ රැඳෙන සංගීත කාණ්ඩ සහ එකල ඉතා ජනප්‍රියත්වයට පත් සංගීතඥයින්, සංගීත තනු සහ පසුබිම් ගායන වෙළඳ දැන්වීම් වල භාවිතය පරම්පරා ගණනාවක මතකයන් රැගෙන යාමට සමත් වී ඇත. රූප රාමු තුල ලංකාවේ සොබා සෞන්දර්ය මෙන්ම ලංකේය සංස්කෘතිය බිළිබිඹුවූ අතර, සංස්කෘතික උරුමයන්ට හා ගුණාංගවලට මූලිකත්වය දෙමින් නිර්මාණය කර ඇත. මෙම කාල වකවානුව තුළ ජනප්‍රියත්වයට පත්වූ වෙළඳ දැන්වීම් සියල්ලක්ම පාහේ ලංකීය නිෂ්පාදන අළෙවි කරණයට නිෂ්පාදනය වූ දැන්වීම් වන අතර එම වෙළඳ සන්නාමයන් පුරා වසර 30කට වඩා වැඩි කාලයක් සේවාදායකයන් අතර පරම්පරා ගණනක වටිනාකම් ලබා ගැනීමට හා පවත්වාගෙන යාමට මෙම 90 දශකයේ වෙළඳ දැන්වීම් ප්‍රබල සාධකයක්ව වී ඇත.

මුඛ්‍ය පද: අතීත ආවර්ජන, සංස්කෘතික බලපෑම, අලෙවිකරණ සාර්ථකත්වය, 90 දශකයේ වෙළඳ දැන්වීම්, ජනප්‍රියත්වය

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Accounting, Business and Management

IPRC/24/18 Accounting, Business and Management

Treat yourself: The role of purchase decision involvement in self-gifting motivations and customer satisfaction

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Self-gifting is a distinctive form of monadic gifting behaviour that brings in important implications for marketing practitioners. While self-gifting is mostly identified as an impulsive decision that often leads to satisfaction, this study argues that self-gifting may not always be impulsive given the various underlying motives. Using Goal Setting Theory, this study establishes the relationships among self-gifting motives, purchase decision involvement, and customer satisfaction. Purchase decision involvement as a mediator in between self-gifting motives and satisfaction, addresses a notable gap by zemphasizing how a person's level of purchase decision involvement may vary depending on different self-gifting motives. To this end, a quantitative study was carried out using a self-administered questionnaire. 204 usable responses from Sri Lankan consumers above 18 years old who occasionally or frequently purchased gifts for themselves were analyzed using AMOS software. The study unfolds that all the self-gifting behaviours are not impulsive since some of the motives (i.e., reward, personal disappointment, positive mood reinforcement, and hedonic) lead to increased purchase decision involvement. Further, some of the self-gifting motives (i.e., hedonic, negative mood reduction, and celebratory) do not lead to customer satisfaction. The mediation results emphasize that purchase decision involvement mediates the relationship between certain self-gifting motives (i.e., reward, personal disappointment, positive mood reinforcement, and hedonic), while the purchase decision involvement fully mediates the relationship between personal disappointment self-gifting and customer satisfaction. These findings enable us to understand self-gifting as a goal-oriented behaviour, highlighting how various self-gifting motives (goals) result in varying purchase decision involvement and satisfaction levels. Theoretical implications are discussed in line with self-gifting, and Goal Setting Theory and practical implications are proposed for marketers who target self-gifting consumers.

Keywords: Customer satisfaction, Goal setting theory, Purchase decision involvement, Self-gifting behaviour, Self-gifting motives

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IPRC/24/19 Accounting, Business and Management

Impact of financial leverage on firm profitability: Evidence from the highest market capitalization Non-financial listed firms in Colombo Stock Exchange

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This study aims to examine how financial leverage affects the profitability of the highest market capitalization firms of non-financial listed companies in Sri Lanka. A sample of the 30 highest market capitalization non-financial firms from the Colombo Stock Exchange (CSE) was selected based on their market performance. This study was conducted from 2019 to 2023, with a total of 150 firm-year observations. The firms were identified using data from Simply Wall St. As independent variables, the debt-to-equity, debt-to-total-assets, and interest coverage ratios were examined. Return on assets (ROA) and return on equity (ROE) were the dependent variables. Liquidity, firm size, and sales growth served as control variables. The data were collected from the firms' annual reports, and the study was conducted using descriptive statistics, correlation, and a generalized least square regression model. The results revealed that in the first model focused on ROA, debt-to-total asset and debt-to-equity ratios have a positive but insignificant relationship. However, in the second model, which was focused on ROE, the debt-to-total asset ratio has a positive significant relationship, implying that increased leverage relative to total assets may improve returns for equity holders. The debt-to-equity ratio has a significant negative relationship, meaning that the high use of debts is unfavorable to the shareholders' returns. The interest coverage ratio in both models has a positive, significant relationship with ROA and ROE. Results suggest that companies with greater ability to cover interest expenses have better financial performance. These findings imply that firms should use dynamic debt management policies to manage the link between debt and changes in profitability to arrive at the optimal debt-profitability relationship that will ultimately support sustainable growth. The findings will be helpful to investors, managers, and financial analysts in ultimately achieving the optimal degree of leverage. Future research could expand the above relationships across industries or different stages in the business cycle.

Keywords: Colombo stock exchange, Financial leverage, Liquidity, Non-financial firms, Profitability

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IPRC/24/48 Accounting, Business and Management

Impact of corporate governance characteristics on environmental reporting in the banking sector in Sri Lanka

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Corporate governance is the mechanism by which organizations are controlled, while environmental reporting discloses the environmental impact of organizations. Previous research on this topic mainly focused on the manufacturing sector, and this research is on the service sector. The first objective of this study was to investigate the level of environmental reporting in the Sri Lankan banks related to Global Reporting Initiatives (GRI). The second objective was to examine the relationship between corporate governance and the level of environmental reporting in the banking sector in Sri Lanka. Corporate governance was measured using independent variables, namely board size, board independence, and CSR committees. Control variables were bank size and bank profitability. Environmental reporting, which was the dependent variable, was assessed by a checklist based on GRI guidelines. An environmental reporting index was developed to measure the level of environmental reporting. This study was based on content analysis of 128 annual reports from 16 banks, including licensed commercial and licensed specialized reports for the period of 2015-2022. The data were analyzed using the STATA statistical package, and regression tests were performed to explore the relationships and effects. The study outcomes revealed that the board size had a significant impact on environmental reporting, while board independence and CSR committees were statistically insignificant. It concluded that the management of banks needs to increase the board size to gather directors with diverse knowledge and experience. This will tend to improve the environmental reporting of the banks. This study further suggested that bank size positively influences environmental reporting, indicating larger banks disclose more environmental information in their annual reports. The results indicated a growing tendency for environmental reporting in the banking sector of Sri Lanka at a higher average. It concluded that corporate governance has a considerable inspiration towards the environmental reporting of the banking sector.

Keywords: Banking sector, Board independence, Corporate governance, CSR committee, Environmental reporting

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IPRC/24/184 Accounting, Business and Management

Impact of ebullient supervision on employee work-life balance: Mediating role of workaholism

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Employee work-life balance is of considerable importance to individuals. Drawing on the Job Demand Resource theory, this study examined how ebullient supervision influences employee work-life balance, specifically focusing on the mediating role of workaholism in this relationship. This study adopted a deductive approach employing quantitative methods. A sample size of 317 was determined according to the Morgan table. The cluster sampling was used to select employees from the kitchen, food, and beverage departments from a population consisting of 1,814 employees of the selected five-star hotels in the Colombo district. Data were collected through a structured self-administered questionnaire distributed via online Google Forms. Overall, 320 participants responded, resulting in a response rate of 90.57% after disregarding three responses due to the identical ratings for all the items in the questionnaire. Simple linear regression analysis was performed using IBM SPSS software (version 29) to analyze the data, and the mediation analysis was performed using the Process Macro for SPSS. The findings revealed that ebullient supervision positively impacts employee work-life balance and negatively affects workaholism. Workaholism, in turn, is moderately negatively correlated with work-life balance. Additionally, workaholism partially mediates the relationship between ebullient supervision and work-life balance in the hotel industry, which supports the developed hypothesis. The paper contributes to the existing ebullient supervision literature. The implications for organizational policies to address workaholism and training programs for supervisors to foster a balanced work environment. Whilst the findings cannot be generalized beyond the selected hotel employees, they deliver some insights for further development. The findings of this study offer guidance for employers, employees, and managers in the hotel sector on fostering a balanced approach between work and home life through the lens of the novel concept of ebullient supervision.

Keywords: Ebullient supervision, Employee work-life balance, Hotel industry, workaholism

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IPRC/24/202 Accounting, Business and Management

The problems identification of industrialization and the criteria to becoming a developed country: A case study of Bangladesh

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The problems are most common in industries, businesses and trade projects in Bangladesh. The impacts of the problems on financial, economic, social, and environmental aspects are significant in a developing country like Bangladesh. In fact, 100% of industries are suffering from the problems and sustainable criteria for becoming a developed country, like other countries such as India, Pakistan, Malaysia, Sri Lanka, Indonesia, and China. The experience is the same in developed countries like the USA, UK, Russia, Australia, Germany, Japan, and Canada. Due to poor performance in industry, business and trade projects, these projects' success is suffering a lot. Now, Bangladesh has started its journey to achieve sustainable development goals (SDGs) by 2030. Bangladesh has already set her vision for 2041 and delta plan 2100. This has led the researcher to explore the major contributing factors of problems in economic zones of mega projects by government and non-government sectors in Bangladesh. Many studies have analyzed the factors contributing to problems and criteria for becoming a developed Bangladesh. This paper tries to identify those factors of problems and challenges to overcome from the agriculture-based economy to the industrial economy in Bangladesh. The data were collected through a questionnaire survey based on the random sampling method from selected respondents. Analysis was done using correlation analysis, co-efficient, factor, qualitative, and content analysis. The study is going to introduce a totally new theory named 'Equal Development Theory', which has five assumptions. The research also identifies the socio-economic impacts in the on-going 100 economic zones, challenges of contributing to export and exportable industries, import-substitutes, contributing to the growth of remittance, probable bank interest rate, utilizing small and medium enterprises (SMEs) into 4th industrial revolution and widely industrialization in Bangladesh.

Keywords: Problem identification, Developed country, Equal development theory

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IPRC/24/235 Accounting, Business and Management

Assessing the impact of Artificial Intelligence (AI) marketing adoption on the competitiveness and economic development of SMEs in Jaffna

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The pivotal role of small and medium-sized enterprises (SMEs) in fostering economic growth cannot be overstated, with these entities encompassing approximately 80% of all businesses in Sri Lanka. In the Jaffna region, SMEs significantly contribute to local economic performance. However, there is limited research on the specific advantages of AI marketing for SMEs in this locale. This study aims to assess how the integration of AI technologies in marketing practices enhances the growth and competitive edge of SMEs. The study employs a qualitative research design, utilizing purposive sampling to select eight SME owners and managers as participants. The study population consists of SMEs in the Jaffna region that have the potential for digital transformation. In-depth interviews were conducted to gather rich, contextual data. The data analysis process involved thematic analysis. The findings reveal that there is a general lack of awareness and understanding of AI marketing among SMEs in Jaffna, with many businesses continuing to use traditional methods. Challenges include inadequate digital infrastructure, limited access to AI tools, and a shortage of skilled personnel. Despite these obstacles, there is growing interest in adopting AI marketing to improve operational efficiency and market competitiveness. The study offers key insights for policymakers, business leaders, and technology providers in Jaffna, emphasizing the need for greater AI marketing awareness, education, and investments in digital infrastructure. Targeted support for SMEs will enhance their competitiveness and drive regional economic development. In conclusion, this research offers a comprehensive assessment of AI marketing's impact on SMEs in Sri Lanka, particularly in the underexplored context of Jaffna. The findings suggest that with proper support and resources, AI marketing can play a critical role in enhancing the growth and competitiveness of SMEs, thereby fostering regional economic development.

Keywords: Artificial Intelligence, Digital transformation, Economic development, Marketing, SMEs

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IPRC/24/55 Accounting, Business and Management

Project delays and circular effects of socio-economic and environmental impacts: A case study of Bangladeshi mega projects

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The Padma Multipurpose Bridge and the Dhaka Metro Rail mega-projects in Bangladesh have significantly influenced regional identity and culture. Both projects, with costs of US $3.6 billion and US $2.8 billion, respectively, experienced substantial schedule delays of up to 9 years. This study examines the socio-economic and environmental impacts of these delays, focusing on the circular effects they create. Circular effects refer to reinforcing feedback loops between socio-economic factors (such as employment, income, and displacement) and environmental factors (such as land use and resource depletion) that exacerbate delays and hinder sustainable development. A qualitative approach was employed, using a multiple case study design to ensure depth and context. Data were collected through semi-structured interviews with 20 engineers and 40 beneficiaries, selected via purposive sampling to represent diverse stakeholder perspectives. In addition, sentiment analysis was conducted on media reports to capture public perception of the project delays. The data were analyzed using thematic analysis, allowing for the identification of recurrent patterns, including the socio-economic and environmental impacts contributing to the delays. The analysis revealed seven key factors contributing to delays: inadequate project planning, frequent design changes, miscommunication among stakeholders, and lack of contractor engagement, among others. Each of these factors created a ripple effect, wherein socio-economic disruptions (such as job losses and reduced income) exacerbated environmental impacts (such as extended land use and resource depletion). This cycle, in turn, led to further project delays. Addressing these circular effects is essential for breaking the chain of delays and their compounding impacts on sustainability. Based on the findings, the study recommends the adoption of advanced technologies, the use of sustainable materials, and the implementation of robust project monitoring systems. These recommendations are grounded in the evidence collected, which showed that addressing the root causes of delays could significantly reduce both the socio-economic damage and the environmental footprint of mega-projects. By implementing these solutions, future projects can achieve more efficient timelines and promote sustainable development.

Keywords: Mega-project's schedule delays and cost overrun, Socio-economic and environmental issues and their circular impacts, Sustain-ability footprint

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IPRC/24/20E Accounting, Business and Management

Sustainable operations management and climate change issues across the globe

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Sustainable operations management is an ever-developing field: The process of making operations management truly sustainable can never have a well-defined endpoint because it is a continuous process. The widespread concern over global warming puts pressure on companies to reduce carbon emissions and become green. The global development to biodiversity, ecosystem, climate condition, environment, ecology, etc., today, the world is heavily burdened with high carbon emissions and environmental pollution. Global warming has been a reality since the 1800s. Therefore, we have to address the climate change issues first. Finland was the first country in the world to adopt a carbon tax, and Germany adopted a feed-in-tariff law to subsidize the generation of renewable energy. Subsequent carbon taxes were adopted in Norway (1991), Sweden (1991), Denmark (1992), Ireland (2008), Japan (2012), France (2014), and Canada (2018). A few developed countries have imposed tax on carbon emission. For example, headline carbon tax rates are $139 per tonne of carbon dioxide (CO_2) in Sweden, $55 in France, $29 in Denmark, and $3 in Japan. Therefore, all countries across the world must ensure the reduction of carbon emissions to zero by 2050. In Bangladesh, we need to establish an institution immediately. The ratio of large three to employee in a green factory shall be (1.38:1). Through semi-structured interviews with green factory experts, I have found that green factories, green technology, green production process, clean air, clean energy, green banking, sustainable financing are urgently required for ensuring sustainable operations management in Bangladesh.

Keywords: Sustainable, Green factories, Green technology, Global climate change, Net zero

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Impacts of Padma Multipurpose Bridge Mega-Project on People's Lives and Livelihoods in Bangladesh

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The Padma Multipurpose Bridge Project (PMBP) is a major infrastructural development in Bangladesh, expected to significantly enhance socio-economic growth in a region with over 30 million residents. This research aimed to assess the socio-economic, demographic, and psychological impacts of the project on displaced populations. A purposive sampling method was employed to select representative households from the affected population. Data were collected from a sample of households in affected areas, using a mixed-method approach along with sentiment analysis of media data to capture public opinion. The findings revealed that the settlement households had an average income of Tk. 23,493, while the non-settlement households earned Tk. 24,054 showing no significant difference in income between the two populations. Education access was high, with 98% of settlement households having nearby schools, but the dropout rate, particularly among girls in secondary school, was a matter of concern. Settlement households experienced a 69% loss in fish cultivation and a 51% loss of cultivable land due to displacement. The Padma Bridge brought economic opportunities although there were administrative lapses that caused inadequate compensations. While the bridge caused environmental damages and the destruction of homes and infrastructure, some households where benefitted by getting modern facilities and better infrastructure facilities and public services such as health care. This research highlighted the need for improved service delivery and long-term support for populations displaced by such mega-projects. Recommendations included the need for the development of alternative livelihood opportunities, enhanced healthcare access, and not permitting any gaps in compensation improving community resilience.

Keywords: Bangladesh, Infrastructure Development Padma Multipurpose Bridge, Displaced populations

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An In-depth Analysis of the *Dasuttara Sutta*: Evaluating its Teachings in Facilitating the Attainment of Nibbāna

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In the *Dasuttara Sutta*, Venerable *Sāriputta* Thero expounded on ten profound teachings that collectively serve as pathways to the attainment of Nibbāna while contemporary people may have diverse perspectives on the attainment of Nibbāna. This research aimed to focus specifically on how the teachings of *Dasuttara Sutta* significantly contribute to the attainment of Nibbāna. The research was a qualitative analysis of both published and unpublished books, primarily utilizing the Pali Canon's *Dasuttara Sutta* as the primary data source. The Venerable *Sāriputta* Thero preached about 550 factors, which were categorized into ten groups, namely helpful factors, developed factors, completely understood factors, eliminated factors, detrimental factors, distinguishing factors, hard-to-comprehend factors, produced factors, directly known factors, and realized factors. Among them, the 55 realized factors were said to be especially significant, which include the emancipation of life, supernormal knowledge and freedom, knowledge of past lives, understanding death and rebirth, ending defilements, stream-entry, once-return non-return, and perfection. They also encompass ethics, immersion, wisdom, freedom, knowledge and vision of freedom, the ability to multiply and become once again, hearing both human and divine sounds, understanding the minds of other beings, recollecting past lives, observing sentient beings' rebirths, ending defilements with true impermanence, renouncing sensual pleasures, practisingfour kinds of mindfulness meditation and developing the five faculties, the seven factors of awakening, and the noble eightfold path. Those factors significantly affect the attainment of Nibbāna, making the *Dasuttara Sutta* an essential text for understanding the concept and attainment of Nibbāna.

Keywords: Dasuttara *sutta*, Nibbāna, Realized factors, 550 facts

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