ISSN 2989-0780

"Achieving UN Sustainable Development Goals Through Biochemistry and Molecular Biology: A step at a time"

"Conference Proceedings"
4th Conference
of
The College of Biochemists of Sri Lanka

7th July 2023

College of Biochemists of Sri Lanka (CBSL)
[Registration number: GL00205278]
[Affiliated to Federation of Asian and Oceanian Biochemists and Molecular Biologists (FAOBMB)]

Conference Proceedings: College of Biochemists of Sri Lanka (Online)

Publisher: College of Biochemists of Sri Lanka

Editor : Dr. Maduka de Lanerolle-Dias
7th July 2023
4th Conference of the College of Biochemists of Sri Lanka

ISSN 2989-0780

TABLE OF CONTENTS

Welcome Message ……. 4

Organising Committee…… 5

Council 2022/2023……. 6

Editorial Board……... 7

Conference Programme …… 8

Past and Present Presidents of CBSL …… 10

Biosketch of Orator. *Prof. C. Deepal Mathew*……. 11

Sustainable Science *C. Deepal Mathew*…….. 12

Structure-Based Antibody Developments, *Andrew H.-J. Wang*……. 13

Discovery of Bioactive Natural Products Using Genomics Driven Approaches. *Jeremy G. Owen* …… 14

Functional Genomics and Metabolomics Advance the Ethnobotany of the Samoan Traditional Medicine "Matalafi" *Seeseei Molimau-Samasoni*…… 15

Nanotechnology and Nanomaterials in Biological Systems and Medicine *K.M.Nalin de Silva* …… 16

From Trees to Treat, *Sandun Senerath*…… 17

Abstracts: Oral Presentations……. 18

Abstracts: Poster Presentations……. 25

Panel of Reviewers……. 39

Panel of Judges…….. 40

Sponsors……. 41

Acknowledgement…… 44

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WELCOME MESSAGE

Prof. Lohini Athiththan

President, CBSL

I am honoured and privileged to welcome all of you to the 4th Biennial Conference of the College of Biochemists of Sri Lanka.

The College of Biochemists has been instrumental in fostering a culture of scientific curiosity among biochemists and molecular biologists, not only in Sri Lanka, but also in Asia and Oceania. Over the years, we have continued to push boundaries, to achieve milestones in the field of biochemistry and molecular biology, focusing on scientific research, innovation, and development. I am immensely proud of the commitment and dedication demonstrated by our members towards furthering the interests and reputation of our organization.

The post-pandemic economic crisis created a drawback in research and development in our country. This led the CBSL to take on the theme, "Achieving UN Sustainable Development Goals through Biochemistry and Molecular Biology: A Step at a Time", for the conference.

I hope that the keynote address by Prof Andrew H.-J. Wang, and the words of our other distinguished invited speakers of the symposium will enable bridging the gap in knowledge in this area, and provide glamour to the conference.

Moving forward, we have introduced the "CBSL Oration" for the first time in our conference, and I am thankful to our orator Emeritus Prof. CPDW Mathew for accepting our invitation to deliver it. We have joined hands with the Centre for Biodiversity at Victoria University to conduct a symposium under the theme, "Ethnomedical Perspectives from New Zealand, Samoa, and Sri Lanka", with the aim of sharing our expertise, and contributing to the development of our nation and beyond, through biochemistry and molecular biology.

I would like to extend a warm invitation to all Biochemists and Molecular Biologists in Sri Lanka, to join us on this journey. Together, we can make significant strides toward a brighter future in the field of biochemistry.

I take this opportunity to acknowledge the Faculty of Medical Sciences, University of Sri Jayewardenepura, for the support given to organise this event, our sponsors for their generous contribution, the IT support team for taking care of the technicalities, and the members of the organizing committee, who have worked tirelessly to make this conference a success.

Thank you, and hope you enjoy the lineup of activities at the conference.

ORGANISING COMMITTEE

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COUNCIL 2021 - 2023

First row seated (Left to Right):

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Second row standing (Left to Right):

Dr. R.Sanjeev, Prof. T.S Suresh, Dr. S.T.C Mahawithanage, Prof. P.P R Perera, Prof. T.Thoradeniya, Dr. W.M.K.M Rathnayake

Absent:

Prof Sharmila Javasena. Dr. Kasuni Akalanka

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Prof. Sugandhika Suresh

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Prof. Anoja Attanayake

Dr. Sanath Mahawithanage

4TH CBSL CONFERENCE GLANCE PROGRAMME 2023

Time (IST)	Event detail
	Inauguration
8.15 a.m.	**Arrival of Guests**
8.30 a.m.	**National Anthem**
8.35 am	**Lighting of the Oil Lamp**
8.40 a.m.	**Welcome Address**
8.50 a.m.	**Address by the Chief Guest: Prof Narada Warnasuriya** *Emeritus Professor, University of Sri Jayewardenepura.* *Former Dean Faculty of Medical Sciences, University of Sri Jayewardenepura.* *Former Vice Chancellor University of Sri Jayewardenepura.*
9.00 a.m.	**Address by the Guest of Honour: Prof. Aloka Pathirana** *Dean, Faculty of Medical Sciences, University of Sri Jayewardenepura*
9.10 a.m.	**Presidential Address: Prof. Lohini Athiththan** *President, CBSL*
9.30a.m.	**Award of Medals for Past and Present Presidents**
9.40 a.m.	**CBSL Oration: Prof. C.P. D. W. Mathew** *Emeritus Professor, University of Colombo*
10.10 a.m.	**Vote of Thanks**
10.20 a.m.	**Tea Break** **(Poster viewing)**

10.50 a.m.	**Keynote Address: Prof. Andrew H.-J Wang** *Chair Professor, Ph.D. Program in Translational Medicine,* *Taipei Medical University* *Session Chair: Prof. Rasika Perera*
11.35 a.m.	**Symposium: Ethnomedical Perspectives from New Zealand, Samoa, and Sri Lanka** *Session Chair: Prof. Sugandhika Suresh & Prof. Usha Hettiaratchi* **Prof. Jeremy G. Owen,** *School of Biological Sciences, Victoria University of Wellington, New Zealand* **Dr. Seeseei Molimau-Samasoni,** *Plants and Postharvest Technologies Division, Scientific Research Organization, Samoa* **Prof. K.M. Nalin de Silva,** *Department of Chemistry University of Colombo* **Prof. Sandun Senerath,** *Department of Botany, Faculty of Applied Sciences, University of Sri Jayewardenepura*
1.45 p.m.	**Lunch Break** **(Poster viewing)**
2.00 p.m.	**Technical Session** *Session Chair: Prof. Tharanga Thoradeniya & Dr. Niroshima Withanage*
3.30 p.m.	**Panel Discussion: Perspectives on Biochemistry Education in Sri Lankan Medical Schools** **Dr. Jayantha Welihinda** **Dr. Nilanka Perera** **Dr. Dulanji Beneragama** *Moderator: Dr. Sanath Mahawithanage*
4.30 p.m.	**Award Ceremony**
5.00 p.m.	**Concluding Remarks**

PAST AND PRESENT PRESIDENTS OF THE COLLEGE OF BIOCHEMISTS

Prof. Rasika Perera

(2013 -2017)

Prof. Sugandhika Suresh

(2017-2019)

Prof. Sharmila Jayasena

(2019 – 2021)

Prof. Lohini Athiththan

(2021 – 2023)

CBSL ORATION

Prof. C.P.D.W Mathew

Emeritus Professor,
University of Colombo

Prof. Deepal Mathew obtained his primary education at Nalanda Vidyalaya Colombo. He obtained a BSc Hons. degree from the University of Kelaniya. He obtained MSc and PhD. Degrees from the Dept. of Biochemistry of the Medical Faculty University of Colombo. He was a visiting scientist at the University of Uppsala and University of Lund in Sweden and the University of Kyoto in Japan. Prof. Mathew has supervised several MSc and PhD projects. He has authored several articles in indexed and peer review journals, a few books, and several monographs.

Prof. Mathew retired as a senior professor in Biochemistry and Molecular Biology and is at present an Emeritus Professor in Biochemistry and Molecular Biology, Faculty of Medicine University of Colombo. He was the head of the Department of Biochemistry from 2010 to 2016. He was a member of the Board of Management Institute of Indigenous Medicine, University of Colombo from 1995 to 2006. Member of the Board of Management, Institute of Biochemistry, Molecular Biology and Biotechnology from 2010 to 2016. Prof. Mathew was the president of the Faculty of Medicine Teachers' Association in 1993,2002 and served for three consecutive years from 2014.

Prof. Mathew was the general president of SLAAS in 2015 and was the chairman of the committee for popularisation of science in 1992, 2001, and 2006. Prof. Mathew was the general secretary of SLAAS in 1996, 1997, and 1998. He served as the honorable secretary of the Institute of Chemistry from 1992 to 1994.

Orations: Commencement lecture, Faculty of Medicine, University of Colombo
Prof. Kandiah Balasubramaniam Gold medal oration at the 24th Annual Sessions of the Jaffna Science Association. 2017 at the Faculty of Graduate Studies of the University of Jaffna.

Prof Mathew was a member of the Board of Governors National Institute of Fundamental Studies, Kandy; Council Member National Science Foundation***;*** Council Member Sri Lanka Standards Institution; Member of the Board of Management Sri Lanka Convention Bureau***;*** Member Board of Trustees SLAAS

At present he is a Board Member Board of Trustees SLAAS; Board Member National; Institute of Plantation Management; Council Member Coconut Growers Association.
Prof. Mathew comes from a family of planters and at present, he is cultivating coconuts, spices, fruits and rice in Kurunegala.

Sustainable Science

C. Deepal Mathew
Emeritus Professor, Dept. of Biochemistry & Molecular Biology, Faculty of Medicine, University of Colombo.

Science is like a tree. Unless the environment is good and fertilizer and water is provided it will not grow and bear fruit. In Sri Lanka science has always been a low priority subject to all Governments since the year 1948. Since independence, our neighbor India, has spent a large percentage of the budget for science and technology development. India is now enjoying the benefits of this investment.

The only significant development in science in Sri Lanka is observed in agriculture. This is seen from paddy production results. Paddy yield has increased from 0.9mt in 1950 to 3.12mt in 1995 the percentage of self sufficiency increased from 36% to 92%.

The success in agriculture was reversed by the decisions of the government to ban glyphosate in 2017 and to convert to organic agriculture in 2021.

Glyphosate is a derivative of the amino acid glycine. It is a broad – spectrum systemic herbicide that has been used since the 1970s and is the most used herbicide in the world. Glyphosate has a LD_{50} of 5000mg. The LD_{50} of some common chemicals are: Sodium Chloride 3000 mg/Kg. ethanol 7000 mg/kg. The International Agency for Research on Cancer (IARC) has classified glyphosate as probably carcinogenic in humans [Category 2A].

In Sri Lanka, a major component of the cost of production of agriculture is weed control. It is vital in major crops like tea, paddy and Coconut. The use of alternative herbicides will not only be more expensive, it will also lead to more serious environmental damage. With the ban of the glyphosate paddy yields in the wet zone decreased by 20%.

The ban of chemical fertilizer in 2021 was a death blow to agriculture. Organic fertilizer is not suitable for new breeds of plants. A major problem in organic fertilizer is that it gives 1% nitrogen compared to 40% for urea. This means 1 Kg of urea has to be replaced by 40Kg of organic fertilizer. Therefore, transport cost and application cost are increased. In general, organic products are expensive due to high cost of production and low yields. Agriculture lands under organic agriculture are India 1.3%, USA 0.6%, China 0.4% and Sri Lanka 3%. Countries with a high percentage under organic cultivation have large grasslands. The monkeys have become a major threat to agriculture. It is estimated that monkeys destroyed coconut worth rupees 1.8 billion per year in Kurunegala district. India has developed machines that produce ultrasonic sounds to chase away monkeys from farm lands. The Indian wildlife department has given an assurance that it is harmless to monkeys. However, Sri Lankan officials are not willing to import them as no evidence is available that it is not harmful to Sri Lankan monkeys. Now we have the joke of a century when it was proposed to sterilized monkeys. In a country where we cannot sterilize street dogs, how is it possible to sterilize wild monkeys? The simple solution is to reduce the population by killing a percentage of monkeys. This is what they do in Europe, Australia and South Africa when wild animal populations increase.

The fault with our scientific community is that many of them support any government decision. This is not what the country expects from scientists who have been educated from people's money.

KEYNOTE SPEAKER

Prof. Andrew H. -J Wang
Chair Professor, Ph.D. Program for Translational Medicine
Taipei Medical University
Taiwan

Structure-Based Antibody Developments

Andrew H.-J. Wang
Ph.D. Program for Translational Medicine, Taipei Medical University, Taipei, Taiwan
Institute of Biological Chemistry, Academia Sinica, Taipei, Taiwan

Monoclonal antibodies (mAbs) have become important biological molecules for many applications, including diagnostic reagents and therapeutic drugs. Monoclonal antibodies can now be produced in several ways such as more traditional hybridoma technology to single B-cell clonal selection to phage display technology. Monoclonal antibodies can possess high specificity and high affinity toward their antigens. However, therapeutic antibodies need to consider other factors such as stability, solubility, biological responses, and production yield for them to be suitable as clinical drugs. To identify suitable antibodies, extensive screening of clonal populations is often the method of choice. Alternatively, structure-based improvements of the initial antibody could be used to achieve the goal.

Recently additional new developments of other forms of antibodies such as antibody-drug conjugates (ADC), bispecific antibodies or combinatory therapies, have emerged as effective tools for clinical applications. In this lecture, several examples of the above-mentioned cases will be addressed. We have used structure-based improvement to produce high affinity, high neutralizing potency, and novel binding epitope simultaneously occupying both IL-1RI and IL-1RAcP residues that bind to IL-1β, which may be a new candidate for clinical treatments of inflammation-related diseases.

In addition, we have used DNA oligonucleotides as a linker to attach potent antitumor drug to anti-Her2 antibody to generate a versatile modular platform for ADC molecules. Finally, brief discussion of future perspective of antibody developments will be provided.

Discovery of Bioactive Natural Products Using Genomics Driven Approaches.

Jeremy G. Owen

School of Biological Sciences, Victoria University of Wellington, New Zealand

**jeremy.owen@vuw.ac.nz*

New Zealand's diverse terrestrial and marine microbiomes present many opportunities for the discovery of natural products and characterisation of their biosynthetic pathways. Our laboratory employs DNA-sequence-driven approaches to explore both the cultivable and as-yet uncultivated members of these microbiomes. In this talk, I will discuss our efforts toward the discovery of new bioactive non-ribosomal peptides and polyketides from soil and lichen microbiomes, as well as metagenomic approaches for elucidating the biosynthetic pathways for cytotoxic polyketides within the genomes of uncultivated marine sponge symbiotic bacteria.

SYMPOSIUM SPEAKER

Dr. Seeseei Molimau-Samasoni
Manager for the Plants and Postharvest Technologies Division, Scientific Research Organization, Samoa

Functional Genomics and Metabolomics Advance The Ethnobotany of The Samoan Traditional Medicine "Matalafi"

Seeseei Molimau-Samasoni
Manager for the Plants and Postharvest Technologies Division, Scientific Research Organization, Samoa

The leaf homogenate of *Psychotria insularum* is widely used in Samoan traditional medicine to treat inflammation associated with fever, body aches, swellings, wounds, elephantiasis, incontinence, skin infections, vomiting, respiratory infections, and abdominal distress. However, the bioactive components and underlying mechanisms of action were previously unknown. We used chemical genomic analyses in the model organism *Saccharomyces cerevisiae* (baker's yeast) to identify and characterize an iron homeostasis mechanism of action in traditional medicine as an unfractionated entity to emulate its traditional use. Bioactivity-guided fractionation of the homogenate identified two flavonol glycosides, rutin, and nicotiflorin, each binding iron in an ion-dependent molecular networking metabolomics analysis. Translating results to mammalian immune cells and traditional application, the iron chelator activity of the *P. insularum* homogenate or rutin decreased proinflammatory and enhanced anti-inflammatory cytokine responses in immune cells. Together, the synergistic power of combining traditional knowledge with chemical genomics, metabolomics, and bioassay-guided fractionation provided molecular insight into a relatively understudied Samoan traditional medicine and developed methodology to advance ethnobotany.

SYMPOSIUM SPEAKER

Prof. K.M. Nalin de Silva
Chair & Senior Prof. of Chemistry
Head of Department
Department of Chemistry
University of Colombo

Nanotechnology and Nanomaterials in Biological Systems and Medicine

K.M. Nalin de Silva

Department of Chemistry, University of Colombo

The influence of biotechnology and nanotechnology on biological systems will greatly impact the future of healthcare in the world. The future landscape of the healthcare industry will drastically change due to the introduction of nanomedicine, nanobots, nanofibers, and nanotech-based wearables. Nanomedicine is currently being used to develop targeted & magnetic drug delivery in cancer therapy. Nanotechnology in healthcare requires more research to overcome a lot of hurdles. There are various advanced applications of nanomaterials in the healthcare industry.

Functionalization of highly specific nanoscale particles which are less than 100 nm, at the cellular level can be employed to develop effective diagnostic and therapeutic procedures with the minimum of side effects. Quantum dots, iron oxide nanoparticles, nanowires and nanotubes are considered as potential nano sized particles in various applications in biological systems. The binding of these nanosized particles with various ligands results in varied properties including optical, magnetic, mechanical, and electrical. These properties will influence the affinity and specificity of nanoparticles towards various biological systems. It should be noted here that various nanoparticles such as silver, iron oxide, gold, carbon quantum dots, carbon nanotubes, graphene, zinc oxide and titania have been used in nanomedicine. Paramagnetic iron oxide nanoparticles have been used in various targeted and magnetic drug delivery applications.

Silver and gold nanoparticles can be synthesized at nanoscale and have unique biological properties like antibacterial, antifungal, antiviral, antiparasitic, antiplatelet, anti-inflammatory, and anti-tumor activity. Gold nanoparticles are used in resonance scattering dark-field microscopy for the detection of microbial cells, and the bio-imaging of tumor cells.

Nanotechnology in healthcare requires extensive, long term and strategic research to overcome a lot of hurdles. In addition, the nanotech solutions are costly which delays mass manufacturing. Therefore, scientists must work towards lowering the cost so that the technology can be accessible to the public. The coupling of nanotechnology with artificial intelligence will play a significant role in advancing the healthcare industry. The significant futuristic nanotechnology applications in the medical field include diagnostics, tissue engineering, targeted drug delivery, disease detection, detection of body oxygen, etc.

From Trees to Treat

Sandun Senerath
WTPSK Senarath, Department of Botany, University of Sri Jayewardenepura, Nugegoda

Recently, interest in natural products has increased. Biotechnology bridges the traditional use of plants and novel drug discovery. Although a large number of secondary metabolites with medicinal importance could be obtained by plants, drastic reductions in arable lands make it impossible to fulfill the demand. Plant cell culture gives an attractive novel tool to obtain pharmaceuticals through growing cells in a bioreactor.

Initially, plant tissues are growing *in vitro* to obtain a calli. Then a homogeneous cell suspension is obtained. Cell density and viability are regularly monitored and once the appropriate volume is reached this is transferred into a bioreactor. A permanent probe fixed in the system facilitates monitoring optimum culture conditions, nutrients, and also microclimatic conditions including temperature and pH.

Typical approaches to increase the productivity of cultured cells include optimizing culture conditions, addition of adsorption compounds to remove unwanted compounds, the addition of precursors, biotransformation, elicitor treatment, and cell immobilization. It is highly unlike that plant cells secrete secondary metabolites into the medium except a few. Taxol produced from cultured cells of Taxus *sp.* secrete into the medium yet most of them are accumulated in the vacuole. Thus use of different methods to facilitate product secretion is necessary. Changing membrane permeability has limited success. However, Quinoline alkaloid in *Cinchona* sp. have successfully been released by changing the pH of the medium. By the addition of selected compounds, equilibrium between the intracellular and extracellular compartments are changed and causes subsequent product release in Indole alkaloids from *Catharanthus roseus* cell culture.

Recovering of products need a number of steps. Initially, cells are removed by filtration then the liquid containing the biopolymer is concentrated and purified. Finally, the purified biopolymer is dried. Overproduction of metabolites in *Panax ginseng* when ginsenosides, rosmarinic acid from *Coleus blumei, and* diosgenin from *Dioscorea* sp. have been reported. On the other hand production of compounds that are not present in plants - Rosmarinic acid from *Lithospermum erythrorhizon* is also reported. Yet there are a large number of metabolites that are synthesized on a commercial scale through cell culture.

ORAL PRESENTATIONS

OP - 01

Association Between Urine Iodine Concentration and Subclinical Hypothyroidism among Normal and Overweight/ Obese Childbearing Age Females.

Hewage NI[1], Wijesekara GUS[2], and Perera PPR[1*]

[1]Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka, [2]Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka

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Background: Individuals must consume the recommended daily dose of iodine to sustain a healthy metabolism because thyroid dysfunction can occur with both low and high iodine levels. **Objectives:** To investigate the association between urine iodine concentration and prevalence of subclinical hypothyroidism (SCH) among young females in selected rural and suburban locations of Sri Lanka. **Methods:** Two-hundred and eighty-two participants between 18 to 35 years were enrolled in this community-based case-control study, and their height, weight, BMI, thyroid profile, and urine iodine concentrations (UIC) were assessed. The study excluded women who had pre-existing thyroid dysfunction, and there were very few women with overt hypothyroidism, hence they were also excluded from the study. The association of thyroid profile parameters with UIC was evaluated between normal and overweight/ obese females. Investigations were carried out in the University of Sri Jayewardenepura and Medical Research Institute, Sri Lanka. Statistical analysis was performed using SPSS version 26.0 (SPSS Inc., Chicago, IL, USA). **Results:** The prevalence rates of SCH and euthyroidism (EU) were determined among the total participants of the study, with SCH accounting for 40.42% and EU for 59.57%. The prevalence of SCH was significantly higher among overweight/ obese women compared to normal females ($p<0.05$). In the normal control group, the average UIC was higher than the recommended levels (288.51±150.24 µg/l), while in the overweight/obese group, it was excessive (340.71±147.00 µg/l), indicating excessive iodine intake. The analysis revealed a significant and strong association between UIC and SCH in both controls and cases ($p=0.003$, $Z=-3.591$ and $p=0.001$, $Z=-6.838$, respectively). Moreover, a significant association was found between thyroid-stimulating hormone (TSH) levels and urinary iodine (UI) concentrations among the study participants ($p=0.0001$). Out of the 137 individuals with elevated UIC, 105 (37.23%) were diagnosed with SCH. Additionally, thirty-two (11.35%) individuals with EU had elevated UIC. A significant association between SCH and high UIC was observed in controls and cases ($p<0.05$). **Conclusion:** There was a strong and positive correlation between high UIC and SCH in both study groups. Therefore, monitoring and controlling the iodine intake and salt iodization is essential to safeguard young females from SCH and its associated non-communicable diseases.

Acknowledgment: Financial assistance by University grant (Grant No: ASP/01/RE/MED/2018/51) from the University of Sri Jayewardenepura.

OP - 02

Comparison of the Selected Biochemical Parameters of Type 2 Diabetic Mellitus Patients Attending the Diabetic Centre, Teaching Hospital Jaffna with Iron Deficiency Anaemia and Non-Iron Deficiency Anaemia

Thivya K[1*], Risla MRF[1], Arasaratnam V[2], Aravinthan M [3]
[1]Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences, University of Jaffna, Sri Lanka, [2]Department of Biochemistry, Faculty of Medicine, University of Jaffna, Sri Lanka, [3]Diabetic Centre, Teaching Hospital, Jaffna, Sri Lanka
* *thivikalai2017@gmail.com*

Background: Prevalence of unrecognized iron deficiency anaemia (IDA) and non-iron deficiency anaemia (NIDA) are common among type 2 DM patients, leading to several complications. **Objective:** Objective of this study was to compare selected biochemical parameters of IDA and NIDA of type 2 diabetic patients, attending the Diabetic Centre, Teaching Hospital, Jaffna. **Methods:** This was a descriptive cross-sectional study. A systematic random sampling method was used to recruit 300 patients. Serum albumin and haemoglobin levels were measured. Among the 300 patients, anaemic patients were selected and their serum ferritin and Total Iron Binding Capacity (TIBC) were measured to identify IDA patients. Statistical analysis was carried out by independent sample t-test and Mann-Whitney U test considering $p<0.05$ as statistically significant. Data were presented as mean ± SD and median (IQR). **Results:** IDA (n=32) and NIDA (n=37) patients had mean haemoglobin levels of 9.74 (±1.54) and 9.31 (±1.69) g/dl, respectively. Mean serum albumin levels of IDA and NIDA patients were 3.67 (±0.64) and 3.72 (±0.70) g/dl respectively and not differed significantly. Median of FPG (Fasting Plasma Glucose) of IDA [6.02 (5.00-6.62) mmol/l] and NIDA [6.36 (5.43-9.51) mmol/l] patients was statistically significant ($p=0.019$). Median of serum ferritin of IDA [7.35 (4.65-8.3) ng/ml] and NIDA [28.9 (17.05-43.7) ng/ml] patients were statistically significant ($p<0.001$). The median of TIBC of IDA patients was [564.59 (267.94 – 961.72) µg/dl] higher than that of the NIDA patients [252.34 (169.85-320.57) µg/dl] and differed significantly ($p<0.001$). **Conclusion:** Between these IDA and NIDA patients, a significant difference was observed for fasting plasma glucose, serum ferritin and TIBC. It is important to include biochemical investigations in the routine screening of diabetic patients which can facilitate the identification of IDA and NIDA early in the course of disease.

Acknowledgment: The Department of Biochemistry, Faculty of Medicine, University of Jaffna for the laboratory facilities.
Keywords: Diabetes Mellitus, Iron deficiency anaemia, Non-Iron deficiency anaemia, Biochemical parameters.

OP - 03

Expression of Micro-RNAs 196a and 205 in a Population of Women with Cervical Cancer

*Wickramasinghe SMRN[1], Goonawardhana NDS[2], Premaratne SP[3], Perera PPR[1]

[1]Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka,[2]Synergy Bio PVT LTD, Sri Lanka, [3]Apeksha Hospital, Sri Lanka

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Background: Cervical cancer is the fourth most prevalent cancer affecting women globally, and is the leading cause of premature death of women in low to middle income countries. In Sri Lanka cervical cancer has the second highest incidence within the female population. The need for a more streamlined and accurate approach in early detection is necessary, and MicroRNAs (miRNAs) may be the best molecular target for detecting cervical cancer. In this study the expression of two Micro-RNAs was analysed and correlation between stage/grade of the tumour and expression level was evaluated. This is the first study to analyse the levels of miRNA-196a and -205 within a Sri Lankan population. **Objectives:** To determine the expression of the selected miRNAs and, to find a correlation between the expression of the miRNAs and tumour stage. **Methodology:** The sample type used was plasma taken from 30 cervical cancer patients attending Apeksha Hospital Maharagama and 30 controls were selected from Well-Women Clinics across Colombo. MicroRNA levels were assayed by Quantitative Real-Time PCR and commercially available kits were used. **Results:** MicroRNA-196a and -205 were downregulated in cases compared to controls. The expression of miRNAs in cases and controls was determined by T-test (2-tailed test) using SPSS software. The results showed a statistical significance between the expression of miRNAs in cases versus controls, with both miRNAs showing $p<.05$ (miRNA-196a $p.018$, miRNA-205 $p.001$). The most prevalent stage was shown to be FIGO stage IIB. **Conclusion:** In conclusion, the two miRNAs may show potential to be used as specific biomarkers for cervical cancer with further investigation.

Acknowledgments: Financial assistance by University Research Grant, University of Sri Jayewardenepura (ASP/01/RE/MED/2017/33).

OP - 04

Formulation and Characterization of *Aegle marmelos* L. Fruit Extracts-Encapsulated Alginate Nanoparticles as a Promising Source of Natural Antioxidants

*WND De Silva[1], AP Attanayake [1], DN Karunaratne [2], KMGK Pamunuwa [3], and LDAM Arawwawala[4]

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Background: Antioxidant activity exhibited by *Aegle marmelos* L. (Family: Rutaceae), has raised great interest in its important biological properties in the development of nanoencapsulated therapeutic agents. **Objectives:** To assess and compare the antioxidant activity of aqueous, ethanol, 50% ethanol, and 50% acetone extracts-encapsulated alginate nanoparticles (ALNPs) *in vitro* using four standard antioxidant assays. **Methods:** Ethanol (2 mg/mL), 50% ethanol (3 mg/mL), and 50% acetone (3 mg/mL) extracts of *A. marmelos* loaded ALNPs were formulated using the ionic gelation method and characterized in terms of encapsulation efficiency (EE%), loading capacity (LC%), particle size, zeta potential, scanning electron microscopy (SEM), and Fourier transform infrared (FTIR) spectroscopy analysis. ALNPs were subjected to evaluate their antioxidant activity *in vitro* by 2,2-di-phenyl-1-picrylhydrazyl (DPPH), 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical scavenging assay, ferric reducing antioxidant (FRAP), and oxygen radical absorbance capacity (ORAC) assays. Trolox was the reference compound of four standard antioxidant assays. Data were analyzed using one-way analysis of variance (ANOVA), followed by Tukey's post hoc test. **Results:** The highest LC% (4.11%) was obtained by aqueous extract-encapsulated ALNPs and its EE%, particle size, zeta potential were 43.84%, 182.7 nm, and -24.5 mV respectively. SEM analysis and FTIR analysis evidenced the successful encapsulation of *A. marmelos* extracts into alginate matrix. The 50% acetone extract encapsulated ALNPs showed significantly ($p<0.05$) higher ABTS radical scavenging activity (IC_{50}=0.02±0.00mg/mL) than the Trolox (IC_{50}=0.03±0.00mg/mL). The highest ORAC value of 386.71±9.88mg Trolox equivalent/g of extract was achieved significantly ($p<0.05$) with 50% ethanol extracts encapsulated ALNPs. The results of the DPPH and ORAC assays showed that antioxidant properties were preserved upon encapsulation. **Conclusion:** The 50% ethanol and 50% acetone extracts of *A. marmelos*-encapsulated ALNPs showed higher antioxidant potential than their crude extracts. The antioxidant potential of aqueous extract and ethanol extracts was preserved upon encapsulation. It is evidenced that extracts encapsulated ALNPs could be promising sources of natural antioxidants. However, further studies are warranted to investigate the safety and efficacy of *A. marmelos* encapsulated ALNPs using *in vivo* models.

Keywords: *Aegle marmelos* L., alginate nanoparticles, antioxidant activity
Acknowledgment: Financial assistance AHEAD DOR-15

OP - 05

Body Mass Index: a Factor that Determines Maternal Serum Calcium and Copper Levels in Pregnancy

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Background: Minerals are crucial for maternal and fetal metabolism. Many adverse pregnancy outcomes demonstrate an association with maternal mineral levels and body mass index (BMI). Nevertheless, association between BMI and mineral levels remains inconsistent. **Objective:** To investigate the association between BMI and maternal serum levels of copper and calcium during the first half of pregnancy. **Methods:** A cohort study was conducted at Teaching Hospital, Peradeniya, involving 539 expectant mothers in the first half of pregnancy (<20 weeks of gestation). BMI was calculated by height and weight measured at the first trimester. Maternal serum copper and calcium levels at the first half of the pregnancy were measured using Atomic Absorption Spectrometer. Normal serum mineral levels were determined based on reference values for first and second trimesters, and values below or above normal were categorized as low or excess, respectively. Correlation between serum mineral levels with BMI and association between mineral status and BMI was assessed, and $p<0.05$ was considered significant. Risk ratio (RR) of serum mineral levels for BMI-category was expressed with 95% confidence intervals (CI). **Results:** Prevalence of overweight and obese BMI-categories were 22.3% and 5.0%, respectively. Positive correlation between maternal calcium levels in the first trimester and BMI was identified ($p<0.05$). Significant association between BMI-category and serum copper ($X^2=24.8$, $p<0.001$) as well as serum calcium ($X^2=14.3$, $p<0.05$) was recognized. Overweight BMI-category was associated with 1.3 times higher risk of having excess maternal serum calcium levels (RR: 1.3; 95% CI: 1.1–1.6), irrespective of the trimester. Risk of occurrence of low (RR: 0.3; 95% CI: 0.1–0.7) and excess (RR: 0.43; 95% CI: 0.22–0.79) maternal serum copper levels were lower with overweight BMI-category. **Conclusion:** Mothers from overweight BMI-category had higher risk of having excess maternal serum calcium levels, but not for maternal serum copper levels.

OP - 06

Assessment of Acute Carbamate Poisoning Using Peradeniya Organophosphorus Poisoning Scale

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Background: Carbamate is chemically similar to organophosphorus (OP) insecticide and prevalence of acute intoxication is higher than OP poisoning. Though red blood cell (RBC) cholinesterase is the gold standard to assess anticholinesterase it is not available in Sri Lankan hospitals. **Objective:** To determine whether the Peradeniya Organophosphorus Poisoning scale (POP) scale, which was developed to assess the severity of OP, could be used as a severity marker to assess acute carbamate poisoning. **Methods:** A cross-sectional study was carried out on 95 patients with acute carbamate poisoning, admitted to Teaching Hospital Anuradhapura (Aug 2018 to Feb 2020). The severity of the poisoning was measured on admission by using both POP scale and RBC cholinesterase level. POP scale contains six common clinical features of OP poisoning, each feature was graded according to its severity to obtain a final score and classified into 3 groups, mild (score 0-3), moderate (score 4-7) or severe (score 8-11). Random blood sugar (RBS), aspartate transaminase (AST) and alanine transaminase (ALT) were assessed at the time of admission. Data analysis was done using SPSS. **Results:** Mean age of the total population was 33 (±13) years and majority were males (66.3%). Kruskal-Walli's test was used to determine median difference of RBS, AST, ALT among groups and 0.05 was considered as the significant level. Median RBC cholinesterase (decreased levels reflect increased poisoning) significantly decreased with the POP severity groups ($p<0.001$). Median RBS ($p<0.001$), AST ($p<0.001$) and ALT ($p<0.001$) levels significantly elevated with the POP severity groups. RBC cholinesterase, RBS, AST, and ALT on admission significantly correlated ($P<0.001$) with the POP scale according to Spearman's correlation test. **Conclusion:** Hence present study findings suggest that the POP scale can be used as an alternative method to assess the severity of acute carbamate poisoning.

Acknowledgment: University of Sri Jayewardenepura (Grant no: ASP/RE/01/MED/2017/63)

POSTER PRESENTATIONS

PP - 01

The Prevalence and Association of Hypertriglyceridemic-Waist Phenotype with Metabolic Syndrome among Normal and Overweight / Obese Young Females.

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Background: Obesity and metabolic comorbidities are significantly rising health risks in Sri Lanka. Abdominal obesity and elevated serum triglycerides are characteristics of the hypertriglyceridemic waist (HTGW) phenotype. **Objectives:** to determine the prevalence of the HTGW phenotype among normal and overweight/obese females of childbearing age and its correlation between HTGW and risk factors for the metabolic syndrome (MetS). **Methods:** Two-hundred and eighty-two females of 18 - 35 years were enrolled in this case-control study, and their height, weight, Body mass index (BMI), waist circumference/ central obesity (WC/CO), lipid profile, fasting blood sugar, fasting insulin levels, insulin resistance using Homeostasis Model Assessment-Insulin Resistance (HOMA-IR) and blood pressure were assessed. The relationship between HTGW phenotype and MetS parameters were evaluated. Those with WC > 76 cm (Sri Lankan borderline values) and triglyceride levels ≥ 150 mg/dl were considered to have the HTGW phenotype. Sample analysis was carried out at the University of Sri Jayewardenepura. The individuals with a BMI ranging from 18 - 22.9 kg/m^2 were classified as normal controls. On the other hand, cases classified as overweight or obese were defined as having a BMI of 23 - 24.9 kg/m^2 and > 25 kg/m^2, respectively. **Results:** From the 282 study subjects, 142 were normal controls and 140 were overweight/obese cases. All females in the overweight/obese group were found to have CO, while 60 females in the normal control group were diagnosed with CO. Furthermore, the presence of hypertriglyceridemia was observed in 34 individuals with CO from the control group and 85 individuals with CO from the case group. A strong and significant association was found between HTGW and WC ($p = 0.001$, $r = 0.786$, OR > 16). Females with the HTGW phenotype had significantly lower HDL levels ($p = 0.002$, $r = -0.336$), and showed an increased prevalence of HOMA-IR (46.78%) with a significant correlation ($p = 0.001$, $r = 0.436$; OR > 4) compared to normal females. Moreover, there was a significant correlation between the increased triglycerides and HTGW ($p = 0.03$, $r = 0.436$). The females with MetS in the CO group demonstrated a significant association with the HTGW phenotype ($p = 0.009$, $r = 0.521$). **Conclusion:** The prevalence of hypertriglyceridemia was significant in females with higher central obesity, indicating that obese women are more likely to have hypertriglyceridemic waist phenotype. Similarly, there was a strong and positive correlation between HTGW phenotype with MetS and its associated CVD risk variables in CO females. Therefore, we suggest that HTGW phenotype can be used as an effective index to spot females who are at higher cardiometabolic risk. **Acknowledgment:** Financial assistance by University grant (Grant No: ASP/01/RE/MED/2018/51) from the University of Sri Jayewardenepura.

PP - 02

Sperm Parameters and the Success Rates of Intrauterine Insemination at a Tertiary Referral Center

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Background: Infertility is a rising global health problem and one in seven couples is infertile worldwide. Intrauterine insemination (IUI) of processed semen into the uterus is one fertility treatment option although couples undergo numerous IUI without success. The density gradient method is one of the semen processing methods uses to process semen samples to extract healthy sperms. **Objectives:** This study aimed to describe the association of semen parameters and related factors on the success rate of IUI on infertile couples. **Methods:** This was a descriptive retrospective study. A total of 140 seminal fluid analysis (SFA) reports of couples who underwent IUI at the Fertility and Andrology clinic of Colombo South Teaching Hospital, from January 2017 to August 2021 were included and those with female factor infertility were excluded. Semen analysis indices (sperm concentration, motility, morphology, viability), related factors (age of female, number of IUI attempts) and the IUI pregnancy status, were extracted from records and analyzed using Pearson correlation test, cross tabulations of SPSS version 22.0. **Results:** Overall IUI success rate was 18.6% (n=26). A significantly high IUI success rate was noted when the age of the female partner is <30 years compared to >30 years (p= 0.000, OR=1.87), with the first two IUI attempts compared to multiple IUI attempts (p=0.017, OR=0.271) and pre-processed sperm concentration >30M/ml compared to <30M/ml (p=0.019, OR=0.271). Further, IUI success rate was significantly high when pre-processed total, progressive and non-progressive sperm motilities >40% compared to <40% (p=0.039, OR=5.31), >32% compared to <32% (p=0.034, OR=3.12) and <15% compared to >15% (p=0.003, OR=4.29) respectively. However, pre-processed sperm morphology (p=0.082) and sperm viability (p= 0.093) did not show significant association with IUI success rate. **Conclusion:** The success rate of IUI was significantly associated with age of the female partner, number of IUI attempts, pre-processed sperm concentration and pre-processed total, progressive and non-progressive motilities.

PP - 03

Evaluation of the Reliability Chronic Kidney Disease Epidemiology 2009 Equation in Calculating Estimated Glomerular Filtration Rate on Healthy Adults.

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Background: Glomerular Filtration Rate plays a vital role in the assessment of renal function. The Measured Glomerular Filtration Rate (mGFR) is time-consuming and expensive. Concurrently, equations were developed to calculate Estimated Glomerular Filtration Rate and they are mostly validated in white people. Therefore, there is a desperate need to validate these equations in the Asian population. **Objectives:** This study was conducted to evaluate the reliability of the CKD-EPI 2009 equation in calculating the Estimated Glomerular Filtration Rate by comparing it with the standard Normalized Creatinine Clearance method in healthy adults of Sri Lanka. **Methods:** This was a cross-sectional study conducted at the Faculty of Allied Health Sciences, University of Jaffna. A total of 156 blood and timed urine samples (Four-hour timed urine samples) each were collected by random sampling method from healthy adults. Creatinine estimation was performed from both serum and urine by the Jaffe Alkaline Picric Acid Kinetic method. Estimated Glomerular Filtration Rate and Measured Glomerular Filtration Rate were calculated. Ethical clearance was obtained to carry out the study. SPSS version 26 was used for the analysis of data. Paired sample t-test was performed to compare the means. $P<0.05$ was considered significant. **Results:** Among 156 participants 98 (62.8%) were females. The age of the participants ranged from 21 to 27 years with a mean of 24.60 (±1.74). The mean difference between the eGFR by CKD-EPI 2009 equation (Mean=110.28ml/min/1.73m^2(±13.43)) and Normalized Creatinine Clearance (Mean=102.75ml/min/1.73m^2(±12.)) was statistically highly significant ($t(155)=-5.795$, $p=0.000$) with a mean difference of -7.528 (±16.224) which overestimated mGFR. **Conclusion:** The study results highlight that the CKD-EPI 2009 equation overestimates mGFR. It is recommended to evaluate the reliability of the equation with wider geographic regions of the country and adding a correction factor or developing new formulae to estimate GFR for the local population.

PP - 04

Liver Function Test Analysis in a Group of Patients with SARS-CoV-2 Infection: A Retrospective Study

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Background: Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is infected primarily through the lungs and then enters the body via viral entry receptors. However, SARS-CoV-2 has the potential for multiple organ injuries which can occur as post-covid complications. Therefore, identifying the negative consequences of the disease could help prevent future healthcare burdens. Interestingly, a mild elevation of liver chemistry has been reported in SARS-CoV-2 patients which suggests the probability of future liver disease. **Objectives:** The study aimed to evaluate the liver function in SARS-CoV-2 infected patients to identify the associations between liver function tests (LFT) and infectious status. **Methods:** An analytical retrospective study was carried out with medical records of 125 patients admitted to the National Hospital Kandy, Sri Lanka during the wave of Omicron (BA.1 & BA.2) variant from January to April 2022. The infected individuals were confirmed by RT-PCR (Reverse Transcription Polymerase Chain Reaction) or by Rapid Antigen Test (RAT) using nasopharyngeal swabs, while blood samples were collected for biochemical analysis. The cycle threshold (Ct) value of RT-PCR, results of RAT, and laboratory results of LFT were collected. The ethical clearance was obtained from the ethics review committee, Faculty of Allied Health Sciences, University of Peradeniya. LFT results were categorized as either normal or abnormal according to the deviation from the accepted reference ranges. The clinical evaluation of the infection was categorized as symptomatic or asymptomatic based on the clinical examination. The infectious status was categorized by Ct>30 or RAT 'negative' as non-infectious while a Ct<30 or RAT 'positive' as infectious. **Results:** The majority of patients were asymptomatic (n=88, 70.4%) and infectious (n=108, 86.4%) while 88% of patients showed abnormal liver function tests (n=110). In addition, LFT showed abnormal results for ALT (20%), AST (39.2%), ALP (25.9%), and TBIL (98%) in symptomatic patients. However, the degree of liver injury may be acute as suggested by normal levels of total protein and albumin in patients with deranged LFT. **Conclusion:** Abnormal LFT results were frequent in SARS-CoV-2 infection but there were no significant associations found with clinical condition or infectious status.

PP - 05

Evaluation of the Effect of fist Clenching during Blood Collection in the Measurement of Lipid Profile

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Background: Repeated fist clenching and maintaining, either with or without the application of a tourniquet was a part of an unreliable collecting procedure that was associated with significant variability in several laboratory tests. The most frequently analyzed analyte is lipid profile since it is crucial to maintaining the homeostasis of the body. **Objectives:** The study aimed to evaluate the effect of fist clenching during blood collection in the measurement of the lipid profile of healthy individuals at the Faculty of Allied Health Sciences, University of Jaffna. **Methods:** A total of 56 paired blood samples were collected from healthy individuals at the Faculty of Allied Health Sciences, University of Jaffna. A volume of 2.5 ml blood was collected each from an arm without and asked the individual to clench the fist for 6 continuous times before venipuncture and maintaining the fist until blood was collected within 5 minutes from the same vein. Serum total cholesterol, serum triglycerides, and serum HDL cholesterol levels were measured by the para-amino antipyrine (PAP) method, enzymatic glycerol phosphate oxidase/peroxidase method, and precipitation method, respectively. LDL was calculated by the Friedewald formula. All the data were analyzed by using paired t-test (Total cholesterol & LDL) and Wilcoxon signed-rank test (TG & HDL). The confidence interval was set as 95% and the study outcomes were considered significant when at $p<0.05$. **Results:** An increase in the mean percentage in samples with fist clenching was observed in total cholesterol (+1.02%), triglycerides (+1.69%), and HDL (+1.62%), whereas a decrease was observed in serum LDL (-0.45%) and serum total cholesterol, triglycerides, and HDL were statistically highly significant ($p=0.000$) while serum LDL was statistically moderately significant ($p=0.003$) when compared to samples without fist clenching. **Conclusion:** This study highlights that fist clenching and maintaining should be avoided during venous blood collection for the measurement of lipid profile. However, it is recommended to evaluate the effect of fist clenching in a larger population to get more accurate results.

Keywords: Total cholesterol, triglycerides, fist clenching.

Acknowledgment: The Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences, University of Jaffna for the laboratory facilities.

Obesity and its Association with Lipid Status and Body Mass Index among Female Undergraduates Residing in Hostels of the University of Sri Jayewardenepura.

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Background: Obesity has been an epidemic in nearly every country in the world. Anthropometric measurements and lipid status are two of the best parameters to assess the magnitude of obesity. **Objectives:** Present study was designed with the aim of investigating the perception regarding nutritional status and its association with lipid status, and selected anthropometric parameters among female undergraduates residing in hostels of the University of Sri Jayewardenepura. **Methods:** An analytical cross-sectional study was performed on 135 female undergraduates residing in hostels of the University of Sri Jayewardenepura, Sri Lanka. Blood samples were collected from the participants who were overnight fasting for 12-14 hours. Total cholesterol and triglyceride concentrations were assayed using the enzymatic hydrolysis method. A pretested self-administered questionnaire was used to retrieve information regarding the personal factors of participants. Physical activities were assessed using the pre-tested self-administrated questionnaire and as it is not a standard method it is a limitation of our study. Height and weight were measured following standard protocols to calculate the BMI of each individual according to Asia-Pacific cut-off points (BMI < 18.5 kg/m² -underweight, BMI between 18.5 to 22.9kg/m²- normal weight, BMI between 23.0 to 24.9kg/m² - overweight and BMI≥ 25.0kg/m² - obese). Descriptive statistical methods and chi-square tests were used to analyze data. **Results:** Of the 135 females, the distribution of individuals according to their BMI categories were 15.6% (n=21) underweight, 54.8% (n=74) normal, 15.6% (n=21) overweight and 14.1% (n=19) obese. Distribution of individuals according to total cholesterol level was 64.4% (n=87) desirable, 28.1% (n=38) borderline high and 7.4% (n=10) high total cholesterol level. Triglyceride levels were normal in all the individuals. BMI categories were not significantly associated with total cholesterol level (P = 0. 730), and physical activities (P = 0. 388). **Conclusions:** The prevalence of overweight and obesity is 15.6% and 14.1% respectively in the population and total cholesterol did not show an association with BMI groups in this study population.

Vitamin D Status of Pregnant Mothers with Gestational Diabetes Mellitus and its Effect on Anthropometric Measurements of the Offspring: Preliminary study

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Background: Both maternal vitamin D deficiency and gestational diabetes mellitus (GDM) are common health concerns in the world. Recent studies have found that maternal vitamin D deficiency is associated with the risk of developing GDM. But, there is very little evidence of its effects on the offspring. **Objective:** To determine the vitamin D status of pregnant mothers with GDM and its effect on anthropometric measurements of the offspring. **Methods:** This was a descriptive cross-sectional analysis of a nested case-control study. Thirty-five pregnant mothers diagnosed with GDM were recruited using convenience sampling. Participants were assessed for GDM considering their OGTT results based on IADPSG criteria in the antenatal record (Fasting ≥92 mg/dl, 1- hour≥180 mg/dl, 2 hours- 153 mg/dl). About 3.0 ml of blood samples were collected from each participant during 24-28 weeks of gestation to analyze maternal serum 25(OH)D levels, and they were followed up until the delivery. Maternal serum 25(OH)D level was analyzed using LIAISON analyzer with chemiluminescent immunoassay technology. Mothers having multiple pregnancies and pre-existing diseases were excluded. The birth weight, length, and head circumference of the neonates were recorded. Descriptive statistics and bivariate correlations in SPSS version 23.0 were used in statistical analysis. P value <0.05 was considered statistically significant. **Results:** Mean maternal serum 25(OH)D level was 16.6±5.1 ng/mL. Mean (±SD) birth weight, fetal length, and head circumference of the babies were 2.92±0.49 kg, 51.6±3.0 cm, and 33.2±1.8 cm respectively. Among the pregnant mothers, 8.6% were vitamin D deficient (<10 ng/mL), 68.6% insufficient (10-20 ng/mL), and 22.9% were sufficient (>20 ng/mL). No significant correlation was found between maternal vitamin D status and neonatal anthropometry (p>0.05). **Conclusion:** The majority of the pregnant mothers diagnosed with GDM were vitamin D insufficient (68.6%). This study shows no significant correlation between maternal vitamin D status and anthropometric measurements of the offspring born to mothers with GDM.

Keywords: Gestational diabetes mellitus, vitamin D deficiency, offspring, anthropometry

Acknowledgment: Financial assistance by the University of Sri Jayewardenepura (Grant no: ASP/01/RE/MED/2021/63)

Evaluation of *in-vitro* Antioxidant Activity of Improved Red and White Rice (*Oryza sativa*) Varieties in Sri Lanka

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Background: In Sri Lanka, rice is the staple food and there are many rice varieties cultivated island-wide including some improved and traditional rice varieties. Research conducted over the last two decades has shown that rice contains a unique complex of naturally occurring antioxidant compounds. Increased implications over the safety of synthetic antioxidants like butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT) have led to an increased interest in investigating effective and economical natural antioxidants. However, no antioxidant activity evaluation study has been conducted on these improved rice varieties. **Objective:** The objective of the present study was to assess the *in-vitro* antioxidant activity of the methanolic extract of grains of rice. **Method:** Rice varieties: Ld408, Ld371, Ld368, Ld376, Ld253, and Ld365, were collected from the Rice Research Station, Labuduwa, Sri Lanka. The methanolic extracts of grains were obtained by maceration and evaporation of the solvent within 24 hours. The extracts were assessed for *in-vitro* antioxidant activity in triplicates using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging and ferric-reducing power activity assays with ascorbic acid as the positive control. The statistical analysis was carried out using descriptive and inferential statistics in GraphPad Prism 9. **Results:** It was observed that mean DPPH scavenging and ferric-reducing power activity was in the range of 27.36±12.84 mcg/ml to 50.53±17.41 mcg/ml and 9.389±0.777mcg/ml to 2092±1.914 mcg/ml respectively for all the rice varieties. Significant differences were observed among all the extracts of rice varieties for investigated antioxidant properties ($p<0.05$). Among the rice varieties Ld408, a red variety had the highest ferric reducing power ($p<0.05$) (EC_{50}=90.84 ± 0.31 mcg/ml) and DPPH scavenging activity (IC_{50}= 45.586 ± 0.035 mcg/ml). The order of scavenging for DPPH was Ld408> Ld253> Ld376> LdLd365> Ld368> Ld371. The antioxidant power of the extracts for ferric reducing power assay was in the order of Ld408>Ld253>Ld365 >Ld371>Ld378>Ld376. **Conclusion:** Among the rice varieties Ld408, a red variety had the highest ferric-reducing power and DPPH scavenging activity. It is concluded that improved rice varieties possess marked antioxidant properties and consumption may play an important role in the prevention of chronic diseases associated with oxidative stress.

Acknowledgment: KIU undergraduate research fund.

Pharmacognostic Evaluation and Antifungal Activity of Rhizome of the *Languas galangal*

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Background: Rhizome of *Languas galangal* (Kaluwala) is traditionally used in Sri Lanka for the treatment of skin infections caused by fungi. **Objectives:** The aim of the present study was to authenticate the plant through pharmacognostic evaluations and access the antifungal activity. **Methods:** The organoleptic studies were carried through sensory organs and histology of the transverse section of rhizome was observed under microscope. Ash values, fluorescence analysis of the rhizome powders was carried out using standard procedures. Dried powdered rhizome was extracted with hexane, dichloromethane, ethyl acetate, and methanol using Soxhlet extraction. The agar well diffusion method was used to assess the antifungal activity against *Candida albicans* and *Aspergillus Niger*. Potato dextrose agar (PDA) was used as the culture medium. Clotrimazole is used as the positive control and dimethyl sulfoxide (DMSO) as the negative control. Phytochemical properties of the most active galangal extract were observed using the test including the tannin test, flavonoid test, saponin test, alkaloid test, steroid test and terpenoid test. **Results:** Morphologically, aerial stem is a pseudo stem which is approximately 3.08 meters in height. Leaves are simple and the underside is purple in color. The rhizome powder is brown in color with a strong aromatic smell. Transverse section of the rhizome shows the multiple layered epidermis embedded with dark brown pigments and consists of parenchymal cells. Vascular bundle composed of triangle shape continuous rim. The microscopic analysis of power showed the presence of phloem vessels, calcium crystals, starch grains, trichomes, short fibers, endocarps and oleo resinous cells. The total ash value of the power is 5% while the acid insoluble ash value is 0.65% and water-soluble ash value is 2.40%. The hexane extract (30mg/ml) showed maximum zone of inhibitions against *C. albicans and A. niger*. (20.20 ±0.46 and 18.20 ±0.46 mm) and moderate zone of inhibition was shown by the methanol extract (30mg/ml). Other two extracts (30mg/ml) show minimum antifungal activity. Clotrimazole (5mg/ml) produced a larger zone of inhibition (36.10 ± 0.65 mm) and no inhibitory zones observed for 5% DMSO. Phytochemical screening of most active hexane extract gives positive results for tannin, flavonoid, alkaloid, terpenoid, steroid tests except for saponin test. **Conclusion:** The hexane extract of *L. galangal* was identified as the best extract with stronger antifungal activity against *C. albicans and A. niger* than the other three extracts. The results of the anatomical, organoleptic and physiochemical parameters of the will be useful for the confirmation of the identity and authenticity of the *L. galangal* plant. Furthermore the galangal hexane extract contained tannins, flavonoids, alkaloids, terpenoids and steroids and did not contain saponins.

Keywords: Pharmacognostic evaluation, Antifungal activity, *Languas galangal* rhizome, phytochemical screening

PP – 10

Association of Red Cell Morphology with Selected Biochemical Parameters in Iron Deficiency Anaemic and Non-Iron Deficiency Anaemic Type 2 Diabetic Patients, Attending the Diabetic Centre, Teaching Hospital Jaffna

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Background: Both iron deficiency anaemia (IDA) and non-iron deficiency anaemia (NIDA) are multifactorial phenomena and independent risk factors for the development and progression of diabetic-related microvascular and macrovascular complications.

Objective: The objective of this study was to find the association of red blood cell morphology with selected biochemical parameters among IDA and NIDA type 2 diabetic patients, attending the Diabetic Centre, Teaching Hospital Jaffna.

Methodology: This study was a descriptive cross-sectional study and 300 patients were selected by systematic random sampling. The haemoglobin (Hb), serum ferritin and Total Iron Binding Capacity (TIBC) were estimated, and a peripheral blood smear was prepared. Data were described as numbers and percentages. Statistical analysis was carried out by independent sample t-test and Mann-Whitney U-test.

Results: Among the total 300 patients, 32 patients had IDA while 37 patients had NIDA. All the IDA patients exhibited microcytic hypochromic blood pictures. All those who had IDA exhibited microcytic hypochromic blood pictures along with teardrops (n=9) elliptocytes (n=8) and both teardrops and elliptocytes (n=5). Meanwhile, NIDA patients had normocytic normochromic (n=9), normocytic hypochromic (n=12) and microcytic hypochromic (n=16) blood pictures. IDA (n=10) and NIDA (n=16) patients with microcytic hypochromic blood picture had median serum ferritin levels of 8.20 (4.52-9.37) and 19.90 (14.47-37.20) ng/ml and median TIBC level of 712.91 (560.93-759.56) and 575.10 (332.52-648.32) ug/dl respectively with no significant difference. The median of serum ferritin level decreased as the red cell morphology changed from microcytic hypochromic [8.20 (4.52-9.37)]ng/ml to elliptocytes [7.50 (4.25-8.15)]ng/ml to teardrops [6.90 (3.67-8.10)]ng/ml.

Conclusion: Some of the patients with NIDA have possibility to develop IDA and hence it is important to evaluate both the biochemical and red cell morphology of the diabetic patients to identify and manage the development of both IDA and NIDA effectively and efficiently.

Keywords: Diabetes Mellitus, Iron deficiency anaemia, Non-Iron deficiency anaemia, Biochemical parameters, Red Cell Morphology.

α-Amylase Inhibition Activity of Selected Edible Mushrooms in Sri Lanka

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Background: Over recent years, there has been an increased demand for mushrooms globally. This is mainly attributed to the immense nutritional and medicinal value of mushrooms. *Agaricus bisporus*, *Pleurotus ostreatus* and *Pleurotus cystidiosus* are three popular mushroom types in Sri Lanka. **Objectives:** This research evaluated and compared the α-amylase inhibition potential of the above three mushroom varieties. **Method:** The crude aqueous extracts (1 g/ 1mL) of each mushroom type were prepared by reflux method. The experiment used the concentration gradient (6.25 –200 mg/mL), and all the tests were performed in triplicate. Acarbose was used as a positive control. Results with $p < 0.05$ were considered statistically significant. The effective concentration of the sample required for inhibition of α-amylase by 50 % (IC_{50}) was obtained by means of linear regression analysis of the dose-response curve plotted between percentage inhibition *vs* concentration. **Results:** The results revealed that all the test doses of each mushroom significantly ($p < 0.05$) inhibit α-amylase in dose-dependent manner, compared to the negative control. The IC_{50} value for aqueous extracts of *A. bisporus, P. cystidiosus and P. ostreatus* were found as 107.88 mg/mL, 5.77 mg/mL and 4.33 mg/mL, respectively. The IC_{50} value for acarbose solution was found as 107.44 µg/mL. **Conclusion:** Hence, *P. ostreatus* was identified as the most active type among there tested mushroom types in the study. This provides scientific support for the medicinal validity of selected mushrooms grown in Sri Lanka and will enhance consumers' preference to add mushrooms to their daily diet.

Acknowledgments: Financial assistance by the Faculty of Health Sciences, CINEC Campus is gratefully acknowledged.

Antioxidant Potential of *Pleurotus djamor*

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Background: *Pleurotus djamor* is an edible oyster mushroom that is a valuable source of proteins, vitamins and minerals. Although *P. djamor* is used as a food source, the literature survey revealed that published scientific information on its medicinal value is still being determined. **Objectives:** Hence, the present study has been aimed to evaluate antioxidant potential of *P. djamor* grown in Sri Lanka. As phenolics and flavonoids play a great role in scavenging free radicals in the body and act as antioxidants, the present study also aimed to evaluate the total phenolic and flavonoids. **Method:** The antioxidant activity of hot aqueous extracts of *P. djamor* (HAEP) was evaluated by using a 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay. Ascorbic acid (0.625 µg/mL- 25 µg/mL) was used as a positive control. The radical scavenging activity of test samples was expressed as an IC50, which is defined as the mean concentration of the antioxidant required to lower the initial DPPH concentration by 50% in each experiment. It was determined by using the graph plotted with the mean concentration of triplicates of each test sample vs percentage radical scavenging activity. The total phenolic content (TPC) of HAEP was determined by using the Folin–Ciocalteu method and the AlCl3 method was used for total flavonoid content (TFC). Gallic acid (100 µg/mL- 2.5 µg/mL) and quercetin (31.25 µg/mL- 800 µg/mL) were used as positive controls for two assays, respectively. The data were analyzed by using SPSS software and the p value < 0.05 was considered as statistically significant. **Results:** The HAEP exhibited significant ($p<0.05$) dose-dependent DPPH scavenging activity with an IC50 value of 37.42 mg/mL, whereas 12.91 µg /mL for ascorbic acid. The result showed that the total phenolic present in HAEP was 0.51 ± 0.06 mg GAE/g fresh weight of *P. djamor*. The result showed the total flavonoid present in the aqueous extract of fresh *P. djamor* was 9.88 ± 0.11 mg QE/g fresh weight of *P. djamor*. **Conclusion:** In conclusion, the present findings provided scientific evidence for the *in-vitro* antioxidant properties of *P. djamor*. **Acknowledgments:** Financial assistance by the Faculty of Health Sciences, CINEC Campus, is gratefully acknowledged.

Antioxidant activity and Brine shrimp lethality of leaf and bark extracts of *Neolitsea cassia* (L.) Kosterm (Dawul Kurundu)

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Background: Antioxidants are dynamic substances that have the ability to delay or prevent the damage caused by free radical-induced oxidative stresses and thereby suppress life-threatening diseases. Plants are an excellent source of phytochemicals with potent antioxidant activity. On the other hand, plants of the genus *Neolitsea* have been reported to possess various bioactivities such as antioxidant, antimicrobial and anti-cancer activities. However, *Neolitsea cassia* (L.) Kosterm (Dawul Kurundu) which is a native plant to Sri Lanka, has not been evaluated on these. **Objectives:** This study was aimed to assess the antioxidant activity and brine shrimp lethality of leaf and bark extracts of *N. cassia*. **Methods:** The air-dried leaves and bark of *N. cassia* were extracted by maceration (24hours, room temperature), using a mixture of methanol and dichloromethane (50:50 v/v %) and concentrated. Both extracts were screened (in triplicate) for Brine shrimp lethality and antioxidant activity using 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay. **Results:** The results revealed that the bark extract exhibited significant ($p<0.05$) antioxidant activity with a lower IC_{50} value of 64.792 ppm while the leaf extract showed moderate antioxidant activity (IC_{50} 252.87 ppm), compared to the ascorbic acid (positive control; IC_{50} value of 50.70 ppm). In addition, both bark and leaf extracts produced a minor brine shrimp lethality against nauplii with LC_{50} values of 125.16 ppm and 349.19 ppm respectively where the positive control (potassium dichromate) had the LC_{50} value of 0.75 ppm. **Conclusion:** Hence, the bark extract of *N. cassia* can be used to develop as an antioxidant therapeutic agent in future studies.

Acknowledgment: Financial assistance given by the Rajarata University of Sri Lanka is acknowledged.

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ACKNOWLEDGEMENT

The council of the College of Biochemists of Sri Lanka, wishes to thank the following for their help and support in organising the 4th Conference of the College of Biochemists of Sri Lanka (CBSL).

- Professor Narada Warnasuriya, Emeritus Professor University of Sri Jayewardenepura for accepting our invitation as Chief guest.
- Prof. Aloka Pathirana, Dean, Faculty of Medical Sciences, University of Sri Jayewardenapura for accepting our invitation as guest of Honour.
- Prof Deepal Mathew, Emeritus Professor, University of Colombo for accepting our invitation to deliver the first CBSL oration.
- Prof Andrew H.-J Wang, for accepting our invitation as the keynote speaker
- All invited speakers who participated in the symposium and the panel discussion.
- The panel of judges for oral and poster evaluation sessions.
- All those who submitted abstracts for free papers.
- All reviewers who reviewed abstracts.
- All sponsors (Astron Pharmaceuticals, Hemas Pharmaceuticals, Commercial Bank, (Pvt) Ltd, GT Pharmaceuticals (Pvt) Ltd., Ceylon Biscuits Limited (CBL),) for financial support.
- Sarasi Studio for IT services.
- Mr. Nishantha for decorations at the venue.
- Jpura Flames for photographic services.
- All participants who joined us both virtually and physically from all parts of the world.

Conference Proceedings: College of Biochemists of Sri Lanka (Online)

Publisher: College of Biochemists of Sri Lanka

Editor : Dr. Maduka de Lanerolle-Dias
7th July 2023
4th Conference of the College of Biochemists of Sri Lanka

ISSN 2989-0780
ISSN 2989-0780