KIU

4TH MULTIDISCIPLINARY RESEARCH CONFERENCE 2025 (MRC 2025)

Proceedings Book IV (Health Sciences)

Inspiring Excellence in Innovation through Multidisciplinary Research
25th October 2025

Organized by: KIU, Sri Lanka

Proceedings

The 4th Multidisciplinary Research Conference 2025 (MRC 2025)

"Inspiring Excellence in Innovation through Multidisciplinary Research"

25th of October 2025 | Colombo, Sri Lanka

Committee of the 4th Multidisciplinary Research Conference 2025
Tel: 011 274 1879

mrc@kiu.ac.lk

Cover page design and Page setup – Ms. Awanthi Nisansala

Disclaimer

The responsibility for opinions expressed, in articles, studies, and other contributions in this publication rests solely with their authors, and this publication does not constitute an endorsement by the 4th Multidisciplinary Research Conference 2025 or KIU, Sri Lanka, of the opinions so expressed in them.

ISSN 3030-7929

Published by KIU Sri Lanka
No. 249/1, Malabe Road, Thalangama North,
Koswatta, Battaramulla, Colombo. 10120, Sri Lanka
e-mail: mrc@kiu.ac.lk | Tel: 011 274 1879

Table of Contents

Advisory Board of the
4th Multidisciplinary Research Conference 2025

Dr. Sajeewanie Liyana-arachchi	Conference Chief Advisor
Prof. Piyanjali De Zoysa	Conference Advisor
Prof. Wasantha Seneviratne	Conference Advisor
Prof. Tissa Perera	Conference Advisor
Prof. Meththika Withanage	Conference Advisor
Prof. Gamithri Karunarathne	Conference Advisor
Prof. Nigel Alexander	Conference Advisor
Assistant Prof. He Yan	Conference Advisor
Dr. Indrapala Chandrasekaram	Conference Advisor
Dr. Ganga Karunathilake	Conference Advisor

Committee Members of the
4th Multidisciplinary Research Conference 2025

Prof. Anuradhi S. Hapuarachchi	Conference Chairperson
Dr. Anuradha Thennakoon	Conference Co-Chairperson
Mr. Akila R. Jayamaha	Conference Co-Chairperson
Ms. Nadeeka Ranadeva	Conference Co-Chairperson
Ms. Thakshila Dushyanthi	Conference Co-Chairperson
Mr. Dilantha Deva Adithya	Conference Co-Chairperson
Prof. Priyanganie Senanayake	Editor-in-Chief
Prof. Ajantha Dharmasiri	Orator
Dr. Malmi Kiriwandalage	Keynote Speaker
Ms. Chamathi Pinnawala	Conference Secretary
Ms. Caroline A Fernando	Conference Co-Secretary
Ms. W. M. D. N Abeyrathna	Conference Co-Secretary
Ms. Yasoda Rasanjanee	Conference Co-Secretary
Ms. Imeshika Dilrukshi	Conference Co-Secretary
Ms. Savindi Kodikara	Conference Co-Secretary
Ms. Ishara Herath	Conference Coordinator
Ms. Inomi Anjala	Conference Coordinator
Ms. Dinithi Dasalya	Conference Coordinator
Ms. Dewni Perera	Conference Coordinator
Ms. Caroline A Fernando	Conference Treasurer

Editorial Committee Members
4th Multidisciplinary Research Conference 2025
Health Sciences Track

Prof. Priyanganie Senanayake	Editor-in-Chief
Prof. Anuradhi S. Hapuarachchi	Editor
Prof. S. S. P Warnakulasooriya	Editor
Prof. M. K. D. L Meegoda	Editor
Prof. Thamara Amarasekara	Editor
Prof. Wasantha Seneviratne	Editor
Prof. Sampath Punchihewa	Editor
Prof. Tissa Abeysekara	Editor
Dr. Sajeewanie Liyana-arachchi	Editor
Dr. Anuradha Tennakoon	Editor
Dr. Indrapala Chandrasekaram	Editor
Mr. Akila R. Jayamaha	Editor
Ms. Kanchanamala Geekiyanage	Editor
Ms. Nadeeka Ranadeva	Editor
Ms. Nirmani Samarakoon	Editor
Ms. Thakshila Koralge	Editor
Mr. Dilantha Deva Adithya	Editor

Technical Session Committee Members of the
4th Multidisciplinary Research Conference 2025
Health Sciences Track

Dr. Dineshani Hettiarachchi	Session Chairperson
Dr. Radhika Samarasekara	Judge
Dr. Lalinka Herath	Judge
Dr. Danusha Nirmani	Judge
Dr. Chamara Basnayake	Judge
Ms. Dilini Jagoda	Judge
Ms. Anjali De Silva	Judge

Panel of Reviewers (Health Sciences) of the 4th Multidisciplinary Research Conference 2025

Ms. Nadeeka Ranadeva	Reviewer
Ms. Nirmani Samarakoon	Reviewer
Ms. Caroline Anastasia	Reviewer
Ms. Charuni Tharindi	Reviewer
Ms. Roshani De Silva	Reviewer
Ms. Yasoda Rasanjanee	Reviewer
Ms. Savindi Kodikara	Reviewer
Ms. Sasini Sathsarani	Reviewer

Organizing Committee of the 4th Multidisciplinary Research Conference 2025 Health Sciences Technical Session Coordinators

Ms. Viboda Savindi Kodikara
Mr. Geeshan Pasindu Bandara
Mr. E.U. Madhushanka
Ms. Nirosha Niwanthika
Ms. Thinuri Wijenayaka
Ms. I.G. Anushka Mamalgaha
Mr. Gayan Nilupul Rajapaksha
Ms. M.C.N.F Sahara

Message from the President

Dr. Jagath Seneviratne
President, KIU University

Research is the foundation upon which knowledge evolves and societies progress. A university's strength is measured not only by the degrees it awards, but by the questions it dares to ask and the discoveries it brings to the world. At KIU, we consider research an essential pillar of academic growth, one that cultivates critical thinking, nurtures innovation, and empowers individuals to contribute meaningfully to their fields.

In an era defined by rapid technological change and complex global challenges, the value of research becomes even more profound. It provides the tools to understand emerging realities, the evidence to guide decisions, and the insight to shape sustainable futures. Whether in the sciences, humanities, or applied disciplines, rigorous inquiry remains a universal catalyst for advancement.

As an institution committed to academic excellence, KIU continues to encourage work that expands perspectives, challenges assumptions, and strengthens scholarly dialogue. The pursuit of knowledge is a responsibility shared by all who engage in academia, and it is through this collective effort that we elevate the intellectual landscape of our nation.

Research does not merely produce answers, it opens pathways. And it is these pathways that lead us toward deeper understanding, greater innovation, and a more informed society.

Message from the Vice Chancellor and the Chief Advisor of the 4th Multidisciplinary Research Conference 2025

Dr. Sajeewanie Liyana-arachchi
Vice Chancellor, Conference Advisor
Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

Distinguished Guests, Esteemed Academics, Researchers, and Participants,

It is with great pride and immense pleasure that I warmly welcome you all to the 4th Multidisciplinary Research Conference (MRC) 2025, organized by KIU Sri Lanka. As the Conference Advisor, it is both an honour and a privilege to inaugurate an event that stands as a testament to our unwavering commitment to advancing knowledge, fostering collaboration, and promoting innovation across disciplines.

The theme of the conference, "Inspiring Excellence in Innovation through Multidisciplinary Research," underscores the vital role of cross-disciplinary collaboration in driving groundbreaking discoveries. By fostering synergies across diverse fields, we aim to inspire transformative ideas and impactful research that transcends traditional boundaries. Over the course of this conference, we will witness an impressive array of research presentations addressing critical global challenges across technology, health sciences, social innovation, and sustainability. I encourage all participants to engage actively, share your perspectives, and maximize the networking opportunities available.

I take this opportunity to express my sincere appreciation to the Conference Chair, the Organizing Committee, and all academic and administrative teams whose dedication, professionalism, and meticulous planning have made this conference a reality. Your collective efforts have ensured that MRC 2025 continues to serve as a dynamic platform for knowledge exchange, critical dialogue, and academic inspiration.

To our distinguished speakers, researchers, and participants, I extend my best wishes for a productive and intellectually enriching conference. May your contributions today inspire new directions in research, ignite innovative thinking, and strengthen our collective pursuit of knowledge for the betterment of society. Thank you for being part of this remarkable academic journey. Together, let us continue to shape a future defined by discovery, collaboration, and transformative impact.

I wish you all a productive, insightful, and inspiring conference.

Message from the Orator

Snr. Prof. Ajantha S. Dharmasiri
Orator
Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

I am delighted to share my thoughts on the occasion of KIU organizing the Fourth Multi-Disciplinary Research Conference, centered on the apt theme, "Inspiring Excellence in Innovation through Multidisciplinary Research". It is a significant step taken by a non-state higher education provider to promote research with intellectual richness and industry relevance.

"Innovation is the ability to see change as an opportunity, not a threat", so said Steve Jobs. In painfully moving beyond a planetary pandemic, economic resurgence of Sri Lanka has become an increasingly challenging endeavour. Innovation on multiple fronts can play a pivotal role there. The support needed by comprehensive research to take data-driven decisions is felt more than any other time. Such efforts should be made in connection with the rapid technological advances around the globe. Referring to global research with local relevance is the starting point. Conducting local research with global reach is the continuous progression.

As we are aware, management research falls into the broader category of social research. Whilst positive initiatives are being taken, current situation with respect to research in Sri Lanka is far from a satisfactory level. We have an acute gap to bridge with regard to the current and desired levels of engaging in management research, with publishable quality and practical relevance. The significant step of conducting the conferences of this nature needs to be commended in this context.

May I take this opportunity to thank the MRC team for their committed collaboration in vibrantly showcasing the solid research findings. Let me wholeheartedly wish this prestigious event a phenomenal success.

Message from the Keynote Speaker

Dr. Malmi Kiriwandalage
Keynote speaker
Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

Dear Esteemed Researchers, Distinguished Guests, and Enthusiastic Students,

It is with immense pleasure and honor that I address you today as the keynote speaker for the Multidisciplinary Research Conference 2025, hosted by the prestigious KIU University in Sri Lanka. As a Solar System Ambassador at NASA's Jet Propulsion Laboratory and an aspiring astrobiologist, I am particularly thrilled to be part of an event that champions the very essence of exploration and discovery across diverse fields. This conference serves as a vital platform, bringing together brilliant minds from various disciplines to share their insights, present groundbreaking research, and ignite collaborative endeavors. The interdisciplinary nature of our discussions here is paramount, as the most profound breakthroughs often emerge at the intersections of different fields, much like how astrobiology draws upon biology, chemistry, geology, and astronomy to unravel the mysteries of life beyond Earth.

This conference represents an unparalleled learning opportunity. Whether you are presenting your latest findings, attending a stimulating session, or engaging in informal discussions, every interaction here is a chance to expand your horizons. The knowledge exchange facilitated by such gatherings is invaluable, offering fresh perspectives and inspiring new lines of inquiry. Furthermore, the networking opportunities at this event are just as significant. Building connections with fellow researchers, potential mentors, and future collaborators can open doors to exciting new projects and career paths. I strongly encourage everyone to seize these opportunities, engage actively, and forge relationships that will undoubtedly enrich your academic and professional journeys for years to come.

I would like to extend my deepest gratitude to the dedicated team at KIU University for their exceptional efforts in organizing this Multidisciplinary Research Conference 2025. The meticulous planning and tireless work involved in bringing together such a diverse and accomplished group of individuals are truly commendable. Your commitment to fostering a vibrant research culture and providing a platform for intellectual exchange is evident, and it is a testament to KIU University's leadership in promoting academic excellence in Sri Lanka. I am confident that this conference will be a resounding success, leading to significant advancements and inspiring the next generation of researchers to push the boundaries of knowledge. Thank you for inviting me to be a part of this remarkable event.

Message from the Conference Chairperson

Prof. Anuradhi S. Hapuarachchi
Conference Chairperson
4th Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

It is with immense pride and gratitude that I extend my heartfelt appreciation to all who contributed to the success of KIU Multidisciplinary Research Conference (MRC) 2025. This conference stands as a testament to the power of collaboration, knowledge-sharing, and innovation across diverse academic disciplines.

MRC 2025 was more than an academic gathering; it was a celebration of intellectual curiosity and research excellence. The wide spectrum of research presented by scholars from medicine, management, technology, humanities, and beyond, reflects KIU's commitment to fostering a vibrant and inclusive research culture. The participation of international dignitaries further highlighted the global relevance of our efforts.

As Chairperson, I am truly inspired by the dedication of our researchers, students, keynote speakers, and organizing teams. Each presentation, discussion, and interaction added a new layer of insight and opened doors to future exploration.

This conference souvenir captures the spirit and substance of MRC 2025. May it serve as a record of our achievements and a reminder of the collective responsibility we hold to pursue knowledge that drives sustainable development and measurable outcomes in society.

Let us continue to challenge boundaries, break silos, and lead with purpose.

Message from the Conference Co-Chairperson

Dr. Anuradha Thennakoon
Conference Co-Chairperson
4th Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

I warmly welcome you to the 4th Multidisciplinary Research Conference - KIU 2025, the Annual International Conference of KIU. With a record number of participants expected this year, we are delighted to see that these annual conferences have become increasingly advanced and have gained substantial popularity every year.

The theme for this year's conference is *"Inspiring Excellence in Innovation through Multidisciplinary Research,"* which I firmly believe to be timely and relevant. I hope that this conference will allow participants a productive discourse not only in managing academic objectives but also in addressing contemporary challenges across various disciplines.

Essentially, the purpose of this conference is to share and exchange valuable information. Through these discussions, different recommendations and solutions can be developed as experts from various fields gather together to examine problems and explore emerging trends in multidisciplinary research.

This conference would not be possible without the generous support of the entire KIU community, our sponsors and well-wishers. I am truly grateful to all organizing committee members, faculty coordinators, session chairs, and volunteers whose dedicated efforts have made this event possible. Most importantly, I thank you, the participants, for enriching this conference by your presence and contributions.

The broad scope of this event provides a unique meeting ground for researchers spanning multiple disciplines. I hope fruitful collaborations will be established while sharing knowledge through meaningful academic exchange. Finally, I extend my best wishes to all participants on their outstanding research contributions and look forward to a successful and enriching conference experience.

Message from the Conference Co-Chairperson

Mr. Akila R. Jayamaha
Conference Co-Chairperson
4th Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

It is with great pride and enthusiasm that I extend my warmest greetings to all the stakeholders of the Multidisciplinary Research Conference (MRC) 2025, under the theme *"Inspiring Excellence in Innovation through Multidisciplinary Research."* This conference stands as a vibrant platform that brings together scholars, professionals, and students from diverse fields to exchange ideas, challenge conventions, and chart new directions for the future of research and innovation. In an era where the boundaries between disciplines are rapidly dissolving, the importance of collaborative inquiry cannot be overstated. The challenges that we encounter in terms of health, education, technology, or the environment are inherently interconnected. Addressing them demands not isolated expertise, but the synergy of multidisciplinary perspectives.

As we reflect upon the conference theme, it is fitting to recall a motto associated with Florence Nightingale: ***"It is better to die in the surf, heralding the way to a new world, than stand idly on the shore."*** These words capture the essence of courage, purpose, and transformative vision that have defined the nursing profession since its inception. Today, as healthcare evolves amidst global challenges, the nursing community continues to "stand in the surf," facing waves of complexity with resilience and compassion. Whether in patient-centered care, evidence-based practice, or health systems research, nurses remain at the forefront of progress bridging science and humanity. Your contributions not only heal individuals but also reshape the very fabric of health and wellbeing in society.

Through your research, innovation, and dedication, you herald the way toward a "new world" one grounded in scientific integrity, ethical practice, and interdisciplinary collaboration. I encourage each of you to use this conference as a springboard to share your discoveries, to question boldly, and to connect meaningfully with peers across disciplines. The insights born here will ripple far beyond the conference halls into hospitals, classrooms, laboratories, and communities across Sri Lanka and beyond. May this gathering ignite in all of us a renewed commitment to excellence. Together, let us continue to innovate, inspire, and lead undaunted by the surf, united in our mission to shape a better, healthier, and more sustainable world.

With my sincere appreciation to the organizing committee, presenters, and participants, I wish MRC 2025 every success. May it be a beacon of inspiration for all who dare to move beyond the shore.

Message from the Conference Co-Chairperson

Ms. Nadeeka Ranadeva
Conference Co-Chairperson
4th Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

Dear Esteemed Participants,

It is with great pleasure and enthusiasm that I welcome you to the 4th Multidisciplinary Research Conference 2025 organized by KIU. The theme of this year, *"Inspiring Excellence in Innovation through Multidisciplinary Research,"* reflects our shared commitment to fostering collaboration and creativity across diverse fields to address the emerging challenges of our world.

In an age where knowledge transcends disciplinary boundaries, this conference provides an ideal platform for scholars, researchers, and professionals to share insights and explore solutions that contribute meaningfully to both national and global development. I am particularly proud of the growing strength of research in the health sciences and the dedication of our academic community in driving evidence-based innovation and sustainable practices.
As we gather to exchange ideas and present research findings, I encourage all participants to engage deeply, question curiously, and collaborate widely. Together, we can nurture a culture of critical inquiry and knowledge creation that shapes a better future.

On behalf of the organizing committee, I extend my sincere appreciation to all presenters, reviewers, and contributors for their commitment. May this conference ignite new partnerships, inspire fresh perspectives, and strengthen the spirit of multidisciplinary scholarship.

Wishing you a successful and enriching conference experience!

Message from the Conference Co-Chairperson

Ms. Thakshila Dushyanthi
Conference Co-Chairperson
4th Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

Dear Esteemed Participants,

It is with great pleasure and enthusiasm that I warmly welcome all participants of the 4th Multidisciplinary Research Conference (MRC) 2025, organized by KIU. This year's theme, "Inspiring Excellence in Innovation through Multidisciplinary Research," reflects our shared dedication to fostering collaboration, creativity, and idea exchange across disciplines to tackle the complex challenges of today's world. In today's dynamic environment, where knowledge evolves rapidly and societal issues are increasingly interconnected, multidisciplinary research has become a foundation of meaningful progress. This conference provides an ideal platform for academics, researchers, and professionals from diverse fields to share their insights, discuss innovative solutions, and foster a culture of research that transcends disciplinary boundaries.

As we gather here to celebrate intellectual diversity, I encourage all participants to engage actively in scholarly discussions, exchange constructive feedback, and build lasting collaborations that extend beyond this event. Such collective efforts not only enhance the quality of academic inquiry but also contribute to national and global development. I extend my heartfelt appreciation to all distinguished speakers, presenters, reviewers, and organizing committee members for their valuable contributions. May this conference inspire innovation, collaboration, and a renewed passion for advancing multidisciplinary research.

Wishing you all a productive and inspiring conference experience!

Message from the Conference Co-Chairperson

Mr. L. M. Dilantha Deva Adithiya
Conference Co-Chairperson
4th Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

Dear Esteemed Participants,

It is with great pleasure and honour that I warmly welcome you to the 4th Multidisciplinary Research Conference (MRC) 2025 of KIU University. This year's theme, "Inspiring Excellence in Innovation through Multidisciplinary Research," celebrates our research outputs of advancing creativity, critical inquiry, and cross-disciplinary collaboration in the pursuit of academic and societal progress.

This year's session, bringing together the fields of Information Technology, Law, and Behavioural Sciences, embodies the very essence of multidisciplinary integration. It highlights how technology, legal frameworks, and human behaviour intersect to shape modern societies and drive meaningful innovation. By exploring this intersection, we aim to inspire novel approaches, strengthen research linkages, and create pathways for impactful, evidence-based solutions.

The Multidisciplinary Research Conference serves as a dynamic platform for scholars, professionals, and students to exchange knowledge, share research insights, and engage in constructive dialogue that transcends conventional academic boundaries. Through thought-provoking keynote addresses, research presentations, and discussions, this event fosters an environment of intellectual curiosity and collaborative excellence. As we convene today, I encourage each participant to embrace this opportunity to connect, learn, and innovate together. It is through such collaborations that we nurture a culture of academic excellence and contribute to sustainable development in our respective disciplines and beyond.

On behalf of the organising committee, I would like to extend my heartfelt appreciation to all speakers, presenters, reviewers, and participants for their invaluable contributions to making this conference a success. Let us continue to inspire excellence and innovation through the spirit of multidisciplinary research.

Wishing you all a fruitful and inspiring conference experience!

Message from the Editor-in-Chief

Prof. Priyanganie Senanayake
Editor-in-Chief
Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

It is with great pleasure that I present the proceedings of abstracts for the 4th Multidisciplinary Research Conference 2025, KIU Campus, Sri Lanka, centered on the theme "Inspiring Excellence in Innovation through Multidisciplinary Research." This compilation reflects the outstanding intellectual contributions of researchers, practitioners, and scholars who are driving knowledge and innovation across diverse fields.

Our focus on multidisciplinary research tracks, Nursing, Biomedical Science, Management, Language and Education, Computer Science and Engineering, and Law highlights the importance of collaboration across disciplines to address complex challenges in health, science, society and organizational practice. The abstracts included herein showcase cutting-edge research, innovative methodologies, and practical insights that have the potential to transform their respective fields.

I commend all authors for their dedication, creativity, and rigorous scholarship. Their work not only advances academic inquiry but also inspires the broader community to pursue excellence through innovation. I am confident that the ideas and findings presented in this collection will spark fruitful discussions, collaborations, and future research initiatives.

On behalf of the editorial board, I extend my gratitude to all contributors, reviewers, and organizers who made this compilation possible. It is our hope that these proceedings will serve as a valuable resource and a source of inspiration for scholars, practitioners, and students alike.

Thanking Note from the Conference Secretary

Ms. Chamathi Pinnawala
Conference Secretary
Multidisciplinary Research Conference – 2025
KIU, Sri Lanka

It is with immense pleasure and gratitude that I thank all esteemed contributors to the 4th Multidisciplinary Research Conference 2025 for making this event a remarkable success. This milestone event has brought together researchers, academicians, and practitioners from Nursing, Health and Multidisciplinary Sciences, and Management to share knowledge, foster innovation, and advance scholarly discourse.

I extend my deepest appreciation to Senior Professor Ajantha Dharmasiri, Former Director and Chairman of the Board of Management, Postgraduate Institute of Management, University of Sri Jayewardenepura, for his inspiring oration. I am grateful to Dr. Malmi Kiriwandalage, Solar System Ambassador from NASA, USA, for her enlightening keynote address.

My profound gratitude goes to Dr. Jagath Seneviratne, President of KIU, for his visionary leadership, and to Dr. Sajeewanie Liyana-Arachchi, Vice Chancellor of KIU and Chief Advisor of MRC, for her strategic guidance.

Special recognition is due to Professor Anuradhi S. Hapuarachchi, Conference Chairperson, for her exemplary leadership. I extend my sincere appreciation to our Co-Chairpersons—Dr. Anuradha Tennakoon, Mr. Akila R. Jayamaha, Mr. Dilantha Deva Adithiya, Ms. Nadeeka Ranadeva, and Ms. Thakshila Dushyanthi for their collaborative efforts. I sincerely thank Professor Priyanganie Senanayake, Editor-in-Chief, for her meticulous oversight in curating these proceedings.

My heartfelt appreciation extends to our Technical Session Chairpersons—Professor S.S.P. Warnakulasuriya, Professor Dunusinghe G. Dharmarathne, Dr. Dineshani Hettiarachchi, and Dr. Dinithi Deva Adithya—for facilitating enriching discussions and maintaining academic excellence. I am grateful to KIU management, Deans, Heads of Departments, academic and non-academic staff, expert reviewers, the Co-Secretaries, the organizing committee, and our dedicated students for their invaluable support and tireless commitment.

To all contributing authors and participants, thank you for your intellectual contributions. I look forward to the continued growth of this platform as a catalyst for interdisciplinary research and innovation.

Schedule of the Technical Session – Biomedical Science

Oral Presentations - Health Sciences Track		
SN	**Abstract ID**	**Title and Author/s of the Abstract**
OP 01	AB011	**Comparative Phytochemical Analysis, Antioxidant Properties, and Toxicity Assessment of Different Varieties of Gonika (*Psychotria sarmentosa*) Extracts.** Nanayakkara G.P.D.T [1*], Bogahawatte N.K [1], Perera A.A.T.D[1], H.M.N Samanmali [1], Umagiliya P.C. [1], Samarakoon D.N.A.W [1], N.D. Kodithuwakku [2]
OP 02	AB023	**Determination of the Presence of *Escherichia coli* and *Salmonella spp.* in Juice Samples from Registered Fresh Juice Outlets in an Urban Area of Colombo District, Sri Lanka** Silva A. H. L. [1*], Wijesinghe S. R. [1], Habaragoda M. K. T. P. [1], De Silva S. P. A. S. S. [1], Imbulegama I. G. H. S. [1], De Silva U. L. R. M. [1], Jayawickrama R.G.D.R.[2]
OP 03	AB059	**The Relationship Between Milk Consumption Pattern and Blood Glucose Control Among Type 2 Diabetes Patients Attending Diabetic Clinic at National Hospital Sri Lanka** Isurini P.H.C.[1*], Herath M.H.M.R.N.[1], Dissanayake W.M.K.G.[1], Wijesinghe S.R.[1], Samarakoon D.N.A.W. [1], Jayawardana S.A.I.U.[2], Bulugahapitiya D.U.S.[2]
OP 04	AB068	**Comparative Evaluation of Antifungal Activity of *Cinnamomum verum*, *Curcuma longa*, and *Ocimum tenuiflorum* Against *Candida albicans*** Dissanayake C. T. N. [1] *, Weththasinghe A. V. [1], Karunarathne G. Y. N. [1], Melani S. S. [1], Rathnayaka M. N. C. [1], Thenuha V. [1], Ranadeva N. D. K. [1]
OP 05	AB069	**Comparative Analysis of Antioxidant Potential and Cytotoxicity of *Erythrina variegata* Methanolic Bark Extracts from Different Geographical Regions in Sri Lanka** Ravinath S.A.P.[1*], Abeyrathne A.V.P.H.[1], Sivasubramaniam A.[1], Galaudaarachchi G.A.L.H.[1], Ranasinghe R.A.A.I.[1], Dissanayake C.T.N.[1], Deva Adithiya L.M.D.[2]

OP 06	AB075	**Effect of Heat Treatment on Protein Quantification in Country Eggs and Farm Eggs: Determining Optimal Cooking Methods for Maximum Protein Retention Using the Lowry Method** Dissanayake C. N.[1*], Dissanayake D. M. U. G. K.[1], Diwyanjali M. R.[1], Herath M. H. M. R. N.[1], Rimaza M. R. F.[1], Ruwandika J. D. I.[1] , Ulluwaduge J. D.[2]
OP 07	AB079	***In Vitro* Evaluation of Anti-diabetic Properties of Leaves and Bark of *Dialium ovoideum* Grown in Sri Lanka** Dharmasiri H. V. G. D.[1]*, Jayasekara M. J. P. Y. N. [1], Karunarathna D. G. P. H. [1], Pradeepraj R.[1], Prabodhani K. G. A. [1], Fernando C. A.[2], Jayamaha A. R.[2]
OP 08	AB081	**Comparative In Vitro Analysis of the Anti-Inflammatory Properties of Kandula *(Musa spp.)* Peel Extracts in Sri Lanka** Kadurebandara K.B.M.I.S.[1], Fernando W.I.Y.T. [1], Dilsha J.A.S. [1], Mithma W.W.P.C.[1], Madushani W.S. [1], Gunawardana K.A.M.N.N.[1]
OP 09	AB085	**Evaluation of the Antimicrobial Effects of Garlic, Ginger, and Turmeric on Pathogens Isolated from Chicken Samples Collected in Pettah, Colombo District, Sri Lanka** Hettiarachchi P.H.A.A.S.1,** Wanigarathna U.G.S.H. [1]., Dewimini D.D.S. [1]., Nadeeranga K.W.T.S. [1]., Kulathunga I.P.S.N. [1]., Ramanayaka A.S. [1]., Ranadeva N.D.K.[1], Hettiarachchi D.[2]
OP 10	AB166	**Assessment of Probiotic Property in Selected Banana Varieties Obtained from Fruit Markets in Colombo District Using *Lactobacillus* Strains** Isurini P.H.C.[1]*, Rathnayaka R.M.R.K.[1], Abeysekara G.G.R.[1], Thathsarani K.B.U.[1], Kumara A.Y.K.[1], Dissanayaka C.T.N.[1]

Poster Presentations – Panel 01

SN	Abstract ID	Title and Author/s of the Abstract
PP 01	AB006	**Evaluating Toxicity of Methanolic Extraction of Leaves of *Tephrosia vogelii* using Zebrafish (*Danio rerio*) Embryonic Assay** Segar N[1], Hamna A. F*[1], Hakeem S. M[1], Jayasooriya M. H[1], Lakshan U. J. I[1], Bandara G. P[1], Rasanjanee D. D. Y[1]
PP 02	AB034	**Pan-Cancer Genomic Landscape of Rare Pediatric Tumors: Insights from the MSK Pediatric Tumor Dataset (2025)** Ranadeva N D K[1], Dissanayake C T N [1], Bandara G P S [1*], Sandamali P M N N [1], Midushika M G H M [1]
PP 03	AB035	***Methylenetetrahydrofolate reductase* Gene Polymorphisms and Autism Spectrum Disorder Susceptibility in the Sri Lankan Population: A Systematic Review of *in Silico* SNP Validation** Paranagama S.A.[1], Mendis B.W.[1*], Rupasinghe H.H.D.M.[1], Lande Badalge N.R.[1], Stanley D.[1], Premarathne M.G.H.M.[1], Ranadeva N.[1], Hettiarachchi D.[2]
PP 04	AB038	**Innovative Approaches to Prenatal Detection and Diagnosis of Congenital Heart Diseases: A Systematic Review** Premarathne M.G.H.M.[1*], Pinnawala C. [1,] Sandamali P.M.N.N.[1], Bandara U.H.R.G.P.S [1], Kodikara V. S.[1,] Ranadeva N.D.K[1]
PP 05	AB042	**A Systematic Review of *In Vitro* Studies on the Effect of Repeated Heating on Lipid Oxidation** Peiris M.N. R[1*], Dissanayake R.K.A.S. A[1], Arka M.L. F[1], Priyadarshana E.D. D[1], Munasinghe M.A.T. N[1], Premaratne M.G.H.M[1], Samarakoon D.N.A.W[1]
PP 06	AB046	**Medicinal plants and their effects on hemostasis: A Systematic Review, comparative analysis of laboratory studies** Ilangasinghe R. K.[1*], Shefa M. F.[1], Jayawardhana G. R. N. G.[1], Shahma M. M. F.[1], Gamage E. G. M. J.[1], Premarathne M. G. H. M.[1], Ranadeva N.D.K[1]

PP 07	AB047	**Antibiofilm Efficacy of Crude Plant Extracts and Green Synthesized Nanoparticles; A Systematic Review** Dheena M.I.[1*], Minza M.F.F.[1], Karunathilaka V.P.P.S.[1], Mathusha S.[1], Muthukumarana N.M.N.S.[1], Premarathne M.G.H.M.[1], Ranadeva N.D.K[1]
PP 08	AB052	**Antibiofilm Synergistic Potential of Plant Extracts with Nitrofurantoin: A Systematic Review** Sachinthani S. D. D.[1]*, Shimra U. F.[1], Dulanjalee G. R.[1], Peiris W. W. D. M.[1], Sandamali S. P.[1], Rasanjanee D. D. Y.[1], Senanayake R. A. S. P.[2]
PP 09	AB053	**Natural Compounds from Ayurvedic Herbs for Potential Platelet Enhancing Activity in Dengue Management – A Systematic Review** Radeesa D. L. K. H[1*], Mallikarathne C. A[1], Bandara A. A. L. S[1], Josita J. A[1], Nilakshi S. H. C[1], Bandara G. P. S[1], Samarakoon D. N. A. W[1], Ranadeva N. D. K[1]
PP 10	AB058	**Antibacterial effect of *Ocimum tenuiflorum* leaves against acne-causing bacteria** Prabodhi L. A. H. [1], Wijebandara D. K. T. Y. [1], Wickramanayake H. M. R. D. [1], Herath H. M. U. K. [1], M. G. H. M. Premarathne[1], . Ranadeva N. D. K. [1], Pathiraja D.[2*]
PP 11	AB060	**Systematic Review on Usage of Artificial Intelligence on Proper Management and Control of Cancer Related Adverse Drug Reactions** Samarakoon D. N. A. W.[1*], Edirisinghe P. K.[1] , Dassanayaka D. M. M. D[1], Kaumini H. A. G.[1], Rajapaksha R. M. N. N.[1], Kahandawa K.A. S. T.[1], Samarakoon D.G.[1], Rajapaksha R. S. H. [1], Jayasinghe D. S. K.[1]
PP 12	AB061	**Artificial Intelligence for Preventing Drug Interactions: A Systematic Review** Waneesha A.D.K.[1], Jayarathna A.G.R.C.[1], Dharmathilaka N.A.D.S.A.[1], Senarathna W.E.M.N.M.[1], Wanasinghe P.A.H.E[1], Hapuarachchi J.H.H.M.J.[1], Yuhansa P.H.Y[1], Zoysa G.T.S[1], Samarakoon D.N.A.W [1] , Liyanage U.P [2]

PP 13	AB063	**Antimicrobial Potential of Herbo-metallic Formulations: Mechanisms, Efficacy, and Modern Challenges- A Systematic Review** De Silva K. T. S. [1]*, Govindi K. A. C. P.[1], Munasinghe K. P.[1], De Mel W. K. R. [1], Premalal A. G. E. P. [1], De Silva U. L. R. M [1], Senanayake R. A. S. P.[2]
PP 14	AB071	**Gut Microbiota Preserving Natural Alternatives; A Systematic Review** De Silva J. C. S.[1*], Ariyarathna T. M. N. H.[1], Wickramage R. P. [1], Ranasinghe R. M. N. M.[1], De Silva D. N. N.[1], Bandara G.P.S[1]
PP 15	AB074	**Does PET Microplastics Induce Oxidative Stress in Adult Zebra Fish (*Danio rerio*) Brain Tissue? A Systematic Review** Fazliya M.N.F.[1]*, Uthpala W.M.P.[1], Niwunhella N.D.S.C.[1], Keerthirathna A.H.L.D.P.[1], Mendis T.M.S.[1], Dissanayaka C.T.N.[1], Ranadeva N.D.K.[1]
PP 16	AB084	**Natural and Sustainable Plant and Agro-Industrial Substrates as Alternatives to Conventional Media for Differential Bacterial Growth: A Systematic Review** Nafla M. N.[1], Anisa F.A. F.[1], De Silva V. L.[1]*, Dilshan H. C.[1], Yashora W. M. P.[1], Mendis B. A. M.[1], Sathsarani K. G. M.[1], Ranadeva N. D. K.[1]
PP 17	AB086	**Natural Alternatives for Treatment of Nephrolithiasis: A Systematic Review** Rathnayake R.U.B.[1]*, Chandrasekara C.A.K[1], Wijenayaka W.A.P.U.S.[1], Mohommed J.A.M.[1], Kahapola A.P.N.[1], Bandara U.H.R.G.P.S[1], Samarakoon D.N.A.W.[1]
PP 18	AB089	**Plant-Based Edible Coating of Tropical Climacteric Fruits: A Systematic Review** Safna M. M. F. [1], Sanjeewa M. V. P. H. [1], Ranasingha D. N. D. [1*], . Halthota[1] H. K. T. A., Karunanayaka K. M. S. L [1], De Silva U. L. R. M. [1]

PP 19	AB091	**Medical Properties of Mucus Extract from Snail Species: A Systematic Review** Peiris H.P.G[1*], Rathnayaka R.M.N.M.C[1], Wijerathna W.A.H.D[1], Shamla M.R.F. [1,] Fernando W.P.A.R.S[1], Kodikara V.S.[1]
PP 20	AB094	**Determinants, Prevalence, and Outcomes of Chronic Diseases Among School-Aged (11-17 years) Children in South Asia: A Systematic Review** Dewmini H. P. G. Y.[1*], Lakshan D. M. G.[1], Sammani L. L. K.[1], Gunarathne R. G. B. N.[1], Kodikara V. S.[1], Jayamaha A. R.[2]

Poster Presentations – Panel 02

SN	Abstract ID	Title and Author/s of the Abstract
PP 21	AB073	**In vitro Antioxidant Activity of *Hemidesmus indicus* and *Moringa oleifera* Extracts and Their Implications for Snakebite-Associated Oxidative Stress** Malrangi N. A. T[1], Wijesinghe D. R. U[1], Sewwandi U. A[1], Sarathchandra D. M. B. C. H[1], Dilshara S. A. D. [1]*, Samarakoon N.[1] , Hewage T.N. [1], Perera S. K. J. D. H.[1]
PP 22	AB096	**Phyto therapeutic Approaches to Diarrhea: A Systematic Review of Anti-diarrheal Properties of Medicinal Plants** Karunarathna A.I.[1*], Shyamali D.M.J.[1], Dulakshi Y.M.T.[1], Jesla M.J.[1], Fasrina M.F.[1], Kodikara V.S.[1], Nadapala, J.H.Y.P.N.[1]
PP 23	AB138	**Alternative Culture Media Formulations Using Natural Alternatives: A Systematic Review** Banu M. A. D[1], Karunarathna H. M. K. S[1], Karunarathna N. D. Y. L. D[1] , Fazla M. F. F[1], Rashminda N. D. C.*[1], Bandara U. H. R. G. P. S[1], Samarakoon D. N. A. W[1]
PP 24	AB153	**Herbal Intervention Against Biofilm-Mediated Antimicrobial Resistance on *Staphylococcus aureus*: A Systematic Review** Amana T. A. F [1], Wanasinghe W. A. C. T. N [1], Perera A. K. D. N. S [1]*, Afra M.A. F [1], Rathnayake R. M. C. P [1], Rasanjanee D. D. Y. [1]
PP 25	AB155	**Evaluation of the Antimicrobial Activity of Mixed Extractions from *Ouret lanata* and *Camelliasinensis* Against Urinary Tract Infection Pathogens** Warusapperuma W. R. A. K. G[1]*, Karunathilaka U. S[1], Charuka S. G. J[1], Samarathunga N. S. B. K[1], Wani S. I. D[1], D.D.Y. Rasanjanee[1], S.P.Nissanka[2]
PP 26	AB157	**The Analgesic Efficacy of Medicinal Plants and Their Formulations for Dysmenorrhea: A Systematic Review of In Vitro and In Vivo Studies** Pemasiri P.L.M.[1]*, Senevirathne T.C.[1], Vishmi A.G.G[1], Madubash K.T.S[1], Tharushika R.A.M.[1], Sathsarani K.G.M.[1], Samarakoon D.N.A.W.[1], Ranadeva. N.D.K.[1]

PP 27	AB159	**The Dermatological and Reproductive Health Effects Associated with the Use of Disposable Sanitary Pads in South Asian Women: A Systematic Review** Yatiwella N. D[1]*, Liyanage-V. A [1], Ariyawansha H. B. G. M. K[1], Madhuwanthi A. A. H. V[1], Ranasinghe K. A. K. R[1], Dissanayake C. T. N[1], Samarakoon D. N. A. W[1], Ranadeva N.D.K.[1]
PP 28	AB160	**Antioxidant Properties of Citrus Juices, Peels, And Pulps: Influence of Extraction Methods-Systematic Review** Amarasena W. H. D. [1*], Fernando L. P. L. M. A. C. S. [1],Warnasooriya W. M. K. K. [1], Bandara P. M. N. T. [1], Bandara A. R. V. C. [1] , Rasanjanee D. D. Y. [1]
PP 29	AB163	**Medicinal Properties and Health Benefits of Endophytic Fungi Associated with Medicinal Plants: A Systematic Review** Vithanage P.R[1]*, Unawatuna Vithanage N.W.L[1], Appuneththi N.H[1], Kuda Anthonige N.V.R[1], Mohamed Thamby F.S[1], Arul Pragasam G.P[1], Samarakoon D.N.A.W[1].
PP 30	AB185	***Escherichia coli* Contamination of Frequently Touched Surfaces in Public Buses, Colombo, Sri Lanka** Heiyanthuduwa M. R.[1*], Dilshan W. A. R.[1], Arachchi L. A. C. P. L.[1], Silva H. K. D.[1], Rujath M. R. M.[1], Samarakoon D.N.A.W.[1], Liyanage N.P.P.[2]
PP 31	AB189	**Evaluation of Antimicrobial and Antioxidant Properties of Selected Common Herbal Plants in the Management of Oral Cavity Diseases: A Systematic Review** Wickramasinghe M.S.T[1] *, Nafasa C.N.F[1] , Godakanda S1, Gamage C.H.R [1], Kumara G.T[1], De Silva. U.L.R.M.[1]
PP 32	AB202	**Isolation and Identification of bacterial contaminants on vision correction glasses used by undergraduates of KIU: A cross-sectional study** A.N.S. Lewis [1*], Wijekoon W.M.C.S[1] , Rubasinghe L.U[1] , Rathnayake R.M.P.H. [1], Hemachandra H.G.S.G[1]

PP 33	AB203	**Medicinal Properties of *Hibiscus* Species: A Systematic Review** Dias M.P.S.H [1]*, Kumara S.P.M[1], Fathima A.G [1], Witharana D.W.D.O [1], Gamage I.M.R.K.[1], De Silva U.L.R.M [1], Samarakoon D.N.A [1].
PP 34	AB206	**Genes Involved in Cardiac Development, Functional Dynamics, and Disease Pathogenesis: A Literature Review** Premarathne M.G.H.M[1], Pinnawala C[1*], Ranadeva N.D.K [1]
PP 35	AB214	**Synergistic and Individual Effects of *Annona muricata* (Soursop) and *Annona squamosa* (Sugar Apple) Leaves and Seeds: Antibacterial, Phytochemical, and Antioxidant Properties** Ranasinghe K.C.[1*], Devindi L.B.K.[1], Nafla M.F.F.[1], Bandaranayake V.H.W.[1], Senevirathne D.W.P.M.[1], Kodikara S.[1], Satharasinghe D.A.[2]
PP 36	AB216	**Awareness, Perceptions and Purchasing Patterns of Skin Whitening Products among Young Adults across Sri Lanka** Hulangamuwa V. W. Y. M[*1], Gunasekara S. R. T[1], Rusiru J.A.C[1], Nimalsiri H. T. P. K. L[1], Ananda L. L. T[1], Bandara G. P. S[1], Ranadeva N. D. K[1], Pathiraja D.[2]
PP 37	AB219	**Evaluation of Antimicrobial Activity of *Garcinia zeylanica* and *Salacia reticulata* Plant Extracts Against Selected Bacterial Pathogens Associated with Urinary Tract Infections** Perera K. J. S.[1*] , Helawansha W. I. M. S. A.[1], Rajakaruna M. G. H. P. K.[1], Kulendradas V.[1], Kularathna H. H. K.[1], Pinnawala P.A.C.P. [1] , Fernando A.M.F.[2], Jayamaha A. R.[2]
PP38	AB222	**Evaluation of toxicity, anti-inflammatory activity, antibacterial activities and stability of aqueous *Nyctanthes arbor-tristis* flower** De Silva A.D.M.[1], Pragnathilaka P.G.C.D.[1] , Abeykoon A.M.C.D.D.[1] Kishalani S.[1] Hamtha H.[1], Bandara G.P.S.[1*], Kodikara V.S.[1]
PP39	AB223	**Evaluation of Antidiabetic Activity of Methanolic Extract of *Doona macrophylla Thw.* (Maha Beraliya) Seeds – In Vitro Assay** Weerasinghe B.B.T.M[1]*, Wijesinghe W.M.I.I[1], Perera K.K.L[1], Edirisinghe G.D.N.B[1], Godage D.P.B[1], Sandamali P.M.N.N[1], Dissanayake C.T.N[1], Ranadeva N.D.K.[1]

KIU

Multidisciplinary Research Conference 2025

Proceedings MRC 2025 - Book IV

Oral Presentations
Health Sciences

OP 01 AB011

Comparative Phytochemical Analysis, Antioxidant Properties, and Toxicity Assessment of Different Varieties of Gonika (*Psychotria sarmentosa*) Extracts

Nanayakkara G.P.D.T [1*] , Bogahawatte N.K [1] , Perera A.A.T.D [1] , H.M.N Samanmali [1] , Umagiliya P.C. [1] , Samarakoon D.N.A.W [1] , N.D. Kodithuwakku [2]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*
[2]*Faculty of Indigenous Medicine, University of Colombo*
[*]*Corresponding Author: b7b8104@kiu.ac.lk*

Introduction: Gonika is a medicinal plant used in Sri Lankan traditional medicine and refers to two botanical species, *Psychotria sarmentosa* and *Hoya ovalifolia*. Although *P. sarmentosa* is traditionally recognized for its analgesic and anti-inflammatory properties, both species are used interchangeably despite potential differences in their chemical composition and pharmacological effects. Limited scientific evidence comparing their efficacy and safety highlights the need for a comparative evaluation to ensure safe medicinal use. (Authenticated by the Royal Botanical Garden, Peradeniya; Ref No: 2025/469)

Objectives: This study compared the phytochemical composition, chromatographic profiles, antioxidant activity, and cytotoxicity of *P. sarmentosa* and *H. ovalifolia* growing in Sri Lanka.

Methodology: Authenticated leaves of both plants were extracted using methanol. Antioxidant activity was assessed using FRAP and H_2O_2 scavenging assays. Cytotoxicity was evaluated using brine shrimp lethality and *Allium cepa* root growth inhibition assays. Phytochemical screening and thin-layer chromatography were conducted to identify bioactive constituents.

Results: *Hoya ovalifolia* showed superior antioxidant activity with lower IC_{50} values in FRAP (0.0506 mg/mL) and H_2O_2 scavenging assays (192.5 µg/mL) compared to *P. sarmentosa* (FRAP: 0.2185 mg/mL; H_2O_2: 347.2 µg/mL). In the brine shrimp assay, *H. ovalifolia* exhibited higher toxicity (LC_{50} = 0.9714 µg/mL) than *P. sarmentosa* (LC_{50} = 1.582 µg/mL). Both species showed comparable cytotoxicity in the *Allium cepa* assay (*P. sarmentosa* IC_{50} = 1.432 µg/mL; *H. ovalifolia* IC_{50} = 1.438 µg/mL). Phytochemical screening confirmed carbohydrates, proteins, alkaloids, tannins, flavonoids, and saponins in both plants, with higher levels in *H. ovalifolia*.

Conclusion: The findings indicate that *H. ovalifolia* possesses greater antioxidant potential than *P. sarmentosa*. Despite similar cytotoxicity profiles, their distinct pharmacological properties emphasize the importance of accurate botanical identification and appropriate dosage when using Gonika in traditional medicine.

Keywords: *P. sarmentosa*, *H. ovalifolia,* Phytochemical screening, Antioxidant activity, Toxicity assessment

OP 02 AB023

Determination of the Presence of *Escherichia coli* and *Salmonella spp.* in Juice Samples from Registered Fresh Juice Outlets in an Urban Area of Colombo District, Sri Lanka

Silva A. H. L. [1*], Wijesinghe S. R. [1], Habaragoda M. K. T. P. [1], De Silva S. P. A. S. S. [1], Imbulegama I. G. H. S. [1], De Silva U. L. R. M. [1], Jayawickrama R.G.D.R.[2]

[1]Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka
[2]Uva Wellasa University, Badulla, Sri Lanka
**Corresponding Author: b7b8109@kiu.ac.lk*

Introduction: Mango and papaya juices are selected because they are the most widely consumed in Colombo. This research aimed to determine the presence of *E. coli* and *Salmonella spp*. present in mango and papaya juice samples that were obtained in registered juice outlets in the Colombo District using standard microbiological and biochemical examinations.

Objectives: The main objective of this study was to determine the presence of *Escherichia coli* and *Salmonella spp*. in juice samples from registered fresh juice outlets in the Colombo District.

Methodology: 32 juice samples (16 mango and 16 papaya) were sampled in 16 registered fruit juice stalls located in Pettah, a large urban commercial centre within Colombo District. The MPN method was used to detect *E. coli* and confirmed on EMB agar and biochemical tests. *Salmonella spp*. Detection involved pre-enrichment.

Results: Findings showed that microbial contamination was high, with 93.75% of the samples positive for *E. coli* and 6.25% positive of *Salmonella spp*. The p-value was 0.001, meaning that the difference between the prevalence is highly significant. These findings prove that *E. coli* (96.9) was significantly higher compared to *Salmonella spp*. (12.5) in the sample of the juice.

Conclusion: The incidence of *Escherichia coli* and *Salmonella spp.* Contamination of fruit juice samples of registered fresh juice outlets in urban areas in Colombo reflects some serious issues with the standards of hygiene and food safety. These findings indicate that more vigorous enforcement of the sanitary regulations, the improvement of the training of the vendors, and further microbial control are required to safeguard the population and ensure the microbiological safety of fresh fruit juices at the commercial sections of the cities.

Keywords: *Escherichia coli*, *Salmonella spp.*, Fruit juice contamination, Microbiological safety, Colombo, Foodborne pathogens

OP 03 AB059

The Relationship Between Milk Consumption Pattern and Blood Glucose Control Among Type 2 Diabetes Patients Attending Diabetic Clinic at National Hospital Sri Lanka

Isurini P.H.C.[1*], Herath M.H.M.R.N.[1], Dissanayake W.M.K.G.[1], Wijesinghe S.R.[1], Samarakoon D.N.A.W.[1], Jayawardana S.A.I.U.[2], Bulugahapitiya D.U.S.[2]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*
[2]*Endocrinology Unit, National Hospital, Colombo, Sri Lanka*
[*]*Corresponding Author: b7a8344@kiu.ac.lk*

Background: Diabetes is a main health concern in Sri Lanka, affects around 23% of adults. Milk contains nutrients such as lactose, which can affect glucose metabolism. This study was conducted to find the effect of milk type and consumption pattern on glycemic levels.

Objectives: To identify the relationship between milk consumption and glycemic level among the patients who attend the diabetic clinic at National Hospital Sri Lanka.

Methods: The study was approved under the ERC Reference No: AAJ/ETH/COM/2024, National Hospital, Sri Lanka. 272 patients participated in a cross-sectional survey (Systematic sampling). Data on milk consumption and glycemic levels were gathered using standardized questionnaire translated into Sinhala and Tamil. A pilot study was conducted with 20 patients, with the use of patients' previous medical records. Inclusion criteria: age >18 with type 2 Diabetes Mellitus and exclusion criteria: type 1 Diabetes Mellitus. SPSS 29 was used for statistical analysis, with significance ($p<0.05$). Analysis methods such as chi-square, independent t-tests, and correlation testing were used.

Results: The study was conducted among 272 diabetic patients; 94% were milk consumers, and 5.8% were non-consumers. Among the milk consumers, 82.4% consumed only powdered milk, 5.1% consumed only fresh milk, and 11.3% consumed both milk types. Independent t-tests showed mean HbA1c level (8.85±2.31%) in the milk-consuming group and (10.03±2.91%) in the non-consuming group ($p=0.061$). A chi-square test revealed no significance between milk consumption and glycemic control ($\chi^2=0.645$, $p = 0.422$). However, a significant correlation exists between the number of teaspoons of milk consumed and the HbA1c level. ($p=0.048$).

Conclusion: Overall milk consumption revealed no significance with glycemic control; a significant correlation was shown between the number of teaspoons of milk powder consumed and glycemic levels, suggesting that the amount of milk powder may influence blood glucose levels. These results highlight the importance of dietary habit control in diabetes.

Keywords: Diabetes, Fasting Blood sugar, Glycemic control, HbA1c, Milk Consumption

OP 04 AB068

Comparative Evaluation of Antifungal Activity of *Cinnamomum verum*, *Curcuma longa*, and *Ocimum tenuiflorum* Against *Candida albicans*

Dissanayake C. T. N. [1] *, Weththasinghe A. V. [1], Karunarathne G. Y. N. [1], Melani S. S. [1], Rathnayaka M. N. C. [1], Thenuha V. [1], Ranadeva N. D. K. [1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*

**Corresponding author: charuni@kiu.ac.lk*

Introduction: Oral candidiasis caused by *Candida albicans* is a leading concern in immunocompromised individuals, smokers, and those on immunosuppression. The need for safer and more natural treatment options motivates the exploration of plant-based antifungal therapies. Extracts of *Cinnamomum verum, Curcuma longa, and Ocimum tenuiflorum* are traditionally recognized to possess antifungal properties, and it is thus appealing to establish them against *C. albicans* scientifically.

Objectives: To compare the antifungal activity of hydro-ethanolic extract of *C. verum, C. longa*, and *O. tenuiflorum* separately and in combination against *Candida albicans*, and to compare their activity with fluconazole using the agar well diffusion method.

Methodology: Authenticated plant materials were collected, air-dried, powdered, and macerated in a 1:5 ratio with ethanol and distilled water separately to obtain both ethanolic and aqueous extracts. Hydro-ethanolic extract of the plants was made and tested against *C. albicans* using the agar well diffusion method in Mueller-Hinton Agar plates. Zone diameters of inhibition were measured after incubation for 48 hours at 37°C. Extracts and mixtures of plants were assayed at various concentrations. The test was replicated. Fluconazole was used as a positive control.

Results: All the single extracts were moderately antifungal with average inhibition zones of 14.5 mm (*C. verum*), 13.5 mm (*C. longa*), and 14.0 mm (*O. tenuiflorum*). The plant mixture, however, showed significantly high antifungal activity. In a concentration of 1562.5 µg/mL, the mixture showed a 26.5 mm inhibition zone, higher than fluconazole's 22.5 mm at a concentration of 750 µg/mL. Similarly, 3125 µg/mL and 781.25 µg/mL concentrations of the mixture were strongly inhibitive (25.5 mm and 20.5 mm, respectively).

Conclusion: The synergistic effect of *C. verum, C. longa*, and *O. tenuiflorum* was more potent than the individual extracts and fluconazole. Caution is needed in interpretation when the comparison is directly with fluconazole, as the crude extracts contain active and inactive components. More in vivo and toxicity studies need to be performed before suggestions for such applications as oral mouthwash preparations are made.

Keywords: *Candida albicans*, Herbal extracts, Antifungal activity, Well diffusion assay

OP 05 AB069

Comparative Analysis of Antioxidant Potential and Cytotoxicity *of Erythrina variegata* Methanolic Bark Extracts from Different Geographical Regions in Sri Lanka.

Ravinath S.A.P.[1*], Abeyrathne A.V.P.H.[1], Sivasubramaniam A.[1], Galaudaarachchi G.A.L.H.[1], Ranasinghe R.A.A.I.[1], Dissanayake C.T.N.[1], Deva Adithiya L.M.D.[2]

[1] *Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
[2] *Department of Psychology, Faculty of Behavioral Sciences, KIU, Sri Lanka.*
[*] *Corresponding Author: ravinathpulasthi9@gmail.com*

Introduction: *Erythrina variegata* also known as "Erabadu" in Sinhalese is an indigenous herbal plant in Sri Lanka known for its antioxidant and cytotoxic properties due to its diverse phytochemicals. Nevertheless, the impact of diverse geographical areas on its bioactivity remains unknown.

Objective: The aim of the study was to compare the antioxidant potential and cytotoxicity of the methanolic bark extracts of *E. variegata* collected from different geographical regions of Sri Lanka.

Methodology: The bark samples of *E.variegata* collected from Colombo(wet zone), Batticaloa(dry zone), and Kurunegala (Intermediate zone).These areas represent Sri Lanka's three climatic zones, enabling comparison of possible bioactivity variations by environment. The barks were extracted by cold maceration with methanol. The crude extracts were concentrated and stored at 4°C.The antioxidant activity was assessed using Hydrogen peroxide(H_2O_2) scavenging and Ferric Reducing Antioxidant Power assays. In H_2O_2 assay IC_{50} values were determined, and relative antioxidant activity(%RAA) for FRAP assay was calculated against Ascorbic acid. One way ANOVA used for the analyzed the variation in Antioxidant assays. The Brine Shrimp Lethality Assay (BSLA) assessed cytotoxicity by exposing *Artemia salina* nauplii to extract concentration ranging from 0.195 to 100 µg/mL. LC_{50} values were calculated and analyzed using One way ANOVA.

Results: All three extracts exhibited antioxidant potential. IC_{50} values for H_2O_2 scavenging assay were 147.4 µg/mL,140.5 µg/mL, and 144.4 µg/mL respectively for dry, wet, and intermediate zones with no significant differences ($p>0.05$). The FRAP assay revealed significant variation ($p<0.05$),with the wet zone having the highest %RAA. The BSLA showed moderate dose dependent cytotoxicity with LC_{50} values of 43.86 µg/ml, 43.62 µg/ml and 42.35 µg/ml respectively for dry, intermediate and wet zones, with no significant differences($p>0.05$)

Conclusion: *E.variegata* has moderate cytotoxicity but varied antioxidant potential due to assay variations and higher wet zone phytochemicals, indicating its potential as an antioxidant source.

Key words: *Erythrina variegata* **,** Geographical comparison , Antioxidant Assays , Brine Shrimp Lethality Assay(BSLA)

OP 06 AB075

Effect of Heat Treatment on Protein Quantification in Country Eggs and Farm Eggs: Determining Optimal Cooking Methods for Maximum Protein Retention Using the Lowry Method

Dissanayake C. N.[1*], Dissanayake D. M. U. G. K.[1], Diwyanjali M. R.[1], Herath M. H. M. R. N.[1], Rimaza M. R. F.[1], Ruwandika J. D. I.[1] , Ulluwaduge J. D.[2]

[1] *Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*
[2] *Faculty of Allied Health Sciences, University of Sri Jayawardenapura, Sri Lanka*
**Corresponding Author: charuni@kiu.ac.lk*

Introduction: Eggs are a significant source of protein. Cooking denatures proteins by altering their structural integrity. Nutrition composition varies among Country and Farm eggs due to different feeding patterns of hens, as Farm hens get a formulated diet, while Country hens consume a natural diet. This study quantified protein using the Lowry method due to higher sensitivity for protein concentration in eggs compared to other protein assays.

Objectives: To identify the effects of different cooking methods (omelet, hard-boiled and half-boiled) on protein concentration in country and farm eggs.

Methodology: The study assessed three cooking methods: microwave omelet (12.5W/g, 80 seconds), half-boiled (5 min), and hard-boiled (10 min) on the protein content of 30 eggs (15 Country, 15 Farm) with Raw eggs as controls. A Bovine Serum Albumin dilution series was performed as the standard curve. Alkaline sodium carbonate was added to the diluted egg samples, heated (10 min at 50°C), and cooled to RT. Copper solution and Folin-Ciocalteu reagent were added, and incubated at 50°C. The absorbances were read at 650nm and triplicated. The results were obtained using GraphPad Prism and SPSS. The median cutoff value is used to classify the protein concentrations as high/low categories for Chi-square analysis.

Results:. There were no significant associations of country eggs, but farm egg omelets had a significant association between cooking method and protein level ($p = 0.014$).. Paired sample test had a significant decrease in protein content of country eggs after cooking ($p = 0.016$, MD 0.0460, SD=0.0649), and a marginally significant decrease in farm eggs ($p=0.051$, MD =0.0722, SD=0.2798). GraphPad Prism revealed that fully boiled egg yolks retained more protein than egg whites, in both egg types.

Conclusion: Country eggs contain comparatively higher protein levels in raw state. Among the cooking methods, Omelet prepared from farm eggs showed a higher protein retention.

Keywords: Country Eggs, Egg Protein quantification, Farm Eggs, Lowry Method, Protein retention

OP 07 AB079

In Vitro Evaluation of Anti-diabetic Properties of Leaves and Bark of *Dialium ovoideum* Grown in Sri Lanka

Dharmasiri H. V. G. D.[1]*, Jayasekara M. J. P. Y. N. [1], Karunarathna D. G. P. H. [1], Pradeepraj R.[1], Prabodhani K. G. A. [1], Fernando C. A.[2], Jayamaha A. R.[2]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
[2] *Research and Innovation Division, KIU, Sri Lanka*
*Corresponding Author: *b7b8234@kiu.ac.lk*

Introduction: Diabetes mellitus is a prevalent metabolic disorder globally. Phytochemicals have gained attention as alternative treatments for diabetes due to their fewer side effects compared to conventional pharmaceuticals. *Dialium ovoideum*, native to Sri Lanka, is one such medicinal plant.
Objectives: To evaluate the *in vitro* anti-diabetic properties of methanolic extracts of leaves and bark of *Dialium ovoideum*.

Methodology: The methanolic extract of leaves and bark of *Dialium ovoideum* was prepared through a maceration process. The alpha-amylase inhibitory assay was used to assess the activity. Acarbose was used as the standard drug. A dilution series prepared from the stock solution (12.50, 10.00, 7.50, 5.00, 2.50, 1.25 mg/mL) was tested, and absorbance was measured at 540nm using a spectrophotometer. Percentage inhibition was calculated and plotted against concentration. All assays were performed in triplicate. IBM SPSS (Version 23.0) was used for the statistical analysis.

Results: The leaf extract showed the highest percentage inhibition of α-amylase at all concentrations ≥5 mg/mL. Maximum leaf inhibition was 55.84 ± 0.048 % at 12.50 mg/mL. The inhibitory activity of acarbose was 49.99 ± 0.078 % at 12.50 mg/mL, which is slightly lower than the leaf and higher than the bark extracts. The bark extract displayed the lowest inhibition value, 42.18 ± 0.060 % at 12.50 mg/mL, although it demonstrated a clear dose-response relationship. The statistical analysis using the Kruskal-Wallis and Mann-Whitney U tests did not reveal a significant difference between the plant extracts and the standard inhibitor, acarbose ($p > 0.05$).

Conclusion: This study provides preliminary evidence supporting the alpha-amylase inhibitory activity of Dialium ovoideum, particularly in the leaf extract. Inhibitory effect of the leaf extract is statistically comparable to the standard drug, acarbose ($p>0.05$). Concentration dependent trend suggests the presence of bioactive compounds capable of modulating carbohydrate metabolism justifying the need of isolating the phytochemicals and in vivo studies.

Keywords: *Dialium ovoideum*, alpha amylase inhibitory assay, phytochemical composition, spectrophotometry.

OP 08 AB081

Comparative In Vitro Analysis of the Anti-Inflammatory Properties of *Kandula (Musa spp.)* Peel Extracts in Sri Lanka

Kadurebandara K.B.M.I.S.[1], Fernando W.I.Y.T. [1], Dilsha J.A.S. [1], Mithma W.W.P.C.[1], Madushani W.S. [1], Gunawardana K.A.M.N.N.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*
[*]*Corresponding Author: b7b8107@kiu.ac.lk*

Introduction: Long-lasting inflammation is a major cause of many chronic disease conditions and plant-based remedies are used for such inflammations. Bioactive ingredients such as flavonoids, tannins, phenolics present in banana peel, of the native *Kandula (Musa spp)* of Sri Lanka may possess such anti-inflammatory properties.

Objectives: In Vitro analysis of the anti-Inflammatory effect of the peels of *Kandula Musa spp*. in Sri Lanka.

Methodology: Fresh peels (2 kg) were collected from the Horana Agricultural Research Center, freeze-dried, and powdered. Sequential extraction was performed using methanol, hexane, and ethyl acetate at a plant material to solvent ratio of 1:2 (w/v). A dilution series (0.125–2.0 mg/mL) was prepared for each extract. The anti-inflammatory activity was assessed using the HRBC membrane stabilization method. Each treatment was tested in triplicate (n = 3), and absorbance was measured at 560 nm. Diclofenac sodium was used as the standard. Data were analyzed via two-way ANOVA. The row factor (concentration) was not statistically significant ($P = 0.3042$), while the column factor (extract type) was highly significant ($P < 0.0001$), contributing 97.78% of total variation.

Results: The hexane extract showed the highest anti-inflammatory activity, with up to 37.00% membrane protection at 6.25 µg/mL, suggesting activity from non-polar lipophilic compounds. Methanol extract showed moderate protection (8.70–13.09%). Ethyl acetate extract resulted in negative inhibition (−24.50% to −28.00%), possibly due to cytotoxic or pro-inflammatory effects. Diclofenac sodium showed consistent inhibition (28.50–33.60%), validating the assay.

Conclusion: The findings indicate that plant-derived bioactive compounds, particularly from A. indica, exhibit significant antimicrobial activity and synergistic potential with conventional antibiotics. This suggests their applicability as supportive agents in AMR management. Future research should focus on in vivo studies and molecular characterization of active compounds.

Keywords: Musa spp., Kandula banana peel, Anti-inflammatory, HRBC assay, Natural therapeutics, Phytochemicals

OP 09 AB085

Evaluation of the Antimicrobial Effects of Garlic, Ginger, and Turmeric on Pathogens Isolated from Chicken Samples Collected in Pettah, Colombo District, Sri Lanka

Hettiarachchi P.H.A.A.S. [1]*., Wanigarathna U.G.S.H. [1]., Dewimini D.D.S. [1]., Nadeeranga K.W.T.S. [1]., Kulathunga I.P.S.N. [1]., Ramanayaka A.S. [1]., Ranadeva N.D.K.[1], Hettiarachchi D.[2]

[1] *Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
[2] *Department of anatomy, Genetics and biomedical informatics, Faculty of Medicine, University of Colombo, Sri Lanka.*
**Corresponding Author: ayodhyahettiarachchi395@gmail.com*

Background: In Sri Lanka, one of growing public health concerns is "Antibiotic resistant foodborne pathogens", which arise from improper meat handling and antibiotic misuse within the community. This study aimed to evaluate the antimicrobial activity of hydroethanolic extracts from garlic (*Allium sativum*), ginger (Zingiber *officinale*), and turmeric (*Curcuma longa*) against *Salmonella spp, Escherichia coli*, and *Staphylococcus aureus* isolated from 30 raw chicken samples collected in Pettah, Colombo District.

Methods: Over the course of three months, a research study was carried out in a laboratory. 30 Pettah meat stores provided 30 raw chicken samples, which were chosen at random. 150 mL of distilled water and 150 mL of ethanol (1:1) were used to extract 25 g of dry powder from each spice. The mixture was then stirred for 6–7 hours at about 25 °C, filtered, and allowed to evaporate at room temperature. The extracts were stored at 4 °C. Bacterial identification was performed according to CLSI 2023 guidelines, bacteria were identified using normal culture and biochemical assays. Agar well diffusion on Mueller-Hinton agar was used to measure the antimicrobial activity, and vancomycin and ciprofloxacin served as positive controls. For each organism, inhibition zones were measured using CLSI standards and phytochemical antimicrobial studies. All experiments were conducted in triplicate, and the mean inhibition zones (mm) ± SD were recorded.

Results: The highest action was showed by ginger extract, which had inhibitory zones of 18.0 ± 0.8 mm for *E. coli* and 18.2 ± 0.9 mm for *S. aureus*. For *E. Coli* and *S. aureus,* garlic extract inhibited 17.0 ± 0.6 mm and 15.0 ± 1.2 mm, respectively, but turmeric extract produced 13.0 ± 0.9 mm and 17.0 ± 0.8 mm. The inhibitory effect of all extracts was 8.0 ± 0.5 to 9.5 ± 0.6 mm for *Salmonella spp*. The most effective were the positive controls, vancomycin (23–24 mm) and ciprofloxacin (24–25 mm).

Keywords: *Escherichia coli*, *Salmonella spp*, *Staphylococcus aureus*, hydroethanolic extract, chicken Samples.

OP 10 AB166

Assessment of Probiotic Property in Selected Banana Varieties Obtained from Fruit Markets in Colombo District Using *Lactobacillus* Strains

Isurini P.H.C.[1]*, Rathnayaka R.M.R.K.[1], Abeysekara G.G.R.[1], Thathsarani K.B.U.[1], Kumara A.Y.K.[1], Dissanayaka C.T.N.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*

[*]*Corresponding Author: b7a8344@kiu.ac.lk*

Introduction: Probiotics are living organisms that are beneficial to health when consumed in adequate quantities. *Musa* spp. can stimulate the growth of beneficial gut microbes. This study was aimed at determining the probiotic capability of selected 3 *Musa* spp. varieties from 29 cultivated varieties in Sri Lanka using *Lactobacillus* strains.

Objectives: To evaluate the probiotic potential of selected banana varieties of Colombo District by determining their capability to promote the growth of *Lactobacillus* strains.

Methodology: Three banana varieties: Ambul (*Musa acuminata* AAB), Kolikuttu (*Musa acuminata*), and Seeni (*Musa paradisiaca* AA) were collected from the local fruit markets in the Colombo District using convenient sampling method. Samples were washed, peeled, and homogenized in sterile distilled water. Each homogenate was prepared as a Dependent Half-fold dilution method and inoculated onto De Man, Rogosa, and Sharpe (MRS) agar. *Lactobacillus* isolates were identified using Gram staining, catalase testing, and motility tests. All samples were analyzed in triplicate, and colony counts were statistically evaluated using two-way ANOVA.

Results: Non-motile, catalase-negative, gram-positive, rod-shaped bacilli were identified and confirmed as *Lactobacillus*. The mean counts (CFU/mL) were Ambul: 1.13×10^3, Kolikuttu: 8.67×10^2, and Seeni: 5.73×10^2. Two-way ANOVA showed no significant difference among varieties ($p= 0.2763$) or among replicates ($p= 0.1568$), suggesting the ability of these three banana varieties to be regarded as having the same probiotic potential.

Conclusion: All three banana varieties supported comparable *Lactobacillus* growth, indicating similar probiotic potential as functional foods for gut health.

Keywords: De Man, Rogosa, and Sharpe agar, *Lactobacillus*, *Musa* spp., Probiotic properties

KIU

Multidisciplinary Research Conference 2025

Proceedings MRC 2025 - Book IV

Poster Presentations – Panel 01
Health Sciences

PP 01 AB006

Evaluating Toxicity of Methanolic Extraction of Leaves of *Tephrosia vogelii* using Zebrafish (*Danio rerio*) Embryonic Assay

Segar N[1], Hamna A. F*[1], Hakeem S. M[1], Jayasooriya M. H[1], Lakshan U. J. I[1], Bandara G. P[1], Rasanjanee D. D. Y[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*
**Corresponding Author: hamnashraff@gmail.com*

Introduction: *Tephrosia vogelii* commonly called fish poison bean, well known for its anesthetic properties that aid fisheries, aquaculture and laboratories. Plants contain rotenone, deguelin and tephrosin as bioactive compounds that exhibit neurotoxic properties indicating the requirement of study on toxicity of *T. vogelii*.

Objective: This study focused on investigating the toxicity of *Tephrosia vogelii* leaves using zebrafish (*Danio rerio*) embryos according to FET (Fish Embryo acute Toxicity) test no. 236 guidelines of OECD (Organization for Economic Cooperation and Development) to discover its safe potential to use as a herbal anesthetic in future.

Methodology: *T. vogelii* leaves collected from Badulla district, Sri Lanka, authenticated at Bandaranayake Memorial Research Institute, Nawinna, Maharagama. Zebrafish embryos aged 3 hpf (hour post fertilization) to 96 hpf were used for study and were exposed from 100 to 1000 µg/L of methanolic leaves extract of *T. vogelii*. Embryos were observed at 24, 48, 72 and 96 hpf using a digital microscope. Hatchability, survival and mortality endpoints were analyzed using two-way ANOVA with reference to control group, followed by Dunnett's multiple comparison test. A non-linear regression analysis in GraphPad Prism used to calculate LC_{50}.

Results: The analysis disclosed a concentration-dependent decline in hatchability and survival upon increasing concentrations. Complete mortality was observed at 800 µg/L as early as 48 hpf, thus indicating acute toxicity. The mortality rate was clearly dose dependent. Analysis revealed a sigmoidal curve with LC_{50} of approximately 828.2 µg/L ($p < 0.0001$).

Conclusion: *T. vogelii* shows dose dependent embryo toxicity with LC_{50} of 828.2 µg/L signifying the importance of dose regulation for long term safety in broader applications in fisheries, aquaculture, laboratories and clinical settings. Future studies need to address the threshold levels and physiological effects of *T. vogelii* as herbal anesthetic in future.

Keywords: Zebrafish, Embryo toxicity, LC_{50}, *Tephrosia vogelii,* Aquaculture

PP 02 AB034

Pan-Cancer Genomic Landscape of Rare Pediatric Tumors: Insights from the MSK Pediatric Tumor Dataset (2025)

Ranadeva N D K [1], Dissanayake C T N [1], Bandara G P S [1*], Sandamali P M N N [1], Midushika M G H M [1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Battaramulla, Sri Lanka*
**Corresponding Author:* nadeeka@kiu.ac.lk

Introduction: Peadiatric cancers show distinct biological and clinical features. Rare peadiatric tumors have not been sufficiently represented in genomic research. The Memorial Sloan Kettering (MSK) pediatric cancer studies focus on exploring such uncharacterized paediatric tumours. Paediatric Tumor dataset (2025) (Understudies data set/ novel), downloaded through cBioPortal, gives whole-exome sequencing data for 60 poorly characterized tumors for further studies.

Objective: To identify mutations that occur across multiple cancer types, gaining knowledge of potentially actionable gene alterations across rare pediatric tumors in the MSK 2025 cohort, and assessing the potential for pan-cancer are the goals of this study.

Methodology: In this descriptive study, 60 tumor samples from the MSK 2025 dataset were examined. The analysis was done with mutation frequency summaries, annotated metadata with tumour classifications, the gene alteration matrices (>260 genes). With non-profiled genes excluded the mutation burden was calculated for each sample. Type frequency was used to assess rarity. OncoKB annotations were used to identify clinically significant genes, and cross tumour mutation patterns were assessed using descriptive statistics.

Results: Out of the cancer types, Diffuse Intrinsic Pontine Glioma, Adenoid Cystic Carcinoma, and Neuroblastoma had 5 cases each. The majority of tumour types were not common with only one or two samples per type. Significant cancer genes such as BCR (33.3%), GAB2 (5%), SMARCB1 (5.0%) commonly showed homozygous deletions. Nearly 1.8% samples had amplifications in POLE, NEGR1 and H3C13 respectively. The mutation burden ranged from 0 to 15 alterations per sample with a median of 3 and an interquartile range (IQR) of 1–6. Highest being a case of medulloblastoma, with 15 gene-level alterations, including mutations in MSH6, AKT2, and LATS1. TP53 was mutated in 9 samples, KRAS in 3, and RB1 in 2, which suggests frequent disruptions in the p53 and RAS signaling pathways. These key alterations were observed across various tumour types, indicating the shared oncogenic drivers. These findings support the cross -cutting genomic changes in rare paediatric cancers and point toward opportunities for pan-cancer treatment stratification.

Conclusion: This understudied data set shows that different rare childhood cancers often share similar genetic changes. This leads to the exploration of the possibility of grouping them based on their common mutations and thereby developing common therapies to address them.

Keywords: Pediatric cancer, rare tumors, somatic mutations, cBioPortal, KRAS, TP53

PP 03 AB035

Methylenetetrahydrofolate reductase Gene Polymorphisms and Autism Spectrum Disorder Susceptibility in the Sri Lankan Population: A Systematic Review of *in Silico* SNP Validation

Paranagama S.A.[1], Mendis B.W.[1*], Rupasinghe H.H.D.M.[1], Lande Badalge N.R.[1], Stanley D.[1], Premarathne M.G.H.M.[1], Ranadeva N.[1], Hettiarachchi D.[2]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
[2]*Department of Anatomy, Genetics and Biomedical Informatics, Faculty of Medicine, University of Colombo, Sri Lanka.*
**Corresponding Author: b8b8497@kiu.ac.lk*

Introduction: Autism spectrum disorder (ASD) is a heterogeneous neurobehavioral disorder, affecting 1/80-100 individuals globally. The *methylenetetrahydrofolate reductase (MTHFR)* gene is necessary for both folate metabolism and the DNA methylation process. Understanding this correlation is essential for developing early screening and intervention approaches.

Objectives: This study aims to assess the association between *MTHFR* gene polymorphisms and ASD among the Sri Lankan population.

Methodology: A systematic review was conducted using relevant keywords across the PubMed (183), Google Scholar (207), and Hinari (122) databases. Following PRISMA guidelines, 47 duplicates were removed, and 83 non-English articles were excluded. Based on title and abstract screening, 99 articles were removed. Of the remaining 283 reports, 179 full-text articles were eligible. Ultimately, 51 published papers from 2014 to 2025 were selected for analysis in accordance with the review's objectives and aims.

Results: Among 51 filtered articles according to PRISMA guidelines, the most reported ASD-associated MTHFR variants were *MTHFR* C677T and *MTHFR* A1298C. Among these, 51% of studies identified the *MTHFR* C677T, while 33% of articles examined the *MTHFR* A1298C polymorphism. Worldwide literature reports a statistically significant correlation between *MTHFR* C677T and ASD susceptibility ($P<0.005$), and the pooled results suggest a more significant association with heterozygous alleles than with homozygous alleles. In the case of the 5 studies examined, no significant association for *MTHFR* A1298C. However, 7 studies discovered a moderate correlation between the *MTHFR* A1298C variant and ASD, particularly within East and West Asian populations. 4 out of 51 studies suggest that *in silico* predictions indicate deleterious effects of certain *MTHFR* gene variants, showing potential population-specific risk patterns.

Conclusion: Global studies suggest there is a significant correlation between *MTHFR* gene variants and ASD. This study highlights a research gap in *MTHFR*-ASD risk patterns within the Sri Lankan population.

Keywords: *Methylenetetrahydrofolate reductase* (*MTHFR*), Autism spectrum Disorder (ASD), Sri Lankan population, *MTHFR* gene polymorphisms

PP 04 AB038

Innovative Approaches to Prenatal Detection and Diagnosis of Congenital Heart Diseases: A Systematic Review

Premarathne M.G.H.M.[1]*, Pinnawala C. [1], Sandamali P.M.N.N. [1], Bandara U.H.R.G.P.S [1], Kodikara V. S.[1], Ranadeva N.D.K[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*

**Corresponding Author:* midushika@kiu.ac.lk

Introduction: Congenital heart diseases (CHDs) affect approximately 1% of live births worldwide, representing one of the most common birth defects. Early prenatal detection is crucial for optimal management and improved outcomes. Traditional screening methods, including fetal echocardiography and obstetric ultrasound, have limitations in accuracy, sensitivity, and accessibility, necessitating the development of novel diagnostic approaches.

Objective: This review examines recent advances in prenatal screening and diagnosis of CHDs, focusing on innovative techniques and emerging technologies to enhance early detection capabilities.

Methodology: The literature on novel methods for prenatal detection and diagnosis of CHDs from 2015 to January 2025 in three databases (PubMed – 102, HINARI – 80, Google Scholar – 132) was systematically reviewed following the PRISMA guidelines of 2020. The search terms used included "Congenital Heart Diseases", “Prenatal Screening," "Novel Methods," "Molecular Screening," and "Fetal Echocardiography" combined with Boolean operators. After excluding reports for being unable to translate, duplicates and being irrelevant to the topic, total number of manuscripts included in the study is thirty-two.

Results: From the analysed studies, enhanced fetal echocardiography (53%, n=17) demonstrated superior anatomical visualization but required specialized expertise. Cell-free fetal DNA testing (28%, n=9) showed higher specificity for CHDs associated with aneuploidies, yet limited direct cardiac assessment was detected. Fetal MRI (25%, n=8) provided advanced anatomical detail in cases that are technically difficult to comprehend. Artificial intelligence-based algorithms (19%, n=6) exhibited significant screening sensitivity (85-95%) but lacked external validation. The evidence has shown that echocardiography is showing the strongest clinical validation, whereas AI applications remain largely developmental.

Conclusion: Novel prenatal methods, including enhanced fetal echocardiography, Cell-free fetal DNA testing, Fetal MRI, and Artificial Intelligence-based algorithms, enable earlier diagnosis, improved family counselling, and timely intervention strategies.

Keywords: Congenital heart diseases, Prenatal screening, Novel methods, Molecular screening, Fetal Endocardiography

PP 05 AB042

A Systematic Review of in vitro studies on the Effect of Repeated Heating on Lipid Oxidation

Peiris M.N. R[1*], Dissanayake R.K.A.S. A[1], Arka M.L. F[1], Priyadarshana E.D. D[1], Munasinghe M.A.T. N[1], Premaratne M.G.H.M[1], Samarakoon D.N.A.W[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
**Corresponding author: b8b8437@kiu.ac.lk*

Introduction: Oils are reheated in many households, food industries due to convenience and affordability. Repeated heating increases lipid oxidation, resulting in the production of toxic substances, including hydroperoxides, aldehydes, and secondary products, causing cancer and cardiovascular diseases.

Objectives: To conduct a systematic review of the in vitro research on the impact of repeated reheating on lipid oxidation in edible oils and animal-derived products.

Methodology: PubMed (109), Hinari (17), Google Scholar (175), and ResearchGate (20) were approached with literature searches. The search was conducted using preset keywords and inclusion/exclusion criteria based on PRISMA 2020 guidelines. Studies that involve in vivo experiments and do not specify the lipid oxidation, repeated heating were excluded. The lipid oxidation measurements, Thiobarbituric Acid Reactive Substances (TBARS) and Peroxide Value (PV), p-Anisidine Value (AV), number of repeating cycles, temperatures, and food type were extracted.

Results: Reheating showed statistically significant increments in lipid oxidation in food matrices. The most susceptible foods were always the ones high in polyunsaturated fatty acids (PUFA) with moderate increases in saturated and monounsaturated-rich fatty acids. The representative data are PV in sunflower oil, that begin to increase since 3.5 to 12 meq O2/kg after 10 cycles, and TBARS in chicken meat, which begins to grow since 0.25 to 0.45mg MDA/kg, all of which are statistically significant ($p < 0.05$). Dry-heat processes, including deep-frying, gave greater oxidation than moist-heat processes. The antioxidants initially decreased lipid oxidation but became ineffective after numerous cycles.

Conclusion: Various in vitro experiments have provided proof that subsequent reheating enhances lipid oxidation in oils, animal foods, and PUFA containing foods are most susceptible. The effects of moist-heat, antioxidants methods offer short-term protection, but the treatment becomes ineffectual with repeated reheating. To determine health risks in oxidized lipids, standardized in vitro reheating systems and uniform reporting of oxidative indices are required.

Keywords: Repeated reheating, lipid oxidation, reheating methods, oxidative products, analytical methods

PP 06 AB 046

Medicinal plants and their effects on hemostasis: Comparative analysis of laboratory studies

R. K. Ilangasinghe[1*], M . F. S hefa[1], G. R. N. G. Jayawardhana[1], M. M. F. Shahma[1], E. G. M. J. Gamage[1], M. G. H. M. Premarathne[1], N. Ranadeva[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
[*]*Corresponding Author:* rasiruil langasingh e01 @gmail.com

Introduction: Hemostasis represents a critical physiological process to inhibit excessive bleeding in response to vascular damage. Although synthetic hemostatic agents have been applied clinically, they are limited by side effects, expensive and access restrictions in low-resource areas. Among plants used as medicine in traditional healing systems, medicinal plants have shown attractiveness as alternative natural medicine of choice with a diverse phytochemical profile and hemostatic potential with minimized cost.

Objective: This review was conducted to assess the hemostatic effects of medicinal plants as laboratory evidence, list down 5 important species, their phytochemicals, mode of action and experiment of interest. The review also intends to provide directions for next generation platforms that may develop in promoting innovation in natural therapeutic development in the future.

Methodology: A systematic review of literature was conducted through PubMed, Scopus, and Google Scholar following the PRISMA criteria. We included 24
peer-reviewed papers published from 2013 to 2024 according to predefined inclusion criteria. Data collected were plant name, part used, extraction method, bioactive compounds, bleeding/clotting time, prothrombin time (PT), activated partial thromboplastin time (aPTT) and limitations of these studies.

Results: 5 medicinal plants (*Mikania micrantha, Moringa oleifera, Lawsonia inermis, Adiantum capillus-veneris, Azadirachta indica*) were mentioned to have an important hemostatic value. Flavonoids, tannins, saponins, phenolic acids, and lectins phytochemicals related to faster formation of clots and stimulated platelet aggregation. Nonetheless, methodological heterogeneity, small sample sizes and lack of mechanistic data were significant limitations in all studies.

Conclusion: Natural hemostatic agents are emerging as potential candidates for hemostasis and lessening the risk associated with synthetic drugs. However, ease of translation toward clinical applications depends on the use of standard protocols, proper mechanistic characterization, and on rigorous preclinical and clinical controlled trials to confirm efficacy and safety.

Keywords: Hemostasis, Medicinal plants, Clotting time, Phytochemicals, Wound healing, Natural hemostatic agents

PP 07 AB047

Antibiofilm Efficacy of Crude Plant Extracts and Green Synthesized Nanoparticles; A Systematic Review

Dheena M.I.[1*], Minza M.F.F.[1], Karunathilaka V.P.P.S.[1], Mathusha S.[1], Muthukumarana N.M.N.S.[1], Premarathne M.G.H.M.[1], Ranadeva N.D.K[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*

[*]*Corresponding Author:* b8b8631@kiu.ac.lk

Introduction: Biofilm associated infections pose major clinical challenges due to antibiotic resistance. Green synthesized nanoparticles and natural phytochemicals are potentially effective antibiofilm agents.

Objectives: To conduct a systematic review of the published evidence on the antibiofilm properties of crude plant extracts and green synthesized nanoparticles against clinically relevant biofilm forming microorganisms.

Methodology: A systematic search was carried out in Google Scholar, PubMed, ResearchGate, ScienceDirect, and other databases (2016-2025) with the Boolean operators and MeSH terms related to biofilm, plant extracts, green synthesis, nanoparticles and clinical isolates. The inclusion criteria were peer reviewed original research and accepted manuscripts, in English and full text access reporting quantitative results of the antibiofilm by in vitro, in vivo or in silico approaches. The quality of the studies was evaluated according to the characterization of nanoparticles, biofilm analysis, experimental design and mechanistic evaluation. Data were screened and extracted by five reviewers whose disagreement was resolved through consensus.

Results: A total of 45 studies out of 407 records were included to evaluate crude extracts of medicinal plants and green synthesized nanoparticles (Gold, Silver, Zinc oxide, copper, Ag-Au bimetallic). These had good antibiofilm effect on bacterial and fungal pathogens. Dose dependent biofilm inhibition was observed in vitro using CLSM, Crystal violet microtiter and SEM, representing silver nanoparticles greater than 90% and zinc oxide or bimetallic nanoparticles 50% reduction at sub-MIC levels. These mechanisms included quorum sensing interference, membrane damage, extracellular matrix disruption and bacterial motility inhibition. In vivo studies demonstrated low cytotoxicity, improved survival and mild ecotoxicity for some zinc oxide nanoparticles. Phytochemicals were found to be well bound to quorum sensing receptors in silico.

Conclusion: The crude plant extracts and the green synthesized nanoparticles exhibit potential antibiofilm property. They need to be validated by standardized protocols and further in vivo research on their clinical applicability.

Keywords: Antibiofilm activity, Green synthesized nanoparticles, Crude plant extracts, Biofilm inhibition, Anti-microbial resistance

PP 08 AB052

Antibiofilm Synergistic Potential of Plant Extracts with Nitrofurantoin: A Systematic Review

Sachinthani S. D. D.[1]*, Shimra U. F.[1], Dulanjalee G. R.[1], Peiris W. W. D. M.[1], Sandamali S. P.[1], Rasanjanee D. D. Y.[1], Senanayake R. A. S. P.[2]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU , Sri Lanka*
[2]*Department of Plant and Molecular Biology, Faculty of Science, University of Kelaniya, Sri Lanka*
**Corresponding author: b8a8395@kiu.ac.lk*

Background: Urinary tract infections (UTIs) is a significant global health challenge, affecting millions of individuals annually. Biofilm formation by uropathogens has subjected as a critical mechanism contributing to the persistence and recurrence of urinary tract infections (UTIs).

Objectives: This review aims to inspect the mechanisms of inhibition of biofilm formation by major uropathogens and evaluate the synergistic potential of plant extracts combined with nitrofurantoin as an innovative therapeutic approach.

Methodology: This comprehensive review was conducted using PubMed and Google Scholar, starting from 1224 articles published between 2020-2025. The study explored the database by relevent keywords. Based on the PRISMA guidelines, 40 articles were filtered. Included any plant derived extract combined with nitrofurantoin. Both crude extracts and isolated phytochemicals were allowed. Excluded studies done against planktonic cells without biofilm assays and proper control comparators.

Results/Findings: As per studies, uropathogenic *Escherichia coli* (UPEC) and *Klebsiella pneumoniae* exhibit sophisticated biofilm formation mechanisms through quorum sensing, fimbrial adhesion, and extracellular polymeric matrix production. Biofilm-associated bacteria manifest 10-1000 times increased resistance to antibiotics. Some phytotherapeutic approaches in studies include Cranberry, *Enantia chlorantha, Castanea crenata, Origanum vulgare* and *Plectranthus amboinicus*. Nitrofurantoin alone exhibits 12-18mm inhibition towards *E.coli* and *S.agalactae,* like common uropathogens, and when combined with *Phyllanthus niruri* or *Origanum vulgare*, it increases up to 20-28mm range. Bioactive compounds like tannins, flavonoids, proanthocyanidins, quercetin, apigenin, arbutin, saponins, and vitamin C are efficient in anti-biofilm properties and synergistic effects when co-administered with nitrofurantoin, resulting in reduced minimum inhibitory concentrations (MICs).

Conclusions: Assimilation of plant-based therapeutic phytochemicals with nitrofurantoin represents an effective strategy for confronting infections caused by biofilm-forming pathogens and recurrent infections. The synergistic interactions significantly enhance the efficacy, reduce antibiotic dosage and are efficient in restricting the resistance. Future studies should be focused on molecular-level mechanisms and standardization of the formulations.

Keywords: Antibiofilm, Nitrofurantoin synergy, Phytochemicals, Antiadhesion therapy, Urinary tract infections.

PP 09 AB053

Natural Compounds from Ayurvedic Herbs for Potential Platelet Enhancing Activity in Dengue Management – A Systematic Review

Radeesa D. L. K. H[1*], Mallikarathne C. A[1], Bandara A. A. L. S[1], Josita J. A[1], Nilakshi S. H. C[1], Bandara G. P. S[1], Samarakoon D. N. A. W[1], Ranadeva N. D. K[1]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU, Sri Lanka*
**Corresponding Author: b8a8392@kiu.ac.lk*

Background: Dengue fever is a mosquito-borne viral disease which is yet a significant health concern in tropical and subtropical areas, frequently cause thrombocytopenia, which may lead to internal bleeding, hospitalization, or even death in severe cases. While Biomedicines offer limited efficacy, emerging evidence suggests that ayurvedic herbs with certain phytochemicals may significantly enhance platelet production in dengue management.

Objectives: This review aims to identify and evaluate the platelet enhancement potential of natural compounds from Ayurvedic herbs, in dengue management.

Methodology: The literature was conducted by using keywords (thrombocytopenia, dengue, platelet enhancement, ayurvedic herbs, natural plants). Google Scholar, PubMed, Core, Semantic Scholar, Science Direct, HINARI were used as databases, focusing on studies published between 2015-2025. The records were screened by title, abstract and language. Original research articles that were evaluated for the effects of herbal plant extracts in treating dengue-induced thrombocytopenia, and quantitative data including mean platelet counts, standard deviations, and p-values were included.

Results: Total 40 out of 98 studies were included in this review. Among them 23 (57.5%) evaluated *Carica papaya,* while 6(15%) studies assessed *Tinospora cordifolia.* The remaining 11(27.5%) studies studied other herbal extracts including *Alternanthera sessilis, Pyracantha fortuneana, Andrographis paniculata, Azadirachta indica, Ocimum sanctum, Cissampelos pareira, Psidium guajava, and Zingiber officinale.* Across studies, *Carica papaya* indicated a mean platelet count increase from 25% -70%, and *Tinospora cordifolia* showed 18%–55%, both with significant improvements ($p < 0.05$). Over 90% of studies evaluated significant platelet enhancement and inclusion of main bioactive compounds like quercetin, rutin, phenolic acids, saponins, alkaloids, and glycosaponins which showed membrane stabilizing and hematopoietic stimulating properties.

Conclusion: *Carica papaya* emerged as the most extensively investigated herb, whereas limited research was conducted on other plants. However, standardized clinical trials are urgently required to ensure safety, establish optimal dosing, and confirm therapeutic efficacy across broader populations.

Keywords: Ayurvedic medicine, Dengue, Natural herbs, Platelet counts, Thrombocytopenia

PP 10 AB058

Antibacterial effect of *Ocimum tenuiflorum* leaves against acne-causing bacteria

Prabodhi L. A. H. [1], Wijebandara D. K. T. Y. [1], Wickramanayake H. M. R. D. [1], Herath H. M. U. K. [1], M. G. H. M. Premarathne[1], . Ranadeva N. D. K. [1], Pathiraja D.[2*]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
[2]*Department of Chemistry, Faculty of Science, University of Colombo, Colombo 03, Sri Lanka.*
* *Corresponding Author*: pmduleepa@chem.cmb.ac.lk

Introduction: Acne vulgaris is a widespread skin condition caused by bacteria such as *Cutibacterium acnes*, *Staphylococcus aureus* and *Staphylococcus epidermidis*. Conventional treatments of this condition often lead to antibacterial resistance and side effects. *Ocimum tenuiflorum* is a well-known medicinal plant in Ayurvedic medicine which contains bioactive compounds like eugenol and ursolic acid with proven antimicrobial properties. However, the antibacterial effect of *O. tenuiflorum* leaf extract over acne causing bacteria has not been studied.

Objective: This study aims to evaluate the antibacterial effect of *O. tenuiflorum* leaf against acne causing bacteria, *S. aureus* and *S. epidermidis*.

Method: Shade dried *O. tenuiflorum* leaf powder was extracted using ethanol and methanol in 1:10 (powder: solvent) ratio (w/v) and concentrated by evaporating in fume-hood. Leaf extractions were prepared into 100%, 50% and 25% concentrations using crude extract. The antibacterial activity of prepared extractions was assessed by agar disc diffusion assay against *S. aureus* (ATCC 2593) and *S. epidermidis* (ATCC 12228) with vancomycin as positive control. Diameters of zones of inhibition were measured and compared.

Results: 100% methanol extract showed higher inhibitory activity against *S. aureus* than *S. epidermidis* with the maximum diameter of the inhibitory zone of 24 mm and 9.5 mm respectively. Similarly, ethanol extract also exhibited inhibitory activity against both *S. aureus* and *S. epidermidis* with the maximum diameter of the inhibitory zone of 14.7 mm and 8.6 mm respectively. The positive control showed 25mm of maximum diameter against *S. aureus* and 22mm of maximum diameter against *S. epidermidis*.

Conclusion: This study indicated that the methanol extraction of *O. tenuiflorum* leaves has the highest antibacterial activity against tested bacteria. Ethanol extracts of *O. tenuiflorum* leaves also exhibit a notable antibacterial activity against *S. aureus* and *S. epidermidis*. Further study is required to confirm the active compound responsible for antibacterial activity.

Keywords: *Ocimum fenuiflorum*, Antibacterial activity, *Staphylococcus aureus*, *Staphylococcus epidermidis*, Acne Vulgaris

PP 11 AB060

Systematic Review on Usage of Artificial Intelligence on Proper Management and Control of Cancer Related Adverse Drug Reactions

Samarakoon D. N. A. W.[1]*, Edirisinghe P. K.[1] , Dassanayaka D. M. M. D[1], Kaumini H. A. G.[1], Rajapaksha R. M. N. N.[1], Kahandawa K.A. S. T.[1], Samarakoon D.G.[1], Rajapaksha R. S. H. [1], Jayasinghe D. S. K.[1]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU, Sri Lanka*
[*]*Corresponding Author: nirmani@kiu.ac.lk*

Introduction: Cancer treatments including chemotherapy, immunotherapy, and targeted therapy, often cause adverse drug reactions (ADRs) compromising patient safety and treatment efficacy. Traditional ADR management methods rely on clinical observations and trial-based data, which may not ensure early detection and personalized intervention. Artificial Intelligence (AI) is a promising tool to improve prediction, monitoring, and control of cancer-related ADRs.

Objective/s: To explore the role of AI in the proper management and control of cancer-related ADRs and how AI-driven models enhance ADR prediction, optimize treatments and improve patient outcomes.

Methodology: This systematic review was conducted from January to March 2025 with a total of 49 records taken from Google scholar (34), PubMed (03) and Research gate (12). The selection and screening were done according to the PRISMA 2020 guideline using the keywords: Adverse drug reactions, Artificial intelligence, cancer and Machine learning. Inclusion criteria for final 26 research articles included in the review were original research articles published within the past 10 years with usage of AI tools, Studies related to adverse drug reactions on cancer patients.

Results: According to reported studies, Al models demonstrated higher accuracy in detecting ADR patterns and predicting high risk patients. The majority (60%) of studies applied machine learning techniques for ADR identification. Other AI methods such as Convolutional neural network (CNN), Artificial neutral networks (ANN), regex were found in fewer studies (20-25%). AI powered chatbots and Electronic Health Records (EHR) analysis have further enhanced real time monitoring and patients centered care. However, challenges such as data privacy, algorithmic bias and regulatory concerns remain barriers to widespread implementation. There were no studies found comparing ADR detection using manual methods versus AI powered tools. So as a future research direction it would be valuable to investigate and compare the manual ADR detection methods with AI powered tools.

Conclusion/s: AI presents a transformative approach to managing cancer-related ADRs, supporting precision medicine. Overcoming ethical and practical challenges is crucial for its successful integration into oncology.

Keywords: Adverse Drug Reactions, Artificial Intelligence, Cancer, Machine Learning

PP 12 AB061

Artificial Intelligence for Preventing Drug Interactions: A Systematic Review

Waneesha A.D.K.[1], Jayarathna A.G.R.C.[1], Dharmathilaka N.A.D.S.A.[1], Senarathna W.E.M.N.M.[1], Wanasinghe P.A.H.E[1], Hapuarachchi J.H.H.M.J.[1], Yuhansa P.H.Y[1], Zoysa G.T.S[1], Samarakoon D.N.A.W[1] ,Liyanage U.P[2]

[1] *Faculty of Health Sciences, KIU, 249/1, Malabe Road, Thalangama North, Koswatta, Battaramulla,*
[2] *Department of Mathematics, University of Colombo*
[*] *Corresponding author: nirmani@kiu.ac.lk*

Background: Drug interactions refer to reactions between two or more drugs, or between a drug and a food or a supplement. Drug-drug interactions (DDIs) can lead to varied therapeutic outcomes. Artificial intelligence (AI) has emerged as an effective tool to reduce and prevent such interactions through advanced computational modeling and data analysis. AI, especially through machine learning and natural language processing (NLP), facilitates the identification of patterns in drug interaction data.

Objective: This systematic review aims to identify AI-driven strategies for the detection and prevention of DDIs, with a goal of supporting healthcare professionals.

Method: The selection process complied to the PRISMA 2020 guidelines. Articles published between 2014 and 2024 were selected. The key words search strategy was developed using Boolean operators. A total of 423 articles were extracted. 321 articles were taken from Google Scholar, 63 from ResearchGate, and 39 from PubMed. Finally, 24 studies were selected based on specified criteria. The inclusion criteria focused on the active employment of AI tools and the reporting of outcomes pertinent to the prevention of DDIs. The exclusion criteria encompassed duplicate publications and review articles. The focus of this review is on research-oriented AI tools in above 24 articles.

Results: A systematic review was conducted on twenty distinct tools, with an emphasis on their respective applications, advantages, and limitations. Among these, tools such as DeepDDI and ProTox-II exemplify AI models grounded in deep learning and machine learning methodologies, whereas BioBERT exemplifies models based on NLP transformers.

Conclusion/s: AI has emerged as a powerful tool in drug interaction prevention. However, several challenges persist. These include data limitation and lack of clinical validation. The future of AI in drug safety lies in merging these models with real-world evidence. With more research, AI tools hold significant potential to revolutionize drug safety in future.

Keywords: Adverse drug reactions, Artificial intelligence, Drug-drug interactions, Machine learning, pharmacovigilance.

PP 13 AB063

Antimicrobial Potential of Herbo-metallic Formulations: Mechanisms, Efficacy, and Modern Challenges - A Systematic Review

De Silva K. T. S. [1]*, Govindi K. A. C. P.[1], Munasinghe K. P.[1], De Mel W. K. R. [1], Premalal A. G. E. P. [1], De Silva U. L. R. M [1], Senanayake R. A. S. P.[2]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU, Sri Lanka*
[2]*Department of Plant and Molecular Biology, Faculty of Science, University of Kelaniya, Sri Lanka*
[*]*Corresponding Author: b8b8463@kiu.ac.lk*

Introduction: Antimicrobial resistance (AMR) is a critical global health threat, causing increasing deaths and hindering current therapies. Traditional herbo-metallic formulations from Ayurveda and Siddha medicine, containing processed metals, minerals, and bioactive herbs, are gaining rapid interest to combat resistant or mutated pathogens.

Objectives: This review evaluates the antimicrobial properties of key herbo-metallic formulations, explores their mechanisms of action, and addresses modern challenges limiting integration into modern medicine.

Methodology: A comprehensive study was conducted on Google Scholar, PubMed, and ResearchGate (2015–2025), using the following keywords: "antimicrobial activity," "herbo-metallic drugs," "Ayurveda drugs," and "Rasashastra." 752 articles were screened, and 20 that evaluate antimicrobial activity via *in-vitro* or *in-vivo* assays were included, following PRISMA guidelines.

Results: Across 20 studies, 31 herbo-metallic formulations were identified, as some have reported multiple. Among those studies, 17 reported zone of inhibition (ZOI) via diffusion assays, while 8 reported MIC or MBC data. The majority of the formulations expressed antimicrobial activity against *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Candida albicans*, with some being active against Methicillin-Resistant *Staphylococcus aureus*. Approximately 41% and 32% of herbo-metallic formulations contained sulfur and mercury, respectively, while copper compounds (19%) often exhibited strong antifungal activity. For example, Tuttha Bhasma exhibited a ZOI up to 40 mm against *C. albicans*, exceeding that of Amphotericin B.

Discussion: Many act through mechanisms mediated via nanoparticles, including membrane disruption, reactive oxygen species synthesis, enzyme inhibition, and immunomodulation, showcasing potential. However, preparation inconsistencies, poor standardization, limited clinical trials, toxicity and bio accumulation issues are modern challenges that raise concerns regarding safety, reproducibility, and efficacy. The lack of regulation frameworks and extensive safety assessments makes their integration into modern medicine difficult.

Conclusion: Herbo-metallic drugs haven't been explored properly against AMR pathogens. Hence, future research should prioritize standardization, clinical validation, and safe application into novel therapeutics, preserving their traditional values.

Keywords: Antimicrobial activity, Herbo-metallic drugs, Ayurveda drugs, Rasashastra

PP 14 AB071

Gut Microbiota Preserving Natural Alternatives; A Systematic Review

De Silva J. C. S.[1*], Ariyarathna T. M. N. H.[1], Wickramage R. P. [1], Ranasinghe R. M. N. M.[1], De Silva D. N. N.[1], Bandara G.P.S[1]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU , Sri Lanka.*
**Corresponding author: b8b8500@kiu.ac.lk*

Introduction: Gut microbiota, which interacts symbiotically with the host organism, is a key factor for maintaining gut as well as general health. Functions, including digestion, metabolism, gut mucosal barrier maintenance, and defense mechanisms against infections. There are several conditions that affect this commensal growth and may lead to different clinical conditions. As a treatment option, mostly plant-based extracts known as prebiotics are used to enhance microbiome growth.

Objective: This comprehensive review focuses on the natural alternatives that preserve the human gut microbiome, mainly dietary starch, fibers, and polyphenols found in plant-derived parts.

Methodology: Publications from Google Scholar, PubMed, and ResearchGate, covering studies between 2015 – 2025. Studies focusing on the effects of plant-derived compounds, particularly in, in-vitro models, were selected following PRISMA 2020 guidelines. Out of 546 articles, 22 were shortlisted for the review. The findings were summarized narratively to highlight key findings, similarities, and differences across the selected literature.

Results: Reviewed studies show that both individual and combined active compounds affect gut microbiome. Combinations of *Artocarpus heterophyllus* seeds, *Musa spp.* sheath, and *Sesbania grandiflora* flowers rich in fibers and polyphenols could enhance beneficial bacteria by 30–50%. Compounds like glycans, fructans, and acemannan strengthen *Lactobacillus* and *Bifidobacterium* levels. Extracts from potato peels, bamboo shoots, *Camellia sinensis*, *Mentha piperita*, and *Petroselinum crispum* promoted beneficial bacteria and inhibited *E. coli* by 20–60%. Combined treatments enhanced probiotic growth more than individual applications, revealing strong synergistic effects.

Conclusion: According to the results, single plant-based compounds are effective in modulating gut microbiota by promoting beneficial bacteria and inhibiting pathogens. Combinations indicated stronger effect and clear synergistic interactions on the beneficial organisms. highlighting novel prebiotic sources from traditional crops and plants. Further clinical and in vivo research is needed to validate efficacy, explore and evaluate the health impact in the long term.

Keywords: Prebiotics, gut microbiota, natural alternative, plant extracts, dietary fibers.

PP 15 AB074

Does PET Microplastics Induce Oxidative Stress in Adult Zebra Fish (*Danio rerio*) Brain Tissue? A Systematic Review

Fazliya M.N.F.[1]*, Uthpala W.M.P.[1], Niwunhella N.D.S.C.[1], Keerthirathna A.H.L.D.P.[1], Mendis T.M.S.[1], Dissanayaka C.T.N.[1], Ranadeva N.D.K.[1]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU,Sri Lanka*
**Corresponding Author: B8b8608@kiu.ac.lk*

Background: Microplastics, especially polyethylene terephthalate (PET) from consumer products, are widespread in aquatic environments and raise concerns due to their potential toxicity in aquatic organisms. Studies show they can disrupt the gut-liver-brain axis and cause behavioural and physiological changes in Zebrafish (*Danio rerio*), a widely used model in toxicological research.

Objective: This study assesses current knowledge on oxidative stress induced by PET microplastics in adult Zebrafish brain tissue and draws parallels from studies on similar microplastics to understand PET's potential neurotoxicity.

Methodology: This systematic review followed PRISMA 2020 guidelines. A total of 325 articles were identified (Google Scholar 220, PubMed 60, ScienceDirect 20, ResearchGate 25). After removing 24 duplicates, 301 records were screened, and 88 were excluded. Of 213 reports sought for retrieval, 153 were not accessible. 60 full text reports were assessed, with 38 excluded. Finally, 22 studies- 6.8% of initial records met eligibility criteria for evaluating oxidative stress in adult Zebrafish brain tissue.

Results: Microplastics, including polyethylene (PE), PGA (polyglycolic acids) PLA (polylactic acids), induce gut microbiota imbalance, oxidative stress and neurobehavioral disorders in Zebrafish. Co – exposure with pollutants like methylmercury increases oxidative damage, evidenced by the upregulation of antioxidant genes and impaired neurotransmitter function. While direct data on PET MPs and scarce, their physicochemical properties and environmental persistence suggest similar or greater potential to induce oxidative damage in adult Zebrafish brain tissue. Oxidative stress is commonly evaluated using ROS (Reactive oxygen species), lipid peroxidation, antioxidant enzyme activities and antioxidant genes.

Conclusion: Most studies are in-vitro, but evidence suggests PET microplastics may significantly contribute to oxidative stress in adult Zebrafish brain tissue, potentially disrupting neuronal function and behaviour. Targeted research is needed to clarify mechanisms like neurotoxicity.

Keywords: brain tissue, *Danio rerio* (Zebrafish), oxidative stress, PET microplastics

PP 16 AB084

Natural and Sustainable Plant and Agro-Industrial Substrates as Alternatives to Conventional Media for Differential Bacterial Growth: A Systematic Review

Nafla M. N.[1], Anisa F.A. F.[1], De Silva V. L.[1]*, Dilshan H. C.[1], Yashora W. M. P.[1], Mendis B. A. M.[1], Sathsarani K. G. M.[1], Ranadeva N. D. K.[1]

[1]*Department of Biomedical Science, Faculty of Health Science, KIU, Sri Lanka*

[*]*Corresponding Author: b8b8706@kiu.ac.lk*

Background: "Microbial Culture Media" facilitate the growth, survival, and multiplication of microorganisms, and are essential tools in microbiology. Notable expenditure, high-resource reliance, and environmental impacts from the generation and disposal of conventional media have prompted the exploration of natural, sustainable, and budget-friendly substrate-derived alternatives.

Objective: This study aims to systematically review the latest research evidence on natural alternatives that can mimic conventional bacteriological media in nutritional composition, gelling properties, differentiation, and pH change detection.

Methodology: The related studies gathered through databases such as Google Scholar, PubMed, ResearchGate, and ScienceDirect, adhering to the PRISMA framework, underwent title and abstract screening, followed by full-text review. Studies published in English within the last 10 years, articles related to alternative media, anthocyanin extraction, and natural gelling agents were included. Duplicate studies, research older than 10 years, and articles unrelated to the topic or focusing solely on specific microorganisms were excluded.

Results: Economically viable plant-based alternatives can replace the high-cost substrates used in conventional media. Peels of banana, watermelon, orange, pawpaw, sweet potato, and drumstick; legumes, such as cowpea, lentil, split pea, soy, chickpea, and mung beans; and others like cauliflower stalk, egg shells, etc., can provide a considerable amount of protein, carbohydrate, other macro and micro nutrients for the microbial growth instead of yeast, beef extract and peptone. Guar Gum, Gellan Gum, and Isubgol offer better solidification, resembling agar. Natural pH indicators rich in anthocyanin, from dry *Hibiscus sabdariffa*, pomegranate peel, dragon fruit skin, etc., can facilitate differential identification, based on lactose fermentation.

Conclusion: Natural substrate-derived alternatives can reduce media production costs and environmental pollution. As a limitation compared to conventional media, plants cannot act as necessary lactose providers; exogenous integration of lactose is essential to achieve differential growth in alternative media. Natural pH indicators obtained from plants require advanced techniques to maintain their pH and heat stability.

Keywords - Alternative culture media, Bacterial growth, Natural gelling agents, Natural pH Indicators, Plant-based media

PP17 AB086

Natural Alternatives for Treatment of Nephrolithiasis: A Systematic Review

Rathnayake R.U.B.[1]*, Chandrasekara C.A.K[1], Wijenayaka W.A.P.U.S.[1], Mohommed J.A.M.[1], Kahapola A.P.N.[1], Bandara U.H.R.G.P.S[1], Samarakoon D.N.A.W.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU Campus, Battaramulla, Sri Lanka*
**Corresponding author: b8b8438@kiu.ac.lk*

Introduction: Formation of renal calculi (nephrolithiasis) is a prevalent urological disorder worldwide, particularly in industrialized nations where dietary and lifestyle factors play a key role. Renal calculi occur in different forms; calcium oxalate is the most prevalent type, particularly affecting individuals with hypercalciuria, hyperoxaluria, and inadequate hydration. Conventional treatment methods include extracorporeal shock wave lithotripsy, ureteroscopy and pharmacological interventions, though effective, have recurrence risks and adverse effects. Consequently, natural alternatives with nephrolytic potential are being explored as safer therapeutic options.

Objectives: To systematically review and consolidate in vitro evidence on natural alternatives for renal calculi management.

Methodology*:* A systematic search was conducted using keywords; Nephrolithiasis, Nucleation, Aggregation, and Dissolution. 65 articles published from 2014 to 2024 were selected from Google Scholar (200), PubMed (80) and ResearchGate (49). Inclusion/exclusion criteria were considered and PRISMA 2020 guidelines were followed. Data related to in vitro studies, plant extracts including *Berginia ligulata, Phyllanthus niruri, Tribulus terrestris* and dietary remedies including citrus lemon juice, apple cider vinegar, coconut water were included in the review.

Results: The outcomes indicates all tested herbal plant extracts and dietary remedies have certain levels of potential nephrolytic effect, with *Berginia ligulata* aqueous root extract exhibited highest nucleation inhibition of 85.13±1.74% and aggregation inhibition of 75.74±1.72% and *Phyllanthus niruri* showing the lower percentage (29.8%) with reported $p < 0.05$ relative to controls. Remedies based on citrus lemon juice, apple cider vinegar and coconut water were exhibited as effective. Nucleation and aggregation assays typically range between 20-90% and 10-80%, depending on concentration of plant extract.

Conclusion: The findings indicate potential of natural alternatives in the treatment of renal calculi, in the crystallization of Calcium Oxalate. Future studies should focus on standardizing phytotherapeutic interventions and validating their clinical efficacy for nephrolithiasis through in vivo methods.

Keywords: Calcium oxalate, Natural alternatives, Nephrolithiasis, Nephrolytic effect

PP 18 AB089

Plant-Based Edible Coating of Tropical Climacteric Fruits: A Systematic Review

Safna M. M. F. [1], Sanjeewa M. V. P. H. [1], Ranasingha D. N. D. [1*], . Halthota[1] H. K. T. A., Karunanayaka K. M. S. L [1], De Silva U. L. R. M. [1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*

* *Corresponding Author: b8b8669@kiu.ac.lk*

Introduction: Tropical climatic fruits spoil quickly, leading to major postharvest losses. Plant-based edible coatings, made from natural biodegradable materials, help maintain shelf life and quality. Recent studies show that coatings with bio polymers and plant extracts effectively reduce moisture loss, microbial growth, and enzymatic activity.

Objective: To review and compare systematically the effectiveness of naturally plant - based edible coatings to extend the shelf life and preserve postharvest quality of tropical climatic fruits under ambient conditions.

Methodology: Databases (PubMed, ScienceDirect, Google Scholar) were searched using the keywords plant-based coating, climacteric tropical fruits, shelf-life extension, ambient storage condition, and natural fruit preservatives for studies published from 2015-2025. Out of 325 articles duplicates irrelevant, and low-quality studies were excluded per PRISMA guidelines, leaving 24 studies. Descriptive analysis was coating composition, concentration, fruit type, and postharvest parameters.

Result: Coatings commonly contained 1-2% chitosan,1.5-3%CMC, to 2%aloe gel with 0.5-2%plant extract. Aloe vera (2%) + citrus peel (1%) extended the bananas shelf life by 8 - 10 days; guava leaf (1%) +aloe vera (2%) + delayed mango ripening by 7-9 days; chitosan (1.5%) +clove oil (1%) prolonged the papaya's shelf life by 45-60%; and cleistocalyx + gum Arabic + chitosan (1:1:2%) preserved mangoes for 21 days. Coating reduces the weight loss by 15-30%, improved firmness by 25-40%, and extends the shelf life by 7-12days ($p<0.05$). Future studies should explore multi-component, agro waste-based coatings with synergistic antioxidant and anti-microbial effects and define optimal formulation ranges (pplymer1-3%, extract 0.5-2%) for tropical fruits.

Conclusion: Plant -based edible coatings combining polysaccharides with phenolics and antioxidant rich extracts can protect tropical fruits physically, chemically and microbiologically. This analysis highlights a new postharvest trend fir tropical climacteric: multi-component edible films using natural polymers and agro - waste extracts.

Keywords: Edible coating, natural preservatives, postharvest quality, Shelf-life extension, tropical fruits.

PP 19 AB091

Medical Properties of Mucus Extract from Snail Species: A Systematic Review

Peiris H.P.G[1*], Rathnayaka R.M.N.M.C[1], Wijerathna W.A.H.D[1], Shamla M.R.F. [1,] Fernando W.P.A.R.S[1], Kodikara V.S.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
**Corresponding Author: *b8b8538@kiu.ac.lk*

Introduction: Snails belong to Phylum Mollusca. These animals have calcium carbonate-based shells, muscles, and mucus-secreting tissues. This mucus is a mixture of peptides, enzymes, glycoproteins, and other bioactive substances.

Objectives: This review was conducted to assess the medical properties of mucus extract from snail species.

Methodology: This systematic review followed PRISMA 2020 guidelines including 38 articles using the databases; Google Scholar, PubMed, and PubChem published between 2015 - 2025 in English including the keywords 'Snail mucus', 'Mucus extraction', 'Antimicrobial', and 'Medical properties'. The inclusion criteria involving land living snail mucus and exclusion criteria used in this studies avoiding harmful mucus extraction methods.

Results: From the selected 38 articles 20% examined predominant *Achatina fulica*, 12% *Helix aspersa,* 10% *Lissachatina fulica* snail species and the remaining 58% examined medical properties of different snail species including *Eremina desertorum*, *Pomacea canaliculata, Archachatina marginata* snail species. The mucus from a single species was frequently associated with multiple medical properties conducted in both in vitro and in vivo methods with evidence provided by the predominant use of disk diffusion assay and the common application of snail mucus to treat wounds or burns in mice. The Study revealed anti-inflammatory (59% edema inhibit), antioxidant (9.68% - 16.95% reactive oxygen species reduction), antimicrobial (12.5µg/ml - 150 µg/ml minimum inhibitory concentration in disk diffusion assay), Antidiabetic (repair damaged pancreatic β cells), wound healing (burn and chronic wounds 25%), properties in snail mucus. Adjuvant therapeutic properties also reported (hepatitis B vaccine, chemotherapy). *Lissachatina fulica* snail species has the strongest and most reliable antimicrobial efficacy with minimum inhibitory values in disk diffusion assay around 2.5 µg/ml - 40 µg/ml)

Conclusion: Snail mucus considered as a natural source for therapeutic development, possessing a spectrum of medical properties including anti-inflammatory, antioxidant, antimicrobial, Antidiabetic, wound healing and potential for direct treatment or as an adjunct to enhance existing medicinal treatments.

Key words: Snail mucus, Mucus extraction, Antimicrobial, Medical properties

PP 20 AB094

Determinants, Prevalence, and Outcomes of Chronic Diseases Among School-Aged (11-17 years) Children in South Asia: A Systematic Review

Dewmini H. P. G. Y.[1*], Lakshan D. M. G.[1], Sammani L. L. K.[1], Gunarathne R. G. B. N.[1], Kodikara V. S.[1], Jayamaha A. R.[2]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU ,Sri Lanka.*
[2]*Faculty of Nursing, KIU , Sri Lanka*
[*]*Corresponding Author: b8b8674@kiu.ac.lk*

Background: Chronic diseases are emerging as a major public health concern among school-aged children in South Asia. There is notable lack of evidence related to dietary habits, physical activity, sedentary behaviors, and sociodemographic factors that contribute to chronic disease risk and their outcomes.

Objectives: To identify the potential causes, prevalence, and outcomes of chronic diseases among school-aged children, identify knowledge gaps to encourage school-based intervention and public health strategies for vulnerable populations.

Methodology: According to PRISMA 2020 guidelines, this review was conducted using relevant literature from Google Scholar, ResearchGate, PubMed, and Hinari, covering studies that were published between 2015- 2025. 'Chronic diseases,' 'school-aged children,' and 'South Asia,' were the keywords used for the search strategy. 303 articles were reviewed under inclusion (11-17 years, South Asian population, chronic diseases data) and exclusion criteria (duplicates, adults, below 11 years, and acute diseases). Finally, 21 articles were included for the review.

Results: Studies in South Asia reveal a high prevalence of childhood chronic diseases driven by interconnected determinants. An unhealthy diet contributes to both undernutrition and overnutrition leading to diabetes, obesity/overweight (6.4%-15.3%) and cardiovascular problems. Malnutrition was present in 90% of children with heart defects. Low physical activity-42.5%, prolonged screen time-23.7%, and inadequate sleep-19.6% are strongly linked with these chronic conditions. These values were compiled from more than 8 articles. Adverse outcomes are reflected in impaired academic performance, increased metabolic risk and reduced quality of life.

Conclusion: The finding highlights a critical public health concern in South Asia where modifiable, behavioral and nutritional factors play a major role in chronic diseases. If they are left unmanaged, they will negatively affect childhood health. This suggests the urgent need for school and community-based interventions for promoting nutrition awareness, physical activity, and healthy lifestyle to ensure a healthier generation.

Key words: Determinants, Outcomes, Chronic Diseases, Schoolchildren, South Asia

KIU

Multidisciplinary Research Conference 2025

Proceedings MRC 2025 - Book IV

Poster Presentations – Panel 02
Health Sciences

PP 21 AB073

In vitro Antioxidant Activity of *Hemidesmus indicus* and *Moringa oleifera* Extracts and Their Implications for Snakebite-Associated Oxidative Stress

Malrangi N. A. T[1], Wijesinghe D. R. U[1], Sewwandi U. A[1], Sarathchandra D. M. B. C. H[1], Dilshara S. A. D. [1]*, Samarakoon N.[1] , Hewage T.N. [1], Perera S. K. J. D. H.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*

[*] *Corresponding Author: dilsharasubasinghe19@gmail.com*

Introduction: Snake envenomation from *Daboia russelii* in Sri Lanka poses significant public health risks due to its common occurrence and systemic effects, including oxidative stress and coagulation problems. This oxidative stress contributes to tissue damage from the venom. Traditional Ayurvedic practices utilize *Hemidesmus indicus* and *Moringa oleifera* as supportive treatments post-snakebite, but scientific validation of their antioxidant properties is necessary.

Objective: Using Hydrogen Peroxide ($H2O_2$) scavenging and Ferric Reducing Antioxidant Power (FRAP) assays, the study investigates the in vitro antioxidant activity of *Hemidesmus indicus* leaves and *Moringa oleifera* roots, evaluating their potential in mitigating oxidative stress from snakebites.

Methodology: Ethanolic (70%) extracts obtained through cold maceration were analyzed in a lab-based in vitro study. The plant materials were authenticated by a taxonomist from Galle and Colombo. Ascorbic acid served as the reference antioxidant, and the antioxidant activity was measured using FRAP and H_2O_2 scavenging assays, with each experiment repeated three times. Data analysis employed one-way ANOVA followed by Tukey's post hoc test, with $p < 0.05$ indicating statistical significance.

Results: Both plant extracts demonstrated dose-dependent antioxidant activity. *Moringa oleifera* exhibited greater efficacy compared to *Hemidesmus indicus*, with IC_{50} values of 0.2083 mg/mL and 0.5786 mg/mL, respectively. However, both extracts showed significantly lower antioxidant activity compared to ascorbic acid ($p < 0.05$).

Conclusion: The results indicate that *Moringa oleifera* and *Hemidesmus indicus* possess in vitro antioxidant activity, potentially alleviating oxidative stress from snake envenomation. These findings support further venom-specific and in vivo studies, highlighting their traditional ethnomedical use, despite the absence of direct venom neutralization assessment.

Keywords: Antioxidant activity, *Hemidesmus indicus, Moringa oleifera*, FRAP, hydrogen peroxide scavenging, oxidative stress, snakebite

PP 22 AB096

Phyto therapeutic Approaches to Diarrhea: A Systematic Review of Anti-diarrheal Properties of Medicinal Plants

Karunarathna A.I.[1*], Shyamali D.M.J.[1], Dulakshi Y.M.T.[1], Jesla M.J.[1], Fasrina M.F.[1], Kodikara V.S.[1], Nadapala, J.H.Y.P.N.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*

[*]*Corresponding Author: b8b8701@kiu.ac.lk*

Introduction: Diarrhea remains a major global health issue, especially among children under five in low- and middle-income countries. The main causative agents are *Shigella*, *Salmonella*, and *Escherichia coli*. Rising antimicrobial resistance and treatment costs highlight the need for safer, affordable alternatives. Medicinal plants, rich in bioactive compounds, show strong potential in managing diarrhea.

Objective: To review current evidence on medicinal plants with antimicrobial properties effective against diarrhea-causing pathogens.

Method: A literature search was conducted in Google Scholar, PubMed, and ResearchGate using the keywords "antidiarrheal agents," "antimicrobial activity," "medicinal plants," "bioactive phytochemicals," and "diarrhea." Following PRISMA guidelines, 38 articles (2010–2025) were included. In in-vivo studies, Wistar rats and rabbits (150–250 g) were used, while animals outside this range were excluded.

Results: Several medicinal plant extracts demonstrated significant antidiarrheal activity. In vivo models showed reduced stool frequency and intestinal secretion, while in vitro assays confirmed antibacterial effects through inhibition zones against causative bacteria. About 67% of studies used in vivo models (mainly castor oil-induced diarrhea in rodents) and 19% used in vitro antimicrobial assays against *E. coli* and *S. typhimurium*. Ethanolic extracts of *Punica granatum* showed the strongest activity (17.2 mm inhibition zone against *E. coli*, 14.3 mm against *S. typhimurium*). Key bioactive compounds identified included flavonoids (10%), tannins (7%), alkaloids (8.75%), saponins (8.75%), glycosides (8.75%), terpenoids (5%), steroids (6.25%), and phenolics (7.5%).

Conclusion: Medicinal plants show promising antidiarrheal effects against major pathogens, supported by both in vivo and in vitro evidence. *Punica granatum* stands out for its potent antibacterial activity and diverse bioactive constituents. Further experimental and clinical studies are needed to confirm safety, efficacy, and integration into standardized plant-based therapies.

Keywords: Antidiarrheal agents, antimicrobial activity, Bioactive phytochemicals, Diarrhea, Medicinal plants

PP 23 AB138

Alternative Culture Media Formulations Using Natural Alternatives: A Systematic Review

Banu M. A. D[1], Karunarathna H. M. K. S[1], Karunarathna N. D. Y. L. D[1], Fazla M. F. F[1], Rashminda N. D. C.*[1], Bandara U. H. R. G. P. S[1], Samarakoon D. N. A. W[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU , Sri Lanka.*

[*]*Corresponding Author: b8b8574@kiu.ac.lk*

Introduction: Due to rising costs and limited availability of standard microbial culture media, researchers have led to exploring sustainable, low-cost alternatives. Natural waste materials, including plant-based compounds and animal by-products, are now being studied as underutilized resources for supporting microbial growth.

Objectives: To assess the potential of natural and waste-derived materials as ecofriendly substitutes to develop microbial culture media.

Methodology: A systematic literature review was conducted in accordance with PRISMA 2020 standards, using databases, Google Scholar, ScienceDirect, and PubMed, Research Gate. Keywords included "Alternative Culture media," "waste-derived peptone," "Microbial growth," "Fish based Culture media" and "eco-friendly nutrient sources." Only published peer- reviewed, original research articles written in English were included. Preprints, Review papers, Conference abstracts, and studies without clear experimental data were excluded. From an initial pool of 309 papers, 64 papers were included for in-depth review.

Results: Microorganisms need carbohydrates, proteins, minerals, vitamins as well as temperature (37^0C), pH (6.5-7.0), oxygen, moisture, and media texture to grow at an optimal rate. Minerals including magnesium, calcium, potassium, iron, phosphorus, and trace minerals (zinc and manganese) are essential to metabolic activities. Natural substitutes provide essential nutrients for microbial growth; Plantain and pawpaw contain 54.79% and 50.23% carbohydrates respectively. Protein is highest in chicken feathers (~90%), while yam peel (21.44%) and Threadfin Bream fish peptone contain (8.12%) protein. Mineral sources are sweet potato (Ca, Mg, K, P, Zn) and pawpaw peel (Mn, Mg, Zn, Fe, Ca, Na). Both Gram-positive and Gram-negative bacteria, Filamentous fungi (*Aspergillus, Penicillium, Rhizopus, Fusarium*) grow well on watermelon and pineapple peels. Yeasts like *Saccharomyces cerevisiae* and *Candida* spp, grow well in natural media.

Conclusion: Natural alternatives are cost-effective and sustainable substitutes for commercial microbial media, promoting waste valorization with industrial and research benefits. However, challenges such as variability in nutrient composition, contamination risks, limited regulatory approval, and gaps in comparative data, micronutrient roles, and stability studies must be addressed for reliable large-scale applications.

Key words: Cost-effective, Microbial culture, Natural Alternatives, Waste-derived media

PP 24 AB153

Herbal Intervention Against Biofilm-Mediated Antimicrobial Resistance on *Staphylococcus aureus:* A Systematic Review

Amana T. A. F [1], Wanasinghe W. A. C. T. N [1], Perera A. K. D. N. S [1]*, Afra M.A. F [1], Rathnayake R. M. C. P [1], Rasanjanee D. D. Y. [1]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU, Sri Lanka*

[*]*Corresponding Author: b8b8732@kiu.ac.lk*

Introduction: Biofilms provide structural and metabolic protection, which enables bacterial cells to adhere to surfaces and be embedded within extracellular polymeric matrix. This structural barrier markedly reduces antibiotic penetration, significantly contributes to chronic and recurrent infections, particularly in methicillin-resistant *Staphylococcus aureus* (MRSA), promoting antimicrobial resistance. Addressing this challenge plant-derived phytochemicals, have shown potential as alternative and adjunctive therapies due to their antibiofilm and antimicrobial properties.

Objectives: This study aims to systematically evaluate the efficacy and mechanisms of herbal and phytochemical interventions targeting *S. aureus* biofilms and their potential in mitigating antimicrobial resistance.

Methodology: A comprehensive literature search was conducted using PubMed, HINARI, and Google Scholar databases, focusing on studies published between 2015 and 2025. Study selection followed the PRISMA guidelines. Eligible studies comprised in vitro and in vivo studies assessing the effects of herbal or phytochemicals on *S. aureus* biofilm inhibition. Among 226 screened studies, 18 articles met the inclusion criteria and were analyzed for biofilm inhibition mechanisms and phytochemical constituents.

Results: Twenty-one herbal extracts from 18 plant species demonstrated significant antibiofilm and antimicrobial effects. Bioactive fraction of *Acalypha wilkesiana* extract, rich in flavonoids and phenolic compounds, significantly inhibited MRSA biofilms by downregulating penicillin-binding protein 2a (PBP2a; $p=0.001$). Aqueous extract of *Polygonum chinense* containing quercetin as the main component of flavonoids, inhibited 24-hour biofilm formation ($p < 0.05$). *Terminalia chebula* ethanolic extract, rich in tannins including chebulagic and chebulinic acids, showed greater inhibition zones, demonstrating strong antibacterial and biofilm-disruptive potential. Across studies, the predominant mechanisms reported included disruption of extracellular polymeric substance (EPS) matrix, quorum sensing inhibition, and downregulation of resistance (PBP2a), collectively demonstrating the antibiofilm potential.

Conclusion: The findings indicate herbal and phytochemical interventions exhibit promising antimicrobial and antibiofilm activity against *S. aureus*, particularly MRSA, offering potential alternatives to conventional antibiotics. Standardized methodologies and in vivo validations are necessary to establish their safety, efficacy and clinical applicability.

Keywords: Antimicrobial resistance, Biofilm, Herbal intervention, Phytochemicals, *Staphylococcus aureus*.

PP 25 AB155

Evaluation of the Antimicrobial Activity of Mixed Extractions from *Ouret lanata* and *Camelliasinensis* Against Urinary Tract Infection Pathogens

Warusapperuma W. R. A. K. G[1]*, Karunathilaka U. S[1], Charuka S. G. J[1], Samarathunga N. S. B. K[1], Wani S. I. D[1], D.D.Y. Rasanjanee[1], S.P.Nissanka[2]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU , Sri Lanka*
[2]*Department of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka*
*Corresponding Author:*b7b8282@kiu.ac.lk*

Introduction: The increasing antibiotic resistance of UTI-causing bacteria, such as *Escherichia coli* and *Staphylococcus aureus*, highlights the need for alternative treatments. *Ouret lanata* and *Camellia sinensis* are medicinal plants with known antimicrobial properties; however, their combined effects against UTI pathogens have not been studied.

Objective: Assess the antimicrobial activity of ethanolic and aqueous mixed extracts of *Ouret lanata* and *Camellia sinensis*, prepared in different ratios, against UTI pathogens.

Methodology: Plant materials, *Ouret lanata* (3246) and *Camellia sinensis* (3247), were processed and prepared for ethanolic and aqueous extractions. Both extracts were obtained by maceration at room temperature for 72 hours with intermittent agitation. The prepared extracts were then mixed in three ratios: 1:1 (equal parts), 1:2 (one part *C. sinensis* to two parts *O. lanata*), and 2:1 (two parts *O. lanata* to one part *C. sinensis*). Antimicrobial activity against *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 25923 was evaluated using the agar well diffusion method, with gentamicin serving as the positive control.

Results: Ethanol-based mixed extracts of *Ouret lanata* and *Camellia sinensis* showed the strongest antimicrobial activity. The 2:1 *C. sinensis* to *O. lanata* ratio produced the largest inhibition zones (17.7 mm for *E. coli* and 21.4 mm for *S. aureus*). Water-based extracts showed no activity. Positive controls produced larger zones (44.7 mm), and negative controls showed none. One-way ANOVA revealed significant differences ($F(2,6)=5.32$, $p=0.046$ for *E. coli*; $F(2,6)=10.67$, $p=0.011$ for *S. aureus*), suggesting potential synergistic effects. These results emphasize the importance of solvent choice and suggest that ethanol mixtures with higher *C. sinensis* content may serve as effective natural alternatives for managing UTI pathogens.

Conclusion: Ethanolic extracts, particularly the 2:1 *Camellia sinensis* to *Ouret lanata* ratio, exhibit the highest antimicrobial activity against UTI pathogens, indicating promising natural alternatives for infection management.

Keywords: antimicrobial activity, plant extractions, urinary tract infections

PP 26 AB157

The Analgesic Efficacy of Medicinal Plants and Their Formulations for Dysmenorrhea: A Systematic Review of In Vitro and In Vivo Studies

Pemasiri P.L.M.[1]*, Senevirathne T.C.[1], Vishmi A.G.G[1], Madubash K.T.S[1], Tharushika R.A.M.[1], Sathsarani K.G.M.[1], Samarakoon D.N.A.W.[1], Ranadeva. N.D.K.[1]

Department of Biomedical Sciences, Faculty of Health Sciences, KIU, Sri Lanka

Corresponding Author: b8b8698@kiu.ac.lk

Introduction: Dysmenorrhea is characterized by painful menstrual cramps resulting from uterine contractions and endometrial shedding significantly affecting women's quality of life. Although non-steroidal anti-inflammatory drugs are widely applied, their adverse effects have encouraged growing interests in safer plant-based alternatives.

Objectives: This systematic review aimed to assess evidence from in vitro and in vivo studies on the analgesic effects of medicinal plants and their formulations for the managing dysmenorrhea.

Methodology: Following PRISMA guidelines. 218 articles published between 2015-2025 were screened, and 30 peer-reviewed articles were selected. Literature searches conducted in Google Scholar, PubMed, ScienceDirect, and HINARI, using words such as "medicinal plant," "dysmenorrhea," "analgesic effect," "in vitro," "in vivo," and "formulations." Included original in vitro/vivo plant-based studies on dysmenorrhea excluded non original or synthetic studies. In vivo studies were evaluated using modified ARRIVE guidelines while in vitro studies were evaluated for design clarity and controls.

Results: Most studies demonstrated that medicinal plant extracts such as *Zingiber officinale 26.6%*, *Cinnamomum verum 13.3%*, *Coix lacryma-jobi 10%*, and *Mentha piperita 6.7%* effectively reduced uterine contraindications, prostaglandin levels and inflammatory markers in both experimental and clinical settings. Out of 30 studies, 33.3% conducted in vitro or animal models, 56.7% conducted in clinical trials, and 10% conducted in both types. Patches, gels and decoctions showed minimal side effects. Animal studies showed 85-90% reduction in uterine contraindications and clinical studies showed 40-70% less menstrual pain versus controls.

Conclusion: Evidence from preclinical studies indicates that medicinal plants and their derived formulations have notable pain-relieving potential in the management of dysmenorrhea but further standardized clinical trials with standardized formulations are needed to confirm their accuracy and safety for clinical use.

Keywords: Analgesic effect, Dysmenorrhea, *In vitro, In vivo*, and Medicinal Plants

PP 27 AB159

The Dermatological and Reproductive Health Effects Associated with the Use of Disposable Sanitary Pads in South Asian Women: A Systematic Review

Yatiwella N. D[1]*, Liyanage V. A [1], Ariyawansha H. B. G. M. K[1], Madhuwanthi A. A. H. V[1], Ranasinghe K. A. K. R[1], Dissanayake C. T. N[1], Samarakoon D. N. A. W[1], Ranadeva N.D.K.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*
[*]*Corresponding Author: nethumiyatiwella@gmail.com*

Introduction: Disposable sanitary pads contain a variety of harmful chemical compounds such as Dioxins, Furans, Volatile Organic Compounds (VOCs), Phthalates, Synthetic fragrances, and plasticizers, which cause harmful dermatological and reproductive health effects in menstruating women.

Objective: The goal of this study is to systematically review current research evidence on the harmful dermatological and reproductive health effects of using disposable sanitary pads among South Asian women.

Methodology: This systematic review was structured according to PRISMA guidelines and conducted by five reviewers via gathering 185 articles from Google Scholar and PubMed which were published between 2015-2025. In the screening process 16 articles were removed as duplicates and finally 16 articles from Google Scholar and 6 articles from PubMed were included for the study. Included studies involved South Asian menstruating women who used disposable sanitary pads. Excluded studies involved non-South Asian population, animal studies, and non-English articles. Databases were searched using following keywords, ("sanitary pads" OR "sanitary napkins") AND ("reproductive health" OR "skin irritation" OR "dermatitis") ("reproductive effects" OR "hormonal effects") AND ("South Asian women").

Results: This study was primarily conducted by reviewing articles from India (11), Bangladesh (3), and Pakistan (4). Out of all, eight studies had commented on chemical composition of sanitary pads, including VOCs (62.5%), Dioxins (50%), Furans (37.5%), Fragrance compounds (25%), Plasticizers (25%), and Phthalates (37.5%). Among the studies included, 18.18% stated rashes, 50% mentioned dermatitis, 32% stated irritation, 40.9% reported reproductive toxicity and 22.72% mentioned bacterial vaginosis in menstruating women due to the harmful chemicals present in the disposable sanitary pads.

Conclusion: South Asian menstruating women are increasingly exposed to toxic chemicals with the use of disposable sanitary pads which results in harmful dermatological and reproductive health effects. Therefore, further research is crucial to identify safer alternatives for the harmful chemicals in sanitary pads and thereby improve menstrual health.

Keywords: dermatitis, reproductive health, sanitary pads, skin irritation, South Asian women

PP 28 AB160

Antioxidant Properties of Citrus Juices, Peels, And Pulps: Influence of Extraction Methods-Systematic Review

Amarasena W. H. D. [1*], Fernando L. P. L. M. A. C. S. [1], Warnasooriya W. M. K. K. [1], Bandara P. M. N. T. [1], Bandara A. R. V. C. [1] , Rasanjanee D. D. Y. [1]

[1] *Department of Biomedical Science, Faculty of Health Science, KIU, Sri Lanka*
** Corresponding Author: b8b8587@kiu.ac.lk*

Introduction: The citruses, such as *Citrus sinensis* ,*C. limon*, and *C. aurantifolia*, consist of components, such as vitamin C, flavonoids, and phenols. The waste peels and pulps are also rich in polymethoxylated flavones and essential oils , which have a great potential in sustainable valorization in food and pharmaceutical applications.

Objective: This review aims to compare the antioxidants of three selected citrus species: *Citrus sinensis, Citrus limon, and Citrus aurantifolia* juices, peels, pulps, and to compare the effects of the method of extraction on the yield and bioavailability of antioxidants.

Methodology: A PRISMA-compliant systematic review was applied to query PubMed, Scopus, Web of Science, and Google Scholar databases, and it retrieved 255 records. Included:29 peer-reviewed articles (2015-2025) on *Citrus sinensis*, *C. limon*, or *C. aurantifolia,* Quantitative data on antioxidants (vitamin C, flavonoids, phenolics), Use of validated assays: DPPH (2,2-diphenyl-1-picrylhydrazyl), ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid)), FRAP (ferric reducing antioxidant power), ORAC (oxygen radical absorbance capacity), TPC (total phenolic content). Once duplicates and studies concerning non-discussed topics were eliminated.

Results: *C. sinensis, C. limon, and C. aurantifolia* juices contain 30–60 mg/100 mL of vitamin C (highest in C. limon at ~53 mg/100 mL) and flavonoids (up to 200 mg/L). *C. sinensis* peels rich in polymethoxylated flavones (up to 1,000 mg/100 g DW) and essential oils (57–91%), along with total phenolics (35–50 mg GAE/g) and flavonoids (60–80 mg CE/g). Pulps are rich in phenolic compounds (>300 mg/100 g,) and dietary fiber content. Comparative analysis shows peels to be better than juices and pulps in antioxidant activity.

Conclusion: The peel shows the strongest antioxidant activity of citrus components. Despite variations caused by extraction methods, its bioactive composition makes it highly valuable for sustainable food and pharmaceutical applications. However, further research is needed on assay standard.

Keywords: phenols, extraction methods, flavonoids, vitamin C

PP 29 AB163

Medicinal Properties and Health Benefits of Endophytic Fungi Associated with Medicinal Plants: A Systematic Review

Vithanage P.R[1]*, Unawatuna Vithanage N.W.L[1], Appuneththi N.H[1], Kuda Anthonige N.V.R[1], Mohamed Thamby F.S[1], Arul Pragasam G.P[1], Samarakoon D.N.A.W[1].

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*
**Corresponding Author: b8b8514@kiu.ac.lk*

Introduction: Natural therapeutic agents have become the focus of recent studies interest because the toxicity of synthetically produced drugs and limitations of plant-derived compounds. Endophytic fungi are symbiotic fungi living in the plant tissues and represent a new and sustainable source of bioactive secondary metabolites.

Objective: This systematic review aims to unify knowledge on the medicinal properties and health benefits of endophytic fungi associated with medicinal plants.

Methodology: Following PRISMA 2020 guidelines, a systematic search on Google Scholar (41), PubMed (225), ScienceDirect (22), and Hinari (33) using search query of “endophytic fungi" AND "medicinal plants" AND ("bioactive compounds" OR pharmacological activity" OR antimicrobial" OR antioxidant" OR anti-inflammatory" OR cytotoxic). Inclusion criteria involved English-language empirical studies published between 2020 and 2025, whereas exclusion criteria included review articles, conference abstracts. After removing duplicates and applying criteria, 29 studies were selected.

Results: Over 70 medicinal plant species were studied for their associated endophytic fungi. The most often isolated types of endophytic fungi include *Aspergillus sp*., *Penicillium sp*., *Fusarium sp*., *Cladosporium sp., Colletotrichum sp*. A broad range of biological activities is reported in the collection of 29 studies used in vivo (4 studies) tests and in vitro (24 studies) tests; that include antimicrobial for *Escherichia coli, Pseudomonas aeruginosa, Bacillus megaterium, Staphylococcus aureus* etc. Antioxidant (18), Anticancer (23), and Anti-inflammatory (9) activities. All studies provided in the sources identify active compounds (over 1400) in the specimens, one can distinguish Nectriapyrone, Griseophenexanthone A., Digriseophene A., and Macrooxazole E. These results clearly demonstrate the major contribution of endophytic fungi toward pharmacological characterizations of medicinal plants.

Conclusion: This review confirms the high therapeutic promise of endophytic fungi as a renewable biodiverse resource of drugs. Future consideration must focus on taxonomic classification, elucidation of biosynthesis pathways and optimization of high-throughput fermentation processes. These steps will transform endophytic fungi from a research subject into novel drug discovery and biotechnological applications.

Keywords: Bioactive compounds, Endophytic fungi, Health benefits, Medicinal plants, Pharmacological activities

PP 30 AB185

Escherichia coli Contamination of Frequently Touched Surfaces in Public Buses, Colombo, Sri Lanka

Heiyanthuduwa M. R.[1*], Dilshan W. A. R.[1], Arachchi L. A. C. P. L.[1], Silva H. K. D.[1], Rujath M. R. R. M.[1], Samarakoon D.N.A.W.[1], Liyanage N.P.P.[2]

[1]*Department of Biomedical Sciences, Faculty of Health Sciences, KIU, Sri Lanka*
[2]*Department of Animal Science, Faculty of Animal Science and Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka*
[*]*Corresponding Author: heiyanthuduwamr@gmail.com*

Introduction: Public buses are a major form of transportation in Colombo, Sri Lanka. Frequently touched surfaces such as door handles and handrails can become contaminated due to overcrowding and poor hygiene practices and pose a serious threat to public health. *Escherichia coli* is one of the main bacteria for fecal contamination and indicates environmental hygiene status. Such contamination in buses may occur indirectly when passengers with unwashed or contaminated hands transfer *E. coli* onto shared surfaces.

Objective: To detect the presence of *Escherichia coli* on frequently touched surfaces in public buses at the Central Bus Station, Colombo.

Methodology: The surface samples were collected from handrails and door handles using the swab sampling technique. A total of 40 swab samples were obtained from 20 selected public buses (10 cm^2 area per surface). Samples were cultured on MacConkey agar and incubated at 37°C for 18-24 hours. Colonies exhibiting specific morphological characteristics of *E. coli* were further identified by using Gram staining and biochemical tests, including indole, methyl red, citrate, Kligler Iron Agar (KIA), and the urease test.

Results: Out of 40 surface swab samples, 06 (15%) were identified as *Escherichia coli.* These isolates were appeared on MacConkey agar as pink coloured, non-mucoid and confirmed as Gram-negative bacilli. Biochemical tests exhibited, indole and methyl red positive, citrate and urease negative, and KIA acid/acid (A/A) with gas and without H_2S. An equal distribution of *E.coli* colonies (3 isolates each) was observed, on door handles and handrails, with no statistical significant difference ($p > 0.05$).

Conclusion: The presence of *Escherichia coli* on the frequently touched surfaces indicates possible fecal contamination and inadequate hygienic practices in public buses. Although the bacterial distribution between the two surface types was not statistically significant, these findings highlight the need for better hygiene practices and regular cleaning protocols to mitigate bacterial transmission.

Keywords: Bacterial contamination, *Escherichia coli*, Hand touch surfaces, Public buses, Public health risk

PP 31 AB 189

Evaluation of Antimicrobial and Antioxidant Properties of Selected Common Herbal Plants in the Management of Oral Cavity Diseases: A Systematic Review

Wickramasinghe M.S.T[1] *, Nafasa C.N.F[1] , Godakanda S1, Gamage C.H.R [1], Kumara G.T[1], De silva. U.L.R.M.D.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*

[*]*Corresponding Author: b8b8434@kiu.ac.lk*

Introduction: Oxidative stress and microbes are the factors that contribute to common oral diseases (dental caries,oral candidiasis) which are global health problems. This is a review of antimicrobial/ antioxidant flavonoids in *Mimusops elengi, Piper nigrum, Terminalia bellirica, Pavetta indica,* and *Garcinia quaesita* regarding oral disease management .

Objectives: The purpose of this review was to review the antimicrobial and antioxidant activities of commonly used herbal plants (*Mimusops elengi, Piper nigrum, Terminalia bellirica, Pavetta indica, and Garcinia quaesita*) and to evaluate their possible use in the treatment and prevention of oral cavity conditions.

Methodology: A systematic literature search was conducted using PRISMA guidelines for the period 2009-2005 across four major databases: Google Scholar (n=92), ResearchGate (n=80), Pubmed (n=10) and Wiley Online Library (n=5). Duplicate records (n=38) and unrelated articles (n=45) were excluded, leaving 109 full-text articles for screening. Additional exclusions were made for review articles (n=13), studied without full-text access (n=15), those containing insufficient data (n=25), and those rated as having low methodological quality (n=10). A total of 46 studies were systematically extracted and synthesized using thematic approach.

Results/Findings: The results showed that these medicinal plants have high antimicrobial and antioxidant properties; which can be mostly attributed to the presence of phytochemicals, phenolics and flavonoids. In 38 studies, antioxidant properties were reported whereas in 33 studies antimicrobial activity against the major oral pathogens was reported especially *Streptococcus mutans* and *Candida albicans*. The in vitro studies provided most of the evidence (n = 42), which provides little in vivo and clinical validation.

Conclusion: This review highlights the therapeutic potential of five herbal plants namely *Mimusops elengi, Piper nigrum, Terminalia bellirica, Pavetta indica* and *Garcinia quaesita* to manage the oral diseases highlighting their great antimicrobial, antioxidant effect against *Streptococcus mutans*

Keywords: Antimicrobial, Antioxidant, Medicinal Plants, Systematic Review

PP 32 AB202

Isolation and Identification of Bacterial Contaminants on vision correction glasses used by undergraduates of KIU: A cross-sectional study

A.N.S. Lewis [1*], Wijekoon W.M.C.S[1], Rubasinghe L.U[1], Rathnayake R.M.P.H. [1], Hemachandra H.G.S.G[1]

[1]*Department of Biomedical Science, KIU, Sri Lanka*
[2]*Department of Microbiology, Faculty of Medicine, Sabaragamuwa University, Sri Lanka*
**Corresponding Author: b7b8084@kiu.ac.lk*

Introduction: Vision correction glasses can serve as a potential reservoir of bacterial colonization and a possible route of transmission that may compromise both personal and public health if left unaddressed. Their contamination can facilitate the spread of pathogenic microorganisms within communities, posing a significant public health risk.

Objectives: The objective of this research was to identify and characterize bacterial contaminants, particularly *Staphylococcus aureus* and coagulase-negative Staphylococcus spp. (CoNS) and to determine the most prevalent bacterial species on these vision correction glasses that are used by undergraduates of KIU.

Methodology: ERC approval was taken by KIU ERC committee (KIU/ERC/25/008). Participants were selected using convenient sampling. 30 samples were collected according to 'rule of thumb' from the inner surface of vision correction glasses and inoculated on blood Agar (BA) and chocolate agar (CA). Plates were incubated at 37^0C in 5 – 10 % CO_2 for 24 hours. After overnight incubation, morphology observation, Gram staining, and biochemical tests, including catalase and coagulase tests were performed for organism identification.

Results: Among the 30 samples collected, 28 samples (93.33%) produced bacterial growth following incubation, 2 samples didn't show any growth on BA and CA. Positive identification was demonstrated for *Staphylococcus aureus*- 36.67%, CONS- 50%, and gram-positive bacilli- 23.33% and 16.67% of samples out of all 28 samples showed a mixed growth.

Conclusion: Findings demonstrate that vision correction glasses used by all KIU undergraduates are frequently contaminated with bacteria. The highest rate of contamination was demonstrated by CONS followed by *Staphylococcus aureus* and gram-positive bacilli. The presence of mixed bacterial growth in a considerable proportion of samples further underscores the potential of these devices to act as reservoirs for microbial transmission. Results highlight the importance of proper hygiene practices and regular cleaning of vision correction glasses to minimize the risk of infection and cross-contamination.

Key words: Vision correction glass, *Staphylococcus* spp., Coagulase negative *staphylococcus*, Bacterial Contamination, Bacterial Identification

PP 33 AB203

Medicinal Properties of *Hibiscus* Species: A Systematic Review

Dias M.P.S.H [1]*, Kumara S.P.M[1], Fathima A.G [1], Witharana D.W.D.O [1], Gamage I.M.R.K.[1], De Silva U.L.R.M [1], Samarakoon D.N.A [1].

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
**Corresponding Author: B8b8667@kiu.ac.lk*

Introduction: *Hibiscus* species are globally recognized for their traditional medicinal uses, exhibiting pharmacological properties. This review connects preliminary ethnobotanical insights with fragmented preclinical data, highlighting the need for human clinical trials, standardized protocols, and comprehensive safety and efficacy evaluations of *Hibiscus* species.

Objective: This study aims to integrate the scientific evidence on *Hibiscus* species by evaluating their phytochemistry and pharmacology to correlate traditional uses, identify key bioactive compounds, and highlight research gaps for advancing evidence-based therapeutic applications

Methodology: A systematic literature search was conducted by adhering to PRISMA 2020 guideline using PubMed, PubChem, Science Direct, Google Scholar, and ResearchGate, applying keywords *Hibiscus* species, Medicinal properties for articles published between 2015- 2025, restricted to English. 502 articles were utilized by five reviewers and are screened using three criteria focusing on *Hibiscus* species, Investigation of medicinal properties, and empirical results (in vitro, in silico, or clinical), resulting in the inclusion of 42 for this study.

Results: The analysis identified predominated species *H. sabdariffa* (28 articles), *H. rosa-sinensis* (11 articles), and *H. cannabinus* (3 articles) confirmed significant benefits. *H. sabdariffa* demonstrated antihypertensive (15-27% pressure reduction) via Angiotensin-Converting Enzyme (ACE) inhibition, lipid-lowering (22% Cholesterol reduction), antidiabetic by inhibiting Î±-amylase/Î±-glucosidase (50-85% enzyme inhibition), neuroprotective, and anti-anemic efficacy (~20% hemoglobin increase) confirmed by a clinical trial (60 patients). High phenolic content (Flavonoids, Phenolic acid, etc.) of *H. rosa sinensis* exhibited the antioxidant (70-88% Scavenging), anti-inflammatory (~50% Cancer cell inhibition), antibacterial, and wound healing activities (~70%-72.4%). *H. cannabinus* demonstrates antioxidant (35% low-density Lipoprotein reduction), anti-inflammatory properties and dermatological benefits against atopic dermatitis (150-200% restorations)

Conclusion: The evidence validates traditional uses and highlights the potential of *Hibiscus* species for developing functional foods and phytomedicines. Future research must prioritize extract standardization, dose-response evaluation, molecular mechanisms elucidation, and robust clinical validation

Keywords: *Hibiscus* species, Medicinal Properties, Traditional Medicine.

PP 34 AB206

Genes Involved in Cardiac Development, Functional Dynamics, and Disease Pathogenesis: A Literature Review

Premarathne M.G.H.M[1], Pinnawala C[1*], Ranadeva N.D.K [1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka.*
**Corresponding Author:* midushika@kiu.ac.lk

Introduction: A complex network of genes governs cardiac development, function and pathology. Disruptions or mutations in these genes can lead to a wide range of cardiac pathologies. Therefore, understanding the key genes involved in the pathogenesis of cardiac diseases, which remain understudied, is of crucial need.

Objective: This study aims to review the key genes involved in cardiac development, functional dynamics, and the role of these genes in the pathogenesis of cardiac diseases.

Methodology: Literature obtained from PubMed (150), Hinari (112), and Google Scholar (180) was systematically reviewed following PRISMA 2020 guidelines, targeting genes involved in Cardiac Development, Functional Dynamics, and Disease Pathogenesis. The keywords used in the search engines are Cardiac Development, Cardiac Function, Cardiac Diseases and Genetics combined using Boolean Operators. The literature from 2010 to July 2025 was considered for the study and of the total literature, only sixty articles were finally considered for the study.

Results: According to the analysed articles transcription factors (NKX2-5, GATA4, TBX5) were most frequently involved in cardiac development (73%, n=44), and the ion channels related genes (SCN5A, KCNQ1, RYR2) dominated arrhythmia pathogenesis which was well established (52%, n=31). Cardiomyopathy genetics showed heterogeneity, sarcomeric genes (MYH7, TNNT2) accounted for 65% (n=39) of hypertrophic cases versus cytoskeletal genes (LMNA, TTN) in dilated phenotypes (43%, n=26). Genotype-phenotype correlations varied significantly, with SCN5A mutations demonstrating broader clinical expressivity across multiple arrhythmic disorders when compared with disease-specific mutations such as PRKAG2.

Conclusion: Genetic defects significantly contribute to different cardiomyopathies, functional malfunctions and congenital heart defects. Understanding the molecular basis of these genes provides critical insights into potential therapeutic targets and genetic interventions in cardiac diseases.

Keywords – Cardiac Development, Cardiac Function, Cardiac Diseases, Genetics

PP 35 AB214

Synergistic and Individual Effects of *Annona muricata* (Soursop) and *Annona squamosa* (Sugar Apple) Leaves and Seeds: Antibacterial, Phytochemical, and Antioxidant Properties

Ranasinghe K.C.[1*], Devindi L.B.K.[1], Nafla M.F.F.[1], Bandaranayake V.H.W.[1], Senevirathne D.W.P.M.[1], Kodikara S.[1], Satharasinghe D.A.[2]

[1]*Department of Biomedical Science, Faculty of Health Science, KIU, Sri Lanka*
[2]*Department of Basic Veterinary Science, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya, Sri Lanka*
**Corresponding Author: bms8194@kiu.ac.lk*

Introduction: The growing concern over antimicrobial resistance has increased the demand for natural therapeutic alternatives. *Annona muricata* and *Annona squamosa* are known for their bioactive compounds, yet limited studies have evaluated their synergistic antibacterial and antioxidant activities. This study investigates their phytochemical composition, antibacterial efficacy, and antioxidant potential.

Objective: To determine the individual and combined antibacterial, antioxidant, and phytochemical qualities of Annona muricata and Annona squamosa leaves and seeds to identify potential therapeutic uses.

Methodology: Methanolic extracts of leaves and seeds were obtained via maceration. Antibacterial activity against *Staphylococcus aureus* (ATCC 23235) and *Escherichia coli* (ATCC 25922) was determined using agar well diffusion and minimum inhibitory concentration (MIC) assays, performed in triplicate with positive (ampicillin(10µg) and ciprofloxacin(10µg)) and negative (Methanol) controls. Phytochemical screening identified flavonoids, tannins, phenols, quinones, and saponins. Antioxidant potential was assessed by DPPH and FRAP assays using ascorbic acid as reference standard and distilled water as a negative control, and data were analyzed using one-way ANOVA ($p < 0.05$).

Results: Among individual extracts, *A. squamosa* leaves showed the highest inhibition against *S. aureus* (11.5 ± 0.3 mm), while *A. muricata* leaves were most active against *E. coli* (10.9 ± 0.2 mm). The synergistic seed–seed combination produced the greatest inhibition zones (20.5 ± 0.4 mm for *S. aureus*; 17.5 ± 0.3 mm for *E. coli*). Phytochemical analysis revealed strong presence of flavonoids and tannins. In antioxidant assays, *A. squamosa* seeds exhibited the highest DPPH inhibition (91%), with synergistic extracts showing enhanced radical scavenging compared to individual parts.

Conclusion: Synergistic extracts of *A. muricata* and *A. squamosa* demonstrated superior antibacterial and antioxidant effects, supporting their potential as natural therapeutic sources. Further studies are warranted to isolate bioactive constituents and elucidate their mechanisms.

Keywords: *Annona muricata*, *Annona squamosa*, synergistic effect, antibacterial, antioxidant

PP 36 AB216

Awareness, Perceptions and Purchasing Patterns of Skin Whitening Products among Young Adults across Sri Lanka

Hulangamuwa V. W. Y. M[*1], Gunasekara S. R. T[1], Rusiru J.A.C[1], Nimalsiri H. T. P. K. L[1], Ananda L. L. T[1], Bandara G. P. S[1], Ranadeva N. D. K[1], Pathiraja D.[2]

[1] *Department of Biomedical Science, Faculty of Health Science, KIU, Sri Lanka*
[2] *Department of Chemistry, University of Colombo, Sri Lanka*
**Corresponding Author: b7b8276@kiu.ac.lk*

Introduction–Skin whitening products (SWPs) that contain harmful substances remain widely available in Sri Lanka. Limited research has examined the awareness, perceptions, and purchasing patterns of SWPs among Sri Lankan young adults.

Objectives–To assess the awareness, perceptions and purchasing patterns of SWPs among young adults across Sri Lanka.

Methodology–A descriptive cross-sectional study was conducted among 436 voluntary young adults (18-26 years) from across Sri Lanka, approached via network sampling. Data was collected through a researcher-developed, pre-tested, structured, self-administered online survey consisting of socio-demographics, awareness, perception, and purchasing patterns in SWPs. Data analysis was performed according to Bloom's cutoff categories using IBM-SPSS (v.25). Ethical approval (KIU/ERC/25/119) was obtained from KIU.

Results–The majority of respondents were single (86%,n=374), females (75%,n=327), with a bachelor's degree (64%, n=279), who were fair in complexion (27%,n=118). Half of the respondents (52%,n=228) had used SWPs at least once in their lifetime. Most respondents (52%,n=226) demonstrated good awareness. The majority (47%,n=204) had negative perceptions towards SWPs. Median awareness score was 4 (IQR=2, range=0-5), median perception score was 21 (IQR=9, range=7-35). Out of users, nearly half (49%,n=151) purchased SWPs from small beauty stores.

Conclusion–Half of the respondents reported lifetime use of SWPs, indicates a disconnection between awareness, perceptions and actual purchasing patterns. This suggests purchasing decisions may influenced by factors beyond awareness and perceptions. Strengthening regulatory enforcement, improving quality control in small beauty stores where nearly half of purchases occur and addressing the underlying motivations for SWP use will reduce the consumption of potentially harmful SWPs among young adults. Selection bias and social desirability bias may affect generalizability and causal inference.

Keywords–Awareness, Perception, Purchasing patterns, Skin whitening products

PP 37 AB219

Evaluation of Antimicrobial Activity of *Garcinia zeylanica* and *Salacia reticulata* Plant Extracts Against Selected Bacterial Pathogens Associated with Urinary Tract Infections

Perera K. J. S.[1*] , Helawansha W. I. M. S. A.[1], Rajakaruna M. G. H. P. K.[1], Kulendradas V.[1], Kularathna H. H. K.[1], Pinnawala P.A.C.P. [1] , Fernando A.M.F.[2], Jayamaha A. R.[2]

[1]*Department of Biomedical Science, Faculty of Health Science, KIU, Sri Lanka*
[2]*Research and Innovation Division, KIU, Sri Lanka*
**Corresponding Author:*b7b8175@kiu.ac.lk

Introduction and Objectives: Urinary Tract Infections (UTI) are one of the commonest bacterial infections, with increasing antibiotics which can be life-threatening. This study aims to investigate the antibacterial activity of *Garcinia zeylanica* (Kaha Goraka) and *Salacia reticulata* (Kothala Hibutu) two species traditionally used in Sri Lankan medicine for urinary and inflammatory conditions against selected UTI-causing bacterial pathogens.

Methods: Fresh, disease-free and mature leaves of *G. zeylanica* and *S. reticulata* were collected from Rathnapura and Mirigama, respectively. Methanolic extracts of the two plants were obtained through the maceration technique and were prepared at concentrations of 0.2 mg/mL and 0.1 mg/mL. This was tested using the agar well diffusion assay against bacterial strains including *Escherichia coli* (ATCC25922), *Klebsiella pneumoniae* (ATCC700603), *Pseudomonas aeruginosa* (ATCC27853), *Salmonella typhi* (ATCC6539), *Shigella sonnei* (ATCC25931), *Bacillus cereus* (ATCC11778), and *Staphylococcus aureus* (ATCC25923). Gentamicin (10 µg) was used as positive control following the Clinical and Laboratory Standards Institute guidelines (2023) and methanol used as the negative control. Inoculated plates were incubated for 24 + h at 37 ºC, All experiments were performed in triplicate and resu;ts were expressed as mean+standard deviation.

Results: *G. zeylanica* inhibited *E. coli* (d=11-13 mm), *S. aureus* (d=16-18 mm), *P. aeruginosa* (d=10-14mm), *B. cereus* (d=12-16 mm), and *S. sonnei* (d=10-12 mm) with 0.1 mg/mL and 0.2 mg/mL dilutions, successfully inhibiting five out of the seven selected organisms. *S. reticulata* only inhibited *S. aureus* (d=11-13 mm) and *S. sonnei* (d=14-29mm) with both dilutions. The significant finding was that the inhibition zone diameter (d=29mm) of *S. reticulata* 0.2 mg/mL against *S. sonnei* was larger than that of the positive control, Gentamicin (d=18 mm). All the results showed a concentration-dependent antibacterial activity, indicating that with higher concentrations, higher antibacterial activity can be exhibited.

Conclusion: The study revealed that both plants exhibit antibacterial activity against selected uropathogens, especially *S. reticulata* against *S.sonnei*. Further studies, such as activity-guided fractionation to isolate the active compounds responsible for antimicrobial activity and toxicity assessment to assess the toxic dose to ensure the safety profile of the plant exactions are recommended.

Keywords: Urinary tract infections, Antibiotic resistance, Methanolic extractions, Antibacterial activity

PP 38 AB222

Evaluation of toxicity, anti-inflammatory activity, antibacterial activities and stability of aqueous *Nyctanthes arbor-tristis* flower

De Silva A.D.M.[1], Pragnathilaka P.G.C.D.[1] , Abeykoon A.M.C.D.D.[1] Kishalani S.[1] Hamtha H.[1], Bandara G.P.S.[1*], Kodikara V.S.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*

**Corresponding Author: geeshan@kiu.ac.lk*

Introduction: The increasing demand for environmentally sustainable textile dyes has driven interest in natural alternatives to synthetic dyes, which are often associated with ecological toxicity and adverse health effects. *Nyctanthes arbor-tristis* flowers have traditionally been used as a natural dye source and possess reported bioactive properties, making them a promising candidate for eco-friendly textile applications with added functional benefits.

Objectives: This study aimed to synthesize a natural dye from *Nyctanthes arbor-tristis* flowers and evaluate its suitability for textile dyeing by assessing toxicity, anti-inflammatory activity, antibacterial properties, and dye stability on different fabrics.

Methodology: Dye extraction was carried out using aqueous, methanolic, and diethyl ether solvents. Antibacterial activity was evaluated using the agar well diffusion method against *Escherichia coli* (ATCC 25992), *Staphylococcus aureus* (ATCC 25922), *Klebsiella pneumoniae* (ATCC 700103), *Enterococcus faecalis* (ATCC 29212), and *Proteus vulgaris* (ATCC 13315). Anti-inflammatory activity was assessed using the egg albumin denaturation assay, while toxicity was evaluated using a modified brine shrimp lethality assay. Textile dyeing was performed on cotton, silk, and polyester fabrics, and dye stability was assessed through wash fastness, light fastness, and rubbing fastness tests using different mordants.

Results: Methanolic extracts exhibited the highest antibacterial activity, while aqueous extracts showed minimal inhibition. Anti-inflammatory activity increased in a concentration-dependent manner, with the highest activity observed at 1600 µg/mL. Toxicity assessment revealed low mortality at lower concentrations, indicating acceptable safety levels. Dyed fabrics demonstrated satisfactory color strength and good wash, light, and rubbing fastness, particularly when bio-based mordants were used.

Conclusion: The synthesized *Nyctanthes arbor-tristis* flower dye demonstrated favorable antibacterial and anti-inflammatory properties, low toxicity, and good textile stability. These findings highlight its potential as a safe, eco-friendly alternative to synthetic dyes with added functional value for sustainable textile applications.

Keywords: *Nyctanthes arbor-tristis*, Natural textile dye, Antibacterial activity, Anti-inflammatory activity, Eco-friendly dyeing

PP 39 AB223

Evaluation of Antidiabetic Activity of Methanolic Extract of *Doona macrophylla Thw.* (Maha Beraliya) Seeds – *In Vitro* Assay

Weerasinghe B.B.T.M[1]*, Wijesinghe W.M.I.I[1], Perera K.K.L[1], Edirisinghe G.D.N.B[1], Godage D.P.B[1], Sandamali P.M.N.N[1], Dissanayake C.T.N[1], Ranadeva N.D.K.[1]

[1]*Department of Biomedical Science, Faculty of Health Sciences, KIU, Sri Lanka*
**Corresponding Author: b7b8306@kiu.ac.lk*

Introduction: Plant-derived natural products have gained attention as safer alternatives to synthetic antidiabetic agents. *Doona macrophylla* (Maha Beraliya), belonging to the family *Dipterocarpaceae*, has been traditionally used for various medicinal purposes, including its potential antidiabetic effects.

Objectives: This study aimed to evaluate in-vitro antidiabetic potential of *Doona macrophylla* seeds through phytochemical screening, α-amylase inhibition, and yeast-glucose uptake assay.

Methodology: The powdered dried seeds were macerated with methanol at a 1:10(w/v) ratio for 48 hours and the filtrate was evaporated to obtain the crude extract. Phytochemical screening was performed using Mayer's test for alkaloids, $FeCl_3$ test for phenolics and froth test for saponins. The α-amylase inhibitory activity was evaluated using the DNS method and the glucose-uptake assay was conducted following Cirillo's method. Both assays were carried out using extract concentrations from 1.25 to 12.5mg/ml, with acarbose as the positive control. All experiments were performed in triplicate. Statistical analysis was performed with SPSS, applying ANOVA for comparison.

Results: Phytochemical screening confirmed the presence of flavonoids, alkaloids and saponins and phenolics. The extract exhibited a concentration-dependent inhibition on α-amylase with highest inhibition of 25.07% at 12.5mg/mL while acarbose indicated 49.41% inhibition. The extract resulted IC_{50} value as 31.54mg/mL and acarbose presented IC_{50} value of 7.185mg/mL in which acarbose is more hypoglycaemic than the extract. The glucose-uptake assay demonstrated an increase in glucose absorption by yeasts in a concentration dependent manner, with a maximum uptake of 31.42% at 12.5mg/ml compared to 44.92% for acarbose. The extract demonstrated significant α-amylase inhibitory activity ($p<0.05$), but in glucose-uptake test wasn't statistically significant ($p>0.05$).

Conclusion: These findings suggest that the extract has indicated lower in-vitro antidiabetic activity than acarbose. Although the extract indicated lower potency than acarbose, the presence of bioactive compounds supports its traditional use as an antidiabetic agent. These validate results are recommended to future studies.

Keywords: antidiabetic, *Doona macrophylla*, phytochemical, alpha-amylase inhibition, glucose uptake

KIU

Multidisciplinary Research Conference 2025
249/1, Malabe Road, Thalangama North,
Koswatta, Battaramulla, Colombo,
Postal Code: 10120, Sri Lanka.
Tel: +94 (0) 11 2741 878, +94 (0) 11 2741 042
Email: mrc@kiu.ac.lk | Web: www.kiu.ac.lk