NSF AWARDS 2023

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April 2024

National Science Foundation

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MESSAGE FROM THE CHAIRMAN

It affords me great pleasure to send this message for the souvenir issued to mark the "NSF Awards Ceremony 2023". This award ceremony is an annual event of the NSF conducted to recognize and celebrate the outstanding achievements and contributions by scientists to research, development and innovation in Sri Lanka.

According to the World Bank, the number of R&D personnel (fulltime equivalent) is only 106 per million of the population in Sri Lanka which is considerably lower than that even in many countries in Asia, i.e. India (253), Pakistan (336), Malaysia (2,185) and Korea (7,980). As per the Global Innovation Index figures released by WIPO in 2023, Sri Lanka is in the 90th position out of 132 countries while India (40th), Vietnam (46th) and Malaysia (36th) are well above us. These are reflected in high-tech exports which amount to only about 1% in Sri Lanka as against about 12% in India, 22% in Thailand, 39% in Vietnam and 28% in Malaysia.

Under these circumstances, the NSF has embarked upon several novel and innovative programmes for capacity building in R&D and promoting inventions and innovations. Establishment of a global digital platform (GDP) to harness almost untapped, high-profile Sri Lankan expatriates for national development and construction of a national instrument database (NID) to provide information on high-end analytical and research instruments available in academia, R&D institutions and industry to its stakeholders constitute two important interventions. They could afford a turbo boost to science, technology and innovation (STI), and export promotion in Sri Lanka through enhancing R&D, international cooperation, foreign direct investment and public-private partnerships.

While reiterating our firm resolve and commitment to advancing R&D to make Sri Lanka a developed nation as per the vision of the Government, I congratulate all the SUSRED award winners most heartily and hope that their academic dynamism and intellectual vibrancy will become contagious so that more staff will acquire and internalize such qualities and attributes to attain excellence.

Emeritus Professor Ranjith Senaratne
Chairman/National Science Foundation

April 2024

MESSAGE FROM THE DIRECTOR GENERAL

As the Director General of the National Science Foundation, I am privileged to send this massage on this special occasion. The NSF Award Ceremony stands as a celebration of excellence, where NSF commends and uplifts the recipients of the SUSRED Awards for their remarkable achievements within their respective fields.

With a steadfast commitment to becoming the nation's foremost catalyst for Research, Development, and Innovation, the NSF has been at the forefront of nurturing the scientific community, driving progress towards economic and social prosperity. Over its fifty-year history, the NSF has tirelessly worked to cultivate an environment conducive to Research, Development, and Innovation through a diverse array of programs and initiatives.

The SUSRED award scheme, inaugurated in 2011, has since recognized numerous supervisors across the nation for their unwavering dedication to guide M.Phil. and Ph.D. candidates. I firmly believe that this scheme serves as a continuous source of motivation for academics to engage in supervisory roles, nurturing the next generation of researchers despite the challenges our country may face.

I extend my heartfelt congratulations to all the award winners for their exceptional contributions in mentoring young researchers, setting a commendable example for aspiring supervisors in Sri Lanka. May these awards serve as a beacon of inspiration, igniting a passion for creating a dynamic Research, Development, and Innovation ecosystem within our nation.

To the award winners, I offer my best wishes for continued success in all your future endeavors.

Dr Sepalika Sudasinghe
Director General/ National Science Foundation

April 2024

INTRODUCTION

Research and innovation are key determinants for Sri Lanka's evolution into a knowledge-based, technology-driven economy. Two key determinants in fostering a vibrant Research & Innovation ecosystem are funding and manpower.

The National Science Foundation established under the Science and Technology Development Act (No.11) of 1994 has been in the forefront in assisting the scientific community in many ways towards realizing its vision to be the nation's foremost catalyst for promoting science, technology and innovation for economic and social prosperity of Sri Lanka. Striving to create an evidence-based research culture upholding stringent standards and fostering research capacity, enhancing quality and transparency through a variety of programmes and activities, NSF assumes a pivotal role as the premier funding organization for science, technology and innovation endeavors within the country.

The availability of a skilled and well qualified research cadre is a critical factor in the establishment of a strong research, development and innovation ecosystem of a country. Recognizing this imperative, the Board of Management of NSF introduced a pioneering rewards scheme in 2011 aimed at motivating, supporting and recognizing researchers engaged in supervision of postgraduate research degrees. Thereafter, the support scheme for supervision of research degrees (SUSRED) awards ceremony was inaugurated in 2012. This scheme conferred awards to researchers for successful and timely completion of post graduate degrees without compromising their quality. The SUSRED award ceremony was launched to strengthen the National Research System with more trained/ qualified research personnel within a vibrant and dynamic research culture.

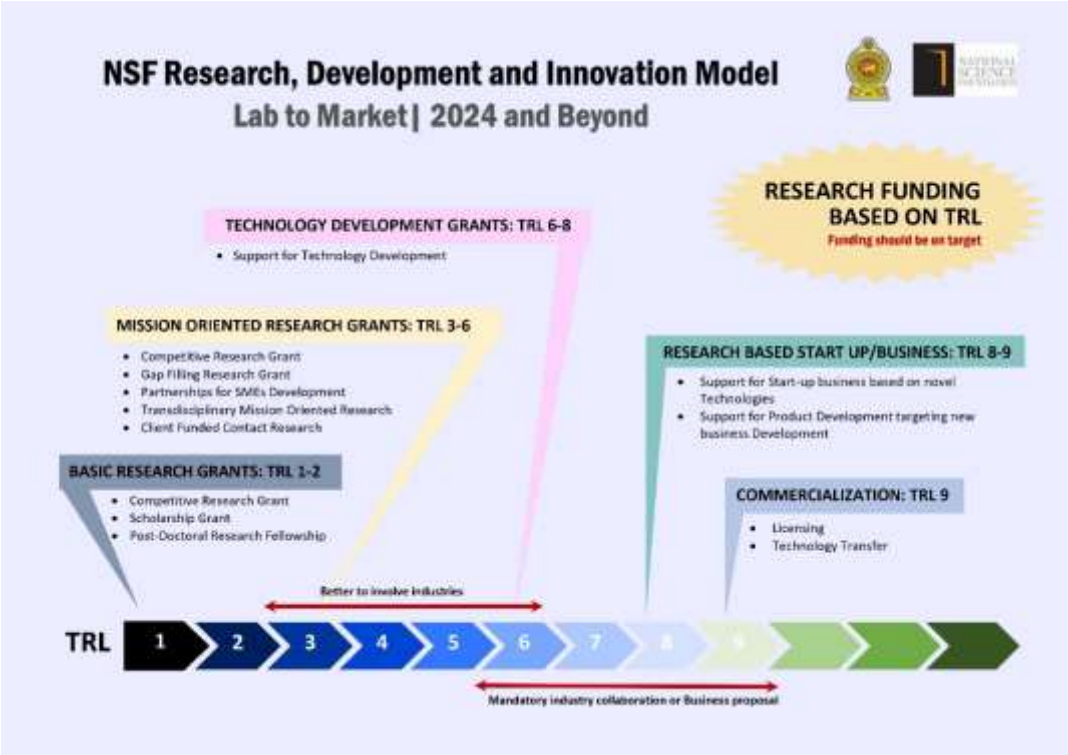

Figure : NSF Research, Development and Innovation Model

NSF Awards Ceremony 2023

The annual awards ceremony of the National Science Foundation (NSF) is organized to confer awards under several awards schemes. This year, the awards will be presented for the Support Scheme for Supervision of Research Degrees (SUSRED).

Support Scheme for Supervision of Research Degrees (SUSRED)

The NSF implemented the Support Scheme for Supervision of Research Degrees (SUSRED) in 2011, with the expectation of strengthening the National Research System with an increased number of trained/ qualified research personnel within a vibrant and dynamic research culture. This will be achieved by motivating, supporting and recognizing scientists/engineers engaged in supervising students conducting research in all areas of Science and Technology including Social Sciences leading to postgraduate degrees (MPhils and PhDs).

Objectives of the scheme are:

- Motivation of senior researchers to supervise postgraduate research degrees.
- Encourage universities and research institutions to promote and facilitate postgraduate research training.
- Encourage supervisors to complete the postgraduate research degrees within the stipulated time period without compromising quality.

Annually, the NSF invites applications through an open advertisement, inviting supervisors of postgraduate degrees, MPhils & PhDs, to apply for recognition. Since its inception in 2012, the SUSRED scheme has conferred 198 awards upon 427 distinguished scientists and engineers across universities, research institutes, and industry sectors, acknowledging their invaluable contributions to the nation.

At this year's ceremony, 42 awards will be presented to 98 researchers including university academics from 17 different universities and research institutes across the country.

SUSRED Awards

Awards
for
Supervision of PhD degrees

Thesis Title : **Fluorescence *in situ* hybridization assay to diagnose cutaneous leishmaniasis and characterization of the microbiome & biofilms in lesions caused by *Leishmania donovani* in Sri Lanka**

Outcome/s of the Project

Cutaneous leishmaniasis (CL) is endemic in Sri Lanka. This study assessed the diagnostic performance of fluorescence *in situ* hybridization (FISH) assay and investigated the microbiome and biofilm formation in CL wounds. The study concluded that FISH performed on wound biopsies, is a more sensitive diagnostic tool than H&E staining of wound tissues. FISH performed on slit-skin-smears of the wound did not have an additional advantage over Giemsa staining in diagnosis. FISH performed on slit-skin-smears could be recommended as a minimally invasive method in studies assessing wound healing where immunological probes are used. Also, the study concluded that more than half of CL wounds harboured biofilms and exhibited a distinct, less diverse, microbiome than unaffected skin. This could be beneficial in CL patient management, especially concerning wound debridement coupled with antibiotics targeting a specific group of bacteria composing these biofilms.

Principal Supervisor

Prof. Shalindra Ranasinghe, Professor in Parasitology, Department of Parasitology, Faculty of Medical Sciences, University of Sri Jayewardenepura is a MBBS graduate with a MPhil and a PhD. Her research interests include diagnostics and molecular biology of infectious parasitic diseases.

Co - Supervisor I

Senior Prof. Renu Wickremasinghe, Professor of Parasitology, Department of Parasitology, Faculty of Medical Sciences, University of Sri Jayewardenepura is a PhD holder with research interests in infectious parasitic diseases.

Co - Supervisor II

Senior Prof. Surangi Yasawardene, Professor of Anatomy, Department of Anatomy, Faculty of Medical Sciences, University of Sri Jayewardenepura is a MBBS graduate and a PhD holder with research interests in anatomy, genetics and molecular biology.

Co - Supervisor III

Prof. Manjula Weerasekera, Professor in Microbiology, Department of Microbiology, Faculty of Medical Sciences, University of Sri Jayewardenepura has a MPhil and a PhD. Her research interests are in molecular biology & microbiology.

Research Student	:	Dr T.D.J. Kaluarachchi
University	:	University of Sri Jayewardenepura

Thesis Title : Seed biological traits of selected rainforest species from Sri Lanka; towards conservation of biodiversity

Outcome/s of the Project

The project aimed to assess important seed biological traits of fifty rainforest species in Sri Lanka. It specifically focused on determining the seed storage, dormancy, and germination of these species, which is crucial for their propagation and conservation, both in *ex situ* and *in situ* settings. Using the seed biological traits, species were categorized into reproductive functional groups which is significant in identifying their ecological niche. For the first time, the seed dormancy and storage behavior profiles of a tropical rainforest plant community were documented. Moreover, the information was used to determine the climate resilience of the study species.

Principal Supervisor

Prof. Gehan Jayasuriya is affiliated with the Department of Botany, University of Peradeniya and earned his PhD in Seed Biology from University of Kentucky. He has authored 43 SCI-indexed and 12 peer-reviewed journal papers. He primarily focused on the seed ecophysiology of native wild species to aid in their conservation.

Co - Supervisor

Prof. Thilanka Gunaratne is associated with the Department of Botany, University of Peradeniya. She obtained her doctorate in Plant Sciences from the University of Aberdeen, UK. She has contributed to 21 manuscripts. Her research focuses on the ecology of ecosystems, with particular focus on promoting biodiversity conservation through restoration efforts.

Research Student : Dr B.R.C.P. Samarasinghe

University : University of Peradeniya

Thesis Title : Comprehensive analysis of fresh fish logistic chain in Sri Lankan marine fishery

Outcome/s of the Project

The study recognized time and temperature as significant elements influencing fish freshness quality across the chain. The hybrid type Fish Stall Refrigerated Equipment (FSRE) is designed with a storage and display facility instead of the traditional fish board, "*Malu Lella*" and can be implemented as a solution to maintain freshness quality at small-scale retail fish outlets in the fish logistic chain. To avoid the deterioration of freshness quality, an appropriate solution will have to be developed and implemented among retail traders, particularly at the small-scale level.

Principal Supervisor

Prof. M.A.J. Wansapala, Professor in Food Science and Technology holds BSc (Sp) Hons. in Chemistry , MSc in Food Science and Technology, PhD in Food Science. A senior researcher and academic in food chemistry, fruits and vegetables processing and the chemical changes of all food commodities from farm to fork is a consultant food technologist in food product process technology.

Co - Supervisor I

Prof. Indira Wickramasinghe, Department of Food Science and Technology, University of Sri Jayewardenepura. Her research interests include meat science, fisheries, and product technology, and has specific interest in the metal content of fish and fish digestibility studies. She is the author of over 150 indexed, peer-reviewed national and international research publications and holds several patents.

Co - Supervisor II

Dr Aruna S.K. Warahena, BSc Engineering Honours, MEng, PhD. He is an educator in engineering, technology & innovation and has expertise on, thermal system technologies of high and low temperature applications, product, appliances, and equipment development & innovation for manufacturing, with the focus of business and entrepreneurship development.

Research Student	:	Dr U.A.S.K. Edirisinghe
University	:	University of Sri Jayewardenepura

Thesis Title : When teachers go the extra mile: Determinants of organisational citizenship behaviour of school teachers in Jaffna, Sri Lanka

Outcome/s of the Project

The research studied the determinants of organizational citizenship behavior (OCB), and the results revealed that teachers' OCB was affected neither by their work interference with family nor by their students' behaviours. However, the teachers who had less perceived support from their schools were negatively affected by their work inference with family, and those who were custodial, by their students' behaviours. A significant positive relationship was found between teachers' self-efficacy and OCB. The teachers who were benevolence-driven displayed more OCBs, and those driven by achievement, self-direction and conformity did not have any association with their levels of OCBs.

Principal Supervisor

Prof. Navaneethakrishnan Kengatharan, Dean of the Faculty of Management Studies and Commerce at the University of Jaffna, is also the Chair Professor in the Department of Human Resource Management. His research is featured in reputed journals, including the International Journal of Manpower, Journal of Beliefs & Values, SAJHRM, IJEM, and JAMR.

Research Student : Dr A.H. Gnanarajan

University : University of Jaffna

Thesis Title : ***Aedes* larval bionomics, circulating serotypes and a risk map in relation to dengue transmission in Jaffna District**

Outcome/s of the Project

The study reported (i) *Aedes* larval bionomics, (ii) circulating DENV serotypes and genotype of DENV1 and DENV3 and (iii) a GIS-based dengue risk map for the Jaffna District. The study recommends for a policy change at the national level to accommodate fresh water, salt water and polluted water environments to target preimaginal forms of dengue vectors to control dengue transmission. Screening adult dengue mosquitoes collected from the field for DENV will help understand the changing epidemiology in terms of DENV serotypes and vector population dynamics. Early detection of dengue hot zones is useful in containing the disease transmission before the disaster. The developed GIS-based dengue risk map has identified urban and semi urban areas as risk areas for dengue. Therefore, concentrating the dengue control measures in areas prone to dengue transmission could prevent the upcoming outbreaks and also reduce the burden to the health sector in terms of resources and finance.

Principal Supervisor

Prof. S.N. Surendran is a Senior Professor and Chair of Zoology, University of Jaffna. He received his BSc from University of Jaffna and PhD from University of Colombo. He has specific training and expertise in medical and molecular entomology. He has received many research grants and has been recognized with awards for his research contributions. He has over 70 research publications in peer-reviewed indexed journals.

Co - Supervisor I

Prof. Vasanthy Arasaratnam is a Senior Professor and Chair of Biochemistry of the Faculty of Medicine, University of Jaffna. She has served as the Vice Chancellor of the University of Jaffna and she is currently serving as a member of the University Grants Commission. She has a long track record of research publications and postgraduate supervision.

Co - Supervisor II

Prof. T. Kumanan serves as Professor of Medicine, Department of Medicine, Faculty of Medicine, University of Jaffna and Honorary Consultant Physician, Teaching Hospital Jaffna. He is a fellow of Royal College of Physicians Edinburgh, American College of Physicians and International Society of Hypertension. Research interests include tropical infectious diseases in particular dengue, amoebiasis and hypertension.

Co - Supervisor III

Prof. K. Gajapathy, a Professor attached to the Department of Zoology of the University of Jaffna, works in the fields of taxonomy and evolutionary biology of animals. He has contributed to a sizable number of scientific publications including research papers, book chapters and manuals.

Co - Supervisor IV

Prof. Karunakaran Suthakar is a Professor in Geography, former Head of the Department of Geography and Dean of the Faculty of Arts at the University of Jaffna. He obtained an MTech in Remote Sensing and Geographic Information Systems (GIS) from Andhra University, India, and a PhD from Nanyang Technological University, Singapore. He has research interests in applications of remote sensing and GIS in land use and environmental management.

Research Student	:	Dr P.J.T. Thanesh
University	:	University of Jaffna

Thesis Title : Investigation of rice husk ash as a sustainable source material for blended low calcium fly ash-based alkali activated binders

Outcome/s of the Project

Blended alkali activated concrete (AAC) prepared by adding 10% rice husk ash (RHA) to fly ash (FA) [10% RHA + 90% FA] achieved an optimum strength of 33.4 MPa, highlighting its potential for concrete applications. The blended FA-RHA alkali activated brick [80% FA + 20% RHA] satisfies the strength requirement for bricks (17 MPa). The cost of blended FA-RHA based AAC is lower than ordinary Portland cement (OPC) brick. The blended FA-RHA based concrete/brick demonstrated comparable performance with OPC based binders in terms of greenhouse gas emission, cost and environmental impacts. The blended FA-RHA based alkali activated binders can be used in construction applications.

Principal Supervisor

Dr M.C.M. Nasvi completed Bachelor's degree in Civil Engineering from University of Peradeniya (2009) and PhD degree in Geotechnical Engineering from Monash University (2014). His research interests include geopolymers, geopolymer-based soil stabilization and industrial by-products in construction applications. He has published many technical papers in the field of energy, geotechnical engineering and concrete.

Co - Supervisor

Prof. Ranjith Dissanayake is a Senior Professor in Civil Engineering and a Fulbright Scholar. He is the President of the Institution of Engineers, Sri Lanka, the former Secretary to the State Ministry, the founder of gap HQ, base of operation of several companies and chairing the international conferences on sustainable built environment, and university-industry collaborations.

Research Student : Dr K.S.D.M. Fernando

University : University of Peradeniya

Thesis Title : **The study of anti-diabetic and anti-cancer activities of the bioactive constituents of Sri Lankan marine algae *Chnoospora minima* and *Gracillaria edulis***

Outcome/s of the Project

Chnoospora minima and *Gracillaria edulis* was studied for their anticancer and antidiabetic properties. Potent antioxidant and anti-diabetic activities in *C. minima* through inhibition of alpha glucosidase, alpha amylase, and inhibiting glycation were seen. *G. edulis* showed anticancer properties via caspase 3/7 activities though upregulation of p21, p53 & Bax genes. A novel "fucoxanthin derivative" from *C. minima* that can be utilized as a potential hypoglycemic agent was also isolated.

Principal Supervisor

Senior Prof. Dinithi Peiris is attached to the Department of Zoology, University of Sri Jayewardenepura. She obtained her BSc from University of Colombo and PhD from Sheffield University, UK. She focuses on pharmacognosy, particularly diabetes and cancer, signaling pathways, molecular mechanisms, drug discovery, etc. Published over 43 SCI-indexed papers, 2 books, and 3 book chapters.

Co - Supervisor I

Dr Pathmasiri Ranasinghe is currently Senior Deputy Director, Herbal Technology Section, ITI. He has a BSc from University of Peradeniya, MPhil and PhD from University of Colombo. He is a visiting lecturer at University of Ruhuna and his research interests are natural products biochemistry & bioassay, plant tissue culture and molecular biology, experimental biological data analysis.

Co - Supervisor II

Prof. K.W. Samarakoon is a Professor in Biotechnology at the Institute for Combinatorial Advanced Research and Education (KDU-CARE), at General Sir John Kotelawala Defence University. His research interests span the fields of natural products chemistry and marine biotechnology and has published over 42 full paper research articles (2089 Citations, h-index 22, i10 index-24).

Research Student	:	Dr T.L. Gunathilake
University	:	University of Sri Jayewardenepura

Thesis Title : Validation of selected physical activity assessment methods against doubly labelled water technique and a school-based physical activity intervention in 11-13 year-old adolescents

Outcome/s of the Project

This study generated energy expenditure data for the first time in Sri Lanka in 11-13-year-old adolescents using doubly labeled water, the gold standard method, and new validated field tools. Through a cluster randomized controlled trial and using gold standard methods for energy expenditure and body composition assessment, a 3-month physical activity intervention programme was shown to be effective in improving physical activity and health related physical fitness parameters. The programme can be implemented in schools, having being developed in concurrence with the Ministry of Education and stakeholders, accounting for logistic limitations in schools.

Principal Supervisor

Prof. Pulani Lanerolle is the Chair Professor and engages in policy support, advocacy and research in nutrition, as member of the WHO Nutrition Guidance Expert Advisory Group, FAO/WHO expert group on sustainable healthy diet, Global Doubly Labeled Water Consortium, Multicenter Body-Composition Study and editorial advisory board - Asia Pacific Journal of Clinical Nutrition.

Co - Supervisor I

Prof. Indu Waidyatilaka is a SEDA (UK) accredited academic, an ISAK accredited anthropometrist and a researcher in nutrition. He has received numerous research awards and published widely in SCI indexed journals. He engages in advocacy work, has served in many national technical committees and has contributed to nutrition projects in South East Asia region.

Co - Supervisor II

Prof. Pujitha Wickramasinghe is a Senior Professor in Paediatrics. He contributes at policy level to ministries of Education and Health of GoSL, on nutrition and child health. He has served as a member in WHO guideline development and UNICEF policy development and is a member of WHO-UNICEF Technical Expert Advisory group on Nutrition Monitoring (TEAM).

Research Student	:	Dr P.M. Dabare
University	:	University of Colombo

Thesis Title : Nephroprotective activity of a novel herbal nutraceutical mixture derived from selected medicinal plant extracts in rats with chemically induced nephrotoxicity

Outcome/s of the Project

Efficacy and safety assessment of polyherbal formulations are essential thresholds for drug leads from preclinical to clinical research. The present study focused on investigation of nephroprotective effects, detailed mechanisms of action of a polyherbal formulation in an animal model of nephrotoxicity. The patented polyherbal formulation developed in the study could be used in manufacturing new phytomedicines and nutraceuticals for the management of chronic kidney disease. The positive results of the study complement the efforts in reaching the national health needs of the general public, enhancing the quality of life of patients, and reducing mortality of people suffering from kidney disease and the disability of the workforce in Sri Lanka.

Principal Supervisor

Prof. A.P. Attanayake, Professor in Biochemistry, Department of Biochemistry, Faculty of Medicine, University of Ruhuna. She has been a researcher in the field of natural product chemistry, nutritional biochemistry with a special emphasis on diabetes mellitus and obesity. She is a winner of many national and international research awards, four patents and a gold medalist in post graduate research at the University of Ruhuna.

Co - Supervisor I

Prof. K.A.P.W. Jayatilaka, Professor of Biochemistry, Department of Biochemistry, Faculty of Medicine, University of Ruhuna. Her main focus on research has been medicinal plants/ natural products as drug leads. She is a post-graduate supervisor and has received many research grants. Prof. Jayatilaka is a recipient of three President's Research awards, three patents and a winner of several national awards.

Co - Supervisor II

Prof. Lakmini K.B. Mudduwa, Senior Professor of Pathology and Specialist in Histopathology, Department of Pathology, Faculty of Medicine, University of Ruhuna. She has been a supervisor for five PhD research projects and many post MD (Histopathology) research. Her main research areas include breast cancer, thyroid cancer and immunohistochemistry. Prof. Mudduwa has received two President's Research awards and two NRC Merit awards.

Research Student	:	Dr A.M.S.S. Amarasiri
University	:	University of Ruhuna

Thesis Title : Assessing environmental sustainability of the rice based agro-food system in Deduru Oya river basin of Sri Lanka

Outcome/s of the Project

This research identified evidence of pesticide pollution of irrigation water in paddy cultivation system in Deduru Oya river basin. Spatial and temporal variation of pesticide residues and the ecotoxic impacts of identified pesticides on fauna species at risk were explored through the study. Study identified the usefulness of basin approach in studying pesticide pollution than local level studies. In addition, the sustainability status of the paddy cultivation system was evaluated using 'sustainable rice platform performance indicators'. The study highlighted the strengths and weaknesses of field level water governance bodies through behavior assessment of the farmer organizations. Gaps in pesticide related policies in Sri Lanka were also identified and potential solutions were discussed.

Principal Supervisor

Prof. N.D.K. Dayawansa is attached to the Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya. She earned her PhD in Agricultural Pollution Modelling from University of Newcastle upon Tyne, UK. She has more than 25 years of experience in teaching and research and her research interests include application of remote sensing and GIS in water management, water and ecosystems and agricultural pollution modelling.

Research Student : Dr M.M.J.G.C.N. Jayasiri

University : University of Peradeniya

Thesis Title : Deep learning based fine-grained diabetic retinopathy image grading

Outcome/s of the Project

Untreated diabetic retinopathy (DR) from high blood sugar damages the retina, risking vision impairment or blindness. This research developed an advanced deep learning system for automated DR grading, crucial for early intervention, achieving performance comparable to experienced ophthalmologists.

Principal Supervisor

Prof. S. Manivannan currently serves as a Professor in Computer Science at the Department of Computer Science, University of Jaffna. He earned his BSc (Hons) in Computer Science from the University of Jaffna, MSc in Computer Science from the Polytech, University of Nice, France, and PhD from the University of Dundee, UK.

Co - Supervisor

Dr A. Ramanan is a Professor in the Department of Computer Science at the University of Jaffna. He obtained his BSc Honours degree in Computer Science from the University of Jaffna, and his PhD degree in Computer Science from the University of Southampton, UK. Prof. Ramanan is also a Senior Member of IEEE.

Research Student	:	Dr N. Rajendran
University	:	University of Jaffna

Thesis Title : Development of novel poly (ethyleneoxide)/ conducting polymer-based electrolytes and graphite-based counter electrodes for dye/Q-Dot sensitized solar cells

Outcome/s of the Project

This research focused on the development of the three main solar cell components, namely photoanode, electrolyte and counter electrode. The photoanode was strategically modified in order to increase the light absorption and to enhance the solar cell efficiency significantly. Four different types of novel gel and solid electrolytes based on poly(ethylene oxide) (PEO) together with PANI conducting polymer, PVdF-HFP polymer, ionic liquids, different cations (LiI, Pr4NI, and KI), and plasticizers (EC, PC) were developed. Novel, low-cost counter electrode (CE) materials including Sri Lankan vein graphite, reduced graphene oxide (RGO), and activated carbon were used in DSSCs as alternatives to expensive platinum. These modifications enabled the development of dye/Q-Dot co-sensitized hybrid solar cells with a conversion efficiency of over 10%.

Principal Supervisor

Vidya Nidhi Prof. M.A.K.L. Dissanayake, BSc (Ceylon), MS, PhD (Indiana, USA), DSc (Wayamba, Sri Lanka), DSc (Open Univ., Sri Lanka), Fellow, NASSL, recipient of "Vidya Nidhi" National Award (2005), National Science Foundation Life Time Award (2018), ranked by Stanford University-Elsevier 2022 and 2023 citation analysis among the world's top 2% of research scientists.

Co - Supervisor

Prof. G.K.R. Senadeera, BSc Hons (Physics, 1994), University of Peradeniya, PhD (1996) University of Peradeniya and Technical University of Denmark, Postdoctoral Diploma (1997-1998) Tokyo Institute of Technology, Japan. Currently serving as a Professor of Physics at Open University of Sri Lanka. His research interests are conducting polymers and dye sensitized solar cells.

Research Student : Dr J.M.K.W. Kumari

University : University of Peradeniya

Thesis Title : A semi-supervised deep learning approach based on attentive visual features for fashion clothing classification

Outcome/s of the Project

Efficient clothing classification systems optimise production, supply chains, and distribution, thereby reducing waste and enhancing productivity. Moreover, they foster innovation by offering insights into consumer preferences for designers. This study contributes to four areas using convolutional neural network approaches: (i) Landmark-driven model, (ii) landmark-free model, (iii) semi-supervised learning architecture, and (iv) clothing detector for fashion classification.

Principal Supervisor

Prof. A. Ramanan is a Professor in the Department of Computer Science at the University of Jaffna. He obtained his BSc Honours degree in Computer Science from the University of Jaffna, and his PhD degree in Computer Science from the University of Southampton, UK. Prof. Ramanan is a member of CSSL and also a Senior Member of IEEE.

Research Student : Dr S. Majuran

University : University of Jaffna

Thesis Title : Development of an innovative and enhanced solar energy harnessing technique using supercapacitor as an energy storage

Outcome/s of the Project

A novel photovoltaic (PV) system, integrating a supercapacitor (SC)-battery hybrid energy storage, was developed to harness solar energy more efficiently than the existing stand-alone PV systems. The proposed system incorporates modifications to the SC-assisted loss management (SCALoM) concept, storing substantial usable energy in a supercapacitor bank unless otherwise wasted. The proof-of-concept prototype demonstrated 98% overall system efficiency, which is considerably higher than the typical efficiency value of conventional stand-alone PV systems. It is envisioned this system will eventually penetrate the commercial PV Industry in the future.

Principal Supervisor

Prof. A.L.A.K. Ranaweera is a Professor affiliated with the Department of Physics and Electronics, University of Kelaniya. He earned his PhD in Electronics and Radio Engineering from Kyung Hee University, South Korea, 2017. He was a recipient of the prestigious Global Korea Scholarship for postgraduate studies. He holds titles MIEEE and MURSI.

Co - Supervisor

Prof. S.R.D. Kalingamudali Senior Professor and Dean/Faculty of Science, University of Kelaniya, obtained his PhD (1994) in Electronic Engineering, University of Sheffield. He has been honoured with Fulbright Fellowship twice and has served as a Visiting Professor at GSU and LSU, USA. He holds titles CSci, CEng, CPhys, FIET, FInstP, FIP(SL), and MIEEE.

Research Student : Dr P.L.A.K. Piyumal

University : University of Kelaniya

Thesis Title : QTL map-based candidate gene discovery for salt tolerance in rice (*Oryza sativa*)

Outcome/s of the Project

Whole genomes of two rice varieties, At354 and Bg352 which have contrasting phenotypes in salt tolerance was sequenced. This is the first reported research in the world on whole genome sequencing of a Sri Lankan rice variety mapped with the Indica rice genome, R498 and it is the second reported research on mapping with the Niponbare rice genome in Sri Lanka. This research improved the capacity in the area of Bioinformatics where assembling whole genomes with respect to a reference genome is possible. Revealing SNP and Indel mutations in these two rice varieties opened endless opportunities to breeders to capture many candidate genes.

Principal Supervisor

Prof. N.S. Kottearachchi obtained BSc (Agriculture) degree from University of Peradeniya, MSc degree from Mahidol University, Thailand and a Doctoral degree from Iwate University, Japan. Her academic career extended with Post-Doctoral fellowships in UK and USA. Presently, she serves as a Senior Professor in Biotechnology at Wayamba University of Sri Lanka. Her major research area is molecular plant breeding.

Co - Supervisor I

Dr (Mrs) D.R. Gimhani is a BSc Agriculture graduate from Wayamba University of Sri Lanka. She holds MSc in Experimental Biotechnology and PhD in Biotechnology. Her PhD thesis was focused on “Identification of salinity tolerant QTLs in elite rice background”. She is currently working as a Senior Lecturer at Wayamba University of Sri Lanka.

Co - Supervisor II

Prof. Venura Herath, a molecular geneticist with a PhD from University of Maine and post-doctoral experience at Texas A&M University. He is a Professor in Environmental Genomics at the Department of Agricultural Biology, University of Peradeniya. His research explores transcriptional regulatory networks in developmental processes and stress responses using functional, comparative, and computational genomic approaches.

Research Student : Dr B.P. Abhayawickrama

University : Wayamba University of Sri Lanka

Thesis Title : **Evaluation of the effect of coconut oil and selected edible oils on the absorption of polyphenolic antioxidants through intestinal epithelium and assessment of resultant nutritional advantages**

Outcome/s of the Project

The project established a novel nutritional advantage of coconut oil. Phenolic antioxidants are small polar molecules that are poorly absorbed through a tight junction-controlled mechanism in the intestinal epithelium. The project showed that the absorption of chlorogenic acid without any edible oils in the preparation was 5.7±0.2%. However, the preparations of chlorogenic acid with soybean and coconut oil showed absorptions 11.8±1.3% and 65.6±18.1% respectively. The higher absorption of chlorogenic acid was accompanied by the improvement of serum and plasma antioxidant capacity. The commercialization process is currently underway.

Principal Supervisor

Prof. Kapila Seneviratne is a Senior Professor in Chemistry at the University of Kelaniya. He received his PhD from Wayne State University, USA and did his Postdoctoral studies at UBC, Canada. He is also a Commonwealth Fellow (Leeds, UK) and a Fulbright Fellow (UMASS, USA). Currently, he is the Dean of the Faculty of Graduate Studies of the University of Kelaniya.

Co - Supervisor

Prof. Nimanthi Jayathilaka is a Professor in Molecular Biology and Biochemistry at University of Kelaniya. Her first degree is from University of Wisconsin-Superior. She did her PhD in Genetics, Molecular and Cellular Biology at University of Southern California and the postdoctoral studies at University of California, San Diego. She has received several national and international awards including OWSD fellowship.

Research Student : Dr T. Weerakoon

University : University of Kelaniya

Thesis Title : **Assessment of pathogeography and pathogenicity of blast and brown spot diseases in rice (*Oryza sativa* L.) using phenetic, molecular and digital image sensing approaches**

Outcome/s of the Project

The research focused on biotic factors influencing rice production, particularly the prevalent fungal diseases, rice blast (RB) and rice brown spot (BS) in northern Sri Lanka over five seasons. The study utilized morphological and molecular methods to pathogeographically analyze RB and BS. Notably, Pi-ta gene sequence diversity was studied, and a mobile app, BlastOSpot, was developed for disease differentiation. Results revealed RB and BS infection rates, disease influencing factors and showcased the efficacy of the developed tools in disease discrimination, leading to the release of the mobile app as a practical solution for farmers.

Principal Supervisor

Prof. O.V.D.S.J. Weerasena is a Professor at the Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo. He has authored many research publications in international peer reviewed journals and he is a recipient of many awards for research excellence including Presidential Award, Vice Chancellor's Award and Senate award**.**

Co - Supervisor

Prof. N.S. Kottearachchi obtained BSc (Agriculture) degree from University of Peradeniya, MSc degree from Mahidol University, Thailand and a Doctoral degree from Iwate University, Japan. Her academic career extended with Post-Doctoral fellowships in UK and USA. Presently, she serves as a Senior Professor for the Department of Biotechnology, Wayamba University of Sri Lanka. Her major research area is molecular plant breeding.

Research Student : Dr S. Terensan

University : University of Colombo

Thesis Title : Modelling and analysis of optimal strategies for the control of dengue transmission in Sri Lanka

Outcome/s of the Project

A criterion to predict dengue outbreaks in Sri Lanka has been developed under this project, through a compartment model approach, based on climate data gathered from each province in the country. In addition to that, considering the resource restrictions in the country for the control process, an optimal resource allocation protocol during an outbreak has also been developed under this project.

Principal Supervisor

Prof. S.S.N. Perera is Chair Professor in the Department of Mathematics, University of Colombo and the current Head of the Department of Mathematics and Director of the Centre for Mathematical Modeling. He has produced 12 PhDs in the field of mathematical modeling.

Co - Supervisor

Prof. Anuradha Mahasinghe is the initiator and the coordinator of the Hons Degree program on Computational Mathematics at the University of Colombo and the current Deputy Director of the Centre for Mathematical Modelling. His research interests include quantum computing, optimization and recreational mathematics.

Research Student : Dr K.K.W.H. Erandi

University : University of Colombo

Thesis Title : Computational studies on inhibition of epigenetic modifications of cancer codes

Outcome/s of the Project

The study yielded significant outcomes, advancing cancer drug discovery, and benefiting societal well-being. Target drug identification promises improved cancer treatment, particularly benefiting patients in the country. Notably, the project streamlined clinical trials, reducing time and costs. It also highlighted opportunities for technology-driven startups in cancer research, fostering innovation and addressing industry needs while empowering future professionals and contributing to drug discovery.

Principal Supervisor

Prof. R. Senthilnithy presently serves as a Professor in Chemistry in the Department of Chemistry at the Open University of Sri Lanka. He obtained his PhD from University of Colombo and his MPhil from the University of Jaffna. His areas of expertise include photochemistry, computational chemistry, and inorganic chemistry.

Co - Supervisor I

Prof. M.S.S. Weerasinghe presently serves as a Professor in Chemistry in the Department of Chemistry, University of Colombo. He obtained his PhD from University of Maine. His areas of expertise include computer applications in chemistry, molecular simulation methods, molecular spectroscopy, statistical thermodynamics, chemical kinetics, and molecular symmetry.

Co - Supervisor II

Prof. D.P. Dissanayake presently serves as a Senior Professor in Chemistry in the Department of Chemistry, University of Colombo. He obtained his PhD from Texas A&M University and MPhil from University of Peradeniya. His areas of expertise include catalytic properties of metal oxides, theoretical studies on reaction mechanisms and clusters, sensors and energy storage.

Research Student	:	Dr R. Dushanan
University	:	The Open University of Sri Lanka

Thesis Title : Perinatal anxiety and its association with obstructive sleep apnoea and other maternal and foetal outcomes in women of selected Medical Officer of Health areas in Colombo District

Outcome/s of the Project

This project has added a validated tool (PASS-S) translated to Sinhala language to screen for perinatal anxiety and two validated tools to detect obstructive sleep apnoea. It has also generated evidence that antenatal anxiety(AA) is high among Sri Lankan pregnant women and there are many adverse outcomes of AA on mother and offspring. It was also found that AA is associated with stimulation of inflammation and appetite which has several implications on the mother and the offspring. These results are useful to develop measures and policies to mitigate AA. A longitudinal study of sleep disorders during pregnancy was also established as another outcome.

Principal Supervisor

Prof. Sharaine Fernando is the Chair Professor of Physiology and the Founder Dean of Faculty of Allied Health Sciences, University of Sri Jayewardenepura. She has over thirty years of experience in health professions education and has supervised higher degrees by research students in medicine and health sciences fields leading to PhD/MPhil.

Co - Supervisor I

Prof. Sampatha Goonewardena is a Board certified specialist in Community Medicine and Professor in Community Medicine, Faculty of Medical Sciences, University of Sri Jayewardenepura. She has supervised over 25 MSc, MD, MPhil and PhD research in medicine and allied health sciences and has over 100 scientific communications and publications.

Co - Supervisor II

Dr M.D.I.A. Waas, is a Senior Lecturer at the Department of Psychiatry, Faculty of Medical Sciences, University of Sri Jayewardenepura and an honorary consultant psychiatrist at Colombo South Teaching Hospital. She has supervised postgraduate students since 2012 in clinical and research work. She has a keen interest in perinatal psychiatry.

Co - Supervisor III

Prof. (Colonel) Aindralal Balasuriya, a Consultant Community Physician, the Chair Professor of Public Health and Dean of the Faculty of Medicine, General Sir John Kotelawala Defence University, Rathmalana has over 200 publications and supervised over 100 PhD, MD, MSc in other public health, medicine, allied health sciences and other research**.**

Research Student	:	Dr M.N. Priyadarshanie
University	:	University of Sri Jayewardenepura

Awards
for
Supervision of MPhil degrees

Thesis Title : ZbS/CdS/CdTe solar cells using close space sublimated CdTe layers deposited on electrodeposited CdS/ZnS layers

Outcome/s of the Project

This is the first report of a research in Sri Lanka in the field of ZnS/CdS/CdTe solar cells using close space sublimated CdTe layers deposited on electrodeposited CdS/ZnS layers. The conversion efficiency of glass/FTO/ZnS/CdS/CdTe/Cu/Au solar cell was 9.89% while it was 6.51% for glass/FTO/CdS/CdTe/Cu/Au solar cell. Here we reduced the normal CdS layer thickness from 100 nm and kept the combined layer thickness of CdS/ZnS to 100 nm by adding ZnS buffer layer on FTO before the deposition of CdS layer. It can be seen that there is a big impact on solar cell performances by adding an extra buffer layer to the standard CdS/CdTe solar cell structure.

Principal Supervisor

Prof. G.D.K. Mahanama, BSc (Ruhuna) received his PhD in Solid State Physics from London South Bank University in London in 2006. He has served in the Department of Physics, University of Ruhuna since 1997. His research interests are in the fields of photovoltaic solar cells and astronomy.

Co - Supervisor

Prof. D.S.M. De Silva, BSc (Kelaniya), earned her PhD in Engineering Materials from the University of Sheffield, UK. She has served in the Department of Chemistry, University of Kelaniya, since 1996. Her current research focuses on the development of photovoltaic materials & devices for solar energy applications, and analysis of microplastics in water and sediments.

Research Student : Ms H.M.L.U. Madhuwanthi

University : University of Kelaniya

Thesis Title : **Development of baseline soil information system for paddy growing soils of Sri Lanka based on soil carbon and other selected soil macro- and micro-nutrients**

Outcome/s of the Project

This study resulted in vital baseline information for regional scale cultivation planning using the digital soil map of soil organic carbon of which reflected the current status of soils in paddy growing areas of the country. A digital soil carbon map has been produced as the main output of the project which shows the distribution of soil carbon content of paddy growing areas of Sri Lanka. In conventional paddy cultivation, inorganic chemical fertilizers are used to maintain the nutrient status of soil. The findings from this study could be used in the site specific fertilizer recommendations in lowland paddy soils in Sri Lanka, which will in turn save the expenditure on unnecessary loadings of fertilizer in paddy cultivation.

Principal Supervisor

Prof. Renuka Ratnayake is an Associate Research Professor at the National Institute of Fundamental Studies, Kandy. Her notable contributions to research have earned her numerous honours, including the SUSRED award, which she has now won four times, demonstrating her ability to mentor and guide postgraduate students.

Co - Supervisor

Prof. S.K. Gunatilake, Professor in Environmental Sciences, Sabaragamuwa University of Sri Lanka. Research interests are environmental geochemistry, remote sensing and GIS. Publications: 24 research papers in indexed journals, 6 text books. Google citations: 1426, H-Index 13, top 10 researcher in the University.

Research Student : Ms T.M. Paranavithana

University : University of Peradeniya

Thesis Title : Fabrication and analysis of super capacitors with low cost composite hybrid electrodes to meet the future energy challenge

Outcome/s of the Project

Objectives of the study was to develop composite electrodes with conducting polymers and exfoliated natural graphite (EG), fabricate super capacitors (SCs) with composite electrodes and gel polymer electrolytes and optimize the performance of SCs. Composite electrodes were prepared with Polypyrrole (PPy): EG and Polyaniline (PANI) : EG. Highest operating potential window was with PPy:EG based SC. With 1.0 µm PPy: EG electrodes, the optimum specific discharge capacitance was obtained, whereas for PANI: EG electrodes, the thickness was 0.75 µm. Composite electrodes showed better results than the non-composite version.

Principal Supervisor

Senior Prof. K.P. Vidanapathirana (BSc (Hons), PhD in Physics) is attached to Department of Electronics, Wayamba University of Sri Lanka. His research expertise is mainly on the domain of conducting polymers and their applications in energy storage devices. He is a Fellow of IOP, UK and IPSL, SL.

Co - Supervisor

Senior Prof. G.A.K.S. Perera (BSc (Hons), MSc, PhD in Physics) is attached to Department of Electronics, Wayamba University of Sri Lanka. Her research expertise is on the realm of polymer electrolytes and diverse applications in energy storage devices. She holds Fellowships of IOP, UK and IPSL, SL.

Research Student : Ms D.S.K. Rajaguru

University : Wayamba University of Sri Lanka

Thesis Title : Fabrication and characterization of energy storage devices using ionic liquid based gel polymer electrolytes

Outcome/s of the Project

The present study was based on preparing and optimizing gel polymer electrolytes (GPEs) with poly (vinylidenefluoride-co-hexafloropropylene) : zinc chloride($ZnCl_2$) : 1-ethyl-3-methylimidazolium chloride and poly (vinylidenefluoride-co-hexafloropropylene) : zinc trifluoromethanesulfinate ($Zn(CF_3SO_3)_2$) : 1-butyl-3-methylimidazolium bis (trifluoromethylsulfonyl) imide and testing their candidacy in Zn cells and super capacitors. The cell with 1-ethyl-3-methylimidazolium chloride exhibited an open circuit voltage higher than 1 V. Identical single electrode specific capacitances were with the super capacitors having natural graphite electrodes and two GPEs. Super capacitors with polypyrrole electrodes showed higher capacitance than with natural graphite.

Principal Supervisor

Senior Prof. G.A.K.S. Perera (BSc (Hons), MSc, PhD in Physics) is attached to Department of Electronics, Wayamba University of Sri Lanka. Her research expertise is on the realm of polymer electrolytes and diverse applications in energy storage devices. She holds Fellowships of IOP, UK and IPSL, SL.

Co - Supervisor

Senior Prof. K.P. Vidanapathirana (BSc (Hons), PhD in Physics) is attached to Department of Electronics, Wayamba University of Sri Lanka. His research expertise is mainly on the domain of conducting polymers and their applications in energy storage devices. He is a Fellow of IOP, UK and IPSL, SL.

Research Student : Mr R.M.L.L. Rathnayake

University : Wayamba University of Sri Lanka

Thesis Title : Investigating geochemical factors contribute to the prevalence of chronic kidney disease of uncertain etiology (CKDu) in the Uva province, Sri Lanka

Outcome/s of the Project

Groundwater quality has a significant effect on CKDu, F^- and PO_4^{3-} are the geochemical risk factors associated with CKDu. High concentrations of F^-, Ca^{2+} and PO_4^{3-} are conducive for the formation of $Ca_3(PO_4)_2$ in the form of apatite as bio minerals in the renal tubules that lead to CKDu. 15% of the total land is eroded (25.62 t/ha/y) due to improper land use practices. Groundwater is controlled by rock weathering and silicate weathering is the key geochemical processes controlling major ions of the groundwater in Uva Province.

Principal Supervisor

Prof. S.K. Gunatilake, Professor in Environmental Sciences, Sabaragamuwa University of Sri Lanka. Research interests are environmental geochemistry, remote sensing & GIS, Publications: 23 articles in indexed journals, 6 text books. Google citations: 1426, H-Index-13, top 10 researcher in the University.

Co - Supervisor I

Prof. E.P.N. Udayakumara, Professor in Soil Science and Natural Resources Management, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka. Research interests are soil science & hydrology, soil erosion & conservation, environmental economics, forestry and environmental impact assessment (EIA).

Co - Supervisor II

Dr L.V. Ranaweera, Senior Lecturer in Geology, Sabaragamuwa University of Sri Lanka. Research interests are deformation of high-grade rocks, natural hazards, disaster management, mineralization In lower crustal rocks, geology of Sri Lanka. Publications: 10 research articles in indexed journals. Google Scholar citations: 118. H-Index: 5.

Research Student	:	Mr I.D.U.H. Piyathilake
University	:	Sabaragamuwa University of Sri Lanka

Thesis Title : **Diversity and distribution of thermophilic bacteria and archaea in hot springs of Sri Lanka: culture-dependent and culture-independent approach**

Outcome/s of the Project

The study provides evidence of high thermophilic bacterial diversity in Sri Lankan hot springs. As such, it is of interest to assess thermophilic bacteria as potential candidates for producing thermostable enzymes that can be exploited in industries such as food, paper, and bioremediation.

Principal Supervisor

Prof. Dhammika Magana-Arachchi is a Molecular Microbiologist, an Associate Research Professor at National Institute of Fundamental Studies (NIFS), Kandy. She received her BSc from University of Colombo, and PhD from Faculty of Medicine, University of Colombo. She is a recipient of Paul Ehrlich Foundation Fellowship, Presidential Awards, WPSC Young Investigators Award, etc.

Co - Supervisor

Dr R.P. Wanigatunge is a Senior Lecturer in the Department of Plant and Molecular Biology, University of Kelaniya. She obtained her PhD from the University of Colombo and her BSc (Special) Degree in Botany from the University of Ruhuna. Her research interests include systematics of cyanobacteria and algae, cyanotoxins, extremophilic microbes, and applied phycology.

Research Student : Ms D.G.S.N. Samarasinghe

University : University of Kelaniya

Thesis Title : Biopolymers/ biosurfactants-based micro-/ nano-vehicles for safe delivery of food bioactives and nutraceuticals

Outcome/s of the Project

The efficacy of chickpea protein in delivering nutrients/ bioactive agents, such as folic acid, curcumin, and hydroxycitric acid, compared to ubiquitously used alginate and soy protein matrices was established via this project. The information derived from this project may be used as a platform in further studies aiming for efficacious oral delivery of nutrients.

Principal Supervisor

Emeritus Professor D. Nedra Karunaratne (BSc Chem. Sp. UoC, PhD UBC Canada) supervised and graduated 6 PhD and 9 MPhil students during her research career at the University of Peradeniya and previously received SUSRED awards in 2013 and 2016. She pioneered in the area of drug delivery and natural product delivery.

Co - Supervisor

Dr K.M.G.K. Pamunuwa (BSc Chem. Sp. UoP, MA WSU USA, PhD UoP) is a Senior Lecturer at the Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka. Her research interests include microencapsulation, nutrient delivery, functional food, and food packaging for which she has contributed significantly through numerous publications.

Research Student : Ms F. Shakoor

University : University of Peradeniya

Thesis Title : **Environmental effect on different tissue parts at different maturity stages in biosynthetic gene expression and biochemical composition of *Cinnamomum zeylanicum* Blume**

Outcome/s of the Project

This is the first study to assess the metabolomics and transcriptomics of cinnamon bark and leaf together from different environments in Sri Lanka at different maturity stages as a foundation for the cinnamon-based nutraceutical industry. To assess the effect of environmental factors, variety *Sri gamunu* leaf and bark samples at harvestable stage were collected from three different agroecological regions. To assess the effect of maturity, three bark stages and two leaf stages were studied. Overall, Sri Lanka has a potential to commercialize the variety *Sri gamunu* in the tested agroecological regions with no considerable effect of the environment and mix harvest at different growth stages without losing overall quality.

Principal Supervisor

Prof. Pradeepa Bandaranayake obtained her PhD from UC Davis with specialization in Molecular Biology, Biochemistry and Genomics with Designated Emphasis in Biotechnology. In addition, she holds two MSc Degrees, an MPhil Degree, LLM and a BSc. She serves as the Director of the Agricultural Biotechnology Centre. She has co-authored over 40 SCI journal publications, and many other scientific publications.

Co - Supervisor

Prof. D.K.N.G. Pushpakumara boasts qualifications including a BSc (Peradeniya), MSc and PhD (Oxford). He has more than 30-years of experience in academia and research within agriculture. Presently, he is the Director at PGIA, specializing in research areas of tree diversity and improvement, agroforestry, climate change, and biodiversity, authoring over 100 publications.

Research Student : Ms N.M.N. Liyanage

University : University of Peradeniya

Thesis Title : Bacteriophage-mediated biocontrol of soft rot in carrots (*Daucus carota*) caused by *Pectobacterium* spp. in Sri Lanka

Outcome/s of the Project

Bacterial soft rot disease of carrots is a serious economic problem all over the world that is mainly brought on by *Pectobacterium* species. This study aimed to develop a bacteriophage-mediated biocontrolling method to control bacterial soft rot disease in carrots. In this study, seven *Pectobacterium* strains were isolated and identified. Thirteen bacteriophages of *Pectobacterium* spp. were isolated from diseased carrots and carrot field soil and their host range analysis was done to identify the phages with a broad host range. Based on the results, two phages were selected for further analysis. The whole genome characterization revealed that they are non-lysogenic and non-transducing phages that are safe to be utilized in biocontrol treatments and to develop phage cocktail. The efficiency of these bacteriophages in biocontrolling applications was determined using carrot disk assay and carrot tuber assays. Phage cocktail treatment was shown to be highly successful in minimizing the visible soft rot symptoms. Therefore, the findings of this study clearly imply that bacteriophage-mediated biocontrol can lessen the soft rot disease development in carrots and thereby reduce the economic loss caused by soft rot disease in carrot production.

Principal Supervisor

Dr A.P. Halmillawewa is a Senior Lecturer attached to the Department of Microbiology, University of Kelaniya. She obtained her PhD in Molecular Microbiology from University of Calgary, Canada. Her research interests include studying bioactive microbial pigments, the use of biological control agents in agriculture, and studying the mobility of antibiotic resistant genes within bacterial communities.

Research Student : Ms N.K.N. Naligama

University : University of Kelaniya

Thesis Title : Ligninase production and low-density polyethylene degradation ability of wood-decaying fungi and the genome analysis of *Phlebiopsis flavidoalba*

Outcome/s of the Project

Most of the hard wood species in dry zone in Sri Lanka are relatively decay resistant. However, some fungal species could decay these hard woods including lignin. Lignin being one of the hardest natural polymers, it was hypothesized that these fungi are equipped with strong enzymes and should be able to decay other polymers as well. Several fungal isolates were assessed for degradation in the laboratory. *Phlebiopsis falvidoalba* had the highest potential in deteriorating Low density polyethylene (LDPE) in laboratory conditions. It was evident that it can mineralize the LDPE into CO_2. Interestingly, LDPE degradation capability was high in the absence of wood in the media emphasizing the ability of wood-decaying fungi to utilize LDPE as the sole carbon source when there is no desirable C source available in the media. The draft genome size of the most effective LDPE degrader was 37,963,603 bp and the presence of binding sites for octadecane molecules in the LiP enzyme was detected in molecular docking analysis. These findings will be useful in mitigating polyethylene accumulation in future.

Principal Supervisor

Prof. R.N. Attanayake obtained her MSc and PhD in plant pathology and population genetics and is currently serving as a Professor in the Department of Plant and Molecular Biology, University of Kelaniya. She is a recipient of 2023 OWSD-Elsevier Foundation Award for Women Scientists. Her research interests are in plant disease diagnosis, fungal population genetics, fungicide resistance, fungal mediated bio degradation.

Co - Supervisor I

Dr Harshini Herath is a Senior Lecturer in the Department of Plant and Molecular Biology, University of Kelaniya. She earned PhD in Plant Biotechnology at the State Agricultural Biotechnology Center (SABC), Murdoch University, Western Australia, with the sponsorship of Endeavour Postgraduate Awards, Australia.

Co - Supervisor II

Dr Priyanga Wijesinghe obtained his BSc honors degree in Botany and PhD in Molecular Biology and Biochemistry. He serves as a Senior Lecturer at the Department of Botany and the Chair of the Board of Study in Biomedical Sciences at the University of Peradeniya. His research interests include plant biochemistry and microbial genomics.

Research Student	:	Ms P. Perera
University	:	University of Kelaniya

Thesis Title : Bioprospecting of secondary metabolites of endolichenic fungi isolated from mangrove-associated lichens in Negombo lagoon

Outcome/s of the Project

Endolichenic fungi (ELF) is a promising source for providing novel bio-active compounds. In the present study, 65 ELF strains, isolated from 31 lichens were collected from mangrove and mangrove associated plants of Negombo lagoon, Sri Lanka. This attributes to the significant diversity of lichens and ELF present in this unique niche, highlighting the importance of its conservation. It was identified that some of these fungi are rich in antioxidant, anti-inflammatory, tyrosinase inhibitory, and anti-bacterial potency when ethyl acetate extracts were utilized.

Principal Supervisor

Prof. P.A. Paranagama is the Chair of Chemistry, University of Kelaniya, Chairperson of the Early Career Network Committee of Commonwealth Chemistry, Past President of the Institute of Chemistry Ceylon. Obtained PhD degree from University of Glasgow, UK. Produced over 25 MPhil / PhD students, Published over 70 publications in peer review journals and recipient of Dr C L De Silva Gold medal for outstanding research in Chemical Sciences.

Co - Supervisor

Prof. R.N. Attanayake obtained her MSc and PhD in plant pathology and population genetics and is currently serving as a Professor in the Department of Plant and Molecular Biology, University of Kelaniya. She is a recipient of 2023 OWSD-Elsevier Foundation Award for Women Scientists. Her research interests are in plant disease diagnosis, fungal population genetics, fungicide resistance, fungal mediated bio degradation.

Research Student : Ms R. Weerasinghe

University : University of Kelaniya

Thesis Title : **Assessment of metabolic syndrome in early pregnancy and its effect on outcomes of pregnant women in Anuradhapura District of Sri Lanka**

Outcome/s of the Project

This study was the first to provide evidence to the national maternal and child health (MCH) programme on prevalence of first trimester metabolic syndrome among Sri Lankan pregnant women. These women carried a significantly increased risk for large babies and preterm births, which are major public health concerns on child health in Sri Lanka. Furthermore, first trimester hyperglycemia is found as a significant predictor of large babies in Sri Lankan population. This research highlighted the potential feasibility and importance of combining national MCH programme and non-communicable disease prevention programme to ensure better pregnancy outcomes in Sri Lanka.

Co - Supervisor

Dr Kumara Dissanayake, MBBS, MD, MRCOG, FSLCOG, Fellowship in Gynae Laparoscopy (India), Diploma in Gynecological Endoscopy (Germany). Currently he is serving as the Head and Senior Lecturer of the Department of Obstetrics and Gynaecology, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka.

Research Student : Dr H.M.I.U. Jayasinghe

University : Rajarata University of Sri Lanka

Thesis Title : Synthesis of copper doped phosphate functionalized activated carbon nanohybrids and its potential applications in drinking water

Outcome/s of the Project

In recent years, researchers have focused significantly on the development of advanced and functional activated carbon compounds. In this study, phosphate-functionalized activated carbon is generated by treating waste coconut coir dust with phosphoric acid vapor and liquid, followed by pyrolysis in an inert environment. The modified activated carbon matrixes have been employed as sachet filters that may purify water "anywhere, any time" and as substitutes for plastic drinking water bottles. Furthermore, functionalized activated carbon incorporated into the polymer matrix via electrospining and the electrospun membrane have the potential for use in next-generation low-cost portable water filters.

Principal Supervisor

Dr Imalka Munaweera obtained her PhD from University of Texas at Dallas, USA. She is a multi-disciplinary researcher in advanced nano-material development. Currently, she is a Senior Lecturer at Department of Chemistry, University of Sri Jayewardenepura.

Co - Supervisor I

Prof. Nilwala Kottegoda is a multi-disciplinary researcher in advanced nanomaterials development. She obtained her PhD from University of Cambridge, UK.

Co - Supervisor II

Prof. Chandani Perera obtained her PhD from Tokyo Institute of Technology, Japan. She is a multi-disciplinary researcher in advanced nanomaterials development.

Research Student	:	Ms M.L.C. Madhusha
University	:	University of Sri Jayewardenepura

Thesis Title : Role of quarterthiophene and ruthenium-based dyes in enhancing the performance of hybrid titanium dioxide/ polymer solar cells

Outcome/s of the Project

This work focuses on the role of thiophene dyes in enhancing the performance of hybrid TiO_2/polymer solar cells as interface modifiers. Newly synthesized dyes at the University of Edingburgh enhances the efficiency of nearly a factor of four times higher than the control devices. Scientific findings resulting from this research work will further contribute to fundamental knowledge in enhancing the performance of organic and inorganic hybrid solar cells which is good a good model system to study the effects of interface properties and film morphology on the performance of bulk heterojunction solar cells.

Principal Supervisor

Senior Prof. P. Ravirajan supervised 14 MPhils/ PhDs and published over 150 research articles listed in Google Scholar with over 3000 citations. He won three national awards for research: CVCD Excellence Award; SCOPUS/NSF Award for Young Scientists and Presidential Awards for Scientific Publications. He had pursued research work at the Imperial College London under Commonwealth scholarship, fellowship and Royal Society fellowship.

Research Student : Mr A. Pirashanthan

University : University of Jaffna

Thesis Title : **Detoxification and removal of hexavalent chromium [Cr(VI)] in aquatic systems using heterotrophic and phototrophic biofilms**

Outcome/s of the Project

Hexavalent chromium is a prominent aquatic environmental pollutant that may lead to serious health hazards for living beings. Therefore, Cr(VI) contaminated effluents should be remediated before being discharged into the environment. This study was focused on biofilm-based remediation using bacteria and microalgae. Mixed bacterial biofilms and microalgal biofilms were separately applied in the remediation process. They were optimized under different physio-chemical conditions, and the success was determined by analyzing Cr(VI) removal potential under laboratory and pilot-scale implementation following standard analytical techniques.

Principal Supervisor

Prof. (Mrs.) I.V.N. Rathnayake is attached to the Department of Microbiology, University of Kelaniya. She has obtained her PhD (Environmental Remediation and Public Health) from University of South Australia. She is a microbiologist, and her current research interests are environmental remediation and risk assessment, bioavailability of contaminants, ecotoxicology, and microbiology of extreme environments.

Co - Supervisor

Prof. M. P. Deeyamulla is affiliated with the Department of Chemistry at the University of Kelaniya. He earned his PhD in Atmospheric Chemistry from University of Cambridge, UK. With a diverse research background, his interests span biomonitoring of air pollution, precipitation chemistry as an indicator of air quality, bioremediation of environmental pollutants and the investigation of microplastics in the atmosphere.

Research Student : Mr A.M.K.C.B. Aththanayake

University : University of Kelaniya

Thesis Title : **Central venous catheter related bloodstream infections and catheter colonization in intensive care unit patients and characterization of coagulase negative *Staphylococci* as a common cause**

Outcome/s of the Project

CRBSI is a significant nosocomial infection and CVC colonization is common in ICU. CoNS are common organisms giving rise to both CRBSI and CVC colonization and biofilm formation is frequent. CRBSI in cancer patients are mainly caused by Gram negative bacteria, whereas CoNS predominate in non-cancer patients. *Staphylococcus haemolyticus* is the most common species found among CoNS. Prevalence of mecA and qacA/B genes is considerably high among CoNS indicating a tendency for resistance to multiple antibiotics and antiseptics. This warrants immediate attention to curtail spread of highly resistant nosocomial pathogens.

Principal Supervisor

Dr D.M.B.T. Dissanayake is a Senior Lecturer in the Department of Microbiology, Faculty of Medical Sciences, University of Sri Jayewardenepura and is a trainer and examiner for Post Graduate Diploma and MD in Medical Microbiology. Her research interests include antimicrobial resistance, multi-drug resistant organisms and pneumococcal infections.

Co - Supervisor

Prof. Jananie Kottahachchi a Professor in the Department of Microbiology, Faculty of Medical Sciences is a trainer and examiner for Post Graduate Diploma and MD in Medical Microbiology. Her research interest ranges from Group B *Streptococcus*, leprosy biosafety, antibiotic resistance and research related to infection control and prevention.

Research Student : Ms L.S.D. Medis

University : University of Sri Jayewardenepura

Thesis Title : **Storage of solar energy by heterostructured carbon/ silver-metal oxides/ tin sulphide photocapacitors**

Outcome/s of the Project

In this work, photocapacitive devices based on the heterostructured carbon-based silver-metal oxide/SnS working electrode system, which allows direct conversion and storage of solar energy, was developed. Silver-metal oxide provides the photoactive core of the device, while SnOx nanoparticles (formed by the controlled oxidation of SnS nanoparticles) deliver a capacitive platform by redox reaction. The synergistic coupling of these two systems leads to high capacitance under solar illumination, which can be subsequently utilized based on the requirements. The developed photocapacitors would be a promising research avenue in the development of novel solar energy conversion and storage strategies.

Principal Supervisor

Prof. Meena Senthilnanthanan, attached to the University of Jaffna, has received a number of research grants worth of more than Rs.10M from national and international agencies and pursued research at Universities of Leeds and Oxford, UK and University of Technology, Sydney, Australia under scholarships and fellowships. She has supervised research work of 12 Masters/PhD candidates and possesses over 60 scholarly publications.

Co - Supervisor

Senior Prof. P. Ravirajan supervised 14 MPhils/PhDs and published over 150 research articles listed in GoogleScholar with over 3000 citations. He received research grants worth of several hundred million rupees for collaborative work with reputed universities around the globe. He had pursued research work at the Imperial College London under Commonwealth scholarship, fellowship and Royal Society fellowship.

Research Student : Ms K. Thirunavukarasu

University : University of Jaffna

Thesis Title : Enhancing the performance of dye-sensitized solar cells through doping / co-doping TiO_2 electrodes

Outcome/s of the Project

This study focuses on enhancing the performance of dye-sensitized solar cells (DSSCs) by doping/co-doping P25- TiO_2 with Ru, Ni, N and Ni/N elements. The optimized cells with Ru-doped, Ni-doped, N-doped and Ni/N co-doped TiO_2 electrodes exhibited PCE with 20, 20, 20, and 35% enhancement, respectively compared to the control device. Scientific findings resulting from this research work will further contribute to fundamental knowledge in enhancing the performance of DSSCs which are the most promising solar cells and alternative to the conventional silicon solar cells due to low cost, facile fabrication, ability to work under low-light conditions and eco-friendly nature.

Principal Supervisor

Prof. Meena Senthilnanthanan, attached to the University of Jaffna, has received a number of research grants worth of more than Rs.10M from national and international agencies and pursued research at Universities of Leeds and Oxford, UK and University of Technology, Sydney, Australia under scholarships and fellowships. She has supervised research work of 12 Masters/PhD candidates and possesses over 60 scholarly publications.

Co - Supervisor

Senior Prof. P. Ravirajan supervised 14 awarded MPhils/PhDs and published over 150 research articles listed in GoogleScholar with over 3000 citations. He received research grants worth of several hundred million rupees for collaborative work with reputed universities around the globe. He had pursued research work at the Imperial College London under Commonwealth scholarship, fellowship and Royal Society fellowship.

Research Student : Mr T. Rajaramanan

University : University of Jaffna

Thesis Title : Improving the stability of XLAsp-P2 through nano-conjugation

Outcome/s of the Project

The main objective of this study was to develop and characterize an *in vitro* sustained release formulation for peptide-based drugs using nanomaterials. The study focused on two different strategies to optimize a nanocarrier for a peptide and a known antibacterial drug. In this study, XLasp-P2, a naturally derived 6-mer peptide with DEDLDE sequence, was synthesized by the Solid Phase Peptide Synthesis (SPPS) method and characterized using nuclear magnetic resonance spectroscopy (NMR) and mass spectrometry (MS). The synthesized peptide and its graphene oxide (GO) incorporated nanocomposites were screened for *in vitro* cytotoxicity against muscle rhabdomyosarcoma (RD) and kidney normal (Vero) cell lines. With this project, a state of the art peptide synthesis lab was established at SLINTEC.

Principal Supervisor

Dr Laksiri Weerasinghe is currently a Senior Lecturer, Department of Chemistry, University of Sri Jayewardene-pura. He obtained his BSc (Hons) degree in Chemistry from University of Colombo, doctoral degree from Washington State University, USA and postdoctoral studies at University of Montreal, Canada. After returning to Sri Lanka, he worked as a Senior Research Scientist in Sri Lanka Institute of Nanotechnology (SLINTEC) from 2015-2020.

Co - Supervisor I

Prof. Inoka Perera is currently a Professor, Department of Zoology and Environmental Science, University of Colombo. Prof. Perara is a trained molecular biologist and a biochemist who obtained his BSc Honors degree in Zoology from University of Colombo and his doctoral degree from Louisiana State University, USA.

Co - Supervisor II

Dr Nuwanthi Katuwavila is a Senior Lecturer/ Dean, Faculty of Science, NSBM Green University. She is a BSc Chemistry special graduate from University of Peradeniya and obtained her PhD in the field of nanobiotechnology from University of Peradeniya with the collaboration of Sri Lanka Institute of Nanotechnology, Homagama. Her research focus is mainly in the fields of nanomedicine and pharmaceutical chemistry.

Co - Supervisor III

Dr Ranga Jayakody is a Senior Lecturer in the Department of Chemistry, University of Sri Jayewardenepura. He obtained his BSc Hons degree from Carlton University, Canada. Then he earned his MSc and PhD from University of Cape Town.

Research Student	:	Ms B.M.Y.D.E. Amarasekera
University	:	SLINTEC Academy

Thesis Title : Next generation plant nutrient delivery system based on modified hydroxyapatite nanoparticles

Outcome/s of the Project

Deficiency in both macro and micro plant nutrients during the early phases of plant growth stunts plant development, resulting in decreased agricultural yields. This nano-seed coating led to improved germination, plant development, and crop yield on *Zea mays* seeds. Its suitability as a promising contestant for nitrogen, phosphorus, and zinc delivery at the seedling stage is claimed. As a macro-micro plant nutrient delivery agent, the created nano-seed coating is futuristic, and it leads to a new arena to investigate the usefulness of metal-doped hydroxyapatite nanoparticles in agriculture.

Principal Supervisor

Prof. Nilwala Kottegoda is a Professor in Chemistry and she has 15+ years' experience teaching in materials science and technology, nanotechnology, physical chemistry and polymer chemistry. She obtained her BSc from University of Peradeniya, specialized in Chemistry. Then she completed her PhD in Material Chemistry from University of Cambridge, UK.

Co - Supervisor I

Prof. Veranja Karunaratne is a Senior Professor in Chemistry and currently serving as the Vice Chancellor, SLTC Campus. Prof. Karunaratne obtained his BSc from University of Colombo specialized in Chemistry. He completed his PhD in Synthetic Organic Chemistry from University of British Columbia, Canada.

Co - Supervisor II

Dr J.A. Surani Chathurika is a Senior Lecturer attached to the Department of Urban Bioresources, University of Sri Jayewardenepura. She obtained her undergraduate degree in Agricultural Technology and Management from University of Peradeniya. She completed her PhD from University of Peradeniya in collaboration with University of Winnipeg, Canada.

Research Student : Ms W.A.D.L.S. Abeywardana

University : SLINTEC Academy

Thesis Title : Characterization of proteins from selected seaweeds in Sri Lanka and application as protein alternatives in bakery foods

Outcome/s of the Project

Macro algae or seaweeds can be identified as an emerging protein source due to various reasons. This study was based on the protein quantification and characterization of different seaweeds found in Sri Lanka and their applications in food industry. Thirteen different seaweeds were harvested from different geographical locations. Among them, *Ulva fasciata* and *Gracilaria verrucosa* were identified as most suitable seaweeds for food applications due to their favourable odour and colour compared to the others. Functional properties of dried seaweed powders and protein extracts were evaluated as a preliminary step in bakery productions to improve their quality. This study will provide a good step in establishing seaweed-based food industry in Sri Lanka.

Principal Supervisor

Dr Isuru Wijesekara is from University of Sri Jayewardenepura and works on seaweed-based functional food ingredients and development of value-added food products from underutilized bio-resources. His current h-index is 21 and has authored 30 indexed journal publications with 3500 citations according to the SCOPUS.

Co - Supervisor

Dr Madhura Jayasinghe is from University of Sri Jayewardenepura who currently conducts research and lectures in Food Science, Human Nutrition & Dietetics. He has been keenly experimenting local plant ingredients in controlling diabetes. New knowledge of his scientific inventions are available in numerous indexed journals, patents and books worldwide.

Research Student : Ms R.M.J.N. Samarathunga

University : University of Sri Jayewardenepura

Thesis Title : Development of coir fiber based insulative composite material to reduce thermal heat in buildings

Outcome/s of the Project

Energy consumption is a critical factor in building design. Sustainable insulation materials for the roof are primarily fabricated using lignocellulose fiber (natural plant fibers). However, these materials are formulated as composites and not as fibres alone. Thus, the thermal properties of these composites depend on the volume fraction of each phase. In this study, coir fibers based latex insulation layer to minimize the heating of building through the roof was introduced. The effective thermal conductivity (K_{eff}) of the composite was analysed through analytical and numerical models and validated through the experimental results. The results concluded that the experimental results agreed with the numerical and analytical results. Furthermore, a novel mathematical model has been proposed to find the K_{eff} of the three-phase composite using the analytical and numerical methods.

Principal Supervisor

Prof. G. Asha Sewvandi is a Professor at University of Moratuwa. She completed her BSc Eng and MEng degrees from University of Moratuwa, and earned her PhD from Kagawa University, Japan. Her research focuses on the synthesis, characterizations, and simulations of materials. Currently supervising many undergraduate and postgraduate projects.

Co - Supervisor

Dr L.K.T. Srimal is a Senior Lecturer (G-I) at the University of Ruhuna. He completed his BSc Eng and MEng degrees from University of Moratuwa, and earned his DEng degree in optical sensing. Currently supervising many undergraduate and postgraduate industry-based projects.

Research Student : Mr L.G. Chamath

University : University of Moratuwa