



NATIONAL  
SCIENCE  
FOUNDATION

# NSF Awards 2018

**National Science Foundation**

18<sup>th</sup> December 2019



**NATIONAL SCIENCE FOUNDATION**

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**MESSAGE FROM THE CHAIRMAN**

I am pleased to send this message for the NSF Awards 2018 – Awards which recognize the outstanding contributions made by Sri Lankan researchers towards the advancement of knowledge, societal development, and fostering innovation.

Research & Innovation are key determinants for Sri Lanka to become a knowledge-based and technology focused economy. There are two factors, which are key to fostering a vibrant Research & Innovation eco system - funding and manpower. Unfortunately, Sri Lanka is far behind the global norms in respect of both funding and manpower. Our investment on R&D (GERD) is 0.11% of the GDP while the number of R&D personnel stands at 234 per million population. This is further compounded by the fact that these R&D personnel spend only 30% of their time in research as against 50-70 % in the developed world. If Sri Lanka is to become a knowledge based economy, it is important not only to increase the number of researchers but it is also equally important to motivate these researchers to spend more of their working hours in research.

The NSF Research Award is a step in this direction. It seeks to motivate scientists to engage in research. It also serves to encourage senior scientists to mentor young researchers in their research studies. The NSF Technology Awards, given under two schemes- “Support for technology development” and “Support for startup businesses based on new technologies”, recognize scientists whose research has made significant impact in societal development and/or fostering innovations in the country. The World Academy of Sciences (TWAS)-NSF Young Scientist Award is offered to a young scientist who has demonstrated a high level of excellence in his/her research.

While congratulating all the winners of 2018 NSF Awards, I am confident that these awards will attract more scientists towards research and help build a vibrant research and innovation culture in the country.

**Dr A M Mubarak**  
Former Chairman (until 04/12/2019)  
National Science Foundation

December 2019

## MESSAGE FROM THE DIRECTOR GENERAL



Awards Ceremony of the National Science Foundation is indeed a happy occasion as we recognize, felicitate and encourage the achievers of Research Awards, SUSRED Awards, Technology Awards and TWAS/ NSF Young Scientist Award for their outstanding performance in their own respective disciplines.

NSF has been in the forefront in assisting the scientific community in many ways towards realizing its vision to be the nation's premier driving force in promoting Science, Technology and Innovation for economic and social prosperity of Sri Lanka. As a key focus, NSF strives to create a conducive research culture in the country while maintaining high standards, building research capacity, enhancing quality and transparency through a variety of programmes and activities as a premier funding organization for science, technology and innovation in Sri Lanka. With increased attention now given for scientific, societal, economic and environmental impacts, a significant improvement of R & D and innovation performance is expected through NSF grants in coming years.

I congratulate all the Awards Winners for their efforts in conducting research of high standard, in supervising young researchers in an exemplary manner and in commercializing developed technologies. These efforts will certainly go a long way in creating a conducive research and innovation eco-system in Sri Lanka. I wish the award winners great success in all your future endeavors.

**Prof. Ananda Jayawardane**  
Director General  
National Science Foundation

December 2019

## INTRODUCTION

The NSF Awards Ceremony is organized annually to confer awards under the following schemes of the NSF:

- NSF Research Awards
- NSF Technology Awards
- TWAS/ NSF Young Scientist Award
- Support Scheme for Supervision of Research Degrees (SUSRED)

### NSF Research Awards

The NSF Research Awards are given annually to researchers who have made outstanding contributions for the advancement of science through NSF funded research projects. This award scheme was initiated in 1984 as Merit Awards. The award is also meant to motivate recipients of competitive research grants to conscientiously maintain high standards of scientific research while at the same time helping them to enhance their own career prospects as recognized scientists. The award winners are selected through a thorough evaluation process where the Final Reports are evaluated by two local reviewers and one foreign reviewer.

### NSF Technology Awards

The NSF Technology Awards are made annually to the grantees for carrying out successful projects under the two Technology grant schemes; “Support for Technology Development” and “Support for Start-Up Businesses based on new Technologies” and completing same with outstanding merit. The objectives of awarding NSF Technology Awards are, to bestow on grantees the recognition they deserve for the contribution made for the enhancement of innovation activities, thereby contributing directly or indirectly to achieve the NSF goals, and to motivate recipients of grants to conscientiously maintain high standards of partnerships with the public and private sectors. This scheme was implemented for the first time in 2014.

### **The World Academy of Sciences (TWAS)/ National Science Foundation (NSF) Young Scientist Award**

The World Academy of Sciences (TWAS) / NSF Young Scientist award is another annual prize for talented young scientists who have attained a high level of excellence in their research work, in the fields of Biology, Chemistry, Mathematics and Physics. Awards are granted by The World Academy of Sciences (TWAS), Trieste, Italy. The prizes are intended to provide incentives to talented young scientists to attain high levels of excellence in their research work and to reward such attainments.

### **Support Scheme for Supervision of Research Degrees (SUSRED)**

The awards for the Support Scheme for Supervision of Research Degrees (SUSRED) was implemented in 2011 to motivate, support and recognize scientists/engineers engaged in supervising postgraduate students conducting research in all areas of Science and Technology. This scheme will also encourage Universities and Research Institutions to promote and facilitate postgraduate research training.





# NSF Research Awards 2017

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**Project Title :** Studies on comparing immunodiagnostic methods and immune status of leptospirosis patients in Colombo and Gampaha Districts

**Grant No :** RG/2011/HS/19

**Outcome/s of the project:**

The project resulted in finding that Microscopic Agglutination Test (MAT) is an imperfect gold standard serological test for early diagnosis of leptospirosis. The Leptocheck-WB test is suitable as a screening test to initiate prompt treatment in resource-limited settings while IgM-ELISA (Virion\Serion) is suitable for early and definitive diagnosis of acute leptospirosis. In assessing disease severity in leptospirosis, some laboratory parameters identified are more useful than clinical parameters. Accordingly, four in-house ELISAs were developed using endemic leptospiral antigens which offered good sensitivity and specificity. These ELISA are less expensive and easy to perform than MAT. Further, 6 indexed journal publications and 18 research communications resulted from this study.



***Principal Investigator***

Prof. Shiroma M Handunnetti graduated from the University of Kelaniya with BSc (Hons) in Zoology. She obtained her PhD in Parasite Immunology from the University of Colombo. At present, she is the Director and Professor in Immunology at the Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB), University of Colombo.



***Co-Investigator I***

Prof. Senaka Rajapakse obtained his MBBS with First Class Honours followed by the MD Medicine from the University of Colombo. He is a Board-Certified Specialist in General Medicine, and a Senior Professor at the Department of Clinical Medicine and the Deputy Director, Post Graduate Institute of Medicine, University of Colombo.



### *Co-Investigator II*

Prof. Sunil Premawansa obtained his first degree, BSc (Hons) in Zoology from the University of Kelaniya and PhD in Immunology of Malaria from the University of Colombo. Currently, he is a Senior Professor in Zoology at the Department of Zoology and Environment Sciences, Faculty of Science, University of Colombo.



### *Co-Investigator III*

Prof. H Janaka de Silva [MD, DPhil (Oxon.), FRCP, FNASSL], is a recipient of the titular national honour for science: Vidyajyothi. He is a Professor of Medicine at the Faculty of Medicine, University of Kelaniya. He is currently the Director of Postgraduate Institute of Medicine, University of Colombo.



### *Research Student*

Dr Roshan Niloofa M J obtained her BSc from the University of Bangalore. She completed her MSc in Cellular and Molecular Immunology and PhD in Molecular Immunology at IBMBB, University of Colombo. At present she is a Lecturer at the Department of Zoology and Environment Sciences, Faculty of Science, University of Colombo.

**Project Title :** Isolation of antimicrobial compounds from endophytic fungi of endemic flora of Sri Lanka

**Grant No :** RG/2012/NRB/01

**Outcome/s of the project:**

Endophytic fungi of Sri Lankan plants are largely unexplored and is a valuable potential source for the discovery of new anti-infective agents that may be developed as clinically useful drugs. In this study, 118 endophytic fungal strains were isolated, inhabiting 6 endemic and 2 native plants of Sri Lanka. Sixty four fungal extracts showed antimicrobial activity against pathogenic bacteria. Further, 18 antibiotics were isolated, whereas in 16 of them the active compounds are already known while 02 are new compounds. In addition, a local patent was received and also succeeded in publishing 02 indexed scholarly articles and 08 communications.



***Principal Investigator***

Prof. E Dilip de Silva is a Fellow of the National Academy of Sciences, Sri Lanka and retired from the University of Colombo in 2016, where he served as a Senior Professor and Chair of Organic Chemistry. He has also served as a Visiting Professor, University of British Columbia, Canada and has over 200 scientific publications and eight international/national patents to his credit.



***Co-Investigator I***

Dr CD Wijayarathna graduated from the University of Colombo with a BSc (Hons) in Chemistry followed by MSc and Dr Eng degree in Biotechnology from the Tokyo Institute of Technology (TIT), Japan. She served as a Postdoctoral Fellow at the Department of Bioengineering, TIT, Japan and joined the Department of Chemistry, University of Colombo, where she is currently serving as a Senior Lecturer.



### *Co-Investigator II*

Prof. R L C Wijesundera has 40 years of dedicated research in Mycology and Plant Pathology. He obtained his PhD from the University of Bristol, UK and is a Fellow of the National Academy of Sciences, Sri Lanka. He retired from the University of Colombo in 2019 where he served as a Senior Professor of Plant Pathology at the Department of Plant Sciences.



### *Research Student I*

Dr Ranga Dissanayake received BSc (Pharmacy) and PhD (Chemistry) degrees from the University of Colombo. After completing his PhD, he worked as a Postdoctoral Fellow and Research Fellow at the Sri Lanka Institute of Nanotechnology (SLINTEC) for three years. Currently he is attached to the Department of Pharmacy & Pharmaceutical Sciences, University of Sri Jayewardenepura as a Senior Lecturer.



### *Research Student II*

Mr Asiri Anuradha Senevirathna obtained his BSc and MPhil degrees from the University of Colombo. At present, he is continuing research in “carbohydrate chemistry and novel methods in organic synthesis” leading to a doctoral degree at the Department of Chemistry and Department of Pharmaceutical and Biomedical Sciences, University of Georgia, Athens, USA.

# Certificates of Commendation 2017

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**Project Title :** Growth responses of *Ophiopogon japonicus* (Silver dragon or Mondo grass) for differential potting media, plant growth hormones and fertilizer treatments

**Grant No :** RG/2012/AG/03

### **Outcome/s of the project:**

Floriculture industry generates foreign revenue to Sri Lanka. *Ophiopogon japonicus* is an ornamental foliage plant, which has a high demand in the local as well as in the international export market. High quality leaves and plants of *O. japonicus* will be more popular in the floriculture industry. A major limiting factor for its commercial value is the leaf length. This study generated important data on differential growth responses of *O. japonicus* towards different potting media, fertilizer treatments, plant growth regulators and irradiance levels. The outcome of this study contributed in improving the quality of this foliage plant in the long-run.



### ***Principal Investigator***

Dr J W Damunupola is a Senior Lecturer attached to the Department of Botany, Faculty of Science, University of Peradeniya. She obtained her PhD from the University of Queensland, Australia and was a recipient of the Australian Endeavour Research Fellowship. Her research interests are postharvest pathology & physiology, phytochemistry and floriculture.



### ***Co-Investigator I***

Prof. W A M Daundasekera obtained her PhD from the Cranfield University, UK and currently serves as a Professor attached to the Department of Botany, Faculty of Science, University of Peradeniya. Her research interests are postharvest technology/pathology of horticultural crops and defense mechanisms in plants against pathogens.



### *Co-Investigator II*

Dr Shelomi A Krishnarajah is the Director General, Department of National Botanic Gardens, Peradeniya. During her 30 years carrier at the Botanic Gardens she served as a Research Officer, Deputy Director (Floriculture Research) and Director (Research and Technology Transfer). Her area of specialization is Floriculture with over 75 research publications.



### *Co-Investigator III*

Prof. D S A Wijesundara [BSc (Peradeniya), PhD (CUNY)], is attached to the National Institute of Fundamental Studies, as a Research Professor. He was the former Director General of the Department of National Botanic Gardens and was elected as a Fellow of the National Academy of Sciences, Sri Lanka in 2006.



### *Research Student*

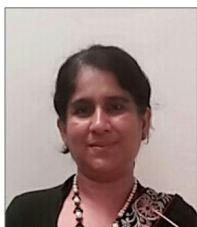
Ms S M K H Wijayabandara is currently a PhD Scholar attached to the School of Agriculture and Food Science, University of Queensland, Australia. She received her BSc degree in Botany and MPhil degree in Plant Sciences from the University of Peradeniya.

**Project Title :** Molecular mapping for improved salinity tolerance in rice

**Grant No :** RG/2011/BT/02

### **Outcome/s of the project:**

The research project developed a Recombinant Inbred Line (RIL) mapping population from At 354 x Bg 352 cross and identified six QTLs (Quantitative Trait Loci) for salinity tolerance and is the first reported mapping population developed from a native cross in the country. The research produced promising salt tolerant rice lines which have the potential to be used as intermediate salt tolerant parents. The research opened the avenue for a collaboration with International Rice Research Institute, Philippines. Findings were disseminated via 5 journal publications, 10 conference proceedings and a workshop.



### ***Principal Investigator***

Prof. N S Kottarachchi currently serves as a Professor in Biotechnology, Wayamba University of Sri Lanka. She obtained BSc (Agriculture) from the University of Peradeniya, MSc (Genetic Engineering) from Thailand and PhD (Bioresources) from Japan.



### ***Co-Investigator***

Dr W L G Samarasinghe is the Head/Additional Director, Plant Genetic Resources Center (PGRC) and has 30 years of experience in PGR conservation and management, biodiversity for food and nutrition, molecular and morphological characterization and molecular marker assisted breeding. He obtained his PhD in Biotechnology, PGIA, University of Peradeniya.



### ***Research Student***

Ms Buddhika A Dahanayaka obtained the BSc degree from Mount Carmel College, Bangalore, India. She completed her MPhil at Wayamba University of Sri Lanka in Molecular Plant Breeding. Currently, she is a PhD Scholar at the University of Southern Queensland, Australia.

**Project Title :** Characterization of mutations and sequence variants of Growth Hormone (GH) and Growth Hormone Releasing Hormone Receptor (GHRH-R) in a cohort of Sri Lankan children with GH deficiency

**Grant No :** RG/2011/BT/03

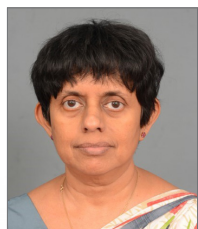
**Outcome/s of the project:**

This project enabled establishment of the genetic mutation spectrum in patients with Growth Hormone Deficiency (GHD) which is a condition that leads to short stature, for the first time in Sri Lanka. Protocols for genetic testing of GHD patients and for characterization of large gene deletions were developed. The project enabled higher level of capacity building and the research student presented her findings in two International conferences. In addition, three indexed international scholarly articles resulted from this study.



***Principal Investigator***

Prof. Kamani H Tennekoon currently serves as a Senior Professor in Molecular Life Sciences at the Institute of Biochemistry, Molecular Biology & Biotechnology (IBMBB), University of Colombo. Her research interests include reproduction and development, cancer, human DNA variation and medicinal plants. She was a former Professor of Physiology at the Faculty of Medicine, University of Colombo.



***Co-Investigator***

Dr Shamy de Silva is a Professor in Paediatrics at the Faculty of Medicine, University of Colombo. She is an Honorary Consultant Paediatrician in the Professorial Paediatric Unit of the Lady Ridgeway Hospital. Her research interests are mainly in paediatric endocrinology with many research publications in local and international journals.



### *Research Student*

**Dr Tharmini Sundralingam** completed her MSc in Molecular Life Sciences and PhD in Molecular Genetics at the Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB), University of Colombo. She has four journal publications, twelve communications and two awards for oral presentations.





# NSF Research Awards 2018

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**Project Title :** Synthesis and characterization of thin films based on Group II and VI elemental compounds for fabricating solar cells

**Grant No :** RG/2012/BS/03

### **Outcome/s of the project:**

This project investigated the use of II-VI elemental compounds for fabrication of thin film solar cells. The research generated a vast amount of new knowledge and understanding of the CdS window and CdTe absorber layer formation of CdS/CdTe thin film solar cells. The project enabled publication of about a dozen indexed peer reviewed international scholarly articles and several workshops that created public awareness on solar energy. A new laboratory dedicated for advanced materials research was also established at the University of Peradeniya as an outcome of this study.



### ***Principal Investigator***

Dr B S Dassanayake received his PhD from Western Michigan University, USA. He is currently attached to the Department of Physics, University of Peradeniya and also serves as a Deputy Project Director to the Solar Edu-Training Project under the Ministry of Science, Technology and Research.



### ***Co-Investigator I***

Dr C P Jayalath is attached to the Department of Physics, University of Peradeniya. He completed his PhD from Hampton University, USA in the field of Theoretical Particle Physics. His research is mainly focused on theory and phenomenology of elementary particles, nuclear activation analysis, radiation detection and shielding.



### ***Co-Investigator II***

Dr V A Seneviratne is attached to the Department of Physics, University of Peradeniya. She completed her PhD in Physics at the University of Oklahoma, Norman, USA in the field of Condensed Matter Physics. Her research is focused on solid polymer electrolytes, gel electrolytes and local structures in amorphous solids.

**Project Title :** Development of a vaccine candidate with a broadly reactive neutralizing immune response against dengue

**Grant No :** RG/2014/BT/03

### **Outcome/s of the project:**

This study resulted in identifying several B-cell epitopes from dengue structural proteins, which have the potential to be developed as universal vaccine candidates, as well as genotype and serotype specific markers for the diagnosis of dengue. The project produced two patents, on dengue-virus-neutralizing peptides as potential vaccine candidates and on dengue-virus-serotype-specific peptides as diagnostic markers. It also resulted in publishing two indexed international scholarly articles and nine local & international communications. Further studies are being carried out on constructing a dengue vaccine with the identified broadly immunogenic neutralizing peptides and developing a rapid dengue diagnostic strip from serotype-specific peptides.



### ***Principal Investigator***

Prof. Charitha L. Goonasekara is a Professor in Biochemistry at the Faculty of Medicine, General Sir John Kotelawala Defence University. She obtained her BSc in Biochemistry and Molecular Biology from the University of Colombo and PhD in Biochemistry from the Memorial University of Newfoundland, Canada. Her current research interests are diagnostics and therapeutics of infectious diseases.



### ***Co-Investigator***

Dr Prasad H. Premaratne is a Senior Lecturer in Parasitology at the Faculty of Medicine, General Sir John Kotelawala Defence University. He obtained his BSc in Zoology and PhD in Immuno and Molecular Epidemiology from the University of Colombo. His current research interests are novel diagnostics and therapeutics of vector borne tropical diseases.



### *Research Student*

Dr Mahesha Nadugala graduated from the University of Peradeniya with BSc (Hons) in Agricultural Biotechnology followed by MSc in Food Engineering and Bioprocess Technology from the Asian Institute of Technology, Thailand. She completed her PhD in Biomedical Sciences at General Sir John Kotelawala Defence University. At present, she is a Senior Scientific Officer at the National Science Foundation.

**Project Title :** Dynamic rating of power distribution lines

**Grant No :** RG/2014/EA&ICT/01

### **Outcome/s of the project:**

With the initiation of the Smart Grid Technology, there has been an interest to utilize dynamic line rating to operate distribution networks optimally while enabling connection of more renewable energy sources. In this research, a system that can determine the dynamic line rating was developed using low cost solutions. The factors that affect the dynamic line rating were evaluated and the conductor temperature was identified as the best parameter to develop a cost-effective sensor that can facilitate the estimation of the line rating dynamically.



### ***Principal Investigator***

Prof. Janaka B Ekanayake is a Professor of Electrical and Electronic Engineering at the University of Peradeniya. He received the BSc Eng degree from the University of Peradeniya and PhD from the University of Manchester Institution of Science & Technology, UK. He has published more than 50 articles in refereed journals and has also co-authored six books.



### ***Co-Investigator***

Dr Janaka V Wijayakulasooriya obtained the BSc Eng degree from the University of Peradeniya and PhD from Northumbria University, UK. He has published more than 10 papers in refereed research journals. Currently he serves at the Department of Electrical and Electronic Engineering, University of Peradeniya as a Senior Lecturer.



### ***Research Student***

Ms Akila Wijethunge received her BSc Eng degree from the University of Peradeniya. Currently she is attached to the Faculty of Technology, University of Sri Jayewardenepura as a Lecturer and is a PhD Scholar at the Faculty of Engineering, University of Peradeniya.

# Certificates of Commendation 2018

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**Project Title :** Development of energy storing devices using conducting polymers

**Grant No :** RG/2014/BS/01

**Outcome/s of the project:**

Rechargeable cells and redox capacitors were fabricated as energy storage devices using conducting polymers Polypyrrole (PPy), Polyaniline (PANI) and Polyethylenedioxythiophene (PEDOT) with a gel polymer electrolyte. Open Circuit Voltages (OCV) of cells with PPy, PANI and PEDOT were 1.0-1.6 V, 1.0-1.3 V and 1.0 V respectively. Devices tested with PANI electrodes had higher results at a particular polymerization current density and a specific aniline concentration. PEDOT electrodes showed better performances when polymerized using lower current densities. Redox capacitors with PPy, PANI and PEDOT films showed the highest specific discharge capacity of 50 Fg<sup>-1</sup>, 393.6 Fg<sup>-1</sup>, 19.3 Fg<sup>-1</sup> respectively.



***Principal Investigator***

Prof. K P Vidanapathirana is a Professor attached to the Department of Electronics, Wayamba University of Sri Lanka. His research experience spans over 20 years in the fields including conducting polymers, energy storage devices with more than 100 research publications in national and international journals and conferences.



***Co-Investigator***

Prof. Kumudu Perera is currently attached to the Department of Electronics, Wayamba University of Sri Lanka as a Professor in Electronics. Her research interests are in the areas of polymer electrolytes, energy storage devices and has published over 100 research articles both in national and international journals and symposia.



***Research Student***

Mr W A D S S Weerasinghe graduated from the Wayamba University of Sri Lanka with BSc joint major degree in Electronics and Computing & Information Systems. He is a PhD Scholar at the Polymer Electronics research group of Wayamba University of Sri Lanka.



**Project Title :** Kinetics and equilibrium aspects of interaction of heavy metal ions and peat in natural and modified forms

**Grant No :** RG/2012/BS/02

### **Outcome/s of the project:**

This research project dealt with the investigation of how heavy metal ions are interacted with peat, a naturally occurring material with no economical value. Chemical modification of natural peat using nontoxic chemicals led to enhanced removal of many heavy metals, demonstrating the superior ability of peat towards heavy metal removal. Optimization of process and experimental parameters for most efficient removal of heavy metal ions, such as Cu(II), Cr(III), Cr(VI) and Ni(II) and the mechanism of interaction were investigated in designing treatment technologies for the removal of heavy metal ions and their compounds from contaminated water, mainly industrial effluents.



### ***Principal Investigator***

Prof. Namal Priyantha completed his PhD in Electrochemistry at the University of Hawaii, USA. His current research interests include designing low-cost methodologies for treatment of industrial effluents and investigation of corrosion inhibition methods for low-grade metals. At present he is serving at the University of Peradeniya as a Senior Professor in Chemistry.



### ***Research Student***

Mr M U S Wickramasooriya graduated from the University of Peradeniya with a BSc in Physical Sciences. He obtained his MPhil on Environmental Analytics Chemistry from the same University. Currently he is serving at the National Gem and Jewelry Authority as a Chemist.

**Project Title :** Cloning and expression of cellulase and xylanase genes of *Trichoderma* in a yeast system to develop synergistic saccharification and direct fermentation of cellulosic biomass to ethanol

**Grant No :** RG/2012/BT/02

### **Outcome/s of the project:**

Cellulase genes;  $\beta$ -glucosidase I (BGLI), endoglucanase I (EGLI) and cellobiohydrolase I (CBHI) and xylanase genes; endoxylanases I (EXNI) and  $\beta$ -xylosidase I (XYLI) of filamentous fungi (*Trichoderma virens* and *Aspergillus niger*) were successfully isolated, cloned and expressed in *Saccharomyces cerevisiae* and *Pichia stipitis* respectively. Co-fermentation studies of all recombinants resulted maximum 14.8 g of ethanol from 100 g of pre-treated straw. The findings of the project have potential applications in both industrial scale ethanol production and cellulase and xylanase enzyme production.



### ***Principal Investigator***

Prof. Sulochana Wijesundera is a Senior Professor at the Department of Biochemistry and Molecular Biology, University of Colombo. She completed her MSc in Bioorganic Chemistry from the University of Bristol, UK and PhD in Molecular Biology from the University of Colombo. Her research interests are fungal & plant genetic engineering and nucleic acid base diagnosis / screening of diseases.



### ***Co-Investigator I***

Dr N V Chandrasekharan has a PhD in Molecular Biology and is currently working as a Senior Lecturer at the Department of Chemistry, University of Colombo. His research interests are in molecular genetics, the development of nucleic acid based diagnostic methods and transgenic technology.



### *Co-Investigator II*

Prof. R L C Wijesundera has 40 years of dedicated research in Mycology and Plant Pathology. He obtained his PhD from the University of Bristol, UK and is a Fellow of the National Academy of Sciences, Sri Lanka. He retired from the University of Colombo in 2019 where he served as a Senior Professor of Plant Pathology at the Department of Plant Sciences.



### *Research Student*

Dr G H I M Wickramasinghe obtained his PhD in Molecular Biology and Biotechnology from the University of Colombo and currently serves as a Visiting Lecturer at the Department of Chemistry, University of Colombo. His research interests are microbial genetics, proteomics and fermentation studies of yeast under the area of bioethanol production.



**Project Title :** Development of DNA based techniques to differentiate *Anopheles culicifacies* species B from species E and *An. subpictus* from *An. sundaicus*

**Grant No :** RG/2011/BT/04

### **Outcome/s of the project:**

The major objective of the project was to develop a DNA based diagnostic technique to differentiate *An. subpictus* from *An. subpictus* B (*An. sundaicus*) and sibling species B from sibling species E of the *Culicifacies* complex. An allele specific PCR- assay has been developed to distinguish sibling species A and sibling species B/*An. sundaicus* in Sri Lanka. The molecular data urge for taxonomic reassessment of the *Subpictus* Complex and other closely related members of the *Sundaicus* Complex. The microsatellite data show that there are two genetically distinct populations in the *An. culicifacies* complex that are not associated with Y-chromosome morphology. All molecular data suggest that species B and E are not reproductively isolated to have fixed molecular variation to call true sibling species.



### ***Principal Investigator***

Prof. S N Surendran is a Professor in Zoology at the Department of Zoology, University of Jaffna. He received his BSc from the University of Jaffna and PhD from the University of Colombo. He has a broad background in zoology, with specific training and expertise in medical and molecular entomology with over 55 research publications in peer-reviewed indexed journals.



### ***Research Student***

Ms Kokila Sivabalakrishnan is a Lecturer at the Department of Zoology, University of Jaffna. She received her BSc and MPhil from the University of Jaffna. Her area of specialization is zoology and medical entomology. She has more than 5 research publications in peer-reviewed indexed journals.

# NSF Technology Awards

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**Project Title :** Enhance English language learning through m- learning in different learning communities

**Grant No :** TG/2013/Tech-D/02

### **Outcome/s of the project:**

Key objective of this project was to design and develop an open learning mobile based English language learning application. Three levels (Preliminary, Intermediary and Advanced) of Mobile4E English language learning applications were developed based on the learner competency. A Mobile4E game application was also developed to identify the possibility of introducing the language learning through game-based learning. These applications were developed based on “English For All” (EFA) curriculum.



### ***Principal Investigator***

Prof. K P Hewagamage is a Professor in Computer Science at the University of Colombo School of Computing (UCSC) and the Head of Department of Information Systems Engineering, UCSC. He was a visiting researcher of Stockholm University, Sweden and Shimane University, Japan. He has more than 125 research publications and received more than 20 national and international awards for his scholarly work in research.



### ***Co-Investigator I***

Dr Yamaya Ekanayaka is a Senior Lecturer, University of Colombo School of Computing (UCSC) and a Fellow of Higher Education Academy, UK and Brunel University, London. Her research interests include mobile learning, usability engineering, gender HCI and digital entrepreneurship. She has teaching experience in Business, Management and Information Systems domain.

Research Student : Ms F Fazeena Jamaldeen

University : University of Colombo School of Computing





# TWAS/NSF Young Scientist Award

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## Field of Study - Biology



Dr Ranil Jayawardena [MBBS, MSc, PhD(QUT), HND, RNutr (Aus)] is one of the youngest to reach the “Tier 4 star” (highest rank) in the Sri Lankan university system with a H-index of 23 and over 2000 citations. He has over 70 full paper publications in international peer-reviewed journals and numerous abstracts. He has authored four books and a book chapter. In recognition of his outstanding achievements as a researcher and a scientist, he has received many national, university and professional level awards including five Presidential Awards and two NRC Merit Awards consecutively since 2010. He won the Senate Awards for Research Excellence (Early Career) 2016 and 2017 and has been awarded more than ten scientific awards in various academic sessions. He also won the “CVCD Excellence Award for the most outstanding young researcher 2018” in the field of Health Sciences.

### *Some of his key contributions to science;*

1. Conducted the first island wide nutrition survey.
2. Developed and validated a food frequency questionnaire (FFQ) for Sri Lankan adults, which is the only validated and published nutritional assessment tool in the country at the moment.
3. One of his studies on Zinc supplementation was found to prevent diabetes and reduce excess body weight.
4. His research on Ceylon Cinnamon supplementation shows promising result as a treatment modality for diabetes mellitus.
5. The concept of the plate model “My Rice Plate”, which was introduced as a modification in rice consumption is a culturally acceptable dietary strategy to lose body weight.



# SUSRED Awards





# Awards for Supervision of PhD Degrees

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**Thesis Title : Development of commercially important plant-based antioxidant preparations to stabilize and improve the nutritional quality of selected foods**

**Outcome/s of the project:**

Potential of natural phenolic antioxidant extracts (AOE) of coconut cake (CC), *Psidium guajava* L. leaves (GL), *Psidium guineense* Sw. leaves (AP), rice bran (RB) and sesame cake (SC) to extend the shelf life of vanilla cake and sunflower oil was investigated. Antioxidant activity of AOE were evaluated using food model systems. Thermal stabilities of AOE were assessed after heating to 180 °C for 2h. AOE displayed antioxidant activities and thermal stabilities comparable to those of synthetic antioxidants and extended the shelf life of vanilla cake compared to synthetic antioxidant BHT by improving the oxidative stability and microbial shelf life.



***Principal Supervisor***

Prof. Kapila Seneviratne is a Senior Professor in Chemistry at University of Kelaniya. He obtained his PhD at Wayne State University, USA and continued his Postdoctoral research at the University of British Columbia, Canada. He was also a Commonwealth Fellow at the University of Leeds, UK and a Fulbright Fellow at the University of Massachusetts, Amherst, USA.



***Co-Supervisor***

Prof. Nimanthi Jayathilaka is a Professor at the Department of Chemistry, University of Kelaniya. She obtained her PhD from the University of Southern California followed by Postdoctoral studies at the University of California, San Diego. She is a recipient of Early Career Woman Scientist (ECWS) Fellowship awarded by Organization for Women in Science for the Developing World.

Research Student : Dr C M.Senanayake

University : University of Kelaniya

**Thesis Title : DNA barcoding, genetic diversity, genetic structure and age structure of selected mosquito species of Sri Lanka**

**Outcome/s of the project:**

Correct species recognition and age-grading of mosquito vector populations are two vital components to design and implement effective vector control strategies. Present study established 344 DNA barcodes of morphologically characterized Sri Lankan mosquitoes belonging to *Aedes*, *Anopheles*, *Armigerus*, *Culex*, *Mansonia* and *Mimomiya*. The population genetic structures of some of the vector groups were analyzed to show their genetic diversity. During the study, multivariate calibration models were also developed to determine the age structure of *Aedes aegypti* and *Ae. albopictus* using transcriptional age grading technique. These models can be used to determine the virus transmission capability of a mosquito population and also lifespan changes of virus/bacteria infected populations.



***Principal Supervisor***

Prof. S H P Parakrama Karunaratne received BSc, MSc from the University of Peradeniya and PhD from the University of London. He is a Senior Professor and Chair of Zoology at the University of Peradeniya. He presently serves as the Deputy Vice Chancellor of the University and was the Dean/Science during 2007-2013. He has won several research awards including CVCD Excellence Award and SLAAS GRC Award. His major area of expertise is medical and molecular entomology.



***Co-Supervisor***

Prof. S N Surendran is a Professor in Zoology at the Department of Zoology, University of Jaffna. He received his BSc from the University of Jaffna and PhD from the University of Colombo. He has a broad background in Zoology, with specific training and expertise in medical and molecular entomology with over 55 research publications in peer-reviewed indexed journals.

Research Student : Dr T C Weeraratne

University : University of Peradeniya

**Thesis Title :** Isolation, characterization and *in vitro* bioactivity studies on the constituents of *Dipterocarpus zeylanicus* and *Vateria copallifera*

### **Outcome/s of the project:**

The research was carried out to identify bioactive medicinal plant extracts and compounds and to validate and add value to selected plants for industrial applications. Medicinal plant extracts including endemic species exhibited good bioactive properties in human health related targeted assays and among them, extracts of *Dipterocarpus zeylanicus* and *Vateria copallifera* showed promising anti-oxidant, neuroprotective, anti-cancer and cholinesterase, protease, Glutathione-S-Transferase enzyme inhibitory properties. Bio-assay-guided isolation of these plant extracts by chromatography resulted six compounds; two novel compounds Lankaferol and Veteriferol from *V. copallifera*, along with a known compound  $\beta$ -amyrin and  $\alpha$ -Viniferin and Bergenin from *D. zeylanicus*. The research findings have produced three indexed publications, ten abstracts and one book chapter.



### ***Principal Supervisor***

Dr Radhika Samarasekera is the Director General at Industrial Technology Institute, Colombo. She obtained her PhD from the Institute of Arable Crops Research (IACR), Rothamsted, UK and was a Postdoctoral Fellow at the Department of Medicinal and Biological Chemistry, College of Pharmacy and Pharmaceutical Sciences, University of Toledo, USA, Department of Chemistry, University of Winnipeg, Canada and Department of Biological & Ecological Chemistry at IACR-Rothamsted, UK.



### ***Co-Supervisor I***

Dr O V D S J Weerasena is a Senior Lecturer at the Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo. He obtained his BSc and PhD from the University of Colombo and has served as a Visiting Scientist at the Genetic Centre, University of Uppsala, Sweden. He has received several awards for research including Presidential Research Award and Vice Chancellor's Award.

***Co-Supervisor II***

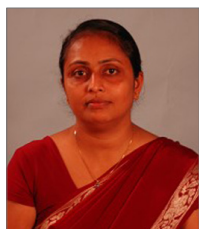
Prof. Shiroma M Handunnetti graduated from the University of Kelaniya with BSc (Hons) in Zoology. She obtained her PhD in Parasite Immunology from the University of Colombo. At present she is the Director and Professor in Immunology at the Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB), University of Colombo.

Research Student : Dr S P Samaradivakara  
University : University of Colombo

**Thesis Title : Development of electrodeposition protocols for growth of CdS, CdTe semiconductor thin films and fabrication of low cost CdS/CdTe solar cells**

**Outcome/s of the project:**

Investigations were directed to identify important experimental variables related to the process of electrodeposition and to determine their inter-dependencies and their relative contributions towards electrodeposition of CdS and CdTe thin film semiconductors. The study fused with mathematical statistics techniques which deals with inter-dependence of electrodeposition experimental variables to identify optimum values of the experimental variables for electrodeposition of these thin film solar energy materials with required optoelectronic characteristics. Based on the optimized deposition parameters, laboratory scale solar cell with an efficiency of 5.6% was produced and that was the highest efficiency seen for CdS/CdTe based laboratory scale solar cell device produced in Sri Lanka so far.



***Principal Supervisor***

Dr D S M De Silva obtained her BSc from the University of Kelaniya and her PhD in Engineering Materials from the University of Sheffield, UK. She is currently serving as a Senior Lecture in Chemistry at the University of Kelaniya. Her current research focuses on development of photovoltaic materials & devices and solar energy applications.



***Co-Supervisor***

Prof. K A S Pathiratne [BSc (Cey.), MSc (Dal.), PhD (NDSU)], is a retired Professor in Chemistry at the University of Kelaniya, specialized in the field of analytical spectroscopy and electrochemistry. He conducted research on development of spectroscopic and electrochemical methods for monitoring of environmental pollutants and fabrication of thin film solar cells using the electrodeposition technique.

Research Student : Dr H Y R Atapattu

University : University of Kelaniya

**Thesis Title : Sustainable export oriented shrimp (*Penaeus monodon*) culture through disease prevention, compliance to food safety regulations**

**Outcome/s of the project:**

An indigenous shrimp (*Penaeus monodon*) has been cultured in the north western province, Sri Lanka since mid-eighties. Cultured shrimp production of the province reached its highest in 1998, declined drastically resulting huge economic losses due to white spot virus disease and bacterial diseases caused by pathogenic *Vibrio*. Use of antibiotics and chemicals to control diseases could affect consumers/environment. Introduction of *Penaeus vannamei* (an American shrimp) is suggested to increase production with a great risk of introducing highly pathogenic, new etiological agents. Present research has confirmed that *P. monodon* could be cultured profitably through disease prevention compliance to food safety regulations while protecting the environment.



***Principal Supervisor***

Prof. Mangalika Hettiarachchi received her BSc (Zoology) from the University Kelaniya and her PhD in Aquaculture from the University of Nigeria under a Commonwealth Scholarship. Currently she serves at the Department of Zoology and Environmental Management, University of Kelaniya as a Senior Professor in Zoology.



***Co-Supervisor***

Prof. U P K Epa graduated from the University of Kelaniya with BSc (Zoology) and obtained his PhD in Aquaculture from the Deakin University, Australia. He is presently serving as a Professor at the Department of Zoology and Environmental Management, University of Kelaniya. He has published 19 indexed scholarly articles and has conducted more than 40 presentations in scientific symposia and conferences.

Research Student : Dr K R P S Kumara

University : University of Kelaniya



**Thesis Title : Investigation of genetic basis for variation in flowering time among Sri Lankan traditional rice varieties**

**Outcome/s of the project:**

The diversity of a large research set of 345 accessions of Sri Lankan traditional rice in terms of flowering time and yield components was depicted at one location. The effect of photoperiod on days to flowering, vegetative growth and yield was determined. A gene expression analysis for flowering time variation in response to photoperiod revealed the potential flowering time gene diversity of Sri Lankan rice. The study resulted in developing a mini core collection of rice for flowering variation and understanding how the photoperiod and atmospheric temperature influence vegetative growth. Further, the genetic basis for the variation in flowering time using Sri Lankan traditional rice germplasm was established while identifying the genetic factors that regulate flowering time variation.



***Principal Supervisor***

Dr Sudarshanee Geekiyanage is a Senior Lecturer at the Department of Agricultural Biology, University of Ruhuna. She obtained her PhD in Applied Plant Molecular Biology from Ehime University, Japan. Her research focuses on exploitation, characterization and genetic improvement of crop and microbial genetic resources for sustainable agriculture.



***Co-Supervisor I***

Prof. Gamini Senanayake is a Senior Professor at the Department of Agricultural Biology, University of Ruhuna. His research interests include plant breeding, quantitative genetics, and indigenous knowledge in agriculture. He is a Council Member of the Sri Lanka Council for Agricultural Research Policy and an Executive Committee member of the Sri Lanka Expert Committee on Biodiversity. He was the Vice Chancellor of University of Ruhuna from 2013 to 2019.



### *Co-Supervisor II*

Prof. Saman Seneweera is the Director at the National Institute of Fundamental Studies (NIFS) Sri Lanka. He has supervised over 25 PhD students and is on the editorial board of many journals. He has published more than 200 research articles in top ranking journals including Nature and Science.

Research Student : Dr E U U Rathnathunga

University : University of Ruhuna



**Thesis Title : Real time translation of Sinhala to Sinhala sign language**

**Outcome/s of the project:**

A person who is born with aural disability does not have the capability to extract information from outside as the mother tongue of a deaf person is the sign language. This has resulted in the requirement for a human interpreter whenever a deaf person wants to convey a message to another healthy person or vice-versa. To fill this void, a Sinhala to Sinhala sign language (SSL) translation software was developed. The software translates Sinhala voice/Sinhala text to a group of Sinhala sign language gestures via 3D virtual human (3D avatar) appearing on a computer. Moreover, the software can translate numbers and basic mathematical equations into SSL. Along with the capability of adding new SSL signs within minutes, software is also capable of translating some of Sinhala grammatical notions to SSL.



***Supervisor***

Prof. R G N Meegama obtained BSc in Computer Science from the University of Colombo and MSc in Computer Science from the Asian Institute of Technology, Thailand. He undertook research in medical imaging leading to a PhD from Nanyang Technological University, Singapore. Presently, he is a Professor in Computer Science at the Department of Computer Science, Faculty of Applied Sciences, University of Sri Jayewardenepura.

Research Student : Dr M Punchimudiyanse

University : University of Sri Jayewardenepura



# Awards for Supervision of MPhil Degrees

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**Thesis Title :** Functional and comparative genomics of grain number, plant height and heading date 7 (*Ghd7*) in Sri Lankan rice varieties and its role in conferring abiotic stress tolerance

**Outcome/s of the project:**

Drought is a major concern in today's Agriculture. *Ghd7* is a major gene involved in rice productivity. The role of *Ghd7* in mediating drought stress in rice was deduced from this study. It also revealed enhanced expression of *Ghd7* under drought in tolerant *indica* germplasm. Ab initio promotor analysis of *Ghd7* identified key cis-element signatures that provide binding sites for drought and other major abiotic stress responsive transcription factors. Sequence variations of *Ghd7* in 34 Sri Lankan rice accessions resulted in identification of three genomic haplotypes. *Ghd7* orthologs revealed an evolutionary trend which is not in line with the speciation of genus *Oryza*.



***Principal Supervisor***

Dr H M V G Herath is a Senior Lecturer attached to the Faculty of Agriculture at the University of Peradeniya. He obtained BSc in Agriculture from the University of Peradeniya and PhD in Molecular Genetics from the University of Maine, USA. Currently, he is a Visiting Postdoctoral Fellow at the Texas A&M University, USA.



***Co-Supervisor***

Dr K K D V Jayatilake is a Senior Lecturer attached to the Faculty of Agriculture, University of Peradeniya. She obtained her BSc in Agriculture from the University of Peradeniya, MSc in Agronomy from Kansas State University, USA and PhD from the University of Adelaide, Australia.

Research Student : Mr I M A D Nagalla

Univesity : University of Peradeniya

**Thesis Title : Investigating factors that lead to liver injury in acute dengue infection**

**Outcome/s of the project:**

In this study it was found that liver injury due to dengue infection peaked around day 6 to 7 of illness and therefore, liver function tests done at earlier dates might not reflect the extent of liver involvement in acute infection. In addition, it was observed severe liver involvement in the absence of fluid leakage, after the peak viraemia, and associated with high IL-17 and IL-10 levels, suggesting possible immune mechanisms leading to hepatic damage. These results were published in a peer reviewed, indexed, international journal which already has 38 citations. The findings have also been presented at international and local meetings.



***Principal Supervisor***

Prof. Neelika Malavige graduated from the University of Colombo, obtained her DPhil (PhD) in Immunology from the University of Oxford, UK, through a Commonwealth Scholarship. She is the Director of the Centre for Dengue Research, University of Sri Jayewardenepura and a Visiting Academic at the University of Oxford. She has done extensive research on severe dengue and vascular leak.



***Co-Supervisor***

Dr Ananda Wijewickrama (MBBS, MD, MRCP, FCCP), graduated from the Faculty of Medicine, University of Colombo. At present he is a Senior Consultant Physician at the National Institute of Infectious Diseases, Angoda and an external Lecturer/Examiner in Faculties of Medicine, University of Colombo, University of Sri Jayewardenepura and Kothalawela Defence Academy. His research interests include clinical management and pathogenesis of dengue.

Research Student : Dr B S M Fernando  
University : University of Sri Jayewardenepura

**Thesis Title : Investigating the mechanisms by which cytokines, chemokines and lipid mediators modulate cellular immune responses in dengue infection**

**Outcome/s of the project:**

This study resulted with further evidence to suggest that T cells are likely to have a protective role in acute dengue and that expansion of the T cells which were earlier identified as regulatory T cells were naïve regulatory T cells with poor suppressive capacity. The regulatory T cells did not associate with clinical disease severity, dengue virus specific T cells or with the degree of viraemia. These results have been published in an indexed, peer reviewed, international journal and has also been presented at international and local conferences. The student received an Elsevier travel award for Early Career Women Scientist to present her research at the 17<sup>th</sup> International Congress on Infectious Diseases.



***Supervisor***

Prof. Neelika Malavige graduated from the University of Colombo, obtained her DPhil (PhD) in Immunology from the University of Oxford, UK, through a Commonwealth Scholarship. She is the Director of the Centre for Dengue Research, University of Sri Jayewardenepura and a Visiting Academic at the University of Oxford. She has done extensive research on severe dengue and vascular leak.

Research Student : Ms H E Jayaratne

University : University of Sri Jayewardenepura

**Thesis Title : The association of HLA alleles, cytokines and selected host factors with *Helicobacter pylori* infection and disease severity**

**Outcome/s of the project:**

This project determined the association of selected HLA alleles and cytokines in *H.pylori* infection and its role in disease severity. In this study 16% was found to be positive for *H. pylori* while those with HLA-DQA1\*0102 allele had a higher risk for infection. Th17 cells had a role in immune response to *H. pylori*. The Gastropanel assay was evaluated for the first time in the country. Further imprint cytology was found to be a useful supportive low cost diagnostic method for rapid *H. pylori* screening from gastric biopsies. These findings were presented at both local and international conferences. This MPhil study also resulted publishing 5 manuscripts in indexed and peer reviewed journals.



***Principal Supervisor***

Dr Chinthika Gunasekara is a Senior Lecturer at the Department of Microbiology, University of Sri Jayewardenepura. Her speciality is immunology and her research focuses are immunopathogenesis of infectious diseases such as leptospirosis and *H. pylori* infection, antimicrobial and antibiofilm activity of green nanoparticles and medicinal plant material. She has several research publications and is a recipient of Presidential Awards.



***Co-Supervisor I***

Prof. Neluka Fernando is a Senior Professor and Head of the Department of Microbiology, University of Sri Jayewardenepura. Her research focuses on leptospirosis, biofilms in chronic wounds, *H. pylori* resistance to antibiotics, green nano-synthesis and anti-bacterial activity. She has many research publications and is a recipient of Presidential Awards.





### *Co-Supervisor II*

Dr Manjula Manoji Weerasekera is a Senior Lecturer at the Department of Microbiology, University of Sri Jayewardenepura. She has specialized in molecular biology and her research focuses on the role of oral microbiota in oral pathologies especially oral cancer, molecular epidemiology of leptospirosis, etc. She has many research publications and is a recipient of Presidential Awards.

Research Student : Ms A M P S Arachchi

University : University of Sri Jayewardenepura

**Thesis Title : Palynological investigations on Gondwana flora from Sri Lanka: Palaeoenvironmental and palaeogeographical implications**

**Outcome/s of the project:**

Paleopalynological and palynofacial investigations are reliable proxies used in interpreting geochronology of sedimentary sequences. The project addresses sedimentary basins in Sri Lanka which resulted in following outcomes. Tabbowa and Andigama beds were dominated by *Araucariacites* sp. and sub-dominated by *Callialasporites* sp. The Callovian-Kimmeridgian age was assigned to Tabbowa beds (21 m) and Tithonia-Berriasian age was assigned to Andigama beds (43 m). Palynofacies indicated four depositional environments for Tabbowa and three for Andigama. Sedimentary features support dysoxic-anoxic conditions under fluvio-deltaic settings and Palynoflora indicated older sediments in Tabbowa than in Andigama. Paleopalynological results from the Gondwana continent, viz; India, Antarctica, Australia and East Africa are tallying.



***Principal Supervisor***

Prof. H A H Jayasena is a chartered geologist from the University of Peradeniya and a consultant for local and international agencies. His research broadly covers hydrology, geology and climate. Currently, he is contributing to the development of paleopalynological and sedimentological research. He has published 4 book chapters, 51 research papers in refereed journals, 60 research communications and several commissioned reports.



***Co-Supervisor I***

Prof. Deepthi Yakandawala is a Plant Molecular Systematist from the University of Peradeniya. Her research involves plant taxonomy/molecular systematics and phylogenetics, aquatic plants, pollen, endemic flora, red-listing and their conservation and molecular characterization of fungi. She has published 2 book chapters, over 50 papers in refereed journals and more than 75 research communications.



### *Co-Supervisor II*

**Prof. Rohana Chandrajith** is a Geochemist from the University of Peradeniya. His research interests are in the field of environmental geochemistry and hydrogeochemistry. He also has a special interest in bridging disciplines, such as chemical, biological and geological sciences, to address, multi-faceted environmental problems. He has published 3 books, 5 book chapters, 80 papers in refereed journals and 100 research communications.

Research Student : Mr W A P Weerakoon

University : University of Peradeniya