NSF Award Ceremony for Science Popularization 2024 (NACSP)

STEAM Education for Better Future

National Science Foundation
Sri Lanka

National Science Foundation

Award Ceremony for Science Popularization (NACSP)

"STEAM Education for Better Future"

30th April 2024

Organized by

National Science Foundation
47/5, Vidya Mawatha
Colombo 07
Sri Lanka

National Science Foundation
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Sri Lanka
2024

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MESSAGE FROM THE HON. MINISTER OF EDUCATION

It is with great pleasure that I am writing this message to the proceedings of the Award Ceremony for Science Popularization which is organized by the National Science Foundation (NSF) annually to felicitate the outstanding achievements of the school students and teachers at the STEAM based competitions conduct by the NSF since 2004. The Science Popularization Award Ceremony (SPAC) serves as a testament to the curiosity, creativity, and passion that our students bring to the world of science.

Science is more than just a subject in textbooks. It is a way of analytical thinking, questioning, and exploring. Our young minds have embraced this spirit of inquiry, and their thirst for new knowledge that has no bounds. Thus, through hands-on experiments, conducting research projects, and engagements in STEAM based activities, they have delved into the mysteries of the natural world.

I hope that today's award winners have not only absorbed existing knowledge but also contributed in terms of fresh ideas for making a value addition to the existing knowledge. Thus, we should celebrate their ingenuity and encourage them to continue their studies transcending the boundaries of what is possible for betterment of the nation.

I congratulate all the award winners for their outstanding achievements and acknowledge with thanks the National Science Foundation commitments towards popularization of science and promoting science education in the country in line with its mandate.

Dr Susil Premajayantha
Minister of Education and Leader of the House of Parliament of Sri Lanka

MESSAGE FROM THE CHAIRMAN

It is with great pleasure that I send this message to the souvenir issued to mark the NSF Award Ceremony for Science Popularization (NACSP) - 2024. The NSF, the premier national institution mandated to promote S&T for socio-economic development in Sri Lanka, in keeping with its mandate, offers a wide range of programmes among which encouragement, motivation and recognition of outstanding students and teachers in science assume prime importance.

To this end, "Kid Naturalist" programme, School Science Competition (SSC) on the theme" STEAM education for a better future", Science Research Project Competition (SRPC) and Sri Lanka Science and Engineering Fair (SLSEF) jointly with IESL for students, and NSF Best Teacher Award for outstanding teachers were conducted in 2023 with the participation of around 4,000 candidates in the country. Over 180 outstanding winners, will be felicitated at the above awards ceremony.

I most heartily congratulate the award recipients on their outstanding achievements and wish them continued success in their future endeavours and initiatives. I wish to express my deep appreciation to Dr. Dilrukshi Ranatunga, Head, Division of Science Communication and Outreach, NSF and its staff for organizing this important event with great dedication and devotion amidst manifold constraints.

Emeritus Professor Ranjith Senaratne
Chairman
National Science Foundation, Sri Lanka

MESSAGE FROM THE DIRECTOR GENERAL

As the Director General of the National Science Foundation, I am privileged to send this message on this special occasion. The NSF Award Ceremony stands as a celebration of excellence where NSF accolades outstanding achievements of school children and teachers in engagement with the NSF programmes towards science popularization, science education and fostering STEAM. The Award Ceremony for Science Popularization is organized by the NSF annually in line with its mandate as well as STEAM initiative of the Ministry of Education. NSF science popularization and science education programs are aimed at students' exposure to innovative concepts, environment, research projects and emerging technologies. This exposure encourages an innovation-driven mindset, where students learn to embrace change, explore new possibilities, and develop an innovative and entrepreneurial spirit.

With a steadfast commitment to become the nation's foremost catalyst for fostering science, technology and innovation, the NSF has been at the forefront of empowering school students with analytical thinking, problem solving skills, reasoning and innovative thinking hence ultimately nurturing them as future science, research and innovation leaders. Recognizing the importance of teachers' role in these endeavors, special awards are also awaited for outstanding teachers at this Award Ceremony.

I extend my heartful congratulations to all the award winners for their exceptional contributions in progressive advancement of the innovation ecosystem in terms of science education and science literacy. This amazing accomplishment is just one step on your journey. Your ability to relentlessly search for solutions to problems and find innovative ways to improve the world is the key to this success and many to come.

Dr Sepalika Sudasinghe
Director General
National Science Foundation, Sri Lanka

MESSAGE FROM THE CHAIRMAN OF THE WORKING COMMITTEE ON SCIENCE POPULARIZATION

National Science Foundation, Sri Lanka

As we gather here today, it's evident that education serves as the cornerstone for the development of our society, nurturing three key domains: knowledge, skills, and attitude. While knowledge forms the bedrock of learning, it's the acquisition of skills and the cultivation of positive attitudes that truly propel individuals towards success in the 21st century.

It's widely acknowledged that skills and attitudes cannot be merely imparted through traditional teaching methods alone. Here, the pivotal role of co-curricular activities in schools comes to the forefront. These activities serve as incubators for the holistic growth of students, fostering not only academic excellence but also the development of essential life skills.

The Science Communication and Outreach Division of the National Science Foundation stands at the forefront of this endeavor, orchestrating a plethora of activities aimed at not only disseminating scientific knowledge but also honing the soft skills essential for navigating the complexities of modern life. Through a national platform meticulously crafted by the NSF, students from all walks of life are provided with the opportunity to showcase their talents and skills honed through participation in various activities, spanning from their formative years to upper secondary education.

One such initiative, the Sri Lanka Research Project Competition, serves as a beacon for nurturing a culture of research within our school communities. While winning accolades in such competitions is undoubtedly gratifying, the true essence lies in the wholehearted engagement and dedication exhibited throughout the journey. It is in this spirit that true winners are born – not merely in the trophies they hoist, but in the strides they make towards personal and intellectual growth.

Therefore, today, as we celebrate the achievements of our future scientists, let us extend our heartfelt appreciation to the visionary leadership of the Chairman, the unwavering support of the Director General, and the indefatigable efforts of the members of the working Committee, the Head, Dr. Dilruksh Ranathunge, and the staff of the Science Communication and Outreach Division of NSF, for their foresight, dedication, and relentless pursuit of excellence. It is through their collective vision and tireless work that we stand to witness the success of this noble mission.

Congratulations to all the participants, winners, and mentors! Your endeavors today pave the way for a brighter, more enlightened tomorrow.

Dr. Jayantha Wattavidanage
Deputy Director General,
UNESCO Category 2 C, South Asian Center for Teacher Development

INTRODUCTION TO THE KEYNOTE SPEAKER

She is a Specialist in Aesthetic Medicine and Clinical Cosmetology with over 06 years of experience in Clinical field in Sri Lanka, India and Europe. She had been the Head of Department of Cosmetology and Holistic Therapy at the Academy of Universal Global Peace, USA and has worked as a Counseling Psychologist for many nongovernment organizations with children and youth. Her bachelors' studies had been conducted at the Kasturba Medical College, Manipal in the field of Cosmetology and Aesthetic medicine and her Masters' studies had also been focused on the same field and had been conducted at the same university. She has obtained her PhD from the United Nations University in the USA in the field of Aesthetic Medicine and CosmetologySciences.

She is also a formula creator for several leading Medical Cosmetic brands in Europe. Her goal is to give leadership and to facilitate girls and young women for global empowerment with innovations and to create female entrepreneurs.

Dr Melki Perera

Consultant/ Specialist - Aesthetic Medicine and Cosmetology Sciences.

Alternate Permanent Representative for United Nations -
FAO, WFP, ICCROM, IFAD

Global Representative (Europe) - Ceylon Women Organization

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Part I

Winners of the NSF School Competitions

1. Kids Naturalist Programme (KNP) 2023/24

The Kid Naturalist Programme (KNP) conduct by the NSF Science Communication and Outreach Division (SCOD) jointly with the Primary Section and Science Branch of the Ministry of Education (MoE) since 2020 aimed at students of grades 1-6. The main objective of the programme is to nurture students to observe the nature that they live in following scientific methodologies thereby to ignite interest in learning science and creating nature loving future generation.

The students who participate the progrmme are expected to prepare a nature journal based on the observations made by them in a period of 6-weeks according to the guidelines given by the NSF. The submitted nature journals were evaluated by a panel of evaluators appointed by the Board of Management. Accordingly, 1,506 applications were received for the programme in 2023 and 369 students have submitted the fully completed nature journals after completion of the 6-week observation period.

Evaluation panel of the KNP 2023 /24

	Name of the Resource Person	Affiliation
1	Dr Jayantha Wattavidanage	Chairman
2	Dr P.R.M.P. Dilrukshi	Head, SCOD
3	Prof. R.M. Dharmadasa	Committee Member
4	Dr N. Karthikeyan	Committee Member
5	Mr Vipula Kulathunga	Deputy Director, Science Branch
6	Ms P.R. Kariyawasam	Director of Education, Primary Branch
7	Ms A.D. Balapatabendige	Deputy Director, Primary Branch
8	Ms S. Manoharan	Additional Director, Primary Branch
9	Mr. K.A.T.P Jayarathna	Retired Deputy Director, Primary Branch
10	Ms. S. Lalithambiheai	Retired Deputy Director, Primary Branch

Best performers of the programme

Category: Grade 1		
	Name of the winner	**School**
01	Muralitharan Akaran	St. John Bosco's Vidyalayam, Jaffna
02	W. Shanuki Shehansa	MR/Kudagalahena K.V.
03	Kavini Nihinsa Menon	Mahamaya Girls' College, Kandy
04	R. Rishika	J/ Holy Family Convent, Jaffna
05	Imalsha Mihisara	MR/Elamaldeniya K.V.
06	S. Kavinaya	J/ Holy Family Convent, Jaffna
07	R. Dironi	J/ Holy Family Convent, Jaffna
08	S.M. Tharushi Madushani	R/Eththota Vidyalaya, Eththota, Gallella, Raththota
09	S. Sujalini	J/ Holy Family Convent, Jaffna
10	A.S. Marita	J/ Holy Family Convent, Jaffna

Category: Grade 2

	Name of the winner	**School**
01	Nethya Palliyage	Girls' High School, Kandy
02	Sakila Gesara Dunukepotha	St. Anthonys Boys College
03	M.G. Suwahas Dewshan	MR/Diyadawa K.V.
04	Wageesha prabashwara bandara	St/sylvester's College -Kandy
05	J. Kasvini	J/ Holy Family Convent Jaffna
06	J.V.G. Thinuli Sehansa	MR/Rambukana Kodikaragoda K.V.
07	Methya Palliyage	K/Girls' High School, Kandy
08	D.G. Esandi Dahamsa	MR/Rambukana Kodikaragoda K.V.
09	T.M. Tasheni Nethusari	M/R Siyambalagoda West Primary School
10	T. Najanitha	J/ Holy Family Convent, Jaffna

Category: Grade 3		
	Name of the winner	**School**
01	H.B.S. Indeepa Geenuka.Hitibandara	CP/KOT/Delta Gamunupura M.V.
02	W. M. Denith Minruka Weerasinghe	Thurstan College, Colombo 07
03	Thesadi Naveethma Deshapriya	K/ Seethadevi B.M.V.
04	Sadiw Kithnuka.Vithanage	Thurstan College, Colombo 07
05	R. Sanjana Rajkumar	J/ Holy Family Convent, Jaffna
06	K.O.G. Jayami Malithya	MR/ Rambukana Kodikarahoda Primary Vidyalaya
07	H.B. Chandeepa Gethma Hitibandara	CP/KOT/Delta Gamunupura M.V.
08	N.H.H. Chamathkara Roosarani	CP/ Hangu Mathurata Central College
09	R.K.Thisum Thejan Nawarathna	CP/KOT/Delta Gamunupura M.V
10	G. Praharsha Kaushan Fonseka	Kingswood College, Kandy
10	D.E. Naduli Tamaya	MR/ Rambukana Kodikaragoda K.V

Category: Grade 4		
	Name of the winner	**School**
01	V.A. Themiya Ranumitha Samarawickrama	Kandy International School, Kandy
02	K. Rahen Seneth Perera	Thurstan College, Colombo 07
03	K. Swarnie Krishmina	Highlands National College, Hatton
04	A.V. Osandi Devduni	M/Morawaka Primary School
05	Shanthakumar Jayashwini	K/Girls' High School, Kandy
06	W.G. Sathsilu Wehara	CP/KOT/Delta Gamunupura M.V.
07	P.G. Iseli Sarya Gallage	Sangamiththa Balika Collage, Galle
08	T. Nethum Mihisara Ranasinghe	Thurstan College, Colombo 07
09	Thedasi Nadulya Kalupahana	G/ Sanghamiththa Balika Vidyalaya
10	Okitha Thanujitha Vidana Gamage	Dharmaraja College, Kandy
10	Ransilu Kaveeshwara Vanigasekara	MR/ Thalapekumbura Primary Vidyalaya

Category: Grade 5		
	Name of the winner	**School**
01	D.A. Chathura Deshanjana Dharmarathne	CP/KOT/Delta Gamunupura M.V.
02	H.R.L. Sanuka Dewsithu	MR/ Deniyaya Madya Vidyalaya
03	L. Tyon Abhishka Perera	WP /Kalaniya Sobitha Vidyalaya
04	W.M. Sanuthi Ashvini Weerasekara	Vision International School Kandy
05	Y. Damsaree Wikramarathna Siriwardhana	St. Joseph's Balika Maha Vidyalaya -Kegalle
06	Senula Insitha Vithanage	Thurstan College, Colombo 07
07	M.G.B.Y.C. Bandara	K/Mahanama Collage , Kandy
08	P.G. Sathusha Nimnada	CP/KOT/Delta Gamunupura M.V.
09	Dulithi Nethumsa Rodrigo	Sujatha Vidyalaya, Matara
10	B.A. Sanudika Sandasan Bandara	R/Kandangoda Primary College

Category: Grade 6

	Name of the winner	**School**
01	V.G. Indumini Nethma	MR/Kirilipana Kanitu Viduhala
02	M.I.M. Aathif	K/Ranabima Royal College
03	D.K. Basitha Thimath Rathnayake	K/Ranabima Royal College
04	J.G. Ashen Nethsara	MR/Kirilipana Kanitu Viduhala
05	W.K.J. Sithumi Seya	MR/Kirilipana Kanitu Viduhala
06	R.K.G.I. Udesh Bandara	K/Ranabima Royal College
07	D.L. Kemitha Suhas Liyanage	K/Ranabima Royal College
08	Mayuran Ajairaav	J/Thavady Hindu Tamil Mixed School
09	Kanishka Balakumar	V/Nelukkulam Kalaimahal M.V.
10	Aranya Ganeshatheva	J/Jaffna Hindu Ladies College

2. School Science Competitions (SSC)

Theme 2023 "STEAM Education for a Better Future"

School Science Competitions are annually conducted by the NSF to popularize science among the school community. Accordingly, seven (07) competitions under the theme **"STEAM Education for Better Future"** were conducted in 2023. First round of the song, viridu and role play competition were conducted through recorded submissions and final round was conducted in person with performance on stage. Poster competition was conducted at the poster exhibition held on the National Science Day programme on November at the National Museum Premises.

NSF School Science Competition – 2023

Evaluation Panel

	Name of the resource person	**Affiliation/ Designation**
1	Dr Jayantha Wattavidanage	Chairman NSF Working Committee on Science Popularization (WCSP)
2	Prof. Mangala Senanayake	Professor (Drama), Univ. of Visual & Performing Arts
3	Dr P.R.M.P Dilrukshi	Head, SCOD
4	Mr Bandula Sarath	Director (Science), Ministry of Education
5	Mr Asoka De Silva	Editor – Vidurava (English)
4	Mr. Thusitha Malalasekera	Editor – Vidurava (Sinhala)
	Eng. Neil Abeysekera	CEO / IESL Member and Member WCSP
3	Dr N. Karthikeyan	Editor-Vidurava (Tamil)
5	Dr Gowry Moorthy	Editor-Vidurava (Tamil)
6	Ms. J.M. Ruvini Jayalath	Assistant Director, Ministry of Education
7	Ms. Chamari Thapaswarage	Lecturer, National Institute of Education
8	Sangeeth Visharad Kapila Maddegoda	Ministry of Education
9	Mr. Maneesha Dukgannarala	Lecturer, University of Kelaniya

Winners of the Competitions

Essay Competition

No.	Name of the Student	School	Place
Sinhala medium			
1	D.P.K.G.T. Deumini Dasanayaka	CP/Denu/Handessa Maha Vidyalaya, Daulagala, Peradeniya	1st
2	Nipun Dhananjaya Premarathna	Dharmaraja College, Kandy	2nd
3	W.G. Senugi Lehansa	Delta Gemunupura Maha Vidyalaya, Pussallawa	3rd
English medium			
1	M. Nowzad Beena Dhaneen	KM/Mahmud Ladies College (National School), Kalmunai	1st
2	Aaysha Mohideen	BADI-Udin Mahamud Girl's College, Kandy	2nd
3	Athiyya Jezee	BT/St. Cecilla's Girls' College, Batticaloa	3rd
4	M.S. Shafa	British International College, Polgahawela	3rd
Tamil medium			
1	Paraniha Selvendradas	J/Skandavarodaya College, Jaffna	1st
2	Thevasihamani Kasanthanan	Tk/Sri Ramakrishna College, Akkaraipattu	2nd
3	S. Logalakshan	Tk/Sri Ramakrishna College, Akkaraipattu	3rd

Short Science Stories (Fiction)

Selected the best 05 Short Science Stories

No	Name of the Student	School	Place
1	H.W.M. R. Vandanu Wijayasinghe	Mahamaya Girls' College, Kandy	Best 5
2	Rubiga Arunthavam	J/Vembadi Girls' High School	Best 5
3	R.M. Charani Sipsandee	Jinaraja Girls' College, Gampola	Best 5
4	Anthony Rupasinghe	Matale International School	Best 5
5	Binal Yesandu Ekanayake	Matale International School	Best 5

Digital Story Telling

No	Name of the Student	School	Place
1	Yaneth Ranabahu	Thurstan College	1st Place
2	Nethuni Himanga Gamage	St Joseph Balika Maha Vidyalaya, Gampola	Appreciation
3	Thewmali Piyadasa	Sirimavo Bandaranaike Vidyalaya	Commendation

Song Competition

No	Name of the student/ teacher	School	Place
1	H.A. Deep Anchitha Ms A. Abayasiriwardena (Lyrics Writer)	CO/Rajasinghe Maha Vidyalaya, Colombo 9	1st
2	Mansoor Fathima Hasna Haroon Fathima Hishma Samsudeen Arashad Shams Aariff (Lyrics Writer)	KM/AK/Akkaraipattu Muslim Central College, Akkaraipattu	2nd
3	M.M.D. Eina Saawangi I.M. Washitha Harshana Mrs. Dhammika Chandralatha (Lyrics Writer)	Harischandra College, Negombo	2nd
4	P.D. Duleema Indeewaree L.W.P. Thisari Sandasiluni Mrs M.S.K. Marasinghe (Lyrics Writer)	Royal Central College, Polonnaruwa.	3rd

Viridu Competition

No	Names of the student/ teacher	School of the Student	Place
1	Atheek Ahamad Mr A.L. Ansar (Lyrics Writer)	Maccan Markar National School, Eravur, Batticaloa	1st
2	Heshan Athapaththu Hirushan Wijesinghe Heshan Athapaththu Hirushan Wijesinghe (Lyrics Writers)	Thoranakada Dharmaraja Vidyalaya, Eheliyagoda	2nd
3	Hashini Sansala Dinuka Dilshan Vidana Pathirana Hashini Sansala (Lyrics Writer)	Alapaladeniya National School	3rd
4	Duleema Indeewari Thisani Sandasiluni Mrs. K.A. Thamara Priyadarshani (Lyrics Writer)	Royal College, Polonnaruwa	3rd

Role Play Competition

No	Name of The Student	School of The Student	Place
1	M.P. Praharshana Undugodage	Royal Central College, Polonnaruwa	1st
2	K.A. Nadin Thathsara	Thurstan College, Colombo 07	2nd
3	Y.G. Bindya Induvari Wijesinghe	St. Joseph Balika Maha Vidyalaya, Gampola	3rd

Poster Competition

No	Name of The Student	School of The Student	Place
Grade 13			
1	A.G.W. Yasami Thenuwara	Royal Central College, Polonnaruwa	1st
2	S.G.M.P. Induwara	Royal Central College, Polonnaruwa	2nd
3	M. Sheba Simirna	WP/ C/ ST Annes Girls' M.V., Colombo 13	3rd
Grade 12			
1	Tharusha Shehan Amarathunga	Royal Central College, Polonnaruwa	1st
2	S.S. Sasmitha Weerasundara	Thurstan College, Colombo 07	2nd
3	A. Chathushki Nayanathara Dissanayaka	KG/St. Joseph's Balika M.V., Kegalle	3rd
Grade 11			
1	D.G. Upeksha Indeewari Abesinghe	Royal Central College, Polonnaruwa	1st
2	G.P.G.M. Kalhara	Thoranakada Dharmaraja Vidyalaya	2nd
3	U.S. Poornima	Royal Central College, Polonnaruwa	3rd
4	U.G. Chathumini Kaushalya	Royal Central College, Polonnaruwa	3rd
Grade 10			
1	K.D.N. Sanvidu	Royal Central College, Polonnaruwa	1st
2	A.G. Nethmina Thejan	Royal Central College, Polonnaruwa	2nd
3	W.H.M. Chameesha Avindi	CP/ HG/ Mathurata M.V	3rd

Grade 09			
1	Hasith Sasmitha De Silva	Thurstan College, Colombo 07	1st
2	D.M.M. Hashara Dissanayeke	Royal Central College, Polonnaruwa	2nd
3	D.M.P. Wathsala Dissanayeke	Royal Central College, Polonnaruwa	3rd
4	U. Harish	C/ St Anthony's Boys'M.V., Colombo	3rd
Grade 8			
1	B. Savishka	St. Annes Girl's M.V.	1st
2	R.M. Raya Raihan	Mercy Education Institute	2nd
3	M.R.F. Riffath Rasha	School of Excellence	3rd
Grade 7			
1	M. Jinulakshaya	Tk/Sri Ramakrishna College, Akkaraipattu	1st
2	S. Thaboorshaan	Tk/Sri Ramakrishna College, Akkaraipattu	2nd
3	K. Sharmithan	Tk/Sri Ramakrishna College, Akkaraipattu	3rd
Grade 6			
1	R. Kiruthigan	Tk/Sri Ramakrishna College, Akkaraipattu	1st
2	P. Kiriththika	Tk/Sri Ramakrishna College, Akkaraipattu	2nd
3	S. Sujasthikan	Tk/Sri Ramakrishna College, Akkaraipattu	3rd

Drama Competition

	Special Award	**Character/Drama**
1	Best Drama script	Not awarded due to not meeting the NSF expected standard and the Theme given (STEM Education for better Future)
2	Best Drama on stage	Not awarded due to not meeting the NSF standard
3	Best Actor	Sirimal's character, Thurstan College, Colombo 07 (S. Shanuk Fernando)
4	Best Actress	Taniya's Character, Royal College, Polonnaruwa (H.M. Amanjalee Vihanga Karunanayake)
5	Best Choreography	Dudley Senanayake Vidyalaya, Narahenpita
6	Best Music	Royal College, Polonnaruwa
7	Best Set Design	Dudley Senanayake Vidyalaya, Narahenpita
8	Best Costumes	Thurstan College, Colombo 07

3. Science Research Project Competition (SRPC) - 2022/23

To inculcate research culture among the school community, the NSF is conducting Science Research Project Competition (SRPC) annually since 2008. Accordingly, SRPC 2022/23 initiated in June 2022. The students of selected projects carried out their projects under the supervision of senior scientist of a university or a research institution for a period of 6-8 months. After continuous progress monitoring done by the NSF, 58 projects became eligible to participate in the competition STEP I. The STEP I competition was conducted on March 23-28, 2023 to select the best twenty (20) projects and the final evaluation (STEP II) was conducted on 26 April 2023 to select ten (10) national winners of the competition.

Panel of Judges of SRPC STEP I & II

	Name	Afliation
01	Dr Jayantha Wattavidanage	Chairman, NSF Working Committee on Science Popularization
02	Prof. Sunethra Karunarathne	Science Education Professor (Retired) at University of Peradeniya
03	Prof. Susira Perera	Department of Physics, Faculty of Natural Sciences, The Open University of Sri Lanka
04	Prof. Manuj Weerasinghe	Department of Community Medicine, Faculty of Medicine, University of Colombo.
05	Eng. (Mr) Neil Abeysekara	The Institution of Engineers, Sri Lanka, Wijerama Mw, Colombo 07.
06	Dr N. Karthikeyan	Department of Physics, Faculty of Natural Sciences, The Open University of Sri Lanka
07	Prof. R.M. Dharmadasa	Herbal Technology Unit, Industrial Technology Institute, Research and Development Complex, Malabe.
08	Prof. Rohini de Silva	Department of Chemistry, Faculty of Science, University of Colombo.
09	Prof. Inoka Perera	Department of Zoology and Environment Sciences, Faculty of Science, University of Colombo.
10	Dr Pradeepika Saputhanthri	Department of Plant Science, Faculty of Science , University of Colombo.
12	Dr P.R.M.P Dilrukshi	Head, Science Communication and outreach Division/NSF.

Winners of the SRPC 2022/23

	Name of the Student	School	Title
1	AM Udula Methsara Abeysinghe	D.S. Senanayake College, Colombo 07	Cyprinidae family fish diversity in Diyagama Ela – South West ichthyological Zone of Sri Lanka.
	Teacher in Charge: Ms W.K.N.J. Amarasinghe Principal Supervisor: Dr Devanmini Halwathura		
2	M. Sahan Clement Shavinda Fernando	St Joseph Vaz College, Wennappuwa	Investigation of anti-cancer activity of bioactive compounds present on plants in Sri Lanka for estradiol synthesis pathway associated with breast cancer via in-silico approach
	Teacher in Charge: Ms B.L.C. Lalani Balasuriya Principal Supervisor: Prof. R Senthilnithy Supervisor: Mr Dushanan Ramachandran		
3	K.A Isuru Chamara Lakshan Kularathna M. Ashan Sankalpa Weerasuriya S.A Kavindu Anuradha Thilakarathna	Ka/ Dehi/Walagamba Maha Vidyalaya, Galapitamada	Conversion of a two-stroke petrol engine to operate using a mixture of biogas and petrol
	Teacher in Charge: Ms W.A.M. Sasanka Dunumala Principal Supervisor: Dr Indrani Kularathne		
4	P. Siluni Sihansa De Silva	Musaeus College, Colombo 07	Investigating the effectiveness of various storage settings to reduce the microbial growth on toothbrushes
	Teacher in Charge: Ms M.D. Lochana Mahawatta Principal Supervisor: Dr Thushari Dissanayake		
5	A.Y.B. Weerakoon	Dharmaraja College, Kandy	Evaluation of field level efficacy of *M. micrantha* solvent extracts against aphids in brinjal crop and preliminary study for commercialization
	Teacher in Charge: Ms W.M.T.S. Wijesundara Principal Supervisor: Dr Wikum Jayasinghe		
6	M.W. Ayesha Nikethanie H.R. Navodya Divyanjali Bandara Kavinsa Dewmini Wickramanayake	Lihiniyawa Kanishta Vidyalaya, Lihiniyawa	A preliminary study on floral sap yield determination of naturally grown Kithul palms
	Teacher in Charge: Ms N.K. Weerasekera Principal Supervisor: Prof. Lanka Ranawaka		

7	P.G. Kavindu Sandeepa P.B. Thushani Kaushalya B.M. Manisha Gimhani	Peramaduwa Vidyalaya, Kanthale	Qualitative analysis of thermal comfort in a dry zone school classroom
	Teacher in Charge: Mr Sarath Dasanayake Principal Supervisor: Eng. I.P.T.S. Wickramasooriya		
8	Medini Thrishala Thudahewage	St. Paul's Girl's School, Milagiriya	Study the Production of ecofriendly degradable film from extract of Pontedeia Crassipes pure powder with gelatin mixed
	Teacher in Charge: Mr D.B. Nayana Kumara Principal Supervisor: Dr T.M. Sampath U. Gunathilake		
9	M.R. Mohamed Baheej Al Barrah	T/Kinniya Central College, Kinniya	Problems associated with sand mining in Upparu Delta region of Kinniya
	Teacher in Charge: Mr M.M.A. Abrar Principal Supervisor: Dr V. Anavarathen Supervisor: Eng. Mohamed Suhail. M. P		
10	Nadeeja Prathibhana	Thurstan College, Colombo 07	Evaluation of Antidiabetic Activity of Flower of Ranawara (Cassia auriculata L.) in High Glucose Induced Zebrafish Embryos
	Teacher in Charge: Ms Upeksha Abeysekara Principal Supervisor: Dr C.D. Jayasinghe		

4. Sri Lanka Science and Engineering Fair (SLSEF) 2024

Sri Lanka Science and Engineering Fair (SLSEF) 2024 was held on 14 March 2024 at Wimalasurendra Auditorium, Institution of Engineers in Sri Lanka. This has been organized by the NSF and the Institution of Engineers Sri Lanka (IESL) in collaboration with the Ministry of Education (MoE) since 2008. The winners (10) of the NSF Science Research Project Competition (SRPC 2023) and the winners (10) of the Junior Inventor (JIY) Competition organized by the Institute of Engineers Sri Lanka are competed at this Fair. The best 10 projects of this competition are selected and of this top 03 projects are nominated to represent Sri Lanka at the International Science & Engineering Fair (ISEF). This year fair is sheduled to be held in Los Angeles USA from May 11-17, 2024.

The Review Panel (SLSEF 2024):

No	Panel Members	Affiliation
01	Prof. Rizvi Sharif Chairman (nomination)	Senior Professor, Kotelawala Defense University
02	Dr Jayantha Wattavidanage	Chairman, NSF Working Committee on Science Popularization
03	Dr PRMP Dilrukshi	Head/SCOD and Principal Scientific Officer

04	Prof. R.M Dharmadasa	Directors and Research Professor, Herbal Technology Unit, ITI
05	Prof. Inoka Perera	Department of Zoology and Environment Management Faculty of Science, University of Colombo
06	Prof. Pradeepika Saputhanthri	Department of Plant Science, Faculty of Science, University of Colombo
07	Eng. Jayavilal Meegoda	Past President IESL, and Fair Director -SLSEF
08	Eng. M.G. Tilakarathne	Member IESL
09	Eng. S.A.P.C. Siriwardena	Member IESL
10	Eng. Sirieardena	Member IESL
11	Dr K.P. Munagama	Additional Director, Ministry of Education

Winners of the SLESF 2024

No	Name of the student	School	Title of the Project
1	R.M. Harsha Bandara Madawala	Mayurapada Vidyalaya, Narammala	Advanced Forced Socket for Tap
2	S.M.C.A. Bimsara Senanayake	Saranath National College, Main Street, Kuliyapitiya	Mattress Ventilation System
3	K.L Nadeeja Prathibhana	Thurstan College, Colombo 07	Evalution of Antidiabetic Activity of Flower of Ranawara (Cassia auriculata L.) in High Glucose Induced Zebrafish Embryos
4	U.N Dhananjaya Jayathilake	Dharmaraja College, Kandy	Spoiled Egg Detector
5	Medini Thrishala Thudahewage	St. Paul's Girls' School, Milagiriya	Study the Production of ecofriendly degradable film from extract
6	Thewnitha Piyadasa	Nalanda College, Colombo 10	Smart Wheelchair
7	Ranula Nethwidu Basnayake	Puhulwella National College, Matara	Multilangual AI Software Wheelchair
8	A.Y.B. Weerakoon	Dharmaraja College, Kandy	Evaluation of field level efficacy of *M. micrantha* solvent extracts against aphids in brinjal crop and preliminary study for commercialization
9	Kulenthiran Anushan	Velanai Central College, Jaffna	Safety Guard Grinder
10	M. Sahan Clement Shavinda Feranando	St. Joseph Vaz College, Wennappuwa	Investigation of anti-cancer activity of bioactive compounds present on plants in Sri Lanka for estradiol synthesis pathway associated with breast cancer via in-silico approach

NSF Award for Science Popularization.

The NSF felicitates the best performed Science Teachers and Science Societies to give recognition for their contribution towards popularization of science and promoting science education among school community to popularize science among the school community. Further, this also become a motivation to get their fullest engagement to promote science education beyond school curriculum. These awards include one Lifetime Award (01), Commendation Awards (max 02) and Appreciation awards (Max 2).

	Award	Name of the teacher	Name of the school
1	Teachers' Award	Ms N.D.C Sagarika Gunathilake	CP/K Ranabima Royal College
2	Commendation	Ms S.I.W. Samaranayake	Royal College Polonnaruwa
3	Appriciation	Ms Chamari Tharangika Colambage	Kg/St Mary's College, Kegalle

Winners of the Star ratings for the best performed Science Societies 2024

The NSF felicitates the best performed School Science Societies under the NSF School Science Society Network by evaluating their performance on the respective year by giving "star ratings". The awards will be given to the Schools Science Societies that received 5-3-stars at the evaluation. The school, Teacher in-charge of the Science Society, President and Secretary of the School awarded certificates at the Ceremony.

Award	Name of the School	Principal	Teacher in Charge	President	Secretory
5 Stars	WP/Ng/ Harishchandra National College, Negombo	Mr. U.G.V.D. Siriwardhana	Ms. A.T. Nelka Munasinghe	K.G.K Nethsara Daham Amarasinghe	K. Binari Nimhara
5 Stars	Royal College Polonnaruwa	Mr. I.K.K.R Wijayawansa	Ms. S.I.W Samaranayake	M.P.P Undugodage	M.A Yenara Methuki
4 Stars	ST/PD/ Paddirippu National School	Mr. Sabeskumar	Mr. S. Thevakumar	S.P Moganapratha	S.S. Shanuja
4 Stars	Thurstan College, Colombo 07	Mr W.A.P.J Wickramasinghe	Ms.Upeksha Abeysekara Mr.W.A Dushantha	Janith Bandara	Sajan Mihiranga
3 Stars	CP/HK/ Mathurata M.V., Hanguranketha	Mr. M.G.N Bandara	Ms. R.M Ajantha Menike	R.M Tharusha Lakshan	M.I Rashimika Dissanayake

Part II

Proceedings of the Science Research Project Competition 2022/23

Abstracts of Oral Presentations of STEP- I Competition held on 24th - 28th March 2023

Problems associated with sand mining in Upparu delta region of Kinniya

M.R. Mohamed Baheej Al Barrah
T/Kinniya Central College, Kinniya, Trincomalee

Sand is a vital component in construction works. The recent acceleration of the development in the country increases the construction works and leads to upsurges the sand mining. The aim of the research is to find out the problems related to sand mining and create awareness to minimize the identified problems. Upparu is a delta region in Kinniya. Trincomalee District, where continuous sand mining is carried out. There are so many problems associated with sand mining in the delta regions. A descriptive study was carried out to collect the data in the paper survey method with open-ended questions. It revealed that mining-related water pollution and the stock breeding of marine lives are continuously affected by the mining and there are no significant effects on cultivation, habitat, and animal husbandry. An aerial view of the study area analysis done by Google earth pro, using add path option and polygon tool method, shows the increases in Relative sea-level Rise (RSLR) in the area within the fourteen years period. Creating awareness among the people in the study area regarding continuous sand mining may minimize the effects.

Keywords: Sand mining, Relative sea-level Rise (RSLR), water pollution, stock breeding, marine lives

Teacher-in-charge: Mr. M. M. A. Abrar, T/Kinniya Central College, Kinniya, Trincomalee.

Principal supervisor: Dr. V. Anavarathan[1],

Supervisor: Eng. Mohamed Suhail[1]

[1]Department of Physical Science, Faculty of Applied Science, Trincomalee Campus,

Eastern University Sri Lanka.

A preliminary study on floral sap yield determination of naturally grown Kithul palms

M.W.A. Nikethanie, H.R.N.D. Bandara, K.D. Wickramanayake
Lihiniyawa Kanista Vidylaya, Mathugama, Sri Lanka

Kithul tapping is the primary source of livelihood for many people in Lihiniyawa village. The Kithul industry has not been commercialized due to its nature: long waiting time for the first tapping, difficulty in climbing, sap yield fluctuation from palm to palm and inflorescence to inflorescence in the same palm, wrinkling the trunk by wind, rainfall, wild animals and mammals, fast natural fermentation ability that needs continuous daily treacle preparation, and manual removal of the supernatant resins during boiling. Amidst all difficulties, tappers earn a considerable income by different Kithul products. The Kithul industry is being continued from generation to generation with a set of indigenous knowledge and skills. Tappers rely on different factors as floral sap yield determinants by their experience. A seasoning mixture is applied in a grove of the inflorescence peduncle.

before starting the tapping to increase the sap yield. A commercial product, Kasper, has also been introduced to tappers for the same. However, tappers keep their trust in traditional seasoning mixtures over Kasper. According to tappers' nomenclature, female palms (expanded trunks) give a higher sap yield than the male palms (uniformly cylindrical trunks). Finding uniform Kithul palms under a similar environmental condition is impossible to prove tappers' concerns scientifically. The objective of the present study was to understand the factors that affect on floral sap yield of naturally grown Kithul palms. Five palms were separately used for two treatments (traditional seasoning mixture, Kasper) and five palms were kept as controls (no seasoning mixture). The sap yield at each tapping was measured throughout the tapping cycle, and morphological features and topological characteristics of the palms were recorded. Quantitative data were analyzed using SPSS statistical software. Using a traditional seasoning mixture was an excellent practice to obtain a significantly higher floral sap yield. Traditional mixture increased the number of harvesting days in a tapping cycle. All other studied factors were not significantly correlated with the floral sap yield. The number of palms must be increased and a uniform Kithul plantation must be used to conclude the relationship between plant characteristics and floral sap yield in future studies.

Keywords: Kithul, Seasoning mixtures, Yield determination

Teacher-in-Charge: Mrs N.K. Weerasekara, Lihiniyawa Kanista Vidyalaya, Mathugama

Principal Supervisor: Prof. Lanka Ranawaka, Department of Agricultural Biology, Faculty of Agriculture, University of Ruhuna, Sri Lanka.

Wastewater treatment using a constructed wetland at Mahamevna Buddhist College.

K.K. Sadisha Devendra
Mahamewna Buddhist College, Demalagama

The use of wetlands in wastewater treatment is a cost-effective method that is widely used all around the world. Mahamevnawa Buddhist College does not have a wastewater treatment system and discharges its' effluent to the neighbouring land. The objective of this research was to investigate the feasibility of using a vertical downflow constructed wetland for the treatment of sinks, kitchen, and bathroom wastewater from the school. A plastic barrel with 168.75 cm height and 87.5 cm diameter was used to prepare the wetland model. Plastic vases, gravel, charcoal, paddy straw, sand, and gardening soil (from bottom to top respectively) were used as the wetland medium. Small pieces of black stone covered gaps between plastic bins and a grid of 1 cm in size to prevent congestion caused by falling concrete stones. The concrete stones formed a depth of 12.7 cm. A thick layer of 10 cm charcoal covering with a net, and a layer of straw with a height of 2.5 cm, a sand layer of 7.5 cm height, and normal gravel soil forming a depth of 12.7 cm. were used to prepare the collum. The plants of Pandanus amaryllifolius roxb and canna were used to wetland plants to create local wetland field. The experiment commenced after the plants were well established in the column. The parameters analyzed are salinity (%), electrical conductivity (EC), total phosphorus (TP), dissolved oxygen (DO), chemical oxygen demand (COD), and hydrogen ion concentration (pH). While average pH, salinity, and EC of the effluent water were 6.91, 0.4 %, and 0.9, respectively and such parameters in treated water were 7.04, 0.17%, and 0.4 ms/cm, respectively. Average concentrations of DO, COD, and TP in the effluent were 5.67 mg/L, 394.7 mg/L, and 0.58 mg/L respectively, and the average concentrations in treated water were reduced to 5.33 mg/L, 170 mg/L, and 0.49 mg/L respectively. According to the water quality parameters it can be concluded that the wastewater from the school can be used after screening for agricultural purposes and the vertical wetland Model might be used to clean wastewater further to use some other purposes at school other than agriculture. It is recommended to continue this research with continuous effluent adding at a constant rate to improve the treated water quality.

Keywords: *Pandanus amaryllifolius roxb*., *Canna,* vertical wetland

Teacher-in-charge: Mr B.H. Supun Udayanga, Mahamewna Buddhist College, Demalagama

Principal Supervisor: Prof. Primali Weerasinghe, Department of Zoology and Environment Sciences, Faculty of Science, University of Kelaniya

Reducing the daily usage of electricity consumed by a refrigerator.

A.M.S.C. Abeysinghe, W.R.W.M.S.K. Bulumulla, and W.M.M.P. Weerasinghe
Mahamaya Girls' College, Kandy

Refrigerators are essential household appliances that help to preserve food and beverages by keeping them at low temperatures. However, they also consume a significant amount of electricity, which can contribute to high energy bills. In general, the power consumption of a refrigerator can vary widely depending on energy efficiency, size and capacity, age, usage patterns and other factors. However, according to the literature, the average power consumption of a refrigerator in urban Sri Lanka is around 336 kWh/y per household. Therefore, reducing power consumption by refrigerators is important for several reasons, such as lower energy bills and environmental benefits. In a household refrigerator, energy is lost mainly when the refrigerator door is opened to access the food inside. Energy loss is proportional to the time the door is kept open. Hence, the aim of this study was to minimize energy loss by using a PVC strip curtain that covers the racks which store food inside the refrigerator. The hypothesis was that these curtains would reduce the airflow between the food-storage space and the outside environment by acting as a barrier and thereby reduce the energy loss when the door is kept open. This was tested by selecting 15 refrigerators that had been used for 10 years. Their daily power consumption was monitored with and without PVC strip curtains, and the data was compared to check the validity of the hypothesis. The results clearly showed a decrease in daily power consumption when the PVC strip curtains were used. In summary, reducing power consumption in refrigerators can have significant economic benefits, the environment, and the overall quality of life. By adopting energy-saving habits and investing in energy-efficient appliances, it can reduce energy usage and other benefits it entails.

Keywords: Refrigerators, PVC Strip curtain, Watt meters, Energy efficiency.

Teacher-in-Charge: Mr Darshana Ekanayake, Mahamaya Girls' College, Kandy.

Principal Supervisor: Dr Nilushi L. Dasanayake, Senior Lecture, Department of Physics, University of Peradeniya

Conversion of a Two-Stroke Petrol Engine to operate using a mixture of bio-gas and petrol

K.A.I.C.L. Kularathna, M.A.S. Weerasuriya and S.A.K.A. Thilakarathna
KG/Dehi/ Walagamba M.V, Galapitamada

Currently fossil fuel is the major energy source for engine. Especially in a country like Sri Lanka, most of the basic income has to be spent on the imported fossil fuels. Considering reducing the fossil fuel usage, this study was designed covert a two-stroke petrol engine to operate using a mixture of bio gas and petrol as an alternative energy source for engine. Two experiments one only using bio gas as fuel source and the other one using mixture of bio gas with petrol & diesel was researched. During the research, an existing two stroke engine was modified by adding several new units such as fuel mixing unit with a T-joint mixture, cooling unit, automated fuel supply system, automated leak detection and safety system, addition of non-return valves, automatic protection system using a thermostat, etc. to operate safely using fuel mixers.

The modified two stroke engine setup was fabricated and tested for the optimum performance by varying biogas inlet valve position and biogas arrival rate. Maximum engine RPM of around 800 was noted when the biogas tap is open at 38 degrees. In addition, it was noted that when the tap is opened further, the speed of the engine decreased due to lack of air for complete combustion. According to the results, it can be concluded that an existing two stroke engine can be converted to operate effectively using fuel mixers.

Keywords: biogas, two stroke engine, fuel mixing unit, safe operation, cooling unit

Teacher-in-Charge: Mrs W.A.M. Sasanka, KG/Dehi/ Walagamba M.V, Galapitamada

Principal Supervisor: Dr (Mrs) Indrani Kularathna, Department of Mechanical Engineering, Faculty of Engineering, University of Peradeniya.

Study of LI-FI technology (Harald Haas) and the simple demonstration of the way data transmission through the LI-FI technology.

N.K.H.H. Wijewardhana
Devi Balika Vidyalaya, Colombo 08.

Li-Fi technology means Light Fidelity technology which was proposed by Harald Haas (a German Physicist). As the name suggests Li-Fi is a data transmission technique which uses illumination for sending the data or light as a medium of communication. This technology is very fast, and it can be very famous in future generation. It also cheaper than WI-FI. This study showed the usage of LI-FI technology by simple demonstration and was about LI-FI technology and the way we are data transmit.

Keywords: LIFI Technology, light, Harald Haas, WIFI, communication, LED

Teacher-in- Charge: Mrs. Chamini Chandrasekara

Principal Supervisor: Dr. A.L.A.K. Ranaweera, Department of Physics & Electronics, University of Kelaniya

Organic fertilizers vs Chemical fertilizers: What is more suitable for Agriculture?

A. Bandara, T. Kothalawala, S. Ranasinghe
St. Thomas' Girls School, Matale

Effect of inorganic and organic fertilizer on growth and yield parameters of two vegetable crops; Radish and Okra was studied. For each crop, treatment-1 was Inorganic fertilizer and treatment-2 was Organic fertilizer and the control was soil without any fertilizers. Data collected for okra are; numbers of leaves, flowers and pods, plant height at 32 days, 39 days, 46 days and 52 days after planting. Harvesting was done at 52 days after planting and pod diameter, length and weight were recorded at harvest. For radish crop, number of leaves, leaf width and leaf length were recorded in 32 days, 39 days, 46 days, and 52 days after planting. In addition, at harvest i.e 52 days after planting, the total weight of each plant was recorded. Mean, range and standard deviations were calculated for each parameter. All the parameters tested were higher in inorganic fertilized samples. Soils in agricultural lands are depleted in nutrients for crop cultivation and therefore fertilizer application is essential for proper growth and high yields, especially for short-term vegetable crops such as okra and radish. Inorganic fertilizer had a higher capacity to provide nutrients needed by both crops compared to organic fertilizer. Accordingly, okra and radish plants treated with inorganic fertilizer showed higher growth rates and higher yields compared to unfertilized soil and soils added with organic fertilizer. It can be concluded that the addition of sufficient levels of nutrients is essential for proper growth and maximum yields of vegetables; Okra and radish and inorganic fertilizer are highly efficient compared to organic fertilizer for higher growth and yields of them.

Key words: Inorganic fertilizers, organic fertilizers, Okra, Radish, Food security

Teacher-in-charge: Mr G.N. Hirimuthugoda, St. Thomas' Girls School, Matale.

Principal Supervisor: Prof. S.A.C.N. Perera, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya.

Identification of the medicinal plants in Nedunkandal GS Division in Adampan, Mannar in Sri Lanka

R. Akash, Agith and Sebastian Desman Antonio
Mn/Adampan M.M.V., Adampan, Mannar

Sri Lanka is a country with rich culture of traditional medicinal practices of Siddha, Ayurvedha, Unini and Deshiya Chikitsa. About 1400 native flora species are used for these medicinal practices across different regions. It is very important to document the local areas these flora naturally grown for the sustainable conservation of these species. The plant inventory was conducted mainly through the belt transect and $1m^2$ quadrants. The study was conducted from the November 2022 to February 2023 in the Nedungkandal DS division of the Adampan, Mannar. Plants were identified by using appropriate field guides. Prepared checklist resulted in identification of 68 medicinal plants out of total 167 plants encountered. These medicinal plants belong to 31 family groups out of 34 total families. These medicinal plants usage data was gathered from the local medical practitioners from the Siddha General Hospital Adampan. The study showed that home-grown commonly use medicinal plants were higher than the plants found in wild. This indicates that the increased knowledge on the medicinal plants were found among the community in the study area.

Keywords: Adampan, medicinal plants, Siddha, belt-transect, quadrant

Teacher-in-Charge: Mrs R. Sivapraba, Mn/Adampan M.M.V., Adampan, Mannar, Sri Lanka.

Principal Supervisor: Mr. T. Keerthanaram, University of Vavuniya, Pampaimadu, Vavuniya, Sri Lanka

Development and evaluation of Palmyrah *(Borassus flabellifer)* pulp incorporated sour dough bread

N. Fathima Rahna and S. Siyani
Mn/Adampan M.M.V., Adampan, Mannar

Palmyrah (*B.flabellifer*) tree is a common palm tree found in Northern Province (NP) of Sri Lanka which has a great potential to produce several products of economic importance. Palmyrah fruit Pulp has known to possess several health benefits as it has antioxidant and nutritional properties. People in Sr Lanka next to rice as the staple food consume bread prepared in corn flour widely. Thus, nutritional enrichment of bread is essential which may increase the nutritional status of public. Sour dough bread offers more health benefits to human enhance digestibility, lower glycemic index, better gluten sensitivity and healthy bacteria activity. Therefore, the study was focused onto formulate sour dough bread incorporated with palmyrah pulp to produce nutritionally enriched product. 180 g (T1), 200 g (T2) and 100 g (T3) of palmyrah pulp was added with the usual ingredients to prepare pulp incorporated sour dough bread. Control (T4) bread was prepared without adding the pulp. The sensory parameters such as colour, odor, taste, texture and overall acceptability of all four treatments were evaluated by 31 untrained panelists using 5-point hedonic scale. Nutritional analysis was performed for selected treatment and control in Palmyra Research Institute. There were no significant differences observed in the sensory attributes except taste among the treatments. Since other attributes were similar in all treatments, it was tested incorporating higher pulp content to bread dough in order to enrich the nutrient content of the bread. Accordingly, T2 (200g pulp added) was selected as the best and was further taken for nutritional analysis. Energy, fat, salt and ash content of T2 were measured and it was recorded to be lower than control. T2 showed high total sugar content than control. This bread has potential to commercialized as a nutritionally enriched products as it contains beneficial characteristics. Further studies are needed to reduce fat and sugar content of this palmyra pulp bread with other nutritional characteristics to recommend it as a healthy food item.

Key words: Palmyrah pulp, Sour dough bread, Sensory evaluation, Nutrient analysis.

Teacher-in-Charge: Mrs R. Sivapraba, Mn/Adampan M.M.V, Adampan, Mannar, Sri Lanka.
Principal Supervisor: Dr (Mrs) Jeyagowri Nimalan, Faculty of Applied Science, University of Vavuniya, Sri Lanka.

Supervisor: Ms Sharanke Kanagalingam, Department of Bioscience, Faculty of Applied Science, University of Vavuniya, Sri Lanka.

Increase the productivity of crop cultivation in space

R.S. Kalugalaarachchi
Ananda Sasthralaya National School, Mathugama

Recent advances in space and gravitational studies have shown that an alteration in the gravity above or below Earth's gravity produces measurable changes in biological systems. Creating low-level gravity or micro-gravity on earth is nearly impossible. But hyper-gravity or above gravity can be created by rotating horizontally to Earth's surface. Therefore, this study was designed to focus on the effects of artificial gravity on plant growth, development, and productivity improvement that can be simulated in outer space. To create artificial gravity accelerations on plant growth, a model was designed and implemented on Earth named "Gravity Accelerator". Artificial gravity can be exerted by a rotating device that makes centrifuge rotation using a powerful motor. The device was installed under laboratory conditions and allow to plant growth under different gravitational accelerations as normal gravity (T0), gravity acceleration 1.8 (T1) and gravity acceleration 2.2 (T2). Plants which were kept on ground level as an open system (T3) and closed system (T4) were considered as a control. Germinated green gram seeds (*Vigna radiata*) were placed on propagators which were connected to the Gravity Accelerator. Green gram plants were kept under experiment for about seven days of growth cycle under each gravity acceleration. Plant morphological and physiological attributes which are affected to plant growth such as plant height, root length, dry matter analysis, chlorophyll content and stomatal conductance were assessed throughout the study period. Results revealed that the invented simulation model named "Gravity Accelerator" facilitates changes in gravity accelerations that increased plant growth significantly. The hyper-gravity level that produces two times normal gravity (T2), significantly enhances morphological and physiological attributes of plant growth when compared to the other four treatments. This would explore the new avenues of crop research that can be produced in outer space. In conclusion, the study confirmed that an alteration in the gravity above the Earth's gravity increases the productivity of plant growth in outer space and under adverse conditions.

Key words: Artificial gravity, Gravity Accelerator, plant growth, productivity, outer-space.

Teacher-in-charge: Ms N.D.K Rasadari, Ananda Sasthralaya, Mathugama.

Principal Supervisor: Dr. (Mrs.) D.S.A Nakandala[1],

Technical Assistant: Mrs. N Udayakumari[1],

[1]Plant Science Department, Rubber Research Institute Sri Lanka, Agalawatta

Impact of organic fertilizer on growth and yield of green chili

K.D.N. Kavindya, D.D.R. Hansika, Y.D. Satsarani
R/EMB/Hiramadagama Maithree Maha Vidyalaya

Chili is an important economic crop in Sri Lanka which is easy to cultivate. They grow well in a shorter period and provide higher economic benefits to the farmers. Fertilizer application is essential to get a higher yield. However, many local farmers having difficulties in nutrient management as it is difficult to find chemical fertilizers in current context in Sri Lanka in low cost. Therefore, the objective of this study was to assess the organic fertilizer types that can get more yield from chili cultivation. This will allow local farmers to get high productivity from chili cultivation using organic fertilizers without using chemical fertilizers. All the chili plants were planted in red soil. Five (5) fertilizer treatments were done on 5 plants batches and their leaves and height were measured respectively. Accordingly, batch of plants that undergone treatment- 1 showed the least growth in leaves and height. The batch of plant applied treatment- 2 showed the higher growth rate compared to treatment 1. The batch of plants that applied treatment-5 showed the highest growth rate and selected as the best treatment among all. The batch of plants undergone treatment-3 showed the lower results than the treatment-5 but was better than the treatments 1 and 2. Accordingly, the treatment-5 that included chicken manure and cow dung, is the best mixture of fertilizer among the others fertilizer mixtures used in this study.

Keywords: Chili, cow dung, organic agriculture

Teacher- in-charge: Mrs M.L.P.M. Liyanage, R/EMB/Hiramadagama Maithree Maha Vidyalaya

Principal Supervisor: Dr Eranga M Wimalasiri, Department of Export Agriculture, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka.

Extending postharvest life of cut roses by cost-effective and easy method

D.D.S. Thilina Disanayaka, B.K. Ashen Malinga and K.P.N. Thatsarani
R/EMB/Hiramadagama Maithree Maha Vidyalaya, Hiramadagama

The cut flower industry has become an important player in the global floriculture export market. They are often used in vase displays, table decoration, garland preparations, bouquet preparations and various flower arrangements during religious ceremonies and social functions. The vase life or postharvest longevity of cut flowers can be depicted as the prolonged existence of cut flowers in the vase while retaining their desirable qualities and has a great importance in the cut flower industry. There are many ways to keep roses fresh. But finding an easy method to preserve roses at home is invaluable. Thus, in this study it was tested by placing cut roses in added solution of vinegar, distilled water, aspirin, Condy's crystals, ethanol and time duration that keep flowers freshness was recorded. The results indicated that the roses kept in ethanol solution, stayed in good quality for about 8 days recording the longest duration compared to other solutions used for the experiment. The other three solutions namely Aspirin, Condy's, and vinegar stayed in fresh condition for about 6 days. Distilled water showed the least shelf life recording only 5 days.

Keywords: rose, shelf life of flowers, Condy's, Ethanol, vinegar, aspirin

Teacher-in-Charge: Mrs M.L.P.M. Liyanage, R/EMB/Hiramadagama M.M. Vidyalaya, Hiramadagama

Principal Supervisor: Mr Adithya Padmaperuma, Facalty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka.

Evaluating the effectiveness of a new organic fertilizer with Thumbergia Plant *(Thunbergia grandiflora)*.

H.B. Supun Sandakalum
R/EMB/ Hiramadagama Maithree Maha Vidyalaya, Hiramadagama

One of the largest genera of the Acanthaceae family of flowering plants is Thunbergia grandiflora, a genus of perennial twining climbers (vines) that is found mostly in tropical regions including Sri Lanka. Demand for Thumbergia is high in Sri Lanka both for the local and export market. Therefore, it appears to be an attractive income source for people. However, with soaring chemical fertilizer prices, the cost of production continues to go up, resulting in lower profits for businesses. Therefore, a cost-effective alternative has become a desperate need to keep up the business with Thumbergia. Also, there are environmental and health concerns regarding the application of synthetic chemical fertilizers. Therefore, this research has focused on formulating a cost effective locally made natural fertilizer for Thumbergia. So, the main objective was to evaluate the new fertilizer as a successful alternative to replace the chemical fertilizers currently in use. A natural fertilizer made using locally available raw materials was tested against the standard synthetic chemical fertilizer package recommended by the Agriculture Department. It was evident that the new natural fertilizer is the best in terms of producing leaves, while control has induced the height (length) of the plants. Results further indicated that there is no difference between the recommended chemical fertilizer and the new locally made natural fertilizer in terms of the overall growth of Thumbergia. Thus, a new natural fertilizer appears to be a better cost-effective and eco-friendly alternative to synthetic chemical fertilizers when growing Thambergia as a business.

Keywords: Thambergia, natural fertilizer,

Teacher-in-Charge: Mrs M.L.P.M. Liyanage, R/EMB/Hiramadagama M.M. Vidyalaya, Hiramadagama

Principal Supervisor: Prof. P.I. Yapa, Departament of Export Agriculture, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka.

Enhance Anthurium production using organic substrates.

E.V.A. Imalsha, S.M. Dilakshi, H.V. Kavindya.
R/Emb Hiramadagama Maithree Maha Vidyalaya

Anthurium is an economic crop, that can be easily managed compared to other flower cultivations in the country. For Anthurium culture, several growing media have been in use, but they have their own benefits and drawbacks. Therefore, this study was conducted to identify the most suitable fertilizer mixture of organic and chemical fertilizers for Anthurium cultivation. This will be an effective solution to address the issues of shortage of chemical fertilizers use in floriculture practices in the country and their high cost. Thus, finding the most appropriate combination ratio of these two types of fertilizers was investigated in this study. To find out the most effective combination, five different fertilizer mixtures were tested in this study. For combination 5g of super posca elder fertilizer was used as chemical fertilizer while 100 ml of organic liquid fertilizer was used as organic fertilizer. 500g of organic fertilizer was prepared in a pot and soaked in 5L of water for 12 hours to make organic liquid fertilizer. After application these fertilizer to 05 anthurium plots, during the first month (6^{th} March -6^{th} February) only group III flowerbeds flowered. In the second month (6^{th} February - 6^{th} March) in group III, the first flower bloomed in the same plant, and the same plant produced two flowers subsequently. Further, two other plants in the same plot (group III) also bloomed. In the second month itself, two new flowers appeared in two plants in group III and a one flower appeared in group V. On March 6, 05 flowers bloomed further in group III plot, one (01) flower in group I and 01 flower in group V also were detected. The final analysis showed that the use of combination of organic and chemical fertilizer is the appropriate type of fertilizer to use for Anthurium cultivation and the most productive combination is the 50:50 ratio of mixture of the two types of fertilizer.

Key word: Floriculture, Anthurium cultivation, organic agriculture

Teacher in Charge: Ms M.L.P.M. Liyanage.

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Preparation of curry cube with natural ingredients.

M.R. Atheeya
Muslim Ladies College, Colombo-04

Curry cube is a moist blend of ground spices and other seasonings. But if a curry cube contains artificial additives and preservatives, it leads to harmful diseases. Therefore, the present study is planned to prepare a curry cube with natural ingredients which can enhance functional properties of the product while imparting health benefits. Its uniqueness is the incorporation of black cumin seed (*Nigella sativa)* which acts as the main preservatory constituent in the product. The curry cube samples were prepared by using different levels of raw materials according to the Taguchi L_8 array and a sensory evaluation was carried out to select the most acceptable sample based on its organoleptic properties including appearance, aroma, texture, taste, after taste and overall acceptability. Proximate analysis was done to the most acceptable sample to determine the moisture, ash, fiber, protein, fat and carbohydrate contents of the sample and shelf life of the product was evaluated. This can deduce that the formulated curry powder cube has acceptable organoleptic characteristics, high nutritional value and enhanced therapeutic properties.

Keywords: Artificial preservative and additives, raw materials, black cumin (*Nigella sativa*)

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Principle supervisor/ Supervisor: Prof. M.A. Jagath Wansapala, Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayawardenapura

Research on breakfast consumption Yasodara Devi Balika Vidyalaya Gampaha

K.D.T. Nimthara Wijesooriya, M.A Methya Siriwardhna, P. Senuthi Pudanima
Yasodara Devi Balika Vidyalaya , Gampaha

The breakfast is the most important meal of the day. The aim of this research was to find out whether there is a relationship between breakfast and nutritional status by using a selected group of students in the school. The Google form was prepared and administered on the school students and information was obtained. According to the obtained data, only 30% of the selected sample skips breakfast and 70.5% of the students who have breakfast, take rice while 60% of them get their food from home. About 10% of students who skip breakfast show conditions such as overweight, visual impairment, and frequent constipation.

Keywords: overweight students, visual impairment, frequent constipation.

Teacher in Charge: Mrs. E.K.P Dhammika Edirisinghe, Yasodara Devi Balika Vidyalaya, Gampaha

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Creating awareness among school students on the correct use of mobility assistive devices in Sri Lanka.

W. M.S.T. Weerasinghe, L.L.O.S. Liyanage, L.L.O.W. Liyanage
Kg/Dehi/ Rajasinghe Central Collage, Ruwanwella

Mobility assistive devices enable persons with disabilities to achieve personal mobility, and access to these devices is a precondition for developing equal opportunities, enjoying human rights, and living in dignity. Correct use of mobility assistive devices improves mobility while incorrect use increases the disability further. It has been shown that most mobility assistive device users apply incorrect techniques due to a lack of knowledge on correct use of the equipment. Therefore, it has been suggested to improve the knowledge, attitude and practice of common society through school students on correct usage of mobility assistive devices application techniques. However, the existing knowledge on correct use of these equipment was not investigated among school students or public to use them to create awareness. Thus,

a cross-sectional descriptive study was conducted among 101 students of Rajasinghe Central College, Ruwanwella, Sri Lanka. A self-administered, pre-tested questionnaire was administered on the participants to get the information. Data were analyzed using SPSS statistical software package. The chi-square test is used to identify the variations of knowledge, attitude, and practice regarding the correct use of mobility assistive devices concerning age and gender. According to the results obtained, 45.5% (n=72) had a poor average level of knowledge and practice while 54.4% among the participants have the knowledge on correct use of mobility assistive devices. However, the level of attitude toward the correct use of mobility assistive devices was found to be good in 63.3% (n=85) and more than 80% of participants (n=85) were willing to learn about the correct use of mobility assistive devices in future. Thus this study showed that the students have poor knowledge and practice on assistive equipment but a good attitude and trend to learn and practice in the future. Further, awareness programs to improve knowledge and practice can be implemented. This study will motivate future research nationwide to be conducted regarding the correct use of all types of assistive devices.

Keywords: mobility assistive devices, school students, disability, elderly

Teacher-in-Charge: Mr. A.P.N.M. Wickramasinghe, Kg/Dehi/ Rajasinghe Central College, Ruwanwella

Principal Supervisor: Dr. K.R.M. Chandrathilaka, Department of Allied Health Sciences Faculty of Medicine, University of Colombo

A primary investigation on the impact of smart devices usage among school education

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R/ Sivali Central College, Ratnapura

Using smart devices (SmDs) for educational purposes can open a world of knowledge and creativity and at the same time it is important to use SmDs wisely and responsibly to enhance learning and growth of school student. According to several studies it has been shown that Sri Lankan school students expose to SmDs very often. This study aims to investigate the relationship between SmDs usage and academic success and perform descriptive analysis on factors determining SmDs usage among school children. In addition to that we investigated the physical discomforts occurred due to prolonged usage of SmDs. Our study population was school students in Rathnapura District, and we choose grade 7,8 and 9 students (n=175) from two government schools as our target group. We use questionnaire-based approach to collect relevant data from students and we use Microsoft Excel and SPSS (v26) to analyze our data. According to the results, we found that, there is no significant relationship between student academic success and SmDs usage ($p>0.05$). Moreover, we identified that there is a considerable physical discomforts (37%) present among our study participants which are believed to be occurred due to prolonged usage of SmDs. Overall, it can be concluded that academic success of school children does not show any significant relationship with their smart device usage and more guidance and monitoring towards school students SmDs usage is needful.

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Keywords: Smart Devices, Questionnaire, Academic success

Teacher in-charge: Mrs M.A.W. Samanmali, R/ Sivali Central College, Ratnapura

Principal Supervisor: Dr. Amal Wageesha, Senior Lecturer in Biochemistry, Faculty of Medicine, Sabaragamuwa University of Sri Lanka.

Investigation of anti-cancer activity of bioactive compounds present on plants in Sri Lanka for estradiol synthesis pathway associated with breast cancer via in-silico approach.

M.S.C.S. Fernando
St. Joseph Vaz College, Wennappuwa.

Breast cancer is the most common cancer in females worldwide, occurring 100 times more frequently in women than men. According to registry data, approximately 3000 new breast cancer cases are diagnosed yearly in Sri Lanka, and the rate is constantly on the rise. A high proportion of breast cancers are hormone-dependent, and it is revealed that estradiol, an active estrogen, is a main factor that plays a key role in the initiation and progression of breast cancer. Aromatase, Estrone Sulfatase and 17β-hydroxysteroid dehydrogenase type-1 (17β-HSD1), that have become major therapeutic interests in novel drug discovery for hormone-dependent breast cancer since they are involved in the biosynthesis of estradiol, were selected as the target enzymes. Sri Lanka is considered one of the most biologically diverse countries in Asia, which has a rich history of a well-developed traditional system of medicine known as 'Indigenous medicine', which uses extracts of many plants, including those which are native and endemic to the country, as treatments for several diseases. Many phytochemicals are found in medicinal plants, which are believed to have minimum toxicity as they have a long history of human utilization. The structures of 200 compounds in endemic plants of Sri Lanka were retrieved from the Sri Lankan Flora database and subjected to virtual screening against the selected enzyme targets to find compounds that can act as the most potent inhibitors. The database of compounds was shortlisted based on two-dimensional similarity for already found inhibitors for enzyme targets, and their drug-like properties and toxicity were assessed using the QikProp model. The shortlisted compounds were subjected to Standard Precision docking, Extra Precision docking and MM-GBSA binding free energy calculations. The results suggested that Methyl-2,4-dihydroxybenzoate and Scopoletin could act as potential inhibitors for Estrone Sulfatase; Cycloartocarpin could act as a potential inhibitor for Aromatase; Ajamalcinine could act as a potential inhibitor for 17β-HSD1, out of the screened compound database. These compounds can be taken for further *in-silico* and *in-vitro* studies and subsequently used as possible therapeutic agents for hormone-dependent breast cancer.

Keywords: Breast cancer, Estradiol, Aromatase, Estrone Sulfatase, 17β-hydroxysteroid dehydrogenase type-1, MM-GBSA

Teacher in Charge:Mrs. B. L. C. L. Balasuriya, St. Joseph Vaz College, Wennappuwa.

Principal Supervisor: Prof. R. Senthilnithy[1] **Supervisor**: Mr. R. Dushanan[1]

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Impact factors associated with usage of digital media devices for neck pain-related disability (NPRD)

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Musculoskeletal pain is an important disease and a predominant condition among School students in childhood and adolescence ages with various risk factors contributing to their development. Long-term use of digital media devices may lead to neck pain-related disability (NPRD) including pain and discomfort. These neck pain-related disabilities may badly affect the learning process of the students. Therefore, it is very important to investigate usage of digital media, among school students in Sri Lanka, which has not been studied. Therefore, the purpose of this was to identify the prevalence of NPRD that occurred due to the usage of various type of digital media devices. The usage of digital devices referred to the total time spent daily using various type of digital devices.

The method included a cross-sectional descriptive study conducted among 300 students of Dehiowita National School, Sri Lanka. Neck Disability Index (NDI) was used to score neck pain-related disability. Data were analyzed using SPSS statistical software package. The results indicated that the 53. 3% of students had any type of neck pain-related disability. The age of students, total time spent daily using digital devises, and there type was investigated. The analysis showed significantly impact. NPRD, ($P<0.01$) and 24.00% of mobile phone users complained of mild NPRD while 9.67 moderate and 5.33% severe neck pain-related disabilities respectively. The type of digital device and total time spent daily using the digital device showed significant ($P<0.05$) impact on headaches. Thus, the analysis concluded that more than 50% of Sri Lankan students had any type of NPRD which has a numerous impact on their daily activities and living. Further.it can be affected the students' participation and studying disabilities. There was a positive relationship between the frequency and type of digital devices used with neck NPRD including headaches. Therefore, we recommend establishing a national-level committee to prevent neck pain-related disabilities due to excessive and incorrect use of digital devices among students in Sri Lanka.

Keywords: Neck pain, Disability, Students, digital media, Mobile Phone, headaches.

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Principal Supervisor: Dr. Sujeewa Weerasinghe, Physio Life Care (Sri Lanka), University of Colombo.

Investigating the effectiveness of various storage settings to reduce the microbial growth on toothbrushes.

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Musaeus College, Colombo 7

Toothbrushes are identified as a medium which provides conducive space for the growth of micro-organisms. Research has shown that bacteria which thrive on toothbrushes may be transmitted to the individual causing diseases. This study was conducted in order to identify the best storage setting for a toothbrush to reduce the microbial growth. A common flora present in the oral cavity (*Streptococcus viridans*) was applied onto toothbrushes. Then the brushes were stored in three surfaces as ceramic, wood and stainless steel with bristles facing up or sidewise in an unventilated or ventilated condition in a horizontal or vertical orientation. Three brushes were kept per setting to average the colony count per setting. After brushes were stored in the storage settings for a period of 6 hours they were recovered and introduced into saline solutions. Solutions were centrifuged and cultured on blood agar culture plates and were placed in an incubator for 48 hours in anerobic condition. The colonies present on the plates were counted using a colony counter. The average growth of microbes per setting was found by analyzing the data obtained. It can be identified that the best storage method of toothbrushes would be in a well-ventilated environment in an upright positing without the bristles touching any surface. However, if kept horizontally the best storage setting for the toothbrush would be on a stainless-steel surface with bristles facing upwards in a ventilated condition.

Key words: Toothbrush contamination, microbial growth, storage methods, *Streptococcus viridans*

Teacher In charge: Mrs Lochana Mahawatta, Musaeus College, Colombo 7

Principal Supervisor: Dr. Thushari Dissanayake, Head of Department of Microbiology, University of Sri Jayawardenapura.

Evaluation of antidiabetic activity of flowers of Ranawara *(Cassia auriculata L.)* in high glucose-induced Zebrafish Embryos

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Thurstan College, Colombo 07

Diabetes mellitus (DM) is a chronic metabolic disease characterized by elevated blood glucose levels. With an estimated 540 million cases, it is considered a global pandemic. Management of diabetes involves insulin therapy, synthetic drugs, and lifestyle management. However, most synthetic drugs are expensive and associated with side effects. Hence, herbal medicine provides a promising alternative.

Ranawara flowers (*Cassia auriculata* L.) are a traditionally claimed remedy against diabetes. Recently, zebrafish disease models are being used for drug testing due to genetic, anatomical, and physiological similarities to humans. Hence, the present study for the first time intended to validate the traditional claim of *C. auriculata* as an antidiabetic remedy using the zebrafish diabetic model.

Three types of extracts; aqueous, ethanol, and hexane extracts were prepared from *C. auriculata* flowers according to the standard protocols. The lethal concentration 50 (LC_{50}) of three extracts was tested using the zebrafish embryo toxicity model adhering to the OECD guideline no. 236. The antidiabetic activity of *C. auriculata* flower extract was investigated by measuring the glucose levels of zebrafish embryo lysate treated with 0.1% D- glucose and without treatment at 24, 48, and 72 hpf. Further, the aspect ratios of the eyes of zebrafish of the above were measured to investigate the effect of *C. auriculata* flower extract on diabetic retinopathy.

Both n-hexane and ethanol extract exhibited significant antidiabetic activity in both 0.1% D-glucose-induced and non-induced assays. n-Hexane (0.5 g/L) extract of C. auriculata flowers showed a 26% ($p<0.05$) and 42% ($p<0.05$) decrease in glucose concentration of zebrafish embryos compared to normal control (distilled water) and 0.1% D-glucose treated embryos respectively. Similarly, ethanol extract (0.5 g/L) exhibited a 28% ($p<0.05$) and 25% ($p<0.05$) decrease in glucose concentration of zebrafish embryos compared to normal control and 0.1% D-glucose treated embryos respectively. However, the aspect ratio of the eyes of zebrafish was not significantly altered by *C. auriculata* flower extract. Thus, indicate that *C. auriculata* flowers may not have a significant impact on diabetic retinopathy.

In conclusion, the present study establishes the ethanolic and n-hexane extracts of *C. auriculata* flowers produced significant antidiabetic activity in the zebrafish embryo diabetic model. Thus, validates the traditional claim of the anti-diabetic potency of *C. auriculata*. It is warranted that a detailed phytochemical analysis should be performed to investigate the phytochemicals responsible for the antidiabetic activity of C. auriculata.

Keywords: *Cassia auriculata,* diabetes mellitus, D-glucose, embryos, zebrafish

Teacher-in-Charge: Mrs. Upeksha Abeysekara , Thurstan College, Colombo 7

Principal Supervisor: Dr. C.D. Jayasinghe, Department of Zoology, The Open University of Sri Lanka, Nawala, Nugegoda

Investigating the use of plants as natural insect repellents in preserving grains

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Insect damage on stored grains have been a common and unavoidable problem. Insects such as weevils, beetles, and moths are responsible in damaging stored grains and thereby it affects the quality and quantity of grains leading to huge financial losses. Therefore, the use of effective pest controlling strategies to prevent insect infestation and preserving the quality and safety of stored grains are important. However, the use of synthetic pesticides in grain preservation has raised concerns in human health and environmental impacts. Hence, the aim of this research is to explore natural alternatives that are effective in repelling insects and preserving grains. In this study weevils were used as the insects and the insect repellent ability of the several plants leaves, namely cinnamon, marigold and, nutmeg was determined. Experimental setup was built into incorporate one side contains grains with preservatives while other side keeping as the control (only the gains without preservatives). Two sides were interconnected trough a rubber tubing which allows weevils to move freely between two sides. Insect repellent ability of the fresh, dry and the aqueous extracts of the cinnamon, marigold and nutmeg leaves were investigated by observing the as a percentage of the damage occurred respectively in three grain types, rice, green gram and cowpea. During the preliminary study on average, the application of fresh, dry and the aqueous extracts of cinnamon, marigold, and nutmeg leaves as the preservatives, indicated a comparatively lower insect damage than the control samples. However, fungal formations were observed in all most all the experimental setups regardless of whether there is a preservative or not. Comparatively, the fungal formation was lower when dry leaves were used. Thus, to reduce the fungal damage and to achieve a quality preservation, further studies are currently in progress using dry leaves of cinnamon, marigold, and nutmeg alone and as combinations. Besides, further studies are recommended to study the effect of these natural herbs on the organoleptic properties of the grains. Moreover, the fresh and aqueous extracts of the leaves could apply when storing grains in spacious environments. However, further studies on this regard are needed.

Keywords: grain storage; insects repellent, insect damage in grain storage

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Principal Supervisor: Dr W.M. Mithila D. Bandara, Department of Food Technology, Faculty of Technology, Rajarata University of Sri Lanka, Mihinthale

Supervisor: Dr. A. R. M. H. A. Rathnayake, Department of Food Technology, Faculty of Technology,

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Floristic diversity of Galviharaya Sanctuary in Polonnaruwa Sri Lanka

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The Galviharaya and originally named as 'Uththararama' is a temple situated in the ancient city of Polonnaruwa. Further, Galviharaya is declared as a sanctuary. However, there has been a forest destruction ongoing in the reservation area and no authorities taking action to prevent the destruction taking place. Thus, this study was conducted to record the structure and composition of the flora of Galviharaya Sanctuary. The study mainly aims to reveal the floristic composition and structure in quantitative and qualitative manners, in order to identify the present status of the Galviharaya sanctuary and to propose the conservation measures to mitigate the problems encountered. The objectives are to study the floristic diversity of trees, shrubs, and herbaceous flora. Two types of vegetation were selected from sanctuary namely, dense woody vegetation with less undergrowth, moderately dense vegetation with visible understory. Two sites were compared by using vegetation sampling and analyzing methods such as density of floristic elements, size class distribution of trees, Importance Value Index (IVI) of woody perennials and diversity indices of the sites. To study vegetation, fifteen 10m*10m quadratic plots were established randomly from each vegetation type. The entire woody perennial flora within each plot were identified, counted, and recorded. GBH was measured by using a sewing tape in all the trees recorded above. In order to avoid accidental errors in recording, battement method was followed to locate flora within each plot. The DBH class distribution of Galviharaya shows a significance decline in plant diversity and diversity index. There is a significant difference in the selected open canopy site and the closed canopy site. This problem is highly highlighted in both of these selected sections. This could be due to human influence or something else. However, its conservation is the responsibility of the departments that look after this sanctuary. Further investigation needed to find out the reason for this and to reduce its occurrence.

Keywords: Diversity indices, Vegetation, Flora, Woody perennials, Conservation, GBH

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Effect of cattle urine on growth and yield of Chili *(Capsicum annum L.)*

W.W.S.R. Waduge, N.M.S.T. Herath
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Since the green revolution, the indiscriminate use of agrochemicals has had a negative impact on the environmental system, crop yield, soil fertility, and produce quality. Given these circumstances, it is imperative to implement eco-friendly agricultural practices to produce food while taking the sustainability of the soil and environment into consideration. One such low-cost agricultural technique is the use of cow urine as a fertilizer. With that background the aim of the research was to study the effect of cattle urine on growth and yield of Chili plants. The treatments were 20% cattle urine (T1), 30% cattle urine (T2), 40% cattle urine (T3), 50% cattle urine (T4), 0 % cattle urine (T5) and fertilizer recommendation given by Department of Agriculture (T6). The treatments were applied weekly interval (except department recommendation.

n) and data was recorded. The results showed that there is no significant difference between cattle urine and fertilized recommendation by the Department of Agriculture for the considered growth parameters; Plant height, number of leaves, number of branches, number of flowers, number of pods and pest incidences at 95% significance level. But a comparative difference was observed in T3 and T4. So further study should be carried out with these two concentrations. With the results obtained from this, we can recommend that the cattle urine can be used as an organic supplement or fertilizer for the chili cultivation.

Keywords: cattle urine, Chili, growth parameters, yield

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Potential of Lemongrass *(Cymbopogon citratus)* leaf extracts as a natural fungicide against anthracnose in banana fruit.

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Sirimavo Bandaranaike Vidyalaya, Colombo 07

Anthracnose is one of the most common post-harvest diseases that affect fruits and vegetables in Sri Lanka caused by a *Colletotrichum spp*.. Bananas are mostly affected with anthracnose disease causing high postharvest losses. However, bananas have a high production rate as well as a high consumer demand and a considerable number of bananas circulate in export and import markets. Due to these circumstances, studies on minimizing post-harvest losses of bananas are very important.

Initially, the causative fungus was isolated from a *Musa* spp. (Ambul banana) infected with anthracnose disease. Pure cultures of isolate were prepared, and it was identified as *Colletotrichum musae*, based on morphological characters and by comparing with published keys and guides. The antifungal activity of lemongrass (*Cymbopogon citratus*) water extract was tested against *C. musae* based on the inhibition in mycelial growth and spore germination of the pathogen on PDA media using "poison food technique". *In vitro* tests were done using different volumes of lemongrass. Based on the inhibition of the growth of pathogen, minimum inhibitory concentration (MIC) was determined as 40-53% of lemongrass extract. Accordingly, field experiment was conducted by spraying the lemongrass water extracts of 40%, 53% and 67% to freshly harvested Ambul bananas. As per the results, all the treatments (lemongrass water extracts) were successful in controlling anthracnose in banana. The banana treated with only water (control) showed anthracnose disease symptoms after few days. Therefore, this can be used as a natural fungicide to control anthracnose in bananas. Further, the sensory evaluation conducted proved that the treatment of the lemongrass water extract had no effect on sensory attributes of banana. Thereby, this treatment can be introduced to farmers as a user friendly, low cost and easy to prepare natural fungicide to prevent the post-harvest losses in Ambul bananas due to anthracnose disease.

Key words: *Cymbopogon citratus*, *Colletotrichum musae*, Poison food technique, sensory evaluation.

Teacher in-Charge: Mrs. K.H.B.B. Jayasekera, Sirimavo Bandaranaike Vidyalaya, Colombo 07.

Principal supervisor: Dr. Surani Ediriweera, Department of Plant Sciences, University of Colombo, Colombo.

Eco – friendly growth mat for cultivation of crops on water.

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Harischandra National School, Negombo

With the rapid increase of human population over the years, the demand for food have also increased exponentially. However, availability and quality of lands for agriculture purposes has been impacted by various factors such as urbanization and desertification. As a result, hydroponics has emerged as an alternative form of horticulture where crops can be grown without soil. This method still needs space as well as a controlled environment. Therefore, this study focused on to prepare a growth mat which can be used to grow crops on normal water bodies. It had made in an environmentally friendly and non-harming manner with technique of growing plants using water based nutrient solution without using soil aggregate substrate or growing media. Thus, this layer prepared has become a part of plants like coir and vermicompost etc.. The ingredients used to make these mats are coir, guinea grass (Megathyrsus maximus), and bamboo (cone tree). All these three raw materials were pressed using coconut pressing factory machine and made it like a layer. A one mat prepared consisted of 850g of raw materials. By growing plants on this layer and turning it to float on water make it possible to cultivate in less space without causing environmental pollution.

Keywords: growth mat, growing crop on water

Teacher in charge: Mrs. A.T.N. Munasinghe, Harischandra National School, Negombo

Principal Supervisor: Dr. D.M.P.S Dissanayake, Assistant Director of Agriculture Soil and Plant Nutrition Division, Sustainable Agriculture Research and Development Center (Research), Makandura, Gonawila (NWP)

Development of instant vegetable soup sashay.

K.B. Nimhara
Harischandra National College, Negambo

Chronic Kidney Disease (CKD) is a major non-communicable disease in Sri Lanka. There are more than 150,000 CKD patients in the country especially in the North Central Province. The diet of a CKD patient is an important thing to reduce the risk of kidney failure or end-stage renal disease (ESRD) requiring dialysis. A CKD patient should consume potassium (K) and sodium (Na) lower than 2000 mg per day and phosphorus (P) lower than 1000 mg per day. In the current scenario of food processing industry, there are very limited number of foods that contain low K, Na, and P. Therefore, the objective of the present study was to develop an instant vegetable soup cube, which has low K, Na, and P to be able to consume by CKD patients.

Vegetables including carrots, cabbage, leeks, beans, okra, cauliflower, garlic, onion and purple yam flour and kaluheenati traditional rice flour were used as the main ingredients. As an herb we used 'Muda Mahana' plant. The final product contained 4.96% of crude protein and 28.36% of fiber, 3.71% of Ash, 2.6% of crude fat, 6.45% of moisture and 53.92% of carbohydrates. Thus, this developed instant vegetable soup cube provides all the necessary nutrients to CKD patients while keeping the Na and K intake at a minimum level recommended.

Keywords: Chronic, kidney, disease, soup cube, healthy, minerals

Teacher-in-Charge: Ms. A.T.N. Munasinghe, Harischandra National College, Negambo

Principal Supervisor: Prof. C.V.L. Jayasinghe, Department of Food Science and Technology, Faculty of Livestock, Fisheries, and Nutrition, Wayamba University of Sri Lanka

Evaluation of field level efficacy of *Mikania micrantha* solvent extracts against aphids in brinjal crop and preliminary study for commercialization.

A.Y.B Weerakoon
Dharmaraja College, Kandy

The study was conducted to find the efficacy M. micrantha extract to be used to control aphids in brinjal crop. M. micrantha is a fast-growing weed, native to Central and South America. It has vastly spread in the agricultural lands in Sri Lanka. This study used both fresh leaves and dried leaves extracts along with 30% dilutions as treatments. Our study proved that M. micrantha fresh leaf extract can be successfully used to control aphid population in brinjal. In our potted plant experiment, on the fourth day after treatment (FLE), the aphids was abstained by the fresh leave extract ($P< 0.05$) and this recorded as the best treatment. Based on the potted plant experiments, we selected FLE as the best treatment to control aphids. The aphid survival and the total number of aphids produced were significantly lower ($P< 0.05$) over the observed period on FLE treated plants. The field trial also provided us promising results which showed that FLE can be used to control aphid population in brinjal crop. According to our experiment, FLE can be stored up to 3 weeks both refrigerated or under room temperature without losing its ability to control aphids. Further, the direct contact of M. micrantha leaf extract on honeybees didn't show an effect on honeybee mortality up to 72 hours. Through this research, it is evident that M. micrantha leaf extracts can be used to control aphids in brinjal with little or no effect on the environment and beneficial insects. Therefore, future studies are required to quantify the effect on natural enemies and to increase the insecticidal effect of M. micrantha leaf extracts.

Keywords: *M. micrantha* extracts, aphids, brinjal crop pests

Teacher in charge: Mrs. W.M.T.S. Wijesundara, Dharmaraja College, Kandy

Principal Supervisor: Dr. Wikum Jayasinghe, Department of Agricultural Biology, Faculty ofAgriculture, University of Peradeniya, Peradeniya.

Development of different coloured butterfly pea flower *(Clitoria ternatea)* tea products

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Butterfly pea flower is a flower in the legume family which is native to Asia. Scientific name of Butterfly pea flower is *Clitoria ternatea*. The flowers can be brewed into an herbal tea and known to have medicinal value in indigenous medical system in the country. Some studies show that butterfly pea flowers help to ensure skin and hair health, promote weight loss, and reduce blood sugar levels. It has antioxidants properties which help to cure a lot of diseases. Though, there are a lot of pea flower tea in the world, there are not any pea flower drinks available in Sri Lanka. Therefore, this study focused on developing pea flower tea products with different colors tea products.

As the first pea flowers were collected and prepared them to dry. The best temperature that moisture level can be reduced to 8-10% was recorded. The physio-chemical properties such as moisture was evaluated. Different quantities of lemon extract were mixed in different ratios to change the pH value, resulting in a colour change in the pea flower as well as resulting in a change of flavor. The antioxidants of the pea flower and its antioxidant activities of the product were measured. Evaluation of sensory properties of pea flowers was done by using a sensory panel at the faculty of technological studies. Statistical analysis was carried out on the results obtained in the sensory level study.

Keywords: *Clitoria ternatea,* antioxidant, pea flower, pea flower drink

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Assistant Supervisor: Dr. Kaushalya Abeysekara

Study the production of ecofriendly degradable film from extract of *Pontedeia crassipes* pure powder with gelatin mixed.

Medini Thrishala Thudahewage.
St. Paul's Girls' School Milagiriya, Colombo 5

Plastics are thrown by humans which are harmful to the environment. As result, they cause adverse impact to the environment such as, killing animals, water, and soil pollution. Further, burned plastics release toxic materials that cause air pollution. In Colombo and all areas of Sri Lanka, plastic disposal is very excessive and often not properly cleaned causing negative consequences for both humans as well as animals. Thus, this study was focused on developing Bio plastics with natural extract from *Pontederia crassipes* as a favorable component to produce eco-friendly films. The bioplastics films were made only with gelatine *and* with different concentrations of the *P. crassipes* to investigate the best possible bio plastic material. The results indicated that the films made only with gelatin (pH 5, maximum tensile strength of 1.12 MPa and maximum elongation at break 426%) tend to spoil quicker than the films made with *P. crassipes* extract. This plastic wrap demonstrated a maximum tensile strength of 15 MPa and a maximum elongation at break of 500%. Further, a test was conducted to find out the time taken to spoil different food materials wrap in *P. crassipes* plastic film. Accordingly, meat and apple were wrap in two types of films-one made with *P. crassipes* extract and another made with turmeric extract. The apple placed in the *P. crassipes* film did not spoil for two weeks, and there was no color change observed in either film. Even after two weeks, the meat did not emit any foul smell or contain worms. However, after two weeks, the meat wrapped in both *P. crassipes* and turmeric films had spoiled. The use of plant parts mixed with gelatin-based mixtures, such as *P. crassipes*, is a better solution for plastic materials. Since *P. crassipes* is one of the most invasive plants in Sri Lanka using it in productive manner in manufacturing bio plastics will be added advantage. In addition, this also will make a best replacement for the use of other environment friendly plant materials in bio plastic production industry.

Key words: excessively, consequences.

Principal Supervisor: Dr T.M. Sampath U. Gunathilake, Department of Polymer Science, Faculty of Applied Science University of Sri Jayewardenepura, Colombo.

Teacher in charge: Mr. D.B. Nayana Kumara

Determination of the responsiveness of the household community in matara district to the economic crisis of the country.

S.D. Ruhunage
Sujatha Vidyalaya, Matara

Sri Lanka is facing the worst economic crisis in the history. The effect of economic crisis on household community and suggestions to overcome the situation from affected community are useful for policy makers. Therefore, this research was conducted to determine the effect of economic crisis on the household community in Matara district Sri Lanka from September 2022 to March 2023. A questionnaire survey was conducted using 53 selected people of 10 divisional secretariat areas of Matara district. Convenience sampling technique was used for the purpose. Respondents were both males and females who represented different income levels and professions. According to the responses received, economic crisis had affected for loss of jobs, high prices of commodities, scarcity of fuel and increased electricity bill. Income was reduced in 35.84% respondents who were employed as labourers, sellers, and people in construction sector mainly. Income had not been changed during the crisis in 56.6% of respondents who mainly do a permanent job while income increased in 7.54% of respondents who mainly involve in tourism industry. Effect of economic crisis on lifestyle of respondents was determined and it was reported that 60.37% moved to use firewood as an alternative gas due to price increase and scarcity. 60.15% reduce the consumption of food who have sacrificed fish, eggs, fruits, dairy products and bakery products at different levels. Use of public transport, foot bicycle and travel by foot are the drastic changes adopted by 66.03% people as an alternative mode of transport. Sole use of own vehicle was preferred for efficiency of travel by 26.41%. Respondents suggested to increase local production of commodities, economical use of electricity, promotion of exports, increasing the foreign employment opportunities and to reduce unnecessary consumption, to overcome the situation.

Keywords: Economic crisis, household community, income, lifestyle changes, suggestions

Teacher in Charge: Mrs. N. Dissanayake, Sujatha Vidyalaya, Matara

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Chemical analysis and the importance of Chinese water chestnut *(Eleocharis dulcis)*.

A.D. Kuruppu
Rathnavali Girls' College, Gampaha

The Chinese water chestnut (*Eleocharis dulcis*) is a stem vegetable crop, which grows in water and is commonly used in Asian foods. The plants are grown in paddy fields often as a substitute crop for rice and the edible part is the tuber. Although it is a considerably popular root vegetable in China, Thailand, and Indonesia, most of the people in Sri Lanka have no proper idea about the importance of this plant. Therefore, this study was carried out to determine the importance and chemical components of the Chinese water chestnut plant. The plant specimens were collected from marshy lands located in Bemmullla, Asgiriya, Kurunegala, Horana, and Baththaramulla areas. The collected plants were cleaned, and herbarium specimens of plants were prepared according to standard procedures. The prepared plant specimens were identified for the species level. The morphological features were recorded. People in the sampling areas were interviewed on their knowledge of the plant. Further, the chemical analysis was done according to standard procedures. The plant was identified as *Eleocharis dulcis* as per the authentication of the National Herbarium, Peradeniya, Sri Lanka. As per the morphological features, it has a tuft of many slenderly tubular stems, which are 60-75 cm high, and deeply green hollow inside. Leaves are reduced to pale or purple-brown sheaths surrounding the base of the stem. At the apices of some stems, small flowers are borne in cylindrical spikes. The base of plants produces slender, elongated, underground runners, and very tiny tubers (8 -10 mm) were observed at the apex. Based on the data of the questionnaire, most of the people know the basic information about the plant while they have little knowledge on the nutritional value and the importance of the plant. The presence of phenolics, tannins, glycosides, alkaloids, saponins, and terpenoids was confirmed according to the results of the chemical analysis. In addition, the previous studies conducted in China revealed the chemical components of Chinese water chestnut tubers as follows; Water-86.0%, Protein-1.2%, Fat-0.1%, Carbohydrate-11.5%, Fiber-0.1%, and Ash-1.1%. Therefore, further investigations to determine the nutritional value of this plant in Sri Lanka is very important, and improving the awareness of this plant among the people in the country can be recommended.

Keywords: *Eocharis dulcis*, herbarium specimen, morphological analysis, chemical analysis

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The indigenous medical secret of applying Akkapana *(Kalanchoe pinnata)* for dissolving urinary stones in Sri Lanka

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Even though the same medicine is given for the different disease, the way of taking it differs in the indigenous medical system in Sri Lanka. The use of Akkapana to dissolve urinary stones is one such instance. The Akkapana leaves are given as food and drink or decoction by mixing with other medicines for different diseases. As such, to dissolve urinary stones, the Akkapana leaves plucked in the dark has been used to prepare medicine in the ancient indigenous medical system in Sri Lanka. Thus, this study focused on a hypothesis to test whether any chemicals that help to dissolve urinary stones are produced in the Akkapana during the dark hours of the day.

To prepare the testing extracts one (1) 6 samples that plucked between 7:00 a.m. to 5:00 p.m. in daytime and for Test sample two (2) 6 samples that plucked between 7:00 p.m. to 5:00 a.m. were utilized. According to the results obtained from measuring pH and doing titration experiments in the test number 1 and 2, it was observed that the acidity varies at different time of the day. The highest acidity was observed at 5:00 a.m. and the lowest acidity at 5:00 p.m. Observation made during the test were consistent with the results of the previous two tests regarding perception of sour taste on the tongue.

4th experiment was conducted to determine whether changes in acidity between daytime and nighttime have the potential to dissolve renal stones. The efficiency of Akkapana leaf extracts plucked at 5:00 a.m. and 1:00 p.m. for the dissolution of renal stones obtained from 2 individual was evaluated. The weight of the stones was measured after 48 and 72 hours to determine the effectiveness of the extractions. The extract from leaves plucked at 5:00 a.m. showed a greater reduction in stone weight than the leaves that plucked at 5:00 a.m., while the weight of the stones in the control that is distilled water remained unchanged.

Therefore, the study showed that the Akkapana extract taken from the sample obtain during nighttime had disintegrated the urinary stones more readily than the extractions from the morning time. According to the medical report, this was also confirmed by having highest stone deposits in individual who had consumed extraction taken at 5:00 a.m. while those taken at 1:00 p.m. showed a lower deposit. When the samples from the above-mentioned time were observed under a microscope no calcium oxalate particles were detected. it was assumed that the particles had already dissolved during the process.

Keywords: Akkapana, Kalanchoe pinnata, Urinary Stones

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Principal Supervisor: Dr. R.L.Y.U. Rathnayaka, Institute of Indigenous Medicine, University of Colombo

Availability of Nitrate in Aubergine in selected areas in Batticaloa region

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In this study, nitrate content was determined on locally available aubergine, taken from different fields located in Kaluthavalai area of Batticaloa district. The spectrophotometer measurements were taken using UV/VIS spectrophotometer at 538 nm. Accordingly, the highest level of nitrate (539.50 mg/kg) was obtained in Kaluthavalai central, (455.32 mg/kg) in coastal side of Kaluthavalai while the lowest nitrate concentration in aubergine was reported in organic farm in Kaluthavalai (111.6 mg/kg). However, the value of the Acceptable Daily Intake (ADI) and the Target Hazard Quotient (THQ) was still higher than the standard limit. ADI for nitrate in this study was about (0.51, 2.18) mg/kg bw/day for adults and children, while the standard limit was 3.70 mg/kg bw/day). In summary, Nitrate is often accumulated in aubergine due to excessive chemical fertilizers and unethical farming practices. From this study was reported that the amount of nitrates in aubergine was higher than the standard limit's level and that this level cause health problems for consumers.

Keywords: Vegetables, Nitrate, fertilizers, aubergine, consumer

Teacher in-charge: Mr. S. Thevakumar, BT/PD/Paddiruppu M.M.V, National School, Kaluwanchikudy.

Principal Supervisor: Prof. S. Arasaretnam, Department of Chemistry, Faculty of Science, Eastern University Sri Lanka.

Formulation of ecofriendly detergent liquid using locally available paddy husk and soapberries

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This research project focused on producing and characterizing liquid detergent using locally available paddy husk and soapberries. The methodology followed included mixing these materials with distilled water to obtain the corresponding detergent. The physicochemical parameters of the synthesized liquid were analyzed. The pH value of the synthesized liquid 7.68, lather volume 3.74 cm^3, and surface tension was 3.15 Nm^{-1} and was similar to those found in literature. The detergent produced was analyzed by testing its viscosity and foaming stability. The results indicated that the synthesized detergent produced by paddy husk: soapberries (2:1 w/w %) had higher performance properties, compared to the detergent produced by paddy husk and soapberries separately. Thus, it mixture of it can be reported as a better performance qualities. Further, it can be recommend as a environment friendly detergent that has minimum health and environment hazard unlike artificially synthesized detergents.

Keywords*:* Detergent, Lather volume, Foaming stability

Teacher in-charge: Mr. S.Thevakumar, BT/PD/ Paddiruppu M.M.V, National School, Kaluwanchikudy

Principal Supervisor: Dr. M. Koneswaran, Department of Chemistry, Faculty of Science, Eastern University Sri Lanka.

Effectiveness of Azolla leaves based organic fertilizers as a natural fertilizer for plant growth.

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BT/PD/Paddiruppu M.M.V, National School, Kaluwanchikudy

Due to the economic crisis in Sri Lanka, importance of cheaper and higher effective fertilizer for agriculture is very crucial. Thus, the present study, focused on measuring the efficiency of azolla based organic fertilizer. The research was done by testing azolla based fertilizer with the pepper plant using pH and electric conductivity measurements. During the study it was observed that the pH level in azolla-based fertilizer was suitable for pepper plant growth. The electric conductivity of the fertilizer was also higher than other usual organic fertilizers. The experiments were conducted by measuring the growth of potted pepper plants and results indicated the higher growth rate than normal conditions. Thus, the final conclusion of the study was that the efficiency of azolla based organic fertilizers shows better for crop yield.

Keywords: Efficiency, Electric conductivity, pH, Fertilizer

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Principal Supervisor: Dr. M. Koneswaran, Department of Chemistry, Faculty of Science, Eastern University Sri Lanka.

Assessment of KOH-activated banana peel for adsorption of Cadmium from aqueous solution.

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Cadmium (Cd) is one of the heavy metals often contaminate the water. Adsorption is one of the methods that are often used for the treatment of contaminated water. In this study, the KOH-activated banana peel particle was synthesized using in a simple aqueous based technique. The adsorption of Cd (II) by the synthesized sample was analyzed using atomic absorption spectroscopy (AAS). The effect of pH and temperature on the adsorption of Cd (II) by KOH-activated particles was studied. In addition, the time to allow for the adsorption and the shaking speed of the solution also was analyzed to get the optimum adsorption of Cd (II) ions by these particles. The results showed that the optimum adsorption of Cd (II) was achieved at the pH 6.0 with the room temperature of 28^{o}C. Further, the shaking speed and the time to allow for the adsorption (equilibrium time) were 200 rpm and 30 minutes respectively. The study on the adsorption of Cd (II) by the synthesized particle was performed and the results showed that synthesized iron oxide particle was removing 94 % of Cd (II) ion in 30 minutes from Cd (II) contaminated water. The study on adsorption isotherms of Cd (II) on KOH-activated banana peel particle was also experimented. Thus, this research revealed that the iron oxide particles could be very promising materials to remove cadmium ions from the water.

Keywords*:* Adsorption, Spectroscopy, Equilibrium, cadmium

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Principal Supervisor: Prof. M. Sithambaresan, Department of Chemistry, Faculty of Science, Eastern University Sri Lanka.

Nelli *(Phyllanthus embilica)* seeds and peels as efficient adsorbents for removal of methylene blue dye in wastewater.

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Water is an essential component in life not only for human but for all the living beings. On the other hand, contamination of water results in many acute and chronic illnesses in humans, and environmental pollution. Methylene blue a commonly used pigment for dyeing wool, leather, cotton, and also use as a temporary hair colorant. However, this has negative and harmful effect on humans if swallowed or inhaled. Thus, present study was focused on investigating suitable materials that can be used as an absorbent of tis harmful chemical that has harmful effect on human health. For this investigation, two materials, Nelli (*Phyllanthus embilica*) seed and peels were used to investigate the removal of dye in an aqueous solution. In this study, the parameters studied are the adsorbent dose, pH, and initial adsorbate concentration and contact time. The maximum adsorption recorded was 70% of removal dye in equilibrium time of 30 min. Adsorption studies revealed that the peel was more effective than porous, and intra particle diffusion mechanisms were involved. The adsorption equilibrium data were well fitted to the Langmuir model for peel material. Moreover, this research revealed that the Nelli (*Phyllanthus embilica*) peel could be promising materials to remove Methylene blue dye from the wastewater.

Keywords: Isotherm, Langmuir model, Methylene blue dye

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Principal Supervisor: Prof. S. Arasaretnam, Department of Chemistry, Faculty of science, Eastern University Sri Lanka.

Qualitative analysis of thermal comfort in a dry zone school classroom.

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Peramaduwa Vidyalaya, Kanthale

When it comes to teaching and learning inside a school classroom student's ability to focus on the subject matter is not only depend on the ability of the teacher to teach or the student to learn but also depend on the environmental factors. The environmental factors play a major role on the student's ability to listen and absorb what the teacher is teaching. Thermal comfort level is one such important parameter which determines the quality of the classroom environment. In a country like Sri Lanka, with a hot humid climate the students would feel uncomfortable during the midday school hours. Thus, this research is focused on to determine the effect of thermal satisfaction level of the school students during classroom hours with the air thermal properties. It is decided to observe the thermal satisfaction of school students under different roofing materials. The knowledge gain by these findings will be used to determine suitable passive cooling techniques which can be applied in a classroom.

Keywords: Passive cooling techniques, Thermal comport Level, Teaching and learning process.

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Supervisor: Eng. I.P.T.S. Wicramasooriya, Department of Mechanical Engineering, Faculty of Engineering, The Open University of Sri Lanka, Nawala, Nugegoda.

Study of coloring effect of coconut shell formulations on greying hair.

J. Amsuga, T. Krishani and M. Rishanujah
BT/PD/Paddiruppu M.M.V, National School, Kaluwanchikudy.

Today most people are concerned about their physical beauty. The appearance of hair plays an important role in a person's outlook. This study describes the development of herbal hair colorants/formulations from aqueous herbal extracts of Lemon, Bhingraj, Coconut oil, Beetroot, Tea powder, Aloe vera gel, Castor oil, Indigo powder, Nelli powder and Henna powder. Fifteen herbal hair colorant dyes were prepared from these dried aqueous herbal extracts and powders. The light and washing fastness of dyed samples were tested with grayscale on human grey hair. The optimal condition for dyeing method was found to be at 28^0C in 30 min time. Based on the above observation a hair colorant was selected. The remarkable results were obtained from herbal hair colorant prepared from Castor oil (*Ricinus communis* L) and Charcoal (from *Cocos nucifera* shell). The maximum accepted formulation indicated that these herb in combination acts synergistically in natural hair coloring action to provide maximum blackening on hair for a period of 30 days.

Keywords: Natural dyeing, Coconut husk powder, Rubbing fastness, Light fastness

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Evaluation of home-based DNA extraction method for plant tissue samples.

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St. Thomas' Girls School, Matale

An experiment was conducted to investigate cheap and easily available home base substances for demonstrations of plant DNA extraction method using standard protocol and set of chemicals along with equipment. Purity of these home-based DNA extractions was questioned due to its non-applicability in research. Thu a commonly use home-based DNA extraction method was applied for fruits of strawberry, banana, avocado, watermelon, grapes, tomato, cucumber, snake gourd, and ridged gourd to investigate the purity of the DNA yields in this method and applicability of it in research. From the fleshy part of the fruit 25g is separated and place in a zip lock bag and gently smashed for about 2 minutes. The DNA extraction solution was prepared by mixing 10 ml of detergent, 5 ml of salt and 120 ml of water. Then 10 ml of DNA extraction solution was added to the fruit sap and gently mixed for 5 minutes. Content was filtered using a strainer. Concentrated Iso-propyl alcohol was poured the side of the cup. Since DNA is not soluble in alcohol a white cloudy substance was developed in the top alcohol layer. Which is shown as DNA. White cloudy substance could be obtained only in Strawberry, Banana and Avocado. Gel electrophoresis failed to provide a clear banding pattern though some signs of RNA was shown due to the absence of RNA denature process. DNA degradation was also noticed due to the absence of a substance to avoid the degradation. The analysis showed spectrophotometer 260/280nm values which were lesser than 1.8 w indicating protein content was higher in the extraction. Thus, DNA produced from home-based method use have a very low level of purity and not suitable for standard research.

Key words: DNA extraction, Plant DNA, Home-based DNA methods

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Principal Supervisor: Dr. Chandima Dhanapala, Department of Molecular Biology & Biotechnology, Faculty of Science, University of Peradeniya

Determination of the effect of moon's phases on weather Conditions in Sri Lanka.

T.S. Ruhunage
St. Thomas' College, Matara

The Moon is the natural satellite of planet Earth. The appearance of the Moon to Earth is variable with the changing angle of the Sun due to its location on the orbit. This is called the cycle of Moon's phases. They are Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Waning Gibbous, Last Quarter, Waning Crescent, and New Moon. The effect of Moon's phases on the environment is due to the gravitational force on ocean tides. The effect of Moon's phases on Sri Lankan environment is not well studied according to the literature. Thus, research hypothesis of this study is that there is an effect of Moon's phases on weather conditions in Sri Lanka. The objectives of this study included to investigate the variation of environmental temperature and rainfall in nine locations representing the nine (9) provinces in Sri Lanka (Anuradhapura, Batticoloa, Colombo, Galle, Jaffna, Katugastota, Kurunegala, Moneragala and Ratnapura). Daily day and nighttime temperature and rainfall data for the selected locations for the years 2020, 2021 and 2022 were received from the Meteorology Department. There was a variation in temperature and rainfall in selected locations within a year and among 3-year period from 2020 to 2022. In 2020, Day time temperature has shown an increase and night temperature has shown a decrease at New Moon. However, the same variation pattern was not observed for the year 2021 and 2022. In 2020 and 2022, average temperature during daytime at the First Quarter, has reduced whereas, the temperature at the First Quarter increased in 2021. Nighttime temperature peaks were recorded at Waning Crescent, Full Moon and Waning Gibbous in 2020, 2021 and 2022, respectively. Average rainfall varied with Moon's phases in 2020, 2021 and 2022. The highest average rainfall was recorded in Last Quarter, Full Moon and Waxing Gibbous in 2020, 2021 and 2022, respectively. In 2020, 2021 and 2022, the average rainfall ranged from 3.7 mm to 8.1 mm, 3.5 mm to 8.3 mm and 4.3 mm to 7.5 mm during the cycle of Moon's phases, respectively. It can be concluded that there is no clear effect of Moon's phases on temperature and rainfall in Sri Lanka.

Keywords: Moon's phases, rainfall, temperature, Sri Lanka

Teacher in Charge: Mrs. U.N. Vidulamani, St. Thomas' College, Matara

Principal Supervisor: Prof. G.D.K. Mahanama, Department of Physics, University of Ruhuna, Matara.

Cyprinidae family fish diversity in Diyagama Ela – South West ichthyological Zone in Sri Lanka.

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Sri Lanka, locating in the Western Ghats identified among the 32 global biodiversity hotspots due to high level of species endemism. However, anthropogenic activities had become a threat to the biodiversity. IUCN estimates that 27,000 species of the ones assessed are at risk of extinction. Therefore, nationally there is a great need to accomplish many goals to protect our endemic flora and fauna. According to many research studies, there is a lack of studies on the ichthyofauna of Sri Lanka. Moreover, recent research's show high diversity of Cyprinidae fishes in Sri Lanka. However, most of these studies were restricted to main river basins in Sri Lanka. Thus, this study was conducted to investigate the Cyprinidae fish diversity

in Diyagama Ela catchment area (Southwest ichthyological zone) for the first time in Sri Lanka and to identify the threats. Cyprinids were sampled, by net fishing, in five selected habitats randomly for 6-month period. Further, physicochemical parameters of each sampling site and the habitat characteristics were recorded. Cyprinidae diversity was estimated using the Shannon-Wiener diversity index and compared with physicochemical parameters collected on each site. Eleven Cyprinidae species were recorded containing 6 endemic species along with 4 globally and nationally threatened species. Observations of

habitat characteristics revealed that there are many human induced activities happening around which directly affects the fish diversity. Even though, there are endemic species were recorded, the residence around the area has very poor knowledge about endemism and the importance of the Cyprinidae species. Therefore, it is timely to develop an action plan to conserve these habitats and aware general public on conservation of these precious biodiversity.

Keywords: Cyprinidae, ichthyofauna, ichthyological zone, Shannon-Wiener diversity index

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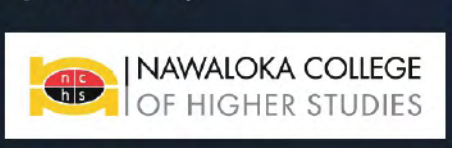

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