PROCEEDINGS

Abstracts

5th NATIONAL SYMPOSIUM ON AGRICULTURE

2022

"Ensuring Food Security Through Smart Agriculture"

30th March, 2022

Faculty of Agriculture
Eastern University, Sri Lanka
Palachcholai, Kaluwankerny

NSA 2022

Proceedings of the
5th National Symposium on Agriculture
(5th NSA-2022)

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MESSAGE FROM THE VICE-CHANCELLOR

EASTERN UNIVERSITY, SRI LANKA

It is great utmost pleasure to write this message to the 5th National Symposium in Agriculture 2022 organized by the Faculty of Agriculture, Eastern University, Sri Lanka under the theme "Ensuring Food Security through Smart Agriculture".

Agriculture plays a vital role in the economy of many developing countries through provision of food for the people, employment and food security to the nation. In addition to providing food and raw material, agriculture is one of the prominent livelihood approaches in the Country.

This National Symposium/Conferences are the forum to share their lifeworld of experiences and expectations of stakeholders in particularly the researchers and the practitioners.

I appreciate the Dean of the Faculty, the Coordinator and the members of the organizing Committee of NSA 2022 for arranging this Symposium as a virtual conference which is the best option at this juncture in order to provide opportunity to participate all the researchers who cannot attend this symposium physically.

I appreciate very much for their continuous efforts to share their new knowledge and experience with numerous scientists and intellectuals from many different areas by organizing NSA annually.

Finally, I congratulate all the presenters, the symposium organizers, participants and all the contributors to make NSA 2022 successfully.

I look forward to witness a fruitful conference.

Prof. V. Kanagasingam
Vice-Chancellor
Eastern University, Sri Lanka
30.03.2022

MESSAGE FROM THE DEAN, FACULTY OF AGRICULTURE, EASTERN UNIVERSITY, SRI LANKA

It is with great pleasure that I send this message to the 5th National Symposium on Agriculture (5th NSA) 2022 organized by the Faculty of Agriculture, Eastern University Sri Lanka. The theme of the symposium is **"Ensuring Food Security through Smart Agriculture"** and this symposium is held at a highly opportune time. I wish to congratulate the Symposium Organizing Committee and selecting this very pertinent topic. The Symposium tracks selected are also highly appropriate for research and discussions on challenges faced by food security and agriculture.

The objective of the Symposium is to get the opportunities to discuss achieving food security through multiple smart agriculture applications. Sufficient food production and access, climate change, conflict, displacement, and a growing global population are among the many challenges facing families and communities who struggle to put nutritious food on the table. In the past decade, there has been a dramatic increase in the number of individuals forced to leave their homes due to conflict, which has become a major cause of food insecurity. Many families facing food insecurity rely on their own food production and income from farming, which is stressed by an escalation of natural disasters due to climate change. These repeating shocks have severe implications on the food security and livelihood of vulnerable populations. The impact of COVID-19 on food supply chains, livelihoods, and food security in nearly every country of the world has made innovative solutions more urgent than ever before. Smart Agriculture help farmers produce more reliable sources of food, increase their income, and attain increased household stability and financial security. It needs to work with farmers to provide access to knowledge, skills, inputs, and markets, as well as ongoing support for climate-adapted and productivity-enhancing sustainable agricultural practices through smart agriculture. These practices have helped increase incomes, decrease malnutrition, and improve food security within communities.

I sincerely hope that the deliberations would assist in future policy directives, and planning and implementation of programs in relation to the theme of the symposium. I wish you a fruitful symposium, and a pleasant stay Eastern University, Sri Lanka. I hope that your excursion here will be a good experience and give you understanding of the agriculture sector in our country.

With best wishes,

Dr. M. Pagthinathan
Dean/ Faculty of Agriculture
Eastern University, Sri Lanka

MESSAGE FROM THE COORDINATOR

5th National Symposium on Agriculture 2022

As the Coordinator of the Fifth National Symposium on Agriculture 2022 (5th NSA 2022), I take pride in forwarding this message on the occasion of the 5th National Symposium of the Faculty of Agriculture, Eastern University, Sri Lanka. Since its inception, the Faculty of Agriculture has contributed immensely to the development of the community in numerous ways. The National Symposium on Agriculture conducted by the faculty can be considered one of such precious contributions to the community. Like the previous years, our National Symposium is conducted online for the third consecutive year under the theme "Ensuring Food Security through Small Agriculture".

The entire world, especially the developing countries, is facing several challenges with the outbreak of the Covid-19 pandemic and other related crises. Its impacts are reflected in almost all sectors. The food sector is one of those sectors, and ensuring the people's food security has become more important these days. The theme, “Ensuring Food security through Smart Agriculture," of the 5th NSA 2022, demands smart technologies to ensure people's food security. I believe that the set theme of the 5th NSA 2022 has led the research community, in particular within the University system, to bring forward innovative ideas and technological advancements which could help ensure food security. It can be expected that the 5th NSA 2022 will provide a platform for graduating students and other scholars to present their valuable research findings and interact with prospective stakeholders. I take this opportunity to extend my gratitude to my committee members for their hard work, commitment, and dedication. Further, it is my humble duty to express my deepest appreciation and gratitude to the Vice-Chancellor/Eastern University, Dean/Faculty of Agriculture, Keynote speaker of the 5th NSA, Editorial Board of the 5th NSA, Reviewers and Panelists, Track Coordinators, all academic, non-academic and all other members for their invaluable contribution deployed to make this symposium a great success. Their support was a great strength in making this symposium a success. On behalf of the 5th NSA Organizing Committee, I wish all the participants of NSA 2022 to have a productive and informative symposium.

Dr. (Mrs). Thivahary Geretharan
Coordinator
5th National Symposium on Agriculture
Faculty of Agriculture

MESSAGE FROM THE SECRETARY

5th National Symposium on Agriculture 2022

I am ecstatic to be given the opportunity to write the message on this momentous occasion. The National Symposium on Agriculture is an annual research symposium hosted by the Faculty of Agriculture, Eastern University, Sri Lanka with the goal of promoting and disseminating research outputs to regional and national growth and development.

The ability of households and individuals to access food is one of the key aspects of food security and is considered an important welfare dimension in the country. However, unpredicted threats challenge food security and question the consumption of quantity, nutritional composition, and safety of food that meets dietary needs which is essential for an active and healthy lifestyle.

The virtual symposium is intended with the objective of finding and disseminating smart agricultural measures that could fulfill the current gaps in the country and to address the questions in combination with agricultural and other life and social sciences with the symposium theme.

As the secretary of the 5th NSA 2022, I would like to express my earnest gratitude to all those who gave me timely needed support and encouragement to me to conduct the event successfully. I wish all the success and good luck to the authors and co-authors to take this opportunity to publicize your valuable findings and knowledge to the community towards regional and national development.

Mr. G. Hariharan
The Secretary/ 5th NSA 2022
Faculty of Agriculture
Eastern University, Sri Lanka

ABSTRACT OF KEYNOTE ADDRESS

5th National Symposium on Agriculture 2022

Confluence of Technologies Needed for the Agriculture of the Future

Agriculture, which was mainly aimed at feeding the population in the Agrarian Era, has gone through a great deal of transformation to date, including its scope, purpose, nature, complexity and sophistication. The present-day agriculture needs to produce not only food, but also feed, fibre, fuel (energy), "cosmeceuticals", nutraceuticals (e.g. dietary supplements, functional food, medicinal food and "pharmaceuticals") and biotechnological products such as crops and livestock resistant to pest, diseases and abiotic stresses, vaccines, antibiotics and enzymes.

However, this sector is beset with a myriad of issues, including stagnant and low yield and quality, poor efficiency in the use of resources, including water and fertilizer, uncoordinated and unregulated production leading to unpredictable gluts and scarcities that cause drastic price fluctuations. Moreover, overuse and abuse of pesticides and fertilizers, heavy post-harvest losses, low-value addition, predominance of small and scattered holdings, excess labour with low productivity, lack of innovative business models, and poor integration of agriculture to national, regional and global value chains are the other major issues. These issues have been exacerbated by lack of a rational, coherent and consistent national policy with a clear sense of direction and depth, particularly in agriculture, land and trade.

Meanwhile, its technological landscape is changing rapidly and markets are becoming increasingly globalized, sophisticated, dynamic and competitive. Besides, with the consumer becoming increasingly health-conscious, importing countries impose stringent control on food quality, safety and hygiene. Therefore, the status quo cannot continue and requisite interventions should be made forthwith to enable the necessary changes and improvements.

Given the serious economic, social, environmental, nutritional and health issues associated with conventional agriculture, agriculture in the 21st Century needs to produce more with less due to limitations in resources such as land, water etc. and harmful effects of inputs such as fertilizer and pesticides and expanding agriculture on landscape, biodiversity and ecosystem services. Therefore, agriculture has to be more productive, eco-friendly, resource-efficient, climate-resilient, knowledge-based, zero-waste through circular production and integrated to regional and global value chains.

It should also be noted that there is increasing interaction between the sectors of agriculture, nutrition, and health, and they have become closely interlinked parts of a larger chain in which agriculture serves as a driver of human health through delivery of nutritional needs.

Hence, a step-change in agriculture in Sri Lanka is urgently needed to transform it into tech-savvy export-oriented agri-business through smart farming where the whole process from production, processing, storage, marketing and distribution should be reengineered and remodeled for value chain enhancement. This includes, among others, advance provision of weather data, market dynamics and price fluctuation through ICT and early detection of pest and diseases, determination of water and nutrient needs based on IoT sensors which contribute a great deal to reduce the risk and uncertainty, associated with agriculture and use of input, including fertilizers and pesticides. While applying modern technologies in agriculture, one should not disregard or underestimate the value and relevance of indigenous knowledge (IK) — a precious hitherto untapped national resource — that should be harnessed to enhance agricultural production in a cost-effective and sustainable manner.

With the advent of climate change, there is rising demand for crops and livestock that are resistant to pests, diseases and abiotic stresses. Moreover, owing to the exacerbating land scarcities following the expansion in population and built areas, aquatic agriculture, sea farming, and vertical farming have become increasingly relevant and important.

This demands a suite of technologies to be adopted from among precision agriculture, IT, biotechnology, nanotechnology and remote sensing and GIS along with the 4th Industrial Revolution (4IR), including artificial intelligence, automation, Big Data, drones, Internet of Things, Robotics, 5G technologies etc., which are of great relevance and value.

Therefore, it is imperative to rethink not only the way we produce, process, package, store, transport, distribute, market, deliver and consume food, but also the way we dispose of agricultural waste, to create a “zero waste” society. This calls for the transformation of conventional agriculture into a knowledge-based circular agriculture through a sea change which will enable increased production based on considerably less resources and inputs to achieve sustainability with reduced carbon footprint, water footprint, energy footprint and ecological footprint with greater profit Therefore, a cultural revolution of sorts is the need of the hour paving the way for a new Agri-Culture in Sri Lanka.

Prof. Ranjith Senaratne
Professor Emeritus
Department of Crop Science, Faculty of Agriculture
University of Ruhuna, Mapalana, Kamburuptiya and
Chairman, National Science Foundation

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A. Biriyangari

AGRIBUSINESS MANAGEMENT AND FARM EXTENSION

ONLINE MARKETING TRENDS OF ORCHIDS IN SRI LANKA

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[1]Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka
[2]Department of Export Agriculture, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka

ABSTRACT

Orchids are one of the largest families of flowering plants that received a remarkable place in the floriculture industry worldwide due to their diversity of colour, size, shape, long shelf life and high attractiveness. Orchids play a significant role by upgrading living standards of small scale to large scale entrepreneurs in Sri Lanka. Online marketing is a branch of digital marketing, referred to as content delivered via the internet. Many industries and floriculture have influenced it to expand its products worldwide. The study was conducted to identify the present status of the orchid sector in Sri Lanka with a particular focus on online marketing trends. Using an interviewer administrated structured questionnaire, data were collected from 50 commercial orchid nursery owners from Gampaha, Colombo, Kandy, Kurunegala and Galle districts. Results revealed that nursery owners sell orchids as potted plants, cut flowers and seedlings. It is followed by traditional methods of selling (shops, roadside mobile selling and selling at nursery outlets), majority of the nursery owners were tried to sell orchids online via using social media, the company's website and online selling websites. Nursery owners were updated and posted about the available orchids and prices through social media. Further, 21.73% of orchid ventures had a website for their company and advertised about the orchids selling through it. Easiness, expansion of customer network and good customer feedback stated that online selling had become an effective marketing channel for orchids in Sri Lanka.

Keywords: *cut flowers, digital marketing, orchids, potted plants, social media*

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FARMERS' LOYALTY TOWARDS PADDY CULTIVATION IN ANURADHAPURA DISTRICT

R.R.S.P. Rajakaruna and N. Varathan*

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ABSTRACT

Rice is the leading food of Sri Lankans. There are different kinds of paddy varieties cultivated in Sri Lanka. Further, the dominant sector of the Sri Lankan economy is paddy cultivation. Anuradhapura is one of the largest paddy cultivating districts in Sri Lanka. Farmers in the Anuradhapura district grow several varieties of paddy every year. Most farmers in the district decide on the suitable rice variety for the current year based on the last year's yield. This motivated us to study the 'farmers' loyalty towards cultivating the type of paddy in the Anuradhapura district. This study analyzed and predicted the farmers' loyalty for growing the type of paddy in the near future by applying Markov analysis. The data were collected from 509 farmers in the Anuradhapura district. Five varieties of paddy, BG-300, BG-352, Samba, H-4, and Others, have been considered in this research. Further, this research borrows the transition probability matrix as the displaying instrument of forecasting the farmers' loyalty. It will reveal how farmers switch between different paddy varieties and the intensive transition probabilities for paddy. Results reveal that BG-300 has a higher chance of cultivation in the near future, and the BG-352 is in second place, having the next higher chance.

Keywords: *paddy cultivation, paddy varieties, Markov chain, transition probability*

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DETERMINANTS OF ADOPTION DECISIONS OF RENEWABLE ENERGY SOURCES BY HOUSEHOLDS

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ABSTRACT

The excessive use of non-renewable energy sources has a significant effect on the environment. Therefore, the entire world is converting to renewable energy sources rather than non-renewable energy sources. The aim of this study is to look at the factors that influence households' willingness to use renewable energy in their homes. The study used a binary logistic regression model to find the significant determinants. A well-structured questionnaire was employed, with 195 households from the study region chosen. According to the findings, age, employment, energy subsidies, education, monthly income, and average electricity consumption of more than 90 units all influence 48.14% of households' adoption decisions of renewable energy sources in the residential area. According to the empirical analysis, young people, government employees, high-income households, households with degree holders, and those who consume more than 90 units per month are willing to adopt renewable energy sources. The subsidized energy scheme, on the other hand, promotes households' use of renewable energy sources in their homes. The findings of this study may encourage policymakers to put more effort into developing the appropriate renewable energy policies to motivate the public to adopt renewable energy.

Keywords: *logit regression, renewable energy sources, willingness-to-adopt*

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AN ANALYSIS OF FACTORS ASSOCIATED WITH TURMERIC YIELD IN THE GAMPAHA DISTRICT

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ABSTRACT

Turmeric has been playing a significant role in the culinary industry of Sri Lanka for centuries. Sri Lanka fulfills its turmeric requirement through inland cultivation and by import. Recently, turmeric import was banned by the Government. Owing to this import ban, farmers could get a better price than usual. In the Sri Lankan context, very few studies have been conducted related to the production of turmeric. It is vital to identify the current status of turmeric production, which helps design future production enhancement activities. Based on this context, the present study was conducted to determine the factors associated with turmeric yield in the Gampaha District. The target population of the study was turmeric farmers in Mirigama and Divulapitiya DS divisions in the Gampaha District. Sixty turmeric farmers were selected for the study using a random sampling method. The number of farmers was selected based on the total number of turmeric farmers in both DS divisions. In Mirigama and Divulapitiya, 28 and 22 farmers were selected, respectively. Both primary and secondary data were extracted for the research purpose. Data were analysed descriptively and through chi-square analysis. The results reveal that majority (92%) grow turmeric in their home garden and engage in it part-time. The chi-square analysis found that education level ($p<0.05$; X^2=3.129), farming experience ($p<0.05$; $X^2=8.712$), cropping type ($p<0.05$; $X^2=0.114$), participation in training programs ($p<0.05$; $X^2=2.821$), and contacts with extension officers ($p<0.05$; $X^2=1.423$) were associated with the total turmeric yield. These factors need to be considered by the relevant personnel when designing turmeric production programs and related policies.

Keywords: *extension contact, Gampaha district, import ban, turmeric*

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PADDY FARMERS' ATTITUDES TOWARDS THE ADOPTION OF CROP INSURANCE SCHEME IN KANTALE DS DIVISION, TRINCOMALEE DISTRICT

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ABSTRACT

Paddy cultivation is one of the crucial components of agriculture. But the paddy cultivation is susceptible to many risks from the date of establishment until the harvesting. Extreme weather events harm agricultural production, food security, and livelihood, especially in developing countries. Agriculture insurance is a technique for mitigating risk, and crop insurance protect farmers' crop investments, increasing their risk-bearing potential. This study aimed to assess the attitude of paddy farmers towards adopting crop insurance in the Kantale Divisional Secretariat (DS) division of the Trincomalee district. Five major Grama Niladhari (GN) divisions under paddy cultivation in the Kantale DS division were taken for the study. A simple random sampling method was used to select 60 farmers, and farmers were selected in proportion to the number of paddy farmers available in each GN division. The collected data were analyzed using the SPSS software. The results reveal that more than half of the paddy farmers engaged full-time in paddy farming. Further, less than half of the farmers know about the crop insurance scheme. More than half of the farmers who adopted the crop insurance scheme were not satisfied with the scheme. The majority (70%) of the farmers have a medium level attitude, 16.7 % have a low-level attitude towards the crop insurance scheme, and 13.3 % have a low-level attitude about the crop insurance scheme. It is recommended that providing awareness on crop insurance schemes be done regularly. The majority (70%) of the farmers have a medium level, 16.7 % have a low-level attitude about the crop insurance scheme, and 13.3 % have a high-level attitude about the crop insurance scheme. It is recommended that the government and other related agencies conduct awareness programs regarding crop insurance schemes to mitigate the risks among farmers. They should introduce an insurance scheme to recover more array of risks that farmers face, and the procedure should be favorable to their economic background the life.

Keywords: *adoption, attitude, awareness, insurance, paddy farming*

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CONSUMERS' AWARENESS TOWARDS INTERNAL QUALITY FEATURES OF DAIRY FOOD PRODUCTS

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ABSTRACT

The dairy food sector plays a vital role in the Sri Lankan economy. This study aims to determine the consumers' awareness towards internal quality features of dairy food products (DFPs) in urbanized areas in Minuwangoda Divisional Secretariat Division representing Gampaha District in Sri Lanka. A well-designed questionnaire was used to collect the data from July 2021 to September 2021, using a random sampling survey method with sixty consumers. The collected data were analyzed by using SPSS Software. Chi-Square analysis was used to determine the factors shaping the consumers' awareness of the internal quality features of DFPs. According to the findings, ice cream and yoghurt were the most preferred dairy products. Most consumers are aware of different DFPs, brands, quality, nutrition, ingredients, quality certifications, and standard product label details. Advertisements moderately affected their awareness of DFPs. Consumers prefer local products to imported products, consuming more nutritious, non-chemical and tastier products. Further, most consumers consider the brand name and produced company before buying. The study further found that the consumers' age, sex, educational level, and income level have a significant association with the consumers' awareness of the internal quality features of DFPs. The findings of this study will become important to DFPs producers, consumers, investors, marketers, importers, relevant enterprises, and the government to implement necessary product improvements and quality enhancement in the dairy food industry.

Keywords: *consumer preference, dairy food products, quality characteristics*

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AGRICULTURAL ENGINEERING & WASTE MANAGEMENT

&

WATER & ENVIRONMENTAL MANAGEMENT

PERFORMANCE EVALUATION OF NEWLY DEVELOPED PALMYRAH FRUIT PULP EXTRACTOR FOR SMALL SCALE INDUSTRIES

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ABSTRACT

Palmyrah Fruit pulp extraction technology could help in better utilization of the income of Agro based processing industries. Pulp extraction from Palmyrah fruit and processing is one of the options available for the above encountered processes, preservation, and value addition. The objective of this study was to develop a newly extracting machine for Palmyrah pulp and fiber. The extraction of the pulp from the seed and to feed the fruit seed into the extractor cylinder (45cm, 25cm & 2mm thickness), which consists of a rotating shaft (45cm & 3.5cm width) with circular blades (15 Nos), which peeled off fruits. The pulp with fiber mix should be manually transferred to the sieve unit where the pulp and fiber could be separated by pressing the handle of the sieve unit (28cm, 16cm & 2mm holes). The pulp extracting efficiency was evaluated with soaking methods. The extracting efficiency is varying with the fruit initial weight, seed weight and the fiber amount. Capacity of the extracting machine is 15 to 17 kg fruit pulp per hour. There were 6 to 7 seeds per one batch operation (7 to 8 min) and 40 to 50 seeds per an hour operation. There were no significant differences among those treatments of soaking with control (360g – 370g per kg of fruit). However, the 20 minutes soaking of pulp yield was higher than the 10 minutes of soaking (370g – 380g per kg of fruit). There was no need of soaking practice for this newly design pulping machine in industrial purpose.

Keywords: *extractor, hot water soaking, Palmyrah pulp, Palmyrah pulpier, sieve unit.*

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STATUS OF MUNICIPAL SOLID WASTE COLLECTION AND DISPOSAL TECHNIQUES IN AKKARAIPATTU MUNICIPAL COUNCIL, AMPARA DISTRICT, SRI LANKA

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ABSTRACT

The disposing solid wastes generated from households becoming an international concern, countries thrive to regulate over decades. A detailed case study was conducted in Akkaraipattu Municipal Council (AMC), Ampara district, Sri Lanka, to explore the status of solid waste collection and disposal among the households where the responsibility is vested to local authorities. Targeting population, pretested questionnaire administrated physically and via social media to collect data from at least 400 households, determined from sample size equation. Survey responses were analyzed using SPSS, were descriptive, frequency, and Chi-Square tests. Among the respondents, nearly half of people aged between 18-25 years, private employees, categorized under lower middle income (Rs. 30,000 to 50,000). Segregating wastes in open containers is common to half of the people but the food was ample, highly disposed of by the people under upper-middle-income strata (Rs. 50,000 to 100,000) while the rich people (earning more than Rs. 100,000) discharge paper, cardboard, and glass wares at most. Hence, there are significant differences between the type of waste generated and the level of income. Though half of the respondents use AMC trucks to dispose of their wastes, the frequency of waste collection within a week is very less, delayed collection and improper disposal methods lead to bad odor and breeding of insects. Municipalities face difficulties in handling the bulky wastes and irregular routine of collection. Implementing rules and regulations, allocating sufficient physical, financial, and human resources would be helpful to upgrade the actions of the municipality and the environment.

Keywords: *households, Municipal council, solid waste, collection, disposal*

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PERFORMANCE EVALUATION OF NEWLY DESIGNED TOWER HYDROPONIC SYSTEM (THS) UNDER PROTECTED STRUCTURES

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ABSTRACT

Soil-less culture has shown good results all over the world. This study was conducted to design Tower Hydroponic Systems (THS) and evaluate the design performance of two different geometrical models of A shape and U shape. The Poly house was made to protect the system, which made of Galvanized iron pipes frame with Poly-sheets. PVC pipes were used for constructing the hydroponic models with using sub-merge pumps. In hydroponic system, plants were placed in Albert solution composed of soluble nutrients and water as opposed to soil. Lettuce plants were selected for the experiment. In this study, a build system that grows the plants in similar constant environment any-how variation may be of light caption which effected on its growth. Measurable parameters such that EC and pH of the solution and level of fertilizer were recorded in each shape of A and U structures and the growth parameters of lettuce plants were measured the leaves length at weekly interval in 7 days, 14 days and 21 days after transplanting. Other parameters such as EC and pH of the solution and level of fertilizer were set as constant with optimum levels. The lettuce plant should grow faster in 14 days after transplanting compare with control. In 21 days after transplanting it have shown 30% faster growing performance than its natural growth in soil. Among these two type of hydroponics systems, U shape and A shape frame system can be used in a small space like garden with maximizing the number of plants.

Keywords: *aeroponics, hydroponics modal, poly house structure, soilless culture,*

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FACTORS AFFECTING CLIMATE CHANGE ADAPTATION AMONG PADDY FARMERS IN COASTAL AREA OF AMPARA DISTRICT

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ABSTRACT

Climate change impacts rice cultivation in the Ampara district, negatively impacting agricultural productivity. However, climate change adaptation techniques are applicable in farming practices that can mitigate this negative impact. Therefore, this study was conducted to investigate the factors affecting climate change adaptation practices among paddy farmers in the Ampara district of Sri Lanka. A questionnaire survey was conducted among randomly selected 300 paddy farmers in the Ampara district, and data were analyzed using SPSS statistical software of version 25. Results revealed that 22% and 77.9% of respondents' main and secondary occupation was paddy farming, respectively. Half of them have completed secondary education, while 22% were degree holders. Furthermore, 98% of farmers do not use any Information and Communication Technology (ICT) related equipment and application for paddy farming. Among the farmers surveyed, 40% felt that pursuing new adaptation practices, including following the SRI method and using ICT related techniques without experience, is an extra burden and risk to farming practices. However, 80% of farmers believe that practicing adaptive climate measures can mitigate the negative effect of climate change. Nearly 96% of farmers do not get any information or guidance from the relevant organizations related to climate change for the last five years. However, farmers have faced difficulties in adopting the Ampara district's climate practices due to lack of awareness, poor educational level, and extension services. Therefore, these limitations could be the priority areas to focus on to improve climate change adaptation among the paddy farmers in the Ampara district.

Keywords: *adaptation, Ampara, mitigation, climate change, paddy farmers*

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PHYTOREMEDIATION OF SHRIMP FARM WASTEWATER: A REVIEW

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ABSTRACT

Phytoremediation is a promising technique using plants to remove pollutants (especially NH^{4+}, NO_3^-, PO_4^{3-} etc.) and mitigate environmental impacts associated with intensive shrimp culture. Shrimp farming is a rapidly growing aquaculture industry that contributes significantly to global aquaculture output. Shrimp farm effluents have the potential to cause environmental issues such as oxygen depletion, benthic community degradation, and the exacerbation of toxic algae blooms. The aim of this review was to study the possibility of using aquatic plants in reducing the pollution potential of shrimp wastewater. Peer-reviewed journals, books related to phytoremediation of shrimp farm wastewater were collected for referring and extracting the relevant information. Free-floating, submerged, and emergent aquatic plants are used in phytoremediation to reduce the amount, mobility, and toxicity of shrimp farm pollutants in groundwater, surface water, and other contaminated media. *Eichhornia crassipes*, *Hydrilla verticillata*, *Pistia stratiotes*, *Colocasia esculenta*, *Limnocharis flava*, are some of the aquatic plants used for phytoremediation. They can purify polluted water by acting as a pH buffer, and remove organic matter like ammonia and nitrite. The phytoremediation approach uses separate mechanisms such as phytoextraction, phytovolatilization, phytostabilization, rhizodegradation, and rhizofiltration. Because of their abundance, high output, and ease of stocking and harvesting, free-floating aquatic plants have become more suitable for phytoremediation. Different researchers reported that pollutants in shrimp farm wastewater were significantly decreased by phytoremediation. In conclusion, phytoremediation is an alternative method to purify the wastewater of shrimp farm.

Keywords: aquatic plants, effluents, phytoremediation, shrimp wastewater,

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GROWTH AND YIELD RESPONSES OF GREEN GRAM (*Vigna radiata*) IRRIGATED BY DIFFERENT CONCENTRATIONS OF SALINE WATER

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ABSTRACT

A pot experiment was performed from June to September 2021 at the home garden, Sammanthurai, Ampara, located in the low country dry zone of Sri Lanka to study the growth and yield responses of green gram (*Vigna radiata*) variety MI-5 to different levels of saline water. The experiment consisted of 5 treatments within 6 replicates and every replicate consisted of 2 plants. The plants were irrigated with salt water with concentration of 2000ppm, 4000ppm, 6000ppm, and 8000ppm. The control pot was irrigated with well water at the level of 260ppm. For first 2 weeks the plants were irrigated with normal well water and after irrigated with the salt water with different concentrations twice a day until two weeks before harvesting. The results found that all saline water treatments significantly decreased the vegetative growth parameters and total yield. Plant height, number of leaves, leaf area, and plant biomass significantly varied between different salinity concentrations. High salinity concentration resulted in severe water stress leads to reduced growth and yield of green gram. Yield parameters such as, number of pods per plant, length of pods decreased, when the salinity concentration increased. It is concluded that, all the studied parameters gradually produced higher values in well water and the next in 2000ppm of saline water. It may be due to the restricted movement of water in soils irrigated with saline water result in retention of salt in surface layers around the root zone that induces salinity stress affecting crop growth.

Keywords: *plant height, saline water, Vigna radiata*

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SOIL AND WATER CONSERVATION IN HILLY AREAS: A REVIEW

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ABSTRACT

Soil and water degradation (SWD) are major environmental problems especially in hilly areas in the world. It is indicated that about 400t ha^{-1} $yr^{-1}$of soil is lost from hilly area worldwide. Fertile soil and available water are main keys of factors of sustainable livelihood and food security. The present review study was conducted to identify (i) the major causes of soil and water degradation process in hilly area (ii) benefits of soil water conservation and (iii) to identify the most suitable soil water conservation measures in hilly areas. The study found that, anthropogenic activities are main causes of soil water degradation than natural impact in worldwide. The reductions of soil erosion, runoff and siltation of reservoirs have several advantages such as enhance soil moisture content, groundwater storage, increased in situ sediment deposition, making the steep land suitable for agriculture and enhancement of soil physical, chemical and biological properties. Soil losses could be reduced dramatically in the hilly terrains by implementing relevant agronomic measures and structural methods like terrace, stone bund, check dam, agroforestry, mulching etc. Rain water harvesting is also one of best way to conserve water in hillsides. Development programs in hilly area push a high pressure on soil and water resources thereby conservation measures in construction sites in hill area is one of the most important considerations.

Keywords: *rainwater harvesting, soil and water conservation, soil erosion, soil water degradation*

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COMPOSTING FROM MUNICIPAL SOLID WASTE IN SRI LANKA: A REVIEW

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ABSTRACT

Municipal Solid Waste (MSW) composting is a rapidly growing method of solid waste management in Sri Lanka. Residential, commercial, industrial, and institutional garbage are all examples of solid waste generated in Sri Lanka. The process of microbiologically decomposing the organic and biodegradable components of MSW under aerobic conditions is known as MSW composting. The main aim of this review was to summarize the information about the methods of composting and problems related to the MSW in Sri Lanka. Peer-reviewed journals, books related to municipal solid waste composts were collected for referring and extracting the relevant information. Home (small scale), windrow, in-vessel, semi-aerobic composting, and vermicomposting are the main methods used for composting MSW in Sri Lanka. In Sri Lanka, the home composting - heap method (on a small scale) is currently popular. The windrow composting technology is ideal for large-scale compost production. Because of the chemical fertilizers banned in Sri Lanka, the MSW composting process is considered as a best alternative option. At present, many people are involved in producing compost from MSW's organic component. However, there are environmental problems related to compost making from MSW. Some of them are the generation of unpleasant smells, bio-aerosols, noise, dust, discharge of leachate, heavy metals, organic pollutants, and other toxins into the environment outside of composting facilities which causes air, water, soil and noise pollution. In conclusion, even though the different methods of composting are practised in Sri Lanka, the home composting – heap method for small scale and windrow composting for large scale are commonly practised.

Keywords: *biodegradable, chemical fertilizer, composting, municipal solid waste*

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TECHNOLOGIES TO GENERATE ENERGY FROM MUNICIPAL SOLID WASTE: A REVIEW

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ABSTRACT

Waste-to-Energy (WtE) technologies are any waste treatment method that generates energy from a waste source in the form of electricity, heat, or transportation fuels (e.g., diesel). Municipal Solid Waste (MSW) can be both organic and inorganic. Households, offices, stores, schools, hospitals, hotels, and other facilities all generate MSW. Food, paper, rags, metal, tires, building debris, glass, and hazardous waste are the main components of MSW. The aim of the study was to review the technologies used to generate energy from Municipal solid waste. Peer reviewed journals, books related to municipal solid waste management and composition were collected for referring and extracting the relevant information. The technologies can be used on a variety of waste types. This study classified the technologies into three categories such as biological treatment, thermal treatments, and utilization of landfill gas. A systematic design of a municipal solid waste (MSW) management system can lead to the identification of a promising and/or sustainable method of handling MSW by converting it to energy and valuable products. Potential technological alternatives (such as recycling, composting, anaerobic digestion with electricity generation, gasification followed by catalytic transformation, gasification with electricity generation, plasma arc gasification with electricity generation, pyrolysis with electricity generation, incineration with electricity generation, and landfill with electricity generation) are producing valuable products from MSW. In conclusion, municipal solid waste is a valuable renewable energy resource and a global opportunity for energy recovery using different WtE technologies. MSW is a viable energy source in both industrialized and developing countries, according to this review.

Keywords: *municipal solid waste, technologies, waste to energy*

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IRRIGATION WITH DIFFERENT WATER SOURCES AND AGRONOMIC PERFORMANCES OF OKRA (*Abelmoschus esculentus*)

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ABSTRACT

Okra is one of the most popular vegetables grown in the dry zone of Sri Lanka. Temporal and spatial water scarcity has been a major problem in these areas during the dry weather conditions. To alleviate the problem, crop could be irrigated with different water sources. According to that, the present study aimed to investigate the effect of different sources of irrigation water on the growth and yield of Okra (*Abelmoschus esculentus*). The experimental set up was a Randomized Complete Block Design (RCBD) of three treatments and three replicates. The applied treatments were, T1 (Well water irrigation), T2 (Water from National Water Supply and Drainage Board for irrigation) and T3 (Canal water irrigation) to Okra. Growth and yield parameters of okra were measured in the study. To find the suitability of irrigation water, quality parameters such as pH, TDS (Total Dissolved Solids) and EC (Electric Conductivity) were also measured for different water sources. Finally, collected data were statistically analysed using SPSS software. The study revealed that the plots irrigated with canal water had shown the plant height, leaf area, fresh shoot weight, fresh root weight as 113.9 cm, 17,935.6 cm^2, 773.3 g and 110 g, respectively. Similarly, the highest yield of 12,724.87 kg/ha also obtained from the plots irrigated with canal water. However, statistical analysis confirmed that there were no significant differences in yield under these treatments at 5% significance level. The study concluded that three treatments (T1, T2 and T3) have positive impacts on the growth and yield of Okra (MI 7). Therefore, crop could be irrigated with canal water and well water. And the NWSDB supply water can also be used depends on its availability during the cultivation period without affecting the yield.

Keywords: *canal water, leaf area, okra, well water*

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CHANGE DETECTION ANALYSIS OF TEA LANDS IN RATNAPURA DS DIVISION, RATNAPURA, SRI LANKA USING LANDSAT IMAGES

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ABSTRACT

Spatial and Spatial and temporal analysis of tea lands are essential for the proper planning and management. The study was aimed at detect the changes of tea lands in Ratnapura DSD for the period 2005 – 2019 using Landsat series. The study used cloud free Landsat 4-5 TM and Landsat 8 OLI/TIRS (path/row: 141/55) images to assess the change detection of tea lands. Unsupervised classification was used to identify the land use land cover classes including forest, tea lands, rubber plantations, urban areas and bare lands. Change detection study was carried out to identify the tea land changes and the area was quantified to assess the percentage change and the rate of change over 15 years. Multi-temporal change detection analysis revealed that the total tea land extent of the Ratnapura DSD has been increased by 2.36 % from 2005 to 2019, while the extent of built-ups was also expanded whereas, the forest and bare lands were declined simultaneously. The rate of changes of tea lands and urban area showed a positive trend of 49.23 ha/year and 78.70 ha/year, respectively and forest showed a negative trend of 0.89 ha/year for the period 2005-2019. According to the change detection map, Forests to Tea conversion had the highest contribution (3,047.84 ha) to the expansion of the tea lands whereas, Tea to Urban had the highest contribution (751.28 ha) to the degradation of tea lands for the period 2005-2019. The overall accuracy of the classified images was 79.9, 80.1, 85.2 and 83.9 % for 2005, 2010, 2015 and 2019 respectively. The study shows that the Landsat images and change detection analysis have the potential to detect and map the changes of the tea lands, which can be used for better planning and policy making.

Keywords: *GIS, remote sensing, spatial-temporal changes, tea lands, unsupervised classification*

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CROP PRODUCTION AND SOIL MANAGEMENT

POTENTIAL OF USING LIQUID AND SOLID FERTILIZERS PRODUCED FROM FISH WASTE AS ORGANIC FERTILIZERS

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ABSTRACT

The fishery sector is one of the crucial sectors that substantially contributes to many countries' economy. However, about 50% of world fish production is going as waste which means about 65.2 million MT of fish waste is generated globally. It has been estimated that each ton of fish consumption generates the same volume of fish waste materials. Most of this fish waste is disposed into the environment causing environmental pollution and health issues. However, fish wastes have many nutrients that could be recycled to produce many commercially valuable products. Fish fertilizer production using this fish wastes is an efficient option to recycle this nutrition while alleviating possible environmental pollution due to this fish wastes. The present study was aimed to formulate fish fertilizers in liquid and solid form using under-utilized fish wastages as an attempt to recycle the nutrients in the fish waste in an effective manner and to assess the potential of fish waste to be used as organic fertilizers in agriculture. Fish compost and fish hydrolysate were produced in triplicates and physical and chemical properties of these fertilizers were analyzed under CRD design. Based on the results, both fertilizers had a substantial amount of major plant nutrients like Nitrogen, Phosphorus, and Potassium. When comparing both fertilizers, fish compost had high nutrition content than fish hydrolysate. This study has verified that fish wastes can be processed to produce fertilizers which can be used as supplementary organic input along with other already available organic inputs.

Keywords: *fish compost, fish hydrolysate, fish waste, organic fertilizers*

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GROWTH AND YIELD RESPONSES OF MAIZE (*Zea mays* L.) UNDER DIFFERENT ORGANIC FERTILIZER APPLICATION RATES IN LOW COUNTRY INTERMEDIATE ZONE, SRI LANKA

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ABSTRACT

The use of organic manure to meet crop nutrient requirements is an unavoidable practice because organic manures generally improve soil physical, chemical, and biological properties while also conserving soil moisture and water holding capacity, resulting in increased crop productivity while also maintaining crop quality. The objective of the study was to evaluate the effect of different organic fertilizer application rates on growth and yield responses of *Zea mays* L. in low country intermediate zone, Sri Lanka. The following treatment combinations, T1: Compost (40 t ha^{-1}); T2: Compost (6.9 t ha^{-1}) + Eppawala Rock Phosphate (ERP) (20 Kg ha^{-1}) +Bio Film Bio Fertilizer (BFBF) (1 lha^{-1}) + Liquid fertilizer-NPK (1250g ha^{-1}), Liquid fertilizer-K (2.5 Kg ha^{-1}); T3: Compost (2 t ha^{-1}) + ERP (20 Kg ha^{-1}) +BFBF (1 lha^{-1}) + Liquid fertilizer-NPK (1250g ha^{-1}), Liquid fertilizer-K (2.5 Kg ha^{-1}); T4: Unfertilized control were laid out in a Randomized completely block design with three replication. The growth parameters, plant height and no of leaves were measured at 2, 4, and 6, weeks after sowing (WAS). The yield parameters including length of the cob, thousand seed weight, no of seed rows, and no of seeds per row were measured at harvesting stage. The results revealed that among the tested fertilizer combinations, Compost (40 t ha^{-1}) performed well in plant height. The highest cob length was recorded in Compost (6.9 t ha^{-1}) + ERP (20 Kg ha^{-1}) +BFBF (1 lha^{-1}) + Liquid fertilizer-NPK (1250g ha^{-1}), Liquid fertilizer-K (2.5 Kg ha-1) combination. It is concluded that application of compost at the rate of 40 t ha^{-1} is the best combination to obtain the highest growth performances at later growth stage and Compost (2 t ha^{-1}) + ERP (20 Kg ha^{-1}) +BFBF (1 lha^{-1}) + Liquid fertilizer-NPK (1250g ha^{-1}), Liquid fertilizer-K (2.5 Kg ha^{-1}) is the best combination to obtain higher pod length and number of seeds per row than unfertilized control. But here was no impact of rates of organic fertilizer combination on yield performances. Therefore, further studies to compare different rates of organic fertilizers to be conducted for confirming the results.

Keywords: *compost fertilizer, growth, intermediate zone, maize (Zea mays L.), yield*

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EFFECTS OF ORGANIC MANURE: AMIRTHAKARAISAL AND COW DUNG ON PERFORMANCES OF GREEN GRAM (*Vigna radiata*) GROWN IN POTS

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ABSTRACT

Green gram (*Vigna radiata*) is an annual important pulse crop that mainly grown in tropical, subtropical and, temperate regions of Asia. Traditionally it is grown on commercial scale with synthetic fertilizer and on subsistent scale with organic manure. Amirthakaraisal is an organic liquid nutrient solution containing of N, P and K. The present study was conducted with the objective of investigating the effect of combination of Amirthakaraisal and Cow dung on the growth and yield of *Vigna radiata*. The experiment was conducted as a pot experiment with six treatments and ten replicates in a completely randomised design. Which was maintained in open field. The treatments are T1 -100% Amirthakaraisal, T2 - 75% Amirthakaraisal and 25% Cow dung, T3 - 50% Amirthakaraisal and 50% Cow dung, T4 - 25% Amirthakaraisal and 75% Cow dung, T5 - 100% Cow dung, T6 - control (zero treatments). Treatments were applied two week interval according to the pot area. Growth and yield parameters were measured and analysed statistically using ANOVA and means were compared with DMRT. The results proved that T3- 50% Amirthakaraisal and 50% Cow dung significantly ($P < 0.05$) increased the dry weight of shoot (27.27%), number of pods per plant (31.03%), weight of 100 seeds (29.78%), total yield (33.73%) in comparison to plants without application of organic manure (T6). T3 given best results when comparing with T1, T2, T4, T5 and also T3 plants were expose their 50% flowering 30 days after planting compared with other treatments. Therefore, it could be concluded with the final yield of *Vigna radiata* that application of 50% Amirthakaraisal and 50% Cow dung to soil increased the growth and yield performance of *Vigna radiata*.

Keywords: *amirthakaraisal, cow dung, growth and yield components, organic fertilizer, tropical*

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EFFECTS OF DIFFERENT COMBINATIONS OF COW DUNG AND JEEWAMIRTHA APPLICATION ON GROWTH AND YIELD OF COWPEA (*Vigna unguiculata* L.)

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ABSTRACT

Cowpea is one of the important vegetable crops in Sri Lanka as well as many other countries. Chemical fertilizer application of cowpea production leads to hazardous effect of agro ecological system. A pot experiment was conducted to study the effects of different combinations of Cow dung and Jeewamirtha on growth and yield of cowpea (*cv* Dhawala) at the home garden, in Kinniya, located in the latitude of 8° 30' N and the Longitude of 81° 11' E Eastern Province Sri Lanka during the period of May to September in 2021. The experiment was laid out in Completely Randomized Design with six treatments and ten replication. The treatments are based on the recommendation T1 (100% Jeewamirtha), T2 (75% Jeewamirtha+ 25% Cow dung), T3 (50% Jeewamirtha + 50% Cow dung), T4 (25% Jeewamirtha + 75% Cow dung), T5 (100% Cow dung), T6 (control). The results showed that, T2 treatment, the plants treated with 75% Jeewamirtha and 25% Cow dung significantly increased the Fresh and Dry weight of shoot (38.90 %, 47.2 %), Days for 50 % flowering (23..6%), Number of pods per plant (44.5 %), 100 seeds weight (34.0 %) and Total yield (50.%) when compared Control treatment (T6). It can be concluded that the 75% Jeewamirtha and 25% Cow dung fertilizer could be used to increase the growth and yield of cowpea as a environmental friendly approach.

Keywords: *chemical fertilizer, cow dung, jeewamirtha, Vigna unguiculata, yield component*

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EVALUATION OF DIFFERENT SOIL AMENDMENTS AND SEED PRIMERS ON GROWTH AND YIELD PERFORMANCE OF BLACK GRAM (*Vigna mungo* L.)

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ABSTRACT

Black gram is one of the important pulse crops grown in dry zone of Sri Lanka. A field experiment was conducted at integrated farm and training center, Faculty of Agriculture, University of Jaffna, Puliyankulam, during the period from February to July 2021, to find out the effectiveness of different soil amendments and seed priming methods on nodulation, growth and yield performance of Anuradha and MI 1 black gram varieties. The treatments consisted of three soil treatment levels (control, partially burnt paddy husk (PBPH) and compost) and five seed treatment levels (control, N-factor, cow urine, panchagavya and *Prosopis juliflora*) for both Anuradha and MI 1 varieties. The experiment was arranged in a split-plot design with three replicates. Data collected on nodulation, growth, and yield parameters were subjected to analysis of variance (ANOVA) to determine the difference between treatments and their interactions using SAS 9.1. Mean separation was done by using the Duncan method. Application of seed primers and soil amendments have significantly ($p<0.05$) induced the nodulation in both varieties. Different seed priming and soil amendment treatments have shown a significant ($p<0.05$) effect on growth and yield parameters. The incorporation of *Prosopis juliflora* leaf extracts has yielded the highest seed productivity in Anuradha (2.11 ton/ha) and MI 1 (2.08 ton/ha) varieties. Among the soil amendments, application of PBPH produced the highest yield in Anuradha and MI 1 as 1.85 ton/ha and 1.85 ton/ha, respectively. Interactions are not significant. This experiment results revealed that PBPH soil treatments and *Prosopis juliflora* seed treatments have improved the productivity of black gram. Therefore, the farmers can be advised to cultivate black gram effectively without applying inorganic fertilizers.

Keywords: *black gram, dry zone, soil amendments, seed priming*

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EFFECT OF DIFFERENT LEVELS OF INORGANIC POTASSIUM FERTILIZER APPLICATION ON THE GROWTH AND YIELD ATTRIBUTES OF CLUSTER RED ONION (VETHALAM)

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ABSTRACT

Onion (*Allium cepa* L.) is an important Alliaceae family crop and it is an economically important vegetable crop in Sri Lanka. The experiment was conducted in Regional Agricultural Research and Development Centre, Kilinochchi, to evaluate the effect of different levels of inorganic potassium fertilizer on growth, and yield of cluster onion during intermediate season January to May 2020. The experiment was carried out in Randomized Complete Block Design with three replicates. Nine different levels of potassium inorganic fertilizer (Muriate of potash) were used as treatments such as T_1 - 65 kg/ha, T_2 - 90 kg/ha, T_3 - 115 kg/ha, T_4 -140 kg/ha, T_5 - 165 kg/ha, T_6 - 190 kg/ha, T_7 - 215 kg/ha, T_8 - without MOP, T_9 - without any fertilizer. Potassium fertilizer levels were changed in basal, 1st and 2nd top dressing. All management practices were performed based on the Department of Agriculture recommendation except potassium fertilizer level. Growth, and yield attributes were measured. Data were analyzed by using SAS 9.1. ANOVA and mean separation were done to find the differences between treatments. Plant height, leaf number and tip burn score, bulb weight and number of bulbs per cluster and post-harvest dry weight reduction were showed significant differences among the treatments. Among all treatments, application of total amount of potassium fertilizer at the rate of 115 kg/ha (T_3) performed best in growth and yield of red onion. The highest weight loss was observed during 10 to 30 days of storage period, after 40 days of weight reduction percentage was low and 40 days to 50 days of storage period onion bulbs were suitable for planting. It can be concluded that total usage of potassium fertilizer at the rate of 115 kg/ ha produced the highest yield and the highest storage period of cluster red onion (Vethalam) with minimal storage loss in intermediate season in Kilinochchi district.

Keywords: *fertilizer, growth, onion, potassium, storage loss, yield*

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REMEDIATIONS ON METAL CONTAMINATED AGRICULTURAL SOILS: A REVIEW

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ABSTRACT

Soil contamination is a major environmental issue worldwide. Soil is a complex structure and contains mainly five major components such as mineral matter, water, air, organic matter and living organisms. The quantity of these components in the soil does not remain the same, but varies with the locality. Therefore, it is essential to make an adequate land management to maintain the quality of agricultural soil. Basically, a given contaminated soil may contain these heavy elements Arsenic, Cadmium, Chromium, Mercury, Lead, Cobalt, Nickel, Copper, Manganese, and Zinc. Those could be released to the environment through natural or anthropogenic processes, eventually causing toxic effects to plants and microorganisms in soil; thus, lessening productivity and posing dangerous threats to the agro-ecosystems. They act as stress to plants, affect the plant physiology and adversely affect to the soil fertility. The sources of heavy metal(loid)s in agricultural soil in most countries include natural source, mining, smelting, agrochemicals, sewage sludge applications, livestock manure, fly ash and wastewater uses. Agriculture fields have been usually contaminated by over-using of fertilizers. To sustain high productivity of crops, the application of large quantities of fertilizers became an important component. Unlike organic contaminants, metal(loid)s do not undergo microbial or chemical degradation and persist for a long time after their introduction. Bioavailability of metal(loid)s plays a vital role in the remediation of contaminated soils. Systematic remediation technologies for contaminated soils are addressed as well, which include physical/chemical remediation, phytoremediation, microbial remediation and integrated remediation.

Keywords: *heavy metals, remediation, soil contamination*

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EFFECTS OF COMPOST AND COMMERCIAL FERTILIZER ON GROWTH PERFORMANCES OF OKRA

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ABSTRACT

The organic fertilizer product is made from natural compounds of plants or animals, decomposed or mineral matter as well as from natural process such as compost. Organic fertilizers improve the nutrient stock, water retention capacity, cation exchange capacity, base saturation. Inorganic fertilizer supplies essential plant nutrient Potassium, Nitrogen and Phosphorus. A pot experiment was carried out to study the effect of compost and commercial fertilizer on growth performance of okra with five treatments in a completely randomized design. The treatments such as T1- 100 % compost, T2- 75 % compost and 25 % chemical fertilizer, T3- 50 % compost and 50 % chemical fertilizer, T4- 25 % compost and 75 % chemical fertilizer, T5- 100 % chemical fertilizer replicated five times. The data was analyzed using SAS packages and differences between treatments' means was compared using Duncan's Multiple Range Test (DMRT). According to the study 50% compost and 50% chemical fertilizer gave the best performance compared with other treatments. The 50% compost and 50% chemical fertilizer (T3) showed the increased plant height, number of leaves, number of branches, fresh weight of shoot, number of flowers, length of roots, fresh weight of root, fresh weight of leaves. From this study it can be concluded that 50% compost and 50% chemical fertilizer integration is the best combination for okra cultivation.

Keywords: *chemical fertilizer, compost, organic manure, over usage, pot experiment,*

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EFFECT OF SALINITY ON AGRICULTURE AND MEASURES TO RECLAMATION: A REVIEW

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ABSTRACT

Soil is a non- renewable resource made up of five ingredients such as minerals, soil organic matter, living organisms, gases, and water. The soil that contains excess salt that is called saline soil and leads to an environment stress. The salinity development is due to are natural process and human activity. Salinity is one of the most brutal environmental factors limiting the productivity of crop plants because most of the crop plants are sensitive to salinity due to high concentration of salts in the soil and land. Approximately, one billion hectares of land world is affected by various concentration and nature of salts. Salinity is a serious problem, that is could only be overcome by removing the salt from root zone. The proper management practices and advance technique methods help to improve the salt affected soil. Physical amelioration which could be applied to any affected soil, if the soil contains more salt level in a specific area, chemical alteration of the soil should be used. However such strategies being land drawn and cost intensive, therefore there is a need to develop simple and low cost biological methods for salinity stress management, which can be used on a short term basis. Microbes can play a significant role in this category, if we use unique properties such as tolerance to salt levels, genetic variation, synthesis of adaptive solution, production of hormones that promote plant growth, biological control ability and their interaction with crop plants. Among the methods available the effectiveness of the method for salinity control is influenced by the condition of the area selected.

Keywords: *electrical conductivity, exchangeable sodium percentage, salinity, sodium absorption ratio, total concentration of salt,*

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EFFECT OF DIFFERENT ROOTING MEDIA ON ROOTING OF AIR LAYAERED *Ixora coccinea* PLANT AND THEIR SURVIVAL RATE AFTER POTTING

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ABSTRACT

Air layering is one of the commercially used vegetative propagation methods. Rooting media is a problem in air layering due to high drying tendency of topsoil which cause for poor root growth and development. To find solution for this problem, the present research was carried out in Kilinochchi during March to June 2021 to study the effect of different rooting media and girdling sizes on growth of air layered *Ixora coccinea* plants and their survival rate. Two factor Factorial experiment was conducted under Complete Randomized Design with three replicates. Two Girdling sizes (2.5cm and 4 cm) as factor one and five different media such as T1 (topsoil), T2 (Coconut coir 50 % + topsoil 50 %), T3 (partially burnt paddy husk 50 % + topsoil 50 %), T4 (Dried cow dung 50 % + topsoil 50 %), T5 (palmyra fiber 50 % + topsoil 50 %) as factor two. Number of primary roots, length of roots, thickness of roots and survival percentage were measured, data was analyzed by SAS package and mean separation was done by Using Duncan's Multiple Range Test to find the best treatment combination. Among different rooting media and girdling sizes, the best results were observed in partially burnt paddy husk 50 % + topsoil 50 % (T3) and in girdling size of 2.5 cm. After detachment from the parental plant, all *Ixora coccinea* showed maximum survival percentage (100%) after planting in polybags. It can be concluded that treatment combinations of partially burnt paddy husk 50% + topsoil as a rooting media and girdling size of 2.5cm as the best treatment combination for Ixora in air layering.

Keywords: *air layering, girdling size, Ixora, propagation, survival percentage*

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EFFECT OF MORINGA (*Moringa oleifera*) AND JACK (*Artocarpus heterophyllus*) LEAVES AS ORGANIC AMENDMENTS FOR TOMATO CULTIVATION (*Solanum lycopersicum* L.)

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ABSTRACT

A pot experiment was conducted to evaluate and compare the effect of moringa leaves and Jack leaves amendments with chemical fertilizers and compost on the vegetative growth, and yield performances of tomatoes (*Solanum lycopersicum* L.) var. Thilina. Six treatments namely T1: 100% Chemical fertilizer [Basal at 3 WAP at the rate of N: P: K-65:325:65 kg/ha and top dressing at 6 WAP at the rate of N-65 K-65 kg/ha). T2: 100% Moringa leaf, T3: 100% Jack leaves, T4: Jack leaves 50% + Compost 50%, T5: common organic amendment (10 g per pot), T6: Control (without any nutrient source) and were replicated three times in a Randomized Complete Block Design (RCBD). T2, T3, T4 and T5 were applied once in a two weeks' interval up to harvest. Plant height and number of leaves were measured at 2 weeks interval at the vegetative stage and the number of fruits which were harvested from each treatment was also measured. The results revealed that the average number of fruits and number of leaves were higher in treatment received jack leaves and compost than chemical treatment. This was on par with other organic combinations. The results suggest that as all organic amendments showed the most significant (p 0.05) influence on all parameters under study, soil application of amendment studied is an appropriate way to feed the tomato crop to enhance its growth, flowering, and marketable yield. This experiment concluded that though the application of *Moringa oleifera* (moringa) leaves and *Artocarpus heterophyllus* (jack leaves) with compost are helpful in improving yield and quality attributes of tomato, Jack leaves 50% and 50% compost amendment as a nutrient source on tomato produced better plant growth and yield performances. Application of those amendments is the cheapest, environmentally friendly, and low-cost.

Keywords: *Jack leaves, Moringa leaves, soil application, tomato, yield*

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EFFECT OF DIFFERENT ANTI-SENESCENCE CHEMICALS AND PACKAGING MATERIALS ON POST-HARVEST SHELF LIFE OF *Jasminum sambac*

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ABSTRACT

Peculiar fragrance flowers and good medicinal and aromatic value of the *Jasminum sambac* get attraction by the people from ancient period to date and has shown a good export demand in the overseas markets. Though, petal senescence is the major problem identified in *J. sambac* and ceases all developmental process which include flower wilting, shedding of flower parts and fading of blooms, ultimately results poor demand and marketing. Hence, the present investigation was planned with the aim of enhancing the post-harvest life of *J. sambac* flower buds by the application of different anti-senescence chemicals and using different packaging materials. The flowers were treated with 2% and 4% of boric acid with or without 2% and 4% sucrose as anti-senescence treatments and distilled water as control. The treated flowers were packed in different packaging materials such as 200-gauge polythene bag without ventilation holes, banana leaf package, corrugated cardboard box lined with aluminum foil and packed flowers were stored in refrigerator at 5^{o}C. Physiological parameters were computed and quality parameters were measured by visual observation and recorded as hedonic scale scoring. The experiment was designed as Completely Randomized Design with nine treatments and three replicates and the data were subjected to ANOVA (SAS version 9.2). Result revealed that jasmine flower buds treated with 4% boric acid combined with 2% sucrose and packed in corrugated cardboard box lined with aluminum foil significantly ($p = 0.05$) increase the freshness index (77.35%), color retention index (91.04%) and reduce the flower opening index (24.70%) and physiological weight loss (48.41%) at 16th day after treatment and maintained the shelf life up to 16 days from the day of harvesting over control for 8 days. Therefore, the results of this experiment suggested the possibilities for extending the postharvest life of jasmine flowers up to 16 days from harvesting by using the anti-senescence chemicals and suitable packaging material.

Keywords: *anti-senescence chemicals, Jasminum sambac, packaging materials, post-harvest life*

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EVALUATING THE IMPACTS OF COVID – 19 PANDEMIC ON THE PRODUCTION OF OTHER FIELD CROPS (OFCs) IN SRI LANKA

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ABSTRACT

This study was designed to evaluate the impacts of COVID-19 pandemic on the production statistics of other field crops (OFCs) in Sri Lanka and to examine whether the production statistics of OFCs show this perceived impact during *Yala* (2020) and *Maha* (2020/21) seasons. The data on extent of cultivation and total production of 15 OFCs at national scale were collected from the database of the Department of Census and Statistics, Sri Lanka. The data were compared to the pre-pandemic, long-term average (2001-2019) of the extent of cultivation and production of OFCs during both seasons. Results showed that, the extent of cultivation and production were highly decreased for potato, sweet potato and big onion, thus highlighting the vulnerability of these crops to COVID-19. Meanwhile, maize, cowpea, black gram, mung bean, ground nut, turmeric and ginger showed substantial increase in the extent of cultivation and production, hence demonstrated resilience to the impacts of COVID-19 pandemic. Notably, farmers began to cultivate turmeric and ginger during the *Yala* season in 2020. Promotional and awareness programs to enhance the local production of OFCs might have contributed to achieve the increased local production of these crops, compared to the pre-pandemic years. Furthermore, this study highlights the possibility of using the national statistics to visualize the impacts of a large-scale pandemic on the production of OFCs in Sri Lanka. Future studies will be employed with advanced statistical techniques to isolate the impacts of this pandemic in crop production.

Keywords: *COVID-19, national statistics, field crops, resilience, vulnerability*

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COMPARISON STUDY OF SOME SOIL CHARACTERISTICS UNDER VARIOUS CULTIVATION SOVEREIGNTIES OF DIFFERENT CROPS IN SRI LANKA

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ABSTRACT

The research associated the comparison of some properties of soil samples from dominant cultivation crops such as tea, rubber, pineapple, banana, tobacco and rice in Sri Lanka. Soil samples were collected from 5 different locations of the same field at 0-15cm soil depth. In the laboratory, Soil properties including water holding capacity (WHC), bulk density, specific gravity (SG), pH, electrical conductivity (EC), buffering capacity and activity of microorganism were estimated in the laboratory. The results showed that there was a significant difference of 5% level among all the soil characteristics that have been measured. Mean WHC of soil from tobacco cultivation showed higher than other samples. Soil from (Compacted and Uncompacted) pineapple cultivation showed high mean bulk density than soil samples from other crops cultivations. Soil from tea cultivation showed lower mean bulk density (Compacted soil). Soil from rice cultivation showed lower WHC in contrast soil from rubber cultivation showed higher WHC. The mean EC of soil from rice cultivation is significantly high compare to other soil samples. This may be due to higher mean ions concentration in dominant rice cultivation field. The pH of the soil was higher obtained from tea cultivation and lower from rice cultivation. The mean specific gravity of soil samples from rice and pineapple were high. Soil from rubber and rice cultivation showed higher and lower buffering capacity respectively. Microbial activity was higher in the soil samples from tobacco and rubber cultivation. The different soil samples collected from different dominant plant cultivation agricultural sites were found to have variation in some soil characters. This may be due to different cultivation practices adopted under different crops.

Keywords: *bulk density, electrical conductivity, specific gravity, water holding capacity*

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EFFECT OF COWDUNG AND GLIRICIDIA LEAVES AS AMENDMENT ON GROWTH AND YIELD PARAMETERS OF OKRA (MI 5) (*Abelmoscus esculentus)*

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ABSTRACT

Adding chemical fertilizers to the soil for a long period of time may cause the soil degradation and ground water pollution. Nowadays, researchers are finding solutions with organic manure to replace the chemical fertilizers. Even though organic manure releases nutrients slowly to the soil, they considered as eco-friendly fertilizers. It is very much needed to produce environmental healthy and high quality foods to the world, with increasing population. By considering above factors a potculture experiment was carried out with *Abelmoscus esculentus,* in Embilipitiya, Rathnapura, Sri Lanka, to study the effect of different organic sources as nutrient supplement on growth performance of *okra*, *variety* MI 5. The experiment was conducted from July to September in 2021 in poly bags with the dimension of 30cm x 30 cm filled with 8 kg of soil. Four treatments with five replicates were arranged in a CRD model. The treatments are T_1 - Dried cow dung, T_2- Dried gliricidia leaves, T_3-Gliricidia- cow dung liquid organic fertilizer and T_4- DOA recommended chemical fertilizer. Chemical fertilizers urea, TSP and MOP at the rate of - 150:200:75 Kg/ha as basal and top dressing and organic sources at the rate of 10t/ha were applied. Plant height and number of leaves were measured at one-week interval from 2nd week after seeding up to the harvest. Average pod length from each treatment was also measured. The results indicated that the application of gliricidia - cow dung mixed liquid organic fertilizer showed significant ($P<0.05$) effect on tested parameters. From this study it can be concluded that the application of gliricidia cow dung liquid organic fertilizer enhances the plant height, number of leaves and length of pod.

Keywords: *chemical fertilizer, organic manure, serious kidney diseases, soil degradation*

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EVALUATION OF THREE TREE SPECIES FOR THE AGROFORESTRY SYSTEM IN BATTICALOA DISTRICT

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ABSTRACT

The agroforestry system is widely recognized as a tool to overcome production constraints in dry zones. Agroforestry improves crop yields and soil properties by minimizing soil degradation. Trees play a vital role in agroforestry systems to reduce climate vulnerability, improve system resilience of natural disasters, and protect agricultural production from climate change. Identifying suitable woody perennials for agroforestry systems is vital to sustaining the system in the district. Therefore, a study was conducted to identify the suitable woody perennial for the agroforestry system in the Batticaloa district located in the dry zone of Sri Lanka. Fifty home gardens were randomly selected in the district, and the growth behaviour of similar age of three woody perennials: Teak (*Tectona grandis*), Khaya (*Khaya anthotheca*) and Halmilla (*Berrya cordifolia*) were measured. Tree height was measured using a meter scale. The girth of these tree species was measured at 1.3m from the ground using a caliper. The number of survival plants was counted in each agroforestry system to measure survivability. The plant height was significantly ($p<0.05$) varied among the species, and Teak had the highest growth (3m) compared with Halmilla (1.5m) and Khaya (2m). Halmilla (*Berrya cordifolia*) had the smallest plant girth size compared with the other two species. The plant's survival rate was not significantly ($p>0.05$) different between Teak and Khaya, but the survival rate of Halmilla was lower than both plant species. The study concludes that Teak (*Tectona grandis)* and Khaya (*Khaya anthotheca*) are suitable woody perennials for the agroforestry system in Batticaloa compared with Halmilla (*Berrya cordifolia*).

Keywords: *agroforestry, plant girth, plant height, survival rate, woody plants*

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ORGANIC VERSUS INORGANIC FERTILIZER MANAGEMENT ON RICE YIELD

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ABSTRACT

Rice (*Oryza sativa* L.) is the staple food of more than half of the world's population. An average Sri Lankan obtains 45% of total calories and 40% of total protein requirement from rice. The imports of agrochemicals have been restricted in Sri Lanka to promote organic agriculture. Information on the effect of organic fertilizer management on rice yield is vital to encourage organic rice cultivation in Sri Lanka. A systematic review was conducted to compare the yield responses of rice in organic and inorganic fertilizer management systems. The relevant information was collected from articles published in journals and other scientific publications. The number of panicles/m^2, 1000 grain weight, filled grains/panicle, grain yield (t/ha) in organic and inorganic fertilizer management systems were obtained from 400 experiments conducted in different locations. Yield ratios of organic to inorganic were calculated. One sample T-test was performed to test whether the yield ratios are equal to one. The results revealed that the average grain yield ratio of organic to inorganic (0.79) was significantly ($p<0.05$) lower than one. The organic to the inorganic ratio of the number of panicles/m^2, 1000 grain weight and filled grains/panicle were 0.78, 0.77 and 0.82, respectively, and significantly ($p<0.05$) lower than one. The study concluded a yield difference between organic and inorganic fertilizer management systems, and yields obtained from plots managed organically were significantly lower than plots managed with inorganic fertilizers. Further research is required to minimize this yield gap.

Keywords: *grain yield, inorganic fertilizer, organic fertilizer, yield ratio*

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CROP PROTECTION TECHNOLOGIES

PRELIMINARY STUDY FOR EVALUATING EFFECTIVE STORAGE TEMPERATURE TO PROTECT DIFFERENT GRAINS AGAINST MAIZE WEEVIL *Sitophilus zeamais*

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ABSTRACT

Substantial amount of grains is lost in storage due to the insect pest infestation. The insecticide application to manage the insect pest infestation is limited; hence, non-chemical approaches are in interest. Use of higher temperature which is lethal for survival and development of stored pests is a potential approach for stored product pest management. This study was conducted with the objective of assessing the upper threshold storage temperature against the maize weevil, *S. zeamais*, on host grains *viz.*, maize (*Zea mays*), rice (*Oryza sativa*), chickpea (*Cicer arietinum*), and lentil (*Lens esculenta*). Laboratory studies were conducted at the Department of Agricultural Biology, Faculty of Agriculture, Eastern University of Sri Lanka during 2020 and 2021. The experiment was arranged in a Completely Randomized Design (CRD) and treatments were the combinations of grain types and stored temperatures (30-36 °C at 70% RH). After ten weeks of storage time, adult survival, new progeny development and weight loss were calculated. There was a significant variation of survival with stored temperature ($F=344.47$; $df= 59, 49$ ≤ 0.05). At 36°C, survival of *S. zeamais* was 0% in chickpea after two weeks storage time and none survived beyond 8th week in all grain types. At 35 °C, about 60% adults survived beyond 10 weeks of storage in all types of grains. At 30 °C, all adults survived beyond 10 weeks except in maize. New adult emergence of *S. zeamais* and percent weight loss in the tested grains were zero at 36°C. Thus, 36°C and 70% RH shall be selected as the suitable conditions to store the grains.

***Keywords**: cereal gains, maize weevil, relative humidity, survival, temperature*

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IDENTIFICATION OF MYCELIAL CHARACTERISTICS AND *IN VITRO* SCREENING OF SELECTED FUNGICIDES AGAINST *Rigidoporus microporus*, THE CAUSAL ORGANISM OF WHITE ROOT DISEASE OF CINNAMON

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ABSTRACT

The wood invasion fungus Rigidoporus microporus has a wide host range and causes white root disease in cinnamon (Cinnamomum zeylanicum Blume), a lucrative commercial crop in Sri Lanka. Despite the fact that this disease has a considerable economic impact on the cinnamon industry in Sri Lanka, there is a scarcity of research about the disease, the causing organism, and control measures. The purpose of this study was to identify the morphological features of *R. microporus* mycelium, and to test three selected fungicides for their ability to suppress the *in vitro* fungal growth. Sulfur, tebuconazole and hexaconazole were used as the fungicides. *R. microporus* was isolated from the infected roots of cinnamon. Isolated fungus was cultured on potato dextrose agar medium at 28±2 °C and the morphological characteristics of the fungus were observed 7 days after culturing. White color fibrous fungal mycelium was observed in infected roots which was firmly attached to the bark of the root. A fully grown circular shaped, white color thick fibrous mycelium with multiple branching like structures was observed on the cultured plates. Under the compound microscope, a threadlike network was observed with a hyaline, septate hyphae and clamp connections. *In-vitro* testing of the fungicides revealed that tebuconazole and hexaconazole treated plates inhibited the most fungal growth 100 % in all three concentrations (100, 250, 500ppm), whereas sulfur treated plates inhibited the least fungal colony growth 50 % less when compared with the hexaconazole and tebuconazole. In conclusion, morphological features of *R. microporus* mycelium were identified, and tebuconazole and hexaconazole were proven to be efficient against the pathogen.

Keywords: *cinnamon, fungicide, morphology, Rigidoporus microporus, White Root Disease*

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PHYTOCHEMICAL COMPONENTS AND ANTIBACTERIAL ACTIVITY OF LEAF, STEM BARK AND UNRIPE FRUIT EXTRACTS OF *Nauclea orientalis* LINN. IN SRI LANKA

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ABSTRACT

Nauclea orientalis is one of the rarely utilized plants as healing remedies in Sri Lanka. The study aimed to evaluate the phytochemicals and antibacterial activity of leaves, bark, and unripe fruits of *Nauclea orientalis*. Powdered plant parts were extracted; using distilled water, ethanol, methanol, and acetone. All extracts were analyzed for tannin, saponin, flavonoids, alkaloids, quinones, glycosides, cardiac glycosides, terpenoids, phenols and coumarins qualitatively using standard methods and antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* by agar well diffusion method. Results revealed the presence of all tested phytochemicals in the tested plant. The leaf part contained all the phytochemicals except flavonoids and glycosides. Only alkaloids were absent in the bark part, while none of the solvent extracts gave positive results for saponin and tannin from the fruit. The bark extract contained the highest number of phytochemicals than other plant parts. In addition, it was found that extracted solvents had an effect on the presence of a wide range of phytochemicals, and among them, water was the best phytochemical extractor for this plant. Results of antibacterial activity revealed that more extracts exhibited antibacterial activities against tested microorganisms and showed significant antibacterial activity ($P < 0.05$) against two tested bacterial strains. The ethanol extracts of all plant parts had the highest zone of inhibition, and ethanol extract of the fruit and leaves were the excellent inhibitor against *E. coli* and *S. aureus* respectively, where zone of inhibition of *E. coli* was 1.25 ± 0.05 for 75mg/100µl of fruit extract and zone of inhibition of *S. aureus* was 1.52 ± 0.03cm for 75mg/100µl of leaf extract. The inhibitory properties of these extracts made them suitable for treating microbial-induced ailments.

Keywords*: antibacterial activity, Escherichia coli, phytochemical, Staphylococcus aureus*

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POTENTIAL USE OF BACTERIOPHAGES IN CONTROLLING SOFT ROT IN CARROTS

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ABSTRACT

Bacterial soft rot in carrots caused by *Pectobacterium* spp., is one of the predominant diseases, which leads to severe economic losses. As the available control measures including chemical controlling and phytosanitary practices do not provide a satisfactory disease control, the use of bacteriophages as biocontrolling agents takes a greater attention, because it provides an environmental-friendly, relatively cheaper and safe alternative to chemical control of unwanted bacterial populations. The efficiency of four previously isolated bacteriophages were tested against *Pectobacterium* isolates C2B6, C2B7, C2B8 and *P. carotovorum* DSM 30168 using carrot disk assay. Evenly cut, sterile carrot disks were inoculated using only bacteria and bacteria with phage separately. After the incubation, disks inoculated with *P. carotovorum* DSM 30168 along with phage P7_Pcc, P9_PC2B7, and P15_PC2B6 separately, showed no typical soft rot symptoms; whereas visible symptoms were observed on positive control and on the disks that were co-inoculated with the bacterium and phage P18_PC2B8. No visible symptoms were observed on the negative controls, which were treated only with four phages separately. Phage P15_PC2B6 was effective in controlling all tested pathogens and on contrary, phage P18_PC2B8 did not show any notable effect against any of the tested pathogens. The results suggested that phage P15_PC2B6 has a greater potential to act as a biocontrolling agent, while phage P9_PC2B7 and P7_Pcc also can be used to develop phage cocktails against *P. carotovorum* DSM 30168 together with P15_PC2B6. Therefore, these preliminary results suggest bacteriophages may be used effectively to control bacterial soft rot in carrots. Further, *in vivo* assays are needed to develop this method up to commercial level.

Keywords: *bacterial soft rot, bacteriophages, biocontrol, carrot*

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PRELIMINARY STUDIES ON THE ISOLATION OF CELLULOSE-DEGRADING BACTERIA

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ABSTRACT

Plant biomass contains cellulose as the major component. Cellulose can be hydrolyzed to glucose by cellulase. Glucose is used as carbon source by different microorganisms for the production of economically important products. The present study was aimed to find cellulase producing bacteria from natural sources. Two stains of cellulose-degrading bacteria (CDB) were isolated from different sources such as termite, soil from termite nest and decaying wood and identified as *Bacillus* sp. Sources were ground in 0.9% saline water and streaked on cellulose agar medium contained (L^{-1}), KH_2PO_4 0.5g, MgSO4 0.25g, cellulose 2.0g, Bacteriological agar 15g and gelatin 2g and pH at 6.8 -7.2 then incubated at 37^{o}C for 48h. Selected strains were subjected to serial dilution and diameter of clear zone around the colony on cellulose Congo Red agar media were measured to show the cellulase activity. Among the several strains isolated, two bacterial strains one from termite (ISO 1) and other from soil sample (ISO 2) showed zone of clearance around the colony. The diameter of clear zone of ISO1 and ISO 2 were 1±0.038 and 1.3±0.028 cm respectively. Bacterial strains were transferred (1 loop per 10 mL) to fermentation medium and incubated at room temperature (30 ± 2^{o}C) at 100 rpm for 3 days. The fermentation medium contained (L^{-1}) KH_2PO4 0.5g, MgSO4 0.25g, cellulose 2.0g and gelatin 2g, and at pH 6.8–7.2. Enzyme samples were taken at different time intervals and activity was measured at different pH levels (pH 4, 5, 6, 7, 8, 9 and 10) at the temperature of 50^{o}C for 30min. The highest enzyme activity was observed at the pH level of 6.0 in 48h of fermentation for both isolates and the enzyme activity of ISO 1 and ISO 2 were 1.09 x 10^{-4} ± 6.72 x 10^{-7} UμL^{-1} and 2.43 x 10^{-5} ± 2.54 x 10^{-7} UμL^{-1} respectively. The research is conducted to characterize the enzyme.

Keywords: *cellulase, cellulose, bacteria*

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FLOOD TOLERANT CROPS: CURRENT TRENDS AND FUTURE PERSPECTIVES – A REVIEW

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ABSTRACT

Heavy rainfall events are becoming longer and more frequent as a result of climate change. This causes soil flooding, which has a negative impact on plant growth and, if the flooding continues for many days, can lead to plant mortality. The majority of crop plants are quite vulnerable. Each year, flooding results in significant yield losses owing to flooding. This review encapsulates recent advances and strategies for improving crop flood resistance. Following the successful identification and mapping of a quantitative trait locus for submergence tolerance, designated as SUBMERGENCE 1 (SUB1) from the FR13A landrace, significant progress in the breeding of submergence tolerant rice varieties has been accomplished in the previous decade. When compared to traditional breeding methods, the SUB1 QTL (quantitative trait locus) has been introduced into several elite types in a short time and with great precision using marker-assisted backcrossing. Swarna-Sub1 is currently used a sensitive check variety. Anatomical adaptations such aerenchyma production, the building of a barrier against radial oxygen loss, and the establishment of adventitious roots are the most promising features that could improve crop flooding tolerance. Waterlogging tolerance may be improved by metabolic changes as well, but more research is needed in this area. Quantitative trait locus (QTL) analyses or genome-wide association (GWA) studies in combination with specific tolerance qualities that may be easily tested are reasonable techniques for future studies. In these investigations, using flooding-tolerant relatives or ancestor cultivars of the crop of interest could improve the chances of uncovering valuable tolerance traits for breeding.

***Keywords**: flooding, molecular breeding, quantitative trait loci, submergence, waterlogging*

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ALKALOID, TERPENOID AND VITAMIN C CONTENT IN EXTRACTS OF SOME COMMONLY USED MEDICINAL PLANTS

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ABSTRACT

Diabetes mellitus and cancer cause a significant global impact, and these have become increasingly prevalent among human populations. There is a growing need to treat these diseases with herbal medicines. Phytochemicals like alkaloids, terpenoids, and the vitamin C (ascorbic acid) discovered in medicinal plants offer a promising new avenue for managing such diseases. However, such phytochemicals in several widely used medicinal plant species have not been quantified yet. We therefore quantified some phytochemicals in commonly used plant parts of *Adenanthera pavonina* (Madatiya), *Cassia auriculata* (Ranawara), *Costus speciosus* (Thembu), *Flueggea leucopyrus* (Katupila), *Momordica charantia* (Bitter Gourd), *Munronia pinnata* (Bin Kohomba), *Spondias dulcis* (Ambarella) *and Tragia involucrata* (Wal kahambiliya). The total alkaloid content was estimated spectrophotometrically using Bromocresol green method with caffeine as the standard, total terpenoid content was determined by separating with petroleum ether while ascorbic acid content was determined with a spectrophotometer, using $KMno_4$. Results showed that both alkaloid and terpenoid contents in ethanolic extracts varied significantly ($p<0.05$) among examined species with the highest recorded terpenoid content, 337±75 µg g^{-1}in *M. charantia* and the highest recorded alkaloid content 503±1.46 µg CE g^{-1}, in *C. auriculata*. The ascorbic acid content in crude extracts of all species did not vary significantly ($p = 0.05$) but that of *C. auriculata, C. speciosus, F. leucopyrus, M. charantia* and *S. dulcis* were higher than 2000 µg g^{-1}. Having a high alkaloid or terpenoid content together with a high ascorbic acid content, these 4 antidiabetic plant species could be more beneficial in the controlling both diabetes and certain cancers, however, further research is required to develop medicines from these to manage the said chronic diseases effectively.

Keywords: *Ascorbic acid, cancer, diabetes, herbal medicine, phytochemicals*

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IN-VITRO INVESTIGATION ON EFFICACY OF SELECTED MEDICINAL PLANT EXTRACTS ON RICE BLAST FUNGUS *Magnaporthe grisea*

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ABSTRACT

Being ranked next to wheat, Rice (*Oryzae sativa* L.), an important staple food of Sri Lanka, is globally hampered by blast disease caused by *Magnaporthe grisea*. Synthetic fungicides are administered to manage it, however, due to Sri Lanka's policy to reduce application of synthetic chemicals, an alternate method of using untapped indigenous resources was explored. An *in-vitro* investigation was carried out to test the efficacy of selected medicinal plant leaf extracts against *M. grisea*. 20% of *Vernonia cinerea*, *Mentha arvensis*, *Aegle marmelos*, *Mimosa pudica* and *Ocimum tenuiflorum* hot water leaf extracts were mixed with PDA media and tested for antifungal activities. Three replicates were maintained along with the non-plant extract as control. For the phytotoxic confirmation test was done on 100 paddy seeds treated with leaf extracts (20%). Experiments were arranged in a Complete Randomized Design. The mycelial growth of *M. grisea* and rice seed germination were recorded. The data were subjected to ANOVA and Tukey's HSD multiple comparison test to determine the best treatment at P <0.05 using SAS 9.1. Significant growth inhibition of 98.07% and no conidial production were observed only in *O. tenuiflorum* treatment whereas in other treatments inhibition percentages were less than 40.27% and were not significant among them at P < 0.05. The seed germination varied from 80 - 93% and indicated no phytotoxic activity of botanicals in seed germination. Therefore, the findings conclude that 20% leaf extract of *O. tenuiflorum* could be useful to manage the blast fungi in paddy seed germination and extended field trials are needed for a recommendation.

Keywords: *Rice blast, Ocimum tenuiflorum, Inhibition, Organic rice production, Oryza sativa*

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FOOD AND NUTRITION AND VALUE ADDITION

PHYSICO-CHEMICAL AND SENSORY QUALITY PARAMETERS OF TOMATO SAUCE SWEETENED AND CONDENSED WITH DATE FRUIT (*Phoenix dactylifera* L.)

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ABSTRACT

Fruits are the one of the major sources of natural sugars and nutrition. As they provide essential nutrients and keep the body healthy, the processed sugar free condiments preparation is required. So, this study was carried out to formulate the tomato sauce with date fruit. The date fruit was used as sweetening agent and hydrocolloid replacer for the sauce. A basic sauce formulation was used to make five different treatments combining with tomato pulp and date pulp in varied concentrations. In-order to evaluate the quality of tomato-date sauce physicochemical, organoleptic test were conducted. Microbial test was accomplished after eight weeks of storage period. Four formulations of 400g of Tomato pulp, 320g of Tomato pulp and 80g of Date pulp, 280g of Tomato pulp and 120g of Date pulp, 260g of Tomato pulp and 140g of Date pulp were selected based on sensory evaluation for storage studies at 30±1°C temperature and 70.65 RH. There were significant ($p<0.05$) differences between sauce formulations for pH, Total sugar and Moisture content. Moreover, there were significant ($p<0.05$) linear negative reduction was documented in all five treatments for pH (4.01-4.34). And significant ($p<0.05$) increasing trend was monitored in all formulations for total sugar (6.49%-16.48%) and moisture (70.96%-76.46%) during the storage period. Sensory study was revealed that T_4 (280g of tomato pulp and 120g of date pulp) exhibited excellent attributes. Based on the overall study the sauce with 280g of tomato pulp and 120g of date pulp was best for storing for eight weeks without any significant alterations.

Keywords: *date fruit, natural sugar, pH, tomato sauce, total sugar*

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ASSESSMENT OF HISTAMINE LEVELS OF YELLOW FIN TUNA LANDED FROM LOCAL MULTI-DAY BOATS

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ABSTRACT

Yellowfin tuna (YFT) (*Thunnus albacares*) is among the most widely held fish in the seafood trade all over the world. The quality of tuna is the key determining factor of its market price. Histamine may also be existing in certain foods containing free histidine, and is produced by certain bacteria during spoilage and fermentation of fish. Scrombo toxin fish poisoning is a worldwide food welfare problem and is a common cause of fish poisoning that occurs in humans. Therefore, the aim of this current study was to analyze the histamine content of yellow fin tuna landed from local multi-day boats. Yellow fin tuna fish samples were analyzed for histamine content in two different fishery harbors and three different multi-day boats from one harbor. Histamine content was none significantly difference ($p>0.05$) among the fishery harbors. The Histamine content of Negombo fishery harbor and Dikkowita fishery harbor fish samples were respectively 8.43 and 6.12 mg/kg. As the values were below 10 mg /kg both harbors have good quality fish. Histamine content was significantly difference ($p<0.05$) among the different multi-day boats in Dikkowita fishery harbor. Histamine content was significantly ($p<0.05$) higher in yellow fin tuna fish samples of boat 2 (44.69 mg /kg). Lower histamine content was observed in yellow fin tuna fish samples of boat 1(6.12 mg /kg). Intermediate histamine content was perceived in boat 4(7.77 mg /kg). This research study presents the Dikkovita fishery harbor multi-day boats and Negombo harbor fish samples had lower amounts of histamine content even the post-harvest handling methods and environmental factors influenced.

Keywords: *fish samples, histamine level, yellow fin tuna, poisoning*

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DEVELOPMENT OF CUCUMBER *(Cucumus sativus)* JAM WITH THE EXTRACTS OF BUTTERFLY PEA BLUE FLOWERS AND *(Kalanchoe pinnata*) LEAVES

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ABSTRACT

In today's world, people are paying more attention to the concept and intake of fruits and vegetables in order to live a healthy life. An effort has been made in this study to prepare the best combination of Cucumber- Vellari (*Cucumus sativus*) with the extracts of Akkapana *(Kalanchoe pinnata)* Leaves and Butterfly Pea Blue flowers (*Clitoria ternatea)* for jam production. Addition of Butterfly Pea Blue Flowers and Akkapana leaves to cucumber pulp increases the nutritional value of the jam and also provides various health benefits to consumers. Considering the choices of a few fundamental examinations, different combined mixtures of cucumber with Akkapana leaves and Butterfly Pea Blue Flowers were blended in the ratio of 500 g: 0: 0, 500 g: 5 ml: 10 ml, 500 g: 10 ml: 10 ml, 500 g: 5 ml: 20 ml, and 500 g: 10 ml: 20 ml. The freshly made mixed jams were analysed for nutritional characters and organoleptic parameters. Chemical analysis revealed that mixed jam mean value for pH (5.55-3.25) and TSS (75^0 Brix - 67^0 Brix) diminished while titratable acidity (2.10 % - 1.27 %), Total sugar (44.51 % - 78.9%), reducing sugar (20.57 % - 40.55 %), moisture content (44.51 % - 78.9 %) were increased with the concentration of butterfly pea extract. Complete Randomized Design (CRD) was used for the experimental designs .In addition, scores for sensorial attributes were significantly different among composite jam formulations, among all formulation T2 scored high in terms of aroma, flavor, texture and overall acceptability in sensory evaluation. With the findings derived from experimental analysis of freshly made mixed jams, formulation T2 (500 g cucumber: 10 ml akkapana leaf extract: 10 ml butterfly pea extracts) was considered as superior mixed jam in terms of chemical and sensorial properties studies.

Keywords: *butterfly pea flower, cucumber pulp, leaf extract, mixed jam, sensory properties*

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DEVELOPMENT OF PROBIOTIC FUNCTIONAL MILK BEVERAGE INCORPORATED WITH NUTRICEREALS

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ABSTRACT

Cereal-based milk beverages, most of the time spontaneously fermented, have long been traditionally produced in different parts of the world. Millets and oats are considered as important cereal food sources as they are rich sources of calcium, iron, and zinc; and oats are rich in beta-glucan. In the present study, finger millet (*Eleusine coracana*) and oats (*Avena sativa*) based probiotic functional beverage was formulated. Prepared mixture of nutricereals (60:40) was inoculated with *Lactobacillus paracasei* and incubated at 36 ºC for 2h, 4h, 6h and 8h. Sucrose, fresh cow milk, and cocoa powder were the other main ingredients used to formulate the beverage and stored under refrigerated (5±1°C) conditions. Sensory evaluation using 9-point hedonic scale was conducted to select the best fermentation time and the highest acceptability was obtained by the sample fermented for 6h. Significant differences between the results were assessed by analysis of variance (ANOVA). Changes in physico- chemical characteristics including the pH, °Brix, titratable acidity, and reducing/non-reducing sugars with the viable cell counts during refrigeration were monitored during the study. The pH was decreased from 7.10 (SD 0.01) to 5.05 (SD 0.00) and titratable acidity was increased significantly ($p<0.05$) due to lactic acid production by probiotic. The complementation of two cereals can further enhance the physical as well as the functional properties of the milk. The dietary fiber content of the prepared nutricereal based beverage is also high due to the previous studies, which makes it a potential prebiotic. Therefore, it concludes that finger millet and oat based probiotic functional beverage can be developed with *Lactobacillus paracasei* and it could be kept in refrigerated (5±1°C) storage up to 4 weeks without any significant changes in quality attributes.

Keywords: *finger millet, functional food, health benefits, nutricereals, oat, probiotics*

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EVALUATION OF SENSORY CHARACTERISTICS OF COOKIES MADE FROM RICE FLOUR INCORPORATED WITH CANISTEL FRUIT FLOUR

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ABSTRACT

Canistel fruit is an under-appreciated and under-valued commodity in Sri Lanka, which is readily and freshly available at a low cost devoid of seasons. It has potential nutritional value and various health benefits due to the presence of functional compounds in it. Its local abundance prompted the researchers to focus on how it could be incorporated into food products. Therefore, this study was focused on developing a flour from canistel fruit and checking the possibility of utilizing it as a food ingredient particularly in bakery industry. The quality of the cookies developed from the blends of canistel flour: rice flour at five different ratios of such as 75:25, 65:35, 50:50, 35: 65 and 25:75 % was investigated in this present study to evaluate the sensory properties of the cookies including texture, color, odor, crispiness, taste and overall acceptability. The sensory evaluation was conducted with 30 untrained panelists who scored against various quality attributes on a 5-point hedonic scale to determine consumer preference. The data generated were statistically analyzed by using SPSS (version 25). The results revealed that, a significant difference ($p<0.05$) was observed among different treatments in terms of all sensory quality parameters. The cookies formulated with 35:65 % canistel flour: rice flour was obtained the highest score in terms of colour, crispiness and overall acceptability. Therefore, the cookies being blended as 35:65% canistel flour: rice flour was the most preferable sample. So canistel fruit could be utilized for making cookies in the future for human consumption to satisfy the nutritional requirement.

Keywords: *canistel, cookies, rice flour, sensory parameters*

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PREVALENCE OF MALNUTRITION AND ASSOCIATED FACTORS AMONG PRIMARY SCHOOL CHILDREN IN NINTHAVUR DIVISIONAL SECRETARIAT AREA IN AMPARA DISTRICT

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ABSTRACT

This study was carried out to assess the prevalence of malnutrition and associated factors among primary school children in Ninthavur Divisional Secretariat in Ampara District. Sixty students from grade one to grade five were randomly selected for this survey. Pretested Food frequency questionnaire contain Background information, Anthropometric measurement and diet pattern of children and time spend for physical activities was used to collect the data. Data analysis including descriptive statistics, Chi-square analysis and correlation analysis were performed by SPSS statistical software. Results study revealed that 35% of the students were male and 65% were female. The grade distribution was 18.3% students were grade 1, 25% were grade 2, 18.3% were grade 3, 25% were grade 4 and 13.3% were grade 5. 40% of the families earned 10,000-30,000 and 8.3% were earned 71,000-90,000 as their monthly income. Considering the family size, 46.7% had two children, 33.3% had three children. Around 20.0% of the total children analyzed in this study were underweight at the time of the survey following 13.33% were wasted and 11.67% were stunted. No any significance differences were observed between the associated factors for underweight, stunting and wasting with the food pattern of children, monthly income, family size, parents' education level, junk foods, watching TV/smart phone and taking breakfast from outside ($p<0.05$).

Keywords: *children, malnutrition, obesity, underweight*

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LIVESTOCK, FISHERIES & AQUACULTURE

DEVELOPMENT OF SOY MILK BASED NON - DAIRY ICE CREAM WITH OATS

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ABSTRACT

Milk is considered one of the most common food allergens. The people with lactose intolerance are unable to fully digest the lactose in animal's milk and subsequently will develop diarrhea, following to consumption of dairy products. Therefore, most people suffering from lactose intolerance and milk allergens are willing to consume nondairy products as a substitute for dairy products. Though non-dairy products are not highly available in the Sri Lankan market soy milk made from soybean has a prospective to be used as a substitute of milk due to its potential health benefits. Among the whole grains, oats had gained a unique position, due to their diverse health benefits to humans. Therefore, an experiment was conducted to investigate the use of soy milk-based non-dairy ice cream with oats to evaluate the physicochemical and sensory properties of soy milk-based non-dairy ice cream with oats. The experiments were conducted with three treatments plus control namely Soy milk + Oats + Vanilla flavor (T_1), Soy milk + Oats + Chocolate flavor (T_2), Soy milk + Oats + Mango puree (T_3), and normal vanilla ice cream (T_4-Control). The present study resulted that different flavors of soy milk with oats had a significant effect ($P<0.05$), on taste, flavor, texture, color and overall acceptability of products. Sensory evaluation revealed that the chocolate-flavored ice cream attracted panelists the most.

Keywords: *dairy based product, ice cream, oats, soy milk*

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CONSUMER PREFERENCE AND PROXIMATE COMPOSITION OF SOME FRESHWATER FISHES FROM SELECTED RESERVOIRS IN BADULLA DISTRICT, SRI LANKA

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ABSTRACT

Freshwater food fishes are excellent sources of nutrients in the human diet. Consumption of freshwater fish may vary according to consumer preferences, depending on several factors. The nutrients available in fish are also a good indication to fulfil the nutritional requirements in Badulla District. This study focuses on analysing consumer preferences and the proximate composition of selected freshwater food fishes from Badulla district. The preferences were randomly measured according to several factors: taste, freshness, nutrients value, availability, price and type of fish. The highest preference (72.34%) was shown for *Oreochromis niloticus* followed by 10.56%, 9.86% and 7.24% for *Labeo rohita*, *Cirrhinus mrigala* and *Catla catla*, respectively. The freshness of the fish was the most important factor considered by the consumers (70.8%), type of fish (68.2%), and the price (66.2%) were the other most concern factors among the community. The highest protein content (18.70%) was observed in *Labeo rohita* from Mapakada reservoir whereas the lowest value (16.39%) shows in *Cirrhinus mrigala* from Nagadeepa reservoir. There was no significant difference ($p>0.05$) in crude protein among the species. The moisture content of all fish species from Mapakada reservoir was significantly different ($p<0.05$) from the other two reservoirs. Ash content was highest in *Oreochromis niloticus* in Nagadeepa reservoir (4.76%), and ash content in selected species from Mapakada reservoir had a significant difference ($p<0.05$) among the same species from other reservoirs. The highest content of fat (3.85%) was in *Catla catla* from Sorabora reservoir, which was significantly different ($p<0.05$) from the same species in other two reservoirs. Also, the study showed that the fat content of *Catla catla* was higher than other fish species found in all three reservoirs. In contrast, the lowest fat content was recorded in *Oreochromis niloticus* when compared with the other three fish species. In conclusion, the nutritional composition of all the fish species selected from three reservoirs can positively impact enhancing the production of freshwater food fish to fulfil the requirement in the Badulla district.

Keywords: *Badulla, consumer preference, freshwater fish, nutrients, proximate composition*

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A STUDY ON DIFFERENT POULTRY FARMING SYSTEMS IN AMPARA DISTRICT-SRI LANKA

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ABSTRACT

In Sri Lanka, poultry meat and eggs are considered as essential food commodities which provide animal protein at relatively a low cost. The country's demand for chicken meat and eggs is satisfied mainly through the local supply chain. Ampara district is an area located in Sri Lanka where poultry farms are functioning on both small and medium scales. The objectives of the current study were to identify the poultry farming systems in Ampara districts. A survey was conducted among 54 randomly selected poultry farmers in eight veterinary ranges in Ampara district using a pre-designed questionnaire. The collected data were subjected to descriptive analysis using SPSS (Version 25.0). The study revealed that in Ampara, 73 percentage of the male farmers involved in poultry farming rest 27 % were female farmers. The majority of the farmers' education were secondary (25 %) level, 21.7 % of them tertiary and 13.3 % were primary level. From the study sample 63.3 % of poultry farmers were involving in this industry for egg production purpose while 21.7 % were involving for meat supply. 53.3 % of the poultry farming serves as the primary source of income and 46.7 % farmers were doing as a part-time job. Of the total poultry farms 88.9 % were adopt to deep litter system while 85.2 % are managed under intensive system. The present study concluded that considerable amounts of the farmers in the study area were kept poultry farms as a primary source of income with an adequate experience. Most of the farmers practicing intensive farming system with deep litter housing

Keywords: *broiler production, deep litter, eggs, intensive systems, layer production*

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INVESTIGATE THE POSSIBILITY OF SYNTHESIZE AND CHARACTERIZATION OF SILICA FROM COW DUNG

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ABSTRACT

Many potential by-products from agricultural wastes are not investigated for their further application in biologically varied nations such as Sri Lanka. Exploration of valuable resources makes any operation more cost-effective while also reducing the pollution caused by waste products. An endeavor was made to synthesize nano-sized silica from cow dung, which encompasses a great potential source of silica and it is a major waste product generated in cattle farming. The ash from cattle dung includes higher percentage of Silica, as well as other elements in the form of oxides. In this investigation, the sol-gel technique was used to synthesize nano silica, from cow dung ash. The silica from the cow dung was transformed to sodium silicate, and then the SiO_2 was precipitated in a controlled way. FTIR analysis and XRD data were used to characterize the nano-sized amorphous silica. The amorphous nature of SiO_2 is confirmed by the XRD powder pattern. The FTIR spectra of nano-SiO_2 and Commercial SiO_2 were obtained. An FTIR analysis was also performed to determine the purity and surface functions of nano-SiO_2. The optimal calcining temperature for the synthesis was identified as 900°C. Even though then ash yield was reduced while increasing the calcine temperature, nearly 50% of final yield of pure and nano-SiO_2 was obtained. According to the study, cow dung ash is a viable and cost-effective feedstock for the production of nano-SiO_2. The generated nano-SiO_2 can be employed in environmental applications, pharmaceutical and cosmetic industries in the future.

Keywords: *chemical extraction, cow dung ash, FTIR, pure nano-silica, XRD*

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A STUDY ON DIAGNOSIS, CLINICAL MANAGEMENT AND CONTROL OF CONTAGIOUS PUSTULAR DERMATITIS (CPD) IN GOATS IN JAFFNA DISTRICT

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ABSTRACT

Contagious Pustular Dermatitis (CPD) is a highly contagious and zoonotic disease affecting small ruminants caused by CPD virus which belongs to Parapox virus genus. Although CPD is endemic to all parts of Sri Lanka, only a few studies were reported in Jaffna district. Therefore, this study reports the diagnosis, therapeutic management and control measures of CPD. The incidence of CPD was reported in a village (Uthayapuram) in Jaffna district during the last quarter of 2021. This study was carried out on 53 goats aged from 3 months to 4 years and of both sexes reared under a semi-intensive management system. The affected animals were clinically examined and the vital parameters (temperature, respiratory & pulse rate) were measured. Details of the animals were collected using a questionnaire. All the studied animals exhibited proliferative lesions around the oral cavity. The clinical picture with the pathognomonic signs was pointed towards CPD. The infected animals showed high body temperature (104.4±0.35°F), respiratory (30.7±2.61 min^{-1}) and pulse rate (93.2±1.4 min^{-1}). The affected animals were treated with parenteral antibiotics, anti-inflammatory agents and supportive to prevent complications. Although the morbidity rate was high (48%), the mortality rate (0.9%) was low in this study. Low case fatality rate (1.9%) shows less severity of the incidence. Good prognosis was observed one-week post-treatment. Then vaccination was carried out using "CPD -auto vaccine" in un-affected population. In addition, isolation of infected animals and proper disinfection were effectively adapted to minimize further spread of CPD. Adequate awareness was created on zoonotic potential of CPD to prevent the occupational health hazards.

Keywords: *case fatality, contagious pustular dermatitis, proliferative lesions, small ruminants, zoonosis*

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