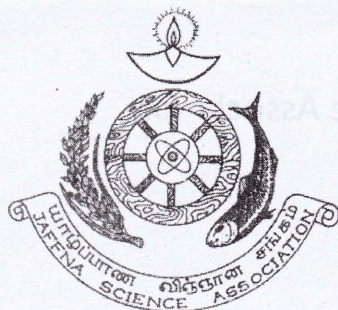


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Editor's Review

The Jaffna Science Association, an NGO, was established in 1991 by the founder President late Prof. A. Thurairajah with the primary objectives such as dissemination of scientific knowledge among the intellectuals in Jaffna region, encouraging national as well as regional research studies and presenting them in the Jaffna society and advancement of scientific knowledge among the secondary school students and at the undergraduate level.

Every year, specific themes relevant to the region depending on the socio-cultural, socio-economic, and socio-political dimensions dominated the situations were identified and focused. The members of the JSA and their research collaborators are encouraged to carry-out researches relevant to the themes and submit their findings which are to be presented at the Annual Conferences. However, all other relevant research findings are also accommodated for dissemination of scientific knowledge. The abstracts are accepted and subjected to national or international reviews. The Abstracts recognized by the evaluators are published in annual proceedings of the Association.

The present twenty first executive committee has arranged its twenty first Annual Conference during 2 – 4 April 2014 and undertaken the responsibility of publishing the abstracts of presentations to be held in the twentieth Annual Conference and the talks and the addresses of the previous Annual Sessions. The abstracts submitted by the contributors have been compiled, organized and appropriately edited according to the recommendations from evaluators in this volume of release.

The editorial board has great pleasure in releasing this volume of the proceedings of abstracts to be presented in the twenty first Annual Sessions of the Jaffna Science Association on 03rd April 2014.

A.Rasakumaran

Chief Editor / JSA

02.04.2014

Head/ELTC

University of Jaffna.

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Locating Global Minimizers of ρ - Convex Programming Problems

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Locating global minimizers of non-convex programming problems has known to be “NP-hard”. Development of global optimality conditions to identify global minimizers of various classes of non-convex problems has been the recent trend in non-linear optimization.

In this paper the following ρ - Convex model problem with bounded mixed variables is studied.

$$(MP) \min_{x \in \mathbf{R}^n} g_0(x) = \min_{x \in \mathbf{R}^n} f_0(x) - \frac{1}{2} x^T \mathbf{A}_0 x$$

$$\text{Subject to } g_j(x) = f_j(x) - \frac{1}{2} x^T \mathbf{A}_j x \leq 0, \quad \forall j \in \{1, 2, 3, \dots, m\}$$

$$x_i \in [u_i, v_i], \quad i \in I, \quad x_i \in \{u_i, v_i\}, \quad i \in J,$$

where $I \cap J = \Phi$, $I \cup J = \{1, 2, \dots, n\}$, for each $j \in \{0, 1, 2, 3, \dots, m\}$ $f_j : \mathbf{R}^n \rightarrow \mathbf{R}$ is a convex function and $\mathbf{A}_j = (a_{st}^{(j)})$ is an $n \times n$ symmetric matrix, and $u_i, v_i \in \mathbf{R}$ with $u_i \leq v_i$ for all $i \in \{1, 2, 3, \dots, n\}$.

This model problem (MP) admits continuous and discrete mixed variables, and covers strongly convex, convex and weakly convex programming problems. Unlike convex problems, weakly convex programming problems are of multi-extremal nature that it may have many local minimizers which are not global. In this paper firstly appropriate local necessary optimality conditions are derived for model problem (MP), using celebrated Karush Kuhn Tucker (KKT) conditions. Subsequently as a main contribution of this paper a verifiable sufficient global optimality condition is provided.

Local necessary optimality condition for (MP): If a feasible point \bar{x} is a local minimizer of (MP), then there exists $\lambda = (\lambda_j) \in \mathbf{R}_+^{m+1}$ with $\lambda_0 = 1$, such that

$$\chi_i(\bar{x}) \sum_{j=0}^m \lambda_j (A_j \bar{x} + a_j)_i \leq 0, \quad \forall i \in I, \quad \text{where } \chi_i(\bar{x}) = \begin{cases} -1 & \text{if } \bar{x}_i = u_i, \\ 1 & \text{if } \bar{x}_i = v_i, \\ (\nabla L(\bar{x}, \lambda))_i & \text{if } \bar{x}_i \in (u_i, v_i), \end{cases}$$

$$\text{and } L(x, \lambda) = \sum_{j=0}^m \lambda_j f_j(x).$$

Verifiable Sufficient global optimality condition for (MP): Let $\bar{x} \in \tilde{D}$ be a local minimizer of (MP). Suppose that $\lambda = (\lambda_j) \in \mathbf{R}_+;$ $j \in \{0, 1, 2, 3, \dots, m\}$ are Lagrangian multipliers associated with \bar{x} and $\mu_j \in \mathbf{R}$ is the first eigenvalue of $-\frac{1}{2}\mathbf{A}_j$ for all $j \in \{0, 1, 2, 3, \dots, m\}$. If

$$\sum_{j=0}^m \lambda_j \sum_{i=1}^n \left[\frac{\chi_i(\bar{x})(\nabla f_j(\bar{x}) - A_j \bar{x})_i}{(v_i - u_i)} \right] \leq \sum_{j=0}^m \lambda_j \mu_j, \text{ then } \bar{x} \text{ is a global minimizer of (MP).}$$

Numerical examples will be discussed to illustrate the significance of the obtained optimality conditions.

Key Words: ρ - convexity, sufficient global optimality conditions, global minimizers, Karush Kuhn Tucker conditions.

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On the Efficient Implementation for Three-stage Gauss Method

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Abstract

The non-linear equations arising in the implementation of implicit Runge-Kutta methods have been solved by several iteration schemes. As an alternative to the modified Newton scheme, some iteration schemes with reduced linear algebra costs have been proposed. In particular, a scheme has been proposed, which is computationally more efficient and avoids expensive vector transformations. The rate of convergence of this scheme is examined when it is applied to the scalar test differential equation $x' = qx$ and the convergence rate depends on the spectral radius of the iteration matrix $M(z)$, where $z = hq$ and h is the step-length. In this scheme, super-linear convergence is required at $z = 0$ and at $z = \infty$ in order to improve the convergence rate of the scheme. Two new schemes with parameters are obtained for three-stage Gauss method. Numerical experiments are carried out to evaluate and compare the efficiency of the new schemes and the original scheme.

Let us consider an initial value problem for stiff system of $n(\geq 1)$ ordinary differential equations

$$x' = f(x(t)), \quad x(t_0) = x_0, \quad f: \mathbb{R}^n \rightarrow \mathbb{R}^n, \quad (1)$$

where f is assumed to be as smooth as necessary. An s -stage implicit Runge-Kutta method computes an approximation x_{r+1} to the solution $x(t_{r+1})$ at grid point $t_{r+1} = t_r + h$ by $x_{r+1} = x_r + h \sum_{i=1}^s b_i f(y_i)$ where

the internal approximations y_1, y_2, \dots, y_s satisfy the sn equations $y_i = x_r + h \sum_{j=1}^s a_{ij} f(y_j)$, $i = 1, 2, \dots, s$,

$A = [a_{ij}]$ is the real coefficient matrix and $b = (b_1, b_2, \dots, b_s)^T$ is the column vector of the Runge-Kutta method. Let $Y = y_1 \oplus y_2 \oplus \dots \oplus y_s \in \mathbb{R}^{sn}$ and let $F(Y) = f(y_1) \oplus f(y_2) \oplus \dots \oplus f(y_s) \in \mathbb{R}^{sn}$. Then the above s equations in y_1, y_2, \dots, y_s may be represented by the compact form $Y = e \otimes x_r + h(A \otimes I_n)F(Y)$ where $e = (1, 1, \dots, 1)^T$ and $A \otimes I_n$ is the Kronecker product of the matrix A with $n \times n$ identity matrix I_n and, in general $A \otimes B = [a_{ij}B]$. This article deals with methods suitable for stiff systems so that the matrix A is not strictly lower triangular and, in particular, is concerned with three-stage Gauss method of maximum order 6.

Cooper and Vigneswaran (1990) proposed the scheme to solve the above non-linear compact system,

$$\begin{aligned} [I_s \otimes (I_n - h\lambda J)](Y^m - Y^{m-1}) &= (L \otimes I_n)(e \otimes x_r - Y^m) + (U \otimes I_n)(e \otimes x_r - Y^{m-1}) \\ &\quad + h(T \otimes I_n)F(Y^m) + h(R \otimes I_n)F(Y^{m-1}), \quad m = 1, 2, \dots, \quad (2) \end{aligned}$$

Cooper and Vigneswaran tested the rate of convergence of this scheme when it is applied to the scalar test problem $x' = qx$ with rapid convergence required for all $z \in \mathbb{C}^-$, where $\mathbb{C}^- = \{z \in \mathbb{C} : \text{Re } z \leq 0\}$. For this test problem, the scheme gives $Y - Y^m = M(z)(Y - Y^{m-1})$, $m = 1, 2, \dots$, and the rate of convergence depends on the spectral radius $\rho[M(z)]$ of the iteration matrix $M(z) = I_s - [(I_s + L - z(\lambda I_s + T))]^{-1} B(I_s - zA)$.

Cooper and Vigneswaran imposed the condition that the iteration matrix M has only one non-zero eigenvalue φ , $\varphi(z) = 1 - \beta \frac{\det(I_s - zA)}{(1 - \lambda z)^s}$ so that the spectral radius, $\rho[M(z)]$, is given by $\rho[M(z)] = |\varphi(z)|$ and the parameters λ and $\beta (= \det B)$ have to be chosen in order to solve the problem $\min_{\lambda, \beta} \max_{z \in \mathbb{C}^-} \rho[M(z)]$.

Cooper and Vigneswaran obtained these parameters to solve the above minimization problem for the Gauss methods of order 4, 6 and 8 respectively.

In this paper, additional constraints, $\rho[M(z)] = 0$ at $z = 0$ and $\rho[M(z)] = 0$ at $z = \infty$ are imposed in addition to the condition that $M(z)$ has only one non-zero eigenvalue. New schemes corresponding to the iteration scheme (2) for three-stage Gauss method are obtained with improved convergence rates and these results are confirmed by numerical experiments.

Key words. Implementation, three-stage Gauss method, Rate of convergence, Stiff systems.

A 3

Bioassay Guided Isolation of some antifungal compounds from *Azadirachta indica* Root bark Extract

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Traditional medicinal practice has been known for centuries in many parts of the world. Plants have the ability to synthesize chemical compounds that help them to defend against attack from a wide variety of predators such as insects, fungi and herbivorous mammals. Most medicinal plants are used as biological alternatives to synthetic fungicides. The present study was carried out to determine the antifungal active compounds present in the ethyl acetate crude of root bark of *Azadirachta indica*. For this study, bioassay guided isolation of ethyl acetate extract of *A.indica* root bark was done using column chromatography and the extract was fractionated into five fractions (named F₁ to F₅) based on the TLC analysis. Then antifungal bioassay was performed with different concentrations (50, 25 and 12.5 ppm) of all fractions against the fungi, *Alternaria* spp, *Aspergillus* spp, *Collectotrichum* spp, *Fusarium* spp, and *Trichoderma* spp, using agar well diffusion method. Subsequently column chromatographic analysis was carried out on all five fractions to identify the active antifungal compounds. Results showed that two pure compounds were isolated from fraction F₁, one from fraction F₂, two from fraction F₃, two from fraction F₄ and one from fraction F₅ of ethyl acetate extract of root bark of *A. indica*, which was identified to possess antifungal activity against all tested fungi. These isolated compounds have to be characterized through NMR studies and mass spectrometry.

Keywords: Antifungal assay, Ethyl acetate extract of *Azadirachta indica*, Column chromatography, Thin layer Chromatography

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In-Vitro Antioxidant Activity of Siddha Herbal Preparation, Vellargu choornam

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Vellargu choornam is a herbal preparation of the Siddha drug mentioned in the Siddha Medical literatures for the treatment of arthritis, oedema, gastro intestinal tract ulcers, itches, and diabetes mellitus. The main constituent of chooranam is whole plant of *Enicostemma littorale* Blume. The total phenolic and total flavonoid contents of chooranam were determined as Gallic acid equivalents (mgGAE/ g) and Quercetin equivalents (mgQE/ g) respectively. Hot aqueous and methanol extracts of the chooranam were screened for their potential in-vitro antioxidant activities using tests such as 2, 2'-diphenyl-1-picrylhydrazyl (DPPH) activity, Ferric-reducing antioxidant power (FRAP) assay, 2, 2'-azino-bis-(3-ethyl-benzothiazoline-6-sulphonic acid) (ABTS) activity, and iron chelating activity. The maximum yield of the extracts, total phenolic and flavonoid compounds were recorded in methanol (21.76%; 44.41±1.26 mgGAE/g; 174.44±9.32 mgQE/g) and aqueous (36.29%; 20.11±0.92 mgGAE/g; 42.74±2.82 mgQE/g) fractions respectively. Iron chelating activity was not found at 1.75 mg/ml concentration of hot methanol and aqueous extracts of chooranam. Overall results of in-vitro antioxidant activity assays indicated that in comparison to the standard trolox, Vellargu choornam has no significant ($P \leq 0.05$) antioxidant activity. Phenolic and flavonoids component have been reported to exert significant antioxidant activity. Although the total phenolic and flavonoids component were detected in the hot methanol and aqueous extracts, these does not appear to be reported a correlation between the observed in-vitro antioxidant activity and total phenolic and flavonoids component of Vellargu choornam. Therefore, antioxidant activity does not appear to be a major mechanism for which Vellargu choornam exerts beneficial effects in inflammatory conditions.

Keywords: Activity, In-vitro antioxidant, Herbal Preparation, Vellargu choornam,

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A 5

Study on traditional fermented foods idli and thosai

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The fermentation of Idli and Thosai was studied at ambient temperature. The microbiological and chemical characteristics of the products were studied for 12 to 24 hrs from the start of fermentation. This process was found to be a lactic acid fermentation by *Leuconostoc mesenteroides*, *Lactobacillus fermentum* followed by yeast more commonly *Saccharomyces cerevisiae*. After 24 hrs *Streptococcus* sp was identified in some samples. The initial bacterial counts in the batter was 10^5 and later increased to 10^7 in idli as well as thosai. Initial microbial load (after 12 hrs) in idli and thosai was due to *Leuconostoc mesenteroides* and *Lactobacillus fermentum*. After 24 hrs *Streptococcus* appeared in idli and thosai. Yeast appeared after 18 hrs in both idli and thosai batter. After 24 hrs the fermentation was complete. The acidity and pH of idli, after the completion of fermentation was 1.017 % and 4.88 respectively. The acidity and pH of Thosai, after the completion of fermentation was 1.044% and 4.82 respectively. Though bacteria and yeast were prevalent in this fermentation process, the overall microbial load was dominated by bacteria.

Key words- *Lactobacillus*, *Leuconostoc*, thosai, idli, yeast

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A 6

AFLP analysis of wild rice species available in Sri Lanka

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Sri Lanka has a valuable repository of rice germplasm collection due to the availability of a large number of traditional and improved rice varieties in addition to wild rice species. However, no proper studies have been reported on their genetic diversity. Therefore, genetic differentiation of Sri Lankan wild rice species will be beneficial in many ways to understand the availability of traits for efficient breeding programs.

Amplified Fragment Length Polymorphism (AFLP) was used to evaluate the genetic diversity among wild rice species available in Sri Lanka using fluorescent marker technology. Genetic similarities were estimated using Jaccard's similarity coefficient (J). Unweighted Pair Group Method with Arithmetic mean (UPGMA) based dendrograms were constructed to assess the genetic diversity within wild rice accessions used in this study. Jaccard's similarity coefficients varied from 0.258 to 0.377. Similarity matrices generated for these rice species categories showed high genetic variation.

Principal Component Analysis (PCoA) further confirmed the patterns obtained by UPGMA dendrograms. In addition, high value of cophenetic correlation coefficients (r) for comparison between dendrograms and the similarity matrices indicated high (0.957) confidence of AFLP data to group the varieties in UPGMA clusters. Similar results of other analysis methods (using Dice, and Ochiai coefficients) also confirmed the reliability of selection of Jaccard's similarity coefficient in this study.

Key words AFLP, wild rice, coefficient, genetic similarity

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Spiders and other Arachnid species of Delft Island, Sri Lanka

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The spiders are of beneficial animal group that feed on all sorts of arthropods, including insects. They are all predators. Sri Lankan Spiders are rarely documented scientifically and receives fairly low attention out of all. Broad studies covering overall diversity of Sri Lanka spiders have not been carried to date. Islands are considered as biodiversity laboratories to study the diversity as well as the evolution of species.

Delft is an island located in the northern peninsula of Sri Lanka around 9-10km away from mainland. Conservation of Biodiversity in the Island like Delft heavily depends on the sustainable utilization of resources within the contexts. Islands are hotspots of biodiversity. Delft is crucially important as it is geographically placed in trophics and also in between two main lands; Sri Lanka and India. The given study of spiders was initiated to provide a checklist of spiders at Delft Island, which is a component of the overall assessment.

This study on spiders and other arachnids were carried out from November 2013 to January 2014 period as a part of an overall biodiversity survey of the island using standard and suitable methods during the day time. Samples were identified using standard keys and pictorial guides. Unknown unidentified specimens were specially pictured. They were identified by field specialists.

Results showed that 43 species of spider family Salticidae with 16 families were recorded. The most abundant species was *Stegodyphus* sp and several other arachnids including scorpions, tailless whip scorpions and whip scorpions were found too in the survey. Major species were in

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the home garden and shrub land where it was less distributed in terms of vegetation certain species prevailing in the building and human association. This study shows that the Delft Island contributes to an average of 10% of the spiders. With regards to 502 identified species of spiders reported from Sri Lanka as per 2013 records. All the observed species were the first records to the island and the species found in India have also been recorded in the island

It is concluded that Delft Island consists of much spider diversity, though it is isolated from the mainland. However, it appears that two factors determine the spider population namely lack of predators, pathogen, parasites and abundance of nutrition rich food. They have been found true in Delft. Occurrence of terrestrial spiders such as the wolf spiders in the island is yet a doubt to be solved as the landmass had no connectivity to Sri Lanka or India. More research work is needed to confirm this matter.

Key words: Arachnida, Bio-Diversity, Delft Island, Spiders

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A 8

Effect of fungal-rhizobacterial biofilms on seed germination of *Oryza sativa*, *Phaseolus mungo* and growth promotion in *Allium cepa*

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Biofilmed biofertilizers (BFBFs) have been popularized due to awareness of the environmental protection from agrochemicals and make use of harmless and eco-friendly substitute for that. Nitrogen fixing bacteria play a major role by supplying N to soil. Chemical fertilizers suppress the action of microbes specially N fixers. Community of micro organism is known as biofilm. Fertilizers that are produced using microbes that form biofilms are known as BFBFs.

Biofilms produced from the fungi and rhizobacteria from root zones of two different soil samples (paddy field soil sample with added chemical fertilizer(CF) and home garden soil without added (CF) plated out on Yeast Mannitol Agar (YMA) medium and confirmed under the microscope were then used in the preparation of BFBFs. Seeds were soaked in BFBFs preparations of proper dilution for 1 hour and observed for the germination and radicle and hypocotyl lengths (Wet paper towel method) and seedling vigor was calculated by using vigor index (V.I.). [V.I. = (shoot length+root length)×germination%].

Rhizobacteria with N fixing ability were selected and incorporated to microbial films. Effects of BFBFs on seed germination and vigor significantly differed from control ($p<0.05$). Reduction in time taken for seed germination (rice) and 35-50% increase in seed germination (green gram) were observed with biofilms of *Aspergillus* sp. - *Beijerinckia* sp., *Pencillium* sp. - *Beijerinckia* sp. and *Aspergillus* sp. - *Azotobacter* sp.

Diversity of microbes was found to be higher in soil without added chemical fertilizer. Growth promotion, breaking of seed dormancy and improved vigor (increased biomass) are apparent from this study. This may be due to the effect of added BFBFs on soil fauna and microbes which improve biological nitrogen fixation that maintain good soil fertility, growth hormone production, mineral release in soil and improved crop production which will be beneficial in sustainable agriculture in the long term.

Key words: Rhizosphere microbes, biofilm, BFBF, N fixers, growth promotion

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A 9

**Effect of biofertilizers on pathogen suppression and phytotoxin degradation
in *Allium cepa* and *Phaseolus mungo***

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Microbial biofertilizers include microbes that have biocontrolling effects on pathogens of the target crops. Alternatively microbial formulations can be developed for the sole purpose of biocontrol of pathogen by different mechanisms. Allelochemicals are considered as common allelopathic groups of compounds found in soil-plant systems. A promising area for the exploitation of plant microbe partnership is the remediation of contaminated soil and ground water. During phytoremediation of some organic contaminants, plants rely on their associated microorganisms possessing the appropriate degradation of organic contaminants resulting in decreases of both phytotoxicity and evapotranspiration of volatile contaminants. In this study organisms that develop biofilms on Yeast Mannitol Agar (YMA) Medium were inoculated to liquid Yeast Mannitol broth and the biofilm biofertilizers were prepared. They were screened for biocontrolling (Agar well diffusion assay) and phytotoxin degradation (Seed germination assay). Onion (*Allium cepa*) blight pathogen (*Alternaria porii*) was used as a target pathogen and greengram (*Phaseolus mungo*) seed germination bioassay was used to evaluate tannic acid degradability. In the biocontrolling assay, complete inhibition of pathogen was observed with fungicide Mancozeb and inhibited not at all by sterile water. All tested BFBFs showed considerable inhibitory effect to the target pathogen, though insignificantly ($p > 0.05$) when compared to commonly used fungicide Mancozeb. In the phytotoxicity assay, Tannic acid inhibited the germination of green gram seeds with only 40 % of germination, but with added BFBF preparations 2-fold increase in germination percentage was observed. Although the use of CFs gives immediate benefits, continuous application of them adversely affect the soil microbes and the environment. Therefore the use of BFBFs with reduced CF is advisable due to the persistence of biofilms in soil that enhances soil quality and performance of crops. The use of BFBFs to other crops should be extended through further research.

Key words : BFBFs, phytotoxicity, biocontrol, inhibition

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A 10

Distribution of mosquito species in Jaffna District

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Mosquitoes are the major contributors to vector bone disease transmission in Sri Lanka. They prevail in all parts of the island and are adapted to breed in different breeding sites. *Culex tritaeniorhynchus*, *Aedes aegypti* *Anopheles culicifacies* and *Culex quinquefasciatus* are the most important primary vector species along with some secondary vector species reported so far. During the last 12 months 728 suspected cases were reported in Jaffna out of the total 30,291 reported dengue cases in Sri Lanka. In this background a survey was carried out in 4 major administrative divisions viz Valigamam, Vadamarachchi, Thenmarachchi and the Islands in Jaffna district from November 2011 to November 2013. Collection techniques such as cattle baited net, cattle baited hut, hand collection, exit window trap, ovitrap and larval collection were used to collect mosquitoes. Adult and larval stages of the collections were identified using standard keys. *Ae.aegypti* and *Ae. albopictus* were collected in both brackish water (1-18ppt) and fresh water (0 ppt) containers and ovitraps. *Ae.vitatus* larvae were collected only in fresh water containers. Larvae of *Lutzia fuscana*, *An. subpictus*, *An. barbirostris*, *An. culicifacies*, *An. Varuna* and *Culexsitiens* were collected in fresh and brackish water bodies in different salinity range (2-68ppt). Larvae of *Toxorhynchites* sp *An. vagus*, *An. annularis*, *An. pallidus*, *An.nigerrimus*, *An. barbumbrosus*, and *An. varuna* were collected only in fresh water bodies. Among the anopheline mosquitoes collected *An. subpictus* (83.5%), *An. Culicifacies*(3%), *An.vagus*(0.3%), *An. pallidus*(2%), *An. nigerrimus*(6%), *An. annularis*(4%), *An.jamesi*(0.6%), *An. peditaeniatus*(0.3%), *An. barbirostris*(1%), *An. tessellatus*(0.3%), and *An. varuna*(3%) were recorded. *Armigeres subalbatus*, *subalbatus*(100%) was the only species among *Armigeres* group, Among the Culicine mosquitoes *Culex quinquefasciatus*(4%), *Culex sitiens*(49%), *Culex tritaeniorhynchus*(6%), *Culex gelidus*(1%), and *Culex fascocephala*(40%) were recorded. Other predatory species such as *Toxorhynchites*(1), *Lutziafuscana*(2) were also collected. Among the total collections *An. subpictus* (83.5%) was the predominant in anophlione species and *Culex*

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sitiens(49%) in *Culex* collection, while *Ae.aegypti* (96.8%) predominated in *Aedes* collection. Mosquito faunal data is useful for any control intervention programme to control dengue transmission and malaria since few imported cases have been reported from the district in recent time.

Financial assistance through NSF/RG/2011/BT/04 from the National Science Foundation is acknowledged.

Key words: *Anopheles* sp, *Culex* sp, *Aedes* sp, mosquito-borne diseases, Mosquito.

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A 11

***In Vitro* screening of soil mycoflora on some plant seeds germination**

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Agricultural consultants still have difficulty in deciding appropriate fertilizers and its application rates to use with seeds to minimize the risk of germination damage. Besides this, naturally the plant-microorganism interaction is specific to certain species of plants and fungi. However there is a lack of information regarding fungal diversity associated with seed and how the germination is affected by the fungal species. Therefore, the present work was focused on the effects of soil mycoflora on seed germination of black gram, green gram and cowpea. Healthy sterilized seeds (25) of the above plants were pre-soaked in 50 ml of fungal spore suspension (10^8 cells/ml) for 24 hours separately. Five different fungi, *Fusarium* spp., *Trichoderma* spp., *Aspergillus* spp., *Alternaria* spp. and *Colletotrichum* spp. were selected. Then seed germination study was carried out and mean value of length of germ tube was measured. Results were subjected to analysis of variance (ANOVA) ($P < 0.05$) followed by Tukey test. The results showed that after 24 hours period, *Colletotrichum* spp. exhibited better activity in enhancing the germ tube formation among the tested seeds, while the *Fusarium* spp. produced the inhibitory effect on seed germination. After 48 hours, *Trichoderma* spp. slightly promoted the length of germ tube of black gram and green gram when compared to control. But, it dramatically increased the length of germ tube in cowpea rather than other treated organisms except *Aspergillus* spp. Thus, *Aspergillus* spp., *Colletotrichum* spp., *Trichoderma* spp. and *Alternaria* spp. have good effects to

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enhance the seed germination and they can be used as an ecofriendly biologically inducing agent in agriculture.

Keywords: Seed germination, Soil mycoflora, *Vigna mungo*, *Vigna radiate* and *Vigna unguiculata*

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A 12

Gene sequence analysis of human Glucose-6-Phosphate Dehydrogenase (G6PD) in malaria endemic areas of northern Sri Lanka

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The glucose-six-phosphate dehydrogenase (G6PD) gene located on the long arm of the X chromosome, consists of 13 exons and provides instructions for making an enzyme called the glucose-6-phosphate dehydrogenase. G6PD deficiency caused by mutations in the G6PD gene, disrupts the normal structure and function of the enzyme or reduce the amount of the enzyme in cells. Considerable variety of structural changes of different deficient variants can cause abnormal enzyme activity and is geographically correlated with historical patterns of malaria.

In northern Sri Lanka, the districts Kilinochi and Mullaitivu are most endemic for Malaria and still remain having reported cases. The goal of this current study is to characterize the nucleotide sequence variation at the G6PD locus in selected individuals from malaria endemic areas of northern Sri Lanka.

One Hundred volunteers (Male-55 and Female-45) from some selected malaria endemic areas in Kilinochi and Mullaitivu districts of northern Sri Lanka aged between 19 and 60 were involved in this study. After obtaining written- informed consent, a structured questionnaire in local language (Tamil) was used to assess exposures for malaria history. The blood samples were collected in EDTA tubes and gently mixed, then stored at -20⁰C until they were assayed. A portion (5μl) of each blood sample was used to determine G6PD activity. Another portion

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(300µl) of blood was used to extract DNA. The 11 exonic regions (1A, 2, 3+4, 5, 6, 7, 8, 10, 11,13B, 13C) of the G6PD gene from fifteen individuals were PCR amplified and sequenced.

None of the individuals was found to be in class I (<1%), class II (1-10%) or class V (>150%)G6PD activity level groups. Forty eight percent were categorized into class III (10-60%) (Moderate G6PD activity) and 52% into class IV (60-150%) (normal activity). In the present study, we have analyzed the molecular variations of the G6PD gene in some selected individuals (15) from malaria endemic areas in northern Sri Lanka. We have identified two mutant variants in the G6PD gene in our selected samples and the variants have been previously reported from South East Asia. There is no natural selection and significant association established between G6PD moderate and normal activity and malaria endemicity in present.

Key words:G6PD gene, Sequence analysis, Northern Sri Lanka

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A 13

Glucose-6-Phosphate Dehydrogenase (G6PD) activity and the associated factors among individuals living in the malaria endemic areas in northern Sri Lanka

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Glucose-6-Phosphate Dehydrogenase (G6PD) is an essential enzyme, present in all cells of the body and has a particularly important role within erythrocytes. The geographical distribution of G6PD deficiency was associated with malaria endemicity, suggests a relationship between G6PD deficiency and malaria.

Blood samples were collected from one hundred volunteers comprising 55 males and 45 females from selected malaria endemic localities in the districts of Kilinochi and Mullaitivu in the part of northern Sri Lanka. A questionnaire (information on sex, age, and history of bean consumption in the previous month, history of current malaria and time since its last attack and history of malaria chemoprophylaxis, blood transfusion and anemia) was administered. They were screened quantitatively for G6PD activity using commercially available G6PD assay kit. The odds ratio techniques and Pearson chi-square test were used to find out the association between G6PD activity and other factors (malarial infection, sex, age, Haemoglobin amount and bean consumption).

None of the individuals was found to be in class I (<1%), class II (1-10%) and class V (>150%) G6PD activity levels. However 48 % and 52% grouped under class III (10-60%) and class IV (60-150%) respectively. Statistically, there is no significant ($p>0.05$) association between G6PD moderate and normal activities and malarial infection, sex, age and bean consumption. There exists a valid relationship between Hb amount and G6PD activity at 95% confidential level. There is no natural selection and significant association established between G6PD moderate and normal activities and malaria endemicity in present study.

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Key words: G6PD deficiency, Malaria endemicity, Northern Sri Lanka

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A 14

**Study of *Sergentomyia* and flies species in Hambantota district;
a leishmaniasis endemic locality in Sri Lanka.**

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Sand flies (Diptera: Psychodidae: Phlebotaminae) are of human health concern. They are vectors of many diseases, especially leishmaniasis. Members of the genus *Sergentomyia* (Franca and Parrot, 1920) mostly prefer to feed on reptiles. Some of the recent reports suggest that various pathogens including *Leishmania* species have been detected from *Sergentomyia* species. Presence of *L. donovani* DNA and human blood in *Se. babu* have been reported in India. *L. major* DNA was detected from *Se. (Spelaeomyia) darlingi*. Human blood was detected in *Se. (Neophlebotomus) zeylanica* in Sri Lanka. These findings suggest the potential role of *Sergentomyia* sp. in the transmission of leishmaniasis. With this background, a series of samplings were done in leishmaniasis endemic localities in Hambantota district. Sandflies were collected from Ranawarunawa, Beliatta and Tangalle from August to December 2013. Sampling was performed using cattle-baited net traps, modified CDC light traps and mouth aspirator. A total of 393 sand flies were collected. Ninety-seven percent (n=276) were identified as *Phlebotomus (Euphlebotomus) argentipes* sibling species A in cattle-baited net traps. Three percent (n= 9) of the cattle-baited net trap collection was identified as *Se. (Parrotomyia) babu babu* (n=5) and *Se. (Par) babu insularis* (n=4). All the flies collected from the indoor using mouth aspirator collections and light trap were identified as *Se. (Neophlebotomus) zeylanica* (n= 99). The present study reveals the presence of potential vector species like *Se. (Par) babu babu*, and *Se. (Neo) zeylanica* in Hambantota district. This warrants a continuous survey to identify sand fly species composition and their role in disease transmission in this area.

Key words: Sand fly, *Sergentomyia*, *Leishmania*, Leishmaniasis, vectors, parasite.

Financial assistance through NRC/11/64 from the National Research Council is acknowledged.

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A 15

Preliminary observations on migratory birds of Thondaimanaru lagoon of Jaffna Peninsula, in Sri Lanka

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Sri Lanka is famous for the migratory birds. According to the fly way concept, Jaffna Peninsula is one of the five entry points for the migratory birds to Sri Lanka. The published works are only available from other parts of the country and no works have been reported from Jaffna Peninsula on migratory birds.

The study area was Thondaimanru lagoon which is one of the three lagoons found in Jaffna Peninsula. The objectives of the current study were to report the migratory birds species in the lagoon, to record the habitats and sub habitats of migratory birds along the lagoon and to find out the seasonal variation of the migratory birds in the study area.

The current study was only confined to the Northern lagoon (80° 08' E, 09° 47' N) and the study period covered eighteen months started from August 2012. It was done in selected ten points covering all the different sub habitats. In every point the observations were done once in a month from 0500 hrs to 0900 hrs and 1500 to 1800 hrs. using Binocular. The visual encounter method was used to observe the birds. Recommended field guides were used to identify the migratory birds. Out of four readings from every point the average was taken as the reading of that month. The rain fall of the area was obtained from the Meteorological department

This study documented 14 migratory birds out of 32 recorded species. Except Flamingos others were not found during the non migratory seasons.

Further their arrival time and the departure time to the lagoon varies. Plovers, pipers and stints appeared in September, ducks appeared in November. From March onwards the migratory birds went back and disappeared completely in April. Further these birds have specificity in selecting the habitats.

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The ducks were found in the main lagoon water and most of the time they were swimming. The Flamingos were also always found in the main lagoon but they were walking. The Plovers and Sandpipers were found in the shallow water of the main lagoon or in the small temporary water body found in the area surrounding the main lagoon. In addition bird aggregations were also noted. From this preliminary work, it seems that Thondaimanaru lagoon acts as a rich migratory bird-site in Jaffna Peninsula. The observation of flamingo throughout this 18 months study need further investigation as it is a migratory bird according to most of the current literature.

Keywords: Migratory birds, Thodaimanaru lagoon, Jaffna Peninsula, Flamingo

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B 1

**BIBLIOMETRIC ANALYSIS OF THE ABSTRACTS PUBLISHED IN THE
PROCEEDINGS OF THE JAFFNA SCIENCE ASSOCIATION (1992-2013)**

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Scholarly publications are often used as a measure of success of research work. Bibliometrics offers a powerful set of methods and measures for studying the structure and process of scholarly communication. This paper describes the bibliometric review of the abstracts published in the proceedings of the JSA during a 22-year period. In this present study, bibliographical details of 741 abstracts available in 20 volumes of the JSA proceedings were collected, tabulated, analyzed and reported. The attributes such as, yearly distribution of abstracts, authorship pattern, contributing institutions, language, subject coverage, and layout of the abstracts were taken into consideration for this bibliometric analysis. Results showed that there is variation in the number of abstracts published per year, ranging from 17 to 74. Besides, 78.27% of the published abstracts were related to pure and applied sciences. Collaborative authorship is a prominent feature observed in 83.80% of the abstracts, which is one of the widely practiced trends in scholarly communication. Among the contributing institutions, over 95% of the abstracts have been contributed by the University of Jaffna independently or jointly with other institutions. In the terms of language attribute, except 2 abstracts (in Tamil) all the 739 abstracts have been published in English. The analysis of subject coverage revealed that agriculture and biochemistry are the key disciplines where 31.98% and 19.84% of the abstracts published, respectively. This indicates the research trend in the region, during the last two decades or so. Furthermore, regarding the layout of the abstracts, it was found that 80.70% of the abstracts comply with the guidelines prescribed by the JSA for format and 43.99% of the abstracts fall in the range of 200-300 word limits. In conclusion, this bibliometric study helped to recognize the research trend of the region, and evaluate the research outputs by employing quantitative methods.

Abstracts: Section B (Applied Sciences)

Keywords: Bibliometrics; Scientific production; Bibliometry; Scholarly publications-Bibliometric analysis; Proceedings of the Jaffna Science Association-Bibliometric analysis.

B 2

ANALYSIS OF RURAL LIVELIHOOD STATUS OF RESETTLED WOMEN: A CASE STUDY IN MULLAITIVU DISTRICT

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This study set out to analyze the socioeconomic factors which affect women's contribution to household income and existing livelihood status of resettled women in Mullaitivu district, Sri Lanka. Primary data was used for this study. Purposive and random sampling method was used to select hundred and fifty respondents from this study area. Analysis of data was done by calculating Livelihood status score (LSS,) multiple regression analysis and together with descriptive statistics. The descriptive statistic showed that most respondents (62%) were married. Mean age was 41 years, while mean household size was four persons. Most respondents were educated up to secondary level (64%) and not all the respondents were engaged in economic activity. Based on the LSS, it has been shown that overall livelihood status score (seven indicators) was lower for housing condition (10) and higher for water facilities (92). The results of the regression shows that significant factors influencing annual household income of the respondents were age, freedom in cash expenditure, any help from organization, household size, food availability, occupation of respondent, livelihood status score and expense.

Key words: Household, Livelihood status score, Regression

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A HIERARCHICAL APPROACH FOR PUBLISHING AN ELECTRONIC CALENDAR

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Traditional printed calendars are used by organisations and people for many purposes such as for scheduling events, knowing public and private holidays and making reminders. Government and private organisations also release calendar with their own events in addition to the regular dates and events of the respective country. The operating systems of computers come with calendars, however, which only show the dates. On the other hand services like Google calendar facilitate organisations to publish their own agenda. Also, these services facilitate for maintaining different types of calendar and also provide features to keep reminders. However, none of the existing electronic calendar systems support for integrating different calendars in a hierarchical manner. For instance, there are no systems available to university students to get academic dates and public holidays through one calendar automatically. A methodology has been proposed in this paper that satisfies the above mentioned requirement. Also, it facilitates to integrate images and the videos along with the calendars. The proposed system consist two components: server and client. Server component used by an organisation can also act as client to both obtain events and add events. The Client calendar checks with server for updates on a regular interval. For instance, a government can have a calendaring server and publish public holidays. Then a calendaring server at University can obtain the holidays from the government server and can add its own academic dates. Thereafter if a student connects to the University calendar server, the student will get both public holidays and academic dates. Even if government announced new holiday, through the University calendar server, the student will get the notification. Further, the events of the proposed calendar can be exported to the iCalendar format and also the events in iCalendar format can be imported to a calendar. We strongly believe that proposed calendaring system will be useful for many organisations to publish their calendar and users to acquire the events from preferred calendars. The proposed system can be used even in offline mode. The format of the communication between a calendaring server and the client is documented so that the server-client setup can be extended to other platforms such as mobile.

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Abstracts: Section B (Applied Sciences)

Keywords: Calendaring system, iCalendar, Hierarchical calendar

B 4

**A HYBRID APPROACH TO A TAMIL SPELL CHECKER
USING LEVENSHTAIN DISTANCE, N-GRAM, RULE-BASE AND CROWD SOURCING**

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The spell checkers are specialised software that provide most appropriate suggestions for misspelled words. Though there are several software programs available for spell checking for languages like English, no fully functional system is available for Tamil language. The existing systems in Tamil find the misspelled words based on an existing list of words in the system or only find the *canti*(in Tamil) mistakes using a set of rules. However, several issues have been identified in these systems. This research proposes a hybrid approach for Tamil spell checking. The proposed system provides a complete solution by integrating existing methods and new approaches such as crowd sourcing and suggestions generation using n-gram in Tamil context. According to the proposed approach, each word is checked whether it exists in the dictionary using Levenshtein distance finding algorithm. If it does not exist, then the n-gram based technique is used to generate possible suggestions for the word. Next, a rule based *canti* check is applied to make sure that the word and the adjoining word are inflecting in an appropriate way. Based on these phases, the corrections and the suggestions are shown to end users. However, if users think that the word is correct, they can add those words through 'Add to Dictionary' facility. Using this feature, new Tamil words that are not in dictionary but in usage can also be collected. A list of 250, 000 unique and error-free words are included in the dictionary. These words have been collected from various sources, including websites. To reduce the search space, the dictionary has been divided into different files based on the first letter of the word. Due to the complex nature of Tamil script compared to English, stacks and lists have been used during the processing of words. The proposed approach and the system is a complete solution for Tamil spell checking. This work integrates dictionary check with Levenshtein distance, suggestions generation with n-grams, *canti* check with a rule-base and crowd sourcing.

Keywords: - Tamil Spell Checker, Levenshtein, *n-gram*, *canti*, Crowd Sourcing

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**OPTIMIZATION OF SPONGE CAKE FORMULATION WITH
PALMYRAH FOOD RESOURCES AND EVALUATION OF ITS QUALITY
CHARACTERISTICS**

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Development of value added products from palmyrah food resources is one of the ways to increase the demand and popularity of palmyrah products among the local population. This study was carried out to develop consumer preferable nutritious palmyrah cake by optimizing the amount of palmyrah food resources (boiled palmyrah tuber flour, treacle and jaggery) as substitute for wheat flour and cane sugar. These substitutes can save the valuable foreign exchange and facilitated maintenance of good health of the population. Optimization of palmyrah food resources in cake formulation was carried out with help of three different sensory evaluation trials using a five point hedonic scale test. Based on the results of the above trials, 40% boiled palmyrah tuber flour with 60% wheat flour was selected as the most preferable flour mix and 60% treacle with 40% jaggery was selected as the best sweetening agent for cake formulation. The nutritional quality and consumer acceptability of the developed palmyrah food resource cake (PFRC) and control sponge cake (100% wheat flour and 100% cane sugar) were determined by proximate analysis and sensory evaluation respectively. Physical quality characters of both samples were also compared. Results of this study revealed that there was no significant difference in nutritional quality between PFRC and control cake except in fiber and ash contents. No significant difference was observed in most of the sensory attributes and physical quality characters between these cake samples. Therefore, the developed PFRC have comparable physical, nutritional and sensory quality characters with sponge cake and can be used as a substitute for sponge cake.

Keywords: Palmyrah food resources, Sponge cake, Boiled palmyrah tuber flour, Jaggery, Treacle.
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B 6

**EFFECT OF PACKAGING MATERIALS ON SHELF LIFE OF PALMYRAH FOOD
RESOURCE CAKE**

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Convenience bakery products have higher market demand when compared to traditional food products. Incorporation of locally available palmyrah food resources into bakery products as a partial substitute for wheat flour can improve the demand and popularity of local resources. In this study shelf life of cake prepared with 40% boiled palmyrah tuber flour and 60% wheat flour as flour mix and 60% treacle and 40% jaggery as sweetener and control (100% wheat flour, 100% Sugar and other ingredients are same for both cakes) cake were evaluated. These samples packed in three different packaging materials, namely, High Density Polyethylene (HDPE), Low Density Polyethylene (LDPE) and cardboard with oil paper stored under ambient conditions (Temperature-29±1°C, RH-70±2%). Microbial counts (total plate count and yeast and mould count), sensory attributes (smell, color, appearance, taste, texture and overall acceptability) and moisture evaluation were done at 4 day intervals up to 16 days for the samples. Results of the shelf life study showed that palmyrah food resource cake and control cake packed in LDPE bags can be stored for 8 days with good sensory attributes, negligible loss of moisture and acceptable level of microorganisms (less than 10⁴ CFU/g of sample). Therefore palmyrah food resource cake packed in LDPE bags can be stored for 8 days under ambient storage conditions and its shelf life was comparable to control cake.

Key words: Microbial count, Packaging material, Palmyrah food resource cake, Sensory attributes, Shelf life

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B 7

**PREPARATION AND QUALITY EVALUATION OF COMPOSITE BISCUITS
INCORPORATED WITH MALTED FLOUR BLENDS**

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Malting of cereals and legumes yields malted flour with improved nutritional quality that can be used in various traditional recipes. This study was conducted to find out the feasibility of partially replacing the wheat flour by malted flour blends of finger millet and mungbean in biscuit preparation. The malted seeds of local varieties of mungbean and finger millet were pulverized into fine flour and blended at a ratio of 4:1. Biscuits were prepared by substituting wheat flour with different levels of malted flour blends from 0 to 50%. The sensory attributes of biscuits were evaluated by a five point hedonic scale test. The formulation of 30% malted flour blend incorporated biscuits had no significant difference ($p>0.05$) with wheat biscuits in all sensory characteristics. Physical properties of biscuits like bulk density and spread ratio decreased with substituting malted flour blends. The nutritional value of sensorially accepted composite biscuit was higher in total protein, crude fibre, ash, K, Na, free amino acid and reducing sugar content when compared to wheat flour biscuit. The bacterial count for 30% malted flour blend incorporated biscuit was 3.6×10^2 CFU/g after 2 months of storage and this was well below the safe level. There was no yeast and mold growth observed up to 2 months of storage. Hence, the locally available finger millet and mungbean can be used in nutritionally superior malted flour blend incorporated composite biscuit preparation as a substitution for wheat biscuit in children's diet.

Key words: composite biscuit, finger millet, mungbean, malting.

B 8

**EFFECT OF MALTING ON NUTRITIONAL VALUE OF FINGERMILLET AND
MUNGBEAN**

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Malting of seeds enhance its nutritional value through induced hydrolytic activity. Local varieties of finger millet and mungbean in Jaffna were selected to evaluate the nutritional changes during malting process. Both finger millet and mungbean seeds were steeped in boiled cool water (w/v=1:2) for 6 hours at ambient temperature (30⁰C) and allow to germinate for different time durations of 12, 24 and 36 hours. The germination was arrested at their respective time by drying the seeds in sunlight for a day. The malted seeds were milled separately and made into fine flour. Raw and malted flour of finger millet and mungbean were analyzed for proximate composition. The results revealed that there was a significant increase ($p<0.05$) found in reducing sugar and free amino acid content, a significant decrease ($p<0.05$) found in total protein for both finger millet and mungbean seeds malted for 24 hours when compared to seeds malted for 12 hours. But there was no significant difference ($p>0.05$) observed for these components between seeds malted for 24 and 36 hours. There was no significant difference ($p>0.05$) found in between seeds malted for 12 and 24 hours of both finger millet and mungbean for moisture, total fat, crude fibre, ash and total sugar contents. The proximate composition of flour of 24 hours malted seeds of both finger millet and mungbean were superior to other treatments.

Keywords: Finger millet, mungbean, malting, proximate composition

B 9

**POTENTIAL TO GROW *Alternanthera sessilis* IN KITCHEN WASTEWATER
HYDROPONIC SYSTEM**

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In this study the potential of growing *Alternanthera sessilis* in hydroponic system using kitchen wastewater was assessed. Twenty one households were selected from seven areas namely Kokuvil, Kondavil, Nallur, Kalviyankadu, Thirunelvely, Jaffna town and Chavakacheri with three households from each area. Kitchen wastewater used in the experiment was analyzed in every week for nitrate N, phosphorous, potassium, calcium, pH and EC. Ground water of respective households was also analyzed for the same properties. Growth of plant was analyzed by weight increase. Analysis of the experiment was done by paired-test and Duncan New Multiple Range Test (DNMRT) at significance level of 0.05. In ground water of the households the average values of nitrate N, phosphorous, potassium, calcium, pH and EC were 5.07 ± 3.28 mg/L, 0.24 ± 0.2 mg/L, 16.55 ± 4.79 mg/L, 30.85 ± 8.16 mg/L, 7.33 ± 0.16 and 1.36 ± 0.37 dS/m respectively. In kitchen wastewater of these households average nitrate N, phosphorous, potassium, calcium, pH and EC were 4.08 ± 2.72 mg/L, 1.71 ± 1.01 mg/L, 13.89 ± 9.59 mg/L, 35.96 ± 6.17 mg/L, and 7.65 ± 0.27 and 1.47 ± 0.76 dS/m respectively. Nitrate N and EC in kitchen wastewater did not show significant difference with ground water. However, phosphorous, calcium, and pH in kitchen wastewater showed significantly higher than with those of ground water. Potassium in kitchen wastewater showed significantly lower than that of ground water. The average biomass increase of *Alternanthera sessilis* grown in kitchen wastewater was 10.38 g in three weeks. Growth of *Alternanthera sessilis* was highest (16.32g) in Chavakacheri area. Results therefore indicate that *Alternanthera sessilis* could be grown in kitchen wastewater hydroponic system in the tested areas which not only fulfills the family need of leafy vegetable but also helps efficient use of wastewater.

Key words: *Alternanthera sessilis*, hydroponics, wastewater

B 10

COMPARISON OF THE FARM PERFORMANCE OF THE SHRIMP FARM INDUSTRY IN THE NORTH-WESTERN AND THE EASTERN PROVINCES

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Shrimp farming is one of the main commercial activities targeted for the export market. In Sri Lanka, North-Western and Eastern Provinces are the main areas developed for shrimp farming. Long term sustainability and economic viability is seriously threatened by frequent disease out-breaks. A study was undertaken to assess the shrimp farm performance in the North-Western and the Eastern Provinces during April to December 2011. A pre-structured questionnaire and farm visits were used to collect information on shrimp farm performances and the degree of adoption of Better Management Practices (BMP).

Severe White Spot Virus (WSV) out-breaks were recorded in the North-Western Province during the study period while only localized incidences of minor disease conditions were reported in the Eastern Province. In 2011 average production in North-Western Province was 685.9 kg/acre while the average production was 1019.9 kg/acre in the Eastern Province. All the farmers in the Eastern Province completed the whole culture cycle and the average days of culture was 118.3 ± 20.6 . In the North-Western Province around 40% of farmers had to go for emergency harvest due to WSV infection. The average culture cycle was limited to 85.8 ± 27.6 days in the North-Western Province.

Average size at harvest in the North-Western Province was 17.1 ± 7.4 g and the local market was the main target. Most of the shrimp produces in the Eastern Province were sold for the export market and the average size at harvest was 30.9 ± 5.4 g. There was no significance difference (p value-0.066) in average Feed Conversion Ratio (FCR) in the North-Western and the Eastern Provinces and ranged between 1.3 – 1.6. There was no difference in degree of adherence to introduced Better Management Practices in both shrimp farming areas. The present shrimp farming practice in the North-Western Province is above its carrying capacity which appears to contribute to the poor farm performance and frequent disease out-break.

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Abstracts: Section B (Applied Sciences)

Key words: Shrimp farming, Farm performance, Better Management Practices, Disease outbreaks, Eastern Province, North-Western Province.

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C 1

Study on the relationship between Obesity and Overweight and the duty pattern among the Nursing Officers working at Teaching Hospital, Jaffna

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Obesity is a global public health problem and related to sedentary life style. Escalating rates of overweight and obesity are also taking a toll in Asian countries that have historically had much lower rates. The aim of this study is to estimate the prevalence of obesity and overweight relating to duty pattern of the Nursing Officers of Teaching Hospital, Jaffna. An institutional based cross-sectional descriptive study was carried out at Teaching Hospital, Jaffna, during February, 2013. Self-administered questionnaire and anthro-parameters were used for this study. Data was analyzed using Statistical Package for Social Sciences (SPSS), version 16.0 and P value below 0.050 was considered as statistical significant. Response rate was 86.4% ($n=342$), and 224 (65.5%) of this subjects were females. Among the study population only 08 (2.3%) Nursing Officers were avoiding night duty, while 25 (7.3%), 129 (37.7%), 180 (52.6%) Nursing Officers were doing single duty, seldom double duty and frequently double duty respectively. The mean BMI of male and female Nursing Officers were $24.1 (\pm 3.5)$ and $24.1 (\pm 4.3)$ kg/m^2 respectively. Higher BMI value was observed among the male Nursing Officers [$25.3 (\pm 5.6)$ kg/m^2], who did only single duty in a week and the female Nursing Officers [$27.2 (\pm 4.2)$ kg/m^2] who were avoiding night duty. The mean BMI of the Nursing Officers who were doing double duty seldom and frequent showed similar BMI values (23.8 ± 4.0 and 24.0 ± 3.9 kg/m^2 respectively). Statistically no significant relationship was found between the duty pattern and BMI. Of the Nursing Officers, who were doing single duty, 12 (48.0%) Nursing Officers had normal weight, while 13 (52.0%) had with overweight and obesity. Among those, who were skipping night duty, 01 (12.5%) and 02 (25.0%) were underweight and normal weight respectively, while 05 (62.5%) were overweight or obese. Among the study population, who were doing seldom double duty, 10 (7.8%) and 75 (58.1%) were under weight and normal weight respectively, while 44 (34.1%) had overweight or obesity. Among the study population, who were doing double duty frequently, 12

Abstract: Section C (Medical Sciences)

(6.7%) and 99 (55.0%) showed underweight and normal weight respectively, while 69 (38.4%) were overweight or obesity. From the results no statistically significant relationship was found between the duty pattern and obesity status.

Mean WC of male and female Nursing Officers were [88.9 (± 9.8) cm] and [86.0 (± 11.1) cm] respectively. Lower WC value was observed among the male Nursing Officers [88.1 (± 9.7) cm], who were doing double duty frequently in a week and the female Nursing Officers [84.5 (± 11.0) cm] who were doing double duty seldom, while higher WC value was observed among the males [94.5 (± 12.8) cm] who were doing single duty and the females [95.8 (± 9.9) cm] who were avoiding night duty. No statistically significant relationship was found between the duty pattern and the Waist Circumference of Nursing Officers. Among the male Nursing Officers who were doing frequent double duty, seldom double duty, single duty and skipping night duty were having central obesity 39 (52.7%), 15 (42.9%), 03 (60.0%), 01 (25.0%) respectively. All of the females who were doing single duty (20) and skipping night duty (04) showed central obesity. Among the females 63 (67.0%), 71 (66.9%) Nursing Officers who were doing double duty seldom and frequently respectively showed central obesity. Only females showed statistically significant relationship between the duty pattern and central obesity (p value= 0.010).

Key words: Nursing Officers, Duty pattern, Body Mass Index, Obesity, Waist Circumference, Central Obesity

C 2

**A retrospective study on scorpion stung patients admitted to the Teaching Hospital Jaffna,
from January 2010 to December 2011**

Thakshagini, M., Rajeshkannan, N., Muruganathan, A. and Kannathasan, S.

Recent past, scorpion bite/sting cases were increasingly reported at the Teaching Hospital, Jaffna. Therefore, a retrospective study was designed to identify the epidemiological and clinical characteristics of scorpion sting patients admitted to the Teaching Hospital Jaffna. Secondary data extracted from the hospital records, from January 2010 to December 2012, were used in this study after getting the permission from the Director, Teaching Hospital, Jaffna. Data were analyzed using statistical software SPSS version 16. During this two year period, 170 scorpion sting cases were recorded. Among them, 59% were males and having the mean age of 32.3 years. Seventy eight (46%) of them reported that they were bitten by “white scorpion”. Most of them (35%) had the sting in between 6 to 12 pm. Fifty eight (34%) were stung on their upper limb whereas 33% had the same on the lower limb. Pain was the most predominant (74%; 95% CI-67.1-80.3) complaint followed by the swelling (24%, 95% CI-18.7-31.6). On clinical examination, 63% had tachycardia and 15% were hypertensive. Prazocin was the specific drug used coupled with the symptomatic treatment. No deaths were reported due to scorpion sting during the study period. This preliminary study opens up the following major areas, knowledge, attitude and practice towards scorpion stings among the people living in risk areas and bionomics of the scorpion, to be further studied in depth.

Key word- Scorpion bite, Scorpion sting

C 3

**PRELIMINARY STUDY ON SERUM LIVER ENZYMES AND BILIRUBIN LEVELS
AMONG DRIVERS AT THE SRI LANKA TRANSPORT BOARD IN KONDAVIL
DEPOT**

Sushana, P., Sivarathy. A, Balakumar, S., Sritharan, K. and Sutharsan, M.

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This research was designed to study on serum liver specific enzymes and bilirubin levels among drivers working at the Sri Lanka Transport Board (SLTB) in Kondavil depot. All drivers working at the SLTB in Kondavil depot were included in this study. Information about age, years of serving as driver, driving mileage per month and, alcohol & tobacco consumption were recorded using interviewer administered questionnaire. Five ml blood was withdrawn and the serum was separated from blood sample at 2500 rpm for 10 minute. ALanine Trasaminase (ALT) and Aspartate transaminase (AST) were measured by spectrophotometric method of Restman and Frankel. Levels of total and conjugated bilirubin were measured by method of Malloy and Evelyn. This is modified Van den Bergh method. All the data were analyzed in SPSS software version 16. Bivariate correlation and multinominal regression were used to analyse the data based on research problems. Total sample size was 50. Age range was 27- 58 years. Mean age was 42 years (± 9.64). Years of serving as a driver range were 2-35 years. Mean years of driving was 14.1 years (± 8.56). Twenty nine subjects were alcohol consumers. Sixteen subjects were smokers. Among the non alcohol consumers, age had significant correlation with conjugated bilirubin ($p=0.01$) which was fairly negatively correlated (Pearson correlation = - 0.503) and driving distance per month had statistically significant correlation with ALT ($p=0.01$) which was found as positively fair correlation (Pearson correlation=0.501). In the total sample, liver enzymes and bilirubin levels did not have statistically significant association with demographic, occupational and alcohol & tobacco consumption among drivers working at the SLTB in Kondavil depot ($p>0.05$). Liver specific enzymes (ALT and AST) and different types of bilirubin levels did not show significant association with occupational factors as well as age, and alcohol and tobacco consumption among drivers working at the SLTB in Kondavil depot.

Key words: Bilirubin, Alanine trasaminase, Aspartate transaminase, Pearson correlation

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C 3

**PRELIMINARY STUDY ON SERUM LIVER ENZYMES AND BILIRUBIN LEVELS
AMONG DRIVERS AT THE SRI LANKA TRANSPORT BOARD IN KONDAVIL
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Key words: Bilirubin, Alanine trasaminase, Aspartate transaminase, Pearson correlation

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RISK OF HYPERTENSION AMONG ADULTS IN JAFFNA DISTRICT

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The aim of this study was to identify the risk of hypertension among adults (above 18 years) in Jaffna District. This was a community based cross sectional descriptive study: multi stage stratified cluster sampling. In the first stage of sampling the population was stratified into urban and rural sectors. The primary sampling unit was a *Grama Niladari* division (GND). Considering proportion of the population, 7 and 25 clusters were selected from the urban and rural sectors respectively. In each GND, selected unit of enumeration was a household. Only one adult from each identified household was randomly selected. Blood pressure measurements were carried out by standard method. Of the 511 subjects, 224 (43.8%) were males. Mean ages of the study population, males and females was 45.65(\pm 14.46), 47.51(\pm 14.98) and 44.20 (\pm 13.89) years respectively. Mean Systolic Blood Pressure (SBP) in the total study population was 117.95(\pm 17.74) mm Hg and it was 121.43 (\pm 17.93) and 115.22 (\pm 17.12) mm Hg in males and females respectively. Mean Diastolic Blood Pressure (DBP) was 77.21(\pm 11.02), 79.26 (\pm 11.17) and 75.67(\pm 10.63) mm Hg in the study population, males and females respectively. Prevalence of hypertension (SBP/DBP \geq 140/90 mm Hg) was 23.7% (95% CI: 20.1-27.6) while it was 29.9% (95% CI: 24-36.4) among the males and 18.8% (95% CI: 14.5-23.9) among the females. Males were 2 times more likely to develop hypertension than females (95% CI: 1.414-3.053, $p < 0.001$). Subjects in the age group greater than 65 years carried 28.3 times higher risk of developing hypertension when compared with the individuals in the age group of 18-34 years ($p < 0.001$, 95% CI: 11.743-68.304). Similarly subjects in the age group of 50-64 years were 10.4 times more likely to develop hypertension than the subjects in the age group 18-34 years ($p < 0.001$, 95% CI: 4.957-22.016). Furthermore, subjects in the age group 35-49 years had a risk of 4.1 times to develop hypertension when compared with the subjects in the age group of 18-34 years ($p < 0.001$, 95% CI: 1.889-8.805). In conclusion, prevalence of hypertension in Jaffna district (23.7%) was lower than the rest of the country (28.4%).

Key words: *Systolic blood pressure, Diastolic blood pressure, Hypertension, Risk.*

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RELATIONSHIP BETWEEN ANTHROPOMETRIC INDICATORS AND FASTING BLOOD GLUCOSE AMONG BANK OFFICERS IN JAFFNA MUNICIPALITY AREA

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The objective of this study was to describe the correlation between anthropometric indicators such as body weight, height, waist circumferences (WC), hip circumferences (HC), Body Mass Index (BMI), Waist Hip Ratio (WHR) and fasting plasma glucose (FPG) level. A total of 223 subjects aged 20-60 years (all bank officers who gave their consent to participate in our study) were included in this study. Anthropometric measurement such as body weight, height, WC, and HC were taken by standard methods. Overnight fasting blood samples were used for FPG analysis by the enzymatic colorimetric assay using semiautomated Analyser Teco 3300. Clinical data, details about life style, socio-demographic factors were obtained using interviewer administrated questionnaire. The mean value of FPG was 91.816(\pm 19.7653) mg/dL. BMI was classified based on WHO classification of Asians. In this study, 16.7% of obese subjects and 6.5% of overweight subjects were diabetics. In this study, 10.7% of centrally obese subjects (WC for male \geq 90 cm, female \geq 80 cm) and 9.4% of subjects with normal WC had diabetes. In this study population, anthropometric measurements such weight ($p=0.001$, Pearson correlation (PC) = 0.221), BMI ($p=0.004$, PC= 0.193), WC ($p<0.001$, PC= 0.280), HC ($p=0.008$, PC= 0.180) and WHR ($p<0.001$, PC= 0.239) were positively correlated with FPG level. Height [$p=0.948$, PC = 0.004] was not correlated with FPG. Among the study subjects, 5.4% (n=12) had diabetes mellitus (FPG>126 mg/dL) and 20.2% (n=45) had pre-diabetes (FPG>100 mg/dL). Mean values of anthropometric indicators which were correlated with FPG such as weight [73.008 (\pm 11.648) vs. 65.671(\pm 14.551) kg], BMI [25.792 (\pm 3.39) vs. 24.067(\pm 4.2525) kg/m²], WC [93.54 (\pm 8.606) vs. 84.87(\pm 13.427) cm], HC [98.54(\pm 5.727) vs. 95.37(\pm 9.9556) cm] and WHR [0.941 (\pm 0.0676) vs. 0.878(\pm 0.954)] were higher among diabetics when compared to non-diabetics. High weight, BMI, WC, WHR can be taken as predictors of diabetes mellitus among the bank officers.

Key words: *Body Mass Index, Waist Hip Ratio, Fasting plasma glucose, Pearson correlation, Diabetes mellitus.*

**Serum Albumin status: their usage in the assessment of malnutrition in children of
Jaffna District**

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Serum albumin is the principal nutritional marker used to identify malnutrition in children. Thus, the aim of this study was to determine the albumin deficiency and its relation to malnutrition among children aged 1 to 5 years in Jaffna District. A multistage cluster sampling of was used. Albumin concentration was estimated by bromocresol green dye binding method. Of the total of 846, 414 were males (48.9%). The mean age of this study population was 34.73 (± 13.14) in months. Mean albumin concentration was 3.9g/dL (95% CI: 3.8, 4.0) with ranging from 2.40 to 6.00g/dL. The mean value of the albumin were significantly high in female [4.0g/dL (95% CI: 3.9-4.2)] than in male children [3.8 g/dL (95% CI: 3.7, 3.9)] ($p=0.045$). Prevalence of albumin deficiency was 27.2% [30.0% ($n124$) in males and 24.5 % ($n106$) in females]. Prevalence of wasting, underweight and stunting were high in male [23.2 ($n96$), 35.7 ($n148$) and 28.3 ($n117$)] when compared with female children [20.4 ($n88$), 31.0 ($n134$) and 24.5 ($n106$)]. Highest percentage [32.2% ($n57$)] and lowest percentage of albumin deficiency [24.4% ($n51$)] was observed in the age group of 48-59 and 12-23 months respectively. Trend of underweight and stunting were significantly increased while overweight was decreased with age [Chi-squared for trend was applied ($p<0.01$)]. Hence, the albumin deficiency has shown significant positive correlation with the undernutrition based on anthropometric measurements. Furthermore, among the wasted children ($n184$), 83.7% ($n154$) of children were affected with albumin deficiency whereas 58.9% ($n166$) and 32.7% ($n73$) of underweighted ($n282$) and stunted children ($n223$) were affected with albumin deficiency respectively. It has been found that, the malnourished children are highly affected with albumin deficiency which is caused by several factors such as protein intake, frequent infection and deworming practices. It is suggested that the measurement of serum albumin concentrations provides a marker of malnourished children, and should prove useful in field assessments of nutritional status.

Keywords: Albumin, malnutrition, Children, Anthropometric indices, and Biochemical marker.

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C 7

Effect of Gestational Age and Educational Levels of Pregnant Mothers on Anthropometry of Newborn from Selected Medical Officers of Health Divisions of Jaffna District

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Gestational age and educational status of the pregnant mothers may influence the fetal growth. Objective of this study was to determine the influence of gestational age and educational status of the mothers on the birth weight (BW) and length of the newborns. In this study, systematic sampling technique was used and 477 pregnant mothers and their newborns were selected from Medical Officers of Health (MOH) divisions in Jaffna District. Among the 477 newborns 239 were males (50.5%). The mean BW of all the newborns was 3031.5(±432.6) g, while the mean length was 51.1 (±2.1) cm. The mean BWs of the newborns were 2500.0, 2950.7(±431.01), 3014.0(±428.81), 3073.2(±423.01) and 3155.9(±472.81) g of the mothers who had the educational levels of non formal education, grade 1-5, grades 6-11, Grade 12-13 and degree and above respectively. Of the low birth weight (LBW) newborns 66.7% (n36) were born to the mothers with the educational level up to grade 11, and 7.3 % (n35) of the newborns were born to the mothers who had studied degree and above. The result shows that there is a significant relationship between poor educational status and LBW. The mean gestational age was 39.33(±1.37) weeks. The mean BW of the newborns was 2784.20(±515.86), 3038.20(±430.39) and 3049.20(±400.69) g in preterm, term and post term deliveries respectively. In this present study, 95.0 % (n453) of pregnant mothers and 92.6% (n50) of LBW newborns were in period of gestation (POG) range from 37 to 42 weeks. Educational levels of mothers statistically correlated with the BW of the newborn (r=0.119, p=0.009). Variation in POG of mothers was significantly correlated with BW (r=0.196, p=0.0001) and length (r=0.128, p=0.005) of the newborns. Based on this study, gestational age and educational levels are the important parameters which determine the anthropometry of the newborn.

Keywords: Gestational age, educational levels, pregnant mothers, birth weight and newborn

Psycho Social Effects of Suicide

Among the Spouses Six Sonths After the Event in Jaffna

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Suicide is a self inflicted death with evidence that the person intended to die. The suicide rate in Sri Lanka is high and in Jaffna it is increasing. The sudden death of the life partner affects spouses seriously which in turn affects the whole family. Better supportive measures can be formulated if the problems were studied properly. A descriptive cross sectional study was formulated in that regards. All The spouses of the suicidal diseased from November 2011 - June 2012, were included in the study; relevant information was collected through an interviewer administered questionnaire. Majority of the diseased were (71.2%) male. , 26.9% were between the ages of 31 to 40 year and 65.4% were studied up to O/L. Among the spouses 23.1% were physically, 65.4% were socio culturally, 67.3% economically & 50% psychological impacted. The female spouses were facing more economical hardships (55.7% - p value 0.007)), security problems (36.5%), and social stigma than their male counterparts. The economical hard ship is significantly associated with the sex of the spouses. Around 76% of the spouses find difficulty to run the family, none of them were remarried.

We recommend the primary health care system with the collaboration of mental health services and social services department, to consider these facts and to include proper programs to reduce the incidence of suicide & support the spouses. In the mean time the community should shoulder the responsibility to improve the live hood of those families

Key words: suicide, spouses, psychosocial problems, Jaffna peninsula, primary health care

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Inferior Thyroid Artery and Its Relation with Recurrent Laryngeal Nerve

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Knowledge of variation in relation between inferior thyroid artery (ITA) and recurrent laryngeal nerve (RLN) is essential in surgery of thyroid gland to prevent damaging the RLN. Our study aimed to determine variations in relationship between ITA and RLN in fresh post-mortems conducted at Judicial Medical Office, Colombo South Teaching Hospital. Sixty fresh thyroid samples (43 Male & 17 Female) without thyroid diseases were collected and 49 (Left) & 47 (Right) sides were studied. RLN passing posterior to ITA or its branches was classified as Type A, RLN passing anterior to ITA or its branches as Type B, RLN passing between the branches of ITA as Type C. Type A- 62.5% (60/96), Type B- 15.6% (15/96) and Type C- 21.8 % (21/96) were found. In another three sides ITA related with extralaryngeal branches of RLN. In first ITA passing between extralaryngeal branches. In second ITA passing posterior to extralaryngeal branches and in third RLN divided near lower 1/3rd of thyroid and ITA passing between them. We also noticed double relation in two sides as RLN related with ITA near lower 1/3rd and again related with its terminal branches about middle 1/3rd of thyroid. Even though 28 types of variations are documented, 95% (96/101) of studied samples were of these three major types. Our study revealed that relationship between ITA and RLN was not similar on both sides. Left side Type A and right side Type C was found to be most common in both sexes. Type B was more common in females. Careful study of terminal branches of ITA in relation to RLN is required for safe thyroid surgery.

Keywords: Inferior thyroid artery, Recurrent laryngeal nerve, Thyroidectomy, Terminal branches, Extra laryngeal branches

**Formation of median nerve by three roots and its relation with axillary artery
– a case report**

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The knowledge of anatomical variations of the peripheral nerves in the upper limb may be of immense clinical help. During routine dissection of a 55 year old male cadaver in the Department of Anatomy, Jaffna an anomalous median nerve with regard to its formation and relation with axillary artery was observed in the left upper limb. The median nerve was formed by the fusion of three equal sized roots, one from medial and two from lateral cords of brachial plexus. Both lateral roots originated in the axilla crossed over the axillary artery at different levels. The upper lateral root, which was the additional root was in close contact with the second part of the axillary artery and crossed over the vessel to unite with the medial root. The common stem thus formed descended medial to the axillary artery. The lower lateral root, which had an oblique course over the third part of the axillary artery, joined the common stem to form the medial nerve. Median nerve descended in the arm medial to the brachial artery up to cubital fossa. The distribution of the anomalous median nerve was normal in forearm and palm. Origin and course of other branches originating from the brachial plexus were normal. Therefore, knowledge of the variations in the nerve formation and course are useful for the clinicians during surgery to prevent accidental injuries and for differential diagnosis of uncommon clinical conditions which permits correct interpretation of clinical neurophysiology.

Key words: Anatomical variation, axillary artery, brachial plexus, lateral cord, median nerve

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α - Amylase inhibitory activity of some plants with known antidiabetic effects

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A key challenge in the management of diabetes mellitus is to reduce the postprandial blood glucose level. Medicinal plants are an important source of phytochemicals with potential for inhibiting α -amylase. Objective of this study was to assess the pancreatic α -amylase inhibitory activity of some plants which are used to treat diabetes.

Methanol extracts from ten plant species were prepared. Amylase inhibition assay was performed using porcine pancreatic α -amylase and starch in presence or absence of plant extracts. Suitable test blanks and a standard were included. Products formed were measured at 540 nm and the percentage amylase inhibition was calculated. Experiments were repeated four times in duplicate.

Pterocarpus marsupium latex (95.90 ± 0.75) and *Ficus racemosa* stem bark (92.28 ± 0.86) showed highest inhibition. *Phyllanthus embelica* fruit and *Phyllanthus debilis* whole plant showed an inhibition of 74.01 ± 1.74 and 53.41 ± 2.84 respectively. Other six extracts namely *Coccinia grandis* leaf, *Gymnema lactiferum* leaf, *Gymnema sylvestre* leaf, *Musa paradisiaca* yam, *Strychnos potatorum* seed and *Tinospora cordifolia* leaf showed only a mild inhibition (<9.18 - 16.18 %).

All plants other than *Gymnema lactiferum* are being used to treat diabetes. Out of the ten plants, four showed promising inhibitory activity on amylase suggesting that one of the mechanisms responsible for their hypoglycaemic effects may be the decrease of postprandial blood glucose concentration.

In conclusion *Pterocarpus marsupium*, *Ficus racemosa*, *Phyllanthus debilis*, and *Phyllanthus embelica* showed highest amylase inhibitory activities ($53.8 - 95.9$) among the tested. Rest of the plants showed an amylase inhibitory activity below 17%.

Keywords: Medicinal plants, Diabetes, α -Amylase

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**EFFECT OF INTENSITY CONTROLLED DANCE TRAINING ON VO₂ MAX AMONG
AEROBIC, BHARATHANATYAM AND KANDYAN DANCERS**

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The purpose of this study was to find out the effect of intensity control Aerobic, Bharathanatyam and Kandyan dance training on VO₂ max. To achieve the purpose ninety (N=90) women dancers were selected from Jaffna, Sri Lanka, and their ages ranged between 17 and 18 years. They were classified into Aerobic Dancers [(AD)(n=30)], Bharathanatym Dancers [(BD) (n=30)] and Kandyan Dancers [(KD)(n=30)] and practice their respective dance training, 45-60 min / day / three days / week over the period of twelve weeks. VO₂ max was assessed for all the selected subjects by Queen's step test before and after the intervention programme, The pre-test and post test means of experimental groups I, II and III were tested for significance by applying dependent 't' to find out the difference between pre and post test. After eliminating the influence of pre-test on post-test means of experimental groups the analysis of variance (ANOVA) was used to find out the mean gain differences. In addition to this, Scheffe's post-hoc test was employed, to find if the F-ratio of the mean gain was significant. In all the cases 0.05 level of confidence was fixed to test the significance. The result of the study on VO₂ max indicates that there was a significant difference among the Aerobic, Bharathanatyam and Kandyan Dancers. From the results it was concluded that there was a significant difference between Aerobic and Bharathanatyam, Aerobic and Kandyan Dance groups on VO₂ max. However between Bharathanatyam dance and Kandyan dance insignificant difference was observed on VO₂ max.

Keywords: Bharathanatyam, Kandyan Dance, VO₂ max

D 1

மிஷெல் :பூக்கோவின் அதிகாரம், அறிவு பற்றிய எண்ணக்கருத்துத் தொடர்பான ஒரு மெய்யியல் நோக்கு.

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இக்கட்டுரையின் பிரதான நோக்கமாக பின்னவீனத்துவ வாதியான மிஷெல் :பூக்கோவின் அதிகாரம், அறிவு குறித்த சிந்தனையினை விமர்சன ரீதியாக, மெய்யியல் ரீதியாக பகுப்பாய்வு செய்வதுடன் போருக்குப் பிந்திய இலங்கையின் அரசியல், சமூக, பொருளாதார சூழலுடன் ஒப்பிட்டு நோக்குவதாக அமைந்துள்ளது. வரலாற்றால் புறக்கணிக்கப்பட்ட மக்களின் வரலாற்றினை ஆராய்வதாகவே பூக்கோவின் முயற்சிகள் அமைந்துள்ளன. அந்தவகையில் பித்துநிலையாளர்கள், நோயாளிகள், குற்றவாளிகள், பிச்சைக்காரர்கள், ஒருபாலினத்தவர், விபச்சாரிகள், வேசிகள், சமூகவிரோதிகள், ஒடுக்கப்பட்டோர் போன்றவர்களுடைய வரலாற்றில் அதிகாரம் எவ்வாறு செல்வாக்குச் செலுத்தியது என்பது பற்றி ஆராய்ந்த விடயங்களை எமது சமூகத்தினுடாக உற்றுநோக்கி அதன் உண்மைத்தன்மையைத் தெளிவுபடுத்துவதாக இவ்வாய்வு முயற்சி அமைகின்றது.

அதிகாரம் என்பது பாதிக்கப்பட்ட விளிம்புநிலைவாதிகளை மட்டுமல்ல ஆதிக்கம் செலுத்தும் மையவாதிகளையும் மறுவுருவாக்கம் செய்கின்றது. மனிதர்கள் சுதந்திரமானவர்கள் அல்லர். ஏனெனில் அவர்கள் அதிகாரத்தினால் அடிமைப்படுத்தப்பட்டவர்கள். அதிகாரத்தின் உரையாடல் அவர்களைக் கட்டுப்படுத்தி வைத்திருக்கின்றது. மனிதனது சிந்தனை அடையாளம் என அனைத்துமே அதிகாரத்தின் உரையாடல்களினால் கட்டமைக்கப்பட்டவையே. அறிவும் அதிகாரமும் ஒன்றையொன்று சார்ந்திருக்கின்றன. அறிவின் நீட்சியாக அதிகாரமும் அதிகாரத்தின் நீட்சியாக அறிவும் இருக்கின்றது என்பது உண்மை. ஆனால் என்னவோ அதிகாரமே இறுதியில் எல்லாவற்றையும் தீர்மானிக்கும் சக்தியாக மாறிவிடுகின்றது. இதுவே :பூக்கோவின் மையச்சிந்தனை ஆகும். இக் கருத்தை மையமாகக் கொண்டே இவ்வாய்வு மேற்கொள்ளப்பட்டுள்ளது. இதன்மூலம் இலங்கை போன்ற நாடுகளில் அவரது அதிகாரம் பற்றிய கூற்றுக்கள் சமூகங்களின் பலதரப்பட்ட அதிகார மையங்களை இனங்கண்டுகொள்ள உதவும் என்பதனை பல எடுத்துக்காட்டுக்களினுடாக தெளிவுபடுத்துவதாகவும் இவ்வாய்வு அமையப்பெற்றுள்ளது.

Abstracts: Section D (Social Sciences)

பகுப்பாய்வு முறையியல், ஒப்பீட்டு ஆய்வு முறையியல், வழிவிளக்க ஆய்வுமுறை போன்ற முறையியல்களின் துணைகொண்டு மேற்படி விடயங்களைத் தெளிவுபடுத்துவதாகவும் அத்துடன் இரண்டாம் நிலைத்தரவுகளை அடிப்படையாகக் கொண்டும் இவ்வாய்வு முன்னெடுக்கப்பட்டுள்ளது.

Keywords: உண்மையறிவு, அதிகாரத்தின் நுண்ணரசியல், மையம் - விளிம்பு, சொல்லாடல், பணிவுடல்.

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குடும்பவன்முறை ஏற்படுத்தும் உள-சமூகத்தாக்கங்கள் (யாழ் மாவட்டப் பெண்களை மையப்படுத்திய ஆய்வு)

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குடும்பவன்முறை என்பது பெண்கள் எதிர்நோக்கும் பாரிய சவாலாகவுள்ளது. யாழ்ப்பாணத்தில் குடும்பவன்முறையினால் பெண்கள் பாதிக்கப்படும் வீதமானது அதிகரித்திருப்பதனை அண்மைக்கால செய்திகளும், புள்ளிவிபரங்களும் தெரிவிக்கின்றன. ஒருவர்மீது அவரது துணை அல்லது குடும்பஅங்கத்தவர் மேற்கொள்ளும் உடல்மீதியான, உளமீதியான, பாலியல்மீதியான, சமூகமீதியான தாக்குதல்களே குடும்பவன்முறையாகும். குறிப்பாக ஆண்களை முன்னிலைப்படுத்தும் பாரம்பரிய கட்டமைப்புக்களைக் கொண்ட யாழ்மாவட்டத்தில் குடும்பவன்முறை என்பது பரவலாக இடம்பெறுகின்றது.

குடும்பவன்முறையினை எதிர்நோக்கும் பெண்கள் உடல்மீதியாக, உளமீதியாக, சமூகமீதியாக மிகவும் பாதிக்கப்படுகின்றனர். வன்முறைக்குள்ளாக்கப் படுவதன் மூலமும் வன்முறையினை அவதானிப்பதன் மூலமும் அக்குடும்பத்திலுள்ள பிள்ளைகளும் பாதிக்கப்படுகின்றனர். இவ்வாறாகப் பாதிக்கப்பட்ட பெண்கள் எதிர்நோக்கக்கூடிய உள்பிரச்சனைகளையும், உள்நோய்களையும், சமூகப்பாதிப்புக்களையும் இனங்காணும் நோக்கில் இவ்வாய்வு மேற்கொள்ளப்பட்டது.

குடும்பவன்முறை என்பது மிகவும் பரந்தளவிலான விடயங்களினை உள்ளடக்கியது. மட்டுப்பாடுகளின் அடிப்படையிலும், குறிப்பிட்ட விடயத்தினை ஆழமாக ஆராயும் நோக்கிலும் கணவனால் மேற்கொள்ளப்படுகின்ற வன்முறை மாத்திரமே இவ்வாய்வில் கவனத்தில் எடுக்கப்பட்டுள்ளது. குடும்பவன்முறையினால் பாதிக்கப்பட்ட பெண்களினை வைத்திசாலையிலும், மகளிர் அமைப்புக்களிலும் சந்தித்து ஆய்வுக்கான தரவுகள் சேகரிக்கப்பட்டது. இதற்கென வினாக்கொத்து, நேர்காணல், தனியாள் விடயக்கலைஆய்வு, அவதானம் போன்ற தரவுமூலங்கள் பயன்படுத்தப்பட்டது. குடும்பவன்முறையினால் பாதிக்கப்பட்ட பெண்களின் உள்பிரச்சனைகளினை அறிந்துகொள்ளப் பயன்படுத்தப்படும் நியமமான வினாக்கொத்துக்களினை அடிப்படையாகக் கொண்டு இவ்வாய்வுக்கான வினாக்கொத்து தயாரிக்கப்பட்டது. பாதிக்கப்பட்ட பெண்களைக் கையாளுகின்ற வைத்தியர்கள், உள்வளத்துணையாளர்கள், பெண்கள் அபிவிருத்தி

Abstracts: Section D (Social Sciences)

உத்தியோகத்தார்கள் போன்றோரையும் நோக்கித் தகவல்கள் திரட்டப்பட்டன. சேகரிக்கப்பட்ட தரவுகள் அளவரீதியாகவும் பண்புரீதியாகவும் பகுப்பாய்வுக்கு உட்படுத்தப்பட்டது.

ஆய்வு முடிவுகளினடிப்படையில் குடும்பவன்முறையினால் பாதிக்கப்பட்ட பெண்கள் உள - சமூக ரீதியாகப் பாதிக்கப்படுகின்றார்கள், உளநோய்களுக்கும் உள்ளாகின்றார்கள், வன்முறை இடம்பெறும் சூழலில் வளரும் பிள்ளைகளும் உள-சமூகப்பிரச்சனைகளை எதிர்நோக்குகின்றார்கள். எனவே பாதிக்கப்பட்ட பெண்களுக்கும், பிள்ளைகளுக்கும் உள, சமூக, பொருளாதார ரீதியான ஆதரவினை வழங்க வேண்டிய தேவையுள்ளது.

Key words: குடும்பவன்முறை, உளப்பிரச்சனை

D 3

விவசாயக் குடும்பங்கள் மத்தியில் உணவுப் பாதுகாப்பு:

பண்டத்தரிப்பு J/146 கிராமசேவகர் பிரிவின் குடும்பங்களை அடிப்படையாகக் கொண்ட ஒரு சமூகவியல் ஆய்வு

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விவசாயக்குடும்பங்கள் மத்தியில் உணவுப்பாதுகாப்பு என்ற சமூகவியல் ஆய்வானது பண்டத்தரிப்பு J/146 கிராம சேவகர் பிரிவை மையமாகக் கொண்டு மேற்கொள்ளப்பட்ட புத்தாய்வாகும். உணவுப்பாதுகாப்பு என்பது விவசாயம் மற்றும் பொருளியல் சார்பு நிலைக்கு அப்பால் சமூகவியல் கண்ணோட்டத்தில் ஆழ்ந்து நோக்குகின்ற போது உணவுப்பாதுகாப்பில் சமூகத்தின் வேறுபட்ட நிலைகள் செல்வாக்குச் செலுத்துகின்றன.

இவ்வாய்வானது பண்டத்தரிப்பு கிராமத்தின் விவசாயக்குடும்பங்களான பயிரிட்டு விவசாயம் செய்வோர், கூலித்தொழில் செய்வோர், பனைவளம் சார் சீவல் தொழில் செய்வோரின் 70 குடும்பங்கள் மாதிரி முறையே அடுக்கமைக்கப்பட்ட எழுமாற்று மாதிரி முறை, எளிய எழுமாற்று மாதிரிமுறை, நோக்கத்துக்குரிய மாதிரி முறை அடிப்படையில் தெரிவுசெய்யப்பட்டன.

குறித்த ஆய்வானது இயலாவு மற்றும் ஜீவனோபாயக் கோட்பாட்டை பிரயோகிப்பதன் வழி உணவுப்பாதுகாப்பில் செல்வாக்குச் செலுத்தும் காரணிகளைக் கண்டறிந்துள்ளது. விவசாயக் குடும்பங்கள் உணவுப்பாதுகாப்பு குறித்து அறிவார்ந்த விழிப்புணர்வைப் பெற்றுள்ள போதும் நடைமுறையில் உணவுப்பாதுகாப்புக் காணப்படவில்லை. குறைந்த வருமானம், நுகர்வுக் கலாசாரம், உணவின் விலையேற்றம், அருகிவரும் கால்நடை வளர்ப்பு விவசாயக்குடும்பங்களின் உணவுப்பாதுகாப்பில் தாக்கம் செலுத்துவதால் உணவின் போசாக்குத்தன்மை, உணவின் பங்கீடு, உணவின் அளவு என்பன மட்டுப்பாடாகவே அமைகின்றது.

எவ்வாறாயினும் சமுர்த்தித்திட்டங்கள், ஆரோக்கியக்கல்வி, பாடசாலை உணவூட்டல் திட்டம் என்பன சிறந்த தீர்வுகளாக சாத்தியப்பாடுடைய நிலையில் கிராமத்தில் நடைமுறையில் உள்ளன. எனினும் உற்பத்தி விளைச்சலிற்கு பொருத்தமான சந்தைவாய்ப்பு, சேமிப்பினை மேற்கொள்ளல், ஒவ்வொருவரினதும் வயது, உயரம், எடை, செய்யும் தொழிலுக்கேற்ற வகையில் நிறை உணவாக அமைந்திருப்பதோடு உள்ளூர் பாரம்பரிய உணவுகளை உட்கொள்வதன் மூலம் உடல் உள ரீதியான ஆரோக்கியமான சமூக மனிதர்களாக வாழமுடியும்

Abstracts: Section D (Social Sciences)

முடிவாக, விவசாயக் குடும்பங்கள் மத்தியில் உணவுப்பாதுகாப்பு குறித்த ஆய்வானது சமூகவியல் பார்வையில் விவசாயக்குடும்பங்களை அடிப்படையாகக் கொண்ட புத்தாய்வாக அமைந்துள்ளமை விசேட அம்சமாகும். தொடர்ந்தும் வேறுபட்ட ஆய்வுப்புலங்கள், தொழிற்சாலைகளை மையமாகக் கொண்ட ஆய்வு நடவடிக்கைகளுக்கான தோற்றுவாயாகவும் குறித்த இவ் ஆய்வு அமையமுடியும்.

Keywords – உணவுப்பாதுகாப்பு, நுகர்வியப்பண்பாடு, வறுமை, இயலாமை, ஜீவனோபாயம்

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D 4

**Revolution and political, social and economic consequences:
A study centered on Syrian revolution**

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Some form of struggle occurs in some part of the world, throughout history. In most cases, the aims and reasons of the struggles remain the same. But the forms of struggles change from time to time. Revolution is not solely political oriented. Revolution is a broad concept that encompasses the intense social, economic, art, culture and scientific changes. When compared to political revolutions, these revolutions are less significant, and their impacts are limited. Yet, it is the political revolution that gains greater significance and is capable of influencing all other domains.

Political revolution in a country creates socio political and economic impacts. These revolutions can be attributed to the peoples' sentiments toward achieving independence and founding democracy. However, some revolutions turn out to be the sources and origins of military governments and dictatorship. In this sense, revolutions could be perceived as forces causing both favorable and unfavorable changes, sociably. Revolution is considered an essential mechanism for securing peoples' rights, winning independence and rebelling against suppression. Simultaneously, in some instances, revolutions bring in evil outcomes such as communalism, religious fanaticism, regional autonomy, economic deterioration, etc.

As such, this research paper authored by me is intended to study the political and socio economic changes caused by revolution. Further, this research will be based on the data related to the rise of the Arabs in Siria. The methodology to be adopted in the proposed research includes the Analytical method, Comparative method and Descriptive method with the use of data from secondary source.

Key words: Revolution, People's rise, Ethnic rift, Socio Political impacts, Economic impact.

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D 5

Stress Level of Advanced Level students in Sri Lanka:

A special reference to Negombo Educational Zone

K.D. Nathalia Fernando¹

The advanced level (A/L) examination is the university entrance selection examination in Sri Lanka. From educationalists point of view this examination is the most competitive examination in Sri Lanka. So, it is a stressful life event to the students who face this exam. Because of that, it affects their mental, physical and social health. The objective of this study is to examine the stress level of A/L students.

For this purpose 108 advanced level students were selected. Data were collected by using a questionnaire and interviews. This is a qualitative and quantitative research. The study shows that high percentage of A/L students suffer from a developing stress level and mental and emotional stress responses are in a high percentage. This research would be helpful to educational specialists and counselors who conduct research in order to guide the students to minimize or control stress overload experienced by students.

Key words: stress level, advanced level students, stress responses.

D 6

A Study about the possibility of the Geographical Information System (GIS) when the Social Sciences researches are done

(With reference to University of Kelaniya)

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At present, we can see that there is a rapid improvement in the information Technology and Communication Technology and it has helped a lot in the GIS. And also the developments in the remote sensing and the satellite technology have helped a lot. As a result of it, a large number of university pupils use the GIS for their researchers. The main objective of this study is to find out the possibility of the geographical information system when the Social Sciences researches are done.

There were several methodologies which were used to do the research. Randomly fifty students were selected from the faculty of Social Science in the Kelaniya University to gather primary data. They represent all the departments of Social Sciences Faculty. A questionnaire was given to those students who were selected at random. And also many books, magazines, articles and the internet were used to gather secondary data. The gathered data was generalized, classified and summarized. Diagrams, charts and percentages were arranged and used as data analysis methods.

At the end of the research some conclusions were reached. Most of the students who are doing their research for their final examination haven't thorough knowledge about GIS. But they are suffering about GIS to use for their researchers. Not only that, most of the students who study Geography in their final year use the GIS Technology for their researches.

Keywords: GIS, Possibility, University Student, Social sciences researches.

D 7

The Contribution of Peace Education for a Peaceful Society

(A study of undergraduates in Peace and Conflict Resolution Degree Programme of Kelaniya University)

Oshadhi Herath¹

ABSTRACT

The term "Peace" is in the top list of public debate in Sri Lanka. It is because of Sri Lanka making an extraneous effort in peace building after three decades of protracted of ethnic conflict. Both Sri Lankan government and the international community are implementing different programmes to energize the peace building process. The success of these peace programmes will be sustained by the enormous contribution made by education. As human beings learn from womb to tomb, the learned things will direct them to the success.

The objective of this research is to examine the contribution of peace education for a peaceful society. Thirty undergraduates, who are following Peace and Conflict Resolution degree programme were taken as the sample of this study. Random Simpling method was used as sampling technique. Both primary and secondary data have been used for this research where as questionnaires and interviews were referred to primary data collection method. In addition, books, web sites and online magazines were used as secondary data. Data analysis has been done both as quantitatively and qualitatively.

The findings of the research proved that peace education has a direct impact in creating a peaceful society.

Key Words: Education, Peace, Ethnic Conflict, Peace Building

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இலங்கைத் தமிழ்ப் பெண் படைப்பாளிகளின் சிறுகதைகள்:
பெண்களின் கூட்டுக்கதைக்கோவைகள் வழியான ஆய்வு

த.அஜந்தகுமார்
முதுதத்துவமாணி ஆய்வு மாணவன்
யாழ்ப்பாணப்பல்கலைக்கழகம்.

இலங்கைப் பெண்களின் தனித்தொகுதிகள் முக்கியமுடையன எனினும் பல பெண் படைப்பாளிகளின் சங்கமமாய் இருக்கின்ற தொகுதிகள் அதிகம் எம் கவனத்தைக் கோருகின்றன. ஏனென்றால் பல பெண் படைப்பாளிகளின் கதைகளை ஒரு சேரப் படிக்கின்ற வாய்ப்பும் அவர்களின் போக்கையும் நோக்கத்தையும் தளங்களையும் ஒரு சேரத் தரிசிக்கின்ற சந்தர்ப்பமும் வாய்க்கின்றது. அவர்களின் ஆளுமையையும், முன்னேற்றங்களையும், சிந்தனைகளையும், அழகியல் உணர்வுகளையும், பிரச்சினைகளையும் ஆள்நிலை, பிரதேசம், நாடு கடந்து நோக்கும் நிகழ்வை அவ்வகைத் தொகுதிகள் ஏற்படுத்துகின்றன.சுமைகள் (1991) புது உலகம் எமை நோக்கி (1999) குறிஞ்சி மலர்கள் (2000) குர்பான் செய்த கனவு (2003) சிறகுகள் விரித்தோம் (2004) அம்மா (2004) வேர்கள் துளிர்க்கும் (2005)கனவுக்கு வெளியேயான உலகு (2003)பாலை நண்டுகள் (2008). இவ்வாறு வெளிவந்த பெண்களின் கூட்டுக்கதைத் தொகுதிகள் வாயிலாக இலங்கைப் பெண்படைப்பாளிகளின் சிறுகதைகள் பற்றிய பொதுச்சித்திரத்தை உருவாக்கி அவர்களின் இடத்தினை இனம் காட்டுவதாக இவ்வாய்வுக் கட்டுரை அமையும்.பெண்படைப்பாளிகளின் சிறுகதைகளினூடாக வெளிப்படும் பிரச்சினைகளையும், சிந்தனைகளையும் இவ்வாய்வு கவனத்தில் கொள்வதனால் பெண்ணியத் திறனாய்வை இவ்வாய்வு பிரதானப்படுத்துகின்றது. பல்வேறு மட்டத்திலான பிரதேச பெண் படைப்பாளிகளின் கதைகளை ஆய்வு செய்வதால் சமூகவியல் ஆய்வாகவும் இது அமையும். தேவை கருதி விவரண ஆய்வும் பயன்படுத்தப்படும்.இலங்கைப் பெண் படைப்பாளிகளின் சிறுகதைப் பங்களிப்பை முழுமையாக நோக்குவதற்கான முன்னரம்பமாக கூட்டுத் தொகுதிகள் வழியான ஆய்வை இக்கட்டுரை மேற்கொள்கின்றது.

ஆய்வு முடிவுகளாவன: இலங்கைத் தமிழ் இலக்கிய வளர்ச்சியில் பெண்களின் வகிபாகம் கவனத்துக்குரியது.1930 களில் தொடங்கிய சிறுகதைத் துறையிலான பெண்களின் பங்களிப்பு இன்றுவரை காத்திரமான பங்களிப்பைச் செய்து வருகின்றது.கவிதைத் துறையில் மாத்திரமல்ல சிறுகதைத் துறையிலும் பெண்ணியச் சிந்தனை வளர்ச்சியை, பெண்களின் விழிப்புணர்வினை அவதானிக்கமுடிகின்றது. கவிதையில் வெளிப்பட்ட பெண்மொழிப்பிரக்ஞை அதற்கான சாத்தியப்பாட்டுடன், அழகியலுடன் புலம்பெயர் சூழலில் சிறுகதைத் துறையிலும் வெளிப்பட்டு வருகின்றது. புத்தனுபவங்களை பெண்களின் சிறுகதைகள் உயிர்த்துடிப்புடன் வெளிக்கொணர்ந்துள்ளன. மலையகம், யாழ்ப்பாணம்,வன்னி, கிழக்கிலங்கை, புலம்பெயர் தேசங்கள் என்று பிரதேசங்கள் வேறுபட்டாலும் பெண்களை நோக்கிய அடக்குமுறைகளும் அதிகாரங்களும் வடிவ வேறுபாட்டுடன் தொடர்ந்த வண்ணமே உள்ளன.தொழிலாளியாய், போராளியாய், அகதியாய், குடும்பப் பெண்ணாய், விதவையாய், தனித்தவளாய், கைவிடப்பட்டவளாய், விபச்சாரியாய் சுரண்டல்களுடன் வசைகளுடன் பல இன்னல்களை அனுபவிக்கும் பெண்களை இக்கதைகள் உயிர்புடன் எமக்குக் காட்டுகின்றன. மிதவாதப் பெண்ணியம்,சமதர்மப் பெண்ணியம், தீவிரவாதப் பெண்ணியம் என்ற பெண்ணியத்தின் அலைகள் இவர்களின் சிறுகதைகளில் பிரதிபலித்துள்ளன. ஆண் எழுத்தாளர்களின் கதைகளில் இருந்து வேறுபடும் கோபம், எள்ளல், ஆற்றாமை என்ற உணர்வுகளுடன் கூடிய புதிய பேசுமுறைகளை அறிமுகப்படுத்தியுள்ளார்கள். பெண்களுக்கான கலை இலக்கிய செந்நெறியை உருவாக்குதல் என்ற கனவு மெய்ப்பட்டு வருவதை இத்தொகுதித் கதைகள் சாட்சியமாக்குகின்றன

திறவு சொற்கள் - பெண்ணியம், இலங்கைப் பெண் படைப்பாளிகள், சிறுகதைகள், பெண்களின் பிரச்சினைகள்

சங்க இலக்கிய ஆய்வில் பேராசிரியர் கா.சிவத்தம்பியின் பங்களிப்பு

வதனரேகா அஜந்தகுமார்

சங்க இலக்கியங்கள் பற்றியபுலமை நாட்டமான ஆய்வு 1920, 1930களில் தான் ஆரம்பமாகத் தொடங்கியது. இதில் கணிசமான பங்களிப்பு தமிழ் நாட்டறிஞர்களுக்கு இருந்தாலும் பதிப்பு - உரை - ஆய்வு - மார்க்கிய ஆய்வு என்ற நிலைகளில் ஈழத்துத் தமிழ் அறிஞர்களின் பங்களிப்பு கவனத்துக்கு உரியதாகும். மார்க்கிய ஆய்வுத்தளத்தில் சங்க இலக்கிய வாசிப்பிற்கு புத்தொளி பாய்ச்சியவர்களில் பேராசிரியர் க.கைலாசபதி, பேராசிரியர் கா.சிவத்தம்பி ஆகியோரின் பங்களிப்பு முதன்மையானது. இதில் பேராசிரியர் கா.சிவத்தம்பி அவர்களின் பங்களிப்பை கவனப்படுத்துவதாக இவ்வாய்வு விளங்குகின்றது. பழைய இலக்கிய இலக்கணம் முதல்நவீன இலக்கியம்வரை, பண்டையநாடகம் முதல் நவீனநாடகம் வரையான ஆய்வுகளும் இதன் மூலம் சமூகவரலாறு எழுதுவதற்கான, கண்டடைவதற்கானதேடல், தமிழில் இலக்கிய வரலாறு எழுதியல் தொடர்பான பிரக்ஞையும் பிரச்சினையும், தமிழர்களின் கலை இலக்கிய பண்பாடு வரலாறு பக்தி இலக்கியங்கள், தொல்காப்பிய, சங்ககாலக் கவிதையியலின் புதியவாசிப்புகள், பல்பண்பாட்டுச் சூழலமைவு பற்றியதேடுகையும் ஆய்வும், ஈழத்தின் பிரதேசப் பண்பாடுகள் தனித்துவம் கருத்து நிலைசார்ந்த ஆய்வுகள், திராவிட இயக்கம், தனித்தமிழ் இயக்கம், மார்க்கிய இயக்கம்பற்றிய ஆய்வுகள் என்று அவரின் ஆய்வுஉலகம் விரிந்து சென்றதைக் காணலாம். பல அறிஞர்கள் விடாது பயணித்துவரும் சங்க இலக்கியப் பாதையில் புத்தொளி பாய்ச்சிய சிவத்தம்பி அவர்களின் பல்வேறு திறனாய்வு முகங்களும் ஒருமுகமாகச் சேர்த்தே நோக்கப்பட்டுள்ளது. இந்நிலையில் பன்முகத்தில் ஒரு முகமாக விளங்கும் பேராசிரியரின் சங்க இலக்கிய ஆய்வுப் பங்களிப்பை நோக்குவதாக இக்கட்டுரை அமைகின்றது. அப்பொழுது இவ்வாய்வு சங்க இலக்கிய ஆய்வில் ஈழத்தின் பங்களிப்பைப் பூர்த்தி செய்வதாக அமையும். ஆய்வுகள் பற்றிய ஆய்வாக இவ்வாய்வு அமைவதால் பகுப்பாய்வு இங்குமுதலில் நிகழ்த்தப்படும் அதேநேரத்தில் விவரண ஆய்வாகவும் விரிந்து செல்லும். பேராசிரியர் சிவத்தம்பியின் தனித்துவத்தை நிலைப்படுத்த தமிழக அறிஞர்களுக்கும் ஏனைய அறிஞர்களுக்கு முன்னோடியாகவும் வேறுபட்டும் சில இடங்களில் ஒத்தும் இருந்ததனைத் தெளிவுபடுத்த அவர்களது ஆய்வுகளும் பேராசிரியர் சிவத்தம்பியினது ஆய்வுகளும் ஒப்பீட்டு ஆய்வுக்கு உட்படுத்தப்படும். இவ்வாய்வில் பகுப்பாய்வு அணுகுமுறை இவ்விவரண அணுகுமுறை, ஒப்பீட்டு அணுகுமுறை ஆகியன பயன்படுத்தப்படும்.

ஆய்வு முடிவுகளாவன: மேலோட்டமாக இருந்தசங்க இலக்கிய ஆய்வை ஆழப்படுத்திய அறிஞர்களுள் சிவத்தம்பி முக்கியமானவர். சங்க இலக்கிய ஆய்வில் மார்க்கிய வெளிச்சத்தைப் பாய்ச்சியதில் தொடர்ந்து ஈடுபட்டதில் முக்கியமானவர். தொல்காப்பியக் கவிதையியலை சங்க இலக்கியத்துள் கண்டெடுத்த பெருமைக்குரியவர். திணைக்கோட்பாட்டில் பேராசிரியர் அகலக்படுத்திய பாதை முக்கியமானது. சங்க இலக்கியத்துள் நாடகத்தைக் கண்டெடுத்தபெருமை இவருக்குரியது. சங்க இலக்கியத்தை அதன் சமூகபண்பாட்டுத் தளத்தோடு பார்ப்பதோடு மட்டுமன்றி அதன் அரசியற் பின்னணியையும் எடுத்துக் கூறியவர். சங்க இலக்கியத்தின் மீதான வரலாற்று ஆய்வுகளில் சாசனவியல் ரீதியான ஆய்வுகளை உள்வாங்கி பொருத்தும் திறன். தமிழிலக்கிய வரலாற்றெழுதியல் பிரச்சினைகளில் கலித்தொகை பரிபாடல் ஆகியவற்றின் கால ஆராய்ச்சிகளை அறிஞர்களின் கருத்துக்களோடு உறுதிபடக்கூடியவர். இவ்வாறுசங்க இலக்கியத்தை அதன் கவிதையியல் சமூகஅரசியல் பண்பாட்டியல் சாசனவியல் இலக்கணவியல் காலஆராய்ச்சி என்ற ரீதியில் ஆய்வு செய்து பின்வருவோர்க்கு பின்வரும் ஆய்வாளர்களுக்கும் வழிகாட்டியாக அமைந்தவராவார்.

திறவுசொற்கள் - நாடகம், சங்க இலக்கியம், மார்க்கியம்,

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பல்கலைக்கழக மாணவர்களின் கல்விச் செயற்பாட்டில் கையடக்கத் தொலைபேசிப் பாவனையின் தாக்கம் - யாழ்ப்பாணப் பல்கலைக்கழக கலைப்பீட மாணவர்களினை அடிப்படையாகக் கொண்ட ஆய்வு

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Abstract

இவ் ஆய்வுக்கட்டுரையானது பல்கலைக்கழக மாணவர்களின் கல்விச் செயற்பாடுகளில் கையடக்கத் தொலைபேசிப் பாவனையின் தாக்கம் - யாழ்ப்பாணப் பல்கலைக்கழக கலைப்பீட மாணவர்களினை அடிப்படையாகக் கொண்ட ஆய்வு எனும் தலைப்பில் மேற்கொள்ளப்பட்டுள்ளது. இன்று உலகளாவிய ரீதியில் கையடக்கத் தொலைபேசி சிறந்த ஒரு தொடர்பாடல் சாதனமாகக் காணப்படுகின்றது. இது இலகுவாகத் தகவல் பரிமாற்றம் செய்து கொளளக்கூடியதாகவும் இருக்கின்றது. பாடசாலை செல்லும் பிள்ளையில் இருந்து வீட்டில் இருக்கும் பாட்டிவரை இன்று கையடக்கத் தொலைபேசி அத்தியாவசியப் பொருளாக மாறிவிட்டது. இதேபோன்று பல்கலைக்கழக மாணவர்களின் அன்றாடச் செயற்பாடுகளில் கையடக்கத் தொலைபேசி அதிகளவு செல்வாக்குச் செலுத்துகின்றது. தொடர்பாடல் சாதனங்களில் மிக முக்கிய இலத்திரனியல் சாதனமாக கையடக்கத் தொலைபேசி காணப்படுகின்றது. எனினும் இதனால் ஏற்படும் பாதிப்புக்களும் அதிகம் என வெகுஜன ஊடகங்கள் வாயிலாக அறிய முடிகின்றது. எனவே இவ் ஆய்வுக்கு உட்படுத்திய மாணவர்களைக் கொண்டு கையடக்கத் தொலைபேசிப் பாவனையின் மூலம் கல்விச் செயற்பாடுகளுக்கு உதவியாகவும் அதேநேரம் கல்விச் செயற்பாடுகளுக்கு ஏற்படுத்தும் இடையூறுகளினையும் ஆராயும் பொருட்டு ஆய்விற்குரிய கருதுகோள், ஆய்வுக்குரிய நோக்கங்கள் முன்வைக்கப்பட்டு அவற்றினை அடையும் பொருட்டு இவ் ஆய்வு மேற்கொள்ளப்பட்டுள்ளது.

ஆய்விற்குத் தேவையான தரவுகள் கலைப்பீடத்தில் உள்ள முதல் மூன்று வருட மாணவர்களின் மொத்தத் தொகையான 1405 இல் எளிய எழுமாற்று அடிப்படையில் தெரிவு செய்யப்பட்டு 10% ஐ அடிப்படையாகக் கொண்டு 141 மாணவர்களிடம் இருந்து Schedule முறையிலான வினாக்கொத்தின் உதவியுடனும் அவதானிப்பு மூலமாகவும் முதலாம் நிலைத் தரவுகள் பெறப்பட்டதோடு, இரண்டாம் Proceedings of Jaffna Science Association, Vol. 21 No.1. 2, 3& 4 April, 2014

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நிலைத்தரவுகள் ஏற்கனவே பதியப்பட்ட பதிவேடுகளில் இருந்தும் கையடக்கத் தொலைபேசி தொடர்பாக வெளிவந்த பத்திரிகைச் செய்திகள், கட்டுரைகள் வாயிலாகவும் இணையத்தள தகவல்கள் ஊடாகவும் பெறப்பட்டு விபரணப் புள்ளிவிபர முறையூடாக முடிவுகள் வெளிப்படுத்தப்பட்டுள்ளன.

இவ் ஆய்வு முடிவுகளின்படி கையடக்கத் தொலைபேசி இன்று தொடர்பாடல் செயன்முறையை மேற்கொள்ள அடிப்படையான சாதனமாகவும் கல்விச் செயற்பாடுகளுக்கு கையடக்கத் தொலைபேசி முக்கியமாக காணப்படுகின்றது என்பது பெரும்பாலானோரின் முடிவாகும். அதேநேரம் படிக்கும்போது குறுஞ் செய்திகள் (SMS) அனுப்பும் பழக்கம் மாணவர்களிடையே காணப்படுகின்றது. மேலும் விரிவுரை நேரங்களில் வரும் கையடக்கத் தொலைபேசி அழைப்புக்களினால் உளரீதியான பாதிப்புக்கள் ஏற்படுகின்றது என்கின்ற ஒரு முடிவும் பெறப்படுகின்றது. ஆனாலும் பெரும்பாலானோரின் முடிவாகக் கற்றல் செயற்பாடு குழப்பமடையவில்லை என ஆய்வின் மூலம் கண்டறியப்பட்டுள்ளது.

Keywords : கையடக்கத்தொலைபேசி, கற்றல் செயற்பாடு, உளத்தாக்கம், ஆளிடத் தொடர்பாடல் சாதனம்.

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**ASSESSMENT OF AAHPER YOUTH FITNESS NORMS: SRILANKAN
(SABARAGAMUWA PROVINCE) ADOLESCENT BOYS**

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The aim of the study was to compare and evaluate the AAHPER youth fitness test among Sabaragamuwa province adolescent boys in Sri Lanka. To achieve the purpose (N=800) adolescent boys from age of 14 years (n=400) and 15 years (n=400) were randomly selected as subjects from Sabaragamuwa province, Sri Lanka AAHPER (50 yards - speed, Standing broad jump-explosive power, 1.5 miles run - endurance, sit-ups – abdominal strength, shuttle run – agility and pull-ups-arm strength) youth fitness test were selected as criterion, variable tested, the data were converted into AAHPER youth fitness norms. The result of AAHPER youth fitness existing norms shows that, 14 and 15 years boys of Sabaragamuwa province were mostly below the 50th percentile in all the fitness qualities. From the result it was concluded that the adolescent boys of Sabaragamuwa province (Sri Lanka) were having poor physical fitness. The pupils scored below 50 deciles on the selected fitness variable in their respective age group should be encouraged to improve their fitness level. National level special fitness program will be designed and implemented to the poor fitness students. Further national Level common fitness norms may be constructed and standardized for fitness assessment.

Key Words: AAHPER, Fitness, Norms, Adolescent.

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