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- Prof. P. Ravirajan, the Dean, Faculty of Science, University of Jaffna.
- Prof. Sara L. Goodacre, University of Nottingham.
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ISSN: 2550 - 2786

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Table of Contents

ISSN: 2550 - 2786

ISSN: 2550 - 2786

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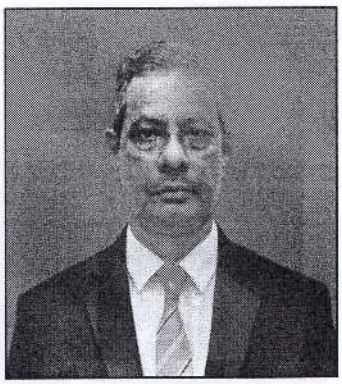
ISSN: 2550 - 2786



MESSAGE FROM THE VICE CHANCELLOR

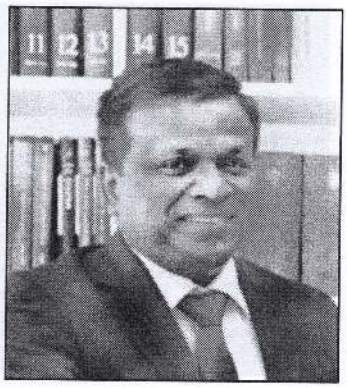
The University of Jaffna, since its inception, has supported and sustained a quality research culture. This is reflected in the vision of the university to become a center of excellence in research. Over the decades, the University has produced many scholars with great reputation. The research culture at the University of Jaffna is enhanced by the research conferences and symposia hosted by its different departments and faculties.

The University is also strongly committed to cultivating an interest in and yearning for research among its undergraduates as well. The undergraduate symposium organized by Zoological Students' Association (ZSA) is an important event in this regard. The Zoological Students' Association (ZSA) is one of the vibrant student associations functioning at the University of Jaffna. This Association supports the academic work students carry out outside their classroom and provides a forum to exchange healthy conversations about their discipline. I am indeed proud that the students who hold membership in this Association are organizing a symposium to motivate themselves and support one another's research. This is an exemplary event for the others to follow suit.

I wish the ZSA and the Department of Zoology the very best for the Student Research Symposium – 2020. I am hopeful that they would conduct similar events in the future as well.

Prof. S. Srisatkunarajah,
Vice Chancellor,
University of Jaffna.

ISSN: 2550 - 2786



MESSAGE FROM THE DEAN, FACULTY OF SCIENCE

On behalf of the Faculty of Science, University of Jaffna, I congratulate the Department of Zoology especially Zoological Students' Association (ZSA) for organizing the Student Research Symposium for the Biological Sciences on 6th December 2020 under AHEAD/ELTAELSE project grant. The Faculty of Science is one of the leading entities in providing quality research publications in the country. It has been supporting researchers and students for promoting their innovative ideas.

This symposium will provide an exciting opportunity to young research students in Biological Sciences for presenting their research findings and exchange their ideas. This symposium will also provide a platform to showcase investigative, writing and communication skills of the Honours students in the Biological Science stream. I am glad to note that all the abstracts have been peer reviewed by the expert panel including eminent researchers from south and published as a book of abstracts at the research symposium.

I appreciate the initiative of the department to organize such a student symposium and wish them all to have a successful event.

Prof.P.Ravirajan,
Dean, Faculty of Science,
University of Jaffna.

ISSN: 2550 - 2786

MESSAGE FROM THE HEAD, DEPARTMENT OF ZOOLOGY

The Department of Zoology always welcome novel approaches and takes the initiative to disseminate the knowledge synthesized by research to support the region. We have very active research laboratories to work on various fields in biology. The research teams strive to produce viable research outcomes to support the need of the country. We are very proud to have specialists in the fields of Entomology, Evolutionary Biology, Molecular biology, Toxicology, Herpetology, Vector biology, Parasitology, Limnology, and Marine biology. This is reflected in the high quality research conducted by our honours degree students every year. We provide honours students with the complete experience in research.

The Students' Research symposium 2020 is an initiative taken by the Zoological Students' Association to encourage the undergraduates by providing an opportunity to gather in a safe and scholarly environment, where meaningful science communication awaits. I'm proud to be a part of this symposium. The Department of Zoology has already conducted considerable number of national workshops and one national conference. This is the first student conference organized by any departments from Biological science stream and I'm proud that our students have taken this initiative and proven again that we always lead.

On behalf of Department of Zoology, I wish the organizing committee a very best for the Symposium and my heartfelt congratulations to the participants as well.

Dr. T. Eswaramohan,
Head,
Department of Zoology.

ISSN: 2550 - 2786

MESSAGE FROM THE SENIOR TREASURER, ZOOLOGICAL STUDENTS' ASSOCIATION

It is with great pleasure to congratulate the Zoological Students' Association of our Department of Zoology for organizing this first ever Research Symposium for Biological Science stream students at the Faculty of Science, University of Jaffna in collaboration with AHEAD ELTA ELSE/ Department of Zoology grant. The main objective of this symposium is to provide a platform to the students in research culture as well as to improve their soft skills. As a developing nation, the scientist and researchers in Sri Lanka should play a greater role in research and development activities in the country for the benefit of the society at large. In this regard, I believe that it is our duty to introduce this culture to our budding graduates. Therefore, as one of the activity under the AHEAD grant of our department we proposed this activity and now it becomes true today. I am extremely happy to see that our undergraduates/ ZSA members are actively participating as the organizing committee of this symposium such as chairperson, secretary, editors, treasurer, logistic committee members, participants and presenters except reviewers for the abstracts.

As a senior treasurer of ZSA, I wish to thank Dr. Gajapathy, Activity Coordinator, AHEAD ELTA ELSE/ Department of Zoology grant & the Senior Lecture of Department of Zoology for initiating this event and for his continuous support in all aspects for the successful of this symposium. Also, I wish to thank AHEAD ELTA ELSE grant of the World Bank for their approval and financial support.

I congratulate the ZSA members (2019-2020) for their tireless effort to make this first Research Symposium for Biological Science stream students a success and I expect that in future years too ZSA should make effort to continue this symposium at the Department of Zoology.

Dr. Mrs. Thulasitha William Shanthakumar,
Senior Treasurer – ZSA and Senior Lecturer,
Department of Zoology.

ISSN: 2550 - 2786

MESSAGE FROM THE COORDINATOR, 'AHEAD ELTA- ELSE DP' PROJECT

The Zoological Students' Association (ZSA) of Department of Zoology, University of Jaffna is organizing the first ever Students' research forum in the history of Biological Science Stream. This forum provides a platform for the young emerging graduates to explore into the diverse areas which will definitely improve their skills.

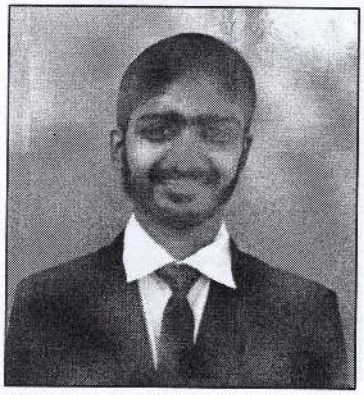
Conducting a student conference was one of the sub activities of our AHEAD ELTA-ELSE Developmental Project, when we have submitted the project proposal to the World Bank which is materializing now. I congratulate the 7th batch of the current ZSA members (July 2019 – December 2020) for their sincere efforts from the process of designing the posters, collecting the abstracts, sending them to the reviewers and delegates, final editing of the proceedings, preparing invitation cards and other related works.

In this prevailing COVID-19 pandemic situation, conducting a student forum is a challenge. Further, I thank the senior treasurer of ZSA; Dr. Mrs. Thulasitha William Shanthakumar for her continuous support for the smooth running of the Students' Association.

This student forum is organized not only by the student body but also managed by them with the support of AHEAD ELTA-ELSE DP of the Department of Zoology fund. Besides their academic abilities, the programme like this provides wider scope for the students to build their graduate profile in a nice way thereby the target of the project can also be achieved. Once again, I congratulate the organizing committee for making this as a successful event.

Dr. Mrs. Abyerami Sivaruban,
Coordinator,
AHEAD ELTA-ELSE DP,
Department of Zoology.

Proceedings of the Student Research Symposium 2020, ZSA, University of Jaffna *ISSN: 2550 - 2786*



MESSAGE FROM THE CONFERENCE CHAIR

My dear scholars and friends,

The research is an eventful experience in a student life which grooms us as researchers and it is also a great opportunity for learning new skills which may be needed in a professional global village we are in. The research symposium for biological science students is an excellent platform for those who have concluded their undergraduate research. This will give you the experience which will be really helpful in your career.

Organizing such event hasn't been the easiest task therefore, I wish to express my deepest gratitude towards my organizing committee for all their tireless hard work and support. It is an invaluable opportunity for me to work with you all happily. The memories we had working together will be cherished by me.

I would like to congratulate all the presenters for their achievement. Keep faith in yourself despite all the obstructions that comes in your way and work honestly with courage to become the best version of yourself and be successful in your future endeavors.

Thank you

With love

H.G.D. Madhusanka
(Conference Chair)

ISSN: 2550 - 2786

MESSAGE FROM THE EDITORS' DESK....

It is our pleasure to welcome you to the Students' Research Symposium 2020 which showcases the diverse perspective and experience of our undergraduate researchers in various disciplines of Biological Science. We are proud and delighted to introduce the proceedings of Students' Research Symposium 2020.

The event aims to provide a supportive atmosphere where participants can present their work and receive feedback, be informed of current research, and further develop presentation skills. Each abstract received was undergone review process by external reviewers, who reviewed the scientific validity of every aspect of the research. This proceeding contains 14 abstracts in various disciplines in Biological Science, which will be presented on 6th December 2020 at the Students' Research Symposium 2020. Research abstracts demonstrate a sound theoretical and/or methodological background in science and contribute to the greater knowledge in the respective fields.

The Editorial Team wishes to thank the undergraduate researchers for their scholarly participation, reviewers for their valuable comments, and the panel of Judges for their time and contribution. We would like to extend our sincere gratitude to the Vice-chancellor of the University of Jaffna, the Dean of the Faculty of Science, and the Head of the Department of Zoology for giving us the freedom and opportunity to exhibit our idea. Also, we would like to thank Dr. (Mrs). Abyerami Sivaruban and Dr. (Mrs).Thulasitha William Shanthakumar for their intense support and coordination.

We believe that science can never fail the human kind and will always stand along the truth. We follow the path of the great scientists who laid the foundation for the existence of our lives with more love and kindness towards the nature. We wish all the participants the very best and would like to express our heartfelt congratulations for their success in Research.

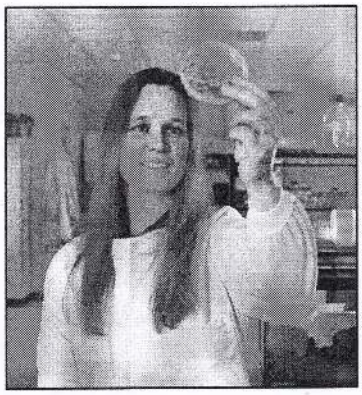
The Editorial team
Students' Research Symposium 2020

ISSN: 2550 - 2786

Keynote Speech

Proceedings of the Student Research Symposium 2020, ZSA, University of Jaffna

ISSN: 2550 - 2786



KEYNOTE SPEAKER: SARA L. GOODACRE

Sara L. Goodacre is a research geneticist and Professor of Evolutionary Biology and Genetics at the University of Nottingham. She is the lead for the *Open Air Laboratories*, a citizen science project that engages people with the outdoor environment and Deputy Director of the Biotechnology and Biological Sciences Doctoral Training Programme.

SYNOPSIS OF THE KEYNOTE ADDRESS

Smarter than a spider: nature inspired biomaterials and pest-control

The natural world provides the blueprint for materials that can be useful in fields of medicine and engineering. In this lecture I will explore how different spider silks can be made synthetically in the laboratory, and how these can be further improved for human use by the addition of useful chemical properties, such as antibiotic activity. I will also explore how the natural ability of spiders to act as predators of pests in settings such as agricultural fields can be harnessed as a natural alternative to the use of pesticides.

ISSN: 2550 - 2786

Technical Session Abstracts

(*corresponding and presenting author)

Proceedings of the Student Research Symposium 2020, ZSA, University of Jaffna

ISSN: 2550 - 2786

SRS- 01

EVALUATION OF THE ACUTE TOXICITY OF PROFENOFOS AND ITS EFFECTS ON THE BEHAVIORAL PATTERN OF GENETCALLY IMPROVED FARMED TILAPIA FINGERLINGS [*Oreochromis niloticus* (Linnaeaus., 1758)].

N.G. Dayananda* and S.N. Surendran

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ABSTRACT

Profenofos is an organophosphate insecticide which acts as acetylcholinesterase inhibitor. It is a potential contaminant to the aquatic ecosystems which can effect on non-targeted organisms including fish. The aim of this study was to determine the 72 h LC_{50} value of Profenophos® and to investigate the changes in behavioral pattern of genetically improved farmed tilapia fingerlings. ((2 ± 0.5) g of average weight and (6 ± 0.5) cm of average length). Three tank setup were prepared with three different concentrations of Profenophos® i.e. 0.2 mgL^{-1}, 0.3 mgL^{-1} and 0.4 mgL^{-1} and one tank was maintained as a control tank without Profenophos®. There were three replicates for each concentration and the control setup. Each tank setup was introduced with four tilapia fingerlings. All the tank setups were maintained under the equal conditions of average temperature (30 ± 1 °C), pH (7), photoperiod of 12 hours dark and 12 hours light, and the average dissolved oxygen (DO) concentration of 6.4 mg L^{-1}. Mortality and the behavioral changes were assessed at 24, 48, and 72 hours. Seventy two hours LC_{50} was determined by probit analysis using the MS Excel 2013 software. The calculated 72 h LC_{50} value of insecticide Profenophos® to *Oreochromis niloticus* fingerlings was 0.26 mgL^{-1} at 30 ± 1 °C. The behavioral responses of fish exposed to Profenophos® were included loss of balance, moving in spiral fashion with sudden jerky movements, lying on their sides and rapid flapping of the operculum with the mouth open. The present study reveals that Profenophos® is toxic to genetically improved strain of *Oreochromis niloticus* and have affected on behavioral changes at low concentrations.

Key words: Acute toxicity, Profenofos, *Oreochromis niloticus*

Notes

ISSN: 2550 - 2786

SRS- 02

TOXICOLOGICAL EFFECTS OF NAPHTHALENE ON THE EARLY DEVELOPMENT OF ZEBRAFISH (*Danio rerio*).

K. Vithushi* and W.S.Thulasitha

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ABSTRACT

Polycyclic aromatic hydrocarbons and their derivatives constitute a large proportion present in diesel or crude oil and are identified as one of the major aquatic pollutants of which naphthalene (*Nap*) is one of the important chemicals. Therefore, the present study was carried out to identify the toxicological effects of *Nap* on the early developmental stages of a lower vertebrate model; zebrafish (*Danio rerio*). Healthy same-aged embryos (6 hours post fertilization –hpf) were obtained by induced spawning and utilized in this experiment. *Nap* was dissolved in 1% Dimethyl sulfoxide (DMSO) and the following concentrations were applied to respective groups (60, 40, 20, 10 and 5 mg/L). Egg water alone and DMSO with egg water were used as control. Percentage of mortality and developmental deformities were recorded at 24, 48, 72 and 96 hpf. All the treatments were done in triplicates. The results showed that LC_{50}value in embryos for *Nap* based on Probit analysis was 19.91 mg/L. Embryos showed developmental deformities such as pericardial edema, yolk sac edema, yolk sac fluid accumulation, yolk sac turbidity, spinal cord bent, haemorrhage and bent tail upon *Nap* treatment. The minimum concentration of *Nap* that showed developmental deformities was 20 mg/L. Percentage of mortality increased with the increasing concentration of *Nap*. The results revealed that, *Nap* showed developmental toxicity on zebrafish embryos and the toxicity is concentration-dependent. Further studies are being conducted to confirm the developmental toxicity of *Nap* based on histological analysis.

Keywords: Naphthalene, Zebrafish, Embryo-toxicity, Malformation, Deformities

Acknowledgement: University Research Grant, University of Jaffna (URG / 2018 / SEIT / 03)

Notes

ISSN: 2550 - 2786

SRS- 03

DETERMINATION OF HEAVY METALS IN SELECTED FISH SPECIES COLLECTED FROM KAKKAITHIVU, JAFFNA ESTUARY, SRI LANKA.

P.Vashni Olivia[1*], P.Sivakumar[1] and G.Sashikesh[2]

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[2]Department of Chemistry, Faculty of Science, University of Jaffna, Sri Lanka

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ABSTRACT

Heavy metal contamination in aquatic ecosystems has become an emerging environmental issue. Therefore, Kakkaithivu coastal waters of Jaffna estuary was selected as the area of investigation for this study. It is a major fish landing centre in Jaffna district and also a highly polluted site due to large amounts of solid waste dumping into the coastal area that is very close to Jaffna estuary. Electronic scrap and some hospital wastes were observed along the coastal area of Kakkaithivu. They are the expected source of Zinc (Zn) and Chromium (Cr). This study aimed to assess the concentrations of two heavy metals (Cr and Zn) in the selected Eel cat fish (*Plotosus limbatus*). Fish samples were collected from the commercial catches in Kakkaithivu landing centre. The metal levels of digested laboratory samples were analysed by using the Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The results revealed the presence of two selected heavy metals; namely, Zn and Cr in the muscle tissue of (*Plotosus limbatus*). The mean concentration of Zn was 33.5 ±8.47 mg/kg and Cr was 1.16 ±0.28 mg/kg in fish muscle tissue. This is the first attempt to report the presence of heavy metals in muscle tissue of Eel cat fish (*Plotosus limbatus*) from Kakkaithivu, Jaffna estuary, Sri Lanka.

Key words: Estuary, Heavy metal, *Plotosus limbatus*

Notes

ISSN: 2550 - 2786

SRS- 04

ASSESSING THE EVOLUTION OF SRI LANKAN SANDFLY SPECIES BELONGS TO THE GENUS *Sergentomyia* USING CYTOCHROME C OXIDASE SUBUNIT I (*CO I*) PARTIAL SEQUENCE.

A. Salomi* & K. Gajapathy

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ABSTRACT

Sandflies are vectors of *Leishmania* parasites that cause Leishmaniasis in human. The taxonomy of sandflies and their vector potential have not been comprehensively documented. This study aimed to assess the evolution of the sandflies by using a mitochondrial DNA marker. Partial DNA sequence for cytochrome c oxidase subunit 1 of Sri Lankan sandfly species were used for the analysis. Edited sequences were used in the phylogeny tree construction using Maximum likelihood method. The consensus tree was obtained with condensation of the clades at a cut-off value of 70% of the bootstrapping value. The phylogenetic tree obtained corresponds to the traditional taxonomy where *Se.bailyi* deviates from Subgenus *Parratomyia* and form a separate group, as discussed in some taxonomic keys. The tree also supports the tritomy concept of the subgenera *Parratomyia*, *Sergentomyia*, and *Neophlebotomus*. It also reflects the species complex of *Se.babu insularis* and *Se.babu babu* within the respective subgenus; *Parratomyia*. Phylogenetic relationship among the species belong to the genus *Sergentomyia* is reassessed. Combined approach of molecular phenotypes (identified via DNA markers) together with morphological features is suggested to identify the definitive taxonomic status of species.

Key words: Sandfly, DNA marker, Taxonomy, Evolution

Notes

ISSN: 2550 - 2786

SRS- 05

MORPHOLOGICAL VARIATIONS AMONG THE RUSSELL'S VIPERS (*Daboia russelii*, SHAW AND NODDER, 1796) IN THE JAFFNA PENINSULA.

N. Abeyaweera[1*], S. Abyerami[1] and A. Murugananthan[2]

[1]Department of Zoology, Faculty of Science, University of Jaffna, Sri Lanka

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ABSTRACT

The Russell's viper is a venomous snake with greater medical importance that belongs to the family: Viperidae. The reptile shows discontinuous distribution over Southeast Asian regions, and also shows diverse clinical manifestations during envenomation. Multivariate studies on the variations has divided Russell's viper into two subspecies; the Western and Eastern forms. The Sri Lankan Russell's viper, *Daboia russelii russelii* (Western form), is distributed over the dry, intermediate and wet climatic zones below 900m above sea level. This distribution in different geographical locations and the complexity of clinical manifestations observed among envenomed patients alarm the necessity of studying this organism very closer in different locations. The present study on the Russell's viper was carried out from July 2019 to September 2020 in Jaffna peninsula which is geographically segregated from the rest of the dry zone. A total number of six samples were collected from different localities including Kopay, Urumpirai and Ariyalai. The detailed morphological study included morphometric characters (10), meristic characters (22) and other physical appearances such as colour patterns and shapes of dorsal and ventral spots (13), totaling for 45 numbers of variables. Comparison of these data with the already published literature, revealed variations in 4 characters namely, the number of scales that touch rostral scale, number of infra labial scales, number of dorsal blotches and the extent of black spots on the ventral side, which is collectively showing an average similarity of 83% with respect to the characters compared. This analysis does not successfully define the reasons behind the variations observed in different locations. Therefore, further analysis of the morphological data with increased sample size, coupled with molecular genetic profiling is necessary to explore the taxonomic status of Russell's viper distributed within the Jaffna Peninsula.

Key Words: Russell's viper, Population distribution, Morphological variation

Notes

ISSN: 2550 - 2786

SRS- 06

FYKE NET FISHERY AND POPULATION PARAMETERS OF SHRIMPS IN THE COLUMBUTHTHURAI LANDING SITE OF JAFFNA LAGOON, SRI LANKA.

E.M. Naafir*, N. Ragavan, Y. Thapeetha and K. Sivashanthini

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ABSTRACT

This study evaluates the fyke net fishery and population parameters of shrimps inhabiting in the Jaffna lagoon. Catch effort and shrimp morphometric data were collected at Columbuththurai landing site from August 2018 to April 2019 by making biweekly field visits. FiSAT was used to estimate the population parameters of shrimps. The fyke net fishing is carried out throughout the year in the Jaffna lagoon by 90 % of the Columbuththurai fishers by using traditional fishing crafts. About 15 % of the gear's total harvest was immediately discarded into the sea, and the remaining were landed. Uneconomical value organisms such as seaweeds, small shellfish, small-sized starfish, and smalls crabs were major components of discard organisms. The shrimp harvest's weight accounted for 60 % of the total landed biomass, including *Penaeus semisulcatus*, *Penaeus indicus*, *Penaeus monodon*, *Penaeus latisulcatus*, *Metapenaeus dobsoni*, and *Penaeus japonicus*. Of which, *Penaeus semisulcatus*, *Penaeus latisulcatus*, and *Metapenaeus dobsoni* were dominant in the catch composition. CPUE of shrimps ranged from 1.42±1.14 kg per fyke net per fishing day in August 2018 to 3.25±2.14 kg per fyke net per fishing day in December 2018. Asymptotic length and condition factor of *Penaeus semisulcatus*, *Penaeus latisulcatus*, and *Metapenaeus dobsoni* were estimated as 15.36 cm, 2.20 yr^{-1}; 20.0 cm, 0.70 yr^{-1} and 9.59 cm, 1.70 yr^{-1} respectively. The estimated natural mortality (M) and fishing mortality (F) in *Penaeus semisulcatus*, *Penaeus latisulcatus* and *Metapenaeus dobsoni* were 3.61 yr^{-1} and 2.59 yr^{-1}; 1.58 yr^{-1} and 4.00 yr^{-1} and 3.47 yr^{-1} and 3.26 yr^{-1}, respectively. The recruitment period for shrimps was predicted. *Penaeus latisulcatus* stock in the Jaffna lagoon seems to be overexploited (E > 0.05). This study's findings will be important to manage and sustainable utility of shrimp resources in the Jaffna lagoon.

Keywords: Shrimps, Jaffna lagoon, Fishery, Fyke net

Notes

ISSN: 2550 - 2786

SRS- 07

ASSESSMENT OF SELECTED WATER QUALITY PARAMETERS IN KAKKAITHEEVU LAGOON, JAFFNA, SRI LANKA.

A.S.R. Fernando*, P. Shobiya, N. Ragavan and K. Sivashanthini

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ABSTRACT

Kakkaitheevu is part of the Jaffna lagoon and is known for its fish production. The area consists of sewerage and solid waste disposal plant. The objective of the study was to investigate the changes in selected physical, chemical, and biological parameters in randomly selected four sites each at different depths from the coastline in August and September 2020. Three samples were taken from each site in each month at equal depth. Temperature, pH, Dissolved Oxygen (DO), and salinity were measured in the field using environment probes. Turbidity was measured using UV-Vis Spectrophotometer. 5-day Biological Oxygen Demand (BOD_5) was measured by Winkler's method. The coliform count was taken by the Most Probable Number (MPN) method. Variations in water quality were observed among sites when comparing mean values of Coliform count, Turbidity and BOD_5 of the water. The site near to transition area showed the highest mean BOD_5 and turbidity values. The rainfall which might have caused runoffs from garbage disposal area to lagoon might be the reason for a high number of Coliform values which vary between 96/100 ml to 210/100 ml. Hence, the study has limited time and sample numbers, a more comprehensive study is warranted to assess the quality of the lagoon.

Keywords: Coliform, Diagnosis, Lagoon, Pollution, Turbidity

Notes

ISSN: 2550 - 2786

SRS- 08

DIVERSITY OF HETEROPTERAN FAUNA IN FARMLANDS AT THIRUNELVELY, JAFFNA, SRI LANKA.

M.A.F.Hasna* and R.Gnaneswaran

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ABSTRACT

The Heteroptera represents the highest and most diverse group of insects. Many of them become significant pests in crop plants. Some are predaceous in habit. This research study was aimed to document terrestrial heteropteran fauna inhabiting various habitats in farmlands. Three different locations were selected at the Department of Agriculture Training Centre (DATC), Thirunelvely (9°69'6313'' N, 80°03'2123'' E), Jaffna and visited weekly to collect the samples of heteropteran species and to prepare a checklist of the same. A complete record of species composition will be a good database for any management practices against crop pests. A total of 185 specimens of suborder Heteroptera were collected from 24th August 2019 to 28th February 2020. The species were identified using possible taxonomic keys. Twenty-one species belonging to ten families were recorded. Among them, *Coranus fuscipennis, Rhynocoris fuscipes* and *Ectrychotes pilicornis* were predators. Other species were phytophagous and they were; *Coridius janus, Halys dentatus, Spilostethus hospes, Cletus trigonus, Nezara viridula, Chrysocoris purpureus, Eysarcoris sp, Leptocoris augur, Dieuches uniguttatus, Riptortus pedestris, Aethus sp, Bagrada picta, Acanthocoris scabrator, Leptocorisa acuta, Dystercus cingulatus, Homoeocerus sp, Graptostethus servus, and Coridius sp.* The guild structure further emphasizes the importance of phytophagous species (18 species) that outnumbered the predators (3 species). The pest species accounted for nearly 85.72% and the predatory form only accounted for nearly 14.29% of all taxa of true bugs collected. It is an evident from the present study, that the balance between the pest and the predatory true bugs was low in this study site.

Keywords: Heteroptera, Crop plants, Phytophagous, Pests, Predators

Notes

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SRS- 09

SPECIES COMPOSITION AND DIVERSITY OF TERRESTRIAL INSECTS ASSOCIATED WITH MANDATHIVU MANGROVE ECOSYSTEM, NORTHERN PROVINCE, SRI LANKA.

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ABSTRACT

Mangrove ecosystem is one of the most productive ecosystems with a hard environment that supports the survival of both terrestrial and aquatic inhabitants of various vertebrates and invertebrates including insects. Insects are one of the important biotic components in the dynamics of mangrove ecosystems. Diversity and abundance of insects are considered as the tools to evaluate the health and the value of their respective ecosystem. This study was performed to assess the diversity of terrestrial insects in the Mandathivu mangrove ecosystem (9°36'48"N 79°59'44''E), Northern Province, Sri Lanka. The field insect survey was done in three locations (L_1, L_2 and L_3) which was selected based on the vegetation and adjoining ecosystem(s). In each location, a 10 x 10 m transect was demarked to sample the terrestrial insects from 0070h to 0930h since 27/ 08/ 2020 to 01/ 09/ 2020. The insects were collected by sweep netting, hand picking and aspiration methods. The diversity of those insects was assessed using Shannon diversity index. This study found 41 different insect species belong to 09 orders. In the present study, the Shannon diversity index (H') varied from 2.359 to 3.149. The lowest species diversity (2.359) was recorded in L_3 whilst the highest (3.149) was in L_1. The minimum species richness (12) was observed in L_3 and the maximum (29) was recorded in L_1 where *Avicennia marina* was dominant in patches with *Suaeda maritime, Salicornia brachiate* and does not adjoin with other ecosystems. This short survey showed that the Mandathivu mangrove ecosystem is rich in insect diversity (S = 41) and that can be used for future sustainable management of this ecosystem.

Keywords: Insect diversity, Mangrove ecosystem, Diversity indices

Notes

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SRS- 10

SURVEY AND IDENTIFICATION OF LOBSTERS IN POINTPEDRO COASTAL WATERS, JAFFNA, NORTHERN PROVINCE, SRI LANKA.

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ABSTRACT

Lobsters are one of the economically important marine crustacean groups occupying variety of habitats. They have a great demand in the domestic market as a delicacy and is a foreign exchange earner for the country. In Sri Lanka, six spiny lobsters have been recorded under two major lobster families. However, taxonomic status of available lobster species is poorly understood in Jaffna peninsula. Therefore, the present study was conducted with the aim of documenting lobsters in Point Pedro coastal waters, Jaffna. A field survey was conducted by suitable field collections of lobsters in Point Pedro coastal waters from September 2019 to February 2020. Samples were initially identified with the help of morphological features at the sample collection site by using the standard keys. At present study, five species of Family Palinuridae were recorded. They are *Panulirus versicolor* (Lareille, 1804), *P. ornatus* (Fabricius 1798), *P. homarus* (Linnaeus, 1758), *P. polyphagus* (Herbst, 1793) and *P. longipes* (A. Milne Edwards, 1868). Although this study was the first study on the survey of lobsters in Point Pedro coastal waters, Jaffna, Northern province, Sri Lanka, further field surveys and studies are required to confirm the distribution and occurrence of these lobsters.

Key words: Coastal waters, Lobsters, Point Pedro

Notes

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SRS- 11

IDENTIFICATION OF BENTHIC MACROINVERTIBRATE FAUNA IN MANGROVES, MANDATHIVU AREA, JAFFNA, SRI LANKA.

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ABSTRACT

Species abundance and diversity of mangrove macrobenthic invertebrate fauna and their relationship to environmental conditions are important to understand the structure and function of mangrove ecosystems. Mangrove litter fuels the mangrove food webs and macrobenthic invertebrates act as intermediate organisms assisting the breakdown of particulate organic material. For the identification of macrobenthos of mangrove ecosystem, a mangrove patch from Mandathivu, Jaffna was selected. Sediment sampling was made weekly from 10th August 2019 to 07th March 2020. A metal quadrat (25 cm ×25 cm ×25 cm) was used to collect sediment samples from the site. Weekly samples were collected up to 10cm depth in triplicates. After recovering, macrobenthos were identified and documented with the water depth they found. At the end of 30 weeks of sampling, altogether 19 species of macrobenthic invertebrate fauna were collected. The mangrove macroinvertebrates were identified using standard taxonomic keys and literature based on the morphological features. Macrofauna were mainly composed of deposit feeders dominated by molluscs (56%), polychaetes (18%), arthropods (24%) and others (2%) including 9 gastropods, 1 bivalve, 4 polychaetes, 4 arthropods, 1 poriferan species. These benthos helps in nutrition recycling and in turn promote primary productivity of the adjacent environments. A complete study on the species richness and the associated environmental parameters is warranted to conclude on the health of this eco system.

Key words: Mangroves, Macrobenthic invertebrate fauna, Taxonomy

Notes

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SRS- 12

PRELIMINARY STUDY ON THE LARVICIDAL ACTIVITY OF *Acalypha indica* STEM EXTRACTS ON SECOND INSTAR LARVAE OF *Aedes aegypti.*

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ABSTRACT

Mosquito-borne diseases have become a rising major concern in many countries in the tropics and subtropics. Sri Lanka has been endemic for many mosquito-borne diseases including dengue which is transmitted by *Aedes aegypti*. *Acalypha indica* has been well known for its medicinal values. Even though there are studies carried out to determine the other properties of its leaf extracts, there is little known about the stems extracts of this plant. The current study investigated the larvicidal potential of *A. indica* stem extracts. The stem extracts were prepared using Soxhelt extraction followed by rotary evaporation. Hexane, ethyl-acetate and methanol were used as solvents. The larvicidal activity of the *A. indica* stem extracts was investigated by treating the second instar larvae of *Aedes aegypti* mosquitoes (10 per replicate) at different concentration levels and exposing them for 24 hours. The concentration series were selected after a few rounds of testing and the selected concentrations for crude extracts from the solvents were 5,6,7,8 ppm for hexane; 10,20,30,40 ppm for ethyl-acetate and methanol respectively. The total average mortality percentage was calculated for each solvent extract from the observed mortality after 24 hours. The calculated total average mortality percentages are; hexane 78.33%, ethyl-acetate 69.16%, methanol 70.83% and for the all three solvents 72.77%. The findings of this study are important considering the controlling of *Aedes aegypti* mosquito vectors. Similar studies on other vectors can lead this to develop a new vector control larvicide which is environmental friendly and financially tolerable.

Keywords: *Acalypha indica*, *Aedes aegypti*, Larvicidal activity, Plant extracts, Vector control

Notes

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SRS- 13

A STUDY ON MATING COMPATIBILITY OF THE BIOTYPES OF *Anopheles stephensi.*

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ABSTRACT

Malaria is a mosquito-borne disease that severely affects tropical and subtropical countries in Africa, Asia, and American continents. In 2017, *Anopheles stephensi*, a major malaria vector of urban malaria in Asia, was first detected in Mannar and later in 2018 in Jaffna. *Anopheles stephensi* exist as three biotypes *viz* type, intermediate, and mysorensis, which possess different vector potentiality and breeding preferences. The current study was performed to assess the mating compatibility of the biotypes. Biotypes were identified according to the egg morphology, such as the number of egg ridges, length of the eggs, and width of the eggs. The number of egg ridges in type, intermediate, and mysorensis was 14-22, 13-16, and 9-15 respectively. The type (T) and intermediate (I) biotypes were identified based on the number of egg ridges. They were maintained separately under laboratory conditions and subsequently used for cross-breeding experiments. Reciprocal breeding experiments were set up using 15 females and 8 males of each type. After a blood meal, eggs were collected on egg-laying surface and the number of egg ridges were counted for each cross. From T female (15) and I male (8) cross, 1 T and 3 I progeny were obtained. Where as in I female (15) and T male (8) cross, 2 T and 2 I progenies were obtained. These preliminary observations indicate that the biotypes are not reproductively isolated and can be regarded as ecotypes occupying different ecosystems. Further studies are warranted to establish this hypothesis.

Key words: *Anopheles stephensi*, Biotypes, Egg ridges, Reproductive isolation

Notes

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SRS- 14

ESTABLISHMENT AND CHARACTERIZATION OF SPLEEN CELL LINES BY USING BALB/C MICE AS A MODEL

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ABSTRACT

The spleen is the largest secondary lymphoid organ in the body and it has a complex cell composition because of the immunocytes' maturity and settling down. Changes in the composition of immunocytes are critical to immune response. *In vitro* culturing of immune cells is the best way to study the behaviour and architecture of the cells. Considerable research works on spleen cell culture have not been conducted in Sri Lanka. The objective of this research project was to establish and characterize a spleen cell line from BALB/c mice as a model. BALB/c strain of the laboratory-bred mouse was chosen as the model organism as they are small in size and they have a short gestational period that permits easy manipulation. Animals were reared in the Animal House, Department of Zoology, University of Jaffna under parasite-free conditions. A BALB/c mouse was dissected and the spleen was isolated from the mouse. The spleen was minced into small residue particles and digestion was done by mixing tissue residues with collagenase solution. Cells were filtered by using a micro-pore filter unit and the cell suspension was centrifuged to obtain a single-cell suspension. The precipitate of the centrifuged cell suspension was mixed with the growth medium and seeded in the cell culture plate consists of the growth medium. 48hours cultured cells were examined under the microscope and a low growth rate was observed. Some cells were in the stage of fission. Cells have poorly adhered with the culture plate and cells were identified from the cell suspension. Additional research is needed to develop a continuous cell line. Immuno-phenotyping using flow cytometry can also be used to identify, quantify, and isolate the immune cells.

Key Words: BALB/c Mouse, Spleen, *In vitro* cell culture

Notes

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Discussion Forum

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ADDRESSING THE IMPACTS OF CLIMATE EMERGENCY AND BUILDING RESILIENCE IN POST-WAR NORTHERN PROVINCE, SRI LANKA | A CASE OF CLIMATHON JAFFNA 2019 & 2020

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ABSTRACT

Sri Lanka ranks second among the ten countries most affected by extreme weather events recorded since 1998 according to the Climate Risk Index 2019. The Northern and Eastern provinces are among the most vulnerable to impacts of climate change. The post-war boom in auto sales, industrialization of agriculture and unprecedented infrastructure development add further to the effects of climate change. One climate action that links innovation, communication, entrepreneurship, and community participation is Climathon. Targeting youth, it features local level ideathons where cities and citizens co-create ideas for climate challenges. A local movement named Organic Movement of North and East along with other youth volunteer organisations(Eleven organisations), successfully staged the Climathon event for the first time in Sri Lanka in 2019 and again in 2020 to engage local entrepreneurs, environmental working groups, policy makers and the public in addressing the local climate challenges and building resilience.

Climathon involved three groups of actors – organisers which included judges, mentors and coaches; participants and the wider Jaffna community including City administration. The event had four orientations – reform of the existing food and water system, developing a sustainable waste management system, concept of sustainable city development, and broad climate change awareness and action. Leaflets, YouTube, Facebook, newspapers, and discussions in local TV were used to communicate the theme and the event to the wider community. While the global focus of Climathon was novel local solutions via the ideathon component, Climathon Jaffna deployed a range of events and activities to ensure effective community mobilisation. Coaching workshops, ideation sessions, group discussions, keynote speeches, photography and drawing exhibits, action theatre and debate were all employed to communicate sustainability aspects among participants and organizers.

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Sixty-two young entrepreneurs with twenty-one innovative ideas competed in the ideathon around "Building a sustainable urban food system for Jaffna" as theme in 2019. Last year most were undergraduate students or recent graduates and 30% were female. This year's Climathon Jaffna has been re-imagined as an e-climathon and took place mainly online spread across November, 2020. 29 groups presented their novel ideas in this year's ideathon among which 16 groups selected the theme "Building a sustainable food & water system for Jaffna" and others selected the theme "Building a sustainable waste management system for Jaffna". Among 105 participants, four fifth were university students or recent graduates and 31.5% were females. Many school students and undergraduates won medals and certificates in parallel events covering art, essay and photography competitions. The mission of Climathon Jaffna initiative is to build a climate-resilient sustainable & healthy Jaffna city by 2030. Strategic complementarity between a local food sovereignty movement mobilising from below, and a global climate justice movement primarily of the technology domain above, both seeking systemic change as a master frame to challenge the political and policy inertia will be discussed.

Keywords: Climate Emergency, Sustainable Jaffna City, Sustainable Food and Water system, Sustainable Waste Management System, Ideathon

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