

# Zoology Newsletter

DEPARTMENT OF ZOOLOGY  
FACULTY OF SCIENCE  
UNIVERSITY OF JAFFNA

# ZOOLOGY NEWSLETTER

DEPARTMENT OF ZOOLOGY, FACULTY OF SCIENCE, UNIVERSITY OF JAFFNA

## EDITOR'S NOTE

It gives us great pleasure and privilege to bring you another interesting issue of our annual newsletter from the Department of Zoology.

Department of Zoology is one of the oldest departments in the Faculty of Science, University of Jaffna. We are focusing to develop Zoological Science knowledge through a variety of activities including teaching and learning and outreach activities to come with great success in achieving the annual work plans and goals.

As the editorial team, it is our great pleasure to present this platter of our memories to our readers on the behalf of the Department of Zoology.

We believe this issue will enthuse our readers and give knowledge about the role of Department of Zoology in developing the scientific knowledge among students and local community.

Cover page photo:  
THE ORIENTAL SPINY ORB-WEAVER  
(*Gasteracantha geminate*)

Cover page designed and Photograph by:  
A.A.K.P.Amarasinghe



Jezebel butterfly (*Delias eucharis*)  
Location: University Garden,

## DEPARTMENT OF ZOOLOGY

*Department of Zoology is one of the oldest departments in the Faculty of Science. It was established in 1975 with the vision to improve science education in the region. We are focused to develop zoological science through a variety of activities including teaching and learning and outreach activities. Our department carries out more outreach programmes and disseminates knowledge to society.*

## EDITORIAL TEAM

Mr. D.N.G.Dayananda

Mr. G.W.A.L.K.Wijewantha

Ms. M.A.F.Hasna

Mr. H.G.D.Madhusanka

Ms. Imesha D.Gamage

Mr. A.A.K.P.Amarasinghe



## “Science Education for Bright Future -2020 (SBF)”: EXHIBITION

To promote interest in Science and Technology among younger generation and to encouraging scientific and technological creativity among students, the Faculty of Science successfully organized an event entitled **“Science Education for Bright Future -2020 (SBF)”** for school children in Northern Province especially for the students in the schools with lack of laboratory facility on 04.03.2020 to 07.03.2020 at the Faculty of Science. Over 40,000 school children and other few thousand non-students participated in this outreach activity. The Department of Zoology had exhibition centers with the themes of Animal Diversity, Animal Physiology, Environmental Science, and Medical Entomology.



## Department Orientation 2020



A brief orientation programme was organized by the Department of Zoology on 4th September 2020 from 9.30 am to 11.00 am. The event was attended by all freshmen. The event was presided by the Head, Department of Zoology; Dr.T.Eswaramohan with a presentation on the available resources of the department.

This was followed by a bilingual presentation on academic opportunities and career progression by Dr.Mrs.T.W.Shanthakumar (Academic Counsellor) with the help of Mrs. Gajavathani. The event was organized with the help of Zoological Students' Association.



## Online Teaching

The Covid-19 pandemic has affected the normal learning process of the Department of Zoology. The staff of the department had to work extensively to face the challenges posed by this, and came up with innovative ideas to engage the students in learning. The practical sessions were designed with the help of our demonstrators and assistant lecturers.

The effort of the staff of all categories should be celebrated as we are one of the departments who thrive on hard times.

*We believe in the survival of the fittest!*



## 3M POSTER SESSION 2020

*“Every successful presentation is built”  
on four pillars.*

*People, Idea, Passion, and Preparations*

The poster session for group presentation for the course unit ZOL304MC3 was held at the Physiology laboratory on two days at the first week of the semester.

Level 3M students did the posters and explained them.

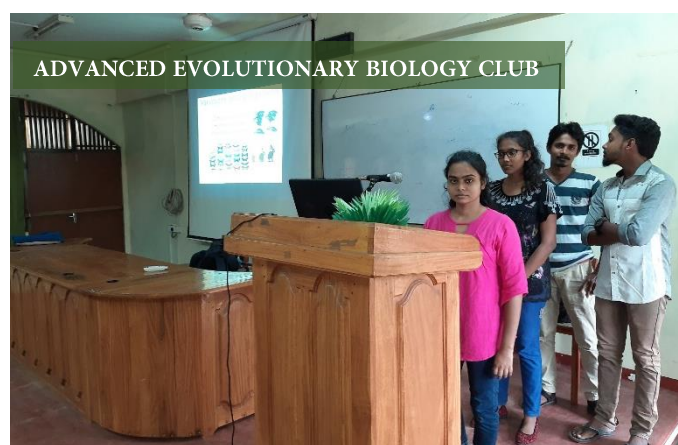


## 3M students interaction with Lotta



A honeybee specialist from Sweden, Lotta Kristiansen, has visited the department and had a fruitful discussion with our 3M students on 26.02.2020.

## ADVANCED EVOLUTIONARY BIOLOGY CLUB: DISCUSSION FORUM



A discussion forum was organized as a part of the course ZOL412GE2: Advance Evolutionary Biology from 25.09.2020. The event was attended by students, and staff. Interesting topics were discussed in the forum.



## CRE OPENING CEREMONY



### THE OPENING CEREMONY OF THE CENTRE FOR RESEARCH IN ENTOMOLOGY

*The Centre for Research in Entomology, a brain child of Prof.S.Noble Surendran, has been officially opened on 25th September 2020 at 9 am by Prof.S.Srisatkunaraja (Vice Chancellor, University of Jaffna). Prof.S.Ravirajan (Dean, Faculty of Science) has graced the occasion along with the Heads and staff from the other departments.*

*Considering the local and national importance of research in entomology and the strength of the research teams in entomology, it has been long felt by the Department of Zoology a need of Centre for Research in Entomology to get recognition from the wider national and international community for community-based activities, training programs, research, and education.*

#### *Vision:*

The center is a pioneer in the quest and dissemination of knowledge through quality research and consultancy, to stimulate entrepreneurship by providing individuals and communities with innovative ideas, the required skills, and direction to resources in Entomology.

#### *Mission:*

To be a distinct center of research, teaching, and community outreach in the field of entomology directed by comprehensive academic, scientific, and ethical principles.

# NEW EQUIPMENT

The following are the contribution for the teaching and learning at the department of Zoology from the AHEAD/ELTAELSE grant of the Faculty of Science. Dr.Mrs.T.W.Shanthakumar is the coordinator from the department.

## **GOODS:**

Equipment: Activity 5

No	Equipment	Number	Status
01	Laboratory Fume hood	2	Order placed
02	Microtome Machine	1	Order placed
03	Wax Embedding Bath	1	Received
04	Mounting Bath	1	Received
05	Slide Storage Cabinet	1	Order placed
06	Slide Dryer	1	Received
07	Micro plate Spectrophoto meter	1	Order placed

Seminar Hall: Activity 5 & 2

No	Equipment	Number	Status
01	Laptop	1	Received
02	Laser printer	1	Received
03	Multimedia projector & screen	1	Received
04	Interactive White board	1	Received
05	Portable Classroom Audio Systems	1	Order placed

In addition to this, the following items were procured under the AHEAD/ELTAELSE grant obtained by the Department of Zoology. Dr.Mrs.A.Sivaruban coordinates the grant with the support from Mrs.P.Sivakumar and Dr.K.Gajapathy as activity coordinators.

- Movable table and chair 02
- MilliQ water plant
- Microscopes 20
- Computer tables and chairs 15
- PC 15
- Laptops 02

In addition to this, a considerable number of training programmes and workshops were also conducted.

## *Sandfly Dissection Training Programme*

A training programme is organized by the Center for Research in Entomology, Department of Zoology on 27.08.2020 to six health staff from RDHS Anuradhapura. The training was facilitated by Dr.K.Gajapathy and assisted by Mr.S.Tharsan and Mr.S.Aranraj.

The inaugural programme of the CRE was attended by Prof.S.Ravirajan (Dean, Faculty of Science) and Dr.T.Eswaramohan (Head, Department of Zoology) along with other staff from the department. Prof.S.N.Surendran was presented with a founder membership card as an appreciation for his efforts to establish the CRE



*Sandfly Dissection Training Programme*



## **TRAINING FOR MRI STAFF**

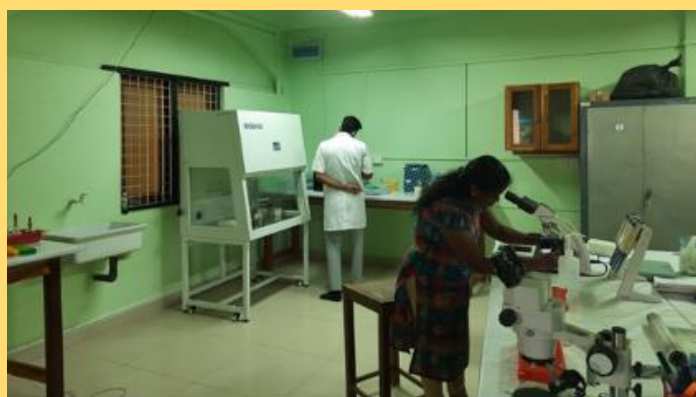


Training Programme in Sandfly Identification held from 25.09.2020 to 27.09.2020.

The Training Programme was organized by the Centre for Research Entomology (CRE) upon the request made by Dr. Wardha Refai from Medical Research Institute, Colombo. The training programme was organized with the following objectives;

- Train the participants in sandfly preservation and processing
- Train the participants in identifying the sandflies up to species level
- Introduce the different sandfly culture techniques
- Introduce the molecular techniques involved in sandfly identification

The workshop was attended by three Entomological officers from the MRI, namely, Mr. H.P.N.T. Jayasinghe, Mr. U.L.Pramitha Rangana and Mr. Gayan Kumarasinghe. The programme was held at the Department of Zoology, University of Jaffna.



# AHEAD-Short Term Training On Water Quality



*High quality water is more than the dream of the conservationists, more than a political slogan; high quality water, in the right quantity at the right place at the right time, is essential to health, recreation, and economic growth.*

*--Edmund Muskie--*

## AHEAD-Short Term Training On Water Quality

Under the department's AHEAD ELTA-ELSE grant a short term training was organized with the theme of "Exposure to the tools and equipment related to water quality assessment or biological assessment to our staff" for both TOs and academics attached to the departments of Botany and Zoology.



## OPEN EDUCATION E-RESOURCE WORKSHOP

A half day workshop on effective usage of Open Education Resource (OER) was organized by the Department of Zoology under the AHEAD/ELTAEELSE grant on 28.09.2020 at the laboratory in the Computer Unit. The event was attended by Academic staff attached to the Faculty of Science. Dr.E.Y.A.Charles served as the resource person.



## SARASWATHI POOJA

Saraswathi pooja, an annual ritual, was performed at the department on 23.10.2020 with social distancing measures. May the blessings of nature be helping us to overcome the current situation without much hardship.



## World Elephant Day 2020



## World Elephant Day 2020

To celebrate World Elephant Day 2020, the CCH (Center for Children's Happiness) organized a small event at Sarasalai where Dr. Mrs. A. Sivaruban served as a resource person to talk about "Elephants and their behaviour". The programme was held on 16.08.2020.

There were participants from various fields and communities. The event was a useful outreach activity of the Department of Zoology along with CCH.



*Outreach Activities: Mr Arthiyan*

Central Environmental Authority (CEA) of the Kilinochchi District has organized the celebrations of World Wetland Day (02.02.2020) on the 5th February 2020, Wednesday. A field study was arranged to the wetlands in Kilinochchi district to convey the importance of wetlands to the students from 10 schools in Kilinochchi. The total of 50 Students (Members of the Environmental Club) were participated in the field excursion.



*Mr. S. Arthiyan from Department of Zoology has been served as the resource person at the discussion on "The importance and the diversity of the Mangrove ecosystem."*

## ACTIVITIES DONE BY ZSA WITH THE UNDP/GEP SGP GRANT-2019

### ACTIVITIES DONE BY ZSA WITH THE UNDP/GEP SGP GRANT -2019

Zoological Students' Association (ZSA) carried out several community-oriented activities and continue the community activities started in 2019, by ZSA in Kavutharimunai, Pooneryn with grant from UNDP/GEP/SGP of USD 35000.00

The project was coordinated by Mr.S.Arthiyan, Dr. K.Gajapathy and Project Assistant was Miss. Subanky Suvendran.



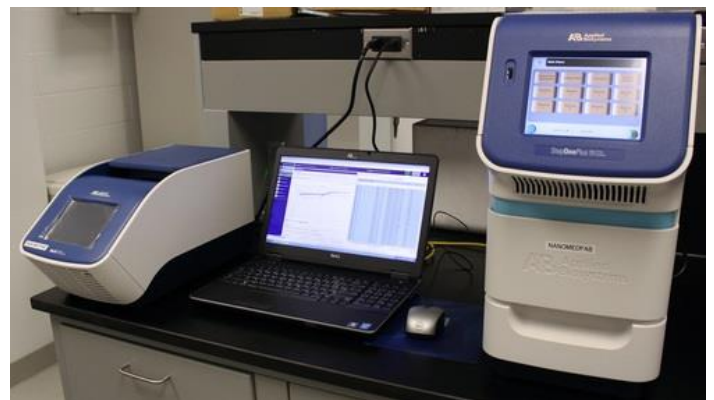
## ACTIVITIES CONDUCTED DURING THE PROJECT

- Home gardening monitoring and providing seed and seedlings to the selected beneficiaries in the community
- Training on “Palmyra pulp preservation and production” at Kavutharumunai Community Centre
- Monitoring the survival rate of mangrove seedlings planted during 2018-2019
- Water sample collection to analysis the water quality of drinking water wells in Kavutharimunai
- Plantation of Palmyra seeds by community beneficiaries
- Providing compost bin
- Plantation of shady plants
- Implementation of rain water harvesting system and providing plastic water tanks
- Purchasing equipment and shelf for environmental lab



## LENDING OF q-PCR

The q-PCR which was obtained from the NSF equipment grant was lent to the teaching hospital of Jaffna to use it in their laboratory for COVID 19 testing. The Department of Zoology is proud to share the resource in the testing time.





# LIFE SAVING FIRST AID



## “LIFE SAVING FIRST AID” ONE-DAY WORKSHOP

“Life-Saving First Aid”, a single-day workshop organized by the Zoological Students’ Association (ZSA), University of Jaffna in collaboration with the Red Cross Society, Jaffna Branch was successfully held on 8th February 2020 at the Library Auditorium, University of Jaffna. It was organized first time in the Faculty of Science with the technical assistance of Sri Lanka Red Cross, Jaffna Branch. Participants were given the chance to practically engage in basic procedures of first aid. Dr. T. Eswaramohan (Head of the Department of Zoology), Prof. (Mrs) R. Ganeswaran (Professor), Dr. K. Gajapathy and Dr. (Mrs) T.W. Shanthakumar (Senior Treasurer- ZSA) graced the occasion with their presence. A total of 50 participants have actively participated. ZSA thanks everyone

*First aid is an important tool in quickly responding to accidents to ensure that injuries can be efficiently and promptly dealt with before a trained medical professional arrives to administer more specialized treatment.*





A Wildlife and Nature Photography Workshop was held on 30th October, 2020 in order to make interest and provide technical knowledge on DSLR photography and Wild Life photography. The AHEAD/ELTAELSE grant under its vision of empowering student associations and forums to organize activities to develop their skills, granted the financial assistance to this programme.

Mr. S. Saravanan, who is an Audio and Video Technician at the University of Jaffna, and also a Wildlife Photography enthusiast shared the technical basics of photography and his experiences in the field of Wildlife photography. Mr. Prasanna Ambigaibhagan, an award winning wildlife photographer contributed online as a resource person to give a brief idea about wildlife photography and on how to start photography at the very basic level.



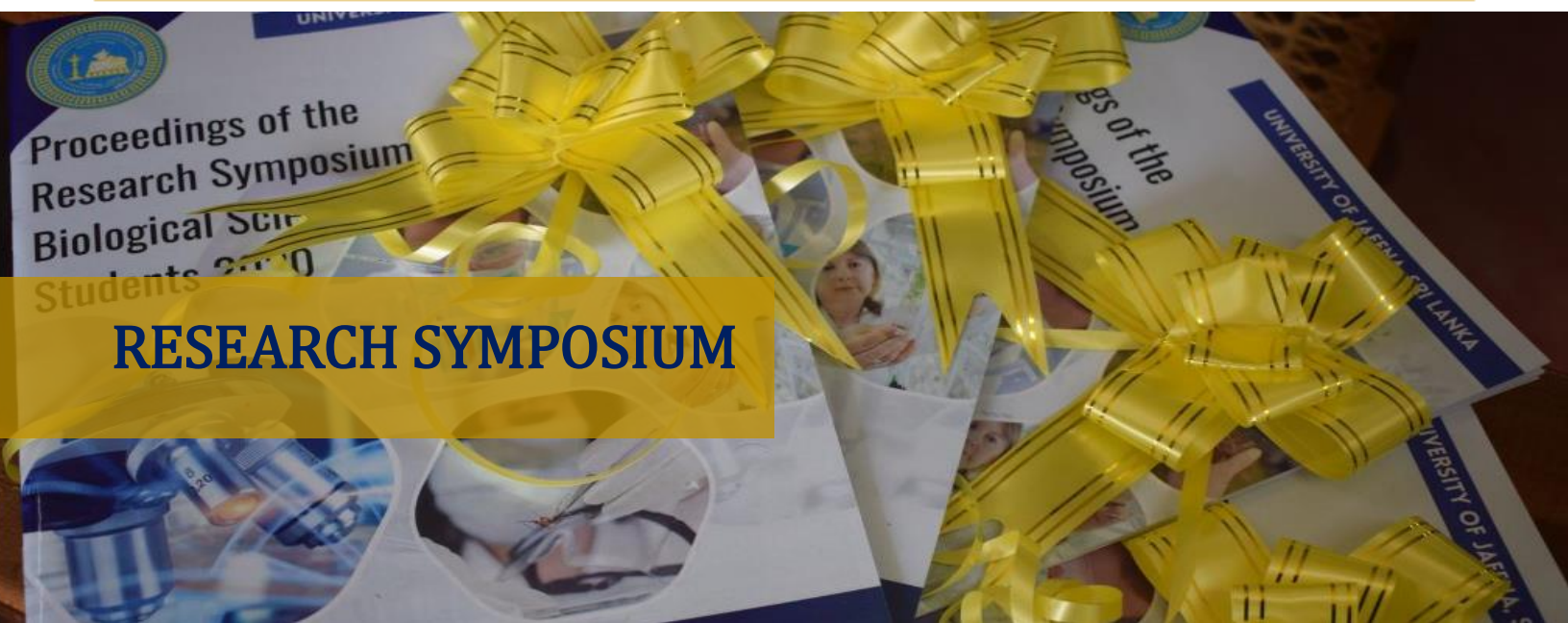
### 3 MINUTE RESEARCH CHALLENGE

*As a part of the skill development programme, ZSA has organized a novel event at the department. The challenge of presenting the research in 3 minutes was taken up by our brave graduates and they were very gleeful as seen in the picture. The winners were awarded with the certificates and prizes.*

*The winners were,*

*Ms.K.Vithushi, Ms.A.Salomi, Mr.N.G.Dayananda, Mr.N.D.Abeyaweera, Mr.R.Nirujan*





## RESEARCH SYMPOSIUM FOR BIOLOGICAL SCIENCE STUDENTS

*The Students research symposium, organized by the zoological students' association was held on 6th of December 2020. The event was held in three sessions including inauguration, technical session and valediction.*

### INAUGURATION

Inauguration was held with the presence of the Vice chancellor, University of Jaffna, Senior Prof. S. Srisatkunarajah, the dean, Faculty of Science, University of Jaffna, Prof. P. Ravirajan, the Head of the Department, Department of Zoology, Dr. T. Eswaramohan, Senior lecturers, Lecturers and presenters. The proceedings of the the Students research symposium was released and it was followed by the keynote speech which was delivered via online by Dr. Sara L. Goodacre of University of Nottingham on “smarter than a spider: nature inspired biomaterials and pest control”.



## TECHNICAL SESSION

The technical sessions were carried out under the surveillance of the judge board with the contribution of lecturers in the Department of Zoology. Fourteen presenters presented their abstracts during the technical session and three of them were via online. The abstract by Ms. Nivetha Sivarajah on “Addressing the impacts of climate emergency and building resilience in post-war Northern province, Sri Lanka: a case of climathon Jaffna 2019 & 2020” was presented in the discussion forum.



## Valediction



*The best presenters were awarded with certificates and prizes, while all participants received certificate of participation.*

**1st Prize** - Mr. Naruwan Dayananda  
**2nd Prize** - Miss. Vashni Olivia Patrick  
**3rd Prize** - Miss. Vithushi Kuganesan

*Organizing committee congratulate all students who published their researches in this symposium. We would also like to extend our heartiest gratitude to the department of Zoology, and the AHEAD/ELTAELSE grant for the immense support and assistance given for the success of this event and to Dr. K. Gajapathy and Mr. Arthiyan who extended their sincere support in organizing the event.*



## ACHIEVEMENTS



### STAFF UNDERGONE TRAINING

Mrs.P.Sivakumar was selected for International Summer School 2020-WASO funded Summer Internship in Norway 2020 (15<sup>th</sup> June-3<sup>rd</sup> July 2020) from University of Jaffna.

### The digital WASO Summer course 2020

Completed followings:

THT311: Water Resources Management and Treatment Technologies (10 ECTS) -

Norwegian University of Life Sciences (NMBU)

4330 "Water Quality Challenges" (5 ECTS)- at University of South-Eastern Norway (USN)

### EXPOSURE TO HANDLE PCR



Mr.S.Arhtiyani has extended his expertise to the PCR laboratory established at the Medical Faculty of the University of Jaffna for the COVID-19 testing. We are very proud of his selfless service and congratulate him for his contribution.



## TRANSLATER AT BIOLOGY SEMINAR NOTHERN PROVINCE



G Venture Publication ("Science Today" Magazine) has organized the seminar for the biology students who are going to sit for the examination in 2020.

**Mr. S. Arthiyan (Department of Zoology, University of Jaffna) has served as the translator at the Nothern province biology seminar organized to the advanced level students (2020)**

The one-day seminar was held on 02.02.2020, at the Kumarasamy hall of Hindu college Jaffna.

Prof. Nazeera Salim, Dr. Dhanushka Udayanga and Ms. Tharaka Mandakini from University of Sri Jeyawardenapura were served as the resource persons at the seminar.



## Miss.Vithusha's publication



*Another knowledge dissemination from our young staff. Miss.A.Vithusha has published a very sound article on Tamil Newspaper to create awareness among the people about salt-water tolerance mosquitoes. It's a worthy read.*



## Video editing training

The workshop for academic support staff on video editing for e-learning; using video editing tools, was held on 16th October 2020 organized by the AHEAD/ELTAEELSE grant programme.

The event was attended by 13 academics attached to the Department of Zoology. The event was conducted by Mr. Pathmanathan Sharanraj (News editor, Capital TV). The event was started with the registration of participants. The resource person used Adobe Premiere software to demonstrate the video and audio trimming, adding titles and sub titles along with the effects creation.

# Human Demodex

## What is Human Demodex?

*Demodex* is the name given to tiny microscopic mites who belongs to the phylum Arthropoda (Arachnids). There are two mites principally involved in human Demodex infestations namely, *Demodex folliculorum* and *Demodex brevis*.

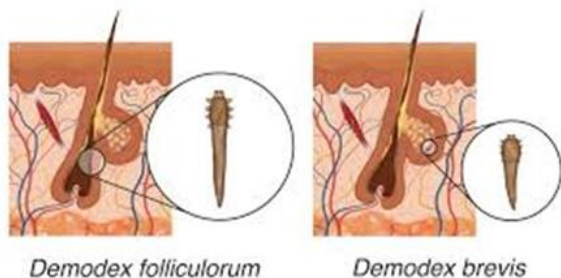
*D.folliculorum* is 0.3-0.4mm in length and occurs in small hair follicles, particularly the follicle of eyelashes and eyebrows, at least-the hair of the head and chest. In both it's immature and adult stages that feeds on skin cells.

*D.brevis* is 0.15-0.2mm and occurs in the sebaceous glands of the skin (e.g.- the Naso-labial folds, the wings of the nose), but can also be found in other areas of the skin such as chest, back and neck where sebaceous glands are located.

*Demodex* sp. Causes the disease named as demodicosis, which is usually diagnosed in adults or immune efficiency stages such as HIV (Human Immuno deficiency Virus) infection.

## How to detect?

By skin surface biopsy (SSB) technique



*Demodex folliculorum*

*Demodex brevis*

## What about their life cycle?

The typical *Demodex* life cycle need around 2 to 3 weeks to complete. Female *Demodex* mites are shorter and rounder when we compare with males. Both male and female *Demodex* mites have a genital opening which leads to internal fertilization. Mating occurs in the follicle opening and eggs are laid inside the hair follicles or sebaceous glands. The six-legged larvae hatch out off an egg after 3-4 days, and the larvae develop as adults within 7 days. The adults contain eight legs. (figure 2). *Demodex* mites able to survive for several weeks.

The dead mites decay inside the hair follicles or sebaceous glands. The number of *Demodex* mites present in the injured tissue varies with age (highest in the 20-30 years age group when the sebum secretion rate is at its highest). Presumably, *Demodex* passes to new-borns through touching after birth; however, due to the low amount of sebum production, infants and children lack significant *Demodex* colonization.

An epidemic of both species abundance in males than in females, with males more heavily colonizing than females (23% vs 13%) and harbouring more *D. Brevis* than females (23% vs 9%).

## What are symptoms?

Thinning hair	Rough skin
Facial discoloration	Freckles
Hair loss	Aging skin
Enlarged spores	Acne
Rosacea	Atopic dermatitis
Itching	General discomfort
Dandruff	

T.Sivatharsini (3M)

Reference:

Rather, P. A. and Hassan, I. (2014). Human Demodex Mite: The Versatile Mite of Dermatological Importance. Indian Journal Of Dermatology, 59(1): 60.

## RESEARCH GRANTS

**Split-site Research Collaboration Funded by Swiss National Science Foundation under the SPIRIT – Swiss Programme for International Research by Scientific Investigation Team at University of Berne, Switzerland and University of Jaffna, Sri Lanka**  
**Grant Number: IZSTZO\_191762**

Prof. S.N.Surendran secured a research grant from Switzerland National Science Foundation, under the – Swiss Programme for International Research by Scientific Investigation Team (SPIRIT) worth of 152,158.00 CHF for 36 months. The study will investigate molecular mechanisms of mosquitoes that adapting to saltwater environment in Jaffna. Under this program two PhD studentships are available for University of Jaffna to work under split-site category (University of Berne and University of Jaffna).

This research will explore and apply advanced molecular (RNA seq, fusion protein and epigenetics) and electron microscopic techniques. Two local PhD candidates will be trained on the application of these new tools. This is expected to strengthen the research capabilities of the University of Jaffna and contribute to the human resource development. Apart from establishing new knowledge in the research field, human and infrastructure development are expected to be the main outcome of this collaboration. In addition, a training program on bioinformatics for 50 local participants is scheduled and this will be conducted by the investigators affiliated to the University of Bern.

**AHEAD/ ELTAESE/R2/JFN/ZOO – a World Bank supported grant has been obtained by the Department of Zoology. The grant worth is 25 Million LKR. The grant is provided to enhance the students'; earning experience through capacity building**

**The AHEAD/DOR/JFN/FGS- A research grant obtained by a group of researchers studying the water security issues in Northern Province is handled by the Faculty of Graduate Studies. K,Gajapathy from our department is a part of the research team along with lecturers from the faculties of Arts, Management, Medicine, Agriculture, Science, and Engineering.**

## ANNUAL RESEARCH PUBLICATIONS

- Arani, Y and Nithiyagowry R, 2020. Larvicidal activity of leaf extract of lime (*Citrus aurantifolia* (Christ.) Swingle) and synthetic pesticide Spinosad against Diamond back moth, *Plutella xylostella* L. (Lepidoptera: Plutellidae) on cabbage. (to be presented in forthcoming 6th International Conference on Dry Zone Agriculture)
- Subothini, G and Thulasitha, W. S. 2019. Preliminary study on the effect of 2-methyl-4-chlorophenoxy acetic acid (MCPA) on the gonadal development of zebrafish *Danio rerio*. Proceedings of Jaffna Science Association, Volume: 26 (1): 14
- Rajapiravinthan, R and Thulasitha, W. S. 2019. Species composition and abundance of zooplankton from Ariyakulam freshwater pond, Jaffna, Sri Lanka. Proceedings of Jaffna Science Association, Volume: 26 (1): 9.
- Umasuthan, N., Bathige, S.N.D.K., Thulasitha, W.S., Oh, M. and Lee, J. 2020. Comparative Characterization of Two cxcl8 Homologs in *Oplegnathus fasciatus*: Genomic, Transcriptional and Functional Analyses. *Biomolecules*. 2020, 10: 1382.
- Gunawardane, K.G. V. and Thulasitha, W.S. 2020. Detection of external parasites in ornamental cyprinids from selected aquariums in Jaffna, Sri Lanka. Proceedings of the 27th Annual Session of Jaffna Science Association held on 22nd October 2020
- Vithushi, K. and Thulasitha, W. S. 2020. Toxicological effects of Naphthalene on the early development of zebrafish (*Danio rerio*). Proceedings of the Research Symposium for Biological Science Students 2020 held at the Department of Zoology, University of Jaffna on 06th December 2020.
- Surendran, S.N., Senthilnathanan, M., Jayadas, T.T.P., Karunaratne, S.H.P.P., Ramasamy, R. Impact of salinization and pollution of groundwater on the adaptation of mosquito vectors in the Jaffna peninsula, Sri Lanka. *Cey J Sci.* 2020;49(2):135–15.
- Surendran SN, Jayadas TTP, Tharsan A, Thiruchenthooran V, Santhirasegaram S, Sivabalakrishnan K, et al. Anopheline bionomics, insecticide resistance and transnational dispersion in the context of controlling a possible recurrence of malaria transmission in Jaffna city in northern Sri Lanka. *Parasit Vectors.* 2020;13:156. doi: <https://doi.org/10.1186/s13071-020-04037-x>.
- A. Sindhania, M. K. Das, G. Sharma, S. N. Surendran, B. R. Kaushal, H. P. Lohani and O. P. Singh (2020). Molecular forms of *Anopheles subpictus* and *Anopheles sundaicus* in the Indian subcontinent. *Malaria Journal.* 19:417. <https://doi.org/10.1186/s12936-020-03492-2>

- Jayadas, T., Thiruchenthooran, V., Tharsan, A., Sivabalakrishnan, K., Santhirasekaram, S. and Surendran., S.N, 2020. First record of the presence of *Aedes* (*Phagomyia*) *cogilli* (Edwards, 1922) in Sri Lanka. *Journal of the National Science Foundation of Sri Lanka*, 48(3):327-331.
- Vithusha, A. and Sivakumar, P. Variation in diversity of macro-invertebrates in relation to the water quality status of Kaakkaithivu coastal waters, Jaffna estuary, Northern Province, Sri Lanka- 2 nd International conference of Center for Environmental Studies Environmental Monitoring and Management- EMM2020, 23rd October 2020 @ Postgraduate Institute of Science
- Vithusha, A. and Sivakumar, P. Diversity of macro-invertebrates in Kaakkaithivu coastal waters, Jaffna estuary, Northern Province, Sri Lanka- Jaffna Science Association, 22nd October 2020 @ University Of Jaffna
- Vithusha, A. and Sivakumar, P. 2020. Fluctuation in species composition of macro-invertebrates in Kaakkaithivu coastal waters, Jaffna estuary, Sri Lanka. *Proceeding of 26 th Scientific sessions of the Sri Lanka Association For Fisheries and aquatic Resources*: 16
- Vashni Olivia, P., Sivakumar, P. and Sashikesh, G. 2020. Determination of Heavy Metals in Selected Fish Species collected from Kakkaitivu, Jaffna estuary, Sri Lanka. *Proceeding of the research symposium for biological science students2020* : 6
- Kirillawala, K.A.L.K.J. and Sivakumar, P. 2020. Survey and identification of Lobsters in Point Pedro coastal waters, Jaffna, Northern province, Sri Lanka. *Proceeding of the research symposium for biological science students2020* : 20
- T.T.P. Jayadas, S. Sharanga, V. Thiruchenthooran, S. Kokila, A. Tharsan, P. Bharathy, K. Sudhakar and S.N. Surendran (2020). *Aedes* distribution, insecticide susceptibility and natural infection; An ovitrap based descriptive study in the District of Jaffna, Sri Lanka. in 27th Annual Scientific session of Jaffna Science Association, October, 2020.
- T.T.P. Jayadas, S. Sharanga, V. Thiruchenthooran, S. Kokila, A. Tharsan and S.N. Surendran. (2020). A cross-sectional survey of *Aedes* in Jaffna district; A pathway to tackle dengue transmission. in 27th Annual Scientific session of Jaffna Science Association, October, 202
- Arani,Y and Nithiyagowry R, 2020. Larvicidal activity of leaf extract of lime (*Citrus aurantifolia*(Christ.)Swingle) and synthetic pesticide Spinosad against Diamond back moth, *Plutella xylostella*L.(Lepidoptera:Plutellidae) on cabbage. ( to be presented in forthcoming 6th International Conference on Dry Zone Agriculture)
- G. Kandasamy, D.K. Weerakoon, A. Sivaruban, H.B. Jayasiri. 2020. Foraging guilds of waterbirds at selected sites in Jaffna and Kilinochchi districts, Northern Sri Lanka G. *Proceedings of the National Conference on Multidisciplinary Research-2020. Young Scientists' Association, National Institute of Fundamental Studies, Sri Lanka*. 17.
- N. Abeyaweera, S. Abyerami and A. Murugananthan, 2020. Morphological variations among the Russell's Vipers (*Daboia russelii*, Shaw and Nodder, 1796) in the Jaffna Peninsula. *Proceedings of the Research Symposium for Biological Science Students 2020. Zoological Students' Association, Department of Zoology, University of Jaffna Lanka*. 10.
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