

Annual Report

2022-2023



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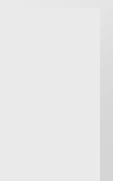
NINETEENTH ANNUAL REPORT
(2022-2023)



TIES – ties Mind and Nature

TROPICAL INSTITUTE OF ECOLOGICAL SCIENCES

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Preface

TIES is stepping to the 19th year of its existence. This year we turned our sail to a new direction with honey bees. We started the project “Bees for Life”, a sustainable apiculture project aimed at providing livelihood support for marginal farmers along with the production pure honey. But the outbreak of Covid-19 has affected many of our projects and which resulted in the overall progress of our projects. Amid this pandemic we strove to achieve our goals. This year we got a great opportunity to work for CSIR-NIIST. We also collaborated with colleges for various programmes like green audit, biodiversity surveys, awareness programmes, etc. And as a proud moment one of our doctoral student completed her thesis work and made

We extend our whole hearted thanks for the support and co-operation rendered by all director board members and our well-wishers. With great pleasure we submit the 19th annual report before the board of directors, members and well-wishers.

1. RESEARCH AND DEVELOPMENT

TIES have a full-fledged research wing on related issues to different environmental issues. Several study reports have been already published in this regard. Moreover, the extension and education wing of the institution regularly conduct trainings and workshops on several areas for various stake holder groups. Moreover, various projects on conservation of plants, amphibians, butterflies, odonates, birds and mammals are being regularly conducted by TIES conservationists' team.



A. TIES-OWN PROJECTS

I. BEES FOR LIFE

Bees For Life- a sustainable apiculture programme of TIES, is one of the flagship projects of TIES. The project aimed to create and provide livelihood support to marginal farmers that will form part of the conservation initiatives of the organization. Livelihood support, Ecosystem services and guaranteed pure honey are the main objectives of the project. Currently TIES have 11 beneficiaries and 140 boxes. Continuous monitoring is done by the project team in order to ensure the sustainability of the project. This year we have donated ten honey boxes to a cancer patient. TIES beekeepers providing training to her daughters on apiculture practices.



Fig 1. Vanaja with donated boxes.

II. KOTTAYAM COLLECTORATE BUTTERFLY GARDEN

It is one of the exemplary project of TIES in the civil station campus of Kottayam district. It was created and is also maintained by TIES. Host and nectarine plants are placed inside the garden for the butterflies. Signages are also placed in the garden showing scientific name, common name and vernacular names of host, nectarine plants and common butterflies. Regular cleaning and weeding out is down under the aegis of TIES every month.



Fig 2. Kottayam Collectorate Butterfly Garden



B. GOVERNMENT PROJECTS

I. FIELD SURVEY TO IDENTIFY POTENTIAL SAND MINING STRETCHES (KADAVUS) AND ESTIMATION OF AVAILABLE SAND VOLUMES THROUGH FIELD/CROSS-SECTION SURVEY IN VARIOUS RIVERS OF KERALA STATE

CSIR-NIIST

CSIR-NIIST has entrusted TIES to conduct the sand auditing of 17 rivers flowing through 10 districts in Kerala to identify potential sand mining stretches (Kadavus) and estimation of available sand volume through field/ cross-section survey. As part of this survey was conducted at Pathanamthitta, Kottayam, Ernakulam, Idukki, Thrissur, Palakkad, Malappuram, Kozhikode, Kannur and Kasargode. Approximately 251 km has surveyed as part of this. Bharathapuzha, Chaliyar, Kadalundi, Mahe, Valappattanam, Sreekandapuram, Perumba, Chandragiri, Mogral, Shiriya, Yalkana, Uppala, Achankovil, Pamba, Manimala, Muvattupuzha and Periyar were the rivers surveyed.

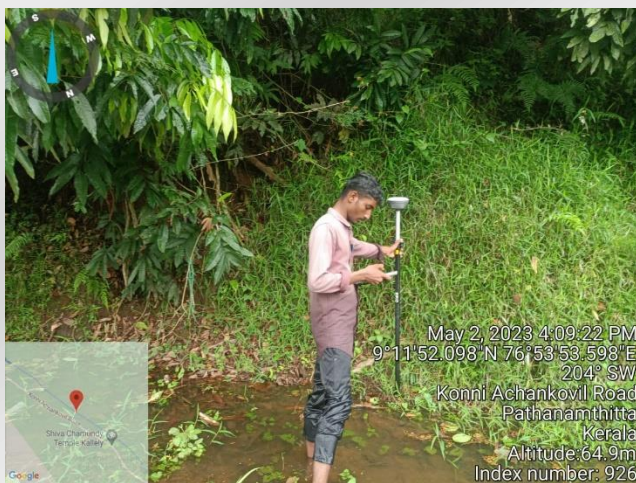


Fig 3. Field Survey- Sand Auditing

II. STUDY ON ODNATES AS BIOINDICATORS WITH RESPECT TO THE WATER QUALITY OF SURFACE WATER BODIES IN MUNNAR FOREST DIVISION

KERALA FOREST DEPARTMENT (MUNNAR DIVISION)

Munnar Forest Division has entrusted TIES to conduct a water quality and odonate diversity study at selected locations under Munnar Forest Division. The entire territorial division was divided into three kinds of zones with respect to the nature of human interactions such as Natural forests, agriculture, and tourism and the study was conducted. Water samples from 60 location were collected and tested. The data on analysis will expose the relationship of water quality and odonate diversity in the Munnar Forest Division, Kerala.



Fig 4. Sample collection at Munnar

III. PAARISTHITHIKAM- MANIMALA RIVER: FLOOD DISASTER MANAGEMENT & SUSTAINABLE LAND USAGE COMMUNITY TRAINING PROGRAMME

DIRECTORATE OF ENVIRONMENT AND CLIMATE CHANGE

As part of Paaristhithikam 2021-2022, a project was initiated by TIES which is aimed at studying the impact of flood disasters in Manimala River basin and developing a disaster management plan based on sustainable land use practices. Structured survey sheets explore the knowledge including traditional knowledge, practices, and community experiences connected with the Manimala River. As part of this a training was given to the students of J.J Murphy Memorial Higher Secondary School, Yendayar. The training was on conducting surveys among the community. A community meeting was also conducted at Kootickal and Kottangal Panchayats to share the live experiences of the community with the Manimala River.



Fig 5. Training and Community Meeting as part of Paaristhithikam

C. CSR PROJECTS

I. PRE-PROJECT STUDY OF ALUVA MUNICIPAL PARK

Apollo Tyres Foundation

The Aluva Municipal Park is located in the 9th ward of Aluva Municipality. Currently the park is an abandoned state and home for anti-social activities. TIES was entrusted to undertake a study to estimate the biodiversity of the park along with assessment of the land area of the park using total station. A stakeholder survey was also conducted a part of the study.



Fig 6. Pre-Project study at Aluva Municipal Park

II. ASSESSMENT OF BIODIVERSITY ENHANCEMENT PROJECT IN APOLLO TYRES CAMPUS, PERAMBRA AND KALAMASERRY, KERALA

Apollo Tyres Foundation

Biodiversity Enhancement Projects (BEP) were implemented by TIES at the Apollo Tyres Campus at Kalamassery and Perambra. Through this medicinal garden, fruit tree garden, apiculture, nectarine garden, butterfly garden, etc were established. The current study was to assess the status of these projects at Perambra and Kalamassery and to suggest strategies to ensure its sustainability. Along with this a study at Perambra campus was conducted on sustainable water usage pattern at their canteen. A survey was conducted as part of this among the staff members. A detailed report was submitted.



Fig 7. Assessment study of BEP projects at Apollo Tyres Campus at Perambra and Kalamassery

D. OTHER

I. INDIAN SNAKE BITE INITIATIVE

F5 Community Impact Grant & Crowd Funding

In partnership with Indiansnakes.org, TIES has initiated a program to mitigate casualties from snake bites in rural districts of Madhya Pradesh and Chhattisgarh. Support is provided to hospitals in the form of Anti-venom provision, community education and outreach programmes. It is the pioneering project on mitigating the issue on the country that encounter 50,000 snake bites every year.

This year along with crowd funding (Global Giving and Benevity) TIES distributed snake rescue kits

to 25 trained and certified snake rescuers at Kottayam and Idukki districts in Kerala. The professional kit constituted

recuse carry case, hooks (large and small), cotton bags, bagger frame. This snake rescue kit is designed by

experienced snake rescuers of Indiansnakes keeping in mind the field conditions and needs of snake rescuers across the country. The programme was conducted by TIES in collaboration with Kerala Wildlife and Forest Department



Fig 8. Snake Rescue Kit Distribution

E. GRANTS

I. DEVELOPING AN ORCHID LIBRARY AND INFORMATION CENTRE: CAPACITY BUILDING AT TIES-KOTTAYAM

New Hampshire Orchid Society, Manchester

An international grant from New Hampshire Orchid Society (NHOS) was received to TIES. The grant was received under the category Conservation Grant. The project was aimed to create a first-time orchid reference and information centre in an organization in the state. Due to the Covid pandemic restrictions the first phase was focused to set up a library and information centre for orchid research and conservation. As part of that relevant books on Orchids were procured. Along with books scientific papers, thesis, dissertations, etc., also availed. An orchid library was setup in the Institute along with an e-library (<https://ties.org.in/ORCHID-LIBRARY>). An orchid field guide was prepared and some native orchid species were planted in the campus along with name boards. Congratulations are due to Dr. Jis Sebastian, Principal Investigator of the project for the successful implementation of the project activities.



Fig 9. Orchids and their name boards

1. TRTP- STUDENT PROJECTS

a. "Isolation of Pectinase Producing Microorganisms from Soil, Enzyme Purification and Industrial Application".

Sreelakshmi V. S, M. Sc. Biotechnology, Submitted to Department of Biotechnology, K. V. M. College of Science and Technology, Cherthala, Alappuzha.

b. "Evaluation of Probiotic Properties of Lactobacillus sp. Isolated from Selected Dairy Products".

Annu Jose, M. Sc. Biotechnology, Submitted to Department of Biotechnology, K. V. M. College of Science and Technology, Cherthala, Alappuzha.

c. "A Comparative Study Between the Effect of Medicinal Plants and Shampoos Available in Market Against Dandruff Causing Fungal Pathogen".

Arun P K, M. Sc. Biotechnology, Submitted to Department of Biotechnology, K. V. M. College of Science and Technology, Cherthala, Alappuzha.

d. "A Study on Bacteriocin Producing Microorganisms in Relation to their Biopreserved Efficiency on Food Particles".

Aswathy M, M. Sc. Microbiology, Submitted to Department of Bioscience, SNGIST Arts and Science College, North Paravur, Ernakulam.

e. "A Study on Biosurfactant Producing Organisms in Relation with respect to Kerosene".

Sruthimol A, M. Sc. Microbiology, Submitted to Department of Bioscience, SNGIST Arts and Science College, North Paravur, Ernakulam.

f. "A Study on Bioethanol Production by Bacteria Isolated from Agricultural Soil".

Arun Babu, M. Sc. Microbiology, Submitted to Department of Bioscience, SNGIST Arts and Science College, North Paravur, Ernakulam.

g. "Isolation and Application of Pigment Producing Microorganisms in Dyeing the Clothes".

Athira Krishnan, M. Sc. Zoology, Submitted to Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.

h. "Extraction, Antimicrobial Activity of Cucumin and Phytochemical Analysis of Turmeric".

Kavya S, M. Sc. Zoology, Submitted to Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.

i. "Prevalent Bacterial Pathogens Among Selected Food Items with Respect to Cooking Practices".

Navya G, M. Sc. Zoology, Submitted to Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.

j. “Study on Prevalent Aeroallergens in Indoor Environment”.

Sisira R R, M. Sc. Zoology, Submitted to Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.

k. “Role of Bacterial Milk Clotting Enzymes in Cheese Production”.

Varsha S Kumar, M. Sc. Zoology, Submitted to Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.

l. “To Study the Role of Biosurfactant Producing Microorganisms in the Degradation of Kerosene”.

Adarsh P Reji, M. Sc. Biotechnology, Submitted to Department of Biosciences, Mar Thoma College, Tiruvalla, Pathanamthitta.

m. “Effects of Heavy Metals on Growth Attributes of Selected Pathogenic Fungi”.

Jerin Chacko Jose, M. Sc. Biotechnology, Submitted to Department of Biosciences, Mar Thoma College, Tiruvalla, Pathanamthitta.

n. “Isolation and Characterization of Pigment Producing Bacteria for Textile Dye”.

Febi Anna Varghese, M. Sc. Microbiology, Submitted to Department of Biosciences, Mar Thoma College, Tiruvalla, Pathanamthitta.

o. “Biopreservative Effect of Bacteriocin on Food Products”.

Neethu Mol Markose, M. Sc. Microbiology, Submitted to Department of Biosciences, Mar Thoma College, Tiruvalla, Pathanamthitta.

p. “Evaluation of Probiotic Properties of Lactobacillus Species Isolated from Selected Dairy Products”.

Sandhya S V, M. Sc. Biotechnology, Submitted to Department of Biotechnology, S N College, Kumarakom, Kottayam.

q. “Screening of Biosurfactant Producing Microorganisms from Oil Contaminated Soil in the Degradation of Kerosene”.

Gopika A, M. Sc. Biotechnology, Submitted to Department of Biotechnology, S N College, Kumarakom, Kottayam.

r. “A Study on the Effect of Vesicular Arbuscular Mycorrhiza on Foxtail Millet (*Setaria italica*) Growth Promotion”.

Divya Vijayan, M. Sc. Biotechnology, Submitted to Department of Biotechnology, S N College, Kumarakom, Kottayam.

s. “Studies on Biocontrol Activity of Plant Growth Promoting Rhizobacteria”.

Ashitha Lalasan, M. Sc. Biotechnology, Submitted to Department of Biotechnology, S N College, Kumarakom, Kottayam.

t. “Biocontrol Activity of Plant Growth Promoting Rhizobacteria (PGPR)”.

Greeshma Raju, M. Sc. Biotechnology, Submitted to Department of Biotechnology, St Thomas College, Pala, Kottayam.

u. “A Study on the Effect of Vesicular Arbuscular Mycorrhiza on Foxtail Millet (*Setaria italica*) Growth Promotion”.

Soniya Ann Kuruvila, M. Sc. Biotechnology, Submitted to Department of Biotechnology, St Thomas College, Pala, Kottayam.

v. “A Study on Biosurfactant Producing Microorganisms with Respect to Kerosene”.

Aparna Shaji, M. Sc. Biotechnology, Submitted to Department of Biotechnology, St Thomas College, Pala, Kottayam.

w. “Bioethanol Production of Cellulase Producing Bacteria From Soils of Agricultural Fields”.

Athira T T, M. Sc. Biotechnology, Submitted to Department of Biotechnology, St Thomas College, Pala, Kottayam.

x. “A Study on Antibiotic Properties of Actinomycetes”.

Balendu Balachandran, M. Sc. Microbiology, Submitted to Department of Microbiology, P G M College, Kangazha, Kottayam.

y. “A Study on Antibiotic Properties of Actinomycetes”.

Anila M, M. Sc. Zoology, Submitted to Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.

z. “Microbial Contaminants of raw and refrigerated meat”.

Nandhu Balachandran, Dony Sebastian and Febin Babu Kuriakose, M. Sc. Microbiology, Submitted to Department of Microbiology, P G M College, Kangazha, Kottayam.

2. ENVIRONMENTAL EDUCATION & OUTREACH

Environmental education division of TIES facilitates long term and short-term academic courses, naturalist courses and school/college projects. TIES has published various books, field guides, booklets, pamphlets etc. on different species and environmental causes. Naturalist courses offer specialized and certified trainings to equip passionate people with scientific skills of nature studies and education.



A. PH.D COURSE WORK

Currently, three students are perusing their Ph. D namely S. Sathrumithra, Alex John and Vinod Mathew. In this Sathrumithra has completed his research works and currently carrying out his data analysis and thesis writing. Rest has submitted their thesis. The Pre-Ph D presentation of Mr. Vinod K was completed.

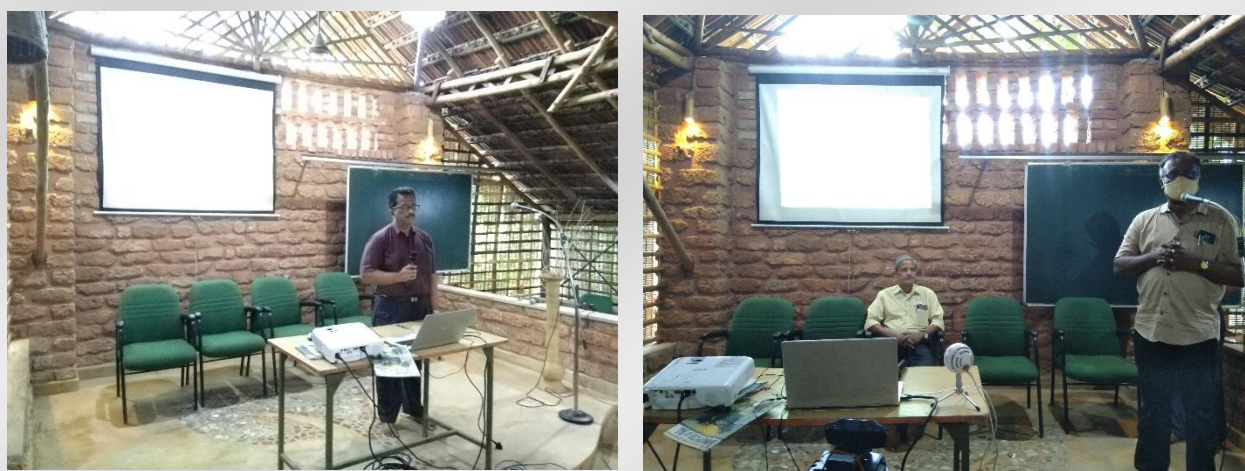


Fig 10. Pre Ph D Presentation of Mr Vinod K

B. TIES RESEARCH TRAINING PROGRAM (TRTP)

The prestigious training programme for masters and research students of South Indian and foreign Universities continued during the reporting year too. Three undergraduate students from P. G. M. College, 25 post graduate students from six colleges, has undergone this training. The students were from two universities, Mahatma Gandhi University, Kerala University and Cochin University, respectively.

Table 1: List of student’s undergone TRTP training at TIES during 2022-2023.

Sl. No.	Student Name	Topic	Course and College
1	Sreelakshmi V. S	Isolation of Pectinase Producing Microorganisms from Soil, Enzyme Purification and Industrial Application	M. Sc. Biotechnology K. V. M. College of Science and Technology, Cherthala, Alappuzha.
2	Annu Jose	Evaluation of Probiotic Properties of Lactobacillus sp. Isolated from Selected Dairy Products	M. Sc. Biotechnology K. V. M. College of Science and Technology, Cherthala, Alappuzha.

3	<i>Arun P. K</i>	A Comparative Study Between the Effect of Medicinal Plants and Shampoos Available in Market Against Dandruff Causing Fungal Pathogen	<i>M. Sc. Biotechnology K. V. M. College of Science and Technology, Cherthala, Alappuzha.</i>
4	<i>Aswathy M</i>	A Study on Bacteriocin Producing Microorganisms in Relation to their Biopreserved Efficiency on Food Particles	<i>M. Sc. Microbiology, Department of Bioscience, SNGIST Arts and Science College, North Paravur, Ernakulam.</i>
5	<i>Sruthimol A</i>	A Study on Biosurfactant Producing Organisms in Relation with respect to Kerosene	<i>M. Sc. Microbiology, Department of Bioscience, SNGIST Arts and Science College, North Paravur, Ernakulam.</i>
6	<i>Arun Babu</i>	A Study on Bioethanol Production by Bacteria Isolated from Agricultural Soil	<i>M. Sc. Microbiology, Department of Bioscience, SNGIST Arts and Science College, North Paravur, Ernakulam.</i>
7	<i>Athira Krishnan</i>	Isolation and Application of Pigment Producing Microorganisms in Dyeing the Clothes	<i>M. Sc. Zoology Department of Zoology Sree Narayana College, Cherthala, Alappuzha.</i>
8	<i>Kavya S</i>	Extraction, Antimicrobial Activity of Cucumin and Phytochemical Analysis of Turmeric.	<i>M. Sc. Zoology Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.</i>
9	<i>Navya G</i>	Prevalent Bacterial Pathogens Among Selected Food Items with Respect to Cooking Practices	<i>M. Sc. Zoology Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.</i>
10	<i>Sisira R R.</i>	Study on Prevalent Aeroallergens in Indoor Environment	<i>M. Sc. Zoology Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.</i>
11	<i>Varsha S Kumar</i>	Role of Bacterial Milk Clotting Enzymes in Cheese Production	<i>M. Sc. Zoology Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.</i>
12	<i>Adarsh P Reji</i>	To Study the Role of Biosurfactant Producing Microorganisms in the Degradation of Kerosene	<i>M. Sc. Biotechnology Department of Biosciences, Mar Thoma College, Tiruvalla</i>
13	<i>Jerin Chacko Jose</i>	Effects of Heavy Metals on Growth Attributes of Selected Pathogenic	<i>M. Sc. Biotechnology Department of Biosciences, Mar Thoma College,</i>

		Fungi	Tiruvalla
14	<i>Febi Anna Varghese</i>	Isolation and Characterization of Pigment Producing Bacteria for Textile Dye	<i>M. Sc. Biotechnology Department of Biosciences, Mar Thoma College, Tiruvalla</i>
15	<i>Neethu Mol Markose</i>	Biopreservative Effect of Bacteriocin on Food Products	<i>M. Sc. Biotechnology Department of Biosciences, Mar Thoma College, Tiruvalla</i>
16	<i>Sandhya S V</i>	Evaluation of Probiotic Properties of Lactobacillus Species Isolated from Selected Dairy Products	<i>M. Sc. Biotechnology Department of Biotechnology, Sree Narayana Arts and Science College, Kumarakom.</i>
17	<i>Gopika A</i>	Screening of Biosurfactant Producing Microorganisms from Oil Contaminated Soil in the Degradation of Kerosene	<i>M. Sc. Biotechnology Department of Biotechnology, Sree Narayana Arts and Science College, Kumarakom.</i>
18	<i>Divya Vijayan</i>	A Study on the Effect of Vesicular Arbuscular Mycorrhiza on Foxtail Millet (<i>Setaria italica</i>) Growth Promotion	<i>M. Sc. Biotechnology Department of Biotechnology, Sree Narayana Arts and Science College, Kumarakom.</i>
19	<i>Ashitha Lalasan</i>	Studies on Biocontrol Activity of Plant Growth Promoting Rhizobacteria	<i>M. Sc. Biotechnology Department of Biotechnology, Sree Narayana Arts and Science College, Kumarakom.</i>
20	<i>Greeshma Raju</i>	Biocontrol Activity of Plant Growth Promoting Rhizobacteria (PGPR)	<i>M. Sc. Biotechnology Department of Biotechnology St Thomas College, Pala.</i>
21	<i>Soniya Ann Kuruvila</i>	A Study on the Effect of Vesicular Arbuscular Mycorrhiza on Foxtail Millet (<i>Setaria italica</i>) Growth Promotion	<i>M. Sc. Biotechnology Department of Biotechnology St Thomas College, Pala.</i>
22	<i>Aparna Shaji</i>	A Study on Biosurfactant Producing Microorganisms with Respect to Kerosene	<i>M. Sc. Biotechnology Department of Biotechnology St Thomas College, Pala.</i>
23	<i>Athira T T</i>	Bioethanol Production of Cellulase Producing Bacteria From Soils of Agricultural Fields	<i>M. Sc. Biotechnology Department of Biotechnology St Thomas College, Pala.</i>
24	<i>Balendu</i>	A Study on Antibiotic Properties of	<i>M. Sc. Microbiology Department of Microbiology,</i>

	<i>Balachandran</i>	Actinomycetes	<i>P G M College, Kangazha.</i>
25	<i>Anila M</i>	A Study on Antibiotic Properties of Actinomycetes	<i>M. Sc. Zoology Department of Zoology, Sree Narayana College, Cherthala, Alappuzha.</i>
26	<i>Nandhu Balachandran</i>	Microbial Contaminants of raw and refrigerated meat	<i>B. Sc. Microbiology Department of Microbiology, P G M College, Kangazha.</i>
27	<i>Dony Sebastian</i>		
28	<i>Febin Babu Kuriakose</i>		

C. INTERNSHIP

Students who completed their course and during academic benefitted from internship at TIES for varied periods of five days to one year. During the reporting year, 23 students, 13 of them were academic interns from two colleges successfully completed their internship at TIES on various topics of interest.

Table 2: List of intern's undergone training at TIES during 2022-2023.

Sl. No.	Name	Topic	Institution
Academic Interns			
1	Anju Thomas	Various Research and education programmes and hand on experience in laboratory procedures.	Department of Post Graduate Studies and Research in Biochemistry St Aloysius College (Autonomous), Mangaluru.
2	Sij Mariya Shaju	Field survey and soil quality analysis of different intercropping sites of Rubber plantations	B. Voc. Agriculture Carmel College, Mala, Thrissur
3	Theerthana M.S		
4	Karthika I.S		
5	Anjanalakshmi P.P		
9	Elsy Brijit George.	Various Research and education programmes and hand on experience in laboratory procedures.	SRM Arts and Science College, Kattankulathur.
12	Sebin Joseph	Prepared a marketing strategy tool for TIES products	Xavier Institute of Management and Entrepreneurship, Chennai
13	Devanarayanan C N	Various Research and education programmes	Tharananellur Arts & Science College, Thanissery,
14	Vismaya M M		
15	Mohammed Sabith P		

16	Swathi P C		Irinjalakuda
17	Adisree V		
18	Mariya S Mattathil	Various Research and education programmes and developed profile videos	Christ (Deemed to be University), Bangalore
19	Merry Mariea Ipe	Various Research and education programmes and also on foraging sources of honey bees (<i>Apis cerana indica</i>) in TIES Campus	Christ (Deemed to be University), Bangalore
TIES Intern			
20	Anagha P S	Various Research and education programmes. TIES Intern	
21	Mekha Thomas		
22	Aswathy R Kartha		
23	Bersis Solaimalai		
24	Devika Gokuldas		
25	Gopika Vrind Rajeev		
26	Jincy Mathew		
27	Anu Rajendran		
28	Sruthi Mol M V		
29	Abiyamol Joy		
30	Angel Benny		
31	Karthika A O		
32	Sona Saji		

D. TIES INTERNSHIP PROGRAMME (TIP)

In order to equip students in sophisticated and deep research TIES started a new programme “TIES Internship Programme (TIP)”. This programme aims to give research experience to students those who has completed their bachelor’s or master’s degree. Interns will get incomparable experience in various microbiological, biochemical, biotechnological and environmental science tools and methods, both lab and field. Along with this they will be provided with experiences in every stages of eco-products preparation- lab to packing.



Fig 11. TIES Internship Programme

E. COLLEGE- NGO PARTNERSHIP PROGRAM

College NGO Partnership Initiative (CNPI) is a mutually benefitting research cum extension project of TIES, involving students and faculty of affiliated colleges in India. CNPI is basically a student capacity building programme, equipping them to meet the challenges and to evolve a socially and environmentally responsible society and to promote environmental awareness among the community. CNPI helps to inculcate research culture among students and faculty of affiliated colleges to empower colleges to take up social and environmental issues and to develop the right scientific temper and outlook. The technical report submitting after the audit contains the recommendations for improving the energy efficiency, biodiversity, waste management and water

usage along with the action plans to reduce resource consumption. CNPI program was inaugurated at Christian College, Chengannur in December, 2016.

This year the green audit programmes were back off so as to attain the ISO 9001:2015 and ISO 17020 certifications.

F. COLLABORATIONS

This year several colleges has been collaborated with TIES in order to use our expertise in the field of biodiversity conservation, ecosystem studies, waste management, biodiversity surveys, capacity building, etc.

The colleges that signed MoU with us is as follows:

1. St Peter's College, Kolenchery
2. Department of Zoology, Baselious College, Kottayam

G. ENJOY LEARNING

Enjoy Learning is a customised one-day nature education session designed for school and college students. The sessions include introduction on nature study, medicinal plants, waste management, building walk, research methodology, studying the flora and fauna inside the campus, eco-friendly games, etc. Regardless of Enjoy Learning programme, several other schools and colleges also visited TIES Campus. Enjoy Learning programme was conducted at TIES for the students of St Teresa's TTI, Vazhappally, who were pursuing their Bachelor's degree in Zoology and students of Mar Baselious Public School, Kottayam. 116 students attended the programme.



Fig 12. Enjoy Learning for S N College, Cherthala

H. MEENACHIL RIVER ODONATE SURVEY

The seventh series of TIES Meenachil Odonate Survey was conducted on 10th and 11th of December 2022 along the Meenachil river basin. The survey was in collaboration with the Department of Forests and Wildlife, Kerala (Social Forestry Division). It was a two-day programme to monitor and survey the dragonflies and damselflies in the Meenachil River Basin. Over 40 participants from educational and research institutions attended the training session and survey and about 80 attended the survey. Dr. Punnen Kurian and Dr.



Abraham Samuel led the training sessions which were intended to familiarize the participants on Odonates and survey techniques. The sites were assigned to each team with an expert. The survey team surveyed dragonfly and damselfly population in their respective sites. The survey was conducted from Adukkam- Pazhukkamalakayal, covering an area of 27 km and surveyed 12 locations. Each location was assigned to 3-8 amateurs along with a field expert.

From the Survey, a total of 45 odonate species including 23 dragonflies and 22 damselflies were found. Social forestry Assistant Conservator Sabu Thomas, and experts like Dr. Abraham Samuel, Dr. Punnen Kurian, Dr. Nelson Abraham, Manoj P, Sathrumitra, Mohammed Haneefa, Sarath N Babu, M N Ajayakumar led the survey.





Fig 13. Seventh Meenachil Odonate Survey

I. LABORATORY ANALYSIS TRAINING FOR STUDENTS

A hands-on-training in bacteriological analysis of water was given to the final year B. Tech Civil Engineering students of Rajiv Gandhi Institute of Technology (RIT), Govt. Engineering College, Pampady. A total of 66 students attained hands-on training on total coliforms (TCC) analysis of water samples. The session was handled by Dr Punnen Kurian and Soumya S. The programme is part of academic and research collaboration between TIES and RIT.



Fig 14. Laboratory Analysis Training for RIT Students

I. COMMEMORATIVE TREE PLANTING

Commemorative Tree Planting is a tree planting programme to commemorate a special occasion or a person. This year TIES in association with Malankara Orthodox Church, 50 plants in their campus at Devalokam, Kottayam as part of the assembly of integration held on 15th February, 2023. The programme was attended by politicians, religious heads, etc.



Fig 15. Commemorative Tree Planting

J. INVITED TALKS & EXPO'S

- ❖ Panel discussion on Continuous engagement for collaborative problem solving organized by CoRAL (Collaborative Research and Learning) centre RIT, Pampady, Kottayam Dr Punnen Kurian.
- ❖ Session on Environment Management Challenges & Sustainable Solutions and Panel Discussion at CSIR-NIIST as part of International Year of Millet Festival by Dr Punnen Kurian.
- ❖ Expo at CSIR-NIIST, Pappanamcode, Trivandrum as part of International Year of Millets
- ❖ Expo at RIT, Pampady, Kottayam



Fig 16. Invited talks at RIT and CSIR-NIIST



Fig 17. Expo at RIT and CSIR-NIIST

3. COMMUNITY DEVELOPMENT

TIES take initiatives in conducting various community developmental or eco-developmental projects to educate people about the need of sustainable lifestyle these days. These outreach activities are the practical response to various needs of today's world and a practice of the organizations core values through community participation. Sustainable development models are conceptualized and implemented under this project.



I. WATER CONSERVATION AND RIVER RESTORATION ACTIVITIES

A. WATER QUALITY STUDY OF MEENACHIL RIVER

As part of Meenachil River Conservation programme water samples were collected from different locations of Meenachil river in order to assess the water quality of the river as there arised panic among the riverine community due to the pollution expelled from nearby areas. 28 samples were collected from river and analysed. The study revealed that the water quality is highly depleted due to the presence of heavy metals, oil content, faecal coliform, etc. and the DO level is also highly declined which has affected the riverine ecosystem. The river is clogged with plastic waste as well as aquatic weeds like Pistia, etc.



Fig 18. Waste dumped at the river bed



Fig 19. Water sample collection at Meenachil River

II. JALARAKSHA CAMPAIGN

TIES as part of its community development initiatives is conducting a water quality analysis campaign in association with residence associations, lions' clubs, etc. The campaign is called "Jalaraskha Campaign". This year in coordination with Peruma Residence Association, Manarcaud tested 56 water samples. The results were distributed in a meeting by explaining the results to the households along with suggestions on what measures can be adopted. The training was led by Dr Punnen Kurian and Ms. Soumya S.



Fig. 20. Jalaraksha Campaign at Peruma Residence Association

III. EXPO AT CSIR-NIIST

As part of the One Wheel One Lab Programme of CSIR-NIIST, Trivandrum, TIES participated in the expo and a stall on TIES publications, products were made. The expo was part of the "Millet Year".



Fig. 21 TIES Expo at CSIR-NIIST

4. CAPACITY BUILDING

A wide spectrum of programmes is offered to various community stakeholders aimed at capacity building to meet the challenges and solve environment related issues. It is a platform to bridge traditional knowledge with modern science and aim at sustainable lifestyles of communities while encouraging preservation of traditional knowledge. Trainings, workshops and day today scientific support are offered by TIES in diverse areas



A. TRAINING ON MUSHROOM FARMING

A total of two hybrid (online and offline) training programme were conducted during this year and 31 people from different parts of India attended the training. It was attended by people from outside and inside Kerala. Beginners, mushroom farmers, students, techies, etc. all were part of our training programme. The session covered topics like tissue Culture, Mother Spawn production, Spawn Production, Bed preparation, post harvesting technologies, Mushroom disease management etc. Dr.Punnen Kurian took the introductory session and Mrs. Roshni Susan Elias led the theoretical and practical sessions. Mushroom includes edible, medicinal and poisonous species and care should be given for its cultivation. So, the training was intended to cover all these aspects and make people closer to these nutraceuticals!!! A mushroom farming training was given to students of Bishop Moore College and 27 students attended the training with hands-on-practical session.



Fig. 22. Mushroom Farming Training

B. POULTRY FARMING TRAINING

A hybrid training programme was conducted during this year and were attended by 12 people from several parts of Kerala. The session was led by Dr Manoju Kumar, Asst. Director, Poultry Farm, Manarcaud; Dr.Punnen Kurian, Secretary, TIES and Sarath Babu, NEO TIES. An offline training was also conducted at TIES and was attended by 17 people. The focal area of the training was on different varieties of Poultry, its management, feeding, cage types and its maintenance, disease control, etc. A poultry package was developed at YIES as part of the training programme.

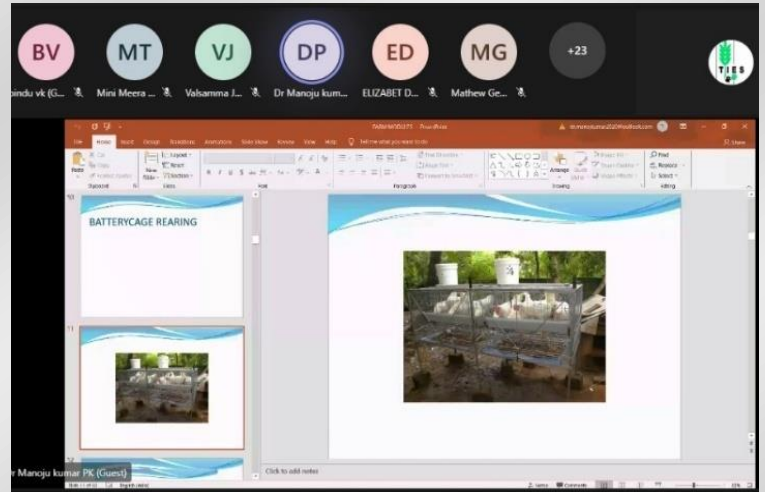
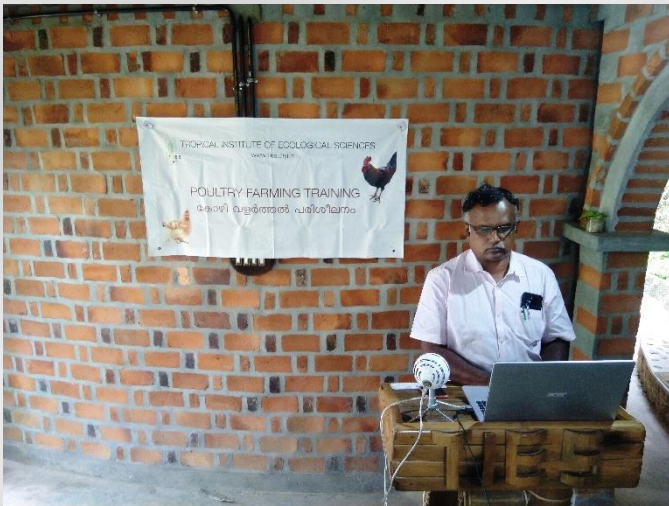


Fig 23. Poultry Farming Training

C. HOMEWASTE MANAGEMENT TRAINING

Homewaste management training is another training given to the community to manage their homewaste at household level. These waste can be transformed into good, eco-friendly fertilizers which help to maintain the soil health. Training covered areas like: waste management, different home waste management techniques, composting (what and how to and what not to) benefits, how to compost at home, etc. The session was led by Dr. Punnen Kurian, Secretary TIES, and Mrs. Roshni Susan Elias. In the current year a hybrid sessions was given to the community and was attended by 26 people.



Fig 24. Homewaste Management Training

D. TRAINING ON STINGLESS BEE FARMING

Honey bees the social insects have immense importance in maintain the ecosystem services and balance. An elementary course on stingless bee rearing was given to community. The training was attended by 31 people. Training constituted live-interactive session. The session was headed by Dr. Sajan Jose K, Retd Professor in St. Joseph’s College, Moolamattam, Idukki. Training covered the basics of bee, bee-keeping, apiary management, etc along with different equipment's used in apiculture.



Fig 25. Stingless bee farming training

E. FISH FARMING TRAINING

Fish farming training was another training given to the community and was attended by around 33 people in hybrid mode. The training was led by Surendran Nair CR, Retd. Deputy Director of Fisheries. Training constituted an introduction to aquaculture, different types of production systems, fishes that can be farmed at our backyards which can be used for home needs, fish health management, etc. There was also an open forum for the participants to clarify the fish farming related queries and also demonstration of two aquaculture models at TIES. Dr. Punnen Kurian, Secretary, TIES; Sarath Babu, NEO, TIES co-ordinated the session



Fig 26. Fish Farming Training

F. WORLD BEE DAY

As part of the World Bee Day, TIES conducted a webinar on “Apiculture Prospects & Challenges”. The webinar was inaugurated by Dr N Jayaraj, MLA. The lead talk was given by Dr Sajan Jose K, Retd. Associate Professor, ST Joseph’s College, Moolamattom on Honey bee farming: Challenges and Solutions and technical session on Quality Issues of Honey was taken by P J Varghese, Deputy Commissioner, FSSAI (Retd.). The webinar was attended by students, researchers and farmers.

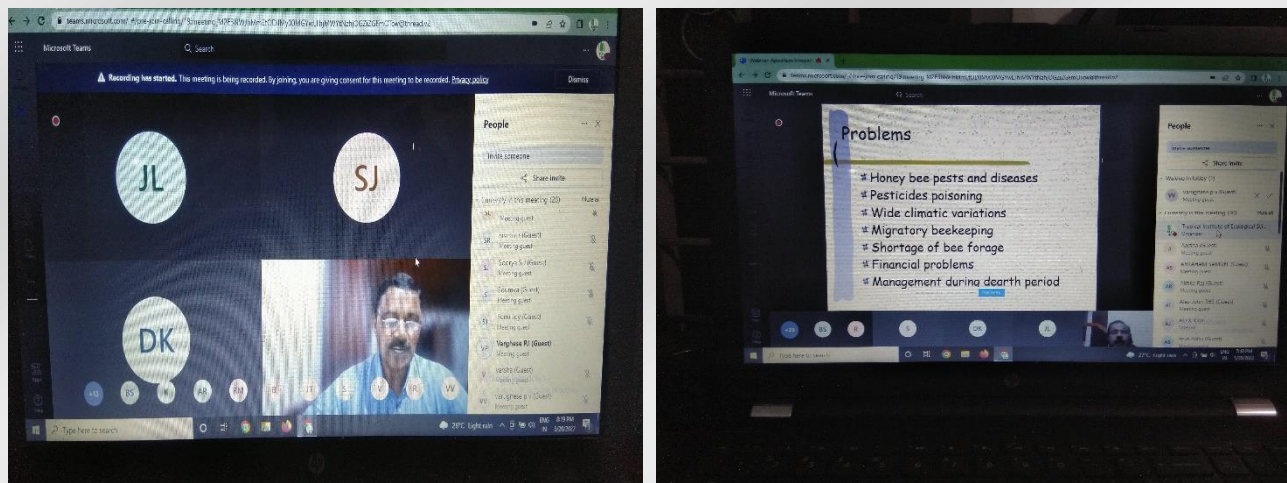


Fig 27. Webinar on World Bee Day

G. TIES LABORATORY SERVICES (KSPCB APPROVED)

1	Water Quality Analysis	
A	MPN	40 samples
B	MPN/FC/EC	502 samples
C	Full test	392 samples
D	Special parameters	90 samples
2	Dry Rubber Content (DRC)	
A	DRC	940 samples
3	Lab Tests	
A	Antimicrobial activity	46 samples
B	Minimum inhibitory concentration	5 samples
C	Isolation and identification of microorganisms	59 samples
D	Quantitative estimation of phytochemicals	5 samples
E	Qualitative estimation of phytochemicals	6 samples
F	Estimation of calcium and protein	4 sample
G	Estimation of antioxidant activity	2 samples
H	Soxhlet extraction	6 samples
I	Estimation of pH, protein, total solids and lactometer reading	6 samples
J	Tests for adulteration	4 samples
4	Soil Test	
A	Soil quality analysis	39 samples

Samples for lab tests were given by postgraduate students and research scholars of Chemistry, Zoology, Gov. Dental College, and different colleges of Mahatma Gandhi University and Calicut University.

J. TRAININGS ATTENDED BY STAFF

1. *ISO 9001:2015 Awareness Training conducted by AQA and was attended by all staff, board members, interns and students on 22nd December 2022.*
2. *Post sanction workshop of Urja Kiran attended by Anoop Mathews on 09th December, 2022*
3. *ISO 9001:2015 Internal Audit training conducted by AQA attended by all staff on 06th March, 2023*



5. CERTIFICATIONS & ACCREDITATIONS

A. CERTIFICATIONS

TIES this year went for ISO certifications and has started the process for ISO 9001:2015 and ISO 17020 certifications. ISO 9001:2015 is a certification on Quality Management Systems and TIES has signed MoU with AQA Quality Management Systems Pvt. Ltd the consultant agency and Indian Register Quality Systems, the certification body. The awareness training as well as training for intern audit was conducted by AQA and 5 staff members were certified as internal auditors. The procedures for ISO 9001:2015 are going on and the internal audit was completed with the internal auditors.



Fig. 28. Internal Audit as part of ISO 9001:2015

B. ACCREDITATIONS

This year TIES also started the NABL accreditation procedure for the laboratory and the initial registration with NABL was completed.



6. TIES VISITORS

 **Students from Mangalam College of Education** *May 25, 2022*

 **Rubber Research Institute Trainee visit** *September 12, 2022*

 **Students from COSTFORD** *November 05, 2021*

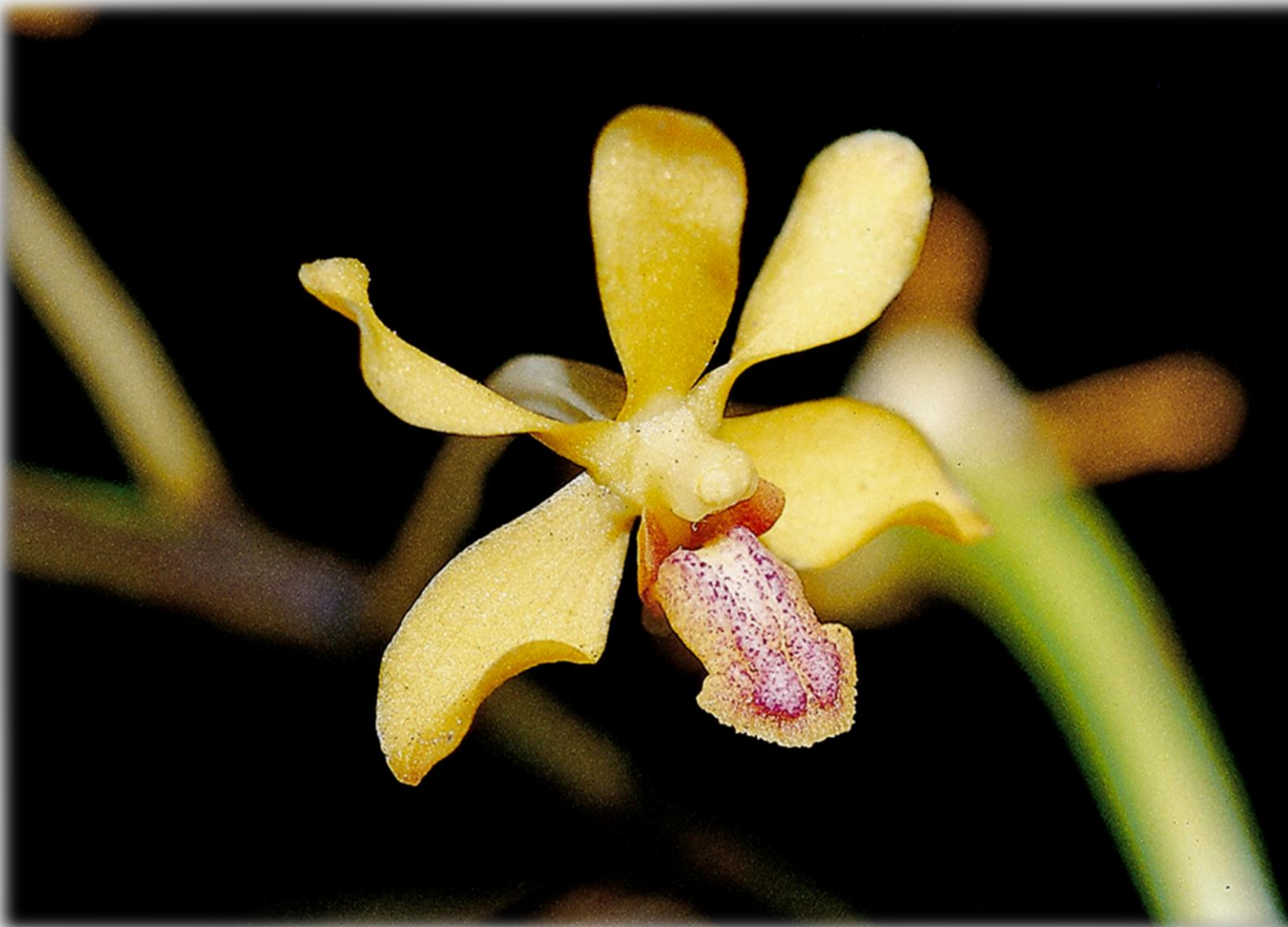
 **M.Ed. Students from PEET Memorial Training College** *November 11, 2022*





7. TIES PUBLICATIONS

- Vinod Mathew & Punnen Kurien (2022). Isolation, Identification and Evaluation of AMF Isolated From Rhizosphere Soils of Cassava Growing Tracts. *J Krishi Vigyan* 2022, 11 (1) : 217-222.
- Mekha Thomas, Gayathri S, Athira K P, Roshini Susan Elias, Soumya S and Kurian P (2022). Efficacy of plant leaf extracts on termites under laboratory conditions. *Journal of Entomology and Zoology Studies* 2023; 11(1): 106-110.
- Nair, V.P., Samuel, K.A., Palot, M.J. and Sadashivan, K. An updated checklist of Dragonflies and Damselflies (Odonata) of Kerala with their Malayalam names. *Malabar Trogon*. 20(1): 19-27.



8. CONCLUSION

All members of TIES have enough reasons to be proud of its growth since its establishment in 2004. Over the past years, TIES has been recognized as the most active environmental research organization in the state.

In the reporting year, TIES have witnessed significant growth in national and Government funded projects. The inputs from the implemented projects are very impressive and are highly appreciated by other organizations. Besides, a number of flagship programmes have been successfully launched. TIES have also witnessed a hike in the number of research projects, awareness and training programmes. As a part of these programmes, eminent persons and foreigners were the guest of TIES. We have achieved immense progress in working as a professionally functioning organization. We have increased the staff strength working for various projects. Further, the support from governmental and non-governmental organizations for various programmes and projects had increased in the last year.

We would like to extend heartfelt thanks to each and everyone for the help, support and guidance rendered in all programmes.

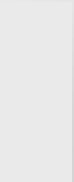
We submit the eighteenth annual report for the approval of the general body.

Dr. Abraham Samuel

President

Dr.Punnen Kurian

Secretary



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of Committed Service to our Mother Nature



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