

# KSCSTE NEWS



A QUARTERLY NEWSLETTER OF KSCSTE  
VOL. II ISSUE : 2 | APRIL-JUNE 2023

Cover Story

02

Highlights of Important  
Programmes

04

Significant Innovations

08

Training Programmes

10

Special News

14







**KERALA STATE COUNCIL FOR  
SCIENCE, TECHNOLOGY AND ENVIRONMENT (KSCSTE)**

കേരള ശാസ്ത്ര സാങ്കേതിക പരിസ്ഥിതി കാൺസിൽ

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Layout, Design & Print  
**Akshara Offset**  
Thiruvananthapuram  
Ph : 0471-2471174

Published & Printed on behalf of  
The Member Secretary, KSCSTE  
Thiruvananthapuram

Published from  
Kerala State Council for  
Science, Technology and Environment (KSCSTE)  
Sasthara Bhavan, Pattom, Thiruvananthapuram 695 004

(Private Circulation only)

Cover Photo



"*Madhuca diplostemon*"

(കാവിലിപ്പ)

## *Madhuca diplostemon*

(കാവിലിപ്പ)

## A Vanishing Imperilled Endemic Tree of the Western Ghats

Plant researchers may often be explorers, but on extraordinary occasions, they turn with divine eyes to face mysteries and solve cases requiring diligence and passion with details. Thus, the rediscovery of plants that have been lost to science for over a century is indeed a remarkable achievement for plant sciences and botanists. One such plant is *Madhuca diplostemon*, which was only recorded once in 1835. Researchers from KSCSTE-Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Palode, Trivandrum, Kerala, have rediscovered this rare, threatened and presumed extinct plant species after a gap of 184 years.

The story was exciting as the research team of KSCSTE-JNTBGRI located a big tree in a sacred grove in the Kollam District of Kerala specifically named "*Madhuca neriifolia*" and on close examination, they found it is not the one as indicated in the name tag. Unfortunately, they couldn't match it with any of the known entities. The breakthrough came finally when they located a low-resolution image of a herbarium, indicating the locality as "Quil...." as faint as it was. This triggered the detective minds of the scientists, and they assumed "Quil...." may be "Quilon" the "Kollam". The search for the original high-resolution image of the herbarium ended in Kew and Royal Botanic Gardens (Edinburgh), and their presumption was absolute in its heights.

The history was retraced. This species was first discovered and inadvertently described as *Diospyros obovata* by Robert Wight in 1835. Robert Wight was a surgeon by profession in the East India Company, and his contribution to the study of Indian plants, especially southern India, made him a botanist by avocation. He organized extensive botanical collecting trips to the virgin forests of south India and also began to collect plants from areas beyond the limits of his own excursions with the help of local collectors. He employed local artists for making botanical illustrations, which served as the backbones of his meticulous botanical mammoths like *Icones Plantarum Indiae Orientalis* (1838-1853), *Illustrations of Indian Botany* (1838-1850), *Spicilegium Neilgherrense* (1845-1851), etc. The pre-eminence of Wight in the development of Plant Taxonomy in

India is still beyond dispute. He was a man of remarkable sagacity and boundless energy, bringing out several covetable botanical mammoths.

Later, Charles Baron Clarke, a Mathematics Professor cum botanist, studied the imperfect herbarium specimens collected by Wight, and he ably placed the wrongly attributed *Diospyros obovata* to the genus *Isonandra* with a new name *Isonandra diplostemon*. In a revisionary study later on the genus *Madhuca* of southeast Asia, P. Royen transferred this species as

*Madhuca diplostemon*. It is a medium-sized evergreen tree with lush green foliage amassed to the tip of its branchlets. Flowers are greenish yellow and mainly hang from the leaf axils and also from below the leaves on the branchlets. Fruits are ellipsoidal in shape with one narrowly ellipsoidal seed. The flowers and mature fruits are sweet and edible. Hence most of the flowers and fruits are eaten by birds and bats.

The genus *Madhuca* is a group of multi-purpose trees having more than 100 species belonging to the family Sapotaceae, distributed in Bangladesh, Borneo, China, Hainan, India, Java, Laos, Malaya, Maluku, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Selawesi, Sumatra, Thailand, and Vietnam. Eight species are reported from India, of these *Madhuca balakrishnanii* E.S.S.Kumar et al., *M.bourdillonii* (Gamble) H.J.Lam. and *M.diplostemon* (C.B.Clarke) P.Royen are found only in Kerala. *Madhuca longifolia* is the commonly cultivated species in India commonly known as 'Mahua' and traditionally, the flower extracts of it are used against heart diseases, leucorrhoea, menorrhagia, polyuria, bronchitis, and tonsillitis. The bark and leaves of the tree are also used for rheumatism, chronic bronchitis, diabetes mellitus, and bleeding. Furthermore, its antioxidants are highly useful in preventing fatal diseases like cancer.

Since its original collection, it was recollected after a hiatus of 184 years from its original locality by researchers of Jawaharlal Nehru Tropical Botanic Garden and Research Institute (KSCSTE-JNTBGRI). It is currently represented by a single mature tree and is enlisted in the



Critically Endangered category by IUCN. This century-old lone tree is located at Koonayil Ayiravilli sacred grove near Paravur in Kollam district. A raised retaining wall guards this tree, and the floor is paved with concrete tiles. The radiating heat kills the majority of flowers and fruits, preventing further expansion of its population. Moreover, two worshipping deities were placed under this tree, making them sacred by the local devotees to impose further restrictions on collecting seeds directly from it. After

its rediscovery in 2020, JNTBGRI located a few seedlings of various ages inside the sacred grove, but none of them now attain the age of flowering. The local restriction imposed by the temple authorities refrains the researchers from collecting the seeds or saplings for further experimental studies until 2022. Kerala Forest Department has sanctioned a small research grant for the conservation and eco-restoration of *Madhuca diplostemon* and through this program, JNTBGRI again approached the temple authorities and convinced them of the urgent need for its effective conservation. Out of the three seeds collected during 2020, one seedling germinated, the only seedling available for this species. In 2023, the researchers procured a few more seeds, raised nearly 200 seedlings, and are slowly maturing at the plant nursery of JNTBGRI. Micropropagation studies using seeds and vegetative shoots are also carried out. All other conventional propagation techniques are also used for their multiplications. The seeds are recalcitrant in nature, which lost their viability soon after falling on the ground. A few seeds are also conserved at the

seed bank of JNTBGRI for further studies.

The Environment Day-2023 witnessed the planting of a sapling of this imperilled tree - *Madhuca diplostemon* (കാവിലിപ്പ-*Kavilippa*) at the Government Model Higher Secondary School, Thiruvananthapuram, by the Hon'ble Chief Minister of Kerala, Shri Pinarayi Vijayan. JNTBGRI is continuing research in developing its ex-situ conservation strategies, such as micropropagation, seed banking, cryopreservation, etc., under the patronage of KSCSTE.



Robert Wight



# HIGHLIGHTS OF IMPORTANT PROGRAMMES

KSCSTE HQ

## World Environment Day 2023

Kerala State Council for Science Technology and Environment, Department of Environment, Kerala State Pollution Control Board, EIACP-PC Kerala Hub and Environment Education Programme jointly celebrated 'World Environment Day- '2023' on 5<sup>th</sup> June at Government Model Boys Higher Secondary School, Thiruvananthapuram.



Hon'ble Chief Minister of Kerala, Shri. Pinarayi Vijayan inaugurated the programme in a function presided over by Shri. V. Sivankutty, Minister for General Education and Labour. The Hon'ble Chief Minister launched the Green Initiative Programme of KSCSTE and also released the book titled 'Field Guide for Aquatic Plants' prepared by KSCSTE-Malabar Botanical Garden and Institute for Plant Sciences (MBGIPS) and published by EIACP Kerala. Prof. R. Vasudevan, (Padma Shri recipient) Dean ECA and Coordinator EIACP RP on Plastic Waste Management Thigarajar College of Engineering, Tamil Nadu delivered key note address. Dr. V. Venu, Addl. Chief Secretary, Environment Department, Prof



'Field Guide for Aquatic Plants' prepared by KSCSTE-Malabar Botanical Garden and Institute for Plant Sciences (MBGIPS).

K P Sudheer, Principal Secretary, S & T department, Shri. M C Dathan, Mentor Science, Kerala, Er. Pradeep Kumar, Chairman, Kerala State Pollution Control Board, Dr S Pradeep Kumar Member Secretary, KSCSTE, Shri. Pramod K V, Principal, Government Model Boys HSS, Thiruvananthapuram and Dr. P. Harinarayanan, Principal Scientist, KSCSTE were among the speakers during the programme.

### Youth Parliament and Youth Icon Award

The Youth Parliament on LiFE is an excellent initiative involving young people in the discussion and debate on sustainable living to create awareness and promote a sense of responsibility towards the environment among young people. This initiative will go a long way in promoting sustainable living and creating a better future for generations to come. The EIACP PC Hub Kerala organized the Stage I of Youth Parliament in Kerala and selected 10 youths to the national youth parliament.

KSCSTE  
NEWS



The Hon. Minister for Environment, Forest and Climate Change, Shri. Bhupender Yadhav conferring the Youth Icon Award to Ms. Aswin K.

At the National Youth Parliament held at Bhopal Ms. Aswini K, Government Brennen College, Thalassery was selected as one among the five Youth Icon's of India and was presented the Indian Youth Icon award.

### Ecoclub Activities

During the school reopening festival 2023-24, GVHS Cheriazheekal, under the leadership of the school Ecoclub decorated the school by braiding *kuruthola toranam* made of tender coconut leaves avoiding plastic decorations. Ecoclub members demonstrated the making of kuruthola toranam to other students also.



### Big Pen- as part of Plastic free campus

As a contribution to the plastic-free campus initiation in alignment with World Environment Day-2023, the students from Hantha Ecoclub at Munda-kkara, AUPS crafted a symbolic pen to raise awareness about the negative impact of using single

use plastic pens to promote the reduction of plastic pen usage among students.

### Environment Day Rallies





## Antidrug Campaigns



## SC & ST Cell

Field Survey was conducted to collect the primary data from Scheduled Caste (SC) and Scheduled Tribe (ST) settlements from Kasaragod, Wayanad, Thiruvananthapuram and Thrissur districts.



*Field survey to collect the Primary data*

## Scheduled Caste & Scheduled Tribe Cell -District level Stakeholders Brainstorming Workshop at Wayanad district

On 28 April, 2023, the SC & ST Cell at KSCSTE with the support of MSSRF-CABc organised a district level stakeholders brainstorming workshop in Wayanad. The objective of the workshop was to address the



sectors that necessitate S & T based solution for the sustainable development of SC/ST communities. The event took place at MSSRF-CABc. The workshop was inaugurated by Dr. S Pradeep Kumar, Member Secretary, KSCSTE in a function presided over by Dr. N. Anilkumar, Former Executive Director, MSSRF. Dr. P Harinarayanan, Principal Scientist, KSCSTE and Dr. Joseph John, Scientist, MSSRF-CABc spoke during the occasion. Sri. Manoharan K., District Scheduled Caste Development Officer, Wayanad and Sri. Pramod G., Tribal Development Officer, Sultanbathery delivered special talks during the programme. Sector-wise discussion was also held. Eighty eight stakeholders including community members were participated.

## CWRDM

- Created a Radar Based nowcasting frame work for Kerala region. Doppler weather radar data obtained from IMD was analyzed for its reflectivities that represent the properties of atmospheric clouds. The data were subjected to analysis by comparing the rainfall rates from Global Precipitation Measurement Satellite to test the usefulness of the data in short term prediction of precipitation. Artificial neural networking algorithms were applied to develop a Standard Operational Procedure of nowcasting for Kerala region.
- CWRDM initiated a project on 'Post facto evaluation of selected irrigation projects implemented in Kerala state', with funding support from IDRB, Govt of Kerala. The project aims to evaluate seven irrigation projects in



*CWRDM signed MoU with IDRB for the study on Post facto evaluation of irrigation projects in the presence of Sri. Roshy Augustine, Minister for Water Resources, Govt. of Kerala.*



Palakkad district and one in Thrissur district, as to its techno-economic efficiency, productivity, enterprises and time and cost over-runs, to enable them to realize their full irrigation potential.

- CWRDM initiated a new consultancy project on 'Bank stabilization of islands with geotextile couples with eco-measures in Ranganathittu Bird Sanctuary, Mysore.
- CWRDM initiated the Rapid EIA study for WRD-Vellayani Kayal Restoration Scheme funded by Minor Irrigation Department, Govt. of Kerala
- The water budget of Kunnamangalam Block Panchayath prepared with the technical support of CWRDM and Green Kerala Mission was released by Sri. PTA Rahim, Hon'ble MLA, Kunnamangalam LA, on 25<sup>th</sup> May, 2023.



Sri. PTA Rahim, Hon'ble MLA of Kunnamangalam LA, releasing the water budget of Kunnamangalam Block Panchayath on 23-5-2023.

## KFRI

- Germplasm conservation of Red Listed Epiphytic angiosperms and ferns of Kerala.
- Developing improved management practices and eco restoration protocols for teak plantations of different site qualities in Kerala.
- Establishing bamboo plantations in different agro-climatic zones and evaluation of growth performance.
- Reappraisal of understanding the correct etiology, epidemiology and transmission of Sandal spike disease in Kerala.
- Population status and genetic diversity of two threatened rattan taxa.
- Development of an in-vitro Co-culture and Loop-Mediated Isothermal Amplification of DNA (LAMP) Based Bioassay for Screening and Evaluation of Potential Anti-Microbial Compounds Against Sandal Spike Phytoplasma.
- A study on taxonomy, phylogeny and conservation of the family Myrsinaceae in the Western Ghats of Kerala, India.
- Scaling up of protocol for in-vitro tuberization for production of quality planting material of two tuber yielding medicinal plants and promotion of organic homestead farming as an income generation opportunity for rural women in Kerala (Phase 2).

## JNTBRI

- "Green Kerala Initiative" project collaboratively undertaken with KFRI and MBGIPS, coordinated by KSCSTE.
- Studies on conservation biological aspects of selected flowering plant wealth of Kerala (Plan project).
- Conservation of vulnerable sandalwood (*Santalum album* L.) through propagation and reintroduction, funded by Kerala Forest Development Fund for a period of 2019-2023.
- Conservation, Eco-restoration and Popularization of three Threatened & Endemic tree species of Kerala, (KFD Project).
- Two project programmes were initiated to assess the diversity of wild edible mushroom resources of Kerala and evaluation of its antimicrobial potential.
- Screening of rhizosphere actinomycetes from marine plants led to 30 actinomycetes isolates out of which 19 isolates showed antibacterial activity. Three most potential isolates selected for further study and experiments in progress.
- Initiated a project on Cardamom for rainforest conservation. The project aims to identify shade loving cardamom varieties that can be cultivated under shade trees in the plantations, thereby facilitating rainforest conservation in these areas. The project funded by Kerala Forest Development Fund (KFDF), Forest Department, Govt. of Kerala for a period of 2023 - 2026.
- Established a Bamboo Museum cum Incubation Centre with financial aid from Kerala State Bamboo Mission.
- Field and nursery data on the listed three species viz. *Dipterocarpus bourdillonii* Brandis, *Hopea racophloea* Dyer and *Syzygium travancoricum* Gamble were documented.
- 2500 seedlings of *Syzygium palodense* were developed, 80 seedlings of *Madhuca diplostemon* and 20 saplings of *Buchanania abrahamiana* were raised and conserved in JNTBGRI.
- Established germplasm collections of *Salacia* Spp. (37 accessions of 12 species) from Western Ghats region of Kerala/Karnataka. Quantification of mangiferin content in different parts (root, leaf & stem) of all the collected species of *Salacia* were done by RP-HPLC analysis. Completed inventory/mapping/accurate field data of the wild population of the two tress, *Buchanania barberi* and *Calophyllum apetalum* across the Western Ghats.
- Systematic documentation and Bio-prospecting of ethnomedicinally important medicinal plants on tribal/traditional knowledge through molecular pharmacological approach (Plan Funded project).
- Livelihood Enhancement of Tribal of Njaraneeli Ward of Peringammala Grama Panchayath, Thiruvananthapuram, Kerala through plant resource enrichment, buy back and Herbal products development (DST funded Programme).



- Conducted Sastra Sameeksha 2023 at MBGIPS during 23<sup>rd</sup> to 27<sup>th</sup> May 2023 with the participation of around 200 students from various schools. Each session was handled by experts on various fields. Classes were given on Agrobiodiversity, Astrology & Astronomy, Biodiversity, Introduction to Parataxonomy and Types of fishes. One session was devoted for science related experiments. The students were given opportunity to interact with the Scientists visit lab along with visit to various conservatories of MBGIPS.



- Summer Program in Mathematics (SPIM) -2023 Kerala School of Mathematics (KSoM) has conducted a Summer Program in Mathematics (SPIM) for inspiring final year of B.Sc. and first year M.Sc students. The program started from 13<sup>th</sup> June to ended at 30<sup>th</sup> June 2023, during which the student participants were be given intensive lectures on different topics in Mathematics like

Algebra, Analysis, Topology, Number Theory, etc. by young eminent and experienced faculty members from premier institutes and universities of India. The primary aim of this program was to promote mathematics among students to take up research in advanced mathematics. 30 students promote across India participated in this program.



Summer program in Mathematics 13-30 June 2023



Workshop on Arithmetic Dynamics 2023 May 15-20

- Strengthening of the State Climate Change Centre/Cell under NMSKCC SCCC-NMSKCC in the State of Kerala: A project under the National Mission on Strategic Knowledge for Climate Change, aimed at the formation of knowledge networks among the existing knowledge institutions engaged in research and development relating to climate science and facilitate data sharing and exchange through a suitable policy framework and institutional support, funded by DST for a period of 2023-2028.
- Climate change assessment and hydrological modelling of Bharathapuzha and Pamba river basins.
- Analysis of various features of the low-pressure systems with intensity of depression and above moving along the Kerala coast.
- Modelling regional sources of air pollutants.

- Sasthra Sameeksha-science orientation program for school students titled "build curiosity in life sciences". This program is intended to develop the curiosity of the students understanding the science in the real-world function through interactive lectures, activities, demonstrations and hands on learning, during April 2023.
- "Skill Based Training on Organic Waste Management and its Use in Agriculture" funded by Kerala Biotechnology Commission (KBC), KSCSTE under Biotechnology Innovations for Rural Development (BIRD) for a period of one year.



A total of 250 students and teachers participated in the Shasthra sameeksha



## SIGNIFICANT INNOVATION/INVENTION

KFRI

- Diagnostic SNP markers for seedling sexing of dioecious *Coscinium fenestratum*
- Artificial Intelligence based Machine Learning Algorithm (Mycorrhiza) for forensic applications
- Value addition and semi-processing of *Sida alnifolia* (Bala), State of the Art Machine for washing and chopping
- Teak seed scarifying machine

- Standardization of eco-friendly coir-based biodegradable root trainers to reduce plastics in nurseries
- Customized and implemented the software tools like ODK/KoboCollect for field data collection (human-wildlife conflict, roost site mapping of birds/bats, socio-economic surveys, mapping of individuals/nests of squirrels, primates, etc) for easier management and retrieval of data

JNTBRI

- As part of the Green Kerala Initiative programme, 18,706 seedlings of threatened species were prepared. The state level inauguration of the

field planting of phase of the project was done by the Honorable Chief Minister of Kerala by planting *Madhuca diplostemon* seedling.

## FACILITIES/INFRASTRUCTURE CREATED

KSCSTE HQ

- **Immunology lab with facilities for RNA extraction**

The SRS project has provided an opportunity to establish a fully functional immunology lab that is well-equipped with essential facilities for RNA extraction at the Department of Marine Biology, Microbiology & Biochemistry, School of Marine Sciences, CUSAT. Recognizing the significance of maintaining RNA integrity, a dedicated "low-traffic" area has been established within the lab to ensure RNase-free conditions. Specific instruments such as a refrigerated centrifuge, electrophoresis unit, filtration unit, and micropipettes have been acquired, meeting the basic requirements for efficient RNA extraction utilizing the support of KSCSTE. With these acquisitions in place, the lab is now fully



operational, ready to facilitate the research and exploration of immunology and RNA-related studies.

- **CombiFlash RETRIEVE Flash Column**

CombiFlash RETRIEVE is one of the highly advanced and sophisticated systems for high-productivity automation for operation in chemical hoods with limited space availability.

The facility was established in the Dept. of Chemistry, S.H. College, Thevara utilizing the grant from SRS, KSCSTE. For either normal or reversed phase, it uses RediSep Rf columns. It has a reliable built-in pump, which reproducibly handles all common solvents. These solvents are held at flow rates from 9 to 99 ml/min. as per the pumped volume; fractions are accurately sized and collected in up to 174 tubes, loaded in the convenient top-mounted fraction collector. The method of flash chromatography is essentially a sped-up version of conventional chromatography. The technique can be considered as a hybrid method, combining medium pressure and shorter column chromatography and utilizing air pressure to speed up the process and obtain the resultant compounds in a shorter time frame. Often synthetic silica is used for this medium onto which the mixture to be separated is introduced.



## CWRDM

- CWRDM established new polyhouse facility with financial support from the Directorate of Arecanut and Spices. This is setup for demonstration of protected cultivation of spices in naturally ventilated polyhouse with automated irrigation system.

## JNTBRI

- Metallic chain link fencing around the carpet beds in the front garden.
- Extended irrigation line at Bambusetum.
- Establishment of Centre of Excellence in Phytochemical-Nanotechnology (CEP) at KSCSTE-JNTBRI under the scheme State Higher Research centres of Excellence in Science & Technology Applications (SHRESTA)-KSCSTE.

## KFRI

- Modernisation of facilities of KFRI Central Nursery
- Field station infrastructure maintenance and WIFI connection
- Infrastructure works for establishing Slimarium at Forest Ecology lab.
- Infrastructure renovation of Biotechnology Department
- RME Unit renovated.

## MBGIPS

- Establishment of Malabar Aquatic Biopark in association with Kozhikode Block Panchayat: Constructed a surrounding wall for the existing Panadanus island and removed silt and soil from the area to protect the existing handiwork.

*Aquagene germplasm- an extension of existing Aquagene unit*



## NATPAC

- NATPAC's Regional Centre commenced functioning at Jawaharlal Nehru International Stadium in Kaloor, Ernakulam on 3<sup>rd</sup> April 2023.

## STIC

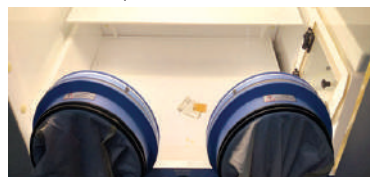
- A unique facility for Food and Water Testing was established under the Special Programme of KSCSTE which was inaugurated by Hon: Minister for Industries, Shri. P. Rajeev on 20.05.2023 in the presence of Executive Vice President-KSCSTE, Vice Chancellor-CUSAT and Member Secretary-KSCSTE.
- An Electric Scooter testing set-up was established for the capacity testing of Electric Scooters.

## MSSRF

- RET Conservatory and crop germplasm (cowpea, tubers, wild edibles, etc.) maintained at the centre. Planting of traditional tuber varieties carried out in April-May.

## IRTC

- Installation of Anaerobic Workstation at IRTC laboratory was accomplished, for the development of anaerobic inoculum for faecal sludge management, supported by - KSCSTE (PLAN FUND 2022-2023).



## RESEARCH/ACADEMIC PROGRAMMES

### CWRDM

#### Ongoing

Plan projects	: 53
External Funded	: 35
Consultancy	: 14

#### Completed

Plan projects	: 2
External funding	: 4
Consultancy	: 5
PhD	: 8 (ongoing)
PDF	: 1
MSc Dissertation/ internships	: 37

### KFRI

Continuing projects	: 55
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### JNTBRI

Continuing projects	: 5
PhD	: 5 (ongoing)

### KSoM

#### Research

PhD	: 3 (ongoing)
Integrated MSc-PhD program, PhD program continuing	

### MBGIPS

Ongoing projects	: 3
Completed projects	: 2
PhD	: 7 (ongoing)

SC/ST-Skill based Training Programme: 19 no's

### ICCS

Ongoing projects	: 5
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### MSSRF

Ongoing projects	: 3
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- 38 Interns from various disciplines mainly Biotechnology, Agriculture, Social Work, Environment Science, etc. continuing internship at the centre. Two SBI fellow continuing their fellowship at the centre in the area of community development



# TRAINING PROGRAMMES/WORKSHOPS/INTERNSHIPS

KSCSTE HQ

- National Mathematics Day  
KSCSTE with the financial support from the Department of Science and Technology (DST), Government of India organized a mathematics training camp for visually impaired students in connection with National Mathematics Day celebrations. The major objective of the programme was to impart the methodologies for effortlessly learning mathematics to visually impaired students through specially developed teaching approaches and models. As an initial



Photographs of Module preparation workshop

step, a two-day module preparation workshop was organized during 25-26 April, 2023 at KSCSTE-Kerala School of Mathematics (KSCSTE-KSoM), Kozhikode. Nine resource persons, who are special educators and school teachers specialized on the theme of the workshop prepared a module for the three day workshop to be held in August.

## Sasthra Sameeksha

- During April-May, 2023, Sasthra Sameeksha programmes were conducted in association with seven institutions (R&D centres and Grant-in-aid) of KSCSTE namely JNTBGRI, KFRI, CWRDM, MBGIPS, KSoM, IRTC and MSSRF. Five one-day programmes were conducted at each institution, comprising of interactive lectures and activity-oriented training programmes. 50 high school level students attended each programme daily at each institute.



A glimpse of Sasthra Sameeksha conducted at KSoM and CWRDM

## CRYSTAL

- KSCSTE conducted the CRYSTAL programme jointly with IIT Palakkad during May 22-31, 2023 to create a platform to nurture India's budding talents and provide them exposure to the state-of-the-art research facilities at early stage. The programme comprised of a continuous mentoring process to encourage scientific temper among children. The 10-day

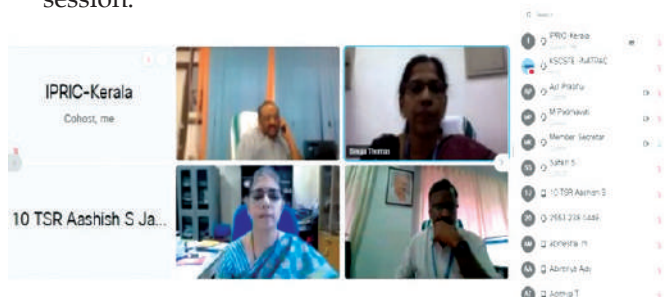


Interactive sessions during CRYSTAL 2023

orientation programme was structured to provide the basics of design thinking and experiential learning to the target students, who are the state level winners of the National Children's Science Congress (NCSC).

## Intellectual Property Day 2023 celebration

- KSCSTE-IPRIC-K celebrated the World IP Day 2023 by conducting an Oration on the World IP Day Theme "Women and IP: Accelerating Innovation and Creativity" by Prof. Padmavati Manchikanti, Rajiv Gandhi School of Intellectual Property Law, IIT Kharagpur on April 26, 2023, through online. More than 250 participants including students, researchers, faculty members, entrepreneurs, etc, attended the session.



Screenshots of World IP Day 2023 celebration

## Workshop on 'Intellectual Property Rights and Patent Drafting' at Cochin.

- KSCSTE -IPRIC-K jointly with the IPR Cell of SCMS School of Technology and Management, Cochin, organized a one-day workshop on 'IPR and Patent Drafting' at Cochin on 15<sup>th</sup> June 2023. Three technical sessions on various aspects of IPR including overview of IPR, patent searching & filing procedures, Drafting of Patent Specifications and hands on session on patent drafting were covered in the workshop and





Views from the Workshop

handled by IPR Experts. Around 60 participants including students, researchers and faculty members attended the workshop.

- District level stakeholders brainstorming' workshop was conducted at Wayanad district to discuss about the various issues in the specific sectors such as Health,

Habitat, Energy, Livelihood, and Science education sectors that require Science and Technology (S&T) based solutions for the sustainable development of SC and ST communities. The workshop was conducted on 28<sup>th</sup> April 2023 at MSSRF- CABc, Wayanad. 88 stakeholders including community members were participated.

## CWRDM

- CWRDM organized 'Sasthra Sameeksha: Science Orientation Programme', funded by KSCSTE during 22-26 May 2023. Interactive lectures, lab visits and hands-on sessions were arranged during all five days. Around 250 students representing various schools in Kozhikode district participated in the programme.
- CWRDM organized a webinar on "Plant Genome Editing" in accordance with the DNA Day- 2023 on April 25, 2023.
- CWRDM organized an internship programme on water and wastewater analysis organized for a group of 15 students from TKM College of Engineering, Kollam from 01<sup>st</sup> to 31<sup>st</sup> May 2023.



Dr. Kalyan Chakraborty, Director, Kerala School of Mathematics inaugurating Sasthra Sameeksha-Science Orientation Program, at CWRDM

## KFRI

- Two-day workshop on 'Recent Advances in Ayurveda and Medicinal Plants Research' for the ISM doctors.
- Exploring Science and nature: KSCSTE-KFRI's Sasthra Sameeksha Programme for School Children.
- Training course on 'Bamboo Propagation,

Plantation Development, Plantation Management, and Entrepreneurship Skill Development' for farmers and field functionaries.

- Summer School in 'Agroforestry and Climate Change'
- One-Week Compulsory Training Course on 'Techniques for combating Land Degradation and Agroforestry'.

## JNTBGRI

- Sasthra Sameeksha program was organized during 22<sup>nd</sup> to 26<sup>th</sup> May 2023 by Dr. Mathew Dan as the Convenor and Dr. K. K. Sabu as Co-ordinator. Dr. M.Saleem, Dr. M. Abdul Jabbar, Dr. Joemon Jacob, Dr. K. B. Ramesh Kumar, Dr. M. Rajendra Prasad, Dr. T. G. Vinodkumar, Dr. S. Suresh, Dr. S. Bindu, Dr. Raju Antony, Dr. B. J. Radhika, and Dr. B. Gopakumar served as Resource Persons. A total of 280 high school students and 20 teachers representing 20 schools participated in the program.
- M.Sc. Dissertation work report "Comparative studies on the *in-situ* and *ex-situ* populations of *Trichopus zeylanicus* subsp. *travancoricus* (Bedd.) Burkil ex K. Narayanan" by Ms. Bijisha K. B. from the Sree Sankara Collage, Kalady of the Mahatma Gandhi University started.
- Dr. A. K. Sreekala served as the mentor of dissertation work of two M. Sc. Botany students from Christian College, Kattakkada.
- Training on Nursery Management and

Administration were given to 12 nos B.Ed. students of Iqbal College during 22/05/2023 to 26/05/2023.

- One-day training on Forest Ecosystem acquaintance for 120 nos of National SPOT qualified children arranged by VSSF, Kochi.
- Exhibition conducted at Pinarayi in connection with 'Pinarayi peruma cultural fest 2023' during 1 April 2023 - 15 April 2023.
- Participated in the exhibition at Kanakakkunnu, Thiruvananthapuram on 25/5/23, in connections with the second anniversary of the Kerala Government.
- Dr. Suja S R attended a hands-on- workshop on Advanced Imaging Applications in Biology from 5 -9 June 2023 at RGCBC BIC campus, Aakulam, Thiruvananthapuram.
- Ajmi Shahul, Aswathy V Nair, Lekshmi S Nath, and Aleena Joseph attended 5 day training programme on 'Animal handling' at Sree Chitra Tirunal Institute for Medical Sciences and Technology, Poojappura, Thiruvananthapuram from 8 May 2023 - 12 May 2023.



## Inauguration of ROOFTOP 20 kW Solar Power Plant and Panel Discussion

- A 20 kW Roof Top Solar Power Plant was installed at NATPAC Head Office, Akkulam, Thiruvananthapuram with the cooperation of Agency for New and Renewable Energy Research and Technology (ANERT). The formal inauguration of the Solar Roof Top Power Plant was done by Shri. K. Krishnankutty, Hon'ble Minister for Electricity, Govt. of Kerala on 19<sup>th</sup> April 2023 at NATPAC Head Office, Akkulam, Thiruvananthapuram. The function was presided over by Shri. Kadakampally Surendran, Member, Kerala Legislative Assembly.
- The Energy Audit of the NATPAC office was conducted by Energy Management Centre (EMC) and the audit report was released by the Hon'ble Minister during the inaugural function. As part of this program, a panel discussion moderated by Shri. Pramoj Shankar P S, IOFS, Additional Transport Commissioner, MVD and JMD, KSRTC was conducted on the topic "Clean and Green Energy Towards Sustainable Transportation".



## Two-day workshop on Full Depth Reclamation (FDR) Technology

- KSCSTE - NATPAC organized a two-day workshop on Full Depth Reclamation (FDR) Technology in association with Kerala Infrastructure Investment Fund Board (KIIFB) on 4<sup>th</sup> and 5<sup>th</sup> May 2023, at RECCAA Club, Kakkanad, Ernakulam. The inauguration of the workshop was done by Smt. Uma Thomas, MLA. The Managing Director of Kochi Metro Rail Limited, Shri. Loknath Behra, IPS was the chief guest for the inaugural ceremony. The workshop aimed at bringing the best technical minds working in the field of FDR technology onto a common platform to share



their expertise, experience, and challenges for the development of infrastructure in the country. The professionals from IITs/NITs, Central and State Government Departments and Industries who have expertise in FDR technology were the resource persons for this Program. The Program was designed primarily for practicing engineers, academicians, researchers and postgraduate students working in the area of pavement design and construction.

## Propagating Engineering Aspects for Coherent Enforcement - PEACE'22

- The three-day training programme for Motor Vehicles Department officials titled as "Propagating Engineering Aspects for Coherent Enforcement" (PEACE) aims to disseminate practical knowledge about road engineering to enforcement officials thereby combining the engineering and enforcement in a scientific way to empower road safety practices. The training programme will be conducted across Kerala by NATPAC in association with Kerala Road Safety Authority (KRSA) and Motor Vehicles Department (MVD) in five phases.
- One programme was completed during this period as listed below.



Participants with NATPAC Officials at KSCSTE- KFRI, Peechi

## Training Course for Drivers of Vehicles Carrying Dangerous and Hazardous Goods

- Government of Kerala accorded sanction to KSCSTE-NATPAC for conducting 'Training Course for Drivers of Vehicles Carrying Dangerous and Hazardous Goods'. A certificate for the same is issued to participants on the completion of training and the certificate is valid for 3 years. The training intends to ensure employee's safety, reduce accidents and crashes, increase employees' skills, ensure environmental protection, preclude penalties and reduce operating costs.

## Road Safety Training Programmes

- One-day Road Safety Awareness Program at SAP camp Peroorkada.
- Road Safety Training Programme for drivers, organised by NATPAC as part of Safe Corridor Demonstration Project (SCDP) at All Saints' Public School Adoor

## Exhibitions

- Conducted Road Safety exhibition as part of the cultural fest "Pinarayi Peruma 2023" at Pinarayi, Thalassery, Kannur from 4<sup>th</sup> to 14<sup>th</sup> April 2023.
- Conducted Road Safety exhibition as part of workshop on Full Depth Reclamation at RECCA Club, Kakkanad, Ernakulam on 4<sup>th</sup> & 5<sup>th</sup> May 2023.



## Training/Invited Expert Talk

### a. TransTech Talk Series

- KSCSTE-NATPAC has initiated a technical talk series entitled "TransTech Talk Series" focussing on various aspects of Transportation sector.
- The third talk in the series was delivered by Prof R Jayakrishnan, Professor of Civil and Environmental Engineering at the University of California on 13th April 2023 on the topic "Traffic Signal Control of the future: Should we do it at intersections?"
- The fourth talk in the series was conducted on 31st May 2023, on the topic 'Application of Safe Systems Approach using Crash Data Analysis Case Study: Himachal Pradesh, India' by Er. Tony Mathew, Head - Operations and Delivery, Transport Research



Laboratory (TRL), India.

- The fifth talk was organized on 15<sup>th</sup> June 2023, on the topic 'Quantifying the trade-offs between environmental sustainability and equity in welfare for Mass Rapid Transit Systems' by Dr. Varun Varghese, PhD, Assistant Professor, Hiroshima University, Japan.

### MSSRF

- MSSRF CAbC participated in the exhibition showcasing the agrobiodiversity of Wayanad at Pinarayi Peruma Fest 2023 at Kannur held during 1-15<sup>th</sup> April 2023



- Five Days Saasthra Sameeksha program conducted from 22-26<sup>th</sup> May 2023 to orient school students towards science communication through sessions on Biodiversity conservation, science education, AI & Climate Change



- Five Days Climate Change Awareness Camps conducted under KSCSTE: "Every Child A Scientist" programme from 25-31<sup>st</sup> May 2023 in schools of Wayanad



- Saplings of 50 rare, endemic & Threatened (RET) species of the Western Ghats planted at the MSSRF CAbC campus on Environment Day 5<sup>th</sup> June.



- Five Days Summer Camp 'Vaisakha Salabhangal' conducted from 15-19<sup>th</sup> May 2023 for 8<sup>th</sup>-12<sup>th</sup> class students on life skills, career guidance, biodiversity conservation and more.



- District Level Stakeholders Brainstorming Workshop organized by KSCSTE SC-ST Cell conducted on 28<sup>th</sup> April to identify gaps in the area of Health, Energy, Habitat, Livelihoods, Agriculture and Digital Divide in Wayanad



### IRTC

- Mushroom cultivation training – two-day training conducted at IRTC campus on 28 and 29 April 2023 for ten upcoming mushroom entrepreneurs.
- Science workshop for school students.
- A one-day workshop on foldscope assembly and specimen preparation on April 2023.
- One month internship on DBT biotech kisan crop residue biomass composting innovations in environment management.
- 15 days internship on Biotechnology for Sustainable Development for four M.Sc Biotechnology students.



## CONFERENCES/SYMPOSIA/SEMINARS ORGANIZED

KSCSTE HQ

- Biotechnology Innovations for Rural Development (BIRD) is an initiative of the Kerala Biotechnology Commission to empower rural folks by providing training in biotechnology techniques that will enable them to earn a living. The Bioscience Department of Rajagiri School of Social Sciences, Kalamassery Cochin, through the KBC-supported BIRD project, provides training and income opportunities for



*"Socio-economic Empowerment of Rural Women of Ernakulam district Agri-entrepreneurship Development" organised at Ernakulam on 14<sup>th</sup> June 2023.*

rural women through mushroom cultivation and helps them set up their own enterprises. The KBC-KSCSTE team visited the training site in Kalamassery region, Ernakulam district on 14<sup>th</sup> June 2023.



- With the support of KBC's BIRD project, the team at Regional Agriculture Research Station (RARS), Kerala Agricultural University, Kumarakom provides training to self-help groups the art of hardening and acclimatisation of micropropagated plantlets of banana and ornamental plants. Rural women were given training in micropropagation techniques to produce healthy plantlets. The KBC-KSCSTE team visited the training site in Thellakom region, Kottayam district on 17<sup>th</sup> June 2023.
- **Title of the programme:** "Empowering Self help Group by Imparting Training on Hardening Acclimatization of Micro propagated plantlets of Banana and Ornamental plants"
- **Name of the Co-Ordinator:** Dr. Sini Thomas K, Assistant Professor, RARS-KAU, Kumarakom.



CWRDM

- The World Environment Day was observed at CWRDM in a befitting manner. Prof. (Dr.) Jiju P Alex, Member, State Planning Board, inaugurated the programme and Dr. Ajith Haridas, Former Scientist, NIIST delivered the Expert Talk on 'Beat Plastic Pollution'. Craft competition from plastic wastes for school students and speech competition for college students, 'Treasure Hunt' to create awareness among the staff, an inventory of plastic waste generated in the campus were conducted as part of the Day.

JNTBGRI

- Organized an invited talk on the topic 'Taxonomy of leaf beetles' on 5<sup>th</sup> June 2023, as part of the World Environment Day celebration and the talk was delivered by Prof. (Dr.) K.D. Prathapan, Associate Professor, Kerala Agriculture University, Vellayani, Thiruvananthapuram.
- Organized an invited talk by Prof (Dr.) S. D. Biju, Delhi University, on June 13<sup>th</sup> of June 2023

on the topic "Biodiversity in crisis: understanding life through story of frogs". The talk was arranged by JNTBGRI Seminar Club in association with Dr. Kamarudeen Foundation for Biodiversity Conservation (KFBC).

- Prof. James Hanken, Harvard University had visited JNTBGRI on the 13<sup>th</sup> June 2023.
- Conducted the award function followed by Abraham memorial programme held on 16<sup>th</sup> June 2023.

## SPECIAL NEWS

- CWRDM received Paristhithi Mithram Award of the State Department of Environment in the year 2022 for the excellent performance in the field of environment protection.

CWRDM





Dr. Manoj P Samuel, Executive Director, CWRDM, receiving the prestigious Paristhithi Mithram Award from Sri. Pinarayi Vijayan, Hon'ble Chief Minister of Kerala.

### Recognitions

- Dr. Manoj P Samuel, Director, CWRDM has been elected as a Governing Body Member of Wetland International, South Asia.
- Dr. Renjith K. R, Scientist B, CWRDM has been selected as a partner in the multi-national project-Global Estuarine Monitoring jointly organized by City University Hong Kong, The State Key Laboratory of Marine Pollution Hong Kong, Baylor University, University of York, United Nations Decade of Ocean

- Science for Sustainable Development etc.
- Dr. Jayasooryan K K, Scientist B, CWRDM has been selected as a member of IUCN-SSC-Otter Specialist Group.
- CWRDM has been inducted as a steering committee institutional member of the South Asia Rainwater Forum.
- Three scholars from CWRDM have been selected for prestigious Chief Ministers Nava Keralam Post Doctoral Fellowship
- CWRDM signed an MoU with NIT-Calicut for research collaboration in various research areas



Dr. Manoj P Samuel, Executive Director, CWRDM and Dr. Prasad Krishna, Director, NIT-Calicut in the occasion of signing a MoU for research and academic collaboration.

### KFRI

- Signed MOU/Collaboration between the Environmental Change Institute School of Geography and the Environment, University of Oxford, UK and KSCSTE-Kerala Forest Research Institute (Dated 13 July 2023)
- TEAKNET (International Teak Information Network) TEAKNET was a co-organizing partner of event with the title "The Forest Treasure Chest: Delivering Outcomes for Everyone" at the upcoming IUFRO All Division 5 (Forest Products) 2023 Conference, which took place in Cairns, Australia from June 4 to 8, 2023. TEAKNET has initiated the Global Teak Resource and Market Assessment study 2023 to update the teak resources and trade flow across the teak growing countries with the financial support of FAO and IUFRO.

- Bamboo Technical Support Group South Zone (BTSG - KFRI) - National Bamboo Mission, Govt of India-Supplied Planting materials for Gram Panchayats; forest Department -52000 seedlings supplied.
- NMPB-REGIONAL CUM FACILITATION CENTRE (Southern Region) Thirteen trainings were organized in different States and Union Territories of Southern Region, and 552 farmers trained in medicinal plants farming and exposed to the activities of NMPB and RCFC (SR). Eight new QPM projects were implemented for the period 2022-2023 for production of 4,59,000 QPMs of 27 species of the Medicinal plants in the 5 Southern states. As an additional intervention, 32,900 QPMs of different species, produced in the KFRI Central Nursery were supplied to different organizations.

### STIC JNTBGRI

- Produced two documentary films in English of two episodes of 60 minutes duration titled, 'Traditional Knowledge and Folk Practices' covering 19 selected sequences of the project, 'Systematic Documentation of Traditional Knowledge related to plants used for food, AYUSH and indigenous medicine' and another documentary film of two day training programme for AYUSH doctors titled 'Traditional and Folk Practices' held at KSCSTE - JNTBGRI on 18<sup>th</sup> and 19<sup>th</sup> November 2021.
- An external consultancy work was signed with M/s. Tata Advanced Systems Ltd., Hyderabad for providing engineering and technical support for their manufacturing plant at Hyderabad.
- Food and Water testing laboratory was established and started functioning.

## APPOINTMENTS/RETIREMENTS

### NATPAC



Ardra S Krishna  
Junior Scientist



Tinku Casper D'Silva  
Junior Scientist



Dr. Sunitha Vijayan  
Scientist

Dr. Sabitha N M  
Senior Scientist  
Awarded PhD  
from NIT Calicut



Smt. Lekha R  
Stenographer  
retired on  
30.04.2023.

### MBGIPS



Dr. Hareesh V S  
Junior Scientist



Dr. Manjula KM  
Junior Scientist



Dr. Raghupathi B  
Junior Scientist

### ICCS



Dr. Sinan Nizar  
Junior Scientist



Dr. C C Bajish  
Senior Scientist





**KERALA STATE COUNCIL FOR  
SCIENCE, TECHNOLOGY AND ENVIRONMENT (KSCSTE)**

കേരള ശാസ്ത്ര സാങ്കേതിക പരിസ്ഥിതി കാൺസിൽ

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