NEWSLETTER

ICAR-CENTRAL ISLAND AGRICULTURAL RESEARCH INSTITUTE

Port Blair, Andaman and Nicobar Islands

Vol : XV No. IV **October - December, 2023**

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

IN THIS ISSUE

Research Highlights
Schedule Tribe Component
Important Events Held
Awards/ Honours/ Recognitions
Trainings/ Meetings/ Campaigns
Publications
Commercialization of Technology
Women empowerment activities/ trainings
Participation in Scientific Events
Personnel

RESEARCH SPOTLIGHT

Cinnamomum
Malabar tamarind
Pandanus
Mangrove
Water conservation
Freshwater fishes
Rabbits
Andaman local buffalo

From the Director's Desk ....

Spices: the niche crops for prosperity

India, the Land of Spices, has long been advocating use of Spices in various cuisines and medicinal preparations owing to their health benefits. Spices are among the premium horticultural commodities, which contribute to Rs. 29,535 crores in the national export. This amounts to 41% earnings among all the horticultural commodities and 9.67% of the agricultural commodities. India has a major share in the export of spices, contributing to 43% in terms of value and 48% in terms of volume in the international market. India has been enjoying top position in the trade of a number of spices and holds a prominent position in the global export of spices oils and oleoresins (70%), cumin (62%), turmeric (60%), curry formulations (52%), mint products (50%) and chillies (50%). Besides the commercial spices, a number of regionally popular spices are being grown in different parts of the country, some of which could be promoted on large scale to reap the benefits. Andaman and Nicobar Islands with humid tropical climate, are highly suitable for cultivation of a number of spices such as true cinnamon, black pepper, clove, nutmeg, ginger and turmeric. Further, crops such as culantro, woody pepper, mango ginger etc. have been locally popular in the islands and hold good potential for scaling up. Considering the dominance of coconut and arecanut plantations in the islands, use of spices as intercrops would be a pragmatic approach in economic prosperity of the island growers. Further, the sector being versatile, has vast potential in generation of employment opportunities for stakeholders involved in various postharvest operations, value addition, marketing and allied sectors using spices as raw material. Adoption of sustainable production technologies, involvement of educated youth in the sector, branding of the produce to improve the traceability and maintenance of quality are some of the issues to be tackled for reaping maximum benefits from these niche crops.

Dr. Eaknath B. Chakurkar

Research Highlights

Volatile oil composition in *Cinnamomum* species

Ajit Arun Waman and Pooja Bohra

In order to study the variability for volatile constituents in the leaf essential oils of true cinnamon, GC-MS analysis was carried out in twenty four identified collections. Invariably, Eugenol was found to be the most dominant constituent in leaves of all the collections, although the quantity varied greatly. Eugenol content varied between 59.54% (Cv/L/09) and 85.67% (Cv/Lib/18) among the collections studied. Four collections showed Eugenol content of less than 70%, while three collections showed more than 85% Eugenol in them. Similarly, essential oil profiling of six collections of tejpat was also carried out which revealed that Eugenol content varied between 38.52 to 44.96% among the collections.

Characterization of Malabar tamarind collections

Pooja Bohra and Ajit Arun Waman

Malabar tamarind collections conserved in the Garacharama farm of the Institute have been perennially studied for various horticultural characters and the data on harvesting season during two years has been presented in Table 1. It was observed that different collections exhibited similar pattern; wherein, GG-05 was the distinctly earliest one. Variations were also recorded in harvesting duration. GG-02 and GG-05 had comparatively longer harvesting period than the other collections. Significant variations were also recorded for fruit and seed morphological parameters besides yield attributes. Peel thickness was the highest in GG-01 (13.2 mm), while significantly thinner peel of 5.7 mm was recorded in GG-05. Longer harvesting period and thinner peel make GG-05 a suitable candidate for cottage scale processing due to ease of handling under island conditions.

Table 1. Harvesting season of different collections of Malabar Tamarind

Collection	Year	Harvesting duration#																	
		Apr			May			Jun			Jul			Aug			Sept		
		E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L
GG-01	2022							*	*	*	*	*	*	*					
	2023								*	*	*	*	*	*	*	*			
GG- 02	2022								*	*	*	*	*	*	*	*	*	*	
	2023							*	*	*	*	*	*	*	*	*	*	*	
GG- 04	2022										*	*	*	*	*	*			
	2023											*	*	*	*	*			
GG- 05	2022			*	*	*	*	*	*	*	*	*	*						
	2023			*	*	*	*	*	*	*	*	*							
UUF- 01	2022							*	*	*	*	*	*	*					
	2023								*	*	*	*	*						
UUF- 03	2022								*	*	*	*	*	*					
	2023									*	*	*	*						

#E: Early, M: Mid, L: Late

Phytochemical profile of *Pandanus lerum* fruit pulp

I. Jaisankar

A study was conducted to know the phytochemical profiles of *Pandanus lerum* fruit pulp collected from three Islands of Nicobar District. The present study revealed that a total 66 chemical compounds which were characterized into numerous classes of

compounds. The phytochemical profile study demonstrated presence of different mixture of compounds varying from 33 to 35. Higher peak percentage area includes dl-Glyceraldehyde dimer (14.28%), 3-Deoxy-d-mannoic lactone (9.38%), n-Hexadecanoic acid (8.95%), oleic acid (14.22%), n-Hexadecanoic acid (18.17%), 9-Octadecenoic acid, (E)-(41.49%), 1, 2-Cyclopentanedione (10.47%), DL-Arabinose (16.90%), n-Hexadecanoic acid (7.60%) and trans-13-Octadecenoic acid (12.10%).

Mangrove community zonation mapping

I. Jaisankar

The mangrove species occurrence, phytosociological data (dominance, abundance, frequency and the importance value index) and position in the tidal range were recorded. Among the 20 mangrove species examined within the 20 × 20 m quadrant, 97 individuals were documented in Kamorta and Galathea River 1 of the Great Nicobar Island. The highest value of the Importance Value Index (IVI), 3.47, was observed in Kamorta and Galathea River 1 of Great Nicobar Island. The lowest IVI value, 2.77, was recorded in Magar Nallah, Galathea River 1 of Great Nicobar Island. Mangrove community zonation mapping, 9 scenes of IRS LISS IV were selected in this context. Imagery processing was done at ArcGIS software (Plate 1).

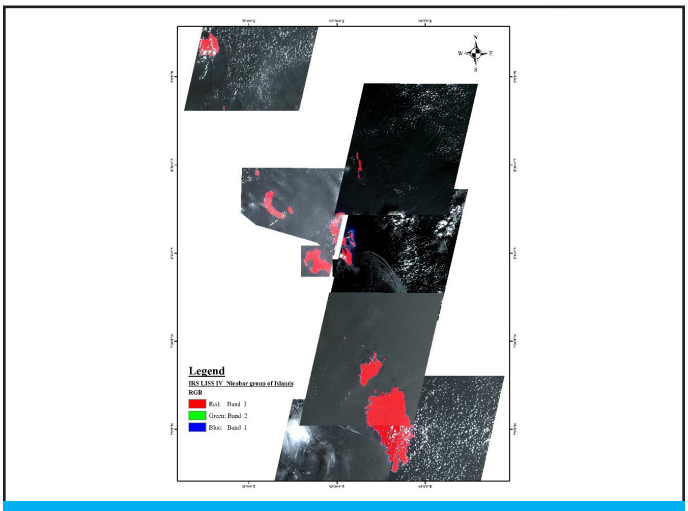

Plate 1. Layer stacking IRS LISS IV imagery of Nicobar Islands

Plant exploratory survey

I. Jaisankar

During the reporting period from Car Nicobar Islands four *Dioscaorea alata*, three *Colocasia esculenta* and three *Pandanus lerum* accessions were collected and conserved and IC numbers were obtained from ICAR- NBPGR, New Delhi.

Studies on *Morinda citrifolia*

I. Jaisankar

Yield performance of *Morinda citrifolia* reference varieties - The mean values of fruit yield per tree showed significant differences among the varieties. The highest fruit yield of 35.3 kg/tree was recorded in CIARI Dweep Sampada which was on par with CIARI Dweep Samridhi (28.5 kg/tree) followed by CIARI Dweep Sanjivini (27.10 kg/tree). Minimum fruit yield of 24.75 kg/tree was recorded in CIARI Dweep Rakshak. In all the four varieties the highest fruit yield per plant was recorded in April like previous year and CIARI Dweep Sampada variety recorded the highest fruit yield of 3.30 kg/tree in September.

Plate 2. CIARI Dweep Sampada reference variety block at ICAR- CIARI, Garacharma farm

Development of reference variety block - The vegetatively propagated 25 saplings of reference varieties *viz.* CIARI Dweep Sampada, CIARI Dweep Samridhi, CIARI Dweep Sanjivini and CIARI Dweep Rakshak were planted with 3 × 3 m spacing. The one year old plants height and basal girth showed significant differences among the varieties. The highest values for height and basal girth of 1.32 m and 3.89 cm, respectively were recorded in CIARI Dweep

Sanjivini followed by CIARI Dweep Sampada (1.28 m and 3.56 cm, respectively).

Farming system studies in tribal areas

I. Jaisankar

The Nicobari tribal communities mainly rely on coconut, tuber crops, pigs and marine fisheries for their livelihood. The tribal farmers clear the forest area and cultivate crops in joint family system called *Tuhet*. They mainly grow only Nicobari Aloo (greater yam) along with Cassava and banana mainly for food in the traditional *tuhet* garden in addition to their existing coconut plantation. Community based tuber crops based farming system was demonstrated at farmer's field at Harminder Bay, Little Andaman during 2022 in 0.3 ha model involving tuber crops, vegetables, fruits and spices integrated with piggery. Farmers were distributed with planting materials of tuber crops (Elephant Foot Yam, Colocasia, Sweet potato), Ginger and Piglets. Regular trainings and field visits were organized to upgrade the farming skills of tribal farmers. Prior to interventions, the net income of the *tuhet* was Rs. 70,000/- with B:C ratio of 1.22. After intervention of tuber crops-based farming system the net income of the *tuhet* increased to Rs. 2,03,770/- with the B: C ratio of 2.29. The employment generation in the tuber crops-based farming system was 457-man days/ha as compared to 240-man days/ha in their traditional system.

Studies on tuber crops

I. Jaisankar

High density planting in elephant foot yam- The experiment conducted on High density of planting in elephant foot yam revealed that, lower corm yield per plant was recorded in T_7 (60 × 60 cm) at 9 months (1.46 kg) of planting followed by T_6 (75 × 60 cm), while individual plant yield was higher in T_2 with plant density of 90 × 90 cm (2.37 kg/plant) and T_4 - 90 × 60 cm (2.33 kg/plant). However, the highest corm yield (43.89 t/ha) was resulted with plant density of 90 × 60 cm (T_4) followed by T_7 and T_6 which was on par with each other. The higher yield might be due to higher plant population per ha with closer planting adopted.

Evaluation of purple flesh greater yam under Island - Eight entries of purple fleshed greater yam along with one national check and one local check were evaluated for tuber yield, tuber shape and tuber flesh colour. The result revealed that, the variety Sree Neelima recorded higher yield (22.1 t/ha) followed by the entry TGy 20-2, which was on par. With regard to flesh colour, two entries *viz.* TGy 20-4 and TGy 20-5 recorded white flesh.

Hydrological response for soil and water conservation in Island Ecosystem

I. Jaisankar

The study on soil and water conservation studies in Andaman Islands revealed that about 5.2% of geographical area *i.e.*, 26,420 ha area is prone to severe and very severe soil erosion, and it should be prioritized for suitable conservation practices. About 25% and 20% of agriculture and barren lands are potential for practicing the soil (contour/graded bunding, terracing, and broad bed and furrow) and water (farm ponds and check dams) conservation practices in the islands. The water conservation practices were underdeveloped (37%) in the Islands and there is a scope for 63% more development in terms of farm ponds and check dams.

Management of parasitic diseases in freshwater fishes

J. Praveenraj

LC_{50} analysis for *Andrographis paniculata* using *Gambusia holbrooki* (Mosquito fish) at various concentrations ranging from 10, 30, 50, 70, 90 and 100 ppm as a first range test, second range test with 150, 200, 300, 400 and 500 ppm, and definitive test with 600, 700, 800, 900, 1000 and

1100 ppm demonstrated that concentration at 635 ppm kills 50% population at 24 h. Hence, a concentration below 500 ppm has been chosen as a safe level for fishes for evaluation of antiparasitic activity. The antiparasitic activity of *A. paniculata* will be tested against important ectoparasites of fish in further studies.

National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)

K. Saravanan, J. Praveenraj and R. Kiruba Sankar

Validated the geo-reference details of 1127 numbers of freshwater fish farms located at Andaman and Nicobar Islands. Baseline data has been collected from a total of 31 freshwater fish farms located at various villages of Diglipur, North Andaman. Altogether, four number of disease cases were reported due to viral infection, bacterial infection, and water quality issues from the freshwater fish farms located at the Andaman Islands and provided the management measures. Characterized the lymphocystis disease virus (LCDV) reported from Indian glass fish (*Parambassis ranga)* by using microscopic analysis, DNA sequencing, and histopathological investigation.

ICAR-CIARI records its first successful artificial insemination in rabbits

R.R. Alyethodi, P. Perumal, Jai Sunder and E.B. Chakurkar

Rabbit farming has tremendous potential in Island conditions. However, due to the lack of quality germplasm and very high cost of rabbits (Approx. 1500-2000/ per pair), it is not flourishing in the Islands. Under a newly initiated project, scientists of CIARI have initiated a new rabbit farm in the institute. For faster multiplication of elite germplasm, Artificial insemination is the proven tool. However, semen collection and insemination are not popular in the Island condition and have not been practiced anywhere on these Islands. With the guidance of the Director, CIARI, scientists have indigenously developed an Artificial vagina and Artificial insemination gun for a Rabbit model. With the use of these tools birth of four kittens was reported in their first attempt.

Plate 3. Rabbit model

Lactation in Andaman local buffalo

P. Perumal, A.K. De and P.A. Bala

Milk yield did not vary among the lactational stages (first: day 07 - 90; second: day 91 - 180; third: day 181 - 305). Blood profiles did not vary among the lactation stages; however, values were within the range of bubaline species. Serum glucose, triglyceride, total cholesterol, total protein, globulin and blood urea nitrogen increased and albumin and creatinine decreased as lactation stages advanced. Activity of aspartate aminotransferase, alanine aminotransferase and alkaline phosphatase and concentration of macro-minerals were nearly similar among the lactational stages. Triiodo thyronine and thyroxine increased while prolactin and cortisol decreased as lactational stages advanced. Total antioxidant capacity increased and malondialdehyde decreased as lactation stages advanced. Lactating Andaman local buffalo suffered nutritional, physiological and oxidative stresses and hormonal imbalance during the early stages of lactation. Thus, first and second lactational stages are more stressful events compared to third stage. Therefore, regular monitoring and adoption of suitable feeding strategies need to be implemented to mitigate these stresses for maximizing milk production in Andaman local buffalo.

Schedule Tribe Component

Programme	Number	No of Beneficiaries
Trainings	6	568
Demonstrations	9	353
Input distribution	4	400

Important Events Held

National Conference on Spices, Aromatic and Medicinal Plants for Economic Prosperity and Ecological Sustainability (SAMPEPES)-2023

National Conference on Spices, Aromatic and Medicinal Plants for Economic Prosperity and Ecological Sustainability-2023 was organized by Andaman Science Association (ASA), Port Blair, Andaman & Nicobar Islands in collaboration with Directorate of Arecanut and Spices Development (DASD), Kerala from October 5-6, 2023 in hybrid mode.

Speaking on the occasion the Chief Guest Ms. Nandini Paliwal, IAS, appreciated efforts of ICAR-CIARI for extending opportunity to visit the campus to witness the cafeteria of technological demonstration in agriculture and allied fields along with landscape with endemic crops. She emphasised that agri-horticultural activity should gratify farmers and motivate them to have balance with agriculture and tourism. Ventures should be economically viable so as to converge technology in policy, deliberate keeping Andaman as a case study to bring out the strategy and a compilation of best practices on post-harvest and value addition of spices as ready reckoner for policy makers. She released Book of Abstracts and institute publications on the occasion. Dr. E.B. Chakurkar, Director, CIARI and President, ASA informed that spices being low volume and high value crops are of National importance. The recommendation from the deliberation of this conference will facilitate the A & N Administration to improve the status of the spice farmers by having a unique brand of Andaman and also add to the national exchequer.

Guest of Honours Dr. Homey Cheriyan, Director, Directorate of Arecanut and Spices Development, Kozhikode, delivered keynote address on "Potential of Spices in India with special reference to Andaman and Nicobar Islands" and Dr. M. Madhava Naidu, Ex Head, CSIR-Central Food Technology Research Institute, Mysore on "Technological intervention: Value Addition of Herbs & Spices for Economic prosperity".

Dr. R. Dinesh, Director, ICAR-Indian Institute of Spices Research, Kozhikode, Kerala, Dr. Manish Das, Director, ICAR-Directorate of Medicinal and Aromatic Plants Research, Anand, Gujarat, Dr. Vijay Mahajan, Director, ICAR-Directorate of Onion and Garlic Research, Pune, Maharashtra, Dr. Vinay Bharadwaj, Director, ICAR- National Research Centre for Seed Spices, Ajmer, Dr. K. Pradheep, Principal Scientist and OIC, ICAR- National Bureau of Plant Genetic Resources, Regional Station, Thrissur, Dr. K.B. Ramesh Kumar, Principal Scientist and SIC, CIF, Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Thiruvananthapuram, Kerala and delegates from A & N Administration attended the inaugural function. Besides 139 participants from 22 states/UTs registered for the event in online and offline mode, wherein a total of 120 research papers were presented by the reputed researchers, academicians and

Plate 4. SAMPEPES-2023

scholars from across the Nation in two days' period.

At the outset, Dr. P.K. Singh, Principal Scientist, Head HCIP and Convener welcomed the august gathering, Dr. Ajit Arun Waman, Organizing Secretary proposed vote of thanks and Dr. Pooja Bohra, Co- Organizing Secretary coordinated the inaugural programme.

Vigilance Awareness Week-2023

The observance of the Vigilance Awareness Week commenced with the administration of 'Integrity Pledge' in bilingual (English and Hindi) to the staff of the of institute, Regional Station Minicoy & KVK North & Middle Andaman. An essay competition was organized for the staff on the theme of "Anti-corruption Measures for National Development" The event took place at Library on October 31, 2023. Dr. M. Balakrishnan, Principal Scientist, ICAR-NAARM, Hyderabad delivered a seminar on "Cybersecurity Measures" on November 2, 2023. Drawing and essay competition was organized November 3, 2023. On November 09 2023, workshop on "Preventive Vigilance" was conducted by Dr. I.P. Sunish, Scientist-E and Vigilance Officer of Indian Council of Medical Research - Regional Medical Research Centre, Port Blair. A training programme on procurement as per GFR 2017 was organized by Shri. Gauranga Ghosh, Senior Finance and Accounts Officer at ICAR - Research Complex for North Eastern Hill Region on November 10, 2023. A seminar on "RTI/ Transparency/Good Governance Measures and Other Stakeholders" was delivered by Ragini Kumari, Assistant Professor of Andaman Law College on November 13, 2023.

Plate 5. Celebration of Vigilance Awareness Week-2023

World Soil Day

On the occasion of World Soil Day, ICAR-Central Island Agricultural Research Institute, Port Blair along with KVK, Sippighat and Dept. of Agriculture organised a public awareness program with farmers at Shoal Bay, South Andaman. A total of 219 participants including farmers, officers from Department of Agriculture and PRI Members from different villages have participated and celebrated world soil day. During the programme, present status of soil in the islands and the importance of good soil health for better crop production were discussed. Organic and natural farming practices and method of preparation of different organic inputs like vermicompost, Panchagavya, Jeevamrit, Dashparni, Agniastra, Brahmastra and Neemastra were discussed. Further, soil conservation measures to protect top soil from erosion and soil fertility improvement through green manuring and biofertilizers (bio consortia) were also briefed. At the end, organic inputs, folders and leaflets were also distributed to farmers.

Swachhta Pakhwada

The Swachhta Pakhwada programme started with the swachhta pledge on December 16, 2023. The programme included cleaning drive at various parts of the campus as well as nearby villages and market area. The staff also conducted awareness programmes at five villages and emphasized the Clean and Green India concept. An online lecture on Wealth

from Agrowaste was delivered by Dr. Tapan Biswas, Professor, BCKV, Kalyani, West Bengal on December 22, 2023. Kisan Diwas was organized, in which 150 farmers participated and learned about smart agriculture practices, organic waste management, natural farming and scientific cattle management.

Awards/ Honours/ Recognitions

Date	Name	Achievement/ recognition	Event
5/10/2023 to 6/10/2023	Dr. Ajit Arun Waman	Organizing Secretary	National Conference on Spices, Aromatic and Medicinal Plants for Economic Prosperity and Ecological Sustainability (SAMPEPES-2023)
5/10/2023 to 6/10/2023	Dr. Pooja Bohra	Co-organizing Secretary	National Conference on Spices, Aromatic and Medicinal Plants for Economic Prosperity and Ecological Sustainability (SAMPEPES-2023)
17/10/2023 to 19/10/2023	Dr. Ajit Arun Waman	Best Oral Presentation Award and Rapporteur for technical session	International Seminar on Exotic and Underutilized Horticultural Crops: Priorities and Emerging Trends (ISEUHC- 2023) held at ICAR-IIHR, Bengaluru
14/10/2023 to 18/10/2023	Dr. R. Kiruba Sankar	Rapporteur	XVI Agricultural Science Congress & ASC expo 2023 at Cochin
18/11/2023	Dr. K. Saravanan and Dr. R. Kirubasankar	Exam coordinator	Moderated the question papers for five subjects for the final theory examinations of M.F.Sc. degree programme of Tamil Nadu Dr. J. Jayalalithaa Fisheries University
20/12/2023	Dr. S.K. Zamir Ahmed	Best Oral Presentation Award	1st International Extension Education Congress on Rural Transformation and Sustainable Agri-food System through Community Based Organisation (CBO) Oriented Extension Strategy held at RARI, Durgapur (SKNAU, Jobner), Jaipur, Rajasthan.
22/12/2023	Dr. I. Jaisankar	Member	Expert Appraisal Committee for Environment Impact Assessment Authority, Andaman and Nicobar Islands, Ministry of Environment, Forest and Climate Change.

Trainings/ Meetings/Campaigns conducted

Name of the training/ meeting/ campaign programme	Venue	Date	Participants (M/F/T)	Organizing committee/ coordinators
Awareness programme on National Surveillance Programme for Aquatic Animal Diseases	Ferrargunj, South Andaman	12/10/2023	10/22/32	D. K Saravanan Dr. S.K.Z. Ahmed Dr. J. Praveenraj Dr. R.K. Sankar Shri. D. Karunakaran
Mahila Kisan Diwas	KVK, Sippighat	17/10/2023	14/66/80	Dr. Y. Ramakrishna Dr. Pooja Kapoor Shri. Thanmai Paul
World Soil Day	Shoalbay	17/10/2023	126/93/219	Dr. Y. Ramakrishna Dr. T. Subramani Shri. Thanmai Paul
Vigilance Awareness Week - 2023 and PIDPI Awareness programme	ICAR-CIARI	30/10/2023 to 20/11/2023	151/187/338	Dr. Y. Ramakrishna Dr. T. Sujatha Dr. T. Subramani Dr. P. Perumal Shri. D. Karunakaran Dr. K. Saravanan Dr. R.R. Alyethodi Shri. Shyam Sundar Rao
Balanced Diet for rural women and children	Rangachang	30/10/23 to 2/11/2023	0/25	Dr. Y.Ramakrishna Dr. Pooja Kapoor Dr. E.B. Chakurkar
Aquatic Animal Diseases and Health Management in Aquaculture	Diglipur, North Andaman	31/10/2023 to 02/11/2023	10/6/16	D. K Saravanan Dr. S.K.Z. Ahmed Dr. J. Praveenraj Dr. R.K. Sankar
Climate resilient agricultural practices for Island based cropping system	Perka, Chukchucha and Tapoiming village of Car Nicobar Islands	01/11/2023 to 03/11/2023	147/47/194	Dr. I. Jaisankar Dr. Santosh Kumar Dr. T. Subramani
Vigilance awareness week	Rangachang	01/11/2023	12/33/45	Dr. Y. Ramakrishna Dr. Pooja Kapoor Shri. Thanmai Paul Dr. E.B. Chakurkar

Name of the training/ meeting/ campaign programme	Venue	Date	Participants (M/F/T)	Organizing committee/ coordinators
Satak krishi for non tribal KVK	Beodnabad, Calicut, Sippighat, Shoal Bay, Mannarghat, Wimberly Gunj, Kanyapuram, Stewartgunj, Bambooflat-I, Bambooflat-II, Shore Point, Hope Town, Bindraban, Ferrargunj, Namunaghar, Tushnabad, Collinpur, Mithakhari, Humphry Gunj, Wandoor, Guptapara.	20/11/2023 to 20/12/2023	6563/9845/16408	Dr. Y. Ramakrishna Shri. Thanmai Paul
Awareness campaign on Third Janjatiya Gaurav Diwas (National Tribal Day)	Car Nicobar	24/11/2023 to 25/11/2023	40/40/80	Dr. Y. Ramakrishna Shri. Thanmai Paul
Awareness program on the conservation of sea turtle nesting and habitats	Car Nicobar Island	29/11/2023 to 6/12/2023	85/20/105	Dr. R. Kiruba Sankar
Controlled breeding and artificial insemination in goat	Namunaghar, South Andaman	4/12/2023 to 8/12/2023	18/22/40	Dr. P. Perumal Dr. A. K. De Dr. T. Sujatha Dr. P. A. Bala Dr. K. Muniswamy Dr. R. R. Alyethodi Dr. Y. Ramakrishna Dr. Jai Sunder Dr. D. Bhattacharya
Awareness programme on 'World Soil Day and Agromet Advisory Services'	Shoalbay, South Andaman	5/12/2023	12/18/30	Dr. T. Subramani Dr. Y. Ramakrishna Dr. S. Adamala
Hands on Training on Nursery Techniques of Horticultural Crops (Customized paid training programme)	ICAR-CIARI, Port Blair	11/12/2023 to 13/12/2023	8/3/11	Dr. A.A. Waman Dr. Pooja Bohra Dr. P.K. Singh

Name of the training/ meeting/ campaign programme	Venue	Date	Participants (M/F/T)	Organizing committee/ coordinators
NABARD sponsored training on Kadaknath Murgi Palan	Lalpahad	13/12/2023 to 15/12/2023	25/5/30	Dr. K. Muniswamy Dr. P.Perumal Dr. T Sujatha Dr. A.K. De Dr. R. R. Alyethodi Dr. P.A Bala Dr. Z. George Dr. Y.Ramakrishna Shri. T. Paul
Hands on Training on Nursery Techniques of Horticultural Crops (Customized paid training programme)	ICAR-CIARI, Port Blair	14/12/2023 to 16/12/2023	11/1/12	Dr. A.A. Waman Dr. Pooja Bohra Dr. P.K. Singh
Swachhata Hi Seva campaign	KVK, CIARI, Community Halls, Farms	16/12/2023 to 31/12/2023	110/55/165	Dr. Y. Ramakrishna Dr. Pooja Kapoor Shri. Thanmai Paul
Organic Oyster Mushroom Cultivation	KVK, Port Blair	27/11/2023 to 02/12/2023	8/27/35	Dr. Y. Ramakrishna Dr. Nitu Sindhu Shri. T. Paul
NABARD sponsored training on Kadaknath Murgi Palan	Guptapara	19/12/2023 to 21/12/2023	0/37/37	Dr. K. Muniswamy Dr. P.Perumal Dr. T Sujatha Dr. A.K. De Dr. Rafeeque R Dr. P.A Bala Dr. Z. George, Dr.Y. Ramakrishna Shri. T. Paul
Awareness programme on National Surveillance Programme for Aquatic Animal Diseases	Mannarghat, South Andaman	22/12/2023	10/15/25	Dr. K Saravanan, Dr. S.K.Z. Ahmed, Dr. J. Praveenraj Dr. R.K. Sankar, Shri. D. Karunakaran
Field Day on Scientific Tuber crops cultivation ti improving the food security of Islanders	Sippighat Farm	22/12/2023	30/4/34	Dr. I. Jaisankar Dr. Y. Ramakrishna Dr. Subramani
Kisan Diwas	KVK & farmers field	23/12/2023	15/45/60	Dr. Y. Ramakrishna Dr. Pooja Kapoor Shri. Thanmai Paul
Millet Processing and Value addition	Guptapara	27/12/2023	0/24/24	Dr. Y. Ramakrishna Dr. Pooja Kapoor Dr. E.B. Chakurkar
Agromet Advisory Services in Island Agriculture	Shivpur, Diglipur, N & M Andaman	28/12/2023	28/22/50	Dr. T. Subramani Dr. Abhilash Mr. T.K.Biswas

Name of the training/ meeting/ campaign programme	Venue	Date	Participants (M/F/T)	Organizing committee/ coordinators
Azad Hind Mela 2023	Chouldhari	30/12/2023 to 5/01/2024	1500/2100/3600	Dr. Y. Ramakrishna Dr. Pooja Kapoor Shri. Thanmai Paul

Plate 6. Glimpses of training

Publications

Research Articles

Jaisankar, I., R, Jayakumara, Varadan., Adamala, Sirisha., Blesy, G.M., S. Lakshmana, Prabu., Umamaheswari, A. and Suresh, Ramanan, S. (2023). Phytochemical properties and antioxidant activities of *Pandanus amaryllifolius*. *Indian Journal of Agroforestry*, **25**(2): 112-121.

Kiruba-Sankar, R., Adamala, S., Barman, J., Saravanan, K., Praveenraj, J., Yuvaraj, E., Kumar, G., Zamir Ahmed, S.K. (2023) Aboriginal tribes' knowledge of the endangered freshwater turtle *Cuora amboinensis* from Car Nicobar, a remote oceanic island in the Bay of Bengal. *Fishes*, **8**(10): 517.

Perumal, P., Sunder, J., De, A.K., Bhattacharya, D., Nahak, A.K., Vikram, R. and Chakurkar, E.B. (2023). Seasonal stress on semen quality profiles, seminal biochemical and oxidative stress attributes in endangered Teressa goat of Andaman and Nicobar Islands. *Asian Pacific Journal of Reproduction*, **12** (6): 288-298.

Pradheep, K., R, Parimalan, K., Joseph, John., Muhammed, Nissar, V.A., I, Jaisankar., P.P. Thirumalaisamy. and M, Latha. (2023). A Note on Taxonomy and Genetic Resource Potential of *Oryza meyeriana* var. *indandamanica*, a Rare Wild Relative of Rice from the Andaman Islands. *Indian Journal of Plant Genetic Resources*, **36**(3): 422-428.

Praveenraj, J., Saravanan, K., Uma, A., Kiruba-Sankar, R., Ahilan, B., Gopalakannan, A. and Manikandavelu, D. (2023) .First report of two bacterial diseases from the freshwater fishes of the Andaman Islands, India. *Indian Journal of Animal Research*.doi10.18805/IJAR.B-5237.

Saravanan, K., Praveenraj, J., Kiruba-Sankar, R., Biswas, U., Sarkar, R, Haridas, H. and Qureshi, N,W. (2023) Aquatic animal diseases with awareness and perception of freshwater fish farmers on aquatic animal health management practices in the tropical archipelago of India. *Biologia*. https://doi.org/10.1007/s11756-023-01573-6.

Swarnam, T.P., A, Velmurugan., Subramani, T., Ravisankar, N., Subash, N., Pawar, A.S., Perumal, P., Jaisankar, I. and S, Roy, Dam. (2024). Climate smart crop-livestock integrated farming as a sustainable agricultural strategy for humid tropical islands. . *International Journal of Agricultural Sustainability*, **22**(1), 2298189.

Technical Bulletin/popular article

Jaisankar, I., Jerard, B.A., Damodaran, V., Chakurkar, E.B., Byju, G., Subramani, T., Harinivas, A. and Karunakaran, D. (2023) Prospects of Nicobari Aloo (*Dioscorea alata*l.) cultivation in Andaman and Nicobar Islands, Technical Bulletin. ICAR-CIARI, Port Blair, India: pp27.

Kiruba-Sankar., R, Barman J., Sarav, Trainianan, K., J, Praveenraj., Eswaran Y., Adamala, S. and Meshack, L. (2023) Record of a Hawksbill Sea turtle at Car Nicobar Island, Andaman and Nicobar archipelago. Indian Ocean Turtle Newsletter. 38, 17-19.

Waman, A.A., and Bohra, Pooja. (2023). Promotion of Spices in the Andaman and Nicobar Islands: a Way Forward to Economic Prosperity. *Indian Journal of Arecanut, Spices and Medicinal Plants*, **25**(1): 3-7.

Zamir, Ahmed, S.K., Kiruba-Sankar, R., Karunakaran, D. and Saravanan, K. *et al.,* 2023. Training manual on mud crab fattening and shrimp farming. Department of Fisheries, Andaman and Nicobar Administration, Port Blair. pp. 45.

Book Edited

Waman, A.A., Bohra, Pooja., Singh, Kumar, Pankaj. and Chakurkar, E.B. (2023) *Book of Abstracts. National Conference on Spices, Aromatic and Medicinal Plants for Economic Prosperity and Ecological Sustainability (SAMPEPES-2023),* ICAR-CIARI, Port Blair, October 5-6, 2023, pp. 1-126.

Book Chapter

Bohra, Pooja. (2023) Mangosteen (*Garcinia mangostana*). In: P.E. Rajasekharan, V.R. Rao (eds.), Fruit and Nut Crops, Handbooks of Crop Diversity: Conservation and Use of Plant Genetic Resources, *Springer Nature,* Singapore, https://doi.org/10.1007/978-981-99-1586-6_14-1.

Gen Bank Accession Number/ Registration Number *etc.*

Jaisankar, I., Subramani, T. and Kumar, Santhosh. (2023). IC numbers 650659 to 650662 for Greater Yam (*Dioscorea alata*) obtained from ICAR-NBPGR, New Delhi.

Jaisankar, I., Subramani, T. and Kumar, Santhosh. (2023). IC numbers 650663 to 650665 for Taro (*Colocasia esculenta*) obtained from ICAR-NBPGR, New Delhi.

Jaisankar, I., Subramani, T. and Kumar, Santhosh. (2023). IC numbers 650666 to 650668 for Kewda (*Pandanus lerum*) obtained from ICAR-NBPGR, New Delhi.

Abstract Published

Jaisankar, I., Damodaran, V., Jerard, B.A. and Chakurkar, E.B. (2023). Influence of plant density on corm yield in elephant foot yam (*Amorphophallus paeoniifolius*) under Island condition. In: Jyothi, A.N. *et al.* (Eds.) Book of abstracts, *National conference on tropical tuber crops for sustainability, tradition, Agri-Food Systems & Resilience* held on November 28-29, 2023 Thiruvananthapuram. p. 67.

Jaisankar, I., Damodaran, V., Jerard, B.A. and Chakurkar, E.B. (2023). A catalogue of greater yam (*Dioscorea alata*) accessions: an initiative towards its conservation. In: Jyothi, A.N. *et al.* (Eds.) Book of abstracts, *National conference on tropical tuber crops for sustainability, tradition, Agri-Food Systems & Resilience* held on November 28-29, 2023 Thiruvananthapuram. p.22.

Praveenraj, J., Saravanan, K., Kiruba-Sankar, R., Karunakaran, D. and Zamir Ahmed, S K. (2023). Success story on Adoption of best management practices in ornamental fish business at Port Blair, South Andaman. Published by ICAR-CIARI. https://ciari.icar.gov.in/ss33.html.

Praveenraj, J., Saravanan, K. and Kiruba Sankar, R. (2023). First report on the parasitic diseases infecting freshwater fishes and crustaceans of the South Andaman Islands, India. In: Paria *et al.*, (Eds.), *Abstract Book. 3rd International conference on aquatic animal epidemiology* (AquaEpi III), ICAR-NBFGR, Lucknow, Uttar Pradesh, India.

Praveenraj, J., Saravanan, K., Uma, A., Sujatha, T. and Kiruba, Sankar, R. (2023). In vitro antibacterial activity of some medicinal plants against bacterial fish pathogens. In: Ajit Arun Waman *et al.* (Eds.), *Book of Abstracts. National Conference on Spices, Aromatic and Medicinal Plants for Economic Prosperity and Ecological Sustainability* (SAMPEPES-2023), ICAR-Central Island Agricultural Research Institute, Port Blair, Andaman and Nicobar Islands, India, pp. 1-126.

Kiruba-Sankar, R., Saravanan, K., Praveenraj, J., Adamala, S., Karunakaran, D., Zamir Ahmed, S.K. and Sarief, M. (2023). Success story on Interventions on Guided Fishing practices to the tribal fisherman of Car Nicobar Island. Published by ICAR-CIARI. https://ciari.icar.gov.in/ss32.html.

Saravanan, K., Praveenraj, J., Kiruba-Sankar, R., Biswas, U., Sarkar, R., Devi, V., Haridas. and Qureshi, N.W. (2023). Deciphering the aquatic animal diseases with awareness and perception of freshwater fish farmers on aquatic animal health management practices in Andaman and Nicobar Islands, a tropical archipelago of India. IIn: Paria *et al.* (Eds.), *Abstract Book. 3rd International conference on aquatic animal epidemiology* (AquaEpi III), ICAR-NBFGR, Lucknow, Uttar Pradesh, India.

Kiruba-Sankar, R., Saravanan, K., Praveenraj, J., Adamala, S., Karunakaran, D., Zamir Ahmed, S K. and Sarief, M. (2023). Success story on Scaling up the initiatives on sea turtle conservation with the indigenous tribal fishermen of Car Nicobar Island. Published by ICAR-CIARI. https://ciari.icar.gov.in/ss31.html.

TOT including Radio Talks/ TV Programme Broadcast

Dr. S.K. Zamir Ahmed participated in the Doordharshan Kendra live program on December 7, 2023 and delivered a talk on the topic "*Agriculture Technologies for Self-Employment: CIARI Initiatives*".

IPRs/Commercialization of Technology

First ever Industrial Design in veterinary parasitology appliance

Animal Science Division of ICAR-Central Island Agricultural Research Institute, Port Blair has registered an Industrial Design in veterinary parasitological appliance named Parasite Egg Concentrator. The invention is unique as this egg concentrator reduces the use of plastic ware by 71.42% and chance of exposure of laboratory personnel. It is also useful for Sheather's sucrose flotation, saturated salt solution, zinc sulphate floatation and formol ether concentration technique and showed 100% sensitivity and specificity. This appliance is useful for field level application.

The team consisted of Dr. Debasis Bhattacharya, Dr. Zachariah George, Dr. Arun Kumar De, Dr. Perumal P., Dr. T. Sujatha, Dr. Jai Sunder and Dr. E. B. Chakurkar.

Industrial Design Registration of coconut leaf mid-rib separator

This Industrial Design is granted for a tool which helps to separate coconut leaf mid rib. This tool is handy, efficient, and labor-saving. Using this tool, one can separate about 500 midribs per hour. Moreover, the midribs obtained through this tool are comparatively cleaner than the traditional method. A team consisting of Dr. I. Jaisankar, Dr. B. Augustine Jerard, Dr. E.B. Chakurkar and Dr. T. Subramani developed the tool.

Patent granted for procedure for preparation of liquid fertilizer and calcium alginate

Patent certificate received for the dual extraction of Ca alginate and sea weed liquid fertilizer from brown sea weed. The team consisted of Dr. T.P. Swarnam, Dr. A.Velmurugan and Dr. T. Subramani, ICAR-CIARI, Port Blair.

Women Empowerment Activities/Trainings

Training on "Use of Women Friendly Agricultural Implements"

ICAR- KVK, N&M Andaman (CIARI) organized three day training programme on "Use of Women Friendly Agricultural Implements" at Dharmapur community Hall under Gram Panchayat Shivapuram from December 29, 2023 to January 1, 2024 for practicing farmers and farm women. The training was inaugurated by Shri. Venkateswara Rao, Pradhan, Shivapuram Gram Panchayat along with PRI members Shri. B. Vijayan Nair and Shri. Jobi. Dr. V. Damodaran, Sr. Scientist and Head, ICAR-KVK, Nimbudera highlighted about KVK mandates and focused the importance of women in present agriculture scenario and appraised them about the special women friendly agricultural tools and equipments for day to day farm activities. He also motivated women to come forward to adopt different subsidiary enterprises *viz.* mushroom production, beekeeping, animal husbandry, poultry farming in the existing plantation based system for effective utilization of resources and get maximum profitability in sustainable manner. Later in three days long technical sessions various aspects *viz.* the role of women in agricultural work, women-friendly agricultural equipment and tools to reduce drudgery, availability of agricultural implements and machines in the market, safety precautions to be followed during the use of advanced agricultural equipment, importance of custom hiring center to promote farm mechanization etc were dealt in detail by the KVK resourse persons. Later demonstration on hand operated equipment was arranged to the trainees. A total of 32 participants including12 women were benefitted from the training. The training was organized by Er. Manoj Kumar SMS Agril. Engg. under the supervision of Dr. V. Damodaran, Sr. Scientist & Head

Participation in Seminars/ Symposia/ Conferences/ Workshop

Name	Programme	Venue and date
Dr. Y.Ramakrishna Dr. Pooja Kapoor Dr. T. Subramani Shri. Thanmai Paul	National Conference on Spices, Aromatic and Medicinal Plants for Economic Prosperity and Ecological Sustainability-2023	ICAR-CIARI, Port Blair during October 5-6, 2023
Dr. K. Saravanan	Inaugural programme of compulsory training course on Coastal and Marine Biodiversity of Island Ecosystem for the IFS Officers	Zoological Survey of India, Port Blair on October 9, 2023.
Dr. K. Saravanan	Meeting for selection of fishers/ fish farmers/ tribals to undergo study tour at mainland held under the chairmanship of Director, Department of Fisheries, UT Administration	Department of Fisheries on October 12, 2023.
Dr. Pooja Bohra Dr. Ajit Arun Waman	International Seminar on Exotic and Underutilized Horticultural Crops: Priorities and Emerging Trends (ISEUHC- 2023)	ICAR-IIHR, Bengaluru during October 17-19, October, 2023.
Dr. S.K. Zamir Ahmed Dr. R. Kiruba Sankar	Participated and presented as co-authors of two posters during the session also attended farmers-scientist interface at Cochin and interaction on collaborative work with BOBP-IGO at Chennai.	XVI Agricultural Science Congress & ASC expo 2023 at Cochin during October 8-14, 2023 for representing ICAR- CIARI, Port Blair

Name	Programme	Venue and date
Dr. R. Kiruba Sankar	Fisheries interface meeting	Department of Fisheries, Andaman and Nicobar Administration on October 21, 2023.
Dr. I. Jaisankar	Meeting to discuss the possibility of obtaining GI tag for Andaman Padauk tree	Vansadan,, Department of Environment and Forests, A&N Adm., Port Blair on November 8, 2023.
Dr. K. Saravanan	Trade test conducted for selection to the posts of Mazdoors in Department of Environment and Forests, Andaman and Nicobar Administration (as observer)	Forest Training Institute, Wimberlygunj on November 20, 2023.
Dr. R. Kiruba Sankar	DST Annual Review Meeting	DST, New Delhi on November 21, 2023.
Dr. R. Kiruba Sankar	STI hub concept on the celebration of National Tribal day event (as presenter	Department of Science and Technology, New Delhi on November 24, 2023 in virtual mode
Dr. I. Jaisankar	National Conference on Tropical Tuber Crops for Sustainability, Tradition, Agri-Food Systems & Resilience	ICAR-CTCRI, Thiruvananthapuram during November 28-29, 2023.
Dr. I. Jaisankar	Mid-term Review Meeting of AICRP on Tuber Crops	ICAR-CTCRI, Thiruvananthapuram on November 30, 2023.
Dr. K. Saravanan	3rd International Conference on aquatic animal Epidemiology (AquaEpi III) (Oral Presentation)	ICAR-NBFGR, Lucknow, Uttar Pradesh, India during November 29 to December 1, 2023.
Dr. S.K. Zamir Ahmed	1st International Extension Education Congress on Rural Transformation and Sustainable Agri-food System through Community Based Organization (CBO) Oriented Extension Strategy (Oral Presentation)	RARI, Durgapur (SKNAU, Jobner), Jaipur Rajasthan during December 18-20, 2023.
Dr. I. Jaisankar	Meeting on Expert Appraisal Committee to evaluate the proposals of Category B-2 Mining projects to be discussed in the SEAC meeting for grant of Environment Clearance, Andaman & Nicobar Administration, Pollution Control Committee	Department of Science and Technology, Port Blair on December 27,, 2023.
Dr. Y. Ramakrishna	XXII National Symposium "Climate Smart Agronomy for Resilient Production Systems and Livelihood Security	ICAR-Central Coastal Agricultural Research Institute, Ela, Goa during November 21-23, 2023

Distinguished visitors

Shri. Sandeep Kumar Mishra, Special Secretary, LPWD and Guardian officer, Minicoy along with Dr. Rahul Rathod, Deputy Collector, Minicoy visited ICAR-CIARI Regional Station, Minicoy farm on October 31, 2023. The visit was coordinated by the scientists of RS Minicoy, Dr. Y. Gladston and Dr. S.M. Ajina under the supervision of Dr. S.K. Zamir Ahmed, PS & Nodal officer .

Personnel

Appointment

- Dr. V. Damodaran, Sr. Scientist-cum-Head KVK, Nimbudera on October 3, 2023.
- Shri. Santosh kumar, Sr. Scientist-cum-Head KVK, Nicobar on October 20, 2023.

Transfer

- Dr. N. Bommayasamy, Sr. Scientist-cum-Head KVK transferred to ICAR-CCARI, Old Goa on October 4, 2023.
- Dr. Bijaya Kumar Nanda, SMS transferred to ICAR-KVK, South Tripura on November 3, 2023.
- Dr. Sirisha Adamala, Scientist transferred to ICAR-NBSSLUP, Nagpur on December 15, 2023.
- Dr. V. Baskaran, Pr. Scientist transferred to ICAR-IIHR, Bangaluru on December 15, 2023.
- Dr. K Abirami, Pr. Scientist transferred to ICAR-IIHR, Bangaluru on December 20, 2023.

Superannuation

- Shri. Sunil Chakraborty, STA on November 30, 2023.
- Smt. K. Mangaiamma, SSS on November 30, 2023.
- Smt. Radha, SSS on November 30, 2023.

Published by	:	Dr. Eaknath B. Chakurkar, Director
Compiled & Edited by	:	Dr. Jai Sunder, Shri. D. Karunakaran and Dr. Ajit Arun Waman
Typesetting & Designing	:	Mrs. Asma Bibi and Mrs. Nazneen Khan
Photo	:	Mr. K. Ali Akbar
Address	:	ICAR-Central Island Agricultural Research Institute Port Blair-744105, A & N Islands
Phone No	:	03192-250436
Website	:	https://ciari.icar.gov.in/
E-mail	:	director.ciari@icar.gov.in