

# ISLAND AGRICULTURE

## ICAR-CIARI NEWSLETTER



ICAR-CENTRAL ISLAND AGRICULTURAL RESEARCH INSTITUTE

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अंडमानतथानिकोबारद्वीपसमूह, भारत

Andaman and Nicobar Islands, India



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### *From Director's Desk*

The first quarter of the year 2021 brings significant research output and witnessed important events in Island Agriculture. Our Scientists have developed new value-added products from native plants, identified potential ornamental palm, revealed genetic diversity among banana genotypes, variability in padauk, diversity in Greater yam, developed a new rice line suitable to island condition which is resistant to bacterial blight. Under farmers participatory seed production programme both truthfully labelled seed and breeder seed of CARI Dhan varieties have been produced and propagated to other needy farmers of South & North & Middle Andaman district. Studies conducted on changes of social dimension having effect on land degradation showed that the construction activities were the major factor responsible for the degradation of the agricultural land. The islands group is endemic to unique medicinal plants with wide range of ethno-botany and ethno-veterinary uses. Our scientists have identified milk wood tree (*Tabernomontana crispa*) as immune-modulatory potential for the rural poultry. Feeding of crude leaves extracts enhanced immunity in the rural poultry which can be a very good source as herbal immunity booster. A new report of copepod, *Bomolochusde capteri* is reported from the marine fish *Ariomma melanum*, which is new to the science.



During the period, our institute have conducted number of important target-oriented training programmes on post-harvest and value addition, home gardening, use of native horticultural plants, vegetable cultivation, dragon fruit technology, immunity boosting crops and a unique five tier programme on avian influenza. Along with rest of the country, we celebrated the 72<sup>nd</sup> Republic Day, International women's day, world water day, Science Day etc. Our scientists have conducted number of field days, demonstration, interactive meetings and training on various aspects of agri/horti/animal/fish sectors for the benefit of the farmers throughout the A & N Islands. Immense contribution to the Island agricultural sector through technical support were provided to the line departments and other stakeholders. I am happy to present this compilation of significant milestones in our activities during the quarter and congratulate all the contributors for this documentation.

I take this opportunity to thank all the staff members of our institute for their tireless effort and productive contribution for growth and development of the institute and Island Agriculture.

## Research highlights

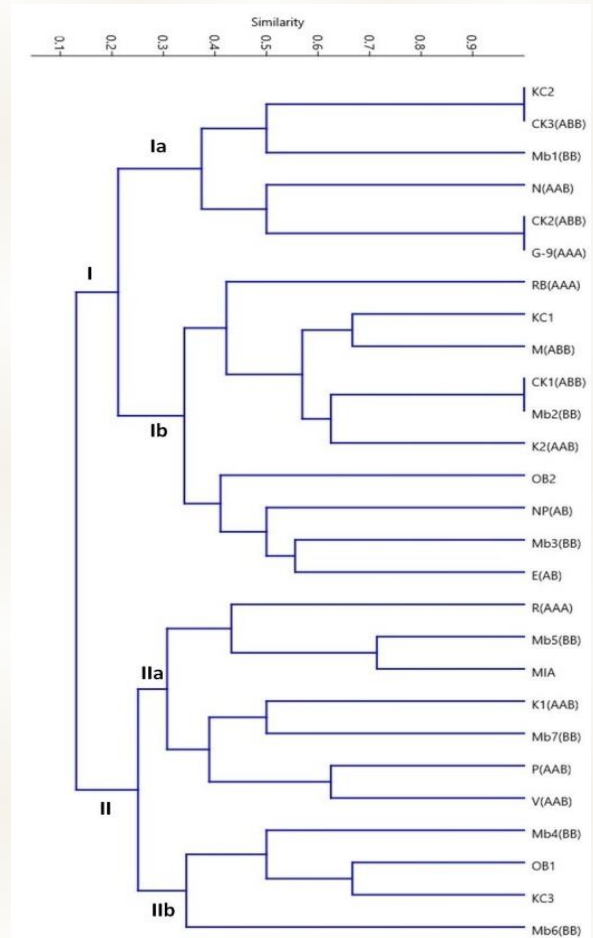
### Value added products from native species

To popularize native underutilized horticultural species, value added products such as mango ginger paste, dehydrated shreds of mango ginger, sweetened rind, syrup and dehydrated rind of Andaman Kokum were prepared without addition of any synthetic preservatives. These products could help in diversifying income avenues for the island farmers apart from providing newer flavours to the tourists.



### Genetic diversity analysis of *Musa* germplasm using molecular marker

Genetic diversity was studied among 27 *Musa* genotypes including cultivars of mainland India and the wild relatives of Andaman and Nicobar Islands based on UPGMA method of cluster analysis. By using Jaccard's similarity co-efficient, dendrogram was generated from 8 SSR marker data (Fig. 1). Two major clusters, Cluster I and II were obtained with 16 and 11 *Musa* genotypes at Jaccard's similarity co-efficient of 0.13, respectively. Cluster I was further divided into sub-clusters, Ia and Ib at Jaccard's similarity co-efficient of 0.2 with 6 [Katta champa- KC (NB1); Cheenakela- CK (CQ); Wild banana - WB (NVC); Nendran; Cheenakela- CK (NB); Grand-Naine] and 10 [Red banana; Katta champa; Monthan; Cheenakela- CK (C); *Musa balbisiana*- MIA (1C); Korangi (C); Ornamental banana [OB



(Oxz); Ney poovan; *Musa balbisiana*- MIA (2C); Elakki] *Musa* genotypes, respectively. Cluster II was further divided into sub-clusters, IIa and IIb at Jaccard's similarity co-efficient of 0.27 with 7 [Robusta; Wild banana - WB (*Musa balbisiana*); Wild banana - WB (*Musa inandamanensis*.); Korangi (A); Wild banana - WB (SG2); Poovan; Virupakshi] and 4 [*Musa inandamanensis*- MIA (3A); Ornamental banana - OB (Rx2); Katta champa- KC (NB2); Wild banana - WB (SG1)] *Musa* genotypes, respectively.

### DNA bar-coding and phylogeography of Andaman padauk

DNA analyses and phylogenetic investigations conducted among Andaman padauk (*Pterocarpus dalbegioides*) accessions collected from various places of Andaman Islands and other of

*Pterocarpus* spp. revealed that Andaman padauk is close to *Pterocarpus indicus* (Indonesia), *Pterocarpus indicus* (China), *Pterocarpus santalinus* (India), *Pterocarpus marsupium* (India), and *Pterocarpus soyauxii* (Cameroon).

### Variability among the hollowness and without hollowness in padauk

An exploratory survey conducted to identify the felled Padauk tree with and without hollowness stumps from South Andaman and North and Middle Andaman District forest area has revealed wide variability for the morphological traits with respect to level of hollowness, production of coppices etc. Twenty-four coppice samples were collected from selected stumps at different locations of Andaman Islands to study the DNA level variability among the hollowness traits.



### Collection, conservation and in-situ characterization of *Pinanga andamanensis*

An endemic palm *Pinanga andamanensis* is having potential for ornamental purpose, distributed in South Andaman district was collected for conservation. The palm possesses solitary, slender stem, opposite leaflets and produce brownish pink coloured fruits. Flowering observed during October-November and fruit matures during March -May. The rachis bears about 1200 seeds, distributed in opposite

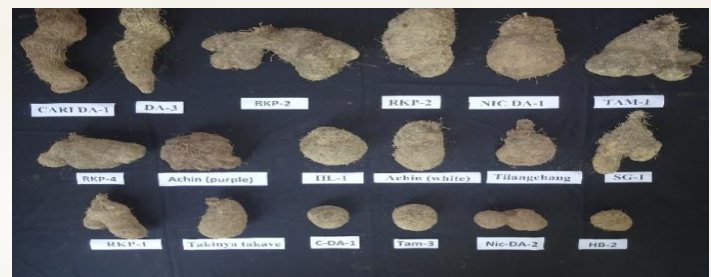
direction, pulp is edible and is feasted by Civet cat and aids in natural regeneration from seeds. The palm seeds were collected and subjected to different regeneration treatments.



### Characterized Greater Yam diversity

The conserved germplasm of Greater Yam was characterized for tuber morphology for catalogue preparation. The documentation revealed wide variability of these tubers at the h= gene bank of CIARI which has immense potential for use in crop improvement programmes. The tubers were further planted for recording DUS characterization on vegetative traits. The germplasm included the farmers varieties of Nicobari Aloo collected from Nicobar which has been recognized by PPVFR Authority by considering for Plant genome saviour Award. The tuber samples were also deposited for conservation with ICAR-CTCRI and the applications are in process for registration as farmer's varieties.

### New rice line developed



An early duration (120 days) rice line ANR 47 was developed. It is a dwarf statured (104 cm), short slender grain and high yielding (5.13 t/ha) rice line for rainfed lowland conditions of Andaman and Nicobar Islands. It has medium panicle length (22 cm) and bears 7-8 effective tillers (panicle bearing) per plant. It is resistant to bacterial leaf blight disease, a severe disease of rice in Andaman and Nicobar Islands.

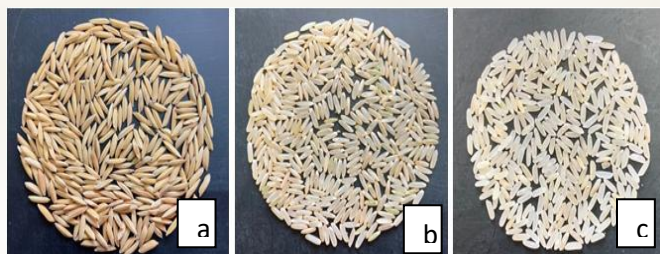


Plate 1: A new elite rice line, ANR 47 a) Paddy b) Milled rice and c) Polished rice

### Seed production of rice under farmers participatory

Under farmers participatory seed production programme a total of 46.9q truthfully labelled seed of rice (CARI Dhan 2, CARI Dhan 5, CARI Dhan 6, CARI Dhan 7, CARI Dhan 8, CARI Dhan 9, CSR36 and Gayatri) of CIARI varieties were produced at North and Middle Andaman.

### Breeder seed production of rice

A total of 42 kg of nucleus seed of 9 rice varieties (CARI Dhan 1, CARI Dhan 2, CARI Dhan 3, CARI Dhan 4, CARI Dhan 5, CARI Dhan 6, CARI Dhan 7, CARI Dhan 8 and CARI Dhan 9) and 319 kg of breeder seed of 12 rice varieties were produced at Bloomsdale Research Farm, CIARI, Port Blair.

### Social dimension of changes having effect on land degradation

The household survey indicated that among the seven identified activities construction of infrastructure, protective structures and new concrete houses were carried out by 40% of the respondents mostly by clearing plantations or encroaching into natural vegetation. These sites were mostly located in the severe erosion category areas. The other prominent activity was intensive cultivation of vegetables in hill slopes and interspaces of coconut gardens which were one of the prominent changes occurred during the post-tsunami period. In addition, hilly uplands were cut to fill the adjoining low lying areas using the excavated soils. These two activities were carried out by 28% of respondents in each case across the islands which become necessary to compensate the loss of agricultural land due to water logging and salinity.

Further, several new houses and shops were constructed in the hill slopes nearby tsunami settlements that contributed to 84.6% increase in urban/settlement areas during 2006-2019. This paved the way for sand mining and quarrying activities which was evidenced from increased area under mining from 5 km<sup>2</sup> to 24 km<sup>2</sup>. This resulted in forest degradation, severe erosion, landslides and sedimentation of near shore areas. More prominently, the island witnessed increased demand for land from tourism industry and vegetable cultivation that probably forced the farmers to cultivate the hill slopes and interspaces of coconut gardens. The effect can be evidenced from 3.5% loss in forest cover during the period. Marine and coastal fishing constitutes one of the major livelihood activities which were evidenced from the significant increase in dependency on mangroves (22%) and coastal area (18%) for livelihood. Consequently the study area witnessed forest degradation, accelerated erosion, coastal salinization and water-logging.

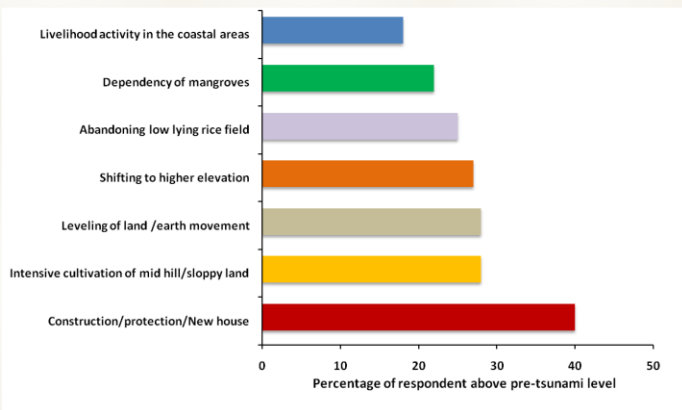


Fig 2: Comparative assessments of human activities responsible for accelerated land degradation

### Exploration of immunomodulatory potentiality of tree leaves in poultry

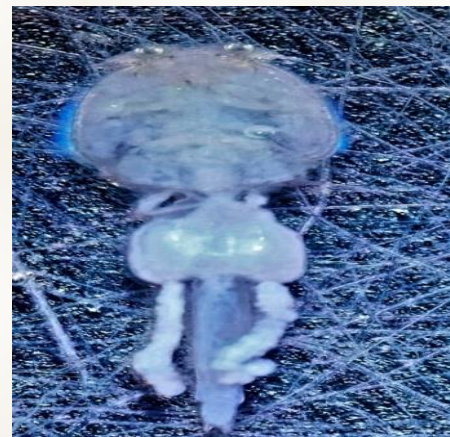
Milk wood trees (*Tabernamontana crispa*) is a flowering plant having pan-tropical distribution and has proven record of medicinal effect in human. To explore the immunomodulatory potentiality of leaves of milk wood tree in poultry, a controlled experiment was undertaken through feeding of 6.1 mg of crude leaves extract from brooding stage. Result suggested that, after feeding of leaf extract there was 1.33 fold increase in immunity compared to control group and birds reared on conventional antibiotic supplementation.



Milk wood tree (*Tabernamontana crispa*)

### Identification of new parasite

A new record of copepod parasite, *Bomolochus decapteri* Yamaguti 1936, is reported from *Ariomma brevimanum* (Klunzinger, 1884) for the first time from the Andaman Islands. The parasites specimens were found attached to the gill lamellae of the host. A total of 6 specimens were recovered from gills, comprising only females. The mature females were identified by the presence of egg pouches. Copepods are of significance in cage culture of marine fishes, as they cause mortality and morbidity by feeding extensively on the body surfaces and gill portion. The area of attachment on the host, also pave way for the secondary pathogens to infect.



A female, *Bomolochus decapteri*

### Training/awareness programme

#### Skill development through value added fishery products

A training programme on skill development through value added fishery products was conducted from 25<sup>th</sup> – 29<sup>th</sup> January, 2021 in collaboration with NABARD, Port Blair & Krishi Vigyan Kendra, South Andaman, wherein 14 participants from different villages of South Andaman have participated. Hands-on training was given to the participants on development of

value added fishery products from the low value fishes. Besides, the trainees were also given exposure to a fish processing facility at Dollygunj.



### Demonstration on immunity boosting fruits and herbs

Women's cell of Institute in collaboration with NABARD conducted a demonstration programme on Immunity boosting fruits and herbs for urban households on 2<sup>nd</sup> February, 2021. The event was inaugurated by watering the plants of herbal spices signifying their contribution in fighting the pandemic across the globe.

The participants were visited Institute demonstration unit, wherein different immunity boosting plants suitable for growing in urban spaces including balconies, terraces and backyard were showcased. Besides, they also visited the Horticultural Plants Propagation Unit of the institute wherein scientific methods for production of seeds and planting material of various fruits and spices were demonstrated. Technologies developed by the institute viz. cultivation of Burmese coriander in pro-trays (CIARI-Pro Dhaniya) and multitier cultivation models were also explained to them. The event was attended by a heterogeneous group of eighteen participants including budding entrepreneurs, farmers, postgraduate students and employees of the institute. The event was concluded by distribution of planting material among participants such as passion fruit, long pepper, mango ginger and Burmese coriander.



### Five tier awareness programme on avian influenza

Institute in collaboration with Department of Animal Husbandry and Veterinary Services, A&N Administration conducted five tier awareness on avian influenza was conducted on 3<sup>rd</sup> February, 2021 at DBT-Biotech Kisan Hub of Institute. The five tier awareness was mainly aimed to disseminate awareness among five categories viz., general public, retail sellers, poultry farmers, entrepreneurs and veterinary officers. A total of six senior veterinary officers, 30 participants including small poultry entrepreneurs and progressive farmers attended the programme.



### Fishery wastes for by product development

Institute conducted an awareness programme on potential of fishery wastes for by-product development at Junglighat fish landing centre on 12<sup>th</sup> February, 2021 to sensitize the fisher folk regarding the potential of fishery wastes in processing and by-product development such as fish meal, fish silage, fish oil, etc. The programme

was conducted in collaboration with Department of Fisheries, Andaman and Nicobar Administration & NABARD. They were also sensitized about PMMSY scheme and its role for the benefit of fishermen community. A total of 27 fisher folk participated in the programme.



### Identification of commercially important marine fish species of Andaman Islands

Institute in association with the Department of Fisheries, A&N Administration conducted a training programme for the staff of Department of Fisheries on identification of commercially important marine fish species of Andaman Islands at ICAR-CIARI Campus, Marine Hill from 15<sup>th</sup> to 20<sup>th</sup> February, 2021. The programme was conducted as a part of implementation of online fish catch data collection project of ICAR-CMFRI in Andaman and Nicobar Islands. The trainees were provided with the theoretical and practical knowledge on subject. The trainees were also taken to the fish market and fish landing centre at Junglighat for the field level identification of the commercially available fishes. A total of 15 officials from the Department of Fisheries have participated in the training programme.



The Second batch of training programme on same subject was also conducted from 1<sup>st</sup> to 6<sup>th</sup> March, 2021. Wherein, a total of 20 officials from North and Middle Andaman have participated.

**Organic production and post-harvest management of spices** Three days training programme on “Organic Production and Post-Harvest Management of Spices” was conducted by ICAR- Central Island Agricultural Research Institute (CIARI) in collaboration with Directorate of Spices and Arecanut Development Board (DASD) at Surabi NGO, Caddlegunj. The

programme was inaugurated on 25<sup>th</sup> February, by Dr. Augustine B. Jerard, Director, ICAR-CIARI in the presence of Rev. Bro. Simolin Ferk, Director, Surabi. About 65 participants from different parts of South Andaman attended the training programme on spices. Lectures were delivered on organic production of spice crops like ginger, turmeric, cinnamon, clove, nutmeg, black pepper and chillies, Entrepreneurship opportunities for organic spice production and its processing. Practical demonstration of cinnamon peeling was also done for the benefit of the participants. ICAR-CIARI distributed the planting material of spice crops to the participants.



### Training on Native horticultural genetic resources of Nicobar group of islands

A three days training programme on “Identification, Conservation and Popularization of Native Horticultural Genetic Resources of Nicobar Group of Islands” under the National Academy of Science, India (NASI), ICAR-CIARI, Port Blair from 4<sup>th</sup> to 6<sup>th</sup> January, 2021 at Community Hall, Kinyuka Village, Car Nicobar. The Chief Guest, Shri. Roderick, 1<sup>st</sup> Headman, Kinyuka village in his inaugural address, expressed his appreciation for the efforts taken by ICAR-KVK, Nicobar and ICAR-CIARI, Port



Blair in creating awareness at grass-root level on identification, conservation, popularization of the indigenous germplasm of Nicobar among Nicobarese and registering the same at national level. During the training, different schemes of GoI pertaining to Agriculture were also explained for the benefit of tribal farmers of Nicobar. An exposure visit was also organized for the trainees on 5<sup>th</sup> January, 2021 to farmer's field in order to make them witness, hear and believe the success stories of respective farmers in improving and increasing the productivity of native horticultural germplasm through practicing scientific cultivation methods. A total of 30 Nicobari farmers including 16 women attended and got benefitted from the training. NASI training.

### Training on Improved techniques of horticulture

Two days training programme on “Improved horticulture techniques as an income earning venture for tribal community” was conducted at Harminder Bay, Little Andaman during 23<sup>rd</sup> - 24<sup>th</sup> March, 2021 which was attended by 52 Nicobari tribes (Male 23; Female 29). The cultivation technologies of different horticultural crops like fruits, vegetables, flowers and spices were elaborated to farmers. The production technology of dragon fruit was discussed in detail for the benefit of the participants.





### Training on Homestead farming of horticulture crops

A training programme under NASI project was organized on “Homestead farming of horticulture crops for nutritional security of tribal community” at Harminder Bay, Little Andaman on 25<sup>th</sup> March, 2021. Nursery production of vegetables and flowers, kitchen gardening practices and production technology of different horticulture crops were briefed to the farmers. Distribution of inputs like vegetable seed kits, flower seeds and papaya seeds were distributed to tribal farmers of Harminder Bay. In participatory mode, nursery beds were prepared and seeds of flowers, vegetables and papaya were sown. Cucurbitaceous vegetables were sown and all the techniques of cultivation were practically demonstrated.



### Technology & Machinery Demonstration cum KVK Kisan Mela

A technology, machinery demonstration cum kisan mela was organized on 12<sup>th</sup> March, 2021 under the AICRP on PHET at KVK, Sippighat, South Andaman in which the demonstrations on various machineries for farm mechanization and crop processing were demonstrated. Particularly, the farmers have shown keen interest on the coconut processing technologies and farm mechanization tools such as power tiller, palm climbing machine, coconut grater, milk expeller, VCO production at home etc. Awareness given on

the technologies available for processing farm products and value addition. The farmers have also displayed their value added food products from fruits, vegetables, coconut and fish during the events. Dr. B. Augustine Jerard, Director, CIARI, has attended the meeting as Chief Guest and congratulated the KVK staff for organizing the Kisan mela. Dr. Ramakrishna, Head, KVK-SA, Dr. Damodaran, ACTO, Dr. LB. Singh, Dr. BK. Nanda and Dr. Bommayaswamy, SMSs have coordinated multiple events during the mela.

### National Horticultural Fair

The Institute has actively participated in the National Horticultural fair held from 8<sup>th</sup> to 12<sup>th</sup> February, 2021 organized by ICAR-IIHR, Bangaluru on virtual mode. The programme was held at Dr. T. R. Dutta conference hall, ICAR-CIARI for the online sessions. Dr. D. Bhattacharya, Director I/c; Dr. S. K. Zamir Ahmed, Pr. Scientist & Nodal officer, NHF; All HoDs; Dr. Y. Ramakrishna, PC KVK, SA; All I/c KVKs; other committee members; other panelists have participated in the deliberations. The Fair conducted by ICAR-IIHR consisted technical sessions which described the prospects of different crops like fruits, vegetables, flowers, medicinal crops, plantation crop and given the live streaming on it. Further, the Institute has described the technologies for polyhouse vegetable production, Basic sciences, Agricultural Engineering also showcase our technologies to our farmers through video clips on dragon fruit, floriculture, coconut, brinjal and woody pepper. Several farmers from all the three districts have participated in the online sessions and benefited.

### Launching of specialty flowers cultivation technology

ICAR-CIARI in collaboration with NABARD, Port Blair, launched the project on “Cultivation and



value addition of cut flowers for entrepreneurship development in A & N Islands at Andaman and Nicobar Co-operative Union, Teylerabad for the benefit of self-help group members on 22<sup>nd</sup> February, 2021. The programme was inaugurated by Honorable Member of Parliament, Shri. Kuldeep Rai Sharma, chief guest of the function in the presence of Dr. Augustine B. Jerard, Director, ICAR-CIARI and Shri. Mashar, General Manager, NABARD as guest of honours. The planting material of specialty flowers comprised 12 different types were

### Health management of rural poultry and goat through ethno veterinary practices

A training was conducted by KVK in association with ICAR-CIARI, Port Blair on 15<sup>th</sup> March, 2021 at Kinyuka village (28 female farmers), 16<sup>th</sup> March, 2021 at Tapoiming village (30 Nicobari Farmers) and on 17<sup>th</sup> March, 2021 at Small Lapathy village (30 Nicobari farmers) got benefitted.

planted in the premises of ANCOU in an area of 550 m<sup>2</sup>. This cut flower model unit will be maintained by SHG members and the flowers from the field will be utilized for making value added products and further commercialization. The Chief Guest and Guest of Honors initiated the model cut flower unit by planting Heliconia genotypes.

### Backyard poultry farming

A training was conducted by KVK, Car Nicobar in association with Division of Animal Science, ICAR-CIARI, Port Blair from 23<sup>rd</sup> to 25<sup>th</sup> February, 2021 at Chukchucha village, Car Nicobar. A total number of 32 Nicobari farmers including 25 females got benefitted.



### Modelling the farming systems of Villupuram and Virudhunagar districts of Tamil Nadu for sustainable income and food security

The complexities of smallholder farming systems pose a challenge in demonstrating the

potential benefits or risks of new technologies and policies. Using Integrated Analysis Tool (IAT), a rule-based dynamic simulation model, a study has been conducted to improve the performance of major farming systems in semi-arid Tamil Nadu State of India. Four farming systems *viz.* black gram based (BFS), paddy based (PFS) and integrated farming systems (IFS) in Villuparam district and dryland farming system (DFS) in Virudhunagar district were identified and characterized through focus group discussions, household surveys and secondary sources. It is concluded that agricultural policy must not only focus on potential interventions that are profitable, but also consider what is acceptable to the farmer, considering synergies and trade-offs between competing resources at farm-level.

### Bio-tech Kisan Hub

Under Bio-tech Kisan Hub project, egg incubators of 240 egg capacity have been installed at the residence of three Farmer Fellow Ambassadors (FFA) *viz.* Smt. Joshna at Nayagaon, Smt. Meenakshi at Indira Nagar and Smt. Binita Singh at New Wandoor. The units were inaugurated by Dr. B. A. Jerard, Director in the presence of Dr. Jai Sunder, Principal Investigator cum Hub facilitator and all the project team members. A survey has been undertaken to assess the utilization of the incubators in accordance with the objectives of the project. The FFAs are highly motivated to develop poultry farming on a commercial scale. The incubators are properly maintained in operational mode. They meticulously collect eggs from the neighbourhood and even from distant places; and provide hatching service for country fowl and duck to farmers; and Quail to CIARI at remunerative price. The hatching efficiency of incubators is 90-93%. FFAs are earning handsomely from a) hatching services @ Rs.7 to 20/egg, b) sale of chicks @ Rs.50 for 1 day old, Rs.100 for 15 days old, Rs.120 for 1 month old and on weight basis thereafter. FFAs expressed the need to increase the capacity of

incubator in future to meet the overwhelming demand for hatching from the neighbourhood.



### Mera Gao Mera Gaurav ( MGGG)

Team No.9 comprising of Dr. T.P. Swarnam, Dr. Pooja Bohra, Dr. K. Muniswamy and Mr. Benny Varghese visited Ferrargunj, Caddlegunj, Aniket and Miletilak villages and created awareness among farmers about safe use of pesticides in vegetable crops. They collected vegetable samples for residue monitoring and distributed literature on adverse impact of off-label usage of pesticides. They also facilitated analysis of soil and water samples of a site for brackish water aquaculture.

### Other Programme

- Workshop cum demonstration on rural poultry and duck were conducted on 9<sup>th</sup> February, 2021 at Nimbutala, 10<sup>th</sup> February, 2021 at Dukenagar, 11<sup>th</sup> February, 2021 at Betapur, 12<sup>th</sup> February, 2021 at Keralapuram, Diglipur, 13<sup>th</sup> February, 2021 at Milangram, Diglipur and on 22<sup>nd</sup> February, 2021 at Shoalbay, wherein 88 farmers got benefitted.
- Training-cum-Awareness on Cultivation of pulses in rice fallow of North and Middle Andaman conducted at Madhupur, North Andaman on 9<sup>th</sup> January, 2021 wherein a total of 25 (20 male & 5

female) Farmers of South Andaman were participated.

- Seed day cum seed distribution of Pulses organized at Rangat, Middle Andaman on 7<sup>th</sup> Jan., 2021, wherein a total of 55 farmers (45 male & 10 female) of Middle Andaman were participated.
- Field day on high yielding varieties of pulses conducted at Garacharma farm of ICAR-CIARI, Port Blair 10<sup>th</sup> Jan., 2021, wherein a total of 70 (9 male & 61female)farmers of South Andaman were participated.
- Two days Human Resource Development programme (HRDP) Rabi 2020-21 organized by CIPMC, Port Blair at ICAR-KVK, Sippighat, South Andaman from 16<sup>th</sup> Feb. to 17<sup>th</sup> Feb, 2021 in which over 40 farmers; officials from ICAR-KVK, SA have participated. Training cum demonstration programme on Integrated Pest Management Vegetable crop was conducted, the training literature was provided to all the trainees by CIPMC officers.
- Training programme on “Enhancement of Pig production with management of Piglet anemia” was conducted from 2<sup>nd</sup> to 6<sup>th</sup> February, 2021 at the Institute.
- Training programme cum frontline demonstration on humpsore treatment to improve reproduction and production performance in cattle from 9<sup>th</sup> to 13<sup>th</sup> February, 2021. Technical sessions consisting preventive measures and various effects of humpsore on production/ reproduction in dairy cattle were discussed.
- Workshop on stress management, immunity boosting &balanced life

through Sahaja Yoga meditation was conducted at ICAR-CIARI, Port Blair Garacharma campus for staff from 15<sup>th</sup> to 20<sup>th</sup> March, 2021.

### Scientific Advisory Committee (SAC) meeting

The Scientific Advisory Committee meeting for the three Institute KVKs (ICAR- KVK, SA; ICAR-KVK, N&M; ICAR-KVK, Car-Nicobar) was held under the Chairmanship of Dr. B. A. Jerard, Director, CIARI on 30<sup>th</sup> March, 2021 through online mode. Dr. Das, Principal Scientist and representative of Director, ATARI, Kolkata; farmers from S. Andaman; Line department officials from Departments of Agriculture, Animal Husbandry, Fisheries, Environment, Forestry& Climate Change; Doordarshan have participated and contributed in the deliberations. Dr. Y. Ramakrishna, Head, ICAR-KVK, SA; Dr Zachariya George, I/c Head, ICAR-KVK, Nicobar; Er. ManjoKumar, I/c Head, KVK, Nimbudera other SMSs of KVK have made presentations on the ongoing activities. Review of achievements undertaken and Action Plan for 2021-22 was finalized.

### Participation in National Seminars/Symposia/ Conferences/ Workshop/Training

- Dr. K. Abirami, Sr. Scientist attended International symposium on “Flavours, Fragrances and Functional Foods (SYMSAC X) held during 9<sup>th</sup>-12<sup>th</sup> February, 2021.
- Dr. K. Abirami, Sr. Scientist attended two days virtual training programme on “Management of fruit genetic resources” during 1<sup>st</sup> - 2<sup>nd</sup> February, 2021 organized by NBPGR in collaboration with AICRP on fruits

- Dr. K. Abirami, Sr. Scientist attended the 04 days “VIII<sup>th</sup> Annual AICRP group meeting on Fruits” from 3<sup>rd</sup> to 6<sup>th</sup> March, 2021 (Virtual mode).
- Dr. Ajit Arun Waman and Dr. Pooja Bohra, Scientists participated National E-Conference on “Biodynamic Calendar and Technological Intervention for Horticulture Sustainability and Health Security in Changing Climate” College of Horticulture, Bidar (UHS Bagalkot) and Melhorn Books, New Delhi January 21<sup>st</sup> to 23<sup>rd</sup>, 2021.
- Dr. Ajit Arun Waman, Scientist participated International Symposium on Spices and Aromatic Crops- X Indian Society for Spices, Kozhikode 9<sup>th</sup> -12<sup>th</sup> February, 2021.
- Dr. I. Jaisankar, Senior Scientist attended 70<sup>th</sup> meeting of Project Screening Committee (PSC-II) of National Medicinal Plant Board, New Delhi and presented revised project proposal on “Bio-prospecting of Pandanus sp.(Kewda) of Andaman and Nicobar Islands for its medicinal properties” for financial assistance held on 19<sup>th</sup> January, 2020 through on-line mode.



- Dr. P. K. Singh, Pr. Scientist participated in a training programme on “Maintenance Breeding in Field Crops” (online) on 19<sup>th</sup> January, 2021, which was conducted by ICAR-Indian Institute of Seed Science, Mau and ICARI-IARI Regional Station, Karnal.
- Dr. P K Singh, Pr. Scientist participated in a QRT meeting of ICAR Seed Project (online)

on 25<sup>th</sup> January, 2021, which was conducted by ICAR-IISS, Mau.

- Dr. T. Sujatha, Sr. Scientist participated in a Symposium on Promising Genetic and Genomic Technologies-Frontier in Selection and Animal Improvement from 27<sup>th</sup> -28<sup>th</sup> , January, 2021, which was conducted by TANUVAS, Tamil Nadu and Kerala Veterinary and Animal Sciences University.
- Dr. P. K. Singh, Pr. Scientist participated in AICRP Mushroom Review Meeting (online) on 29<sup>th</sup> January, 2021, which was conducted by ICAR-DMR, Solan.
- Dr. S.K. Zamir Ahmed, Pr. Scientist and Dr. R. Jaya Kumaravaradan, Scientist participated in the International webinar on “Food System Approach to Nutritional Security: Role of Agricultural Higher Education System in India” on 06<sup>th</sup> February, 2021, organized by Department of Agricultural Economics and Extension, PAJANCOA&RI, Karaikal, Puducherry .
- Dr. Kiran Karthik Raj, Scientist participated in campus training programme on Tracer Techniques Related to Carbon Isotopes and its use in Monitoring Change in Soil Organic Matter from 11<sup>th</sup> - 20<sup>th</sup> Feb., 2021, which was conducted by ICAR-IARI, New Delhi.
- Dr. T.Sujatha, Sr. Scientist participated in a Symposium on Coastal Agriculture: Transforming Coastal Zone for sustainable food and income security (online) from 16<sup>th</sup> -19<sup>th</sup>, March, 2021, which was conducted by ISCAR.
- Dr. K. Saravanan and Miss Sreepriya Prakasan, Scientists participated in a online training programme on Phenotypic and molecular methods for detection of Antimicrobial Resistance (AMR) from 17<sup>th</sup> -

- 19<sup>th</sup> March, 2021, which was conducted by ICAR-NBFGFR and ICAR-CIFT.
- Dr. R. Jaya Kumaravaradan, Scientist attended the webinar on “Water use in agriculture and future challenges” on 23<sup>rd</sup> March, 2021 organized by Division of NRM on the occasion of World Water Day.
  - Dr. Pooja Bohra participated in Online training Programme on "Enhancing Research Skills and Refinement of Technology by a Scientist" from January 18<sup>th</sup>-20<sup>th</sup>, 2021 organized by ICAR-Indian Institute of Horticultural Research, Bengaluru.

#### **Important meetings attended by Dr B. Augustine Jerard, Director (A), CIARI**

- 01/01/2021: Review meeting attended under the Chairmanship of Hon'ble Agriculture and Farmers Welfare Minister followed by New Year Address.
- 05/1/2021: Virtual Meeting on the occasion of ICAR-CPCRI Foundation Day and participated in the discussions on description for technology interventions about coconut based food and products.
- 05/01/2021, 08/01/2021, 12/01/2021: Meeting attended to review the progress on the implementation of Prime Ministers Formalization of Micro food processing Enterprises Scheme (PMFME) at Chamber of Secretary (Agri.), Secretariat, A & N Administration along with Dr. Zamir Ahmed, Pr. Scientist & Nodal Officer, PMFME, Dr. L. B. Singh, Head KVK-SA and Dr. Sreepriya Prakasan, Scientist. Reviewed of DPR for establishment coconut based incubation centre for south Andaman at Krishi Vigyan Kendra, Sippighat
- 18/01/2021: Attended and chaired the 56th meeting of State Level Technical Committee of HVADA for sanctioning subsidies to the farmers to achieve the target of the Second quarter of the financial year 2020-21.
- 22/01/2021: Attended 2nd meeting of “State Level Approval Committee (SLAC) for Centrally sponsored scheme “Prime Minister Formalization of Micro food Processing Enterprises (PMFME) in the Islands at Secretariat, A & N Administration along with Dr. S. K. Zamir Ahmed, Pr. Scientist, & I/c SSS; Dr. L. B. Singh, SMS, ICAR-KVK; Smti. Sreepriya Prakasan, Scientist, FSD, CIARI; Officials from A & N Administration.
- 25/01/2021 and 01/02/2021: Meeting attended at chamber of Secretary (Agri.), A & N Administration to finalize DPR of Prime Minister's Formalization of Micro Food Processing Enterprises. Dr. B. Augustine Jerard, Director, CIARI; Dr. S. K. Zamir Ahmed, Pr. Scientist, & I/c SSS; Dr. Y. Ramakrishna, Head KVK, SA; Dr. L. B. Singh, SMS, ICAR-KVK; Smti. Sreepriya Prakasan, Scientist, FSD, CIARI; Officials from A & N Administration have participated.
- 27/01/2021: 92nd Annual General Meeting of the ICAR Society hosted by ICAR through Video Conferencing chaired by the Hon'ble Agriculture and Farmers Welfare Minister. Director, CIARI attended meeting as invitee and various discussion held on the Agenda points. DG, ICAR presented the ATR, Achievements of ICAR to Hon'ble MoA&MoS.
- 17/02/2021: 6.00 PM Attended the State level NABARD meeting for the launching of Potential Credit Plan 2021-22 for Andaman and Nicobar Islands

- 18/02/2021, 22/02/2021, 01/03/2021: Chaired the Review Meetings on FSPF projects funded by NABARD, Port Blair wherein Shri. V. Mashar, GM, NABARD; PIs of the projects of all division (H&F, FCIP, FSD, ASD, All KVKs) participated.
- 24/02/2021: Attended interactive Meeting along with Dr. R. Kirubasankar, I/c HoD FSD to discuss the revival plan for Andaman Fisheries Limited under the Chairmanship of Secretary (Fisheries), A&N Administration
- 05/03/2021: Meeting with Ministry of Agriculture officials for the filing of Affidavit in Hon'ble Supreme Court of India on 'Replanting of the Red Oil Palm'. Discussion held/ suggestion and various decisions were taken in the Agenda points of the meeting.
- 18/03/2021: Attended the Appraisal Committee for Incubation Centre under PMFME proposal through VC meeting. Officials from Dept. Of Agriculture and Dept. of Fisheries, A&N Administration have presented the Detail project report (DPR) further, suggestion were given by the Appraisal committee for uploading.
- 19/03/2021: Chaired the 57th Technical Committee meeting of HVADA at Directorate of Agriculture, Haddo for sanctioning subsidies to the farmers to achieve the target of the financial year 2020-21.

#### Awards/ honours:

- Dr. Ajit Arun Waman, Scientist received Best Oral Presentation Award for his paper entitled "A new method for commercial production of Burmese coriander in the Andaman Island" during National E-

Conference on "Biodynamic Calendar and Technological Intervention for Horticulture Sustainability and Health Security in Changing Climate" organized by College of Horticulture, Bidar (UHS Bagalkot) and Melhorn Books, New Delhi (21<sup>st</sup>-23<sup>rd</sup> January, 2021).

- Dr. Pooja Bohra and Dr. Ajit Arun Waman, Scientists served as Panellists during National Workshop on 'Development of in vitro regeneration protocol in oil palm: challenges and Opportunities' organized by ICAR-IIOPR, Pedavegi (17<sup>th</sup> February, 2021).

#### TV / Radio programmes

- Star-Jasmine – a potential flower crop for Andaman and Nicobar Islands" on 3<sup>rd</sup> Marc, 2021 by Dr. V. Baskaran.
- "Jasminum acuminatissum – a potential loose flower for year-round cultivation in Andaman and Nicobar Islands" on 10<sup>th</sup> March, by Dr. V. Baskaran.
- Launching of NABARD project on specialty flower cultivation telecasted in Door darshan on 22<sup>nd</sup> February, 2021.
- Production technology of star jasmine in Andaman and Nicobar Island – a live phone in program in Tamil.

#### New External funded Project

- A new External funded Project entitled "Bio-prospecting of *Pandanus* sp. (Kewda) of Andaman and Nicobar Islands for its medicinal properties" has been approved by the NMPB, Govt. of India, Ministry of AYUSH for financial assistance of Rs. 32.519 Lakhs.

## Celebration Republic Day

72<sup>nd</sup> Republic Day was celebrated at the Institute with gaiety and fervour. Dr. B. Augustine Jerard, Director CIARI hoisted the National flag and all the staff of the institute attended the ceremony with patriotism. The Director lauded the effort of the scientists, technical, administrative, skilled supporting and temporary status staff of the institute and given message for the need to work on doubling the income of farmers. The strength and opportunities along with the challenges were highlighted for the way forward to make the farming in the Islands sustainable and regenerative. He also impressed upon the staff to strive for focused achievements in view of the ever-changing demand and priorities in these islands under climate change and organic farming regimes.



## International Women's Day-2021

Institute celebrated International Women's Day with the theme "Women Leadership in Agriculture: Entrepreneurship, Equity and Empowerment" on 8<sup>th</sup> March, 2021. Three women farmers/entrepreneurs involved in high density black pepper production, fish processing, vermicompost production, poultry and mushroom production were felicitated during the occasion. Various events like essay writing and painting competitions was also

organized online for school and college students. Besides, an exhibition of Institute technologies developed for the women farmers and entrepreneurs was also organized. As a token of promotion of agricultural entrepreneurship in the islands, planting material of passion fruit was distributed to the participants.



## World Water Day

One day workshop on world water day was conducted on 22<sup>nd</sup> March 2021 at ICAR-CIARI, Port Blair. Prof. K. Palanivel, Bharathiyar University delivered a lecture on Water resources and agriculture. The programme was organized by Dr. Velmurugan, Pr. Scientist & I/c HoD, NRM and team. All staff and representative farmers have participated in the programme. Dr. B. Augustine Jerard, Director, CIARI addressed the gathering. Awareness programme conducted in a befitting manner among the farmers about importance of water in life and Agriculture and the Global water crisis. Further, lectures on Status of water in A&N Islands were given by Dr. Sirisha Adamala, Scientist, NRM. Drawing competition were also held for the school children on the theme "Valuing Water" and the certificates issued to the participants.



## National Science Day

An interactive meeting with farmers, Anganwadi workers and farm women on National Science Day organized at KVK, Nimbudera on 27<sup>th</sup> February 2021 under the chairmanship of Dr. B. Augustine Jerard, Director, CIARI in which about 70 farmers, students and anganwadi staff have participated and shared their feedback on Scientific Agricultural Practices and Expectations from ICAR-CIARI-KVK. The programme was organized by Er. Manoj Kumar, I/c Head, KVK, Nimbudera with the participation of all the KVK staff. Shri. Sushil Kumar Singh, Senior Administrative Officer, CIARI as guest of honor has felicitated the celebration and participated in the interactive meeting. The farmers have praised the contributions by the Institute and KVK and urged for further strengthening the KVK facilities. Director, in his address has stressed upon the potentials of scientific findings in uplifting the knowledge levels and livelihood security. He enumerated the efforts of the Institute in disseminating the agricultural technologies through KVK and highlighted the scope for doubling the farmers income in North and Middle Andaman.



At CIARI Headquarters on the same day, National Science Day was celebrated under the chairmanship of Dr. D. Bhattacharya, Director I/c, CIARI organized by Dr. Y. Ramakrishna, Head, KVK, SA; Dr. N. Bommayasamy, SMS; and other staff of KVK with the participation of students. Programme conducted with the students on the theme “Future of STI: Impact of Education, Skills work” and quiz competition were also held between the students. All the staff have actively took part in the activities.

## Schedule Tribe Component Activities

S. No.	Description	Unit	Achievements
1	Training for farmers in Horticulture crop production	No. of Training	04
		No. of Farmers	151
2	Distribution of planting material/ seed of Horticultural crops	(A) No. of plants/ cuttings	1046
		No. of beneficiaries	153
		(B) Poultry/ Piglets	51
3	Distributions of agricultural inputs like pesticides, fungicides, fertilizers, traps and small farm implements, etc	Name/ Quantity of input	516
		No. of beneficiaries	268
4	Demonstration of technologies in horticulture	Number	05
5	Promotion of Kitchen Garden	Number	05

## Infrastructure development

### KVK Administrative Building

Foundation stone laid on commencement of construction of Administrative Building for KVK, Nimbudera at North and Middle Andaman on 27<sup>th</sup> February, 2021 by Dr. B. Augustine Jerard, Director, CIARI in the gracious presence of Shri. Sushil Kumar Singh, SAO, CIARI, Er. Manoj Kumar, I/c Head, KVK, Nimbudera, Dr. Shardul Lal, SMS. The officials from Departments of Fisheries, Animal Husbandry, progressive farmers in the region have participated in the foundation stone laying event followed by an interactive meeting. The administrative building for the KVK at this locality is being constructed at an estimated cost of about Rs.310 lakhs.



### Upgraded fish feed mill

Fish feed mill has been upgraded with the increased production capacity of 80-100 kg feed per hour by installing the essential equipments viz., automatic feed pelletiser and crumbling machine.



### Urban Horticulture Unit

Institutional Demonstration Unit on Urban Horticulture was established at Garacharma farm under NABARD-Urban Horticulture Project with suitable models and plants.

### Propagation Chambers

One mini clonal propagation unit and one poly house were constructed at Garacharma farm under DBT Padauk project for vegetative propagation experiments.



### Newly constructed Mini clonal chamber and Poly House

### Success stories

#### Impact of herbal health management of rural poultry

A poultry farmer, Smti. Meenakshi of Indiranagar, South Andaman district started rearing Vanaraja and Desi birds since 2014. In her farm, average mortality of the birds

was 25% per annum. Due to high mortality and economic loss she initially decided to close down her farm. However, after undergoing one month training programme on scientific poultry farming under Biotech Kisan Hub, she gained the confidence and changed her mind set to restart the poultry farming with scientific and technological support from the ICAR-CIARI. Scientists of ICAR-CIARI trained her on scientific poultry management through practical demonstrations and audio visual education. To mention a few are feeding, vaccination schedule, and treatment of ailing birds, brooding & litter management, importance of disinfection and an idea about marketing network. As a special venture, scientists of ICAR-CIARI demonstrated successful use of indigenous medicinal plants to promote ethno veterinary practices with this intervention. She adopted the scientific management practices advised by the scientists of Animal Science Division. Presently she is having flock of more than 100 desi birds and mortality also reduced to less than 5%. She could earn Rs. 64000/- within six month and her income was four times more compared to previous years.



### Livelihood security through seed business

Seed is an essential component in agriculture. Quality seed of high yielding

varieties can increase yield up to 25-45%. Adequate amount of quality seed of rice and pulses (Green gram and Black gram) is not available in Andaman and Nicobar Islands. The seed replacement rate of rice is about 15% only whereas in pulses it is less than 5%. To ensure the timely supply of quality seed to the farmers of Andaman, the ICAR-Central Islands Agricultural Research Institute, Port Blair initiated Farmers Participatory seed production in North and Middle Andaman under ICAR Seed Project seed Production of Agricultural Crops. By this program, so far 25 farmers have been trained in seed production of field crops from time to time in last five years. One among them, Shri Tankeswar Das, a 50 years old Island farmer from village Madhupur, Diglipur Tehsil, North and Middle Andaman who is enthusiastic, hardworking and has about 2 ha of cultivated land. He started a seed production under farmer's participatory mode with ICAR-CIARI, Port Blair after taking training on seed production and he usually grows rice crop in Kharif and black/green gram in Rabi season. Till date he has produced about 80.36q TFL seed of rice and 3.67q seed of pulses. He had earned about ₹2,01,870 from seed business alone. He has not only supplied quality seed to ICAR-CIARI but also to the neighboring farmers on nominal price. He is now motivational to the other farmers who are associated with seed business.



## Publications

- Pooja Bohra and Ajit Arun Waman (2021). E- Calendar on Underutilized Fruits of Andaman and Nicobar Islands, India. ICAR-CIARI, Port Blair, pp. 1-12.
- Ajit Arun Waman, Pooja Bohra, T.K. Roy and K.S. Shivashankara (2021). Seed morphological and biochemical studies in wild nutmegs. *Trees* <https://doi.org/10.1007/s00468-021-02091-1>
- Pooja Bohra, Ajit Arun Waman and N.A. Giri (2021). *Garcinia andamanica* King. (Clusiaceae): an important horticultural genetic resource from Indian Islands. *Genetic Resources and Crop Evolution*, 68: 1675-1689.
- Ajit Arun Waman, Santosh Kumar Jha, Pooja Bohra and B.A. Jerard (2019). Woody pepper: a potential spice crop for intercropping in arecanut gardens. *Journal of the Andaman Science Association*, 24(2): 131-135.
- Pooja Bohra and Ajit Arun Waman (2019). A note on performance of *Annona* hybrid 'ArkaSahan' under South Andaman condition. *Journal of the Andaman Science Association*, 24(2): 160-162.
- Pooja Bohra and Ajit Arun Waman (2020). Air layering under protected condition: a new technique for year-round propagation. *Journal of the Andaman Science Association*, 25(2): 147-150.
- Ajit Arun Waman and Pooja Bohra, 2020, Horticulture in urban areas: a venture beyond landscaping and crop production during the COVID pandemic. *Journal of the Andaman Science Association*, 25(2): 210-213.
- B. A. Jerard, Josephraj Kumar, V. Damodaran, S.K. Zamir Ahmed, L.B. Singh and I. Jaisankar. (2021). Invasive whiteflies infesting on Coconut palms in Andaman. *Eco of India, A English Daily News Paper*, 26.03.2021
- De, A.K., Sawhney, S., Bhattacharya, D., Sujatha, T., Sunder, J., Ponraj, P., Ravi, S.K., Mondal, S., Malakar, D. and Kundu, A (2021). Origin, genetic diversity and evolution of Andaman Local Duck, a native duck germplasm of an insular region of India. *PLoS ONE* 16(2): e0245138. <https://doi.org/10.1371/journal.pone.0245138>
- Kiruba Sankar, R., Krishnan, P., George, G., Kumar, K.L., Angel, J.R.J., Saravanan, K. and Roy, S.D., *et.al* (2021). Fisheries governance in the tropical archipelago of Andaman and Nicobar – opinions and strategies for sustainable management. *Journal of Coastal Conservation*, 25:16.

- Praveenraj, J., Uma, A., Saravanan, K., Rebecca, G. and Mandal, C.K., *et.al.* (2021). Outbreak of hirudiniasis in aquarium-reared albino red-bellied pacu *Piaractusbrachypomus*. *Diseases of Aquatic Organisms*, 144: 55-59.
- Sunder, J., Sujatha, T., Bhowmick, S., Mayuri, S.C., De, A.K., Bhattacharya, D., Perumal, P. and Kundu, A. (2021). Distribution of TET, AAC and CTX-M Genes among Antibiotic Resistant *Escherichia coli* Isolated From Poultry under Various Farming System of A and N Islands. *Indian Journal of Animal Research*. DOI: 10.18805/IJAR.B-4005
- Velmurugan, A. and Swarnam, T.P. *et.al.* (2021). Effect of enriched organic manures and traditional practices on soil carbon dynamics and yield of maize-rice cropping system in coastal lowlands. *Journal of Pharmacognosy and Phytochemistry*, 10(1): 273-278.

## Retirements / New Entrants / Transfer/Promotion

### New entrants

Mrs Shannonn N. Sangma, Scientist (Agricultural Chemistry) joined on 12th January 2021

### Transfer

- Mr. C.H. Rama Rao, SSS transferred to Regional Centre of ICAR-CMFRI, Visakhapatnam.
- Mrs. Harsha Haridas, Scientist (Aquaculture) transferred to ICAR-CIFE, Powerkheda, M.P.
- Shri Sanjay Kumar Pandey, SMS, Agronomy, ICAR-KVK, Nicobar transferred to ICAR-KVK, IISR, Lakhimpur Kheri, U.P. on 19th January, 2021.



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