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Newsletter of ICAR-Central Marine Fisheries Research Institute

INSIDE

Headlines

Fishermen motivated to save endangered whale shark

The continuous efforts through rigorous awareness campaigns on conserving endangered marine species by the institute has borne fruit with a group of fishermen from Kozhikode, Kerala saving an endangered whale shark (Rhincodon typus). The incident occurred on 25th January 2020 when a whale shark, protected under the Schedule 1 of the Indian Wildlife (Protection) Act was accidently caught in the trawl net. In a rescue operation that took nearly 4 hours the fishermen had to cut the trawl net to rescue the whale shark which measured about 5m in length and weighed around one tonne.

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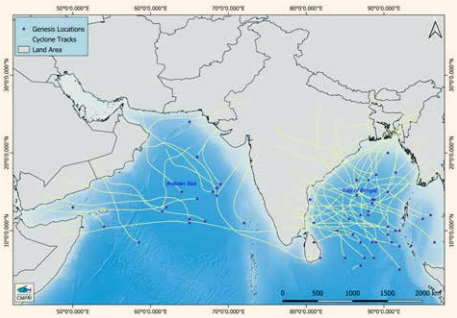
Headlines

Conservation of migratory marine species gets a boost

Research Highlights

Impact of climate extremes and disasters on fisheries and mariculture

An assessment of the impact of cyclones in the recent past on marine fisheries were assessed by the scientists of the Fishery Environment Management Division. The total number of cyclones (1989-2018) in the Arabian Sea showed a positive trend and the Bay of Bengal showed a negative trend (Fig. 1).



Genesis location and track of the major cyclonic systems formed in the Bay of Bengal and Arabian Sea during the period 1989-2018 was done.

The impacts of tropical cyclones on the monthly fishery landing of Tamil Nadu and Kerala coast from 2007-2018 showed that the cyclones had a significant negative impact on the marine fishery catch of

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The institute has joined the initiative to intensify the awareness campaigns on the conservation of marine migratory species by involving the fishing communities in India. During the recent 13th Conference of Parties of the Convention on the Conservation of Migratory Species of the Wild Animals (CMS COP13) hosted by India during 17-22 February 2020 at Gandhinagar, Gujarat, the Institute played a key role in organising a side event titled 'Marine Animal Conservation Programmes: Sea turtles, Whale shark, Humpback Whale

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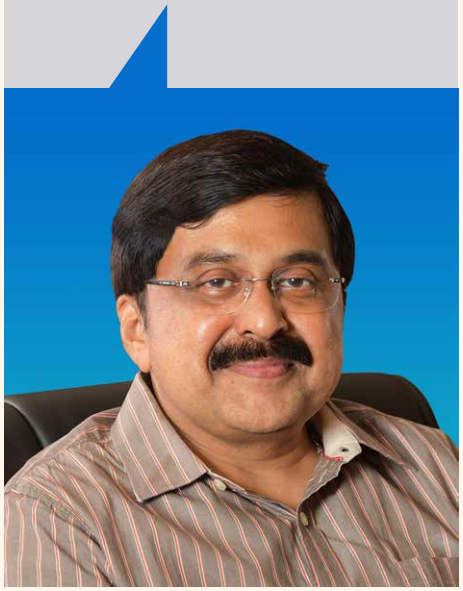
Director Speaks

In marine fisheries management, the term ETP (Endangered, Threatened and Protected) species is commonly used and includes certain species of sharks, rays, sea turtles and dolphins. ICAR-CMFRI has been active in the protection of iconic marine species through awareness creation among stakeholders as well as active participation in programmes aimed at conserving marine resources and ecosystems. On the occasion of the 73 Foundation Day we can recollect the establishment of the Marine Biological Association of India in 1958 and its worthy contributions in the cause of promotion of research on various marine living resources in Indian seas and Asia-Pacific region. Today, we also need to overcome the challenges associated with the COVID 19 pandemic, in the marine fisheries sector with appropriate and innovative actions. For this, let each one of us pledge to give our best effort.

With best wishes

A. Gopalakrishnan

Director, ICAR-CMFRI



Research Highlights

Whale shark landed at Puducherry

A whale shark *Rhincodon typus*, measuring 18ft in length and weighing approximately 3 tonnes was entangled accidentally in a trawl net and landed at Pondicherry Fisheries Harbour on 24.01.2020. Protected under schedule I of Indian Wildlife (Protection) Act, 1972, Appendix II of CITES and listed as endangered species in the IUCN Red list the local fishermen who caught the shark probably were unaware of its protected status. These sharks are often susceptible to incidental capture by multigear mechanised trawlers. The incident was reported by the fishermen to the concerned conservative authorities and the fish was buried near the fishing harbour. The institute records landings of Endangered, Threatened and Protected (ETP) species as reported during fishery surveys and monitoring of fish landings in various centres ◆

Advisory on Minimum Legal Size implemented

Minimum legal size (MLS) of 72 marine fish species of commercial importance in Karnataka were estimated and policy advisory document prepared based on this was submitted to Department of Fisheries, Govt of Karnataka. Based on this, Department of Fisheries has issued an order on MLS for 19 commercial species landed in Karnataka vide order no. DF/60/MEF/2018 dt 02.08.2019 and is implemented by the state fisheries department. It is expected that this will lead to decline in juvenile fish catch and the fisheries will be more sustainable and yield good economic returns to the fishermen in the long run ◆

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and Dugong in India'. The CMS COP13 with the theme "migratory species connect the planet and we welcome them home" was the first of a series of international nature-related meetings in 2020, which will culminate in the UN Biodiversity Conference at the end of this year.

ICAR-CMFRI is recognised as a key partner for the sustainable management of coastal and marine biodiversity in India. As a part of creating public awareness on conservation of migratory marine species, a special postal stamp with the institute's logo was released during the programme. Dr. Tarachand Kumawat represented the Institute in the side event hosted on 19th February 2020 by Ministry of Environment, Forest and Climate Change, Government of India ◆

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Snowflake coral recorded off Karnataka coast.

Snowflake coral or branched pipe coral *Carijoa riisei* is a branching soft coral (family Clavulariidae) that forms carpets by attaching to hard surfaces in marine waters. The cylindrical branches have multiple polyps which have eight white tentacles when extended. The organism is seen to inhabit both reefs as well as introduced artificial surfaces which are not exposed to direct sunlight. A survey in the rocky reef areas off Kaup, Mulki rocks, recorded the presence of *Carijoa riisei*, probably for the first time in Karnataka waters. The species was earlier reported from the reef areas of Andaman-Nicobar Islands, Gulf of Mannar, Gulf of Kuchchh, Grand Island and rocky reefs off Trivandrum Coast. Currently, the scientific community is in a dilemma on its 'invasive' status, and Global Invasive Species Database does not recognize *C. riisei* as an invasive species in India ◆

Successful seed production of maze rabbit fish

The maze rabbit fish *Siganus vermiculatus* which can reach above 2 kg is a top priority species for mariculture. Under the All India Network Project on Mariculture (AINP-M), successful rearing of larvae to metamorphosis following induced breeding during full moon phase of the lunar cycle was achieved. The breeding pair was intramuscularly injected with Human Chorionic Gonadotropin (HCG) and Greenwater technique was used for egg incubation and larval rearing. Copepod, *Parvocalanus crassirostris*, rotifers (S type & L type), Artemia and artificial pellet feeding regimen was used during larviculture. The larvae completed metamorphosis at 2.5-2.8 cm total length after 36 days of rearing. This is the first report of larval rearing of *S. vermiculatus* to metamorphosis in India.

Reported by: Anuraj A., Suresh Babu, P. P., Jayasree Loka, Raghu Ramudu K., Vaidya, N. G., Srinivas K., Sonali S. M., Praveen Dube, Pramila B., Vineeth T., Manoj H., Nagaraj Durgekar. Karwar Research Centre ◆

Foundation Day celebrated

To mark its 73rd Foundation Day on 3 February, 2020 the institute Headquarters and various Regional Research Centres opened its doors to students and public. The Open House programmes evoked a huge response from the school students and general public to learn about the latest developments in marine fisheries research and to interact with the scientists. Marine research aquarium showcasing rare ornamental fishes and models of cage fish farming, aquaponics, ornamental fish farming, recirculating aquaculture system (RAS) drew the attention of visitors ◆

International symposium on marine ecosystems hosted

The third international symposium on Marine Ecosystem: Challenges and Opportunities (MECOS-3) was hosted from 7th to 10th January 2019 by the institute. Organised by the Marine Biological Association of India (MBAI), it set the platform for discussion on a wide range of topics, including impact of climate change in marine ecosystems, meeting the country's Sustainable Development Goal- (SDG) 14 (life under water) unveiled by the United Nations, development of small-scale fisheries, recent developments in aquaculture, eco-labelling and green fishing technologies.

Dr Petri Suuronen, Director, Blue Economy Natural Resources Institute, Finland inaugurated the symposium and Dr A Gopalakrishnan, Director, ICAR-CMFRI presided over the function. The Dr. S Jones memorial prize, instituted by the MBAI for outstanding contributions in marine biology and fisheries, was presented to Dr T Balasubramanian, Vice Chancellor of Chettinad University, Chennai. (With inputs from: Dr K Sunil Mohamed, Convenor, MECOS 3) ◆

The Quinquennial Review Team meeting held

The Quinquennial Review Team (QRT) meeting to review the achievements of Mandapam, Madras and Tuticorin Regional Research Centres for the period between 2014-15 to 2018-19 was held at Mandapam Regional Centre on 9th March, 2020. The meeting was chaired by Dr. Satheesh C. Shenoi, Director, Indian National Centre for Ocean Information Services (INCOIS). The QRT also visited the Visakhapatnam Regional centre on 27.01.2020. They were apprised of the centre's research activities and accomplishments by Dr. Shubhadeep Ghosh, Scientist-in-Charge. Dr. Subal Roul, Scientist-in-Charge, Puri Field Centre of and Dr. Gyanranjan Dash, Scientist-in-Charge, Digha Research Centre also presented their centre's research activities and achievements ◆

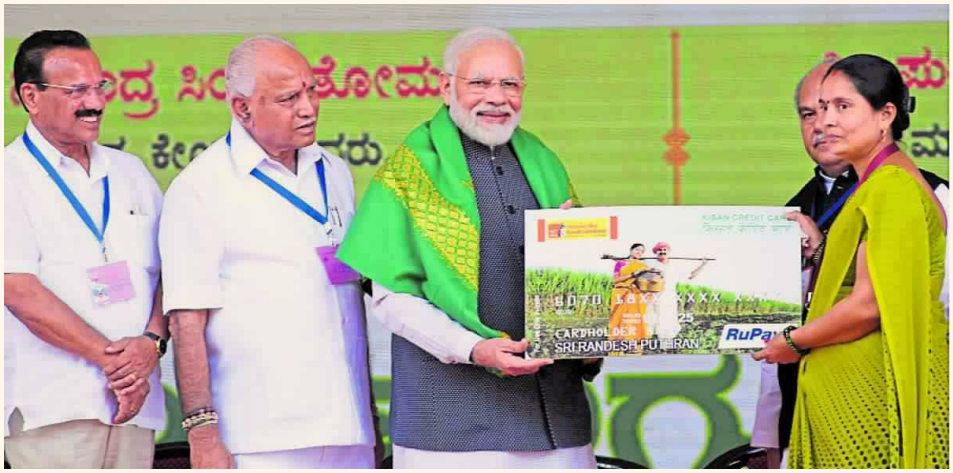
Events

ICAR-CMFRI celebrates International Women's Day

International Women's Day was celebrated in the institute on 7th March 2020. The Chief Guest for the programme organised on the occasion by the Women Cell of the institute, was Ms. Anuvinda Anil, an MBBS student and an Organ donor. The main address was followed by a brief sharing of experiences by Mrs. Durga Anil, Special Invitee and mother of the Chief Guest ◆

Outreach

Kisan Credit Card to help cage farming trained fishers



Mrs. Supriya Sudhir Sarang, a beneficiary of the coastal water cage culture demonstration undertaken by Karwar Research Centre of ICAR- CMFRI received the Kisan Credit Card from the honourable Prime Minister Shri Narendra Modi on 2 January 2020 at Tumkur, Karnataka. The Government of India has extended the benefits of the KIsan Credit Card (KCC) to enable fishermen and fish farmers through efficient access to credit for their working capital needs. A fisherwoman-turned-cage fish farmer, she had undergone training on open water cage culture at the Institute in August, 2018 and was felicitated by ICAR-CMFRI during the National Fish Farmers' Day celebrations in 2019. Several training programmes to empower fishermen with requisite skills to enhance their incomes are organized regularly by various research centres of ICAR-CMFRI ◆

Cobia harvest during lockdown keeps fish supplies going

As the consequence of total lockdown due to COVID-19, the fishing activities were banned temporarily in Tamil Nadu. This resulted in non-availability of low value fishes for feeding the cage reared cobia fishes. Hence, the beneficiaries decided to harvest the cage farmed cobia fishes based on the demand in neighbouring districts' markets. The farming period had already completed around eight months. The farm gate price was ₹330 per kg of cobia fishes. Nearly nine tonnes of cage farmed cobia fishes were harvested by seven farmers from Munaikadu (Palk Bay) & Kunthukal (Gulf of Mannar) region of Ramanathapuram district during the last week of March, 2020 earning a gross revenue of 29.50 Lakhs. This work was carried out under NFDB funded Project on "Extensive demonstration of technology of open-sea cage farming of marine finfishes all along Gulf of Mannar and Palk bay" ◆

Mariculture of Indian Pompano shows promise

Indian pompano (*Trachinotus mookalee*) is a new candidate species for mariculture in India and holds immense potential due to its fast growth rate, easy adaptability to culture environment as well as its meat having high market demand. Breeding technology for the species was developed by Visakhapatnam Regional Centre of ICAR-CMFRI in 2016 and since then seeds were constantly produced with good survival. Experimental culture was carried out at multiple locations in different culture systems such as coastal ponds and marine cages.

Circular High Density Polyethylene cage of 6 m diameter having net depth of 4 m were installed in the open sea using single point revolving mooring system. In May 2019, this was stocked with Indian pompano fingerlings of 10 g weight, produced in the Mariculture Hatchery of Visakhapatnam Regional Centre of ICAR-CMFRI. The stocking density was 25 numbers / m3 and pellet feed containg 40% protein and 10% fat was given twice a day. On 28th January, 2020 after approximately eight months of culture partial harvest of one cage was performed. Survival rate was >95% while the Feed Conversion Ratio (FCR) calculated was 1:1.75. The harvest of 1.9 tonne of Indian pompano was flagged off by Sri Dronamraju Srinivasa Rao, Honourable Chairman, VMRDA in the presence of Joint Director, Department of Fisheries, Govt. of Andhra Pradesh and other officials of state and centre. The team of scientists including Dr. Sekar Megarajan, Dr. Ritesh Ranjan, Dr (Mrs) Biji Xavier Dr. Shubhadeep Ghosh and Dr. Imelda Joseph were actively involved in promoting the demonstration farming of Indian pompano. This successful cage harvest of Indian popmpano is expected to trigger large scale development of cage mariculture in the country ◆

Maiden harvest of pond cultured Indian pompano

The first demonstration of Indian pompano culture in coastal pond was carried out at Bhavedevarapalli, Nagayalanka Mandal, Krishna District, Andhra Pradesh with financial support from National Fisheries Development Board (NFDB). On 4th January 2020 in the presence of Mr. Mopidevi Venkataramana Rao, Minister of Animal husbandry, Fisheries & Marketing, Govt. of Andhra Pradesh; Mr. Simhadri Ramesh Babu, MLA, Avanigadda (Krishna Dist); Mr. G. Rathinraj, Executive Director (Tech.), NFDB; officials from centre and state departments and fish farmers a harvest mela was held. Under this demonstration project, three 1 acre ponds were stocked with fingerlings (0.5-1.0 g) produced in the Mariculture Hatchery of the institute. After a nursery rearing duration of 2 months fishes grew to 30-35 g with survival rate of >90%. The fish fingerlings were fed at 10-8% of the body weight four times a day with a pellet feed (45% Crude Protein & 10% Crude Fat) of different sizes (1.2, 1.8 and 2.0 mm) used according to the growth. Paddle wheel aerators were provided to maintain the dissolved oxygen level in pond water at above 4 ppm. Then they were transferred to grow-out culture system for a duration of 12 months where they were stocked @ 3000 numbers per acre. Floating pellet feed of various sizes (3, 4, 5, 6 & 7 mm) was used and they grew to an average size of 800g with a survival rate of >95% and FCR of 1:1.61. The harvested Indian Pompano was purchased by Max Well Sea Foods, Kochi, Kerala and Matsyafed, Kerala. The fish sold at ₹330 per kg earned a profit of ₹120 per kg. Higher stocking density of up to 5000 numbers per acre with sufficient aeration will be more profitable to farmers and also lead to species diversification of the cultured fishes list in India ◆

Seaweed Farming emerges as a Success Story in Tamil Nadu

Puthukudi village, Thondi in Ramanathapuram district of Tamil Nadu was selected by the institute for implementation of Scheduled Caste Sub-Plan (SCSP) programme fully funded by the Government of India. 97 percent of the total village population are SC families with majority of them involved in fishing in Palk Bay and had shown keen interest to take up additional livelihood activities. After an awareness and training programme on "Mariculture Technologies for Diversified Livelihood" given to the beneficiaries during September and November, 2019 respectively, 28 fishers in 10 groups, were selected for undertaking seaweed farming of Kappaphycus alvarezii under the SCSP component. Each fisher was given 20 monoline unitsand the entire cost for making 575 monoline units was borne under the SCSP component of the Institute, AINP on Mariculture and NICRA projects operated by ICAR-CMFRI. The beneficiaries were linked with the AquAgri Pvt, Ltd., Manamadurai to sell their produce either in fresh/dry, from the farming site itself. The amount pertaining to purchase of harvested seaweed in was deposited in the respective Joint bank account for each group opened at Canara Bank, Thondi by the purchasing firm.

Seaweed farming was initiated during the second week of November, 2019 and first harvest made during from 200 monoline units in the first week of December 2019 was around 8.7 tonnes. This was mainly utilized as seeding material for expanding additional 150 monoline units under various SCSP programmes. Each beneficiary earned ₹17,400 in the first harvest after 45 days of culture period. The second crop was initiated during the first week of January, 2020 with three groups which was harvested by mid February, 2020. Around 24 tonnes of fresh seaweed harvested were utilized for expanding 400 monoline units further and each beneficiary earned ₹13,500. The third crop was initiated during the last week of February, 2020 with seven groups. Due to the impact of 'total lockdown' due to COVID -19 pandemic, the beneficiaries decided to conduct a partial harvest during the first week of April, 2020. Around 2.648 tonnes of dry seaweed was sold benefitting each with ₹6,500. Since entire start-up cost was met under the SCSP with five crops in a year depending on the climatic conditions, each fisher can earn around ₹10,000 per month. As the first Government of India backed livelihood improvement initiative for fishers in the Puthukudi village beneficiaries expressed their happiness in their additional income through seaweed farming.

(Reported by Johnson. B, R. Jayakumar, G. Tamilmani, K. K. Anikuttan, M. Sakthivel, P. Rameshkumar, & M. Sankar, Mandapam Regional Centre) ◆

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both mechanized and non-mechanized sectors. The study points out that though the ecological system based changes were low due to tropical cyclone, the socio-economic impact was high and there is a need to develop early warning and vessel tracking systems to increase the preparedness of fishers to unexpected extreme events. The increase in current velocity and change in current direction found during the cyclone period can lead to drifting away of eggs, larvae and juvenile fishes which may impact recruitment to the fishery after cyclone. An analysis of the impacts of cyclone Ockhi through losses in man-days, catch and revenue indicated that in Kerala and Tamil Nadu the estimated revenue losses were 107 and 12.5 crores respectively. The mechanized sector had the highest revenue loss while the number of man days lost was highest in the motorised sector. In Kerala, 3,21,495 man-days of fishers directly engaged in marine fishing activities were lost while in Tamil Nadu, it was 1,06,250. The need to increase the adaptive capacity of fishers by more robust early warning systems and by making satellite vessel tracking systems mandatory for fishing crafts, robust housing and infrastructure and training in Disaster Management is flagged in the study ◆

Nutraceutical for osteoporosis from seaweeds

Release of Cadalmin™ AOe by Dr. B. Meenakumari, former DDG (Fisheries), ICAR

Cadalmin™ Antiosteoporotic extract (Cadalmin™ AOe) a nutraceutical product prepared from seaweeds developed by ICAR-Central Marine Fisheries Research Institute, as a natural remedy for osteoporosis, was released by Dr. B. Meenakumari, former DDG (Fisheries), ICAR, at a function on 3 March 2020.

Osteoporosis, a metabolic bone disorder associated with low bone mass density and structural deterioration of bone tissue followed by an increase in bone fragility, is considered as a serious threat to quality life. Currently, synthetic anti-osteoporotic medications are used in clinical treatment and prolonged intakes were reported to exhibit adverse effects. Bioactive pharmacophore leads from seaweeds were used to develop a nutraceutical product, which can be administered to regulate clinical indicators leading to osteoporosis. Cadalmin™ AOe contains 100% natural marine bioactive ingredients from selected seaweeds by a patented technology (Indian Patent Application No. 202011009121), and would be made available in 400 mg capsules. Bioactive pharmacophore leads from seaweeds used to develop Cadalmin™ AOe, were found to increase the activity of alkaline phosphatase and bone morphogenic protein (BMP-2), along with higher serum osteocalcin levels and prominent mineralization, which was effective for bone health development. This nutraceutical is purely natural without any side effects. The Institute is in the process of developing more health products from the underutilized seaweeds. The institute is also promoting seaweed farming all along the Indian coasts as a livelihood option for the coastal communities ◆

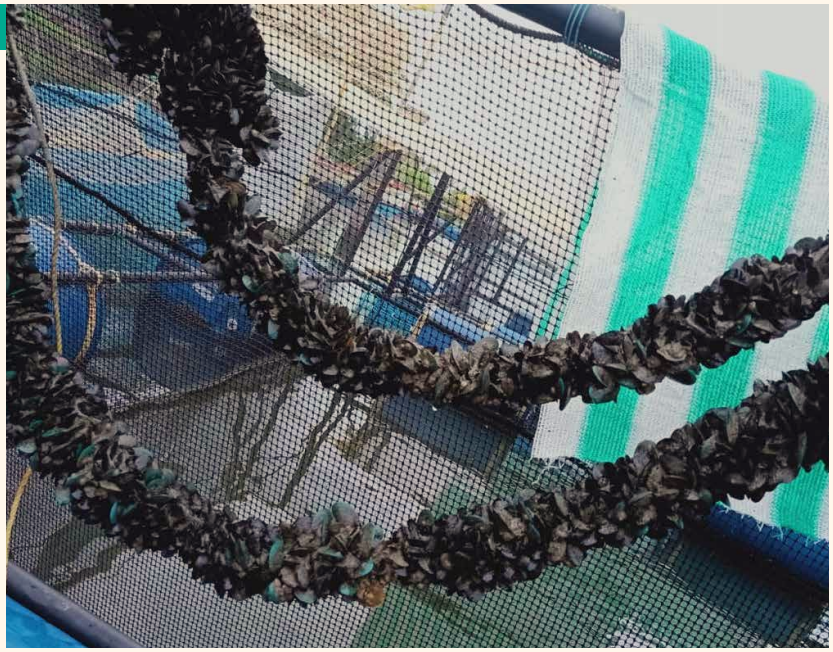
Fish seed supplied to Fishermen Self Help Groups at Karwar

To encourage participation of self help groups in marine cage farming under All India Network Project on Mariculture operated by the Karwar Research centre at Mudga, Karwar and Keni, fish seed was distributed to the participating fishermen. Dr. B. Meena Kumari, Former DDG, Fisheries, ICAR distributed the Asian Seabass, *Lates calcarifer* fingerlings on 8.1.2020. Earlier, ICAR-CMFRI had provided 6 m diameter GI steel cages and nets for the demonstration of marine cage farming at these sites.

Distribution of fish seed by Dr. B. Meenakumari, Former DDG (Fisheries), ICAR

Hatchery-produced mussel seed supplied to farmers

Seeded green mussel ropes



Mussels ready for harvest

Bivalve production in India is limited by seed supply as the bivalve hatchery sector remains mostly undeveloped. Most farmers rely on a limited quantity of wild-caught seed. A team of scientists from the Vizhinjam Research Centre produced green mussel, *Perna viridis* seeds of 6 to 10 mm size in its research scale bivalve hatchery. Seeded ropes were sold to the farmers through the Kerala State Fisheries Department, for the first time in India. The 8 mm diameter coir ropes of 1.5 m length were conditioned in seawater for two days followed by the seeding procedure, at the rate of 2000 numbers per metre and secured to the coir rope by covering with cotton mosquito net mesh cloth. This prevents mussel seed from falling off from the line before getting attached by byssus threads. Each seeded rope was sold at the rate ₹350 to the farmers from Thiruvananthapuram, Kollam and Alappuzha district. The seeds from the initial size of 10 mm attained an average length of 40 mm in three months which was achieved when it was grown between the fish cages at Kayamkulam. In another 3-4 months it can be harvested and marketed.

Reported by: M. K Anil, Gomathi P, B. Raju, Krishna Priya P. M and Praveen Prasannan ◆

TSP helps tribal youth in taking up marine fish cage culture

Under the Tribal Sub-plan programme of the institute, 10 beneficiaries belonging to Mavilan tribal community of Navodya self-help group at Kuruchikunnu colony, Bekal, Kasargod. participated in the Hands-on Training programme on Cage Culture of Marine Fishes conducted by Calicut Research Centre during 3 -5 February, 2020.

Felicitation of the fishermen at Calicut Research Centre

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ICAR-CMFRI regularly organizes awareness programme on conservation of protected elasmobranchs including the recently conducted workshop on the International Whale shark day at Ponnani on 30th August 2019 and another at Kozhikode on 24th September 2019. Along the Indian coast, the iconic whale shark shows highest aggregation off Gujarat coast. Later, on the occasion of the Foundation Day celebrations of the Institute, the Calicut Research Centre felicitated the fishermen who participated in the operation to save the whale shark ◆

NICRA extends community support through SCSP component

Under the ICAR's National Innovations in Climate Resilient Agriculture (NICRA) project, fish farming support was extended through the SCSP component. Distribution of Pearl spot seed, feed and insulated iceboxes to 10 beneficiaries of Edavanakadu, Nayarambalam and Puthuvypeen coastal villages in Kochi, Kerala and two chest freezers cum cooler equipment for two identified beneficiaries of Edavanakadu and Puthuvypeen villages was done.

Seaweed seeding material to fishermen for improvised monoline seaweed farming and distribution of cage to fishermen for conducting Integrated Multi-trophic Aquaculture (IMTA) benefitted fish farmers of Ayyanadaippu coastal village of Tuticorin. In Mangaluru, fish seed and further support for fabrication, installation and mooring of cage frame was given. In Mandapam seaweed farming monoline unit inputs such as casuarina poles, ropes, seaweed seeds and other accessories were provided to six beneficiaries. Awareness programs on mariculture technologies for diversified livelihood options were also provided to fifty identified persons. Training in mariculture activities was also extended to fishermen of Vishakhapatanam ◆

Handing over of iceboxes, fish feeds and fish seeds to beneficiaries at Kochi by Dr. P. U. Zacharia, Principal Investigator, NICRA project

Motivational career guidance in fisheries sector organised

Career guidance and experience sharing cum motivational talks by eminent scientists working in the fisheries sector was organized for the students of 14 Government Fisheries Vocational Higher Secondary (VHSE) schools in Kerala. The Socio-Economic Evaluation and Technology Transfer Division (SEETTD) organized a series of satellite workshops on 'vocational education and employability' under the ICAR-Extramural Research Project 'Pedagogic and pragmatic dimension of vocational education system: A diagnostic study on employability of fisheries students' during December 2019 to February 2020. workshop provided a platform for knowledge-sharing and discussing various career opportunities and options for higher studies options in the Aquaculture (AQ), Marine Fisheries and Seafood Processing (MFSP) and Marine Technology (MT)) streams of fisheries vocational studies under the department of Vocational Higher Secondary Education, Kerala. 964 students participated in these workshops ◆

SCSP Programmes focus on empowerment through marine fish farming

Hands-on training to fisher youth on sea cage farming under SCSP program

Under the Scheduled caste Sub-Plan (SCSP) programme funded by the Government of India, the institute arranged various trainings and Transfer of Technology programmes. A training on cage farming of Silver pompano and lobsters was organised for 40 beneficiaries by Vizhinjam Research Centre on 07-01-2020 at Karakkattu, Kunnathoor Panchayat, of Kollam district in Kerala. Tuticorin Research Centre organised a hands-on training on feed preparation for cultured marine finfishes and shellfishes for 25 selected farmers belonging to Alangar and Suriyakanthi SHGs during 28- 30 January 2020.

Visakhapatnam Regional Centre organised a Hands-on training programme "Cage culture of finfishes in backwaters" during 5-7 March, 2020 at Nagayalanka, Krishna District, Andhra Pradesh. Another training programme under AINP-SCSP component was conducted 9-11 March, 2020 at Edurumondi, Nagayalanka Mandal, Krishna District, Andhra Pradesh. Dr. Sekar Megarajan, Dr (Mrs). Biji Xavier, Dr. Ritesh Ranjan and Dr. Shubhadeep Ghosh, co-ordinated the programmes. Several participants from the Mala community and associated with ALERT NGO, Vijayawada benefitted. Hands-on training programme on "Open sea cage farming and mariculture" was organized by Veraval Regional Centre from 19 - 23 March, 2020. Twenty youths from the "Shri Bhimrao Matsyodhog Seva Sahakari Mandali" from Veraval participated in the training co-ordinated by Dr. Divu D, with other scientists and technical officers at the centre ◆

Fish seed stocking in open waters of Andhra Pradesh

Under All India Network Project on Mariculture (SCSP component) Dr. Jayasree Loka, organized three training programmes on 6th, 11th and 13th February 2020 for selected fishermen in Krishna and Guntur districts of Andhra Pradesh. Release of fish seed into the circular cages installed in the open waters of Vijayawada and Guntur districts was also done.

Sea bass farming taken up under SCSP

Chennai research Centre extended support under the SCSP programme operated by the institute to around 200 fishers of the SC-Adi Dravidar fisher community in Kottaikkadu, a very remote coastal village located in Chingleput district. Nearly 350 families traditionally involved in oyster picking, crab and shrimp fishery, mullet and estuarine fishing and sea fishing and registered with the Tamil Nadu Fisheries Department stood to benefit from this initiative. Scientific support from ICAR-CMFRI for cage fabrication and mooring was extended by team led by Dr. Joe Kizhakkudan in March 2020. Two units of 3x4 m inner area and depth of three metres net enclosure were stocked with Seabass fingerlings sourced from Nellore and transported by trucks. Spanning 18 hours transport, the open sintex tanks were provided oxygen support with two transit points for water exchange. About 1800 fingerlings of 10-15 cm size were stocked. During the COVID -19 national lockdown and transport issues the monitoring is carried out online through mobile phones and gathering the videos. Updates on the net maintenance, feeding of the fish and the fish stock biomass is done regularly. The members of the team are taking turns in feeding and watching the cage during the operations ◆

Mariculture training programmes organised

Sea Cage Farming training was given under the Skill Development Programme sponsored by National Fisheries Development Board (NFDB), Hyderabad. It was successfully conducted on 03.01.2020 at Punjakkad, Payyanur by Calicut Research Centre of ICAR-CMFRI. 9 cages of 4×4 meter with a depth of 3 meters were installed and each cage was stocked with 1300 numbers of *Lates calcarifer* (Kalanji) and 200 numbers of *Etroplus suratensis* fingerlings. Dr P. K. Asokan, Scientist in-Charge, Dr Shilta M. T., Scientist and cage fish farmers of Payyanur panchayath participated in the programme.

Under the Tribal Sub-plan programme of the institute, 10 beneficiaries belonging to Mavilan tribal community of Navodya self-help group at Kuruchikunnu colony, Bekal, Kasargod. participated in the Hands-on Training programme on Cage Culture of Marine Fishes conducted by Calicut Research Centre during 3 -5 February, 2020 ◆

KVK conducts online trainings for farmers

In order to continue its services to farming community even during lockdown due to Covid 19, the KVK shifted all its training programmes to online mode. Facebook and Multi location audio conference tools were used to train 120 farmers from Ernakulam district with the active support of Kochi unit of Reliance foundation Information services. The topics covered were Feed and fodder management (24th June 2020), Aquaculture practices (6th June,2020), Pest& disease management in vegetables (06thMay 2020), Pest and disease control measures & nutrient management in Banana (29th May 2020) and Pest and disease management in Paddy (08th July 2020). The KVK also conducted two training programmes using facebook platform viz., Poultry farming (12th April, 2020) and Fish farming (16th April, 2020) through which 9000 farmers benefitted.

Supply of Amur carp seeds by KVK

Supply of Amur carp seeds through KVK commenced in March 2020. The fish seed (Fry stage) were sourced from Fisheries Research and Information Centre (Inland) of Karnataka Veterinary and Animal Sciences University, Bengaluru were reared at KVK's satellite units in partner farmers fields. When they became fingerlings, they were packed in oxygen filled bags, branded and sold through sales counter located at ICAR-CMFRI ◆

Focus on elasmobranch fisheries, trade, conservation and management

A stakeholder meeting was organised at ICAR-CMFRI, Kochi on 6th February 2020, as part of the three day Consultative workshop on threatened and protected elasmobranchs of India: Conservation status and policy needs under a FAO-CMFRI collaborative project. Several stakeholders including from trading and fishing communities, NGOs and the institute's scientists working on elasmobranch assessment studies participated. The traders and fishermen representatives raised their concern on the impact of blanket ban on shark fin exports from India. They assured their co-operation to not catch any protected species and extended their support to share whatever the data available with them for formulating effective management strategy for the conservation of sharks along the coast of India ◆

Fisheries officials trained in marine fish seed production protocols

A Training programme on "Seed Production and Farming of Cobia and Pompano" was organized at Mandapam Regional Centre of ICAR- CMFRI during 18-21 February, 2020 for officers in Kerala State Fisheries Department. The training programme aimed at creating awareness on marine fish seed production techniques developed by the institute was coordinated by Dr. K. K. Anikuttan, Dr. Johnson and Shri M. Sankar.

Workshop on Value chain of elasmobranchs in Gulf of Mannar

Shark fishers from different coastal fishing villages of Thoothukudi District and various stakeholders involved in the value chain of elasmobranchs in Gulf of Mannar region, attended the workshop organised by the Tuticorin Research Centre during 6-7, February 2020. Smt. N. Chandra, Joint Director of Fisheries, Tamil Nadu State Fisheries Department, Thoothukudi inaugurated the function. She stressed the need for creating awareness on identification of scheduled elasmobranchs under the Indian Wildlife (Protection) Act, 1972 and the species listed in appendix under the CITES. Shri Raghuvaran Rajesh, Forest Range Officer and Officer-in-charge, Gulf of Mannar Biosphere Reserve Trust (GOMBRT), Tamil Nadu State Forest Department, Thoothukudi and Dr. Vinoth S Ravindran, Station coordinator, Marine Products Export Development Authority (MPEDA)-NETFISH, Thoothukudi were also present on the occasion ◆

Retirements

Shri Swapan Kumar Kar
Technical Officer
31.01.2020
Digha Research Centre

Smt. R. Sarojini
Skilled Support Staff
29.02.2020
Madras Research Centre

Shri V. P. Benziger
Technical Officer (Deckhand)
31.03.2020
Vizhinjam Research Centre

Shri M. P. Devadasan
Skilled Support Staff
31.03.2020
Calicut Research Centrel

Promotions

Name & Designation	Promoted as	w.e.f
Shri N. K. Harshan, Senior Technical Assistant	Technical Officer	11.01.2019
Shri Suresh Krishna Rao Kamble, Senior Technical Assistant	Technical Officer	01.01.2019
Shri C. G. Ulvekar, Senior Technical Assistant	Technical Officer	27.06.2019
Shri N. P. Ramachandran, Senior Technical Assistant	Technical Officer	18.08.2018
Shri M. N. Sathyan, Technical Assistant (Motor Driver)	Senior Technical Assistant (Motor Driver)	01.09.2018
Shri C. V. Jayakumar, Technical Assistant (Press & Editorial)	Senior Technical Assistant (Press & Editorial)	01.04.2019
Shri Sajikumar K. K., Technical Assistant	Senior Technical Assistant	15.04.2019
Shri K. M. David, Technical Assistant (Artist)	Senior Technical Assistant (Artist)	25.05.2019
Shri Umesh Hari Rane, Technical Assistant	Senior Technical Assistant	22.07.2019
Shri K. P. Kanthan, Technical Assistant	Senior Technical Assistant	09.03.2019
Shri Ravikumar Avadhanula, Technical Assistant	Senior Technical Assistant	25.04.2019
Shri David Babu, Senior Technician	Technical Assistant	18.02.2019

Name & Designation	Promoted as	w.e.f
Smt. I. Santhosi, Senior Technician	Technical Assistant	25.08.2019
Shri B. Kathiresan, Technician	Senior Technician	02.08.2018
Shri Bhangara Sunil Ramachandra, Technician	Senior Technician	13.03.2019
Shri K. M. Sreekumar, Technician	Senior Technician	13.03.2019
Shri M. T. Vijayan, Technician	Senior Technician	31.03.2019
Shri Paulose Jacob Peter, Technician	Senior Technician	15.05.2019
Shri Jishnudev M. A., Technician	Senior Technician	19.05.2019
Shri V. Sitaramacharyulu, Technician	Senior Technician	19.06.2019
Shri K. Muniyasamy, Technician	Senior Technician	19.06.2019
Shri M. Ganesan, Technician	Senior Technician	19.06.2019
Shri T. K. Sumesh, Upper Division Clerk	Assistant	02.01.2020 (AN)

Transfer

Name & Designation	From	To	w.e.f.
Smt. Sreelakshmi S., Skilled Support Staff	ICAR-CMFRI, Kochi	Vizhinjam Research Centre	18.02.2020
Shri Ashish Chobey, Assistant Administrative Officer	Madras Research Centre	Mumbai Research Centre	02.03.2020

Voluntary Retirement

Name & Designation	Designation	w.e.f
Shri P. Satheesh Kumar	Skilled Support Staff	14.01.2020 (FN)
Shri S. Sekhar V. Rayer	Technical Officer (Skin Diver)	29.02.2020 (FN)
Dr. V. Mohan	ACTO (Library)	09.03.2020 (FN)

Resignation

Name	Designation	w.e.f
Shri A. Vinoth	Skilled Support Staff	31.03.2020

Obituary

Shri V. Jayapradeep
Skilled Support Staff, Kovalam Field Centre
09.03.2020

Awards & recognition

Mr. Rajesh Kumar Pradhan, Scientist, won the Young Marine Biologist Award for the best Digital Presentation entitled "Clam fishery of Subernarekha estuary, Balasore, Odisha and its utilization" during the International symposium "Marine Ecosystems Challenges and Opertunities-3" held at ICAR-CMFRI Kochi from 7th to 10th January, 2020.

Mr. Sajikumar, K. K Technical Assistant, Molluscan Fisheries Division and **Mr. N. Ragesh**, Technical Assistant, Crustacean Fisheries Division participated on deputation in the 11th Indian expedition to Southern Ocean/Antarctic waters, organized by the National Centre for Polar & Ocean Research, Ministry of Earth Sciences from 3rd January to 11th March 2020.

Dr. Eldho Varghese conducted a group interactive session with the 110th FOCARS Probationers on 11.02.2020 on the invitation by Director, NAARM. This was aimed at boosting the Agricultural Research Service (ARS) probationers in the transformation process from student to emerging scientists in the National Agricultural Research System (NARS).

Mr. Kapil S. Sukhdhane, Scientist was awarded Ph.D degree on 28th February, 2020 for the research thesis "Assessment of Litter Contamination in Marine Fishing Areas and Different Sensitive Habitats of Gujarat" by ICAR-Central Institute of Fisheries Education, Mumbai.

Mr. Sanal Ebeneezar, Scientist was awarded the Ph.D. degree on 12th March 2020 for his thesis entitled: Dietary requirement of lysine and methionine in Silver pompano, *Trachinotus blochii* (Lacepede, 1801) by ICAR- Central Institute of Fisheries Education, Mumbai.

Programme participation

Dr. A. Gopalakrishnan, Director

- Attended meeting at National Fisheries Development Board (NFDB), Hyderabad on 17th January 2020
- Attended the IOTC-Tuna quota fixing meeting with DDG (Fisheries), ICAR, New Delhi held in the Department of Fisheries, Government of India, New Delhi on 28th January 2020.
- Participated in the the 3rd International Seaweed Summit & Expo held at National Institute of Ocean Technology (NIOT), Chennai on 30th January 2020.
- Participated in the 'Sustainable sea fishing Meet' and Govt. of Kerala ASFIB Meeting in Thiruvananthapuram on 31st January 2020
- Attended the Convocation at Kerala University of Fisheries and Ocean Studies (KUFOS), Panangad on 06th February, 2020.
- Attended the Food Safety and Standards Authority of India (FSSAI) meeting held at ICAR-Central Institute of Fisheries Technology, Kochi on 06th March, 2020.
- Video Conferencing with Scientist-In-Charge of Regional/Research Centres of ICAR-CMFRI to discuss the financial expenditure status for the year 2019-20 on 20th March, 2020.
- Attended the Governing Body Meeting of Kerala University of Fisheries and Ocean Studies (KUFOS) on 21 March, 2020.

ICAR-CMFRI

The Central Marine Fisheries Research Institute is a premier research institute under the Indian Council of Agricultural Research and focusses on research and training in marine fisheries and mariculture.

Cadalmin is the quarterly newsletter of ICAR-CMFRI. This publication gives an insight into the major events of the institute, besides highlighting the salient research findings for the benefit of various stakeholders in the marine fisheries sector.

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