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Newsletter of ICAR-Central Marine Fisheries Research Institute

INSIDE

Secretary, DARE & DG, ICAR visits ICAR-CMFRI's KVK in Lakshadweep

Dr. Trilochan Mohapatra, Secretary (DARE) and Director General (ICAR) visited the Krishi Vigyan Kendra, Kavaratti, Lakshadweep UT operated by ICAR-CMFRI. He was accompanied by Dr. J. K. Jena, Deputy Director General, ICAR; Dr. A. Gopalakrishnan, Director, ICAR-CMFRI and Dr. V. Venkatasubramanian, Director, ICAR-ATARI, Bengaluru, Karnataka. Chairing the Interface Meeting between the ICAR

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News Highlights

Secretary, Department of Fisheries visits Veraval Regional Station of ICAR-CMFRI

Shri Jatindra Nath Swain, IAS, Secretary, Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India visited Veraval Regional Station of ICAR-Central Marine Fisheries Research Institute on 6th March, 2022. During his interaction with the scientists and staffs, the efforts of Institute in popularizing sea cage farming development of diversified mariculture activities and seaweed

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Director Speaks

ICAR-CMFRI which is celebrating its Platinum Jubilee, has research programmes oriented for sustainable fisheries and mariculture. Recently, in an innovative, path-breaking manner, the established technologies such as Integrated multi-trophic aquaculture (IMTA), Biofloc and Recirculatory Aquaculture Systems (RAS) were combined to deliver a unique fish production model that gives higher and sustainable yields. Work on the micro-propagation of red algae, a highly valuable seaweed group has given excellent leads. Socio-economic empowerment through fish culture training and farming demonstrations under Central Schemes such as SCSP and TSP programmes were actively pursued. Fingerling production units and sea ranching programmes ensure reliable fish seed supply for fish farmers and support livelihoods of coastal fishers, respectively. Let us continue with these endeavours and ensure a bright future for all stakeholders..

With best wishes

A. Gopalakrishnan

Director, ICAR-CMFRI

New Heights

National Campaign on Diversification in Aquaculture

As part of the ongoing "Azadi Ka Amrit Mahotsav" celebrations to mark 75th Anniversary of Indian Independence in the country, an event 'National Campaign on Diversification in Aquaculture' was jointly organised by ICAR-Central Marine Fisheries Research Institute (CMFRI) and seven other ICAR Fisheries Research Institutes (CIFE, CIFRI, CIFT, CIFA, CIBA, NBFGR and DCFR) on March 10th, 2022. The webinar was attended by 687 participants, in addition

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Platinum Jubilee celebrations for ICAR-CMFRI

Established on 3rd February 1947, the ICAR-CMFRI is celebrating its Platinum Jubilee Year with several activities lined up for the year. The institute has been playing a pivotal role in marine fisheries research since its inception. CMFRI which joined the Indian Council of Agricultural Research (ICAR) in 1967, has grown into a leading tropical marine fisheries research hub in the world. At the online foundation day celebrations organised by Dr. A. Gopalakrishnan, Director ICAR-CMFRI, Dr. J. K. Jena, Deputy Director General, ICAR and chief guest addressed staff from all regional centres and stations. On the occasion a special logo and theme song also was released ◆

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Assisted by: Mr. Arun Surendran, Mr. C. V. Jayakumar, Mr. P. R. Abhilash

Twinning Integrated Multi-Trophic Aquaculture in hybrid biofloc system for higher fish production

Combining the benefits of Integrated Multi-Trophic Aquaculture (IMTA), Biofloc Technology and Recirculating Aquaculture Systems (RAS), Vizhinjam Regional Centre of ICAR-CMFRI has developed a unique fish production model. With apparent advantages of reduced environmental impact, higher production potential from limited land and water sources along with addressing of sustainability concerns, this newly developed model is path breaking. The main objective was nursery rearing of bivalve spat (Asian green mussel *Perna viridis* and backwater edible oyster *Crassostrea madrasensis*) along with biofloc farming of white leg shrimp (*Litopenaeus vannamei*), based on the principle of IMTA. A substantial cost involved in the nursery rearing of oysters and mussels is for the production of pure algal cultures of several species to feed the early spat of the bivalves. Afterwards the spat is taken to outdoor up-weller nurseries, Floating Upweller System (FLUPSY) for further rearing and then for grow-out culture. A bottleneck in making economically viable mussel hatcheries is the lack of a system for nursery rearing of spat and the costs involved in the large-scale production of algae for feeding the spat. According to IMTA principles, two or more species from different trophic levels are grown together and metabolic wastes by one species is used by other organisms as an energy source.

Multitrophic Hybrid-Biofloc System

Nursery silos and ropes in the system

Growth of green mussel in silos

Vannamei shrimp grown in the system

Seeded green mussel ropes ready for farming

Edible oyster spat nursery reared in the system

The present pilot system consists of 4 m diameter biofloc tank, which holds 10000 litres of diluted seawater (25ppt). It is connected to RAS components like a biological filter and a protein fractionator for better control of water quality and control algal blooms or excess floc if it accumulates in the system. Aeration is provided by two A3 venturi aerators and two airoxy-rings connected to the main blower line. An oxygen concentrator and diffuser cone are also incorporated to give pure oxygen in case of an emergency. The white shrimp is stocked in the tank at the PL10 stage, and oyster and mussel spat are stocked in downwellers silos of 30 cm diameter where spat attached to ropes is kept immersed in the floc water. Floc water and algae inoculated in the tank are constantly circulated in the wells/silos using an airlift system. The study showed above 95% survival and better spat growth, as compared to the traditional techniques. In addition, production of shrimp *L. vannamei* stocked in the system at the rate of 200 numbers per m^3 could be harvested. The system with excellent growth of bivalves in addition to a crop of shrimp shows it as a promising technology to increase returns of fish farmers.

Reported by: M. K. Anil, P. Gomathi, B. Raju, P. Praveen, R. Siju, V. M. Arjunan, O. Shalini, P. M. Krishnapriya, and M. P. Sharanya ◆

Paracalanid copepod *Bestiolina coreana* a potential live feed for marine fish larvae

Members of the copepod family Paracalanidae are important as live feed for marine fish larval rearing. *Bestiolina coreana* Moon, Lee and Soh, 2010 a recently identified planktonic calanoid copepod from coastal waters of Korea, were isolated from plankton samples collected from coastal waters of Vizhinjam confirming the distribution of this species in India, for the first time. *B. coreana* is a prolific similar to *B. similis* and *Parvocalanus crassirostris* and within a short period of 15 days, can reach maximum density (6000-8000 numbers per litre) in culture systems. Stock culture can be maintained in 100-300L tanks and mass culture can be made in circular tanks of 3 to 5 ton capacity. Length of adults of *B. coreana* ranged between 750 to 850 μm and width 200 to 250 μm. Males are slightly smaller and thinner. Eggs are small and spherical, measuring 65-70 μm and hatch out as nauplius of length 75-80 μm and width 40-45 μm. Eggs broadcast in the water sink to bottom and can be easily siphoned out if needed. Most of the eggs hatch within 12-18 hours at 28-30°C. All six naupliar stages are within 60-200 μm in length and 40-90 μm in width. Initial trials conducted at Vizhinjam Regional Centre confirmed that this species is suitable for larval rearing of many marine fishes and can be used as the first feed for even the altricial type of fish larvae. Like most copepods, it is also rich in PUFA and pigments essential for better survival of fish larvae during their rearing process.

Reported by: B. Santhosh, Ritty Maria Thomas, Muhammed Anzeer, K. S. Aneesh, S. Darsana and Ambarish P. Gop ◆

Controlling *Zoothamnium* sp. infestation in cobia larvae

Ciliate protozoan infestation was observed from 12 days post hatch (DPH) cobia larvae reared in the hatchery at Mandapam Regional Centre of ICAR-CMFRI. They were reared with live feeds such as Artemia nauplii and rotifers (*Brachionus plicatilis, B. rotundiformis*) in FRP tanks of 2000 litres capacity. The infested cobia larvae showed white discoloration, sluggish swimming activity and feeding behavior and moribund larvae settling at the bottom of the tank.

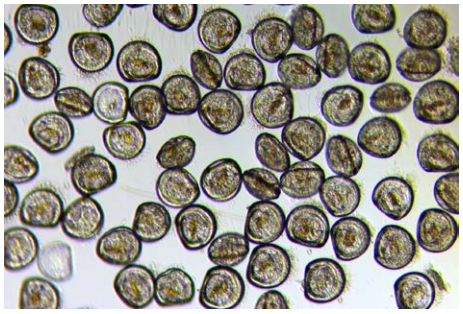
Efficacy of therapeutic agents *viz.*, Formalin (Merck, India), Potassium permanganate (Sigma, Aldrich) and Povidone Iodine 5%w/v (Wockhardt, India) to control the infestation was tested at three different doses of 25 ppm, 50 ppm and 100 ppm. It is concluded that the causative organism for the mortality of the 12 DPH larvae of the cobia was ciliate *Zoothamnium ignavum.* Povidone iodine disinfectant treatment (25 ppm, 50 ppm and 100 ppm) at short term exposure gave better results such as complete detachment and death of the ciliate *Zoothamnium ignavum* as well as complete recovery of the cobia larvae within short duration as compared to the formalin and the potassium permanganate treatments.

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

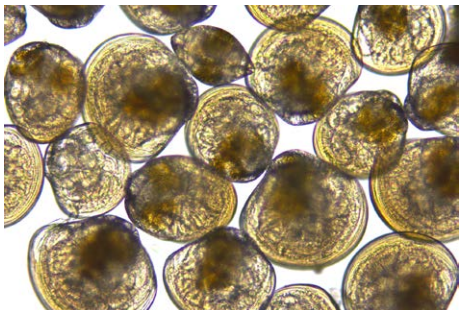
First successful hormone induced breeding and spat production in Short neck clam

Adult *Paphia malabarica*

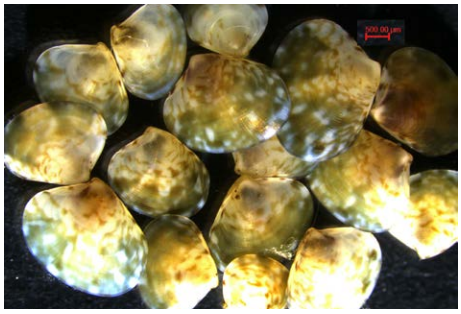
Hormonal induction



Pediveliger stage of *P. malabarica*



Umbo stage



Spat of *P. malabarica*

P. malabarica juvenile in downweller

Hormone-induced breeding and spat production of Short neck clam *Paphia malabarica* was achieved for the first time in Vizhinjam Regional Centre of ICAR-CMFRI on 27.03.2022. This species is considered a nutritious and inexpensive source of protein source and produces valuable raw materials for industrial application, making them an essential source of income for local people. Recent reports show a drastic decline in the short neck clam fishery in Ashtamudi Lake, Kerala, even though this is India's first Marine Stewardship Council (MSC) certified fishery. The depleted resources can be replenished by the successful hatchery production and ranching. For the broodstock development, wild clams of average weight 17.5±0.26 g and total length 34±0.5 mm were collected from the Ashtamudi lake in Kerala. The brooders were conditioned and fed with a mixture of microalgae for 60 days till the ripe gonads were obtained at a temperature range of 24-25 °C.

Gonadal conditions were observed microscopically before induced breeding. And the hormone was carefully administered; serotonin 2.5 M intramuscularly. Spermatozoa were successfully released within 5–10 minutes, followed by the eggs. Trochophore Larvae (55.1±1.1) were observed after 11.45 hours, followed by veliger larvae (69.58 ± 2.47) 18.04 hours after fertilization. When the newly hatched larvae reached the pediveliger stage, they began to settle on 6 -7 DPH. Gill development began 13 days after hatching, and by 15 days, most of the larvae had fully developed gills. In 25 days, a completely developed syphon was seen, and this spat with 1mm size was transferred to the downwelling system for further rearing and juveniles (7.2 mm) were produced in 60 days.

Reported by: A. Mariyam fazula, M. K Anil, P. Gomathi, Summaya Rahuman, Ponni J. Mohan and B. Raju ◆

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farming trials in Gujarat were appreciated. He was accompanied by Dr. Jujjavarapu Balaji, IAS, Joint Secretary, Department of Fisheries, Government of India; Shri Nitin Sangwan, Director of Fisheries, Govt. of Gujarat; Dr. L. Narsimha Murty, Senior Executive Director, National Fisheries Development Board (NFDB) and other senior officials from FSI, CIFNET, NIFPHATT and MPEDA.

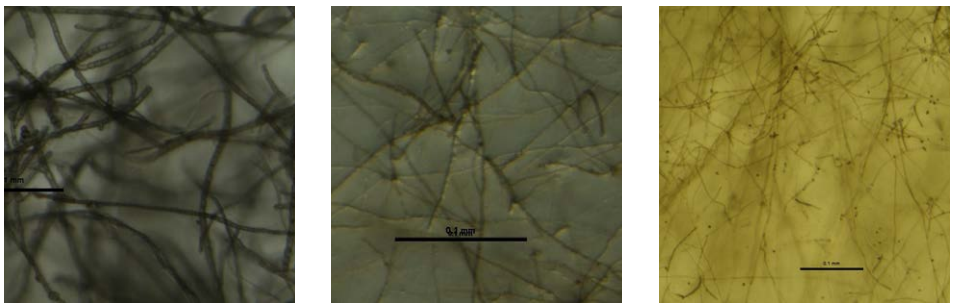
The dignitaries visited the open sea cage farm located at Prabhas Patan operated by the "Sidi" adivasi tribal society, Bharat Adimjuth M*atsyodyog Sahaya Sahakri Mandli- Talala*. They also interacted with Shri Hasambhai Musangara, an innovative farmer who does sea cage farming of lobsters and seaweed farming. Dr. Divu D., Scientist-In-Charge,Veraval Regional Station made a brief presentation regarding the research activities of the Institute and initiatives of deployment of artificial reefs along Gujarat coast to boost marine capture fish production and the seaweed farming trials ◆

Research Highlights

Observations during micro-propagation of marine red algae

During the on-going work on micro propogation of marine algae in ICAR-CMFRI, most of the red algae like *Kappaphycus alvarezii*, *Gracilaria corticata, G. crassa, G. foliifera, G. dura* and *Acanthophora spicifera* were found having a filamentous structure that exactly looks like the conchocelis stage of *Porphyra* with lot of conchospores. This stage was achieved during micro propagation of seaweed with growth hormone manipulations. The explant inoculated in the agar plate showed lot of branching (Fig.1) and after a period of incubation developed spores like structure like conchospores (Fig.2). This work needs to be ascertained with more evidence using molecular techniques. The success of this work means that the seed requirement of any red algae can be achieved with limited space and it can be transported from one place to another easily. Further focus will be on getting these spores to attach to nylon nets for farming in the sea.

Reported by Reeta Jayasankar ◆



Kappaphycus alvarezii | *Gracilaria corticata* | *Gracilaria dura*

Gracilaria crassa | *Acanthophora spicifera* | *Gracilaria foliifera*

Fig.1. Filamentous structure of algae in agar plate

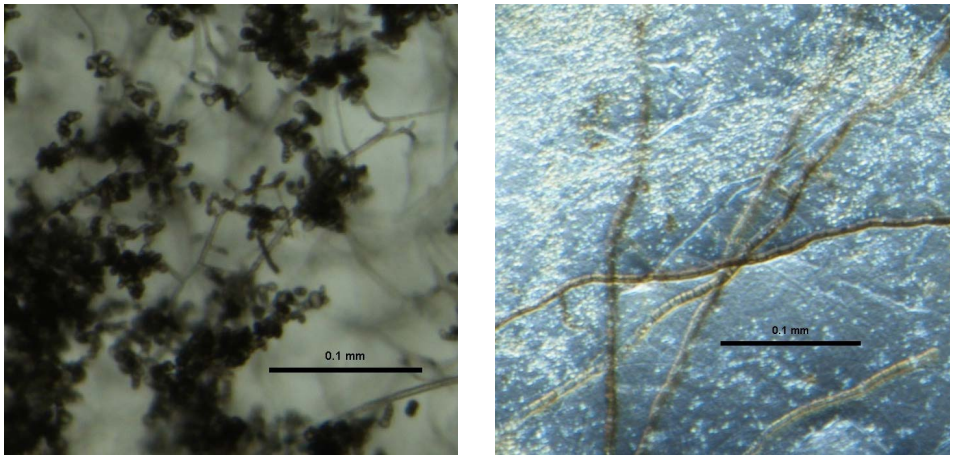


Fig. 2. Conchocelis and conchospores type of structure in *K. alvarezii*

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and officials of the UT Administration of Lakshadweep, Dr. Mohapatra urged for carrying out the works on promoting the nutri-gardens, soil-less media, water conservation, coconut value-addition and processing availing expertise of the ICAR Institutes in the region.

He also visited the District Agro Meteorological Unit established by the KVK, Lakshadweep, at Kavaratti. Dr. P. N. Ananth, who heads KVK, Lakshadweep highlighted the centre's contributions. More than 60 progressive fishermen farmers along with the senior officials of the UT Administration of Lakshadweep participated in the Farmers' meet organised on the occasion ◆

Vaccination and immune responses against viral nervous necrosis (VNN) in Silver pompano

The disease viral nervous necrosis (VNN) is caused by Betanodavirus of the family Nodaviridae which are icosahedral, non-enveloped viruses with a diameter of about 25 nm and a bipartite positive-sense RNA genome. In India, the betanodavirus infection has been reported in wild and hatchery/farm grown marine fishes and is considered as an emerging fish disease affecting finfish species of aquaculture potential. Healthy silver pompano *(Trachinotus blochii)* juveniles found negative for VNN by Reverse transcription polymerase chain reaction (RT-PCR) were selected for vaccination experimental trial at the Mandapam Regional Centre of ICAR-CMFRI. Four experimental groups were maintained namely T1- Negative control, T2- Positive control, T3- vaccinated unchallenged and T4- vaccinated challenged (n=20 each group in triplicates). The Formalin-inactivated VNN vaccine was given at a dose of 0.05 ml intraperitoneally. After two boosters of 14-day intervals the positive control and vaccinated groups were challenged with live betanodavirus (10^6 $TCID_{50}$) by intraperitoneal route on 30 DPV. After 13 days of DPC, the positive control fish displayed the clinical symptoms of viral infection like circling, surfacing and acute death. The mortality was started at 25% on 16th day, then increased to 50% on 17th day, and finally 100% on 20th DPC. To investigate the immune response against VNN virus, samples were collected and analysed for RT-PCR, and immune gene expression (Beta-2- macroglobulin and Lysozyme). Results indicate the vaccinated fish showed viral neutralization, which was confirmed by RT-PCR. The vaccinated fish has gained higher protective antibody titers in serum as compared to the positive control fish. Immune gene up regulation was also significantly higher in vaccinated group (T4) than in controls (T1 and T2). The inactivated VNN vaccine has given good protective immune responses against *betanodavirus* in silver pompano juveniles with 93.5% RPS and also revealed expression of immune genes as compared to the non-vaccinated fishes.

Reported by P. Rameshkumar, A. K. Abdul Nazar, K. K. Anikuttan, G. Tamilmani, M. Sakthivel, M. Sankar and R. Jayakumar, Mandapam Regional Centre

Skill development training in Backwater cage Culture

Hands-on Skill Development training programme on Backwater cage culture of Indian pompano and Asian Seabass under Scheduled Tribes and Scheduled Caste component were organised Visakhapatnam Regional Centre of ICAR–CMFRI, in two districts of Andhra Pradesh. Three programmes, two under TSP (Kothanavarasapuram, Narasapuram Mandal, West Godavari District and Lakshimipuram, Kruthivennu Mandal, Krishna District) and one under SC-SP (Etiparu Pallipalem, Kruthivennu Mandal, Krishna District) were organized during 8-10 March and 10-12 March, 2022 respectively. Each training was attended by 50 interested individuals including ladies, youth and fishermen from respective communities.

Reported by Sekar Megarajan,. Ritesh Ranjan, Shubhadeep Ghosh,. Biji Xavier, Jeyasree Loka, Balla Vamsi and Nagaraju, Visakhapatnam Regional Centre

Outreach

Fingerling Production Units set up

Two RAS Fingerling Production Units (FPU) were designed and set up under the SCSP programme, at Venganur, Thiruvananthapuram district and Thrukunnapuzha in Alappuzha district of Kerala by the Vizhinjam Regional Centre. The system consists of a rearing tank, settling tank, drum filter, foam fractionator, and UV filter. It works with a single pump that circulates the water as well as additional functions like driving the A3 venturi aerator and the foam fractionator. The system installed in Alappuzha district has a capacity of 10 tonnes while the one in Thiruvananthapuram has 5 tonnes capacity. The system can be stocked with 10000-20000 seeds per m^3 depending on the size. The system is being run at a salinity of above 15 ppt so that all the 3 important saltwater fishes, such as Pompanos, seabass and pearl spot can be reared simultaneously. For easy capture for sales, different species can be kept in net-hapas. The system is stocked with small seeds of about 10 mm size and reared for 2-3 months to produce fingerlings suitable size for stocking in cages and ponds. Economic gain per seed during this short rearing period is from ₹5 to ₹20 per seed, making it highly profitable. Technology of RAS unit for fingerling production was transferred to a self-help group *"Navodaya"* at Venganoor, Thiruvananthapuram on 10-03-2022.

Reported by: M. K. Anil, B. Raju P. Praveen and Swathi Lekshmi ◆

10-ton RAS fingerling rearing unit at Thrikkunnapuzha

Grading of seed in RAS-FPU

Seed sales from the production Unit

Pond cultured Pearlspot harvested

Harvest programme of pond cultured pearls pot fish was organised at Peddapalamel Village, Nagayalanka Mandal, Krishna District, Andhra Pradesh on 03-01-2022. Under the scheduled tribes component programmes, Visakhapatnam Regional Centre of ICAR–CMFRI in association with ALERT, a NGO in Vijayawada selected beneficiaries from the Yenadi tribal community and facilitated pond culture of Pearl spot. Around 5000 seeds of pearl spot collected from wild were stocked in one acre pond at 20 g attained an average size of 120 g after 10 months of culture. About 510 kg of fishes was harvested with an average survival of 83%. Sold at ₹225 per kg the group could earn the profit of ₹60,000 from the fish culture. This demonstration showed that underutilised lands can be used and raised awareness among the tribal communities to venture into the fish culture with low investment.

Reported By: Sekar Megarajan, Shubhadeep Ghosh, Ritesh Ranjan, Biji Xavier, Jeyasree Loka and Nagaraju, Visakhapatnam Regional Centre

Sea ranching project under PMMSY launched off Tamil Nadu

The Mandapam Regional Centre of ICAR-Central Marine Fisheries Research Institute (CMFRI) has kick-started a sea ranching project under the 'Pradhan Mantri Matsya Sampada Yojana' by releasing a total of 1.38 million green tiger shrimp (*Penaeus semisulcatus)* seeds at Vedalai in the sea grass beds of the Gulf of Mannar on 17 February 2022.

The project sanctioned by the Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Govt. of India to the ICAR-CMFRI under Central Sector Scheme component of the *Pradhan Mantri Matsya Sampada Yojana* (PMMSY) with a total budget of ₹168.948 lakhs aims to release a total of 200 million green tiger shrimp post larvae in a period of four years in the Palk Bay and the Gulf of Mannar region of Tamil Nadu.

The sea ranching of hatchery produced green tiger shrimp seeds in the region is helping to replenish the natural shrimp stocks and sustaining the livelihoods of the fishermen. During the period from 2017 to 2021, a total of 17.245 million seeds were released in this region with the efforts of Mandapam Regional Centre of ICAR-CMFRI and local fishermen.

Reported by G. Tamilmani, B. Johnson, M. Sakthivel, P. Rameshkumar, K. K. Anikuttan, R. Vinothkumar and R. Bavithra, Mandapam Regional Centre ◆

Field demonstration of marine fish grow-out farming

Harvest of Asian seabass *(Lates calcarifer*) was conducted under a Field Demonstration programme of Scheduled Caste Sub Plan (SCSP) program on 07.02.2022 in the presence of the Assistant Director of Fisheries, Thoothukudi. The Asian Seabass fingerlings reared in HDPE sea cages for a period of 10 months had attained an average weight of 2 kg each and earned a good market price of ₹410 per kg. Sea-cage culture training and scientific guidance to the selected fishers was done by the Tuticorin Regional Station. The 406 kg of Asian seabass harvested provided good returns to the beneficiaries, Alangar Self Help Group at Mela Alangarathattu village, Thoothukudi district.

Reported by: C. Kalidas, D. Linga Prabu, L. Ranjith, M. Kavitha and P. S. Asha, Tuticorin Regional Station ◆

Pilot seaweed farming project at Ratnagiri

Mumbai Regional Station has taken up the initiative to propagate and promote seaweed farming along the Maharashtra coast under SCSP programme. A women self-help group from Golap village, District Ratnagiri,) was identified to take up seaweed culture training and farming locally. Three training and demonstration programmes for the 60 women was completed. Floating bamboo raft and tube net seaweed culture for *Kappaphycus alvarezii* and *Gracilaria salicornia* was launched with 57 floating bamboo rafts and 68 tube nets stocked with seaweed seed in January 2022 with focus on capacity building and impact assessments of seaweed farming in Maharashtra.

Reported by: S. Ramkumar, Ajay Nakhawa, Vaibhav Mhatre, Umesh Rane, Punam Khandagale, Santhosh Bhendekar, K. Baikar and C. Ashish, Mumbai Regional Station ◆

a) Seaweed seeding b) Seaweed farmers self-help group c) Bamboo raft installed with seaweed seed d) Tube net with seaweed seed

Jellyfish *Turritopsis cf.dohrnii* collected from Mandapam Coastal waters

During the routine jelly plankton surveys in coastal waters off Mandapam, Gulf of Mannar a swarm of hydrozoans was collected and identified as immortal jellyfish species *Turritopsis cf. dohrnii.* There are nearly seven species accepted under the genus.

Reported by R. Saravanan and S. Thirumalaiselvan, Mandapam Regional Centre ◆

Bumper landings of Hilsa at Paradip Fisheries Harbour

Unprecedented bumper catches of about 6 and 4 tonnes of Hilsa (*Tenualosa ilisha*) were landed on 12th and 13th March 2022 by an inboard engine (28 HP) fitted craft operating a ring seine about 20 km south-east of Paradip harbour at a depth of 30 m. It is usually caught in good quantity along Odisha during July to October. The fishes weighed 700 to 1800 g each that commanded a market price of ₹700 -1500 per kg bringing good incomes to the fishermen

Reported by: Gyanaranjan Dash, Swatipriyanka Sen Dash, Rajesh Kumar Pradhan and Prakash Chandra Das ◆

Heavy landing of Talang queenfish at Pamban, Gulf of Mannar

Large sized Talang queenfish *Scomberoides commersonnianus* were landed by pair trawls operated off Pamban Island at a depth of 40-55 m in Pamban Therkuvadi Fish landing centre on 21st March 2022. A total of 1.35 tonne of the fish was caught with around 147 Talang queenfish of 95.5-113 cm total length and 5.95-9.55 kg weight range recorded from single unit. The fish is common in the trawl landings at Pamban and Rameswaram landing centres, especially during and after north east monsoon. However catch in such large numbers is recorded only rarely. The fish was sold to local dry fish unit at ₹120 per kg.

Reported by L. Remya, R. Vinothkumar, M.Midhun, R. Rajkumar, R. Suresh, M. Mahalingam, V. Vetrivel and M. Prakash, Mandapam Regional Centre ◆

Harvest Mela of Asian Sea Bass

Tuticorin Regional Station of ICAR-Central Marine Fisheries Research Institute organised a Harvest Mela on 02 March, 2022 for Asian Sea Bass cultured in the sea cage farm at Arockiyapuram, Kaniyakumari. Shri M. Arvind, IAS, District Collector Kanyakumari, flagged off the program. *Annai Meen valarpu Kuzhu*, Arockiyapuram under the scientific and technical support of Tuticorin Regional Station were involved in the cage farming activity. After ten months of culture, the fish had attained an average weight of 1.850 kg and around 1144 kg could be harvested. With a market rate of ₹430 per kg of seabass, the farming proved profitable.

Reported by Tuticorin Regional Station ◆

Training

Skill upgradation of tribal fisherfolks in Odisha

Under the Tribal sub-plan programme (TSP) of the institute, skill upgrdation of the marginal tribal fisherfolks of Jugadiha village (Balasore, Odisha) was addressed by Puri field centre. A total of 40 beneficiaries have been trained under two hands-on training programmes, 'Poly-culture of *Mugil cephalus* with prawns in high saline coastal ponds' during 28.02.22 to 02.03.22 and 'High saline grow-out culture of Crabs in HDPE boxes' during 3-5 March, 2022. Region specific improvised best management practices (BMP) for the mariculture were extended to the trainees.

Reported by: Gyanaranjan Dash, Rajesh Kumar Pradhan, Biswajit Dash, Swatipriyanka Sen Dash and Madhumita Das. ◆

Hands-on trainings organized for skill upgradation of small scale fishers in Odisha

Two hands-on training programmes, i.e., (1) Poly-culture of *Mugil cephalus* with prawns in high saline coastal ponds" during 10.03.22 to 12.03.22 and (2) High saline grow-out culture of Crabs in HDPE boxes" during 14.03.22 to 16.03.22 have been organized by Puri field centre of ICAR-CMFRI (Odisha) for the 20 scheduled caste marginal fishers of Kanamana (Astarang, Odisha) and 30 scheduled caste marginal fishers of Alupatana (Satapada, Odisha) respectively to refine their skills on the region specific improvised scientific coastal mariculture techniques. The training programmes through the scheduled caste sub-plan programme (SCSP) is aiming to upgrade their existing skills and increase technology adoption by which their socio-economic status could be improved.

Reported by: Rajesh Kumar Pradhan, Swatipriyanka Sen Dash, Gyanaranjan Dash, Biswajit Dash and Madhumita Das. ◆

Support to fisherwomen under NICRA

The Madras Regional Station conducted a Stakeholders Meeting for Empowering Women in Fisheries under NICRA-SCSP component at Kottaikadu village, Chingleput district, Tamil Nadu on 05 March 2022 and extended support to 36 women beneficiaries, who are involved in oyster picking from the nearby creeks. They go by small country crafts to the sites and wade into neck-deep waters during the day time for nearly six hours.

The oysters are picked by their feet, shucked and the meat tossed into the baskets which they carry they hang on their backsand the oyster meat is sold locally. Aluminum vessels, locally called *Annakoodai* to carry the oyster meat/fishes for marketing, umbrellas and hand towels were distributed to them. Dr. Shoba Joe Kizhakudan, Centre Coordinator, NICRA and Dr. Joe K. Kizhakudan, Co-PI, NICRA oversaw the distribution and had discussions with the beneficiaries regarding further support in their activities. Smt. Susheela Arumugam, Councillor, Kottaikadu Panchayat was the special invitee at the function who distributed the items to the beneficiaries. The beneficiaries identified in December 2020, following discussions with the village leaders were supported with field accessories like customized gloves, shucking knives and socks last year ◆

Training programme on seed production of food fishes

A training programme on "Seed production and farming of cobia and pompano" was organised from 14th to 17th March, 2022 for 10 officials of State fisheries department, Govt of Kerala. Certificates were distributed to the participants during the valedictory function held on 17th March, 2022.

Reported by K. K. Anikuttan, B. Johnson, and G. Tamilmani, Mandapam Regional Centre ◆

Potential sites for seaweed culture and sea-cage farming in Puducherry to be identified

The request to identify the potential sites available for seaweed and sea cage farming at Puducherry by the Department of Fisheries, Puducherry in the Regional Committee Meeting for Zone VIII held on 14th September, 2021 was addressed by the Mandapam Regional Centre of ICAR-CMFRI. A preliminary survey with 18 identified parameters, was undertaken in coastal Puducherry and Karaikal during 9th to 16th March, 2022 ◆

Seaweed farming outreach at Mandapam

An awareness cum outreach programme on *Pradhan Mantri Matsya Sampada Yojana* (PMMSY) and seaweed farming was conducted successfully at Manora, Thanjavur district in Tamil Nadu on 27th January, 2022. Forty three participants attended the programme and briefed about the schemes in the PMMSY, seaweed farming through bamboo raft, monoline or tube net methods and government supported schemes for seaweed farming under the PMMSY.

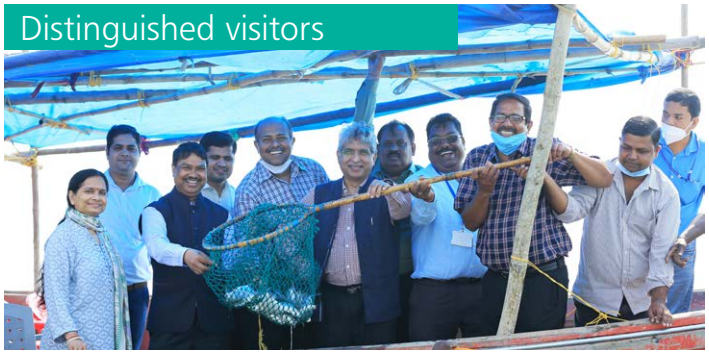
Reported by B. Johnson, and G. Tamilmani, Mandapam Regional Centre ◆

..... continue from page 1

several viewers via YouTube.

Dr. J. K. Jena, Deputy Director General (Fisheries), ICAR, New Delhi in his address as the chief guest, underlined the importance of aquaculture diversification in order to achieve the expectations of the country in terms of production and productivity. Dr. A. Gopalakrishnan, Director, ICAR-CMFRI and Chief Organizer, welcomed all and also presented an overview of the status of global and Indian fisheries production and aquaculture diversification with insights into future prospects. Dr. Krishna R. Salin, Program Chair, Aquaculture and Aquatic Resources Management (AARM) Program, Asian Institute of Technology (AIT), Thailand, delivered the lecture on the topic 'Aquaculture System Diversification: Successful Examples from Asia' highlighting prominent examples and concerns, as well as restrictions and the level of industrialization in aquaculture. Nano bubble technologies, Aquapod designs, cluster farming, steel barge farming, shallow sea aquaculture, carbon sink fisheries, and river cage farming are just a few of the innovative aspects, he said. In his talk on 'Towards industrial microalgae production for food and feed application', Prof. (Dr.) Rene H. Wijffels, Professor, Department of Agrotechnology and Food Sciences, Wageningen University, Netherlands highlighted the relevance of microalgae, its industrial production, the development of stand-alone technologies, bioprospecting in three different temperature zones, circular technology and microalgae biotechnology. Dr. Jorge Dias, Co-founder and CEO, Sparos LDA, Portugal, delivered the webinar's concluding presentation, titled 'Unlocking the Potential of Microalgae in Aquafeeds.' He spoke about the use of a variety of microalgae in aquafeeds, such as *Nannochloropsis*, *Schizochytrium*, and *Phaeodactylum tricornutum*, as a novel n-3 HUFA source, the replacement of fish meals and fish oils, the importance of traditional feeds during sensitive periods of the production cycle and microbiome modulation among others ◆

Distinguished visitors



Dr. J. K. Jena, Deputy Director General (Fisheries), ICAR, New Delhi and Shri Sagar Mehra, Joint Secretary (Inland Fisheries), Department of Fisheries, Government of India visited the open sea cage farm established at Bahabalpur, Odisha. This work was carried out by the Visakhapatnam Regional Centre and Puri Field Centre of ICAR-CMFRI, in collaboration with the National Fisheries Development Board (NFDB). During their visit on 5th March 2022, the dignitaries accompanied by officials from ICAR-CMFRI, NFDB and state fisheries department, Government of Odisha interacted with the stakeholders to assess the feasibility and performance of the open sea cage farming activities off Balasore coast, Odisha ◆

Dr. Pravin Puthra, Assistant director General, (Marine Fisheries) visited Madras Regional Station of ICAR-CMFRI on 31 March 2022 and addressed the staff members of the centre ◆

Awareness on conservation of elasmobranchs

Digha Regional Station of ICAR-CMFRI organised one-day awareness programme on "Conservation of Elasmobranchs" with special emphasis on the protected species in the Indian Wildlife (Protection) Act (IWPA), 1972 under the in-house project "Developing Management plans for Sustainable Exploitation and Conservation of Elasmobranchs in India (DEM/ELS/11) on 21st April 2022. Elasmobranchs have a great role in the marine ecosystem by serving as an important ecological function in marine food webs, indicators of a healthy ecosystem, significant socio-economic value to humans, and important food source for many coastal communities, but are highly susceptible to overexploitation due to their typical biological characteristics. The awareness programme was coordinated by Dr. Subal Kumar Roul, Scientist In-Charge of Digha Regional Station and attended by 45 B.F.Sc students from the School of Fisheries, Centurion University of Technology and Management (CUTM), Odisha ◆

Dr. C. Suvarna, IFS and Chief Executive, NFDB, visited Veraval Regional Station on 11.01.2022, as part of coordination of "Sagar parikrama" and status review on mariculture technologies implementation under PMMSY. Stakeholder meets at Okha, Dwaraka, Porbundar, Mangrol, Veraval and Diu, interactions with Dept. of Fisheries, Gujarat and beneficiaries of TSP and SCSP programmes operated through ICAR- CMFRI were conducted ◆

Winter School on marine fish taxonomy held

ICAR sponsored online Winter School "Recent development in Taxonomic techniques of marine fishes for conservation and sustainable fisheries management" was held from 3 - 23 January, 2022 with Dr. Rekha J. Nair, as Course Director. Dr. P Krishnan, Director, Bay of Bengal Programme Inter-governmental Organisation (BOBP -IGO-FAO) inaugurated the Winter School and Dr. A Gopalakrishnan, Director of ICAR-CMFRI presided ◆

World Water Day celebrated

On World Water Day celebrated on 22.03.2022, Tuticorin Region Station distributed fish seed (Asian seabass) and mangrove sapling to the selected SC fishermen of Udhaya Self Help Group, Pullaveli, Tuticorin. The programme was conducted under National Innovations on Climate Resilient Agriculture project. Seabass seed procured from RGCA, further reared in the marine hatchery of Tuticorin Regional Station were distributed by Dr. P. S. Asha, Scientist In-charge and Shri. Vijayaragavan, Assistant Director of Fisheries, Department of Fisheries and Fishermen Welfare, Tuticorin ◆

Awards

Cage fish farmer associated with ICAR-CMFRI bags prestigious award of Kerala Government

The constant efforts of ICAR-CMFRI to popularise its cage fish farming technology has paid off with P. M. Dinil Prasad a cage fish farmer trained by the Institute bagging the prestigious 'Thozhil Shreshta' award constituted by the Kerala Government.

While ICAR-CMFRI introduced project funded by the National Fisheries Development Board (NFDB) to set up 500 cage farming units in Kerala in 2018, Dinil Prasad was among the first to launch cage farming in Anjarakandi River in Kannur guided by the Mariculture Division of the Institute. Presently, he undertakes farming of 7000 pearl spots in seven cages of 4x 4 m dimensions and also pearl spot seed production along with mussel farming activities. Consultancy services, including cage fabrication and site selection to those desiring to start cage fish farming with around 75 cage culture units launched in many parts of the Malabar region has been accomplished by him, helping to boost local fish supplies and incomes of mariculture entrepreneurs. Even with COVID restrictions, he took to social media to market his harvested crops among targeted consumers and managed to sell the fish at a good price. Dr. A. Gopalakrishnan, Director, ICAR-CMFRI congratulated the successful farmer for his contribution to mariculture and the recognition by Government of Kerala ◆

Exhibitions

ICAR-CMFRI bagged the "Best Stall Award" in the "1st Indian Fisheries Outlook (IFO) 2022 Priming Indian Fisheries in Attaining Sustainable Development Goals" held at ICAR-Central Inland Fisheries Research Institute (CIFRI), Barrackpore from 22nd to 24th March, 2022 jointly organized by ICAR-CIFRI in collaboration with Inland Fisheries Society of India (IFSI) and Professional Fisheries Graduate Forum (PFGF). Dr. W. S. Lakra, former Vice Chancellor, ICAR-Central Institute of Fisheries Education, Mumbai conferred the Institute with the "Best Stall Award" during the valedictory function held on 24th March, 2022 for showcasing the scientific achievements and technologies/ products developed and transferred by it for the development of marine fisheries and mariculture in the country. The award was received by Dr.Subal Roul, Scientist-in-Charge, Digha Regional Station. Dr. Dilip Kumar, Former Director and VC ICAR-CIFE; Dr. Gopal Krishna, Former Director and VC ICAR-CIFE; Dr. V. V. Sugunan, Former Director, ICAR-CIFRI and ADG (Inland Fisheries), ICAR; Dr. B. K. Das, Director, ICAR-CIFRI and other dignitaries, scientists, professors and students from different organization besides farmers and entrepreneurs visited the stall.

Stall exhibitions were set up during 3rd Smart aqua expo and conference, India, 2022 at Balasore, Odisha during 4th to 5th March, 2022 and International conference on agriculture for sustainable future (AgriVision-2022) at Revenshaw university (Cuttack, Odisha) during 6th to 8th March, 2022 by Puri field centre

Visakhapatnam Regional Centre set up Exhibition Stall at the Science Week Festival celebrations in Andhra University held during 22 -28 February, 2022. Vice-Chancellor, Andhra University and other dignitaries visited the stall ◆

Retirements

Shri N. Ramakrishanan
Senior Technician
31.01.2022

Smt. K. Balamani
Assistant Administrative Officer
31.01.2022

Dr. K. K. Joshi
Principal Scientist & Head
Marine Biodiversity Division
31.01.2022

Dr. P. U. Zacharia
Principal Scientist & Head
Demersal Fisheries Division
28.02.2022

Shri R. Sreenivasan
Assistant Administrative Officer
31.03.2022

Shri W. Sathyavan Neelraj
Assistant
31.03.2022

Smt. Nandini N. Mayekar
Skilled Support Staff
31.03.2022

Promotions

Name & Designation	Promoted as	w.e.f
Shri D Augustus Julin Raj, Assistant	Assistant Administrative Officer,	09/02/2022
Shri Santosh Kumar, Assistant `	Assistant Administrative Officer	14/02/2022
Shri Rishikesh Aandi, Assistant	Assistant Administrative Officer	2.02.2022
Smt. V K Sobha, Assistant Administrative Officer	Administrative Officer	14.01.2022
Smt. K. N. Meera, Assistant Administrative Officer	Administrative Officer	03.03.2022
Shri Prashant Kumar, CF&AO	Comptroller	07.03.2022
Shri G. S. Hareesh Nair, CAO	Director/CAO (Sr. Grade)	18.03.2022
Shri Akhil Babu, SSS	Technician	11.02.2022
Shri Midhun Muthayan, SSS	Technician	11.02.2022
Shri M. Mahalingam, SSS	Technician	11.02.2022
Shri Pakkri Muthu, SSS	Technician	11.02.2022
Shri U. Aneesh, SSS	Technician	11.02.2022
Smt. M. Sethulakshmi, SSS	Technician	11.02.2022
Shri Jerin V. Jose, SSS	Technician	11.02.2022
Shri Damodhara Rao Paumu, SSS	Technician	11.02.2022
Shri P. J. Joby, SSS	Technician	11.02.2022
Shri P. K. Prashant, SSS	Technician	11.02.2022
Smt. P.Prasannakumari, SSS	Technician	05.05.2022
Shri R. Suresh, SSS	Technician	11.02.2022
Smt. V. V. Vijayalakshmi, SSS	Technician	22.02.2022
Shri Suresh, SSS	Technician	11.02.2022
Smt. M. P. Sharanya, SSS	Technician	11.02.2022
Smt. Sindhu K. Augustine, Technical Officer	Senior Technical Officer	30.12.2019
Shri U. Jayaram, Technical Officer	Senior Technical Officer	03.07.2020
Shri K. Diwakar , ACTO	Chief Technical Officer	06.09.2019
Shri D. Pugazhendi, ACTO	Chief Technical Officer	02.11.2019
Shri A. Udayakumar, Retd. STO	Assistant Chief Technical Officer	03.02.2020
Shri Narayan G. Vaidya, STO	Assistant Chief Technical Officer	01.01.2020
Shri N. Rudhramurthy, STO	Assistant Chief Technical Officer	09.09.2019

Transfer

Name & Designation	From	To	w.e.f.
Shri Ashish Chobey	ICAR-KVK, Ernakulam	ICAR-CIRCOT, Mumbai	05.02.2022
Smt. L. Saritha	ICAR-CMFRI, Kochi.	ICAR-CTCRI, Thiruvananthapuram	22.01.2022
Shri Arjun Murali	ICAR-CTCRI, Thiruvananthapuram	ICAR-CMFRI, Kochi	17.01.2022
Shri Ajith Mattappada	ICAR-CPCRI, Kayamkulam	Calicut Regional Station of ICAR-CMFRI	14.02.2022
Smt. A. S. Aswathy	ICAR-CMFRI, Kochi	ICAR-CPCRI, Kayamkulam	14.02.02022

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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