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Newsletter of ICAR-Central Marine Fisheries Research Institute

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Mariculture support for Indian Pompano gets a fillip

An indigenously developed Recirculatory Aquaculture System (RAS), a culture system for rearing marine finfish in controlled conditions with minimum use of water and efficient management practices. Dr. A. Gopalakrishnan, Director, ICAR-CMFRI inaugurated the facility developed at Visakhapatnam Regional Centre of ICAR-CMFRI on 20.03.2023. It is expected that the development will pave

continue to page no. 14...

NICRA Project Review identifies focus areas for climate-resilient agriculture and fisheries

The ICAR-Central Marine Fisheries Research Institute (CMFRI), Kochi hosted the review meeting of the research works of various fisheries research institutes and state agricultural universities under the fisheries component of the National Innovations in Climate Resilient Agriculture (NICRA) of ICAR on 11th March 2023. The meeting was chaired by Dr. S. K. Chaudhari, Deputy Director General (Natural Resources Management) of the ICAR who emphasised the need for finding scientific solutions to the impacts of climate change on food producing sectors, including fisheries. Dr. B. Venkateswarulu, Chairman of the NICRA Expert Committee urged scientists to focus on innovative technologies to

continue to page no. 13...

Director Speaks

Marine fisheries managers are constantly looking out for tools to enhance marine fish production, productivity and sustaining it. Artificial Reefs are basically long-term habitat reconstruction programs to protect, produce and sustain a natural reef like faunistic community which has the potential to yield several socio-economic benefits to the community mainly by improving their livelihoods. Since 1980, ICAR-CMFRI has a rich experience in setting up of artificial reefs and is actively collaborating with the Fisheries Departments of Tamil Nadu, Andhra Pradesh and Gujarat. With demand for more ARs from stakeholders the Union Ministry of Fisheries is looking to implement it on a larger canvas, with a well trained and informed workforce as through workshops organised by ICAR-CMFRI. Sea ranching programmes also have been deployed to rejuvenate fisheries in the Gulf of Mannar and Palk Bay region. Such initiatives augur well for the marine fisheries sector in India.

With best wishes

A. Gopalakrishnan

Director, ICAR-CMFRI

New Heights

Artificial Reefs Technology for the benefit of marine fishers

Trainers Training programme funded by the NFDB-PMMSY, on "The Fundamentals of Artificial reefs for improving marine fisheries in India" was extended to the Fisheries Department officials of all the maritime states and UTs and Fishery Survey of India (Goa, Mumbai, Kochi, Visakhapatnam and Chennai), CIFNET (Kochi and Chennai) and CICEF, Bangalore during 18th to 20th January 2023 and 30th January to 1st February 2023. 71 participants attended both the programmes which consisted of lectures, sea trips and visits to fishing villages. Interactive sessions with stakeholders such as fishers, Reef Committee members, SCUBA divers, Engineers -Fabricators and freight and sea vessel operators in the area were arranged. The first batch was inaugurated by the Director ICAR-CIBA, Dr. Kuldeep K. Lal and the Addl. Director Dr. Noorjahan Beevi, Fisheries Department, Tamil Nadu was the Guest of Honour. The Artificial Reefs programme will be implemented in all Maritime states with the support of the Ministry of Fisheries, Govt. of India. The valedictory function of the first batch was held on the 20 January, 2023 chaired by Dr. E. Vivekanandan. Dr. A. Gopalakrishnan, Director, ICAR-CMFRI and the Chief Guest, Dr. (Smt.) C. Suvarna, IFS and Chief Executive, NFDB Hyderabad participated in the valedictory programme for the second batch which was chaired by the commissioner of Fisheries Dr. K. S. Palanisamy, IAS, Department of Fisheries Tamil Nadu.

Reported by: Joe Kizhakudan, Co-ordinator, Artificial Reefs Programme ◆

Published by: Dr. A. Gopalakrishnan, Director, ICAR–Central Marine Fisheries Research Institute, Post Box No.1603, Ernakulam North P. O., Kochi-682 018, Kerala, India.
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Successful seed production of marine ornamental *Amblyglyphidodon indicus*

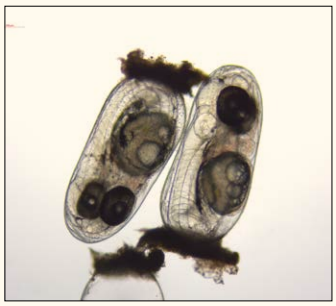
Adult Broodstock

The Maldives damselfish (*Amblyglyphidodon indicus*) is a popular marine ornamental fish well-suited for community aquariums and has been bred in ICAR-CMFRI for the first time.

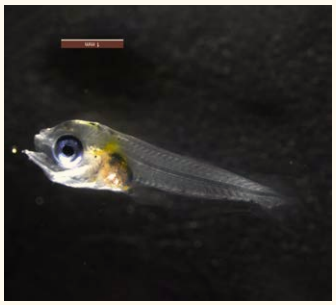
Fifteen sub-adults of the damselfish were collected from the coastal waters of Kanyakumari, in the month of August 2021. The fishes with size range 5.5-6.5 cm were transported to the hatchery of Vizhinjam Regional Centre of ICAR-CMFRI, in oxygen packed bags. The fish were quarantined and acclimatized and reared in a rectangular FRP tank with simple biofilter setup. The fishes were fed 2 times a day with a special broodstock diet. After 7 months of rearing fish reached the size of 7.6-8.3 cm and started spawning.

The male fish (dominant and big) cleaned the sides of the tank for a total area of 200 cm^2 for attaching the egg by the female (spawning site). Spawning occurred in the morning between 5 am and 8 am. In general, more than one female lay eggs but only a single male protected the spawning site from all other fishes in the group.

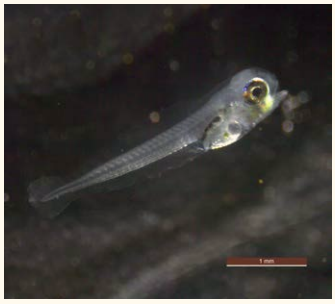
The eggs were cylindrical, 1300-1350 µm in length and 500-600 µm in width and hatched in the late evening of the 5^{th} day. The newly hatched larvae measured 3400-3490 µm in TL and 530-580 µm in width. Preflexion larvae (4-6 days post hatch (dph)) has measured 4450-4600 µm in TL and 950-970 µm in width. Flexion larvae (7-8 dph) measured about 5470-5500 µm in TL and 1250-1270 µm in width. Post flexion larvae (9-10 dph) measured about 7600-8000 µm in TL and 1700-2000 µm in width. The larvae has attained a total length of 13000 µm in TL on 30 dph and larvae started metamorphosing.



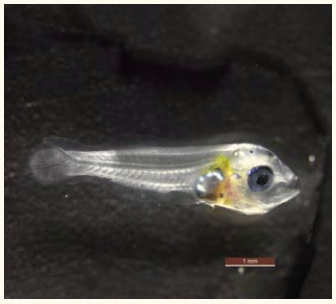
Eggs about to hatch



Hatchling



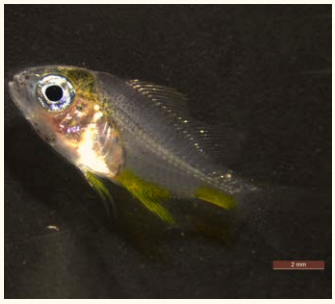
Preflexion larvae



Flexion larvae

Postflexion larvae

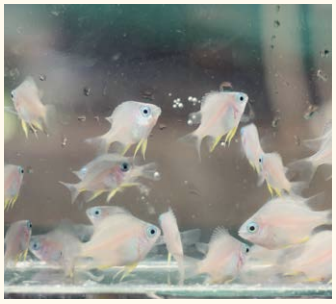
20 dph larvae



30 dph larvae

55 dph

75 dph



100 dph

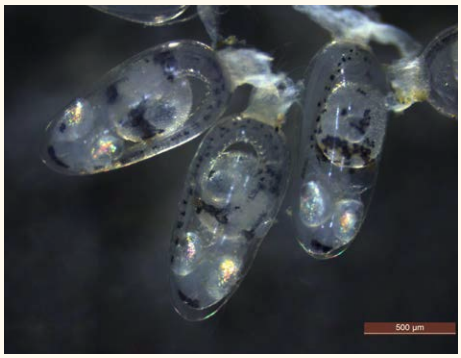
Reported by Ambarish P. Gop, F. Muhammed Anzeer, K. S. Aneesh, B. Santhosh, M. K. Anil and A.R. Akhil, Vizhinjam Regional Centre ◆

Seed production of Caerulean damsel, *Pomacentrus caeruleus* successful

Caerulean damsel (*Pomacentrus caeruleus* Quoy & Gaimard, 1825) is a popular marine ornamental fish native to the Western Indian Ocean and it was successfully bred at the Vizhinjam Regional Centre of ICAR-CMFRI. Ten juvenile Caerulean damsels collected from the coastal waters of Kanyakumari were transported to the hatchery in oxygen packed polyethylene bags. They were quarantined and acclimatized for one week and then reared in circular HDPE tanks of 500 L capacity. Size of the fishes at the time of stocking ranged from 5 to 7.2 cm in total length and were fed with commercial pellet feeds (0.8-1.2 mm) plus fresh squid/ mussel meat, three times every day. After 6 months of rearing, after reaching a size of 8.5-9 cm in total length and 12.5-17.3 g in weight, matured fishes started spawning in July, 2022 which continued till October and initiated again from February 2023. All the spawnings occurred in the early mornings with around 600-800 eggs laid in different batches. The eggs were cylindrical in shape and hatched in the late evening of the 3rd or 4th day of spawning depending the temperature. The larvae started feeding from 2-3 days post-hatch (dph) and different stages of copepods were used as live feed till the metamorphosis stage at 23-25 dph.

Reported by: F. Muhammed Anzeer, Ambarish P. Gop, K. S. Aneesh, B. Santhosh, M. K. Anil, A.R. Akhil, Vizhinjam Regional Centre

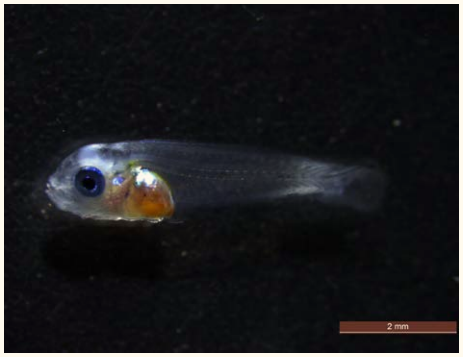
Broodstock



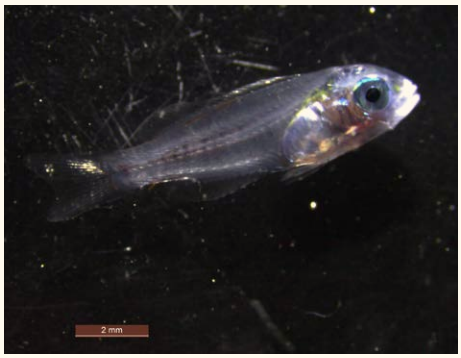
Eggs

Hatchling

Preflexion larvae



Flexion larvae



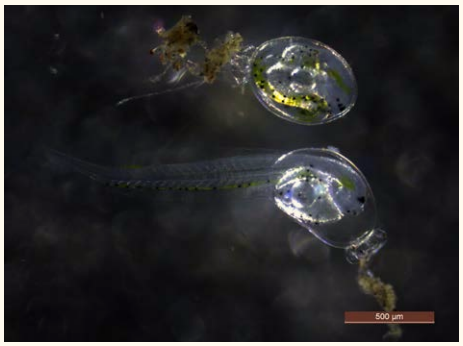
Post flexion

Metamorphosing juvenile

Captive breeding of two-tone chromis, *Pycnochromis fieldi*

Broodstock

Day 1 egg



Egg hatching

Hatchling

Captive breeding of Two-tone chromis or chocolate dip chromis (*Pycnochromis fieldi*), a widely sought-after marine ornamental fish native to the Indian Ocean was successful. Ten sub-adults collected from the coastal waters of Kanyakumari were transported in oxygen packed polyethene bags to the hatchery. The fishes were quarantined, acclimatized and reared in circular HDPE tanks of 500 L capacity with 380-390 L of water and a biofilter setup. The fishes were fed with commercial pellet feeds (1.2 mm) and fresh squid or mussel meat thrice a day. The fish with a size range of 5-7 cm in total length and 2.9-6.5 g in weight started spawning from February 2023. The egg clutch size varied between 400-600 eggs. The perfectly oval shaped eggs hatched 55–60 hour post-fertilization with newly hatched larvae in the size range of 1850-2020 µm.

Reported by K. S. Aneesh, Ambarish P. Gop, F. Muhammed Anzeer, B. Santhosh, A.R. Akhil and K.S. Sudarshan, Vizhinjam Regional Centre ◆

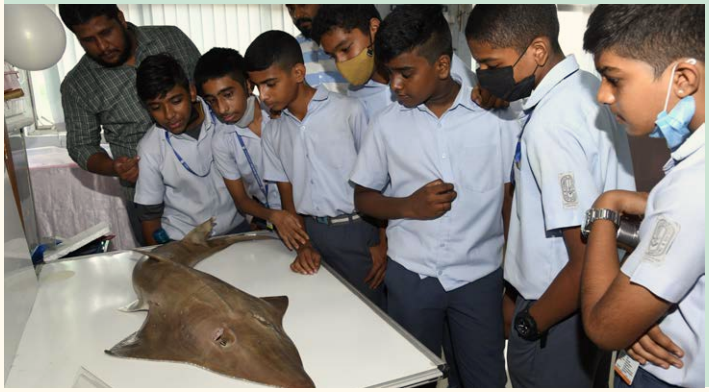
Backyard ornamental fish rearing units set up in Ratnagiri

Backyard ornamental fish culture units were established in the Kasop village during March 2023 under Scheduled Caste Sub Plan programme of the Union Government of India. Fifteen beneficiaries were trained on the aspects of rearing technology of four varieties of clownfish, such as percula clown, tomato clown, maroon clown and designer clown fish. The fish seed stocking size and was 0.5 inch with a 45 days rearing cycle using the marine ornamental fish feed, Varna. This backyard farming is expected to enhance the livelihood of these beneficiaries ◆

Dr. Tejaswi Naik, IAS, PS to the honourable Minister for Agriculture and Farmer Welfare, Government of India, visited Karwar Regional Station on 12.2.2023 and visited the facilites and programmes in operation at the marine cage farm and the marine hatchery complex for finfish breeding.

Foundation Day celebrations of ICAR-CMFRI

The 76th Foundation Day of ICAR-CMFRI was celebrated on 3rd February 2023 at ICAR-CMFRI Headquarters in Kochi as well as Regional Centres and Stations in all maritime states of India. Open House conducted enabled the public, especially students to familiarize themselves with the on-going research programmes of the institute and technologies developed ◆



Hatchery produced Single Oyster culture in Palghar district of Maharashtra

Cultchless spat stocking and growth monitoring in hanging trays

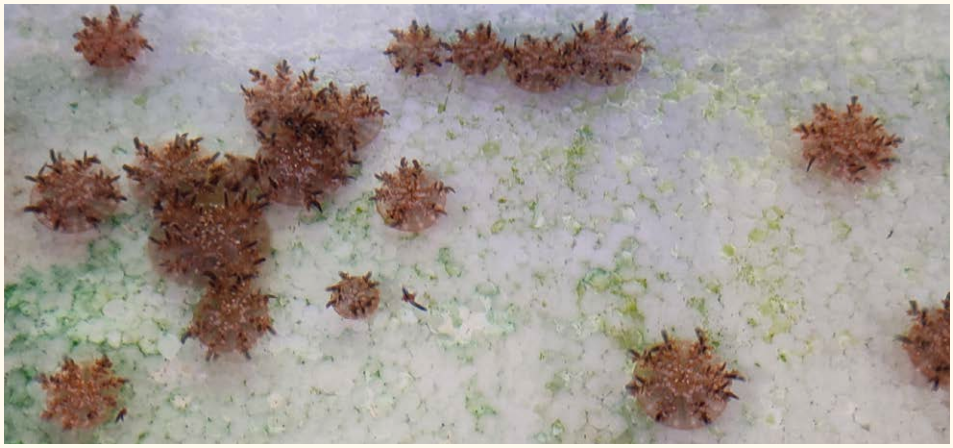
The nursery reared cultchless spats (*Crassostrea madrasensis*) measuring 0.5 to 0.8 mm procured from Vizhinjam Regional Centre of ICAR-CMFRI, were stocked in the hanging trays on rafts launched in the Palghar district of Maharashtra in January 2023. The 35 cm diameter plastic trays and its lids were tightly stitched with 0.5 mm mesh and two concrete sinkers (1500g) were attached at bottom periphery of basket for keeping the tray at upright position. Total 16 trays were hanged in the rafts with stocking densities of 500, 1000, 1500 and 2000 in different trays. The design and mesh size of trays were decided based on the size of cultchless spats. The growth of these spats was rapid and after one month mean anterior-posterior measurements (APM) was 2.5 cm. The regular growth monitoring and cleaning of trays and nets are carried out for water exchange in trays.

Reported by Santosh Bhendekar, Sunil Ail, Thakurdas, Ashish Chaturvedi, Ajay D. Nakhawa and V. Venkatesan, Mumbai Regional Station

Aquarium potential of upside-down jellyfish explored

The biomass production of non-stinging upside-down jellyfish *Cassiopea xamachana* in closed systems was carried out at the Cnidarian laboratory, Tuticorin Regional Station of ICAR-CMFRI. The settled polyp releases ephyrae in 10-15 days through monodisc strobilation. Fifty numbers of captive-reared ephyrae (2-3 months old) were distributed to a local aquarium, to examine the trade feasibility and acceptance by the public.

Reported by L. Ranjith, R. Saravanan, C. Kalidas, D. Linga Prabu, M. Kavitha, R. Vinothkumar, P. Nevathitha and P. S. Asha, Tuticorin Regional Station



Heavy landings of Indian mackerel at Rameswaram Verkode, Palk Bay

Landings of Indian mackerel, *Rastrelliger kanagurta* during second week of January 2023 at Rameswaram Verkode Fish Landing Centre, indicated good catch rates of 0.7 t to 1.35 t per boat. Average size of the fishes caught was 21 cm. The vessels of 15 to 18m overall length fitted with 110 to 180 hp engines operated at 10-12m depth and mad 5 to 6 hauls per trip. Indian mackerel forms a common resource along Rameswaram Island during January to March but such heavy landings are rare. Usually, *R. kanagurta* is sold at ₹ 100-120/kg but prices declined to ₹ 50/kg as a glut condition developed. Most of the fish was transported to Kerala and remaining was sold in local markets.

Reported by L. Remya, M. Midhun, R. Rajkumar, and S. Thirumalaiselvan, Mandapam Regional Centre

Algal bloom dynamics along southern Tamil Nadu coast

To document the extent and impact of harmful algal blooms (HABs) along the coasts of southern Tamil Nadu in the Gulf of Mannar and Wadge Bank areas, on-board collections were conducted. Analysis of water and plankton samples from different bloom locations carried out between September 2022 and January 2023 indicated dinoflagellate *Noctiluca scintillans* of size 0.3-1.12 mm. The water quality analysis showed a reduction in dissolved oxygen content, and an increase in chlorophyll, ammonia, nitrate, nitrite, phosphate and silicate concentrations noticed in all the bloom locations in proportion with high algal concentrations. A high DIN (dissolved inorganic nitrogen) value and consequently, a low DIP (dissolved inorganic phosphate) was also detected in all the stations with the DIN:DIP ratio minimum at Vellapatti and maximum at Pullaveli in Thoothukudi. Since all the stations showed DIN: DIP ratios are less than 10, it indicated N_2 was the limiting nutrient. The monsoon winds during summer (June–September) may led to more nutrient-rich surface along this region. The nutrient flux due the onset of the southwest monsoon transporting water mass into the Bay of Bengal by the eastward flowing Indian Monsoon Current (IMC) might favour on set of bloom during September to November 2022. The frequent appearance and disappearance of algal bloom was observed due to the effect of wind and current along the region. The cell density (43 to 2394 cells/L) recorded from coastal waters of the Southern Gulf of Mannar was much lower than other reported studies in the northern Gulf of Mannar. Also, fish mortality was not observed during the study period.

Reported by L. Ranjith, P. S. Asha, C. Kalidas, R. Vinothkumar, M. Kavitha, D. Linga Prabu, B. Ramar and P. Nevathitha, Tuticorin Regional Station ◆

Stakeholders Workshop to address post-covid socio-economic concerns in the marine fisheries sector

Series of workshops were held as part of ICSSR sponsored research project 'COVID Pandemic and Marine Fisheries Sector in India: Impacts, Externalities and Stakeholders Reflection on Adaptation and Mitigation'. Findings from study conducted which covered 3360 respondents–boat owners, labourers, women, marketing functionaries, traders, exporters and consumers in Kerala, Karnataka, Maharashtra, Gujarat, West Bengal, Odisha, Andhra Pradesh and Tamil Nadu were deliberated in the workshops. Inauguration of the workshop at ICAR CMFRI

headquarters by Dr. A. Gopalakrishnan, Director, on 6th February 2023 was followed by workshops conducted at Madras Regional station (9th March), Visakhapatnam Regional Centre (13th April) and Mumbai Regional Station (4th May 2023).

Reported by Dr. Shyam S. Salim, Project Leader ◆

Awareness program on seaweed culture in Ratnagiri

Seaweed culture (*Kappaphycus alvarezii)* using bamboo raft, rope and tube net method was demonstrated in the Ratnagiri coast was organised during the month of January 2023 under Scheduled Caste Sub Plan programme. Thirty individuals comprising fisherwomen and youth from Mirya, Waingani and Golap villages attended the training programme. The uses of seaweeds, different culture methods and economic benefit of seaweed culture in enhancing their livelihood were conveyed and all the participants got practical training in preparation of bamboo raft, tube nets, and other seaweed culture activities. Fifty bamboo rafts with rope and 100 tube nets of seaweed were launched at Golap site.

Reported by S. Ramkumar, A. K. Punam, D. M. Vaibhav, U. H. Rane, K. K. Baikar, S. Hotekar, M. Sonawane, S. David and V. Venkatesan, Mumbai Regional Station ◆

Skill Development Training in backwater cage culture

Hands-on skill development training programmes on Backwater Cage Culture of Marine Finfishes were organised in the field under Scheduled Tribes and Scheduled Caste components by Visakhapatnam Regional Centre of ICAR – CMFRI during 16th to 18th February, 2023. The programmes focus was on enhancing livelihood and socio-economic empowerment. Major beneficiaries belonged to *Yenadi* and *Madiga* communities of Scheduled Tribes and Scheduled Caste, respectively. Two different skill development training programmes were organised in two different villages in Narasapuram Mandal, West Godavari District, Andhra Pradesh. Each program was attended by 25 beneficiaries of respective communities including women, youth and fishermen. The programmes were co-ordinated by Dr. Sekar Megarajan and team comprising Drs. Ritesh Ranjan, Biji Xavier, Jeyasree Loka and Shubhadeep Ghosh from the Visakhapatnam Regional Centre of ICAR-CMFRI ◆

Harvest mela of cultured *Gracilaria edulis*

Flag-off the harvest by chief guest and dignitaries

Harvested *Gracilaria edulis*

Under the Govt. of India's PMMSY scheme, a pilot-scale experimental seaweed farming with 135 rafts has been initiated off Vellapatti coast in Thoothukudi. Harvest of the farmed seaweed *Gracilaria edulis* was conducted in March 2023 in the presence of Shri. P. Vijayaraghavan, Assistant Director of Fisheries, Thoothukudi and Dr. P.S. Asha, Scientist-in-charge, Tuticorin Regional Station of ICAR-CMFRI. From the two cycles of harvest, an average 8 times increase in growth was observed in *Gracilaria edulis* within a culture period of 42–45 days.

Reported by L. Ranjith., B. Johnson, M. Vinothini Vaz, Michael S. Anandaraj and P. S. Asha Tuticorin Regional Station

Sea ranching under the Central Sector Scheme component of 'Pradhan Mantri Matsya Sampada Yojana'

Under the Project entitled "Sea ranching of Green tiger shrimp (*Penaeus semisulcatus*) Post Larvae (PL) in Palk Bay and Gulf of Mannar, Tamil Nadu" funded by Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Govt. of India under the Central Sector Scheme component of the PMMSY, several releases were made every month. 4.3 million green tiger shrimp seeds (PL-30) were sea ranched at Kundukal (Gulf of Mannar) on 31st January, 2023 followed by 2.8 million green tiger shrimp seeds (PL-20) at Pamban (Gulf of Mannar) on 28th February, 2023 and 2.3 million green tiger shrimp seeds (PL 15-20) were sea ranched at Thangachimadam (Palk Bay) on 10th March, 2023. A total of 50.04 million green tiger shrimp seeds have been sea ranched in Palk Bay and Gulf of Mannar since the inception of the Project in February, 2022.

Reported by Mandapam Regional Centre

On-field demonstration on HDPE modular cage unit fabrication and installation

"On-field demonstration on HDPE modular cage unit fabrication and installation" was successfully conducted by Calicut Regional Centre of ICAR-CMFRI for Scheduled tribes of Wayanad district at Nellarachal, Ambalavayal, Wayanad on 20.01.2023. A total of 20 scheduled tribe cage fish farmers have participated in the demonstration programme ◆

On-field demonstration of cage culture farming practices held

Training and on-field demonstration of cage culture practices was successfully conducted from 27.02.23 to 04.03.23 under the Scheduled caste sub-plan programme (SCSP) for the beneficiaries of Kannur district at Punjakkad in Payyanur, Kerala. Besides lectures on site selection, species selection, feed management, disease management, stocking of fingerlings in cages, cage maintenance and integrated multi-trophic aquaculture, field visit to cage farms at Mujukunnu, Kozhikode was also arranged.

Reported by Calicut Regional Station ◆

Field demonstration of Integrated Multi-trophic Aquaculture

"On-field demonstration on Integrated Multi-trophic Aqucaculture" was successfully conducted for 20 cage fish farmers of Kozhikode district at Mujukunnu, Moodady in Kozhikode on 27.01.2023. During 2018-2019, the cage fish farmers of Moodady initiated the farming in two GI cages provided by ICAR-CMFRI, later on the number of cage units have been increased to 10 in 2020, 24 in 2021 and by 2022 the Mooday cage farmer's own a total of 76 cages. Currently, with the technical support of ICAR-CMFRI, 76 cages are under operation out of which 55 cages are engaged in seabass farming, 15 cages are used for pearl spot farming, three cages for red snapper and three cages for tilapia (chitralada) farming.

Reported by M. T. Shilta, Programme Convenor, Calicut Regional Station ◆

Awareness programme on Conservation of Elasmobranchs

Digha Regional station of ICAR-CMFRI organised an awareness programme on 5th January 2023, to raise awareness among college students on conservation of elasmobranchs, with emphasis on protected species in the Indian Wildlife (Protection) Act, 1972 under an in-house project "Developing Management plans for Sustainable Exploitation and Conservation of Elasmobranchs in India.

Reported by Subal Kumar Roul, Digha Regional Station ◆

Seaweed Culture using HDPE Raft demonstrated

Under the All India Network Project on mariculture, AINP-M an awareness programme on seaweed culture using HDPE raft-based method was conducted. Twenty-five fisher youths from Visakhapatnam and Vizianagaram districts of Andhra Pradesh attended. Seaweed culture technology using innovative HDPE raft based net tube method developed by ICAR-CMFRI and information about different schemes available under PMMSY for seaweed cultivation was extended in the programme jointly organised by ICAR-CMFRI, Visakhapatnam Centre and LAYA, an NGO.

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

Sensitization programme on seaweed farming

An awareness and exposure programme on seaweed farming in the domain of climate change adaptation and mitigation strategy was conducted during 07th March to 13th March 2023 under the SCSP component of NICRA project. Hands on training in seaweed farming related operations such as monoline and net tube preparation for selected women beneficiaries and visits to seaweed farming sites along Porbandar coast was done in association with local SHGs of the SC community as a means of their socio-economic empowerment

Reported by Veraval Regional Station ◆

Winter School on Advanced Analytical Tools for Social Science Research

The Winter School on Advanced Analytical Tools for Social Science Research being organised by ICAR-CMFRI, Kochi was inaugurated on 11th January 2023 by Dr. Seema Jaggi, Assistant Director General (HRD) in ICAR. 25 participants from Rajasthan, New Delhi, Madhya Pradesh, Gujarat, Assam, Arunachal Pradesh, West Bengal, Maharashtra, Telangana, Bihar, Karnataka, Tamil Nadu and Kerala attended the Winter School.

During her inaugural address, Dr. Seema Jaggi stated that in line with the National Education Policy (NEP,2020), agricultural education in the country will be revamped by laying emphasis on skill development. The course curriculum will be restructured such that a wide array of opportunities in the agriculture sector open up. Dr. A. Gopalakrishnan, Director, ICAR-CMFRI presided over the function. Dr. J. Jayasankar, Head, Fisheries Resources Assessment Economics and Extension Division, Dr. Eldho Varghese, Course Director and Dr. Reshma Gills, Course Co-Director from ICAR-CMFRI also spoke on the occasion ◆

..... continue from page 1

help fishermen sustain their livelihood during extreme weather conditions. Dr. A. Gopalakrishnan, Director, ICAR-CMFRI mentioned that India's carbon emission from marine fisheries at the national level is lower than that of global figure and the project helped quicken the pace of ICAR-CMFRI's research activities in India's marine fisheries. Principal Investigators of the NICRA project from other ICAR institutes such as Central Institute of Brackishwater Aquaculture (CIBA), Chennai; ICAR-Central Inland Fisheries Research Institute (CIFRI), Barrackpore; ICAR-Directorate of Coldwater Fisheries Research (DCFR), Bhimtal; ICAR-National Bureau of Fish Genetic Resources (NBFGR), Lucknow; Tamil Nadu Dr. J. Jayalalithaa Fisheries University and Bihar Animal Sciences University presented the status of their research works at the meeting which was reviewed by a team of experts ◆

National Science Day Celebration 2023

With the theme, "Global Science for Global Wellbeing" Visakhapatnam Regional Centre of ICAR-CMFRI celebrated the National Science Day on 28th February 2023. Selected students from Shri Prakash Vidyaniketan, Visakhapatnam participated in various programmes organised. The winners of the Science Quiz were felicitated with certificates and prizes and others were congratulated with the certificate of participation during the valedictory function ◆

Workshop on One Health Aquaculture

Fishery scientists and experts from India and the United Kingdom have called for an Indo-UK partnership to achieve the *One Health Aquaculture* concept in the Indian aquatic food sector. Funded by the Ocean Country Partnership Programme (OCPP) of the UK Government's Blue Planet Fund, the workshop observed an Indo-UK partnership facilitating research collaboration would help to support the adoption of a sustainable seafood practice, reducing the risk of negative impacts from unsustainable activities and subsequently improving the livelihoods, environments, and economies of the country. The One Health Aquaculture India Workshop was jointly organised by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) of the UK government Department for Environment, Food and Rural Affairs and the ICAR-CMFRI from 20-22 February 2023 in Kochi.

Woman entrepreneurs felicitated on International Women's Day

Successful women entrepreneurs Thripthi Shetty and Deepa Manoj who defied all odds during the COVID-19 pandemic and managed to earn a decent income from their entrepreneurial initiatives in ornamental fish culture and trade were felicitated on the occasion of International Women's Day celebrations in ICAR-CMFRI on 8th March 2023. Hosted by the Women's Cell of the Institute, the Kochi Corporation Councilor Padmaja S. Menon, chief guest at the function and Dr. A. Gopalakrishnan, Director, ICAR-CMFRI addressed the gathering. ICAR-CMFRI Women Cell Chairperson Dr. Miriam Paul Sreeram and Member Secretary, Dr. Sandhya Sukumaran also spoke on the occasion.

International Women's Day was celebrated at the Mandapam Regional Centre with sports and cultural events conducted for the staff and felicitation of all the women staff of the centre. Madras Regional Station invited Ms. S. Rekha, Social Activist and Secretary of National Union of Fishermen (NUF) and recipient of several national and international awards for her social service works including Covid Warrior Awards on the occasion who shared her thoughts on the occasion ◆

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the way for entrepreneurs to invest in mariculture. It can produce a fish seed of 12 gm at only ₹11.20 and is standardized for rearing fish seed of average 0.5 gm size. Dr. A. Gopalakrishnan opined that along with the training programs on nursery rearing of Indian pompano in RAS to fish farmers, students and entrepreneurs, it is ensured that skilled manpower will be available for scaling up production in the future.

The newly constructed Farmers Training Hostel "Indian Pompano" was also inaugurated. Products from Visakhapatnam Regional Centre including a centre profile and two products Cadalmin Nann Con and ICAR-CMFRI Marine Microbial Consortium (MMC) were released. Cadalmin Nann Con is an indigenous, packaged concentrate of *Nannochloropsis oculata* which is a critical feed for rotifers, in turn used as live feed for marine finfish larvae in hatcheries. This product has a shelf life of 5 months and can be reconstituted as required. The ICAR-CMFRI MMC is an indigenously developed multi-strain probiotic supplement for marine finfish in nursery and grow-out culture systems which helps in improving growth, survival and gut health of marine cultured fish. Three MoUs were also signed on the occasion which included with MSR Aqua Pvt. Ltd. for broodstock development and seed production technology for Indian pompano, another for providing technical services on sea cage farming of Indian pompano and one for technical services in seaweed cultivation as a knowledge partner ◆

Winter School on Mariculture Technologies

Dr. Kuldeep K. Lal, Director, ICAR-Central Institute of Brackishwater Aquaculture (CIBA) inaugurated the Winter School on Mariculture Technologies for Income Multiplication, Employment, Livelihood and Empowerment' on 7th February 2023. Sponsored by the Indian Council of Agricultural Research (ICAR), the 21 days Winter School held at the ICAR-CMFRI, Kochi aimed at popularising ICAR-CMFRI's mariculture technologies to a diverse group of scientists and academicians from different parts of the country. ICAR-CMFRI has developed and standardised indigenous sea cage fish farming technology suitable to Indian coastal and open waters. Technologies for seaweed farming and integrated multi-trophic aquaculture (IMTA)—an innovative practice combining seaweed and mussel farming with cage fish farming

has also been developed. Dr. Imelda Joseph, Course Director of the Winter School, said popularising the mariculture technologies would offer employment opportunities to the coastal community and make way for women empowerment. A total of 22 researchers from seven states attended the Winter School. Dr. V. V. R. Suresh, Head, Mariculture Division and Dr. Boby Ignatius, Principal Scientist also spoke on the occasion ◆

Turtle conservation activities promoted in Uttara Kannada

Uttara Kannada district with a 140 km of coastline is known for clean beaches and hence sea turtles which prefer clean beaches for nesting and incubation of eggs are recorded regularly. Olive ridely (*Lepidochelys olivacea*) turtles nesting was observed at Majali beach, Devbagh Beach and Mudga beach in Karwar, Manjuguni beach and Bhavikeri beach in Ankola, Dhareshwar Beach and Gokarna Beach in Kumta, as well as at Tonka beach, Kasarkod, Honnavara during January and March 2023.Turtle nestings were identified and relocated to safer zones if required by the officials of Coastal and Marine Ecosystem Wing of Forest Department, Govt. of Karnataka along with the cooperation of local people who were monetarily rewarded for joining hands in conservation activity of sea turtles with Forest Department. After 55 to 60 days of incubation, hatchlings were released back to Sea. The Aame Utasava – 2023 to celebrate turtles was held at Vanasiri Bhavan, Karwar on 30-03-2023. It was an awareness programme for public and students on the need of conservation and existing protection under the Indian Wildlife Protection Act (1972). Scientists from ICAR- CMFRI also attended the programme and Dr. Prathibha Rohit and Dr. Mahesh V., made presentations on "Marine protected species with special reference to turtles" in the lecture session organised by the Forest Department ◆

Dr. Shubhadeep Ghosh
Principal Scientist and Head, Visakhapatnam Regional Centre of ICAR-CMFRI took charge as Assistant Director-General (Marine Fisheries) at ICAR Headquarters in New Delhi on 21-3-2023 (AN).

Dr. Eldho Varghese, Senior Scientist, ICAR-CMFRI, was inducted as National Academy of Agricultural Sciences (NAAS) Associate-2023 by the President, NAAS based on his research contributions to Social Sciences, particularly in the area of Agricultural Statistics.

Retirements on Superannuation

Shri V. K. Kunhikoya
ACTO
31.03.2023

Shri M. Soundara Pandian
Skilled Support Staff
31.03.2023

Re-joining after Deputation

Name & Designation	From	To	w.e.f.
Shri Upender Kumar, Assistant	ICAR-NCIPM, New Delhi	ICAR-CMFRI, Mangalore Regional Centre	23.01.2023

Inter-institutional transfer

Name & Designation	From	To	w.e.f.
Shri Tarachand Kumawat, Scientist	ICAR-CMFRI, Veraval Regional Centre	ICAR-NBFGR, Lucknow	02.02.2023(AN)
Shri S. Bhadra Kumar, ACTO	ICAR-CMFRI, Kochi	ICAR-CTCRI Trivandrum	07.03.2023 (A.N)

Intra-institutional transfer

Name & Designation	From	To	w.e.f.
Shri Tanveer Hussain, Scientist	Vizhinjam Regional Centre	Karwar Regional Station	01.03.2023
Dr. A. Anuraj, Scientist	Karwar Regional Station	Vizhinjam Regional Centre	16.02.2023
Dr. Prathibha Rohit, Principal Scientist	Mangalore Regional Centre	Karwar Regional Station	01.03.2023

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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