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Newsletter of ICAR-Central Marine Fisheries Research Institute

INSIDE

News Highlights

Parliamentary Standing Committee on Agriculture visits ICAR-CMFRI

The Parliamentary Standing Committee on Agriculture with Shri P C Gaddigoudar as the chairperson and Shri Afzal Ansari, Shri A Ganeshamurthi, Shri Kanakamal Katara, Shri Abu Taher Khan, Smt Shardaben Anilbhai Patel, Shri Bheemrao Baswanthrao Patil, Shri Pocha Brahmananda Reddy, Shri V K Sreekandan Nair, Shri Ram Kripal Yadav,

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Union Fisheries Secretary visits ICAR-CMFRI

Mr. Jatindra Nath Swain, IAS, Secretary, Department of Fisheries, Government of India and Dr Jujjavarapu Balaji, IAS, Joint Secretary (Marine Fisheries) visited ICAR- CMFRI, Kochi on 24th September 2021. They interacted online with the scientists of the Institute across the country. Addressing the audience, Mr. Swain appreciated the initiatives to promote cage farming and sea ranching activities undertaken by the institute and said that the Central government is looking forward to promote seaweed farming as an additional livelihood option that can play a major role in the socio-economic upliftment of traditional fishermen, especially during difficult times following Covid pandemic. Mentioning that the

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Director Speaks

During the past few months the institute has consistently taken up programmes that enhance sustainability of marine capture fisheries as well as promote mariculture practices that will enhance livelihood options of the fishermen. Successful captive breeding of the highly valued food fish *Pomadasys furcatus* as well as the marine ornamental, Lyretail anthias for the first time globally is a major credit to the sustained efforts towards the goal of a divesified mariculture species basket aimed by the institute. Indian pompano culture is also being promoted as there is good scope for open sea cage farms for this species. The institute continues to support the marginalized fishermen communities through appropriate interventions through centrally sponsored schemes. Such endeavours will pave the way for all round development of the marine fisheries sector in the country.

With best wishes

A. Gopalakrishnan

Director, ICAR-CMFRI

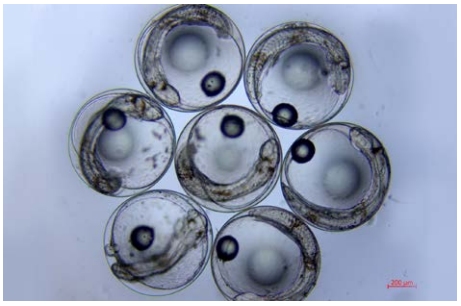
New Heights

Successful captive breeding of Banded Grunter in Recirculating Aquaculture System

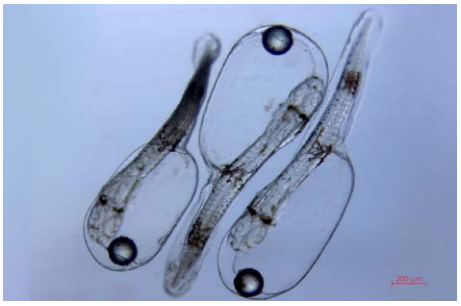
In a global first, a team of scientists at the Vizhinjam Regional Centre of ICAR-Central Marine Fisheries Research Institute have reported successful breeding of the banded grunter *Pomadasys furcatus* (family Haemulidae) an important food fish in India and other Indo-West Pacific countries. The brood-stock maturation was done in an Recirculating Aquaculture System (RAS) of 5-ton capacity and induced spawning achieved by hormonal induction using LHRH. Fertilized eggs (782.21 ±15.91 μ) were transparent, pelagic, non-adhesive with a single oil globule (180.33±5.11 μ). A green water system with a combination of algae was used for larval rearing. The size of the hatchling ranged from 1581.71 μ to 1878.67 μ and the mouth (size: 90–125 μ) opened on 2nd day post hatch (dph). Larvae were reared using copepods, rotifer, artemia and micro diet. Black pigmentation on the body began by 18 dph, and by 20-25 dph, larvae started moving from pelagic to the benthic realm. Larvae became juvenile (length – 3.8 cm; weight–0.79g) after 30 dph with adult colourations, and by 40 dph, it reached a length of 5 cm and weight of 1.8 g with a survival rate of 12%. This fish is a highly euryhaline species that can be used for farming in ponds, cages and recirculating aquaculture systems in seawater and brackishwater as it has a good market value of around ₹ 400 per kg. This work was done under the All India Network Project (AINP) in Mariculture.

Reported by: M.K Anil, Ambarish P Gop, Surya S, Gomathi P, Siju R and Raju B ◆

Hormone administration in *Pomadasys furcatus*



Developing eggs



Yolk-sac larvae

Seed of *Pomadasys furcatus*

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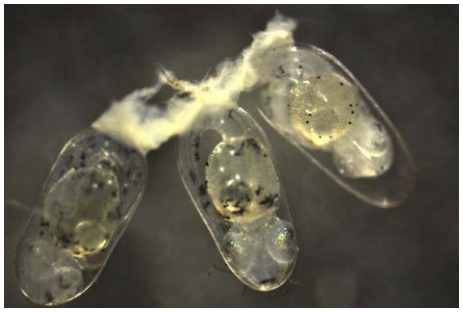
Assisted by: Mr. Arun Surendran, Mr. C. V. Jayakumar, Mr. P. R. Abhilash

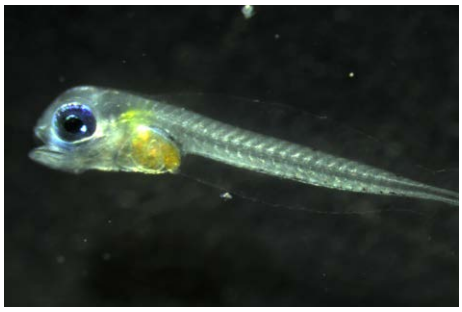
Captive breeding and seed production of Azure damsel

Azure damsel (*Chrysiptera hemicyanea*) is a popular ornamental fish native to the eastern Indian Ocean and western Pacific regions with very good demand in the marine aquarium trade due to its vibrant colouration. Broodstock development and captive breeding for one of the most promising species for community aquariums was successfully accomplished at Vizhinjam Regional centre of ICAR-CMFRI. Azure damsel subadults collected from the coastal waters of Kanyakumari on 31st March 2021 were acclimatized and reared in 150 litre capacity HDPE tanks and pair formation was noticed after two months. A few such pairs were kept in breeding tanks and fed with special broodstock feed. The first spawning occurred on 03rd June 2021 with eggs hatching on the 4th day followed by the larvae starting to metamorphose on 16-18 dph and completed by 23-25 dph. The juveniles reached 1.5 cm by 60 dph. More than 25 spawnings were obtained from a single group. Larvae were fed with copepod nauplii as live feed up to 12-15dph and a survival of up to 25% was obtained. The price per piece of this attractive marine ornamental fish in aquarium trade is around ₹400

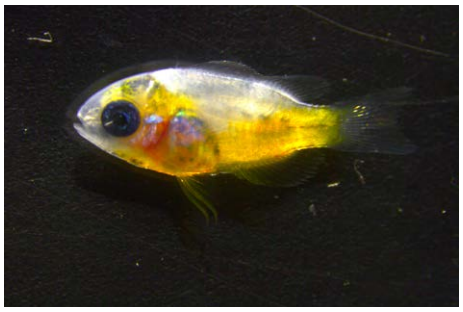
Egg deposited on PVC pipe

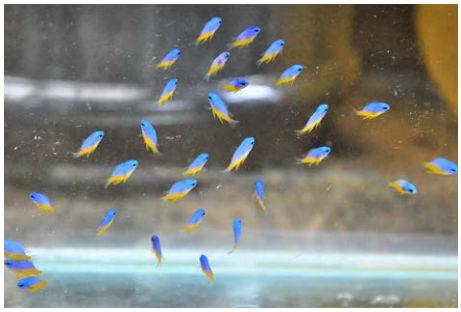


Eggs



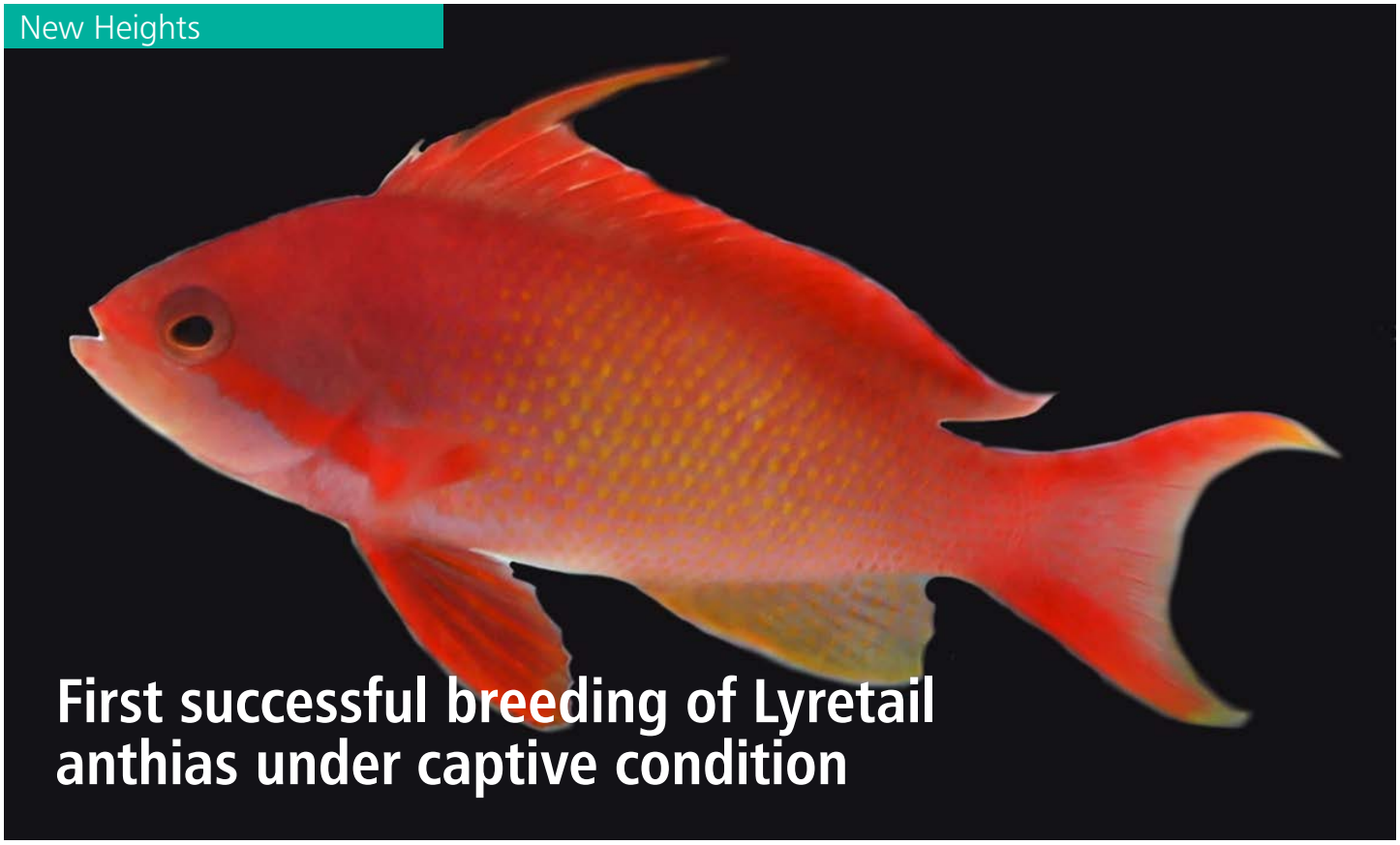
Larva (1dph)



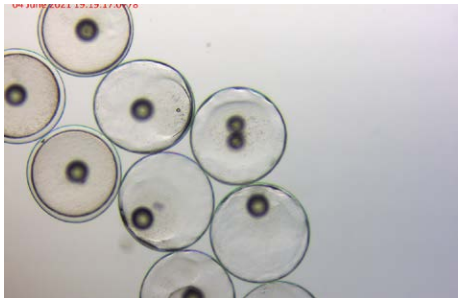


Juveniles 50dph

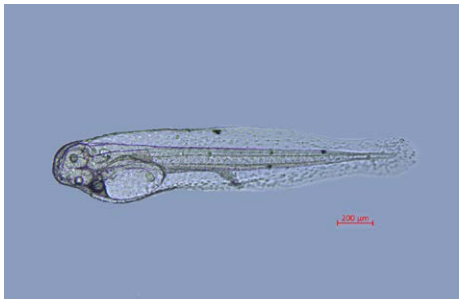
Reported by: B.Santhosh, Ambarish P. Gop, S.Surya, M.K. Anil, Anzeer Muhammed & Aneesh ◆



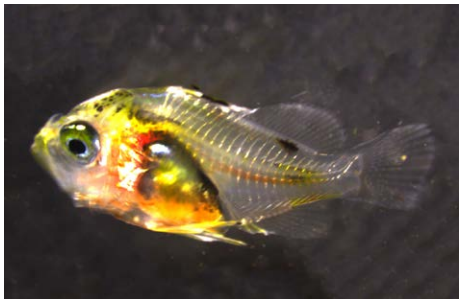
First successful breeding of Lyretail anthias under captive condition



Fertilized eggs

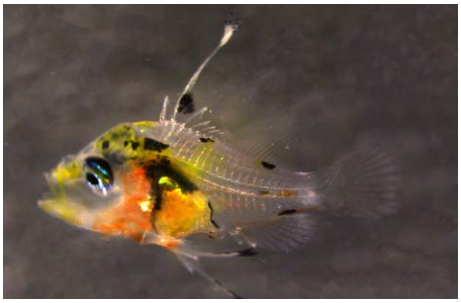


1DPH larva



25 DPH larva

Vizhinjam Regional Centre of ICAR-CMFRI has successfully bred yet another anthias fish, *Pseudanthias squamipinnis* (Peters, 1885) belonging to the subfamily: Anthiinae (Family: Serranidae). Popularly called Lyretail anthias, it is a highly-priced (US$ 16) coral reef fish distributed in Indo -West Pacific region. Broodstock was developed in the 2 ton Recirculatory Aquaculture System (RAS) and the first volitional spawning without any hormonal induction was achieved on May 11, 2021. Fertilized eggs were pelagic, spherical, non-adhesive, transparent, measuring 596 to 615 μ size with a single oil globule. A green water medium with a combination of algae was used for larval rearing. Eggs hatched out 16-17 hours after spawning at the water temperature of 28 $\pm$1°C. Newly hatched larvae were planktonic and measured 1.428$\pm$0.094 mm in total length. These were reared using copepods nauplii as first feed, and in later stages, they were fed with rotifer, artemia and micro diet. By 25 days post hatch (dph), larvae were in an advanced stage of development with all the fins. However, metamorphosis of larvae began only by 30 dph, and was completed between 35 and 40 dph, when larvae became juvenile with adult colourations with a mean survival of 15%. The price of each adult marine ornamental fish is around ₹700 in the aquarium trade. This work was done under AINP on Ornamental fish culture.



17th DPH larva

40 DPH juveniles

Reported by: M.K Anil, Gomathi P, Ambarish P Gop, Surya S, Siju R and Raju B ◆

Rajarshi Tandon Rajbhasha Puraskar for ICAR-CMFRI

Central Marine Fisheries Research Institute, Kochi bagged Rajarshi Tandon Rajbhasha Award instituted by the ICAR for the excellent implementation of Official Language Policy among the Institutes situated in 'C' Region for the year 2019-2020 for the 11th time. The institute also bagged ICAR Best Hindi Magazine Award -Ganesh Shankar Vidyarthi Puraskar- for the in House Hindi Magazine 'Matsyagandha'. This award has been consistently won for the second time ◆

Modified pen design for fish culture in low lying coastal waters

Fish culture in coastal waters and brackishwater areas became popular in Kerala since 2009 due to the advent of GI cages and HDPE cages. Many farmers adopted the ICAR-CMFRI technology for cage fish farming as an alternative livelihood option and employment. However, the massive flood and associated phenomenon of sand deposition occurring in Kerala from 2018 onwards have made these coastal waters less deep, making cage fish farming impossible in some areas due to the diminished water depth. In this scenario, a modified pen was designed for those areas having depth less than 3.5 meters, as an alternative for cage farming and to safeguard the interest of fish farmers. A site was identified at Chathamma ward, Kumbalam Panchayath in Ernakulam district and baseline studies on water and soil quality, fouling studies, weed accumulation, water flow, depth and bottom soil parameters was done in 2019-2020. The site was found to be satisfactory since it was devoid of any kinds of weed accumulation, flow of water was continuous, the bottom was flat and muddy for proper net fixation and the depth in and around the selected site were 1.5m-2.5m. The first modified Pen culture unit measuring 6 x 3 x 3meter was installed at Chathamma on 16th March 2021, under SCSP (Scheduled Caste Sub Plan), to generate livelihood options for the coastal dwelling SC and ST communities and also as a demonstration unit for other fisher folks. The frame of rectangular pen was made of 1.5 inch G.I pipes with outer frame and inner frame, pole supports (4meter) downward, and both the frames on upper portion were kept apart with clamps to maintain a gap of 30 cm between each frames & nets. *Etroplus suratensis* (Pearl spot) seeds were released into the pen system and were fed with pellet feed. After 7 months, the growth recorded was fish with 20 cm TL and 120 gm (W). A second unit was also launched next to this for the culture of seabass *Lates calcarifer* and both units are ongoing successfully at farmers field. The study revealed that growth of fishes in the modified pen was at par with that of farmed in the cages. Thus the new innovation of modified pen culture structure was found suitable for culture of fishes in shallow areas of coastal waters, where water depth is not conducive for cage farming. It has enabled the effective utilization of coastal water bodies for the fish production by farmers, and as the fishes grown are inside the net cages, this method made the fish harvest easy on need base as in the case of cage farming.

Reported by: Rema madhu, K. Madhu, M.T.Vijayan, K.S.Abhilash, Immanuel Issac, M.P.Mohandas and N.H. Harikrishna, Mariculture Division ◆

Bumper harvest of Pearl Spot through cage farming scheme for SC community

A group of fish farmers from the scheduled caste community in Maradu, Ernakulam have reaped good profit through a bumper harvest of pearl spot (*E.suratensis)* on 11th August 2021 from their cage fish farming venture in the midst of livelihood disruptions caused by Covid pandemic. The self-help group named *'Puzhayoram'* in Maradu recorded a yield of 600 kg of pearl spot from a 5x5m square-sized cage fish installed in Maradu-Nettoor backwaters under the Scheduled Caste Sub Plan (SCSP) of ICAR- CMFRI. The harvest was inaugurated by Adv. Reshmi Sanil, Vice chairperson Marad Muncipality in the presence of Dr A Gopalakrishnan, Director, ICAR-CMFRI. The cage farming technology of ICAR-CMFRI proved its potential for the socio-economic development of marginalized sections of the society through small-scale enterprises.

The harvested pearl spot was completely sold at the farming site itself for ₹450 per kg and the SC families in the region got a profit of ₹273000 from a 10-month long farming with 95% survival rate.As part of the programme, the ICAR-CMFRI had provided the group with cage, seeds, feed and guided the farmers during all the phases of the farming ◆

Sea ranching of Indian pearl oyster for conservation purpose

The natural populations of the Indian pearl oyster *Pinctada fucata* have been dwindling over a period of time due to the natural, anthropogenic and fishing activities. As a part of the conservation measures, ICAR-CMFRI has initiated the experimental hatchery production and sea ranching of Indian pearl oyster, *Pinctada fucata* spats in paars (pearl oyster beds) of Tuticorin Region, Southeast coast of India to rebuild the wild natural population. For sea ranching, 25,000 spats with size ranging from 2 to 5 mm produced at the Vizhinjam Regional Centre of ICAR-CMFRI were procured and further hatchery-reared in Tuticorin Regional Station of ICAR-CMFRI for 50 days. Under optimum phyico-chemical conditions the spats were fed ad libitum with mixed microalgae such as *Isochrysis galbana*, *Pavlova lutheri* and *Chaetoceros calcitrans*. On 19 September 2021, nearly 15,000 spats with the size ranged from 9 to 12 mm were sea ranched. Adult oysters collected from Kayalpattinam coast of Tuticorin were also brought to the hatchery and spawned naturally without thermal shock. Nearly 16.5 million numbers of D veliger were produced in the successful spawning and sea ranched on 05th August 2021 at Hare Island of Gulf of Mannar, Thoothukudi.

Reported by: M. Kavitha, M. K. Anil, P. Gomathi, P. Laxmilatha, P. S. Asha, D. Linga Prabu, C. Kalidas and L. Ranjith, Tuticorin Regional station ◆

Indian Pompano harvest amidst severe cyclonic flood in Odisha

About 13,500 advanced fingerlings of Indian pompano (*Trachinotus mookalee*), produced in the marine hatchery complex at Visakhapatnam Regional centre of ICAR-CMFRI were stocked on 8th August 2021 in eight HDPE cages of 6 m diameter and 4 m depth (Area: 28 m^2, Volume: 113 m^3) deployed along Bahabalpur coast of Balasore district (Odisha) under a frontline demonstration programme funded by National Fisheries Development Board (NFDB), Hyderabad in the august presence of Sri Pratap Chandra Sarangi, Honorable MP and former minister of State for Animal Husbandry, Dairying and Fisheries and Micro, Small and Medium Enterprises, Government of India. The seeds with an average weight of 50 g were stocked at a density of about 1700 seeds per cage. Artificial pelleted feed containing 40% crude protein and 10% crude fat at 10-7% of biomass at a feeding frequency of three times a day was done. The proposed period of culture was six months during which they would have attained an average weight of 750 g.

Unfortunately, incessant rain during the second week of September, 2021 due to deep depression over Bay of Bengal, resulted in huge release of water from upper land locked catchment area to the low lying coastal areas causing severe flood in the districts of Balasore, particularly at Bahabalapur. The increased the levels of suspended and dissolved solids and lowered dissolved oxygen around the cage culture site decreased drastically to around 2 ppm. Furthermore, the heavy inflow of fresh water from the Jalaka, Subarnarekha and Budhabalanga rivers also reduced the salinity drastically which necessitated urgent harvest of cage farmed Indian Pompano. The innovative region specific modification of mooring assembly made by the inclusion of a specifically designed five prong anchor was very much successful in preventing any drifting of cages despite severe wind and current action during the cyclonic event. All the cages were harvested on 18th September, 2021 which was forty days after stocking and were brought to Bahabalapur fishing harbour on 19th September, 2021 in the presence of Dr. Manas Kumar Sinha, Officer in-charge and senior executive, National Freshwater Fish Brood Bank (NFFBB), Kausalyaganga, Bhubaneswar. More than 1.7 tonnes of production was achieved indicating threefold increase within a period of 40 days. The survival was 87% and average body weight at harvest was 170 g. Daily weight increment was 3 g and food conversion ratio was 1:1.4. With Indian pompano, being cultured in most maritime states of the country, such unparalleled daily growth increments and high feed conversions have never been achieved earlier. The produce was auctioned and procured by M/S Bharat Fish Centre (BFC), Bahabalapur.

Reported by Gyanaranjan Dash, Biswajit Dash, Rajesh Kumar Pradhan, Ritesh Ranjan, Sekar Megarajan, Pralaya Ranjan Behera and Shubhadeep Ghosh ◆

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Shri Ram Nath Thakur and Smt Chhaya Verma as members visited Visakhapatnam Regional Centre of ICAR-CMFRI on 10th September, 2021. The visiting team was welcomed by Dr. P Pravin, ADG (Marine Fisheries), ICAR along with Dr. Prathibha Rohit, and Dr. Shubhadeep Ghosh of ICAR-CMFRI. The members expressed their happiness on the various programmes and activities aimed at promoting sustainable marine fisheries and mariculture for the benefit of fishermen and farmers ◆

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Govt. of India's flagship programme, Pradhan Mantri Matsya Sampada Yojana (PMMSY) has a special focus on promotion of large-scale seaweed farming, he suggested actions to popularise seaweed farming in the coastal region including setting up seedbank of seaweeds. Dr. A.Gopalakrishnan, Director, ICAR-CMFRI also apprised the visiting team of the various research and outreach activities like marine cage farming and sea ranching programmes successfully undertaken by the institute ◆

Outreach

Awareness campaign on ecosystem based fisheries management

The Mandapam Regional Centre of ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI) organised an awareness campaign on *Ecosystem Management for Sustainable Fisheries* to mark the National Fish Farmers Day on 10 July 2021. Awareness on ecosystem health, biodiversity and sustainable livelihood options was created among 200 fisherwomen in Pamban and Thoppukadu villages in Ramanathapuram district. Shri. K. Muraleedhran, IMC Member, ICAR-CMFRI was the chief guest at the programme.Dr. R. Jayakumar, Principal Scientist,ICAR-CMFRI, Shri. Rajendran, Assistant Director of Fisheries, Rameswaram, Dr. G. Tamilmani, and Dr. Johnson, B., ICAR-CMFRI also spoke on the occasion ◆

Tree plantation drive at Mandapam Regional Centre

As part of various programmes to mark the 75th Independence Day celebration and the 75th year of ICAR-CMFRI, Mandapam Regional Centre organised a tree plantation initiative in association with Dr. A. P. J. Abdul Kalam International Foundation, House of Kalam, Rameswaram on 13th August 2021. Around 100 tree saplings including neem (*Azadirachta indica*), Indian tulip, *Poovarasu* (*Thespesia populnea*) and pongam (*Pongamia pinnata*)were planted on the institute premises and residential quarters. Shri. K. Muraleedharan, IMC Member, ICAR-CMFRI, Shri. A. P. J. M. J. Sheik Salim, Grand Nephew of Dr. A. P. J. Abdul Kalam and Co-Founder of the Foundation, Shri. K. Anbazhagan, General Manager, Dr. A. P. J. Abdul Kalam Memorial and Shri. Muthu Manikandan, Secretary, Rotary Club, Rameswaram along with Dr. R. Jayakumar, Principal Scientist & Head-in-Charge and staff of the Centre took part in the initiative. Later, the dignitaries distributed around 150 papaya and 133 guava saplings to the staff of the Centre ◆

Marine mammals observed off Odisha coast

Dead bottlenose dolphin, *Tursipos truncates* at Puri, Odisha

Beach stranded marine mammals were recorded from different locations along the Odisha coast during May to September, 2021. Three were identified as bottle nose dolphin and one as long snouted spinner dolphin. Local fishermen informed the incidents to the officials from Forest Department and FRAD survey officers of ICAR-CMFRI which recorded observations. On 8th May, 2021, an injured bottlenose dolphin (*Tursipos truncatus*) died during rescue in Balasore district of Odisha and investigation is in progress to ascertain the cause of death. In another incidence recorded on 30th June, 2021, the carcass of a long snouted spinner dolphin (*Stenella longirostris*) was found at the seashore of Paradip port Gate no.5. The dolphin was a 137.2 cm long male weighing about 30 kg and there were no external injuries or scar marks on the body. The investigation is still in progress to know the cause of death.On 29th August, 2021, a dead calf bottlenose dolphin (*T. truncatus*) was found on Chandipur beach, Balasore district. The officials from Forest Department revealed that the dolphin had head injury, probably due to collision with fishing vessels. On 7th September, 2021 a 125 cm long female bottle nose dolphin weighing approximately 35 kg with external injury marks probably due to accidental collision with ships, was washed ashore at Puri. Officials from Forest Department buried the partially decayed carcass on Puri beach with the help of local fishers. All the dolphins are protected under Schedule I of Indian Wildlife (protection) Act, 1972.

Dead spinner dolphin, *Stenella longirostris* at Paradip, Odisha

Reported by Swatipriyanka Sen Dash, Rajesh Kumar Pradhan, Gyanaranjan Dash, Madhumita Das, Biswajit Dash, Prakash Chandra Das, P. Shankar and Shubhadeep Ghosh ◆

Whale shark rescue along Odisha coast

Whale shark (*Rhincodon typus*), is protected under Schedule I of Wildlife (protection) Act, 1972 in India. On 12th August, 2021, a 15 ft long female whale shark got itself entangled in fishing net, about 12 km away from Paradip coast of Odisha. Attempts were made by the fishermen to save the shark and the net was cut in order to release the animal into sea. A whale shark stranded at Ganjam district was also released by local fishers on 25th February, 2021 and one stranded at Balasore district freed on 5th March, 2021 ◆

Successful initiation of open sea cage culture demonstration for Indian Pompano, *Trachinotus mookalee* at Odisha

The open sea cage culture demonstration of Indian Pompano, *Trachinotus mookalee* has successfully been initialized for the first time in Odisha coast. The sea along Bahabalpur of Balasore district in Odisha (GPS co-ordinates: 21027.756'N, 87008.014'E) has been selected for mariculture based on the suitability of oceanographic features such as sediment characteristics, sea bottom topology, tidal amplitude and hydrological properties such as salinity, dissolved oxygen (DO), turbidity etc. The active fishing grounds and navigational routes of the fishing fleets have meticulously been avoided during the finalization of ideal culture site. A total of eight HDPE cages of 6 m diameter and 4 m depth (Area: 28 m^2, Volume: 113 m^3) has been fabricated and deployed in the sea. About 2.1 tonnes of mooring weight comprised of 10 mooring blocks (weighing 200 kg each) and a 5 prong anchor (weighing 100 kg) has been used to secure the mooring point for each cage. The specifically designed anchors have been used as an innovative precautionary measure to prevent any drifting of cages during the adverse flooding events caused due to frequent cyclonic storms along Odisha coast. Three epoxy coated 500 L barrels have been used per cage as floats to counteract the heavy weight of mooring chain on the cage frame. One bird net to prevent predation and two culture nets (one inner and one outer net per cage) along with ballast ring to maintain the shape of nets in water have been used in each culture unit.

About 13500 seeds of Indian pompano (*T. mookalee*) with an average size of 50 g were successfully transported from Visakhapatnam Regional station of ICAR-CMFRI over road using an innovative seed transportation methodology. In this methodology the seeds were transported in 1000 L HDPE tanks using vigorous uninterrupted aeration during entire phase of transportation. Water temperature was carefully monitored and any rise in temperature was prevented by submerging the polythene packed ice blocks to ease stress during transportation. This innovative seed transportation method resulted in 100% survival during 18 hour of surface transportation. The freshly arrived seeds were transported to the preinstalled cages at sea using vigorous aeration and were stocked during early morning hours to minimize mortality. The stocking event was conducted on 8th August 2021 in the august presence of Sri Pratap Chandra Sarangi, Honorable MP and former minister of State for Animal Husbandry, Dairying and Fisheries and Micro, Small and Medium Enterprises, Government of India.

This is a first time demonstration of best management practices (BMP) in the open sea cage culture for Indian Pompano, *Trachinotus mookalee* along Odisha coast by ICAR-CMFRI under the project funded by National Fisheries Development Board (NFDB), Hyderabad. About 1700 seeds with an average size of 50 g have been stocked per cages which will be grown for a period of 6 months during which they will grow to an average size of 750 g. The fishes will get a daily ration of formulated commercial feed (Approximate 40% protein and 10% crude fat content) at 10% of the body weight initially which will be reduced to 7% of the body weight, subsequently. During harvesting each cage has the potential to produce a biomass of about 1.25 tonnes. At an average price of ₹300 per kg, the produce from each cage can be sold for 3.75 Lakh rupees (INR) which can transform the socio-economic status of fishermen. The installed sea cages could also increase the fish abundance near cages by acting like a Fish aggregating Device (FAD) which if declared as protected and no fishing area could also serve as a much needed fish breeding and revival ground in augmenting fish population in the area. The successful demonstration of the ongoing culture technology through the Pradhan Mantri Matsya Sampada Yojana (PMMSY) scheme can instill confidence among the fishermen and will further encourage them to take up such alternative livelihood method which will not only improve their socio-economic status but also conserve the fishery ecosystem by reducing dependency on capture fishery alone.

Reported by: Biswajit Dash, Gyanaranjan Dash, Rajesh Kumar Pradhan, Ritesh Ranjan, Sekar Megarajan, Pralaya Ranjan Behera and Shubhadeep Ghosh ◆

Farming of indigenous seaweeds promoted in Lakshadweep

A massive demonstration farming of indigenous seaweed species *Gracilaria edulis* and *Acanthophora spicifera* was launched in nine inhabited islands of Lakshadweep with the technical support of the ICAR-CMFRI. The Lakshadweep administration has prioritised seaweed farming as a major driver for the development of the islands which is in line with a ICAR-CMFRI study that revealed immense potential for production of quality seaweeds for high-end utilisation as food and nutraceuticals in pollution free lagoons of Lakshadweep. 10 women self-help groups benefitting 100 families belonging in different islands are participating in the programme.

Well co-ordinated efforts of the Lakshadweep administration such as Fisheries, Environment & Forests and Rural Development as well as the ICAR-CMFRI have created the demonstration which focuses on capacity building of stakeholders and impact assessment of seaweed farming for a planned development of seaweed farming enterprises in the islands. Under the programme launched on 21 August 2021, so far nearly 400 rafts seeded with *G edulis* seed strains grown in the islands by the ICAR-CMFRI as well as the seed sourced from Rameshwaram, Tamil Nadu have been deployed. Additional units to reach the target of 2500 rafts are being added as the seed materials are developed in subsequent farming cycles of 45 days.Recent studies have revealed that indigenous seaweed species in various lagoons of Lakshadweep show nearly 60-fold growth in 45 days for the species *Gracilaria edulis*. Seaweeds are well known for its carbon sequestration properties and the farming of seaweed has the potential to enhance the carbon credit to the nation while providing a climate resilient livelihood to the islanders. Providing a sound scientific basis for a sustainable seaweed farming enterprise, the ICAR-CMFRI and the Lakshadweep Krishi Vigyan Kendra are assessing the carrying capacity of the lagoons, spatial mapping of suitable farming sites, standardising farming methods for year-round farming in deeper areas and means to ensure quality seeding materials of indigenous seaweed species ◆

Special Publication on first Community Reserve of Kerala released

A detailed study on the biodiversity and economic value of the Kadalundi-Vallikunnu Community Reserve (KVCR) was made by ICAR-CMFRI with the support of the Kerala State Biodiversity Board (KSBB) and the outcome of the study was brought out as a CMFRI Special Publication entitled 'Glimpses of biodiversity in the Kadalundi-Vallikunnu Community Reserve – the first Community Reserve of Kerala'. Dr. (Mrs.) B. Meenakumari, Chairperson, Research Advisory Committee of ICAR-CMFRI visited the Kadalundi-Vallikunnu Community Reserve (KVCR) on 14th September 2021. This Community Reserve which lies partly in Kozhikode and Malappuram districts is the first Community Reserve of Kerala. The official release of the publication was done in a programme organized at KVCR on 14th September 2021 in which officials from the Forest Department, KSBB and other stakeholders attended and participated in the discussion.

Reported by: P.K.Asokan & K.Vinod, Calicut Regional Station ◆

Innovative intercropping mariculture practices attract entrepreneurs

The innovative mariculture technology of intercropping introduced for the scheduled caste beneficiaries by ICAR-CMFRI has turned into a huge success in Gujarat. The Veraval Regional Station conceptualized the idea of intercropping of marine finfishes in coastal shrimp ponds and demonstrated it successfully among the SC community in the state. The innovative farming produced a total yield of 13.1 tonnes that includes 5.2 tonnes of silver pompano and 7.9 tonnes of shrimps. ICAR-CMFRI guided the registered SC society under the Schedule Caste Sub-Plan (SCSP) to carry out the front-line demonstration of silver pompano intercropping with tiger shrimps in coastal marine farms. The concept was intended to ensure round the year production of

both finfishes and shellfishes by taking 3-4 months fallow farm period into an active production cycle. A total of 30,000 number of silver pompano seeds were stocked in two mariculture ponds of one acre each and reared for 6 months along with various shrimp species in a commercial scale.The Station conducted intercrop harvest mela of marine finfish and shellfish with *Matsya Sampada Krishi Sammelan* on 29 August 2021 and handed over the yield to the beneficiaries. The intercropping is also aimed at reviving tiger prawn culture in the region, as a part of species diversification. Five entrepreneurs signed MoU with ICAR-CMFRI for the adoption of this technology. More than 150 stakeholders including shrimp and fish farmers, entrepreneurs, feed formulation and hatchery units and other aquaculture sector representatives from the coastal districts of Gujarat attended the programme.

Dr. A. Gopalakrishnan, Director ICAR-CMFRI, in his inaugural address highlighted the importance of coordinated effort by researchers, planners, and administrators in order to achieve the goal of doubling farmer's income and enhancing seafood production under the PMMSY in the country. Shri Hareesh Nair, Chief Administrative Officer, ICAR-CMFRI; Dr. Ashish Kumar Jha, ICAR-CIFT; Shri. Vinod Kumar, Dy. Director, MPEDA, Shri. Vimal Pandya, Dept. of Fisheries, Govt. of Gujarat and Dr. D.Divu Scientist-In-Charge, Veraval Regional Station of ICAR-CMFRI attended the function ◆

Technology adoption encouranged through Farmer's Front

In a bid to improve the practice of technology adoption, the Veraval Regional Station of ICAR-CMFRI also formed "Farmer's Front" in association with Shri. Bhimrao Matsya Udyog Seva Sahakari Mandali-Dari at Gujarat, first ever in the country, for promoting mariculture entrepreneurship development in Gujarat. It is aimed at overcoming hurdles and complexities involved in technology adoption and to develop entrepreneurial initiatives among stakeholders through training and skill-development programmes in mariculture in Gujarat region. Those who adopted the technologies at initial level will be used as 'Master Trainers' and act as a 'brand ambassadors' of successful mariculture technology. The Front comprises skilled society youth who are trained hands-on over a period by ICAR-CMFRI on various mariculture technologies

Reported by: D.Divu, V.Vinay Kumar, Suresh Mojjada, K. Tarachand, Rajan Kumar, Abdul Azeez, R.Shika and K.Madhu ◆

Crab culture in high saline coastal waters

A Field day programme to initiate the grow-out culture of crabs in HDPE boxes by the fisherwomen of Alupatna village in Satpada (Puri, Odisha) under the SCSP programme of the Institute has been organized by Puri FC of ICAR-CMFRI on 24th September, 2021. The fisher women belong to Chaubar Mahila Samiti, an exclusive woman self help group (SHG) from Kaibarta community. HDPE crab boxes, PVC floating raft and seeds of mud crabs, *Scylla serrata* were distributed to 20 women beneficiaries of Chaubar Mahila Samiti. They also advised about necessary farm management techniques.

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

Clean Beach campaign supported

Veraval Regional Station of ICAR-CMFRI joined hands with Indian Coast Guard, Veraval for Somnath Beach cleaning activities on the occasion of International Coastal Clean Up Day-2021.

Solar powered marine ornamental fish rearing units set up

Under the Tribal Sub Plan (TSP) Scheme 2020-21, the marine ornamental fish rearing technology was extended to the Warli Scheduled Tribe beneficiaries of Kalbadevi Adiwasi Matsyavyavsaay Sahakari Sanstha Maryadit, Villlage Dharavali, Mumbai. The established recirculating (RAS) marine ornamental fish rearing units are fully powered by solar energy. Four varieties of juvenile marine ornamental fish (percula clown, tomato clown, maroon clown and designer clown fish) were reared in captivity for 45 days till they attain marketable size by the trained beneficiaries.

Reported by: Ramkumar S., Nilesh A. Pawar, Santosh N. Bhendekar, Punam A. Khandagale, Vaibhav D. Mhatre, Umesh H. Rane, Ajay D. Nakhawa, K.V. Akhilesh and Anulekshmi Chellappan ◆

Parliamentary Committee on Official Language visits Veraval Regional Station

The Second Sub Committee of the Committee of Parliament on Official Language inspected the Official Language implementation activities of Veraval Regional Station of ICAR- CMFRI on 27th August, 2021. The inspection meeting was chaired by Prof. Rita Bahuguna Joshi, MP (Lok Sabha). Shri Pradeep Tampta, MP (Rajya Sabha), Smt. Ranjanben Bhatt, MP (Lok sabha), Shri Durga Das Uikey, MP (Lok sabha), Smt. Mala Rajya Laxmi Shah, MP (Loks abha), Dr. Rameshwar Lal Meena, Under Secretary, Shri Kamal Swaroop, Research Officer, Shri Kiran Pal Singh, Committee Assistant and Shri Kavish Sharma, PA to Convener were also present. Dr. Praveen P., Assistant Director General (M.Fy.), Smt. Seema Chopra, Deputy Director (OL) and Shri Manoj Kumar, CTO (Hindi), ICAR; Dr. A. Gopalakrishnan, Director, ICAR-CMFRI, Shri Hareesh Nair, Chief Administrative Officer, Smt. E. K. Uma, CTO (Hindi), and Dr. Divu D., Scientist in Charge of Veraval Regional Station and Shri Chandra Mauli Sharma, Asst. Admn. Officer, attended the meeting.The progress made in the implementation of Official Language Policy was discussed in the inspection meeting and the committee appreciated the efforts taken by the Institute ◆

Outreach

Nutraceuticals from seaweed commercialized

Cadalmin™ Immunoboost extract (Cadalmin™ IBe) and Antiosteoporotic extract (Cadalmin™ AOe), two patent-protected nutraceutical products developed by ICAR-Central Marine Fisheries Research Institute, as natural immune boosting agent and remedies for osteoporotic disorders, respectively from seaweeds, were commercialized with Chazah Pharmaceuticals Limited-a leading wellness and pharmaceutical company based at Kochi. Seaweeds are the natural bounty of the Sea, and are known for their extraordinary medicinal properties.

Indian nutraceuticals market has been growing at the compound annual growth rate of 20% for the past three years, particularly in the segments of functional food products, antioxidants, and immunity boosters. India's growth of nutraceuticals is in double digits which is significantly more than the global surge of 7%. With increasing health awareness, and the shift towards preventative health care, immunity-boosting and increased regulatory clarity, India's future in this segment is promising ◆

Distinguished visitors

Dr.B. Meenakumari, Former DDG (FY), ICAR and chairperson, National Biodiversity Authority of India and presently Chairman, RAC, CMFRI, Kochi visited the Vizhinjam Regional Centre on 30-07-2021 ◆

National recognition for developing products from seaweeds to combat lifestyle diseases

Dr Kajal Chakraborty, Principal Scientist bagged the prestigious Norman Borlaug National Award for Excellence in Agricultural Research instituted by ICAR, Ministry of Agriculture and Farmers' Welfare for his path-breaking research and products developed from bio-active compounds extracted from seaweeds. The award announced once in every 5 years, carries a cash prize of ₹10 lakh and a research grant of ₹1.5 crore for carrying out a challenging research project for five years ◆

Farming of fin fishes under SCSP programme

Four families from the Mundala community were selected from Koluvayalu, Haleyangadi, Dakshin Kannada District of Karnataka, for finfish cage culture under Scheduled caste sub-plan programme during 2021-2022. A hands-on training and demonstration of cage fabrication and mooring of cages was conducted at farmers site on 27th September, 2021 and later the cages were launched in the estuary. The moored cages were stocked with Seabass fingerlings on 29th September.

Reported by: Mangalore Regional Centre ◆

Retirements

Dr. P. Vijayagopal
Principal Scientist
31.07.2021

Smt. Vijayalaxmi Y. Gamanagatti
LDC
31.07.2021

Dr. P. Kaladharan
Principal Scientist
30.08.2021

Shri M. V. Devassykutty
Canteen Attendant
30.08.2021

Dr. C. P. Suja
Principal Scientist
30.09.2021

Transfer

Name & Designation	From	To	w.e.f.
Shri Mahendra Pandit Sonawane (Technician)	Goa Field Centre	Ratnagiri Field Centre	31.08.2021

Inter-Institutional Transfer (Deputation)

Name & Designation	From	To	w.e.f.
Shri Asharam Choudhary	Mumbai Regional Station, ICAR-CMFRI	Directorate of Rapeseed Mustard Research (DRMR) Bharatpur, Rajastan	30.09.2021
Shri Santosh Kumar Assistant	Digha Regional Station ICAR-CMFRI	ICAR-NIVEDI Bangaluru	07.08.2021

Promotions

Name & Designation	Promoted as	w.e.f
Smt. K. Smitha, Personal Assistant	Private Secretary	08.07.2021 AN
Smt. M. Safiyabi, Assistant	Assistant Administrative Officer	08.07.2021 AN

Joining

Name & Designation	From	To	w.e.f.
Shri Ancil Perera Skilled Support Staff	CPCRI, Regional Station Kayamkulam	ICAR-CMFRI Kochi	22.07.2021
Smt. Febeena P A	ICAR-CIFT, Kochi	ICAR-CMFRI, Kochi	23.09.2021

Programme participation

Dr. A. Gopalakrishnan, Director, Attended online ICAR-Directors Conference on 02.07.2021

Attended Monthly Meeting of Fisheries SMD & Directors of Institutes on August 13, 2021

Attended Parliamentary Committee Inspection of Official Language at Veraval Regional station of ICAR-CMFRI from 25.08.2021 to 30.08.2021

Attended review Meeting for the Zone-VIII Regional Committee Meeting with the Director General, ICAR, New Delhi on 10.09.2021 and the Regional Committee Meeting for the Zone VIII on 14.09.2021 as Member Secretary.

Dr. Prathibha Rohit, attended the SAARC Agriculture Centre (SAC) Regional Consultation Meeting on "Cross-learning for Thematic Regional/Sub-regional Challenges in Aquaculture and Fisheries" held on 3-4 August 2021 and presented a paper.

Was nominated to attend the Online Indian Ocean Tuna Commission Working Party on Ecosystem and Bycatch 17th Session (IOTC WPEB17) during 6-10 September 2021 and Working Party on Billfish 19th Session (IOTC WPB19) during 13-16 September 2021

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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