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INSIDE

Green Mussel extract (GMe) goes commercial

page 5

Cadalmin IV - Continues to support research for more than 3 decades

see back cover

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ICAR

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
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About CMFRI

The Central Marine Fisheries Research Institute, Cochin, is a premier research Institute under the Indian Council of Agricultural Research, devoted to research and training in marine fisheries and mariculture.

CMFRI has three Regional Centres viz., Mandapam Camp, Visakhapatnam and Veraval and seven Research Centres located along the Indian coastline, catering to the marine fishery policy needs of all maritime states of the country.

Director Speaks

Dear Colleagues,

2012, another eventful year has passed in the history of CMFRI.

Looking back, we can proudly recollect our achievements in marine fisheries research during the year, which commenced with an international collaborative effort with University of Tasmania, Australia to formulate inter-continental projects on "Preparing for climate change in the marine eco systems of India and Australia. The much awaited, rather expected from CMFRI, a 100% vegetarian nutraceutical Cadalmin™ GAe, the green algal extract was released in March, which has no side effects and provides a permanent pain relief for the rheumatic arthritis patients across the country.

Our efforts to help the poor and downtrodden fishermen got a boost, we provided financial and technical support for cage culture practice for the "Sidi" tribes of Gujarat in September under the Tribal Sub Plan (TSP) component. Our Cadalmin™ GMe, green mussel extract went commercial, taken by a subsidiary company of Amalgam Sea foods, Kochi in October. This will further motivate us to develop more such beneficial products from the sea. To strengthen our research in oceanographic studies, we are getting two fisheries research vessels in this plan period, for which "keels" were laid in September and December. We have also successfully demonstrated the large scale production of our cobia and pompano in farmers' field at selected locations across the country.

All the above feats bear testimony to our committed and determined effort towards a common goal-achieving sustainable marine fisheries production. Team CMFRI deserves full compliments for such wonderful achievements. We should now look forward to take our efforts further ahead, remembering the fact that reaching greater heights is important but it is more important to resist gravity.

Wishing you All a Happy, Prosperous and Productive New Year 2013

Dr. G. Syda Rao
Director

Chlorophyll based assessment of Indian Marine Fishery Resources

CMFRI's research initiative

Indian marine fisheries have all along remained buoyant to vagaries of fishing effort and other factors with the past decades recording consistently increasing trends despite the disaggregated analyses throw up new scenarios. The most imposing challenge before the planners and hence in the realms of research feeding to policy designing is the real time assessment of harvestable potential and possible mechanism to forecast the near future availability. CMFRI with its internationally acclaimed sampling design has been providing timely estimates of marine fishery resources landed in the peninsular region of the country which has been used by various agencies like GoI and FAO. Many previous attempts to revalidate the marine resource potential were also dependent on these time series of landings. But given an opportunity, a chance to base the entire resource measurement mechanism on a complete coverage platform while assessing the potential would always improve the figures.

Primary productivity, best indicated by chlorophyll concentration at various parts of the EEZ, are the single most dependable factors of resource wealth as they are the first link in the process of existence and proliferation of marine fishery resources apart from being a rapid indicator of their concentration. Organic production based assessment of Indian marine resources was first attempted by CMFRI in the late fifties and early sixties. With the methodologies in vogue those days viz. Oxygen and C14 methods using limited resources available attempts were made by CMFRI scientists to estimate the carbon production and thus the fishery resource potential, after applying globally accepted and locally pertinent conversion factors. Those efforts put the production possibilities of the Indian ocean region at 39- 40 million tonnes with 40% attributable to Indian territory which as per the level of exploitation prevailed elsewhere at that point of time could be taken as 11 million tonnes of harvestable potential. Such pioneering works introduced a very different perspective to the assessment of resource potential but was severely constrained by the assessment coverage of the organic productivity. But the advent of remote sensing tools and the algorithms to convert the optical data into relevant parameters has changed the entire scenario recently. The chlorophyll concentration has been very successfully measured simultaneously across the vast expanse of seas using the satellite propelled OCM sensors. Such measures and derived fishery potential assessments have long been standardized by Space Applications Centre (SAC), Ahmedabad.

Taking cue from the recent technological advances and dwelling deeply on the seminal research carried in the past, CMFRI has rededicated itself to forge the best of remotely sensed information and its physical infrastructure existing at various centres across the Indian coast towards construction of a paradigm aimed at assessing and forecasting marine fishery resources and harvestable potential. The green data supplied through the OCM sensed information and the brown data based on the benthic studies involving detritus along side the derived data on secondary producers and higher level animals are planned to be modeled on a spatio-seasonal basis over a period of five years with a sound sea-truthing rigour planned at various regions of the EEZ. Such a mammoth exercise would always require collaboration of like mandated organizations and CMFRI has initiated joint research exercises along with SAC and FSI towards achieving better results. The initiative is likely to herald the finalization of a hybrid modeling modules by the end of the first phase in three years starting from 2012-'13. After revalidating the output of these models, bieconomic subsidiary models based on the market scenarios existing for different resources at different parts of the country would be developed alongside the fleet capacity availability on a dynamic basis, which would result in the realistic prediction of harvested catches for different seasons of the year.

Kicking off the project a two-day brainstorming workshop on Chlorophyll based Remote Sensing assisted Indian Fisheries Forecasting System (ChloRIFFS) was conducted on 17-18th October 2012 at CMFRI, Cochin wherein experts from FSI as well as SAC participated. The overall work plan and temporal framework were deliberated at length during the sessions. The focus was more on the strengths of the constituent institutions and the approach to be followed towards achievement of synergy in the future endeavours. During the course of deliberations the existing algorithms adopted to decipher remotely sensed data and facilities available for *in situ* evaluation and the areas needing immediate focus vis-à-vis validation and sea truthing were assessed at length. These initiatives have drawn the attention of a couple of foreign research institutions who have evinced keen interest to take part in the model development.

With a road map in place and mutual prerogatives thrashed out, this CMFRI led concerted efforts towards predicting and forecasting marine fisheries resources through the most tangible causal factor namely chlorophyllis bound to add strength to the Indian marine fishery management.

(Reported by J. Jayasankar, Senior Scientist, FRAD)

Inaugural address of the Director, CMFRI

A short course on "World Trade Agreement and Indian Fisheries paradigms : A Policy outlook" at Headquarters

CMFRI organised the ICAR funded short course on "World Trade Agreement and Indian Fisheries paradigms : A Policy outlook" at Headquarters during 17-26 September 2012. Dr. Shyam.S.Salim, Senior Scientist was the Course Director and Dr.R.Narayanakumar was the course co-director. Dr. C. Ramachandran, Dr.Vipinkumar., V.P Dr. N. Aswathy were the co-ordinators of the workshop. There were 25 delegates participated from various parts of the country.


A view of Participants

Keel laying ceremony of the new research vessel of CMFRI

Dr. G. Syda Rao, Director, CMFRI with officials

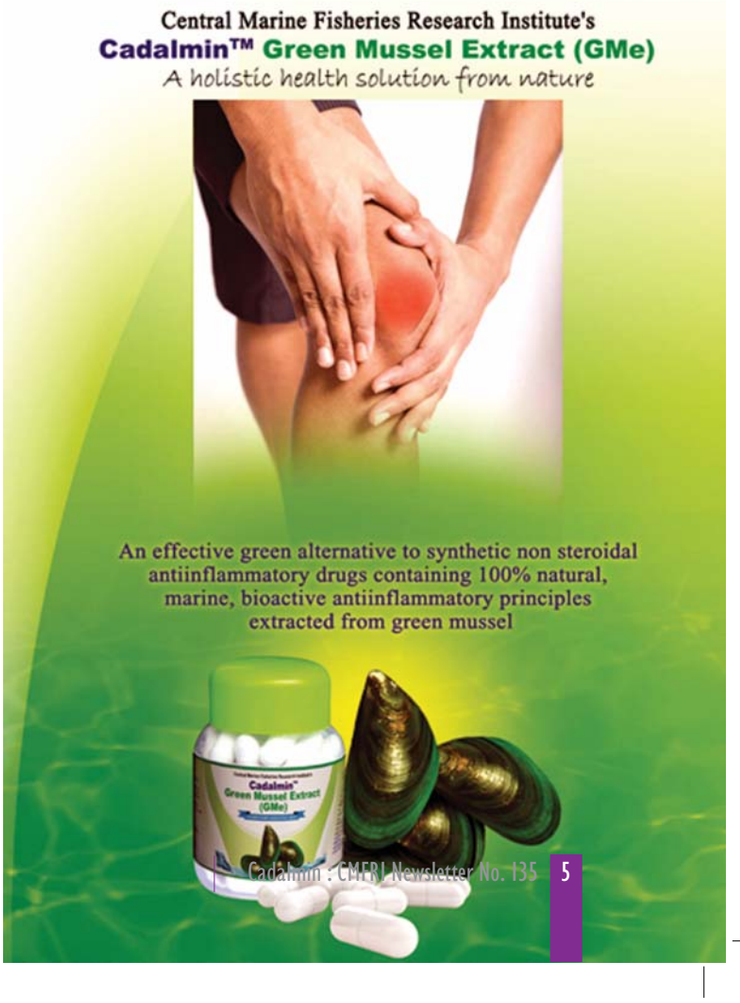
Dr. G. Syda Rao, Director along with Dr.K.K.Philipose, SIC, Karwar, Dr. G. Gopakumar, SIC, Mandapam and Scientist of CMFRI attended the keel laying ceremony of the new research vessel at Goa Shipyard Limited, Goa. Director laid the keel of the research vessel on 7.12.2012. The officials took the Director and Scientist around the Shipyard and explained the activities of the shipyard.

Green Mussel extract (GMe) goes commercial

First nutraceutical produced by an ICAR Institute

Green Mussel extract (Cadalmin™ GMe) contains 100% natural marine bioactive anti-inflammatory ingredients extracted from green mussel *Perna viridis* (Indian Patent Application No. 2065-2066/CHE/2010). The product is effective to combat arthritic pain and inflammatory diseases in human beings, and is an effective green alternative to synthetic non steroidal anti-inflammatory drugs and other products available in the market. Consuming Cadalmin™ GMe will avoid unfortunate side effect of these synthetic non steroidal anti- inflammatory drugs (NSAIDs). The active principles in Cadalmin™ GMe isolated from *P. viridis* were found to competitively inhibit inflammatory cycloxygenases - II (COX II) and lipoxygenase - V (LOX V) in an inflammation and oxidative stress reaction, resulting in decreased production of pro-inflammatory prostaglandins and leukotrienes, and its activity was found to be superior than synthetic non steroidal anti-inflammatory drugs available in the market. The active principles isolated from *P. viridis* and concentrated in the product registered higher inflammatory COX II and LOX V inhibition (70-75%) than synthetic NSAIDs such as aspirin and indomethacin (55-66%) at a comparable dose. *In vivo* animal model studies revealed that the active principles effectively suppressed (64 - 77%, 2-4h) the edema produced by histamine, which indicate that they exhibit anti-inflammatory action by means of either inhibiting the synthesis, release or action of inflammatory mediators.

Green Mussel extract (Cadalmin™ GMe) developed by CMFRI during 2010 was commercialized on 5th October 2012 with



Accelerated Freeze Drying Company Pvt. Ltd., a FDA, ISO 22000 FSSC 22000:2011 certified flag Ship Company of Amalgam Group of Companies. This is the first nutraceutical produced by an ICAR institute. The MoU was signed by Dr. A. J. Tharakan, Chairman, Accelerated Freeze Drying Company Pvt. Ltd. and Dr. G. Syda Rao, Director, Central Marine Fisheries Research Institute on behalf of Indian Council of Agricultural Research (ICAR).

GMe has techniques to identify the active components and to concentrate them to have higher activity; it has sustained activity and no toxicity due to the unique biochemical engineering methodologies adopted to develop the product. This product is designed to find a unique way to prevent the degradation by air, moisture, heat and light and to maximize the activity. The product is free from deleterious carcinogenic *trans* fatty acids, free radicals/ free radical adducts, low molecular weight carbonyl compounds. Long term study on mammalian model proved the efficiency and safety of this nutraceutical.

This product will be commercially produced and marketed by Accelerated Freeze Drying Company Pvt. Ltd. under their brand name. The commercialization of Cadalmin™ GMe is significant to the mariculture industry and fishermen as this will enhance the demand to produce more green mussels, particularly along the west coast of India. The company plans to produce about 100 million capsules for domestic as well as for export purposes.

Signing of MoU by Dr. Syda Rao, Director, CMFRI and Dr. Tharakan, Chairman, AFDC Ltd. Dr. Vijaykumaran, Director General, FSI is also seen

Acute toxicity studies and lethal dose of Cadalmin™ GMe using adult Wistar rats to understand its effect on various parameters indicated that Cadalmin™ GMe (up to 4.0 gm/kg body weight) given to experimental subjects (male and female) did not produce any change in food consumption, water consumption and body weights in rats, indicating that it has no toxicity to these animals. Also it did not produce any biochemical changes related to hepatic and renal function. This product did not produce any change in haematological parameters such as WBC, RBC, platelet, haemoglobin and differential count neither it caused any weight loss to the animals, or any weight change in organs. Necropsy of the treated animals showed normal appearance of various tissues. A long term chronic toxicity studies did not produce any change in food consumption, water consumption and body weights in rats, indicating that Cadalmin™ GMe did not produce any toxicity to these animals. Also it did not produce any biochemical changes related to hepatic and renal function. Lipid profile such as cholesterol, HDL-cholesterol, LDL cholesterol and triglycerides levels were unchanged in experimental subjects after the trial.

(Reported by Kajal Chakraborty, Scientist-in-charge, ITMU)

Exchanging signed agreement

Thrissur & Kollam Districts also in Cage Mariculture Adoption Map

Dr. G. Syda Rao, Director CMFRI handing over *M. cephalus* seed to farmers at Kaipamangalam

Through the successful demonstration of cage culture at Pooyappilly, Ernakulam District, it has been proved that open water cage culture can be highly profitable to the landless farmers. This has inspired the farmers from other districts of Kerala also to initiate the programme at their sites. After the site survey at Thrissur District during October, 2012, CMFRI has decided to have a demonstration of cage culture at Kaipamangalam in Thrissur District. The group was identified based on their background, financial level and interest towards adopting a new technology. Kaipamangalam area which is about 65 km from Cochin has good open water resources for cage culture and it is accessible by road and water from Cochin.

On December 1st 2012, a 6m dia HDPE cage was installed at the site. The Programme was inaugurated by the President, District Panchayat, Thrissur. Director CMFRI had handed over 2000 numbers of *Mugil cephalus* and 1000 numbers of *Etroplus suratensis* seed to the farmers for initial stocking. The programme was attended by the local Panchayat President, Members of the Panchayat and Scientists of Mariculture Division, CMFRI, Cochin.

(Reported by Imelda Joseph, Senior Scientist, Mariculture Division, Cochin)

Shri. K.V. Dasan, President, District Panchayat, Thrissur, inaugurating the cage launching at Kaipamangalam

Seed release to the cage by Shri. K.V. Dasan, President, District Panchayat, Thrissur

New areas in oyster farming

Trainess from cherai visiting oyster farms in moothakunnam

As a new farming venture, two groups of Kudumbashree members from Cherai, one of the main tourist spot in Kerala have now started oyster farming. To initiate the farming activities, Molluscan Fisheries Division conducted two training programmes (25 trainees) and the team members visited oyster farms and depuration facility in Moothakunnam during December 2012.

Cage launching in Ashtamudi, Kollam

Two 3 x 3m GI cages were launched at Perumon, Ashtamudi lake, Kollam on 15th October, 2012 for farming of finfishes especially pearl spot. Mr. R. Rajesekharan, Panchayat president, Panayam Panchayat was the chief guest for the lauching ceremony. Other dignitaries present were Mr. R. Anil Kumar, ward member, Panayam Panchayat Vicar –General of Kollam diocese and Director, Quilon Social Service society. The Panchayat President congratulated the group members for venturing into cage farming as an alternative income source, which will also improve the fish production from the area. He also told that the pearl spot from that part of Ashtamudi Lake is of great demand because of its taste and fetches premium price in the market. Fr. Vicar – General of Kollam diocese blessed the cages before launching and first batch of seed was introduced into cages by him and Director of QSS. The cages at Perumon are being managed by St. Alphonsa SHG under Quilon Social Welfare Society. The group has 10 active members engaged in fishing in the Ashtamudi Lake. The group had collected the seeds of pearl spot from wild and was stocked in cages. Feeding the fish and the daily maintenance of cages will be done by the group members. The cage frames are fabricated with 1.5" grade B GI pipes. The mesh size of inner HDPE net is 16 mm and outer net 24mm. Each cage is stocked with about 2000 pearl spot juveniles. Commercial pellet feed is used for feeding the fishes which is done twice a day.

(Reported by Boby Ignatius, Mariculture Division, Cochin)

Square GI Cages ready to launch at Kollam

Blessing of cages during launching function at Kollam

Cages installed in Ashtamudi, Kollam

Eighth successive breeding and larval production of Cobia at Mandapam Regional Centre

In continuation to the first seven successful breeding of cobia, eighth successful spawning and larval production was achieved at Mandapam Regional Centre of CMFRI on 30th October 2012. Here the males employed were weighing around 26 kg and 23 kg respectively. The female employed was around 24 kg. Hormonal induction of cobia was carried out on 28th October 2012. Spawning was observed at the early hours on 29th October 2012. The total eggs spawned were estimated to be 3.5 lakhs and 57 per cent fertilization was recorded. Due to low temperature (26.5ÉºC) which prevailed, the embryonic development was arrested and hence there was a low hatching percentage. Newly hatched larvae were reared in tanks containing green water and appropriate live feeds. The larvae as on 14.12.2012 are 45 days old with average length of 11.2 cm.

Measurement of cobia fingerling

Cobia fingerlings in the tank

Cage farming of cobia and pompano at Mandapam

Feeding the fishes

Cage farming of cobia *(Rachycentron canadum)* and Pompano (*Trachinotus blochii*) was experimented for the first time in India at Mandapam Regional Centre of CMFRI from the hatchery produced fingerlings since 2010-2011. In continuation of first few experiments the fingerlings were stocked after nursery rearing in August - September, 2012. Seven cages are utilized for grow out, two cages for broodstock development. In addition, cobia farming is also being carried out in three cages under participatory mode with an SHG from Marakayarpattinam village, Ramanathapuram district and a private entrepreneur.

(Reported by G.Gopakumar, A.K.Abdul Nazar, R.Jayakumar, G.Tamilmani, M.Sakthivel, C.Kalidas, P.Ramesh Kumar & Johnson, B. Mandapam Regional Centre)

Sea cage farm at Mandapam RC

Broodstock development of cobia and pompano

Broodstock of cobia was already developed from F_1 generation and is being employed for spawning experiments. Further F_1 generation of cobia and pompano is also grown in cages for broodstock development. Around 300 nos. of cobia with an average weight of one kilogram and 16 nos. of cobia with an average weight of six kilograms are being developed for broodstock. Around 600 nos. of pompano (hatchery produced) with an average weight of 840 grams and 300 nos. of pompano (wild collected) with an average weight of 920 grams are being developed for broodstock in cages.

F_1 generation of cobia with average weight of 6 kg

F_1 generation broodstock of cobia with average weight of 27 kg

Pompano weighing more than one kg weight

CMFRI establishes sea cage farm off Veraval waters for the 'Sidi' tribals of Gujarat


Fabrication of cages

The CMFRI, through the Regional Centre, Veraval have established the first of its kind Sea Cage Farm in the sea off Veraval for the Primitive Tribal Group of Gujarat 'Sidi' as a livelihood development programme under the institutes' Tribal Sub Plan outlay 2012-13. The farm comprising of 20 circular cages having 5m diameter made of G.I. pipes is the largest sea cage farm established in an exposed sea area ever since the sea cage farming research initiated in India by CMFRI in 2007.The cages are moored individually with single point anchor made of SS chain connected to combination rope gabions filled with river stones. Anchor deployment was done basing a barge installed with JCB crane hired for the purpose. The farm is located at off Marine Police Station, Patan, Veraval and is half a kilometre away from sea shore and nearly one kilometre away from the Veraval fishing harbour.

The programme has been carried out with the association of the Bharat Adimjuth Mandali, Talala, a registered society of the 'Sidi' tribals of Junagadh District. The members of the Society as already been trained in the sea cage farming by the CMFRI is undertaking farming activities under close supervision of the Scientists of Veraval RC. The farm is being stocked with juveniles of mud spiny lobster, *Panulirus polyphagus* having an average body weight of 70g, collected from various coastal villages of Gujarat, mainly Bhavnagar and Amreli districts in the south Sauashtra coast, where it comes as a bycatch of 'Wada' nets, a common gillnet used in the intertidal areas. Juvenile lobsters landed as bycatch by the bottom trawlers of Veraval are also collected for stocking in the cages for on growing to qualify it for export i.e. 150g body weight. Few cages are also stocked with Cobia seeds provided by the Marine Fish Hatchery, Mandapam RC of CMFRI and Grey mullet *Mugil cephalus* collected from some of the creek areas in the vicinity like that in Diu and Sutrapada. The sea farming experience of the 'Sidi' tribals and their involvement in all aspects of sea cage farming right from cage fabrication to net mending and mounting, mooring preparation, deployment and farm managent etc in addition to providing a quality livelihood would also make this primitive tribals a key community in the spread of sea cage farming technology in Gujarat, thereby improving their social status in the State.

Reported by K. Mohammed Koya, Sreenath K.R., Gyanaranjan Dash, Swatipriyanka Sen, Scientists and Suresh Kumar Mojjada, Technical Officer (T6)


Feeding in progress


Stocking of juveniles of spiny lobsters

Hatchery production of sea snail

Hemifusus pugilinus collected from the Kakinada Bay of Andhra Pradesh spawned in the Mariculture hatchery of Visakhapatnam Regional Centre of Central Marine Fisheries Research Institute. Female of 80.13mm shell height, 41.39 mm shell width and total weight 53.04.g, laid a string of 35 egg capsules on 16th October, 2012. The capsules were held together by a common holdfast. Development was inside the capsule and the hatchlings were released from the capsules on the 28th to 30th day of incubation. About 2500 hatchlings hatched out from 35 capsules. The hatchlings were fed bivalves such as *Perna viridis, Meretrix casta* and also meat paste of squids and attained a size of 10 mm. Hatchlings of *Hemifusus* sp. have been produced in the hatchery for the first time and given their fast growth under capture conditions; it is a suitable candidate species for mariculture.

Hemifusus hatchlings with egg capsules

Olive ridley turtle stranded at Bheemunipatnam, Visakhapatnam

The coastline of Andhra Pradesh is one of the important sporadic nesting habitats of olive ridley turtles (*Lepidochelys olivaceae*). The species is known to nest on the northern Andhra Pradesh coast which encompasses three districts namely Srikakulam, Vizianagaram and Visakhapatnam. Olive ridley turtles are categorised as vulnerable on the IUCN Red List (IUCN, 2010) and are included in Schedule I of the Indian Wildlife (Protection) Act, 1972. This coast may also serve as an intermediate developmental habitat for sub-adult ridley turtles and for juvenile and sub-adult green turtles *Chelonia mydas*.

Olive ridley turtle *Lepidochelys olivaceae*

On 19th November 2012, a dead Olive ridley turtle was found washed ashore near Bheemunipatnam, south of Visakhapatnam. An injury mark was present on the head of the specimen and it is suspected that death was caused by incidental capture and drowning. Intensive fishing takes place near-shore between Visakhapatnam and Bheemunipatnam, a distance of nearly 25 km. The curve carapace length and weight of the turtle was 70 cm and a 35-40 kg respectively. From morphometric measurement it appeared that the turtle was adult male.

(Reported by Pralaya Ranjan Behera, Scientist, Visakhapatnam RC)

Avian fauna sighting

Thirty five species ofcoastal birds were identified and photographed from 10 surveys conducted in the coastal regions of Ullal, Someshwara, Mangalore Bunder, Bengre, Kudroli, Hegemadikodi, Mulki, Kaup, Uppunda,and Murudeshwar. This included the groups of Egrets, Herons,Cormorants, Kites, Shanks, Sandpipers, Lapwingsand Plovers. Among seabirds, the major birds observed were the gulls, brown head *Larusbrunnicephalus* and black headed *Larusridibundus* followed by the terns. Oceanic birds Pomarine Skua *Stercorariuspomarinus* 4 no's were observed off Mangalore coast on 8.11.12. At Uppunda, the fishermen had caught a vagrant Blue-footed Booby *Sula nebouxii.* The bird belongs to the Order Pelecaniformes and FamilySulidae. This has not been reported from the coast of Karnataka. The natural breeding habitat of the Blue-footed Booby is tropical and subtropical islands off the Pacific Ocean especially found in the Galapagos Islands, Ecuador where they are a protected species. The IUCN status of the bird is leastconcern. Sardine is the main food for the bird and recent studies in Galapagos Islands suggest that, there is a shortage of food for the birds hence the birds are failing to breed.

(Reported by Mangalore RC.)

Little cormorantMicrocarboniger, Large EgretCasmerodiusalbus, Western reef EgretEgrettagularis, Cattle EgretBubulcus ibis and Little EgretEgrettagarzetta observed at Bunder 21.11.12

Bench mark survey on "Sidis" - Tribes of African lineage

A Bench mark survey to study the socio-personal, socio-psychological and socio-economic characteristics of Sidis- a primitive tribal group who are the beneficiaries of the ambitious cage culture programme of CMFRI under the Tribal Sub-Plan was conducted . A sample of 135 Siditribals consisting of 45 numbers of Sidis practicing cage culture, 45 numbers of non-practicing beneficiaries of the tribal society and 45 numbers of Sidis who were non- practicing and non-beneficiaries of society were selected using multi stage random sampling method. The findings of the study revealed that, majority of the participant beneficiaries (58.33 percent) were having high school level of education, when compared to non-participant beneficiaries' majority of whom were illiterates (55.55 percent). It could be inferred that, the participant beneficiaries had a higher average monthly income ie Rs. 1516.25 when compared to non-participant beneficiaries who earned an average monthly income of Rs. 854.25. Majority of the participant beneficiaries (41.67 per cent) had medium level of knowledge in cage culture followed by 50.00 per cent who had medium level of attitude, followed by 75 per cent who had medium level of perceived skill towards cage culture technologies

(Reported by SEETT Division)

Structural change in the socio-economic status of marine fishers in India

The structural change in the Indian Marine Fisheries Sector was analysed through a socio economic evaluation process. The study revealed that Fisheries sector in India plays a vital role in Indian economy through its consistent contribution to the country's GDP besides being a vital source of livelihood for about four million people. Not only the sector but also the socio economic framework of the marine fishing community has also undergone rapid changes. The fishing pattern, fleet size, mode of disposal and consumption pattern experienced lot of positive changes during the last three decades (1980-2010), helping the sector to improve its contribution to the economy. The structural changes in socio economic parameters like housing pattern, literacy, occupational profile and income have been encouraging. The supportive services of the basic fishery infrastructure have also been found productive. Hence our effort at present is to be focused on consolidating the gains achieved so far, sustain them to build up a strong platform for further development

(Reported by SEETT Division)

Sea survey and site selection for deployment of artificial reefs in two districts of Tamil Nadu

As part of the consultancy project on "Installation of artificial reef in the inshore waters of seventeen villages along the Tamil Nadu coast" sea surveys were carried out to select suitable sites for artificial reef installation. A team consisted of technical staff of MRC of CMFRI, Chennai and divers from TRC of CMFRI, Tuticorin undertook sea surveys off Nagapatnam and Pudukottai Districts. The sea surveys carried out in two phases; one from 14th to 15th and another from 27th to 28th , September 2012 in six villages such as Vellapallam, Seruthur, Chinnangudi, Perumalpettai in Nagapattinam District, Kattumavadi and Muthukuda in Pudukottai district. Water and soil samples were collected to examine the physio and oceanographic parameters for determining suitability of selected sites for artificial reef deployment.

Reported by Madras RC of CMFRI

NAIP Shellfish Value Chain Activity on Oysters

Belgian Chef Team Visits Oyster Farms

A team of 12 chefs from Belgium visited oyster farms in Moothakunnam in Ernakulam District, Kerala. Dr.K.S. Mohamed, HOD, MFD explained all the technical aspects of oyster farming, depuration and live consumption. The visit was part of a cuisine exchange programme for European chefs organized by the Malabar House Hotel chain in Fort Kochi. The chefs opined that the live oysters that they ate were absolutely world class and were greatly enthused about the great scope in value enhancement and income generation for oyster farmers.

Dr. K.S. Mohamed showing the oyster depuration process to Belgian chefs

Unusual landings of catfish by ringseiners at Mangalore Bunder

Landings of Blackfin sea catfish (*Arius jella*) at the rate of 800-2000 per carrier boat was observed continuously from 28-09-2012 to 30-10-2012 at Mangalore Bunder. Cat fish was caught at a depth of 4 to 6 metres and at a distance of 1 to 2 km.

Unusual landings of Blackfin sea catfish at Mangalore Bunder

Awareness programme on Artificial Reefs in Visakhapatnam District

Under HRD training programme a batch of 15 fishermen accompanied by two officials from Visakhapatnam Regional Centre of CMFRI visited the Madras Research Centre of CMFRI for an Exposure visit cum Awareness programme on "Fabrication, deployment and use of artificial reefs for enhancing marine fish production" from 19.11.2012 to 22.11.2012.

The Fishermen youth participated in this programme to understand the concept of artificial reefs, its fabrication, deployment and its uses and uniqueness in enhancing the marine fish production. After initial one day knowledge development at VRC of CMFRI, they were taken to MRC of CMFRI. They visited Neelankarai fishing village on the forenoon of 20.11.2012 and interacted with the fishermen (53) benefited by deployment of artificial reefs. They interacted with the fishermen regarding the benefits as well as the difficulties faced during the process of deployment. They were described about the artificial reef deployment and the benefits of it while fishing in those areas by Village head of the fishing hamlet. Fishermen of Visakhapatnam raised their queries and got their answer from the fishermen benefited. They had hands on training on fabrication of three types of artificial reefs namely grouper module, sea horse module and reef fish module with the participation of local fabricators in the presence of experts, Dr. H. M. Kasim and Dr. G. Mohan Raj (Retired Principal Scientists). They interacted with the experts and Scientist-in-Charge of Madras RC of CMFRI, Chennai with regards to benefits of artificial reefs deployment in the enhancement of biomass, rehabilitation, conservation of depleting fish stock and its future implications pertaining to their local situations.

They visited the Pulicat fishing village and interacted with the fishermen (45) involved in deployment and benefited from the increase in catch in and around the artificial reef area. During the interaction the fishermen of Pulicat shared their difficulties faced during deployment of artificial reefs, since they had done this for the first time. The trainees were shown a video on deployment of artificial reef by the expert. They also visited the fish landing centre and saw the landings from the reef area.

The fishermen trainees visited the Kovalam field centre of Madras RC of CMFRI, Chennai. They were appraised of the activities of the centre and the seed production of sand lobster, cage culture done by Madras RC of CMFRI, Chennai. They interacted with the scientist and visited the laboratory as well as hatchery. They were shown a video on cage culture activities of CMFRI. The trainees got knowledge on different seeds production activities of finfishes like Seabass, Cobia, Mullet, Milkfish and other brackish water fin fishes.

Trainees involved in fabrication of Artificial Reefs

Trainees interacting with Dr. H.M. Kasim and Dr. Vinod, SIC Madrass RC of CMFRI

Trainees at Pulicat fishing centre

Artificial Reef - Interaction meeting with fishermen

As a part of the consultancy project taken up by the Madras Research Centre of CMFRI, for the Tamil Nadu Corporation for Development of Women Ltd. (A Government of Tamil Nadu undertaking), a series of scientist and fishermen interaction meeting were conducted to discuss issues regarding deployment of artificial reefs in nearshore waters in 16 selected fishing villages of Nagaptanam, Pudukottai, Cuddalore, Kanchipuram and Thiruvalluar districts. During November and December 2012, this kind of interaction meetings were arranged in collaboration with state fisheries and local panchayat bodies in the following villages.

Districts	Villages
Nagapatnam	Vellapallam, Seruthur, Chinnangudi, Perumalpettai
Pudukottai	Kattumavadi and Muthukuda
Cuddalore	Pillumedu and Pudhu kuppam
Kanchipuram	Cuddalore chinna kuppam, Mahabalipuram, Chemmencherry and Kanathur

Fishermen meet at Pillumedu, Cuddalore District

Fishermen meet at Argankuppam, Thiruvalluvar District

Cuddalore chinnakuppam, Kanchipuram District

Vellapalam, Nagapatinam District

Kattumavadi, Pudukokottai Dt

Fishermen expert interaction meet at Bhimili, Andhra Pradesh

An interactive gathering on artificial reefs was held at Bhimili, Visakhapatnam on 6th November, 2012. Dr. G. Maheswarudu, Scientist-in-Charge, VRC of CMFRI, Visakhapatnam, addressed the fishermen with an introduction to artificial reef and its importance in management of the coastal resources. Briefly explained how artificial reefs increases socio-economic status of fishermen community. Dr. H. Mohammed Kasim (Retd. Principal Scientist), CMFRI presented brief on aspects of artificial reef and its prospects. He explained the benefits of artificial reefs deployment in the enhancement of biomass, rehabilitation, conservation of depleting fish stock. He presented the different designs and aspects of the fabrication, installation and economics of setting up of these artificial reefs. He emphasized mainly how productivity can be increased multifold by setting up these artificial structures by increasing surface area. He stressed that these artificial reefs as one of the approach of management of the fishery resources, used for sustainable fish production and to promote community based management of resources.

Awareness meeting at Bhimili Visakhapatnam Andhra Pradesh

(Reported by Visakhapatnam RC)

Dr. Mohamed Kasim speaks

District officials exposed to the concept of Artificial Reef at Visakhapatnam

An interactive gathering on artificial reefs was held at Hotel Green Park, Visakhapatnam on 7th November, 2012. Dr. G. Maheswarudu, Scientist-in-Charge, VRC of CMFRI, Visakhapatnam, addressed the officials and eminent dignitaries with an introduction to artificial reef and its importance in management of the coastal resources. Briefly explained how artificial reefs increases socio-economic status of fishermen community. Dr. H. Mohamed Kasim (Retd. Principal Scientist), CMFRI presented brief aspects of artificial reef and its prospects. He explained the benefits of artificial reefs deployment in the enhancement of biomass, rehabilitation, conservation of depleting fish stock. He presented the different designs and aspects of the fabrication, installation and economics of setting up of these artificial reefs. He emphasized mainly how productivity can be increased multifold by setting up these artificial structures by increasing surface area. He stressed that these artificial reefs one of the approach of management of the fishery resources, used for sustainable fish production and to promote community based management of resources.

Mr. J. Purnachandra Rao, Commissioner of Police, Visakhapatnam in his speech mentioned that district administration is planning to deploy these artificial reefs all along the Visakhapatnam coast to improve the depleted stocks as a pilot project to sustain livelihood of fishermen community. Dignitaries actively interacted with scientists and cleared their doubts about functionality and economics of artificial reefs, appraised the efforts of CMFRI scientists and staff. This meeting was facilitated by Sri.V.Seshadri, District Collector and Magistrate and Mr. J. Purnachandra Rao, Commissioner of Police, Visakhapatnam. Dignitaries participated: Mr. Ajay Kalam, Chairman, Visakhapatnam Port Trust, Dr. Vijay Kumar, M.D.VNC, Prof. Vijay Prakash, and Prof. Prasanna Kumar of Andhra University. Mr. Srinivas Raju (Real Estate Builder) and Dr.G.Mohan Raj (Retd. Principal scientist), Loveson Edward (Scientist) and Technical Staff of CMFRI, Visakhapatnam.

(Reported by Visakhapatnam RC)

CMFRI participates in Clam Fisher Societies Meeting

Scientists from CMFRI, Kochi led by Dr. K. S. Mohamed, HOD participated in the meeting of clam fisher societies of central Kerala organized by the NGO, ATREE on 07-12-2012. The meeting discussed the various problems faced by black clam fishers in Vembanad Lake. The societies agreed to implement various management measures such keeping the mesh size of the dredge at 35 mm, stopping exploitation of juvenile clams and transplantation and relaying of seed clams from areas with high abundance to areas of low abundance as per the densities prescribed by CMFRI.

(Reported by Molluscan Fisheries Division)

Mandapam Regional Centre Library Goes Online - Rare volumes now freely accessible

Mandapam RC's Library owns over 5000 rare volumes of journals & books on marine sciences. It houses Expedition reports such as Great Barrier Reef Expedition, John Murray Expedition, Pacific Expeditions, Report of Pearl oyster fisheries of Gulf of Mannar-6 Vols, Dana Reports etc. and rare reprints on Sponges, Corals, Planktons published during 18th Century are also available.

Important volumes have been digitized. Uploading of these volumes in the INTERNET is in progress. So far 277 volumes have been uploaded.

Full text of these volumes may be accessed freely at:

http://14.139.56.90:8080/dspace-1.7.2/handle/123456789/3355

Training Programme on "Recent advances in sea farming" conducted at Kanyakumari

Dr. S. Edison, former Director of CTCRI delivering the inaugural address at Kanyakumari

The Vizhinjam Research Centre of CMFRI has organized the CMFRI-HRD training programme on "Recent Advances in Sea farming: Prospects for better livelihood options" at Kanyakumari from 10 to 12th October, 2012. Training was inaugurated by Dr. S. Edison, Former Director of CTCRI (ICAR) & FAO/UNDP consultant for spices and tuber crops, Trivandrum.

In his inaugural address Dr. Edison, appreciated CMFR Institute's recent achievements in sea farming and emphasized the role of small scale sea farming activities integrated with other resources in enriching the livelihood options along the coastal areas. He opinioned such activities will certainly provide subsidiary and gainful occupations not only for men but also for coastal women with definite monitory benefits. Dr. A.C.C. Victor, former Principal Scientist and pearl culture expert in his felicitation address listed out the milestones of successes such as seaweed farming, mussel farming, oyster farming, pearl culture, crustacean culture and finfish culture developed and demonstrated by the CMFRI. Shri Rubert Jothi, Assistant Director of Fisheries for Training and Extension, Govt. of Tamil Nadu in his felicitation address inforemed the audience about the keen interest shown by the District Collector as well as other project officials of Tamil Nadu state Government about sea farming activities, particularly in cage farming and other innovative farming technologies and need for 'on hand' training for the those interested in it. He also informed about identification of seven teams for sea farming along the coast with possible funding support from District administration. The Presidential address was delivered by Dr. R. Sathiadhas, Principal Scientist, CMFRI, Vizhinjam. The welcome address and vote of thanks were proposed by Dr. A.P. Lipton, Principal Scientist and Dr. S. Jasmine, Senior Scientist respectively.

The Fisheries Department of Government of Tamil Nadu had deputed six staff members for attending the training. The Nehru Yuva Kendra through the initiatives of Rajiv Gandhi National Institute of Youth Development (Ministry of Youth Affairs, Govt. of India), Sriperumbudur has nominated five coastal youth as trainees for the training programme. A total 30 participants including fisher folks, research scholars and entrepreneurs attended the training programme. A compiled Lecture Manual was provided to all the participants.

Trainees and other staff with Dr. G. Gopakumar, SIC & Head, Mariculture Division at Mandapam Regional Centre of CMFRI

Participants at finfish hatchery at Mandapam RC

The trainees were explained about the recent developments in sea farming like: open sea floating cage culture of fin fishes/ shell fishes and seed production techniques. The trainees were initially taken to the Mandapam Regional centre of CMFRI, Mandapam. Dr. G. Gopakumar, Head, Mariculture Division of CMFRI and the team of scientists from Mariculture Division explained about the recent advances in mariculture. The trainees received theoretical and practical knowledge on cobia (*Rachycentron canadum*) and pompano (*Trachinotus blochii*) seed production technologies, cobia farming in open sea cages, marine ornamental fish farming, live feed culture and feed technologies for sea farming.

The participants were subsequently visited the Tuticorin Research Centre of CMFRI. After an introductory talk by Dr. S. Madan, Scientist In Charge, they were provided first hand information about bivalve/gastropod hatchery management and culture techniques by Dr. I. Jagadis,

Senior Scientist. They also received training on different live feed strains such as microalgae and rotifers maintained in the Tuticorin Research centre.

A group discussion of all the trainees with officials from various agencies dealing with fisheries development and finance was organized on the afternoon of 12-10-2012 at Kanyakumari. The group discussion was coordinated by Dr. A.P. Lipton with the active participation of the trainees. Shri. Kajendra Nathan, Lead District Manager (LDM), Indian Overseas Bank answered all the queries raised not only by the trainees but also by the Government officials about bankable programmes and projects and also different options available for commercialization of fish farming. Shri. R. Shankar, Deputy General Manager, NABARD described about the Rural Innovative Schemes and possible assistances from NABARD.

The valedictory function of the training programme was conducted on 12-10-2012. The programme was initiated with the presidential address by Dr. Rani Mary George, Scientist In Charge, Vizhinjam RC, Ms. Reena Selvi, Deputy Director of Fisheries, Government of Tamil Nadu, Kanyakumari gave the Valedictory address. She informed that the Govt. of Tamil Nadu is keen to develop sea farming ventures considering the higher prices of quality fishes in markets and scarcity of supplies. She told that close collaboration will be established with the CMFRI for implementation of appropriate farming techniques at chosen areas along the coast. She insisted all the participants to take up the innovative sea farming ventures along the Kanyakumari and Tuticorin coast of Tamil Nadu. Dr. R. Sathiadhas, Principal Scientist, Vizhinjam Research Centre of CMFRI welcomed the gathering. Shri Issac Jayaraj, Assistant Director of Fisheries and Dr. A. Palavesam, Professor and Head, MS University, Rajakkamangalam addressed the trainees. The need for imparting skills and knowledge to the entrepreneurs, farmers and students were highlighted. Certificates were distributed to the participants by the dignitaries.

(Reported by A.P. Lipton, Principal Scientist, Vizhinjam Research Centre)

Group discussion with NABARD, Lead Bank (IOB) and Dept. of Fisheries, Govt. of Tamil Nadu officials after completion of field training

Training program on marine ornamental fish breeding and aquarium keeping at Vizhinjam RC

CMFRI has organised a training programme on marine ornamental fish breeding and aquarium keeping at Vizhinjam RC. The training was conducted from 16 to 20th October 2012. Fourteen fish farmers attended the 5 day training program. The training program was inaugurated by Dr. Bijukumar, Head, Department of Aquatic biology and fisheries, Kerala University. On the valedictory function Mrs. S. Anitha, Deputy Director, Projects, ADAK, Department of fisheries, Kerala distributed the certificates to the participants.

Discussions at the training programme

Capacity building workshop on vulnerable/ threatened marine ecosystems

Calicut Research Centre conducted a Capacity building workshop on vulnerable / threatened marine ecosystems from 29-10-2012 to 31-10-2012. Twenty participant comprising researchers, wildlife officials, Fisheries Technical School teachers and State Fisheries Dept officials besides Scientists and Technical Officers of CMFRI attended the workshop.

Mussel culture training conducted at Calicut RC

Training on mussel farming was conducted at the centre from 29-30 Nov 2012. On 29th training on the biology was conducted and by afternoon hands on training on mussel was demonstrated. On 30th November, tour to Padanna was arranged and the farmers were shown the major mussel growing areas. The participants were introduced to Mr. Balakrishnan, the Matysa Kerala Award winner from Kerala state on mussel farming and one of the first batch of trainees conducted by CMFRI, Calicut. The participants actively participated in the mussel seeding operation that was going on at Padanna. The difference in the methods was observed and practical knowledge gained through the process.

Inauguration of training programme by lighting of lamp by Shri.K. Nandakumar, IAS, District collector, Ramanathapuram

Training programme on "Mass production of live feeds protocols for larviculture of cobia and pompano" at Mandapam RC

The training programme on "Mass production of live feeds protocols for larviculture of cobia and pompano" organized by Mandapam Regional Centre of CMFRI for the technicians working in fish and prawn hatcheries is meant to impart hands on training on the seed production of marine finfishes especially cobia and pompano. The training programme was conducted from 12th to 21st December 2012. The training was inaugurated by Shri.K.Nandakumar, IAS, District collector, Ramanathapuram on 12th December 2012 noon by lighting the lamp and he delivered the inaugural address. The felicitation address was given by Dr.K.Eswaran, Scientist-in-Charge, CSMCRI, Mandapam and Shri. Abdul Nazar, President, Marakayarpattinam panchayat. Dr.G.Gopakumar, Scientist-in-Charge & Head, Mariculture Division, Mandapam RC delivered the presidential address. In his address he appraised the importance of breeding and seed production of high value marine finfishes. About 20 technicians working in private prawn hatcheries are being trained in various techniques on fish breeding and seed production. The training focused on broodstock development, micro algal stock and mass culture, cannulation, PIT tagging, rotifer culture, enrichment procedures, hormonal induction, hatching of artemia cysts, green water techniques, larviculture protocols and disease management.

Release of training manual

Lecture session

Practical session

Training programme at Cochin

A weeklong training programme, "Capacity building workshop on taxonomy and identification of pelagic finfishes" was organized by Pelagic Fisheries Division at CMFRI, Kochi, for Scientists, Technical staff and research scholars during 17-22 December 2012. A total of 23 participants from headquartes and Research Centres of CMFRI attended the programme.

Participants of the Training programme

- Two day training on Pearl spot culture and seed production was given to 40 farmers of Thodupuzha, Idukki District during October 4-5 at Gandhiji Study Centre. Dr. Boby Ignatius, Senior Scientist, CMFRI had coordinated the programme.
- A two days training was organized on Seed identification and cage culture of grey mullet *Mugil cephalus* and red snapper *Lutjanus argentimaculatus* for 20 farmers at Nagaya Lanka, Krishna District, Andhra Pradesh during 16-17, November, 2012, at Fisheries Polytechnic, Nagaya Lanka. Dr. Imelda Joseph, Senior Scientist, CMFRI had coordinated the Programme.

Workshop on "Assessment of Elasmobranch Resources in the Indian Seas" held at Madras RC

A project inception Workshop on "Assessment of Elasmobranch Resources in the Indian Seas" was held at Madras RC of CMFRI, Chennai, from 11th to 13th December 2012. Scientists and Technical staff of the Demersal Fisheries Division, and other Divisions associated with the project, stationed at CMFRI HQ and different Regional and Research Centres participated in the workshop. The workshop was inaugurated by Dr. Y.S. Yadava, Director, BOBP-IGO. Dr. P.U. Zacharia, Head, Demersal Fisheries Division, CMFRI, gave an overview of the scope and objectives of the project. A series of lectures were conducted in the course of the workshop, including discourses on "Global status of shark fishery" and "Research approach for shark fishery management" by Dr. E. Vivekanandan, Emeritus Scientists, CMFRI, Chennai, "Status of trade in sharks and shark by-products" by Dr. O.K. Sindhu, Technical Officer, MPEDA, Chennai, "Whale shark fishing in Gujarat" by Dr. Joe K. Kizhakudan, Senior Scientist, CMFRI, Chennai, "Molecular Taxonomy" by Dr. V. Srinivasa Raghavan, Scientist, CMFRI, Chennai and "Deep sea Elasmobranchs of India" by Dr. A. Anrose, Zonal Director, Chennai Base of FSI . The workshop also included an interactive discussion with the Chief Executive, Mr. Vincent, of the Association of Deep Sea Going Artisanal Fishermen (ADSGAF), and Mr. Periyanayagam progressive shark fisherman from Thuthoor, and a session on Taxidermy (demonstration) by Shri. Balraman, Taxidermist, Government Museum, Chennai. The valedictory address was delivered by Dr. A. Anrose, Zonal Director, Chennai base of FSI.

(Reported by Sobha Joe Kizhakudan, Madras RC)

Review workshop of Mariculture Division projects at Karwar

A three day review workshop on the two ongoing projects of the Mariculture Division "Innovations in sea cage farming and coastal mariculture" and Development and standardization of seed production technologies of selected high value finfishes and shellfishes" was held at Karwar during 5th to 7th December 2012. Director and Scientist associated with the projects participated in the workshop. Research done and work to be completed during the remaining period of the year was critically discussed in the workshop.

Dr. G. Syda Rao addressing the Mariculture Scientists

Workshop on "Popularisation of Open Sea Cage Culture" at Karwar RC

A workshop on "Popularisation of Open Sea Cage Culture" organized by NFDB was held at the Karwar Research Centre on 4-5 October 2012. Supply of seed and feed for the cage farming operation in the above states were discussed in detail along with other aspects of cage farming including nursery rearing, health and cage fabrication. Fishermen from Maharashtra, Karnataka, Odisha and west Bengal and officials from Karnataka, Maharashtra and Karnataka participated in the workshop. Dr. Madhumita Mukhargy, Executive Director, NFDB, Shri. Bal Mane, MLA, Ratnagiri, Scientists from HQ as well as Karwar and Mangalore Research centres participated in the workshop. A field trip to the Marine Farm was also organized for the participants during the workshop.

Dr. Philipose, Scientist-in-charge addressing the participants

Technical Talk in Hindi

A technical talk in Hindi on the subject *Fishing techniques and aquatic environment* was conducted for the Scientists and Technical personnel of CMFRI Headquarters on 15.12.2012. Shri Rakesh Kumar, Chief Administrative Officer of the Institute presided over the function. Dr. Pravin P., Senior Scientist, Central Institute of Fisheries Technology gave the talk on the subject with interesting video clippings and slides. Total 20 Scientists and Technical Staff attended the function. In the interactive session chaired by Dr. V. Kripa, Head, FEMD, Dr. Sunil Mohamed, Head, MFD, Dr. P.C.Thomas, Principal Scientist, MBTD, Dr. Grinson George, Senior Scientist and Shri K.M.Venugopalan, T-5 (Technical Officer) actively participated.

Workshop on use of Unicode in Hindi at Mangalore RC

As a part of the official language implementation, a workshop on "Official Language Knowledge and use of Unicode in Hindi" was conducted at Mangalore RC on 12-12-2012. Smt. Lakshmi Devi, Senior manager Corporation bank, Mangalore delivered the lecture on use of Unicode in Hindi.

Participation in Official Language Scientific Seminar

Dr. Lakshmi Pillai, Scientist participated in the All India Official Language Scientific Seminar organized by Naval Physical & Oceanographic Laboratory, Cochin on 23.11.2012 and presented a paper in Hindi on the subject Think Green (Harit Socho).

Inspection at Centres

Director, CMFRI inspected the Official Language implementation activities of Karwar and Vizhinjam Research Centres of CMFRI on 7th December 2012.

OLIC Meeting

The quarterly meeting of Official Language Implementation Committee of the Institute was held on 21.12.2012 under the Chairmanship of Director, CMFRI, Cochin. Official Language implementation activities for the quarter October- December, 2012 were reviewed in the meeting.

Exhibition

CMFRI participated in the following exhibitions

- Exhibition in connection with the 'Expert Consultation on Managing Transbondary Diseases of Agricultural Importance in Asia & Pacific" during 10-12 October, 2012 at NASC Complex, New Delhi.
- Exhibition in connection with the International seminar of 'Pan Ocean Remote Sensing Conference : PORSEC 2012' during 05-09 November, 2012 at IMA House, Kochi.

Visit of DG, DDG (Fy) and Directors of Fisheries Institutes to CMFRI pavilion at NASC Complex

International Exposition PORSEC 2012 at IMA House, Kochi

- Exhibition of Science Expo 2012 in connection with 125th anniversary clebrations of Leo XIIIth Higher Secondary School during 05-09 November, 2012 at Alappuzha.
- Exhibition in conection with Swadeshi Science Movement '*Swasrayabhratham*' during 10-12 October, 2012 at NASC Comploex, New Delhi.

Tree plantation programme

The Staff Recreation Club of Mandapam Regional Center of CMFRI organized a tree plantation programme in the premises of guest house on 29th November 2012. Dr.G.Gopakumar, SIC initiated the planting programme. Staff and family members actively participated in the tree plantation. Nearly 100 seedlings of coconut and *neem* were planted.

Dr.G.Gopakumar, SIC, Mandapam Regional Center initiated the coconut seedlings plantation

Dr.G.Gopakumar, SIC, Mandapam Regional Center initiated the *neem* seedlings plantation

Tree plantation by staff members

CMFRI Recreation club lends a helping hand

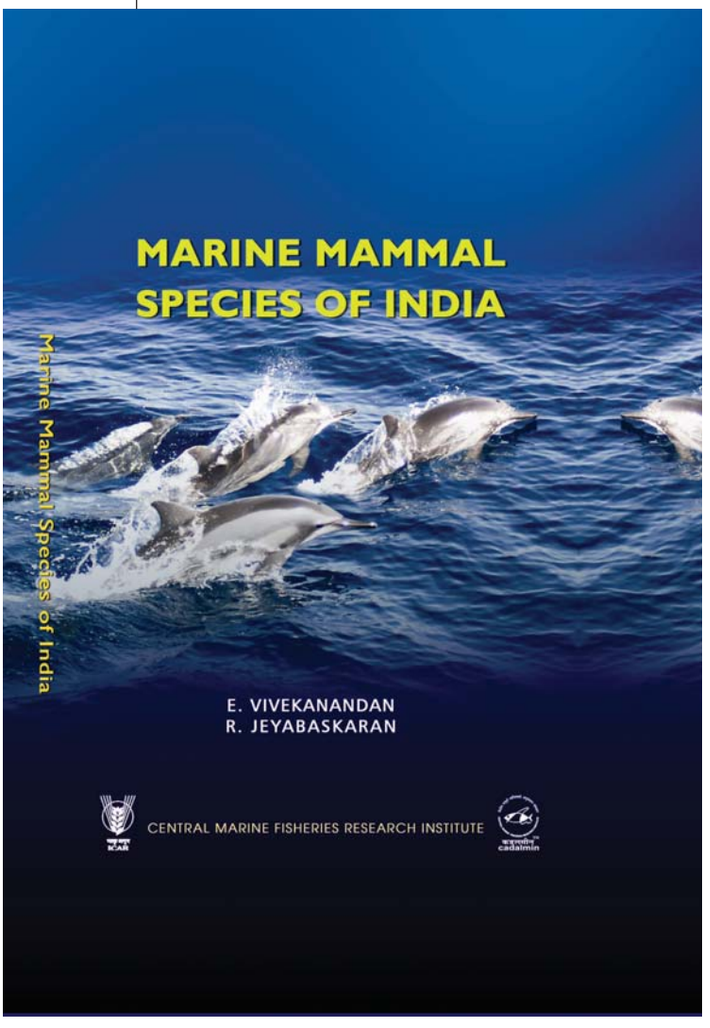
On 19th October 2012, the members of the CMFRI staff recreation club Kochi handed over dresses donated by staff of CMFRI Kochi, NBFGR, Kochi and CIFRI, Kochi to the inmates of Evangelashram, a charity home (Reg. No.522/97) for the mentally challenged, deaf and dumb in Koonammavu, Ernakulam. There are about 150 inmates here who were rescued from different places. We have given dresses for women, men and children of the home.

Members of Staff Recreation club, CMFRI Kochi with Brother Amal, Founder President of the Charitable Society and some inmates of the destitute home after handing over the cartons of dresses donated by club members

BOOK REVIEW

Title of the book	Marine Mammal Species of India
Authors	E. Vivekanandan and R. Jeyabaskaran Scientists of CMFRI
Special features	146 illustrations, 32 tables, 622 references, year 2012; 228 pages Hard Bound
Price	Rs 750 US$50
Published by	Central Marine Fisheries Research Institute www.cmfri.org.in
ISBN	978-8-923271-5-0

The charismatic marine mammals of Indian waters which include the majestic whales, intelligent dolphins and endearing sea cows are among the least known of the marine living resources. Lack of appropriate literature on identification, nature of their habitat and restrictions on their capture under Wild Life protection Act are some of the constraints faced by researchers studying these spectacular endangered animals. The recent publication of the Central Marine Fisheries Research Institute, " Marine Mammal species of India" is packed with vital information on all the 26 species recorded in the Indian Seas.



The Institute has been studying marine mammals since 1947 and particularly from 2003 to 2012 as a programme funded by Ministry of Earth Sciences.

The descriptions on the taxonomic status and identification characters along with supportive illustrations of each of these species will definitely aid in field identification of these resources. The authors have included separate maps indicating their distribution in Indian waters and also added information on their habitat, food, exploitation and threats and the conservation status of each of these species which makes the publication an indispensible reference book for all who are interested in understanding marine living resources of our planet. The narration is in simple language, intermingling science with interesting facts and observations on their social behavior which will mesmerize the reader. The authors have also added a glossary for scientific terminologies which will help the reader in understanding the text clearly. Apart from the descriptive text, it would have been more helpful for the readers if a consolidated table comparing the main morphological characters had been included.

Stranding of marine mammals on the beaches has always attracted human attention. People throng the beaches to have a glimpse of the giants of the sea when their carcasses are washed ashore. The history of stranding of whales for the last 150 years in different parts of the Indian coast has been traced by the authors with relevant anecdotes whereever possible. One interesting report is that of the skeleton of a dwarf female sperm whale which was stranded at Vishakhapatnam on 28th Feb 1853 and was gifted to the British Museum by Sir Walter Elliot.

The publication is packed lavishly with clear and vivid illustrations capturing various activities like spouting, breaching, spy hopping, and lob tailing of these enchanting animals in their natural habitats. These photographs are extremely fascinating and needs special appreciation. The section on 'Future Directions' provide clear cut directions needed to strengthen programs which would help to conserve and understand these highly vulnerable group which are considered as icons of conservation movement and at the same time support more advanced research in the country.

The publication will definitely be a useful guide for researchers, planners and students. The book is suggested as a "must read" and "must possess" for all those are interested in marine animals especially, naturalists, mariners and those who plan to be prospective mammalogists studying these marvels of ocean life.

Reviewed by V. Kripa, Head, Fishery Environment Management Division, Central Marine Fisheries Research Institute, Cochin, India

KVK Scientific Advisory Committee Meeting held

The Scientific Advisory Committee (SAC) meeting of KVK for the year 2012 held at Narakkal campus on 29th October 2012. Dr.S.Prabhukumar, Zonal Project Director, Zone VIII inaugurated the meeting in the presence of Dr. P. V. Balachandran, Director of Extension, Kerala Agricultural University. The meeting was chaired by Dr.G.Syda Rao, Director CMFRI. During his speech he suggested that considering the specific situation in Ernakulam district, priority should be given for high value agriculture and urban agriculture. He has appreciated the efforts taken by the KVK to promote new farming systems like commercial high density curry leaf farming and integrated fin fish-pokkali culture. Kerala, particularly He has appreciated the efforts taken by KVK to promote and popularise the programme- Development of Community Orchards in Waste Lands (d-COWL). Dr.S.Prabhukumar offered all financial support from Zonal Project Directorate to KVK Ernakulam particularly to establish new administrative building at Thevara campus. Considering the importance of Pearlspot fish in Kerala, he suggested that Pearlspot seed production capacity of KVK need to be augmented.

Dr. S. Prabhukumar inaugurating Scientific Advisory Committee Meeting-2012

KVK conducted farmers field school (FFS) on mechanization of Paddy fields

Power weeder operation in Paddy field

KVK Conducted Farmers Field School (FFS) on Paddy mechanization at Kanjoor near Kalady. Three sessions were held. Training on laying mat nursery for mechanized seedling transplantation was done in the first lesson held on 31st October 2012. The training was given by renowned expert in Rice mechanization in Kerala- Dr. Shaji James, Programme Coordinator, Palakkad KVK. The second session held on 16-11-2012 was on mechanized transplanting. The session was inaugurated by Shri. Anwar Sadath, M.L.A followed by oath taking on conserving paddy lands. Dr.Shaji James and Dr. Shinoj Subramannian lead the class wherein 2 acre paddy field was transplanted using rice transplanter. There was a demonstration on the usage of dry seeder machine also. The third session held on 06-12-2012 was on the usage of power weeder in paddy fields. Dr.Shinoj Subramannian demonstrated the power weeder for weed removal in paddy fields.

KVK participated in the Exhibition during National Conference-2012 at PAU, Ludhiana

KVK (Ernakulum) set up a stall in the exhibition organized in connection with the National conference of KVKs at Punjab Agricultural University, Ludhiana during 20th, 21st and 22nd November 2012. Hundreds of students from various universities in and around Ludhiana and general public of Ludhiana city visited the stall in addition to officials and delegates from Indian council of Agricultural Research, Various Agricultural universities, KVKs from various parts of the country and other organizations. Live pearlspot (Karimeen), the state fish of Kerala was the centre of attraction in the exhibition. In addition, various fishing gears, fixed specimen of lobsters, prawn, tuna, clam, mussel and squid, marine fish cage, rabbit waste composting unit, model of pokkali farm, bush pepper plant, VARNA fish feed, packed sea food products of KVK, Green Algal Extract, Green Mussel extract, Pokkali rice and paddy, seeds, seedlings and posters showcasing various technology interventions of KVK in Ernakulam district were exhibited. The Green Algal extract samples were distributed to dignitaries free of cost for data collection.

Dr. K.D. Kokate, DDG (Agrl extn) and Dr. Gurbachan Singh, Chairman, ASRB visiting KVK stall

Programme participations

Dr. G. Syda Rao, Director

- Attended the meeting convened by DG, ICAR at ICAR, New Delhi on 8th October, 2012
- Attended the 225th meeting of the Governing Body of ICAR at New Delhi on 6th November 2012.
- Attended the Review meeting of research at Mumbai Research Centre of CMFRI from 15th to 17th November 2012.
- Attended the meeting with the Development Commissioner of Fisheries at Hyderabad and visited the cage culture site at Nagayalanka near Vijayawada from 22nd to 24th November 2012.
- Attended the meeting convened by DG, ICAR at New Delhi on 5th and 6th December 2012.
- Visited Goa Shipyard and attended the review meeting of research at Karwar Research Centre on 7th December 2012 .
- Reviewed the research work of Vizhinjam Research Centre and reviewed the research work and progress in cage culture at Kanyakumari on 14th & 15th December 2012.

Dr. (Mrs.) V. Kripa, Head, FEMD Served as Chief Guest at Vimala Public School, Thodupuzha of their Science exhibition 'Science Expo 2012' on Monday 22nd October 2012.

- Served as member of the Institute Management Committee, Central Institute of Freshwater Aquaculture, Bhubaneswar, Orissa on 30th October 2012.
- Attended the 22nd Swadeshi Science Congress at CPCRI Kasaragod from 5th to 7th November 2012 and delivered a special lecture on 'Marine Habitats'.

Dr. R. Narayanakumar, Head, SEETTD attended 'Management Development Programme on Leadership Development (a pre-RMP programme) held at NAARM, Hyderabad, October 8-19, 2012.

- Attended 'Meeting of RFD Nodal Officers of Fisheries Research Institutes' held at ICAR, December 4-5, 2012.
- Attended 'Review Workshop and Sensitization Meeting of the PME Cells of the ICAR Institutes held at NDRI Karnal, December 8, 2012.

Deputation Abroad

Dr. Prathibha Rohit and Dr. Abdussamad at Malaysia

Dr. Prathibha Rohit, Sr Scientist, Mangalore RC and Dr. E.M. Abdussamad, Sr Scientist, CMFRI, Cochin attended the Second Working Party on Neritic Tunas (2WPNT) organized by Indian Ocean Tuna Commission (IOTC) at Penang, Malaysia during 19-21 November 2012. Scientific paper entitled 'Status and potential of neritic tunas exploited along the Indian EEZ' was presented in the meeting. The meeting was attended by thirty five participants from sixteen member countries.

Dr. Vijayan, Dr. Jagadis and Dr. Kajal Chakraborty at Australia

Dr. K. K. Vijayan, Head, MBTD, Dr.I. Jagadis, Senior Scientist, Tuticorin RC and Dr. Kajal Chakraborty, Scientist, MBTD attended the workshop on "Nutraceuticals from Muricidae Molluscs at Australia during the period from 1st to 16th November 2012.

Dr. Asha at Tanzania

Dr. P. S. Asha, Senior Scientist - attended and presented a paper on "The status of sea cucumber fisheries and management in India" on 13th Nov'12 at the workshop on " Sea Cucumber Fisheries an Ecosystem Approach to management in the Indian Ocean " organized by Food and Agricultural Organization (FAO) and Western Indian Ocean Marine Science Association (WIOMSA) at Zanzibar of Tanzania during the period 12-16 Nov'2012.

Dr. G. Gopakumar, Scientist-in-charge, Mandapam RC participated in the 'Technical discussions on Mariculture programme' from 23rd-25th September, 2012 at Visakapattinam RC of CMFRI.

- Participated in the 'Governing Council meeting of KUFOS' at Kochi on 17th November, 2012.

Dr. Vinay D. Deshmukh, Principal Scientist and Scientist-in-charge, Mumbai RC attended 22nd Regional Committee meeting at ICAR, RC, Goa on 09.11.2012 and 10.11.2012.

Dr. G. Maheswarudu, Principal Scientist & SIC, attended meeting on 'identification of areas for skill upgradation in fishery sector and development of model curriculum' at NFDB conference hall at Secunderabad on 9th October, 2012.

- Attended one day workshop as a resource person, on "Aquaculture, new possibilities, constraints" organized by SPICAM at Kakinada on 29th October, 2012.
- Participated the Institute Management Committee Meeting at Central Institute of Brackishwater Aquaculture, Chennai on 14th December, 2012.

DR. K. K. Philipose, SIC and **Dr. S. R. Krupesha Sharma,** Scientist attended a field day at the Asian seabass pond culture site of CIBA at Harwada on 1 November 2012.

- Attended the NFDB sponsored national brain storming on mariculture development in India at NAAS complex, New Delhi on 3-8-2012.
- Attended the NICRA Technology demonstration review workshop at IIHR, Bangalore from 7 and 8 August 2012.

Dr. K. K. Philipose, SIC visited Mundra on 3 9-2012 and attended a meeting convened by TATA power to explain the possibilities of developing alternate livelihood for the fishermen displaced by the thermal power project.

Dr. K. Vinod, Senior Scientist & SIC attended fishermen meet held at ten villages of Cuddalore district on 19.12.2012 in connection with NICRA project

- Attended fishermen meet held at Chemmencherry, for artificial reef project on 23 .11.2012

Shri. K. Mohammed Koya, Scientist-in-Charge, Regional Centre of CMFRI, Veraval attended the XXII Meeting of the ICAR Regional Committee No.VI held at Central Arid Zone Research Institute (CAZRI), Jodhpur, Rajasthan on 16th to 17th November, 2012

Dr. Veerendra Veer Singh, Principal Scientist attended Final Consultation Workshop on GEF India Country Portfolio Evaluation in New Delhi on 08.11.2012 and received Certificate of Appreciation from NAIP during 22nd Regional Committee meeting at ICAR, RC, Goa on 09.11.2012 and 10.11.2012

- Participation in meeting at CESCRA, New Delhi on m-KRISHI® and m-KRISHI® Fisheries with CPI and others for finalizing roadmap for the m-KRISHI® Fisheries programme for Ganjam and Raigad district and for meeting with higher dignitaries of the state where m-KRISHI® service is planned to be extend from 13.12.2012 to 14.12.2012.

Dr. Joe K. Kizhakudan, Sr. Scientist & OIC, Kovalam Field Laboratory

- Attended fishermen meet held at Cuddalore chinnakuppam on 21.11.2012 for artificial reef project

Dr. Shoba Joe Kizhakudan, Dr. Sethi, Dr. R. Geetha and **Smt Indira Divibala** Scientists

- Attended fishermen meet on Artificial Reefs at Pillumedu and Pudhupuppam, Cuddalore Dt on 7.11.2012, Cuddalore chinnakuppam, Mahabalipuram on 13 July 2011.
- Attended meeting with Deputy Director and Assistant Director, Tamil Nadu State Fisheries, Cuddalore on 7.11.2012 for identification of fishing villages for IDLAM data collection.

Dr. K. S. Sobhana, Senior Scientist attended the Task Force Meeting at DBT, New Delhi on 3-4.12.2012.

Dr. C. Ramachandran, Senior Scientist attended the "FAO/BOBP National Result Sharing and Scoping Workshop on Outcomes of the FIMSUL Project" during 22-23 November 2012, at Chennai.

Dr. P. K. Asokan, Sr.Scientist conducted a training on Mussel Farming for the Entrepreneurs of South Goa organized by the BFFDA, Goa

Dr. Vipinkumar. V. P., Senior Scientist participated in the international meeting for the 'Expert Consultation on Managing Trans-boundary Diseases of Agricultural Importance In Asia & Pacific" during 10-12 October, 2012 at NASC Complex, New Delhi

Dr. Shyam. S. Salim, Senior Scientist attended the Academic Council meeting of KAU on the 14th November 2012 at the conference Hall of Kerala Agricultural University, Vellanikkara, Trichur.

- Attended the MDP workshop on Supply Chain management in Agriculture at Hyderabad during 15-19 October 2012 at National Academy of Agriculture Research Management, (NAARM) Hyderabad.

Dr. A. K. Abdul Nazar participated in the '7th meeting of Fish, Fisheries and aquaculture sectional committee, FAD12' at Bureau of Indian Standards, Manak Bhawan, New Delhi on 31st October, 2012.

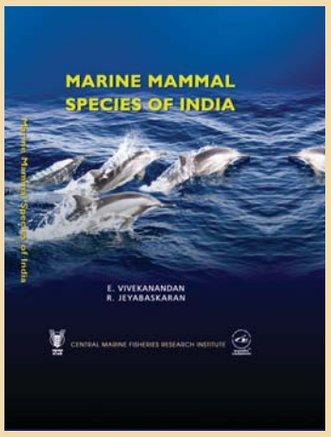
Dr. Grinson George, Senior Scientist attended Training Course on Field Trial & QTL analysis using R & R/QTL at ICRISAT, Patancheru from 02-06 Dec 2012.

Shri. C. Kalidas participated in the CAFT training programme on 'Research strategies for mitigation and impact of climate change on fisheries' at CIFE, Mumbai, from 15th November to 5th December, 2012.

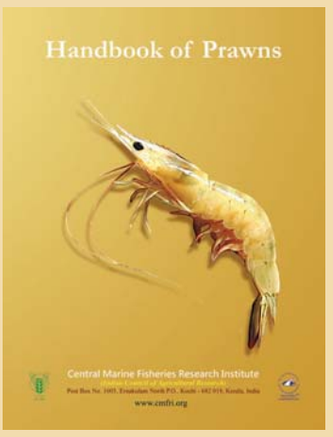
Publications

Movie DVD:

Vipinkumar V. P, Narayanakumar R., Shyam S. Salim, Sathiadhas R., Madan M. S., Ramachandran C., Swathilekshmi P. S. and Johnson B. 2012. Coastal Indebtedness and Impact of Microfinance in Marine Fisheries Sector: Success Case Studies, Central Marine Fisheries Research Institute, Kochi.

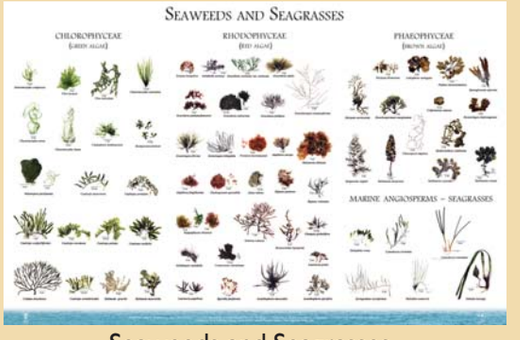


Marine Mammal Species of India. p. 228 Rs. 750/-



Handbook of Prawns p. 125 Rs. 600/-

Posters released

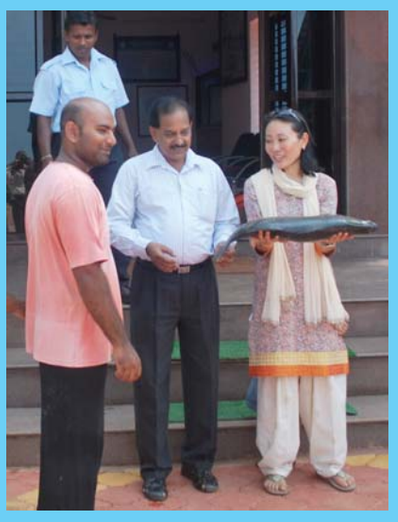


Seaweeds and Seagrasses Rs. 50/-

Soft corals and sea fans of India Rs. 50/-

Visit of Dignitaries

Deputy Commissioner visits marine farm of Karwar



Deputy Commissioner holding a cage farmed Asian seabass

Smt. Imkanglo Zamir, Deputy Commissioner of Uttara Kannada Dist visited the marine farm of Karwar Research Centre on 26th October 2012. The deputy Commissioner observed different species of fish including brood stocks being reared at the farm and appreciated the efforts of the Centre for the successful demonstration of the cage farming in the sea.

Deputy Commissioner observing feeding at a cage site

Dr. Paul Pandian visits Karwar

Dr.Paul Pandian, Executive Director, NFDB visited the Karwar Research Centre and marine farm on 8-6-2012

Dr. Paul Pandian and Dr. A.R.T. Arasu visiting the marine farm

Mr. Michael Carter at Visakhapatnam RC

Mr. Michael Carter, Consul-Commercial and Trade Commissioner for South India, Australian Consulate General, Chennai visited the Visakhapatnam regional centre of Central Marine Fisheries Research Institute on a scheduled meeting on 19th October, 2012. He interacted with Dr. G. Maheswarudu, Scientist-in-Charge, RC of CMFRI and all the scientists associated with the monitoring of the Marine fisheries of Andhra Pradesh.

Mr. Michael Carter visits the fishing harbour at Visakhapatnam

Personnel

APPOINTMENTS

Name	Designation	Center	w.e.f
Shri Upendar Kumar	Assistant	Veraval RC	29.09.2012
Ms. Sumeena N. K.	Assistant	Mandapam RC	05.12.2012

Compassionate Appointments

Name	Designation	Center	w.e.f
Smt. R. Eswari	SSS	Madras RC	20.09.2012
Shri Rajesh P. A.	SSS	CMFRI Hqrs.	28.09.2012

PROMOTIONS

Names & Designation	Promoted as	Center	w.e.f
1. Dr. P. Vijayagopal	Principal Scientist	CMFRI Hqss.	01.01.2009
2. Dr. Gulshad Mohammed, Sr. Scientist	Principal Scientist	Calicut RC	14.09.2011
3. Dr. P. P. Manoj Kumar, Sr. Scientist	Principal Scientist	Calicut RC	21.01.2011
4. Shri A. V. Joseph, Sr. Finance & Accounts Officer	Chief Finance & Accounts Officer	CMFRI Hqrs.	27.10.2012
5. Smt. P. J. Sheela, Assistant Director (OL)	Deputy Director (OL)	CMFRI Hqrs.	14.12.2012
6. Shri Gangadhar B. Naik, Assistant	Assistant Administrative Officer	Karwar RC	10.12.2012
7. Shri C. K. Sivadas, Upper Division Clerk	Assistant	CMFRI Hqrs.	19.12.2012
8. Shri Tomy Prince, Upper Division Clerk	Assistant	CMFRI Hqrs.	19.12.2012
9. Shri M. Samuthiram, Upper Division Clerk	Assistant	Tuticorin RC	17.12.2012
10. Smt. N. G. Supriya, Upper Division Clerk	Assistant	Calicut RC	21.12.2012
11. Shri I. Syed Sadiq, SSS	T-1 (Field Assistant)	Mandapam RC	01.12.2012
12. Shri M. Shanmughavelu, SSS	T-1 (Field Assistant)	Mandapam RC	01.12.2012
13. Shri M. Bareen Mohamed, SSS	T-1 (Field Assistant)	Madras RC	15.12.2012

We salute the seniors on their retirement


Shri G. Arumugham
T-6 (T O)
Tuticorin RC
30.11.2012


Shri M. N. Kesavan
Elayathu T-5 (T O)
CMFRI Hqrs.
30.11.2012


Smt. P. T. Mani
T-5 (T O)
CMFRI Hqrs.
30.11.2012


Smt. K. K. Valsala
T-5 (T O)
CMFRI Hqrs.
31.12.2012


Shri G. Srinivasan
T-5 (T O) Madras
RC. 31.10.2012


Shri P. Poovannan
T-5 (T O)
Madras RC
31.12.2012


Shri S. Erishikesan
Asst. Adm. Officer
Vizhinjam RC
30.11.2012


Shri Gangadhar B. Naik
Asst. Adm. Officer
Karwar RC
31.12.2012


Smt. V. Parukutty
Assistant
CMFRI Hqrs.
30.11.2012


Smt. Chinnamma Anjalo
SSS
KVK of CMFRI
30.11.2012

TRANSFERS

Name & Designation	From	To	w.e.f.
1. Shri. Fofandi Mahendra Kumar, Technical Officer (T6)	Verval RC	Karwar RC	25.09.2012
2. Shri M. R. Wadadekar, Assistant Administrative Officer	Veraval RC	Mumbai RC	01.11.2012
3. Shri D. Augustus Julin Raj, Assistant	Mumbai RC	KVK of CMFRI	16.11.2012
4. Shri V. Ashok Maharshi, T-3 (Technical Assistant)	Tuticorin RC	Mandapam RC	15.11.2012

Re-designation

Name & Designation	Res-designated as	Centre	w.e.f
1. Shri P. V. George, Bearer	Canteen Attendant	CMFRI Hqrs.	13.12.2012
2. Shri M. V. Devassykutty, Bearer	Canteen Attendant	CMFRI Hqrs.	13.12.2012
3. Shri P. K. Purushan, SSS	Canteen Attendant	CMFRI Hqrs.	13.12.2012

Voluntary Retirement

Name	Designation	Centre	w.e.f.
1. Shri K. B. Waghmare	T-6 (Technical Officer)	Mumbai RC	01.11.2012(FN)

Resignation

Name	Designation	Centre	w.e.f.
1. Shri Anilkrishna G.	Assistant	CMFRI Hqrs.	30.11.2012

Change of Name

Name & Designation	Changed as
1.Miss. Swathi Priyanka Sen, Scientist, Veraval RC	Smt. Swathi Priyanka Sen Dash

Ph.D. awarded

Ms. Asha Augustine, Research Scholar (Mariculture, CIFE, Mumbai) has been awarded doctoral degree by Central Institute of Fisheries Education, Mumbai, on the topic "Utilisation of starch and cellulose by microbial symbionts in selected marine fishes" under the research guidance of Dr. Imelda Joseph, Senior Scientist, Mariculture Division.


Shri V. Krishnan
T-1 (Field Assistant) CMFRI Hqrs.
28.11.2012

Obituary

With profound sorrow CMFRI family records the demise of our beloved colleague Shri V. Krishnan.

Cadalmin IV - Continues to support research for more than 3 decades

Tuticorin Research centre is equipped with the 43.6' Research Vessel "CADALMIN-IV". Modern boating and sailing equipment like GPS, echo sounder, water sampler and wireless communication system etc. were provided along with fish trawl and prawn trawl and other gears. The speed of the vessel is now 7 knot per hour without load and 2.4 to 2.6 knot per hour with load.

The vessel has been in use for hydrographic studies. Fortnightly samples are being collected from different depths ranging from 10 to 30m. The parameters studied are salinity, oxygen, temperature, pH, nutrients besides primary and secondary production. Regular fishing trips are also made for the NICRA project using the vessel Cadalmin-IV. The trawling operation was carried out at the same grounds off Tuticorin and Punnakayal, where the small and medium size mechanized commercial trawlers are operating. Fishing is done during day time and is carried out at different depths ranging from 6 to 25 m at a distance of 4 to 25 nm away from the shore. Each haul was of one hour duration. The fishing is done with a view to understand the depth-wise and month-wise species abundance and diversity in a latitude longitude position. The catch by fish trawl was comprised by fishes, crabs, and cephalopod in addition to the non-edible biota. The average catch per hour of operation yielded 28.5 kg of fish, 2.8 kg of cephalopod, 1.4 kg of crab, 1.8 kg of prawn and 10 kg of non-edible biota. Fish composition include *Inistius* spp., *Synodus* sp., *Saurida* spp., *Trachinocephalus myops*, *Leognathus* spp., *Sillago sihama*, *Siganus* spp., *Platycephalus* spp., *Plotosus indicus*, *Dascyllus trimaculatus*, *Lethrinus* spp., *Seleroides leptolepis*, *Upeneus* spp., *Parupeneus* spp., *Scolopsis* spp., *Scarus spp.*, *Bothus* spp., *Samaris* sp., *Scarus* spp., *Halichoeres* sp., *Amphiprion* spp., puffer fishes, balistids etc. Cephalopod was comprised by *Sepia* spp., *Sepiella* sp., *Sepioteuthis* sp., *Loligo* sp., *Octopus spp.* Crabs like *Portunus spp.*, *Charybdis natator*, *Calappa spp.*, *Matuta* sp., were also landed. The non-edible biota was constituted by sea urchins, star fishes and *Oratosquilla* sp. mainly which were released back to the sea live immediately after taking a representative sample. The main prawn trawling ground in Tuticorin is a ground called 'eral mada', which is near Punnakayal. The operations in this ground using the prawn trawl yielded prawns like *Penaeus indicus*, *P. semisulcatus*, *Parapenaeopsis maxillipedo*.

(Reported by Tuticorin RC)

RV CADALMIN-IV

cadalmin
CMFRI Newsletter

Cadalmin, the CMFRI Newsletter is a quarterly publication of the Central Marine Fisheries Research institute, Cochin. The publication gives an insight into the major events of the quarter, besides highlighting the salient findings in the research front and dissemination of technological know-how to the farming community.

केंद्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान
CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
कडलमीन TM
cadalmin