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भाकृ अनुप
ICAR

Contents

Editorial Committee

Dr. B. Meenakumari as the new DDG (Fisheries), ICAR

Dr. B. Meenakumari, Director, CIFT, Cochin assumed the charges of Deputy Director General (Fisheries) at Indian Council of Agricultural Research, New Delhi. She is the first ever woman scientist to occupy the prestigious position. Dr. Meenakumari, who is having more than 32 years of service in ICAR is a renowned scientist in the field of Fishing Technology with about 100 research publications to her credit. Earlier she was the Head of Division of Fishing Technology at CIFT since 2000 and was the Director of CIFT since November 2008. She has done extensive research in the areas of development of newer fishing gear for coastal and deep sea fishing, conservation of fishery resources, up-gradation of gear systems for reservoirs, introduction of eco-friendly fishing methods, remote sensing and validation of PFZ, pollution monitoring, environment impact assessment, marine corrosion and biodeterioration, fisheries policies of Kerala state etc.

Dr. Meenakumari is a recipient of Young Scientist Award of Govt. of Kerala (1989), Fellow of Academy of Environmental Biology, Lucknow, Fellowship Award (2002) from Bioved Research Society, Allahabad, Panjabrao Deshmukh Women Agricultural Scientist Award (2002) of ICAR, Vasvik Award (2003), WATI National Award (2007), Fellowship of the Academy of Science, Engineering and Technology (F.ASET), Fellowship Award from Zoological Society, Calcutta (2008) and Dr. R.C. Dalela Oration Award (2009), ICRISAT, Hyderabad.

She has completed short term assignment studies at International Ocean Institute, Canada on UN Convention on the Law of the Sea and its implementation (1997), Bedford Institute of Oceanography, Canada on receiving POGO-IOC-SCOR fellowship (2002) and Plymouth Marine Laboratory, U.K. to attend First Chlorophyll Workshop and Meeting (2006).

Dr. T.K. Srinivasa Gopal as the new Acting Director, CIFT

Dr. T.K. Srinivasa Gopal, Head, Fish Processing Division, CIFT, Cochin took over as the new Acting Director of the Institute. Dr. Srinivasa Gopal, born at Mysore had early education at University of

केन्द्रीय मात्स्यिकी प्रौद्योगिकी संस्थान
सिफ्ट जंक्शन, मत्स्यपुरी पी.ओ., कोचिन - 682 029
Central Institute of Fisheries Technology
CIFT Junction, Matsyapuri P.O., Cochin - 682 029

Mysore and got his M. Sc. (Food Technology) from CFTRI, Mysore during 1972. Prior to joining Defence Food Research Laboratory (DFRL), Mysore, during April 1974 he was working at Tamil Nadu Agricultural University. At DFRL he was working on the development of accelerated freeze dried food products and development of suitable packaging materials for defence rations. In 1976 he joined ICAR service as a scientist at Krishi Bhavan, New Delhi. From 1977 onwards he is working as scientist at CIFT, Cochin. Dr. Gopal is the Head, Fish Processing Division since February 2009.

In 1982 he secured a Norwegian fellowship to pursue diploma in Fishing and Fish Technology at the University of Trondheim, Norway. He worked on several aspects of fish processing and packaging with many new revolutionary concepts. His specialization is in Retort pouch technology, Modified Atmosphere Packaging and Extruded products. He was instrumental in developing various retort pouch food products based on vegetables, dairy, coconut, meat and fish. He also underwent extensive training in the University of Humberside and RAPRA Institute, Shrewsbury, U.K. on retort pouch technology and testing of various packaging materials used in food industry during 1996. He obtained Ph. D. degree during his service in 1994. Dr. Gopal underwent training at Department of Food Science, McGill University, Quebec, Canada during 2003 to familiarize with Modified Atmosphere Packaging.

Dr. Gopal has bagged ICAR team Award for retort pouch technology and Chidambaram Award for developing value added fish products. He was the Project leader in the Institute project and collaborative research project on test marketing of fish curry in retortable pouches. He also worked as Principal Investigator in many of the externally funded projects. Recently he was conferred Fellow of National Academy of Agricultural Sciences, New Delhi.

Bharat Ratna Dr. A.P.J. Abdul Kalam visits CIFT, Cochin

Bharat Ratna Dr. A.P.J. Abdul Kalam, former President of India visited CIFT, Cochin on 6th June, 2010 in connection with the World Environment Day and International Year of Biodiversity celebrations.

The United Nations has declared the year 2010 as the International Year of Biodiversity (IYB), in order to raise awareness of the consequences of the loss of biodiversity and the year is to be celebrated under the slogan "Biodiversity is Life, Biodiversity is Our Life". In recent years, CIFT has given much focus on development of conservation technologies to facilitate utilization of fishery resources on a long term sustainable basis, minimization of biodiversity loss and conservation of energy use in harvest and post harvest operations in fisheries.

At CIFT, Cochin Dr. Kalam addressed a gathering of scientists, officials and students of R&D organizations at Cochin, on the theme 'Fisheries sector and national development - Technology leads to non-linear growth'. In his talk he suggested the creation of a separate Union Ministry for Fisheries and Fish Products in order to give impetus to fisheries development. He also pointed out the need for conservation of over-exploited capture fishery resources, addressing the issues of intellectual property rights in the inland and coastal fisheries to facilitate management and finding technological solutions for seasonal problems of the fisher population. He mentioned that CIFT has to spearhead the strategies to conserve biodiversity of the aquatic resources. He also suggested an action plan for increasing fish production in Andaman & Nicobar Islands and developing it as a fisheries hub. He also told that research programmes that can address some of the seasonal problems of the fishing population and solutions with the assistance of satellite pictures from ISRO and growing of algae and developing biodiesal from them should be carried out.

During his speech he opined that, with the growing demand for food, upward trend in seafood exports and with growing constraints on land availability for agriculture, the fisheries sector will be playing a prominent role as a revenue earner, food supplier and job provider. In this context, the role of fisheries technology institutions like CIFT, would be extremely important for taking the nation's fisheries sector to the next level of development. He proposed five missions for the economic prosperity of the fishing community and fishermen villages, which the R&D organizations need to pioneer with the government and other organizations. The mission programmes suggested by him are as follows:

- Establishment of PURA (Providing Urban facilities in Rural Areas) in coastal areas; about 200 PURAs are to be established along the coastline of India.
- Capacity building of fishermen through training in deep sea fishing, processing, value addition, packaging and marketing.
- Conducting unique courses by CIFT for the benefit of fishermen in preservation of fresh fish, processing technologies, value addition and marketing, with venture capital support.
- Sending fishermen abroad in batches for training to countries where fish production and processing are highly developed.
- Facilitation of higher studies for children of fishermen

Dr. Abdul Kalam delivering the lecture

Dr. Abdul Kalam visiting the laboratories

in engineering, medicine, biotechnology and management through an appropriate mechanism by the Government.

Dr. Kalam also found time to answer a few questions from research students, ranging from mitigation of impacts of global warming to acceptability of Genetically Modified crops. An exhibition of the Institute activities was arranged and Dr. Kalam spent time going through various programmes and achievements of the Institute.

Dr. B. Meenakumari, Director, CIFT welcomed the gathering and Dr. P.N. Joshi, HOD, Engineering proposed vote of thanks.

News from the Research Front

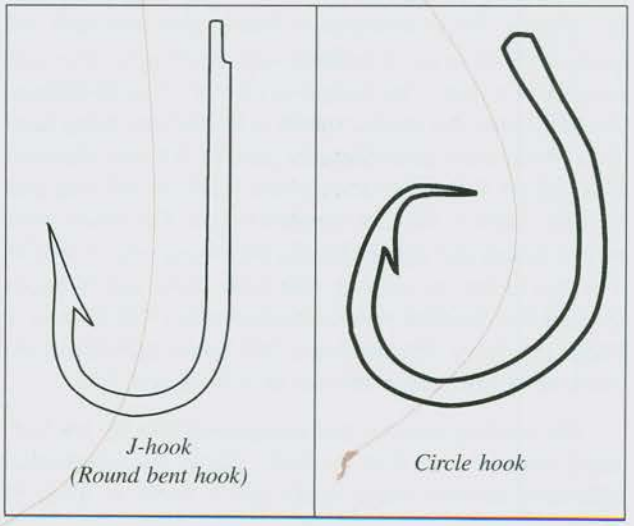
Advantages of circle hooks

Mortality and discard of non-target species due to unintended capture has been a widely discussed issue in today's fishery. Besides, accidental capture of endangered and protected species such as marine mammals, sea turtles and sea birds is also a matter of concern.

Though mostly applicable to trawl fisheries, bycatch problem is associated with hook and line fishery also. The pelagic longlining, especially the monolining is a fast growing fishing method in India too. There are reports that many times sea birds and sea turtles are hooked in the longline accidentally. Most of the turtles caught in longlines are alive when the gear is hauled in. The survival of these turtles after release depends on the hooking location and severity of the wound. Among many of the precautionary measures developed to reduce the mortality of sea turtles and sea birds, use of circle hooks is important.

Circle hooks have been in use in the commercial long line industry since 1960s. One of the improvements in long line fishing in the recent past is mainly the change of 'J' hook to 'circle' hook. Recently circle hooks gained much attention owing to their ability to reduce bycatch especially marine turtles. While use of circle hook is mandatory in the U.S. longline fishery as a regulatory measure taken for the reduction of sea turtle catch rate, the International Commission for the Conservation of Atlantic Tunas (ICCAT) has been encouraging its use in the Atlantic pelagic longline fisheries.

The main differences between a circle hook and a standard 'J' hook are the shape and the orientation of the point of the hook. A circle hook has a circular shape with a point that turns inward to the shank at about 90^{O}angle. The conventional round bend or 'J' shaped hook on the other hand has a perfect round bend and the point is parallel to the shank. Atlantic States Marine Fisheries Commission has defined circle hook as a non-offset hook with the point turned perpendicularly back to the shank. Circle hooks come in a light wire and a heavy-duty variety and depending on the size and type of fish to be caught, suitable hook is selected.



J-hook (Round bent hook)

Circle hook

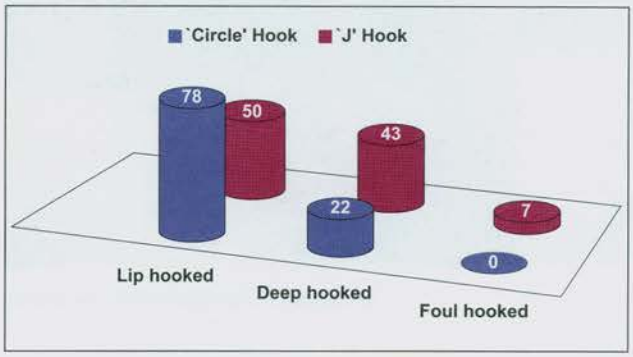
The design of a circle hook reduces the likelihood of a hook being caught in the gut cavity or throat if swallowed. When a fish swallows a circle hook with bait, the hook comes out of the throat without penetrating. As the fish swims away, the hook is pulled to the corner of the mouth where it penetrates into the body. The hook is designed to catch only in the corner of the fish's mouth and the gape of the hook fits over the corner of the fish's mouth and locks in. This feature of the circle hook makes it an ideal hook type that can be used for catch and release (recreational) fisheries. The effectiveness of circle hook depends on the hook size, fishing style, feeding mode and mouth morphology of the fish. Circle hooks show good size selectivity in minimizing the number of under-sized fish hooked.

These hooks are now increasingly being used in a number of marine catch and release fisheries also. Anglers use circle hook to facilitate easy release of under-sized or protected fish. Recent international research on the effect of hook type and survival was confined to the recreational fishery where catch and release fishing practice is common. A comparison of the performance of circle hook and 'J' hook in recreational catch and release fisheries for billfish to promote the release of these important resources found that circle hooks used for sailfish had a hooking percentage 1.83 times higher than 'J' hooks. More sailfish were hooked in the corner of the mouth using circle hooks (85%), as compared with 'J' hooks (27%). On the other hand, 46% sailfish were deep hooked in the throat and stomach with 'J' hooks, as compared with circle hooks (2%). Only 1% was foul hooked. It was also found that the sailfish caught on 'J' hooks were 21 times more likely to suffer hook-related bleeding than those caught on circle hooks.

While circle hooks are being promoted as a responsible fishing gear, its performance in the Indian context is least studied. Recreation angling is getting prominence in the states like Himachal Pradesh and Kerala along with tourism.

A performance comparison of circle hooks with that of 'J' style hooks was carried out at CIFT under the ICAR Ad-hoc project, 'Standardization of fishing gear materials and accessories' in terms of hooking rate, hooking location and severity of wound. The study was carried out in freshwater, brackish water and marine waters in Kerala state using hand lines. Polyamide monofilament yarn of 0.8 mm diameter was rigged with non-offset circle hook of 9/0 size and straight shank 'J' hook of number 6 size. The hooks were rigged, baited and operated in the traditional way. A total of 178 operations carried out with both circle and 'J' hooks showed low hooking rate for circle hooks (8.56%) than 'J' hooks (15.56%). The catch per 100 hooks (CPUE) of the circle hook was 5.06 while that of 'J' hook was 7.87.

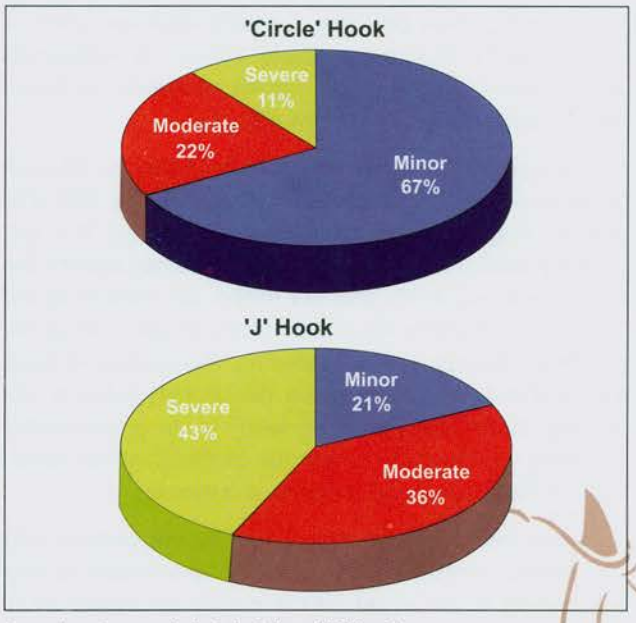
The hooking location was categorised into 'lip hooked', 'deep hooked' and 'foul hooked'. There was substantial difference between circle hooks and 'J' hooks in terms of hooking location. In most of the fishes caught with the circle hook, the hook was found to be lodged at one corner of the mouth opening.



Hooking location (% occurrence) in 'circle' and 'J' hooks

The results indicated that 78% of the fish caught in circle hooks were hooked at the lip and only 22% fishes were deep hooked. There were no foul hooked fish caught with circle hook during the experimental fishing. In contrast, only 50% of fishes caught with the 'J' hook were lip hooked, 43% deep hooked and 7% were foul hooked.

The severity of wounds was assessed based on the bleeding observed in the captured fish after removal of the hook. On the basis of a scoring system the injury of fish was categorized into minor, moderate and severe.



Severity of wounds in 'circle' and 'J' hooks

Higher incidence of minor injuries was observed in the case of fish caught with circle hooks (67%). About 22% of fishes suffered moderate injuries and only 11% suffered severe injuries with circle hooks. In contrast 21% of fish caught using the conventional 'J' hook had minor injuries, 35.71% had moderate injuries and 43% had severe wounds.

The findings of this study are in agreement with reports from elsewhere. While using circle hooks, more fishes were lip hooked with minor injuries as against 'J' hooks in which fishes were mostly gut hooked with severe and moderate injuries. This property of circle hook make it an ideal hook type that can be used for 'catch and release' fishing or recreational fishing. The effect of circle hooks in commercial longline fishing and survival of fishes de-hooked and released from circle hook needs further investigation.

- Saly N. Thomas and Gipson Edappazham

Fishing Technology Division, CIFT, Cochin

Protective effect of polyunsaturated fatty acids on cancer

Cancer, a disease characterized by uncontrolled growth and spread of abnormal cells, is the second leading cause of death in the world. The development of cancer involves three stages such as initiation, promotion and progression, which interact sequentially in the formation of malignancy. Benign tumors are localized tumors and ordinarily do not cause death, but there are rare exceptions to this rule. Cancerous or malignant tumors are those, which detach and migrate to other parts of the body giving rise to secondary tumors. The process is called metastasis. The cells of malignant tumors have the intrinsic ability to kill the host unless they are removed or killed.

In the year 2000, 10 million new cases of cancer were estimated worldwide over with more than half of incidences reporting from the developing countries. Although estimates vary, it was predicted that by the year 2020, there would be almost 20 million new cases of cancer and the contribution from the developing countries might rise upto 70%. At present nearly one million new cases are being detected in India alone annually. Cancer incidences have been related to environmental and life-style factors. Classic epidemiological studies conducted by world over showed that environment and life style factors account for more than 60-80% of human cancers. In India the incidence of cancers of colon, pancreas, liver and gall bladder is rising largely due to urbanization that leads to major changes in the diet and personal habits. It is reported that approximately 35% of cancer cases are directly attributed to diet. Liver cancer is the fifth most important cancer worldwide and because of poor prognosis, it is responsible for the third most common cause of death from cancer.

In recent years considerable attention has been given to the role of diet and nutrition as important determinants in the development and optimal maintenance of health throughout life. Recognizing the vital role of nutrition on cancer, recent world cancer report of World Health Organization emphasizes the importance of improved nutrition as a means of controlling the expected 50% rise in global cancer incidence over the first two decades of this century. The importance of polyunsaturated fatty acids (PUFA) in human nutrition and disease prevention was scientifically recognized three decades ago. Studies on n-3 fatty acids demonstrated its potential to prevent a variety of medical conditions from occurring or progressing such as: arthritis, some cancers, cardiovascular diseases, depression, maternal/foetal well-being, and neurological diseases. Research findings over the last 60-70 years provided convincing evidence that dietary fat plays an important role in tumorigenesis. Consumption of more fat and red meat is reported to be positively correlated with the risk of colorectal and prostate cancer. Change in source of fatty acids in diet was a potential risk factor for development of cancer among Japanese women who shifted their diet from fish to vegetable oil rich in n-6 fatty acids. Most of the epidemiological, cohort case studies and animal experiments have shown the role of long chain n-3 PUFAs in suppressing the development of cancer in colon, breast, leukemia, pancreas, prostrate and lungs. Whereas only very few epidemiological studies having a case-control or cohort design reported an inverse association between intake of n-3 fatty acids or fish and carcinogenesis.

n-3 fatty acids, mainly EPA and DHA, are long chain fatty acids derived from alpha-Linolenic acid. Their counter parts n-6 fatty acids are derived from Linoleic acid. Marine oils are abundant in n-3 PUFA and have traditionally been used as the raw material for preparation of n-3 PUFA concentrate. EPA and DHA, two important components of fish oil, are primarily synthesized by both unicellular and multicellular marine plants such as phytoplankton and algae and are transmitted to marine fishes through food chain. PUFA concentrate are now available commercially (such as MaxEPA, Amway n-3 fatty acid product) and used as complementary or alternative medicine by cancer patients. Conventional cancer treatments such as chemotherapy and radiation therapy can injure and kill the tumour cells, with an inevitable degree of collateral damage to the normal cells. Nutrition therapies could be used alone or along with the existing traditional cancer treatments with the aim to prevent the development of cancer cases and to enhance the efficacy of cancer treatments. Evidence from several clinical studies has shown an improved efficacy of cancer chemotherapy and radiotherapy with n-3 supplemented diet in the treatment of breast, prostate and colon cancers.

- Jyotiranjan Nayak and Suseela Mathew

Biochemistry & Nutrition Division, CIFT, Cochin

Publications

Popular Article

Pravin, P. and Meenakumari, B. (2010) - Improved purse seine, *ICAR Reporter*, **16**(1): 17-18.

Training Programmes

Cochin

1. Laboratory techniques for microbiological examination of seafoods (19 April - 20 May, 3-15 May & 17 May - 2 June)
2. A comparative study of frozen fish balls coated with conventional and extruded bread crumbs (19 April - 30 June)
3. Changes in quality parameters of frozen tuna burger packed in thermoformed poly propylene containers (19 April - 30 June)
4. Effect of high temperature short time processing on quality aspects of prawn Manchurian in opaque retortable pouches (19 April - 30 June)
5. Development of ready-to-eat snack from prawn (*Fenneropeneaues indicus*) using extrusion technology (19 April - 30 June)
6. Studies on the quality changes of tuna sausage in synthetic (Polyamide) casings during chilled and frozen storage (19 April - 30 June)
7. Shelf life studies of ready-to-eat and ready-to-fry dried condiment-incorporated anchovies (*Stolyphorus indicus*) in different packaging material (19 April - 30 June)
8. Utilization of shellfish processing waste and its analytical methods (26 April - 7 May & 14-26 June)
9. Laboratory techniques in Microbial Biotechnology (3-31 May)
10. Evaluation of handling practices of fish onboard and at harbour (10 May - 10 June)
11. HACCP concepts (12-15 May)
12. Seafood quality assurance (24 May - 5 June)
13. Laboratory methods for the microbiological quality of seafoods (7-19 June)
14. Application of HPLC, Ion Chromatography and LC-MS-MS in the quality evaluation (5 May - 28 June)

Visakhapatnam

1. Laboratory techniques for microbiological examination of seafoods (12-27 April)
2. Preparation of pickles (15 April)
3. Hygienic handling of fish and usage of insulated bags (14-15 June)
4. Microbial examination of seafoods (14-27 June)

Outreach Programme

During the period under report the following outreach programmes were conducted at various parts of the country:

1. Awareness-cum-training programme on 'Deployment of foldable traps for Tandava reservoir' at Salika Mallavaram Village, Tandava, A.P. on 25th April 2010.
2. Awareness-cum-training programme on 'Value addition of freshwater fishes and the business horizons' at College of Fisheries, GADVASU, Ludhiana during 29-30 April 2010
3. Training programme on 'Personal hygiene in seafood processing at Moothakunnam, Ernakulam district on 21st May 2010.
4. Training programme on 'Fish processing and value addition' under the Medicom Project of Kanjikuzhi Block Panchyath, Alappuzha district, during 24-26 June, 2010.

Participation in Exhibitions

During the quarter the Institute participated in the following exhibitions:

1. Exhibition on 'Technologies available on value addition of agricultural, horticultural, livestock,

Exhibition at Namakkal

'Indian Aqua-Invest Congress and Expo 2010'

poultry and fisheries products' organized by ATMA, Namakkal at KVK, Namakkal on 17 April, 2010.

2. 'Indian Aqua-Invest Congress and Expo 2010', organized by the Indian Fisheries Association and CIFE, Mumbai at Mumbai during 26-28 May, 2010.
3. 'The Seafood Fest' - Exhibition organized by CIFT at Moothakunnam, Ernakulam district on 17 June, 2010

Training on Deployment of Foldable Traps

Reservoirs play a vital role in augmenting food production for human consumption and mitigating protein deficiency. The fishermen have to adopt novel harvest technologies to catch fish and prawn. Visakhapatnam Research Centre of CIFT has designed new foldable traps for fishing in reservoirs. The advantages of these traps are that they are foldable, easy to fabricate and easy to carry. Fishermen of Tandava reservoir are using traps made of split bamboo for exploitation of prawns. These box shaped traps occupy more space, and are not durable and decay in 3-4 months. Moreover, fishermen have to spend more time for fabrication of traps and could not carry more than two in small boats. The foldable trap measuring 0.5m x 0.5m x 0.5m is made with six square shaped iron frames which are covered with plastic coated iron mesh. An entrance channel made with split bamboo is fixed in the middle of the frame. All the six frames are foldable and it occupies less space and fishermen are able to carry more traps at a time. Before operation all the frames are unfolded and set in to a box shape. These traps are durable and last for more than three years. The total cost of a trap is about Rs. 400/-. These iron traps are foldable, easy to fabricate and carry. The fishermen can carry more than 20 traps at a time in a small space.

Visakhapatnam Research Centre of CIFT conducted an Awareness-cum-Training Programme on 'Deployment of foldable traps for Tandava reservoir' at Salika Mallavaram village, Tandava, Narasipatnam on 25th April 2010. Dr. M.M. Prasad, Principal Scientist & SIC of the Centre presided over the programme. Dr. U. Sreedhar, Scientist (SG), CIFT, welcomed the gathering and explained about the activities of CIFT. Dr. G. Rajeswari, Senior Scientist also spoke on the occasion. Shri Kollana Kondala Rao, Sarpanch, Salika

Dr. M.M. Prasad distributing foldable traps to fisherman

Dr. G. Rajeswari handing over framed gill net to fisherman

Mallavaram village thanked CIFT for adopting his village for the programme. Smt. Nirmala Kumari, FDO, Fisheries Department, Narasipatnam, Govt of Andhra Pradesh, explained about the various schemes for reservoir fisheries. Dr. L.N. Murthy, Scientist, Senior Scale proposed vote of thanks.

As part of the Human Resource Development programme of CIFT, a total of 30 numbers of foldable traps were distributed to the fishermen of Salika Mallavaram of Tandava for their use. Four designs of improved Polyamide multifilament gill nets and one framed gill net were also distributed to the fishermen of Salika Mallavaram village for exploitation of fishery resources in Tandava reservoir. These improved gillnets were designed by incorporating all corrections based on the survey conducted and the problems encountered by the fishermen fishing on this reservoir.

Training Programme on Value Addition of Freshwater Fishes and Meat Bone Separator at Ludhiana

CIFT, Cochin in collaboration with College of Fisheries, GADVASU and Punjab Fish Farmers Association, Ludhiana organized a two days Awareness cum Training programme on "Value addition of freshwater fishes and the business horizons" at College of Fisheries, GADVASU, Ludhiana during 29-30 April, 2010.

The programme was inaugurated on 29th April by Dr. O.S. Parmar, Director of Extension, GADVASU. The function was presided over by Shri S. Kanwaljith Sing Sidhu, Member, Board of Management, GADVASU. Dr. Kamaldeep Kaur, Dean, College of Fisheries explained about the activities of the College. The technical sessions of the training programme was lead by Shri P.K. Vijayan, Principal Scientist of CIFT, Cochin. The programme covered various types of value added products from freshwater fishes, methods of production and the business prospects of value added products. At present, the domestic consumption of the farmed fish is at a minimal level due to the problem of pin bones and are consumed only by the migrant laborers. The CIFT had developed a fish meat bone separating machine for the College of Fisheries, GADVASU, which was also demonstrated by Shri M. Nasser, Principal Scientist for the trainees. He explained that as the machine separates even the pin bones, the minced meat can be used for making a wide range of products, which will boost the domestic consumption as well as fish-based business opportunities. More than 40 participants including fish farmers, State Department officials and students of the College of Fisheries were benefited by the programme.The programme was cordinated by Dr. S. Ashaletha, Senior Scientist.

Training Programme on Personal Hygiene in Seafood Processing

CIFT, Cochin in association with the Department of Science and Technology (DST), New Delhi conducted a one day training programme on 'Personal hygiene in seafood processing' at Moothakunnam in Ernakulam district on 21st May, 2010. The training programme was conducted as part of the CIFT's project on 'Location specific livelihood interventions in fisheries sector for the empowerment of fisherwomen of Kerala'. The project envisages empowerment of women through scientific interventions suited to selected locations in Kerala through value addition of edible oyster and other seafood products. Food safety is an upcoming issue in food processing as hygienic handling reduces chances for food borne infections. The training intended to promote food safety habits among the stakeholders.

The inaugural function of the programme was presided over by Shri Varghese Maniyara, Vice President, Vadakkekkara Panchayath. Smt. C.R. Sathiavathy, Joint Director of Fisheries, Govt. of Kerala spoke on the occasion and distributed 'hygiene kits' comprising of head gear, mouth cover and aprons for the participants from different Self Help Groups. Earlier, Dr. Femeena Hassan, Senior Scientist, CIFT and the Project Leader welcomed the gathering and briefed about the project objectives.

Distribution of 'Hygiene Kits' to the trainees

In the technical sessions that followed the inaugural programme, a lecture on 'Importance of personal hygiene in seafood processing' was delivered by Dr. Femeena Hassan. Dr. J. Charles Jeeva, Scientist, Senior Scale, CIFT delivered a talk on 'Capacity building for fisherwomen self help groups'. More than 50 women members from different Self Help Groups in Moothakunnam participated in the programme. Dr. V. Geethalakshmi, Senior Scientist, CIFT proposed vote of thanks.

'The Seafood Fest' - An Exhibition of Seafood Cuisines Organized by CIFT, Cochin

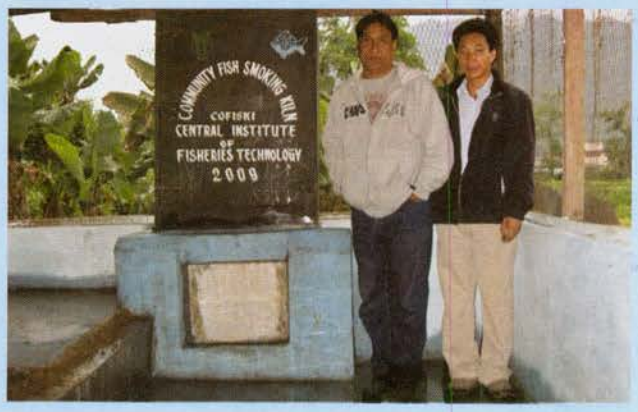
'The Seafood Fest' tickling the taste buds with exquisite seafood cuisines was hosted by the CIFT, Cochin as part of the Department of Science an Technology funded project, 'Location specific livelihood interventions in fisheries sector for the empowerment of fisherwomen in Kerala' at Moothakunnam on 17th June, 2010. The harvest of the project initiative of 'rack and ren' culture of edible oyster was inaugurated during the function. The women groups participating in the project came out with flying colours with a bumper harvest of edible oysters and preparing seafood items and exhibiting the same before the panel of experts enabling recognition of outstanding recipes. The evaluators found it tough to rate from the variety of 'home-made' seafood delicacies exhibited by the women groups. An exhibition was also organized during the function demonstrating the mandate and significant research outputs of CIFT.

Dr. S. Balasubramaniam, HOD, EIS of CIFT presided over the function and Shri M.D. Appukuttan, Block Panchayath President inaugurated the harvest. Outstanding recipes were recognized by cash awards distributed by Shri T.G. Asokan, Panchayath President, Vadakkekkara. Dr. S. Sanjeev, Dr. Femeena Hassan and Dr. J. Charles Jeeva of CIFT spoke on the occasion. Felicitations were offered by Shri Varghese Maniyara, Vice President and Smt. Raphel, Kshemakarya Samithi Standing Committee Chairperson, Vadakkekkara Panchayath.

Inauguration of 'Seafood Fest'

Installation of COFISKI at Arunachal Pradesh

A team from CIFT Research Centre of Visakhapatnam consisting of Dr. M.M. Prasad, SIC, Shri V.V. Ramakrishna, Tech. Officer (T6) and Shri A.K. Panigrahi, Tech. Officer (T5) visited Arunachal Pradesh during 12-23 April, 2010. During the period, a number of Community Fish Smoking Kilns were successfully installed at Aalo, West Siang district and also at Doparijo, Upper Sibinsiri district of Arunachal Pradesh. The team also demonstrated different methods of packaging of smoke cured fish and fishery products using high quality polythene bags employing heat sealing machines.



COFISKI installed at Doparijo

CIFT, Cochin Celebrates Foundation Day

CIFT, Cochin celebrated its 53rd Foundation Day on 29th April, 2010. To achieve the mandated objectives, CIFT has been focusing on researches leading to innovative and cost-effective technologies for fish harvest, developing and

Visitors at Fishing Technology Division

Visitors at Biochemistry and Nutrition Division

standardizing various aspects of post harvest technologies, and developing technologies for extraction of biomedical, pharmaceutical and industrial products from aquatic organisms. The Institute was the proud recipient of the Sardar Patel Outstanding ICAR Institution Award in 2000 and 2006. The award was given in recognition of the contributions made by the Institute in the field of harvest and post harvest technology of fish. CIFT is the only Institute in the entire ICAR system to receive the prestigious award twice. This prestigious institution is also accredited by National Accreditation Board for Laboratories (NABL). As part of the Foundation Day celebrations, an Open House was conducted on 29th April. The laboratories of the Institute were open to public. A large number of interested public and students from various schools and colleges visited the exhibition conducted by the different laboratories of CIFT and witnessed the research activities. The first ever conducted Open House was an opportunity to show case the achievements of the Institute to the general public.

A meeting was held also held in the afternoon, which was presided over by Dr. B. Meenakumari, Director, CIFT. In her presidential address Dr. Meenakumari reiterated that CIFT is dedicated to work for the all round development of the fishing and fish processing industry of the country. The Chief Guests of the Day were Smt. Lakshmi Nair, Former Scientist, CIFT and Shri S. Sadanandan, Former Asst. Administrative Officer, CIFT. Felicitations were offered by Dr. M.K. Kandoran, Former HOD, EIS Division, Dr. P.J. Cecily, Former Sr. Technical Officer, Shri P.A. Uthup, Former AF&ACO an Shri K.P.S. Gautam, SAO, CIFT. Dr. P.N. Joshi, HOD, Engg. welcomed the gathering and Dr. C. Jessy Joseph, AD(OL) proposed vote of thanks.

CIFT observed National Technology Day

CIFT, Cochin in association with the Gandhi Smaraka Grama Seva Kendram (GSGSK), S.L. Puram, Alappuzha conducted a workshop on 'Greener technologies in fisheries' at Matsya Samridhi Industrial Fish Processing Unit, Kuthiathodu in Alappuzha district on 8th June 2010. The programme was organized in connection with the National Technology Day (2010) Celebrations, under the sponsorship of Kerala State Council for Science, Technology & Environment, Thiruvananthapuram.

The programme started with a welcome by Dr. S. Ashaletha, Coordinator & Senior Scientist, CIFT. Dr. B. Meenakumari, Director, CIFT was the Chief Guest of the function and she also inaugurated the Seminar. The programme was presided over by Dr. S. Balasubramaniam, HOD, EIS. Smt. C.R. Sathyavathy, Joint Director of Fisheries, Govt. of Kerala and Shri K.G. Jagadeesan, General Secretary, GSGSK, S.L. Puram offered felicitations on the occasion. Dr. J. Charles Jeeva, Scientist, Sr. Scale, CIFT proposed vote of thanks.

In the technical sessions, lectures were delivered to the workers of fish processing sector on how to make the environment safe, avoiding pollution from fish processing waste etc. The sessions were on 'Waste management in fisheries - Technological solutions' by Dr. A.A. Zynudheen, Senior Scientist, CIFT, and 'Management of environmental

Dr. Meenakumari inaugurating the Workshop

issues - Women's role' by Dr. S. Ashaletha, 'Micro enterprises in fisheries - The opportunities and challenges' by Shri M. Nasser, Principal Scientist, CIFT, and 'Sustainable development of coastal villages' by Smt. C.R. Sathyavathy. As part of the workshop, preparation of 'silage' from fishery wastes, which is a remunerative nutrition supplement for livestock feed was also demonstrated. More than 50 women fish processing workers participated in the programme.

World Bank Team Visits CIFT, Cochin

The officials from the World Bank reviewing the National Agriculture Innovation Project (NAIP) sub projects being implemented at the CIFT, Cochin visited the Institute on 24th May, 2010. The World Bank is assisting seven projects under various components at CIFT. The team had detailed discussions with the Director and Scientists involved in the projects.

A review of the facility being set up for the Business Planning and Development Unit under the NAIP, one among the five being set up in the country by the ICAR, New Delhi was carried out by the team. The team visited the Pilot Plant which will be utilized by prospective entrepreneurs in incubating the technologies before actual commercialization.

In the afternoon, the team visited the Community Based Processing Unit set up under the project, 'Responsible harvesting and utilization of selected small pelagics and freshwater fishes' at Chellanam. They interacted with the fisherwomen belonging to the activity clusters formed under the project to operate and manage the unit. These women had been trained earlier in hygienic handling and processing of fresh fish for the domestic market and they have been engaged in this activity for the past few months under the technical guidance of CIFT.

World Bank team at CIFT

FAO Experts Visits Visakhapatnam Research Centre

On 7th May, 2010, two FAO experts Dr. Rudolf Hermes, Chief Technical Adviser and Dr. Chris O'Brien, Regional Coordinator of Bay of Bengal Large Marine Ecosystem Project have visited the Visakhapatnam Research Centre of CIFT. The dignitaries were appraised of the Institute mandate and its activities and achievements. A group of fisherwomen belonging to Cheppala Uppada fishing village adopted by CIFT have also met the FAO team in the presence of CIFT scientists. The interaction between FAO team and the beneficiaries was facilitated by CIFT scientists.

Distribution of insulated bag to fisherwomen by FAO expert

Institute Research Committee Meeting

The annual Institute Research Committee meeting was held at CIFT, Cochin on 17 and 18 May, 2010 to discuss in detail about the ongoing research programmes and the new research proposals for the year 2010-2011. The house discussed in detail the 18 ongoing research projects, besides six closed projects and six new projects apart from the various ad hoc projects being entertained at the Head Quarters and Research Centres. The following is the list of new projects initiated during 2010-2011:

i. Development of protection measures and composite materials for fishing craft and gear (PI - Dr. Saly N.

Thomas)

ii. Fishing systems for recreation (PI - Dr. P. Pravin)

iii. Technologies for utilization of fishery resources at Maharashtra coast (PI - Dr. R. Chakrabarti)

iv. Studies on the detection, surveillance and implications of hazards in seafood meant for export market (PI - Dr. Femeena Hassan)

v. Nutritional profiling and hazard assessment of fish and fishery products of marine and lacustrine environs of the east coast of India (PI - Dr. M.M. Prasad)

vi. Bio-monitoring of bivalve Mollusks and Crustaceans from Indian waters as health promoters and indicators of environmental contaminants (PI - Dr. P.T. Lakshmanan)

Dr. T.V. Sankar, Secretary, IRC and Dr. B. Meenakumari, Director, CIFT

World Environment Day Celebrated

As part of the World Environment Day celebrations at CIFT, Cochin Dr. Renjan Mathew Varghese, State Director, World Wide Fund for Nature - India gave a talk on 'Sustainable development - Kerala scenario' on 5th June, 2010.

Dr. Renjan Mathew Varghese delivering the talk

Anti Terrorism Day Observed

Anti Terrorism Day was observed at the Institute on 21st May, 2010, The staff of the Institute assembled together and took Anti Terrorism Day Pledge.

Radio Talks

1. Dr. G. Rajeswari, Senior Scientist - 'Diversified fishing methods' (In Telugu), AIR, Visakhapatnam (4 April)

2. Dr. B. Madhusudana Rao, Scientist (SG) - 'Utilization of fish and shrimp processing waste' (In Telugu), AIR, Visakhapatnam (18 April)

Invited Talk

Dr. C.K. Eapen, Honorary Professor of Medicine and Dr. M. Abraham Ittyachen, Associate Professor in Medicine, MOSC Medical College, Kolencherry delivered a talk on 'Communicable diseases' at CIFT, Cochin on 25th June, 2010.

Dr. C.K. Eapen delivering the talk

Post Graduate Studies

Ph. D. Awarded

Shri B. Ganesan, Technical Officer (T5), Biochemistry & Nutrition Division, CIFT, Cochin was awarded Ph. D. degree in Biochemistry of Vinayaka Mission University, Salem, for his thesis entitled, "Biochemical studies on the protective effect of betaine on experimentally induced myocardial infarction in rats". He worked under the guidance of Dr. R. Anandan, Senior Scientist, Biochemistry & Nutrition Division, CIFT, Cochin.

Myocardial infarction is one of the most common manifestations of cardiovascular disease. In recent years, accumulating evidence has indicated that the incidence and progression of cardiovascular disease may, to some extent, be modified by dietary means. The protective effect of betaine, a potent lipotropic molecule was examined in isoprenaline-induced myocardial infarction in rats, an animal model of myocardial infarction in man, with respect to the alterations in the levels of diagnostic markers, protein and glycoprotein components, histopathology, lipid profiles, antioxidant system, mitochondrial function, lysosomal integrity and mineral status. The overall cardioprotective effect of betaine is ascribable to an inhibition of lipid accumulation by its hypolipidimic property or to a counter-action of free radicals by its antioxiodant nature.

Shri P.G. Sreenath, Senior Research Fellow, Fish Processing Division, CIFT, Cochin was awarded Ph. D. degree of Cochin University of Science and Technology, Cochin for his thesis entitled "Standardization of process parameters for ready to eat fish products in polymer coated tin free steel cans". He worked under the guidance of Dr. C.N. Ravishankar, Senior Scientist, Fish Processing Division, CIFT, Cochin.

Indigenous polymer coated TFS cans were tested following standard methods and found that they are suitable for thermal processing and storage of fish and fish products. The indigenous polymer coated TFS cans were compared with the conventional containers like tin and aluminium cans and found that the former is superior to other cans with respect to migration, coating perfection, price, metallic contamination etc. Traditionally canned fish products are packed in oil/brine media which is the main reason for the low momentum for canned products in the markets. This can be overcome by the development of canned fish products in ready to eat form. The process parameters for two ready to eat fish products, squid masala and shrimp curry were standardized in TFS cans and the standardized products were subjected to analysis of shelf life at room temperature. The periodic analysis of these products revealed that they remain acceptable with respect to sensory and biochemical parameters up to 18 months. Thermal processing although helps in enhancing the shelf life of food products, inflicts damage to the sensory and nutritive value of the food and the magnitude depends on the time and temperature of processing. Mackerel was processed in brine medium at three different temperatures of 115, 121 and 130°C to a common F0 value of 8 minutes. It was found that processing at higher temperatures resulted in attaining considerable savings in terms of total process time, and the subsequent analysis of the mackerel meat revealed that products processed at higher temperatures and shorter time were superior in terms of both sensory and nutritive parameters to those processed at lower temperature and higher time.

Forthcoming Event

A 21 days Winter School entitled, "Current trends in microbial biotechnology: Genomics, diversity and gene mining" is being conducted at CIFT, Cochin during 9-29 November, 2010.

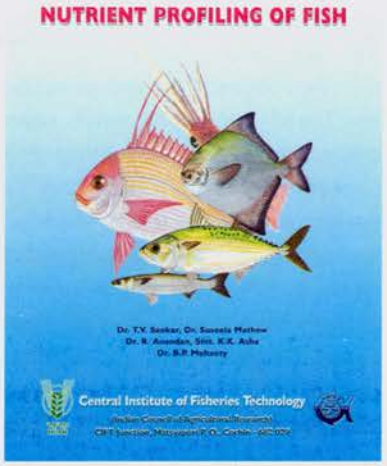
The Winter School will be built around the following topics: 1. Molecular approaches in bacterial taxonomy, 2. Genetic aspects of bacterial virulence, 3. Molecular methods for detection of food-borne pathogens, 4. Molecular biology techniques to assess microbial diversity, 5. Quantitative real time PCR, 6. High-throughput sequencing, 7. Recombinant DNA technology, 8. Bioprospecting of microbes for enzymes and genes, and 9. Application of bioinformatics and bio-computing in microbiological research. The Winter School is meant for researchers and teachers in the rank of Assistant Professor/ Scientist/Lecturer having a minimum of 2 years research experience in Microbiology/Biotechnology and related field in Universities/Research Institutes/Colleges etc. Dr. Toms C. Joseph, Scientist (SG), Microbiology, Fermentation and Biotechnology is the Course Director of the ICAR funded Winter School. For further details contact: Dr. Toms C. Joseph, Course Director, Winter School, MFB Division, CIFT, Matsyapuri P.O., Cochin - 682 029, E Mail: cift@ciftmail.org, microbiotechwinterschool@gmail.com, tomscjoseph@hotmail.com

New Publications from CIFT

Nutrient profiling of fish

Fish is generally agreed upon as a nutritive as well as a health food. Understanding the composition of food is very important to determine its nutritive value. There is diversity in the fish species from different sources and there exists changes in the composition of fish based on its habitat, feeding and season. Fish being a highly perishable commodity, a proper knowledge on these aspects will give a chance to the processors to streamline their processing methodologies since the basis of spoilage of this commodity

is composition related.



Fish plays a major role in human nutrition. Importance of fish as a source of high quality, balanced and easily digestible protein is now well understood. Besides, it is also a well-known source of polyunsaturated fatty acids particularly, Omega - 3 fatty acids which play a significant role in the physiology of living system. It is also known to be a source of several other nutrients. In this context, it is a primary requirement to understand the biochemical composition of fish.

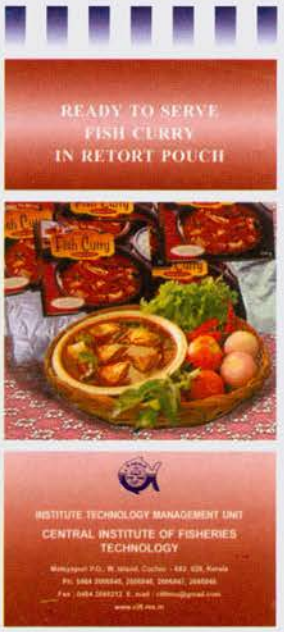
The present publication is an outcome of the ICAR funded outreach activity project entitled, 'Nutrient Profiling and Evaluation of Fish as a Dietary Component'. The significant aspect of the project is that seven ICAR research institutions are partners in the mega project. The project envisaged studies to get all relevant information on the compositional and health aspects of fish under one head. Even though studies have been carried out elsewhere, a more comprehensive work on the varied compositional parameters was the scope of the project. The analytical work is subject to error, if appropriate and authentic methodology is not adopted. Therefore a comprehensive methodology was developed. The present publication gives an insight to the methodology followed and the scheme drawn for various sampling purposes for the benefit of project partners.

The following are the main chapters of the publication: 1. Biochemical composition of fish, 2. Health benefits of eating fish, 3. Instrumental methods and analyses, 4. Gas chromatography - Principles and applications, 5. High performance liquid chromatography, 6. Atomic absorption spectrophotometer, 7. Sampling and analytical methodology, 8. Proximate composition, 9. Lipid profiling, 10. Fatty acid composition of fat, 11. Amino acid profiling, 12. Profiling of vitamins and fish tissues, and 13. Mineral profiling.

The authors of this concise publication are Dr. T.V. Sankar, Dr. Suseela Mathew, Dr. R. Anandan, Smt. K.K. Asha from CIFT, Cochin and Dr. B.P. Mohanty from CIFRI, Barrackpore.

Ready to serve fish curry in retort pouch

Value addition is the most talked about word in food processing industry, particularly in export oriented fish processing industry because of the increased realization of valuable foreign exchange. Value can be added to fish and fishery products according t the requirements of different market. Today, the busy homemaker throughout the world wants products which can be served off the shelf. The ready-to-serve fish curry in flexible packages developed by CIFT has shown very good acceptability in the domestic and overseas markets.



CIFT has developed various types of fish curry in flexible retort pouch which include Kerala style sardine curry, Punjabi style catla curry, Manipur style rohu curry, Mughlai style rohu curry, calcium fortified shrimp soup, iron fortified shrimp soup, Goan style mackerel curry, Ready-to-eat mussel meat, etc.

The present publication gives the details about the method of preparation of ready-to-serve fish curry in retort pouches, the advantages of the technology and the uniqueness of the technology in comparison with the existing technologies.

Personnel News

Participation in Seminars/Meetings etc.

- **Dr. B. Meenakumari**, Director – Expert consultation on marine biotechnology and biodiversity conservation, Goa (21 April). Dr. Meenakumari also made a presentation on 'Sustainable utilization of marine resources through efficient eco-friendly fishing practices'.
- **Dr. B. Meenakumari**, Director – ICAR Regional Committee No. VIII meeting and KVK interaction, Bangalore (13-15 May)
- **Dr. B. Meenakumari**, Director – NAIP-PIU Agricultural Technology Innovation meeting, ICAR, New Delhi (21 May)
- **Dr. B. Meenakumari**, Director – Workshop on Aquatic biodiversity, NBFGR, Lucknow (22 May)
- **Dr. B. Meenakumari**, Director, **Shri M. Nasser**,

Principal Scientist and **Dr. T.V. Sankar**, Senior Scientist – Special meeting of the ZTM & BPD Units, ICAR, New Delhi (8 April)

- **Dr. B. Meenakumari**, Director, **Dr. T.K. Srinivasa Gopal**, HOD, FP and **Shri M. Nasser,** Principal Scientist – 2nd Annual Workshop for the Component – 2 Sub project of NAIP, TNAU, Coimbatore (16 April)
- **Dr. B. Meenakumari**, Director and **Dr. K. Ashok Kumar**, Senior Scientist – NFDB Meeting on Project implementation and annual action plan 2010-11, New Delhi (6 May)
- **Dr. P.N. Joshi,** HOD, Engg. and **Dr. T.K. Srinivasa Gopal**, HOD, FP – Brain storming meeting on Post harvest technology and value addition of agricultural produce: Scenario, issues and strategy, CIPHET, Ludhiana (1-2 May). Dr. Joshi presented a Lead paper on 'Present scenario and future research needs in post harvest technology of fish'.

Participants of Brain storming meeting along with DG, ICAR

- **Dr. T.K. Srinivasa Gopal,** HOD, FP – Symposium on Diversification of aquaculture and policy framework for fisheries and aquaculture sector in India, CIFE, Mumbai (27-28 May). Dr. Srinivasa Gopal also presented an invited paper on 'Recent advances in aquaculture product development and new products' in the Symposium.
- **Dr. T.K. Srinivasa Gopal**, HOD, FP – Central Technology Management Committee Meeting, ICAR, New Delhi (2 June)
- **Dr. T.K. Srinivasa Gopal**, HOD, FP – 17th Foundation Day of NAAS, New Delhi (4 June)
- **Dr. T.K. Srinivasa Gopal**, HOD, FP – Annual GB meeting of NAAS, New Delhi (5 June)
- **Dr. T.K. Srinivasa Gopal**, HOD, FP – Meeting of the Shadow Committee of Codex on fish and fishery products, New Delhi (13-14 June)
- **Dr. T.K. Srinivasa Gopal**, HOD, FP – 16th Meeting of Food and Agriculture Division Council, BIS, New Delhi (21 June)
- **Dr. Leela Edwin**, HOD, FT, **Dr. R. Badonia**, SIC, Veraval and **Shri V.R. Madhu**, Scientist – National seminar on 'New avenues for fisheries and aquaculture development in Gujarat', Ahmedabad (14 June). Dr. Leela Edwin gave a talk on 'CIFT's initiatives for the development of sustainable fisheries in Gujarat.'
- **Dr. Leela Edwin,** HOD, FT, **Shri M. Naser, Dr. C.N. Ravishankar,** Principal Scientists, **Dr. T.V. Sankar, Dr. P. Pravin Dr. Nikita Gopal, Dr. S. Ashaletha,** Senior Scientists and **Dr. Toms C. Joseph**, Scientist (SG) – Review meeting on NAIP projects by World Bank experts, CMFRI, Cochin (22-23 May)
- **Dr. K.V. Lalitha,** HOD, MFB – National consultation on Agro-biodiversity management, ICAR, New Delhi (26-27 May)
- **Dr. K.V. Lalitha,** HOD, MFB and **Dr. Toms C. Joseph**, Scientist (SG) – Seminar on Flow cytometry application in marine biotechnology, NIO, Goa (8 April)
- **Dr. M.M. Prasad**, SIC, Visakhapatnam – Fisheries stake-holders meeting, NFDB, Hyderabad (5 May)
- **Dr. M.M. Prasad**, SIC, Visakhapatnam – Interface meeting with Member of Planning Commission, NAARM, Hyderabad (31 May)
- **Dr. M.M. Prasad**, SIC, Visakhapatnam, **Dr. G. Rajeswari,** Senior Scientist, **Dr. U. Sreedhar**, Scientist (SG) and **Dr. L.N. Murthy**, Scientist, Senior Scale – National inception workshop of the FAO-GEF sponsored project of Bay of Bengal large marine ecosystems of Fisheries Survey of India, Visakhapatnam (6-7 May)
- **Dr. S. Sanjeev**, Principal Scientist and **Dr. S.K. Panda,** Scientist – Training programme on Food safety management system as per IS/ISO 22000, BIS, Cochin (23-25 June)
- **Shri P.K. Vijayan,** Principal Scientist – PRMC meeting of DST, New Delhi project on Value addition of low value marine pelagic fishes, Tharangambadi, Tamil Nadu (6-7 April)
- **Dr. Femeena Hassan**, Senior Scientist – Kerala Science Congress – Women scientists meet, Thiruvananthapuram (21 April)
- **Dr. V. Geethalakshmi**, Senior Scientist – Meeting to discuss the report on Estimation of quantitative harvest and post harvest losses of major agricultural produces in India, ICAR, New Delhi (6 June)
- **Dr. V. Geethalakshmi**, Senior Scientist – Installation

training programme for consortia-based research project, 'Strengthening statistical computing for NARS', UAS, Bangalore (21-22 June)

- **Dr. Saly N. Thomas**, Senior Scientist – Meeting of the technical committee for purchase of net making machines for the proposed net factory of Matsyafed, Thiruvananthapuram (29 June)
- **Dr. Saly N. Thomas**, Senior Scientist – Meeting of the technical committee for supply of propylene rope to the fishermen of Kolleru lake in Andhra Pradesh, Hyderabad (20 April)
- **Dr. M.P. Remesan**, Senior Scientist – Workshop on development of Kannur Parliament Constituency, Kannur (26 April)
- **Dr. J. Bindu**, Scientist (SG) – Annual workshop of the Component 4 of the NAIP sub project on 'Studies on high pressure processing of high value perishable commodities', CIAE, Bhopal (11-12 May)
- **Dr. P. Muhd. Ashraf**, Scientist (SG) – Annual review meeting of the INCOIS SATCRE project, '*In situ* time series measurements of bio-optical parameters off Cochin coast', Andhra University, Visakhapatnam (28 April)
- **Dr. P. Muhd. Ashraf**, Scientist (SG) and **Shri V.R. Madhu**, Scientist – Workshop on Logical framework analysis, Andhra University, Visakhapatnam (27 April)
- **Dr. J. Charles Jeeva**, Scientist, Sr. Scale – Exhibition-cum-conference on Technologies available on value addition of agricultural, horticultural, livestock, poultry and fisheries products, KVK, Namakkal (17 April)
- **Shri V.R. Madhu**, Scientist – Review committee meeting of INCOIS project, 'Validation of PFZ along Gujarat coast', Andhra University, Visakhapatnam (27 April)
- **Dr. C.O. Mohan,** Scientist – Workshop on Combating environment degradation and climate change – A roadmap for Gujarat, Ahmedabad (22 April)
- **Shri K.J. Francis Xavier**, Tech. Officer (T9) – Radar ARPA stimulator course, Indian Maritime College, Chennai (10-15 May)
- **Dr. A.R.S. Menon**, Tech. Officer (T9) – Training on Right to Information Act, IMG Regional Centre, Cochin (24 April)
- **Shri M.V. Baiju**, Tech. Officer (T7-8) – Meeting of the committee to provide subsidy for construction of insulated fish hold in fishing vessels, MPEDA, Cochin (15 June)
- **Shri M.V. Baiju**, Tech. Officer (T7-8) – Meeting of the committee to purchase sea safety kits for the Department of Fisheries, Govt. of Kerala, Cochin (29 June)

Personalia

Appointments

1. Shri Ankur Nagori, Scientist, Mechanical Engineering, Cochin
2. Shri Dharmendra Kumar Meena, Scientist, Fish & Fishery Sciences, Cochin
3. Dr. P.K. Binsi, Scientist, Fish Processing Technology, Cochin
4. Ms S. Tanuja, Scientist, Fish Processing Technology, Cochin
5. Ms P. Viji, Scientist, Fish Processing Technology, Cochin
6. Dr. V. Murugadas, Scientist, Veterinary Microbiology, Cochin
7. Shri V. Chandrasekhar, Scientist, Agricultural Economics, Cochin

Promotions

1. Dr. C.N. Ravishankar, Senior Scientist, Fish Processing Technology, CIFT, Cochin as Principal Scientist
2. Shri T.D. Bijoy, Skilled Support Staff, Cochin as LDC

Transfers

1. Shri K.P.S. Gautam, Sr. Administrative Officer, CIFT, Cochin to CPCRI, Kasaragod
2. Shri T.V. Bhaskaran, Tech. Officer (T5), NBAII, Bangalore to CIFT, Cochin

Retirements

1. Shri P. Ravindranathan Nair, Principal Scientist, Fish Processing, Cochin (Voluntary Retirement)
2. Shri G.M. Vaghela, Jr. Lab. Asst. (T3), Veraval
3. Shri K. Appa Rao, Skilled Support Staff, Visakhapatnam

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