

CIBANEWS



भाकृअनुप - केन्द्रीय खारा जलजीव पालन अनुसंधान संस्थान
ICAR- CENTRAL INSTITUTE OF BRACKISHWATER AQUACULTURE
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CIBANEWS

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ICAR-CIBA - a nodal R&D agency working in brackishwater aquaculture for the past three decades with a vision of environmentally sustainable, economically viable and socially acceptable seafood production. Technology backstopping and interventions by the institute is benefiting the sector to the tune of Rs 10,000 crore annually.

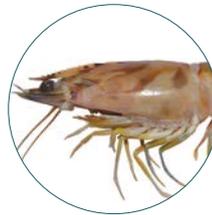
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Harvest of Milkfish,
Chanos chanos

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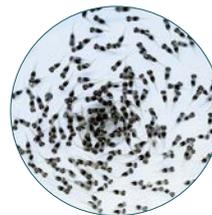
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FROM THE DIRECTOR'S DESK

The scope and expansion of brackishwater aquaculture in India is highly promising with considerable resources of brackishwater along coastal states, union territories, islands and inland saline areas. While acknowledging the economic benefits and employment opportunities provided by the shrimp farming sector, it is essential to recognize the dependence on single species exotic Pacific white shrimp, *Penaeus vannamei*, which constitute 90% of the farmed shrimp production, valued at Rs. 30,000 crores. Therefore, we continue to stress upon the diversification of brackishwater aquaculture with different candidate species of shellfish and finfish to judiciously and responsibly utilise the brackishwater resources in the country in a sustainable manner.

Indian white shrimp, *Penaeus indicus* is gaining importance in the Indian shrimp farming from the culture demonstrations carried out by CIBA in coastal states of the country. CIBA adopted a farmer from the state of Odisha for farming of *P. indicus*. With a production of 3 to 6.5 tons/ha, he was awarded the title of the "Best Brackishwater Shrimp Farmer – Coastal States 2018" by NFDB and DADF. Stakeholders interactive meeting on SPF *indicus* broodstock development organised by CIBA and chaired by Secretary, Department of Fisheries, Ministry of Fisheries, Animal husbandry and Dairying, Government of India is a welcome initiative towards reducing the dependency on single species. Considering the significance of diversification in aquaculture, CIBA has made commendable progress in developing technologies for seed, feed and husbandry of diversified brackishwater food fishes.

MoUs were signed with Government agencies and private entrepreneurs for the establishment of Seabass hatchery in Andhra Pradesh and Maharashtra, and milkfish hatchery in West Bengal, where it is being popularised as 'Decan hilsa'. Domestication and development of captive stock of hilsa, *Tenulosa ilisha*, an important commercial fish of the Indo-Pacific region, is being carried out at our Kakdwip Research Centre (KRC) of CIBA. The technology breakthrough on the nursery rearing of pearlspot, *Etroplus suratensis* as a brackishwater ornamental fish was implemented for the livelihood development of tribal communities. Studying the population genetic structure of pearlspot fish in

Indian waters would enlighten us on biodiversity of the species which is crucial on for conservation.

Establishment of first shrimp feed mill in Haryana under PPP mode is a first of its kind in Northern India, which will be a great advantage for shrimp farmers in inland saline regions of Punjab, Haryana and Rajasthan, where the feed is brought from the southern states. The commercial feeds available in the market for ornamental fishes are not only costly but the quality is highly variable. The Institute developed 'Colourfish feed', indigenous formulated feed as Desi brand aquarium feeds to meet the consumer requirement of quality feed. The technology developed for recycling of fish waste to high value products such as plankton booster, Plankton^{Plus} and manure for horticulture, Horti^{Plus} is an initiative towards circular economy in aquaculture, which can provide ancillary income to the fisher folk and will also help for making the fish market of the country clean.

I am happy to share that we have inaugurated the Navasari-Gujarat Research Centre (NGRC) of CIBA in the Navsari Agriculture University Campus, Gujarat to cater the services of CIBA in west coast and particularly in Gujarat. The Institute joined hands for collaborative research programmes in frontier areas of research with the Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), the Ministry of Earth Sciences (ESSO)-NIOT and the Academy of Maritime Education and Training (AMET), a Deemed University.

It is encouraging to see the tremendous support from the farmers, industry and government agencies for our efforts, which was witnessed during BRAQCON 2019 Conference and Farmers Conclave, the most successful event in the fisheries sector in the context of Brackishwater Aquaculture, Coastal Ecosystem, Food Security and Societal Development. I take this opportunity to thank all the stakeholders for their continued support and we expect it to continue forever.

CIBA is pleased to bring the sixth special issue of the CIBA NEWS which carries the significant achievements, events, and outcomes of CIBA in 2018, which would be enriching and interesting to the wide spectrum of readers.

Dr. K.K. Vijayan
Director

IDENTITY OF KURUMA SHRIMP IN INDIA REVEALED

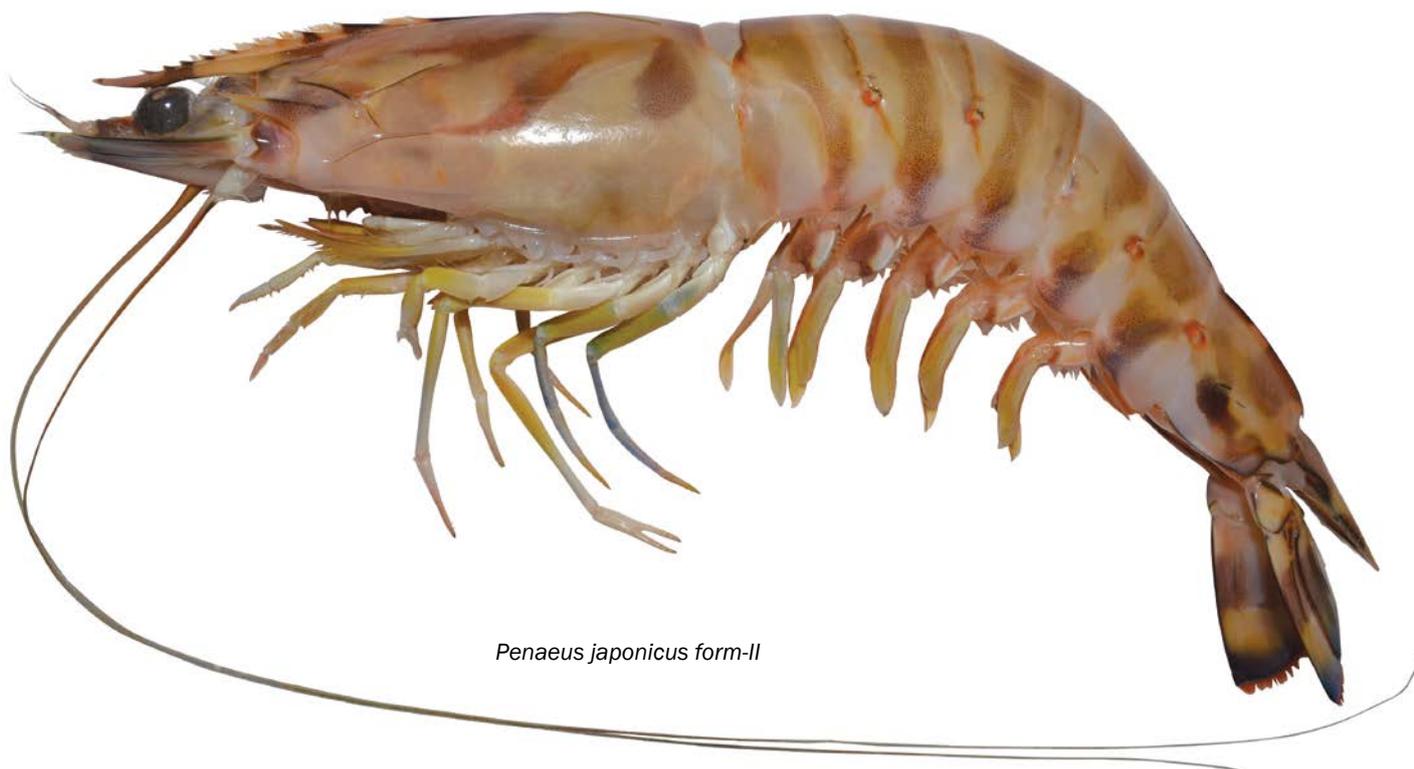
Kuruma shrimp (*Penaeus japonicus*), is the most high-valued penaeid shrimp species due to its high market demand in Japan and other countries, and the most widely distributed penaeid shrimp across the Indo-West Pacific. Kuruma shrimp was considered as a single species under the subgenus *Marsupenaeus*; however, recent studies have shown the existence of cryptic species within kuruma shrimp, having a slight variation in banding pattern on carapace with no other noticeable morphological differences. The form-I, is confined to Japan, Korea and China including Taiwan and dominates the East China Sea and north of the South China Sea. The form-II is widely distributed in South-East Asia, Australia, the western Indian Ocean, the Red Sea and the Mediterranean with type locality being South Africa (Great fish point). Kuruma shrimp is distributed along both coasts of India. Studies conducted by ICAR-CIBA using mitochondrial DNA markers showed that the species present in India is phylogenetically more closely allied to form-II. This study indicates that *P. japonicus* form-I is not naturally present in India and the cryptic species in Indian waters is *P. japonicus* form-II.





Penaeus japonicus form-I

The species present in India is more “farming friendly” as they do not show the hiding in sand behavior and requires low protein diet compared to the form I of the same species, which need clean, sandy bottoms and high protein diets. Misidentification of species has many negative implications, and accurate identification is the basic corner stone of biology. For instance, failure in kuruma shrimp aquaculture has been reported several times and it was thought to be due to acclimatization problems, however now it is realized that the occurrence of two cryptic species might have been the reason for failure due to unrecognized differences in environmental adaptations in introduced places. The confirmation of *P. japonicus* form-II will open up new avenues in understanding the species biology and its environmental requirements, which will help to develop a sustainable production technology for this species. Further studies on the biology of this species would help to develop a protocol for the production system for this species.



Penaeus japonicus form-II



A NEW APPROACH IN MILKFISH FARMING: MULTIPLE STOCKING AND MULTIPLE HARVESTING METHOD

Milkfish (*Chanos chanos*) is an important candidate species suitable for brackishwater aquaculture. Milkfish is a herbivore fish, which can grow rapidly in natural water bodies by feeding on benthic algae, *lab-lab*, phytoplankton and detritus matter. It can tolerate a wide range of salinity, ranging from freshwater to full strength seawater. West Bengal conferred with enormous resources of brackishwater area, which cover almost over 2.1 lakh ha, provides tremendous opportunity to undertake milkfish farming in its bheries and other small water bodies of Sundarbans. ICAR-CIBA has developed seed production technology of milkfish through captive breeding in June

2015. The hatchery produced milkfish fry are further reared in nursery ponds for 30-40 days to produce fingerlings (>5 g) suitable for stocking in grow-out culture. Generally, milkfish is farmed either in monoculture or polyculture with other fishes and shrimp. When the availability of seeds is ensured, productivity from the same water bodies could be augmented by partial harvesting and re-stocking.

In this context, a multiple stocking and multiple harvesting (MSMH) technique could be suitable to the farmers. To evaluate performance of this technique in brackishwater ponds; a trial was conducted with two stocking densities (7500 and 15000/ha) as treatments. Milkfish fingerlings (6-8 g) were stocked



Harvested milkfish from multiple stocking and multiple harvesting pond

and reared in fertilized ponds (500 m²) provided with CIBA formulated feed (Protein 30%; Price: Rs. 35/ kg) @ 5-3% of body weight daily. The stock was harvested after 100 days when the fish attained at least 150 g and ponds were re-stocked with same numbers of advanced fingerlings (25-40 g) at 15 days intervals keeping the total number of fish same as that of initial stocking. This system exhibited higher production of 3.6 ton/ ha in the high-density compared to 2.8 ton/ ha in the low-density culture in 160 days suggesting suitability of the former density. However, for this system, a separate nursery pond is a pre-requisite where the seeds are maintained for re-stocking throughout the culture period.

There are several added advantages of this system. The farmers need not have a big capital to meet the various recurring expenditure. He has to manage the pond for a maximum period of 3-4 months. Then onwards he starts earning, which is reinvested for purchasing of various inputs required for further fish rearing. Therefore, a marginal farmer can also take up scientific milkfish farming with meager resources by adopting this system and can meet day to day needs from fish harvest at regular intervals. Moreover, netting in short intervals results in release of noxious gases and mixing of bottom nutrients with surface water, which enhances primary productivity of the pond.

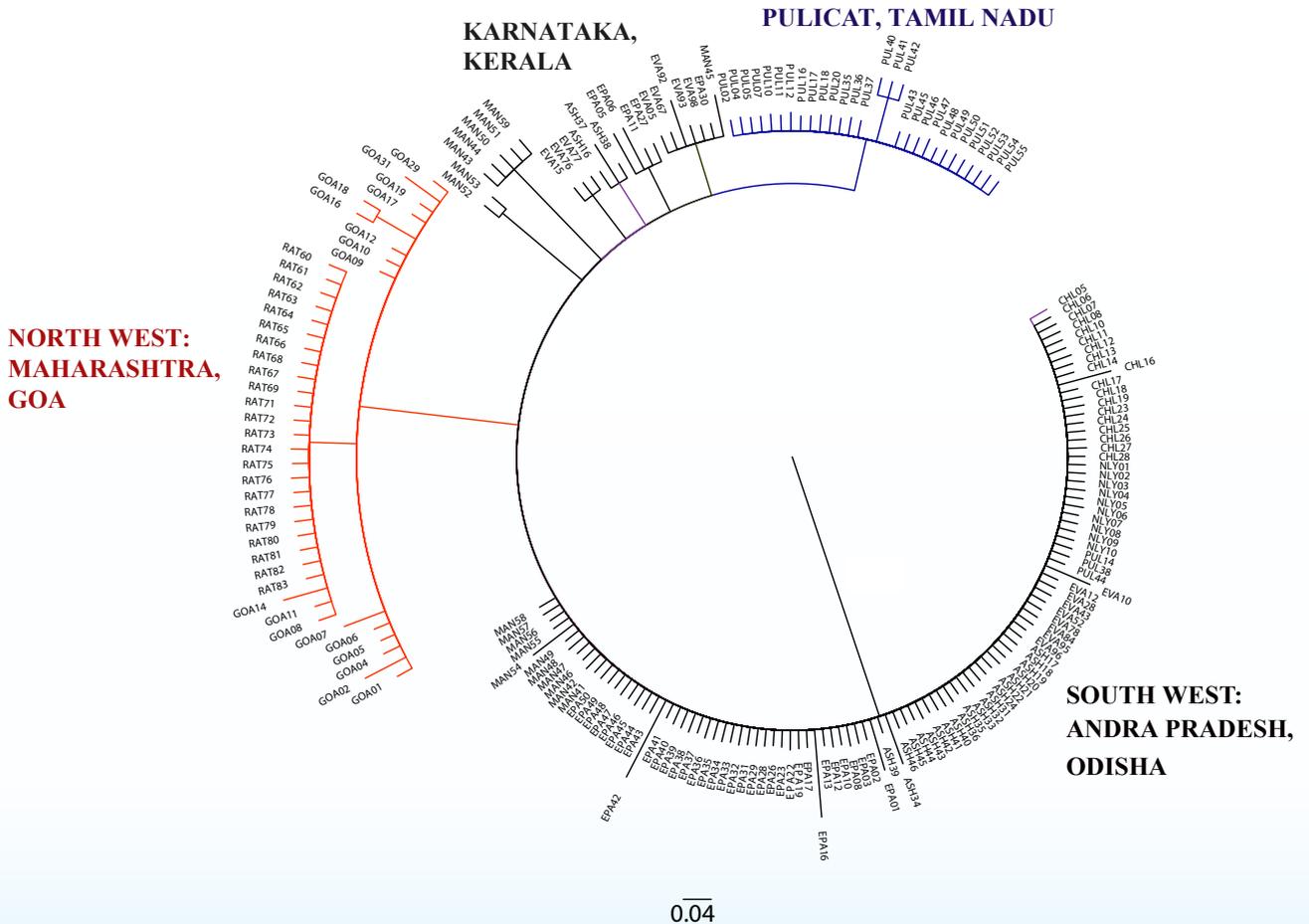


POPULATION GENETIC STRUCTURE OF PEARLSPOT (*ETROPLUS SURATENSIS*) IN INDIAN WATERS

Generally, individuals of a species have a similar morphological and genetic pattern. Mutation, migration, natural selection, population size, geographical barriers and climate determine the variations between the populations. Owing to the above factors, in the long term, the large wide distributed populations become several small isolated populations which are called stocks. Studying the genetic structure of a species throughout its distribution would enlighten us on biodiversity of the species which is crucial for conservation efforts.

Etroplus suratensis (Bloch 1790) commonly known as pearlspot is the largest among the *Etroplus* genus and distributed in the lagoons, backwater environment of southern peninsular India and Sri Lanka. It fetches higher price for its delicacy. The subpopulation structure and genetic diversity of pearlspot across Indian coasts at nine different locations was studied using ATPase 6/8 an mtDNA marker. The locations extend from North-East to North-West of the Indian coast, i.e., Chilika, Nagayalanka, Pulicat, Vellayani, Ashtamudi, Vembanad, Mangalore, Goa and Ratnagiri.

The samples exhibited 31 polymorphic sites which include 16 singleton and 15 parsimony informative sites. The total haplotypes were 29 with the diversity of 0.85. ATPase 6/8 gene revealed monomorphic pattern in Nagayalanka stocks. Chilika and Nagayalanka stocks did not differ. However, a significant difference between all other stocks for F_{ST} based genetic differentiation ($F_{ST}=0.75$; $P<0.01$) was observed, which indicates that the pearlspot population in India has diverged as several small subpopulations. Non-significant Mantel test ($r = 0.46$ $P=0.025$) suggests that the stock isolation and difference is not due to the distance between the stocks. The divergence may, therefore, be due to non-migration, mutation and natural selection. Phylogenetic trees established two haplogroups; one of them includes Ratnagiri and Goa stocks, and the second one consists of all the others. Non-significant Tajima's D (-1.47) and F_u 's F statistic (-14.89) revealed there is no change in population size in the recent past.



Phylogenetic tree showing distinct genetic stocks of *E. suratensis* in Indian subcontinent

DRY STRIPPING AND NOVEL APPROACH IN THE REARING OF HILSA LARVAE

Hilsa, *Tenualosa ilisha* is an important commercial fish of the Indo-Pacific region, especially Bangladesh, India and Myanmar. At present, the total catch has declined in these countries due to obstruction of natural migration for breeding, overfishing and water pollution in rivers. Therefore, to conserve and develop aquaculture of this species, development of technology for captive breeding is essential. With this background, wild mature migratory fishes were bred through dry-stripping, and larval rearing methodology is developed using earthen pond system.

Oozing male (270 ± 5.0 g) and female (780 ± 15 g) fish during its spawning migration (February to April) were captured from Hooghly River at Godakhali, and bred through dry stripping. Fertilized eggs were incubated in a glass jar,

and after hatching three different age group of larvae such as 3 days post-hatching (dph) before yolk sac utilization, 5 dph- after yolk sac utilization and 12 dph-before oil globule utilization were stocked in well prepared nursery ponds (100 m^2). Stocking density in each pond was approximately 500 numbers / m^2 individuals. During nursery rearing, larvae were fed with *Artemia* nauplii (2 g *Artemia* cyst in each treatment) along with powder feed (20 g/day). At the weekly interval, fermented GNOC (100 g) was applied in each pond. Significantly higher survival (5%) was observed in yolk sac absorbed group (5 dph) than the other two groups, after 60 days of nursery rearing. However, the average size was significantly larger (1.8 g) in 12 dph group than the other two groups (0.8 g). The results indicated that hilsa larvae of post yolk sac absorption can be successfully reared in earthen pond system.



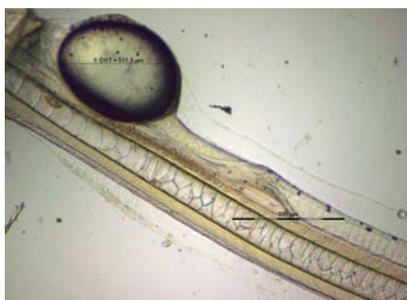
Stripping of oozing fish



Fertilized eggs



3-dph larvae with yolk sac and oil globule



5-dph larvae with larger oil globule



12-dph larvae with smaller oil globule



50-dph larvae (Ave.TL 2.5 cm)

SEED PRODUCTION OF PEARLSPOT AS LIVELIHOOD SUPPORT FOR COASTAL FAMILIES

Clam collection is a small scale livelihood activity of coastal fishers mainly for fisher women, and it is considered as an important factor for the uplift of their social and economic conditions. Mrs. Navaneetham of Kundrakadu, Kovalam, Kancheepuram district (Tamil Nadu) is a clam collector and a clam marketing agent. She supplies clams to hotels in Kovalam as well as to shrimp and crab hatcheries in Mugaiyur and Vandalur around Chennai as a fresh feed. She also plays a vital role in the community development and capacity building of rural coastal women through WSHGs and gave opportunities for her group in clam collection and processing. Mrs Navaneetham was a Jamsetji Tata National Virtual Academy (NVA) Fellowship awardee in the year 2007. She approached ICAR-CIBA for taking up the activity of pearlspot nursery rearing in her house premises, and CIBA offered fish seeds. This article explains the success story of the technology adoption.

Technology details

Ornamental fish trade is a multibillion dollar global industry propelled by enormous consumer demands since the interest among the people for aquarium keep is increasing every year. Pearlspot (*Etroplus suratensis*) is an indigenous ornamental fish and esteemed as the state fish of Kerala, India. A local delicacy, herbivorous feeding habit

and round the year juvenile production through intervention in parental care of pearlspot makes it a desired candidate species for diversification practices for brackishwater aquaculture. The hatchery produced seed from CIBA is being distributed to the fish growers for augmenting the fish production in the country.

Modular tank based pearlspot nursery rearing as a homestead activity at Kovalum village, Kancheepuram dt. (TN) was established during October 2018. Mrs Navaneetham started this activity with 2000 pearlspot seeds of 1.0 to 2.0 cm obtained from CIBA finfish hatchery. She stocked them in 4 concrete tanks @ 500 nos. each (in a hatchery shed of 200 sq.ft (20 x 10 ft.)). Required quantity of feed was also supplied by CIBA feed milland feeding was done @ 3-5 % body weight daily. After 52 days of culture, the fish attained the average size of 0.6 g in the size ranged from 2.5 to 3.13 cm with the survival rate of 93.3 %.

A total of 1865 numbers of pearlspot juveniles (fingerlings?) were harvested from all the tanks. The juvenile fishes were sold to the farmers identified by CIBA for a price of Rs. 4.50 per fish and she could earn approximately Rs. 8000 per rearing cycle which lasted for a month. Seeing the success and profitability, she decided to expand the rearing and breeding units of her own to get uninterrupted supply of fry for further rearing.



Homestead backyard pearl spot hatchery, Kundrakadu, Kovalam, Kancheepuram dt. TN.



MILKFISH (*CHANOS CHANOS*)

Milkfish (*Chanos chanos*) is one of the most popular cultivable brackishwater finfish in the south East Asian countries and widely distributed in the Indo-Pacific region.

The maximum weight and age of this fish were reported as 14 kg and 15 years, respectively. In India, it is named as *Paal Meen* in Tamil, *Pala Bontha* and *Tulli Chepa* in Telugu, *Poomeen* in Malayalam, *Hoomeenu* in Kannada, *Golsi* in Goa and *Seba khainga* in Oriya. Being herbivore, milkfish feeds on plankton, benthic algae, detritus matter in the natural condition and easily accepts the pellet feed under culture condition. It can tolerate and live in extreme salinity ranges but growth is optimal between 0.5-40 ppt. Milkfish can attain the table size weight from 400 to 500 gm in 5-6 months under culture condition. Milkfish having tiny bones resemble with Hilsa and can be considered as a '*Decan hilsa*'. Milkfish can be produced in the farm with the production cost of Rs. 80-90/ kg by feeding with low protein pellet feed.

Adult milkfish (50-150 cm total length) are powerful swimmers and mostly found in open sea. During the breeding, it migrates towards reefs and sandy-rocky shores for breeding. Milkfish fertilized eggs appear slightly yellowish (size 1.10 - 1.25 mm). Incubation period ranged 24-26 h. Milkfish fry are most abundant in shore waters. Large juveniles and sub-adults return

to sea. During 1986, the Southeast Asian Fisheries Development Center (SEAFDEC) at Philippines under National Bangus Breeding Program successfully established milkfish seed production technology. Global production of milkfish is estimated to be 9 lakh metric ton during 2012 Philippines is the leading producer of milkfish with 391,983 MT during 2014 apart from Indonesia and Taiwan.

Wild milkfish seeds are collected during March to May from Andhra Pradesh and Tamil Nadu coasts by traditional methods and farmed in the coastal ponds along with other finfish and shell fishes. ICAR-CIBA has made major breakthrough on captive breeding of milkfish for the first time in India during June 2015 and developed comprehensive technology package for seed production of milkfish. To educate the farmer community about farming and seed production technology, need-based trainings are being organized by CIBA.

KINGDOM : Animalia
PHYLUM : Chordata
ORDER : Gonorynchiformes
FAMILY : Chanidae
GENUS : *Chanos*
SPECIES : *C. chanos*



TECHNOLOGY TRANSFERS, PRODUCT RELEASES AND KNOWLEDGE PARTNERSHIPS

Establishment of shrimp feed mill under public private partnership mode (PPP) at Bhiwani (Haryana)



ICAR-CIBA has developed a cost-effective and quality feed shrimp feed, 'Vanami^{Plus}' using indigenous feed ingredients for *vannamei* farming. The technology is being transferred to entrepreneurs for upscaling and commercial production on a non-exclusive basis. Dr. Attar Aqua feed commissioned a new feed mill under PPP mode at Bhiwani, Haryana by adopting Vanami

Plus feed technology of CIBA, through an MOU to cater the needs of shrimp farmers in inland saline regions of Punjab, Haryana and Rajasthan. The feed mill has been jointly inaugurated on 15 May 2018 by Dr. K.K. Vijayan, Director, CIBA and Dr. Pravin Puthra, Assistant Director General of ICAR. The feed mill with production capacity of 750 kg/h can produce 8-10 ton of feed per day.

Transfer of modular hatchery technology of brackishwater catfish, *Mystus gulio*



Two MoU's were signed between Director CIBA and clients Shri. Aniruddha Das, from Namakhana, Dist- South 24 Parganas, West Bengal and Shri. Krishnendu Gayen, from Vill. Narayanpur, P.O. Namkhana, P.S. Kakdwip, Dist- South 24 Parganas, West Bengal for transfer of modular hatchery technology of brackishwater catfish, *Mystus gulio* on 28th June 2018.

MoU for technical support and partnership farming for adoption of periphyton based milkfish grow-out culture model



Two MoUs were signed on 28 June 2018 between ICAR-CIBA and farmer:

- Mr. Debakinandan Patra, S/O Late Harihar Patra, Village + P.O.- Madanganj, P.S.- Namkhana, District- South 24 Parganas, West Bengal.
- Mr. Animesh Das, S/O Mr. Jadugopal Das, Village- Debichak, P.O.- Shibgobindapur, P.S.- Patharpratima, District- South 24 Parganas, West Bengal.





Biofloc Based Shrimp Nursery Technology Demonstrated By ICAR-CIBA – 10th July 18



ICAR-Central Institute of Brackishwater Aquaculture, Chennai has been conducting Frontline Demonstrations on Biofloc based Nursery rearing Technology for Pacific white shrimp *Penaeus vannamei* in different parts of the country with support from the Department of Biotechnology, Govt. of India. The genesis of this demonstration was initiated with the MoU signed by ICAR-CIBA with one progressive farmer (Dandapat Aquatics) on 10th July 2018 in presence of Hon'ble Member of Parliament Mr. Rabindra Jena. As part of the demonstration and to disseminate the BFT based shrimp nursery technology in Odisha, a Farmer-Scientist

Interaction Meet was organized at Sahada, Balasore, on 27th September 2018. This technology ensures good survival of 90 to 98 % and juveniles reaching a size of 300 to 600 mg when stocked at a density of 3000 to 8000 PLs/m³. Nursery rearing phase extends for 3-4 weeks and can reduce the culture period in the grow-out phase by 20-30 days. It improves productivity, natural food, FCR, economic gain; and reduced costs (15-20% lower cost of production). A farmer friendly publication on nursery rearing technology for penaeid shrimp with salient points about the technology was released on this occasion.

ICAR-CIBA Signs MoU With Ministry Of Earth Sciences (ESSO)-NIOT At Chennai For Technical Partnership In The Promotion Of Aquaculture In The Country, On September 25, 2018



ICAR-CIBA entered into the MoU with ESSO-NIOT for technical collaboration in the promotion of aquaculture systems in the country. The MoU was signed on 25th September, 2018 by Dr.K.K.Vijayan, the Director CIBA and Dr. M.A. Atmanand, the Director of NIOT in the presence of, Dr. Madhavan Rajeevan, Secretary, Ministry of Earth Sciences (MoES); Chairman, Earth System Science Organization and Dr. Vipin Chandra Joint Secretary, MoES, at NIOT campus, Chennai.

The MoU will help to contribute towards the roadmap conceived by the MoES 'Farming the Oceans for the Future' to promote India's blue economy. Partnership

of NIOT with its blend of engineering expertise in finfish cages and CIBA with its proven technologies in hatchery, farming and feed biotechnology for candidate finfish species such as Seabass, would help in expanding the finfish cage culture operation, in the depths from 5 m to 100 m. This has the potential for the production of 5 MMT of marine fish, by utilizing just 1% of the Indian EEZ, once the procedure for leasing and site specific cage culture systems are in place, with institutional and private sector participation. The initiative will facilitate increased fish production, generation of employment income, along the coastal belt of India.

ICAR-CIBA Signed MoU For The Technology Transfer Of Seabass Fish Hatchery Technology On 30th October 2018 At Chennai



Hatchery technology developed by ICAR-CIBA for the production of seabass seed and nursery rearing technology for the fingerlings, has been transferred to a young entrepreneur, Mr. Nishanth Reddy from Nellore, Andhra Pradesh through a MoU on 30th October 2018, at CIBA Headquarters, in the presence of Dr. J.K. Jena, DDG (Fy. Science), ICAR, New Delhi. Dr. J.K. Jena expressed the market potential of seabass, which is profitable and also contribute to our effort in increasing

the farmed fish production. He has congratulated CIBA and the client for handholding initiative to start the first seabass hatchery in Andhra Pradesh. Dr. K.K. Vijayan Director, CIBA has emphasized the importance of setting up seabass hatchery in the private sector, as this would enable the supply of quality seabass seeds for the fish farmers, which is one of the major limiting factor in the expansion of seabass farming in the country.

ICAR-CIBA Made Strategic Alliance With 'Aditi Enterprise (Ultima Feeds)' Porbandar, Gujarat' For The Transfer Of Formulated Fish And Shrimp Feed Technology Through An MoU To Promote Brackishwater Aquaculture Development In The West Coast Of India



ICAR-CIBA entered into a strategic alliance with Aditi Enterprise, Porbandar, Gujarat by transferring Shrimp and Seabass Feed Processing Technologies to spread its feed biotechnology footprints in the West coast of the country. CIBA has developed cost effective and quality feed using indigenous feed ingredients for shrimp and seabass farming, and these technologies are being transferred to series of private entrepreneurs for up scaling and commercial production, on a non-exclusive basis. Adding to the list, Aditi Enterprise, Porbandar, Gujarat signed MoU with ICAR-CIBA for shrimp and seabass feed processing technology.

'Aditi enterprise', having its presence in the field of aquaculture and fisheries for the last one decade with hatchery, processing unit and an integrated feed mill envisaged to produce 'Vanami^{Plus}' and 'Seabass^{Plus}' feed with the technical collaboration of CIBA. The feed will cater to the need of aquaculture farmers of West coast of the country, particularly the small and marginal farmers, who cannot afford the high cost feed. The proposed concept of 'factory to farm' promoted by CIBA would help the farmer to source the feed directly from the feed mill, enabling the farmers to save the usual marketing cost also.



Shri. Deepak Kesarkar, Honorable Minister for Home (Rural), Finance and Planning, Maharashtra visited ICAR-CIBA



Hon. Minister of the state of Maharashtra, Shri. Deepak Kesarkar for Home (Rural), Finance and Planning and a team of officers visited CIBA's Muttukadu Experimental Station on 19 April 2018. Dr. K.K. Vijayan, Director, CIBA explained the achievements and technologies developed by the institute. Hon. minister interacted with the CIBA scientists and was very much impressed with the role played by CIBA in the sector, infrastructure facilities for research and development and technologies, and stressed the need of working together in the development of brackishwater aquaculture sector in Maharashtra. The honourable minister expressed his interest to initiate joint programs between CIBA and Maharashtra government in the areas of crab farming, seabass farming and feed development.

The 23rd Research Advisory Committee (RAC) meeting



Twenty third Research Advisory Committee (RAC) meeting was held on 27th February 2018 at CIBA, Chennai under the chairmanship of Dr. K. Gopakumar, former DDG, Fisheries. Distinguished members of RAC, Dr. V.V. Sugunan, former ADG, Dr. K.M. Shankar, former Dean, Karnataka Veterinary, Animal and Fisheries Sciences University, Dr. G. Gopakumar, Emeritus Scientist, CMFRI, Dr. Aparna Dixit, Professor, Jawaharlal Nehru University, Delhi, Dr. S.N. Mohanty, former head, ICAR-CIFA and Dr. Pravin Puthra, ADG

(Marine Fisheries) and Dr. K.K. Vijayan, Director, CIBA attended this meeting and reviewed the research activities and provided directions for future research. In a small parallel event arranged by ITMU-CIBA, a start-up entrepreneur, Mr. Nishanth Reddy from Nellore, Andhra Pradesh, who did seabass nursery rearing with consultancy and training support of CIBA handed over a cheque worth of Rs. 2.5 lakhs to RAC chairman, Dr. K. Gopakumar as profit share to CIBA.

Navsari-Gujrat Research Centre (NGRC) of ICAR-CIBA inaugurated in the Navsari Agriculture University Campus, Gujarat



A new research centre of ICAR CIBA, Navsari-Gujarat Research Centre (NGRC) was inaugurated in Navsari Agricultural University (NAU) campus, Navsari, on 7 June 2018 by Dr. J.K. Jena, Deputy Director General (Fisheries), ICAR, in the presence of Shri. R.C. Patel, Member of Legislative Assembly, Navsari, Dr. C.J. Dangaria, Vice Chancellor, NAU and Dr. K.K. Vijayan, Director, ICAR-CIBA, Chennai. Highlighting the importance of CIBA centre in the west coast, Dr. K.K. Vijayan underlined the importance of having partnership between fisheries college of NAU and CIBA in extending the technological support to the aqua farmers in the region. Shri. R.C. Patel in his presidential remarks, expressed his happiness on establishing CIBA's centre in Navsari and sought the help of CIBA to bring the technologies for quality seed, cost-effective and quality feed and diseases management products to the shrimp farming sector of

Gujarat. Dr. J.K. Jena in his inaugural address thanked Vice Chancellor and all the officers of NAU for hosting the NRGRC in Navsari Agricultural University campus and urged the scientists of CIBA and NAU to work with farmers so that the objective of FISH FOR ALL FOREVER is achieved. Dr. C.J. Dangaria, Vice Chancellor of NAU underlined the opportunities in working together of CIBA and NAU in addressing the needs of the aquaculture farmers. During the occasion, Dr. C. Gopal, Member Secretary, Coastal Aquaculture Authority, Govt. of India, Chennai, Dr. Pravin Puthra, Assistant Director-General (Marine Fisheries), ICAR and Dr. N.H. Kelawala, Dean, Veterinary College, gave their facilitation and offered support for the newly established centre. Brackishwaterfarmer's interaction meet was organised and Soil and Water Health cards were distributed to aquaculture farmers of the region.

National Fish Farmers Day on 10th July, 2018 with the Coastal Fishers of Puducherry



ICAR-CIBA celebrated the National Fish Farmers Day on 10th July 2018 with the coastal fishers of the Puducherry. Scientists of CIBA, sensitized fishers and other villagers from the coastal areas of Puducherry on the food production, employment and income generation using cost-effective and environmentally sustainable models of fish farming such as polyculture and Integrated Multi-Trophic Aquaculture (IMTA), in the vast stretches of brackish water resources available in

the region. Thiru. K. Deivasigamani, Additional Director of Fisheries, Puducherry presided over the interaction and stated that under the World Bank-funded Fisheries Management for Department of Fisheries Sustainable Livelihoods (FIMSUL) project, co-management and governance systems at the village, district and state levels are being planned to enhance the livelihood security and resilience of fishers in the region.

'Aquaculture Startup Day' to Promote Innovations and Entrepreneurship in Indian Aquaculture Sector – 16th July 2018



Startup initiatives are common in sectors other than aquaculture, and hence an aquaculture startup day has been organized on the occasion of 90th ICAR-foundation at CIBA on 16th July 2018, to infuse innovations and attract entrepreneurship in aquafarming. A brainstorming workshop on “Startup India programme on aquaculture sector” brought the outgoing students from Fisheries Colleges of Andhra Pradesh, Karnataka, Kerala, and TamilNadu together on the startup platform at CIBA. Presentations were made by the participants on novel ideas on projects related to aquaculture sector before a panel of experts drawn from industry,

promotional agencies like MPEDA, NFDB, MSME, CII, FICCI, Investors, Startups, Farmers, Professors and Scientists, followed by critical review and suggestions. The budding startup proposals include cost-effective feed for freshwater aquaculture, value-added products and its labelling, certification and marketing avenues, aquaculture vaccines, seaweed technologies, probiotics, online delivery system using IoT and Android platforms, genetically improved ornamental fish, live fish marketing system and integrated aquaculture systems.

ICAR-CIBA Celebrated Independence Day paying respects to freedom fighters and all those contributed to the cause of the nation -2018



India celebrated its 72nd Independence Day on 15th August 2018 with pride and honour the great sacrifices made by patriots and freedom fighters. ICAR-CIBA celebrated the same with colourful illumination of the campus symbolizing the growth and prosperity of the country. Dr. K.K. Vijayan, Director of the institute hoisted the tricolour flag and delivered the speech. In his address, he remembered the great sacrifices made by the great leaders and freedom fighters for getting the Independence and highlighted that it is the duty of every Indian citizen to protect the same and to strive hard for sustainable growth and prosperity of the country.

“Waste to Wealth”: Recycling Of Fish and Domestic Waste at Srinivasapuram, Adyar Creek and Estuary under Swachhata Hi Seva 2018 on 28th September 2018



ICAR-CIBA has conducted “Waste to Wealth” programme by recycling of fish and domestic waste under Swachhata Hi Seva 2018 on 28th September, 2018 at Srinivasapuram, Mullikuppam, Mullimanagar fishermen villages cluster located near CIBA headquarters in Chennai. These three villages are located on the creek, where Adyar River finally discharges water inflow into the Bay of Bengal. The villagers were also affected by garbage pileup around the locality and fish market area. In this backdrop,

Dr. Debasis De, Principal Scientist, ICAR-CIBA, has demonstrated the protocol for recycling of fish waste to value added products. He explained the usage of this value added products in commercial aquaculture and agriculture and its marketing potential. The recycling will not only help in cleaning and hygienic disposal of fish market waste which is abundantly available in the village cluster but will also help to produce wealth from waste.

Interaction Meeting of the Second Sub-Committee Of Parliament On Official Language With Officials Of ICAR- Central Institute of Brackishwater Aquaculture, Chennai



The second sub-committee of Parliament on Official Language had interaction meeting with officials of Central Institute of Brackishwater Aquaculture, Chennai on 4.10.2018. The meeting was convened by Honorable Dr. Prasanna Kumar Patasani, Member of Parliament (Lok Sabha) and Convenor of the second sub-committee of Parliament on Official Language. The other honorable members of this committee were Dr. Sunil Baliram Gaikwad, Member of Parliament (Lok Sabha), Shri. Prataprao Ganpatrao Jadhav, Member of Parliament (Lok Sabha), Shri. Pradeep Tamta, Member of Parliament (Rajya Sabha), and Mr. Harnath Singh Yadav, Member of Parliament (Rajya Sabha). During this interaction meeting, Dr. K.K. Vijayan, Director, Central Institute of Brackishwater Aquaculture, Chennai apprised the Honorable Members of Parliament on the

progress related to the implementation of the official language at the Institute. The interaction meeting was attended by Dr. P. Praveen, Assistant Director General (M.Fy.), ICAR, New Delhi, Shri. M.L Gupta, Deputy Director (Official Language), ICAR, New Delhi, Mr. Manoj Kumar, ACTO, ICAR, New Delhi. Dr. M.S. Shekhar, Principal Scientist and Officer, In-charge Hindi Cell, Shri. K.V.S. Satyanarayana, Administrative Officer, Shri. R.K. Babu, Finance and Accounts Officer, and Mr. K.G.G.K. Murthy, Personal Assistant, were other personnel from Central Institute of Brackishwater Aquaculture, Chennai who attended this meeting. In this occasion, the Institute also exhibited books, publications and other documents of the Institute related to official language for the Honorable Members of the Parliament.

ICAR-CIBA Celebrated Mahila Kisan Divas with Irula Tribal Women at Karathittu Village, Kancheepuram District of Tamil Nadu



ICAR-CIBA celebrated Mahila Kisan Divas on 15th October, 2018 at Karathittu village, Vayalur Panchayat of Kancheepuram district of Tamil Nadu to recognize the contribution of women in fisheries and aquaculture. About 60 tribal women from the village participated in

the programme. Two successful women farmers from Thirividanthai village who have successfully adopted CIBA's pearlspot fish larval rearing technology shared their experiences the way the technology provided them a viable livelihood option. Mrs. Selvi, Director-in-charge, Irula Tribal Women Welfare Society, Chengelpet, Tamil Nadu highlighted the significance of non-farm activities undertaken by them for doubling the family income tribal families.

Annual review meeting of CRP on vaccines and diagnostics

The annual review meeting (2017-18) of the Consortium Research Platform (CRP) on Vaccines and Diagnostics was held at ICAR-CIBA during 30-31 October, 2018 under the chairmanship of Dr. J.K. Jena, Deputy Director General (Fisheries) and DDG in-charge Animal Sciences, ICAR. Dr. Ashok Kumar, ADG (AH), ICAR, Dr. K.K.Vijayan, Director, CIBA, Dr. Aniket Sanyal, Co-ordinator, CRP on V & D, sectoral

coordinators and all Principal investigators under CRP on vaccines and diagnostics participated in the event. Two external experts, Dr. K.S. Palaniswami, Former Director (Research), TANUVAS and Dr. Malathi, Adjunct Professor, Department of Plant Pathology, TNAU, Coimbatore reviewed the projects and given the directions for future.

ICAR-CIBA Celebrated World Fisheries Day on 22nd November, 2018 with Fishers from Karathittu Coastal Village, Kancheepuram District, Tamil Nadu



Globally, World Fisheries Day is observed to highlight the importance of fisheries and fish farming and to focus on issues such as overfishing, habitat destruction and other serious threats to the sustainability of marine and freshwater resources. CIBA celebrated the World Fisheries Day with the coastal fishers at Karathittu village in Vayalur Panchayat of Kancheepuram

district of Tamil Nadu. About 60 fishers' including, tribals and rural youth participated in the programme. The participants were sensitized about the importance of sustainable fishing, impact of habitat destruction and conservation of bio-diversity and opportunities for livelihood and income through the technologies developed by CIBA.

World Soil Day celebration at ICAR-CIBA on 5th December 2018



On the occasion of celebration of World Soil day, ICAR-CIBA organised Brackishwater Aquaculture Farmers Meet at B. Mutlur, village, Cuddalore District, Tamil Nadu on 5th December 2018 under the National Innovations in Climate Resilient Agriculture (NICRA) Project. About 104 farmers participated in the meeting, and 55 Soil and Water Health Cards were distributed to aqua farmers during the occasion. Dr. M. Srinivasan, Director and Dean, Faculty of Marine Sciences, Annamalai University, Parangipettai, Shri. C. Subramanian, Assistant Director of Fisheries, Parangipettai and Shri. Babu, RGCA (MPEDA), Sirkazhi attended the celebrations.

ICAR-CIBA Celebrated Kisan Diwas with Fishers and Tribal Farmers at Sadraskuppam Village, Kancheepuram District, Tamil Nadu



National Farmers Day or Kisan Diwas is celebrated every year on 23rd December in the honour of Chaudhary Charan Singh who was the fifth Prime Minister of India. ICAR-CIBA celebrated the Kisan Diwas with the fishers and tribal farmers of the Sadraskuppam village, Kancheepuram district, Tamil Nadu. Dr. T. Ravisankar, Principal Scientist, ICAR-CIBA, Chennai, narrated the demonstration and extension activities

conducted in various coastal states by ICAR-CIBA for tribal and coastal communities for enhancing their livelihood. CIBA staff sensitized the participants about their employment opportunities in fisheries especially for youth and women, and income generation using cost effective brackishwater aquaculture technologies in the vast stretches of brackishwater resources available in the region.

ICAR- CIBA Celebrated its Foundation and Annual Day on 29th December, 2018



The ICAR-Central Institute of Brackishwater Aquaculture (ICAR-CIBA), Chennai celebrated its Foundation and Annual Day on 29th December, 2018. On this occasion the institute observed “Open House” by making the laboratories open to the graduate and post graduate students of city colleges and the public to visit the state of the art research facilities. Visiting students showed keen interest in research programs and had active interactions with scientists. The exhibition of brackishwater live fishes, shrimp and crab species, and an array of ornamental fishes, has been the main attraction. During the interaction with scientists, health benefits of finfishes and shell fishes have been highlighted. The institute research and development activities were displayed as posters, pamphlets and videos, for the benefit of the visitors. Students and

staffs from major colleges in the city visited the labs and exhibition during the open day.

The annual day was celebrated in the evening where Dr. M.A. Atmanand, Director, National Institute of Ocean Technology (NIOT), Chennai graced the occasion as Chief Guest. On the occasion, Dr. Atmanand appreciated the efforts and achievements of CIBA, and specially appreciated the efforts in bringing the green concepts to the CIBA campus. He also explained about the life cycle of plastic particles entering into human food chain and its adverse consequences. He highlighted the CIBA's lead role in the frontier areas of aquaculture and emphasized the necessity for the active co-operation between institutions such as CIBA and NIOT to pave the way for sustainable aquaculture.

Harvest of Pond Culture Milkfish from Demonstration Site and Farmers Interaction Meet on 6th September, 2018 at Debichak, Shibgobindapur, Patharpratima



Harvest of hatchery produced milkfish in West Bengal for popularization among the stakeholders through farmers interaction meet was organized at Debichak, Ramganga, South 24 parganas on 6th September 2018. Milkfish fingerlings stocked in a 0.14-ha brackishwater pond during March 2018 attained 300-350 g in 6 months of monoculture. Approximately 600 kg milkfish (4.2 ton/ha) was harvested from this pond. Farmer has experienced good survival of milkfish fed with floating

pelleted feed and natural food like periphyton. The cost of production for milkfish is around Rs. 80/ kg and it has a ready market of minimum Rs. 160-180/ kg which is economically viable. Milkfish is having tiny bones and appearance resembling hilsa and can be considered as the 'Deccan hilsa', an alternative to costly hilsa, affordable by ordinary consumers. About 50 farmers witnessed the harvest and attended the interaction meet.

Hindi Week Celebration During 16-22 September 2018

Hindi week was celebrated at Kakdwip Research Centre during 22-28 September 2018 to promote the use of Hindi in Official and Scientific works. In this connection various competition such as singing, quiz, extempore etc. were conducted, among the KRC-staffs.

Chief Guest of the valedictory function, Mr. Chandra Gopal Sharma (Ex-Deputy General Manager, Rajbhasa, Eastern Railway, Kolkata) delivered a motivating talk on how to use Hindi in official and scientific works. He also encouraged the uses of Hindi in file noting.

Swachh Bharat Mission: Swachhta Hi Sewa programme at Ganeshnagar Village, Namkhana

Organized Swachhta Hi Sewa programme at vill. Ganeshnagar, Namkhana, South 24 Parganas, West Bengal on 01.10.2018. In this occasion, scientists of the centre addressed a group of 30 farmers from the adopted village about the necessity of cleanliness and

swachhta programme. All the farmers participated in cleaning of plastics and garbage from the village road and market. All the scientists, staff and research scholars took active participation in the programme.

Organization of Swachhta Hi Sewa programme



Organized Swachhta Hi Sewa programme at Dakshin Lakshminarayanpur, Patharpratima Island on 25.09.2018 and vill. Ganeshnagar, Kakdwip on 01.10.2018 in South 24 Parganas, West Bengal. In this occasion, scientists of the centre addressed a group of 40 farmers from the adopted village Patharpratima and

30 farmers from Ganeshnagar about the necessity of cleanliness and swachhta programme. All the farmers participated in cleaning of plastics and garbage from the fish pond dyke. The village road and market place were also cleaned. All the scientists, staff and research scholars took active participation in the programme.

Swachhta Pakhwada Celebration at Tribal Village



Organized Swachhta Pakhwada at Mundapara-Manmathapur, South 24 Parganas, West Bengal with an address to the farmers about the importance of utilization of homestead fallow land by converting to kitchen garden for cultivation of horticultural crops that provide extra incomes, meet up domestic needs for vegetables and nutrition, and create clean and esthetic surroundings of a house. This would also help in keeping house premise weed free and maintaining healthy organic environment. Therefore, maintenance

of kitchen garden as a household activity by small and marginal farmers is promoted in the adopted tribal village and few tribal farmers are doing kitchen garden with the help of CIBA, Kakdwip Centre. As a Swachhta Pakhwada celebration to motivate other farmers on this practice, scientists and staff of the centre along with village women participated in the activity of maintenance of kitchen garden in their land adjoining house

SCAFi-CIBA lecture series



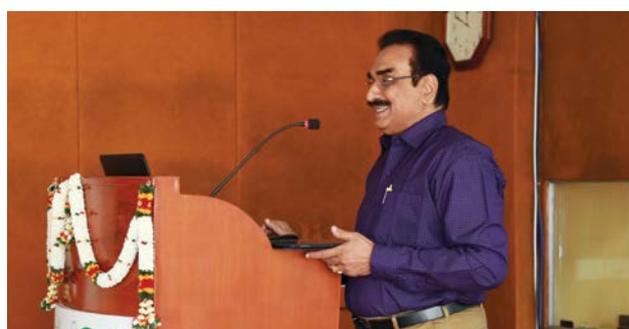
Dr. K.K. Ramachandran, Scientist and Head, Central Geomatics Lab, Group Head Atmospheric process group, National Centre for Earth science Studies (ESSO), Trivandrum, Ministry of Earth Sciences, Gol given a talk on “GPS and Natural System Research” on 20th April 2018.



Dr. George Chamberlain, President, Global Aquaculture Alliance (GAA), USA spoke about “The Technological Advances in Global Shrimp farming” on 1st May 2018.

CIBA-SCAFi Lecture Series: “Emotional Quotient and You”, Prof. (Dr.) Mohan Joseph Modayil, Former ASRB Chairman, Ex-Director CMFRI Delivered Invited Talk on 15th November, 2018, at CIBA, Chennai

SCAFi lecture series at ICAR-CIBA is intended to provide understanding and debate on the issues of importance under ICAR research system and also to give futuristic perspectives on research and philosophical aspect of day to day life. Prof. Modayil opened up his talk on ‘Emotional Quotient and You’ citing the importance of balanced Intelligence Quotient (IQ) and Emotional Quotient (EQ) in with a balance in personal life and career. The anecdotes on the attributes to be acquired by citing the ‘Ant Philosophy’ and ‘Fish philosophy’ was very captivating. He carefully analysed the behavioural patterns of ants and fish and pointed out that the different traits like finding the way forward, thinking ahead, being positive, adaptability and co-existence etc., are some of the qualities that can be adopted in our routine. The concept of EQ pyramid and EQ matrix were introduced to the audience by the speaker. Prof. Modayil elucidated the concept of EQ pyramid by explaining the different layers of the pyramid with relevant examples, relating the career in ICAR itself. The growing concern of Attention Deficiency Trait



(ADT), due to excessive use of technologies such as smartphone & social media and increasing detachment of individuals from the societal activities was also brought to limelight. He also addressed the management of emotions which was very beneficial. The Director of CIBA, Dr. K.K. Vijayan, President of SCAFi, in his presidential remark, stressed upon the importance of institution building when one pursues the career. Talk elicited active discussion among the audience with scientist, staff and students.

Sl. No.	Training programme	Duration	No. of Participants
1.	Seed production and farming technology of brackishwater catfish, <i>Mystus gulio</i>	2-7 July 2018	25
2.	Advances in Brackishwater Aquaculture Practices	23-28 July 2018	13
3.	Training of Trainers (ToT) Programme on Advances in Brackishwater Aquaculture Practices	20-24 August 2018	11
4.	Brackishwater fish, shrimp and crab culture with feed formulation and feed management	10-15 September 2018	15
5.	TSP Training programme on "Integrated Polyculture with Fish and Livestock"	9 October 2018	50
6.	Need Based Training for IFB Technical Staff on "Advances in Brackishwater Aquaculture Practices"	26-28 December 2018	19



Mystus gulio training programme



Skilled Development Training for Shrimp farmers

Skill Development Training programme on “Recent Advances in Soil and Water Management in Brackishwater Aquaculture”



A six-day hands-on training programme on “Recent Advances in Soil and Water Management in Brackishwater Aquaculture” was organized by Environment Section of Aquatic Animal Health & Environment Division during 25–30 June 2018 at ICAR–CIBA, Chennai.



EXHIBITION

- CIBA Exhibition Stall in National Fish Farmers Day Celebration at NFDB, Hyderabad during 9-10 July 2018.
- CIBA Exhibition Stall in the 22nd National Agricultural Exhibition at Milan Samity Maidan, Nimta, Kolkata during 3-6 August 2018.
- Exhibition Stall in Mati, Krishi, Udyan Palan, Matsya, Krishi Bivanan, Samabai-o- Pranisampad Mela at Kakdwip, South 24 Parganas during 8-10 December 2018.
- CIBA Exhibition stall in the 27th Agri-Horticulture Show during 1–8 January 2019 at Bidhan Maidan, Kakdwip.
- CIBA Exhibition stall in National Workshop at ICAR-CIFA, Bhubaneswar during 18-19 February 2019.





NEWLY JOINED

Sl.No	Name of Officials	Designation	Date of Joining
1	Shri. R.K. Babu	Finance and Accounts Officer	23.05.2018



PROMOTION

Sl.No	Name of Officials	Designation	Date of Promotion
1	Dr. K.P. Kumaraguru vasagam	Principal Scientist	26.03.2018
2	Dr. B. Sivamani	Senior Scientist	07.01.2017
3	Dr. P.S. Shyne Anand	Senior Scientist	07.01.2018
4	Dr. Prem Kumar	Senior Scientist	10.02.2018
5	Dr. R. Geetha	Senior Scientist	23.06.2018
6	Smt. B. Prasannadevi	Upper Division clerk	27.10.2018
7	Smt. K. Subhashini	Personal Assistant	06.12.2018
8	Shri M. Shenbaga Kumar	Chief Technical Officer	01.07.2018



SUPERANNUATION

Sl.No	Name	Designation	Date
1	Shri. P.S. Samanta	Technical Officer	30.09.2018
2	Shri. K.V.S. Satyanarayana	Administrative officer	31.10.2018
3	Dr. G. Gopikrishna	HOD, NGBD	30.11.2018

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THE TIMES OF INDIA

CIBA to inaugurate its first aquaculture research centre at Navsari Agriculture University

TNN | Jun 7, 2018, 04:00 AM IST
SURAT: Chennai-based Central Institute of Brackishwater Aquaculture (CIBA) has joined hands with Navsari Agriculture University (NAU) in setting up the first regional research centre for aquaculture in south Gujarat.

CIBA will be launching its first regional research centre in aquaculture at NAU campus on Thursday in the presence of deputy director general (fisheries science), Indian Council of Agricultural Research (ICAR), Dr Joykrushna Jena and director of CIBA Dr K K Vijayan, including deputy chief whip in Gujarat assembly R C Patel.

Sources said the total seafood exports from the country in 2016-17 is pegged at Rs 37,571 crore and the farm aquaculture export constitute a whopping Rs 25,000 crore. After Andhra Pradesh and Tamil Nadu, Gujarat is leading in shrimp farming.

THE  HINDU
ANDHRA PRADESH

Scientists up in arms against 'illegal imports' of Asian Seabass wild seed

Indian scientists and progressive aquafarmers are up in arms against alleged illegal imports of Asian Seabass (Lates Calcarifer) wild seed from Bangladesh, Malaysia, and South Africa, even as there is an acute shortage of the seed with government agencies such as the Central Institute of Brackishwater Aquaculture (CIBA) and Rajiv Gandhi Centre for Aquaculture (RGCA).

In brackishwater aquaculture, Asian Seabass is the prime species alternative to the Vennamei species that had badly suffered due to the spread of 'White Spot Disease', which

THE HINDU
BusinessLine

Agri Business

Maharashtra to set up seabass hatchery

V Sajeew Kumar Kochi | Updated on August 27, 2019 | Published on August 27, 2019

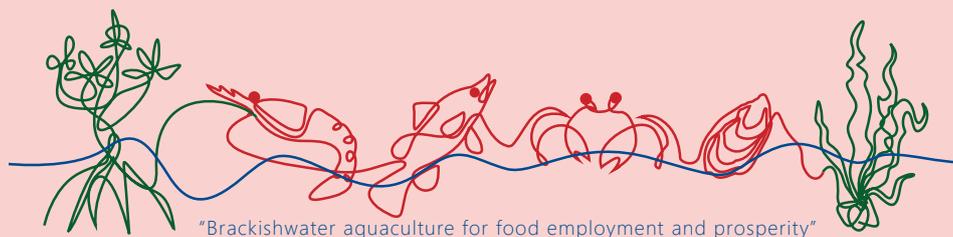


The Maharashtra government has signed an agreement with the Chennai-based Central Institute of Brackishwater Aquaculture (CIBA) to boost farmed fish production.

The MoU involves setting up of a seabass hatchery, and continuing the partnership of CIBA with Mangrove Foundation of Maharashtra for the promotion of brackishwater cage farming. Maharashtra, with huge brackishwater resources along its 720-km coastline, offers good potential in the farming of brackishwater fin-fishes such as seabass, said KK Vijayan, Director, CIBA.

Location

CIBA will provide technology support to the hatchery with an annual production capacity of 20 lakh of seabass larvae. The facility, which is to be established in Vengurula taluk of Sindhudurg district, will provide livelihood support to the fisherfolk and coastal villagers living on the fringes of mangrove forests, he said.



Navsari Gujarat Research Centre, ICAR-CIBA



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