

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.

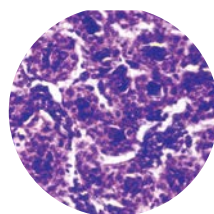
Front cover :

Farming of Asian seabass in customised floating cages in open brackishwater at Sindhudurg (Maharashtra)

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FROM THE DIRECTOR'S DESK

Another eventful year for CIBA, with significant success stories, meaningful research outcomes, achievements and events, which brought CIBA right in front of the stakeholders. All these constructive outcomes have significantly increased the visibility of CIBA both nationally as well as internationally. As a research and development organization, our main objective is to provide technology backstopping based on the issues faced by the different stakeholders of the sector, mainly the farming community. We see tremendous scope for expansion of brackishwater aquaculture, considering the under-utilized brackishwater resources along the coastal states, union territories, islands and inland saline areas. Our focus is not only restricted with the diversification of species, but also to the farming systems, customized to our diverse agroclimatic conditions. In this perspective, this year, we successfully demonstrated cage farming of Asian seabass (*Lates calcarifer*) in the Buckingham canal estuarine complex near Marakanam, Tamil Nadu, using the three-tier farming model. This model comprises nursery rearing, pre-grow out and grow out cages, which were indigenously crafted in collaboration with the National Institute of Ocean Technology (NIOT), Chennai. Main bottleneck in cage farming of seabass is how to raise the stockable fingerlings of size, 25-50 g, and we have showed it through the tier based nursery rearing of seabass, where self-help groups of women, families or an entrepreneur can take up homestead rearing in the nearby backwater or pond, in 2 months cycle, realizing the income at the end of 2 months, producing the fingerlings of 25 g and above, giving hope for many farmers and other stakeholders in the aquafarming sector. This has given hope for many farmers and other stakeholders in the aquafarming sector.

We are also closely looking at the emerging disease issues in the exotic *Penaeus vannamei* shrimp farming and addressing the needs of the sector from time to time with our expertise under the project on National Surveillance Programme on Aquatic Animal Diseases. Hepatopancreatic

microsporidiosis caused by *Enterocytozoon hepatopenaei* (EHP), White spot disease (WSD), and aquaculture management related syndromes appear to be the predominant issues resulting in mortalities and crop losses. We also observed sporadic occurrence of Infectious myonecrosis virus (IMNV) in farms at Andhra Pradesh and Tamil Nadu, which would be a serious concern, as IMNV is known to cause significant mortalities in *P. vannamei*. The occurrence of EHP and WSSV of an epidemic magnitude and the recent detection of exotic IMNV in certain shrimp farms indicates the lack of strict biosecurity regulations.

Farming of native Indian white shrimp *Penaeus indicus* as a species of choice for the future is gaining importance. The Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying has taken initiatives in organizing a discussion on the prospects of *P. indicus* selective breeding for growth and developing a desi SPF, as a complimentary species to exotic *P. vannamei*. Secretary, DFAD visited ICAR-CIBA on 25th September 2019 and reviewed the available infrastructural facilities for initiating a national level flagship programme on selective breeding of *P. indicus*, involving the research institutions, developmental departments, private sector and farmers on consortium mode. This has given new hope for the stakeholders and encouragement for CIBA, who works at the forefront of this task.

I am privileged to inform that CIBA scientists bagged two ICAR awards this year, the National Swami Sahajanand Saraswati Outstanding Extension Scientist Award and the Nanaji Deshmukh Award for outstanding interdisciplinary team research in the category of Animal and Fisheries Sciences, which is a testimony to the quality research work CIBA is taking up. We feel contented to bring the seventh issue of the CIBANEWS, which carries the significant achievements, events, and outcomes of CIBA in the year 2019. I hope you all will feel interesting, useful and inspiring while glancing through the pages, which gives a glimpse of CIBA in 2019.

Dr. K.K. Vijayan
Director



DISEASE SURVEILLANCE IN SHRIMP FARMS ALONG THE EAST COAST OF INDIA

Disease epizootics are the major hurdles in the growth and development of aquaculture. Disease surveillance was carried out in 389 *Penaeus vannamei* farms along the east coast of India viz., Tamil Nadu (TN), Andhra Pradesh (AP), West Bengal (WB), and Odisha during 2015-2018. *Enterocytozoon hepatopenaei* (EHP), White spot disease (WSD), and aquaculture management related syndromes were predominant during the surveillance period. EHP was prevalent in as many as 27% of the total farms investigated, and White spot syndrome virus (WSSV), the primary viral disease in 16% of the farms, followed by Monodon baculovirus (MBV) and Infectious hypodermal and haematopoietic necrosis virus (IHHNV) in 2% of the farms. Lately, the exotic virus Infectious myonecrosis virus (IMNV) was detected with a prevalence of 2% in certain areas of TN and AP. Among the management related syndromes, size variation and White faeces syndrome (WFS) were predominant and were recorded in 23% and 17% of the farms. Other management syndromes, viz., running mortalities, loose shells, white muscle and black gills were recorded in 6, 5, 4 and 4%, respectively. Diseases like Hepatopancreatic parvo-like virus (HPV), Taura syndrome virus (TSV), Yellow head virus (YHV) and Acute hepatopancreatic necrosis disease (AHPND) were not detected during this period.

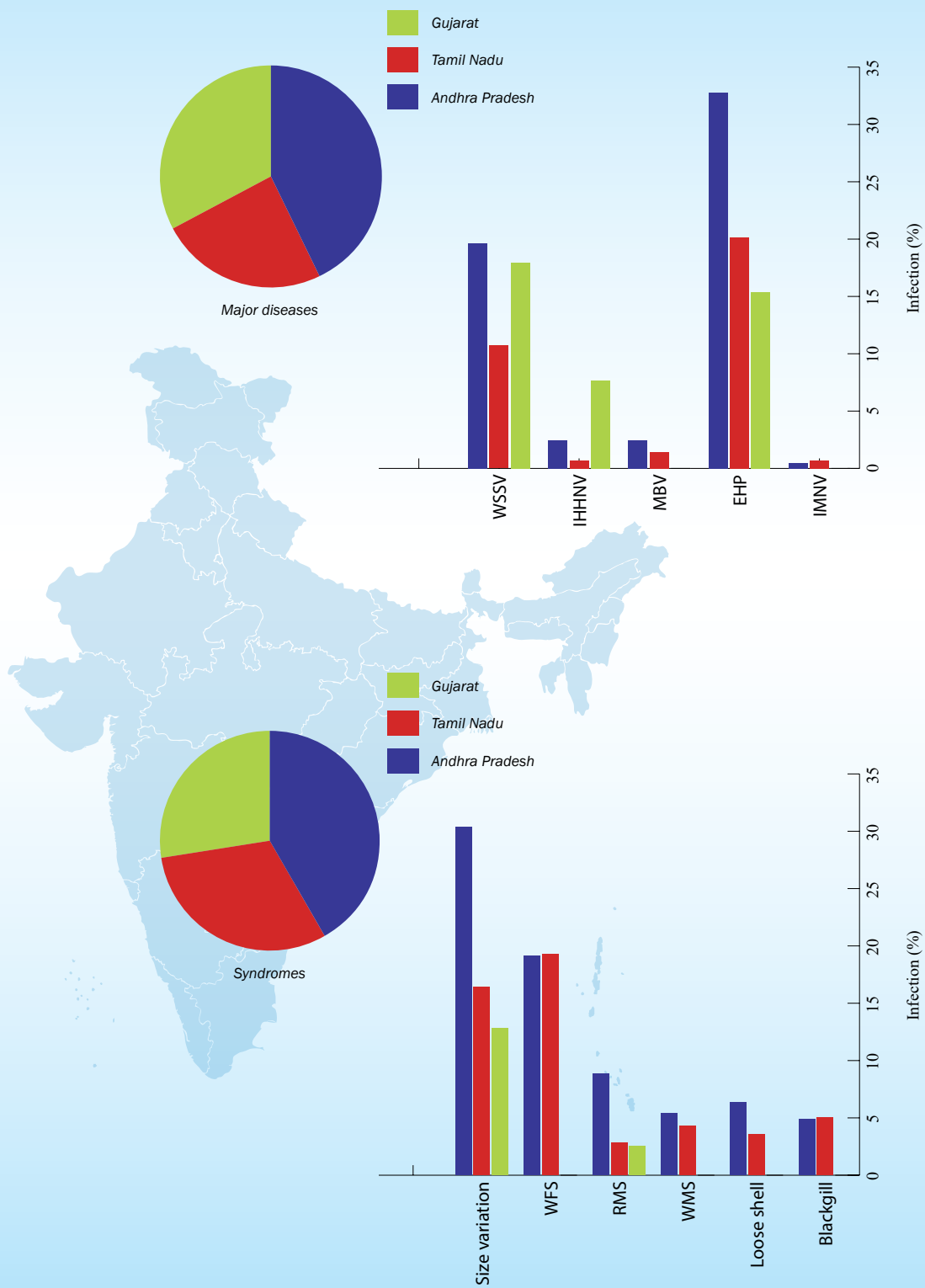
Spatial distribution

Among the shrimp farming states, the prevalence of WSSV infection was highest in AP (20%) followed by WB (18%) and TN (11%). The emerging disease, microsporidian EHP was highly prevalent in states of AP (28%), TN (21%) and WB (15%). Farms affected with size variation were highest in AP (30%) followed by TN (16%) and WB (13%) and 19% of the farms in AP and TN farms were affected with WFS. Among RMS affected farms, 9% of affected ponds were in AP followed by TN (3%) and WB (3%).

Seasonal distribution

Of the 212 summer crops (March- July) and 177 winter crops (August- December), the prevalence of WSSV was marginally higher in summer (16.5%) than during the winter (15.2%) crops. In contrast, the prevalence of EHP was marginally higher in winter (27.4%) than in the summer season (25.6%). Size variation was higher in winter (26%) than during summer (20.7%). The proportion of farms affected with WFS and RMS was higher during summer than in the winter.

The occurrence EHP and WSSV to an epidemic magnitude and the recent detection of exotic IMNV in certain shrimp farms indicates the lack of strict biosecurity regulations and susceptible nature of shrimp aquaculture. Apart from the epidemic diseases, the substantial damage (46%) caused by management related syndromes in Indian shrimp farms are found to be a major obstacle in the future sustainable productivity from Indian shrimp farms.



INFECTIOUS MYONECROSIS: AN EMERGING THREAT IN INDIAN SHRIMP FARMING

Infectious myonecrosis caused by infectious myonecrosis virus (IMNV), is an OIE listed pathogen. In India, sporadic occurrence of IMNV was detected in shrimp farms in Krishna, West Godavari districts of Andhra Pradesh and Nagapattinam district of Tamil Nadu, during the year 2017 and 2018. Its emergence recently in India is a serious concern as IMNV is known to cause significant disease outbreaks and mortalities in principal host species *Penaeus vannamei*. The onset of the disease characterized by gross signs such as slow growth (~4-5 g at 70 days of culture (DOC)), growth variation, whitish abdominal muscle, muscle cramp and full gut with FCR 2.2. Precariously affected shrimp become moribund, and mortalities can be instantly high and continue for several days with 15% mortality on 70th DOC progressing to 40% in West Godavari farms. The RT-PCR assay of shrimp samples revealed presence of IMNV (NCBI. Acc. No.KY930468) and 100% sequence similarity with Indonesian strain of IMNV (KF 836757). On histopathology, there was edema, shredding of muscle fibers, coagulative to liquefactive necrosis with haemocytic infiltration in striated muscle, hypertrophy of lymphoid organ (LO) and ectopic lymphoid organ spheroids (LOS) in myocardial trabeculae.

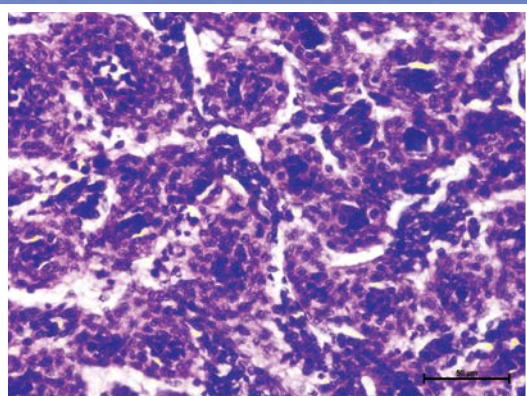
IMNV has been demonstrated to be transmitted through cannibalism. Vertical transmission from broodstock (transovarian or by contamination of the spawn eggs) to progeny and via water-borne route is also likely to occur. IMNV may also be transmitted among farms by faeces of seabirds or shrimp carcasses. Outbreaks of IMNV with unexpected high mortalities may happen following stressful incidents

such as sudden changes in salinity or temperature, capture by cast-net, feeding, etc., in early juvenile, juvenile, or adult *P. vannamei* in regions where IMNV is enzootic. As there are no therapeutic options available for the shrimp viral diseases, prevention and control measures are of paramount importance. It has been realised that the best approach to manage aquatic animal health is to improve biosecurity at all levels. Hence it is essential to screen and detect IMNV to avoid the pathogen entry into culture systems and grow-out farms, using diagnostic tools. The disease can be prevented by stocking IMNV-free post-larvae produced from the virus-free broodstock. Tilling and restocking of affected farms helps in preventing its recurrence. Implementation of better management practices (BMPs) is needed to maintain good water quality, proper feed usages and good health of shrimps through regular monitoring.

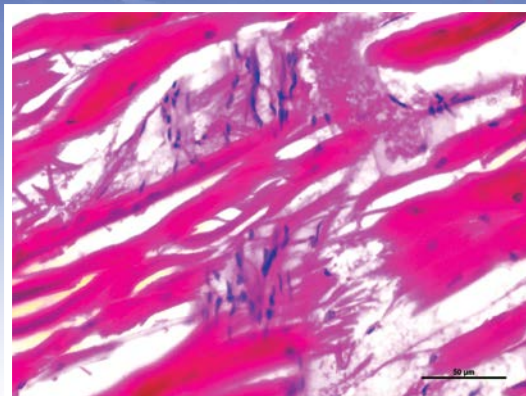
Farmers are advised to contact ICAR-CIBA when they come across symptoms similar to IMNV in rearing ponds, for detailed investigation and confirmation. Samples of affected shrimp showing signs of disease must be preserved suitably for IMNV testing. Dead shrimp samples cannot give accurate diagnosis. Live and moribund samples collected in RNA later or in ice can be sent for IMNV testing. It is necessary that IMNV like new disease cases requires detailed investigation and active surveillance to confirm and create awareness among the farmers. On confirmation of a positive IMNV case, the pond water should be disinfected by chlorination. The treated water should be discharged only after proper deactivation of the disinfectant.

White necrotic area in the distal abdominal segment and tail fan of the diseased shrimp.

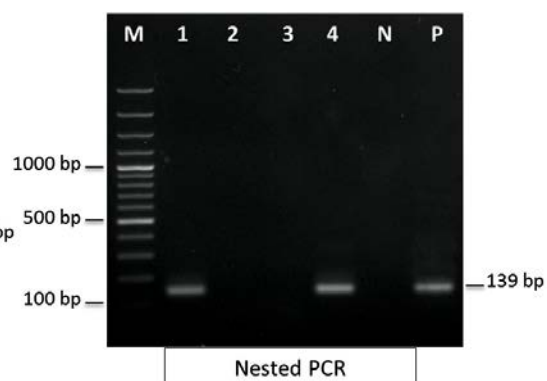
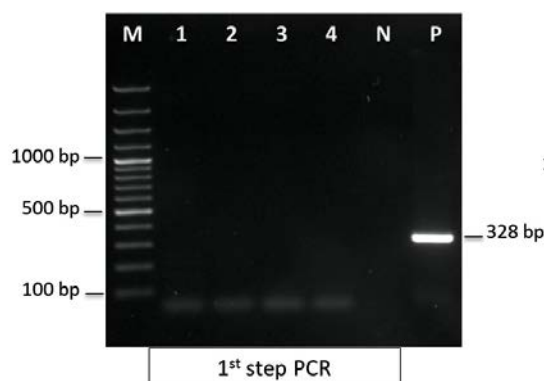




Hypertrophy of lymphoid organ (LO) due to accumulation of LO spheroids (LOS) with lack of central lumen surrounded by fibrous connective tissue, more basophilic cytoplasmic cells, and elongated flattened cells with pyknotic nuclei, H&E (bar: 50 μ m).



Coagulative to liquefactive necrosis of striated muscle fibres with haemocytic infiltration in IMNV infected shrimp, H&E (bar: 50 μ m).



Agarose gel of RT-PCR amplicons using IMNV specific primers.

Lane M: 100 bp DNA ladder, Lane 1: Sample 1, Lane 2: Sample 2, Lane 3: Sample 3, Lane 4: Sample 4, Lane N: (-) Control, Lane P: (+) Control [Note: Samples 1 & 4 are positive for IMNV].

FIRST RECORD OF THE JAVANESE RICE FISH, *ORYZIAS JAVANICUS* (BLEEKER, 1854) (BELONIFORMES: ADRIANICHTHYIDAE) IN THE NATURAL WATERS OF INDIA

ICAR-CIBA, Chennai in collaboration with KUFOS, Kochi recorded the Javanese rice fish, *Oryzias javanicus* (Bleeker, 1854), for the first time from the natural waters of India, based on 15 samples collected from the Muttukadu lagoon, on the south east coast. The Javanese ricefish, *Oryzias javanicus* (Bleeker, 1854), (Beloniformes: Adrianichthyidae) has a natural distribution in the brackishwaters of south east Asia from peninsular Thailand, Malaysia, Singapore, western Borneo and Indonesia east to Sulawesi and Lombok, and in Bangladesh.

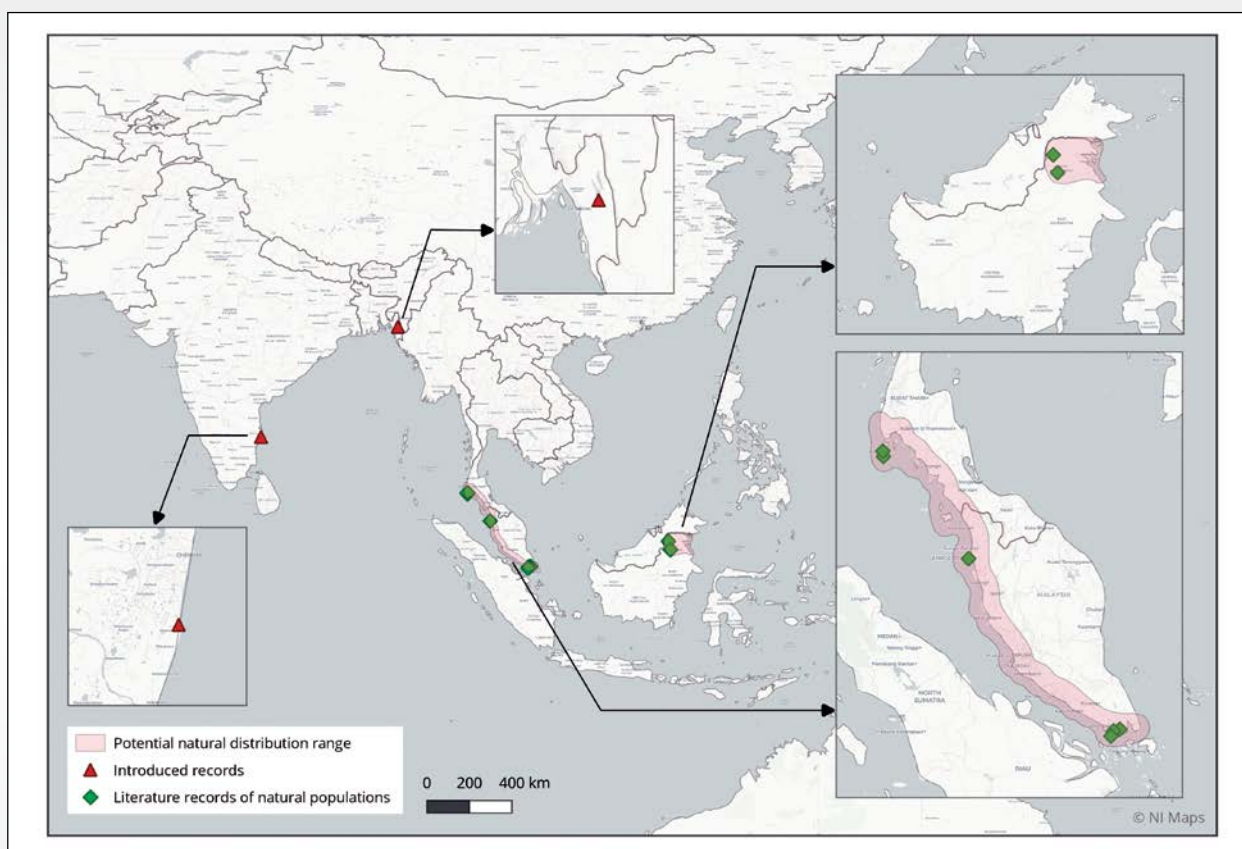
The Muttukadu lagoon population of *Oryzias* sp. was identified as *Oryzias javanicus* following the taxonomic characters supported by genetic data. The species shows population-level variations in their meristic counts. *Oryzias javanicus* is very similar to *O. dancena* and *O. carnaticus*, species that are native to the Indian subcontinent; but *O. javanicus* can be easily distinguished from the Indian species, by the presence of yellowish sub-marginal bands on the dorsal and ventral sides of the caudal fin. The habitat

of *O. javanicus* in Muttukadu lagoon is similar to those observed in peninsular Malaysia.

The confirmation of *O. javanicus* in the natural waters of the Indian peninsula, by ICAR-CIBA upgrades the number of *Oryzias* species recorded from India to five, the others being, *O. dancena* (Hamilton, 1822), *O. melastigma* (McClelland, 1839) (currently in the synonym of *O. dancena*), *O. carnaticus* (Jerdon, 1849), and the endemic *O. setnai* (Kulkarni, 1940). The water bodies around Muttukadu currently comprise the western most distribution range of this species. The presence of a considerable number of individuals in the Muttukadu Lagoon and also in the adjacent experimental ponds of ICAR-Central Institute of Brackishwater Aquaculture (CIBA), suggests that *O. javanicus* is well established in the present locality. However, its natural occurrence in this region needs further exploration, and detailed studies are required to understand the larger distribution range of this species on the south-eastern coast of India, and the areas beyond, in peninsular India.



(a) Male and (b) female *Oryzias javanicus* collected from the Muttukadu lagoon, India



Map showing the native distribution range of *Oryzias javanicus* in South East Asia, and the new record from India

FARMING DEMONSTRATION FOR INDIAN WHITE SHRIMP *PENAEUS INDICUS* IN NAVSARI, GUJARAT

Shrimp aquaculture in Gujarat, as elsewhere in the country is totally dependent on the exotic, whiteleg shrimp *Penaeus vannamei* which is presently plagued by the issues of mortalities, microsporidian infections, white faecal syndrome, slow growth, and poor survival resulting in reduced production and profitability. Among the indigenous penaeids, the Indian white shrimp, *Penaeus indicus* is a candidate species for brackishwater aquaculture owing to its euryhaline behaviour, ease of seed production and reasonably fast growth rate. A commercial grow-out farming trial of *P. indicus* was carried out in Gujarat, India to study the growth characteristics, and economics of the species and thereby test its feasibility as a supplementary species to *P. vannamei* in the state. Grow-out trial was carried out in a 0.4 ha (4000 m²) earthen pond of the Navsari Gujarat Research Centre Farm (Matwad Village, Navsari, Gujarat) where 1.28 lakh WSSV free *P. indicus* post larvae (PL) were stocked (stocking density – 32 PL/m²). The shrimp were fed using a commercial whiteleg shrimp feed (CIBA-Vanami^{plus}) containing 35% crude protein. Shrimp attained a mean body weight of 10 g and 15 g at 76 and 133 DOC, respectively. At the end of 144 DOC, shrimp attained a mean body weight of 16.55±0.31 g with a mean daily and weekly weight gain of 0.13±0.02 g/day and 0.91±0.13 g/week, respectively. Salinity

during the culture period increased to 53 ppt by 10 DOC before reducing to 12 ppt (115-120 DOC) and further increasing to 14.5 ppt at the time of harvest (144 DOC). All the water quality parameters except turbidity were maintained within the optimal range for the species. Turbidity of the rearing medium exceeded 100 NTU beyond 55 DOC. High clay turbidity during the culture may be attributed to the local soil conditions and vigorous bottom feeding/dwelling habit of *P. indicus*. The growout trial for *P. indicus* in Gujarat resulted in a total production of 2053 kg of shrimp with a survival rate of 97.2%, which transforms to a productivity of 5.13 tonnes/ha/crop. Feed conversion ratio during the trial was determined as 1.902. Shrimp production from the growout pond resulted in a total revenue of Rs. 6,36,430 against a total production cost of Rs. 5,87,258, ensuing a net profit of Rs. 49,171/acre/crop, which transforms to a total revenue of approximately Rs. 2.5 lakhs/ha/year. The present trial indicates that *P. indicus* can be used as a species for shrimp aquaculture in Gujarat. Although, Indian white shrimp demonstrates a lower growth rate as compared to the exotic *P. vannamei* (which is genetically improved for growth), its high survival rate, excellent market value and reasonable productivity give conclusive evidence on its potential future in the Indian shrimp industry.

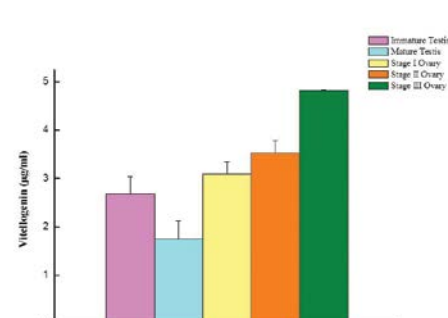
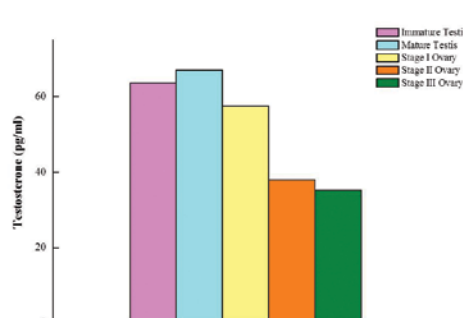
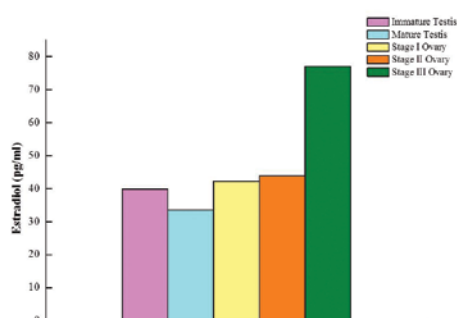




SEX IDENTIFICATION IN GREY MULLET, *MUGIL CEPHALUS*, USING PLASMA LEVELS OF VITELLOGENIN AND SEX STEROIDS

Sustainable production of grey mullet *Mugil cephalus*, an economically important brackishwater aquaculture candidate species, has been challenging with the reproductive dysfunction of females in captivity. Maintenance of appropriate gender ratio under captivity is essential for controlled breeding and seed production of any cultured species. However, the monomorphic nature of grey mullets imposes difficulty in identifying the sexes outside the breeding season. Therefore, identification of markers with a dimorphic expression pattern could help in discrimination of the sex and help in the development of assisted reproductive

techniques for hatchery-based seed production protocols. The associated changes in plasma sex hormone levels with gonad development were examined for sexing grey mullets. Higher levels of plasma E2 was observed in females compared to males while the levels of testosterone were higher in males. The plasma E2 levels and vitellogenin exhibited a positive correlation with the growth of oocytes (ova diameter). The results suggest that assays of vitellogenin combined with sex steroid quantification of plasma can be a potential tool for non-lethal procedure for sex identification of grey mullet, *M. cephalus*.

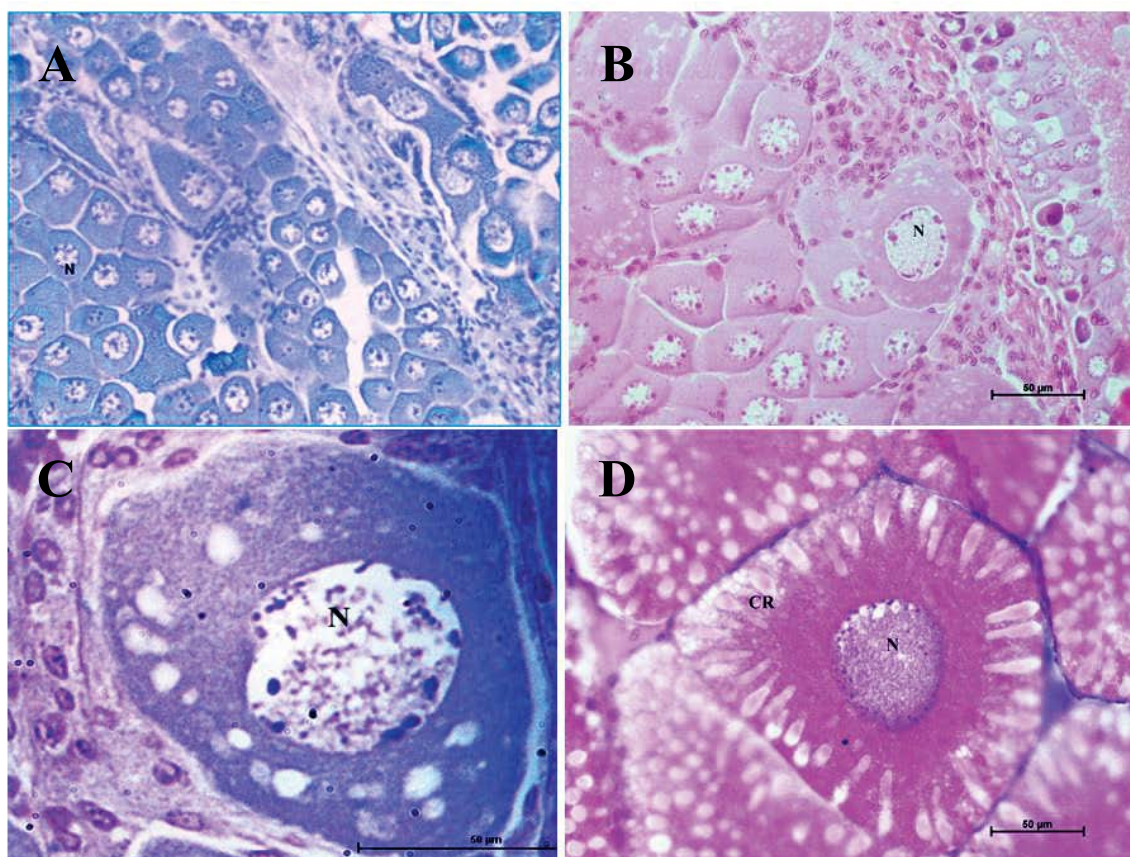


SEROTONIN INDUCED OVARIAN MATURATION IN *PENAEUS INDICUS*

Reproductive performances of wild broodstock are generally higher, compared to domesticated and/or induced matured animals. Manipulation of reproduction in captive brood stock poses a major hurdle in crustacean aquaculture. Unilateral eyestalk ablation, commonly practised in hatcheries, reduces the levels of gonad inhibiting hormone (GIH) and induces ovarian maturation of captive broodstock. But this often results in the production of inferior quality seeds and high mortality with successive spawning. Developing alternative techniques to eyestalk ablations for captive

broodstock development is challenging. Manipulation of the endocrine system to promote gonadotrophic activity by eyestalk ablation and/or treatment with serotonin resulted in enhanced ovarian development in *P. indicus*. The stimulation in ovarian development observed was probably due to removal of GIH in eyestalk ablated group, stimulating the release of gonad stimulating hormone from thoracic ganglia or by acting directly on the oocytes in serotonin treated group and a combination of both the stimulatory processes in the ablated shrimps treated with serotonin.

Histological sections of ovarian tissues collected from Penaeus indicus on Day 14 (A) control, (B) 5-HT group, (C) ESA group and (D) mature oocyte in 5-HT+ESA group.





FARMING OF ASIAN SEABASS IN OPEN WATER CAGES: A SUCCESS STORY

Farming of brackishwater fishes in locally crafted cages suitable for estuaries, creeks, backwaters, and lagoons is an emerging innovative and viable technology for the production of valuable finfish such as seabass. The technology is efficient in utilizing the vast stretches of brackishwater resources along the coastal India for increasing fish production, employment creation and income generation, which entails the vision of the Govt. of India under the blue revolution scheme. In this direction, the ICAR-CIBA, Chennai in collaboration with the National Institute of Ocean Technology (NIOT), Chennai had successfully demonstrated cage farming of Asian seabass (*Lates calcarifer*) in the Buckingham canal waters at Vennangupattu coastal village in Kancheepuram district, Tamil Nadu. Skill development training was provided to fisher youths as part of the Attracting and Retaining Youth in Agriculture (ARYA) initiative of ICAR-CIBA partnering with NIOT. A self-help group named as Dr. A.P.J. Abdul Kalam Fish Producers Self Help Group was formed to take up the cage farming in the backwaters.

A novel three-tier farming model developed by CIBA comprising nursery rearing, pre-grow out and grow out cages were taken up in a phased manner. The farming cycle began with stocking of fish fry (1 cm size) initially in the nursery cages, which were grown to fingerlings (7-8 cm size) in 45-60 days. The fingerlings were transferred to the pre-grow-out cage and then 90-100 g juveniles from pre-grow out were transferred to the grow-out cages for further rearing. The stocking density adopted was 12 kg per/m³. The fishes were fed CIBA's formulated indigenous feed (Seebass^{Plus} @ Rs. 80/kg), respectively @ 10-8%, 4-6% and 2-4% of their body weight in nursery, pre-grow-out and grow out stages. The average Feed Conversion Ratio (FCR) realised was 1.85:1 (1.85 kg feed to produce 1 kg fish). The juveniles were grown to a marketable size of

900 g - 1.25 kg in 6 months. A productivity of 460 kg was realised in two partial harvests in one cycle. Two cycles of production can be taken in a year. The production cost worked out to be Rs. 190/kg of fish and sale price was Rs. 380/kg with a B: C ratio of 2.0. The fish producers were linked to the Tamil Nadu Fisheries Development Corporation a state government body for marketing.

A harvest cum interaction meet organised at the farming site, on 4th August, 2017, in which the Director, ICAR-CIBA, handed over the revenue generated from the sale of fish produced to the SHG. He told that the three-tier cage farming has proved to be a successful model and opined that the group members can divide themselves in to three units to look after one component each and one unit can sell their produce to the other unit for further rearing so that everyone can get income in 3-4 months. Customized designing of cages for the brackishwaters has been done by the Marine Biotechnology Division, NIOT. Fisheries being the state subject, state fisheries department extended full support, the Joint Director of Fisheries, Tamil Nadu witnessed the harvest and viable technology for the state fisheries department which will be taken up for popularization to other coastal districts of the state. Similarly, the Joint Director of Fisheries, Pondicherry Union Territory has informed that their department has already initiated a work plan with CIBA to take up cage farming in the backwaters of Pondicherry Union Territory. This concept adopted a 'logical technology transfer mode' starting with skill development, provision of inputs (seed and feed) for one cycle, successful cage rearing and production, and successful marketing, can be easily duplicated. This three-tier cage farming model is a win-win model available for fishers as an alternative livelihood option and also an employment opportunity for the fisher youth in coastal India.



FLATHEAD MULLET

(*MUGIL CEPHALUS*)



The flathead mullet, *Mugil cephalus* is an important food fish species in the mullet family Mugilidae. It is a cosmopolitan species found in tropical, subtropical and temperate zones of all seas, and attains a size of 30 to 75 cm in total length. It is known with numerous English names, including the flathead mullet, striped mullet (US, American Fisheries Society name), black mullet, bully mullet, common mullet, grey mullet, sea mullet and mullet, among others.

The species is euryhaline, that can acclimate to different levels of salinity and the adults are profoundly seen in coastal waters often entering estuaries and rivers, and sometimes far-up-river, lagoons and hypersaline environments. It usually schools over sand or mud bottoms, feeding on zooplanktons in the early stages and feeding on detritus, micro-algae and benthic organisms later. Grey mullet is an ecologically and economically important teleost species occupying lower trophic levels of the food chain, which makes it a suitable candidate species for sustainable aquaculture like polyculture. It's a high value aquaculture species in India, which have a market value of up to Rs. 750/- per kilogram. As the hatchery technology for the seed production is not standardised, the farming of this fish

KINGDOM	: Animalia
PHYLUM	: Chordata
CLASS	: Actinopterygii
ORDER	: Mugiliformes
FAMILY	: Mugilidae
GENUS	: <i>Mugil</i>
SPECIES	: <i>M. cephalus</i>

solely depends on the availability of wild caught fry and fingerlings. The farming is also restricted to those places where there is ample availability of seed in wild.

Many researchers have attempted to develop hatchery technology for flathead mullet with limited success for decades. ICAR-CIBA has successfully developed the captive maturation of two stocks of mullet brooders from different geographical areas. Larval rearing was also developed successfully for the first time in the country and need further standardisation for commercially disseminating the technology for the benefit of farmers.

TECHNOLOGY TRANSFERS, PRODUCT RELEASES AND KNOWLEDGE PARTNERSHIPS

Rallis India Limited, Mumbai Signed MoU for the Transfer of “CIBAMOX”- Water Probiotic Technology



ICAR-CIBA has developed a water probiotic “CIBAMOX” which has the innovative combination of ammonia oxidizing bacteria, nitrite oxidizing bacteria and denitrifying bacteria. Rallis India Limited, (Tata Enterprise), Mumbai and ICAR-CIBA signed MoU on 15 February 2019 for up-scaling and commercial production on a non-exclusive basis. Dr. K.K. Vijayan, Director, highlighted the role of ICAR-CIBA in providing

technology support to Brackishwater aquaculture sector. Representing Rallis India Ltd., Shri. N.K. Uppal, Vice-President (Corporate Growth Projects) appreciated the knowledge initiatives of CIBA for developing cost effective user friendly technologies for the sector. The event was coordinated by the Institute Technology Management–Agri Business Incubation (ITMU-ABI) unit of ICAR-CIBA.



‘FISH WASTE PROCESSING UNIT’- AN INITIATIVE BY ICAR-CIBA, CHENNAI

ICAR-CIBA has developed technology for transforming fish waste to high value products for use in commercial aquaculture and agriculture. In a major initiative under Mera Gaon Mera Gaurav programme, a ‘Fish Waste Processing Unit’ was established by the institute on 18 February 2019 at Nambikkai Nagar, Pattinapakkam, Chennai. The facility will be operated by a Self Help Group (SHG) and tribal communities of Nambikkai Nagar for recycling of fish waste to value-

added products in line with the theme of ‘Waste to Wealth: recycling of fish waste’ under Swatch Bharat Mission. This start-up unit focuses on cleaning and hygienic disposal of fish-market waste available in the village cluster and put into use of fish waste processing unit for producing value-added products for livelihood. Two cost effective indigenous eco-friendly products, branded as CIBA-Plankton^{Plus} and Horti^{Plus} were developed under this programme.



ICAR AWARDS



Dr. M. Kumaran, Principal Scientist (Agricultural Extension), ICAR-CIBA Received ICAR National Swami Sahajanand Saraswati Outstanding Extension Scientist Award for his contribution in the field of extension education. The award was presented to him by the Hon'ble Union Minister for Agriculture and Farmers Welfare, Shri. Radha Mohan Singh on 16 July 2018 in recognition of his contribution in the field of extension research and education. In his commendable work on 'Appraisal of evolving *Litopenaeus vannamei* shrimp culture systems and associated production risks for the development of Better Management Practices and their dissemination through innovative extension approaches". He assessed the technical efficiencies of the Pacific white shrimp (*Penaeus vannamei*) production systems across the country adopting innovative extension approaches. Further, he has appraised the risk factors in the production systems of shrimp farming and advocated risk management practices. The scientist has contributed for the enhancement of knowledge and skill capacities of aqua farmers and extension workers on risk management practices through sensitization cum training workshops in all the coastal states and publication of farmer-friendly publications in vernacular languages besides launching of a mobile application-Vanami Shrimpapp. The award carries a citation and cash prize of Rs. 1 lakh.



AWARDS

ICAR NATIONAL TEAM AWARD FOR NUTRITION AND FEED BIOTECHNOLOGY WON BY CIBA SCIENTISTS



ICAR-CIBA Nutrition team was awarded with the Nanaji Deshmukh ICAR Award for outstanding inter-disciplinary team research in Agriculture and allied sciences 2015-16 in the category of Animal and Fisheries Sciences. The team leader, Dr. K. Ambasankar, Principal Scientist received the award from Dr. Trilochan Mohapatra, Hon'ble secretary, DARE and Director General, ICAR, on the occasion of Pusa Krishi Vigyan Mela organized at ICAR-IARI, New Delhi on 5 March 2019. The inter-

disciplinary team comprises of Dr. K. Ambasankar, Dr. J. Syama Dayal, Dr. K.P. Kumaraguru Vasagam, Late Shri. S. Stanline, Dr. P. Nila Rekha, Dr. Debasis De, Shri. K.P. Sandeep, Dr. T.K. Ghoshal and Dr.K.K. Vijayan. The team has successfully developed indigenous feed processing technologies and cost-effective feeds for brackishwater shell fish and finfish species leading to commercialisation. The award carries a citation and cash prize of Rs. 5 lakhs.



Bangladesh delegates visited ICAR-CIBA to learn the development of shrimp farming in India



A team of 14 officials from Government of Bangladesh led by Ms. Mahbooba Panna, Joint Secretary, Ministry of Fisheries and Livestock, visited ICAR-CIBA on 25th April 2019. The main purpose behind this visit was to study the developments in the shrimp farming sector in India and to share the challenges India faced in the past one decade to become a major shrimp producing country in the world. The team comprised ten officials representing the Government of Bangladesh and four representatives of the private sector. The visit was jointly coordinated by the Bay of Bengal Programme (BOBP) and the Department of Fisheries, Government of Bangladesh. Officials from the Coastal Aquaculture Authority of India (CAA) and ICAR-CIBA were part of this meeting to interact and clarify the

doubts of the Bangladesh delegates. Initially, Dr. Y.S. Yadava, Director, BOBP welcomed the gathering and moderated the discussion. Dr. K.K. Vijayan, Director, briefed on brackishwater aquaculture sector, the role of CIBA, milestones over the period and the challenges India faced in the shrimp sector before *P. vannamei* introduction, and the developments post introduction and the way forward. Dr. C. Gopal, Member Secretary, CAA, presented the role of CAA as a national regulatory agency on coastal aquaculture in the country. At the end, Ms. Mahbooba Panna, Joint Secretary, thanked CIBA, CAA and BOBP for organizing such a fruitful interaction meet and visit to the laboratories and research facilities.



Dr. Trilochan Mohapatra, Director General, ICAR & Secretary, DARE, Govt. of India visited CIBA, Chennai



Dr. Trilochan Mohapatra, Director General, ICAR & Secretary, DARE, Govt. of India visited ICAR-CIBA, and had a joint discussion with the Scientists of CIBA and CMFRI-MRC, on 7 August, 2019. While addressing the scientists, he emphasized that scientists should increase their visibility and quality in their research output on par with the international level. He was of the opinion that social scientists also should adopt novel methodologies in their research and with appropriate

analysis of the results should reflect the research contributions at the international level, with high impact factors and citations. The DG visited the institute premises and laboratories and Dr. K.K. Vijayan, Director, briefed him about the salient research achievements of the institute and gratefully acknowledged the continued support from the ICAR and DARE for the research and development programme of the institute.

Shri. Jawaharbhair P. Chavda, Honourable Minister of Fisheries and Tourism, Govt. of Gujarat visits Navsari Gujarat Research Centre of ICAR-CIBA



Jawaharbhair Shri Pethalajibhai Chavda, Hon. Minister of Fisheries and Tourism (Govt. of Gujarat) visited the Navsari Gujarat Research Centre of CIBA and the Brackishwater Aquaculture Research and Demonstration Farm (BARD) at Matwad village, Navsari on 1 December, 2019. The minister interacted with CIBA scientists and the women SHGs involved in the brackishwater aquaculture promoted by the centre for their livelihood enhancement. Mr. Pankaj Patil, Scientist In-charge of NRGRC explained the impacts of the CIBA technologies on the farming community and

overall development of brackishwater aquaculture sector in Gujarat. While addressing the gathering comprising of shrimp farmers, tribal and scheduled caste beneficiaries of NRGRC and other stakeholders and congratulated ICAR-CIBA for its technologies and emphasized the farmers and stakeholders to take up these technologies for improving production and profitability in aquaculture. The minister applauded the NRGRC team for supporting the beneficiaries and developing the farm within a short span and promised all support to ICAR-CIBA in future endeavours.

24th Research Advisory Committee meeting of ICAR-CIBA



ICAR-CIBA convened its 24th Research Advisory Committee (RAC) meeting on 2nd March 2019 in the Headquarters, Chennai under the chairmanship of Dr. K. Gopakumar, former DDG, Fisheries. Distinguished members of RAC, 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-CIBA and Dr. Pravin Puthra, ADG (Marine Fisheries) reviewed the research activities of CIBA and provided directions for future research. Dr. K.K. Vijayan, the Director, welcomed the RAC team and the scientists

and highlighted the significant achievements of CIBA in the last one year in different thematic areas of brackishwater aquaculture and about BRAQCON 2019. Chairman and members of the RAC congratulated the Director and the dynamic CIBA team for the grand success of the BRAQCON 2019 on an international level, which showcased brackishwater aquaculture to the society and its importance to meet the nutritious food demand for the first time. All the members suggested developing more practical solutions for the emerging issues considering the existing techno-economic situations in seed production, farming, health and feed technologies.

Interactive meeting with tribal fishers of Tiruvallur and Kancheepuram districts of Tamil Nadu



ICAR-CIBA conducted an interface meeting on 24 July, 2019 as part of a Corporate Social Responsibility (CSR) project on “Knowledge and Economic Empowerment of women, tribal and their families in coastal villages of Tamil Nadu through adoption of brackishwater aquaculture and allied technologies integrated with societal development programmes” funded by Chennai Petroleum Corporation Limited (CPCL), a Group company of Indian Oil Corporation. About 30 tribal fishers from the coastal villages of Tiruvallur and Kanchipuram

districts participated and interacted with subject matter scientists of CIBA. Dr. K.K. Vijayan, Director, CIBA inaugurated the interaction and expressed that CIBA along with CPCL is striving for improving the livelihood opportunities of the resource-poor tribal fishers through brackishwater aquaculture technologies and allied enterprises. Shri. Kaushikbhar, Senior Manager, CPCL Chennai assured that considering the tribal fishers involvement, his organization could support them further for enhancing their standard of living.

Jal Shakti Abhyan: ICAR-CIBA organized outreach activities for the school students



The Govt. of India through the Jal Shakti Abhyan envisages a time bound, mission mode water conservation and water security campaign which aims at making water conservation a Jan Andolan through asset creation and extensive communication. As part of the campaign, ICAR-CIBA organised outreach activities for high school students on 5 and 10 September, 2019 in collaboration with the Krishi Vigyan Kendra, Kanchipuram, Tamil Nadu to inculcate the importance

of water conservation, rain water harvesting and efficient utilization water through essay writing, elocution competitions and audio-visual presentations for the students of Chennai High School Mylapore on 5 September, 2019 and Muruga Dhanuskodi Girls Higher Secondary School at Tondiarpet, Chennai on 10 September, 2019. More than 1500 school students took a water conservation pledge in these events.

'Shun Single Use Plastics' campaign launched at ICAR-CIBA



The Hon'ble Prime Minister has called upon a nationwide campaign, Swachhata Hi Seva, shun single-use plastic, from 11 September, 2019 to Gandhi Jayanti day on 2 October, 2019. The aim of the campaign was to highlight the importance of avoiding the single use plastics and how to control the plastic pollution around the globe. As a part of this campaign, CIBA scientists organized various swachhata activities at the Institute campus, adopted villages and schools by conducting essay writing, elocution and drawing competitions, and awareness programmes on plastic pollution with 3 'R's; reduce, reuse and recycle of plastics. During the

awareness programme held on 18 September, 2019 at CIBA Campus, Dr. K.K. Vijayan, Director, sensitized the participants to shun the usage of single use plastics in our environment viz., office, market place, residential places and also the nearby water bodies. Rallies against the use of single-use plastic were taken out by the staff, scholars of CIBA and students from various schools during 17-21 September, 2019. Scientists of CIBA explained various means to shun single-use plastic and a pledge in this regard was administered to the participants under the Swachhata Hi Seva campaign.

A Secretary level interactive meeting with stakeholders and coastal state governments at Muttukadu Experimental Station of ICAR-CIBA



Smt. Rajni Sekhri Sibal, IAS, Secretary, Department of Fisheries, Ministry of Fisheries, Animal husbandry and dairying visited ICAR-CIBA on 25th September 2019 and reviewed the available infrastructural facilities for initiating a national level programme on selective breeding of *Penaeus indicus*, involving the Research Institutions, Developmental Departments and private sector and farmers on consortium mode. The secretary visited the hatchery complexes at Muttukadu Experimental Station of CIBA and the *P. indicus* farming facilities. Secretaries/Commissioners of Fisheries of various States, Chairman and officials of Marine Products Development Authority (MPEDA), Kochi, Chief Executive Officer and officials of National Fisheries Development Board (NFDB), Hyderabad, Directors and officials from Tamil Nadu, Kerala, Karnataka, Odisha, Maharashtra, Haryana and Punjab, members of Society of Aquaculture Professionals (SAP), Sea Food Export Association of India (SEAI) & All India Shrimp Hatchery Association (AISHA), progressive farmers from Kerala,

Tamil Nadu, Andhra Pradesh and Odisha, Shrimp hatchery owners and scientist of CIBA participated in the consultative meeting. Dr. K.K. Vijayan, Director, presented the R&D initiatives of CIBA and a road map for developing a selective breeding programme for *P. indicus* on a consortium mode. In her presidential remarks, the secretary emphasized to have a plan-B taking *P. indicus* as a complimentary species to *P. vannamei*. While acknowledging the efforts made by the CIBA on *P. indicus*, she felt that this needs to be taken up on a broader scale with the cooperation of all the key stakeholders. Shri. K.S. Srinivas, IAS, Chairman, MPEDA indicated that selective breeding of *P. indicus* is highly essential and species diversification, area expansion and productivity enhancement as 'three mantras' for a better future he added. In her concluding remark, Secretary, Fisheries hoped that with the combined effect of Govt. of India, MPEDA, NFDB and private entrepreneurs, this project should be initiated, which is the need of this hour.

Harvest mela cum farmer's interaction meet on Indian white shrimp and milkfish jointly organised by ICAR-CIBA and Department of Fisheries, Govt. of Gujarat

NGRC of CIBA along with the Department of Fisheries, Govt. of Gujarat, jointly organized a harvest mela cum farmer's interaction meet on 19th October 2019 at the BARD farm, Matwad village, Navsari for the popularisation of the Indian white shrimp, *Penaeus indicus* farming in Gujarat. The interaction was inaugurated by Dr. C.G. Dangaria, Vice Chancellor, Navsari Agriculture University (NAU), Navsari in the presence of Dr. K.K. Vijayan, Director, ICAR-CIBA, Chennai. Around 120 participants including the village panchayat president, progressive fish and shrimp farmers, officials from CIBA, NAU, and the department of fisheries, Govt. of Gujarat, students of COF, NAU and members of tribal SHGs attended the programme. Dr. C.J. Dangaria, congratulated the CIBA Scientist team for developing the farm within a short period and emphasized on the importance of native Indian white shrimp for Indian aquaculture. Dr. K.K. Vijayan, Director, ICAR-CIBA in his presidential address mentioned that the NGRC centre is dedicated for brackishwater aquaculture development in Gujarat and the west coast as a whole through the introduction of new farming systems and diversified aquaculture species for sustainable growth.



SCAFi lecture series

Bhatnagar awardee in Fishery Biology Prof. T.J. Pandian delivered a talk on 'Fish breeding and Genetics' on 1st October, 2019

The Society of the Coastal Aquaculture and Fisheries (SCAFi) lecture series at ICAR-CIBA is intended to provide understanding and scientific discussions topics of importance in fisheries and aquaculture, and to give futuristic perspectives on research and role of science in day to day life. Prof. (Dr.) T.J. Pandian opened up his talk on 'Fish Breeding and Genetics' with philosophy of science, starting from logistics, abstract and experimental studies. The lecture highlighted the importance of fish breeding in aquaculture through a series of anecdotes starting from Mendelian law of genetics, and even connecting how the genetics of haemophilia affected the Queen Victoria kingdom. Prof. Pandian vividly put forth how the basic knowledge of fish breeding like identification of sex in fishes, breeding habit, various stages of oocyte maturation and reproductive physiology, which can be employed in understanding the spawning and executing hormonal manipulation in breeding. He cited the work done by

renowned fisheries scientist such as Dr. H.L. Chaudary and K.H. Alikunhi on carps, and cited this as an example of team work on how scientists from different parts of the country, religion and culture have come together, and the importance of the work culture and its relevance in the conduct of present day research. Prof. Pandian outlined how the idea of genetic improvement in fish, conceived from the first mammal cloned, Dolly, using the process of nuclear transfer and how they had achieved it in fish in much economical way. He had inspired and motivated the scientific staff and scholars of CIBA. The Director of CIBA and the President of SCAFi, Dr. K.K. Vijayan, in his presidential remark, stressed up on the importance of translating the basic science into the applied areas in aquaculture, highlighting the work done by Prof. (Dr.) T.J. Pandian in fish reproduction breeding and selection. The talk elicited active discussion among the audience including scientist, staff and students.



Navsari Gujarat Research Centre of ICAR-CIBA conducted training on ‘Brackishwater Aquaculture and Allied Technologies for Alternative Livelihoods’ for the Tribal Farmers

The Navsari Gujarat Research Centre (NGRC) of ICAR-CIBA conducted a three-day training programme on “Brackishwater Aquaculture and Allied Technologies for Alternative Livelihoods for Tribal Farmers” from 26th to 28th June, 2019 at Matwad village, Navsari district, Gujarat as part of the Tribal Sub-Plan (TSP) programme. The training was inaugurated by Dr. R. Borichangar, Associate Professor and Nodal officer, College of Fisheries (CoF), Navsari Agriculture University (NAU) in the presence of Dr. (Mrs.) P. Mahalakshmi, Principal Scientist, ICAR-CIBA. The training programme consisted of interactive lectures in the forenoon session on mud

crab polyculture, nursery rearing of seabass, milkfish culture, health issues in brackishwater aquaculture, value added product from fish and shrimp, benefits of CIBA-Plankton^{plus} and basics of goat farming etc., followed by hands on training and exposure visit to the Brackishwater Aquaculture Research and Demonstration farm (BARD) under ICAR-CIBA and the Department of Fisheries, Govt. of Gujarat, at Matwad during the afternoon sessions on all three days. A total of 48 women and 28 men participants from tribal communities in Matwad and adjacent villages attended the training cum exposure visit.





Hands-on Training on Shrimp and Mud Crab Aquaculture



A six-day 'Hands-on Training on Shrimp and Mud Crab Aquaculture' was conducted from 22-27 July, 2019. Dr. K.K. Vijayan, Director, Inaugurated the training programme and briefed about the importance of the shellfishes in brackishwater aquaculture and emphasized the need for diversification for sustainable development of the sector. Fourteen trainees, including 12 from the country and 2 from abroad (Myanmar) participated in the training. This training programme consisted of both theoretical as well as practical sessions on the hatchery management and growout production of shrimp and mudcrab. As part of the training field visit was arranged to CPF (INDIA) Pvt Ltd, Commercial Shrimp hatchery, Marakkanam, Tamil Nadu and Mud crab farm, Kalpakkam, Tamil Nadu.

ICAR-CIBA conducted Training cum Workshop on “Seabass Nursery Rearing and Farm Management Practices” for the fisher folk youth beneficiaries from Nagapattinam District, Tamil Nadu

ICAR-CIBA conducted a two-days Training cum Workshop on “Seabass nursery rearing and farm management practices” during 5-6th August 2019 under the CSR project on “Sustainable livelihood models for resource poor fish farmers/fisher folk in Nagapattinam district of Tamil Nadu for doubling their income” funded by the Chennai Petroleum Corporation Limited (CPCL). Fourteen fisher youth from Thargas village in Nagapattinam district participated in the programme. The workshop was inaugurated by Shri. S. Venkateswaralu, Administrative Manager, CPCL, Chennai. In his address he emphasized that voluntary co-operation of the fishers is necessary in implementing the sustainable livelihood programmes under the project. He also released the training manual published

in vernacular language (Tamil) and appreciated the efforts of CIBA for popularization and adoption of novel livelihood development technologies for the benefit of the participants. The participants were provided hands-on experience on seabass nursery rearing, pre-grow out and grow out farming practices, cage culture techniques, nutrition and feed management, disease management, economics and marketing. The programme also included a field visit to the cage farming site at Vennangupattu village, Kancheepuram district operated by local fisher folks and pond based nursery rearing unit at Thengaithittu village, Union Territory of Puducherry. The participants interacted with the fishers and gained first-hand information about the technologies from them.





PERSONNEL



Dr. T. Senthil Murugan



Shri. S. Solin Igneshus



NEWLY JOINED

Sl.No	Name of Officials	Designation	Date of Joining
1	Dr. T. Senthil Murugan	Senior Scientist	09.12.2019 (on inter-institute transfer)
2	Shri. S. Solin Igneshus	SSS	05.07.2019



SUPERANNUATION

Sl.No	Name	Designation	Date
1	Shri. N.N. Jana	SSS	28.02.2019
2	Shri. Jeevanantham	SSS	30.09.2019
3	Shri. M. Pichandi	SSS	31.10.2019



Shri. N.N. Jana



Shri. Jeevanantham



Shri. M. Pichandi

Publication of BRAQCON 2019 Proceedings as Special Issue of Journal of Coastal Research



The Proceedings of the BRAQCON 2019 conducted during 23-25 January 2019 was published as special issue of the Journal of Coastal Research (Vol. 86) with 40 selected scientific papers. www.JCRonline.org

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Home > Cities > Chennai

Chennai lab revolutionising ornamental fish industry in India, develops indigenous feed

This feed is scientifically formulated to maintain good health and colour of the brackishwater ornamental fish, where growth is not the primary objective.



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Fish feed developed by CIBA

By SV Krishna Chaitanya

Express News Service

CIBA develops technology to transform fish waste to wealth

DT NEXT
FOR THE NEW AGE READER

The Central Institute of Brackishwater Aquaculture of the Indian Council of Agricultural Research has developed a technology for transforming fish waste to high value produce to be used in commercial aquaculture and agriculture.



THE NEW INDIAN EXPRESS

Chennai's milkfish to soon satisfy Bengali palate

Vijayan emphasised brackishwater aquaculture is one of the vibrant farming sectors, and CIBA's research findings have direct applications in the field.

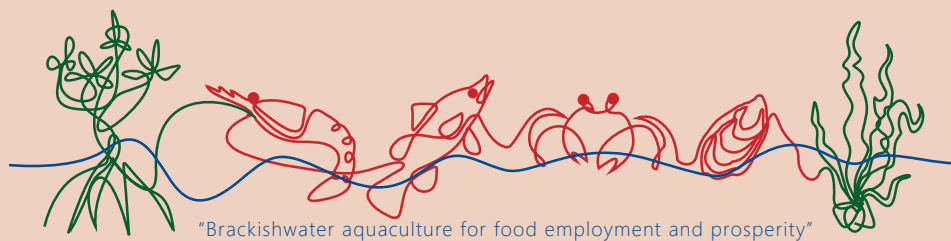


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By Express News Service

CHENNAI: In a bid to popularise milkfish as 'Deccan Hilsa', Chennai-based ICAR-Central Institute of Brackishwater Aquaculture (CIBA) is planning to transfer milkfish (Chanos chanos) hatchery technology and setting up a state-of-the-art finfish hatchery in West Bengal.



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