Issue No. 4 July 2017 - December 2017

www.ciba.res.in

CIBA NEWS

भाकृअनुप - केन्द्रीय खारा जलजीव पालन अनुसंधान संस्थान
ICAR- CENTRAL INSTITUTE OF BRACKISHWATER AQUACULTURE
ISO 9001-2008

CONTENTS

CIBANEWS

Published by
Dr. K.K. Vijayan
Director, ICAR-CIBA,
Chennai - 28

Editorial Committee
Dr. M. Muralidhar
Dr. C.V. Sairam
Dr. K.P. Kumaraguru vasagam
Mr. T. Sathish Kumar
Dr. J. Raymond Jani Angel
Dr. T.N. Vinay
Mr. Tanveer Hussain
Dr. K.K. Vijayan

Editorial Assistance
Mr. S. Nagarajan

Design & Print
Sradha Arts
Kochi

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 **:** An environmental friendly brackishwater shrimp farming model at Andhra Pradesh

FROM THE
DIRECTOR'S DESK

Brackishwater not only a diverse in food fishes, but also rich in ornamental fishes

India emerged as a fastest growing economy in the world and the second largest producer of farmed fish and shellfish. Frozen shrimp produced from brackishwater sector continued to be the major valued item accounting for a share of 70% of the total export earnings (about US$ 6.5 billion). After playing a crucial role in the introduction of exotic *P. vannamei* to Indian shrimp farming, ICAR-Central Institute of Brackishwater Aquaculture (ICAR-CIBA) realizes the risk of complete dependence of the sector entirely on imported broodstock. As a futuristic alternate strategy, CIBA has identified native Indian white shrimp, *P. indicus* as native candidate species for research in the direction of stock improvement through selective breeding. Ornamental fish industry is a multi-billion-dollar industry with an estimated value of 15 billion US dollars involving trade in over 5000 species. Though Indian ornamental fish basket is dominated by majority by freshwater species and very few wild collected marine species, brackishwater fish is least known and the industry is in its infancy. Brackishwater ornamental species are hardy to withstand the wide range of water parameters as they naturally thrive in extreme water parameters. More simply said 'brackishwater ornamental fish offer the charm of a marine species at the ease and cost of maintaining a freshwater species. With this strength, CIBA has initiated efforts for developing a niche for the brackishwater ornamental species.

CIBA envisions the 9 million hectares of salt-affected inland soils in the states of Haryana, Rajasthan, Punjab, Uttar Pradesh, Maharashtra and Gujarat as potential resources for expansion of brackishwater aquaculture in a sustainable manner. We already demonstrated successful model of shrimp farming and a integrated feed mill in this region. To further strengthen the brackishwater aquaculture and national fish production, CIBA took efforts on diversified aquaculture systems and species. As an addition to the existing list of seed production technologies (5 shrimp species + 5 finfishes + 1 crab), we are focussing on seed production of grey mullet *Mugil cephalus*, mystus catfish *Mystus gulio*, spotted scat, *Scatophagus argus*, mono angel, *Monodactylus argenteus* etc. Finfish such as mangrove snapper, rabbit fish and Indian salmon were identified as potential species to be added in the list and preliminary works have been started with a goal of having multiple species in our farming basket. Considering the brackishwater ecosystem as a dynamic diverse environment which involves, estuaries, backwater, mangroves, lagoons, etc. we are working on diversified rearing system such as customized open-water cages, Integrated Multi-Trophic Aquaculture systems (IMTA), biofloc based simple RAS, family farming and organic farming models. Further, we have taken sincere efforts to bridge the relationship between the stakeholders and farmers, and the results are visible in the form of the partnership agreement and MoU signed on a public-private partnership (PPP) mode. Also, CIBA has developed a close working relationship between the state government and other government agencies working for the development of brackishwater aquaculture in the country by sharing the strength and weaknesses, which provided a new synergy.

Our ultimate goal is achieving sustainable brackishwater aquaculture for food, employment and prosperity. It is encouraging to see the tremendous support from the farmers, industry people and government agencies for our efforts. We are certain that this issue of CIBANEWS will bring you the significant achievements and events during the last one year, which would be enriching and interesting to the wide spectrum of readers.

Dr. K.K. Vijayan
Director

BRACKISHWATER ORNAMENTAL FISHES AN EMERGING SECTOR IN INDIAN AQUARICULTURE

Ornamental fish industry is a multi-billion-dollar industry with an estimated value of 15 billion US dollars involving trade in over 5000 species. India is blessed with a rich diversity of fish species, which includes more than 400 listed ornamental fish species. The potential of the ornamental fisheries sector to earn valuable foreign exchange for the country, guarantee employment and support livelihood, especially to rural communities and women. With an enormous diversity and wealth of fish, India's share in the ornamental fish trade is very low, below 0.1% of the global trade. Data shedding light on the underutilised potential of a sector is so promising and stirs the different stakeholders to plan and contribute further. A repository of information on the ornamental species, sources, mode of capture, value, volume, value chain, workforce, domestic operators, exporters and issues of concern is wanting. Though Indian ornamental fish basket is dominated by majority by freshwater species and very few wild collected marine species, brackishwater fish is the least known and the industry is in its infancy.

Brackishwater habitats are among the most productive environments of our nation supporting an enormous diversity and abundance of species. These habitats offer a mixture of sub-optimal biotic and abiotic conditions which vary rapidly both spatially and temporally. Hence, the organisms which occupy these habitats are naturally adapted to respond well to environmental stress and disturbances. Euryhalinity is one of the key adaptations which make the brackishwater fish and crustaceans very special. It helps the species to adapt to wide ranges of salinity. In general, most of the brackishwater ornamental species are hardy to withstand the wide range of water parameters as they naturally thrive in estuaries and backwaters where they are exposed to freshwater from surface runoff during monsoons and full-strength seawater during summer. In the case of brackishwater ornamental species, this trait can be effectively harnessed and the fish can be kept in an environment of a desired salinity after the initial acclimatisation phase. More simply said 'brackishwater ornamental fish offer the charm of a marine species at the ease and at the cost of maintaining a freshwater species. With this strength, CIBA has initiated efforts for developing a niche for the brackishwater ornamental species. For this, CIBA's roadmap

for the development is i) Concerted efforts on developing captive breeding protocols for indigenous brackishwater ornamental fish species ii) Developing indigenous cost-effective and efficient feeds for brackishwater ornamental broodstock, larvae and aquarium fish iii) The research outputs from the captive breeding program to be simultaneously translated into models of livelihood development for rural communities; tribal groups and women entrepreneurs, and develop suitable location specific and client specific rearing systems iv) Popularisation of the brackishwater ornamental species and awareness of aquarium fish as a popular hobby among the youth and the general public.

To our knowledge; captive breeding protocols of indigenous ornamental species; over 10 marine species; six brackishwater species and few of the freshwater species have reached different levels of success by the research institutes and universities in India. Many of these protocols are still to be refined for scaling up the production on commercial levels. Yet without being judgmental, such efforts are to be nurtured and recognized so that Indian ornamental fish industry can stake claim to a more sustainable model based on the captive breeding of a much larger diversity of indigenous species. CIBA has witnessed its breeding capabilities with the breeding and seed production of potential food fishes such as seabass, milkfish and pearlspot . In addition, CIBA continues to work on other food fishes viz. striped grey mullet, mangrove red snapper and rabbitfish etc., and significant milestones has been achieved. While planning research strategy for the development of brackishwater ornamental fish species, CIBA has focused its research on the following four potential ornamental brackishwater fish species; spotted scat, *Scatophagus argus*; silver moony, *Monodactylus argenteus*; orange chromide, *Etroplus maculatus*; crescent perch, *Terapon jarbua.*

Potential brackishwater ornamental species

Spotted Scat, *Scatophagus argus*

The species belonging to the order Perciformes and family Scatophagidae attains a maximum total length of 380 mm. The spotted scat with its strongly compressed quadrangular body, steep head profile, rounded snout, greenish

brown to silvery colouration and spots make it an attractive ornamental fish. The fish is observed to occur in two colour morphs; green scat and red scat. The fish adapts well to aquaria and readily accepts artificial feeds.

CIBA has successfully developed protocols for captive maturation and induced breeding of spotted scat. Brood fish sized 150- 300 g are maintained in ponds and tanks by providing optimal environmental conditions and feed for accelerating maturation. The fish are then used for successful spawning of the captive broodstock through hormonal manipulations. Female fish weighing about 150 g with ova diameter of 400 µm are selected and administered hormonal treatments; HCG, 1000 IU per kg and LHRHa, 100 µg per kg. Male fishes are administered the same hormones. Spawning is observed about 90 h after the first injection and up to 1 lakh eggs were obtained per female. Newly hatched larvae are about 1.6 mm in size. Larvae are reared on rotifers from day 3 to 10, and afterwards with Artemia nauplii up to day 25. Fry are then weaned to formulated feed and a juvenile of marketable size is attained in 25 days.

Moon fish *Monodactylus argenteus*

The moonfish belonging to the order Perciformes and family Monodactylidae are naturally distributed in the Indo-Pacific region. The fish attain a maximum total length of 270 mm. The fish has a compressed body and are bright silver in colour with yellow and dusky dorsal fin tip. Small juveniles are more colourful with yellow over most of their dorsal fin and two vertical black bands over the head. Moonfish easily accept artificial feed in aquariums.

CIBA has standardized broodstock management and induced spawning of moonfish. Mature females of above 75 g and oocyte diameter 450 µm are used for induced breeding. For females, LHRHa @ 100 micro gram per kg was standardized as an effective dose for induced

spawning. For male's, half the dose is found to be effective to induce a successful breeding response. Spawning is observed after 36 h of this hormonal administration. The protocols for larval rearing are currently in the process of standardization.

Pearlspot *Etroplus suratensis*

Pearlspot, belonging to order Perciformes; family Cichlidae is one of the three indigenous cichlids of India. The fish is distributed in the Indian peninsular region and Sri Lanka. Pearlspot is oval in shape and has grey-green colouration with pearly spots over the body. The fish is a popular food fish in Kerala and the juveniles of the species are emerging as an ornamental fish in the markets of other states. The fish is also popular as an ambassador fish of Kerala. Pearlspot exhibits intense parental care of the young ones and shows interesting behavior patterns during the pairing of parents and during territorial defence. The trait is uncommon in other fish species and provides an opportunity to explore the scope for marketing the fish as a "Model Parent Fish" or a "Family Fish" and packaging a pair of pearlspot for special occasions as a "Mother's Day" or "Father's Day".

The seed production technology of the species in a modular tank-based system has been standardized by CIBA. The breeding frequency of pearlspot is optimized through intervention like curtailing of parental care and specialized broodstock feeds. Production of up to 1000 fry per pair per month is observed from the system. Larval rearing is conducted using artemia or starter feeds. Pearlspot larvae are being successfully reared by women and tribal groups as a subsidiary homestead activity for generating additional income with the technical guidance from CIBA.

Orange Chromide *Etroplus maculatus*

The orange chromide, belonging to order Perciformes; family Cichlidae is endemic to freshwater and brackishwater bodies in southern India and Sri Lanka. The fish is compressed, oval

shaped and yellow to orange in colour. Large black spots are observed on the body. The fish exhibits parental care.

CIBA has standardised a breeding model for a pair of orange chromide. The fish were observed to have an average fecundity of 292 eggs and an average breeding interval of 12±2 days. Juveniles were found to attain a mean total length of 45 mm in 75 days. This size is considered to be good for stocking in brackishwater aquarium.

Crescent perch *Terapon jarbua*

The crescent perch belong to order Perciformes and family Teraponidae is distributed in the Indo-Pacific region. The fish has three or four crescent shaped dark brown bands running from the nape to the hind part of the body which earned it the name 'Crescent perch'. Milting males and female with oocyte diameter exceeding 460 µm are used for induced breeding. The hormonal concentration of HCG and LHRHa have been optimised for successful induced breeding and upto 3 lakhs larvae are obtained per spawning. Larvae are fed on rotifer *Brachionus plicatilis* and later weaned to artificial feeds.

BRACKISHWATER ORNAMENTAL FISH BASED LIVELIHOOD DEVELOPMENT FOR RURAL COMMUNITIES; TRIBAL GROUPS AND WOMEN

The research output from the captive breeding are being simultaneously translated into models of livelihood development for rural communities; tribal groups and women. For export of ornamental fish, a consistent supply of both quality and volume of fish is critical. For this a cluster-based approach may be adopted. This model of a nodal hatchery with satellite rearing units is being tested by CIBA, which has initiated village-based programs; 4 village groups in Tamil Nadu for conducting nursery rearing of hatchery produced larvae and fry. CIBA has supported the establishment of the rearing systems; RAS based tank, hapa and cage-based systems at each of these villages. Fry of fish are procured at a cost by the village groups, the inputs like feed are supplied by CIBA and the advanced fry or fingerlings produced from the system are marketed to consumers.

FUTURE PLANS OF CIBA IN SUPPORTING BRACKISHWATER AQUARICULTURE SECTOR

To further strengthen the emerging brackishwater aquaculture sector as an enterprising industry, CIBA intends to scale up and commercialize the production of the brackishwater ornamental species for which the technologies are currently developed. A wide diversity of brackishwater finfish species remain to be explored for their ornamental value; eyespot puffer *Dichotomyctere ocellatus*, ocellated puffer *Takifugu ocellatus*, banded archer fish *Toxotes jaculatrix*, yellow catfish *Horabagrus brachysoma* to name a few. CIBA plans to bring into its fold non-fish ornamental species like brackishwater crustaceans, bivalves and plants. In a long term perspective, captive breeding of an ornamental species is the foundation stone for further development of new varieties to further sustain consumer demand of these species. Colour and body forms of many freshwater fish example guppy, discus, angel fish *etc*. have seen successive changes. This has assured a steady market demand for these species over the past decades. Achieved through a well and time-consuming plan, the selective breeding process proves rewarding for the aquarists or breeders involved. Hopefully, the coming decades will bear testimony to a new variety of brackishwater ornamentals through well-executed selective breeding and hybridisation programs.

POPULARISING BRACKISHWATER ORNAMENTAL FISH KEEPING AMONG THE YOUTH

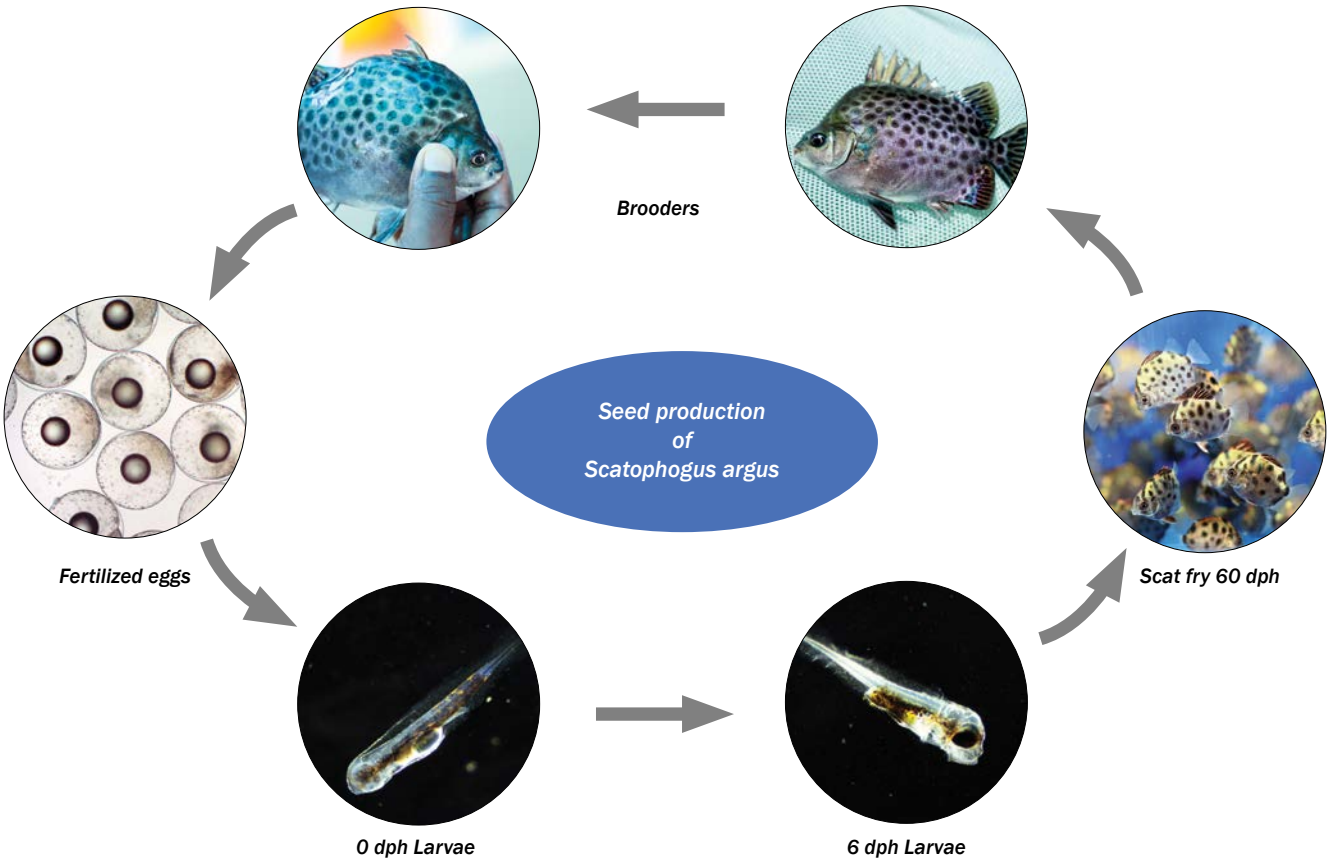
Adoption of nursery rearing of ornamental fish as an additional livelihood option for tribal women group at Thiruvidanthai village, one of the four village groups involved in the activity

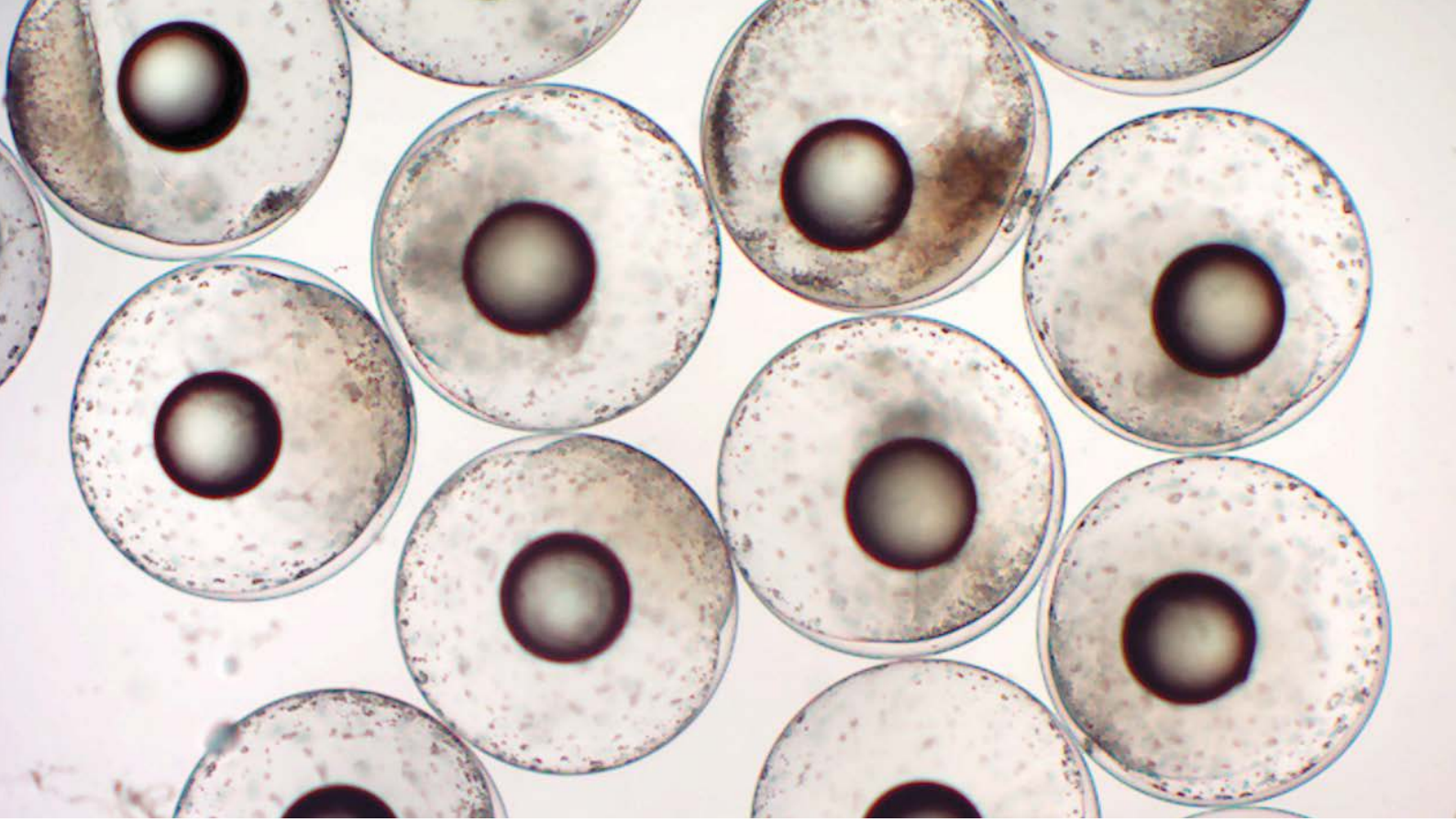
Distributed aquarium and brackishwater ornamental fish to students from different schools for popularising fish keeping as a hobby

Domestic trade for ornamental fishes in India is witnessing an annual growth rate of 20% and the domestic market for ornamental fish is valued at Rs 20 crores. Indian domestic market of ornamental fishes is currently dominated by more than 300 exotic species. Rising standard of living is set to make India the largest consumer market in the coming years. Hence, it is imperative to orient our ornamental fish marketing strategy to cater to the needs of the domestic consumer. Popularising and creating awareness of the indigenous captive bred fish species will be rewarding in terms sustainable development of the indigenous ornamental fish market and avoid havoc created by bio-invasion of escaped exotic fish into our aquatic environment. CIBA has initiated steps to popularise brackishwater indigenous ornamental species among youth especially to school children. As a step to popularise the species; school children visiting CIBA have been distributed aquaria for maintaining in their schools. They are also given an opportunity for visiting the ornamental fish breeding units, familiarizing with the fish species and provided with extension material like pamphlets and posters for their further information and knowledge.

CAPTIVE BREEDING OF SPOTTED SCAT- A LUCRATIVE FINFISH SPECIES FOR BRACKISHWATER ORNAMENTAL PORTFOLIO

Indian brackishwater ornamental sector urgently requires attention and upscaling to represent reasonably in the international ornamental trade. India contributes about 1 % to international ornamental trade which is dominantly represented by freshwater fish species and merely by marine species. These Freshwater fishes are highly exported and well represented in the market due to their easy seed production techniques. Marine aquarium set-up and maintenance is technological as well as expensive, which needs advanced equipment for managing the water quality standards. Additionally, several marine fishes species sold in ornamental markets are caught from the sea due to non-availability of their breeding and seed production technology. Ornate fish species of brackishwater are euryhaline and hardy in nature and can withstand different saline environment thus easy to maintain in aquaria. *Scatophagus argus* is a brackish water ornamental fish commonly called as Spotted scat, butterfish, Argus fish, spadefish and spotted spade fish, belong to family scatophagidae under the order perciformes. Spotted scat widely distributed in the mudflats, mangrove swamps, estuaries and marine habitats of Indo-pacific





Spotted scat widely distributed in the mudflats, mangrove swamps, estuaries and marine habitats of Indo-Pacific region. It is also considered as a food fish of delicacy in South East Asia. It is an algivore fish having omnivore feeding habit and accepts commercial feed readily in captivity.

regions. It is also considered as a food fish of delicacy in South East Asia. It is an algivore fish having omnivore feeding habit and accepts commercial feed readily in captivity. Juvenile scats are popular due to their quadrangular shape and attractive spotted pattern. This fish is also known as "Indian Discus'' by aquaria hobbyist in India. Traded scat juveniles are extensively collected from the wild which may result in a declining population and adverse effect on biodiversity.

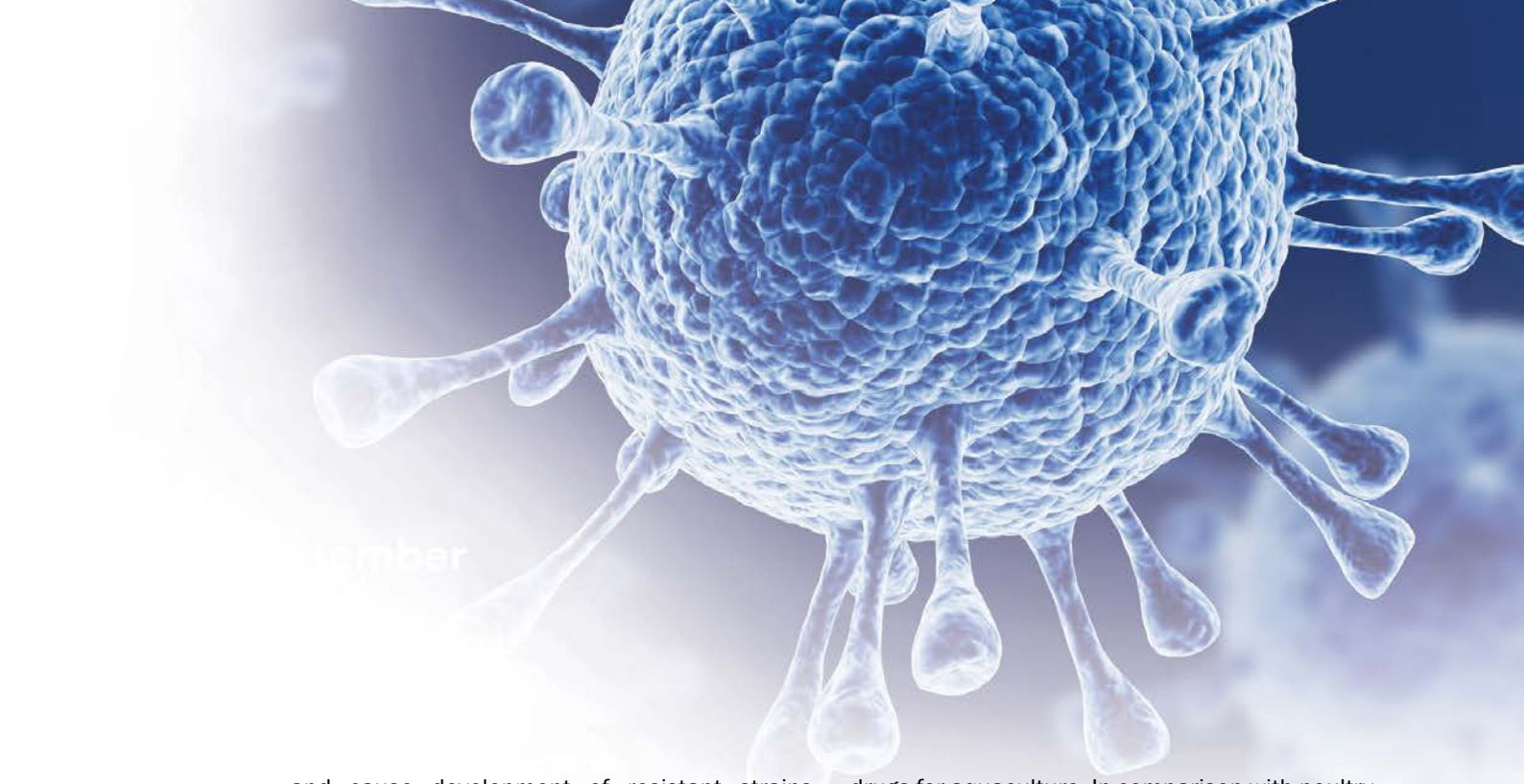
CIBA has standardized the broodstock development, induced breeding and larval rearing methodologies of spotted scat in captivity for commercial production by hatcheries. In the hatchery facility of CIBA, mature broodstock have reported from April to November months. Male and female fishes of 100 – 150 g and 200 – 250 g body weight respectively are suitable for pair formation for breeding purposes. Fecundity of female fish depends on body weight which ranges from 800 – 900 spawned eggs/g body weight. Captive maturation and induced breeding technology have been standardized which can produce market-ready juveniles after 45 – 60 days of nursery rearing. Mature broodstock is induced by standardized doses of synthetic hormones (HCG and LHRHa) in hatchery facility and strip spawned after 30 – 32 hours. Fertilized eggs are incubated for 18 – 24 hours for hatching. The newly hatched larvae start feeding on rotifers from 2nd dph in green water-based indoor nursery rearing. Larvae feeding regime gradually shifts to *Artemia* nauplii feeding post 12 – 15 of hatching. Weaning on commercial microparticulate feed starts from 20 – 25 dph onwards. Scat larvae metamorphose through "Tholichthus stage" and transformed into spotted juveniles during 25 – 30 days of indoor nursery rearing. These juveniles are nursed in outdoor ponds for 15 – 30 days which are fertilized prior to boost natural productivity. 3 – 5 cm (1 – 2 inch) size juveniles can be sold for Rs. 10 – 15 / fish in the ornamental market by traders. Scat juveniles can be maintained in fresh, brackish and marine aquaria due to their euryhaline nature and considered as peaceful schooling fish in a tank. The technology of captive maturation and sustained seed production of spotted Scat is ready to be transferred to stakeholders and hatchery entrepreneurs. Low input cost and simplified breeding technique of juvenile scat production can be adopted as back-yard hatchery units by Women SHG's and small-scale aqua farmers for additional income generation.

FARM INPUTS THAT CAUSE ANTIMICROBIAL RESISTANCE AND EXPORT REJECTION

Aquaculture has been growing in India over the years and became a leader of shrimp exporters in the year 2016-17 with 4, 34,484 MT worth USD 3,726.36 million. Enhanced production of shrimp comes with the risk of disease and huge economic loss. In recent years, several products have been introduced as farm inputs for improving health and growth of shrimp or improving the water/soil quality of the pond environment. Shrimp production has been encountering several emerging diseases such as Running Mortality Syndrome (RMS), White Faeces Syndrome (WFS), Zoea-2 syndrome, white muscle, slow growth syndrome *etc*. Intensification of culture and zero water exchange system has further stressed the environment where the shrimp survive. Since aetiology of several diseases such as RMS, WFS, Zoea syndrome etc. are not well known and doubted to be caused by bacterial pathogens, different types of drugs/ therapeutics, disinfectants, water/soil quality enhancers, gut/water/soil probiotics, immunostimulants etc. are being used for improving the pond environment, controlling the diseases and enhancing the production. In such a situation, there is a chance of entry of unwanted drugs into the culture system and this leads to detection of such substances by importing countries and the exporters face rejections of such containers. Nationally as well as internationally, use of drugs meant for human use including antibiotics has raised concerns on environmental degradation, impact on natural fauna and flora and Antimicrobial Resistance (AMR). Issues like AMR are highly discussed and they get media attention on identification of any bacteria that is resistant to vital antibiotics for curing human diseases.

Shrimp is the most priced food commodity being exported to developed countries such as USA, EU countries and Japan. These countries have formed strict residual monitoring system for antibiotics in the consignments imported.

Use of antibiotics in a culture farm may be intentional or unintentional; however, it is essential to have understanding on use of farm inputs including antibiotics. Large quantity of antibiotics used as growth promoters in animal husbandry and agriculture, and as prophylactic or sub-therapeutic in hospitals are major reasons for development of AMR in microbes. Water is the universal solvent and waterbodies are recipient of all drugs discharged from these sectors. For aquaculture, water containing these drugs may be used, leading to entry of antibiotics in the culture ponds. In addition, reports are available on the presence of banned substances in poultry and cattle manure. Use of poultry waste as feed can be source of antibiotics. Unregistered drugs may be another source of banned substances in aquaculture, that need to be controlled by proper policy development and creating awareness among the farming community. Unscientific application of drugs or chemicals is known to cause ecological imbalance



and cause development of resistant strains. Application of antibiotics below the minimum inhibitory concentration or improper exposure period will cause development of antimicrobial resistant bacterial strains.

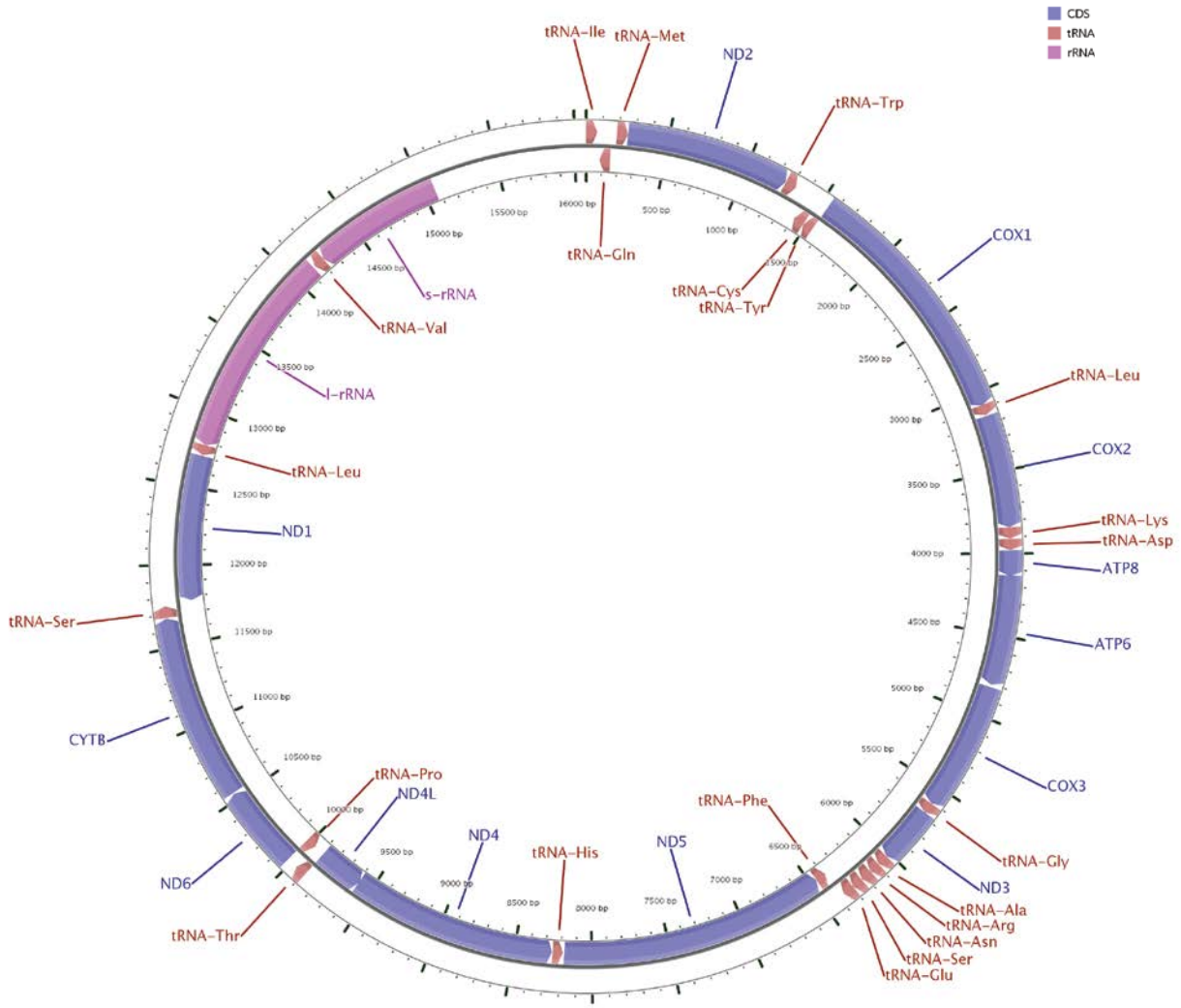
Shrimp is the most priced food commodity being exported to developed countries such as USA, EU countries and Japan. These countries have formed strict residual monitoring system for antibiotics in the consignments imported. Food consignments detected for residue of veterinary drugs that are banned or containing more than maximum residual limit level is rejected at the entry point by importers. US Food and Drug Administration (USFDA) and the Rapid Alert System for Food and Feed (RASFF) are the key agencies working on analysis of the imported food consignments for traces of veterinary drug residues in USA and EU, respectively. Marine export rejection due to microbiological contamination has been significantly reduced by all three major importers (USA, EU and Japan) by adopting good manufacturing practices by the processing plants. However, rejections due to antibiotic residue persists. Major rejections of shrimp consignments are due to presence of metabolites of chloramphenicol and nitrofurans. In the recent years, rejection due to chemicals, mainly veterinary drugs shows varying trend among the three importers. Shrimp exported to USA has seen gradual increase since 2012 but Japan saw the highest in the year 2012 and declined in later years. Rejection cases reduced from EU post 2009, however the EU has increased sampling size of Indian shrimp consignments from 10% to 50%.

In India, application of veterinary drugs for aquaculture has been banned by various governing agencies such as MPEDA, CAA and FSSAI, but no guidelines are available on use of drugs for aquaculture. In comparison with poultry, agriculture and cattle sectors, issues of AMR might be smaller in the aquaculture sector due to strict regulations on antibiotic usage., However, in the recent years there are several bacterial isolates identified to be resistant to multiple antibiotics. Shrimp farming being high in investment, risk and profit, farmers thrive in razor-thin margin in keeping their culture animal safe and protect their investment. For curtailing entry of banned drugs into culture system, it is necessary to have certain regulatory mechanism, such as registration and regulation of the farm inputs, licencing of drug and feed manufacturers, monitoring of the farm inputs at each level (manufacturer/ retailer/ field), development of alternatives to antibiotics and conducting awareness programmes. Implementation of better management practices could further reduce occurrence of the diseases and application of drugs. The approved drug should be used scientifically and as a last resort to control the infection. The drug should be prescribed by a trained technician and should follow the proper dosage and treatment schedule of the drug. It is also essential to keep the animals until the drug is withdrawn naturally before harvested. The drugs applied should be noted and recorded for future references.

For successful farming of shrimp, several farm inputs are essential. However, by adopting better management practices, use of such products can be reduced. In addition, it is essential to understand the content of the drug and its efficacy and effectiveness in mitigating the infection. Farm technicians play a key role in the use of farm inputs and an effective awareness programme may reduce application of unwanted products in the farm. Development and implementation of policies and guidelines is another key factor that will ensure safety and sustainability of shrimp industry.

MITOGENOME OF PENAEUS INDICUS

Mitochondrial DNA genes are generally explored to study the phylogenetic relationships among species. The phylogenetic relationships indicate which species are more related and in what order speciation events have taken place. This would also help to extrapolate possible production and reproduction behaviour of a less-studied species which is closer to a well-studied species. Full mitogenome of *Penaeus indicus* is not available so far and has been deciphered for the first time. The Illumina paired-end sequencing on NextSeq instrument generated 15,58,542 reads which were then filtered, trimmed and assembled into a single contig of 16,071 bp and annotated using various bioinformatics tools. The mitogenome of *P. indicus* has the same 13 protein-coding, 22 tRNA and 2 rRNA genes like other penaeid shrimps.



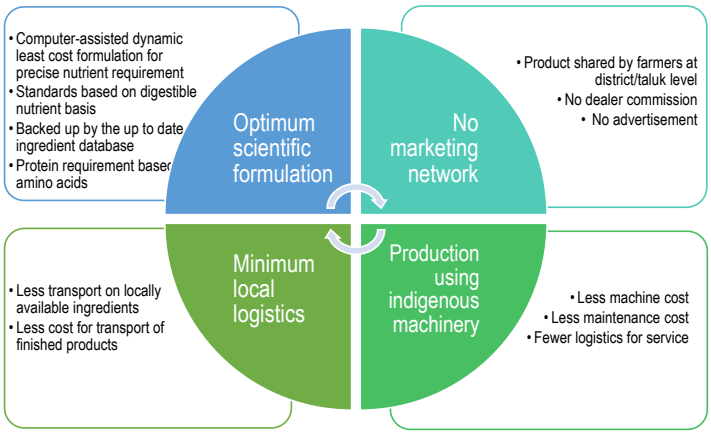
Penaeus indicus mitochondrial DNA genome

INDIGENOUSLY FORMULATED COST EFFECTIVE VANNAMEI SHRIMP FEED TAKES OFF IN INDIA

The aquaculture sector in India witnessed a boom with the introduction of White leg shrimp (*Penaeus vannamei*) since 2009-10. Increased production of farmed vannamei lead to many fold increase in shrimp production and India become the leading shrimp producing nation in the Asian region with a production of 0.6 million metric tonnes in 2017-18, and contributed about 60% seafood exports of the country in terms of value. This increase in production created a multifold demand for shrimp feed, which often ranges from 50 to 60 % of the total cost of production and directly determine the profitability to the farmer. Feed being a critical input in shrimp farming, not only determine the growth performance of the shrimp, but also a key factor related to cost of shrimp production and sustainability. Feed also plays a critical role in maintaining the ambient water quality of the rearing system. This sharp growth of demand for shrimp feed lured many multinational companies. Currently, major share of Indian shrimp feed business is grasped by the multinational corporate companies or their joint ventures, where an upward trend in price has been noticed during the last few years due to monopoly. While farmers already facing several challenges due to emerging diseases, water management issues, increasing energy cost, lack of manpower etc. increasing feed cost is a double blow for medium and small-scale farmers. Visualizing this as a critical obstacle, ICAR-CIBA, pioneer in indigenous shrimp feed technology prioritized cost effective feed as a key component for sustaining the pace of the shrimp industry in India, and planned a systematic research on nutrition.

Initiative

ICAR-CIBA's focussed research on nutrient requirements of shrimp for more than a decade, expertise in scientific feed formulation, database on price and seasonality of locally available ingredients led to a cost-effective shrimp feed using indigenous feed processing technology. Initially feeds were tested in clear water system without influence of natural feeds. Then the feeds were tested in microcosm tanks, a simulated pond environment with lot of natural feeds and good control over production parameters. In the final phase, feeds were tested in varying shrimp farming systems at different phases during grow-out with sufficient replications and commercial feed as control. Indigenous shrimp feed has been widely tested in farmers' ponds of Indian coastal states such as Andhra Pradesh, Kerala, West Bengal, Gujarat and Punjab.



Performance of Vanami^{Plus} was demonstrated in different coastal states of India

Elements brings the cost effectiveness of the indigenous shrimp feed

Nutrient composition of the formulated shrimp feed

g/kg	
Crude Protein	365.2
Crude Fat	62.1
Total Ash	126.4
Moisture	94.8
Crude fibre	25.6
Nitrogen free extract	325.9

This indigenous feed manufacturing technology has been branded as Vanami^{Plus}, and commercialized by transferring the technology on a non-exclusive basis to different entrepreneurs. ICAR-CIBA has signed MoUs with 9 stakeholders from different coastal states *viz*., Andhra Pradesh, Gujarat, Kerala, West Bengal, Odisha and Haryana for setting up feed mill to produce indigenous shrimp feed. The recent unique one in the list is Dr Attar Aqua feed, which commissioned a new feed mill at Bhiwani, Haryana by adopting Vanami^{Plus} feed technology of CIBA. It 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 indigenous shrimp feed has good attractability, palatability and performed on par with the top performed commercial brands in terms of growth, survival, and feed utilization, as revealed.

Impact of the technology

Feed launch at Haryana

Currently, the installed capacity of feed processing plants is 10,000 tonnes/ annum which can cover the farming area of 1500 ha. Though the Vanami^{Plus} taken up by the clients covers a very small portion of the feed demand, it is serving benchmark for pricing as well as to compare the performance of the other commercial feeds evolving in the sector. About 900 people are directly employed and 1500 people are indirectly employed in shrimp feed industry worth of Rs 65 crores/annum. With this capacity, ICAR-CIBA serves as a national aqua feed standard setting and monitoring authority of the industry which is about 1.2 million tonnes/annum size.

KINGDOM	:	Animalia
PHYLUM	:	Chordata
CLASS	:	Actinopterygii
ORDER	:	Perciformes
FAMILY	:	Monodactylidae
GENUS	:	*Monodactylus*
SPECIES	:	*M. argenteus*

Silver Moony, *Monodactylus argenteus*

Silver moony, *Monodactylus argenteus* is a high value brackishwater ornamental fish in the family Monodactylidae. Commonly found in mangrove estuaries, often entering creeks. Sometimes found in silty coastal reefs. Small juveniles are solitary or seen in small aggregations. Can live in freshwater also. Feeds on plankton and detritus. Highly territorial. Its ability to survive in a wide range of salinities makes it a highly demanded fish in ornamental industry.

Short description

Dorsal spines (total): 7 - 8; Dorsal soft rays (total): 27-31; Anal spines: 3; Anal soft rays: 27 - 32. Adults bright silver with yellow and dusky dorsal fin tip. Small juveniles are more colorful with yellow over most of the dorsal fin and two vertical black bands over the head. Fins yellow except pectoral translucent. Eyes large, mouth small.

Distribution

Native to Australia (Western Australia); Cambodia; Comoros; Djibouti; Egypt; Fiji; French Polynesia; Guam; India; Indonesia; Japan; Kenya; Madagascar; Maldives; Mauritius; Micronesia, Mozambique; Myanmar; New Caledonia; Norfolk Island; Northern Mariana Islands; Palau; Papua New Guinea; Philippines; Réunion; Samoa; Saudi Arabia; Seychelles; Somalia; South Africa; Sri Lanka; Taiwan, Province of China; Tanzania; United Arab Emirates; Vanuatu

Trade

Monodactylus argenteus is a commercially sought after fish, for sale and consumption as well as for the ornamental aquarium trade. Landings reported by the Emirate of Abu Dhabi listed 7.1 tonnes of *M. argenteus* landed in 2009. Moonfish landings (in general, not species-specific) totalled just under 20,000 tonnes in 2010, with the Philippines landing the vast majority of the catch, with over 17,000 tonnes.

Highlights

Furthermore, *M. argenteus* is a highly sought after ornamental fish for the aquarium trade. It is listed as a “very popular ornamental fish” and it is known to be able to breed in an aquarium. In fact, these moonfish are in such high demand that aquaculture farms have sprung up in India and all over the Indo-Pacific in order to cultivate this species of fish to sell in the ornamental aquarium trade.

Shrimp farming in inland saline soils

A SUCCESSFUL DIVERSIFICATION MODEL

We are Mr. Manish Goyal and Mr. Vineet Verma from Bathinda, Punjab. We have been into our family business of corrugated box manufacturing and fuel outlets for the last few decades. We were in search of a new sector for diversification of our activities to obtain high returns within short span of time. We tumbled upon the idea of shrimp farming using inland saline groundwater as a good business option to generate substantial profits. Ever since the success of inland shrimp farming in Haryana, we have been carefully observing several of these farms to take a final decision on our entry into shrimp farming. Having done little baseline study on shrimp farming in Haryana, being new to this field, we were in search for a partnering institution which can provide us with the required training, technical know-how and input support. During this time, we happened to attend a business fair, 12th edition of CII Agrotech at Chandigarh wherein CIBA had setup a stall to provide information on new technologies in shrimp aquaculture. On interaction with the scientists, we came to know that CIBA is the nodal research arm for brackishwater aquaculture in the country and have recently launched the cost-effective desi, white shrimp feed Vanami^{Plus}. We were asked to attend a need-based training program at Chennai to obtain the required technical information concerning shrimp farming. In, 2017 we participated in the training conducted by the Crustacean Culture Division of CIBA on shrimp farming wherein individual sessions on inland shrimp farming were incorporated. During this visit, we also tested saline groundwater samples collected from several locations in Punjab in the Environmental Chemistry Lab of the Institute to find the most suitable site based on the ionic profile. Having gained sufficient knowledge on shrimp farming, we established M/s BLANCAS AQUA for shrimp farming in Haryana. Having confidence in CIBA technologies and their assurance on hand holding for technical and input support we signed a MoU with CIBA on 3rd June 2017 for partnership farming of *Penaeus vannamei* in Punjab.

The CIBA scientists provided all the requisite information concerning pond preparation, fertilization, ionic manipulation, aeration, feeding and water quality management.

The stocking of PL in two 4000 m2 ponds was carried out towards the end of July 2017 after screening the seed for WSSV and EHP at the Aquatic Animal Health Laboratory of the Institute. We were also provided with about 4 tonnes of CIBA white shrimp feed Vanami^{Plus} at Rs. 60/Kg for the culture. The CIBA scientists provided all the requisite information concerning pond preparation, fertilization, ionic manipulation, aeration, feeding and water quality management. As a result of our combined effort, we harvested about 5 tonnes of 36-40 count shrimp (BW -26.5 g) after 120 DOC during the last week of October. With the technical support from CIBA, we could able to manage the problem of high alkalinity in the pond some mortality during the early stages of the culture. The use of cost-effective shrimp feed from CIBA we could able to achieve reduction in the cost of production. We are happy with our fruitful association with CIBA, and would like to take this to the next level by venturing into re-circulating aquaculture systems and seabass farming. With the confidence gained from this trial, this year we propose to start shrimp farming in another five acres of land. We would like to thank the Director and Scientists of CIBA for their wholehearted cooperation for the successful demonstration of vannamei farming using saline groundwater at Bathinda, Punjab.

TECHNOLOGY TRANSFERS, PRODUCT RELEASES AND KNOWLEDGE PARTNERSHIPS

Shri. Radha Mohan Singh, Hon'ble Union Minister for Agriculture and Farmers Welfare released products and technologies developed by ICAR-CIBA, Chennai

On the occasion of 89th ICAR Foundation Day, Hon'ble Union Minister for Agriculture and Farmers Welfare, Shri. Radha Mohan Singh released White Spot Syndrome Virus (WSSV) Nested PCR kit and a water probiotic CIBAMOX, technologies developed by CIBA on 16th July 2017. To strengthen the indigenous disease diagnostic capability, institute has developed an improved nested PCR kit for diagnosis of WSSV. CIBAMOX, a water probiotic product has also been developed to mitigate the nitrogenous toxins in grow-out shrimp culture operations ensuring good water quality.

A private fish hatchery signed MoU with ICAR-CIBA for seabass seed production technology

The hatchery technology for Asian Seabass Seed Production developed by CIBA for the first time in India, has been commercialized to a private aquaculture entrepreneur. There is a huge potential for the culture of Asian seabass in brackishwater ponds, enclosures, cages and also in marine waters. The fish attains marketable size in 6-8 months and fetches a market price of Rs.400 to Rs. 500/Kg while the production cost is Rs. 200 to Rs. 225/kg. Director, CIBA signed the MoU under Public-Private Partnership (PPP) mode with Mr. E. M. Senthil Kumar, Golden Eye on 30th December 2017 at CIBA Head Quarters with a payment of Rs. 5 lakhs and a royalty of 10%.

ICAR-CIBA and TNFU join hands for sustainable development of aquaculture

CIBA & Tamil Nadu Fisheries University, Nagappatinam joined hands for undertaking collaborative programmes in research, teaching, and extension in the areas of brackishwater aquaculture by signing a MoU on 25th September 2017 at CIBA Chennai. The mutual agreement was signed by the Dr K K Vijayan, Director, CIBA and Dr G. Jeyasekaran, Director of Research, TNFU in the presence of Dr S. Felix, Hon. Vice Chancellor of TNFU in an official meeting organized by CIBA. Dr. Vijayan in his opening remarks stressed the importance of convergence between CIBA and TNFU for the better utilization of resources regarding manpower, expertise and funding. Dr S. Felix, Vice Chancellor, mentioned the day as a historic event both for TNFU and CIBA, and TNFU will make necessary administrative and policy provisions for having a robust and efficient collaboration with CIBA in research, teaching and extension programmes.

Dr. Trilochan Mohapatra, Director General ICAR and Secretary, DARE visited ICAR-CIBA, Chennai

Dr.Trilochan Mohapatra, the Director General, ICAR and Secretary, DARE visited ICAR-CIBA during 6 - 7 August, 2017. He visited the research facilities at Muttukadu Experimental Station of CIBA and interacted with the scientists on the ongoing research programmes. Dr.K.K.Vijayan, Director, CIBA highlighted the salient achievements of the institute, focusing on the technological backstopping role of CIBA in taking up the brackishwater aquaculture and the way forward for the sector. Dr.Joykrushna Jena, Deputy Director General (Fisheries) accompanied the DG and apprised him about CIBA's contribution to the sector. DG congratulated the Director and scientists of CIBA for the achievements and appreciated CIBA's track record in terms of commercialization of viable technologies for the benefit of brackishwater aquaculture development in the country and asked the scientists to focus on the prioritized programmes, taking the requirement of the developmental needs of the brackishwater sector. He distributed hatchery produced seabass fish seeds to farmers from coastal states and Women SHGs from Tamil Nadu, released a DNA based diagnostic kit for the screening of EHP disease in shrimp, books on CIBA Technologies and FAQs on Shrimp farming in Hindi language.

Fisheries Commissioner Telangana State visited ICAR-CIBA

In order to explore the feasibility of vannamei farming in low saline waters of land locked state of Telangana, Dr. C. Suvarna, IFS, Commissioner of Fisheries, Telangana State along with Fisheries Department officials visited CIBA on 18th December, 2017. During the meeting, Commissioner interacted with Head of Divisions and Section-In-Charges on issues related to vannamei farming and diversification of species in low saline waters. Fisheries Commissioner and team visited all the laboratories, hatchery and wet lab facilities at Head Quarters and Muttukadu Experimental Station of CIBA. The Commissioner expressed her willingness to collaborate with CIBA for increasing fisheries production and income in Telangana State.

Dr. E.G. Silas visited CIBA and launched the thematic logo of SCAFi during the CIBA Annual Day-2017

ICAR-CIBA celebrated its annual day 2017 and family get-together on the Saturday evening, August 26, 2017 at Headquarters, Chennai. The event was organized jointly by the recreational club of the Institute and the Society of Coastal Aquaculture and Fisheries (SCAFi), CIBA-Chennai. CIBA staff along with their family members, participated in the get-together. An exhibition of technologies, recent publication of the institute, and aquarium of brackishwater candidate species was displayed. Dr. E.G. Silas, Founder Director, CIBA & Former Vice Chancellor, Kerala Agricultural University was the chief guest for this annual day celebrations. Dr Silas in his inspirational address briefed how CIBA evolved from a humble beginning to present level. A newly formed Society for the promotion of coastal aquaculture and fisheries, at CIBA has been inaugurated by Dr. E.G. Silas, by lighting the lamp. Dr. Silas unveiled the logo of the SCAFi and launched the thematic logo of the society.

Interaction meet on "Role of media in dissemination of brackishwater aquaculture information to the stakeholders and public"

ICAR-CIBA conducted a Scientists-Media Interaction Meet on 15th September 2017 to discuss the means of increased engagement with media for communicating with the stakeholders. Correspondents from press, visual and digital media, agriculture magazines, post graduate students of journalism from the city colleges and scientists participated in the programme. Shri. M.Annadurai, IIS, Director, Directorate of Field Publicity (DFP), Ministry of Information and Broadcasting, Govt. of India, the chief guest, underlined that constant interaction between the scientific institutions and media located in a geographical area is important to know the felt needs of the society and taking the technological solutions available with the institutes to solve the field problems. Dr. K.K. Vijayan, Director, CIBA emphasized on the branding of institute and its technologies and importance of the connectivity between the research institutions and media for popularizing R&D coming out of the research institutions in the country.

ICAR-CIBA participated in 3rd India International Science Festival – 2017

ICAR-CIBA participated as the Nodal Institute for ICAR in the "3rd India International Science Festival – 2017" held at Anna University, Chennai during 13-16 October 2017. The mega event was inaugurated by Dr.Harsh Vardhan, Hon'ble Union Minister for Science and Technology, Environment, Forests, Climate Change and Ministry of Earth Sciences on 13th October 2017. The CIBA stall at the national exhibition showcased the scientific achievements and technologies developed and transferred by CIBA for the development of brackishwater aquaculture in the country. Aquariums with live specimens of candidate finfishes and shellfishes were the main attraction for the visitors. The exhibition elicited huge interest among the students, entrepreneurs and public in brackishwater aquaculture. Dr. Harsh Vardhan after visiting the CIBA stall on 14th October 2017 appreciated the displays and content of the exhibition and advised that young generation need to get attracted towards brackishwater aquaculture technologies.

ICAR- CIBA Celebrated World Fisheries Day Celebrations at Koovathur Village, Kancheepuram District, Tamil Nadu

CIBA celebrated World Fisheries Day on 21st November 2017 at Keelarkollai village in Koovathur Panchayat of Kancheepuram district of Tamil Nadu in convergence with about 120 villagers including fishers, tribals, rural youth and local leaders. Dr. V.S. Chandrasekaran, Scientist in Charge, Social Sciences Division in his welcome address explained the changing scenario from capture fisheries to culture fisheries and stressed the importance of brackishwater aquaculture as an economic activity where healthy fish, employment and profit can be realized. Dr. V. Selvam, Executive Director, MSSRF, Chennai in his Presidential address focused that fishers income need to be doubled and for that cost effective and profitable technologies need to be widely disseminated. Later milk fish (*Chanos chanos*) seeds were handed over to the farmers for pen culture operation.

Agricultural Education Day Celebrated at ICAR-CIBA, Chennai

ICAR-CIBA conducted the Agricultural Education Day on 4th December, 2017 to educate the school students on various facets of brackishwater aquaculture and inspire them to develop interest in agriculture in general. About 250 higher secondary students and 17 school teachers from leading schools of Chennai participated in the programme held at the Muttukadu Experimental Station of CIBA. The students were taken to all the research facilities for a real-time field exposure. A career guidance session pertaining to aquaculture, agriculture, veterinary and fisheries subjects was held wherein the students had evinced keen interest to know the higher educational courses and job opportunities available in the sector. Finally a quiz programme comprised of identification of fish, shrimp and mud crab species, inputs and aids used in aquaculture and general knowledge pertaining to agriculture was conducted for the students.

ICAR-CIBA participation in the 'Aqua Goa Fish Festival'

ICAR-CIBA showcased the novel technologies at the exhibition 'Aqua Goa Fish Festival, Panaji, Goa' organized by the Government of Goa during 7-10 December, 2017. Smt. Mridula Sinha, Hon'ble Governor of Goa & Shri. Manohar Parikar, Chief Minister of Goa visited the ICAR –CIBA Stall on 7th December 2017 and interacted with the scientists about brackishwater aquaculture technologies developed by CIBA and stressed for effective convergence through strategic planning between Government of Goa and CIBA for large scale promotion of brackishwater aquaculture in Goa State. On 9th December, 2017, Shri. Radha Mohan Singh, Hon'ble Union Minister of Agriculture and Farmers Welfare, Government of India visited the CIBA Stall, observed the exhibits on brackishwater aquaculture candidate species; fish & shrimp feeds, water quality testing kits etc. and interacted with CIBA scientists. About 3500 stakeholders visited CIBA stall during the exhibition.

ICAR-CIBA developed a working model to scale up the distribution of "Soil and Water Heath Cards" to brackishwater aquaculture farmers

ICAR-CIBA is the first institute initiated the distribution of soil and water health cards (SWHC) in fisheries sector and distributed about 705 SWHCs since 2015. As it is not possible to issue the SWHCs to a large number of aquaculture farmers throughout the country by the Institute, CIBA developed a working model during 2017 by impressing upon the fisheries college and private aquaculture laboratories existing in Nellore District, Andhra Pradesh to analyze the samples at free of cost. The technical backstop and validation for the analysis was provided by CIBA. About 190 SWHCs were distributed to aqua farmers in the Brackishwater Aquaculture Farmers Meetings organized by the Institute in the district on 21st and 22nd December 2017 at Kota and Allur, respectively under National Innovations in Climate Resilient Agriculture (NICRA) Project. This model was successful and ready for the distribution of SWHCs to a larger number of aquaculture farmers in coastal states of the country.

National Workshop on 'Strategic Approach In Fisheries Sector on the Potential and Viability of Culturing Endemic and Exotic Species in India' at ICAR-CIBA, Chennai

ICAR- CIBA organized a one day workshop on "Studying the potential and viability of culturing endemic and exotic species for aquaculture" on 29th December 2017 under the scheme "Strengthening of Database and Information Networking" programme of Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture and Farmers welfare, Government of India. Dr. B. Meenakumari, Chairperson, National Biodiversity Authority inaugurated the workshop and emphasised the importance of cataloguing of exotic fish species in India and stressed the co-ordination of national bodies like ICAR institutes, National biodiversity and State Fisheries departments to create region wise quarantine facilities in order to address the biosecurity concerns in Indian context, with reference to the exotic species and pathogens.

NEWLY JOINED

The following officials newly joined from July, 2017 to June, 2018			
1	Shri. Raghavendra K.	Assistant	28.07.2017
2	Shri. Sanjoy Some	Skilled Support Staff	30.05.2017
3	Shri. V. Kishor Kumar	Skilled Support Staff	31.05.2017

PROMOTION

The following officials promoted during July, 2017 to June, 2018			
Sl.No	**Name of Officials**	**Designation**	**Date of Promotion**
1	Shri. S.Rajamanickam	Asst. Chief Technical Officer	28.10.2015
2	Dr. J. Joseph Sahaya Rajan	Asst. Chief Technical Officer	08.12.2015
3	Shri. S. Nagarajan,	Asst. Chief Technical Officer	03.01.2017
4	Dr. S. Sivagnanam,	Chief Technical Officer	14.02.2017
5	Shri. D. Raja Babu,	Chief Technical Officer	13.03.2017
6	Shri. D.M. Ramesh Babu	Technical Officer	24.07.2017
7	Shri. G.Thiagarajan,	Technical Officer	04.08.2017
8	Dr. A. Nagavel,	Asst. Chief Technical Officer	21.08.2017
9	Shri.R.Subburaj,	Asst. Chief Technical Officer	27.08.2017
10	Shri. K.Karaiyan	Senior Technical Assistant	10.09.2017
11	Smt. E. Mary Desouza	Assistant	13.10.2017
12	Dr. K.P. Kumaraguru Vasagam,	Senior Scientist	26.03.2015
13	Dr. Vinaya Kumar Katneni,	Senior Scientist	12.06.2016
14	Dr. P. Mahalakshmi	Principal Scientist	12.11.2016
15	Dr. Krishna Sukumaran,	Senior Scientist	07.01.2017
16	Dr. P. Ezhil Praveena,	Senior Scientist	07.01.2017
17	Dr. Ananda Raja,	Senior Scientist	08.01.2017
18	Dr. Gouranga Biswas,	Senior Scientist	08.01.2017

SUPERANNUATION

1	Dr. V.S. Chandrasekaran, Principal Scientist	30.11.2017

CIBA IN NEWS MEDIA

05/08/2017 The Hindu

THE HINDU CHENNAI
SATURDAY, AUGUST 5, 2017

Cashing in on sea bass in backwaters

Project in Vennangapattu succeeds in cage-farming of sought-after fish species

B. KOLAPPAN
MARAKKANAM

The Central Institute of Brackishwater Aquaculture (CIBA) has achieved a breakthrough in cage-farming of sea bass, commercially one of the most sought-after fish species, in the backwaters of Vennangapattu near Mamallapuram. Earlier, CIBA had experimented with cage-farming in Adyar Creek after the creek was cleaned, but only milk fish survived in the cages.

The success in Vennangapattu has increased the prospects for sea bass culture as it has proved to be a complete model. The technical assistance for fabricating the cages came from the National Institute of Ocean Technology (NIOT). Over 200 kg of fish, with their size ranging between 1 kg and 1.5 kg, were

Tangible benefit: The cage-rearing of sea bass helps to augment the incomes of local fishermen.

on Friday and sold to the Tamil Nadu Fisheries Development Corporation.

In India, captive breeding of sea bass was achieved in 1997.

Since then the fish has been cultivated in ponds. But the advantage with cage-rearing of sea bass in brackishwater is that it belongs

augmenting their income. Pond culture benefits only individuals. "The fish catch is depleting in the sea and we have not utilized the potential of brackishwater area. Now lagoons and estuaries can be used for cage-farming wi

fish," said K.K. Vijayan, Director of the CIBA.

Handsome profit

In Vennangapattu, Dr A.P.J. Abdul Kalam Fish Products Self Help Group managed the cage-farming and they sold their first harvest for ₹75,900. It will cost farmers ₹190 to rear fish up to 1 kg and the market value is between ₹350 and ₹400.

CIBA has designed cage-farming as a three-tier system. In the first phase, fish fry of 1 cm length is reared in the nursery for 45 to 60 days till they weigh five to six grams. They are then shifted to the pre-grow-out cage where th grow to

requirement of the market before going for a harvest. Otherwise farmers will not make profit. Normally we can harvest the fish two times a year. Here this is the second harvest," said M. Kumaran, Principal Scientist of the CIBA and the head of the project in Vennangapattu.

R. Kirubagaran, NIOT scientist, said his team zeroed in on Vennangapattu after studying the nature of the waves there, wind speeds, water salinity and the depth of the backwater.

"The project can be successfully rep

9-12-2017

4

அதிக இலாபம் தரும் இந்திய வெள்ளை இறால் வளர்ப்பு சி.பா. நிறுவனத்தின் புதிய தொழில் நுட்ப சாதனை

OWNED, BY published and Printed by K.UMAR, Printed at Chennai Offset Printers, No:19/1, 21/2 "ithabath "han bhadhur street, ellis road, Chennai-600 002. Publish from No: 31/16, Mathavan Nagar, 1st street, R.K.Nagar, R.A. Puram, Chennai - 600 028. Editor: K.UMAR, Cell: 9841934731, 9176810000, 9600971717, email id: tseditor@yahoo.com No.17/1,Madha Church Road, Mandaiveliipakkam, Chennai - 600 028. E-Mail ID - thalaimaiseithi123@gmail.com

The Hindu - 21st Aug 2017

Indian shrimp to replace exotic spec

Native species is being promoted under the 'Make In India' programm

B. KOLAPPAN
CHENNAI

After depending on the exotic shrimp species Penaeus vannamei, which is prone to disease outbreak, aquaculturists in the country have opted for Indian white shrimp as it has proven to be more robust and resistant to diseases.

This native species will be promoted as an alternative to exotic species under the Make in India programme.

"It has performed very well in terms of growth and disease resistance under culture conditions and has surpassed the growth of P. vannamei during the first two and half months of culture though it is non-Specific Pathogen Free (SPF) and has not been subjected to any selective breeding," said Akshya Panigrahi, principal scientist at the Central Institute

The Indian White Shrimp.

of Brackishwater Aquaculture (CIBA).

P. vannamei, a Pacific white shrimp, was introduced in 2009 after recurrent outbreaks of disease led to loss in the production of another Indian species P. monodon.

"Now P. vannamei has also become a victim of many viral, bacterial and parasitic disease and suffered slow growth syndrome," said Mr. Panigrahi, who led a research on upgrading of breeding and culture of Indian white shrimp.

Successful farming trials of P.indicus have been conducted in six maritime states – Odisha, West Bengal, Andhra Pradesh, Tamil Nadu, Kerala and Gujarat – under the National Fisheries Development Board (NFDB).

The results were encouraging as the productivity level ranged between three tonnes and six tonnes per hectare.

On August 3, the farmers' group signed a Memorandum of Understanding (MOU) with the CIBA for rearing the shrimp. CIB Vijayan said t gent need to farming of nat species along w P. vannamei.

Mr. Panigrah tion of P. indicu pense with the pending on othe for brood stock.

"P. indicus is a over the Indian breeding of the s also easy," he expla

"Native species monodon has beco after the introductio vannamei," he said.

CIBA has submitte ject report to the India ernment for developm Indian white shrimp.

It envisages developing a total of 25,000 hectares and additional production of 1.5 lakh tonnes of native shrimp.

మెలకువలు పాటిస్తే అధిక దిగుబడులు

కోట : ఆక్వా సాగులో శాస్త్రవేత్తల సూచనలు, సలహాలు పాటిస్తే అత్యధిక దిగుబడులు సాధించవచ్చని ఆక్వా శాస్త్రవేత్తలు తెలిపారు. కోట పట్టణంలోని రెడ్డి కల్యాణ భవనంలో గురువారం సిబా(ఎంపెడా) ఆధ్వర్యంలో ఆక్వా రైతులకు అవగాహన సదస్సు నిర్వహించారు. కోట, వాకాడు, చిట్టమూరు, చిల్లకూరు మండలాల ఆక్వా రైతులు హాజరయ్యారు. పలు ప్రాంతాలకు చెందిన ఆక్వా శాస్త్రవేత్తలు మురళీధరన్, బాల సుబ్రహ్మణ్యన్, శ్యామ్, దయాళ్, హరిమ, ఆళోక్, కుమార్ రాజా, సుజను మాట్లాడుతూ ఆక్వా రంగంలో రైతులు కచ్చితంగా శాస్త్రవేత్తల సూచనలు సలహాలు తీసుకోవాలన్నారు. నెల్లూరు జిల్లాలో సముద్రతీర మండలాల్లో ఆక్వా సాగు ప్రతి ఏడాది విస్తరిస్తోందన్నారు.ప్రస్తుతం ఆయా మండలాల ఆక్వా రైతులు వెనామీ సాగుపై దృష్టి పెడుతున్నారన్నారు. దీని వల్ల ఎన్నో ఉపయోగాలు పొందుతున్నారు. సాగు చేసేటప్పుడు వాతావరణ మార్పులకనుగుణంగా సదుపాయాలన్నారు. అవగాహన లేక పలువురు రైతులు నష్టపోతున్నారన్నారు. రైతులకు అవగాహన కల్పించేందుకు మండలాల వారీగా ఈ అవగాహన సదస్సులు ఏర్పాటు చేస్తున్నట్లు తెలిపారు. అనంతరం రైతులకు వాట్ర్ మెల్ట్ కార్యులను పంపిణీ చేశారు.

సదస్సులో మాట్లాడుతున్న శాస్త్రవేత్తలు

రొయ్యలసాగులో మెలకువలు అవసరం

కోట, న్యూస్‌టుడే : రొయ్యలసాగులో రైతులు మెలకువలు పాటించవలసిన అవసరముందని, సాంకేతికతను అందిపుచ్చుకొని సాగు చేయాలని ముత్తుకూరులోని మత్స్య కళాశాల అసోసియేట్ డీన్ హరిబాబు పేర్కొన్నారు. కోటలోని అల్లారెడ్డి శ్యాంసుందరరెడ్డి కల్యాణ మండపంలో గురువారం ఐసీఏఆర్‌సీబా ఆధ్వర్యాన ట్రాకిష్ వాటర్ ఆక్వా రైతుల అవగాహన సదస్సు నిర్వహించారు. కోట, వాకాడు, చిట్టమూరు మండలాల్లోని ఆక్వా రైతులకు సాయిల్ హెల్త్‌కార్డులు పంపిణీ చేశారు. అనంతరం ముత్తుకూరులోని మత్స్య కళాశాల అసోసియేట్ డీన్ హరిబాబు, మత్స్య శాఖాధికారులు లాలీమహమ్మద్, ఎంపెడా అసిస్టెంట్ డైరెక్టర్ గణేష్ జిల్లాలో రొయ్యల సాగు విశిష్టతను వివరించారు. వాతావరణంలో వచ్చే మార్పులు వలన సాగులో వచ్చే సమస్యల పరిష్కరించుకునే విధానంపై శాస్త్రవేత్తలైన

సదస్సులో మాట్లాడుతున్న మత్స్య కళాశాల అసోసియేట్ డీన్ హరిబాబు

మురళీధరన్, బాలసుబ్రహ్మమణియన్, శ్యామదయాల్, పూర్ణిమ, అశోక్‌కుమార్, కుమార్‌రాజు, సువన, సీనియర్ టెక్నికల్ అధికారి నాగవేల్ సాగు రైతులకు వివరించారు. ఈ కార్యక్రమంలో నిర్వాహకులు విజయన్, కోట, వాకాడు, చిట్టమూరు మండలాల ఆక్వా సాగు రైతులు పాల్గొన్నారు.

முதல் மீனவர்களுக்குப் பாராட்டு!

நமீன்

Published : 25 Nov 2017 | 11:21 IST
Updated : 25 Nov 2017 | 11:27 IST

காஞ்சிபுரம் மாவட்டம், கூவத்தூர் பஞ்சாயத்தின் மேற் உள்ளது மோர்கொள்ளை இராமம். இங்குள்ள மக்களில் பலருக்கு உழவே தொழில். அதனாலோ என்னவோ, பல குடும்பங்கள் வறுமைக் கோட்டுக்குக் கீழ் உள்ளன.

இவர்களுக்கு உழவிலிருந்து வரும் வருமானத்தைத் தவிர்த்து, கூடுதல் வருமானத்துக்கு வழிசெய்யும் விதமாக, சென்னையில் உள்ள மத்திய உவர்நீர் மீன்வளர்ப்பு நிறுவனம், கொடுவா மீன் நாற்றாங்கால் வளர்க்க உதவி செய்துவருகிறது.

செப்டம்பர் மாதம் தொடங்கப்பட்ட 'கொடுவா மீன் நாற்றாங்கால் வளர்ப்புத் இட்ட'த்தின் முதல் அறுவடை இந்த மாதத் தொடக்கத்தில் நடைபெற்றது. நிறுவனம் வழங்கிய சுமார் 5 ஆயிரம் கொடுவா மீன் குஞ்சுகளில் சுமார் 2 ஆயிரம் மீன் குஞ்சுகள், விரயிகளாக வளர்க்கப்பட்டு, மீன் வளர்ப்பு ஆர்வலர்களுக்கு விற்பனை செய்யப்பட்டன.

இந்தத் இட்டத்தை ஆர்வமாக முன்வந்து ஏற்றுக்கொண்ட அந்த முதல் 'மீனவர்களுக்கு' (இவர்கள் தொழில்முறை மீனவர்கள் இடையாது) கடந்த 21-ம் தேதி, 'உலக மீன்வள நாள்'ன்று பாராட்டு விழா நடைபெற்றது. இதில், எம்.எஸ்.சுவாமிநாதன் ஆய்வு அறக்கட்டளையின் நிர்வாக இயக்குநர் வி.செல்வம் கிற்பு விருந்தினராகக் கலந்துகொண்டு, மீன் வளர்ப்பின் முக்கியத்துவம் குறித்துப் பேசினார்.

4 Sunday Times of India, Chennai
September 10, 2017.

TIMES CITY

Desi shrimps set to be the next big fish in the market

U.Tejonmayam | timesgroup.com

When a contagious viral disease struck the Indian shrimp industry in the 1960s, taking as many species like Asian tiger shrimps (penaeus monodon) off the market, an exotic species from Latin America, the Pacific white shrimp (penaeus vannamei) came to the rescue of the ailing industry.

Now, scientists are working to revive an indigenous species — the Indian white shrimp (penaeus indicus) — that can challenge the foreign species dominating the country's shrimp exports. Scientists from ICAR-Central Institute of Brackishwater Aquaculture (CIBA) in Chennai are promoting the native species among shrimp farmers under the Make in India programme.

CIBA director K K Vijayan said a project proposal had been submitted to the Centre to launch a selective breeding programme for the native species. The project includes developing a total of 25,000 hectares for farming and an additional production of 1.5 lakh tonnes of native species. Popularisation of the native species is important, as it

VARIETY ON THE PLATTER
The native species is being revived to provide diversification in shrimp aquaculture

EFFORTS TAKEN | White spot syndrome-free hatchery produced species evaluated at six locations along the coast in Gujarat, West Bengal, Odisha, Andhra Pradesh, Kerala and Tamil Nadu. Growth, reproductive ability and diseases occurrences were studied

▶ A proposal has been submitted to the Centre to launch a selective breeding programme at a cost of ₹150 crore to genetically improve the native species and make it disease-resistant

▶ Project also involves developing 25,000 hectares for farming and additional production of 1.5 lakh tonnes of native shrimp species

HEALTH AND TASTE
Average nutrient profile of 100g edible shrimp

Protein (g)	15.4
Energy (kcal)	85
Polyunsaturated fatty acids (mg)	321
Saturated fatty acid (mg)	257.5

Scientific name: Penaeus indicus	Scientific name: Penaeus Monodon	Scientific name: Penaeus vannamei
Common name: Indian white shrimp	Common name: Asian tiger shrimp	Common name: White leg shrimp or Pacific white shrimp
Native: Indo-West Pacific from east and south Africa through India, Malaysia and Indonesia to south China, Papua New Guinea and north Australia	Native: Indo-west Pacific including East Africa, South Asia, Southeast Asia, Philippines and Australia	Native: Western Pacific coast of Latin America, Peru to Mexico
Size: Length of 23cm (females) and 18.4cm (males)	Size: Up to 30cm and 320g (females larger than males)	Size: Up to 23cm, weighing at least 30g

"The result of these trials showed immense potential of the native shrimp. The Indian white shrimp production of up to 3 to 6 tonnes/ha has been achieved in four months," said Panigrahi.

The non genetically improved cultured Indian white shrimp is found to have a growth and productivity on a par with the Pacific white shrimp. "Since Indian white shrimp is a native species, there is no fear of alien pathogens affecting it. And in five years, a genetically improved variety of the native species will come to the fore

than the exotic species in Indian conditions," he said. Apart from farming demonstrations across the country, scientists have also been conducting genetic characterisation of the species. "Genetic characterisation is an important step for selective breeding of a species to genetically modify it," said Panigrahi. A national workshop on Indian white shrimp farming was also conducted earlier this month among stakeholders where memorandums of understanding were signed to promote white shrimp aquaculture.

Bharat tomorr awaren child a

Times News

Chennai: The Y thi Children's H nounced on Sat Nobel Peace Lau would undertak tra to fight chil and trafficking i mari in Tamil Na ber 11. The yatra Vivekananda. M nyakumari to the anniversary address at Chico

The march w Salem, Madurai Vellore in Tamil September 12 a 15. The yatra wi Delhi on October will highlight t sues of child sex exploitation, an awareness to co sues.

This yatra is three-year cam child rape and abuse and HIV/Ai ing awareness a the causes, strengt tional response t lical health and e ensuring prem tims and with trials and incre tions of child sex time bound mec

Sivaj

Yogesh.K.S @timesgr

Chennai: Const memorial of lat Ganesan is com building is yet open to the publ ment of a date f of chief minis Palaniswami it ration is awaite

The memo over 2800 sq f Deshmukh Roa Adyar bridge w ne statue of th that was remov rajar Salai on ch ech in a pre-dr month follow high court ord According

"Brackishwater aquaculture for food, employment and prosperity"

ICAR-Central Institute of Brackishwater Aquaculture
75, Santhome High Road, M.R.C. Magar, Chennai - 600 028.
Phone : 044-24610565, 24618817, 24616948, Telefax : 044-24613818, 24610311
Email : director@ciba.res.in/itmu@ciba.res.in, Website : www.ciba.res.in