



MPEDA

Newsletter

VOL. XII NO. 6 SEPTEMBER 2024



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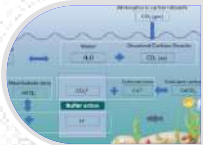
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D.V. Swamy IAS
Chairman

Dear friends,

In 2024, global aquaculture production reached a milestone, with aquaculture contributing 51% of the total fish production, surpassing capture fisheries for the first time. The Indian aquaculture sector, which began with traditional methods of growing naturally impounded fish and shrimp, transitioned to scientific farming in the 1980s, leading to exponential growth, and plays a very significant role in global production. Despite challenges, the sector embraced innovation to enhance rural livelihoods and reshape the economic landscape. MPEDA has supported this transformation through scientific farming, species diversification for exports, and the introduction of advanced processing techniques and infrastructure. Mr. Peter Drucker, the champion of management as a serious discipline, once said, "the best way to create the future is to create it". This quote underscores the importance of improvising and implementing changes to shape the future.

MPEDA constantly creates platforms to showcase innovations and advanced technologies in the seafood production and processing sector. As part of its continued efforts, MPEDA organized an "International Conclave on NextGen Technologies in the seafood sector" at Cochin on 30th August 2024. The call for proposals on innovative technologies received a very warm response, with 44 proposals from India and abroad. The shortlisted 11 proposals were presented at the final conclave, which saw an overwhelming participation of stakeholders across the value chain, such as farmers, hatchery operators, seafood processors, researchers, academicians, bankers, and policymakers. The participants were introduced to the technologies that are ready for adoption in the field by the innovators. Currently, MPEDA is creating additional platforms for these innovators to take their technology forward, and we are hopeful that they will find their place in the value chain.

MPEDA's market promotion efforts were boosted by its participation in the Japan International Seafood and Technology Expo in Tokyo on August 21-22, 2024, alongside fifteen exporters. MPEDA had the honour of having Shri. Jitin Prasada, Hon'ble Union Minister of State for Commerce and Industry, Govt. of India, inaugurate the Indian pavilion at the expo. His visit to our exporters' stalls inspired them and fostered meaningful interactions.

On August 21, 2024, I had the opportunity to meet with Shri K. Atchannaidu, the Hon'ble Minister for Agriculture, Cooperation, Marketing, AHDD & Fisheries for the Govt. of Andhra Pradesh. During our discussion, I provided insights on the necessary interventions to support the growth of the aquaculture and fisheries sectors, aiming to boost seafood exports from the state. Further, I had the opportunity to present the "Andhra Pradesh State Action Plan to Enhance Seafood Exports" to Shri Babu A., IAS, Secretary of Fisheries, AP, in a meeting that brought together officials from various departments and representatives from MPEDA, NABARD and SEAI. I also had the privilege of visiting local processing units, feed mills, and MPEDA offices in Vijayawada and Bhimavaram. Additionally, I explored the RGCA GIFT project and farming clusters facilitated by NaCSA. These visits were incredibly valuable in helping us identify areas for collaboration and improvement as we work together to advance the seafood industry.

As part of an ambitious 100-day action plan and in collaboration with the Pradhan Mantri Matsya Sampada Yojana, the Marine Products Export Development Authority (MPEDA) hosted an exciting practical training event on seafood value addition in Tuticorin on August 22, 2024. This hands-on experience was a game-changer for fifty local processing technologists, who deepened their expertise on seven popular value-added products.

The momentum continued throughout the month with a series of dynamic state-level workshops focusing on implementing Turtle Excluder Devices (TED) across Tamil Nadu and Andhra Pradesh. Meanwhile, in the coastal district of Visakhapatnam, MPEDA organized a comprehensive Seafood HACCP training program for processing technologists, ensuring that the region's seafood industry is equipped with the best practices for safety and quality. It was a month filled with learning, innovation, and a commitment to enhancing the seafood sector.

Thank you.

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MPEDA's stellar presence at the 2024 JISTE

The Japan International Seafood and Technology Expo (JISTE) is Japan's largest seafood trade fair. The 26th edition of JISTE was held at Tokyo Big Sight International Exhibition Centre. The Expo was organized by Exhibition Technologies Inc. The venue brought together a variety of seafood and processing machineries from different countries to a single platform. There were more than 1000 stalls with a target of 25000 visitors.

India's marine product trade with Japan

Japan is the 5th largest market for Indian seafood involving 212 exporters and 159 importers in Japan last year. During 2023-24, exports to Japan have decreased by 5.67% in terms of value and 12.31% in terms of quantity when compared with 2022-23. Japan is the third largest importer of Indian seafood, with a share of 6.06% in quantity and 5.42% in US\$ value terms. Frozen shrimp is the major item of exports to Japan, with a share of 33.26% in quantity, 65.94% in ₹, and 65.98% in US\$ value.

During 2023-24, India exported US\$ 14.8 million worth of prepared and preserved shrimps and prawns to Japan, capturing a share of 2.4% Japan's total imports in this category (US\$ 617.4 million). India's exports of prepared or preserved fish to Japan amounted to US\$ 7.9 million, achieving a significant 7.6% share of Japan's total imports in this segment (US\$ 103.1 million), indicating a stronger foothold in this market. India's export performance for octopus, prepared or preserved, was minimal, with only US\$ 0.13 million in exports, resulting in a negligible 0.15 % share of Japan's US\$ 84.9 million imports in this category.

Inauguration – "Kagami – Biraki"

JISTE 2024 began on 21st August 2024 with a traditional "Kagami Biraki" (breaking the sake barrel) ceremony. In Japan, the lid of a sake

barrel is broken and opened at special occasion in a ceremony called "Kagami -Biraki". This is to wish for health and well-being at times of new celebration. Mr. Anil Kumar P., Joint Director, MPEDA, participated in the ceremony along with 16 country representatives.



Kagami Biraki ceremony

Mr. Jitin Prasada, Hon'ble Union Minister of State for Commerce and Industry, Govt. of India inaugurated the Indian pavilion in the presence of co-exhibitors and the officials of MPEDA. The minister also visited the stalls and interacted with the co-exhibitors.



Mr. Jitin Prasada, Hon'ble Union Minister of State for Commerce and Industry, Govt. of India inaugurating the Indian pavilion

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Interaction with co-exhibitors by Hon'ble Union Minister of State for Commerce and Industry, Govt. of India

World Sushi Cup Japan 2024

The World Sushi Cup Japan 2024 was held at the venue which featured top Sushi Chefs from around the globe, competing in various categories. The categories included the Edomae Sushi Open Competition and the Creative Sushi Open Competition. The event showcased innovation and culinary excellence. The French team of chefs won all the categories.



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Indian Pavilion

MPEDA took a space of 136 sq. m. along with 15 export companies as co-exhibitors in JISTE. The following co-exhibitors participated in JISTE 2024, presenting their products to a diverse audience.

Sl. No.	Company Name
1	M/s. Pramadha Marine Exports Ltd.
2	M/s. Sriram Exim
3	M/s. Sunrise Seafoods India Pvt. Ltd.
4	M/s. Ashadeep Aquacultural Pvt. Ltd.
5	M/s. Hari Marine
6	M/s. BRC Marine Products
7	M/s. Snow world Marine Exports Pvt. Ltd.
8	M/s. Sabri food Products Pvt. Ltd.
9	M/s. Monsoon Bounty Food Manufacturing Pvt. Ltd.
10	M/s. Seadoris Marine Exports
11	M/s. United Marine Products
12	M/s. Seacatch International
13	M/s. Ulka Seafoods Pvt. Ltd.
14	M/s. Kings International
15	M/s. Dwaraka Sea Foods

Mr. Anil Kumar P., Joint Director, Dr. S. Shassi, Deputy Director and Mrs. Anju, Assistant Director represented MPEDA at JISTE.

Frozen seafood samples were displayed to capture the interest of consumers and importers. MPEDA brochures, printed in Japanese, providing details about MPEDA's activities, were also available at the stall. Visitors could access information on the Indian seafood exporter directory, co-exhibitor guide, commercial fish species of India, and seafood products by scanning the prominently displayed QR codes at the stall.



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Interpreters were engaged to facilitate conversations with importers/consumers, helping to understand market demands and requirements. They assisted the officials in effectively communicating with buyers and visitors. Around 38 trade enquiries were received and featured in the trade enquiry section of this newsletter, providing the export community with valuable opportunities to establish trade connections.

Innovative products

Chuka Kurage

Chuka Kurage, a popular Japanese side dish, is often enjoyed as a snack or appetizer alongside sake or beer, and also pairs perfectly with sushi. It complements rice, porridge, and can even be wrapped in white rice. Made from seasoned, cooked, and frozen jellyfish, its key ingredients include jellyfish, water, sugar, shoyu, oil, white sesame seeds, and salt.

Katsuobushi

Katsuobushi, also known as bonito flakes or okaka, is made from skipjack tuna that is simmered, smoked, and fermented. The process begins with the fish being beheaded, gutted, and filleted, followed by boiling and removal of the rib bones. The fillets are then smoked for a month using oak, pasania, or castanopsis wood, with each smoking session followed by a resting period to allow condensation to form on the surface. Once the fish becomes hard and dry, further sun-drying and fermentation result in the final product, katsuobushi.

Takoyaki

Takoyaki is a ball-shaped Japanese snack made of a wheat flour based batter and cooked in a special molded pan. It is typically filled with minced or diced octopus (tako), tempura scraps, pickled ginger and green onion. "Tako" means octopus and "yaki" means "fried". It's a famous Japanese street food item.

Meetings with importers

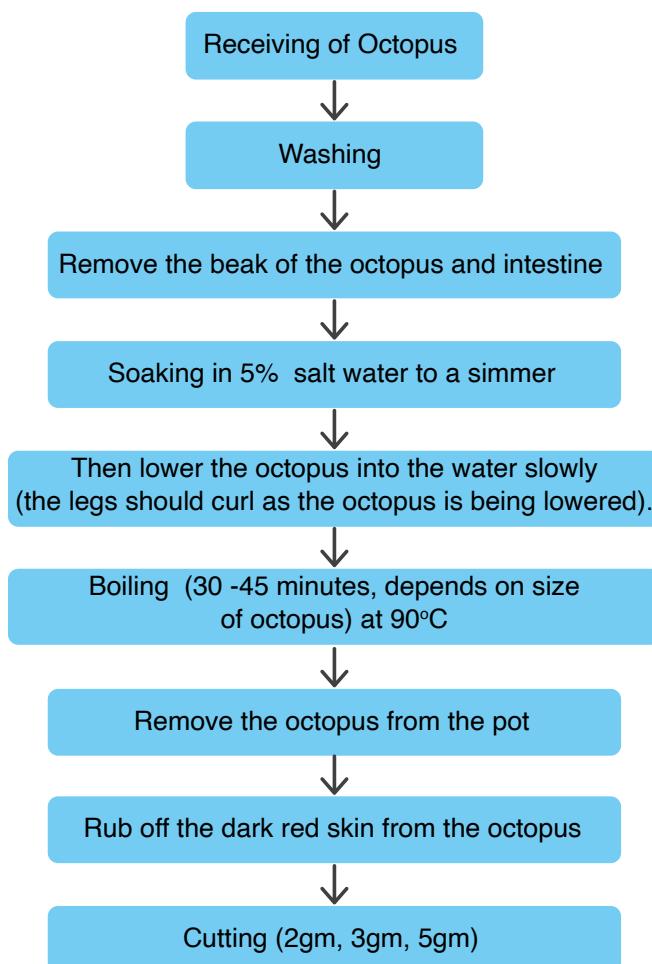
MPEDA officials held productive meetings with prominent seafood importers in Japan. Below are the details of the discussions.

Meeting with Mr. Shigeki Oyasato, President, UP FIELD Co., Ltd. Tokyo, Japan

Mr. Shigeki Oyasato visited MPEDA stall on 21st August 2024 and discussed about the availability of boiled octopus from India for Takoyaki snacks.

The product is very popular in Japan, and there is demand for boiled octopus from India. Mr. Shigeki explained in detail regarding the steps involved in the production of the boiled octopus and also volunteered to demonstrate the process in India. Mr. Anilkumar P. invited Mr. Shigeki for the BSM at World Food India.

Processing steps



MARKETING NEWS

Meeting with Mr. Seiichiro Kondo, Director General Manager, Sales Department, Hamasho Co., Ltd, Tokyo, Japan

On 21st August 2024, Mr. Seiichiro Kondo visited the MPEDA stall and engaged in discussions with the Mr. Anilkumar P., Joint Director (Marketing) and Dr. Shassi, Deputy Director. M/s. Hamasho Co. Ltd. expressed interest in sourcing Headless (HL) and Nobashi shrimp (*Vannamei* species) from India. They also proposed providing a protocol to help identify shrimps affected by a muddy, mouldy smell, allowing exporting units to avoid sourcing raw material with such issues.

Meeting with Mr. Kiyoshi Kimura head of Kiyomura Corporation, Tokyo, Japan

On 22nd August 2024, Mr. Kiyoshi Kimura, known as the "Tuna King" of Japan and head of Kiyomura Corporation, which operates the Sushi Zanmai chain of restaurants, visited the MPEDA stall and engaged in discussions about importing tuna from India.

Visit to Toyosu Market

MPEDA officials visited the Toyosu market and observed the auctioning of tuna. The procedure involves auctioneer and buyer assembling in the auction hall. The auction begins at 5.00 am and the buyers wear a cap with a yellow label. These are buyers with licenses to purchase. The auction begins with ringing of bell by the auctioneer and the buyer quotes the price by raising the fingers of the hand. The buyer tests the quality of the fish kept for auction by checking the texture, smell etc. The auction is completed once the auctioneer announces the final bid amount thrice and no further quotes are received. The buyer then takes the fish. Auctioned fish will have labels with origin, weight of fish, indication of any damage etc. There are two sections in the market, one for wholesalers and another for retailers supplying to restaurant chains. The market also has frozen tuna, chilled sea urchin, live fish and octopus sections.



Yellowfin Tuna displayed for auction with a cut piece to demonstrate the quality

A discussion was also held with Mr. Akira Katagiri, Chuo Gyorui Co., Ltd. Marunaka Group, Tokyo Central Wholesale Market, Toyosu regarding export of Tuna from Andaman Island to Japan. He informed that following requirement has to be met for importing yellowfin tuna from Andaman Island.

1. Long line fishing is preferable for Tuna catch and minimum size shall be 35 kg per piece.
2. Fresh fish with good appearance, taste and texture.
3. Styrofoam packing with maximum of two pieces

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MPEDA officials observing the activities at Toyosu market

not less than 35 kg per piece.

4. Gel ice / dry ice is preferable for chilled packing

5. Type of fishing shall be labelled.

Visit to Numazu Fishing Harbour

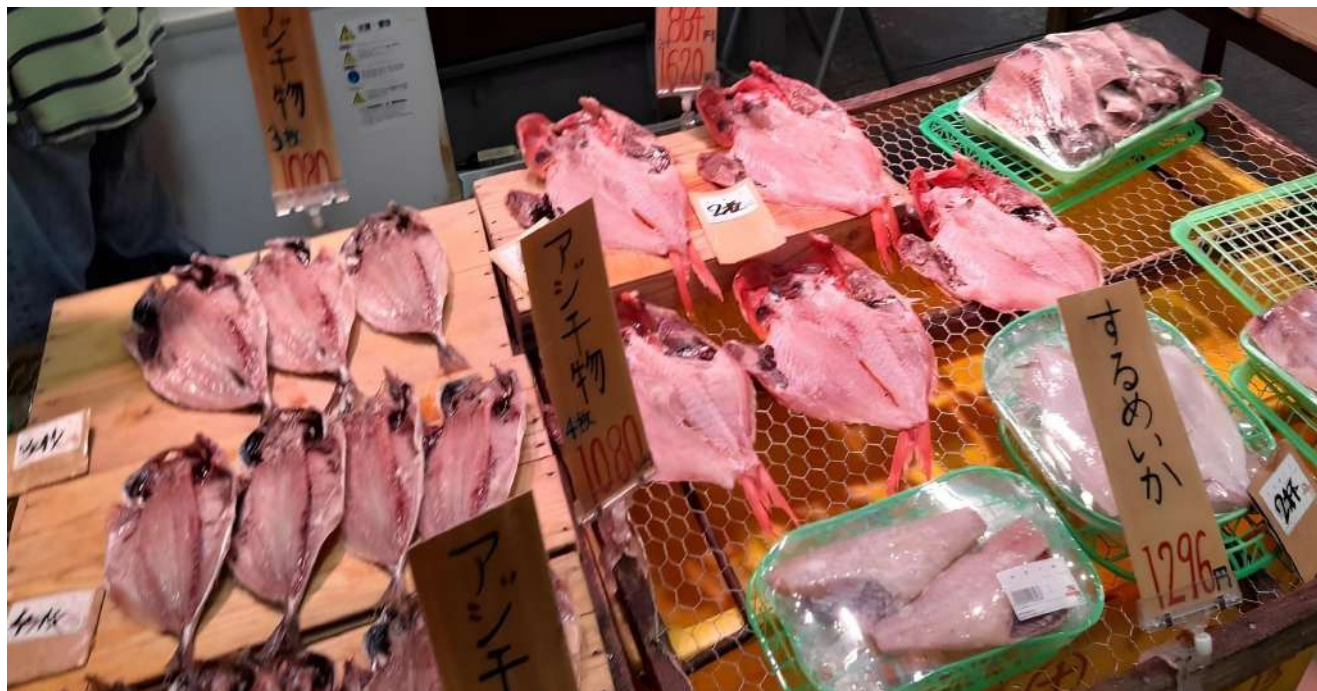
The Port of Numazu is located between Mount Fuji to the north and Suruga Bay to the south, is known as the gateway to the Izu Peninsula. Numazu fishing harbour is a traditional fishing harbour with state-of-the-art berthing and auction

centre. Supermarkets and seafood restaurants catering to tourists are major attraction in the fishing harbour. The fishery cooperatives are operating the fish harbour and most of the fishing vessel do one day fishing.

MPEDA's participation in JISTE 2024 offered opportunity to explore new technology, interact with prospective importers and advertise Indian seafood. The venue provided a platform for important business interactions and also offered a glimpse of the array of seafood offered by competitor countries.



View of Numazu fishing harbour



View inside the retail fish markets at Numazu harbour

The impact of Ocean Acidification on marine organisms

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Introduction

Acidity of the world's oceans is increasing due to the absorption of carbon dioxide (CO_2) in the atmosphere. There has been a significant increase in atmospheric CO_2 concentrations due to the continued burning of fossil fuels and is expected to reach 970 ppm by the end of the century and 1,900 ppm by 2,300. It is estimated that 50% man-made emissions of CO_2 released into the atmosphere have been absorbed by the world's oceans over the past two centuries, and around 30% of the most recent emissions have been absorbed by the oceans. As a result, the average pH of the ocean surface will decrease by 0.1 units compared to pre-industrial times and is expected to decrease by 0.3 to 0.46 units by the end of the century, but parallel to the current CO_2 emission scenario. The drop in ocean pH is called ocean acidification.

Over the past decade, scientific research on ocean acidification has mainly focused on understanding

carbonate chemistry and the resulting calcification response of major calcifying organisms to changes in ocean pH.

The diffusion of CO_2 in sea water immediately causes it to react with water and form carbonic acid. Carbonic acid then rapidly dissociates into bicarbonate (HCO_3^-) and protons and can dissociate further to form carbonate ion (CO_3^{2-}) and protons.

Under abiotic conditions of temperature, salinity, and alkalinity, nearly 90% of CO_2 is present as HCO_3^- and nearly 10% as CO_3^{2-} , while less than 1% is acid-soluble CO_2 and carbon dioxide.

These forms are also known as dissolved inorganic carbon (DIC) and if the ocean surface continues to absorb atmospheric CO_2 emitted by humans, this could lead to an increase in DIC and thus lead to a change in carbonate composition. This will lead to an increase in HCO_3^- .

In general, it is suggested that marine organisms with calcium carbonate structures will be most susceptible to ocean acidification. Any variation in sensitivity among these marine organisms depends on the mineral form of CaCO_3 . Aragonite is more soluble than calcite, while magnesium calcite is more soluble than aragonite, and amorphous calcium carbonate (ACC) is the most soluble of all. Higher solubility of CaCO_3 polymorphs is predicted for marine organisms at higher latitudes such as polar regions, because high latitude regions where cold water increases CO_2 absorption causes the greater depth of the

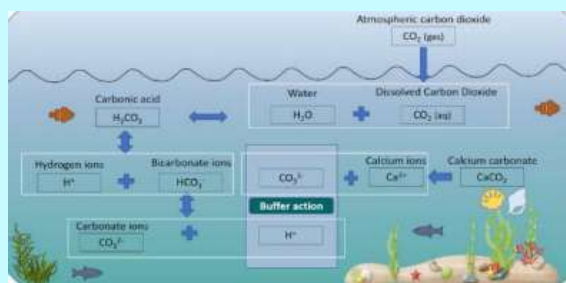


Fig. 1: Schematic of the ocean acidification mechanism and pCO_2 while decreasing CO_2 and decreasing pH

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CaCO_3 saturation horizon makes calcification energetically more difficult and thus these regions were probably the region where the effects of calcification were first detected.

Such a decrease in pH may particularly affect the sensitive and vulnerable early developmental stages of marine organisms, as these life cycles have specific environmental demands. Indeed, it has been suggested that the sensitivity of larvae is hierarchical, being most sensitive when embryos and least sensitive as pediveligers and metamorphs, following a linear sequence; embryos>veligers (D larvae)> pediveligers>metamorphs>adults. Such sensitivity may vary among marine groups. During the early larval stage many marine organisms synthesise and deposit CaCO_3 through a series of pathways starting with depositing an amorphous calcium carbonate (ACC) crystal skeleton, known to be 30 times more soluble than stable forms of aragonite and calcite secreted later in larval life. Larvae of marine organisms which often begin the deposition of their shells and skeletons with ACC are thus likely to be more susceptible than adults (and depending on their distribution particularly susceptible in the polar regions because they deposit a more soluble form of calcite (ACC) in a region where this is energetically difficult to do so.

Fertilisation

Compared to larval development, fertilisation is thought to be relatively resilient to ocean acidification. However, echinoderms, molluscs, copepods (*Acartia tsuensis*), fish such as cod, and *Gadus morhua* may be adversely affected at pH values predicted at 2300, especially if sperm concentrations are low and limiting.

Echinoderms

The Echinoderms are an ecologically important group on which numerous ocean acidification related experiments have been undertaken to date. Since the skeletons of these organisms are composed of magnesium calcite, they are thought to be particularly susceptible to changes in ocean

pH. Several studies have been conducted on sea urchins, one of the dominant groups and a major player in mediating coastal ecosystem processes. There are reports of decrease in fertilization success, developmental and cleavage rates and pluteus larval size in the sea urchins *Hemicentrotus pulcherrimus* and *Echinodetra mathaei* with elevated CO_2 concentration (pCO_2 level $5000 \mu\text{atm}$) resulting in an increased dissolved inorganic carbon (DIC). In another study, involving the same species, significant reductions in weight gain were reported when exposed to CO_2 concentration of $550 \mu\text{atm}$ for six months. Authors explained that the reduction in weight gain could be partly explained by the larger surface area/body weight ratio of the sea urchins and their inability to regulate changes in their internal body condition. because of their direct connection with the ambient seawater through their madreporites. Since sea urchin tests are made of high magnesian calcite, it is substantially more soluble under lowered pH conditions. A study focused on the Australian sea urchin *Heliocidaris erythrogramma* has reported a decline in sperm, swimming speed and increased % mortality when individuals were incubated at pCO_2 of $1000 \mu\text{atm}$ (seawater pH 7.7).

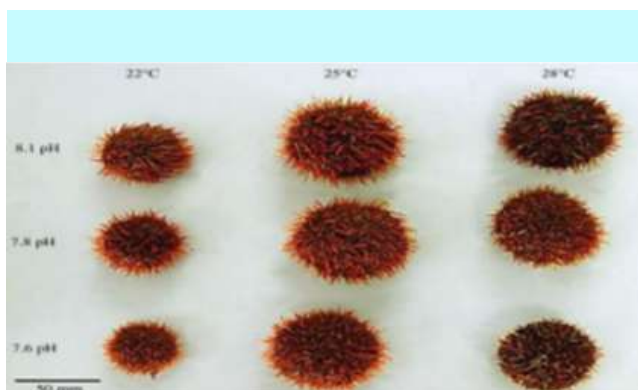


Fig. 2: Showing the indicative effect of pH and temperature on the growth of *Tripneustes gratilla*

Molluscs

Molluscs play an important role in coastal ecosystem processes, especially during bioturbation, and also provide the basis for marine

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products commercially important. Most of these studies have reported a negative impact of reduced pH levels on the growth and development of these organisms. It has been shown that reducing the pH of sea water can reduce calcification in the mussel *Mytilus edulis* and the pacific oyster *Crassostrea gigas*, even when the sea water is saturated with CaCO_3 . Another study of *C. gigas* found that only 5% developed into normal veliger larvae when incubated at a pCO_2 of 2,270 atm, although no abnormal effects were detected until the trochophore stage. The authors in another study reported morphological deviations in *M. galloprovincialis* larvae when exposed to CO_2 under 2,000 μatm conditions. A study by Green et al. showed that newly settled clams of the clam species *Mercenaria mercenaria* suffered significant shell decomposition and increased mortality when exposed to aragonite-unsaturated surface sediment, a level characteristic of organic-rich surface sediments near the coast. The authors reported that CaCO_3 shells completely dissolved within two weeks after colonisation, leaving only the organic matrix of the shell.

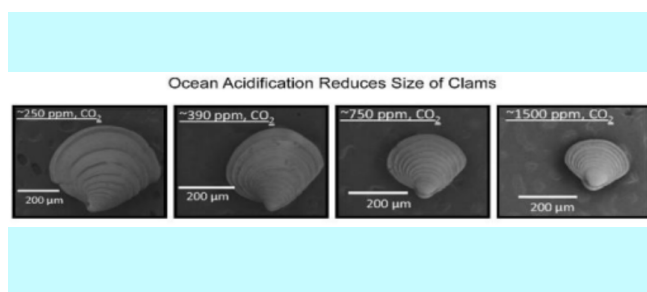


Fig. 3: 36-day-old clams in the photos are a single species, *Mercenaria mercenaria*, grown in the laboratory under varying levels of carbon dioxide (CO_2) in the air. CO_2 is absorbed from the air by ocean water, acidifying the water and thus reducing the ability of juvenile clams to grow their shells. As seen in the photos, where CO_2 levels rise progressively from left to right, 36-day-old clams (measured in microns) grown under elevated CO_2 levels are smaller than those grown under lower CO_2 levels. The highest CO_2 level,

about 1500 parts per million (ppm; far right), is higher than most projections for the end of this century but could occur locally in some estuaries. (Figure source: Talmage and Gobler, 201043).

Crustaceans

The impact of ocean acidification on crustaceans is known to a lesser extent because these organisms have better acid-base regulation than echinoderms and molluscs. Impacts of ocean acidification scenarios were studied on two marine crustaceans *Acartia steueri* and *A. erythraea*. Egg production and hatching rates decreased in both species with increasing pCO_2 . Nauplius mortality was observed only in the case of *A. erythematosus*. However, one of the major limitations of the study is that pCO_2 levels are much higher than predicted future atmospheric CO_2 concentrations and therefore the conclusions drawn have limited relevance. A separate study examined the effects of exposure to 2,380 pCO_2 on two subsequent generations of the crustacean *A. tsuensis*. The authors detected no significant effects on the parameters tested (survival, body size, egg production, and hatching rate of 1st and 2nd generation females), suggesting that *A. tsuensis* is able to withstand increased levels of CO_2 compared to other marine organisms.

Studies are also being conducted to examine the ability of crustaceans to adapt to internal acid-base imbalances while exposed to pCO_2 levels expected in the medium term. In the highly ionically regulated shrimp species *Palaemon elegans* and *P. ceratus*, a complete response to a pCO_2 of 0.30 kPa after 30 days of exposure, although ionic homeostasis was maintained at the expense of acid-base balance.

Fish

Finally, the effects of ocean acidification on early development are not limited to invertebrates. Gamete embryos and larvae of vertebrates such as fish are also vulnerable to changes in

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ocean chemistry. When embryos and larvae of the Japanese whitefish, *Sillago japonica*, and silver sea bream, *Pagrus major*, were exposed to extremely high pCO₂ concentrations, hatching and survival rates of fish decreased significantly with increasing CO₂ and exposure time. However, this CO₂ concentration is much higher than expected due to the amount of atmospheric CO₂ produced by humans.

Conclusion

Impact of ocean acidification on early developmental stages, especially on larval stages of calcified marine organisms, shows reduced larval development rates, a decrease in larval size and a change in shell integrity, shown these can severely affect the larval life forms and ultimately alter the level of higher nutrition. The sublethal effects of elevated pCO₂, as noted previously, may alter larval composition and fitness, altering settlement and dynamics and ultimately influencing recruitment. It is likely that increase in anthropogenic CO₂ concentrations in the atmosphere will lead to increase on CO₂ at the ocean surface as well as in coastal environments, combined with increase surface water temperatures. Although there have been efforts to understand the response of calcifying marine invertebrate communities, there is still a lack of knowledge about how non-calcifying marine invertebrates may react to such changes. Ocean acidification itself effect marine invertebrates, vertebrates and their population structure, other factors induced by human intervention such as release of pollutants and warming in addition to normal factors (such as change in salinity, temperature, increased deoxygenation or hypoxia) can also affect marine organisms. It has been now clearly established that there are significant interactions between ocean acidification, temperature, salinity, as well as pollutants within the marine environment. Interactions of these multiple stresses can lead to several physiological stresses in marine organisms including invertebrates that

ultimately may result in their deaths.

Reference

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Seafood value addition- Success story

During the year 2023-24, MPEDA organized seven training programmes on seafood value addition, one each at Kochi, Mumbai, Veraval, Kolkata, Vijayawada, Bhubaneswar and Chennai to create expertise in value addition of seafood, particularly shrimps and cephalopods. The trainings were given by experts from Vietnam and the programme has given a hands on skill development experience in preparation of popular seafood value added products in the export market. The training programme was for 3 days' duration each with a participation of 25 trainees per venue.

India had exported seafood products worth US\$ 7.40 billion to 127 countries during the year 2023-24. Value added products are in great demand in international markets particularly in the United States, European Union and Japan. The share of value added products in Indian seafood export is 10%. Countries such as Vietnam, China and Thailand are effectively leveraging existing markets, leading to a significant increase in the export share of value added products from their

respective markets.

India with diverse raw material, large processing capacity and large labour force is having all the potential to be one of the market leaders in the production and export of value added products. One of the factors that is hindering the production of value added products is the lack of adequate skilled workers.

With the skills gained during the value addition training organized by MPEDA, M/s. St. Peter and Paul Seafood Exports Pvt. Ltd., Chennai gave further training to their 20 production staff in fish filleting and processing techniques. This focused training initiative not only enabled the successful preparation and export of 25 tons of high-quality Yellow Fin Tuna loins to Tunisia within just one and a half months but also resulted in additional enquiries from markets in the Middle East and Thailand. The positive outcome of the training has motivated the company to plan a new, dedicated processing facility exclusively for the production and export of value-added seafood products.



Frozen Yellow Fin Tuna Loins



Marine landing report - June 2024

Dr. Afsal V.V. & Dr. Joice V. Thomas, MPEDA-NETFISH

The MPEDA-NETFISH monitors real-time data on fishing vessel arrivals and species-specific approximate catches from nearly 100 major fishing harbours and landing centres across India. This initiative supports the MPEDA's Catch Certification Program. The data, collected by Harbour Data Collectors at selected sites, is detailed in this report, which summarizes the key trends in marine landings observed in June 2024.

1. Observations on catch landings

In June 2024, data from 52 fish landing sites revealed a total catch of 10,578.69 tons. The pelagic finfish resources significantly contributed to the total catch with a 46% share, amounting to 4,878.13 tons. This was followed by demersal finfish resources with a 27% share (2,824.45 tons). Crustaceans accounted for 17% (1,778.01 tons), and molluscs made up the remaining 10% (1,098.09 tons) (Fig. 1).

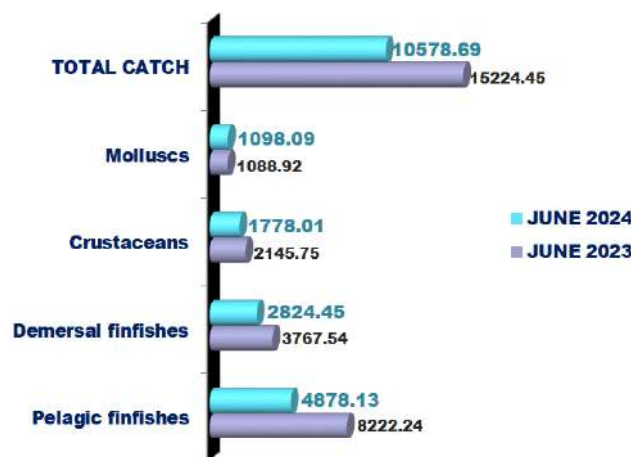


Fig. 1: Catch composition of marine landings (in tons)

A total of 202 species of marine finfishes and shellfishes were landed this month. The top five species were *Rastrelliger kanagurta*, *Johnius dussumieri*, *Metapenaeus dobsoni*, *Nemipterus japonicus* and *Sepia pharaonis* (Table 1).

Sl. No.	Common name	Scientific name	Quantity (tons)
1	Indian mackerel	<i>Rastrelliger kanagurta</i>	1,046.93
2	Croaker	<i>Johnius dussumieri</i>	787.77
3	Poovalan shrimp	<i>Metapenaeus dobsoni</i>	594.74
4	Japanese thread fin bream	<i>Nemipterus japonicus</i>	568.0
5	Pharaoh cuttlefish	<i>Sepia pharaonis</i>	463.65

Table 1. Top five species landed during June 2024

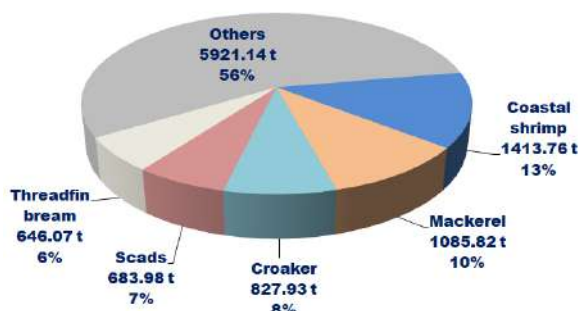


Fig. 2: Major five fishery items landed in June 2024

Coastal shrimps, mackerel, croaker, scads, and threadfin breams were the dominant groups, collectively accounting for 44% of the total catch. Other notable landings included cuttlefish, tunas, and anchovies (Fig. 2).

The pelagic finfish landings were led by mackerel and scads, while croakers and threadfin breams were the primary demersal varieties. Coastal

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shrimps, particularly *Metapenaeus dobsoni*, represented nearly 80% of the crustacean landing. The predominant mollusc varieties were cuttlefish and squid.



Fig.3: State wise marine landings (in tons)

State-wise landings: Tamil Nadu topped the list with 3,241.71 tons, accounting for 33% of the total catch. Kerala and West Bengal followed with 2,907.46 tons and 2,529.14 tons respectively (Fig. 3). Together, the eastern coastal states accounted for 72% of the total marine fish landings for the month.

Harbour-wise landings: Among the 52 landing sites, Petuaghat Deshapran Harbour in West Bengal recorded the highest landings. Table 2 lists the top ten harbours based on the total catch quantity.



Fig. 4: State-wise boat arrivals (nos.)

Sl. No.	Harbour	Quantity (tons)
1	Petuaghat Deshapran	983.53
2	Chennai	977.79
3	Munambam	883.18
4	Thoppumpady Cochin	629.49
5	Paradeep	427.18
6	Beyppore	422.45
7	Nagapattinam	421.17
8	Visakhapatnam	375.08
9	Raidighi	373.16
10	Pazhayar	367.60

Table 2: Top ten harbours based on catch landings

2. Observations on boat arrivals

In June 2024, the 52 designated landing sites recorded a total of 9,307 fishing vessel arrivals. Tamilnadu led with 4,535 boat arrivals (Fig. 4), followed by Kerala with 2,330. Considering the harbour-wise boat arrivals, the Cuddalore and Pulicat harbours in Tamil Nadu were the busiest, with 628 and 488 boat arrivals, respectively

Summary

In June 2024, marine landings from 52 major sites in India totalled 10,578.69 tons, with 9,307 vessel arrivals. This represents a decrease of about 25,000 tons in catch landings and over 12,000 vessel arrivals compared to May 2024, primarily due to the fishing ban along the West Coast.

Pelagic finfish remained the predominant contributors to the landings. The Indian mackerel (*Rastrelliger kanagurta*) retained the top position of the most landed species of the month. Tamil Nadu led in both catch landings and boat arrivals.

Petuaghat Deshapran ranked highest in catch landings, while Cuddalore harbour had the most boat arrivals.



Monthly outlook forecast report

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USD INR

The USDINR pair set a new all-time high of 83.67 on June 20, 2024, surpassing the previous high of 83.575 from April 19, 2024. The initial trading sessions saw significant volatility, with the pair dropping to a 2.5-month low of 82.945 before rebounding to the 83.50 levels within two days.

On the daily chart, the pair indicates potential for a correction as it trades just above the key 100-day EMA (yellow line). The 14-day Relative Strength Index (RSI) remains below the 50 mark, suggesting a bearish bias. The initial short-term support at 83.43, aligned with the 21-day EMA (blue line), has been breached, with the next strong support level at 83.29, aligning with the 100-day EMA (yellow line). Resistance has risen, with the current level at 83.60, as the pair continues to reach new highs frequently.

The pair has been trading in a narrow range of 10-12 paisa, indicating stability and offering limited hedging opportunities for importers. Importers should take advantage of minor drops of 15-20 paisa around support levels for near-term payables. Exporters, having had ample opportunities to hedge, should maintain a hedge ratio of around 50-60%. A combination of forwards and options is recommended for hedging exposures.



EUR USD

The EURUSD started the month with a positive note above 1.0850 level, amid US dollar weakness following the releases of lower than expected PCE data of April month. Later the pair experienced fluctuations influenced by significant events and EU political uncertainties. Although, persistent USD strength driven by hawkish fed comments and risk aversion mood pressured EURUSD pair below 1.0700 level towards the month-end. The Euro faced challenges including concerns over fiscal issues ahead of French elections and central bank actions elsewhere. Hawkish signals from Fed officials tempered rate cut expectations, supporting the USD despite mixed economic data. The pair closed the month marginally higher at 1.0712, marked by volatility around US PCE data and investor caution ahead of geopolitical events. However, Market focus remains on upcoming economic indicators, the Eurozone second phase election which will be conducted on July 7, ECB's policy signals, and developments influencing global risk sentiment. These factors will likely continue shaping EURUSD movements in the near term.

The EURUSD pair exhibited a bearish trend throughout the month, reaching a monthly low of 1.0666 toward the end. It started near the key resistance around 1.0850, prior to the announcement of French re-elections, which triggered uncertainty and political instability in the Eurozone. Looking ahead, a break below the recent lows could push the pair down to 1.0600. Conversely, if the EURUSD surpasses the 1.0750 resistance, it may climb towards the 50-week EMA at 1.0800, with the next key resistance at 1.0900. The last week's movements underscore the critical levels to monitor for potential breakouts or breakdowns in the upcoming sessions.

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GBP USD

During June month, the GBPUSD struggled around the 1.2800 level against the US Dollar and fail to continue positive momentum witnessed previous month and then declined most of the trading sessions in June. During the mid of the month, pair reached a three month high of 1.2860, following the weakness in the dollar index after the release of lower-than-expected US Inflation numbers. On the other hand, higher-than-expected Average earning Index which showcases that wage inflation still remains higher in the UK economy supported

the pair. But towards the end of the month, the sterling remained under pressure and fell to a one-month low of 1.2621 due to the strengthening of the dollar index. The dollar gained support from hawkish remarks made by Fed Chairman Jerome Powell, signaling a reduced frequency of rate cuts from an earlier expectations of three cuts in FY24 to now just one. UK CPI data showed inflation hitting the BoE's 2% target, reinforcing dovish rate cut bets. The BoE's decision to hold the policy rate at 5.25%, with two members voting for a cut, highlighted concerns over inflationary pressures. Market attention now shifts to the upcoming UK general elections scheduled for July 4, which are expected to provide new momentum and direction for GBPUSD.

The GBPUSD pair failed to sustain the upward momentum of the last month, as it fell by 0.67% in the month of June. The pair started the month by opening at 1.2726, hitting a new six-week low at 1.2612 before strengthening to close the month at 1.2641. Despite this stabilization, bearish momentum persists as the pair trades



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below the 100-day EMA (blue line). Additionally, the 14-day Relative Strength Index (RSI) remains below the 50-mark, indicating that sellers are still in control and further losses are likely. The initial support level is at 1.2600 (yellow line). If this level is breached, a further decline towards 1.2550 is expected. Conversely, the first resistance level is at 1.2700, and a move above this level could pave the way for the next resistance at the key psychological level of 1.2800.

JPY USD

The USDJPY pair started at around 157.20 and fell to 154.55 on initial trading days after the release of April PCE data which showed slow growth in US economy. Although, mixed US and Japanese economic data, including strong services sector growth and weakening of earnings, shaped market sentiment. However, the pair fluctuated and reached to its 37-years high near 161.28 fueled by hawkish Fed official's signal and widened interest rate differentials, despite irregular volatility from US economic indicators. The Bank of Japan's cautious policy stance contrasted with global

easing trends, influencing the yen's ongoing weakness. The pair may continue responding to Fed policy expectations and Japan's economic indicators, with potential downside risks tied to US economic data and global sentiment shifts affecting interest rate differentials.

USDJPY exhibited sideways movement in the first half of the month, hitting a low of 154.52. The lack of BoJ signals for a rate hike and the wide interest rate differentials between the US and Japan spurred bullish momentum in the second half. Market participants identified 160 as a key intervention level, a threshold previously noted when the pair reached a 34-year high two months ago. The yen continued its bullish trend, touching a new high above 161. Technically, the pair is forming higher lows each month, indicating a range shift. A break below the current range could push the pair down to 158, a historically strong resistance that has turned into support. Short-term pullbacks are expected to attract buyers, particularly around the ¥155 level. On the upside, the 160-161 levels will be closely watched for potential new highs, which could establish historical resistance for future projections.



Capacity building programmes in Pune district

The seafood industry provides direct and indirect employment opportunity to large number of people in the country. Most of the workers and handlers working in fishing, fish marketing, transportation, processing and aquaculture are unaware about the importance of personnel hygiene while handling fish. The workers in aquaculture sector also are ignorant on the biosecurity requirements in the farms/hatcheries. Skill of the workers in the primary production centers and processing units can be enhanced by imparting proper training.

MPEDA Regional Division, Mumbai conducted two capacity building programmes on biosecurity measures and personal hygiene for farmers and



Innauguration function in Junnar

fishermen belonging to ST category on 8th and 9th August 2024 at Junnar and Kusur, respectively in Pune District. As programme on 9th August 2024 was organized on World Tribal Day, all participants were given a floral welcome and were appreciated for their contribution to Indian fisheries. A total of 60 fishermen participated in the capacity building programmes in Junnar and Kusur.

Junnar, Pune District

The Junnar program, held on 8th August 2024, was inaugurated by Mr. Rohidas Bhandve, a social worker from Junnar, Pune District, in the presence of Mr. Bhushan Patil, Assistant Director, MPEDA RD Mumbai.



Mr. Bhushan Patil, Assistant Director, MPEDA handling the session



Mr. Mangesh Gawde, Field Supervisor, MPEDA speaks in the session



Distribution of aid materials

Mr. Bhushan Patil, Assistant Director and Mr. Mangesh Gawde, Field Supervisor handled the sessions on MPEDA activities, importance of biosecurity and personal hygiene. Mr. Rohidas Bhandave briefed the participants on the Govt. schemes instituted for ST category. After the training programme, aid materials such as plastic crates and life jackets were distributed to the

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participants. As most of the participants work in the reservoir area, life jackets are essential for ensuring safety during fishing activities. The programme was concluded with a vote of thanks by Mr. Mangesh Gawde, Field Supervisor, MPEDA RD Mumbai.



MPEDA officials and participants in Junnar

Kusur, Pune district

The programme in Kusur held on 9th August 2024, was inaugurated by Mr. Hrishikesh Palve, Assistant Fisheries Development Officer (AFDO) of the Maharashtra Fisheries Development Corporation, and Mr. Manohar Kedar, Chairman and Owner of Akash Fish Merchant Wholesaler, with the presence of Mr. Bhushan Patil, Assistant Director, MPEDA RD Mumbai.



Mr. Bhushan Patil, Assistant Director, MPEDA handling the session

Mr. Bhushan Patil, Assistant Director and Mr. Mangesh Gawde, Field Supervisor handled the sessions on MPEDA activities, importance of bio-security and personal hygiene. Mr. Hrishikesh Palve, AFDO, MFDC gave information on the

Govt. schemes meant for ST Category. After the training programme, aid materials such as plastic crates and life jackets were distributed to the beneficiaries. The programme was concluded with a vote of thanks by Mr. Mangesh Gawde, Field Supervisor, MPEDA RD Mumbai.



Mr. Mangesh Gawde, Field Supervisor, MPEDA handling the session



Distribution of aid materials



Participants at Kusur with MPEDA officials

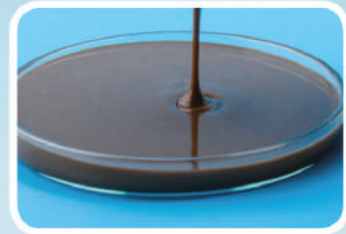
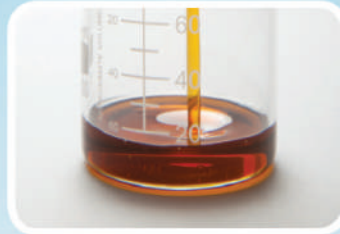
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Awareness programme for college students

MPEDA Regional Division, Mumbai conducted an awareness programme for the students of Patkar Varde College, Goregaon, Mumbai, Maharashtra on 23rd August 2024. The programme was conducted as per the request of the college authorities for creating awareness about the activities of MPEDA, seafood export trade and aquaculture among the students. Dr. Gautam



Mr. Bhushan Patil, Assistant Director, MPEDA RD Mumbai addressing the students

V. Zodape, Professor and Head, Department of Zoology, and Dr. Madhuri Tayade, Assistant Professor, Department of Zoology made arrangements for conducting the programme. 60 students from the faculty of Arts, Commerce and Science pursuing graduate courses actively participated in the programme.

Mr. Bhushan Patil, Assistant Director, MPEDA RD, Mumbai delivered a presentation explaining the functions of MPEDA along with the seafood export trends of India. Mr. Atul Sathe, Field Supervisor, MPEDA RD, Mumbai explained the aquaculture of *L. vannamei*, *P. monodon*, Sea bass, GIFT, Mud crab and Soft Shell crab.

The presentations were followed by an interactive session in which students raised their queries which were answered by MPEDA officials. There was positive feedback from the participants and the programme concluded with a vote of thanks proposed by the student representative.



Mr. Atul Sathe, Field Supervisor, MPEDA RD, Mumbai giving lecture

Community unites for coastal conservation: Swachhata campaign at Nallavadu beach

As part of the MPEDA's Swachhata action plan for the year 2024-25, a beach cleanup programme was organized by MPEDA-NETFISH on 20th August 2024 at Nallavadu beach, Pondicherry. The primary objective of the event was to raise awareness among the public and fishing communities about the importance of maintaining cleanliness in coastal areas and the need to protect our marine environment from pollution.

The event saw active participation from 100 volunteers, including students from Rajiv Gandhi Arts and Science College, members of the village committee, representatives from fisherwomen's self-help groups, and local fishers from Nallavadu village.

The event commenced at 7:30 am with an inaugural session, where key dignitaries addressed the participants. Dr. M. Senthamizhco, Assistant Professor in Tamil and Programme Officer of NSS at Rajiv Gandhi Arts and Science College, delivered an insightful lecture on the significance of coastal cleanliness and the environmental importance of the day. Mr. Luther Samy, Field Officer from MSSRF, and a prominent leader of the fishermen's association, inaugurated

the clean-up drive. Dr. M.P. Arulmoorthy, State Coordinator of MPEDA-NETFISH, elaborated on the crucial role of maintaining coastal ecosystems and emphasized the collaborative efforts required to ensure a sustainable environment.

Participants were divided into 10 teams to cover different sections of the beach efficiently. With great enthusiasm, they collected debris and other waste materials, filling up a total of 20 gunny and plastic bags. The waste was then transported to municipal handling centers with the assistance of local authorities, ensuring that all collected materials were disposed of properly.

The event successfully concluded with a vote of thanks by Mr. Luther Samy, expressing gratitude to all participants for their commitment to the cause. The campaign not only resulted in a cleaner beach but also fostered a sense of responsibility among the local communities towards preserving coastal environments. Such initiatives are crucial in promoting environmental sustainability and encouraging the involvement of local communities in maintaining the health of our beaches and marine ecosystems.



Participants with the waste collected from the beach area

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Glimpses of the clean-up event at Nallavadu beach, Pondicherry



RAINBOW IN A BOWL

AUCHENOGLANIS



V.K. Dey

V.K. Dey has over three decades of experience in diverse sectors of the seafood industry in the Asia-Pacific region. He was the Deputy Director of MPEDA and then associated with INFOFISH, Malaysia. As part of INFOFISH, he was involved in several studies related to the seafood industry in the Asia-Pacific region and beyond, including setting up of Aqua-technology Park for ornamental fish. MPEDA has published Living Jewels, a collection of his articles on ornamental fish.



AQUACULTURE SCENE

Auchenoglanis, the name derived from the Greek, *auchenos* means neck and *glanis* meaning catfish, referring to the long cranial shield. Until recently only two species of *Auchenoglanis* were recognized as valid, *A. biscutatus* from the Nile and the whole of West Africa and *A. occidentalis* from Central Africa, belong to family Claroteidae. In 2010 the genus was revised by Retzer, who accepted a total of 8 different species, 7 already described formerly and one new species, namely *A. senegali* later identified, is from the Niger, which looks almost most similar to *A. wittei* from the Congo, but according to Retzer the *Auchenoglanis* from the Niger belongs most probably to a still scientifically undescribed species. All *Auchenoglanis* can grow to a length of more than 40 cm, but as they feed mainly on small food particles, they are usually very peaceful against even much smaller tankmates. The meaty lips that serve for the detection for food in mud led to the nickname “kissing mouths” for *Auchenoglanis* in aquarium circles. They are relatively large in size, up to 70 cm. Species of this genus occur predominantly in the Nilo-Sudan region and Western Africa, but also in the Congo River, Lakes Albert and Tanganyika. They mainly feed on insect aquatic larvae and eventually on small molluscs, alevin, and swimming insects. Their feeding habits should also enable them to stand a relatively wide range of ecological conditions.

Auchenoglanis is rare in the fossil record compared to other African catfishes. It has an extinct species, *Auchenoglanis soye* from Western Chad. A few other fossils are also attributed to *Auchenoglanis* with no specific species described. A *occidentalis* popularly known as Giraffe catfish is the native of Senegal. The genus is diagnosed based on a unique combination of characters: a deep and broad skull, narrow mouth, reduced premaxillary tooth patches, anterior nostrils on the upper lip, and three large nuchal plates, the first which is in close proximity to the rear of the supraoccipital- a bone on the dorsal side of the great foramen(opening)

of the skull. The adult body is uniformly dark brown on the sides of the body and dorsally and light brown ventrally. Juveniles are heavily spotted. The fins of adults are mostly dark but may have vague mottling. The maxillary barbels are very dark but the mandibular barbels are less dark but not white. The sides and top of the head are brown and without spots. The lower side of the head is white or light brown. The upper lip is dark but the lower lip is less pigmented. The anterior edge of the adipose fin rises gradually to its maximum height at the posterior end of the fin, well behind the mid-point of the fin. Though there are nine species recorded, seven species, *A. occidentalis*, *A. senegali*, *A. biscutatus*, *A. tanganicanus*, *A. wittei*, *A. sacchii* and *A. tchadiensis* are popular in the hobby.

A. occidentalis – They are identified on the basis of a unique combination of characters, a deep and broad skull, narrow mouth, reduced premaxillary tooth patches, anterior nostrils on the upper lip, and three large nuchal plates, the first which is in close proximity to the rear of the supraoccipital- a bone on the dorsal side of the great foramen(opening) of the skull. There are a number of populations which may eventually gain species status, is from the Upper Guinean fish faunal group that has four to five very large spots along the side of the body, which this fish does have.

A. senegali, known only from the Senegal and Gambia river basins of West Africa. They have a unique combination of characters: a deep and broad skull, narrow mouth, reduced premaxillary tooth patches, anterior nostrils on the upper lip, and three large nuchal plates, the first which is in close proximity to the rear of the supraoccipital- a bone on the dorsal side of the great foramen(opening) of the skull. The adult body is white to light brown on the sides of the body, the ventral portion is white. Occasionally the upper one half of the body is slightly darker than the lower half. Large specimens have three horizontal series of dark spots on the body and intense dark spots on the

AQUACULTURE SCENE

fins although spots may be less intense and more diffuse on some specimens.

A. biscutatus, known as yellow Spiny Catfish, is a native of Nile River, Egypt, Niger, Senegal and Lake Chad Basin and Gambia basin. They have deep and broad skull, narrow mouth, reduced premaxillary tooth patches, anterior nostrils on the upper lip, and three large nuchal plates, the first which is in close proximity to the rear of the supraoccipital- a bone on the dorsal side of the great foramen(opening) of the skull. The body of large specimens is uniformly brown on the sides of the body and dorsally and white ventrally. The other fins have distinct small, closely spaced, spots that do not fuse to form bands. Vague dark spots are on the sides of the body and adipose fin of juveniles. The barbels are dark. The sides and top of the head are brown and without spots. The lower side of the head is white including the lower lip. The anterior edge of the adipose fin rises steeply and reaches its maximum height at a point approximately one half the length of the adipose fin.

A. tanganicus, Tanganyikan Giraffe Catfish, restricted to Lake Tanganyika. The adult body is dark dorsally and laterally but light ventrally. The adults have irregularly shaped brown spots of varying intensity on the body and the adipose fin. In very large adults, six small but evenly spaced prominent spots occur beginning under the dorsal fin and end on the caudal peduncle just above the lateral line. Each of these spots may be paired with a similar spot just above it. The brown spots are present on all the fins but are less visible in the anal fin and paired fins especially in large specimens. The brown spots on the rayed fins are in an irregular pattern but occasionally form short bands. The barbels and upper lip are dark but the lower lip is lightly pigmented.

A. wittei, reported in the Central Congo Basin. The adult body is dark dorsally and laterally but

light ventrally. The body has a regular pattern of dark spots in a reticulated pattern that may become vague dorsally. In some adults, two or three very dark spots are present in a line just above the lateral line. The dark spots are present in the dorsal, caudal, and adipose fins. They are less visible in the anal fin and paired fins that are otherwise brown. On small individuals, the reticulate pattern is more apparent with the spots in the dorsal and caudal fins coalescing to form bands and spots evident on all the fins. The barbels are mostly black although the base of the external and internal mandibular barbels may be less pigmented.

A. sacchii is reported only from the Omo River, Ethiopia. The body is brown with darker spots on the body and fins. The diagnostic character that clearly distinguishes *A. saachi* from the other species is the position of the origin of the adipose fin relative to the origin of the anal fin. The holotype is in poor condition and perhaps the position of the adipose has been distorted and changed from its original position. However, it is noticed that the adipose-fin origin is over the origin of the anal fin. In the other species, the length of adipose fin is much greater than the space between the dorsal fin and adipose fin.

A. tchadiensis, found in the Lake Chad basin. The adult is uniformly brown on the sides of the body and dorsally and white ventrally. Some vague mottling may be present. The mottling is more apparent in juveniles. The dorsal, adipose, and caudal fins have indistinct spots that sometimes fuse to form indistinct bands. The other fins are plain or with very faint mottling. The maxillary barbel is darkly pigmented and the mandibular barbels are white or slightly brown. The sides and top of the head are brown and without spots. The lower side of the head is white. The anterior edge of the adipose fin rises gradually to its maximum height at the posterior end of the fin, well behind the mid-point of the fin.



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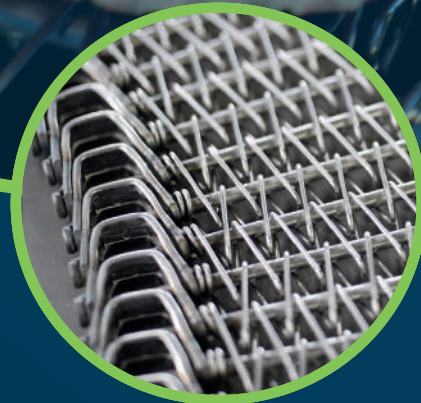


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Campaigns against abuse of antibiotics in aquaculture

MPEDA Regional Division, Mumbai conducted two awareness campaigns against the abuse of antibiotics in aquaculture in Ratnagiri district on 9th August 2024. The first programme, held in collaboration with Marine Biological Research Station (MBRS) at Zadgaon Ratnagiri, Maharashtra took place in the morning. It was conducted with the permission and guidance of Hon'ble Vice Chancellor, Dr. Sanjay Bhawe, Dr. Parag Haldankar, Director, Extension Education and Dr. Prakash Shingare, Director of Research, Dr. Balasaheb Kokan Krishi Vidyapeeth (DBSKKV), Dapoli. This session saw the participation of 31 individuals, including farmers, supervisors and staff from the shrimp farm of MBRS. The second programme was held in the afternoon at Shirgaon Village, Ratnagiri District, with 11 participants in attendance.

Dr. S. D. Naik, Senior Scientific Officer, MBRS, Ratnagiri inaugurated the program. During the



Dr. S. D. Naik, Senior Scientific Officer, MBRS, Ratnagiri guiding the participants during the program

program Dr. Asif Pagarkar, Associate Research Officer and Professor guided on the importance of awareness to prevent the abuse of antibiotics in aquaculture and Dr. S. D. Naik guided participants on the impact of antibiotics on human life. Mr. Atul Raosaheb Sathe, Field Supervisor, MPEDA Regional Division, Mumbai and Mr. Sachin Satam, Assistant Research Officer, MBRS coordinated the programme.

Participants were briefed about the importance of farm enrollment to establish traceability for shrimp value chain. Following aspects including precautionary measures to be adopted by farmers to avoid antibiotic residues in aquaculture products; steps taken by MPEDA to control use of antibiotic in aquaculture; monitoring programmes being implemented by MPEDA to check the quality of aquaculture produce, task force for monitoring antibiotic misuse and list of banned antibiotics in aquaculture were covered during the presentations. The coordinators instructed the participants to take necessary precautions to avoid accidental input of antibiotics in their system by checking the registration of Coastal Aquaculture Authority in the labels of the products. Programme concluded with the vote of thanks proposed by Mr. Atul Sathe and Dr. Narendra Chogale, Assistant Research Officer, MBRS.

The second awareness program was conducted in collaboration with the office of Assistant Commissioner of Fisheries, Ratnagiri, Department of Fisheries, Government of Maharashtra at Adishti Aquaculture Farm, Ratnagiri, Maharashtra. The programme was attended by 11 stakeholders in aquaculture. Lectures on abuse of antibiotics in aquaculture were given by Mrs. Utkarsha Keer, Assistant Fisheries Development Officer and Mr. Atul Sathe, Field Supervisor, MPEDA RD, Mumbai. Programme concluded with the vote of thanks proposed by Mr. Atul Sathe.

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Dr. Asif Pagarkar, Associate Research Officer and Professor handling a session



Mr. Atul Sathe, Field Supervisor, MPEDA Regional Division, Mumbai handling a session on abuse of antibiotics in aquaculture



Mrs. Utkarsha Keer, AFDO, Department of Fisheries delivering lecture on abuse of antibiotics in aquaculture at Adishti Aquaculture Farm, Shiragon, Ratnagiri



View of participants



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Capacity building training programme

MPEDA Regional Division, Vijayawada organised a one-day capacity building training program for SC workers on biosecurity and personal hygiene in aquaculture farms. The training programme was conducted on 19th August 2024 in Brother in Christ Church, Ramudupalem Village, Indukurpet Mandal, Nellore, Andhra Pradesh. 30 farm workers participated in the program.



The training was imparted by Dr. G. Praveen Kumar, Assistant Professor, Muthukur Fisheries College, Nellore, Dr. K. Iyyapan, Junior Technical Officer, MPEDA and Mr. J. Kiran, SCO, NaCSA, Vijayawada. The training session covered a comprehensive range of topics, including biosecurity and access control in aquaculture farms, efficient waste management and disposal techniques, perils associated with using unauthorized substances and untreated organic compounds and essential steps to be taken while handling products for export. It also touched upon the do's and don'ts for maintaining a safe and productive farm environment, the importance of personal hygiene, the hygiene of aquaculture inputs and facilities within the aquaculture industry. The participants were provided with biosecurity kits which included a pair of gumboots, hand glove, cap, raincoat, T-shirt and a kit carrying bag. The programme concluded with a vote of thanks by Mr. Cheranjivi, FTO.



View of participants

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Better Management Practice in scientific shrimp farming

*Dr. T. G. Manoj Kumar, Deputy Director, MPEDA Bhimavaram
N. Purna Chandrasekhar, Regional Coordinator, MPEDA-NaCSA*

In the last issue we discussed the water quality management to be followed in shrimp farming. In the current issue we will discuss the health and disease management practices in shrimp farming.

a. Health Management

i. Basic information

- Check the health of the shrimps in feed check trays on a daily basis. If there is poor feed consumption consecutively for two to three days, it indicates a health problem to the shrimp.
- Check the general health and growth of shrimps collected through cast netting on a weekly basis. Carry out sampling early morning or late evening at different places.
- The shrimps should be clean with normal colour, have a full gut and without any infection on legs or antennae.
- If there are antennae cut without black tip, check for under feeding. If the antennae tip is black, it is a bacterial infection. Immediately follow good pond bottom management practices.
- Take 5-10 shrimps from feed tray or from cast net and check whether the gills of the shrimps are black. If so, it means that the pond bottom is not clean.
- Gut content of >80% of the shrimp sampled from a healthy, recently fed pond should be full of food. If not, it could be an indication of the onset of disease.
- Check shrimp for external fouling, which is growth of organisms and accumulation

of debris on the surface of the shrimp. This indicates poor pond condition. In this case, improve water quality to encourage shrimp to moult regularly.

b. Disease management

For the ease of disease management, the shrimp pathogens can be categorized into those listed by the World Organization for Animal Health (WoAH) and other potential pathogens that cause significant economic losses in culture systems.

The World Organization of Animal Health (WoAH) listed shrimp pathogens are:

1. WSD (White Spot Disease)
2. IHNV (Infectious Hypodermal & Haematopoietic Necrosis Virus)
3. YHD (Yellow Head Disease)
4. IMNV (Infectious Myonecrosis Virus)
5. TSV (Taura syndrome Virus)
6. NHP (Necrotising hepatopancreatitis)
7. AHPND (Acute Hepatopancreatic Necrosis Disease)
8. Shrimp Hemocyte Iridescent Virus

Of the above 8 shrimp diseases/ pathogens listed above, only 3 diseases i.e., WSSV, IHNV and IMNV are reported from India so far.

Other potential shrimp pathogens/ infections (non- WoAH listed) are given below:

- i. Vibriosis.
- ii. White faeces syndrome
- iii. Hepatopancreatic microsporidiosis (HPM)
- iv. White muscle disease (also known as muscle cramp syndrome)

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- v. Muscle necrosis
- vi. Running Mortality Syndrome (RMS)

All the above infections are very common in our culture systems.

WoAH listed pathogens

1. White Spot Disease

White spot disease (WSD) is a highly contagious viral infection of decapod crustaceans that can cause high levels of mortality in cultured shrimp. Since its first outbreak in 1992–93, this disease has caused serious economic losses in shrimp farms across the world.

Disease agent

White spot disease is caused by a virus called as White Spot Syndrome Virus (WSSV) (Genus Whispovirus, Family Nimaviridae). Most crustaceans including all penaeid shrimps (monodon, vannamei, indicus etc.) and crabs can be affected by WSD. All the life stages of shrimp may get infected by this virus. Mortality of shrimp may start 2-3 days after infection and reach upto



Fig.1: White Spot Disease infected shrimps

80-90 per cent within 5-7 days.

Signs of disease

- Lethargy
- Reduced food consumption
- Anorexia
- Pink to red discolouration of the body.
- Appearance of white spots (0.5 to 2.0 mm in diameter) on the cuticle (Fig. 1) and high mortality; white spots are the result of calcified deposits by the cuticular epidermis.
- WSD-affected prawns often swim near the surface of ponds.

Epidemiology and control measures

- WSD virus can persist in wet soil. Hence, carry out pond preparation properly through drying, application of lime etc.
- Stock only post larvae (PL) of at least PL12-15 stage. Select healthy PL using stress tests and make sure that the PLs are negative for WSD virus through RT-PCR testing.
- Usages of approved probiotics and immunostimulants are helpful.
- Make sure total biosecurity including good water screening is maintained throughout the crop period.
- Restrict the entry of visitors into the entire farm area.
- Any problem during the crop like shrimp coming to the side, mortality etc. should be observed on a daily basis
- If the shrimps are tested positive for WSD do not let water out and inform immediately to all the nearby farmers.
- If the shrimp size is too small, do not abandon/drain the pond without disinfection. Do not become panic. Isolate the pond and take necessary disinfection measures (treat the

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pond with an active chlorine concentration of 30ppm for 72 hours) to confine the disease to the affected pond only.

- If the size of the shrimp is harvestable, harvest all the shrimps by adopting good sanitary practices. Ensure that the water is not discharged into the creek without proper disinfection.
- Care should be taken to collect all the shrimp in the pond to prevent contamination. Dead shrimps after disinfection should be buried under soil away from the pond area.
- Necessary precautions should be taken to avoid the transfer of shrimps or equipment or anything used in the disease-affected pond to other ponds.
- Ensure that the bird netting is in good condition to prevent the picking up of the dead shrimp by birds and carrying it to the neighbouring ponds.
- The manpower deployed for the activities in the infected pond should be totally isolated from the other ponds.
- When the disinfected water is discharged after a week inform all neighbouring farmers to avoid pumping of water into their ponds at least for 4 days.
- Do not stop feeding in other normal ponds during disease outbreak. Lack of proper feeding will make shrimps weak and susceptible to diseases.

2. Infectious Hypodermal and Haematopoietic Necrosis (IHHN)

Also known as infection with *Penaeus stylirostris* densovirus (PstDNV) and Runt Deformity Syndrome (RDS).

Disease agent

IHHNV causes runt deformity syndrome (RDS).

IHHNV is a densovirus belonging to the family Parvoviridae (subfamily Densovirinae, genus Brevidensovirus). At least 3 distinct genotypes of IHHNV have been identified, but only 2 are known to be infectious to either Pacific white shrimp (*L. vannamei*) or black tiger shrimp (*P. monodon*). IHHNV is believed to be the most stable virus among the known penaeid shrimp viruses. Infected tissues remain infectious after repeated cycles of freeze–thawing and after storage for long time. IHHNV has been detected in all life stages (i.e. eggs, larvae, post larvae [PL], juveniles and adults) of *L. vannamei*. Nauplii produced from infected brood stock has a high prevalence of infection with IHHNV.



Fig. 2: IHHNV infected shrimps

Signs of disease

- Reduced feed consumption
- Cannibalism
- Repeatedly floating slowly to the water surface, rolling over and then sinking to the bottom.
- Morbidity or mortality.
- Poor hatching success of eggs.
- Poor survival of larvae and post larvae.

Gross pathological signs are

- Opaque abdominal musculature (Fig. 2).
- White to buff lesions under the carapace both in *L. vannamei* and *P. monodon*.

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- Blue appearance of moribund prawns.
- Reduced and irregular growth in juveniles and sub adults.
- Deformed rostrums growing to one side.
- Deformed sixth abdominal segment.

Microscopic pathological signs are

Eosinophilic to pale basophilic intranuclear inclusion bodies within tissues of ectodermal and mesodermal origin. These inclusion bodies may be easily confused with developing intranuclear inclusion bodies caused by white spot disease.

3. Infection with Yellow Head Virus

Yellow head disease is caused by infection with yellow head virus genotype 1 (YHV1), a corona-like RNA virus in the genus Okavirus, family Roniviridae and Nidovirales. YHV1 is one of the 10 genotypes in the yellow head complex of viruses and is the only known agent of yellow head disease. Gill-associated virus (GAV) is designated as genotype 2 and is also causing infections in Penaeids. Several other known genotypes in the complex (genotypes 3 to 10) occur commonly in black tiger prawns (*Penaeus monodon*) in East Africa, Asia and Australia. Most of these other genotypes are rarely or never associated with disease.

Epidemiology

- *Penaeus monodon* suffers acute epizootics, with mortality reaching 100% within 3 to 5 days of the first appearance of gross signs of infection.
- YHV1 can be transmitted horizontally by injection, ingestion of infected tissue, immersion in membrane-filtered tissue extracts or cohabitation with infected shrimp. Transmission has also been demonstrated by injection of extracts of jelly prawns (*Acetes* spp.) collected from infected ponds.

- Vertical transmission occurs from both male and female parents, possibly via surface infection or contamination of tissue surrounding fertilised eggs.
- Infection are not observed in post larvae upto PL15. Those from post larval days 20 to 25 to sub adult are highly susceptible.
- Mortalities usually occur during the early to late juvenile stages in rearing ponds.

Signs of disease

- Aggregations of moribund prawns near the



Fig.3: YHV infected shrimps

water surface at the edge of the rearing pond or tank.

- Abnormally high feeding rate of infected 5g to 15g prawns for several days and then cessation of feeding.
- Mass mortality (up to 100%) happening within 2 to 4 days after cessation of feeding.

Gross pathological signs are:

- Yellowing of the cephalothorax and general bleaching of the body.
- White, yellow or brown gills.
- Exceptionally soft hepatopancreas compared with normal.
- Yellow, swollen hepatopancreas, making the head appears yellow (Fig.3).

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Microscopic pathological signs are:

- Moderate to large numbers of deeply basophilic, evenly stained, spherical, cytoplasmic inclusions within tissues of ectodermal and mesodermal origin.

4. Infectious Myonecrosis Virus (IMNV)

Disease agent

Infection is due to infectious myonecrosis virus (IMNV), a putative totivirus.

Epidemiology

IMNV was originally identified in northeastern Brazil in cultured *L. vannamei*. Thereafter the virus has since been reported in South-East Asia, including Indonesia, India and Sri Lanka. *P. monodon* also susceptible to this virus infection. Sudden onset of stressful events like capture by net, reduced feeding or sudden changes in temperature or salinity leads to the manifestation of the infection. Affected life stages include juveniles and sub adults. Significant mortality occurs in juvenile and sub adult pond-reared populations. Horizontal transmission has been demonstrated via cannibalism. Vertical transmission is likely but not confirmed.



Fig.4: IMNV infected shrimp

Signs of disease

Disease signs at the farm, tank or pond level are:

- Lethargy
- Large numbers of moribund animals and significant mortalities (up to 70%), during or

following stressful events.

Gross pathological symptoms are:

- Focal to extensive white necrotic areas in the striated muscle commonly observed in distal abdominal segments.
- Necrotized and reddish tail fan (Fig. 4).
- Lymphoid organs size increases 3 to 4 times than the normal size.
- Moribund prawns with a full stomach because affected individuals may continue to feed until death.

Microscopic Pathological signs are:

Coagulative necrosis of skeletal muscle by haemocytic infiltration and fibrosis.

5. Infection with Taura Syndrome Virus (TSV).

Taura syndrome is a disease mainly in the nursery phase of *L. vannamei*. It usually occurs within 14 to 40 days of stocking post larvae into grow-out ponds or tanks and results in mortality rates of 40% to 90%. TSV has been documented in post larvae, juvenile and adult life stages. Also known as red tail disease.

Disease agent

Taura syndrome is caused by infection with Taura syndrome virus (TSV), a small picorna-like RNA virus that belongs to the genus Aparavirus in the family Dicistroviridae.

Epidemiology

- Survivors of infection with TSV may become lifelong carriers.
- Transmission is horizontal through ingestion. Vertical transmission is suspected, but it has not been experimentally confirmed.
- Migratory birds, aquatic insects and humans are likely mechanical vectors of the virus. Birds may be an important route of transmission.

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TSV has been demonstrated to remain infectious for up to 48 hours in the excreta of sea gulls that have ingested infected prawn carcasses.

- Resistance of *Penaeus monodon* to TSV is unclear, but *P.monodon* appears to be more resistant than *L. vannamei*.
- TSV-resistant stocks of *L. vannamei* and *P.stylostris* are commercially available. TSV-resistant stocks have shown survival rates up to 100% following laboratory challenge.



Fig.5: TSV infected shrimp

Signs of disease:

Disease signs at the farm, tank or pond level are:

- Lethargy
- Cessation of feeding
- Animals gathering at the pond edge when moribund.
- Sudden increase in the presence of seabirds fishing in ponds.
- Sudden onset of high mortalities in late-post-larvae, juvenile or subadult prawns.

Gross pathological signs are:

Acute phase

- Empty stomach and pale red body surface and appendages
- Red tail fan and pleopods due to the expansion of red chromatophores

- Soft shell

Transition phase

- Multiple, irregularly shaped and randomly distributed melanised (dark) cuticular lesions (Fig. 5).
- Death usually at molting.

Microscopic pathological signs are:

- Necrosis of the cuticular epithelium of appendages
- Multifocal lesions in the cuticular epithelium (transition phase)

6. Infection with *Hepatobacter Penaei* (Necrotising Hepatopancreatitis) (NHP)

Hepatobacter penaei is an obligate intracellular bacterium of the Order α -Proteobacteria. The disease is commonly known as necrotizing hepatopancreatitis. It is a Gram-negative, intracytoplasmic species of alphaproteobacterium that infects the hepatopancreas of shrimps. *H. penaei* exists in two morphological forms: 1) rod-shaped, non-flagellated rickettsia-like organism 2) helical flagellated form.

Epidemiology

- NHP outbreaks are often preceded by lengthy periods of high-water temperatures (29°C to 31°C) and elevated salinity (up to 40ppt).
- Mortalities usually occur midway through the grow-out phase and can reach 90% to 95% within 30 days.
- NHP appears to be transmitted by direct ingestion of carrier prawns (survivors of *H. penaei* infections may carry the bacteria throughout the life) and through contaminated water.
- *Hepatobacter penaei* may also be shed in excreta and contribute to disease transmission.



Fig.6: NHP infected shrimp

Signs of disease

Disease signs at the farm, tank or pond level are:

- Lethargy
- Emaciation
- Heavy protozoan or bacterial fouling
- Reduced growth rate
- Soft shell
- Flaccid body (Fig.6)
- Black gills
- Empty intestinal tract
- Degenerated or atrophied digestive gland (hepatopancreas), which appears pale to white.
- Black (melanized) streaks in the hepatopancreas.

Microscopic pathological signs are:

- Multifocal granulomatous lesions in hepatopancreatic tubules, with atrophy of adjacent hepatopancreatic tubule epithelial cells
- Tubular cells within the granulomatous lesions that can be hypertrophied and contain

basophilic organisms within the cytoplasm.

- Sloughing of tubule epithelial cells.
- Severe haemocytic inflammation in the intratubular spaces.

7. Acute hepatopancreatic necrosis disease (AHPND)

AHPND was known as Early Mortality Syndrome (EMS), and is caused by infection with *Vibrio parahaemolyticus* (VpAHPND). VpAHPND contains a plasmid (pVA1) of an approximately 70-kbp with genes that encode homologues of the *Photobacterium* insect-related (Pir) toxins PirA and PirB. This disease affects mainly *L.vannamei* and *P. monodon*. It may also be problematic in *Penaeus chinensis*. Though *P. japonicus* are unaffected, they may act as carriers. Live polychaete worms may also act as vectors for specific virulent strains of *Vibrio parahaemolyticus* when used to feed broodstock prawns.

Signs of disease

- Animals with this disease may show one or more of these signs, but the pathogen may still be present in the absence of any signs.

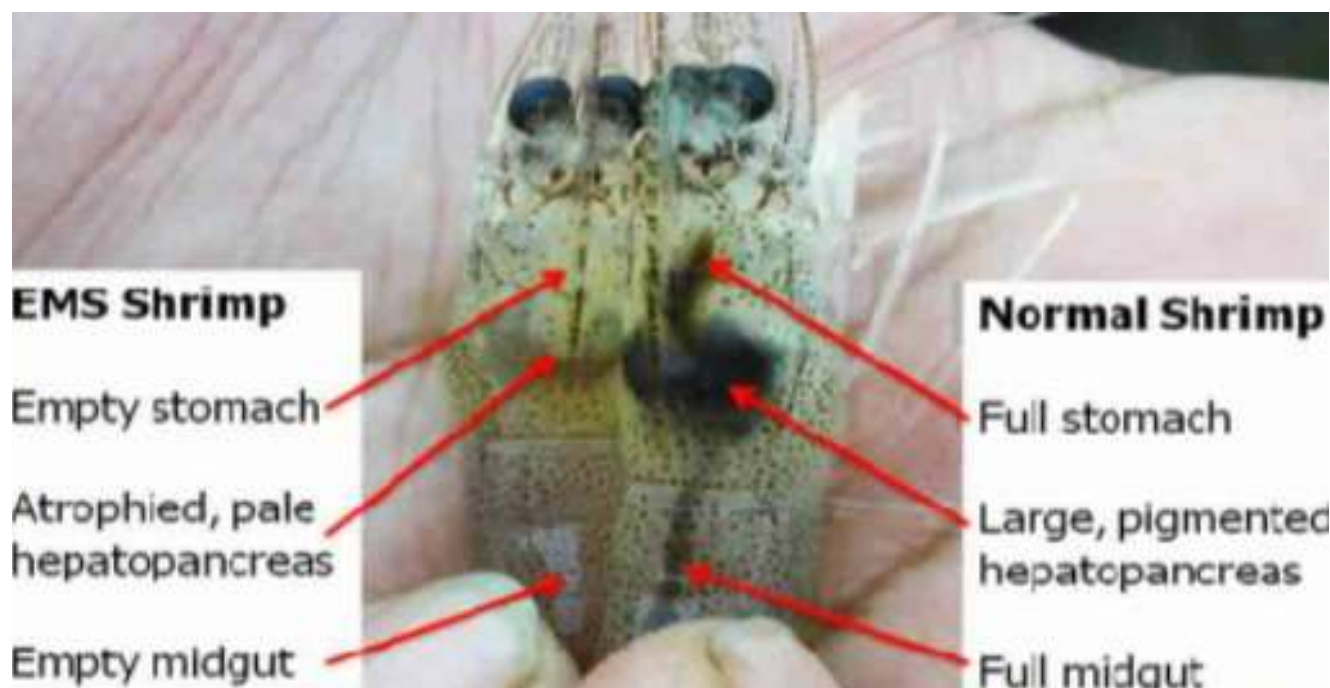


Fig. 7: AHPND infected shrimp

Disease signs at the farm, tank or pond level are:

- Pale to white hepatopancreas due to pigment loss in the connective tissue capsule.
- Moribund prawns sink to bottom.
- Onset of clinical signs and mass mortality up to 100% starting as early as 10 days post stocking and usually within 30 to 35 days.

Gross pathological signs are:

- Soft shell
- Guts with discontinuous contents or no contents.
- Black (melanised) spots or streaks visible within the hepatopancreas.
- Atrophy (shrinkage) of the hepatopancreas (Fig.7).
- Hepatopancreas does not squash easily between thumb and forefinger.

Microscopic Pathological signs are:

Acute phase

- Massive and progressive degeneration of the hepatopancreas tubules from proximal to distal end.
- Significant rounding and sloughing of hepatopancreas tubule epithelial cells into the tubule lumens, collecting ducts and posterior stomach.
- The only definitive histopathology in the acute stage is the massive sloughing of hepatopancreas tubule epithelial cells in the absence of bacteria.

Terminal phase

- Massive secondary bacterial infection (*Vibrio* spp.) in the sloughed cells.
- Complete destruction of the hepatopancreas.

8. Decapod Iridescent Virus 1 (DIV1)

Decapod Iridescent virus 1 (DIV1) is an infectious agent causing high mortality in *L. vannamei*. DIV1 can affect late-post larvae, juvenile and sub adult shrimp, mainly during low temperature seasons. The virus has not been found in samples taken at

AQUACULTURE SCENE

temperatures above 32°C.

The causative agent of Decapod Iridescent virus 1 Disease is *Cherax quadricarinatus* iridovirus (CQIV) or Shrimp Hemocyte Iridescent virus (SHIV). Classified within the proposed genus Decapodiridovirus within the family Iridoviridae, was first reported in juvenile White Shrimp *L. vannamei* and crabs in Chinese aquaculture settings in 2014. DIV1 has a characteristically large icosahedral shape that can reach a diameter of around 150 nm. The virion particle contains a linear double-stranded DNA. This family of viruses has a broad spectrum of hosts including invertebrates (insects) and poikilothermic vertebrates (fish, amphibians, and reptiles). Shrimp species susceptible to DIV1 infection include penaeid shrimps such as *L. vannamei*, *P. monodon* and *P. chinensis*. The virus has also been detected by PCR in frozen samples of krill and polychaetes from China, as well as in freshwater shrimp *Macrobrachium rosenbergii*. The screening and detection of DIV1 in frozen polychaete is critical, as it will enable farmers to only feed high-quality virus free polychaete feed to shrimp and avoid infection of post larvae by vertical transmission from feed to shrimp.

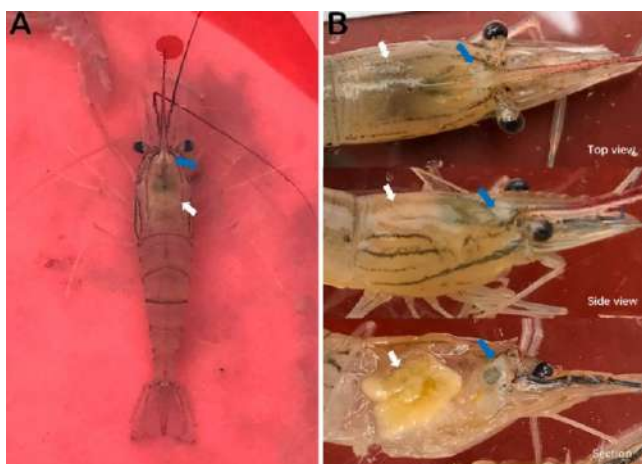


Fig.8: DIV1 infected shrimps

Signs of disease

Disease signs at the farm, tank or pond level are:

- Lethargy

- Cessation of feeding.
- Diseased shrimp sinking to the bottom of the pond.
- Sudden onset of high mortalities in late-post larvae, juvenile or sub adult prawns.

Gross pathological signs are:

- Empty stomach and gut.
- Soft shell.
- Mutilated antennae.
- Whitish to yellowish coloured head caused by a pale atrophied hepatopancreas (Fig.8).
- White triangle under the carapace at the base of the rostrum in *Macrobrachium rosenbergii* (Fig.8).
- Slightly reddish body colour in around one third of the affected shrimp.

Microscopic pathological signs are:

- Many necrotic cells with pyknotic nuclei in the haematopoietic tissue and circulating haemocytes in the gills, hepatopancreas and haemolymph sinuses.
- Dark eosinophilic inclusions in haematopoietic tissue.
- Basophilic intracytoplasmic inclusions in haemocytes and other affected cells.

Shrimp are animals whose immune system differs considerably from that of vertebrates. Shrimp immune system has only innate immunity and is devoid of acquired immunity. Hence treatment of viral infections is not possible in the case of shrimps. Some recent studies revealed that substances with immunostimulant effects can help to prepare the shrimp's body against the risk of disease outbreaks. But the constant commercial level success of those immunostimulants are yet to be proved. Hence prevention of shrimp diseases by following better management practices is better than cure.



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Details of SPF *P. vannamei* brooders imported & quarantined at AQF during August 2024

Sl. No.	Name of the importer	State	Country of origin/supplier	Date of receipt of the lot at AQF	Broodstock imported (nos)		
					Male	Female	Total
1	B Tech Hatcheries	Andhra Pradesh	SIS, Florida	01.08.24	400	400	800
2	Golden Marine Harvests	Tamil Nadu	SyAqua Americas Inc, Florida	02.08.24	400	400	800
3	NGR Aquatech Pvt. Ltd	Andhra Pradesh	SIS, Florida	02.08.24	200	200	400
4	CPF (India) Pvt. Ltd	Tamil Nadu	Kona Bay, Hawaii	03.08.24	276	276	552
5	Seven Staar Aquatech	Tamil Nadu	SIS, Florida	08.08.24	200	200	400
6	Snehitha Hatcheries - Unit II	Andhra Pradesh	SIS, Florida	09.08.24	300	300	600
7	Sri Mahalakshmi Hatcheries	Andhra Pradesh	SIS, Florida	11.08.24	300	300	600
8	Suhaan Enterprises	Andhra Pradesh	SIS, Florida	14.08.24	215	215	430
9	Sree Victory Shrimp Products Pvt. Ltd	Andhra Pradesh	SIS, Florida	14.08.24	400	400	800
10	Sea Park Hatcheries Pvt. Ltd	Andhra Pradesh	SIS, Florida	16.08.24	250	250	500
11	Sun Hatcheries - Unit II	Andhra Pradesh	SyAqua Americas Inc, Florida	16.08.24	250	250	600
12	Sree Dattareya Hatcheries	Andhra Pradesh	SIS, Florida	16.08.24	300	300	600
13	Srinivasa Aqua Hatcheries	Andhra Pradesh	SIS, Florida	18.08.24	400	400	600
14	Sun Glow Marine	Tamil Nadu	Benchmark Genetics, Florida	23.08.24	104	104	208
15	Meenakshi Hatcheries - Vizag	Andhra Pradesh	SIS, Florida	23.08.24	400	400	800
16	Sree Hatchery	Andhra Pradesh	SyAqua Americas Inc, Florida	24.08.24	250	250	500
17	Divyasneha Hatcheries	Andhra Pradesh	SIS, Florida	05.01.24	200	200	400
	TOTAL				4945	4945	9890

MPEDA participated in BTSF training on Food Safety Risk Analysis in Jakarta, Indonesia

Better Training for Safer Food is a European Commission training initiative to improve the knowledge and implementation of EU rules covering food safety, plant, and animal health. The training is fully funded by the European Health and Digital Executive Agency (HaDEA) acting under powers delegated by the European Commission.

The BTSF training course on "Food Safety Risk Analysis" took place in Jakarta, Indonesia from 24th to 27th June 2024, which was attended by 35 participants from 8 different countries. Mrs. Vinitha K. V. and Dr. Biji K. B., Technical Officers of MPEDA attended the training programme. The training course was a mix of theoretical and practical training sessions with an emphasis on practical exercises, using case studies from "real life" to improve knowledge on the complex area of food safety risk analysis.

The science-based risk analysis is a powerful tool for, consistent solutions to food safety problems. The training sessions covered the topics on EU General Food Law, three pillars of food safety risk analysis, i.e. risk assessment, risk management and risk communication. The food safety risk analysis based on the three pillars is the EU preferred way to assess possible links between the hazards in the food chain and actual risks to human health.

Risk assessment is a scientifically based process consisting of four steps: hazard identification, hazard characterisation, exposure assessment and risk characterisation. Risk management is the process of weighing policy alternatives in consultation with interested parties, considering risk assessment and other appropriate factors, and, if need be, selecting appropriate preventive and control options. Risk communication is the interactive exchange of information and opinions

throughout the risk analysis process about hazards and risks, risk-related factors, risk perceptions among risk assessors, risk managers and consumers, feed and food businesses, academic community and other interested parties, including the explanation on findings of risk assessment and risk management decisions.

The training also covered risk analysis on plant health, chemical contaminants, food contact materials, veterinary medicinal products, zoonosis and animal health with a focus on microbiological risk analysis, regulated products, and official controls with practical exercises. The practical sessions covered real-life exercises on food safety risk analysis and discussions to familiarize the concept of food safety risk analysis. Participation



MPEDA officials with lead instructor Dr. Thomas Frenzel

QUALITY FRONT

in discussion rounds and team works helped the participants in improving competence and acquire insights on the participating nation's best practices in risk analysis.

The trainers conducted the training assessment through Kahoot mobile application. BTSF issued certificates to the participants after the successful completion of training.



Presentation of case studies by MPEDA officials



Participants and instructors of BTSF Food safety risk analysis training

MPEDA celebrated 52nd Annual Day on 24th August 2024

The Marine Products Export Development Authority (MPEDA) celebrated its 52nd annual day on 24th August 2024. MPEDA was established in 1972 under the Ministry of Commerce & Industry with the objective of promotion of marine products exports from India. The inaugural session of the 52nd MPEDA day celebrations commenced with an invocation followed by a silent prayer in remembrance of the departed souls of the organization. Mr. K. S. Pradeep IFS, Secretary MPEDA & President, MPEDA Staff Club gave the welcome address. Dr. K. N. Raghavan IRS, Retired Director General, National Academy of Customs, Indirect Taxes and Narcotics (NACIN) inaugurated the annual day celebrations by lighting the lamp and delivered the inaugural address. During his inaugural speech, Dr. K. N. Raghavan appealed to the audience to work hard and work honestly to reach the predestined path set for each individual. The inaugural ceremony was presided by Mr. D. V. Swamy IAS, Chairman, MPEDA. In the presidential address, Chairman, MPEDA provided valuable insights, drawing connections between life's challenges and uncertainties while highlighting the importance of perseverance, teamwork, and authenticity in professional and personal lives by providing examples from the realm of cricket. He emphasized that an institution looks for knowledge, diverse skills and attitude in its employees to meet the complex challenges in real-life situations. He acknowledged the challenges accepted by the seafood industry and congratulated it for achieving marine products exports worth US\$ 7.38 billion during the year 2023-24. He concluded his speech by emphasizing that, seemingly impossible goals can be achieved through dedication and teamwork.

Felicitations were offered by Dr. M. Karthikeyan, Director, MPEDA, Dr. Ram Mohan M. K., Joint Director (Quality control), Dr. S. Kandan, Joint

Director (Training) and Mr. S. S. Shaji, Secretary, MPEDA Pensioners Forum.

The octogenarians and the employees who had completed 25 years of service in MPEDA were honoured during the occasion. The Rajeswari Memorial Endowment award instituted in the memory of Late Mrs. M. Rajeswari, a former employee of MPEDA was awarded to the children of MPEDA employees who secured the highest marks in board examinations of 10th and 12th standard during the year 2023-24. On the occasion, prizes were distributed to the winners of the Hindi magazine – “Sagarika” cover page design competition conducted by the Official Language section of MPEDA. Prizes were also distributed to the winners of the painting competition conducted for the children of MPEDA officials as part of MPEDA day celebration. Dr. Biji K. B., Technical Officer & Vice-President, MPEDA Staff Club proposed vote of thanks.

The event was attended by MPEDA officials and pensioners along with family members. The event was made colourful by the cultural programmes performed by the employees, pensioners, and their family members. Mr. D. V. Swamy IAS, Chairman, MPEDA distributed mementos to all the participants of cultural programmes.



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3	Ocean Shanghai Quyang International Trading Co. Ltd., China Tel : +86 18321182931 Email: 794827852@qq.com <i>Shrimp</i>	4	Apex Co. Ltd. 258-1 Kaminamie, Takasaki, Gunma, Japan 370-0801 Tel: +81 27 370 5678 Email: t.ideno@apexb1.com <i>Shrimp</i>
5	Bio Science Co. Ltd. Meiwa Bldg. 9F, 2-12-16, Shinbashi, Minato -Ku, Tokyo, 105-0004 Japan Tel :+ 81 80 6284 8287 Email : yo@bioscience.co.jp Head office: 246-1, Takumuji, Nakagawa, Anan Tokushima, 779-1292 Japan, Tel : + 81 884 42 3090 <i>Shrimp powder</i>	6	Japan Halal Business Association Osaka Branch, 2-3-12, Shikitsunishi, Naniwa- ku Osaka-city, Osaka, Japan Tel : +81 70 8394 3551 Head Office: Ikebukuro Park Bld. 2-49-7, Minamikebukuro, Toshima-ku, Tokyo, Japan Tel: +81 3 4540 7564, 070-8394-3551 Email: katayama@hba.jp <i>Shrimp</i>
7	Mitsui & Co. Seafoods Ltd. A-8 Floor, Shiba Park Bldg., 4-1, Shiba-koen 2-Chome, Minato -ku, Tokyo 105-0011, Japan Tel: +81 3 3438 5746 Mob: +81 80 1080 0166 Email: t.hamada@mitsui-seafoods.com <i>Shrimp powder</i>	8	Fuji Corporation Marine Products Division Hokusui Bldg, 9F, 1-13-13 Tsukiji Chuo-Ku, Tokyo 104-0045, Japan Tel: +81 3 3542 0242 Mob: +81 80 5419 0597 Email: m.koike@fuji-co.co.jp <i>Shrimp</i>
9	Hamasho Co. Ltd. Office -Belmate, 3-16-3 Minamioi, Shinagawa- Ku, Tokyo Japan Tel: +81 03 3768 1361 Mob: +81 80 8852 0665 Email: kondo@hamasho.co.jp <i>Shrimp</i>	10	Cross Reach Inc. Office No. 403, 1-14-16 Kundan Kita, Chiyoda-ku, Tokyo 102-0073, Japan Tel: +81 3 4213 4298 Mob: +81 70 4408 5250 Email: sakuma@xreach-inc.com <i>Shrimp</i>
11	Matsuda Sangyo Co. Ltd. 10F, Shinjuku-Nomura Building, 1-26-2, Nishishinjuku, Shinjuku-Ku, Tokyo 163 0558, Japan Tel: +81 3 3346 2311 Email: hattori-m@matsuda-sangyo.co.jp <i>Shrimp</i>	12	Nihon Shokken Japan Tel: +81 03 5805 1881 Mob: +81 070 3795 8965 Email: matsuzaki51829@nihonshokken.co.jp <i>Shrimp</i>

TRADE ENQUIRY

13	Itochu Corporation Tokvv Section 5-1, Kita-Aoyama 2-chome, Minato-ku, Tokyo 107-8077 Japan Tel: +81 3 3497 6139 Email: otani-r@itochu.co.jp <i>Shrimp</i>	14	China Best Food Group Limited (U.S.A) Head Office: 710 Epperson Dr, City of Industry CA 91748, USA Tel: +1 626 977 3444, +1 774 303 3604 China address: No. 27-A -14F NanSanHuan DongLu 100078 Beijing, China Tel: +86 10 8761 4547 Mob: +86 139 0113 2886 Email: 13901132886@139.com Korea address: 303/61 3FL. Euncheon nurieddle Eunacheon – Rogwanak – gu Seoul, South Korea, 151- 826 Tel: +82 2 883 0217 Email: USAI@chinabestfood.net <i>Frozen Shrimp</i>
FISH			
1	Sean Ward (Fish Exports) Ltd. Roshine Road, Killybegs, Co.Donegal, Ireland F94 CH99, Tel : + 353 74 97 31613 Mobile : + 81 (0) 9032235358 Email : efpitoh@icloud.com itoh@wardfish.com <i>Mackerel, Sprat</i>	2	Taiga Resorts India Pvt. Ltd. A-11/15,Ground Floor, Vasant Vihar, New Delhi – 110057, India. Office Tel : 011-4050-1983 Mob India : + 91 98114 73338 Japan : + 81 080 3545 6229 Email : imamotoindia@yahoo.co.jp <i>Tuna</i>
MIXED ITEMS/OTHERS			
1	Tosenbo Co. Ltd. 3-4-20 Yawatakiti – Cho, Ichihara-Shi, Chiba Zip;290-0069 Japan Tel: +81 436 43 6490 Mob: +81 90 4351 0700 Email: k.miyadera@tosenbo.co.jp <i>Shrimp, Crab, Lobster</i>	2	Tsuruhachi Co. Ltd. Pmo Hacchobori Iv, 8f, 2-1, 1-Chome, Irifune, Chuo-Ku, Tokyo 104-0042, Japan Tel: +81 03 3297 8883 Mob: +81 080 4118 7374 Email: shindo@tsuru8.co.jp <i>All Seafood</i>
3	Aeon Retail Co. Ltd. Isao Takazawa Buyer, MD Dept. of Fishery Products Mer- chandising Division, 1-4, Nakasa, Mihama -ku, Chiba-shi, Chiba, 261-0023, Japan Tel: +81 043 212 6195 Email: takazawa-i@aeonpeople.biz <i>All Seafood</i>	4	Makefood Future Co. Ltd. Room 4811, China Resources Building A, No.6, Qingdao, China Tel: +86 532 80901268, +86 532 80901260 Direct Line : +86 532 80905080 Email: coco@makefood-international.com <i>Cod, Pompano, Salmon, Whitefish Redfish, Tilapia, Squid, Pangasius</i>
5	Ins Nako Arakawa Daiei Foods Sweedeen Tel: +46 266 2200, +46 266 2201 Email: df-headoffice@daieifoods.jp Email: takazawa-i@aeonpeople.biz <i>All Seafood</i>	6	Donggang Luyuan Food Co. Ltd. China Tel: +86 0415 7153266 Email: hyfoods.008@lyfoods.com <i>All Seafood</i>
7	Nosui Corporation 11-36,Mita 3- Chrome, Minato-ku Tokyo 108- 0073 Japan Tel: +81 3 5476 0554 Email: dongyeone-kim@nosui.co.jp <i>Frozen Shrimp, Frozen Fish</i>	8	Toyota Tsusho Foods Corporation 2-3-13, Konan, Minato-ku, Tokyo, 108-0075, Japan Mob: + 81 90 3443 2688 Email: sugisaki@toyotsu-shokuryo.com <i>All Seafood</i>

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9	Maple Foods Limited 6-14-8 Tsukiji, Chuo-ku, Tokyo, Japan 104-0045 Tel: +81 3 5565 7001 Mob +81 90 4826 9032, +81 0986858422 Email : teto_tsukiji@maplefoods.co.jp, hatran@maplefoods.co.jp <i>Crab, Shrimp</i>	10	Tokyo Seafoods Ltd. Saiesuta Building 5F, 14-5, Tsukiji 2 Chome Chuo-Ku, Tokyo 104-0045, Japan Tel: +81 3 5565-3573 Mob: +81 70 4815 2886 Email: k-kyotani@tsf.co.jp <i>All Seafood</i>
11	Wismettac Foods, Inc. Nihonbashi Muromachi Mitsui Tower 15F, 3-2-1 Nihonbashi Muromachi, Chuo-ku, Tokyo 103- 0022 Japan Tel: +81 3 6870 2003 Mob: +81 80 7609 2341 Email : erina.nikaido@wismettac.com <i>Prepared and preserved seafood</i>	12	The Marine Foods Corporation Roppongi T-Cube 10F, 3-1-1, Roppongi, Minato-ku, Tokyo 106-0032, Japan Tel: +81 03 5545 6122, +81 03 5545 6120 Email: n.mizuguchi@marinefoods.co.jp, m.kishida@marinefoods.co.jp <i>All Seafood</i>
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19	Nissui Corporation Nishi-Shimbashi Square, 1-3-1 Nishi-Shim- bashi, Minato-ku, Tokyo., 105-8676 Japan Tel: +81 70 4068 9747 Email: y-kato@nissui.co.jp <i>Shrimp, Tuna, Crab</i>	20	Up Field Co. Ltd. 205 Heights Kanda Iwamotocho, 1-11-7, Higashi-Kanda, Chiyoda-ku, Tokyo101-0031, Japan Mob: +81 80 4493 1118 <i>All Seafood</i>
21	Johnson Seafood & United Ocean Foods Co. Ltd. No. 195, Fodao Rd., Qianzhen Dist., Kaohsiung City 806, Taiwan R.O.C Tel: +886 7 822 1812#137 Mob: +886 931 890070 Email: devin@johnsonseafood.com.tw <i>All Seafood</i>	22	Marubeni Seafoods Corporation 9-25, Shibaura 4-chome, Minato -ku, Tokyo 108-0023, Japan Tel: +81 3 3769 0401 Mob: +81 70 3933 8020 Email: ochiai-midori@marubeni-seafoods.com <i>Shrimp, Mackerel, Octopus, Squid</i>



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