# MPEDA

## Newsletter

VOL. IX NO. 5 AUGUST 2021

**COVER STORY**

## Strategies & Action Plan – 2025

By K.S Srinivas IAS, Chairman, MPEDA

## Indian Seafood at the Taste of Times Square Week

## Role of Tuna in Indian Seafood Exports

## Unraveled: "Port of Entry" of Pathogen in Shrimp

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VOL. IX / NO. 5 / AUGUST 2021 Newsletter

# CONTENTS

BEST IN MARKET

IMPORTED FROM SPAIN

# MARBYS

MASTERS IN CEPHALOPODS ADDITIVES

## PRODUCTS LIST

### BIWET - I

Phosphate free Moisture retainer & texture enhancer for Cephalopods

### ACUATIC - K

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# On the Platter

## K. S. Srinivas IAS
## Chairman

Friends,

Hon'ble Prime Minister of India on 6th August 2021 has announced a US$ 400 Billion export target for the country in the current financial year. While addressing a virtual conference with the Indian Missions abroad, Commodity boards, Export Promotion Councils and other stakeholders, he has stated that 4 factors including the multifold increase in manufacturing, reduction in logistics cost and international market for domestic goods can help to boost the country's exports.

The target fixed for marine products export sector is US$ 7.83 billion for the current fiscal. The year-on-year trend of export for the first quarter of 2021-22 indicates a 23% increase in the exports in terms of US$ value. However, the sector needs to grow by 31% to reach the targeted export figure. We are hopeful that in the coming months, the gaps in growth rate can be bridged to achieve the target figure.

The reports of detection and subsequent suspension of Indian seafood processing establishments by General Administration of Customs China (GACC) for the Covid-19 nucleic material on seafood packages continue to plague our exports to China. So far, 37 units have been suspended indefinitely by the GACC from exporting to China. Export Inspection Council has submitted a list of 15 units to the GACC for virtual inspection by them through Embassy of India, Beijing and five companies are getting ready for virtual inspection in August. I hope these companies will clear the inspection and get approval by GACC.

To resolve the issue of Covid-19 nucleic material, MPEDA is in touch with institutes like National Institute of Virology, Pune, Institute of Plasma Research, Gandhinagar and Centre for Cellular & Molecular Biology, Hyderabad. I hope these premier institutes will suggest suitable protocols to solve the problem.

MPEDA has opened its 14th ELISA Lab in Baptla on 30th July 2021 for Pre-Harvest Testing (PHT) of farmed shrimps. This lab will cater to the testing needs of aqua farmers in Guntur, Prakasam and Krishna districts of Andhra Pradesh.

As a part of market promotion, MPEDA organized Buyer Seller meets between Indian exporters and importers from Thailand, South Korea, Japan and Portugal in July. During the bilateral meetings with the Thai importers, the Indian Mission in Bangkok was requested to take measures to lift the ban imposed by Thai authorities on Indian farmed shrimp for the presence of Infectious Myonecrosis Virus (IMNV), as it could help boost export of farmed shrimps to Thailand for further processing and consumption. Buyer-Seller meets with Qatar and Belarus are also planned during the month.

Thank you.



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# Indian seafood at the taste of Times Square Week

The Marine Products Export Development Authority (MPEDA) in partnership with Consulate General of India, New York and SAAR Indian Bistro participated in the Taste of Times Square Week for the promotion of Indian Seafood and Saffron during the festival held during 7th to 14th June 2021. Indian exporters from Visakhapatnam viz., Nekkanti Sea Foods Ltd, Devi Seafood Ltd, and Sandhya Aqua Exports P Ltd had participated in the annual celebrations by contributing Indian Shrimps to the restaurants.

The complimentary dishes of Garlic Butter Shrimp and Saffron Rice was made by Mr. Hemant Mathur, a Michelin starred chef and restaurateur in NYC. The items were featured in a specially curated Indian Seafood menu and were served as complimentary dishes from Marine Products Export Development Authority (MPEDA) to the visitors in the course of the Food Festival.

Food was served along with the small recipe card of the dishes with Indian Seafood brand.

The festival was attended by the 3,00,000 visitors including people from High End Hospitality and other Restaurants. 3500 complimentary dishes were served throughout the week. Standee of MPEDA with brand image of Indian seafood was showcased. The event was publicized on the Social Media channels of the Consulate General of India, New York and MPEDA.

Consulate General of India, New York commented that while India is having a strong foothold in the US market, Indian seafood do not have commensurate branding presence. As a follow-up to the event, CGI has proposed to conduct a sea-food competition and stressed the need to carry out social media campaign on sustained basis along with the work on brand-building.

**Taste of Times Square**

Taste of Times Square is Times Square's annual celebration involving the restaurants in New York

*Inside view of SAAR Indian Bistro*

with all their flavour and variety. The programme is organized by The Times Square Alliance and has been supporting local restaurants through Taste of Times Square for the past 26 years. It offers the special three-course prix fixe menus for US$35 (beverages, tax, and tip not included) at participating restaurants.

Diners are encouraged to come out and experience Times Square's best restaurants, eat great food, and dine in confidence knowing that they are taking all appropriate measures to protect the health and safety of patrons and staff.There will be some surprise performances also in between. The Taste of Times Square prix fixe menus will be offered for indoor dining, outdoor dining, takeout, and delivery from the applicable participating restaurants.The weeklong promotion supports local businesses who have struggled to serve customers during the pandemic and welcomes people back to Times Square.


*Standee of MPEDA with brand image of Indian seafood*

**Participated restaurants**

| | | |
|---|---|---|
| Barbetta Restaurant | Bar Dough | Charlie Palmer Steak NYC |
| Gallaghers Steakhouse | Pasta Lovers Trattoria | Playwright Celtic Club |
| P.S. Kitchen | Saar Indian Bistro and Bar | Seamore's Market Bar & Restaurant |
| Tito Murphy's | Tony's Di Napoli | Trattoria Trecolor Hard Rock Café |
| Haru Times Square | Le Rivage | O'Donoghue's Bar & Restaurant |
| M Social Times Square | Havana Central | Hold Fast |
| House of Brews | Hurley's Saloon | ICHIRAN |
| Jasmine's Caribbean Cuisine | Bubba Gump Shrimp Co. | Dos Caminos |
| Friedman's | | |

**The Times Square Alliance**

The Times Square Alliance works to improve and promote Times Square cultivating the creativity, energy and edge that have made the area an icon of entertainment, culture and urban life for over a century. Founded in 1992, the Alliance keeps the neighbourhood clean and safe, promotes local businesses, manages area improvements and produces major annual events with partners including New Year's Eve, Solstice in Times Square and Taste of Times Square.

As the custodians of Times Square, the Alliance works every day to improve the quality of life for the neighbourhood residents and businesses while driving economic growth in New York City.

# MPEDA conducts Virtual Buyer Seller Meet with Japan

MPEDA in association with Embassy of India, Tokyo had arranged a Virtual Buyer Seller Meet on 8th July 2021. Thirteen exporters had participated in the meeting with their presentations. The programme started at 10:30 AM IST (3 PM Tokyo time). Mr. Manoj Singh Negi, First Secretary (Commerce), from EOI, Tokyo and Mr. Jun Nakayama from MPEDA TPO Japan participated in the meet from Japan. Mr. Anil Kumar P, Joint Director (Marketing), and Dr. T.R. Gibinkumar, Deputy Director, Market Promotion & Statistics joined the meet from Head Office MPEDA, Kochi.

Mr. Naoki Kaneko of M/s. Ocean Trading Company Pvt Ltd., a trading company located at Kyoto with strong sales network through supermarkets and restaurants interacted with the 13 exporters. The main queries placed by Mr. Naoki Kaneko to the exporters were regarding the strength of the company product, trade experience with Japan market, ASC certification, source of raw material and quality assurance. Mr. Naoki Kaneko also stressed that markets like Malaysia & Singapore required certifications for seafood to gain access to these markets whereas Japan market accords priority to quality. EOI, Tokyo promised to coordinate in arranging further meetings as per the requirement of M/s. Ocean Trading Company Pvt Ltd. The programme ended at 12:30 PM.

Ocean Trading Co. Pvt. Ltd is a trading company with its headquarters located in Kyoto, Japan and branch offices in Tokyo, Kuala lumpur in Malaysia, Ho Chi Min City in Vietnam and Puerto Varas in Chile. Ocean Trading Co. Pvt Ltd., is dealing with perishable items such as seafood, vegetables and flowers and do the distribution in Japanese market as well as all over Asian markets.

They also have their own flower farm in Dalat of Vietnam producing Chrysanthemum for Japanese market. More details of the company is available at the website (http://www.oceantrading.co.jp/eng/). Ocean trading Co. Pvt Ltd have strong sales network through supermarkets and restaurants segments in Japan as well as all over Asian markets especially in Singapore and Malaysian markets. Currently they are working to establish prawn business from India due to the requests from their clients in Japan.

# Role of Tuna in Indian seafood export scenario

Dr. T R GIBINKUMAR
DEPUTY DIRECTOR (MARKET PROMOTION & STATISTICS)

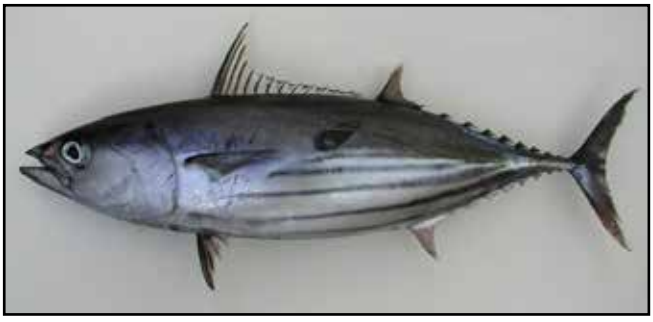
India is blessed with diverse fish stocks and tuna is one of the most sought after species in the country for domestic consumption as well as for exports. Fewer landings coupled with Covid- 19 had affected country's tuna exports to several major markets during 2020-21.

According to the Indian government's report to the IOTC, small-scale and artisanal sectors largely contribute to the tuna fishery using a variety of gears with gillnets being the main one. The fleet also uses small purse seiners, longliners, and pole-and-liners. Fishers use artisanal pole-and-line boats to primary target skipjack in the Lakshadweep Islands.

The major species contributing to tuna fishery are *Euthynnus affinis* (Little tuna or Kawakawa), *Auxis* spp. (Frigate tuna), *Katsuwonus pelamis* (Skipjack tuna), *Thunnus tonggol* (Longtail tuna) & *Thunnus albacares* (Yellowfin tuna).

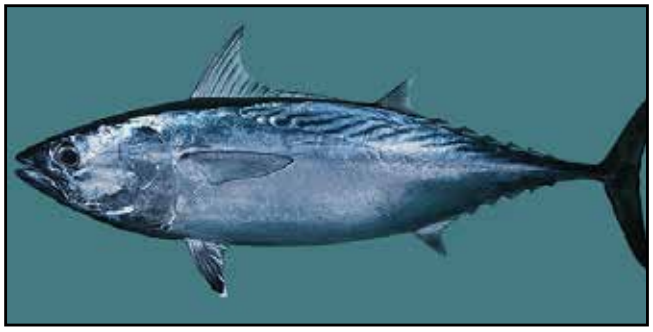
Development of fishing for tuna and tuna like fishes was one of the major thrust areas for the development of seafood export from the country. MPEDA's actions were focused on creating infrastructure for exploiting the tuna resource through fisher's training on tuna fishing and onboard handling. The first phase in this direction was successfully done by assisting fishing vessel owners for either introducing new tuna longliners or by converting existing fishing vessels to do tuna long lining. But lack of infrastructure onboard fishing vessels and at fish landing centres to maintain the quality of tuna has become the bottle neck and hence it was difficult for fisher's to realize good price for their catch.

*Auxis thazard © Randall, J.E.*



*Katsuwonus pelamis © Fretis, Rui*

*Thunnus tonggol © Hermosa, Jr., Gregorio V.*



*Euthynnus affinis © Randall, J.E.*

*Thunnus albacares © Archambault, Clay*

**Tuna production in India**

As per the Earth System Science Organization (ESSO) -Indian National Centre for Ocean Information Services (INCOIS) fishery resource potential of oceanic tuna in the Indian EEZ is 2,13,000 tons with estimated composition of yellowfin at 54 per cent, skipjack at 40 per cent and big-eye at 6 per cent. Tuna production in India had grown from 53,323 MT in 2010 to almost double production of 1,08,390 MT in 2019 and the growth is evident from chart given as Fig.1. The resource utilization is only about 50% and there is ample scope for increasing tuna production. Species wise landing details of tuna from 2010 to 2019 is given in Table 1. *E. affinis* followed by *K. pelamis* and *T. albacares* are the species dominant in landings. During 2019, *E. affinis* & *K. pelamis* contributed 29% each followed by *T. albacores* with 24%, *Auxis* spp & *T. Tonggol* contributed 12% & 5% respectively and other tunnies represented meagre 1%.

The species composition of tuna landings in India during 2019 is illustrated in Fig.2 and the landing trend of various species of tuna is illustrated in the Fig. 3.

*Table 1: Tuna landings in India for last 10 years (Source: CMFRI)*

| Species | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| *Euthynnus affinis* | 21289 | 32937 | 32763 | 39738 | 36894 | 35858 | 35466 | 27680 | 32744 | 31843 |
| *Auxis. spp* | 11236 | 12494 | 9747 | 7724 | 10991 | 8176 | 13418 | 16640 | 16042 | 12947 |
| *Katsuwonus pelamis* | 4901 | 8758 | 5780 | 7078 | 11124 | 8302 | 16232 | 10559 | 23147 | 31014 |
| *Thunnus tonggol* | 5590 | 11116 | 13926 | 12643 | 9937 | 9207 | 8090 | 7350 | 7678 | 5853 |
| *Thunnus albacares* | 7703 | 9396 | 14696 | 15342 | 16922 | 15554 | 16792 | 13505 | 27198 | 26177 |
| Other tunnies | 2604 | 1914 | 4462 | 2766 | 2973 | 1373 | 1637 | 4656 | 2910 | 556 |
| Total (In MT) | 53323 | 76615 | 81374 | 85291 | 88841 | 78470 | 91635 | 80390 | 109719 | 108390 |

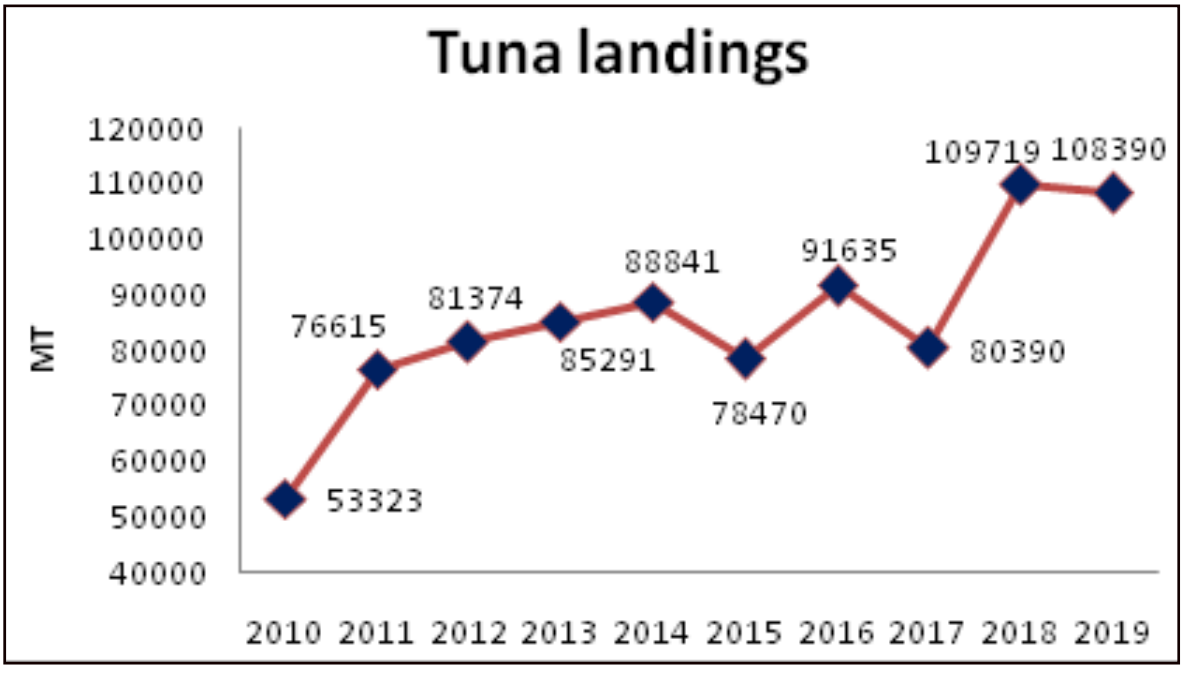



*Fig.1: Tuna landings in India for last 10 years*

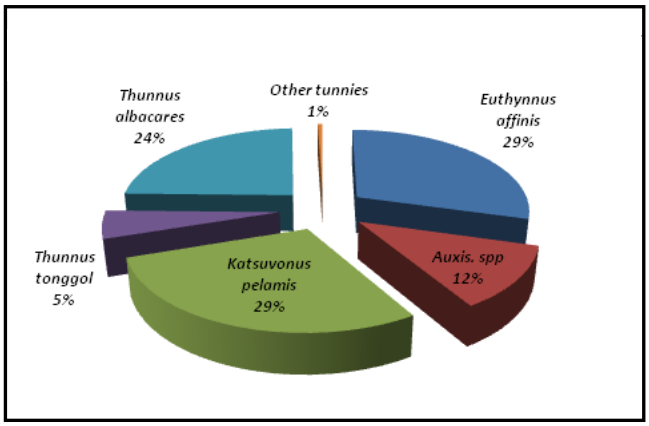



*Fig.2: Species composition of Tuna landing in 2019*

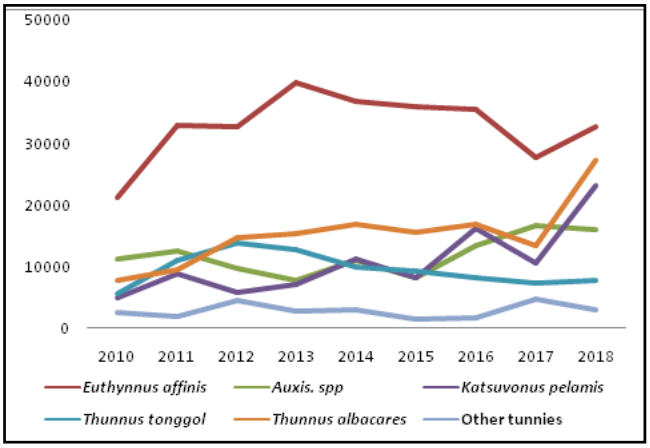



*Fig.3: Trends in species - wise tuna landings in last 10 years*

### Increased domestic consumption

There is high tuna consumption within the country whereby locals prefer to buy this fish fresh in wet markets- mainly skipjack, Kawakawa and yellowfin. A portion of the catch is also headed to restaurants and hotels. Out of 1,08,390 MT landed, only 41,586 MT was exported during 2020-21. So more than 65,000 MT are being consumed domestically. Fig.4 illustrates the trends in export and domestic consumption of tuna in India.

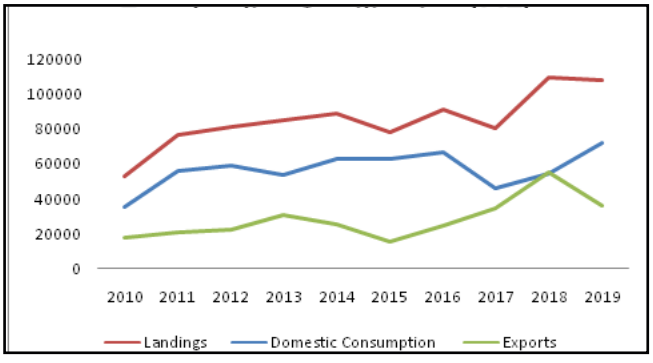



*Fig.4: Tuna landings and utilization for last 10 years*

### Fluctuating exports

As per the statistical data for past four years, the export of tuna seems to be reducing for the last two years on a stretch. During the last four years from 2017-18 to 2020-21, the volume of tuna shipments to overseas destinations was the highest during 2018-2019 at 55,322 MT with earnings of USD 90.47 million. 2019-2020 saw a drop of nearly 38 percent in tonnage, and India's tuna export income only reached USD 56.58 million. Though in 2020-21 the exports in quantity has increased from 36,287 MT to 41,586 MT, the export earnings reduced by another 7.4% to reach USD 52.40 million. The growth pattern is illustrated in Fig.5.

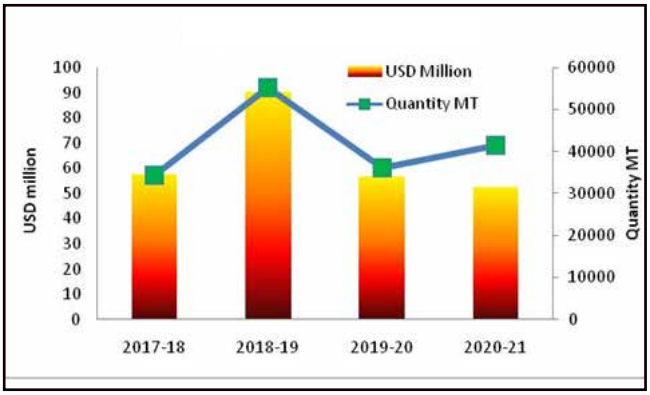



*Fig.5: Export trend of Tuna*

### Major markets for Indian Tuna

India is currently exporting tuna to 36 countries as per 2020-21 data. India's main markets have been the African nation of Tunisia and regions such as the Southeast Asia and Middle East in the past few years. During 2020-21, Tunisia was the main destination for India's deliveries – a total of 24,384 MT of tuna largely made up of frozen skipjack which earned USD 27.31 million. Indian exporters have also sent 5065 MT of tuna to Iran. Countries like Vietnam, Turkey, Algeria, Libya, Italy, China and Oman also took a fair volume of the shipments. Top 15 export destinations of Tuna from India is given in Table 2.

*Table 2: Top 15 countries importing Tuna from India*

| Sl No | Country | Qty. Tons | Value Rs.Lakh | U S $ (Mln) |
|---|---|---|---|---|
| 1 | TUNISIA | 24384 | 19925.50 | 27.31 |
| 2 | IRAN | 5065 | 5040.25 | 6.72 |
| 3 | THAILAND | 4580 | 3947.33 | 5.38 |

| | | | | |
|---|---|---|---|---|
| 4 | VIETNAM | 2361 | 2703.00 | 3.72 |
| 5 | TURKEY | 1930 | 1648.16 | 2.25 |
| 6 | ALGERIA | 555 | 879.29 | 1.19 |
| 7 | LIBYA | 409 | 759.34 | 1.05 |
| 8 | ITALY | 290 | 571.78 | 0.78 |
| 9 | CHINA | 158 | 406.94 | 0.56 |
| 10 | OMAN/ MUSCAT | 285 | 359.00 | 0.49 |
| 11 | SPAIN | 244 | 331.90 | 0.45 |
| 12 | INDONE-SIA | 376 | 305.80 | 0.42 |
| 13 | U A E | 224 | 222.92 | 0.31 |
| 14 | SOMALIA | 80 | 194.15 | 0.27 |
| 15 | USA | 97 | 156.78 | 0.21 |

Market-wise exports of tuna is given at Table 3. There was a large decline in volumes exported to Southeast Asian markets in 2019-2020 – falling to 7,922 MT from 23,556 MT from the previous two-year period and further declined to 7385 MT in 2020-21. Overall, revenue from this region in 2019-2020 was USD 12.34 million, which was further reduced to USD 9.63 million in 2020-21.

Overall, EU buyers took in 2,344 MT and paid USD 6.76 million to the Indian suppliers in 2019-2020 and the market became more sluggish in 2020-21, reducing the exports to 690 MT and USD 1.64 million in terms of quantity and USD value respectively.

If we look at the Middle East market, Indian exporters has continuously increased their business in the last four years and experienced increase in exports from USD 2.76 million in 2018-19 to 7.78 in 2020-21 showing 181% growth. The quantity also increased from 1560 MT to 5638 in last four years, a growth of more than 2.6 times.

*Table 3: Market-wise exports of tuna for the last four years*

| MARKET-WISE EXPORT OF TUNA | | | | | |
|---|---|---|---|---|---|
| Q: Quantity in Tons, V: Value in Rs. Crore, $: US$ Million | | | | | |
| MARKET | | 2017-18 | 2018-19 | 2019-20 | 2020-21 |
| JAPAN | Q: | 20 | 64 | 43 | 12 |
| | V: | 0.47 | 2.47 | 1.55 | 0.37 |
| | $: | 0.07 | 0.35 | 0.22 | 0.05 |
| USA | Q: | 39 | 33 | 144 | 97 |
| | V: | 0.70 | 0.58 | 2.35 | 1.57 |
| | $: | 0.11 | 0.09 | 0.33 | 0.21 |
| EUROPEAN UNION | Q: | 2112 | 2947 | 2344 | 690 |
| | V: | 45.55 | 53.47 | 47.23 | 12.10 |
| | $: | 7.14 | 7.73 | 6.76 | 1.64 |
| CHINA | Q: | 394 | 835 | 374 | 198 |
| | V: | 8.11 | 13.80 | 5.84 | 4.89 |
| | $: | 1.27 | 2.01 | 0.84 | 0.67 |
| SOUTH EAST ASIA | Q: | 6815 | 23556 | 7922 | 7385 |
| | V: | 70.88 | 280.31 | 86.59 | 70.35 |
| | $: | 11.11 | 40.57 | 12.34 | 9.63 |
| MIDDLE EAST | Q: | 1560 | 2342 | 3760 | 5638 |
| | V: | 17.61 | 23.87 | 43.12 | 58.18 |
| | $: | 2.76 | 3.75 | 6.07 | 7.78 |
| OTHERS | Q: | 23454 | 25546 | 21699 | 27565 |
| | V: | 224.82 | 249.24 | 210.04 | 236.64 |
| | $: | 35.35 | 35.97 | 30.02 | 32.42 |
| TOTAL | Q: | 34393 | 55322 | 36287 | 41586 |
| | V: | 368.14 | 623.76 | 396.72 | 384.10 |
| | $: | 57.80 | 90.47 | 56.58 | 52.40 |

**Major Tuna items in export**

Tuna is being exported as frozen, chilled and dried forms, but for the last two years there is no export of dried items of tuna. 99.42% in quantity and 98.21% in USD terms are frozen products. An item - wise export of tuna for the last four years is given at Table 4. The products mainly comprised of frozen skipjack & yellowfin which are ending up as raw material in the canneries across the globe.

*Table 4: Item-wise exports of tuna for the last four years*

| ITEM-WISE EXPORT OF TUNA | | | | | |
|---|---|---|---|---|---|
| Q: Quantity in Tons, V: Value in Rs. Crore, $: US$ Million | | | | | |
| ITEM | | 2017-18 | 2018-19 | 2019-20 | 2020-21 |
| FROZEN FISH | Q: | 34187.03 | 55037 | 35934 | 41345 |
| | V: | 359.67 | 612.28 | 382.86 | 377.28 |
| | $: | 56.47 | 88.80 | 54.61 | 51.46 |
| DRIED ITEM | Q: | 12.74 | 4.00 | 0.00 | 0.00 |
| | V: | 0.29 | 0.05 | 0.00 | 0.00 |
| | $: | 0.04 | 0.01 | 0.00 | 0.00 |
| CHILLED ITEMS | Q: | 193.03 | 211 | 178 | 59 |
| | V: | 8.15 | 10.14 | 9.11 | 1.97 |
| | $: | 1.28 | 1.48 | 1.30 | 0.27 |
| OTHERS | Q: | 0.60 | 70 | 175 | 182 |
| | V: | 0.27 | 1.29 | 4.76 | 4.85 |
| | $: | 0.00 | 0.18 | 0.67 | 0.67 |
| TOTAL | Q: | 34393.40 | 55322 | 36287 | 41586 |
| | V: | 368.38 | 623.76 | 396.72 | 384.10 |
| | $: | 57.80 | 90.47 | 56.58 | 52.40 |

India was not known for its canned tuna production but it managed to export 5 MT of canned tuna worth USD 0.11 million in 2019-2020 and in 2020-21, the figures have grown to 166 MT & USD 0.62 million. This is a major jump in the export of canned products.

**Low unit value realization**

If we refer the Table 5, we can see the unit value realized by Indian Tuna in the international market. In all markets, the unit value seems to be very low except in the case of Japan. Frozen products are realizing only around 1.24 USD/kg and chilled items realize a unit value of 4.58 USD/kg. But the presence of chilled Indian tuna in international market is substantially low (only 0.58% in quantity) to improve the average unit value of tuna exported from the country.

*Table 5: Unit Value realization of tuna in various markets*

| MARKET | 2017-18 | 2018-19 | 2019-20 | 2020-21 |
|---|---|---|---|---|
| Japan | 3.50 | 5.47 | 5.12 | 4.17 |
| USA | 2.82 | 2.73 | 2.29 | 2.16 |
| European Union | 3.38 | 2.62 | 2.88 | 2.38 |
| China | 3.22 | 2.41 | 2.25 | 3.38 |
| South East Asia | 1.63 | 1.72 | 1.56 | 1.30 |
| Middle East | 1.77 | 1.60 | 1.61 | 1.38 |
| Others | 1.51 | 1.41 | 1.38 | 1.18 |
| TOTAL | 1.68 | 1.64 | 1.56 | 1.26 |

**Major players in tuna in India**

If we see the list of top 15 exporters in India given in Table 6, 10 out of 15 top exporters of tuna are based in Kochi and the major constraint before the exporters is the availability of good quality raw material in a consistent manner. This issue also creates the major hurdle for value addition of tuna in India. More focus on fishing technology and most importantly on the onboard handling of the catch plays a significant role in the development of export market of this resource. We also need to upgrade the infrastructure available in fishing vessels as well as in the landing centers.

*Table 6: Top 15 exporters of tuna*

| Sl. No. | Exporter Name |
|---|---|
| 1 | St Peter & Paul Sea Food Exports P Ltd., Chennai |
| 2 | Nas Fisheries P. Ltd., Kochi |
| 3 | Indian Marine Industries, Kochi |
| 4 | Frontline Exports (P) Ltd., Kochi |
| 5 | Indian Exports, Veraval |
| 6 | G K S Business Associates P Ltd., Kochi |
| 7 | Keshodwala Foods, Veraval |
| 8 | Ocean Wealth Exports, Kochi |
| 9 | Freeze Exim, Kochi |
| 10 | Jude Foods India P.Ltd., Kochi |
| 11 | Al Badar Seafoods Pvt Ltd, Kochi |
| 12 | Gopal Fisheries, Veraval |
| 13 | S M Sea Marines Pvt. Ltd., Kochi |
| 14 | Cochin Frozen Foods, Kochi |
| 15 | Ghan Marine Products, Vizag |

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1. https://incois.gov.in/MarineFisheries/TunaAdvisory
2. Marine Fish Landings in India, CMFRI (2010 to 2019)
3. Marine Products Export statistical database of MPEDA.

# 2020 batch ITS Probationers visit MPEDA

*ITS Probationers with Chairman, MPEDA*

A team of 10 Indian Trade Service probationers visited MPEDA on 28th July 2021 as part of their basic training. The probationers had an introductory meeting Mr. K. S Srinivas IAS, Chairman, MPEDA wherein Dr. M Karthikeyan, Director, Mr. K S Pradeep IFS, Secretary, Dr. Ram Mohan M. K., Joint Director (QC), Mr. Anilkumar P, Joint Director (Marketing) and other officials were present.

During the introductory meeting, the probationers were explained the activities of the organization and shown related videos. A presentation on Export Performance of Marine Products during 2020-21 was presented by Dr. T R Gibinkumar (Deputy Director, Market Promotion & Statistics). Their doubts were also clarified by the concerned officials.

Later on, the probationers had a visit to the Quality Control lab of MPEDA at Head Office where they were explained the quality control and analytical activities performed in chemical, microbiological and molecular biology divisions by Mr. G. Mahesh, Deputy Director and Dr. E. C. Abhilash, Assistant Director. Afterwards, they had also visited the seafood processing plant of M/s. Mangala Marine Exports, Aroor under the coordination of Mr. Johnson D'Cruz, Deputy Director, MPEDA Regional Division, Kochi.

# Strategies and action plan for seafood exports by 2025 – Series 2

**K. S. Srinivas IAS, Chairman, MPEDA**

*This is a series published by Chairman, MPEDA on the strategies and action plan envisaged by MPEDA in enhancing the seafood exports from the country to achieve the goals set for 2025. This paper is the second one among the series, which details the Technical Barriers faced by Indian seafood export trade.*

**Introduction**

In the series 1 we had discussed about the current scenario of exports and production of exportable finfish and shellfish species, expected levels of projection in exports, and identified constraints in achieving the target. In this edition, we will look at the strategies envisaged to achieve the target set for exports one by one. Export promotion is one among the core mandates of MPEDA. The organization undertakes a series of activities to promote Indian seafood in various markets aboard. Before discussing those activities and associated strategies, we may have a glance to the Technical barriers to Trade faced by Indian seafood sector in various markets, which need to be effectively addressed to build up the brand image of Indian seafood, ensuring continuous supply with assured quality.

**Technical Barriers to Trade:**

**(i) Antibiotic residue:**

The major issue faced in the export of aquaculture shrimp in most of the markets is the rejection of consignments due to the presence of banned antibiotics such as Nitrofuran (NF) and Chloramphenicol (CAP) (Table 1). The EU also increased the sampling for cultured Indian shrimps from 10% to 50% in October 2016, which is applicable to India only.

*Table 1: Rejections due to residues in major markets*

| Rejections | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | EU | | USA | | Japan | | Total | |
| Year | Total | Antibiotic | Total | Antibiotic | Total | Antibiotic | Total | Antibiotic |
| 2015 | 17 | 5 | 43 | 15 | 9 | 7 | 69 | 27 |
| 2016 | 27 | 5 | 61 | 28 | 3 | 3 | 91 | 36 |
| 2017 | 39 | 15 | 47 | 3 | 7 | 6 | 93 | 24 |
| 2018 | 37 | 13 | 52 | 8 | 5 | 4 | 94 | 25 |
| 2019 | 11 | 4 | 30 | 6 | 5 | 5 | 46 | 15 |
| 2020 | 13 | 4 | 71 | 11 | 5 | 5 | 89 | 20 |

The market share of Indian shrimps have fallen from 14.06% in 2016 to 8.12% in 2020 due to the stringent actions adopted by the EU against the antibiotic residue incidence in cultured Indian shrimp consignments (Fig.1). The EU had delisted 14 Indian seafood processing units based on the detection of antibiotic residues in their consignments. No new units were being approved by EU for exports.

After considerable bilateral persuasions, 5 of the 14 delisted establishments along with certain new establishments are now permitted to export sea caught material.

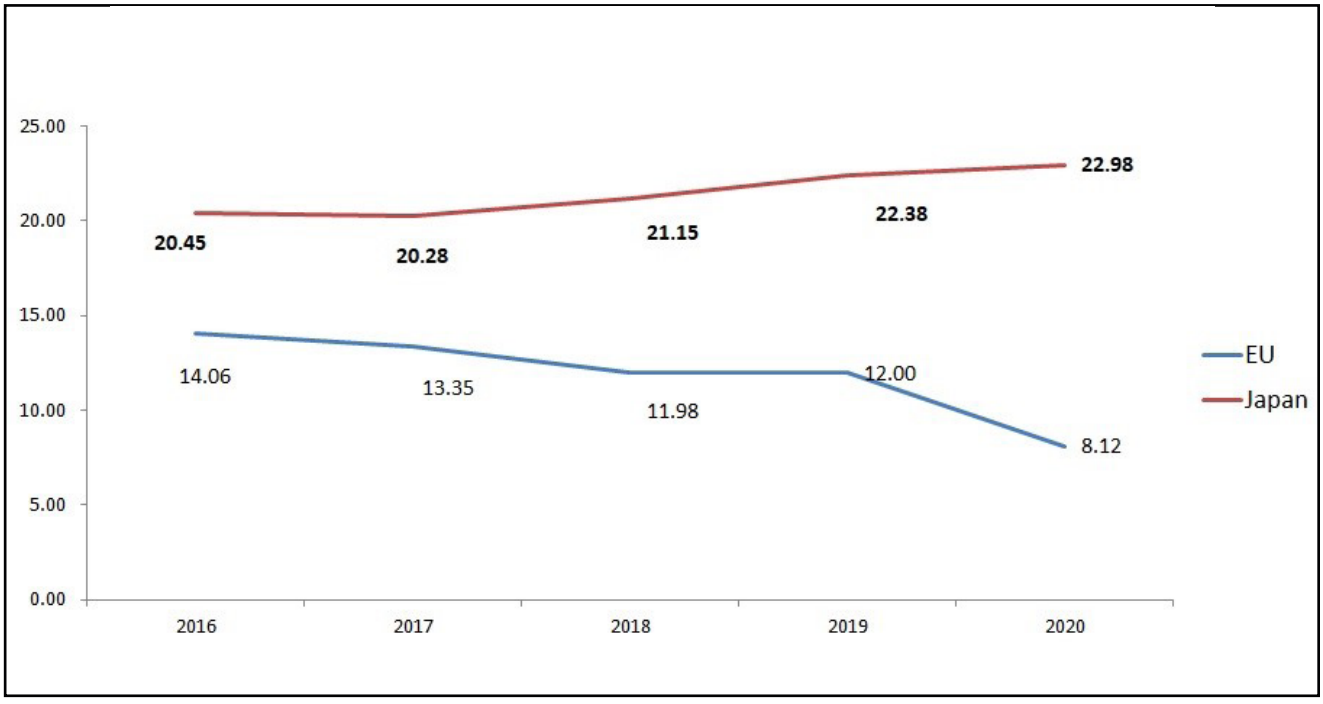


*Fig.1: Percentage share of raw shrimp imports in EU & Japan markets*

To contain the rejections due to banned antibiotic residues, MPEDA had introduced Pre harvest Testing (PHT) for all farmed shrimps in 2010 through the ELISA labs established by MPEDA. Later, this requirement was limited since May 2014 for shrimp exports to the EU market only by an order of MoCI.

The exports to Japan are almost stagnating because of the risk of antibiotic residue. Country follows a 100% import inspection regime for farmed vannamei shrimp from India, while they have exempted farmed Black Tiger from import inspection since December 2020 since there were no antibiotic detection cases for the species since 2013. We need to emulate a similar scenario for vannamei shrimp also in the Japanese market by completely eliminating antibiotic detections in Japanese market atleast for 2 years.

During our field trials, it is noted that pre harvest tested and non tested material get mixed up at aggregators' level as the requirement of PHT is limited to shrimps destined to EU market alone. This heightens the risk of contamination of a lot and need appropriate measures to arrest such contamination. Considering the rejections of consignments in all major markets due to antibiotic residues, MPEDA had been advocating to make PHT mandatory for all farmed shrimps produced and exported from the country. This will create a foolproof mechanism to check the residues at the farm level.

**(ii) Biosecurity Issues:**

Detection of OIE listed pathogens in export consignments is another significant trade barrier effectively used by certain markets against Indian shrimp exports. Reports indicate the presence of White Spot Syndrome Virus (WSSV), Infectious Hypodermal and Hematpoietic Necrosis Virus (IHHNV) and Infectious Myo Necrosis Virus (IMNV) in Indian aquaculture systems.

These diseases besides causing crop loss to the farmers, also affect trade access to Indian shrimps in certain potential markets. Countries like Australia, Kuwait, Saudi Arabia, Canada, South Korea, Thailand and China have regulations in place and insist for test certificates proving absence of OIE listed pathogens for raw shrimp consignments.

This has resulted in restriction to market access for Indian shrimp to these markets, and has reduced market share of Indian shrimps. Australia, Thailand & South Korea are specific examples where the market share of Indian shrimps have dropped or not improved due to their biosecurity requirements (Fig. 2).

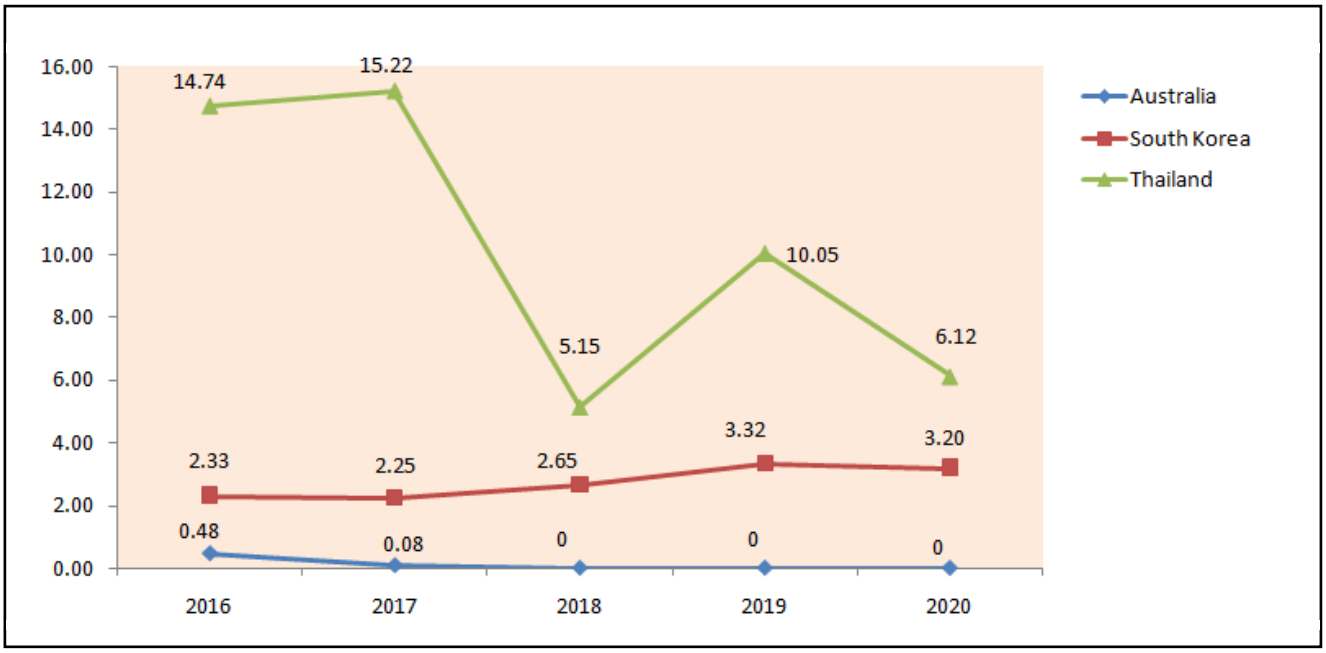


*Fig.2: Percentage share of raw shrimp imports in markets with biosecurity issues*

RGCA, a society under MPEDA is operating the Aquaculture Quarantine Facility (AQF) for vannamei shrimp broodstock, which screens the import of broodstock and PPLs of vannamei & Black tiger shrimps for OIE listed pathogens. RGCA is also part of the National Surveillance Programme for Aquatic Animal Diseases (NSPAAD) operated by the National Bureau of Fish Genetic Resources (NBFGR).

NaCSA, another society under MPEDA is involved in encouraging cluster farming by farmers with small farm holdings. In addition, it is also involved in establishment & operation of Aqua One Centres (AOC), which serve as one stop solution to assess the water quality parameters, and for disease diagnosis.

Coordinated efforts by Department of Fisheries, states and fisheries research institutions are required to eliminate the risk of shrimp pathogens in our farming systems. There is a need to have an active surveillance programme to understand the spread of these pathogens in the farming systems of the country, which will help to map the areas of disease / pathogen concentration and to take corrective actions. MPEDA has already brought this matter to the attention of Department of Fisheries, Govt. Of India. This also warrants more disease diagnostic labs have to help the farmers and capacity building on Best Management Practices (BMPs). Cluster farming has to be promoted, and to strengthen bio-security regulations in farms & hatcheries have to be followed.

**(iii) Sustainability:**

As more countries are introducing non tariff barriers, it has become the need of the hour to comply with the associated regulatory requirements and equip our fishing sectors to reduce by catch of endangered and protected species such as sea turtles and marine mammals, failing which our exports from wild catch

could face a ban. One of the major lacunas identified in such cases is the lack of a proper stock assessment of these species to compare and quantify the effectiveness of the conservation measures.

**a. Catch Certificate:**

In accordance with the EU Regulation 1005/2008, all countries exporting wild caught seafood shall furnish a catch certificate along with the consignment to the effect that the catch does not comprise of items sourced from Illegal, Unreported, Unregulated (IUU) fishing. The regulation came into effect from 1st January 2010. The Ministry of Commerce & Industry has notified MPEDA as the nodal agency to validate the catch certificate for the export of seafood to EU countries. To validate the catch certificate, MPEDA- NETFISH has implemented real time boat-wise, species-wise Electronic data collection from 100 fishing harbours by using Harbour data collectors (HDCs). Under the catch certificate system, MPEDA issues approx. 7500 catch certificates annually.

The data collection derives fishing vessel information from ReALCraft database of Dept. of Fisheries, Govt. of India. During the year 2020 about 7, 07,845 ton of fishes landed in 100 harbours covering 3,67,882 voyages of fishing vessels. The Harbour Data Collectors engaged by NETFISH collect the harbour-wise, boat –wise landing data, which facilitates the issue of catch certificates to the exporters to comply with IUU regulations of the EU. The entire exercise is web based. The collected data is also used to supplement traceability requirements under the Seafood Import Monitoring Programme of the USA.

In order to strengthen traceability of fish catch and to prevent, deter and eliminate IUU fishing, the following steps have to be implemented :

• Electronic Catch documentation in all fishing vessels, harbours & landing centres need to be implemented for strengthening the catch reporting and compliance for EU regulation on IUU.

• In order to strengthen the catch reporting, Sagar Mitras can also be utilized for data collection.

• Strength of HDCs has to be increased from present 100 to atleast 150 harbours so as to have a wider data capture.

• Satellite based Vessel Monitoring System shall be installed in fishing vessels engaged in distant water fishing to ensure traceability of the catch and safety of fishers. The estimated investment requirement for this will be around Rs. 1.00 lakh per vessel.

MPEDA has assisted 520 fishing vessels during last plan period to the tune of Rs. 5.29 Cr.

**b.Compliance with Certification under Section 609 of US Public Law 101-162:**

Indian wild caught shrimp fishery is not certified by the US Department of State under Section 609 of US Public Law 101-162 due to the fishing methods followed in India such as trawl nets, trammel nets, gill nets, Dol nets etc which allegedly affect sea turtle population. This has eventually resulted in an import restriction on Indian wild caught shrimp USA, resulting in an annual trade loss of Rs. 2500 Cr.

The US requirement is that shrimp trawl nets shall be fitted with a Turtle Excluder Device (TED) to allow escape of sea turtles while

fishing for shrimps. MPEDA has filed an application for certification under Section 609 of US Public Law and organized 2 field visits by NOAA officials in November 2018 & April 2019.

MPEDA also organized online workshops with NOAA along with CIFT, DoF to address the design of TED. US experts noted that the TED designed by CIFT did not meet the US specifications and needs revision. The process of redesigning the TED based on the guidance from NOAA is underway.

Once the design is finalized, TED has to be installed in over 35,000 shrimp trawlers. The investment requirement @Rs 10,000/vessel is Rs. 35 Cr. The Department of Fisheries may consider assisting the fishers to install TED in shrimp trawlers under the PMMSY- Central sector scheme.

In addition, strict enforcement of TED installation and compliance to the provisions of Wild life & MFR Act in all maritime states has to be done through State fisheries departments.

**c. Compliance with Marine Mammal Protection Act (MMPA) of USA:**

The National Marine Fisheries Service (NMFS) of USA has observed the overall risk of the marine mammal by-catch in Indian fishery, as 'High'. To ensure effective implementation, MMPA rule establishes a 5 - Year exemption period to allow foreign harvesting nations time to develop, as appropriate, regulatory programs comparable in effectiveness to the US programs and apply for comparability findings for the fisheries. The act will be in force w.e.f. 01.01.2023, which implies that

the imports from export fisheries which were found to harm marine mammal population will not be permitted to the US from that date. MPEDA submitted the progress report to NOAA portal in 2019 in consultation with scientific institutions and reviewed it in 2020. The last date for filing Comparability Finding for the listed fisheries to U.S authorities is 30th November 2021.

Since, it was required to assess the stock of marine mammals in the Indian EEZ to ascertain the comparability of the measures taken in protecting the marine mammals from fishery related injury / mortality in defining a fishery as 'export' or 'exempt' as per US regulations, MPEDA has assigned CMFRI a study on Marine Mammal Stock assessment with a budget of Rs. 5.66 Cr based on their proposal. CMFRI is joined by institutions such as FSI, NPOL etc and the study is under progress. This is a market access issue, which will cost us almost Rs. 3000 crore export revenue annually, if not complied. The study needs to be supported under PMMSY-Central sector scheme- assistance may be considered under the head: 9. Fish data collection, fishers survey and strengthening of fisheries database. (v) impact study on fishing activities and documentation for marine animals specially for protected/endangered species etc.

• The outcome of the study will provide information on the marine mammal population in the Indian EEZ, which will be used for filing comparability finding applications to USA on or before 30th November 2021 and is expected to retain market access of wild caught marine product export from India.

• Department of Fisheries (DoF), Govt. of India may provide fund support to FSI to continue the study on a regular basis.

• It may be required to install Marine Mammal Evading Devices (MMED) in 50,000 purse seine / gillnet / long line vessels to comply with US regulations. The total investment requirement for this @Rs. 25,000 per vessel is Rs. 125 Cr.

**d.Traceability:**

To cater to the traceability requirements in various overseas markets, MPEDA has introduced an Enrolment scheme during 2012. MPEDA enrollment satisfies traceability validation as per US Seafood Import Monitoring Programme (SIMP). MPEDA does online enrollment of Hatcheries and Farms with geo tagging & UID.

So far more than 75,000 farms and 405 hatcheries have been enrolled by MPEDA.It will be appropriate if DoF recognize MPEDA enrollment as provisional registration of farms and hatcheries. In addition, CAA also needs to speed up registration of farms & hatcheries.

**e. Fisheries and Aquaculture Certification:**

Fishery and aquaculture certifications are mostly market driven. Currently, expensive private certifications are in prominence, which are not affordable for small scale farmers, and eventually drive their products out of access to elite retail chains. Considering this situation, MPEDA launched a scheme named "SHAPHARI" which roughly translates to pure fish in Sanskrit.The objective of the scheme is to produce residue free shrimp by ensuring Better management Practices (BMPs) in the value chain, thereby enhancing market access and market value. 13 hatcheries have already joined the


pilot project pledging their allegiance to supply residue free quality shrimp seeds to farmers. SHAPHARI is an aquaculture certification scheme, which is affordable to our hatcheries and farms, and aims to produce and certify shrimps free of residues. This is the first and foremost Indian certification scheme in the coastal aquaculture sector of the country. There is no Indian certification scheme for marine fisheries at present.

In order to help our small scale farmers and to equip their shrimps to find a place in major retail chains, implementation of SHAPHARI certification scheme is quite important. For this to happen, the DoF shall recognize SHAPHARI scheme of MPEDA as the national aquaculture certification scheme, and provide adequate fund support for the investments required by farms & hatcheries to earn SHAPHARI certification. Assistance to the tune of Rs. 15.00 Cr is required to certify 400 hatcheries and 100,000 Ha of shrimp farms. Subsequently, DoF may also take a policy decision on certification of marine capture fisheries considering the demand for certified product in overseas markets.

*(To be continued…)*

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# Potential of North East in marine exports perspective

Mr. Archiman Lahiri, Deputy Director, Regional Division, Kolkata &
Dr. T R Gibinkumar, Deputy Director, Market Promotion & Statistics, MPEDA, Kochi -36

The North-East Region of India, comprising the States of Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim and Tripura is blessed with rich biodiversity and fishery resources. More than 90 percent of populations of 40 million of the region are fish eaters and so are the visiting tourists.


North east has got great potential as far as for the development of fish and fishery products are concerned. The potential is mainly due to the following factors:

- the availability of immense water resources
- natural habitat for a variety of fishes with high ornamental value
- presence of largest dry fish market in South Asia
- more than 90-95% of fish consuming population
- only 50% of fisheries production potential is being utilized
- close proximity to countries like China, Bangladesh, Myanmar, Bhutan and Nepal

Along side the above advantages there are some impediments for the development of this region. Some of the constraints for fisheries development in the NE states are:

1. Lack of good infrastructure facilities particularly for transport, processing, storage and communication.

2. Lack of post harvest infrastructure including marketing channels.

3. Acidic soil conditions.

4. Non-availability of fish seed in adequate numbers and quality.

5. Inadequate facilities for growing fish spawn into fingerling stage to stock the beels and reservoirs.

6. Shortage of critical fish farming inputs like fish feed.

7. Lack of mechanization in pond construction and flood control mechanisms.

8. Prevailing low temperature during winter especially in areas at higher altitudes.

9. Natural calamities like flood, drought, etc.

10. Complex land ownership pattern and small fragmented land holdings make financial support for the system difficult to implement.

11. Lack of private entrepreneurship.

12. Poor extension facilities and technology transfer.

13. Above all the uncertainty of conditions and prevalence of insurgent groups imposing double taxation and pose threat to life and property.

**Domestic demand for fish in North East**

Fish is an important source of protein in the diet of the people of the Northeastern Region, with 90-95% of fish

*Fig.1: Bheel Fishing in Assam © Pratidintime*

eating population. The annual production of fish is reportedly about 271,160 metric tons, compared to the estimated requirement of about 430,000 metric tons, indicating a shortage of 158,840 metric tons. But at this production levels also only 50% of the fisheries production potential is being utilized. To meet the demand of the people, the region is importing fish to the tune of 38,340 tons per annum form Andhra Pradesh, Bihar, WB and UP in addition to unaccounted import from the neighboring countries of Bangladesh and Myanmar. But the gap in production and consumption still remains.

Tripura is among the highest fish consuming state in India, which accounts for 29.29 Kg. per capita/ per Year. According to the Department of Fisheries, the state of Assam alone have a potential of 400,000 tonnes annually.

The existing production level is 199,410 tonnes (2008-09) only and the state, is catering to the 75% of fish supply in North east. As per the estimate of Dept of Fisheries, Assam itself has got the potential of producing 400 thousand tonnes of fish per year. In the plains, the common practice of

*Fig.2: Assamese women fishing with Jakoi © aaiassami*

aquaculture is mixed farming with Indian major carps (catla, rohu, and mrigal) and exotic carps (common carp, silver carp, and grass carp). These species has got no export demand. In the case of high and medium altitudes, there are not yet any organized culture practices. After all N.E. states including Assam is yet to achieve the average fish productivity target of 200 kg/ha/yr.

The sizeable import of fish in Assam indicates the high cost of fish production in the state. The acidic soil of Assam does impose a burden on fish producers. Though the state department has claimed to have reached self sufficiency in production of fingerling, the problem of limited supply of quality fingerlings still persists.

**Trout farming experience**

Earlier, there were experiments with trout farming and ranching programmes were undertaken in some rivers. Unfortunately, this attempt failed and the unstable weather conditions and the inability of the trout to multiply fast enough has been stated as the main reasons. Trout farming in northeast India is, at present, done only in the Sella Pass in Arunachal Pradesh. Setting up of hatcheries for good quality seed is essential, which is the primary bottleneck in the development of trout culture in these area. Sites suitable for trout farming is mostly at difficult terrains with limit access and there is lack of specific feed for trout farming.

*Table 1: Water resources available at North East Region*

| Name of the states | Rivers &Canals (km) | Reser-voirs Area (ha) | Tanks and Ponds (ha) | Beels (ha) | Oxbow Lake (ha) | Derelict water (ha) | Total (ha) |
|---|---|---|---|---|---|---|---|
| Arunachal Pradesh | 2000 | 160 (1) | 3625 | 2500 | 5 | 11864 | 18,154 |
| Assam | 4820 | 2000(1) | 73065 | 100815 | - | 86204 | 2,62,084 |
| Manipur | 3360 | 2142(6) | 11442 | 24433 | - | 4728 | 42,745 |
| Meghalaya | 5600 | 8000 (5) | 2000 | 221 | 61 | 54 | 10,336 |
| Mizoram | 1395 | 8100 (4) | 5468 | - | - | - | 13,568 |
| Nagaland | 1600 | 2258 (1) | 3426 | 3000* | 1700 | - | 10,384 |
| Sikkim | 900 | 850 (3) | 16 | 3000* | - | - | 3,866 |
| Tripura | 1200 | 5000 (2) | 17552 | 240# | - | 361 | 23,153 |
| **Total** | **20,875** | **28,510 (23)** | **1,16,594** | **1,34,209** | **1,766** | **1,03,211** | **3,84,290** |

*Note: Figures in parenthesis mentioned in 3rd column are the numbers of reservoirs*
**These are mostly upland lakes, also known as upland wetlands, but not floodplain in nature. Source: DAHDF-GoI (2014) and DoF-GoI (2019); #Rudrasagar lake (Barman et al., 2013).*

*Table 2: State-wise fish production in NER: (In Lakh MT)*

| States | 2017-18 | 2018-19 | 2019-20 |
|---|---|---|---|
| Arunachal Pradesh | 0.04 | 0.05 | 0.05 |
| Assam | 3.27 | 3.31 | 3.73 |
| Manipur | 0.33 | 0.32 | 0.32 |
| Meghalaya | 0.12 | 0.13 | 0.14 |
| Mizoram | 0.08 | 0.07 | 0.07 |
| Nagaland | 0.09 | 0.09 | 0.09 |
| Sikkim | 0.00 | 0.00 | 0.0 |
| Tripura | 0.77 | 0.70 | 0.78 |
| **TOTAL** | **4.70** | **4.67** | **5.20** |

*Table 3: State-wise fish seed production in NER : (In Lakh Fry)*

| States | 2017-18 | 2018-19 | 2019-20 |
|---|---|---|---|
| Arunachal Pradesh | 70.00 | 0.00 | 0.00 |
| Assam | 80000.00 | 98930.00 | 95190.00 |
| Manipur | 2500.00 | 4060.80 | 2494.80 |
| Meghalaya | 97.0 | 0.00 | 3.00 |
| Mizoram | 426.00 | 406.60 | 400.00 |
| Nagaland | 481.00 | 760.00 | 795.00 |
| Sikkim | 6.50 | 16.25 | 16.25 |
| Tripura | 4350.00 | 0.00 | 0.00 |
| **Total** | **87930.50** | **104173.65** | **98898.25** |

*Table 4: Major fish species cultured in NE states*

**Table 2** Major fish species cultured in North-Eastern States

| States | Fish species |
|---|---|
| Assam | Rohu (*Labeo rohita*), catla (*Catla catla*), mrigal (*Cirrhinus mrigala*), silver carp (*Hypophthalmichthys molitrix*), grass carp (*Ctenopharyngodon idella*), common carp (*Cyprinus carpio*) |
| Arunachal Pradesh | Rohu, catla, mrigal, silver carp, grass carp, common carp, mahseer (*tor* spp.), trout (*Salmo gairdnerii*, *Salmo trutta fario*) |
| Nagaland | Rohu, catla, mrigal silver carp, grass carp, common carp |
| Mizoram | Rohu, catla, mrigal, silver carp, grass carp, common carp |
| Tripura | Rohu, catla, mrigal, silver carp, grass carp, common Carp, *Pangasius* spp |
| Meghalaya | Rohu, catla, mrigal silver carp, grass carp, common carp, and *Labeo gonius* |
| Manipur | Rohu, catla, mrigal, silver carp, grass carp, and common carp |
| Sikkim | Common carp, grass carp, rainbow trout |

**1. Aquaculture**

The aquaculture of exportable varieties has not been taken up in the NE region due to higher demand for local fish in the domestic market and non availability of quality seed of exportable varieties for aquaculture. Lack of good infrastructure facilities particularly for transport, processing and storage is also limiting the aquaculture development of the region.

Notwithstanding the above facts NE region has got sufficient potential for the development of *Scampi*, Tilapia and to a small extend trout. Development of *Scampi* culture is possible in the states of Assam, Tripura, Manipur and Nagaland, if sufficient *Scampi* seeds and feed are made available.

There is also greater scope for the development of tilapia in the region. Ample scope is there for farming trout in Arunachal Pradesh, Sikkim and to a small extend in Meghalaya. Primary survey is required to assess the availability of areas for all the above species. Options for cage and pen culture can also be explored in larger water bodies available in Assam and Manipur. Aquaculture activities may be initially concentrated in high potential areas like Assam, Manipur and Tripura.

**2. Ornamental Fish**

Out of the total 274 fish species reported from this region, around 250 species (91 per cent) possess ornamental value. The ornamental fish sector in the North-Eastern states remains untapped mainly due to lack of systematic collection, breeding, marketing and poor infrastructure essential for all the above are the major constraints.

There is also a lack of access to market information as the stakeholders in North East are mostly fish collectors and the exporters are operating from Kolkata. All states in North east has got the potential for ornamental fish sector development but the major potential is in the state of Assam.

The scope for this sector is enormous and the region can be developed into ornamental fish hub by creating awareness among the interested entrepreneurs and motivating them by giving training on ornamental fish entrepreneurship and by equipping the breeders to develop technologies for breeding indigenous fishes, especially the endemic varieties.

**3. Dry fish sector**

A flourishing dry fish market is functioning in Jagiroad, Morigaon district in Assam, which is known to be the largest in South Asia, where transactions worth about Rs 40 crore take place every year. The origin of the market can be traced back to the early sixties. The dry fish varieties transported from Gujarat, Maharashtra, Uttar Pradesh, Andhra Pradesh and Tamil Nadu were marketed in this market along with the dry fish from different regions of the North east.

Apart from supplying fish to NE states, exports are happening to neighbouring counties like Nepal, Bangladesh, Myanmar, and Bhutan. Most of these exporters are not having MPEDA registration for

doing exports. Initiatives to develop dry fish sector with capacity building and with the establishment of modern technologies such as setting up mechanical solar based dryer not only enhance exports markets to neighbouring countries but also will help to meet the very requirement of dry fish domestic markets of seven NE states. Jagiroad fish market may develop as a model hub for dry fish market by providing with all necessary infrastructure facilities.

**4. Chilled fish / live fish**

Exports of chilled fish/ live fishes are practiced in North east states to Bangladesh, Bhutan and Myanmar. Indian Major and minor carps in chilled conditions form Andhra Pradesh, Odisha and West Bengal are reaching various markets in North East and getting exported to neighbouring countries. Most of these shipments are done illegally through unfenced borders of the country.

*Fig.3: Dry fishes from Jagi road dry fish market*

# Highlights of marine fish landings and boat arrivals at selected harbours of India in July 2021

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

Monitoring of marine landings in terms of fish catch and boat arrivals is being done by NETFISH on a regular basis at selected major harbours/landing centres in the 9 coastal states of India. The name, registration number and type of fishing vessels arriving every day at the harbour and the species-wise quantity of fish catch landed by these vessels are collected on a real time basis and recorded in the MPEDA Catch Certificate website.The fish catch and boat arrival data obtained during July 2021 were analyzed and the species-wise, harbour-wise and state-wise trends observed during the month are presented in this report.

## I. OBSERVATIONS ON FISH CATCH

In July 2021, marine catch landing was recorded from 59 major selected landing sites, which has totalled to a quantity of 24996.85 tonnes. About 42 % of the total catch ie. 10474.26 tonnes were composed of Pelagic finfish resources,and the share of Demersal finfishes, Crustaceans and Molluscs were 25% (6263.82 tonnes), 24% (6062.82 tonnes) and 9% (2195.95 tonnes) respectively(Fig.1).

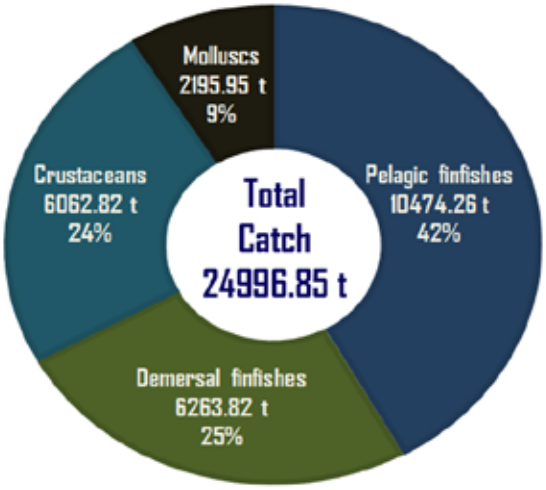



*Fig.1: Catch composition of marine landings recorded in July 2021*

Altogether, 226 species of marine fishery items were recorded in the month,of which,the top five contributors were *Rastrelliger kanagurta* (Indian mackerel), *Katsuwonus pelamis* (Skip jack tuna), *Parapenaeopsis stylifera* (*Karikkadi* shrimp), *Stolephorus indicus* (Indian anchovy) and *Metapenaeus monoceros* (Brown shrimp)(Table1).

*Table1. Major fish species landed during July 2021*

| Sl. No: | Common name | Scientific name | Qty. in tonnes |
|---|---|---|---|
| 1 | Indian mackerel | *Rastrelliger kanagurta* | 1382.79 |
| 2 | Skip jack tuna | *Katsuwonus pelamis* | 1275.90 |
| 3 | *Karikkadi shrimp* | *Parapenaeopsis stylifera* | 1206.12 |
| 4 | Indian anchovy | *Stolephorus indicus* | 1054.36 |
| 5 | Brown shrimp | *Metapenaeus monoceros* | 925.95 |

The various species of fishery items recorded were categorised into their common groups and the catch trend was analysed. Coastal shrimps, Croakers, Anchovies, Tunas and Indian Mackerel were the major five items landed during the month.These five items have together formed 47 % of the total catch (Fig 2).

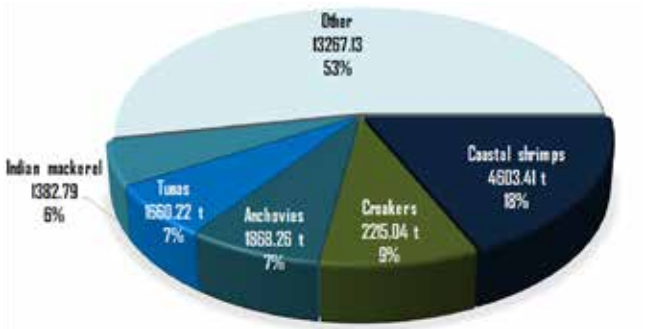



*Fig.2: Major fishery items landed during July 2021*

Quantity of Pelagic finfish, Demersal finfish, Crustacean and Mollusc resources landed during July 2021 is given in Table 2.Anchovies, Tunas and Indian mackerel were the major contributors among the Pelagic finfishes, with each recording a landing of more than 1300 tonnes. Croakers were the most landed item among the Demersal finfishes and it was followed by Pomfrets and Japanese Threadfin bream.About 76% of the Crustacean catch was comprised of different species of Coastal shrimps ,of which the *Karikkadi* shrimp was the most landed species with a share of 1206.12 tonnes.In the case of the Molluscs, cuttle fishes and squids were the major items.

*Table 2. Category- wise landing of various fishery items during July 2021*

| Fishery Item | Quantity in tonnes | % of Total Catch |
|---|---|---|
| Pelagic finfishes | | |
| Anchovies | 1868.26 | 7.47 |
| Tunas | 1660.22 | 6.64 |
| Indian mackerel | 1382.79 | 5.53 |
| Ribbon fish | 946.23 | 3.79 |
| Bombay duck | 899.04 | 3.60 |
| Indian oil sardine | 823.93 | 3.30 |
| Lesser sardines | 681.02 | 2.72 |
| Scads | 594.52 | 2.38 |
| Shads | 293.77 | 1.18 |
| Seerfish | 284.89 | 1.14 |
| Sword fish | 186.10 | 0.74 |
| Mullets | 146.54 | 0.59 |
| Barracudas | 119.85 | 0.48 |
| Indian Salmon | 90.05 | 0.36 |
| Trevallies | 69.62 | 0.28 |
| Sail fish | 69.22 | 0.28 |
| Herring | 57.90 | 0.23 |
| Marlins | 56.14 | 0.22 |
| Queenfishes | 55.50 | 0.22 |
| Herrings | 51.56 | 0.21 |
| Other Mackerels | 36.14 | 0.14 |
| Flying fish | 34.52 | 0.14 |
| Needlefish | 33.01 | 0.13 |
| Perchlets | 13.19 | 0.05 |
| Mahi Mahi | 7.68 | 0.03 |
| Mullets | 4.93 | 0.02 |
| Cobia | 4.59 | 0.02 |
| Halfbeaks | 2.18 | 0.01 |
| Milk fish | 0.84 | 0.00 |
| Wahoo | 0.05 | 0.00 |
| **Total pelagic** | **10474.26** | **41.90** |
| Demersal finfishes | | |
| Croakers | 2215.04 | 8.86 |
| Pomfrets | 868.89 | 3.48 |
| Japanese thread fin bream | 609.50 | 2.44 |
| Catfish | 606.76 | 2.43 |
| Sole fishes | 356.23 | 1.43 |
| Pony fishes | 353.49 | 1.41 |
| Rays | 264.89 | 1.06 |
| Lizard Fish | 172.59 | 0.69 |
| Spinefoot | 145.85 | 0.58 |
| Goat fishes | 145.18 | 0.58 |
| Eels | 132.76 | 0.53 |
| Snappers | 49.93 | 0.20 |
| Halibut | 39.92 | 0.16 |
| Reef cod | 37.23 | 0.15 |
| Leather Jacket | 37.12 | 0.15 |
| Moon Fish | 33.67 | 0.13 |
| Whitings | 27.53 | 0.11 |
| Silver Biddies | 26.24 | 0.10 |
| Emporer breams | 20.68 | 0.08 |
| Sharks | 20.11 | 0.08 |
| Perches | 17.59 | 0.07 |
| Bullsyes | 14.09 | 0.06 |
| Sweet lips | 13.12 | 0.05 |
| White fish | 11.15 | 0.04 |
| Surgeon fish | 10.28 | 0.04 |
| Unicorn leatherjacket | 7.00 | 0.03 |
| Parrot fish | 6.98 | 0.03 |
| Pompano | 4.70 | 0.02 |
| Spade Fish | 3.69 | 0.01 |
| Sickle Fish | 2.16 | 0.01 |

| | | |
|---|---|---|
| Rabbit fish | 2.11 | 0.01 |
| Indian threadfin | 1.94 | 0.01 |
| Sea bass | 1.64 | 0.01 |
| Indian threadfish | 1.22 | 0.00 |
| Drift Fishes | 0.95 | 0.00 |
| Triggerfish | 0.85 | 0.00 |
| Groupers | 0.56 | 0.00 |
| Flat heads | 0.20 | 0.00 |
| **Total demersal** | **6263.82** | **25.06** |
| Crustaceans | | |
| Coastal shrimps | 4603.41 | 18.42 |
| Crabs | 1199.36 | 4.80 |
| Deep sea shrimps | 257.73 | 1.03 |
| Lobsters | 2.32 | 0.01 |
| **Total crustaceans** | **6062.82** | **24.25** |
| Molluscs | | |
| Cuttle fishes | 1192.12 | 4.77 |
| Squids | 929.31 | 3.72 |
| Octopus | 74.39 | 0.30 |
| Baigai | 0.12 | 0.00 |
| **Total molluscs** | **2195.95** | **8.78** |
| TOTAL CATCH | 24996.85 | 100.00 |

**State-wise landings:** Landing data was recorded only from 6 coastal states of the country during the month. Due to fishing ban, no landing was reported from Gujarat, Maharashtra & Goa states and the catch quantity from Karnataka and Kerala were very meagre. West Bengal along the East coast has recorded the highest marine catch landings during July 2021, with a share of 36% (8979.83 tonnes) (Fig.3).Tamil Nadu with a contribution of 7373.14 tonnes (29%) stood in the second position and Andhra Pradesh, with a total landing of 3631.92 tonnes (15 %), in the third position.

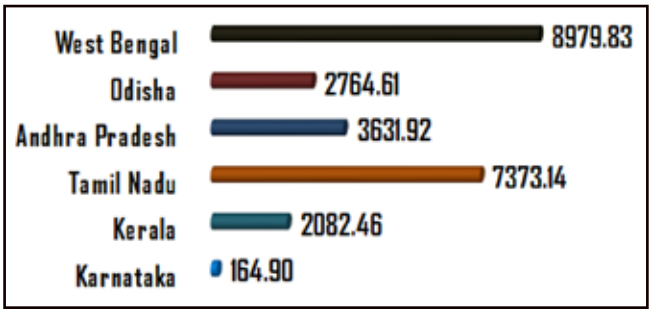



*Fig.3: State- wise fish landings (in tonnes) during July 2021*

**Harbour-wise landings:** The total marine landing reported from each harbour is given in Table.3. Among the 59 harbours, Deshapran harbour in West Bengal recorded the maximum fish landing, which was to the tune of 2861.42 tonnes (11 %) and it was followed by Chennai and Sankarpur harbours with 2647.39tonnes (10%) and 2164.86tonnes (9%) respectively. The least landing was reported from Munakkakadavu harbour in Kerala(0.50 tonnes).

*Table 3. Harbour-wise catch quantity & boat arrivals during July 2021*

| Sl. No: | State | Harbour | Catch Quantity (tonnes) | No. of Boat Arrivals (nos) |
|---|---|---|---|---|
| 1 | Karna-taka | Malpe | 116.45 | 108 |
| 2 | | Mangalore | 34.90 | 231 |
| 3 | | Bhatkal | 11.57 | 84 |
| 4 | | Karwar | 1.99 | 46 |
| 5 | Kerala | Chettuva | 486.00 | 285 |
| 6 | | Kayamkulam | 362.34 | 385 |
| 7 | | Neendakara | 207.21 | 351 |
| 8 | | Koyilandi | 195.50 | 230 |
| 9 | | Munambam | 147.20 | 174 |
| 10 | | Mopla Bay | 135.35 | 248 |
| 11 | | Thottappally | 130.53 | 254 |
| 12 | | Chellanam | 128.78 | 207 |
| 13 | | Vaadi | 88.32 | 268 |
| 14 | | Vizhinjam | 68.04 | 400 |
| 15 | | Thangassery | 64.82 | 230 |

| | | | | |
|---|---|---|---|---|
| 16 | | Ponnani | 36.52 | 57 |
| 17 | | Cheruvathur | 16.51 | 57 |
| 18 | | Vypin | 14.20 | 44 |
| 19 | | Puthiyappa | 0.65 | 2 |
| 20 | | Munakkaka-davu | 0.50 | 1 |
| 21 | Tamil Nadu | Chennai | 2647.39 | 616 |
| 22 | | Nagapattinam | 1640.65 | 703 |
| 23 | | Karaikal | 913.09 | 369 |
| 24 | | Tharuvaikulam | 693.04 | 217 |
| 25 | | Pazhayar | 429.90 | 651 |
| 26 | | Tuticorin | 257.00 | 588 |
| 27 | | Pondicherry | 203.71 | 181 |
| 28 | | Cuddalore | 115.79 | 442 |
| 29 | | Rameswaram | 78.10 | 194 |
| 30 | | Mandapam | 76.68 | 272 |
| 31 | | Colachel | 75.08 | 202 |
| 32 | | Poompuhar | 46.85 | 319 |
| 33 | | Mudasalodi | 40.54 | 291 |
| 34 | | Pulicat | 34.35 | 515 |
| 35 | | Kodiyakarai | 33.69 | 441 |
| 36 | | Mallipatnam | 31.04 | 250 |
| 37 | | Chinnamuttom | 28.99 | 213 |
| 38 | | Thengaipat-tinam | 15.77 | 95 |
| 39 | | Kottaipatnam | 7.28 | 118 |
| 40 | | Jagathapathi-nam | 4.21 | 78 |
| 41 | Andhra Pradesh | Visakhapatnam | 1816.13 | 624 |
| 42 | | Nizampatnam | 523.65 | 212 |
| 43 | | Kakinada | 514.00 | 272 |
| 44 | | Yanam | 227.93 | 125 |
| 45 | | Machilipatnam | 225.44 | 152 |
| 46 | | Vodarevu | 192.38 | 436 |
| 47 | | Pudimadaka | 132.39 | 466 |
| 48 | Odisha | Paradeep | 1432.39 | 486 |
| 49 | | Balramgadi | 611.35 | 295 |
| 50 | | Dhamara | 573.25 | 210 |
| 51 | | Balugaon | 95.86 | 356 |
| 52 | | Bahabalpur | 51.75 | 18 |
| 53 | West Bengal | Petuaghat Deshapran | 2861.42 | 967 |
| 54 | | Digha Sankarpur | 2164.86 | 867 |
| 55 | | Namkhana | 1258.97 | 455 |
| 56 | | Kakdwip | 911.28 | 613 |
| 57 | | Soula | 703.32 | 313 |
| 58 | | Raidighi | 569.23 | 251 |
| 59 | | Fraser Ganj | 510.74 | 339 |

## II. OBSERVATIONS ON BOAT ARRIVALS

A total of 17,874 nos. of fishing vessel arrivals were recorded from the 59 harbours during July 2021.State-wise figures (fig. 4) show that the highest number of boat arrivals had occurred in Tamil Nadu (38 %) and then in West Bengal(21%) and Kerala(18 %). Gujarat, Maharashtra and Goa states did not have any boat arrival records due to the fishing ban.

The harbour-wise details of boat arrivals are given in table.3 above. Deshapran (967 nos.), Sankarpur (867 nos.) and Nagapattinam (703 nos.) harbours had recorded the highest fishing vessel arrivals during the month. The least number of boat arrivals was reported from Munakkakkadavu harbour in Kerala.

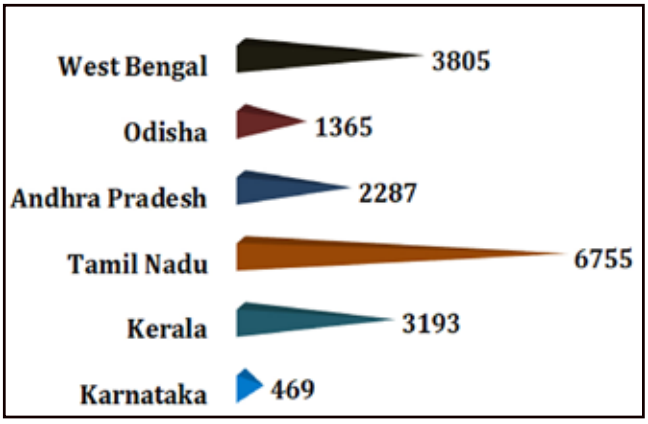
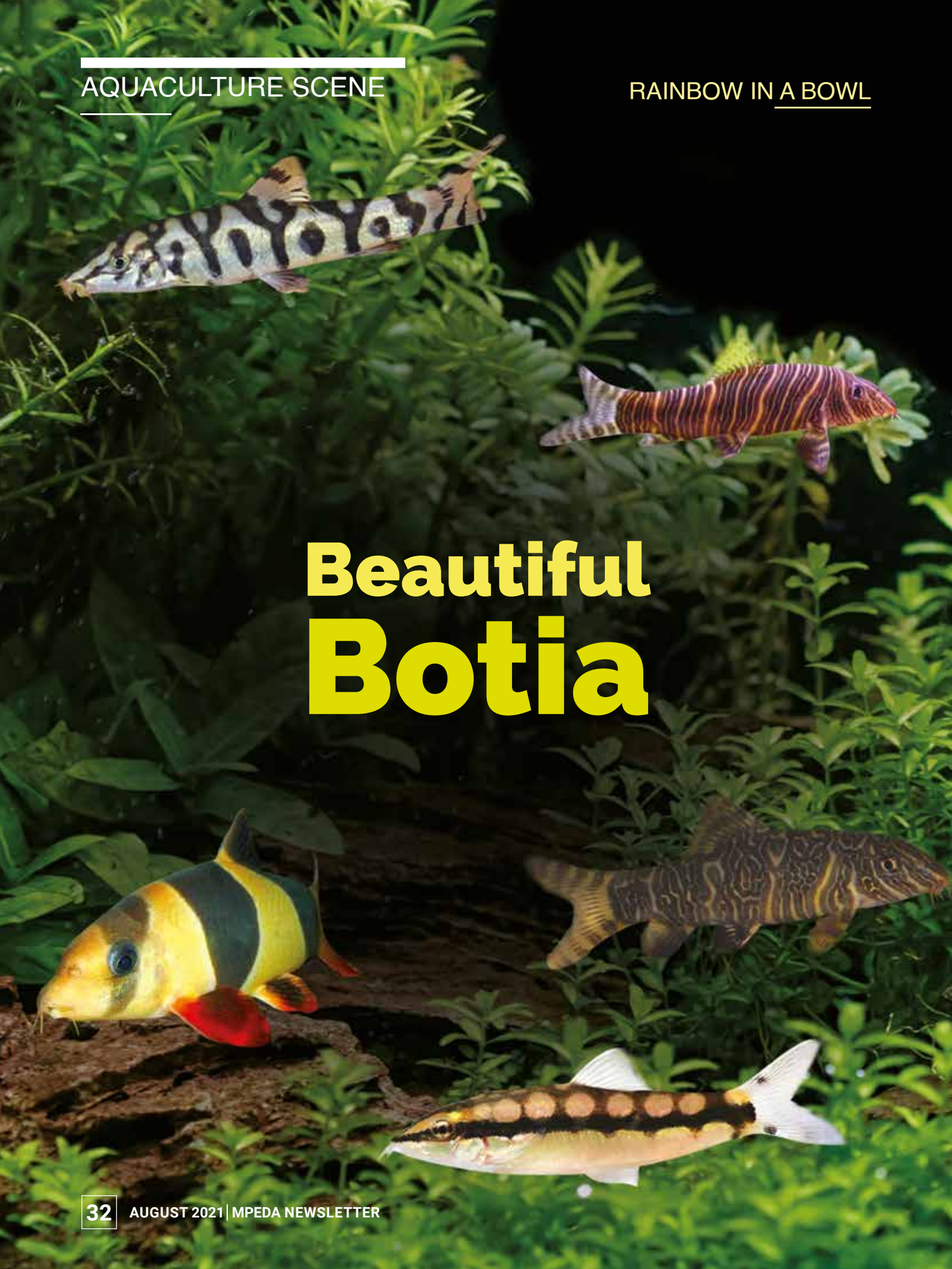



*Fig.4: State- wise boat arrivals (nos.) during July 2021*

**Summary:** In the month of July 2021, a total of 24996.85 tonnes of marine catch landings and 17874 nos. of boat arrivals were reported from 59 major fish landing sites of India. The total catch has increased by around 14224.58 tonnes, when compared to that of June 2021 and the number of boat arrivals has increased by around 7042 numbers.

Though Pelagic finfish continued as the major contributor to the total landings, the Indian Mackerel *(Rastrelliger kanagurta)* had attained the 1st position among the most landed fish species for the month. Whereas, the various species of coastal shrimps had together formed the most landed fishery item for the month.

The state of West Bengal had attained the first position among the states in terms of total catch landed but the Tamil Nadu state had recorded the highest number of boat arrivals. Among the harbours, the Deshapran harbour remained at the prime position in terms of total catch landed and number of boat arrivals.



# Beautiful Botia


## V. K. Dey

*V K Dey has over three decades of experience in diverse sectors of seafood industry in 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 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.*


Loaches, commonly known as Botia, are belonging to the family Cypriniformes. There are around 40 species of loaches known today, belonging to the genus Botia. They are native of Thailand, India, Pakistan, China, Bangladesh and some Indonesian Islands. Loaches are predominantly bottom dwellers and often found under the stone or piece of driftwood. They are probably the most diverse group of fish in the hobby, both in pattern and behaviour, ranging from extremely peaceful, *Botia histrionica* to the aggressive *B. beauforti.*

Colour patterns differ from plain grayish bodies of *B. lecontei* to brightly coloured, *B. macracanthus*. They prefer slightly acidic water ranging from pH 6.2 to 7.0 with a water temperature ranging from 24 -27°C depending on the species. However, some can tolerate water conditions up to pH 7.3. They are very active in juvenile stage while they are shy and need hiding places as they grow. Live feeds are preferred and are difficult to breed them in captivity. However, commercial breeding has been undertaken in Thailand and Florida for certain species using hormone injection as in the case of carps. In the wild they breed during summer months.

*Botia macracanthus*, better known as clown loach is from Sumatra and Borneo of Indonesia, is the most colourful and popular among the loaches. They are moderately elongated and laterally compressed in shape. With a small arched back, straight belly profile and four pairs of small barbel located on the lower jaw, they look beautiful in the aquarium. The head is large and the mouth faces downward with fleshy lips. The spine in front of the eye is quite short. The colouration of the body is bright orange and the flanks are crossed by three wide, wedge shaped black bands. The first band runs from the top of the skull across the eye and then obliquely down to the region of the mouth, the second starts in front of the dorsal fin and extends down to the belly and the third covers a large part of the caudal peduncle and runs down to the anal fin. The pectoral, ventral and caudal fins are yellowish with black markings. They can be easily kept in a community tank. They eat wide varieties of food including brine shrimp, blood worms, snails. They prefer soft water and need to be changed often.

*Botia sidthimunki* or dwarf loach is a native of Thailand and reported to be extinct in its native habitat due to over fishing and water pollution. Juveniles of this carry a chain pattern on its body hence also known as chained loach, while adult or breeding size develops a long thick black stripe going along both sides. Though spawning behaviour is known, breeding in captivity has not been achieved so far.*Botia almorhae*, better known as Pakistani loach or Yo Yo loach, originate from India and Pakistan found in slow running waters. They will quickly become accustomed to captivity and remain in sight during daylight hours although most of the botia are considered to be nocturnal.

*Botia histrionica* or Golden Zebra loach is the native of India, China and Myanmar, also referred as Burmese loach. They are very active among other botias and are generally very peaceful and social species. They are characterised by short nose, black bands on the body that disappear at the bottom of the body. The bands extend into the caudal fin as distinctive vertical stripes, 2 or 3, on both lobes. The characteristic thinner black line extends through the eye and a smaller line runs from the eye to mouth, a feature to distinguish this species in its juvenile stage of life from very similarly looking *B..rostrata* and *B..almorhae.*

*B..beauforti* is known for its aggressiveness in nipping the fins of other fish in a community tank and are territorial. Their red dorsal fin and dark red tail with black dots over a light gray-light green body make very beautiful. Generally, they are kept in groups of 3 – 5 to reduce aggression towards other fish. They are mostly nocturnal and need hiding place in the aquarium. *B.dario* is one of the most active loaches, originate from India and Bangladesh, commercially known as queen loach. With yellow-golden stripes on a black background, they look attractive. In young ones the bands are set further apart and become more numerous in adult. They enjoy resting hidden between dense plant leaves. They prefer live foods such as worms and small shrimp, but will accept flaked and sinking food.

# "Port of entry" of pathogen in shrimp unraveled

## Organ involved, the antennal gland, renamed as Nephrocomplex

Viswakumar M, Assistant Director, MPEDA Regional Division, Kochi.

Shrimp culture has been plagued with the disease outbreaks, which cause huge losses to the sector. White Spot Syndrome Virus (WSSV) has been the most widespread and most common among the viral infections plaguing shrimp culture globally.

The exact route of entry of pathogens (Viruses like WSSV and bacterial pathogens like Vibrio) were not identified and confirmed by the experts, though various routes of transmission were suspected. Feeding of infected shrimps; increased pathogen load in culture pond water; and vertical transmission of infection from mother prawn to seed are among the most common disease transmission routes proposed.

Though gut was considered to be the primary target organ that allows WSSV entry into shrimp, the gut along with every other structure is protected by a non-penetrable layer of cuticle makes it a strong barrier against pathogens like WSSV and Vibrio. A study by a team of scientists (G.M. A. De Gryse *et al.*, 2020) has unraveled the main portal of pathogen entry into shrimps and confirmed the empirical observation of the shrimp farmers, that period of heavy rainfall are linked to major outbreaks of WSSV infections in shrimp ponds.

The investigation by the study team to identify structures that are connected to the outside world but have no cuticle-lined lumen led them to the antennal gland. Hemolymph(blood of shrimp and other crustaceans) filtration and osmoregulation (maintenance of volume of blood and other body fluids) is the primary function of the antennal gland.

The antennal gland (Fig. 2 a & b), one of the organs that are known to become infected in the initial stages of infections (Fig. 3 a & b), was suspected as a portal of entry for pathogens, though without any conclusive evidence.There is a common conjecture that during monsoon seasons and heavy rain falls there are major WSSV infection outbreaks in shrimp ponds.

It is also known that when shrimps are subjected to sudden low-salinity conditions tend to urinate more frequently as physiological response to maintain their osmotic balance (maintaining body fluid volumes). Shrimp urinate through an opening called the nephropore. Normally this pore remains closed with the help of a valve like structure. The study observed that

*Fig.1: a. Whole shrimp with white spots*

*b. Shrimp Carapace with white spots*

*(Picture courtesy: Dr. Biju, V.N., Asst. Director, MPEDA)*

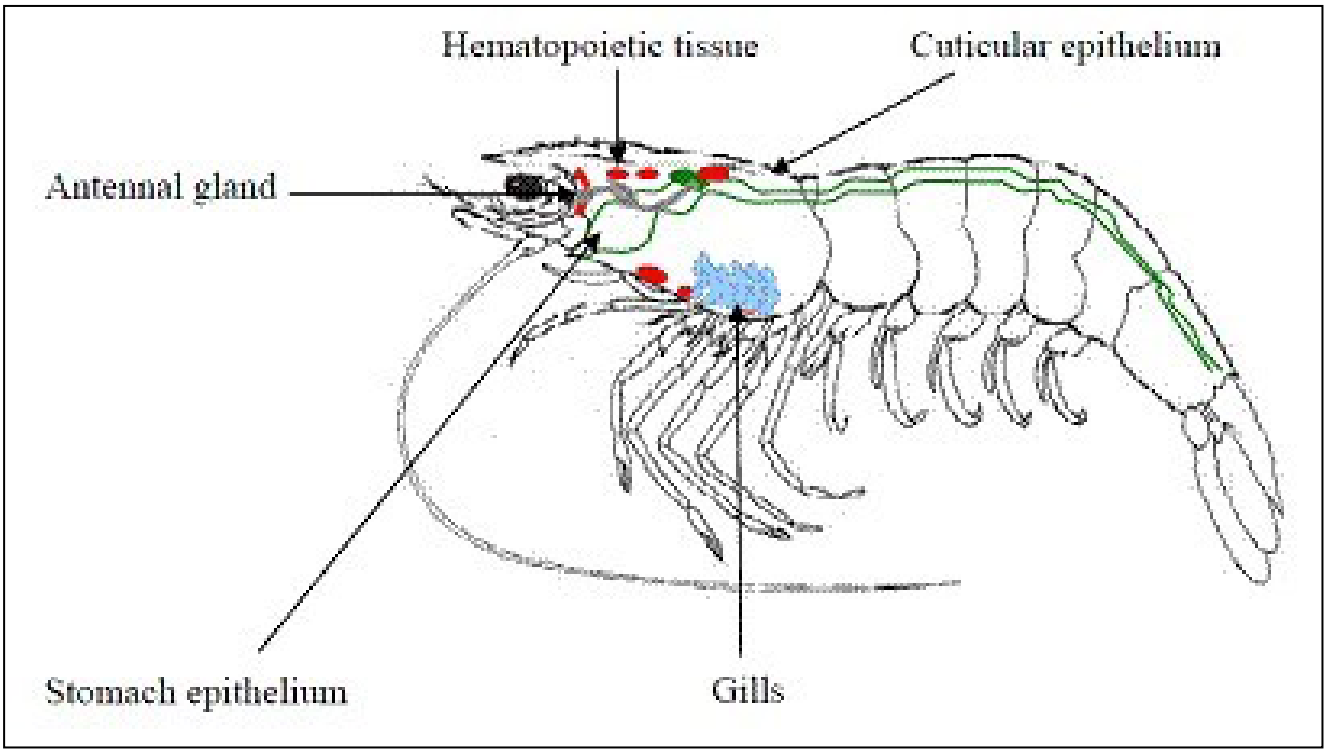



*Fig 2a: Location of AG(© RGCA Patholab)*

"in a closed position, water cannot enter the shrimp, and thus the cuticular barrier remains impenetrable for pathogens. Under normal conditions, the only time this cuticular valve opens is during urination. Specific conditions during which the nephropore opens more often could provide pathogens a window of opportunity for pathogen invasion.

A sudden drop in salinity, resulting in frequent urination (and thus frequent opening of the nephropore), is such a condition." In it's (Nephrocomplex or Antennal Gland) role to maintain body fluid volume, "the sudden decrease in salinity prompts the shrimp to produce and expel urine in higher quantities and at higher frequency. During this release of urine through the nephropore, the valves are open." According to the report "the sealing function of the nephropore valves was examined and found to be an efficient pathogen barrier. However, it was demonstrated that at the end of the urination process, the function of the nephropore valve is briefly compromised.

Thus, during conditions where frequent urination takes place (sudden salinity drop during, e.g., heavy monsoon rains, aggression, establishment of social dominance, and feed intake) combined with a high virus titer in the surrounding water, the nephrocomplex has to be considered a major portal of pathogen entry."

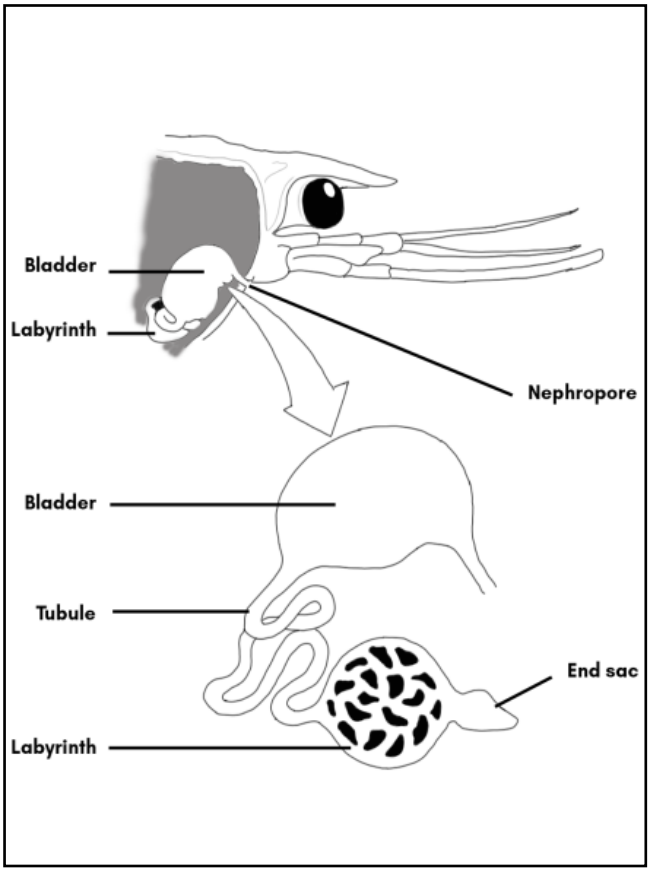



*Fig. 2b: diagrammatic sketch of AG*

The study concludes that:

• "The unraveling of the complete structure indicates that the antennal gland is a perfect portal for pathogen entry and that its wide distribution in the shrimp cephalothorax results in close contact to all WSSV susceptible organs: the nervous system, the alimentary tract, the lymphoid organ, the gills, the hepatopancreas, and various muscles".

• "Based on function and complexity, we propose to rename the antennal gland as the "nephrocomplex."

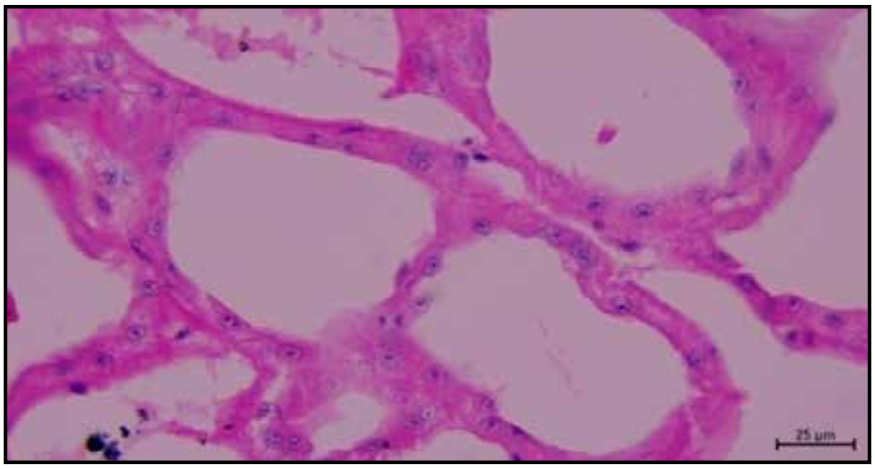



*Fig. 3 a: Histological section of normal AG*

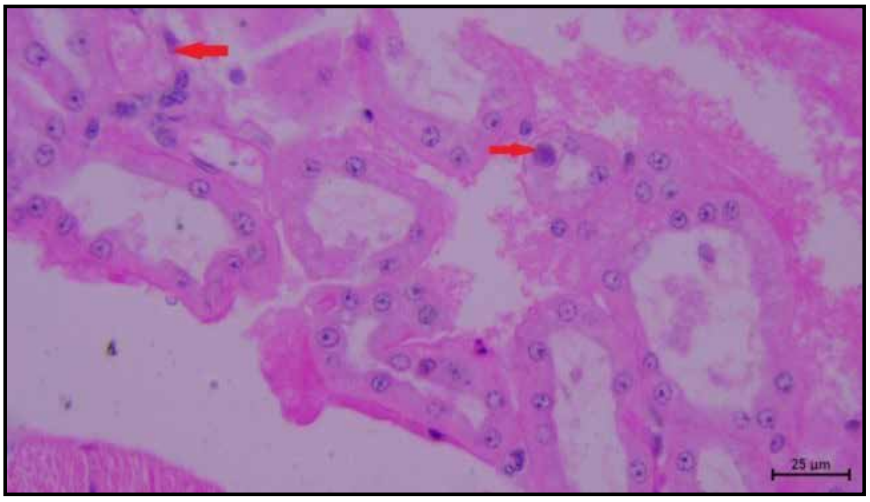



*Fig.3 b: Histological section of WSSV infected AG (© RGCA Patholab)*

In another study, Fei Liu *et al* (2021) have also arrived at similar conclusions "we suggested that antennal gland was a new important target organ for WSSV infection. The virus particles in aquatic environment can invade into shrimp through the antennal gland. Salinity stress could significantly accelerate virus replication and the mortality of shrimp caused by WSSV infection." These study results lays stress on the importance of avoiding sudden decrease in salinity of ponds in which shrimp are grown. Gryse GMA *etal.*, also predict "a major shift in shrimp pathogen research, especially in the field of WSSV".They also opine that "WSSV pathogenesis and immunity studies have to be performed using intrabladder inoculation or via immersion upon drop in salinity. Also, the identification of the nephrocomplex as an entry portal will focus the search for control measures to this organ. It will also allow for a direct breeding program for pathogen resistance"

**References:**

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2. Frequent urination can be hazardous to health of farmed shrimp. Global Aquaculture Advocate 15 February 2021 by Gaëtan M.A. De Gryse, DVM , Thuong Van Khuong, Ph.D. , BenedicteDescamps, Ph.D. , Wim Van Den Broeck, DVM, Ph.D. , Christian Vanhove, Ph.D. , Pieter Cornillie, DVM, Ph.D. , Patrick Sorgeloos, Ph.D. , Peter Bossier, Ph.D. and Hans J. Nauwynck, DVM, Ph.D.

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# MPEDA demonstrates Asian Seabass grow out in coastal Karnataka

The Mangalore Regional Division of the Marine Products Export Development Authority (MPEDA) under the Ministry of Commerce & Industry, Govt. of India has organized a pond grow out demonstration programme of Asian Seabass *(Lates calcarifer)* Anagalli Village, Kundapura Taluk, Udupi district, Karanataka.

The demonstration was done in the aquaculture farm of Ms. Sannamma G., who is selected based on her past experience and her willingness to try out a different species other than shrimp. She belongs to the SC/ST community.

Asian seabass, known as Barramundi in the international trade parlance, is of very good demand in both domestic as well as international markets because of its white meat and high nutritional profile. The fish fetches a price of Rs. 400 to 700 per Kg in local markets. It could be cultured from 0 - 35 ppt salinity, which make the seabass distinct from other fishes for its wide suitability in inland aquaculture.

Seabass fingerlings of 4.5-5.0 cm (<2gm) size were stocked 1000 numbers each in 4 numbers of nursery rearing cages, each having a capacity of 5 cu. m. capacity (2m x 2m x 1.25m) on 13th October 2020.

*Fig.1: View of the Asian seabass demonstration farm at Anagalli Village, Kundapura Taluk*

English name: Giant Sea Perch / Asian Seabass

Scientific name: *Lates calcarifer*

Trade name: Barramundi

Names in Indian vernacular

Gujarati: Bhekti / Jitaada

Marathi: Khaajari / Jitaada / Kaanhai

Telugu: Pandugappa

Tamil: Koduva

Malayalam: Kaalaanji

Kannada: Kurudi / Koliji

Odiya: Bhekati

Bengali: Bhetki

The seeds were supplied by Multispecies Aquaculture Complex (MAC) of RGCA, Vallarpadam. Kochi.

The nursery cages were placed in the same pond which was later used as grow out pond. Total 4000 fingerlings were stocked and within 52 days, the fishes reached an average size of 26 gram with more than 95% survival. Initially the fishes were fed with 0.8 mm sinking pellet feed and later they were trained to accept 1.2 mm floating pellet feed during the nursery phase (52 days).

Within 52 days of culture, the seabass seeds have grown to an average body weight of 26 gm with 95% survival. Fishes were released in to the open pond of 1 Ha area on 4th December 2020 and further fed with 2 mm, 4 mm and 6 mm pellet feeds of 40-42 % protein.

Within 6 months of culture, fishes attained an average body weight of 1 kg with an estimated biomass of 3000 kg in the pond. The crop was officially harvested on 16th

*Fig.2: Seed supply from MAC, Vallapadam for the demonstration farm*

June 2021. The farmer herself took the crop for retail sales @ Rs. 400/- per kg.It is reported that the farmer has done a partial harvesting of 1,341 kg and continue to rear the rest of the fishes. So far, 2500 kg pellet feed was used for the demonstration farm during nursery and grow out phase. The final FCR can be arrived at only once the farmer harvests the entire crop.

The successful demonstration has proved that Asian seabass farming can be taken up as an excellent income generation opportunity to the rural folk of Karnataka with proper planning. The Regional Division of MPEDA in Mangalore has extended

*Fig. 3: Stocking seeds in the nursery cages*

*Fig. 4: Release of 26 gram Seabass fingerlings to the grow out pond*

*Fig. 5: Harvested seabass of around 1kg size*

*Fig.6: Inaugural harvest on 16th June 2021*

all technical support to the farmer in bringing out successful crop.While congratulating the farmer for a good harvest of Asian Seabass, Mr. K. S Srinivas IAS, Chairman, MPEDA has expressed hope that such programmes will pave way for more farmers to take up the aquaculture of diversified species such as Asian seabass, Tilapia, Cobia, Pompano, Mud crab etc., and reiterated MPEDA's technical support to farmers in transferring the aquaculture technologies developed by MPEDA's R&D wing the Rajiv Gandhi Centre for Aquaculture (RGCA).

He has also opined that there is a need to diversify our export basket with more products from inland aquaculture, which mainly depends on shrimp at present.

# Meeting with Director of Fisheries of North Eastern States

Mr. K S Srinivas IAS, Chairman MPEDA hosted a meeting for the Directors of Fisheries of North Eastern States on 08/07/2021, to explore the possibilities of implementation of viable projects towards aquaculture development in these states. Dr. M. Karthikeyan, Director MPEDA presented the development and extension activities of MPEDA in culture fisheries with special reference to diversified species. There was a technical presentation of the Genetically Improved Farmed Tilapia (GIFT) project and the services offered by Rajiv Gandhi centre for Aquaculture (RGCA) to the aquaculture sector by Dr. S Kandan, Project Director, RGCA. RGCA operates the only commercial Nucleus Breeding Centre for GIFT in India.

Chairman MPEDA suggested the representatives of the States to formulate guidelines/notification in line with the Government of India notification for Responsible farming of Tilapia in India, to bring out policies for open water cage culture and to frame proposals for setting up of Satellite Breeding centres

for the GIFT species. He also added that MPEDA and RGCA can assist them with technical consultancy, skill development of technical manpower, demonstration farming and funding through SC/ST plan scheme.In addition to Directors of Fisheries NE States , Dean, Fisheries College, Tripura and Principal Scientist from CIFE, Kolkata also participated in the meeting. The meeting was coordinated by Aqua section, HO and RD Kolkata.

# Demonstration on nursery rearing of Seabass in cages

*Cages arranged in demo pond*

*Preliminary arrangements at demo site*

As per the approved demonstration programme on nursery rearing of Seabass in cages, the demonstration was conducted at the MPEDA enrolled farm of Shri Pushpangadhan at Ernakulam, Kerala with two batches of rearing, each batch with 5000 numbers of frys. The first batch of rearing was completed on 21/02/2021. The second batch of operation was delayed due to the issues noticed with the water quality parameters, particularly the presence of Microcystis bloom and the release of poison. As per the observations made during field visits conducted at demo site and the water quality testing conducted at MPEDA RGCA MAC Lab ,Vallarpadam, the water quality improved and it was decided to start the second cycle by stocking 5000 numbers of seabass seeds. After verifying the availability of seeds with MAC Hatchery, the stocking date was fixed on 07/07/2021. All preparatory works were completed and cages were arranged for stocking.

The demo farm is an open pond having 0.4 ha area. A pen having a size of 40 meter length and 20 meter width was available in the middle of the pond. A PVC floating platform having 14 meter length and around 1 meter width was available inside the pen and for the easy movement and monitoring, a wooden catwalk from pond dyke to floating platform was also available. 15 numbers of cages having a size of 1m x 1m x 1m was arranged in both sides of floating platform.5000 numbers of Seabass seeds were packed from MPEDA- RGCA- MAC and transported to demo site by road. The seeds packed in polythene bag containing oxygenated water were transported in air conditioned vehicle and released to cages in the pond after proper acclimatisation.

**Farmer / Farm details:**

Name of the Farmer: Shri Pushpangadhan,
KollayilHousee,Vasudevapuram,
SouthChengamanadu,
Ernakulam
MPEDA Enrolment Id: KL002417
WSA : 0.4 Ha

Details of seed packed and transported

| | |
|---|---|
| Total Number of bags | : 84 bags |
| No of seed packed per bag and 1 bag with 20 numbers | : 83 bags with60 seed |
| Size of seed | : 3 cm to 3.5cm |
| Average weight of seed | : 0.4 g |

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# MPEDA Pre- Harvest Test certification of aquaculture products

G. Mahesh, E. C. Abhilash, Bibi V.C. & Ram Mohan M.K.
MPEDA, Kochi -36

**Introduction**

Rejection of aquaculture shrimp consignments due to the presence of banned antibiotic residues from EU, USA and Japan act as a barrier to expand the trade to those markets. Subsequent to the visit of FVO Mission to India during 2008, MPEDA shouldered the responsibility of setting up ELISA labs in 2009 for testing aquaculture shrimps for banned antibiotics, Chloramphenicol and Nitrofurans & its Metabolites by ELISA method.

Pre Harvest Testing envisages screening of farmed shrimp or fish for banned antibiotic substances prior to the harvest so as to ensure that the crop is free of residues of such substances. It was introduced since April 2009 to certify the absence of the banned antibiotic residues like Nitrofuran Metabolites and Chloramphenicol for the aquaculture products used as raw material meant for exports.

Pre Harvest Test (PHT) was made mandatory for export of all aquaculture products, irrespective of the country to which the material was being exported by the Govt. of India vide Notification no. S.O. 2714(E) dated 28.10.2009, followed by EIC Instructions no. EIC/D(QC)T-1/2009 dated 13.11.2009. The Marine Products Export Development Authority (MPEDA) was entrusted with the competency of Pre Harvest testing and certification of farmed shrimps.

Accordingly, all the processors were required to procure raw material with PHT certificate for all markets including EU and Non EU Countries. The PHT system brought down the rate of antibiotic rejection till 2013, to an average of 14 rejections per year from the 45 rejections in 2009. After the introduction of the PHT, the European Union vide decision 2012/690/EU of 6 November 2012 has amended the decision 2010/381/EU of 8 July 2010. Accordingly, EU has reduced the mandatory checking frequency of farmed shrimp consignments from India intended for human consumption for the presence of specified pharmacologically active substances, and in particular Chloramphenicol, Tetracycline, Oxytetracycline and Chlortetracycline and Metabolites of Nitrofurans from 20% to 10%.

Later on since May 2014, based on a representation from seafood exporters, the Department of Commerce has restricted the requirement of PHT for only farmed raw material meant for exports to EU countries. The subsequent rise in rejections of shrimp consignments in the EU market has prompted the EU authorities to revise their decisions and by the Commission Implementing Decision (EU) 2016/1774 of 4 October 2016, the sampling frequency for testing farmed shrimps at border inspection posts on their territory has been raised to at least 50%.

**MPEDA ELISA laboratories**

MPEDA had set-up 20 Enzyme Linked Immunosorbent Assay (ELISA) Screening Laboratories in the maritime states of India by 2012 for PHT certification. These labs were operated by private laboratory management upto July 2017. Subsequent to the limitation of PHT certification to EU exports, the private laboratory management has stopped operating many of the ELISA labs. At this juncture, MPEDA has intervened and started directly operating the ELISA Laboratories August 2017 onwards.

Today, 15 ELISA Laboratories are operated by MPEDA in states such as Gujarat, Kerala, Tamil nadu, Andhra Pradesh, Odisha and West Bengal, at various locations in close proximity to aquaculture farms. State-wise

*Table 1. State-wise location of MPEDA ELISA labs*

| No. | State | Location |
|---|---|---|
| 1 | Andhra Pradesh | Kakinada |
| 2 | | Machilipatnam |
| 3 | | Bapatla |
| 4 | | Nellore |
| 5 | | Ongole |
| 6 | | Amalapuram |
| 7 | | Bhimavaram |
| 8 | Gujarat | Valsad |
| 9 | Tamil Nadu | Nagapattinam |
| 10 | | Pattukottai |
| 11 | Odisha | Bhubaneswar |
| 12 | | Balasore |
| 13 | West Bengal | Kolkatta |
| 14 | | Contai |
| 15 | Kerala | Kochi |

location of MPEDA ELISA labs for PHT is given in Table 1. Of these 4 labs are accredited by NABL under ISO: 17025:2017.

Two more ELISA labs are being set up at Haroa and Contai in West Bengal, which will be commissioned shortly. These labs conduct the pre-harvest screening of the aquaculture products (shrimp/fish) for presence of antibiotics residues like Chloramphenicol & Nitrofuran Metabolites and issue certificates thereof. The labs are equipped with adequate equipments, analysts and samplers to serve the farmers.

ELISA test method is considered as one of the highly sensitive and specific method based upon antigen-antibody reaction. MPEDA ELISA Laboratories are equipped with fully automated ELISA Readers (Fig.1) and other required equipments for sample extraction, preparation etc.

Use of fully automatic ELISA reader will nullify the human error in the testing process and provide accurate results. Automated ELISA method for testing antibiotics has several advantages over the manual assay, including 1) better precision, which is particularly important at low veterinary residue concentrations; 2) less operator dependence; and 3) faster sample throughput.

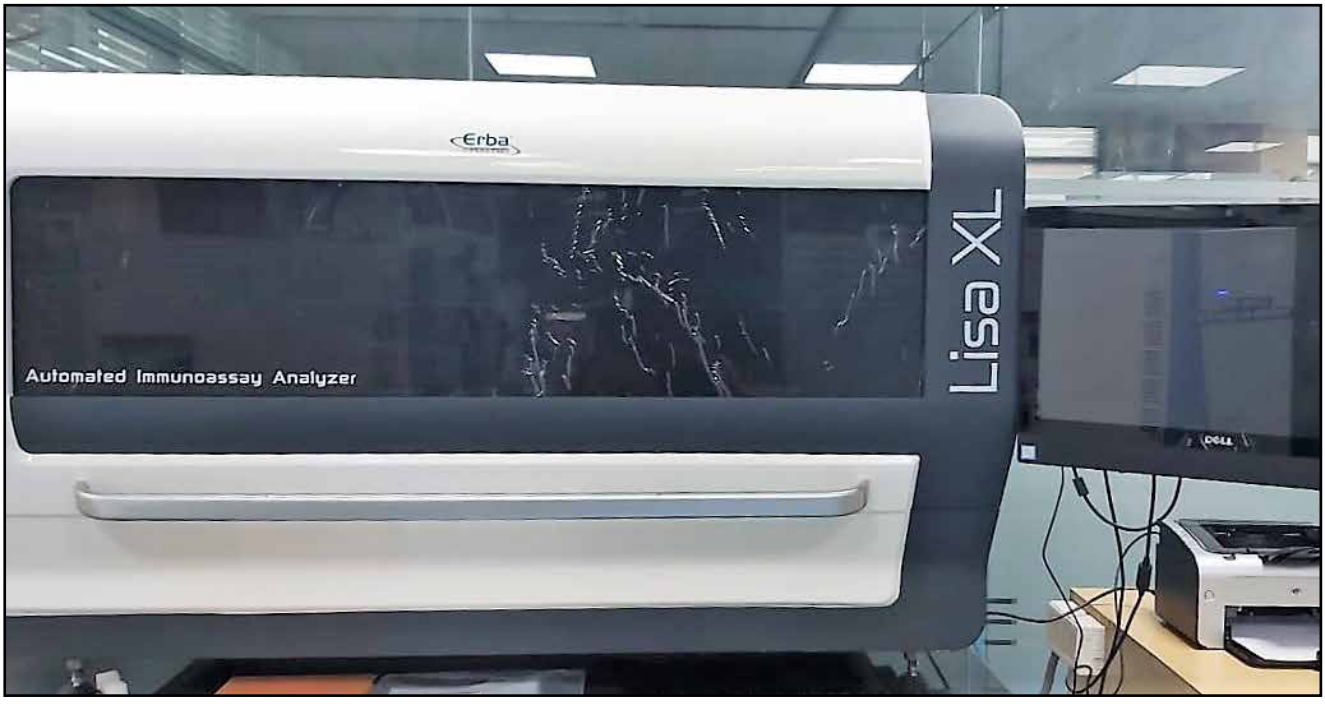


*Fig.1: Fully Automatic ELISA machine*

**Enrollment of aquaculture farms**

MPEDA has been recognized as an authority to enroll aquaculture farms that supply farmed raw material for export processing establishments. Farmer shall possess ownership right, either free hold or lease hold for a period not less than 2 years for enrollment purpose.

The enrolled farms are given a unique ID to identify them after capturing the details of farmer, land area, ownership, species cultured, number of ponds etc. Once the farmer submits a manual application to the nearest MPEDA office, the information is fed on to an online system. MPEDA issues unique enrollment ID to aqua farms after physical verification of the farms with GPS (Fig. 2). So far, MPEDA has enrolled over 51,000 farms with GIS verification (Fig. 3). PHT samples are accepted only from enrolled farms or those farms which were submitted application for enrollment and obtained an acknowledgment to that effect.

*Fig.2: Depiction of GPS way points from each corner of farm used for identification*

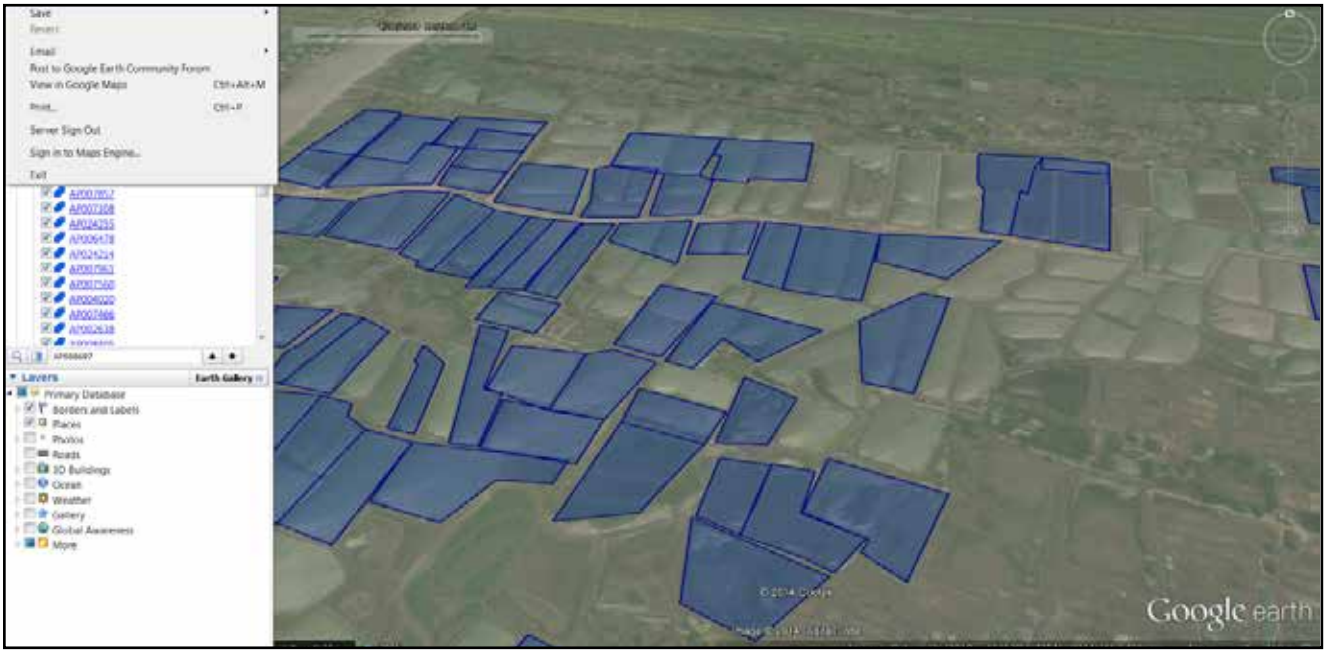


*Fig.3: GIS Map representation of MPEDA enrolled farms*

**Sampling and Screening procedure**

Earlier, the farmers need to physically approach the nearest ELISA lab to place a request to sample their crop and test it under PHT system. They had to pay the fee in cash. However, since January 2021 MPEDA has put in place an integrated web based system by which the farmer can apply for sample testing online and receive the test results online.

The system automatically leads the farmer to the nearest ELISA lab, and also supports digital payment of the fee, and helps the farmer to track the sample testing status. SMS alerts are also generated to sample collectors and farmers on sampling and alerting farmer through SMS on generation of test report in e-PHT portal.The online PHT certification system was inaugurated by Shri. K. S Srinivas IAS, Chairman, MPEDA on 26th January 2021.

The farmer can place a request online 10 days before the tentative harvest date. Upon receipt of the request from the farmer alongwith the prescribed test fee, the lab arranges the approved sampler of the laboratory to draw the samples from the farm. Sample collectors of PHT are given GPS instruments to properly locate the farm. The sampler upon visit to the farm verify the documents, identifies the farm and location based on the registration details, and the GPS waypoints are taken for confirming the farm & pond sampled to the laboratory.

The sample collector draws a representative sample of minimum 250g of the cultured species after specifying the species, from the pond intended to be sampled into a polythene bag and wraps it with aluminum foil, whenever necessary and affix Farm ID / code number/ Request ID for identification and pack it appropriately for transfer to the designated lab.

The thermocol box / ice box with ice/ gel ice containing the sample is labeled and sealed protecting its identity and integrity (Fig.4). The sample collector of the lab will also issue a receipt to the farmer conveying the ID/ reference number allotted for the sample. The samples for testing are then transported to the lab.

If the farmer requires retaining part of the sample with him, the sampler will draw a representative sample of 500grams from different locations of farm. The sampled lot is then divided into two equal parts of 250g each; one part of the 250grams is taken for analysis in the ELISA lab as mentioned above and the other part of


*Fig.4: Sealed sample for Pre Harvest Testing ready for transport to lab*

250 grams will be handed over to the farmer in sealed cover/container to be kept in the custody of the farmer with the condition that the sample shall be preserved by the farmer appropriately in the desired temperature. On receipt of the sample, the ELISA Laboratory verifies the sample observation sheet, which includes request ID number, sample note, condition of seal/ sticker, quantity, GPS data, size of shrimp, temperature of the sample etc. before accepting the sample.

The Lab-in-charge allots a lab code for the sample and divides it in two portions of 150g and 100g having unique Identification number for traceability. 150g portion of sample is taken for analysis and the 100g sample is retained as reference sample for 20days from the date of analysis.

After analysis of the sample, the test reports are prepared by the lab, which can be accessed for reference by the farmer in the online software. A copy is also sent to the registered email id of the farmer. However, to avoid unauthorized duplication, the lab issues the original test certificate to the farmer or his representative after affixing a hologram. A sample of the PHT certificate is placed as Fig. 5.

If the sample is found to be screened positive in ELISA, it is subjected for a confirmatory testing in NABL & EIC approved MPEDA Quality Control laboratories using LC MS/ MS. In such cases, LC MSMS confirmed antibiotic free products only entitled to be processed for export. The positive results of farm samples confirmed after confirmatory test by LC MS MS, are communicated to the farmer, Seafood Exporters Association of India and CAA/ Department of Fisheries of the concerned state.

**Significance of PHT certification system**

MPEDA has also put in place sufficient number of technically qualified MPEDA personnel for monitoring the various activities of ELISA Labs and ensuring the compliance to the protocol devised for sample collection & analysis of samples. Adequate training is also being given to the personnel to carry out their work effectively. Test method is validated as per the CRL 2010 of EU.

Testing shrimp samples in MPEDA ELISA Screening laboratories will provide accurate traceability of the aquaculture products procured and processed for export. This will also help to ensure residue free exports as all the major markets have zero tolerance to antibiotic residues. Through ELISA screening of the crop, farmers can ensure traceability and quality while they supply to the export value chain, and demand a better price for the sale.

MPEDA QUALITY CONTROL LABORATORY - COCHIN
(Ministry of Commerce & Industry, Govt. of India)
MPEDA House,, Panampilly Avenue,P.B. No. 4272,
Cochin, Ernakulam, Kerala, 682036
Phone: 91-4842315199,2311033,2311979, E-mail : lab.koc@mpeda.gov.in
TC-8117

TEST CERTIFICATE

ULR No. : TC8117210000000237F
Discipline & Group : Chemical Testing (Marine aquaculture products) Date of Issue : 28/05/2021
Certificate No. : EL021/291697/21 Valid Upto : 16/06/2021
Sample Id : EL021/S00015/21 Sampling Method : PHT Protocol
Date of Sample Receipt : 27/05/2021 Condition of sample(At the time of receipt) : Good
Date of Start of Analysis : 28/05/2021 Date of Completion of Analysis : 28/05/2021

Name of the Farmer : [redacted]
Address : [redacted]
Name & Address of the Exporter :

Farm Location : Thycattussery
Farm Enrollment No. / Pond Id : [redacted]
Farm Reg.No. / Reg. Authority : [redacted] / State Fisheries Dept.
Scope of Registration / Enrollment : Cultured Shrimp
Pond area under culture (Ha.) : 5.00
Type / Species Cultured : Shrimp / P.monodon
Size in gms. : 35
Approximate production assessed (Kgs.) : 2,000 (Two Thousand Kgs Only)
Name of the sample collector : ARUN N C
Date & Time of sample collection : 24/05/2021 / 12.05 PM

TEST RESULT

| Sl. No. | Parameters Tested | MRPL (µg/kg) | CC-ß ELISA (µg/kg) | Cut-off level ELISA (µg/kg) | Test Result ELISA (µg/kg) | Compliance |
|---|---|---|---|---|---|---|
| 1 | Chloramphenicol | 0.300 | 0.150 | 0.107 | Screened Negative | Compliant |
| 2 | Nitrofuran Metabolite - AOZ | 1.000 | 0.500 | 0.300 | Screened Negative | Compliant |
| 3 | Nitrofuran Metabolite - AMOZ | 1.000 | 0.500 | 0.302 | Screened Negative | Compliant |
| 4 | Nitrofuran Metabolite - AHD | 1.000 | 0.500 | 0.300 | Screened Negative | Compliant |
| 5 | Nitrofuran Metabolite - SEM | 1.000 | 0.500 | 0.354 | Screened Negative | Compliant |

*Remarks: Test results below Cut-off level reported as Compliant;*
*Test Method: ELISA; Instrument used: Automatic ELISA reader; Validation Protocol: CRLs 20/01/2010*
*CC-ß=Detection Capability µg/kg = ppb ; MRPL: Minimum Required Performance Limit.*

Authorized Signatory
(Name & Designation)
महेश जी. / MAHESH G.
उप निदेशक / Deputy Director

*Note : The above results are related only to the sample drawn from the pond indicated above. The report should not be used for advertisement, evidence or litigation. The liability of the laboratory will be limited to refund of the fee collected. This certificate shall not be reproduced except in full and without the written approval of the MPEDA,Head Quarters,Kochi-682 036.*

- End of Test Certificate -

*Fig.5: PHT Certificate with hologram and QR code*

**Conclusion**

The rejections due to presence of antibiotics continue to affect the trade despite compulsory Pre Export Testing for antibiotics and claims of in house tests by processing units. Middlemen play a big role in the market fabric of farmed shrimp, especially those sourced from small scale farmers. They collect the harvested material, pool it and sell it to processors. The pooled material may contain lots that are Pre harvest tested for antibiotic residue as well as non - tested material.

Ultimately, the processors receive a mixture of raw material with PHT and without PHT for export to EU & other markets creating chance of co-mingling of raw materials in the unit or at supplier level.

It is practically difficult for units to maintain separate traceability for EU and non EU material throughout the supply chain. This results in mixing of tested materials with non - tested material in the processing units. The only solution to avoid such situation is to make PHT compulsory to all the aquacultured shrimps for exports.

**Reference:**

1. Standard Operating Procedure - SAMPLING FOR PRE-HARVEST TESTING, MPEDA, 5 pp.

2. Farmer login link http://e-mpeda.nic.in/PHTOnlineSystem/Pht_Login_Farmer.aspx

3. ELISA lab login link http://e-mpeda.nic.in/PHTOnlineSystem/Pht_LoginPage.aspx

# MPEDA opens 14th ELISA Lab at Bapatla, Andhra Pradesh


The farmed shrimps meant for export to EU are subject to Pre Harvest Testing (PHT) in the ELISA Laboratories set up by MPEDA. The raw material is screened for the presence of banned antibiotic residues such as Nitrofurans and Chloramphenicol. MPEDA has set up 15 ELISA Laboratories for this Pre Harvest Testing certification programme in the farming clusters of coastal states right from Gujarat to West Bengal.

Responding to the demands from the aqua farmers of Guntur district in Andhra Pradesh, MPEDA has opened its 14th ELISA Laboratory at Bapatla on 30th July 2021. The laboratory is expected to cater to the antibiotic testing needs of aqua farmers in Guntur district and the villages of Prakasam and Krishna districts that border the Guntur district.

The lab was formally inaugurated by Mr. P. Koteswara Rao, Additional Director, Department of Fisheries, Govt. of Andhra Pradesh & Principal of State Institute of Fisheries Technology (SIFT), Kakinada, Andhra Pradesh, in presence of Mr. K.S. Srinivas IAS, Chairman, MPEDA, who presided over the virtual function organized from MPEDA Head Quarters in Kochi. The function was attended by Dr. M. Karthikeyan, Director, MPEDA, Mr. K.S. Pradeep IFS, Secretary, MPEDA, Dr. Ram Mohan M.K., Joint Director (QC), MPEDA, Mr. A. Jeyabal, Joint Director, MPEDA Regional Division, Vijayawada, Mr. Mahesh, Deputy Director (Lab), Mr. IPR Mohan Raju, President, Prawn Farmers Federation of India, Mr. Ch.Sudheer, Vice President, Seafood Exporters Association of India, Andhra Pradesh Region, farmers, exporters, and MPEDA officials.

Mr. Koteswara Rao appreciated the initiative taken by the Chairman to open an ELISA lab at Bapatla in his inaugural address, and told that this will help the exporters to check the quality of shrimps grown by farmers thereby reducing the antibiotic rejections instances. Felicitations were offered by Mr. IPR Mohanraju, President, Prawn Farmers Federation of India, Mr. K. S. Pradeep, Secretary, MPEDA and Mr. Ch.Sudheer, Vice President, Seafood Exporters Association of India, Andhra Pradesh Region. Chairman, MPEDA reiterated that the farmers shall restrain from using any banned antibiotics in the


shrimp culture system. He also emphasized the need to contain the detection of antibiotic residues in farmed shrimp consignments in markets such as EU, USA and Japan for enhancing our market share. He stressed that Indian seafood can take up a larger market share, if the quality is ensured. He urged the farmers to utilize the laboratory services at its maximum so that they will get a better sales value by ensuring the quality and traceability of the produce.

Chairman, MPEDA also reminded the farmers and other stakeholders to remain vigilant about Covid -19 infections and requested them to follow the prescribed protocols to prevent the pathogen and nucleic material contaminating the value chain citing the recent spate of rejections by China alleging detection of Covid- 19 nucleic material in seafood consignments exported from India. He also urged the farmers and exporters to utilize e-Santa online platform to do direct business eliminating middlemen. Earlier, Dr. Karthikeyan, Director, MPEDA welcomed the participants and Mr. Mahesh introduced the process of online PHT system to the farmers and other participants. Mr. A. Jeyabal, Joint Director, Regional Division, Vijayawada proposed the vote of thanks.

# Audits in processing plants by MPEDA to ensure safety of seafood amid COVID 19

With an aim to ensure adherence to COVID-19 guidelines laid down by MPEDA by seafood processors and exporters, officials of the Regional Divisions of MPEDA carried out inspections at various plants. Inspections were undertaken by the officials of Regional Division of Veraval in M/s. Monarch Foods Pvt. Ltd, M/s. Castlerock Fisheries Pvt. Ltd. Unit-2, M/s. Keshodwala Foods Unit-2, M/s. Rajan Sea Foods, M/s. Nagina Exports, M/s. Raunaq Ice & cold Storage, M/s. Satyam Marine Exports and M/s. J. M. Marine Exports.

During the visit, it was found that the above units have maintained maximum precautions to prevent the contamination by COVID-19.

The visiting officials had instructed them to maintain vigil continuously. Few minor deficiencies noticed were instructed to be rectified. Awareness messages were regularly passed on to all workers and staff by the supervising teams by them. Units had their own SOPs and it was implemented.The Task Force of MPEDA constituted to inspect the units indefinitely suspended by GACC has inspected 16 units across India and submitted their reports. The non compliances recorded were communicated in writing to the respective units for corrective actions. The units in Gujarat were not inspected as those are shut down due to non fishing season till 31st August 2021.

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MPEDA RECIPE

# Shrimps Newburg

**Recipe Card**

Butter 2 tablespoon

Sliced mushroom : 1 cup

Chopped garlic : 2 tablespoon

Tomato paste half cup

Dry Sherry : 60ml

Shrimp stock : 1 cup

Cooking cream : 1 cup

Indian Vannamei Shrimps : 450g

Cayenne Pepper : 1 tablespoon

Paprika : 1 tablespoon

Nutmeg : 1 pinch

Salt to taste

Parsley chopped : 1 tablespoon

Grated Cheddar cheese : 2 tablespoon

**Instructions**

Heat butter in a pan and sauté mushrooms until they are golden in colour.

Add in garlic and stir for a few seconds.

Add the tomato paste and cook for two minutes

Add the shrimp stock, sherry and cream to the pan and cook on medium heat till the sauce thickens and coats the back of the spoon.

Add the shrimps, cayenne, paprika, salt and stir till the sauce coats evenly.

Cook the shrimps for three minutes

Add ground nutmeg, salt, cheese and mix well.

Garnish with chopped parsley.

Prep time: 15 minutes

Cooking time: 20 minutes

Serves 4

Scan the QR code to watch the recipe in Youtube

# Indian aquaculture operators embrace e-commerce

Many aquaculture operators in Andhra Pradesh are planning to market their stocks through e-Santa, an electronic marketplace to export marine products, according to one of the country's most influential export authorities.

e-Santa is a platform that's designed to connect aqua farmers and buyers across the country, to avoid middlemen. It can be used by producers and exporters who are registered with India's Marine Products Export Development Authority (MPEDA).

"Online marketing, e-Santa, will be very helpful for the farmers. The system will provide direct connectivity to farmers and exporters and the producer will get a good price, depending upon the quality of the produce," MPEDA chairman, K. S Srinivas IAS, quoted. Many fish, shrimp and crab farmers have been suffering losses due to lack of knowledge on marketing facilities and are getting deceived by middlemen.As a result officials from MPEDA and the National Centre for Sustainable Aquaculture (NaCSA) are helping farmers make use of e-Santa.

In order to use the platform farmers must enter the details of their expected harvests – for example the species, volume and date of harvest, and buyers can then contact the farmers and negotiate with them directly, list the price details and make a 25 percent online downpayment after the deal is struck. The producers will then be paid the outstanding balance within three working days after the stocks are handed over to the exporter.

SOURCE: https://thefishsite.com/articles/indian-aquaculture-operators-embrace-e-commerce

# Researchers make tilapia lake virus breakthrough

The possibility of breeding tilapia that are resistant to tilapia lake virus (TiLV) is one step closer, thanks to a genomic research breakthrough. A new study, led by the Roslin Institute and WorldFish, has found that a specific region in the genome of Nile tilapia – a key aquaculture species that is worth nearly $10 billion globally – has a major effect on mortality levels during an outbreak of TiLV.

They found that fish with specific genetic variants in this region were substantially less likely to die in an outbreak of the virus than fish without these variants. Survival rates improved by approximately one-third, the scientists observed.

By selecting parent fish for breeding based on these variants, tilapia strains with innate resistance can be developed. This will reduce the number of outbreaks and mortality rate of TiLV, which is one of the biggest threats to tilapia aquaculture, with mortalities up to 90 per cent and for which vaccines are not yet available.

"Tilapia lake virus can cause mass mortality to farmed Nile tilapia, which has major negative impacts for farmers and food security in many countries. Our results provide a clear route to selecting fish with improved genetic resistance to TiLV, with major potential to help tackle this devastating virus," said Professor Ross Houston, from Roslin Institute, in a press release."Breeders will be able to select the best candidates for resistance to tilapia lake virus by marker-assisted selection, generating new strains of Nile tilapia with enhanced resistance. Interestingly, we also showed that this selection won't have any negative impact on the fish harvest weight," added his colleague, Dr Agustin Barria.In the study, scientists analysed the genome of almost 1,000 fish from a pond that had experienced an outbreak of TiLV.Comparing the genomes of fish that survived the outbreak with fish that did not enabled scientists to find the region in the genome containing variants associated with survival.The average survival rate of tilapia with the favourable variants was 32 per cent higher than that of fish with none of the variants, the scientists found.

"This information will be invaluable in creating resilient tilapia breeds that can help maintain production of fish in the face of increasing disease risks that threaten food security in many parts of the world. WorldFish plans to incorporate TiLV resistance in the new strains of genetically improved farmed tilapia (GIFT) we are developing," said Professor John Benzie, from WorldFish.

SOURCE :www.thefishsite.com

# 'MIMI Fish' to hit the market soon

Here's some good news for fish lovers who worry about the quality of the fish they get from the market. MIMI Fish, a retail venture of the Fisheries Department, is set to open sales outlets and launch online home delivery services in the State for the supply of fresh fish and value-added products.

Traceability of the product is billed the USP of this initiative. The buyer will be able to track all relevant information about the fish; where it was caught or harvested, details of the fishers involved in the capture or production and their locations. Partner fishing boats of MIMI are given individual RFID-tagged ice boxes, so that the date, time and place of capture of the fish are accessible to the consumer.

The initiative is being implemented by the Kerala State Coastal Area Development Corporation (KSCADC) under its socio-economic initiative 'Parivarthanam,' with support from the Central Institute of Fisheries Technology (ICAR-CIFT).

**Products on offer**

Products immediately on offer include fresh fish, dry fish, fish curry and fish pickles. More value-added products will be added soon. The website of MIMI Fish will be launched by Fisheries Minister Saji Cherian at a function in Kollam shortly.Initially, MIMI Fish will be introduced in Kollam, Alappuzha and Pathanamthitta districts. It will be extended to other districts in phases, Roy Nagendran, Chief of Operations, Parivarthanam, said.

**Why the name**

The name 'MIMI' has its origins in 'Meemi,' the way small children pronounce 'Meen,' Malayalam for fish. Fish sold under the MIMI brand will be free from adulterating materials and follow the hygiene standards set by advanced countries in processing, preservation and storage, they said.Last year, the Food Safety Department had seized and destroyed thousands of kilos of stale and contaminated fish in Statewide raids.

Besides consumers and fishers, a important beneficiary of this project will be engineering and degree dropouts, who will get part-time jobs of home delivery of MIMI products, and later, they would be given coaching to help them become graduates.

SOURCE:www.thehindu.com

# Govt launches mobile app 'Matsya Setu' for aqua farmers

Union Fisheries, Animal Husbandry and Dairying Minister Giriraj Singh launched a mobile app 'Matsya Setu' to disseminate the latest freshwater aquaculture technologies to the country's aqua farmers. The app has been developed by the ICAR-Central Institute of Freshwater Aquaculture (ICAR-CIFA), Bhubaneswar, with the funding support of the National Fisheries Development Board (NFDB), Hyderabad, according to an official statement.

Matsya Setu app has species-wise/ subject-wise self-learning online course modules, where renowned aquaculture experts explain the basic concepts and practical demonstrations on breeding, seed production and grow-out culture of commercially important fishes like carp, catfish, Scampi, murrel, ornamental fish, and pearl farming.

Better management practices to be followed in maintaining the soil and water quality, feeding and health management in aquaculture operations have also been provided in the course platform.

The modules are divided into small video chapters for the convenience of the learners, along with additional learning materials.To motivate the learners and provide a lively learning experience, quiz/test options have also been provided for self-assessment.Upon successful completion of each course module, an e-certificate can be auto-generated.

Farmers can also ask their doubts through the app and get specific advisories from experts.Speaking on the occasion, the minister said capacity building of fish farmers is a vital part of spearheading the technology-led aquaculture development in the country.He said the app will be surely helpful for the farmers to learn the advancements in the technologies and better management practices at their convenience.

SOURCE: www.economictimes.com

# Bangalore railway station gets India's 1st movable freshwater tunnel aquarium

The Krantivira Sangolli Rayanna Railway Station also known as Bengaluru City Railway Station has become the first railway station in India with a movable freshwater tunnel aquarium, news agency PTI reported. The aquarium has been opened by the Indian Railway Stations Development Corporation Limited (IRSDC) in collaboration with the HNi Aquatic Kingdom, the report added.

The aquarium is based on the concept of Amazon River and is one-of-its-kind, promising to be a visual treat and a passenger's delight, the IRSDC said in a statement. Besides augmenting the experience of passengers, the initiative would add to the revenue of the Indian Railways, IRSDC added in the statement. The nominal entry fee of the aquarium at the Bengaluru railway station has been kept at ₹25 for each passenger.Addressing the ongoing coronavirus (Covid-19) pandemic, IRSDC CEO and MD SK Lohia said that strict norms would be in place and that up to 25 visitors can visit the aquarium at a time, the PTI report stated.In the statement, IRSDC added that the aquatic kingdom, which is 12-feet long, is Indian Railways first paludarium housing myriad flora and fauna, and when a visitor will enter the venue, a dolphin will greet them with a "slight bow and a smile."Notably, IRSDC stated that the establishment of the aquarium comes after it was given the mandate to undertake facility management of five railway stations across India in order to make travel hassle-free and boost customer experience. Apart from Bengaluru, the other stations are located in Anand Vihar (Delhi), Secunderabad, Chandigarh and Pune.

The company also noted, as reported by PTI, that it will soon undertake the facility management of 90 additional railway stations of India in a phased manner.

www.hindustantimes.com

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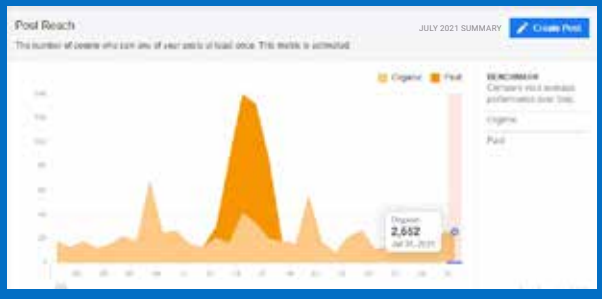



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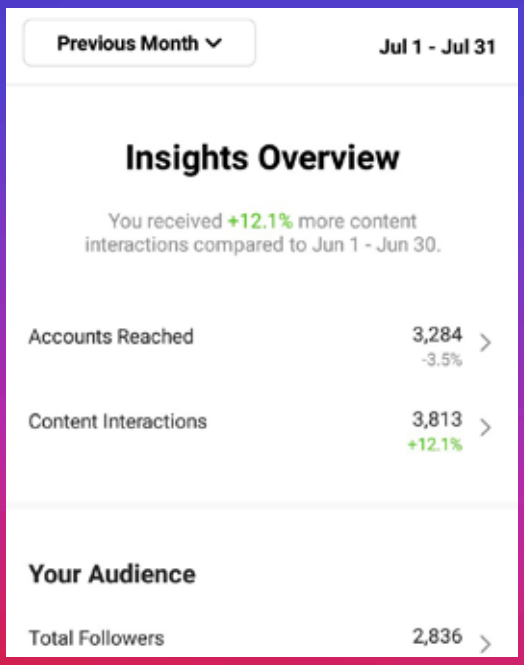


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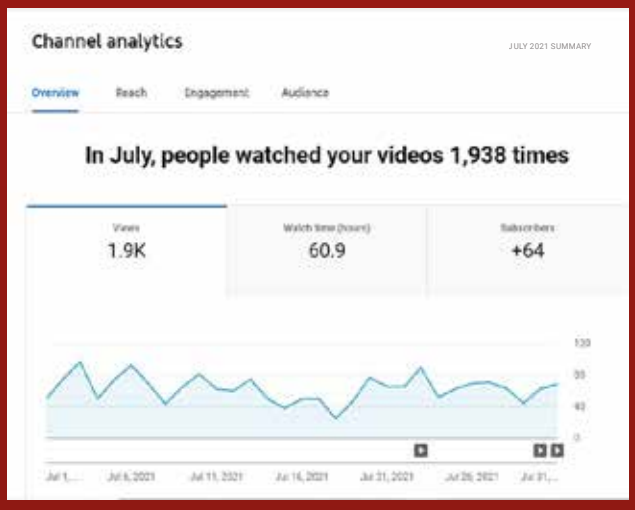


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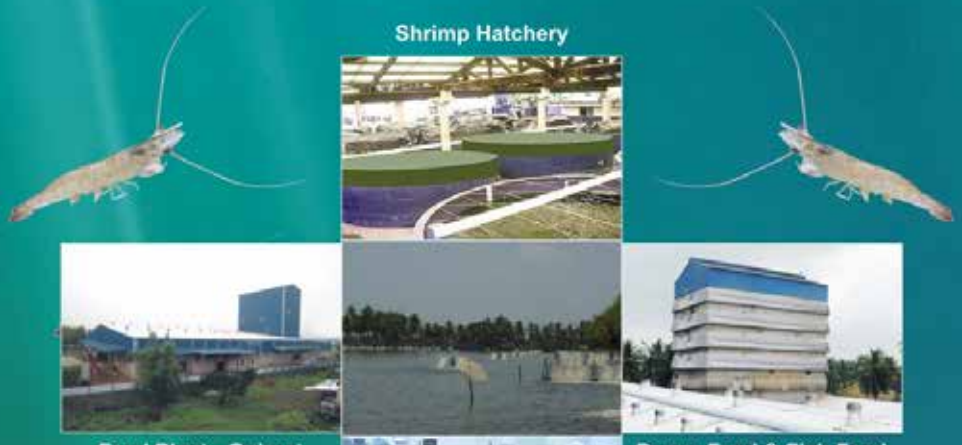

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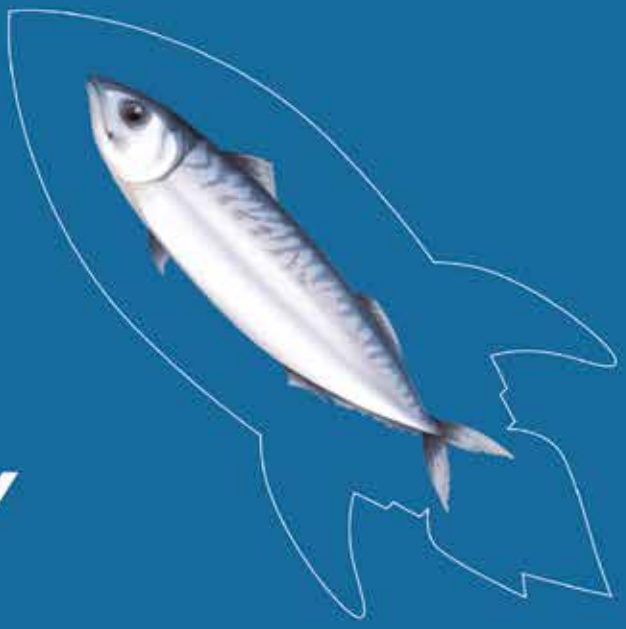

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