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CPF-TURBO PROGRAM

The shrimp industry has seen major developments and tasted success over the years, And not only are we proud to be part of it, but also take pride in pioneering it. To ensure the success and profitability of the Indian Shrimp Industry, our highly determined team with committed Aquaculture specialists constantly provide the shrimp farmers with access to the latest and updated technology.

CPF-TURBO PROGRAM -
Pioneering Successful and Profitable Shrimp Aquaculture

JUNE - 2020

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In the Platter

K. S. Srinivas IAS
Chairman

Dear Friends,

As you all are aware, the Covid-19 pandemic has created havoc to most sectors in many economies including the Seafood sector. After a slump in April, the exports showed slight recovery in May as well as June, though the instability in market demand as well as the restrictions of public movement and dining out options have made the market conditions very volatile. Considering this uncertainty, MPEDA has stepped in to organize Webinars on major markets in order to provide first hand information to its exporter members about the market situations and future trends so that it would help them to plan their businesses in the coming days. The first of its series of Webinars was on the US market, held on 25th June 2020. The presenter was Mr. Richard Barry, Director (Programmes), National Fisheries Institute, USA. The response to the webinar was overwhelming and I am sure from the feedback we received the webinar has helped the exporters to know about the market conditions in USA and the future prospects as the Covid-19 pandemic altered the way people spend their times outside.

Meanwhile, with the help of scientists from Institutions like CMFRI, FSI and CIFT as well as from the exporters from Seafood Exporters Association of India, MPEDA has furnished the progress report for India under the US Marine Mammal Protection Act. The project on the stock assessment of Marine Mammals in Indian EEZ has been entrusted to CMFRI by MPEDA and the institute has already initiated the work. The outcome of the project is very critical in establishing the comparability of our conservation measures for marine mammals with those of USA so as to fetch an 'exempt fishery status' to 12 export fisheries identified by the US. This issue of MPEDA Newsletter brings out a cover story of Marine Mammal Protection Act and narrates how and why it is important to our seafood sector.

The Quality Control Laboratory of MPEDA has developed methodology to detect free formaldehyde in fish products, as formalin is a potential health hazard to the seafood consumers. This will help the researchers, health officials, seafood fisheries as well as general public to test fish samples to detect the formalin, if used as adulterant to preserve the fish.

From this issue onwards, we would like to introduce certain leading and prominent business groups in the Indian seafood sector, so that the readers will be able to know more about those companies which are doing excellent job in promoting the seafood from our country to various exporters across the globe.

Thank You

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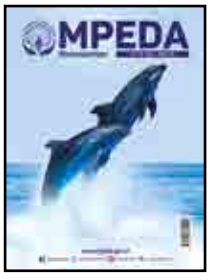

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OZONE : A DISINFECTANT IN SEAFOOD PROCESSING

Dharani, M. [a], **Subash Chandraboss, M.** [b] **and K.A. Martin Xavier** [a]
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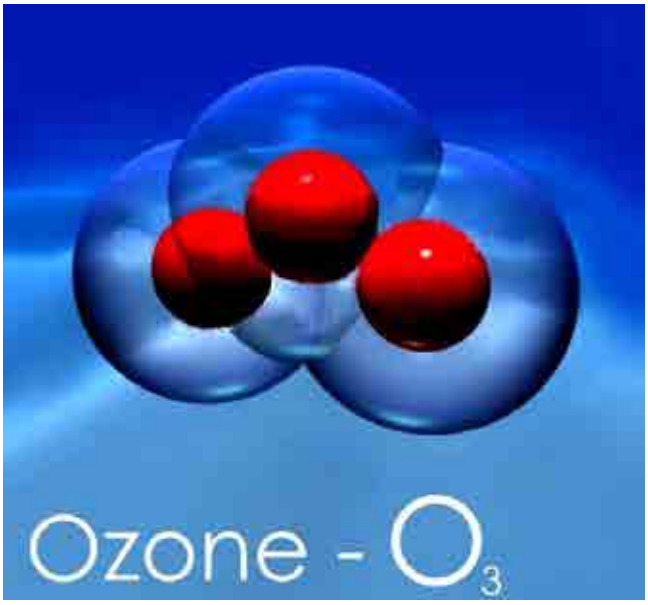
Introduction

Disinfectants have widespread applications to assure safety & quality in the sea food industry. However, agents like chlorine are inefficient against spore forming microbes and also cause harmful effects to humans as well as to the environment. Chlorine can react with organic and inorganic matter in the water to form trihalomethanes which are of great concern in both human food safety and environment safety. Therefore, there is a need for an alternative disinfectant in seafood industry which should be able to:

- Inactivate the common emerging pathogens
- Remove the toxic contaminants
- Give less loss in quality & freshness to the food products
- Have no any harmful effects on the workers
- Environment friendly & economically feasible



Ozone can satisfy the above qualities. Ozone is a molecule having three oxygen atoms with a negative electric charge. It was discovered and named by Schoenbein in 1840. It exists in the gaseous state at room and refrigeration temperature and partially soluble in water. In nature ozone is produced from the sun's UV rays and also from thunderstorms. We can also produce it according to our wants by using ozone generator with great purity.

APPLICATION OF OZONE

Ozone is a powerful oxidant. It can be used in water treatment, sanitising, washing, disinfection of equipment, odour removal and fruit, vegetable, meat and seafood processing. In the year 2001, June 26th, FDA has approved ozone for direct contact with foods & food products.

OZONE GENERATION

Ozone can be generated commercially at the present time by using corona discharge, UV – radiation & electrolysis.

Ozone system will take air from the atmosphere

↓

Oxygen molecules will be concentrated for the generation of ozone.

↓

Ozone is formed by giving high energy input.

↓

The given high energy will split the oxygen molecules in the air into free oxygen atoms.

↓

Then the atoms will rapidly bind with available Oxygen molecules to form ozone.

↓

Later the generated Ozone will be sent to the treatment chamber after the analysis of its concentration for the inactivation of microorganisms.

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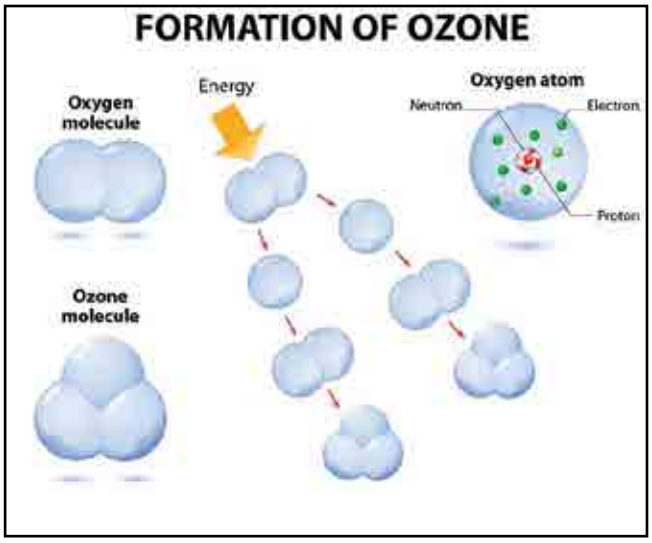

Ozone Generator

ACTION OF OZONE

Three major action pathways will occur during disinfection by ozone.
They are:

- Direct oxidation reaction of ozone by oxygen atoms is the highly potential first order reaction.
- In indirect oxidation reaction, ozone molecule decomposes to form free radicals or it reacts quickly to oxidise organic and inorganic compounds.
- Ozone may also act by ozonolysis, by fixing the complete molecule on double linked atoms and generating two simple molecules with varying properties and molecular characteristics.

MODE OF APPLICATION

Ozone can be used in both aqueous phase and gaseous phase depending upon the requirement and type of food. The concentration & intensity of ozone also vary accordingly with the different modes used on the same product.

AQUEOUS PHASE

Ozone has comparatively less half life and stability in aqueous solution than in gaseous state. Therefore, it decomposes in a very short time. For this reason it can't be stored and must be generated continuously .Ozone is partially soluble in water, hence it is necessary to transfer Ozone into water efficiently. For this transfer we can use various types of positive pressure ozone contractors such as bubble diffuser/columns, mechanically agitated vessels, turbine mixers, tubular reactors, in-line static mix as well negative pressure reactors & injectors.

GASEOUS PHASE

Ozone is stable in air and it is easy to pump the ozone into the area which is to be treated. However the reaction rate is lower in gaseous phase when compared to aqueous phase. Some of the contaminants like odoriferous compounds such as hydrogen sulphide, mold, spores and some air borne microbes are having rapid reactivity with Ozone.

DOSAGE

During the freezing process a concentration of 2-3 ppm is recommended & 1ppm is sufficient for freezing maintenance.

- Ozone has been applied in freezing chambers and cold storage in order to reduce the bacterial load by eliminating their growth and to increase the shelf life of the food.

BENEFITS OF OZONE OVER CHLORINE

- Ozone is 51% more powerful on bacterial cell walls than chlorine.
- It kills bacteria 3100 times faster than chlorine.
- It is the most powerful broad spectrum micro biological agent and it eliminates the use of hot water, conventional sanitizer and other chemicals.

	Chlorine	Ozone
Oxidation potential (volt)	1.36	2.07
Disinfection: Bacteria Virus	*Moderate* *Moderate*	Excellent Excellent
Environmental friendly Colour removal Carcinogenic formation Organic oxidation Micro flocculation pH effect water half life	*No* *Good* *Likely* *Moderate* *None* *Variable* *2-3 hrs*	Yes Excellent Unlikely High Moderate Lowers 20 minutes
Operational hazard : Inhalation toxicity Skin toxicity Complexity Capital cost Monthly use cost	 *High* *High* *Low* *Low* *Moderate-High*	 High Moderate High High Low

- It kills microorganisms by the mechanism of oxidation. Therefore, microbes find it difficult to develop any resistance against ozone.
- Chlorine forms residues after the treatment. However, ozone auto decomposes rapidly to produce oxygen after its action against microbes. Therefore, it leaves no harmful residues in the foods.
- Ozone is safe in both air and water. It improves the taste in water & helps in removing the colour in water.
- It will reduce COD & BOD. Hence we can use this in effluent treatment plant also.

PRESENT APPLICATIONS IN FOOD INDUSTRIES

Ozonated water and ice can be easily produced by dissolving ozone into water by using an ozone injection system, then fed into an ice making machine that will freeze the water and produce ozonated ice. Another important benefit of ozone is ozonated ice. Normally after harvesting, fishes are stored in ice to keep them fresh. Because fresh fish will fetch th e highest price .But some people are using formalin and ammonia like toxic substances as preservatives and artificially improving the sensory quality of the fish. Instead of using those toxicants we can use ozonated ice that will comparatively extend the storage life and reduce the bacterial count on fish.

CONCLUSION

So there is great potential behind the usage of ozone as the disinfectant than others when produced under controlled conditions and used in proper concentrations for food based applications. Even though ozonation existed for over hundred years, its recent acceptance is due to its wide applications in the food industry, promising people for food safety and also its eco friendly and cost effective nature.

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High Hydrostatic Pressure Processing: Advances in the seafood sector

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ICAR Central Institute of Fisheries Technology, Kochi

Seafood sector has received huge demand worldwide due to the high nutritional qualities of fish over other meat counterparts and this has created the sector an economically important one. Value added products from fish provides us with a good alternative through which the nutritional benefits from the fish can be further utilized. But the high perishable nature of fish always reflects on product quality and its market value. Hence maintaining quality and ensuring safety of the product is of given paramount importance. Many processing and preservation techniques have been employed to preserve freshly caught fish catch for future use. Continuous efforts are being made to create safer products for consumers by conserving inherent quality attributes and also extending shelf-life in order to enhance economic returns to producers. Recent focus of food scientists and food engineers has shifted towards finding advanced technologies, for preservation of freshness and quality characteristics of the product.

In the last few decades, consumers are demanding new alternatives of fish and sea foods, which have led to more value addition and introduction of novel technologies in their production. Changing lifestyle and awareness about the nutritional qualities and healthy diet, led to the necessity of bringing more fresh and natural ready to eat foods in the market. Hence the current focus of product development shifted from traditional ones towards market-driven, health-driven and technology-driven ones, which often adds safety as well as quality characteristics. The demand for such convenient foods with higher quality and freshness, minimally processed and packaged, easy to consume

and nutritionally healthier have led to the introduction of "minimal preservation and processing technologies" (Gould, 2000).

Many minimal preservation and processing technologies covering novel thermal technologies like Ohmic heating, microwave heating, dielectric heating, infrared heating etc. and non-thermal technologies like HPP. Pulse light, pulse electric field, cold plasma, ultra sound processing etc. are being explored recently. when compared even though thermal technologies can reduce the cooking time and have direct effect on the heat and energy efficiencies (Pereira and Vicente, 2010), and regarded for volumetric forms of heating where generation of thermal energy inside the food (Cullen et al., 2012) which can sometime affect the heat labile bioactive compounds in the food. This introduces more possibilities in the minimal non thermal preservation technologies in the food sector for microbial inactivation, meeting the current global interest on more freshness, healthy and natural foods.

Non-thermal processing technologies are often effective at ambient or sub-lethal temperatures. High hydrostatic pressure/HPP, pulsed electric fields, pulsed light technology, ultrasound, ultraviolet light, cold plasma technology, oscillating magnetic field etc. are some of the advanced non thermal technologies that have the ability of inactivating spoilage microbes/ enzymes leading to the enhancement of safety and shelf life (Butz and Tauscher, 2002). In HHP and PEF a small amount of heat is generated as internal energy like adiabatic heating and resistive heating, but, they are classified as non-thermal once, as they can eliminate the use of high temperatures to inactivate the microorganisms, avoiding the deleterious effects of heat on flavor, colour and nutritive value of foods (Pereira and Vicente, 2010). Among them most extensively studied and explored non thermal process for preservation of foods appears to be HPP and PEF, which has been in commercialization for liquid food like juices, milk and other fruit derived ones.

High pressure processing (HPP) or high hydrostatic pressure processing (HHPP) is defined as an innovative processing technology which allows inactivation of pathogenic and/or spoilage microorganisms, enzymes in foods with fewer changes in texture, flavour, and colour when compared to conventional technologies. This emerging technology finds its application in the field of food preservation to extend the shelf life of food and to improve food safety of products, as a novel post packaging decontamination technology (Bajovic et. al., 2012) or cold sterilization method.

The high pressure works on the principle of microbial inactivation by protein denaturation, enzyme inactivation and cellular proteins agglomeration in addition to the changes happening in the permeability of cell membrane. Since high pressure on food does not involve in the breaking of covalent bonds, the development of undesirable flavours is eliminated and the natural qualities of the products are maintained.

This advantage of minimal effect on flavour and nutritional attributes of final products, can is usually done at ambient temperature conditions but can be used with high and low temperatures. The combined effect of high pressure with sub-zero temperature open up the unexploited potentialities for improving the kinetics of the freezing process. Also the application of pressure to food results in instantaneous and uniform transmission of the pressure throughout the product, independent of the product volume. This environment friendly, safe food preservation technique has been exploited in the area of developing newer food products which can retain the natural appearance, flavour, texture, and nutritional qualities.

The initial reports on HPP of food dated back in 1899 by Hite, who used this technology in shelf life extension of milk. Although earlier attempts of this high pressure were dated back in the 19th century, the true potential of its application in the field of food processing was put at the end of 1980's (Erkan, 2010). High pressure processed foods were first commercialized in Japan in 1992 (Murchie et. al., 2005) and now this technology has been applied to a range of foods like milk, fruit juices, jams, guacamole, oysters, fish and meat products, ready- to- eat dishes etc. and are already available in the markets of Europe, America, Japan etc. The studies on meat and fish have also shown that HPP can be a useful processing tool for such types of muscle foods (Ohshima et.al., 1993).

HPP in fish and fish products

In fish and fishery products, due to its perishability and safety concerns scope for a detailed investigation on their amenability to HPP has been increasing. Although the sensitivity of microorganisms like both spoilage and pathogenic, can be exploited for shelf life extension and also their hygienization in fresh fish. So application of high pressure can not only destroy spoilage bacteria and inactivate enzymes that affect the quality of fish, it helps to display better qualities like nutrition retention, fresh flavour, improved taste and texture, when compared with traditionally processed products. The technology has led

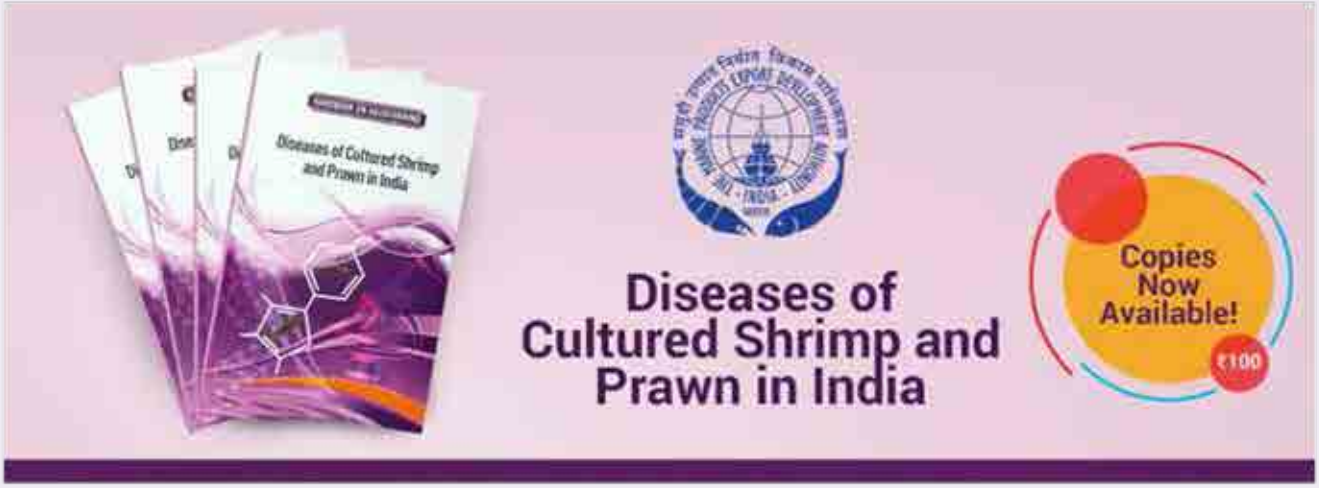
to innovative processing methods and many products have been commercialized in different parts of the world especially Japan, Europe and American markets. The regulatory agencies (USFDA) have accepted the preservation method using high pressure for the pasteurization of food products. However, in India HPP is still a novel and potential technology especially for solid based foods and hence having huge research potential in the current areas.

The effect of pressure on fish and seafood for microbial inactivation and shelf life extension has been extensively studied. High pressure has been found to inhibit the formation of putrefactive compounds and maintains the hardness of fish muscles during storage, thereby ensuring higher sensory quality. High pressure (HP) processing helps in shucking the raw meat without cooking, to remove meat from the rigid shell of crustaceans and molluscs easily without losing the natural texture and appearance.

Many research has been done in the area of shucking of live clam, oysters and mussels. Live oysters subjected to moderate pressures of 240–350 MPa for 3 min help to open up the oysters without knife and thus have developed as an alternative to the laborious and costly hand shucking process in the oyster industry (Morrissey, 2002). Similar, reports showed an optimum shucking pressure range of 240 to 275 MPa resulted in minimum changes to pacific oyster (He et al., 2002). Mussel meat is usually consumed as raw, blanched or cooked and the meat removal from the shell is done by steaming or dipping the whole mussel in boiling water. This process leads to the loss of structure, moisture reduction, protein degradation and loss of juiciness, resulting in rubbery texture. Thus, a more efficient means of meat removal can be achieved without changing the size and shape of the meat and at same time the nutritional qualities are retained.

Various other fields of applications of high pressure are pressure – freezing and thawing, preservation at subzero temperatures under non frozen conditions, in addition to its potential in developing many novel texturized products. HPP has received increased attention in recent years as a possible way of improving functional properties of muscle proteins and also a powerful tool for protein and enzyme modulation studies (Mozhaev et.al., 1996). Wide application of this technology has dealt as a result of protein denaturation, textural alterations, gelation, greater flavour and colour retention, and enzyme modifications. So this technology has shown its potential in seafood industry for the production of surimi, kamaboko or other minced products. The response of food products to HPP is complex in nature and is being affected by the product characteristics (pH, water activity) and processing parameters (pressure intensity, duration of pressurization, temperature etc.) (Sequeira-Munoz et.al., 2006).

Now the focus is on enhancing textural and functional quality of fish mince by the application of HPP for the development of new and improved products. The application of pressure will



also minimise protein denaturation, increase nutritional and sensorial quality and maintain inherent properties which can be best lose in traditional pasteurisation process. Fish proteins with increased gel strength, softer gels and higher water retention can be well produced by application of pressure. High pressure processed products will create a new demand for raw or fresh like products and command a niche in the world food markets. Also the conventional process of restructuring depends on hot set binding of extracted myofibrillar proteins with the combined effect of salt, phosphate and mechanical action and the new trend has shifted towards non thermal/ cold setting of restructured products. Because in restructured products binding can be achieved through the formation of gels that set thermally (heat set) or chemically (cold set). In cold setting of restructured products, high pressure technology promises many value added products which can offer fresh like qualities.

High pressure processing machine -Research model 2L capacity (FPG 7100:9/2C, Stansted Fluid Power Ltd. Essex, UK)

CIFT High pressure equipment is an iso- lab model designed by Stansted Fluid Power Ltd., UK having cylindrical pressure chamber of 2L capacity with 570 mm X 70 mm length and diameter. The chamber is filled with pressure transmitting fluid consisting of distilled water (100%) or 30% propylene glycol. Process temperature of pressure transmitting fluid inside the chamber can be monitored through T-type thermocouple.

An increase of 2–4°C in the transmitting fluid occurs with ramp rate, which is brought down to the set temperature by the cooling system of the machine (Ever Cool, Type EPIALT-7 .5). Holding time/ dwell time does not add pressure come-up or release time. An average come up time of 60-70s and a decompression time of 72s was noticed for seafood processing. Adiabatic compression was observed in pressure transmitting fluid which causes a raise in temperature at a rate of 3–4°C for every 100 MPa increase in pressure.

Extensive research on the effect of high pressure on the quality attributes like pH, colour, browning index, total soluble solids content, total phenolics, ascorbic acid content, antioxidant activity, sensory characteristics, spoilage causing enzymes (polyphenol oxidase and/or peroxidase and/or pectin methyl esterase), microorganism (aerobic mesophiles, psychrotrophs, coliforms, latic acid bacteria, yeast and mold) of fish, shrimp, shell fishes, molluscs and fruits like mango, litchi etc. has been done.

Work on high pressure induced inactivation of spoilage causing enzymes and microorganisms have been modelled and the developed kinetics will help for designing the technology adoption at industrial level. Some works on the effect of pressure processing on fish mince and mince based products like fish sausage, ham, smoked tuna, shrimp analogue etc. have been carried out and compared against the conventional heat treatments. When analyzed the effect of pressure in replacing the conventional method of sausage development, High pressure could possibly replace it with an enhanced quality and form softer and glossier gels with bubble-free surface than heat-induced ones. At higher pressures (like above 400 MPa) denaturation of myofibrillar protein creates the required consistency and texture to the products with increased shelf life. But textural modification was achieved at 250 MPa in 10 min, when microbial transglutaminase enzyme was used along with high pressure and so that enzyme addition could drastically reduce the optimized pressure in mince products.

The research works carried out focused on to

i. Employ shelf-life extension of the products by destruction of pathogens & spoilage organisms

ii. Reduces the microbial risks during raw seafood consumption

iii. Inactivation of oxidative endogenous enzymes before storage and processing of fish products

iv. Employ little effect on low molecular compounds like flavour compounds, vitamins and pigments.

v. Develop new gel based products with desired sensory attributes and mouth-feel

vi. Modify palatability and functional properties by inducing denaturation and muscle protein gelation

vii. Application in shellfish processing for 100% removal of meat from shells

viii. As an alternative to the conventional heat treatments for processing of various value added foods

Based on the studies carried out the optimized pressure ranges and dwell time of various products is shown below.

Product	Optimised Pressure and Dwell Time
HL Indian white Prawn	250 MPa, 6 Min
PUD Prawn	250 MPa, 6 Min
Tiger Prawn	435 MPa, 5 Min
RTC Prawn	235 MPa, 5 Min
Yellow fin tuna	200 MPa, 5 Min
Litchi juice	300 MPa, 5 Min
Mango Pulp	600 MPa, 10 Min
Fish Gel	400 MPa, 20 Min
Fish sausage	560 MPa, 15 Min
Marinated Tilapia	300 MPa, 5 Min
Restructured sausage	200 MPa 15 Min

Mussels

Fish ham

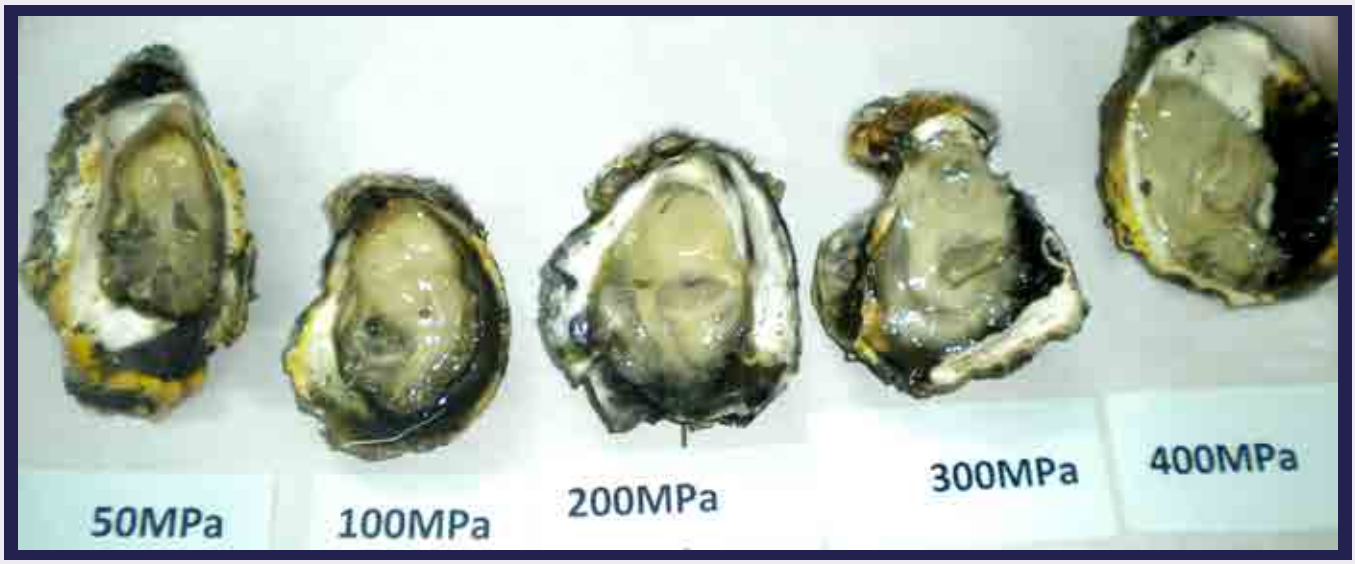
Indian white shrimp

Lobsters

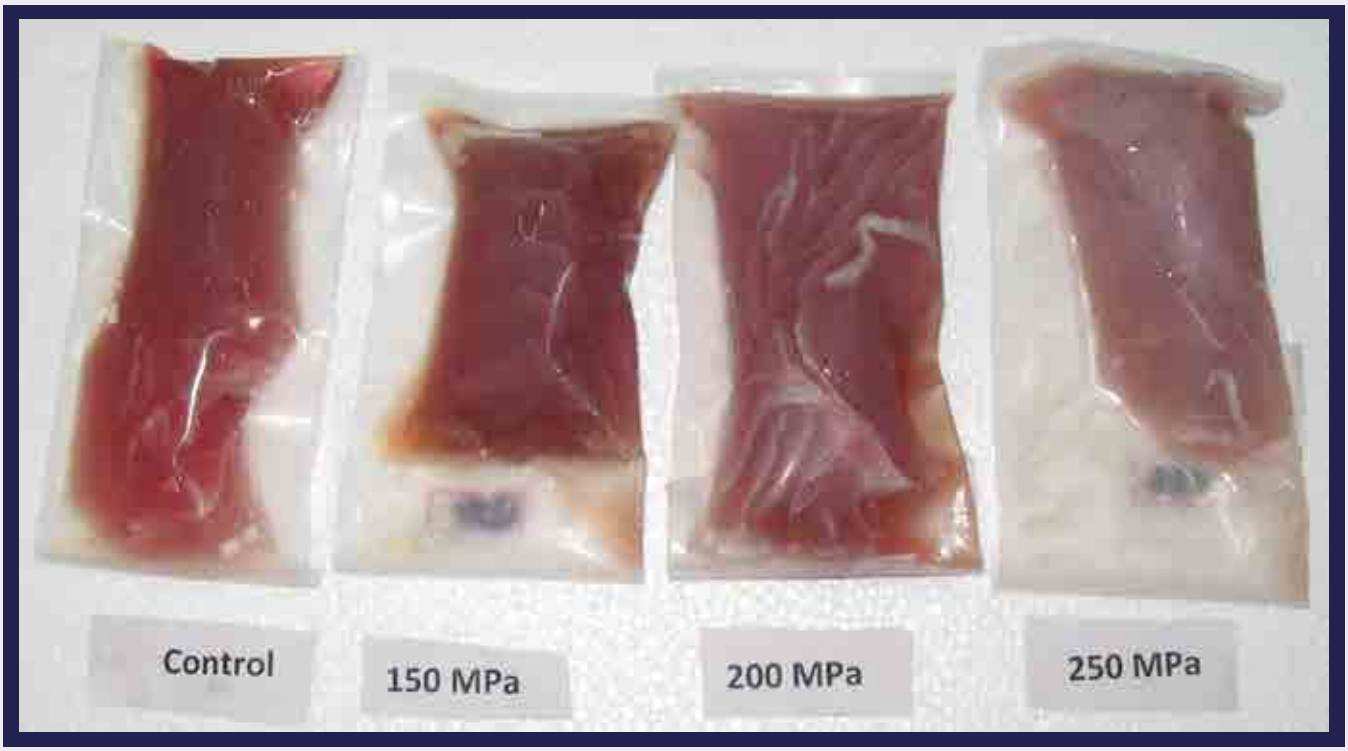
Surimi balls

Fish sausage

Crab Claws



Oysters



Tuna meat

Conclusions: Consumers awareness and concern on nutritional quality and safety of food in turn affects its market value. Hence emphasis is shifted towards developing novel products and technologies for future. Large varieties of fish-based products have been introduced in our market and are having huge demand like other meat counterparts. In many products the fish mince either cooked or uncooked is used with different formulation and the concern for safety and quality is gaining importance. The application of modern processing and preservation techniques in developing such formulated products in food industry has evolved to greater significance.

In India it is worthwhile to give more attention to the development of such formulated products and advanced technologies. There is unlimited scope for design and fabrication of such convenient products by technological interventions which causes physical, chemical or functional modification.

Advanced researches have been conducted in the application of high pressure on various fields of food processing especially in fruit and fruit juices, milk and milk products, soups, sauces and smoothies, vegetables and meat and seafoods. In Indian context the application of high pressure, as a means of non-thermal preservation techniques, has emerged recently and its application on fish and other meat is in nascent stage. This technique can be used as an alternative to conventional heating treatments for the development of various products with a minimum quality loss and extended shelf life.

Technology for products of commercial value from crustacean's seafood processing discards

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Introduction

Seafood is known as good source of easily digestible protein with balanced essential amino acids, lipids with the composition of therapeutic and essential fatty acids, mineral and other micronutrients enriched with biologically beneficial elements. The seafood industry provides both food and livelihood to the millions of people and ensures the food sovereignty of many countries across the continents. In India, 14.5 million people were directly or indirectly depends on fisheries activities. China and India together account for more than 45 % of global fish production and in Asian region alone both the countries contributed about 74% and 25% of global exports (FAO, 2018 & COMTRADE UN, 2017).

Seafood processing produces a huge quantity of waste accounts approximately 20-80% depending on the level of processing and type of fish. Global fish waste generation is estimated to be excess of 100 mMT and in Indian scenario which is estimated has less than 4mMT. As per MPEDA data in 2019, India has 285 Non-EU plants and 331 EU plants with the production capacity of 13,618.30MT (non-EU) and 17,999.72MT (EU) respectively. In the year 2017-2018, the quantity of seafood exported from India was 13,77,244 tonnes. Though this higher production can satisfy the consumer demands, it causes several negative impacts including generation of huge proportion of wastes which leads to environmental pollution, depletion of fish stocks etc. Already India has a clear road map for increasing the production and expanding its domestic as well as international markets. Hence it is obvious that as a country India is in the need to have strategies and technology for utilization of the huge quantity of waste likely to be produced in each maritime states.

Common causes of waste generation

The waste generation begins with the practice of discarding unintentional catches at sea. Traditionally, Indian seafood process follows the long marketing channel to reach the consumers. There are many avoidable and unavoidable occurrences that cause fluctuation in the cold chain which affect the quality and ultimately produce certain quantity of catch as waste. Subsequently, the waste is generated during on-board handling, transportation and processing operations. During value addition of seafood processing, only the edible parts are processed and the rest is discarded which can be used as secondary raw material for production of many pharmacologically and biologically active important compounds.

Table 1: Seafood processing plants of India (Region-wise Processing Plants as on 12-12-2019 MPEDA (2019)

S.No	Office	Non- EU/ EU plants	Capacity (MT)
1	RO Chennai	44	2,835.14
2	RO Kochi	106	3,869.22
3	RO Kolkata	44	1,604.31
4	RO Mumbai	46	3,413.80
5	RO Veraval	94	4,711.56
6	RO Vizag	14	654.50
7	SRD Ratnagiri	12	1,459.40
8	SRO BBSR	33	1,286.92
9	SRO Bhimavaram	49	2,671.17
10	SRO Goa	15	1,080.76
11	SRO Mangaluru	50	4,829.06
12	SRO Porbandar	28	1,564.68
13	SRO Quilon	16	577.20
14	SRO Tuticorin	38	1,060.30
Total		**589**	**31,618.02**

List of MPEDA approved value added products from crustaceans

- Breaded and Battered Shrimp
- IQF Marinated Shrimp
- Skewered Shrimp
- Stretched Shrimp (Nobashi)
- AFD Shrimp, AFD Powder
- Blanched/ Cooked Shrimp
- IQF Head-On/ Headless / Butterfly cooked/ blanched shrimp
- IQF Peeled Tail-on cooked shrimp
- Cooked salad shrimp
- Cooked and peeled shrimp
- Sushi
- Shrimp Pickle
- IQF tray pack shrimp
- Shrimp curry
- Pasteurized crab
- Lobster whole

Waste composition of shellfish processing

Annually, Indian shrimp industries produces more than 1 lakh tons of shrimp by products. Processing of shrimps generates large quantities of solid wastes contains head and body shell which accounts for approximately 40 – 50 % of whole shrimp weight. With approximately 60 - 70 % of the total weight of crustaceans (shrimp, crabs, prawns, lobster, and krill) ending up as by-products (Hamed et al., 2016). The tropical shrimp's head generally constitutes 34 - 45 % and body shell constitutes 10 – 15 %. In general, the exoskeletons contain about 30 - 40 % proteins, 30 - 50 % minerals (mainly calcium carbonate), and 20 – 30 % chitin along with others compounds such as pigments (e.g., astaxanthin) and lipids (Vani et al., 2013 and Hayes, 2011). The table 2 show the waste generation of crustacean seafood processing from Gujarat.

Table 2: Data collected from seafood processing plants of Veraval, Gujarat

Type of product before process	Type of product After processing	Waste generated (%)	Yield of edible meat (%)	Present utilization	Price (Rs/ kg)
Head on *Penaeus vannamei*	Headless *vannamie*	32	68	Chitosan production	2-3/-
Head on white *Penaeus indicus*	Headless white	35	65	Chitosan production	2-3/-
Head on green tiger prawn *Penaeus semisulcatus*	Headless green tiger prawn	35	65	Chitosan production	2-3/-
Head on pink shrimp *Matapenaeus monoceros*	Headless pink shrimp	38	62	Chitosan production	2-3/-
Head on kiddi shrimp *Parapenaeopsis sytlifera*	Headless kiddi shrimp	45	55	Chitosan production	2-3/-
Head on white *Penaeus indicus*	PUD white	50	50	Chitosan production	2-3/-
Head on green tiger prawn *Penaeus semisulcatus*	PUD green tiger prawn	52	48	Chitosan production	2-3/-
Head on pink shrimp *Metapenaeus monoceros*	PUD pink shrimp	54	46	Chitosan production	2-3/-

Head on kiddi shrimp *Parapenaeopsis sytlifera*	PUD kiddi shrimp	60	40	Chitosan production	2-3/-
Head on coastal mud prawn *Solenocera crassicornis*	PUD coastal mud prawn	70-68	30-32	Chitosan production	2-3/-
Headless white *Penaeus indicus*	PUD white	25-20	75-80	Chitosan production	2-3/-
Headless green tiger prawn *Penaeus semisulcatus*	PUD green tiger prawn	25-20	75-80	Chitosan production	2-3/-
Headless pink shrimp *Metapenaeus monoceros*	PUD pink shrimp	22-25	75-78	Chitosan production	2-3/-

a) Carbohydrate

Chitin is the second most important natural polymer in the world. Chitin and its derivatives are the major commercial products produced from crustacean processing waste. The main sources exploited are two marine crustaceans, shrimp and crabs. The percentage of chitin content is varies with different crustacean waste. The shrimp and crab waste contains 14 - 42 % & 13 - 26 % (Ashford et al.,1977), krill 39 - 49 % (Naczk et al.,1981) and lobster 60 - 75 % (Synowiecki et al.,2003) of chitin on a dry basis exoskeleton. The deacetylated form of chitin is known as Chitosan.

Chitosan is the most important derivative of chitin.Chitin and chitosan offer a wide range of application from the agriculture to pharmacy industry due to its specific properties like bioactivity, biodegradability, chelation ability, absorption and film forming ability. Although the chitin and chitosan are known to have very interesting physicochemical, functional and biological properties in many areas, their molecular weight and their solubility property restrict their usage. Chitosan, which is soluble in acidic aqueous media, is used in many applications (food, cosmetics, biomedical and pharmaceutical applications).

Unfortunately, all chitin and chitosan are not applicable in all sectors owing to its high molecular mass, high viscosity and, thus, low absorption for in vivo applications. The effectiveness of chitosan in various applications appears to be dependent on the degrees of acetylation. Recent studies on chitosan derivatives particularly water soluble derivatives have drawn considerable attention, since the products obtained possess versatile bio-functional properties. The different types of chitosan derivatives and its application are mentioned below.

Chitooligosaccharides

The depolymerised form of chitosans is called as chitosan oligomers or chitooligomers, or chitooligosaccharide (COS). COS has been paid great interest in pharmaceutical and medicinal applications due to their high solubility and non-toxicity.

Carboxy methyl Chitosan

Carboxy methyl chitosan (CM-chitosan) is the most fully explored derivative of chitosan. This derivative is water soluble in a wide range of pH, only if prepared from a fully acetylated chitin.

Hydroxy propyl Chitosan

Hydroxypropyl chitosan (HPCS), a kind of water-soluble functional derivative of chitosan, is obtained by means of etherification through propylene oxide at the C6/C3 position under alkali conditions. Application of HPCS includes drug delivery, tissue engineering and wound healing.

Phosphorylated Chitosan

Through phosphorylation chitosan is converted to the form of Phosphorylated Chitosan. This derivative is important due to its interesting biological and chemical properties and it also exhibits bactericidal and osteoinductive properties.

Application of chitosan derivatives

Specific properties	Main applications
Bioactivity	Antimicrobial additive to fibers and textile products, food packaging, wound healing and anticholesterolemic agent
Biodegradability	Controlled release of drugs, agro-chemical, food packaging and toiletries production
Chelation ability	Reduction of surface water and waste water pollutions by chelating of heavy metal ions and radionuclide
Absorption capacity	Efficient electrostatic painting, clarification of juices and beverages.
Film forming ability	Production of dialysis membranes and dental fluids, separation membranes for medicine and food processing.

Glucosamine hydrochloride

Glucosamine in the form of glucosamine sulphate, glucosamine hydrochloride, or N-acetyl-glucosamine is extensively used as a dietary supplement for the treatment for osteoarthritis, knee pain, and back pain, and glucosamine is safe and does not affect the glucose metabolism.

Glucosaminoglycans

Glycosaminoglycans(GAGs) are heteropolysaccharides consist of a repeating disaccharide unit without branched chains in which one of the two monosaccharides is always an amino sugar (N-acetylgalactosamine or N-acetylglucosamine) and the other one is a uronic acid. It possesses significant antioxidant and antihypertensive properties and could be utilized as natural preservative ingredient in functional foods and pharmaceutical industry.

b) Protein hydrolysate

Protein hydrolysates are the mixture of amino acids

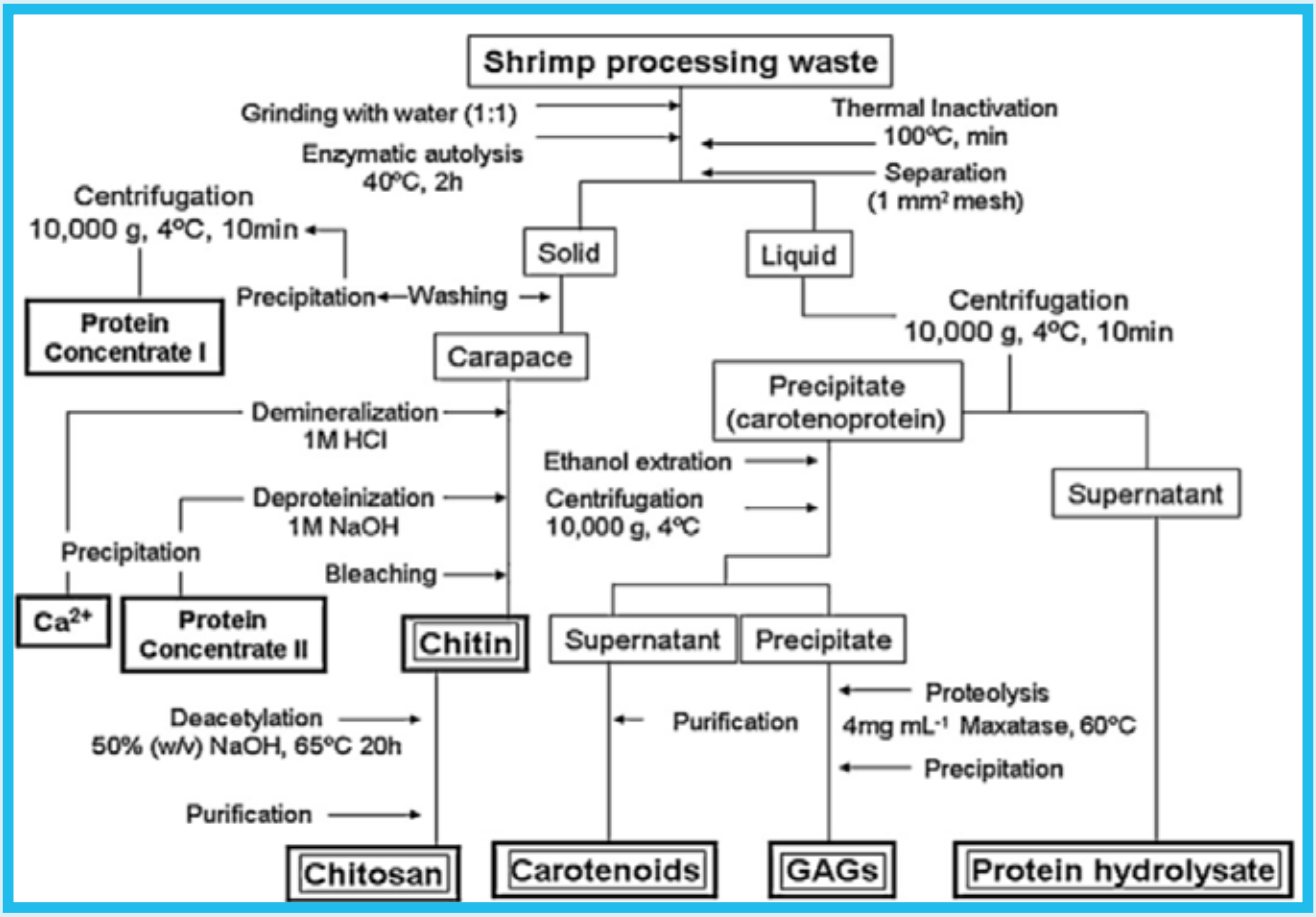

Figure1: Valuable compounds from shrimp processing waste and their process flow (adopted from cahu et al.,2012)

and peptides obtained by digesting proteins from crustaceans processing waste using proteases. The enzymatic hydrolysis is the promising bio-technique currently employed to recover the nutritionally and physiologically important peptides from the protein rich secondary raw material of crustacean processing. Bioactive peptides present in the mixture of protein hydrolysates have been found to possess many physiological functions, including antioxidant, antihypertensive, anticoagulant, antimicrobial, anticancer, antiproliferative, antiobesity and antidiabetic activities.

c) Carotenoids

Shrimp waste is one of the most important natural sources of carotenoids (Shahidi and Brown, 1998). Shrimp waste, such as head and body carapace, are used for carotenoids extraction using organic solvents. Astaxanthin is a red carotenoid with high scavenging activity and has proven excellent biological activities including anticancer and anti-aging, repairing central nervous system, improvement cardiovascular function and protecting eyesight, hence become more essential ingredient in formulations of in pharmaceutical, food industries and cosmetics.

Conclusion

In conclusion, fish waste represents a diverse array of biomolecules having numerous potential. Abundant studies have emphasized the scope to develop new products from crustaceans processing discards. Nevertheless, the major problem to industrialize these developments is the freshness of the processing discards. Processing discard must be better considered as secondary raw materials than wastes both on-board as well as at the processing plants. The quality of the

secondary raw material should be maintained as like the edible products and due care should be taken for minimizing the rate of enzymatic degradation and microbial spoilage. The major challenges like poor cold chain during processing, lack of clear legislation, highly scattered nature of seafood processing units, and uncertainty of marketing needs to be addressed for better conversion of these resources into high value commercially important commodities.

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SEAFOOD TRADE IN THE MIDST OF COVID-19 - A REPORT

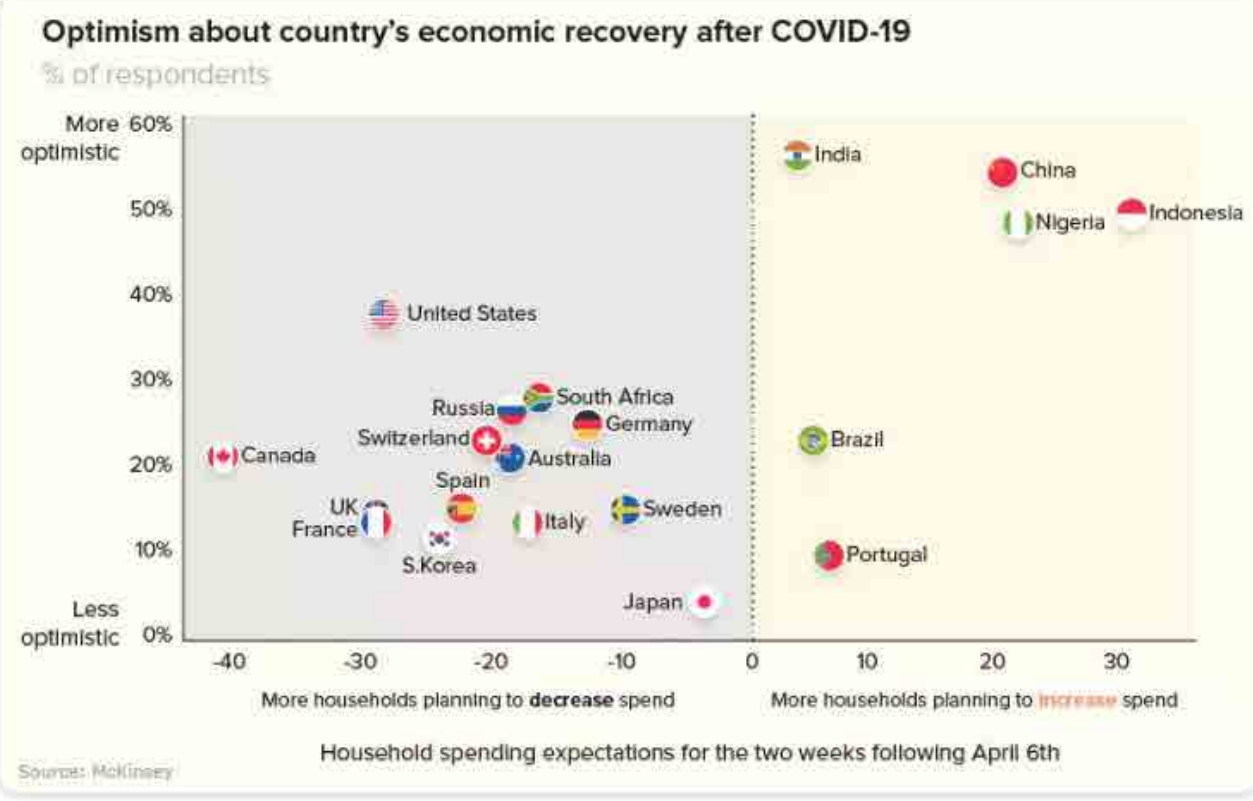
The COVID-19 pandemic has disrupted industries all over the world thereby affecting the global economy. Seafood industry also had to face both demand and supply challenges. The shutdown of restaurants and retail outlets has reduced the demand for seafood items and panic-buying has been replaced with a very less and unpredictable demand.

India has a growing aquaculture sector contributing to the seafood export. Due to the lockdown, there was disruption in the production side, which has affected the supply chain.

Hatcheries were not able to operate to produce seed stock due to shortage of labour and logistics during the initial phase of lockdown. This in turn has increased the seed price. Due to the unpredictable conditions in the international market, farmers were panic stricken and resorted to early harvests.

There was a fall in export prices and cancellation of large orders from regular buyers. In the present scenario, tapping a new market or switching to a new buyer became very difficult due to lesser demand, travel and other logistic issues. The purchasing power of consumers as the pandemic has affected the job of many people. Seafood exporters are facing difficulty due to cancellation of regular orders, logistic issues and decreased price.

Due to the decline in orders, there is a possibility of stock piling of seafood. Seafood orders from EU countries have stopped. While China used to import large quantities of shrimp for both domestic



Optimism is promotes higher household spending.

Image: Visual Capitalist

consumption and export, shutdown of China market due to COVID-19 has affected several exporters.

Though the markets are opening up slowly, reports indicate that the orders have decreased by more than 50% from pre-COVID-19 scenario. Existing major markets are on their path to recovery and will take time to resume imports and reach the earlier level. As per the World Economic Forum, the level of optimism in India, China, Indonesia and Nigeria about their respective countries' economic recovery is high, thereby increasing consumer spending. Compared to the EU, the USA shows better chances of consumer spending.

During this time, the markets show an alarming decline in restaurant food consumption and out-of-home entertainment. This has shifted the consumption pattern drastically, which many of the supplier countries are finding difficult to cater. It is also observed that the orders are for new seafood products.

During the initial phase of COVID-19 pandemic, the demand was for bulk packs as consumers were making panic purchases. Now the situation has changed. There is an increase in the demand for value/ retail packs which may be related to the lower purchasing power of the consumer and in home dining.

Demand for packaged and frozen seafood has increased over fresh seafood as people want to store food rather than risking going out for purchase.

The pandemic triggered a shift in the normal purchase behavior of consumer in various ways which include online buying. Survey by e-Marketer reveals that 60-85% of the people from China and South East Asia are avoiding crowded places fearing infection.

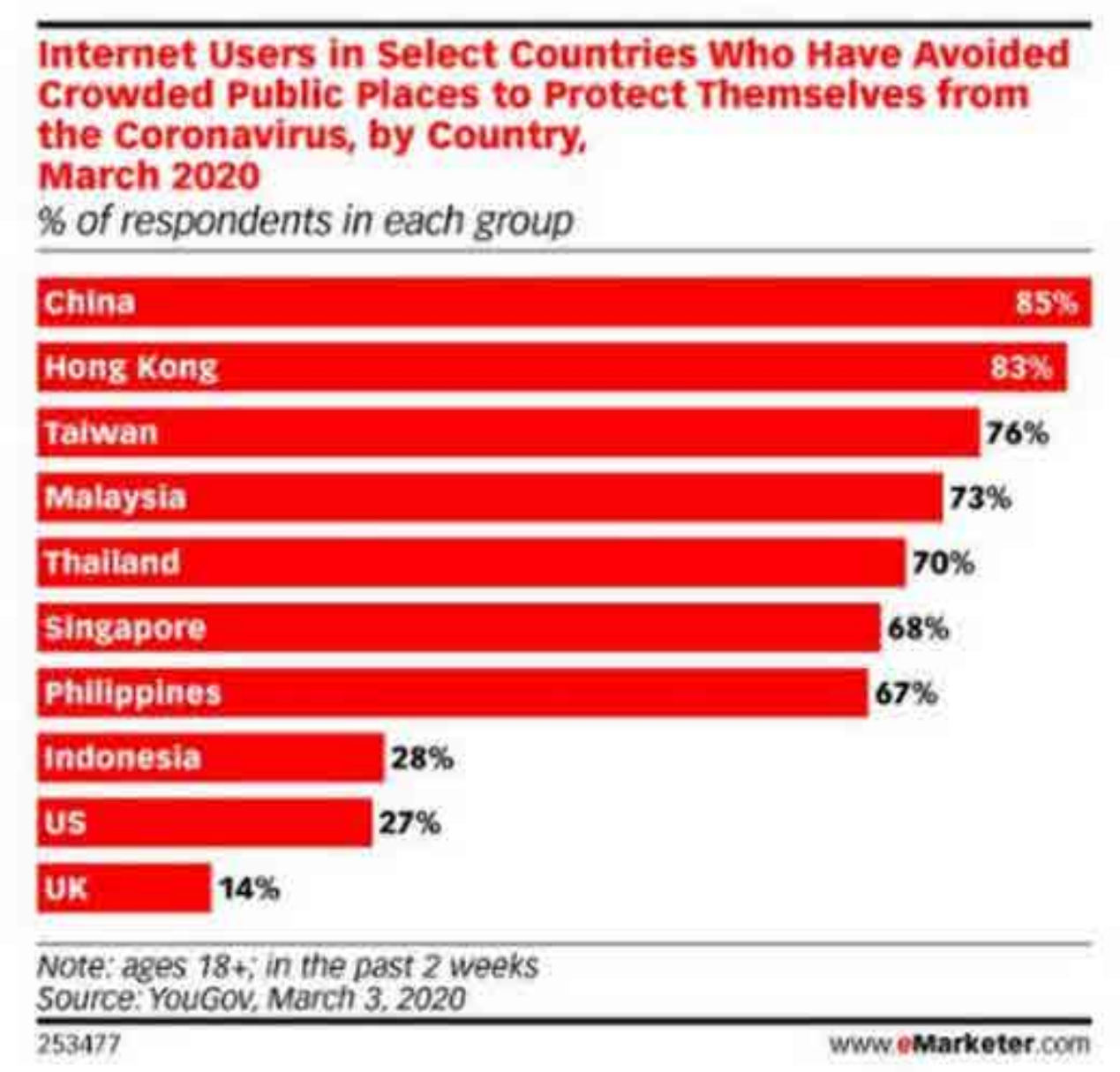
Earlier, companies used to benefit from showcasing/ advertising their product or brand through seafood fairs/ exhibitions in overseas markets. These events had also facilitated close interaction with the consumers/

buyers and helped firms to understand the pulse of the market. The pandemic resulted in cancellation of several scheduled fairs. This has affected the trade prospects of many small scale exporters.

It may take time for seafood trade to get back to normalcy as the pandemic has affected the economy of many, but there are opportunities opening up of late in EU market. The demand may be limited to established brands with new products, innovative packaging styles and as per the above shown statistics; e-commerce will have a higher role in marketing.

It is likely that the pandemic will have a predominant effect on the type of fish species consumed, their processing and sourcing. Consumers will be very particular about the safety of the product they purchase and ensure this by confirming the quality and source of the material, and traceability becoming a priority norm.

Seafood industry needs to be equipped to cater to the new charter of demands of the post- COVID-19 global seafood market. It is too early to predict whether the change in consumer demand will be sustained. But the sector should be flexible enough to cater to the changing needs of the market. In order to boost global seafood trade during this tough time, trade barriers must be liberalized without compromising the



quality or safety of the seafood.The pandemic also opens up new avenues for Indian exporters as many international trading companies and supply chains intend to outsource their job works, due to an increase in the demand for ready to cook / eat products, and policy decisions on China. Certain ASEAN countries are already in an advantageous position to take up this shift. Collective and concerted efforts will help Indian seafood exporters also to have a pie out of this outsource efforts.

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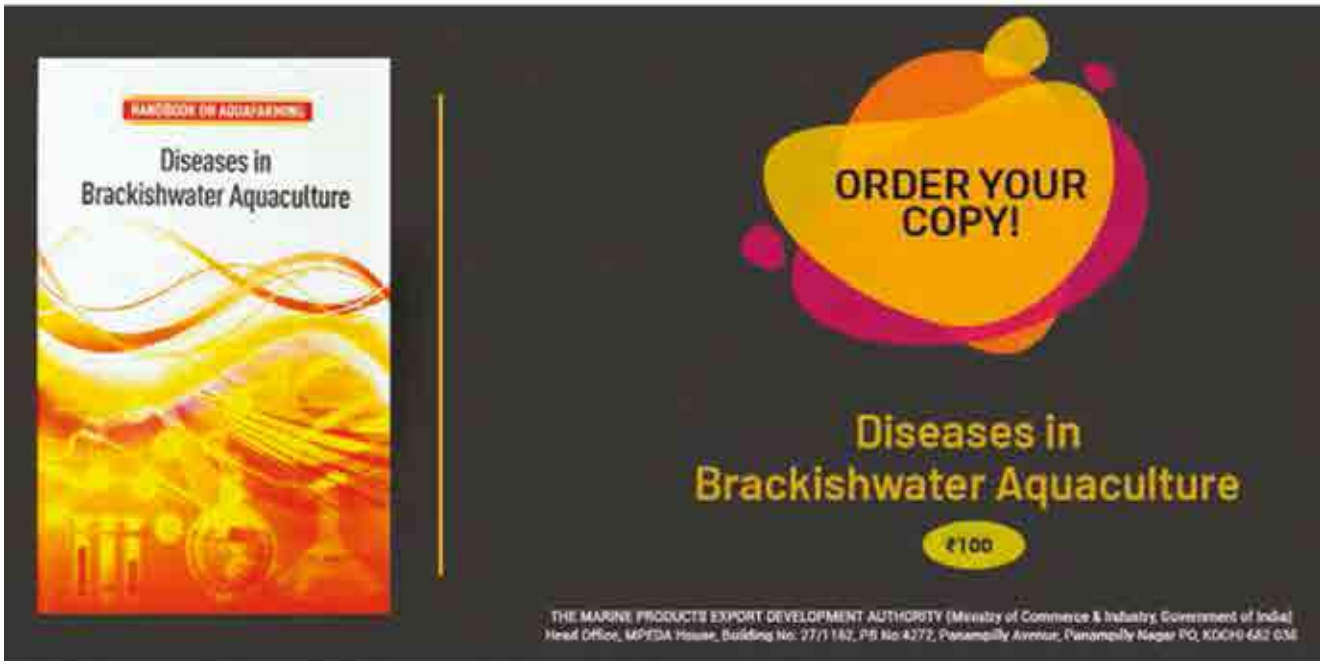
Prepared by: Anju, Assistant Director, MPEDA Sub Regional Division, Thoothukkudi, Tamil Nadu



Mr. Richard Barry,
Director, Programmes,
National Fisheries Institute, USA

Understanding the US seafood market: MPEDA launches webinar series on COVID-19 trend analysis

The Marine Products Export Development Authority (MPEDA) has launched a webinar series for seafood industry stakeholders, providing authentic insights on the current market trends across the world in the face of COVID-19 pandemic.

Industry experts from key seafood markets are roped in to present the webinar hosted by MPEDA. The first webinar was by Mr. Richard Barry, Director, Programmes, National Fisheries Institute, the USA on key market trends and emerging challenges in the US seafood industry.The webinar on 25th June 2020 was attended by 177 people including exporters, officials of MPEDA and members of allied organizations.

Addressing the participants, MPEDA Chairman Mr. K. S. Srinivas said that the seafood industry is not immune to the impacts of COVID-19. He pointed out that all stakeholders were concerned about the situation and MPEDA wanted to address their concerns through such digital initiatives.Following the Chairman's address, Mr. Richard Barry made a presentation on the US Seafood Market and the present scenario. In his presentation, Mr Barry pointed out that COVID-19 has resulted in vastly different consumption patterns with 90% of Americans eating at home more often than at restaurants. Frozen food sales, however, increased as people started to stock up food in the wake of lockdown.

US monthly seafood imports declined 25% during January-April 2020. Shrimp imports from India also declined since January though it has started to show some signs of recovery after March. Nonetheless, the overall shrimp import volume from India year-to-date remained higher than the same period last year, according to official figures presented by Mr. Barry.

The Chairman started the Q&A session with a query if demand for seafood products will improve in the next two-three months. Responding to this Mr. Barry said it would be better to wait and watch how the scenario unfolds since the US economy is in recession. He added that while some US states are showing signs of recovery with increased spending, some have been hit hard.

To a question regarding cargo movements in the US amid the pandemic scare, Mr. Barry said there are no restrictions at present on cargo movements. Responding to another query on demand for crab products, he noted that the scenario is positive for crab products in the US.Regarding cephalopods, he said the majority of the US consumers have hesitancy in consuming them. He also pointed out that the brief spike in the sales of canned seafood products could be the result of panic buying.

Responding to another query, he said the demand for branded 'ready to cook' and 'ready to eat' is still high. One participant inquired whether there will be any relaxation in the restriction on sea shrimp exports due to turtle excluder devices, he said any change to the ban is unlikely in the near future.

Discussing another question by a participant, he said 68 percent of the imported seafood goes to the restaurants and only the remaining goes to retail. With several restaurants still closed due to lockdown, there will be a delay for seafood imports to reach pre-COVID levels. Regarding price rise, he said seafood prices in the US are comparatively low. There are a large chunk of seafood traders in the US who bets on possible rise in prices once the demand picks up.

MPEDA expands testing facility for exporters, aqua farmers, domestic consumers

MPEDA has set up a network of four Quality Control (QC) Laboratories at Kochi, Bhimavaram, Nellore & Bhubaneswar years back. These labs are engaged in the implementation of the National Residue Control Plan for aquaculture products, as per European Commission Directive 96/23/EC. Now, MPEDA's laboratory at Kochi has expanded its testing facility to accommodate commercial samples from seafood exporters as well as domestic consumers. As a part of this, MPEDA has expanded its testing parameters of existing QC Laboratory for chemical testing, and opened a new microbiology laboratory to test biological contaminants.

Testing facility for antibiotics and free formaldehyde (Formalin) in seafood

MPEDA QC Laboratory Kochi is the first National Accreditation Board for Testing and Calibration Laboratories (NABL) Accredited laboratory in Kerala for testing Fish and Fishery products. The laboratory is equipped with high precision sophisticated equipments like Liquid Chromatography Tandem Mass Spectrometer (LC-MS/MS), Inductively Coupled Plasma - Mass Spectrometer (ICP-MS), High Performance Liquid Chromatography (HPLC), Gas Chromatograph(GC-ECD), Gas Chromatograph - Mass Spectrometer (GC-MS / GC-MS/MS), etc and all necessary supporting equipment/instruments. It has the facility to test various veterinary medicines (antibiotics), pesticides and heavy metals including Mercury and Cadmium. The QC Laboratory Kochi has also developed a method for detecting free formaldehyde in fish products. Formalin is considered as a potential health-hazard for human beings and is wrongly used as a preservative in domestic fish transportation and markets.

Formaldehyde testing in MPEDA Kochi lab is open for all and interested public and seafood retailers can approach the laboratory for testing their products at an affordable rate. All parameters of Chemical contaminants testing in MPEDA Kochi laboratory are approved by NABL and Food Safety Standard Authority of India (FSSAI).

Microbiology Laboratory

MPEDA has set-up Microbiology laboratory for testing food and water samples at Kochi. It was inaugurated by Shri Rameswar Teli, Honorable Minister of State, Ministry of Food Processing Industries (MoFPI) on 9th February 2020. The laboratory has two sections, one for conventional microbiology testing, and the other for molecular biology analysis. Conventional Microbiology section is dedicated to carry out testing for pathogenic and non-pathogenic microorganisms in water and food samples. The molecular biology section has advanced equipment and tests samples based on Polymerase Chain Reaction (PCR) method for testing pathogenic viruses that affect fish and shrimp.

The Laboratory is facilitated with equipment Like Real Time -PCR, Thermal cycler, and High end-Biosafety cabinets etc for testing various viruses and bacteria in fish and prawns. MPEDA microbiology laboratory is also providing the testing facility for the detection of pathogenic viruses in aquacultured shrimp, which would be beneficial for the aquaculture farmers. Microbiology laboratory is under the process of standardizing various food testing parameters based on national and international standards acquiring NABL and FSSAI accreditations.

Setting Seafood Industry on A New Path

> "The only way to tide over present crisis is to fall back to original values in the trade."

Alex K. Ninan

President, Kerala Region,
The Seafood Exporters Associationof India
& Head of Baby Marine International

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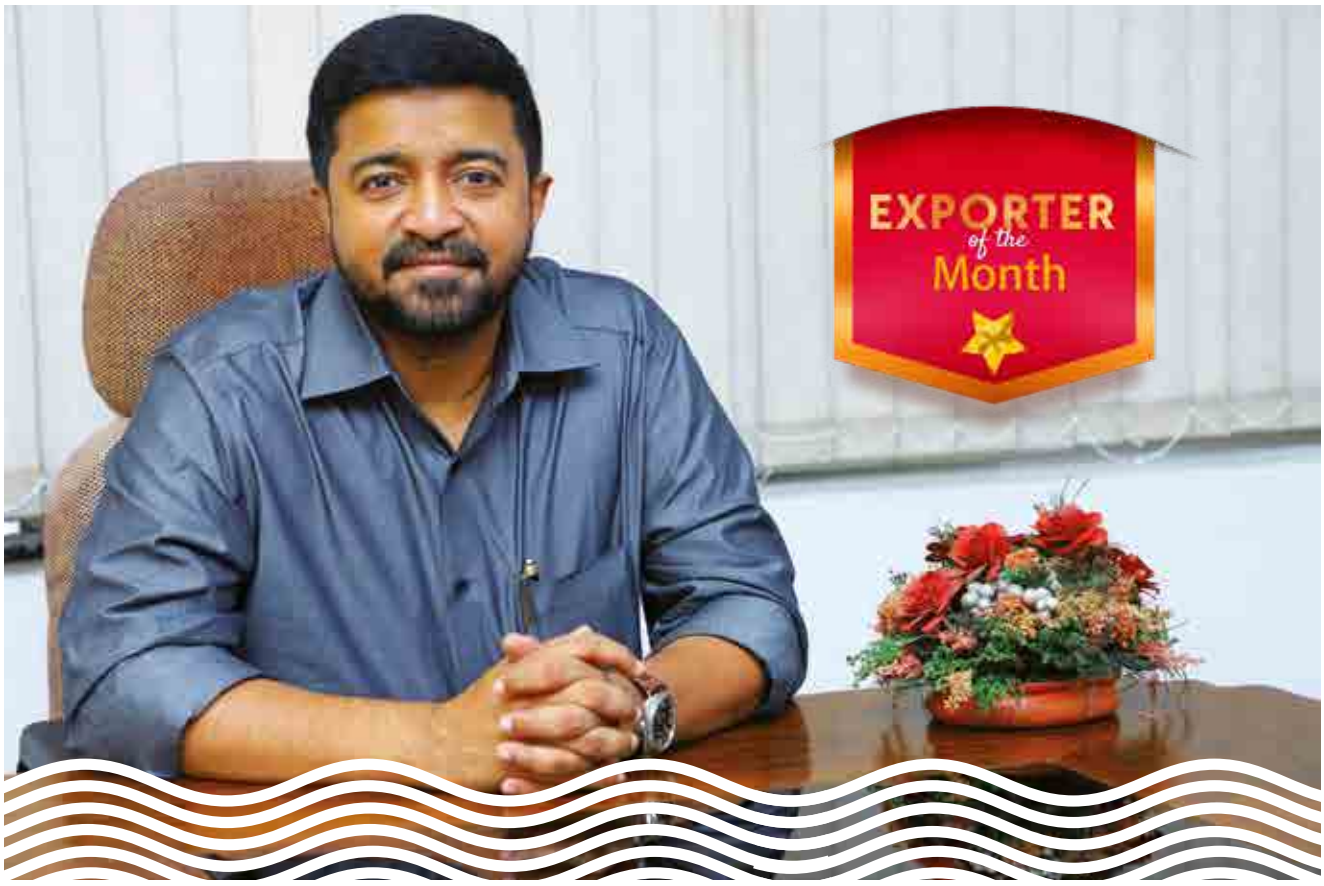

It is going to be a rough sea ahead for the seafood industry. Especially for region like Kerala, that has been spearheading the industry for more than half a century now. As a leading seafood exporter and the President of the Kerala Region of The Seafood Exporters Association of India (SEAI), Alex K. Ninan should be a worried man.

Instead, he is right there at the helm, imparting positivity among his peers and others. In an exclusive interview to the MPEDA Newsletter, Mr. Ninan outlined the possible ways to tide over the crisis.

Mr. Ninan represents the best of country's seafood export tradition. "It is a Rs. 47,000 crore industry, which was launched with the first shipment of shrimp to the United States of America from Kerala way back in the 1950s. We are facing the hardest ever challenge now. Because, the seafood industry peaks during the months of February and March, when winter recedes and Easter market warms up in Europe and America. That was when the lockdown struck us."

Mr. Ninan heads Baby Marine, one of the earliest seafood exporting houses that rode the crest of the booming industry. His father K.C. Ninan was a serving personnel in Indian Air Force. He took an early voluntary retirement when his elder brother Baby died prematurely. The seafood export house was started by Mr. Ninan and his brothers in 1969.

"Those were the golden times of the seafood industry. Kerala ruled the scene till 2005, when aquaculture took off in a big way. Since then, Andhra Pradesh has surged ahead. Whatever command we had is

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now lost through repeated floods, cyclone and now, lockdown." Being the leader in the industry, Mr. Ninan can foresee the tide of fortune changing. "We might have lost the premium market for high-value products like big prawns in the current year, but the commodity market for smaller size seafood products are slowly opening up.

There is still a lot of uncertainty in the industry, but we can overcome this by reverting to the basic values." Kerala still holds the top position in providing skilled labour for peeling, right from the smallest product to the premium one. That is why, the concentration of peeling units is so high in the central Kerala region, especially Kochi and Alappuzha regions. "Our workers are highly trained in hygiene and safety issues as well as skilled in their areas.

So, we can win back that segment of the industry as the lockdown is eased in a phased manner."Another worry casting shadows over the industry is the dwindling capture fishing volume and lesser number of boats venturing out to the high seas. "The labourers from neighbouring States are not able to return due to the pandemic and only around 30% of the available boats are operating from our coasts now."

Another aspect that the local seafood industry players need to work on is value-addition and thus enlarging their product profile. "At present, majority of the seafood from India goes to China, Thailand, Vietnam and Indonesia as raw-material for their re-processing and value-addition for re-export. We should convert the current political situation in China to our advantage. Many foreign investors are pulling out of China and this paves way for huge potential for investments in India." With that aspect too improving, the seafood industry can slowly bounce back to its glorious days.

Converting the already existing state-of-the-art factories for importing raw materials, to do value-adding here and re-exporting can easily convert India to a 'seafood processing hub' and this sector offers immense possibilities for Union Government's 'Make In India' programme.

As for Kerala, it is high time for the State Government to change its policies to promote aquaculture. "Kerala has 65,000 hectares of wet-land, a number of rivers, canals, dams, reservoirs, lagoons, lakes, back-waters and its long coastline has enormous potential for aquaculture both inland and off-shore cage culture."

Product List of Baby Marine	
a)	Shrimps (both wild caught and aquaculture) in HOSO, HLSO, Easy Peel, HOTO Body Peeled, PUD, PD, PTO – In bulk and retail packs
b)	Squid – Whole, Cleaned, Tubes, Tubes & Tentacles
c)	Cuttlefish – Whole, Whole Cleaned
d)	Octopus – Whole, Whole Cleaned
e)	Fish – Whole, Whole Gutted/Scaled, Fillets, Steaks

Major Export Destinations

- Europe
- Russia
- South Africa
- Japan
- New Zealand
- China
- Middle East
- USA

Major Certifications

BRC, Naturland & Bio Suisse for Organic Shrimps

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Daily Fish

As part of engaging the retail market, in tune with its quality standards, Baby Marine launched 'Daily Fish'. This online seafood store offers an array of ready-to-cook products, which are at par with similar products available in international markets. True to its motto, 'As Good As Live', Daily Fish delivers seafood products with all the goodness of nutrients secure.

Daily Fish has been on an incredible journey from 'catch' to 'kitchen', carrying its legacy of 49 years with poise.

Leading the Way

George K. Ninan, K.C. Ninan and Alex K. Ninan

K. C. Ninan with his brothers Rajan, Thomas and Babu

The year was 1969. K. C. Ninan has just taken an early retirement from the Indian Air Force. He did so after K.C. Varghese, his elder brother who was fondly called Baby, died. Mr. Ninan brought together his other brothers – K.C. Thomas, K.C. Rajan and K.C. Babu – and launched a seafood export house in memory of their departed brother. It was the beginning of a new chapter.Since then, the group has spread its wings and has been flying high. Today, it has factories and establishments in Kozhikode and Kochi in Kerala as well as in Tamil Nadu, Karnataka and Andhra Pradesh, with its headquarters in Kollam.

The group has diversified its activities into a bouquet of sectors like plantations, aquafarming, real estate and health care. Baby Memorial Hospital at Kozhikode and Hedge Equities, a premium player in share broking are two leading players from the group, as is Daily Fish, which is online retail sales of fresh fish products.

Alex Ninan and his brother George K. Ninan – children of K.C. Ninan – are the new faces of the company. They have taken the company to a new level by launching Baby Marine International in 1992.

The company has set new benchmarks in industry – being the first ever producer of Organic Shrimp in India and the world's first producer of Organic Fresh Water Shrimp.

The factory is equipped with the most sophisticated machinery and technology and houses highly skilled professionals. It has got international accreditations like BRC and is approved for exports to all over the world including the EU, US and Russian markets as well.

Baby Marine International is the first seafood factory that has employed solar power unit to run their cold store. Interestingly, the 24 kW Solar Grid-Tie PV system generated more power than is actually needed at the plant and this was fed to the State Power Grid. Baby Marine's 'green initiative' was recognised by the Government as part of the Earth Day observance.

WHAT'S NEW: UPDATES ON SPS & TBT

Every country has the responsibility to ensure that its citizens are being supplied with food that is safe to eat. Nations are also obliged to ensure that trade is not affecting national security or violate the rights of the domestic producers. Also, regulations of a country should be non-discriminatory and should not create unnecessary obstacles to trade. When all these objectives are to be met, countries need to agree upon some common practices of fair trade.

The World Trade Organization (WTO) has an agreement on Sanitary and Phytosanitary (SPS) measures for setting out rules for food safety and animal and plant health standards. It also has Technical Barriers to Trade (TBT) Agreement to remove obstacles to trade. While the SPS Agreement covers all measures for food safety, the TBT Agreement covers all technical regulations, voluntary standards and the procedures to ensure that these are met.

SPS-TBT UPDATES

Taiwan - Quarantine requirements to prevent Decapod Iridescent Virus 1(DIV-1)

Taiwan has notified quarantine requirements for imported seafood, to prevent Decapod Iridescent Virus 1(DIV-1). The quarantine requirements are established for the importation of live Procambarus clarkii, Cherax quadricarinatus, Macrobrachium nipponense, Macrobrachium rosenbergii and Penaeus vannamei to prevent the invasion of Decapod Iridescent Virus

1. Quarantine requirements include sampling & testing prior to exportation and test result declaration (in English/Chinese) on the original animal health certificate. Each consignment with a certain amount of shrimps shall be provided for sample inspection for DIV

1. This notification is effective from 29 May 2020.

Ref: SPS notification G/SPS/N/TPKM/531 dated 5th June 2020 (docs.wto.org)

Peru - Self declaration concerning absence of Infectious Myonecrosis Virus (IMNV)

Peru has issued self declaration as a country free from the Infectious Myonecrosis Virus (IMNV). The self -declaration has been published by the OIE on their website. Peru has shown that their basic bio security conditions to prevent IMNV have been consistently achieved for at least the last two years.

Also, active monitoring has been implemented in Peru for ten continuous years without any detection of IMNV. Sanitary surveillance for IMNV was carried out by both the National Fisheries Health Agency (SANIPES) and the Peruvian Sea Institute (IMARPE).

Ref: SPS notification G/SPS/N/PER/873 dated 8th June 2020 (docs.wto.org)

Australia - Interim import conditions to manage Enterocytozoon hepatopenaei (EHP)

Australia has notified interim import conditions for uncooked prawns to manage the risks associated with Enterocytozoon hepatopenaei (EHP). All uncooked prawns imported into Australia from 1 July 2020 must be certified by exporting countries to have been de-veined.

An updated model of health certificate for prawns and prawn meat for human consumption is available. This conditions would remain interim while Australia finalizes the “Review of the bio-security risks of prawns imported into Australia for human consumption”.

Ref: SPS notification G/SPS/N/AUS/495/Add.1 dated 13th May 2020 (docs.wto.org)

All the way from Maldives!

Maldives, just 700 km away from the Asian mainland, is the smallest nation in Asia and is fully dependent on imports to sustain the life of its 515 thousand inhabitants. So, the Republic of Maldives is relying on its bigger Asian neighbours for bringing in essential items for their survival and in exchange, Maldives export fish.

With the changes in the trade policies that the Government of India has brought in during recent times, a big window of opportunities has been opened up between India and Maldives. In a landmark development, direct cargo ferry service between the two countries is about to start and this will change the trade equations hugely.

The ferry service was announced by Prime Minister Narendra Modi during his Maldives visit in June 2019. The ferry service will run twice a month and will be operated by the Shipping Corporation of India. This will ensure direct connectivity for movement of cargo, thus boosting bilateral trade. A vessel of capacity 380 TEUs will be used for the ferry.

Despite being the closest neighbour, India has only been the fourth largest trade partner of Maldives, with UAE, China and Singapore being the first three. India's bilateral trade with Maldives has always remained around USD 280 million, with the trade in 2019 showing USD 286.85 million.

This will have a significant change with the introduction of the direct ferry service. The most important feature of the ferry is that it will have a cold storage facility. In other words, the direct ferry will be a boon for Maldives to export its chief product tuna along with other marine products.

Maldives focuses on pelagic fisheries, mostly on tuna fishery. The most important species obtained from the country is skipjack tuna and then the large yellowfin tuna. The skipjack tuna (*Katsuwonus pelamis*) is a medium-sized perciform fish in tuna family Scombridae, which is also known as the balaya, tongkol, arctic bonito, mushmouth, oceanic bonito, striped tuna, or victor fish. The yellowfin tuna (*Thunnus albacares*) is often found in pelagic waters of tropical and subtropical oceans.

Fishermen in Maldives employ methods like pole and line, handline and longline to catch tuna. The first one, pole and line method, is the most popular one and brings in nearly 65 per cent of skipjack tuna and 55 per cent of yellowfin tuna caught. This is a traditional method of fishing and this explains the sustainability of resources in the Maldivian tuna industry.

India to benefit

Trade links with India through Kochi was not treated as viable till this direct ferry made it possible for exchanging tuna and other seafood products.

It is pointed out that strengthening trade links with India through Kochi port could be mutually beneficial. Right now, Maldives is importing basmati rice from Pakistan. The nation stands to benefit if this produce is imported from India along with other food products like potato. It is also pointed out that other products like wheat, coir, coffee, textiles, vegetables, and chemicals are most often originated from India, processed elsewhere and imported to Maldives.

At present, Maldives exports its fish products, especially tuna, to Thailand and from there the processed product is exported to the US and European markets. With the ferry being streamlined, India can enter into this process and claim a stake in the export market. The Ernakulam-Alappuzha region houses the majority of seafood processing units of international competence and so, the situation is ideal for India to take over.

The US Marine Mammal Protection Act: Why it matters to Indian Seafood Industry ?!

For years, the United States of America has been one of the most important markets for Indian seafood industry. Indian farmed shrimp varieties are extremely popular among American seafood lovers.

Any amendment in the US regulations with respect to exports, therefore, is bound to have huge implications for India's seafood industry and its stakeholders.

The US Marine Mammal Protection Act, first introduced in 1972 and being amended time to time since then, is something that is closely monitored by the governments of seafood exporting nations including India.

Understanding the Marine Mammal Protection Act (MMPA)

All marine mammals are protected under the MMPA. It prohibits, with certain exceptions, the capture of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S.

The law applies to any person or vessel (or other conveyance) under U.S. jurisdiction, whether on U.S. waters or lands, or on the high seas.

The National Oceanic and Atmospheric Administration (NOAA), USA, had issued import provisions of MMPA stating that seafood exporting countries should not allow intentional killing of marine mammals in commercial fisheries.

This essentially means, when we export a seafood product into the U.S., it should be captured without killing/hurting marine mammal population. The U.S. is a country that promotes traceability of seafood, i.e., fully tracing a product from the point of sale back to its point of origin.

If they find any export item not complying with the MMPA, they can reject the consignment and place a long-time ban on seafood exports from that particular harvesting nation.

Marine Mammals

Marine mammals are a diverse group of aquatic mammals. They include cetaceans (whales, dolphins, and porpoises), sirenians (manatees and dugongs), pinnipeds (true seals, eared seals and walrus), otters (sea ottera and marine otters) and polar bears.

However, for exporting fish and fish products, the U.S. has given a five-year exemption period, starting 1st January 2017, to nations for developing regulatory programs by assessing marine mammal stocks, estimating bycatch, calculating bycatch limits, and reducing total bycatch.

Once the five-year exemption period elapses, the import of fish/fish products in the 'export' category of fishery will be banned by the US.

This will cause serious implications for our seafood exports to the US, which has emerged as our largest and most important market.

The List of Foreign Fisheries

The List of Foreign Fisheries (LOFF) is an essential component in implementing the import provisions of the MMPA. It lists foreign commercial fisheries that export fish and fish products to the United States and that have been classified as either 'export' or 'exempt' based on the frequency and likelihood of incidental mortality and serious injury of marine mammals.

The entire list of these export and exempt fisheries, developed by reviewing the documentation provided directly by harvesting nations, is called LOFF.

The 2020 Draft LOFF

The 2020 draft LOFF identifies and classifies nearly 2,900 foreign commercial fishing operations, within 129 nations, that export fish and fish products to the United States based on the frequency of incidental and intentional mortality and serious injury of marine mammals in those fisheries.

The NOAA-NFMS will revise the List of Foreign Fisheries (LOFF) once before the expiration of the five-year exemption period and then every four years.

On 16th March 2018, the US has brought out the Final List of Foreign Fisheries under the MMPA. Based on the inputs provided by the Central Marine Fisheries Research Institute (CMFRI), MPEDA has furnished certain information in October 2017 on the fishing practices in India through the Department of Commerce. This has helped in bringing down the export fishery of India from 23 to 13.

However, National Marine Fisheries Service (NMFS) had then observed that there were shortcomings in the data submitted by India and as the result of which, it categorized the overall risk of the marine mammal by catch in India as 'High'. The NMFS while appreciating India's submission has remarked that they could not reclassify any of the India's export fisheries as the information was unclear on several counts.

Exempt fisheries & Export fisheries

Exempt fisheries are fisheries that have no known or a remote likelihood of marine mammal bycatch and are exempt from instituting a regulatory program.

Export fisheries are those fisheries with more than a remote likelihood of marine mammal bycatch or insufficient information available on marine mammal interactions.

Project to Assess Status of Marine Mammals

In order to address the information gap on the status of stocks of marine mammals as well as bycatch of sea turtles, India has launched a massive research project. The study, assigned to by the Central Marine Fisheries

Research Institute (CMFRI), will assess the status of 27 species of marine mammals and five species of sea turtles in Indian waters.

With a budget of ₹.5.66 crore (USD 0.77 million), the project is funded by the Marine Products Export Development Authority (MPEDA) for three years. It is being implemented with the technical support of NOAA.

"We are hopeful that with the assessment study and the protection measures in place in the country, India will be able to strongly advocate for seeking exemptions to its various fisheries under the US Marine Mammal Protection Act," said Mr. K.S. Srinivas, Chairman, MPEDA.

The research project is expected to bolster the preparedness of the country in meeting the challenge faced by the seafood export industry, and enhance the indigenous capacity to address the emerging conservation concerns of marine mammals and sea turtles. MPEDA has allotted advance amount of Rs. 1 Cr to CMFRI for initiating the study titled 'Assessment of marine mammals' stock and by-catch of marine mammals and sea turtles' in order to evaluate the comparability finding of marine mammal by catch in the Indian EEZ under MMPA act.

All nations must complete and submit their Comparability Finding application by March 1, 2021 in order to make Comparability finding determinations not later than November 30, 2021.

In addition to this, all exporting nations must provide a progress report to NMFS on their efforts to develop a monitoring and regulatory programmes comparable to the US regulatory program.

MPEDA has submitted the report to NOAA on 6th September 2019 before the revised deadline.

Marine Mammals in Indian Waters

Marine mammals and sea turtles play a key role in maintaining marine ecosystems. Considering the need for conservation, our Wildlife (Protection) Act 1972 listed the species of marine mammals and sea turtles under Schedule I.

However, interaction on fisheries and other human interventions have negative effects on their population and is evident from frequent reports on bycatch and stranding of these animals along the coastline of India. Of the 120 odd species of marine mammals found in the world, 30-35 cetaceans including one true freshwater dolphin one sirenian, the dugong, are found in the waters of the Indian subcontinent. Three species of otters are found in coastal habitats, estuaries and rivers in India.

US ban on wild-caught Indian shrimp

Though India is the largest supplier of farmed shrimp to the US in the world, the country has placed a complete ban on import of wild-caught Indian shrimp. Section 609 of the US Public Law provides that shrimp products should not be imported unless the US certifies that the exporting nation harvests wild caught shrimp without adversely affecting sea turtles. Consequently, the US banned import of shrimp from India from May 2018.

Beckoning All Seafood Lovers!!!

Seafood India Signature Stalls by MPEDA at Panampilly Nagar and CIAL is a treat for all seafood lovers

Pickled prawns, biriyanis, fish fingers, breaded crabs, Kerala-style fish curry… the list is pretty long. The 'Seafood India' signature stall by the Marine Products Export Development Authority (MPEDA) offers a wide range of export quality for the public.
If you are looking for a one-stop destination for all varieties of seafood products, this is the best place to be.

Seafood India is a first-of-its-kind initiative by the MPEDA. It is an exclusive arena in perfect ambience for the display and marketing of value-added seafood products of international standards. This includes ready-to-cook, ready-to-eat value-added products from exporters across India.

The first stall is situated at MPEDA Headquarters at Panampilly Nagar in Kochi, Kerala. Following overwhelming response from The 2nd Seafood India stall of MPEDA was opened at the Cochin International Airport. MPEDA is also planning to open another stall at the Aluva Metro station.

The objective of providing a unique space for showcasing value-added marine products is to explore the promotion of such products in line with changing preferences of the global consumer.

The traditional frozen seafood consignments from India are being imported by various Asian countries and re-exported as value added products to major markets. Therefore, India needs to emerge as one of the major suppliers of value added seafood to the global consumer, and create a brand image for quality, ready to consume seafood.


SEA SPARKLE
MACKEREL CURRY
Daily delight
759
Fully Cooked
breaded
squid rings
Buffet
FISH BIRIYANI
Daily delight
759
Fully Cooked
FISH TAPIOCA CAKES
(STUFFED WITH CHEESE SHELL)
TASTY NIBBLES
LIGHT MEAT TUNA
CHUNKS IN SUNFLOWER OIL
TASTY NIBBLES
LIGHT MEAT TUNA
CHUNKS
OCEANS SECRET
TUNA
SARDINES
KERALA FISH CURRY
Daily delight
759
Fully Cooked
TASTY NIBBLES
Buffet
peeled & deveined
jumbo prawns

SL NO	NAME	REMARKS
1	ABAD FISHERIES	EXPORTER
2	PARAYIL FOOD PRODUCTS	EXPORTER
3	HIC -ABF	EXPORTER
4	AMALGUM- BUFFET	EXPORTER
5	GADRE MARINE PRODUCTS	EXPORTER
6	RF EXPORTS	EXPORTER
7	SEAHATH CANNING COMPANY	EXPORTER
8	JUDE FOODS	EXPORTER
9	RGCA	SOCIETY, MPEDA
10	MATSYAFED	KERALA STATE COOPERATIVE
11	ICAR-CMFRI	RESEARCH INSTITUTE
12	ICAR-CIFT	RESEARCH INSTITUTE
13	NIFPHATT	TRAINING INSTITUTE

Establishing more outlets in various regions across India is one the prime visions of this initiative, which will help to promote the seafood production in the country and Improve quality of seafood products. The brand value of Seafood India will be enhanced by commencing more units in various regions.

Public will be benefited in getting an opportunity to buy good quality ready to cook products of their choice with reasonable price.

Seafood India has several satisfied customers across the city. One common characteristic that links all Seafood India customers is their preference for quality seafood.

Advocate Rashmi Varma, who has been a customer of the signature stall since its inception in 2018, has this to say: "I have been a regular customer of Seafood India Panampilly Nagar store since the very beginning. I mainly purchase frozen fish and seafood varieties, which are freshand of high quality. Value-added seafood products like breaded crab and fish fingers from Seafood India are the most-loved snacks at my home. My family always insists on purchasing seafood products from MPEDA's store."

SEAFOOD INDIA TIMELINE

• The Signature stall of MPEDA was inaugurated on December 2018, by Mr. Suresh Prabhu, the Hon'ble Minister of Commerce, Industry and Civil Aviation, Government of India

• The first Sale from the Seafood India was inaugurated by Mr. K S Srinivas IAS, Chairman of MPEDA, on December 17, 2018 by handing over the seafood products pack to Mr. Siva Prasad, MIG residential association president

• Students from Assam of the interactive fish comparison exhibit

• School Students from Tamil Nadu visiting the stall

• Students from Government Vocational Higher secondary school Narakkal enjoying the exhibition

• SEAFOOD EVENING BY SEAFOOD INDIA February 3, 2019

• The Seafood India @ CIAL was inaugurated on October 3rd 2019, by Mr. V J Kurien IAS, Managing Director CIAL in the presence of Mr. K S Srinivas IAS, Hon'ble Chairman of MPEDA

• PRODUCTS EXHIBITED IN COCHIN FLOWER SHOW 2020

• SEAFOOD INDIA STALL@IISS 2020

• Home Delivery started on July 21, 2020

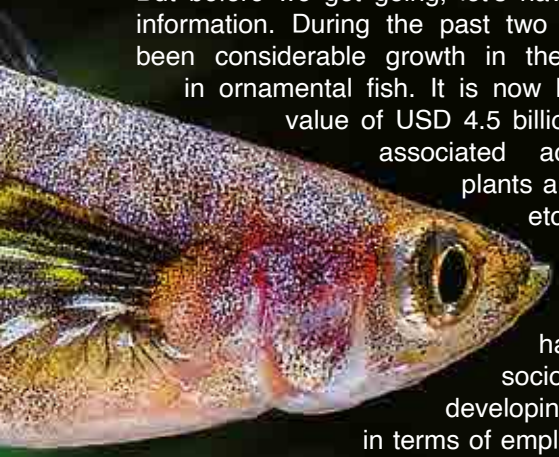
RAINBOW IN A BOWL

Story of the Splashing Colours

By **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.

Everybody loves a splash of colours in their lives and homes. That makes, ornamental fish keeping very popular across the world. This column will deal with some of the popular species in ornamental fisheries.



But before we get going, let's have some background information. During the past two decades, there has been considerable growth in the international trade in ornamental fish. It is now having an estimated value of USD 4.5 billion while the trade in associated accessories (aquatic plants and aquarium gadgets etc) is estimated at an additional USD 7 billion. Growing in popularity, the trade has contributed to the socio-economic benefit of developing countries in Asia, in terms of employment opportunities and foreign exchange earnings. Although there is very little data on the volume of the ornamental fish trade, a conservative estimate suggests that at least 200 million ornamental fishes are traded globally currently.

Precisely because of their visual appeal and adaptable nature, gold fish *(Carassius auratus)* and Koi carp *(Cyprinus carpio)* are widely traded. According to trade sources, the most popular species that are in demand worldwide are neon and cardinal tetras *(Paracheirodon innesi and P axelrodi)*, guppies *(Poecilia reticulata)*, platy *(Xiphophorus maculatus)*, swordtails *(X helleri)*, Siamese fighting fish *(Beta splendens)* angelfish *(Pterophyllum scalare)*, cat fishes *(Corydoras)*, rasbora *(Rasbora daniconis)*, barbs *(Capotea spp)*, danio *(Brachidanio sp)*, gourami *(Colisa spp)*, loaches *(Botia spp)*, and molly *(Poecilia sphenops and Platipinna)*.Today, we will be talking about the guppy or Poecilia reticulate. Among all tropical fishes, guppy is considered to be the most popular as they are beautiful, easy to breed and maintain, even for a beginner in the hobby. They are also known as million fish as they are prolific breeders.The colour pattern shows considerable variations. Depending on the variations in the tail fins, they are known as round tail, spear tail, fan tail, veil tail, pin tail etc. Guppies are able to tolerate crowding, accept wide fluctuations in temperature, water hardness, pH and salinity and are not so expensive.

Guppies show sexual dimorphism. Males are brightly and stunningly coloured.The species was introduced to mankind Rev Robert Guppy became the first person to genetically produce new variations of this tiny fish found in Trinidadian streams in 1866. As a result of hybridization among different varieties and selective breeding, no two males appear to have exactly the same markings and it is this extreme variability of colour and finnage that is responsible for selective breeding.

The ideal temperature for breeding ranges from 23.5 to 25.5 oC with medium hard to very hard and alkaline water with pH ranging from 7.0 to 8.5. Depending on the temperature of the water, the female can reproduce every 25-90 days. However, it is noticed that generally higher the temperature, the faster the rate the female matures the eggs.

On an average, 10-25 fry will be produced initially and as the female matures the number of fry can be ranged from 40 to 100 in a healthy female. They are omnivorous and will take small live and frozen foods and also flake foods.

There are over 40 varieties of guppies being marketed at present. Guppies commonly called rainbow fish due to the numerous colour patterns on the tail and body, originated from Central America to Brazil and West Indies.

Thus begins, the story of colours in your bowl. There is more to come. Keep watching this space.

Efforts on to revive Suchitwa Sagaram

Plastic waste pollution and its impact on marine life and the human food chain is a globally identified potential health hazard. Kerala generates around 450 tons of plastic per day and only a small portion of it gets recycled. More than 70 per cent of it ends up in the sea. According to Suchitwa Mission, on average, a family in the state generates 60 grams of plastic waste everyday.

The role played by plastic waste in worsening the back-to-back floods in the state pushed authorities to focus on the issue. Unfortunately, a large chunk of waste ends up in streams and rivers, until it is discharged into the sea causing pollution. A team of NGOs, as part of a special initiative, conducted a sea-diving drive on Kovalam beach and scooped up around 71kg of plastic debris. Bottles, caps, food packets, sanitary products, ghost nets and other discarded items were found among the debris. Likewise, in the past three years, fishermen who venture into the sea have brought back tons of plastic waste to the harbour at Shakthikulangara in Kollam as part of Suchitwa Sagaram -- an initiative of the state government. The waste is then segregated, shredded, auctioned and used for road construction.

A hopeful project

Despite spending `2.5 crore over two years on anti-plastic waste campaigns, the state government has failed to reduce plastic pollution. Now, the government has come up with an Integrated Coastal Zone Management Project (ICZMP), which is funded by the World Bank and primarily aims at removing marine litter and ghost nets from the coasts of Kerala. The `280-crore project will be implemented along a 175-km-long coastal stretch, covering Kasaragod, Kannur, Malappuram and Kozhikode, over a period of four years.

"The World Bank has approved the detailed project report and even sanctioned `30 lakh for setting up the state project implementation unit. We will begin implementing the project from next month. Besides the four years to implement the project, the World Bank will monitor the initiative for four more years to ensure the initiative is sustainable," said P. Kalaiarasan, additional project director, Kerala Centre for Integrated Coastal Management (KCICM). Kerala State Coastal Area Development Corporation (KSCADC) will be the nodal agency for the project.

He said the state will chip in with 20 per cent of the total project cost. "Fifty per cent of the fund will be provided by the World Bank and 30 per cent by the Centre. We have listed 74 activities as part of the project and will implement it with the help of various government departments. The primary aim is to minimise the quantum of plastic pollution in the sea by collecting it manually and recycling it," said P. Kalaiarasan. He also said that around 25 nautical miles of the sea, which falls under the CRZ area, will be cleaned up. Abandoned, lost and discarded fishing gear (ALDFG) or ghost net is another major concern that needs to be addressed.

Efforts on to revive 'Suchitwa Sagaram'Ever since Suchitwa Sagaram scheme's launch in 2017, fishermen have collected around 70 tons of plastic waste from the ocean. However, the project has been facing setback because of fund crunch. According to Krishnan B T V, chief engineer, harbour engineering department, the fund crunch issue has been resolved. "A London-based NGO has promised funds for running the project. Also, the government recently released `25 lakh for the purpose.We had to stall the project due to the pandemic," said Krishnan. Around 40km of rural roads have been laid using plastic waste collected from the sea, he added. The project is implemented by various departments, including harbour engineering, fisheries, local body, and other agencies like KSCADC, Suchitwa Mission, NETFISH, MPEDA and Kerala State Fishing Boat Owners Association.

Objectives of ICZMP

- Protection of environment through effective waste management
- To bring down the amount of plastic waste in the sea
- To save aquatic life from various plastic pollutants

Various plastic pollutants

- To make the beaches litter free
- To convert plastic waste into useful commodity

Issues caused by marine plastic waste

Over 300 million tons of plastic waste are produced every year At least eight million tons of plastic end up in the ocean every year and make up for 80 per cent of all marine debris. Marine species ingest or get entangled in plastic debris.

Marine wildlife like seabirds, whales, fishes and turtles mistake plastic waste for preys and end up dying of starvation as their stomachs are filled with plastic debris.

Floating plastic in the ocean also contributes to the spread of invasive marine organisms and bacteria, which disrupts the ecosystem.Plastic waste threatens food safety and quality, human health, coastal tourism etc.

Reasons for plastic waste accumulation in water-bodies

- Lack of awareness Lack of enforcement Lack of facilities
- Low value for scrap and recycled plastic Lack of recycling facilities

- www.newindianexpress.com

Aquatic Quarantine Facility gets biggest consignment from US

For the first time since its inception in 2009, the Aquatic Quarantine Facility (AQF), a premier institution of RGCA-MPEDA, received 3,600 Vannamei (Whiteleg shrimp) broodstock imported by India's shrimp hatchery operators from Hawaii, USA, providing a firewall against the entry and spread of pathogens in animals through rigorous quarantine measures during the COVID-19 pandemic.

The import of broodstock, which came as a single consignment from a single source, was facilitated by a chartered flight by six hatchery operators on June 4. The broodstock was quarantined for five days and handed over to hatchery operators with 97.12 per cent of survival on June 8.

MPEDA Chairman K. S. Srinivas said all the broodstock were confirmed their SPF status by the screening of OIE standards set by the World Organisation for Animal Health and non-OIE- listed pathogens."Although the broodstock arrived at the airport 10 hours later than the scheduled time, the strict bio-security protocol followed in the AQF ensured their successful quarantining and secured the high survival percentage," he said.

The brooders were brought through cargo flights instead of passenger flights and the animals were under severe stress due to long travel time.

"However, the dedicated and positive efforts of AQF team ensured better survival of the brooders during difficult times of quarantine, and such an initiative was highly appreciated by the hatchery operators and farmers," he said.

www.newindianexpress.com

New fish species discovered in Arunachal

A new species of fish has been discovered in the Northeastern state of Arunachal Pradesh.

The new species was discovered by Dr. Keshav Kumar Jha, who has named it as *Schizothorax sikusirumensis*, after the rivers - Siku and Sirum in East Siang District at the junction, from where it was found.

Jha also serves as an associate professor and current head of the Department of Zoology at Jawaharlal Nehru College in Pasighat.

It may be reminded that last year, Fisheries and Aquatic ecology research team led by prof. DN Das from Rajiv Gandhi University (RGU) discovered five species of fish from the state.

These species include the Mystus prabini (discovered in Sinkin and the Dibang rivers in Lower Dibang Valley district); the Exostoma kottelati (discovered in the Ranga river in Lower Subansiri district); the Creteuchiloglanis tawangensis (discovered in the Tawangchu river in Tawang district); the Garra ranganensis (discovered in the Ranga river); and the Physoschistura harkishorei (discovered in the Dibang and the Lohit rivers in Lower Dibang Valley district).

www.nagalandpost.com

MPEDA comes to aid production of Kerala's most popular fish

Production of one of Kerala's most popular fish varieties, the Karimeen (Pearl Spot), on Friday got a huge boost with the Marine Products Export Development Authority developing facilities for its commercial scale breeding and seed production.

The facility at the Multispecies Aquaculture Complex at Vallarpadam here will offer a lucrative alternative to fish farmers to grow it round the year.

In 2010, the Kerala government had declared 'Karimeen' as the 'State Fish' to protect it from over-exploitation.

Karimeen has always been much in demand fish, especially among the foreign tourists, and the most popular tourist destination at Kumarakom is known for its availability from the Vemband lake.

It shot into global prominence after the Prime Minister Atal Bihari Vajpayee spent his Christmas holidays at Kumarakom two decades back.

At Kumarakom, a kilogram of Karimeen costs Rs 600 and upwards.

MPEDA Chairman K.S. Srinivas, while inaugurating the sale of first batch of Karimeen seed produced from MAC, said the commercial production would enable farmers to get good quality seeds throughout the year and enhance the production of the fish in the state.

"The production of Karimeen should be substantially boosted in order to make it a candidate species for export. Nowadays, the farmers are mainly depending on wild caught seeds for culture. Too much dependency on the seeds from the wild will lead to over-exploitation. To overcome this, MPEDA has developed facilities for commercial-scale breeding and seed production at MAC," he said.

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Oceans are central to the future. Manage them wisely | Opinion

The ongoing pandemic has cruelly reminded us of the need for partnerships that transcend boundaries in order to solve global challenges. This is more than ever true for the challenges facing our oceans. India and Norway recognise this today in our celebration of World Oceans Day. Only by respecting (samman in Hindi) our ocean spaces together (sammen in Norwegian) can we benefit from its full potential today and in the future.

Our oceans hold the world's longest mountain ranges and deepest canyons. They give us oxygen and regulate the climate. Almost half of the world's inhabitants depend on the oceans for food and employment, and the figures are increasing. In only 30 years, the global population may be close to 10 billion people. The world will look to the oceans for food, jobs, energy, transport, raw materials, medicines and economic growth to be able to sustain a population of this magnitude.Our oceans are already under tremendous pressure. There is an urgent need for concerted action to ensure a more sustainable and integrated approach in years to come. India and Norway have joined forces to tackle some of the most pertinent questions related to this balance between exploitation and preservation.

The ocean industries — offshore energy, maritime transportation, seafood and newer industries — constitute the backbone of the Norwegian economy. They provide significant opportunities for prosperity and employment for both our countries on the path to recovery after the pandemic. Norwegian businesses recognise the vast potential of the Indian blue economy industries, and can offer important competence. India and Norway are ready to pursue new commercial partnerships in a range of sectors, such as sustainable shipping, aquaculture and renewable energy.

India has launched an ambitious Deep Ocean Mission last year which over a five-year span will explore the deepest recesses of the Central Indian Ocean Basin, look at harnessing tidal energy and study the oceans' biodiversity, metals and minerals.In order to fulfil the potential of the blue economy also for future generations, we must ensure that our oceans are safe, clean and healthy. Neither of our countries has always got the balance right between exploitation and protection. In the long run, it is, however, clear that what is good for the ocean environment is also good for ocean business.

A recent "blue paper" commissioned by the high-level panel for a Sustainable Ocean Economy makes the case for integrated ocean management for achieving a sustainable ocean economy. The longstanding scientific partnership between India and Norway regarding ocean research has been strengthened with the launch of a Joint Initiative on Integrated Ocean Management between our two countries in February. We are currently exploring how we can share experiences, research and technology in this field.

Marine litter is an environmental issue that represents a significant risk for the blue economy as well as for marine life itself. We are concerned by reports that there could be more plastic than fish in our oceans by 2050. Fortunately, we have the knowledge and technology to solve this problem. Both India and Norway are taking great strides in the right direction. India, for example, has ambitions to phase out single-use plastic by 2022. We have established a Joint Marine Pollution Initiative, which is taking advantage of our respective strengths in waste management, marine research, business and technology in order to learn from one another and implement best practices.

Litter does not respect national boundaries; so this is another challenge that demands global solutions. Our two ministers of environment have, therefore, jointly committed to supporting global action on plastic pollution. We are exploring the feasibility of establishing a new global agreement in order to manage the responsibility of the world, for the common challenges on marine litter.

India and Norway are both strongly committed to achieving ambitions set in the Sustainable Development Goals (SDGs). This is our common global framework. Much work remains to be done in order for us to reach SDG 14 — Life Below Water. Success related to this goal will, however, facilitate progress in other SDGs such as ending poverty and hunger and ensuring good health. Cooperation between a variety of stakeholders is key to achieving all the SDGs — at the national, bilateral and multilateral levels — on land and at sea.

On this World Oceans Day, we are proud to affirm a solid partnership between India and Norway on our journey towards oceans that are both wealthy and healthy. We learn from each other about the oceans themselves, the technologies to master its resources, and the action needed to increase sustainability. An added value is an increased understanding of each other's countries and our culture, heritage and language. These are important cornerstones in any good relationship. The Indo-Norwegian ocean partnership aims to deliver siger (victory) for our sagar (oceans) through respect (samman) together (sammen).

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Sustainable development is key to enhancing competitiveness in fisheries sector: Fisheries Secretary

Sustainable development is key to increasing the competitiveness in the fisheries sector and reducing post-harvest losses in fisheries to less than 10 per cent is extremely important, said Rajeev Ranjan, Secretary, Department of Fisheries.Speaking at FICCI webinar on 'Developing Competitiveness in Fisheries Sector', Ranjan said, "Per capita consumption in India is substantially low in fisheries compared to global levels. Therefore, development of the domestic market and increasing per capita consumption needs a focused approach."

"Investment in fishing harbours, value addition and promotion of Mariculture will boost the sector," he added.

Speaking on the same, Venkat R Nekkanti, Managing Director, Nekkanti Sea Food, said, that the country has set an ambitious fish production target of 22mn MT by 2025 which signifies adding 10mn MT in the next 5 years.

"On the demand side, it is imperative to widen the domestic consumption base with a strong thrust on value-added products," he added.

He also stressed that we took 35 years to add the last 10mn MT production and it is time to do meticulous planning.

"Sustainable practices coupled with emphasis on Fishtech & requisite infrastructure augmentation along with domestic market development is the key to boost the fisheries sector." said Shashikant Singh, Director, Agriculture & Natural Resources, GRID, PwC.

Highlighting the need to promote sustainable models in this sector, Devleena Bhattacharjee, Founder & CEO, Numer8 Analytics said, "Development of efficient supply-chain, controlling wastages and building strong traceability mechanism in partnership with private sector, is crucial for future growth of fisheries sector."

She further asserted that sustainable fishing practices should be promoted and subsidies should be awarded to farmers adhering to sustainable fishing methods.

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India's marine fish production records marginal increase

India's marine fish production registered a marginal increase of 2.1 per cent in 2019 compared to the previous year, according to the figures released on Tuesday by the Central Marine Fisheries Research Institute (CMFRI).

The CMFRI report says the country recorded 3.56 million tons in total landings from across the coasts during 2019, with Tamil Nadu grabbing the first position in the landings with 7.75 lakh tons. It was followed by Gujarat with 7.49 lakh tons and Kerala came at the third position with 5.44 lakh tons.

A highlight of the report was a commercially unimportant fish -- redtoothed triggerfish -- which became the most landed resource of 2.74 lakh tons.
This fish has been in little demand in the domestic markets and is mostly caught for the purpose of feed mills.

The Indian mackerel, which was in the first spot in 2018, suffered the highest setback with its landings declining by 43 per cent in 2019.The second highest landing was the ribbon fish with 2.19 lakh ton catch, followed by penaeid prawns -- 1.95 lakh tones and non-penaeid prawns --1.80 lakh tons.

The study also pointed out that as many as eight cyclonic storms in and around India, of which six of them turned out to be severe, affected the fishing calendar days more adversely on the west coast of the country.

It also found out that Kerala suffered a significant drop of 15.4 per cent in the marine fish landings during 2019, with a sharp decline in the catch of oil sardine and Indian mackerel.

While oil sardine dropped to a meagre 44,320 tons, the lowest catch in two decades, the Indian mackerel with 40,554 tons experienced a steep decline of 50 per cent .
The estimate of the value of marine fish landings based on price at landing centres across the country during 2019 was Rs 60,881 crores with 15.6 per cent increase over 2018.

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