English Monthly from Hyderabad, India

RNI Regn. No. 52899/93

# Aqua International

Estd. 1993

Health • Nutrition • Management • Processing

April 2023

Annual Subscription: Rs 800 Foreign $ 100

Inside...




Registered with Coastal Aquaculture Authority (CAA) as Antibiotic-free inputs.

*Quality Inputs - Quality Management... Towards Sustainable Aquaculture!!*

**SRIBS BIOTECHNIQS PVT. LTD.**

302, Wing-A, Cello Triumph, I.B.Patel Road,Off Western Express Highway, Goregaon East, Mumbai 400063, Maharashtra, India. Phone: +9122 2686 1441/ 2685 1442

Email: info@sribsbio.in • Web: www.sribsbio.in

SRIBS sustainability simplified®

# SDC Solutions for optimizing your Aquaculture business performance

**HEALTHY ANIMALS, HEALTHY FOOD, HEALTHY WORLD**

## Pervic-A™


**Ultimate high level Disinfectant**

## SDC Biobac-N®


**Water & Soil Probiotic**

## ODOCLEAR-A40®


**Natural protection for super natural growth**

**For Details Contact:**

**SDC AGRO-VET (INDIA) PVT. LTD.,**

#103 & 104, SDC HOUSE, D. NO. 12-13-97, Tara Tycoon,Tarnaka,
SECUNDERABAD-500 017. T.S. INDIA.
Ph: +91-40-27006075, Fax : +91-40-27006076.
email : info@sdcagrovet.com www.sdcagrovet.com

An ISO 9001 : 2015 Certified company

SDC Products Registered with CAA as Antibiotic-free product


biomed
FEED SUPPLEMENT
BioPhage-V
War of Virus over Vibriosis
First of its Kind
Phage Technology
For Vibrio Bacteria
In Liquid Form
Targets Specific
Vibrio Species
Vibrio Harvey
Vibrio Campbelli
Vibrio Alginolyticus
Vibrio Anguillarum
Vibrio Parahaemolyticus
New Product
GRAND LAUNCH
20th March 2023
Make Your Farm
Vibrio Free
biomed
Product By:
Biomed Techno Ventures
# 54-9-17, Plot No. 1 &2, Block F XIX, 100 Feet Road,
Jawahar Autonagar, Vijayawada - 520 007.
biomed vja@gmail.com
biomed.org.in

GENTLE®
LEADING THE WAY

## Gentle Bio-Sciences Pvt. Ltd.

*Founded by group of People having over 2 decades of experience in Animal health care industry.*

*"A trusted brand in aquaculture industry since 10 years."*

CELEBRATING 10 Years OF EXCELLENCE

CARING ANIMAL HEALTH


Unique & Innovative Products For "Sustainable Aquaculture"

# Gentle Bio-Sciences Pvt. Ltd.

ISO 9001:2015 CERTIFIED COMPANY

**Regd. Off:** Unit No.7, V.S.P.Homes, Road No.3, Madhavapuri Hills, Hyderabad-500 050. Telangana.
E-mail: info@gentlebio.in

**Mktg. Off:** # 7-616/3, Plot No. 2, Aananda Nilayam, Flat No. 201, 2nd Floor, KCP Colony, Bandar Road, Kanuru, Vijayawada,AP -520007.
Ph : 0866 2452345

www.gentlebiosciences.com

Excellence! Everyday In Every Way!!


Spiral Stopper


Bevel Gear Box


2 HP Motor


Spiral


Worm Shaft & Wormwheel


Spiral [Helical] Gear Box

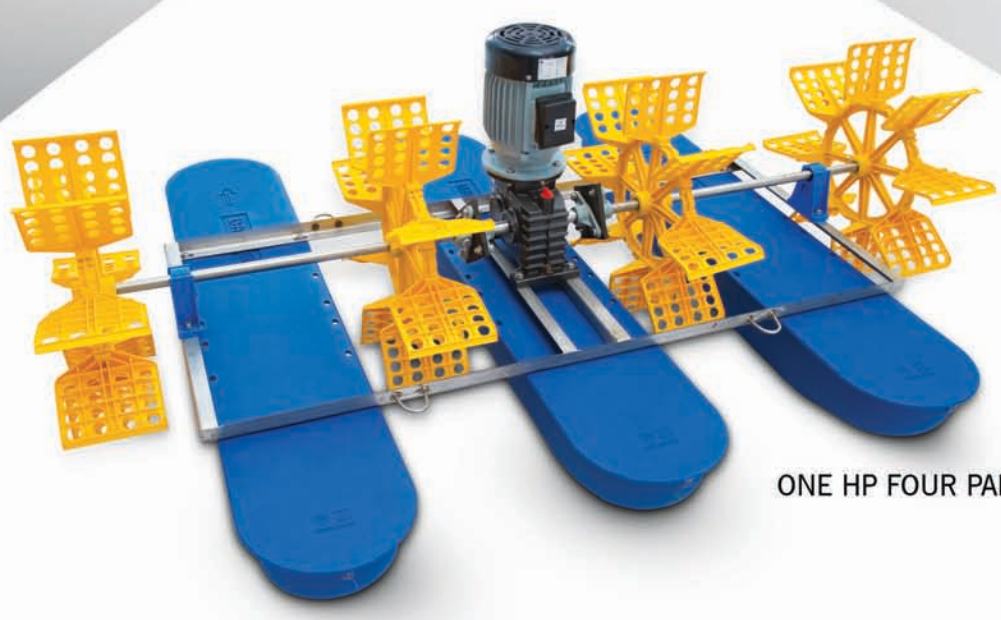

1 HP Gear Box


Paddle Wheel


Long Arm Gland


2 HP Gear Box


2 HP Out Put Shaft


ONE HP FOUR PADDLE WHEEL AERATOR

1 HP Two Paddle - 2 HP Four Paddle - 2 HP Six Paddle

High Productivity - Excellence Performance - Easy Installation - Low Maintenance - Long Life

# Nandini Gears™

www.nandinigears.com - nandinigears@yahoo.co.in

M : +91 98422 43447


Bearing Stand For Spiral


Spiral Gear Box Movable Joint


Long Arm Gear Box


Movable Joint


Paddle


Float


1 HP Motor


2 HP Motor


HDPE Cover

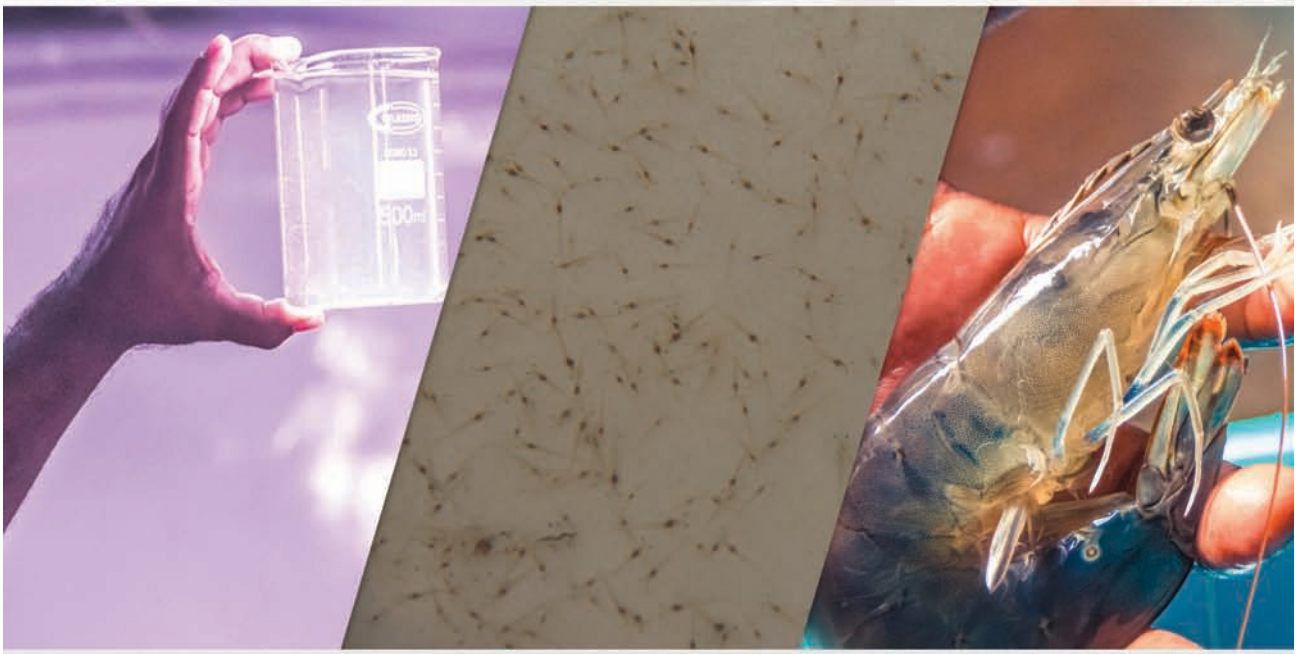

TWO HP SPIRAL AERATOR

QUALITY IS OUR MAIN CONCERN

10th 2008-2018
Harvesting Dreams Year after Year

GOLDEN MARINE HARVEST
GMH
INDIA

The *BEST* You Can Get



*L.Vannamei

"Satisfaction is a Rating
Loyalty is a Brand"

BEST AQUACULTURE PRACTICES CERTIFIED
Cert. No. H10305
www.bapcertification.org

The Responsible
Seafood Choice

"A Thankful Receiver
Bears a Plentiful Harvest"

Corporate Office

GOLDEN MARINE HARVEST
Valathamman Koil Street
Chettikuppam
Marakkanam
District : Villupuram
Tamil Nadu, India

GOLDEN WHITE PRAWNS
Valathamman Koil Street
Chettikuppam
Marakkanam
District : Villupuram
Tamil Nadu, India

GOLDEN MARINE HARVEST
Thoduvai Village, Kooliyar
Thirumullaivasal
District : Sirkazhi
Tamil Nadu, India.

GUJARAT GOLDEN MARINE
Survey N0- 312
Velan – 362720
District – Gir-Somnath
Gujarat, India

Email : info@goldenmarine.in
Website : www.goldenmarine.in

Contact : +91 99944 35858
FOLLOW US ON facebook Golden-Marine-Harvest GMH



# Aqua International

English Monthly Magazine
(Established in May 1993)

Volume 30 Number 12 April 2023

**Editor & Publisher**
M. A. Nazeer

**Editorial & Business Office:**
**AQUA INTERNATIONAL**
NRS Publications,
BG-4, Venkataramana Apartments,
11-4-634, A.C.Guards,
Hyderabad - 500 004, India.
Tel: 040 - 2330 3989, 96666 89554
E-mail: info@aquainternational.in
Website: www.aquainternational.com

**Annual Subscription**
India : Rs. 800
Foreign Countries : US $ 100
or its equivalent.

Aqua International will be sent to the subscribers in India by Book Post and to the foreign subscribers by AirMail.

Edited, printed, published and owned by M. A. Nazeer and published from BG-4, Venkataramana Apts., 11-4-634, A.C.Guards, Hyderabad - 500 004, India. Printed at Srinivasa Lithographics.
Registered with Registrar of Newspapers for India with Regn. No. 52899/93. Postal Regn. No. L II/ RNP/HD/1068/2021-2023.


Views and opinions expressed in the technical and non-technical articles/ news are of the authors and not of Aqua International. Hence, we cannot accept any liability for any loss or damage arising from the use of the information / matter contained in this magazine.

- Editor



NRS PUBLICATIONS
www.aquainternational.in


## CONTENTS



## ADVERTISERS' INDEX



**Subscriptions for Aqua International, English monthly, should be sent to:**
The Circulation Department, Aqua International, BG-4, Venkataramana Apartments, 11-4-634, A.C.Guards, Near Income Tax Towers, Hyderabad - 500 004, India. Email: info@aquainternational.in

FAMSUN

Integrated Solution Provider

# Vacuum coater

## Exceptional design & Flexible operation

Vacuum coater for the application of oil or fat, pigments, flavors, functional improver, vitamins, etc. onto pellets after drying and/or cooling. Aquafeed and pet food in particular.


**FAMSUN Co., Ltd.**

Add: No.1 Huasheng Road, Yangzhou, Jiangsu, China 225127
T:+86-514-87848880
E-mail:mypublic@famsungroup.com
www.famsungroup.com

**India Office**

Add: No 401 , Dega Towers , Raj Bhavan Road , Somajiguda , Hyderebad , Telangana - 500082
T: +62-21-30027458; 30027459
Contact: Arun Kumar K
E-mail : arunkumar@famsungroup.com
Mob: +91 9901916554

Contact: Shelby
E-mail: lxb@famsungroup.com
Mob: +91 9100436652

# *Minister Rupala told the stakeholders to ensure 50 to 60% of shrimps produced in the country sold in the domestic market*

*Adulteration in food can be broadly classified into two groups, namely, intentional and incidental food adulteration. Apart from the economic problems, they may also lead to very serious health problems for the ones who consumed the adulterated products. In recent years, very sophisticated methods have been used for adulteration of foods to minimize the detection levels. Hence, reliable and very efficient procedures and techniques should be developed for the detection of fraudulent manipulations.*

The April 2023 issue of Aqua International is in your hands. In the news section you may find news about ...

**The event VIV Asia 2023** delivered a dynamic, expansive marketplace to the large attendees which featured Feed to Food products and services from more than 1,186 global manufacturers and suppliers representing over 57 countries. The expo concluded successfully, as a robust platform for B2B international business. Over three days, 8-10 March 2023, the show facilitated face-to-face interactions, networking, knowledge-sharing and a lively marketplace at Bangkok, Thailand. According to a note from the organizers, with 47,527 visitors from 112 countries, the event maintained its stable attendance and even slightly exceeded the previous edition. Despite the global circumstances and the past three long years of Covid-19 restrictions, the show's international appeal for the Feed to Food industry remained evident, confirming its significance as a World Expo.

Aqua International editor M.A. Nazeer, participated in the event and interacted with global experts, entrepreneurs and exhibitors.

**Union Minister for Fisheries, Animal Husbandry and Dairying** Mr Parshottam Rupala called the aquaculture sector stakeholders to ensure enough supply of shrimp in the domestic market. He said that most of the shrimps produced in India is being exported. The stakeholders should ensure that 50 to 60% of shrimps produced in the country is sold in the domestic market. The Union Minister was launching National Surveillance Programme on Fish Diseases Phase 2 and Genetic Improvement Programme of Indian White Shrimp (PanaeusIndicus) at the Central Institute of Brackishwater Aquaculture (CIBA), Chennai.

**Andhra Pradesh is focusing more on aquaculture industry** which is a rapidly growing sector in the country. It also provides significant economic benefits for the state. Andhra Pradesh plays a vital role in country's seafood exports, ranking first in production of fish and shrimp, besides eggs. It stood on top in marine exports in the fiscal year 2021-22. While the state is gearing up for the Global Investors Summit on and G20 Summit on March 28 and 29 in Vizag, the government has been showcasing its advantages in the farming sector. The state has favourable climatic conditions and ample water resources, besides a long coastline of 974 kms for aquaculture. Around 1.38 lakh farmers are involved in aquaculture in 2.12 lakh hectares in Andhra Pradesh. As many as 111 cold storages store 2.27 metric tonnes of aqua products. The government is now providing subsidised power to aqua farmers cultivating in areas of less than 10 acres falling under aqua zones, with about 26,000 power connections currently receiving the benefit.

**According to data provided by the Union government in Parliament** the total fish production in the country was 162 lakh metric tonnes in 2021-22. According to the state fisheries department, fish production in Gujarat in 2021-22 was 8.74 lakh tonnes, about 5% of the country's fish production. In 2021-22, production in the state was 6.88 lakh tonnes of marine fish and 1.86 lakh tonnes of inland fish, for a total of 8.74 lakh tonnes.

*Contd on next page*

NRS GROUP

Aqua International

## *Our Mission*

*Aqua International* will strive to be the reliable source of information to aquaculture industry in India.

***AI*** will give its opinion and suggest the industry what is needed in the interest of the stakeholders of the industry.

***AI*** will strive to be The Forum to the Stakeholders of the industry for development and self-regulation.

***AI*** will recognize the efforts and contribution of individuals, institutions and organizations for the development of aquaculture industry in the country through annual Awards presentation.

***AI*** will strive to maintain quality and standards at all times.

TALK TO US

SEND AN EMAIL:

info@aquainternational.in

Please do not send attachment.

FOLLOW US:

facebook.com/aquainternational.nrs

twitter.com/nrspublications

***Send a letter:*** *Letters to the Editor must include writer's full name, address and personal telephone and mobile numbers. Letters may be edited for the purposes of clarity and space. Letters should be addressed to the Editor:*

**AQUA INTERNATIONAL,** BG-4, Venkataramana Apartments, 11-4-634, A.C.Guards, Near Income Tax Towers, Masab Tank, Hyderabad - 500 004, T.S, India.
Tel: +91 040 - 2330 3989, 96666 89554. Website: www.aquainternational.in

**Vaccine maker Indian Immunologicals Ltd** said it has entered into a partnership with Bhubaneswar-based Central Institute of Freshwater Aquaculture (CIFA), an Indian Council of Agricultural Research (ICAR) institute, for the commercial development of a freshwater fish vaccine against Hemorrhagic Septicemia. Also called Aeromonas Septicemia, Ulcer Disease or Red-Sore Disease, Hemorrhagic Septicemia is an infection caused by Aeromonas Hydrophila, an opportunistic pathogenic bacterium, in freshwater fish. All the cultured freshwater fish species in India like Rohu, Catla, Mrigal, Silver Carp, Grass Carp, Common Carp, Medium Carp, Channel Catfish and Eel are susceptible to this disease, which is the scourge of fresh and brackish water fish farming worldwide and has emerged as a significant economic problem in Indian aquaculture over the past few decades, IIL said. Pointing out that over the years, antibiotics and chemo-therapeutants have been used for controlling bacterial diseases, including a Hydrophila, IIL pointed out that bacterial pathogens have now become resistant to these chemicals due to use over an extended period with some chemicals also posing environmental health hazards which is why vaccination has emerged as the most promising and environmentally safe option for disease control in fish.

**Experts have discussed the need for diversified aquaculture** with better management of ponds and rearing of fish varieties in demand. Farmers, researchers, officials and scientists from the State and Central government organisations exchanged views on various aspects of aquaculture at 'Fish India 2023' conclave organised by the Society of Aquaculture Professionals (SAP), here on Saturday. SAP president Arul Victor Suresh said more than 200 delegates from different States and foreign universities, consultants and heads of various companies attended the event. Founder president, SAP, S. Sanathanakrishnan said that stakeholders of aquaculture discussed various issues related to feed supply, hatchery and pond management. S. Kandhan, Director, Rajiv Gandhi Centre for Aquaculture (RGCA), a research wing of the Marine Products Export Development Authority (MPEDA), spoke on 'Seed quality for successful seabass farming'. He explained the rising demand for seabass in the market. Prof. Dominique Bureau of the University of Guelph, Canada, gave a presentation on 'Making precision fish farming in Asia with latest technology'. Principal Scientist, Central Institute of Brackishwater Aquaculture, R. Jaya Kumar, farmer and Aquaculture Outlook editor Jaideep Kumar and others spoke.

**Abdul Rahaman Ilyas from India,** who has been appointed as advisor to the Academy of Scientific Research and Technology (ASRT) of the Arab Republic of Egypt, said that they wish to develop a focussed collaboration with the Andhra Pradesh government with regard to aquaculture, besides pharma, drones, and commodities. Ilyas said that Egypt has set up the world's largest aquaculture farms of about 8,000 hectares and plans to introduce vannemi shrimp farming in Biofloc. "In Egypt, they are facing some difficulties and there is an opportunity for Andhra Pradesh exporters to develop a Business to Business (B2B) collaboration," he said, adding that couple of proposals are under consideration, which will be discussed for implementation with a Joint Venture and ASRT will take up pilot programmes. Dr Amr FaroukhAbdelkhaik, Vice President, ASRT said they have been working through Dr Abdul Rahman Ilyas in mapping right partners, companies and models of replicable value that fit well to Egyptian context.

**Skretting is a global leader in providing innovative and sustainable** nutritional solutions and services for the aquaculture industry working closely with shrimp and fish farmers. Skretting has 30 production facilities in 18 countries on five continents and manufactures and delivers high-quality feeds from hatching to harvest for more than 60 species. The total annual production volume of feed is more than 3 million tonnes. It is headquartered in Stavanger Norway and it employs 4,000 people. Its team of more than 140 employees is dedicated to Innovation that works on the core competencies of nutrition, feed production and health for aquaculture. Skretting India is a subsidiary of Skretting and is headquartered in Hyderabad. It started in India in 2018, recognising the Indian sub-continent and Asia's critical role in fulfilling the purpose of Feeding the Future. India is among the top 2 producing countries with shrimp exports and the industry is expected to grow at 8-9% per annum.

**Shrimpculture is developing well in Ersama**, Paradeep and Jagatsinghpur coastal area in Odisha, which was heated by SUPER CYCLONE in the year 1999. At that time it was declared that the area with high risk zone. Near about 30,000 people lost their lives and atleast two lakh people were affected with loss of property, food, shelter and livelihood by the Super Cyclone -1999. Time changed due course of progressive work from Govt and Non Govt sector and organization, now this area is well developed and rised as an Aquaculture and Fishery potential zone in Odisha economic map. About 40 to 50% of total Fish and Shrimps production and exports of Odisha is happening from Ersama and Paradeep areas. Looking at the business and aquaculture growth potential the commercial and technical professionals working for different companies join together time to time, discuss the issues with the farmers and other stakeholders, and are providing technical support to the local farmers for the past one decade and trying to make sustainable aquaculture development in the area.

In the Articles section – **Adulterants in Aquafeeds**, authored by K. Manikandan said that adulteration is defined as the mixing of some cheaper or low-quality substances with pure or costly materials. Adulteration in food generally occurs globally and can be seen in almost all food commodities. It is a longstanding and a common problem encountered in much low income and developing countries, rarely found in some developed countries also. Adulteration in food can be broadly classified into two groups, namely, intentional and incidental food adulteration.

Article titled **Disinfectants used in aquaculture: Aquatic animal health management prospective** *authored by* Krishnaveni K N said that principle relating to aquaculture establishments includes the application of chemical treatments in sufficient concentrations, and for sufficient periods, to kill all pathogenic organisms that would otherwise gain access to surrounding water systems.

Another article titled **Eco-acoustics: Sound's ecological significance in aquatic ecosystems** *authored by* Rinkesh N. Wanjari said that the global marine and freshwater ecosystems are experiencing a drastically decline and re-distribution of biodiversity, due to far reaching effects of human activities, including accelerated climate change and over-exploitation. Such Change in baselines in terms of species abundance and distribution will result from changes in aquatic diversity patterns, which must be monitored immediately.

**M.A.Nazeer**
Editor & Publisher
Aqua International

CHEMIFINE

Formulating
Chemicals
For Better Growth


## C-MOULT MIN®

**Feed Minerals for Shrimp Culture**

- ✓ Controls Loose Shell problems and Helps in moulting
- ✓ Helps in Osmoregulation and improves shrimp health
- ✓ Recovers the animals from Muscle cramp syndrome
- ✓ Balances the mineral deficiency in pond water

## GUTCARE®

**Gut Probiotic for Disease Control in Shrimps**

- ✓ Prevent & control White Feces & White Gut Disease.
- ✓ Improves the Immunity in Shrimps
- ✓ Removes the pathogenic Bacteria from Shrimp Gut.
- ✓ Reduces the incidents of Running Mortality Syndrome.

## C-SOFT®

**Water Softener and Toxin Remover**

- ✓ Normalizes the Hardness of pond water and make the water softer & suitable for aquaculture.
- ✓ Controls Heavy metal concentrations in culture ponds.
- ✓ Works effectively in creek and bore water based aquaculture system.

CHEMIFINE™
Formulations Pvt. Ltd.,
An ISO 9001:2015 & cGMP
Certified Company

e-mail: chemifine@gmail.com
www.chemifineformulations.com

Please give Feed Back:
Contact No.: 8185007700

# Ensure availability of shrimp in domestic market, Union Minister urges exporters

*Minister Rupala says most of the shrimp produced in India was exported and asks the stakeholders to ensure that 50-60% of shrimps produced in the country was sold in the domestic market*

*Union Ministers Parshottam Rupala and L. Murugan, left, at the launch of the National Surveillance Programme for Aquatic Animal Diseases at CIBA in Chennai recently*

**Chennai:** Union Minister for Fisheries, Animal Husbandry and Dairying Mr Parshottam Rupala on called for ensuring enough supply of shrimp in the domestic market. He said that most of the shrimp produced in India was exported. The stakeholders had to ensure that 50-60% of shrimp produced in the country was sold in the domestic market.

The Union Minister was launching National Surveillance Programme on Fish Diseases Phase 2 and Genetic Improvement Programme of Indian White Shrimp (Panaeus Indicus) at the Central Institute of Brackishwater Aquaculture (CIBA), Chennai.

> *"Dependence on only one species of shrimp had proven risky"*

Mr Rupala said the surveillance programme was being introduced to reduce economic loss to farmers and bring down expenditure on drugs. It would also help in increasing exports. "At present, we are exporting to 120 countries and are among the top five fish exporters," he added.

**Genetic improvement**

On the Genetic Improvement Programme of Indian White Shrimp (panaeus indicus), he said that dependence on only one species of shrimp had proven risky and Prime Minister Narendra Modi had insisted upon introducing another species. The native species Indian white shrimp was available in the wild. The aim of the programme would be to collect good shrimps and develop pathogen-free seeds. From the second year of the five-year-long programme, improved seeds would be provided to farmers, he said.

Union Minister of State for Fisheries Mr L. Murugan said despite the pandemic, aquaculture exports from India had increased by 30%. It stands at over ₹44,000 crore. He said tenders had been called for the development of the Kasimedu Fishing harbour in Chennai for carrying out work totalling ₹120 crore.

As far as the seaweed park was concerned, he said that ₹1,056 crore had been allocated for the project for which approval had been given. A total of 682 deep-sea fishing vessels had been sanctioned and a subsidy of 60% was being provided to those under SC/ST and women categories.

Union Fisheries Secretary Mr Jithendra Nath Swain said that ₹33.4 crore had been set aside for the surveillance programme for a three-year period. It would help the industry identify, isolate and treat the cause of the diseases in the shrimp.

State Fisheries Secretary A. Karthik said shrimp production and export from Tamil Nadu had increased from 47,865 tonnes in 2011-12 to 1,62,838 tonnes in 2021-22. In monetary terms, this was an increase from ₹2,262 crore to ₹9,542 crore over the last 10 years.

J.K. Jena, DDG (Fisheries Science), ICAR, New Delhi; and J. Balaji, Joint Secretary (Marine Fisheries), Union Department of Fisheries, were also present.

> *"₹ 33.4 crore had been set aside for the surveillance programme for a three-year period. It would help the industry identify, isolate and treat the cause of the diseases in the shrimp"*

Uni-President

# AQUACULTURE PROBIOTICS EXPERT

Nu Ri
NET 200 g **BSL**

**Probiotics for water treatment**

## 1. WATER QUALITY CONDITIONING

Best choice of *Bacillus* spp. that rapidly decompose uneaten feed, feces and other organic substances in pond water, keeps water quality optimal


## 2. HIGH ACTIVITY OF SPORES

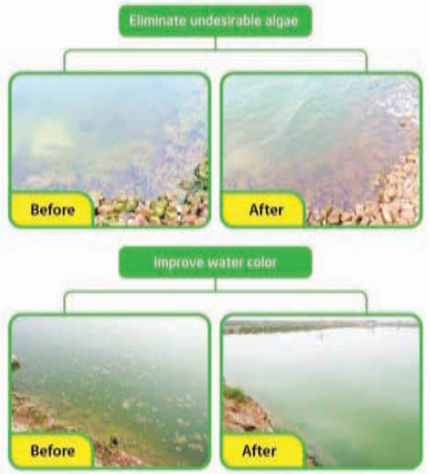
No cultivation is needed. Easily adapt to the changes of surroundings and grow fast in freshwater or seawater culture farming, even under low oxygen environment

## 3. DECREASE AMMONIA CONTENT

Prevent the accumulation of toxic substances such as $NH_3$, $NO_2$, etc.

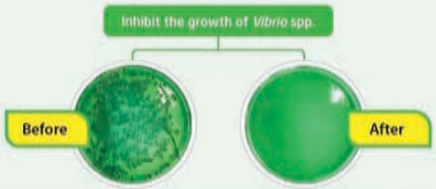
## 4. IMPROVE WATER COLOR

Improve water color regulate the algae and bacteria balance in water, turning your pond from green to clear




## 5. ESTABLISH BALANCED POND BACTERIA SYSTEM

Compete nutrition with vibrio and inhibit them to grow. Provide nutrition for probiotics in the pond, to establish a well-balanced farming system.




## 6. INCREASE AQUACULTURE PRODUCTION

Good quality of water prevents fish/prawn infections, making high profit of production

## * COMPOSITION:

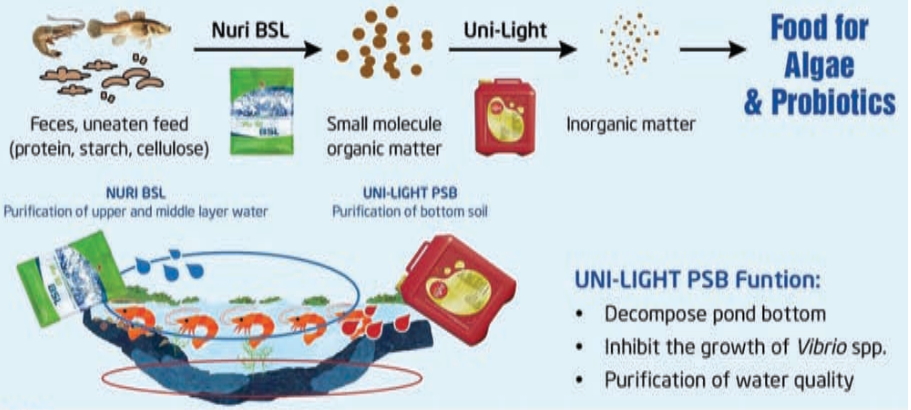
| | |
|---|---|
| *Bacillus* spp. > 1x $10^{11}$ cfu/kg | 15% |
| *(Bacillus subtilis, Bacillus amyloliquefaciens, Bacillus licheniformis)* | |
| Carrier (rice bran, corn gluten) | 75% |
| Moisture | 10% |


## * STORAGE:

Keep at dry, well-ventilated condition. Avoid direct sunlight exposure and use as soon as possible once opened for best quality.

## * DIRECTION OF USE:

No cultivation is needed. Apply Nuri BSL with water-soluble bag near to the working water wheel or pour into the pond evenly. Recommend apply Uni-Light PSB together with Nuri-BSL on sunny day to achieve a clear pond more efficiently.




### UNI-LIGHT PSB Funtion:

- Decompose pond bottom
- Inhibit the growth of *Vibrio* spp.
- Purification of water quality

## BSL Dosage:

| /10,000 m³ Quantity | 10 - 30 pl/m² tiger prawn or < 80 pl/m² Vannamei | For >30 pl/m² tiger prawn or > 80 pl/m² Vannamei | For > 150 pl/m² Vannamei |
|---|---|---|---|
| 7 days before stocking | 800 g - 1,000 g | 1,200 - 1,500 g | 1,200 - 1,500 g |
| Day of stocking | 300 g - 500 g | 800 g - 1,000 g | 800 g - 1,000 g |
| Every 7 - 10 days after stocking | 300 g - 500 g | 800 g - 1,000 g | 3 - 5 days / use 1,000g - 2,000g |

****Dosages can be adjusted according to the water conditions and practices.*

**UNI-PRESIDENT VIETNAM CO., LTD**

No. 16-18-20, DT 743 Road, Song Than II Ind Zone, Di An Ward, Di An City, Binh Duong Province, Vietnam.

aquafeed@upvn.com.vn
www.uni-president.com.vn

# Skretting India launches state-of-the-art shrimp and fish feed facility in Surat

*The 50,000 MTPA facility has been built with an investment of EUR 18.5 million and will cater to the domestic and export markets.*


*Customers attending the event*

**Surat:** Skretting, the Norway-based global leader in aqua feed and nutrition, inaugurated its state-of-the-art production facility for shrimp and fish feed in Mangrol, Surat, on Monday. The high-end facility allows Skretting to further enhance support for its customers and the Indian aquaculture sector.

Skretting, a division of The Netherlands-based Nutreco, the leader in animal and aqua nutrition, which is a subsidiary of SHV Holdings N.V., a family-owned Dutch multinational, has manufacturing footprints in 18 countries and produces 3 million MT of feed annually for more than 60 species from hatching to harvest, with global leading position in salmon and shrimp

The facility was inaugurated by Dr Sanjeev Balyan, Hon'ble Minister of State of Fisheries, Animal Husbandry and Dairying, and Mr Michiel van Erkel, Agriculture Counsellor for India and Sri Lanka, Embassy of the Kingdom of the Netherlands.

Dr Sanjeev Balyan congratulated the team for their achievement and welcomed the multinational as they bring the global expertise and research for Indian aquaculture development. He also sent the message to the Indian aquaculture industry about the requirement of technology usage for improving productivity and efficiency and promoting domestic consumption to continue our leading position globally.

Mr Erkel mentioned that just last year they had celebrated 75 years of warm diplomatic relations and that business from the Netherlands finds its way to India. When Nutreco was nominated last year as the most innovative company in animal nutrition by World Finance, they had stated that they want to help farmer's produce more, strengthen animal health and resilience while also looking at sustainable practices. He congratulated Skretting India for the support to Make in India initiative.

*Dignitaries performing lamp lighting ceremony*

Spread over an area of 20,000 sq mt and built with an investment of EUR 18.5 million (Rs 165 crores approximately), the facility will cater to both shrimp and fish cultures. The shrimp cultures will include white tiger and black tiger, while fish cultures will include Indian major carps and high-value fish like snakehead, seabass, etc.

The Mangrol facility has three production lines with a production capacity of 50,000 metric tonnes per annum. It will produce both extruded/floating and pelleted/sinking feed as per the requirement of the species and customers. There is also adequate land and infrastructure available to increase production capacity in the future.

"We are thrilled to launch our state-of-the-art production facility at Mangrol in Surat. We have been meeting the needs of shrimp hatcheries, nurseries and farmers since 2018 in India, and supporting customers across feed-farm-health with our high-quality feed and services. The new facility will enable us to contribute to the prestigious Atmanirbhar Bharat – Make in India initiative, while simultaneously improving efficiencies for a closer connect with our customers. We will cater to the domestic market and also customers in Bangladesh, Sri Lanka and The Middle East," said Dr Saurabh

*Skretting India team*

**Global Leaders in Aqua Nutrition**

SKRETTING
a Nutreco company

# Integrated Solutions for Aquaculture


To know more contact us: +91 73047 95555

SKRETTING AQUACULTURE INDIA PVT. LTD.
Unit No. L4 04, SLN Terminus, Survey No. 133, Besides Botanical Gardens
Gachibowli, Hyderabad-500032, Telangana | contact.india@skretting.com
www.skretting.in | Skretting-India | Skretting India

Connect with us

*Plaque unveil ceremony by dignitaries*

*Ribbon cutting ceremony by dignitaries*

Shekhar, General Manager, Nutreco South Asia.

Skretting has held a leading position in Ecuador and has played a key role in the transformation of shrimp culture in the country. With a combination of products, technical services and digitally enabled solutions like Aqua Sim and Skretting 360 plus, Skretting has supported in improving efficiencies and production of the shrimp farmers. With this facility and stronger footprints, Skretting India aims to deploy the same technologies and capabilities for South Asia.

The facility is equipped to support both sustainability and feed-to-food safety measures, in line with Skretting's Sustainability Road Map 2025 and Nutrace. As part of sustainability measures under Road Map 2025, the premises has systems like rainwater harvesting and effluent treatment plant, amongst others. The factory follows the global feed-to-food safety and quality program Nutrace for end-to-end tracking and traceability with certified supplier assessments and checks at each critical point.

"The factory is key to achieving our purpose of Feeding the Future in growth territories of Asia and India. We already have plants in Vietnam, Japan, China and Indonesia. This state-of-the-art production facility reinforces our commitment to South Asia and the Indian markets. Construction of the factory started in September 2020, and the work was completed in just over two years despite the various challenges posed by the Covid pandemic. The facility has generated local employment opportunities with 120 employees. This is just the beginning in our journey and to bring knowledge and technology as a differentiator and enabler," said Mr Jurriën Zandbergen, Managing Director, Nutreco, Asia.

Nutreco has both organic and inorganic growth plans to expand its footprints in South Asia and is actively looking for companies that can support its purpose of Feeding the Future via its investment arm NuFrontiers. Through NuFrontiers, Nutreco has invested strategically in startups globally, including the Internet of Things (IoT) enterprises, Eruvaka – for innovations in aquaculture and Stellapps – for improving efficiencies in the dairy value chain.

**About Nutreco:**

Nutreco is the global leader in animal and aqua nutrition with headquarters in Amersfoort, The Netherlands. It has two divisions - Trouw Nutrition which is in animal nutrition and Skretting, the global aqua feed and nutrition leaders. With over 125 years of experience, Nutreco's more than 11,000 dedicated employees in more than 33 countries across the globe relentlessly pursue its purpose of Feeding the Future in a way that ensures sustainability is front and centre in all it does. It has over 4,000 employees in growth geographies of Asia, Africa and Latin America. Nutreco's solutions go beyond nutrition - it provides best-in-class advice and technology to help customers produce more food in a sustainable way to feed the rising population. It produces 9.2 million tonnes of animal products annually through more than 98 production plants in 33 countries. Its NuFrontiers team works to identify, develop and invest in next-generation breakthrough innovations. In 2021, Nutreco had net revenues of € 9.0 billion. It is a subsidiary of SHV Holdings N.V., a family-owned multinational with net sales of € 20 billion in 2021.

*Dr Alex Obach presenting to audience*

**About Skretting:**

Skretting is a global leader in providing innovative and sustainable nutritional solutions and services for the aquaculture industry working closely with shrimp and fish farmers. Skretting has 30 production facilities in 18 countries on five continents and manufactures and delivers high-quality feeds from hatching to harvest for more than 60 species. The total annual production volume of feed is more than 3 million tonnes. It is headquartered in Stavanger Norway and it employs 4,000 employees. Its team of more than 140 employees is dedicated to Innovation that works on the core competencies of nutrition, feed production and health for aquaculture.

**About Skretting India:**

Skretting India is a subsidiary of Skretting and is headquartered in Hyderabad. It started in India in 2018, recognising the Indian sub-continent and Asia's critical role in fulfilling the purpose of Feeding the Future. India is among the top 2 producing countries with shrimp exports and the industry is expected to grow at 8-9% per annum. Skretting India's team works closely with farmers to support their feed, farm and health requirements. Skretting India goes beyond nutrition and feed with its Aqua specialty range that supports pond, water and soil management. For more information, please visit us at: www.skretting.in

# It's the circle of life: the best for them, is the best for us.

**First and only shrimp feed in the world that:**

. Contains advanced probiotics promegaBiotic f PF and organic acids megAcid G to augment health and disease resistance
. Highly digestible proteins 100% from marine origin
. Does not contain terrestrial plant or animal proteins

**Non GMO.**
**Certified free of shrimp pathogens.**
**Cold extruded to preserve vitamins and nutrients intact.**
**Outstanding production results.**


megasphe Nurturing from the start.
www.megasupply.com . orders@megasupply.net Made in USA

Let's aquaculture together.
MEGASUPPLY

ECMPS
Exclusive distributor for India

**EAST COAST MARINE PRODUCTS AND SUPPLIES**
**Contact: 9380246133 . E-mail: info@ecmps.in**
New. No.294, Old Nº.186, Malhotra House IInd Floor, Thambu Chetty Street, Parrys Chennai-600001, Tamilnadu, India.

# India Stands Third in World in Fish Production: Centre tells Parliament

*Fisheries and Aquaculture Infrastructure Development Fund (FIDF) with a total fund size of Rs 7522.48 crore implemented for a period of 5 years from 2018-19 to 2023-24 for providing* ***concessional finance***

**March, 2023:** India stands third in the world in terms of fish production, said the union minister of fisheries, animal husbandry and dairying, Parshottam Rupala in a written reply in Lok Sabha.

Rupala said that the government is working on the development of fisheries to attract farmers towards fisheries along with agriculture to increase their income through its various schemes namely.

He also mentioned about the centrally sponsored schemes such as Pradhan Mantri Matsya Sampada Yojana (PMMSY) with effect from the financial year 2020-21 to 2024-25 in all states and union territories.

"Fisheries and Aquaculture Infrastructure Development Fund (FIDF) with a total fund size of Rs 7522.48 crore implemented for a period of 5 years from 2018-19 to 2023-24 for providing concessional finance," he added.

Under PMMSY, during 2020-21 and 2021-22 and the current financial year 2022-23, the department has accorded approval to the fisheries developmental proposal of States/UTs amounting to Rs. 11010.00 crore with a central share of Rs 3,864.99 crore.

Further, the department through National Fisheries Development Board (NFDB) is providing grants for taking up various training programmes in fisheries in collaboration with states and UTs, he mentioned.

# Aquaculture industry set to scale new heights

**VISAKHAPATNAM:** Andhra Pradesh is focusing more on aquaculture industry which is a rapidly growing sector in the country. It also provides significant economic benefits for the state. Andhra Pradesh plays a vital role in country's seafood exports, ranking first in production of fish and shrimp, besides egg. It stood on top in marine exports in the fiscal year 2021-22.

While the state is gearing up for the Global Investors' Summit on March 3 and March 4 and G20 Summit on March 28 and March 29 in Vizag, the government has been showcasing its advantages in the farming sector.

The state has favourable climatic conditions and ample water resources, besides a long coastline of 974 km for aquaculture.

Around 1.38 lakh farmers are involved in aquaculture in 2.12 lakh hectares in Andhra Pradesh. As many as 111 cold storages store 2.27 metric tonnes of aqua products. The government is now providing subsidised power to aqua farmers cultivating in areas of less than 10 acres falling under aqua zones, with about 26,000 power connections currently receiving the benefit.

Apart from this, the government has implemented several initiatives to support the growth of aquaculture, such as subsidising pond and tank construction, establishing hatcheries, and organising training programmes for farmers.

# Gujarat accounts for 5% of India's fish production of 162 lakh tonnes

**Ahmedabad:** According to data provided by the Union government in Parliament recently, total fish production in the country was 162 lakh metric tonnes in 2021-22. According to the state fisheries department, fish production in Gujarat in 2021- 22 was 8.74 lakh tonnes, about 5% of the country's fish production.

According to the Gujarat fisheries department, in 2021-22, production in the state was 6.88 lakh tonnes of marine fish and 1.86 lakh tonnes of inland fish, for a total of 8.74 lakh tonnes.

According to the livestock census 2007, there are 2.18 lakh active fishermen among a population of 5.59 lakh fishermen in 1,058 fishing villages in the state.

In 2020-21, 28,355 mechanical boats and 8,625 non-mechanical boats were registered with the government, for a total of 36,980 boats.

**Revenue from marine fishing in Gujarat in 2021-22 was Rs 7,659 crore, and revenue from inland fishing was Rs 3,561 crore, for a total revenue from fish production of Rs 11,220 crore.**

Deepak NEXGEN™
Nutrition Empowered

AFT
Aqua-Food Technologies, Inc.
USA

iFEED™
THE TRUE VANNAMEI FEED

CERTIFIED ISO 9001:2008 COMPANY
Q-02140822

DEEPAK NEXGEN FOODS & FEEDS PVT. LTD.
Factory: #53/1, Koyyur Road, Bommuluru, Krishna Dist. - 521 105,
Ph: 08656 - 203399 | ifeed@nexgenfeeds.in | www.nexgenfeeds.in

# Hilsa fish absent for almost 50 years may make comeback in Uttar Pradesh's menu

***Hilsa is a highly sought-after fish in West Bengal, Assam, Tripura and Odisha, with prices ran ging from Rs 1,200 to Rs 3,000 per kilogram***

*An Indian chef prepares a special dish of the fish locally called 'Elish' during a Hilsa Festival organised by an authentic Bengali restaurant in Siliguri, West Bengal.*

Due to the Farakka Barrage in West Bengal, Hilsa fish virtually disappeared from the dining tables of Prayagraj and other Uttar Pradesh cities. But now there is a possibility that fish connoisseurs could enjoy fresh Hilsa once again.

About 30,000 rare Hilsa fish, collected from the lower portion of the Farakka Barrage, were released by the authorities in the Ganga River upstream.

Shoals of this prized fish have now been spotted in Mirzapur (one of the districts in Uttar Pradesh).

Sandeep Behera, an advisor to the Union Jal Shakti ministry's National Mission for Clean Ganga, told PTI, "The fact that the Hilsa has reached Mirzapur is an indication that the Ganga is gradually getting cleaned.

"Oxygen levels have also risen because the Hilsa moves very fast and it requires a lot of oxygen."

Sandeep Behera, who was present at a seminar organised by Nehru Gram Bharati (Deemed) University and ICAR-Central Inland Fisheries Research Institute, Barrackpore, remarked that a fish ladder on the Farakka Barrage had previously facilitated the upstream movement of Hilsa fish.

However, the ladder's gate has been non-functional for years. Behera stated that the gate is now being replaced to allow the fish to swim upstream in the Hooghly River which is in West Bengal.

A fish ladder is a structure installed on the wall of a barrage to provide a passage for migrating fish.

Also known as the "queen of fish," Hilsa is a popular delicacy due to its distinctive flavour and aroma.

It can be enjoyed by frying or cooking it in mustard sauce.

Despite being a saltwater fish native to the tropics, Hilsa can survive in rivers and estuaries.

According to Behera, Hilsa is a saltwater fish that lays its eggs in freshwater. However, the construction of the barrage in 1971-72 had obstructed its upstream migration for the fish to lay eggs.

He said that the tender for building the fish ladder has been issued and the process is expected to be completed in six to seven months. It is anticipated that the new ladder will be operational by the end of this year.

Hilsa is a highly sought-after fish in West Bengal, Assam, Tripura and Odisha, with prices ranging from Rs 1,200 to Rs 3,000 per kilogram.

Hilsa, a highly esteemed delicacy that can be fried, smoked or cooked in mustard sauce, typically migrates upstream in the Ganga, Brahmaputra and Irrawaddy rivers from the Bay of Bengal during the monsoon season for spawning.

This fish can also be found in the Arabian Sea, where it swims up rivers in Gujarat and Pakistan's Sindhu, as well as in the Red Sea, Persian Gulf, Vietnam and China seas.

According to a 2017 report by the Central Inland Fisheries Research Institute, the fish's peak upstream migration occurs from July to October or November, coinciding with the arrival of monsoon rains.

# Gassen Plus

Bon Ammonia and obnoxious Gasses

Shrimp / Fish performs all their body functions and growth in water. Good quality water and proper D.O. levels determines the success or failure. Good quality water, optimum D.O. level is of prime importance for health and growth of Shrimp / Fish.

Irregular water exchange, excess and leftout feed, dead algae, fecal matter, increases the organic load at the pond bottom. Accumulation of such waste absorbs available oxygen, creating anaerobic condition which leads to pollution of pond bottom. Polluted pond bottom and unhealthy environmental conditions triggers the release of toxic gasses like Ammonia, $H_2S$, Methane, etc, The toxicity of Ammonia, Hydrogen Sulphide, Methane attributed mainly due to unionized form. As the concentration in water increases, ammonia excretion by aquatic organism diminishes and the level of ammonia in blood and in other tissues increases. Ammonia increases oxygen consumption by tissues, damage gills and reduces the ability of blood to transport oxygen, and increases the disease susceptibility. To eliminate / overcome the above problems 'GASSEN PLUS' Yucca Schidigera, it contains Steroidal"Saponin" which help to reduce ammonia and other noxious gasses such as $H_2S$, Methane, etc., Microbial enzyme "Urease' Production inhibited by Saponin which leads to an increases D.O. and reduction of BODand COD levels.

Bacterial strains such as Bacillus Subtilis, Nitrobactor, Nitrasomonas, rapidly converts ammonia into Nitrates, Nitrites and finally non-toxic Nitrogen. Hydrogen Sulphide converts into Sulphates, Sulphites and finally non-toxic Sulphur, Methane into Non-toxic carbon. This conversion reduces the obnoxious gasses in the pond bottom. Reduction of this gasses improve the D.O. level in the water and bottom.

**COMPOSITION:**
YUCCA SCHIDIGERA
ALOEVERA
BACILLUS SUBTILIS
BACILLUS POLYMIXA
BACILLUS LICHENIFORMIS
NITRASOMONAS
NITROBACTOR
STABILIZERS

**DOSAGE** : 1 Kg per Acre or consult your Aqua Technician For Specific Usage & Dosage

**PRESENTATION:** 500 gms &1 kg


**DOCTOR'S VET-PHARMA PVT. LTD**
cG.M.P. Certified an ISO 9001:2008 Company
Survey No. 263/1, 264/1, P.R. Palem (V), Kovur (M),SPSR Nellore Dist.- 524137. A.P. INDIA.
Tel. 08622 - 210902. Email: dvpl33@yahoo.com, www.doctorlifesciences.com

ANTIBIOTIC FREE,
STEROIDAL FREE.

# IIL joins hands with ICAR-CIFA to develop freshwater fish vaccine against Hemorrhagic Septicemia

**HYDERABAD:** Vaccine maker Indian Immunologicals Ltd said it has entered into a partnership with Bhubaneswar-based Central Institute of Freshwater Aquaculture (CIFA), an Indian Council of Agricultural Research (ICAR) institute, for the commercial development of a freshwater fish vaccine against Hemorrhagic Septicemia.

Also called Aeromonas Septicemia, Ulcer Disease or Red-Sore Disease, Hemorrhagic Septicemia is an infection caused by Aeromonas Hydrophila, an opportunistic pathogenic bacterium, in freshwater fish.

All the cultured freshwater fish species in India like Rohu, Catla, Mrigal, Silver Carp, Grass Carp, Common Carp, Medium Carp, Channel Catfish and Eel are susceptible to this disease, which is the scourge of fresh and brackish water fish farming worldwide and has emerged as a significant economic problem in Indian aquaculture over the past few decades, IIL said.

Pointing out that over the years, antibiotics and chemo-therapeutants have been used for controlling bacterial diseases, including A Hydrophila, IIL pointed out that bacterial pathogens have now become resistant to these chemicals due to use over an extended period with some chemicals also posing environmental health hazards which is why vaccination has emerged as the most promising and environmentally safe option for disease control in fish.

Commenting on the development, IIL managing director Dr K Anand Kumar said: "IIL is the first in India to get fish vaccines. We are aware of the challenges associated with being the first, having been in similar situations for many other livestock vaccines. We are working on multiple fronts in defining pathways for commercial development of fish vaccines in India."

Pointing out that currently there are no fish vaccines available in India on a commercial scale to prevent aquaculture infections, ICAR-CIFA director Dr Pramoda Kumar Sahoo said: "CIFA scientists conducted years of research to develop a vaccine candidate against Aeromonas Septicemia. I am glad that IIL has come forward for commercial development of this vaccine."

IIL ventured into the aqua business in October 2022 with the rollout of products for aquaculture health market dealing with pond management and fish or shrimp gut management and also announced the commercial development of fish vaccines with ICAR-CIFE (Central Institute of Fisheries Education).

# Subsidies launched for fishermen, fish vendors

**Panaji:** Fishermen in the state can now purchase fishing equipment and accessories required for fish vending at a subsidised rate through two schemes notified by the directorate of fisheries.

Fish vendors registered with the directorate of fisheries will be able to purchase fish vending crates, weighing balance, insulated box, gloves, stool, platform to keep tool, choppers and other equipment related to fish sale.

Any beneficiary belonging to the general category is eligible for the grant of 50% subsidy limited to Rs 10,000 on a unit cost of Rs 20,000. The beneficiary belonging to SC/ ST/woman category is eligible for the grant of 60% subsidy limited to Rs 12,000 on a unit cost of Rs 20,000.

The beneficiary shall produce the bills from the registered dealers towards the purchase of accessories required for fish vending. The scheme can be availed once every three years.

Under the other scheme, the directorate of fisheries will provide a subsidy for purchase or construction of new fishing craft of less than 26 feet for fishing in inland waters of Goa. Stake nets and its accessories, barrier net and its accessories, out board motor of 2HP to 5HP for fitment on the fishing canoe below 26 feet can be purchased.

The beneficiary shall be eligible for financial assistance for only one fishing canoe of less than 26 feet and must possess valid net registration certificate and licence certificate issued by the department of fisheries to be eligible.

The scheme can be availed after every 7 years against the replacement of his/her existing canoe.


Versatile Growth promoter and Immuno Booster in Gel Form
ALL IN ONE
gel
A UNIQUE COMBINATION OF FAT SOLUBLE VITAMINS, WATER SOLUBLE VITAMINS, AMINO ACIDS , TOXIN BINDERS, HEPATO PANCREATIC STIMULANTS, ANTI STRESSORS, USFA, LDLP, APF, AND MACRO & MICRO ELEMENTS IN GEL FORM
COMPOSITION :
Vitamin-A - 5000IU
Vitamin-D3 - 1000 IU
Vitamin-E - 15 mg.
Vitamin-B1 - 1.86 mg.
Vitamin-B2 - 1.25 mg.
Vitamin-B6 - 0.62 mg.
Niacinamide - 30 mg.
D-Panthenol - 1.26 mg.
Inositol - 10 mg.
Folic Acid - 10 mg.
Biotin - 15 mcg.
Vitamin-B12 - 6.25 mcg.
L-Lysine - 175 mg.
DL-Methionine - 150 mg.
Vitamin-C - 200 mg.
Toxin Binders - 200 mg.
Hepato Pancreatic stimulants - 100 mg.
LDLP - 15mg.
USFA - 5 mg.
APF - 30 mg.
Calcium Gluconate - 20 mg.
Magnesium - 25 mg.
Manganese - 15 mg.
Cobalt - 15 mg.
Zinc - 25 mg.
Selenium - 2.5 mcg.
Protein Hydrosylate - 1000 mg.
Betaine Hydrochloride - 1000 mg.
BENEFITS :
Improves feed conversion and growth rate. Enhances resistance against diseases. Ensures uniform growth. Neutralizes imbalances of Vitamins, Minerals, Amino Acids and Proteins Detoxify toxic materials and improves health. Improves absorption of the Calcium, Phosphorous and reduce incidence of loose shell.
DOSAGE :
50 ml per kg.
of feed or consult
your aqua technician
for specific usage
and dosage.
Presentation: 5 Ltr. & 25 Ltr.
Antibiotic Free, Steroidal Free
DOCTOR'S VET-PHARMA PVT. LTD
cG.M.P. Certified an ISO 9001:2008 Company
Survey No. 263/1, 264/1, P.R. Palem (V), Kovur (M),SPSR Nellore Dist.- 524137. A.P. INDIA.
Tel. 08622 - 210902. Email: dvpl33@yahoo.com, www.doctorlifesciences.com

# Experts stress need for better management of aqua ponds in A.P.

*Over 200 delegates, including researchers, **officials and representatives of various** companies, discuss ways to improve aquaculture at Fish India 2023 conclave*

***Members of the Society of Aquaculture Professionals presenting a memento to Prof. Dominique Bureau of the University of Guelph, during Fish India 2023 conclave in Vijayawada.***

Experts have discussed the need for diversified aquaculture with better management ofponds and rearing of fish varieties in demand.

Farmers, researchers, officials and scientists from the State and Central governmentorganisations exchanged views on various aspects of aquaculture at 'Fish India 2023'conclave organised by the Society of Aquaculture Professionals (SAP), here on Saturday.

SAP president Arul Victor Suresh said more than 200 delegates from different States andforeign universities, consultants and heads of various companies attended the event.

Founder president, SAP, S. Sanathanakrishnan said that stakeholders of aquaculturediscussed various issues related to feed supply, hatchery and pond management.

S. Kandhan, Director, Rajiv Gandhi Centre for Aquaculture (RGCA), a research wing of theMarine Products Export Development Authority (MPEDA), spoke on 'Seed quality forsuccessful seabass farming'. He explained the rising demand for seabass in the market.

Prof. Dominique Bureau of the University of Guelph, Canada, gave a presentation on'Making precision fish farming in Asia with latest technology'.

Principal Scientist, Central Institute of Brackishwater Aquaculture, R. Jaya Kumar, farmerand Aquaculture Outlook editor Jaideep Kumar and others spoke.

# 'Focus on Egypt-Andhra government collaboration over aquaculture'

*Ilyas said that Egypt has set up world's largest aquaculture farms of about 8,000 hectares and plans to introduce vannemi **shrimp farming in Biofloc.***

**VIJAYAWADA:** Abdul Rahaman Ilyas from India, who has been appointed as advisor to the Academy of Scientific Research and Technology (ASRT) of the Arab Republic of Egypt, said that they wish to develop a focussed collaboration with the Andhra Pradesh government with regard to aquaculture, besides pharma, drones, and commodities.

Ilyas said that Egypt has set up the world's largest aquaculture farms of about 8,000 hectares and plans to introduce vannemi shrimp farming in Biofloc. "In Egypt, they are facing some difficulties and there is an opportunity for AP exporters to develop a Business to Business (B2B) collaboration," he said, adding that couple of proposals are under consideration, which will be discussed for implementation with a Joint Venture and ASRT will take up pilot programmes.

Dr Amr Faroukh Abdelkhaik, Vice President, ASRT said they have been working through Dr Abdul Rahman Ilyas in mapping right partners, companies and models of replicable value that fit well to Egyptian context.

*For Effective Branding & Promotion of your Products & Services in Indian Aquaculture Sector*

Advertise in

**Aqua International**

English Monthly on Aquaculture

# Team Agrotech

YOUR STEPPING STONES IN SUCCESS!!

Country Representative
**CPM ASIA**

## *Your Single Stop Source for*

**Complete Project management of Turnkey Solutions in the following areas:**

1. Integrated Feed plants for Poultry, Floating Fish, Sinking Fish, Shrimps, Cattle etc.
2. Balance of plant eqpuipments for Pre/Post processing
3. Complete Plant Automation Solution, on **GATE In to GATE Out concept.**
4. In-house design and manufacturing of Pre Fabricated steel structures for Plants, Warehouses etc.

*CPM Dryer*

*CPM Pellet Mill*

*CPM Extruder*

Contact Today

## *Team Agrotech Pvt. Ltd.*

**1- 4, 249, Hill Road, Gandhi Nagar, Nagpur-10 , Maharashtra, India.**
**M. :** +91 9422803386, +91 9650559095
**Ph. :** +91 712 2222142
**e-mail :** teamagrotech@yahoo.com
**Website :** www.teamagrotech.com

For Queries Contact

Scan me

# VIV Asia 2023: A Resounding Success Underpinning the Leading Market Position


**10 March 2023, Bangkok, Thailand:** The event VIV Asia 2023 delivered a dynamic, expansive marketplace to 47,527 attendees which featured Feed to Food products and services from more than 1,186 global manufacturers and suppliers representing over 57 countries, said a note from the organizers.

VIV Asia 2023 concluded successfully, as a robust platform for B2B international business. Over three days, 8-10 March 2023, the show facilitated face-to-face interactions, networking, knowledge-sharing and a lively marketplace at Bangkok, Thailand. With 47,527 visitors from 112 countries, the event maintained its stable attendance and even slightly exceeded the previous edition. Despite the global circumstances and the past three long years of Covid-19 restrictions, the show's international appeal for the Feed to Food industry remained evident, confirming its significance as a World Expo.

The event featured more than 1,186 exhibitors from 57 countries, representing five continents, showcasing the latest developments in their respective sectors in the three Challenger halls at Thailand's mega-venue IMPACT, in a collective of more than 31,544 sqm exhibiting space.

In addition, the co-location with Meat Pro Asia, the premier trade platform for processing and packaging solution in the meat industry consolidating the Feed to Food industry under one roof. The animal protein sector responded positively to this powerful co-location, resulting in high attendance.

This achievement represents another significant milestone in the VIV global series of events. "VIV Asia is the first VIV show in 2023 and it represents – and rightfully so – our goal to connect the markets and enhance industry trade both locally and globally," stated Birgit Horn, Managing Director of VIV Worldwide, during the event.

"It's always pleasing when a new trade fair is warmly received and this was certainly the case with this first edition of Meat Pro Asia," adds Mr Richard Li, Executive Director, Messe Frankfurt (HK) Ltd. "More importantly, however, it was encouraging to see a high number of energetic business discussions taking place throughout the fairground. From the feedback we have received, it's clear that holding these two fairs concurrently is popular among buyers and exhibitors alike – it consolidates so many resources together in one place. I think everybody will conclude that Meat Pro Asia is a valuable new addition to the trade fair calendar in South East Asia".

***A global feed and food system reimagined***

VIV Asia serves as the primary platform for sector leaders in Asia to showcase their latest developments. This year's innovations spanned a wide range of topics, including safe and effective farming automation tools, ingenious medical and medicinal products, and efficient broiler house control systems. Other exciting innovation-related events included a regional seminar on Innovations in Good Farming led by the Federation of Asian Veterinary Association, as well as a seminar presented by Tony Hunter of Future Cubed on new technologies for a future sustainable and equitable global food system. "We need to reimagine the food system using the new technology. The industry needs to think about this issue as they are in the business of supplying food. VIV Asia and Meat Pro Asia is a really great place to gather new information on this new and important topic. I am very impressed with the show", commented Hunter.

Knowledge-stacked programs were a major highlight at the event. With more than 120 sessions spread over four days, attendees could gain an all-round understanding on industry insights, technologies and best practices. The day before the show, the Aquatic Asia Conference organized by International Aquafeed of Perendale Publications and VIV, featured a variety of industry experts with

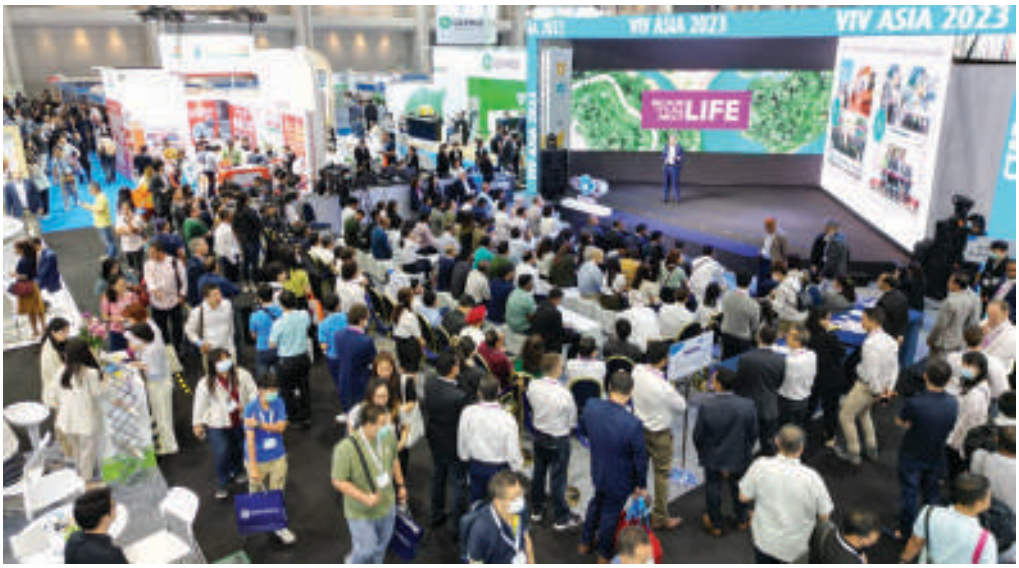
captivating presentations on the latest in fish and shrimp nutrition. On the first of the show the Asian Inspiration brought together key speakers that discussed the latest on local and sustainable farming based on the Netherlands model.

Most of the sessions were fully booked with very few possibilities of walk-ins finding availability – a fact that showed how important are the sessions presented during VIV Asia to an audience that is keen on learning and following the industry trends.

Looking ahead, VIV Asia will return 12-14 March 2025, carrying on the tradition of providing a premier platform for the animal protein industry to connect, learn and innovate. VIV Asia will undoubtedly be another landmark event in the VIV series of events around the world, with a strong commitment to delivering a top-quality trade show and knowledge programs.

The show organizing team, its partners, which included over 60 industry media titles, 45 global industry associations and the exhibitors are grateful to everyone who came out to support this event in Bangkok.

*Aqua International and Poultry Fortune Editor M.A. Nazeer from India, the most qualitative and well read magazines on Poultry and Aquaculture sectors participated in the event and interacted with global experts, entrepreneurs and exhibitors.*

Aqua International participates in VIV Asia 2023

# Glimpses of VIV Asia 2023

*Aqua International and Poultry Fortune Editor M.A. Nazeer with Ms Phatanee Leksrisompong, Executive Vice President, Feed Technology Office, Charoen Pokphand Group Co Ltd, during VIV Asia 2023 in Bangkok on March 9.*







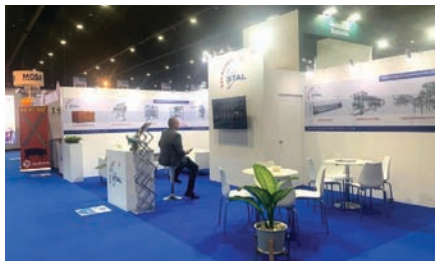
TavSan


SALMET


SALMET


MOBA
ROW 1400


foodmate
foodmate
INSPIRIENCE CENTER




FAMSUN


Butirex C4


POWER OF
LUMIS
ENZYMES
PROTEASE
PHYTASE
MULTI-ENZYMES
MULTI-IMPACT PROBIOTICS


ADISSEO
ADISSEO

# Ersama Aqua Specialists Group working towards sustainable aquaculture development in Odisha

**Ersama Aqua Specialists Group:** Shrimpculture is developing well in Ersama, Paradeep and Jagatsinghpur coastal area in Odisha, which was heated by SUPER CYCLONE in the year 1999. At that time it was declared that the area with high risk zone. Near about 30,000 people lost their lives and atleast two lakh people

*Pramod Pati ( Falcon Marine Feeds Ltd and Falcon Marine Exports) falicitating Dinabandhu Tripathy, IHC LTD, PVS Group.*

*Dinabandhu Tripathy, Convenor, Ersama Aqua Specialists Group, Odisha.*

were affected with loss of property, food, shelter and livelihood by the Super Cyclone -1999.

Time changed due course of progressive work from Govt and Non Govt sector and organization, now this area is well developed and rised as an Aquaculture and Fishery potential zone in Odisha economic map. Near about 40 to 50% of total Fish and Shrimps production and exports of Odisha is happening from Ersama and Paradeep areas.

Looking at the business and aquaculture growth potential the commercial and technical professionals working for different companies join together time to time, discuss the issues with the farmers and other stakeholders, and are providing technical support to the local farmers for the past one decade and trying to make sustainable aquaculture development in the area.

More than 40 members working under the banner of "Ersama Aqua Specialists Group" here are doing a good job for the industry here.

All the active members participate in group discussion, organise picnic and get-together parties with farmers for the discussion of development in Aquaculture in Odisha, especially in Ersama and Paradeep area.

On February 8, 2023 they had a get-together cum

*Pramod Pati, Falcon Marine Feeds Ltd and Falcon Marine Exports falicitating Jiban Jey Das, Growel Formulations Ltd.*

**List of 40 members:**

1. Mr Prana Krushna Raut (PVS)
2. Mr Santanu Kumr Sahu (PVS)
3. Mr Sandeep Ku Raut (PVS)
4. Mr Jiban Jey Das (Growel Formulation)
5. Mr D.Basudev Dora(Growel Feeds Ltd)
6. Mr P. K. Pati Babu (Falcon Marine Exports)
7. Mr Soraj Kumar Pradhan (Falcon Marine Feed)
8. 8) Mr Tapas Kumar Patra (Falcon Marine Feed)
9. Mr Nihar Ranjan Patra (SANZYME: KENKO)
10. Mr Debassis Dash (SANZYME: KENKO)
11. Mr G. Ananda Babu (SANZYME: KENKO)
12. Mr Atanu Ku Jana (Deepak NextGen: ifeed)
13. Mr Gadadhar Swain (AABT: Advance Aqua)
14. Mr Susil Kumar Maithy (AABT: Advance Aqua )
15. Mr Susil Ranjan Raut (AABT: Advance Aqua)
16. 16) Mr Rajeev Pal (AABT: Advance Aqua)
17. Mr Mularidhar Sahu (Avanti Feeds Ltd)
18. Mr Abinash Behera (Avanti Feeds Ltd)
19. Mr Priyabrata Sahoo (Avanti Feeds Ltd)
20. Mr Rajendra Sahu (CP Aquaculture Feed)
21. Mr Amit Mallick (CP Aquaculture Feed)
22. Mr Karthik Nayak (CP Aquaculture Feed)
23. Mr Sunil Kumar (CP Aquaculture Feed)
24. Mr Simanchala Dash (Biostadt)
25. Mr Debasish Satyaprakash (Biostadt)
26. Mr Sweta Kanta Tripathy ( Neospark)
27. Mr Achinta Ku Patra (Tarohi Formulations)
28. Mr D. Kumar Singh (Golden Streak Pvt Ltd)
29. Mr Somya Swarup Padhi (MARSCO)
30. Mr Dinabandhu Tripathy (IHC LTD, PVS Group)
31. Mr Arun Kumar Rout (ABIS Feeds)
32. Mr Bikram Swain (Faster)
33. Mr Chiranjeevi Swain (Shinemax Aqua)
34. Mr Susanta Ku Mahunta (Biosol Aqua)
35. Mr Bickendra Biswal (Bicky) (Gentle Bio sciences)
36. Mr Surendra Kumar (Supreme Bio Solutions)
37. Mr Aniruddha (Supreme Bio Solutions)
38. Mr Monaj Kumar Rout (Bhuvan Biological)
39. Mr Raj Kumar Dash (Technician) and others
40. Mr Bapulu (Technician) and others


microbasia

Plot No. 4/328, Sivapatham Street, Mel Ayanambakkam, Chennai - 600 095 . INDIA. Customer Care: +91-9445211141 / customercare@microbasia.com

picnic party of *Erasama Aqua Specialists* Group at Meera Sea Beach, Ramtara led by Mr Jiban Jey Das (Convener), Growel Formulation and supported by all members. It was the totally technicians picnic cum get-together party with interchange of thoughts and knowledge, and also the latest technology in Aquaculture sector to serve the Aqua community for better prospects. The get-together cum picnic party programme was concluded with great success followed by group discussion, meeting, sightseeing, fabulous lunch, lots of music and entertainment. Apart from this they have a Charity Trust fund collected by all active members donation.

## Shrimps production and it's support

**Shrimps production places around Ersama** area are Gadaharishpur, Gada bisunpur, Olara, Nalavedi, Durgapur and Dasamatha, Ramtara,Siali, Badabelari, Boulapur, Tentulibelari, Nendara, Balikuda, Balitutha, Baleipur,Balijhara Bandar ,Andhari and Kujanga etc.

**Number of Shrimps farmers** - Around 3800 plus.

**Number of Shrimps Processing Plants** - at Bhubaneswar at 100 km and Paradeep at 30 kms - 6.

**Number of Cold Storage** - at Bhubaneswar, Paradeep and Khurda area - 12.

Number of Dealers, Sub-dealer and Business Counters for Feed, Healthcare and Feed Supplement - 52

**Number of Sales and Technical Professionals** - 40 plus.

**Number of Diagnostic Labs:**

a. Odisha State Government Aqua lab and,

b. CP Aquaculture India Pvt Ltd lab,

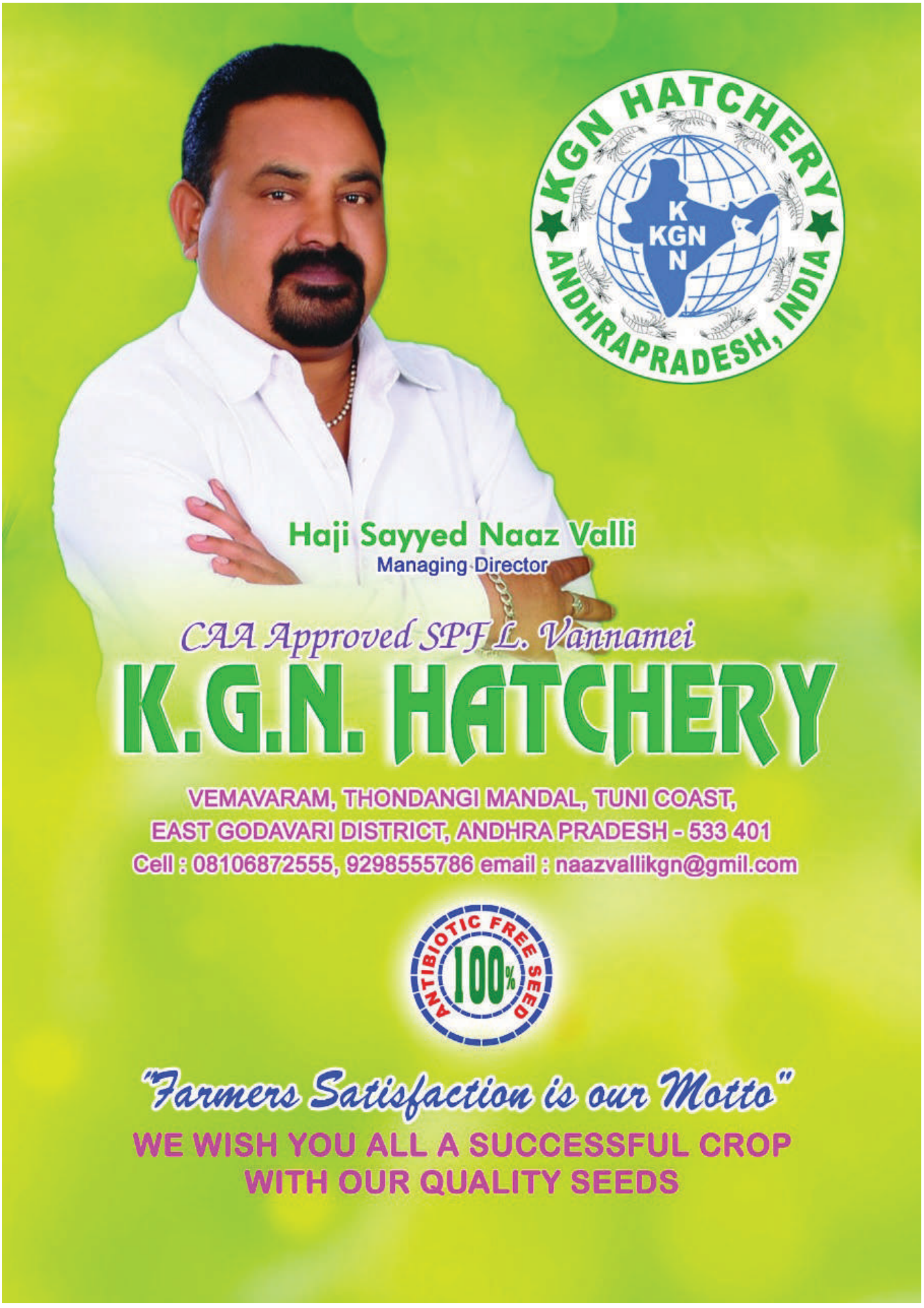
c. Kenko (Sanzyme Biologics Lab, at Iribina, Ersama)

**Fishery Officials:** FEO (Fishery Extension officer at Erasama, Balikuda and Kujanga, Block Office), DFO (District fishery Officer at Jagatsinghpur Head Quarters), DDFO (Deputy Director of Fishery at CDA, Cuttack, Orissa), CIFA (Central Institute of Freshwater Aquaculture, Bhubaneswar nearby at 100 kms distance from there). Laboratory Technician members and Seed Production Hatchery for IMC Culture or Polyculture Support.

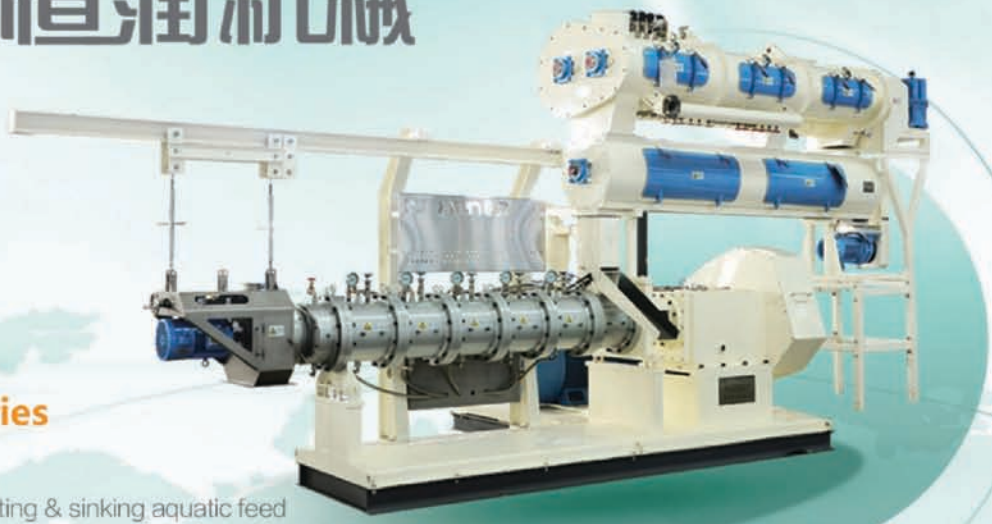
In around 4,500 plus hectors area shrimps farming is done in Ersama, Paradeep and Balikuda zone. Average size of Shrimps production is 50 to 60 count (20 to 16 GM's) in total production. This zones share and value of shrimps exports from Odisha around 30% of total production.

*Members having lunch together on the occasion.*


*Ersama Aqua Specialists Group members at an occasion.*


KGN HATCHERY
ANDHRAPRADESH, INDIA
K
KGN
N
Haji Sayyed Naaz Valli
Managing Director
CAA Approved SPF L. Vannamei
K.G.N. HATCHERY
VEMAVARAM, THONDANGI MANDAL, TUNI COAST,
EAST GODAVARI DISTRICT, ANDHRA PRADESH - 533 401
Cell : 08106872555, 9298555786 email : naazvallikgn@gmil.com
ANTIBIOTIC FREE SEED
100%
"Farmers Satisfaction is our Motto"
WE WISH YOU ALL A SUCCESSFUL CROP
WITH OUR QUALITY SEEDS

HRIN 恒润机械



## Hengrun HR Series Extruder

Suitable for all kinds of floating & sinking aquatic feed
The screw permutation is adjustable to fit different formulation.
Advanced automatic touch screen control system

| Model | HR165 | HR118X2 | HR145X2 | HR168X2 |
|---|---|---|---|---|
| Capacity(t/h) | 3-5 | 3-6 | 6-10 | 10-15 |
| Type | Single-screw | Twin-screw | Twin-screw | Twin-screw |


## Hengrun HRHG ( FB ) Series Rotating-Type Dryer

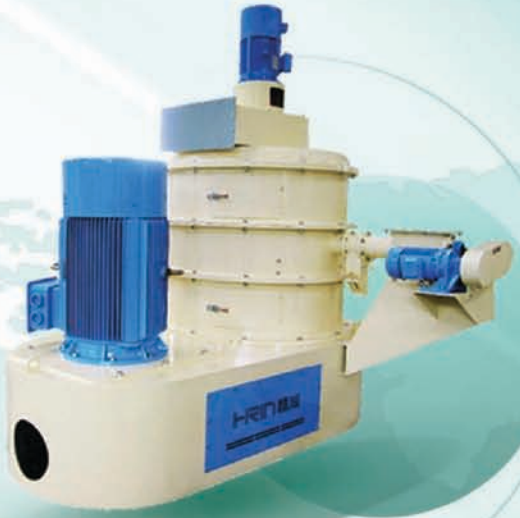
Moisture evenness≤1.5%
Use only one-third power compared to other competitors.

CE

**ZHANJIANG HENGRUN MACHINERY CO., LTD**

Add: Shapo Industrial Zone, Suixi, Zhanjiang, Guangdong, China (524300)
E-mail: hirin_co@126.com
Tel: +86 759 7770818 Fax: +86 759 7769088
Web: www.hirin.cn

# Professional Feed Machinery Manufacturer



## Hengrun SWFL Series Vertical Pulverizer

Vertical shaft with no-screen grinding, Bearing no maintenance. The production is uniform and the fineness is adjustable ( Range from 40~200 mesh.)

## Hengrun HRYTZ Series Vacuum Sprayer

Totally enclosed spraying space, Precision & Efficient spraying proportion widely ranged from 2%-30%.

# Adulterants in Aquafeeds

**Email: mani.ayyap@gmail.com**

***K. Manikandan[1], N. Felix1 and E. Prabu[1]***
*Directorate of Incubation and Vocational training in Aquaculture, Tamil Nadu, Dr J. Jayalalithaa Fisheries University, ECR-Muttukadu, Chennai, India.*

**Highlight Points**

- Adulteration in food is defined as the mixing of some cheaper or low-quality substances with pure or costly materials and is a longstanding and common problem globally.
- The most commonly adulterated feed ingredients in the aquafeed preparation are the fishmeal and oilseed cakes.
- The use of adulterants in aquafeeds are ever-growing and knowledge on adulterant is as important as that of understanding the quality of feed ingredients.
- The unethical use of these toxic substances in feed ingredients should be discouraged.

## Introduction

There is a tremendous increase in the number of population across the whole world and estimated that the number may reach around 900 crores by the year 2050. The nutritional status of fishes are continuously reported and the importance is being published and many awareness is being created. This has resulted in increased demand and consumption of fish in recent decades. Fisheries sector serves as a crucial source of food and nutrition as it provides a substantial source of income and employment for a huge number of individuals around the world. Even though the world capture fisheries production increases annually, a stable and nearly constant production from it across the years have indicated that we have reached the peak. While on the other side, the aquaculture production tends to be dynamic and on the increasing trend.

The feed which is given to the cultured animals is the most important factor to be considered in the farming of aquatic animals. They become so irresistible that the feed given alone contributes to about 50 – 60% of the total operational cost in the culture practices. Formulation issues, explicitly the supply of species-specific feeds to necessitate the nutritional requirements of various developmental phases of the farmed species, remain an essential topic for both commercial and farm-made feed production sectors. The efficiency of feed utilization in the aquatic organisms and the development of the aquafeed industry of the country is dependent upon the quality of feed used for the culture of animals. The quality of compounded animal feeds is based on the quality of the feed ingredients used. The common feed ingredients which are used in the preparation of the aquafeeds are fishmeal, oilseed meals, cereals, cereal by-products, agro-industrial products and their by-products, etc. A quality feed would be able to supply all nutrients in adequate quantity with higher palatability and digestibility.

## Adulteration

Adulteration is defined as the mixing of some cheaper or low-quality substances with pure or costly materials. Adulteration in food generally occurs globally and can be seen in almost all food commodities. It is a longstanding and a common problem encountered in much low income and developing countries, rarely found in some developed countries also. Adulteration in food can be broadly classified into two groups, namely, intentional and incidental food adulteration. Incidental adulteration occurs when foreign substances are added to a portion of food as a result of ignorance, negligence, or improper facilities. Intentional adulteration involves the deliberate addition of low-grade materials to a food to increase the appearance, quality and to improve the revenues. Apart from the economic problems, they may also lead to very serious health problems for the ones who consumed the adulterated products. In recent years, very sophisticated methods have been used for adulteration of foods to minimize the detection levels. Hence, reliable and very efficient procedures and techniques should be developed for the detection of fraudulent manipulations.

## Adulteration in Aquafeeds

Adulteration in Aquafeeds is advertent and deliberate by mixing main or costly feed ingredient with other ingredients of low quality or price as compared to the main ingredient and selling them by declaring it as a pure feedstuff. This affects the quality of raw materials. It is also described as deliberate or intentional mixing or replacement of raw or wholesome ingredient with a substandard and cheaper ingredient or removal of a raw ingredient just to gain benefit in the form of money.

## Common adulterants in feed ingredients

The most commonly used feed ingredients in the aquafeed preparation are the fishmeal and oilseed cakes. Oilseed cakes are often adulterated by mixing them with urea, husk, and some non-edible oilseed cakes to increase the protein contents. Costly feed ingredients like fishmeal are often adulterated by spraying urea to increase the nitrogen content, as the common traditional detection of protein content in the feed and feed ingredients involved is the analysis of nitrogen content in the product and thereby converting them to protein. The commonly adulterated

# ARCL ORGANICS LTD

## 64 years legacy of Bonding

**Mould Inhibitor with Toxin Binding Capacity**

**SPREADING OUT GLOBALLY & INNOVATIVELY**

**MOULD GROWTH in Fish Feed CAUSE of FISH DISEASES & MORTALITY.**

**Which Mould Inhibitor to be used?**

**ARMOUR MST AF**

**ARMOUR MST AF**

**ENVIRONMENT FRIENDLY & BIODEGRADABLE**

**Advantages of ARMOUR MST AF**

- ARMOUR-MST-AF is a potent Mould inhibitor, antibacterial, pellet binder and growth promoter.
- Inhibits Mould and bacterial growth in processed feed (11- 15% moisture) even for 21d of storage.
- Prevents lump formation in stored processed feed.
- Prevents aflatoxin ($AFB_1$) production in commercial pellets (NDDB Lab study).
- It acts as pellet binder. Reduced fines to 8-10%, improves texture and shining of feed with complete Mould inhibition.
- Improves growth and feed utilization efficiency.
- Provides solution for clean fish production.

**Mould Inhibitor to improve quality of FEED PELLETS**

- Active Ingredient: Organocarbonyl Diamidomethylol
- Use Level: Varies depending on feed moisture content

  0.5-1 kg/ton for Feeds up to 12% moisture
  1-1.5 kg/ton for Feeds more than 12% moisture
- Packaging: 25 kilogram, tied inner polybag with sewn outer woven nylon bag.
- Storage: Store in cool and dry place.

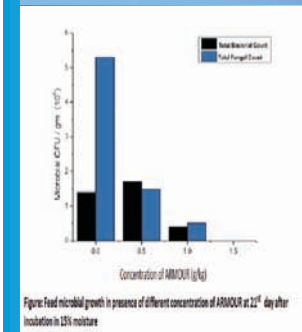
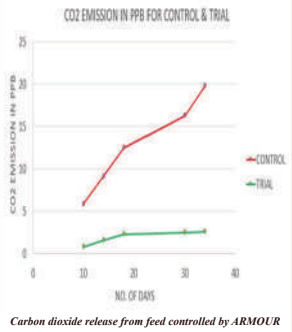


Figure: Feed microbial growth in presence of different concentration of ARMOUR at 21st day after incubation in 15% moisture




*Carbon dioxide release from feed controlled by ARMOUR*

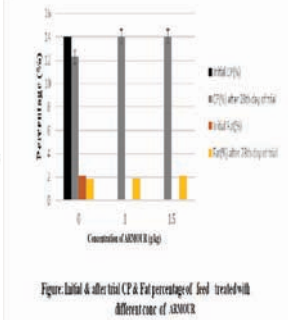


Figure: Initial & after trial CP & Fat percentage of feed treated with different conc of ARMOUR

*Pellet with ARMOUR (PDI 96% )*

*Pellet without ARMOUR (PDI 70%)*

*Corporate Office*

*Budge Budge Trunk Rd, Rampur,*
*Santoshpur, Kolkata, West Bengal 700141*
*Email: Aqua@arcl.in*
Phone No: 9073333243 / 9339146661

*Serving* the industry *Since 1959*

*www.arcllifesciences.com*

feed ingredients and the common adulterants are shown in Table 1.

**Table 1: Feed ingredients and their common adulterants**

| Feed ingredients | Common adulterants |
|---|---|
| Groundnut cake | Groundnut husk, urea, non-edible oil cakes |
| Mustard cake | *Argemone mexicana* seeds, fibrous feed ingredients, urea |
| Soybean meal | Urea, raw soybean, hulls |
| De-oiled rice bran, wheat bran | Ground rice husk, sawdust |
| Mineral mixture | Common salt, marble powder, sand, limestone |
| Molasses | Water |
| Maize | Cobs, cob dust, sand |
| Broken rice | Marble, grit |

(Source: Uppal et al., 2004)

**Evaluation of quality feed**

Three types are commonly used for evaluating the quality of the feeds. They are:

- Physical
- Chemical
- Biological

**Physical Evaluation**

Evaluation by physical means is very easy, but the accuracy cannot be obtained. The persons who are involving in the physical evaluation should be highly trained to identify the changes that are seen in the pure raw feed ingredients or feeds. Physical evaluation can be done in the following aspects:

- **Colour**
- **Size**
- **Homogeneity**
- **Smell**
- **Taste**
- **Touch**

**Colour**

The appearance of the ingredient will reveal its quality. The colour change of the feed ingredients could be easily related to the maturity of the grain, storage conditions, presence of toxins, contamination due to sand, possible use of insecticides/fungicides which gives the dull and dusty appearance. For example, Red or orange-red colour of the sorghum can be an indication of high tannin content. Improper storage of the ingredient may lead to browning or blackening, thereby reducing the nutritive value. Black coloured fish meal indicates the rancidity of fish oils.

**Size**

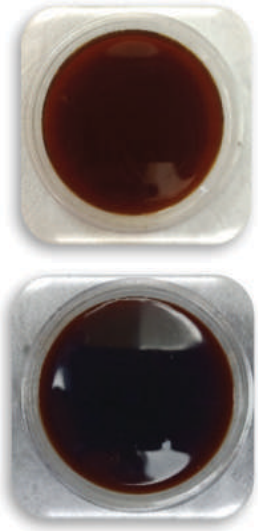
The energy value of the grains is determined by the size of the grains. Smaller the grain lower will be the Metabolizable Energy (ME) value due to more proportion of coater hulls. To evaluate the weight of the cereal, a fixed number of grains usually 100 grains or fixed volume is taken. Higher weight indicates a higher ME value. The difference in the original or actual size of the grain may indicate that the ingredient is adulterated. By sieving the feed ingredients, we can be able to differentiate contaminants based on particle size.

**Homogeneity**

Similarity or evenness in the ingredient is determined by homogeneity. Closer observation of the feed ingredients like oilseed cakes might reveal the presence of fibrous materials, exclusively seen in de-oiled groundnut cake. The oil cakes with hulls containing 20 to 25% crude fibre can be visually identified. Mineral ingredients with clumps are not suitable for premixing.

**Smell**

Any stinking or abnormal smell from the stock may be used for identifying the rancidity, contamination and adulteration in the raw materials. The leathery smell in the meat meal may be used as an indication of adulteration of the meat meal with the leather meal. The smell can also be used for detecting the rancidity of oil-rich feed ingredients by the rancid smell.



*Difference between animal grade fish oil and rancid fish oil*

**Taste**

Each ingredient has a different taste, any change in the taste like bitterness in the grains, soya, sunflower oil meal and groundnut cake indicates the presence of mycotoxins. 'The level of salt can be detected by tasting the ingredient and the feed. The bitter taste of rice polish indicates the rancidity of the fatty acids.

**Touch**

Sensing the raw materials by touching them may reveal the difference between pure raw materials and adulterants. It requires a high knowledge on the appearance, size and the feeling of the raw materials and the common adulterants used in the raw materials.

# Min Total™

## Organic & Inorganic Mineral

- Natural Moulting
- Growth of Plankton
- Controls Body Cramp
- Pond Water Mineralization
- Shell Formation


Net Weight : 10 kg

HI-TECH PHARMA
Solutions for Animal Health & Nutrition

An ISO 9001 : 2015 Certified Company
An ISO 22000 : 2018 Certified Company
A GMP Certified Company

Corporate Office :
D.No. 15/395, 3rd Floor, Brindavanam, Nellore-524001. A.P. INDIA.
email : info@hitechpharma.co, website : www.hitechpharma.co
Mfg. Unit : 6-82/1, P.R. Palem, Kovur, Nellore-524137. A.P. INDIA.
Cust. care No.: +91 97010 22555

*Raw fishmeal*

*Adulterated fishmeal*

*Raw soybean meal*

*Adulterated soybean meal with sand*

**Chemical Evaluation**

Analysing the feed ingredient in an analytical laboratory and the accurate estimation/determination of the nutrient content present in the feed ingredients and contaminants should be given utmost importance. The feed ingredients are commonly analysed for their proximate values. This may indicate the possible changes in the feed ingredients in the aspects of their original crude fibre, lipid and total ash values. Low crude protein and high crude fibre in the oilseeds may be used as an indication of adulteration with some cheaper fibrous materials. High crude fibre values alone could be used as an indication of adulteration with urea or other low-quality feed ingredients like mahua, Karanja or castor oil cakes.

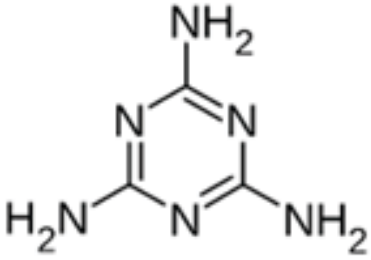
To determine the amount of sand or other dirt adulterants in the feed ingredients, acid insoluble ash determination would be a good indicator. Fishmeal is usually contaminated or adulterated with sand during the drying process. To determine the rancidity of oils, oily materials like fish oil are subjected to free fatty acid evaluation. The chemical composition of various animal feeds is laid down by the BIS which act as guidelines for the suppliers. Ingredients which are mainly used as a protein source in the aquafeeds should be analysed for their amino acid contents, as the common adulterant used is urea which increases the nitrogen content alone and not the amino acid content. These fraudulent protein substitutes are added to feeds to mislead the industry where traditional methods are employed to determine the protein content, based on the total nitrogen content.

**Biological Evaluation**

Biological evaluation of the feed ingredients and the prepared aquafeeds involves the use of aquatic animals like fishes and shrimps to conduct the digestion process and metabolic trials and to determine the outcome. This method of evaluation is time-consuming and labour intensive.

**Melamine in Aquafeed**

Melamine (2,4,6-triamino-1,3,5-triazine) is a heterocyclic compound containing six atoms of nitrogen and is commonly used for manufacturing plastics. Melamine has a high nitrogen content(66.6% by weight), which makes it an excellent adulterant in feed ingredients. Production of melamine increased considerably in the 1990s in China. Worldwide production of melamine was estimated to be 1.2 million tons. Melamine and their related triazines were found in protein sources like wheat gluten meal and rice protein extract in the USA which were exported from China to prepare the animal feed. Few reports have indicated the negative effects of melamine on the aquatic animals also. Studies of melamine on the growth performances, blood components and alteration in the histology of catfish were also depicted. They can also influence the skin of the aquatic animals. However, there is not much information on the effects of this compound on the growth of major finfish species as well as on melamine-inflicted pathology. The findings on the inclusion of melamine adulterated feed would help the aqua industry to understand the consequences of using adulterated feeds for farmed fish. Though the protein content in fish that has consumed melamine will be higher than in normal fish, this cannot be an excuse for allowing the inclusion of melamine in aquatic feeds.



*Melamine structure*

**Dioxins in fish oil**

A global increase in contamination due to polychlorinated dibenzo - p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and coplanar polychlorinated biphenyls (cPCBs),which are lipophilic, persistent, bio accumulative, and toxic, has caused grave concerns due to their adverse effects on the environment. For humans, dietary intakes are the primary intake sources of these contaminants. The main sources are fish, seafood, oil, and fat. In particular, it was recently revealed that the concentrations of these contaminants are significantly greater in farmed fish as compared to wild fish. This is due to the contamination of feedstuffs for farmed fish, which comprise fish oil and fishmeal. Because fish oil is a unique source of highly unsaturated fatty acids, it is widely used not only as feed ingredient but also as food products and dietary supplements. Therefore, the research and development regarding the technology for the removal of contaminants from fish oil assume considerable importance for reducing health risks to humans.

**Feed microscopy**

Feed microscopy is usually used for checking the adulteration and detecting the adulterants. Feed ingredients, adulterants and contaminants are studied under high and low magnification for distinctive features whether coarsely or finely ground. The physical characteristics like shape, size, colour, softness-hardness and texture of the feeds are observed at low magnification of 8x to 50x. It is a useful method for identifying impurities or contaminants and estimating the quality of feed ingredients. It also serves as a useful method for identifying omitted/mislead ingredients in prepared aquafeeds. Higher magnifications of 100x to 500x are used for observing plant cells and structural features of the feed ingredients since they are retained after grinding or even after powdering the feed ingredients.

**Conclusion**

Adulteration is very common nowadays and the use of adulterants destroy the actual purpose of the feed formulation and preparation. Knowledge on adulterant is as important as that of understanding the quality of feed ingredients. Recent advances in science lead to developed identification methods of adulterants. Though advanced methods have been standardized, the use of adulterants in aquafeeds are ever-growing and therefore updating information on this aspect is key to the success in feed manufacturing. In recent years, Near Infrared spectroscopy have been successfully applied for the analysis of adulterants in the feed ingredients. More importantly, the unethical use of these toxic substances as a feed ingredient should be discouraged. ☐


## SUBSCRIPTION ORDER FORM

Aqua International

*English monthly on Aquaculture*

Subscribe to Aqua International and Update yourself on Aquaculture

☐ 1 Year (12 issues): Rs 800 ☐ 2 Years (24 issues): Rs 1500

☐ 3 Years (36 issues): Rs 2100 ☐ 5 Years (60 issues): Rs 3500

Payment for subscription should be sent by Cheque/Bank Draft drawn in favour of **NRS Publications**, payable at Hyderabad.

Name of the Company: .....

Mr/Ms: ..... Designation : .....

Address: .....

.....

.....

Place / City : ..... State : ..... Pin Code :.....

Mobile: ..... Tel: .....

E-mail: .....

PAYMENT: Please find enclosed a Bank Draft/Cheque No ..... Dated .....

for Rs ..... favouring **'NRS PUBLICATIONS'**, payable at Hyderabad, India.

Please send the magazine to the above address.

Date: Signature

Payment may also be sent through wire transfer. Our Bank Account details are: ***A/c Name:*** *NRS Publications,* ***Bank Name:*** *ICICI Bank Limited,* ***A/c No:*** *000805004644,* ***IFSC Code:*** *ICIC0000008,* ***PAN No.*** *ABMPM6671L,* ***Swift Code:*** *ICICINBBNRI.*

NATURE OF ACTIVITY (Please mark √ in the appropriate box)

☐ Farmer ☐ Hatchery ☐ Feed Manufacturer

☐ Healthcare & Nutrition Co. ☐ Technical Expert

☐ Aerators & Equipment Suppliers ☐ Consultant

☐ Processing / Exporter ☐ Insurance Company

☐ Dealer / Distributor for: Seed / Feed / Healthcare & Nutrition Products / Equipment ☐ Others

Mail this Subscription Order Form duly filled in along with payment to:

The Circulation Department,
AQUA INTERNATIONAL, NRS PUBLICATIONS
BG-4, Venkataramana Apartments,
11-4-634, A.C.Guards, Near IT Towers,
Hyderabad - 500 004, India.
Tel: 2330 3989, Mob: 96666 89554

NRS PUBLICATIONS
www.aquainternational.in

**E-mail: info@aquainternational.in,**
**Website: www.aquainternational.in**

**FOR OFFICE USE**

Inward No. ..... Received on ..... DD/Cheque No: .....
Date : ..... Subscription No. : ..... Initial: .....

# Disinfectants used in aquaculture; Aquatic animal health management prospective

Email: venikitty1234@gmail.com

***Krishnaveni K N[1]., Lavanya . K[2] and Sudarshan. S[1]***

*[1]Dr MGR. Fisheries College and Research Institute, Tamil Nadu Dr J. Jayalalithaa Fisheries University, Thalainayeru, Nagapattinam, Tamil Nadu, India.*

*[2]Dr MGR. Fisheries College and Research Institute, Tamil Nadu Dr J. Jayalalithaa Fisheries University, Tutucorin, Tamil Nadu, India.*

**Highlight Points**

- Disinfection is of the biosecurity measures followed in aquaculture.
- It reduces the risk of introducing infectious disease and its occurrence and transmission in the fish and shrimp culture.
- It also minimizes the stress on animals thus it provide less susceptible to disease. It eventually increases the health status of fish. Proper disinfection methods minimize the critical situation faced by farmers.

**Introduction**

Aquaculture is the fastest growing animal food production in the world. The disease is the major constraint to hamper production. Good management practices can prevent the occurrence of the disease in the culture system. The one most widely used management practices are the use of disinfectant. In the aquaculture industry, a variety of compounds are commonly used as disinfectants. These compounds are routinely used to kill bacteria, viruses, and other pests that could affect productivity at most fish and shrimp hatcheries, grow-out, and processing facilities. Regulations controlling disinfectant use vary by country and can range from simple to quite complex.. However, in the case of an outbreak of a notifiable disease, rigorous disinfection procedures are necessary (Torgersen and Håstein, 1995).

**General principles of disinfection**

Principle relating to aquaculture establishments includes the application of chemical treatments in sufficient concentrations, and for sufficient periods, to kill all pathogenic organisms that would otherwise gain access to surrounding water systems. As the inherent toxicity of disinfectants prohibits safe use in open water, or open water systems, disinfection can only reasonably be applied to hatcheries and tank holding facilities (Health (OIE), 2009).

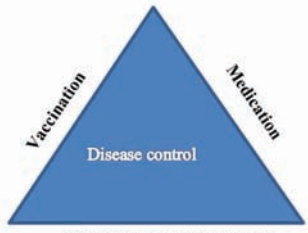


Figure no.1:Disease control triangle

**The choice of disinfection depends on**

1. Procedures depends on the size of the material
2. Type of material
3. Nature of the materials
4. Facilities to be disinfected
5. The products that are legally available in a country .

(Fischbach and Dunning, 2009)

BKMN

BKMN AQUA

SPF. L. vannamei Seed Production Center.

"YOUR SUCCESS IS OUR GOAL"

- Well Experienced & Qualified Team.
- Antibiotic Free Seed Production.
- Own Maturation Centers.
- Equipped with High-Tech Facilities.
- Screening of Nauplii & Post Larvae By PCR.

Vijayawada
Ongole
Nellore
Gudur
Pondicherry

HATCHERIES

Amaravathi karakata road, Undavalli Village, Tadepalli Mandal, Guntur Dist Vijayawada, Andhra Pradesh - 522501

SY No. 1189/2, 1190/1,2,6 Srikakulam Village, Ghantasala Mandal, Krishna Dist - 521132

R.S. No. 248, Ramudupalem Village, Challapalli Mandal, Krishna Dist - 521126

SY No. 206, Vajjireddypalem Village, Rajupalem Post, Kothapatnam Mandal, prakasam Dist, Andhra Pradesh - 523280

SY No. 489/2A Ramudupalem Village, Madivathipalem Post, Indukurpet Mandal, SPSR Nellore - 524313

Tupilipalem Village, Vakadu Mandal, SPSR Nellore Dist, Andhra Pradesh - 524415

1/5, Anna Street, Chinna Kuppam, Kadalur Village, Seyyur Taluka, Kanchipuram Dist Tamilnadu - 603305

BKMN Aqua
BKMNAquaHatcheries
www.bkmnaqua.com
1800 572 6232
info@bkmnaqua.com
bkmnaqua@gmail.com
For Bookings:
8179751745, 9603769095

Disinfection procedures must be established and used according to the objectives of disinfection and any identified risks. Diseased aquatic animals, animal fluids and tissues (e.g. viscera, blood, mucus, faeces), and their contact with equipment and workers present a risk of transmission of pathogens that could eventually infect healthy aquatic animal populations (Health (OIE), 2009).

**An effective disinfectant is chosen based on**

1. Efficacy
2. Environmental impact
3. Operator safety

**Properties of good disinfectant**

- It should have a broad spectrum and potent germicidal activity, with rapid onset and long-lasting effect.
- It should not be liable to to development of resistance in target microorganisms.
- It should withstand a range of environmental factors (eg, pH, temperature, humidity) and
- It must retain activity even in the presence of organic material.
- Disinfectants should be nondestructive to applied surfaces.
- They should be readily biodegradable, not accumulate in the environment, or react with other chemicals to produce toxic residues.
- It should not have or minimal of offensive odor, color, and staining properties.

**Cleaning and disinfection protocol.**

The following steps are recommended in this order to routinely clean and disinfect equipment.

1. Manually remove dirt and organic matter.
2. Clean vigorously with a detergent or soap and water.
3. Rinse.
4. Apply a disinfectant with appropriate contact time.
5. Rinse again or neutralize.
6. Dry completely (preferably in the sun)

**Basic disinfection protocols**

The basic disinfection protocol is

1. Removal of all aquatic animals(both dead and alive) from the facility, (Direct disposal of disease aquatic animals of any life stage into water is harzardous then the stock should be harvested or humnanely killed)
2. A claeaning programme to eliminate all organic matter adhering to surfaces
3. The use of disinfectant on equipment and installation and
4. Final neutralization using chemical products
5. In the case of land-based aquaculture establishments, the tank, raceway, or pond, etc., should be disinfected prior to discharge and again prior to restocking (Health (OIE), 2009)

**Table no.1: Disinfectant activity can be divided into several levels:**

| Disinfectant level | Bacteria | | | Fungi | Viruses | |
|---|---|---|---|---|---|---|
| | spores | Mycobacterium tuberculosis | Vegetative cells | | Hydrophilic and small | Hydrophobic (lipophilic) and medium size |
| **High** | Killing effect | Killing effect | Killing effect | Killing effect | Killing effect | Killing effect |
| **Intermediate** | Little or nio killing effect | Killing effect | Killing effect | Killing effect | Killing effect<br>Little or no killing effect | Killing effect |
| **Low** | Little or no killing effect | Little or no killing effect | Killing effect | Killing effect<br>Little or no killing effect | Killing effect<br>Little or no killing effect | Killing effect |

**(Noga, 2010)**

**Use No. 1:** Eradication of infectious agents from a contaminated environment

- Euthanized fish should be disposed of using standard biohazard guidelines for infectious waste are usually disinfected by using chlorination.
- If there is a large amount of organic matter in the aquarium, this may require more disinfectant than recommended.
- In ponds or other large culture systems, slaked or hydrated lime is the method of choice for disinfection.

POSEIDON
INDIA
25 years
1995 2020
... of living and growing with nature


POSEIDON BIOTECH
An ISO 9001 : 2015 certified company
2&3, PKM Cross Street, School Road, Mel Ayanambakkam, Chennai - 600 095 INDIA.
Customer Care: +91 94440 24888 / customercare@poseidonbiotech.com / www.poseidonbiotech.com

**Use No. 2:** Killing of infectious agents in contaminated water supply

- Surface water sources are often contaminated with infectious agents that may cause problems in culture. Treating incoming water can reduce or eliminate these problems, although it is expensive to treat water in this manner.
- **Ozone, ultraviolet irradiation, and chlorination/ dechlorination** have been used. Pathogens are often spread by fomites. If these fomites are properly disinfected at defined critical control points, exposure to pathogens will be greatly reduced (Noga, 2010).

**Most common disinfection methods** are

1. Physical and
2. Chemical

**Physical methods of disinfecting equipment**

1. Heat,
2. Sunlight and
3. Drying (dessication).

**1. Heat,**

Exposure to temperatures of 80 to 100 °C for 10 minutes kills all active microorganisms, but spores may require much longer time periods.

**2. Sunlight**

Sunlight can be effective, but exposure time will vary depending upon intensity, temperature and other factors.

**3. Drying**

Drying equipment can also help reduce pathogen numbers, although spores, cysts or eggs may survive treatment. In areas with high humidity (such as closed aquaculture buildings or outdoors during rainy or wet seasons), complete drying may not be possible.

**Table No.2: Chemical disinfectant commonly used in aquaculture**

| Disinfectant type | Products / chemicals | Dose or dilution | Contact time |
|---|---|---|---|
| **Chlorine** | **Sodium hypochlorite** (liquid) | 200 to 500 mg/L available chlorine | 10 to 60 minutes for general disinfection. |
| | **Calcium hypochlorite** (powder, granules, pellets) | 5,000 to 10,000 mg/L available chlorine | Higher concentrations and longer contact times may be required for specific pathogens and situations.<br>10 to 30 minutes to eliminate some more resistant types of mycobacteria and spores.<br>When cleaning tanks, disinfect for 24 hours, neutralize, rinse, and allow to dry. |
| **Iodine/ Iodophor** | **Providone-iodine** Contains 9 to 12% available iodine calculated on a dry weight basis.<br>Formulations may contain1 to 10% providone-iodine, which is equivalent to 0.1 to 1% available iodine | 30 to 50 mg/L of free iodine.<br>Dilution depends on product. 200 to 250 mg/L free iodine | 10 to 30 minutes for general disinfection<br>Prolonged contact time likely for mycobacteria and spores. |
| **Virkon®** Aquatic | **Virkon® Aquatic** 21.4% potassium peroxymonosulfate and 1.5% sodium chloride | Virkon dilution of 0.5% to 1% or 50 to 100 g per 10 liters of water | 10 to 15 minutes for general disinfection. |
| **Quaternary Ammonium Compounds (QAC)** | **Roccal®-D**<br>10% solution of benzalkonium chloride | 250 to 500 mg/L benzalkonium chloride<br>5 ml of Roccal per 1 liter of water often used for a net dip Roccal dilution of 0.1 to 1.5% also common | 10 to 30 minutes for general disinfection. |

| | | | |
|---|---|---|---|
| **Alcohol** | **Ethyl alcohol** (ethanol) and **isopropyl alcohol** (isopropanol | 60 to 90% (v/v; volume of alcohol to volume of water) | 10 to 30 minutes for general disinfection. |
| **Chlorhexidine** | **Nolvasan®-S** 2% Chlorhexidine Diacetate<br><br>**Virosan™** 2% Chlorhexidine gluconate (CHG)<br><br>Most solutions contain 2% active chlorhexidine | Nolvasan dilution of 10% (add 100 ml to 1 liter of water) for disinfection | 5 to 10 minutes for general disinfection |
| **Hydrogen peroxide** | **3% Hydrogen peroxide**<br>**35% PEROX-AID** | 3 to 30% w%; weight Percentage (If using 35% PEROX-AID for treatment of fish or disinfection of eggs,follow labeled instructions.) | 5 to 30 minutes for general disinfection. (One recommendation is for 3 to 5% for 5 to 15 minutes.) |
| **Phenolic derivatives** | ***ortho*-phenyl phenol**<br>***ortho*-benzyl-*para*chlorophenol**<br>***para*-tertiary amylphenol**<br><br>**Lysol®** 1% Benzyl-4-chlorophenol-2-phenylphenol | 2 to 5% active Ingredient<br><br>1% Lysol | 10 to 30 minutes for general disinfection.<br><br>1 minute inactivates mycobacteria. |
| **Aldehydes** | **Formaldehyde** | 1 to 8% | 10 minutes to 16 hours. |
| **pH** | **Calcium hydroxide** (slaked lime)<br>**Calcium oxide** (quicklime)<br>**Hydrochloric acid**<br>**Phosphoric acid** | pH > 11<br><br>pH < 4 | >4 hours |

*(Yanong and Erlacher-Reid, 2012)*

**Conclusion**

This study concludes that disinfectants are an essential method to avoid the crisis in the aquaculture, mainly in hatchery units the disinfectants protocols are strictly followed because the animals are easily got affected by pathogens It eventually minimizes the occurrence of mass mortality of larval rearing. Regularly monitor of systems, water quality, isolate sick fish and remove dead and moribund fish. Thus disinfection is employed as a common disease management tool in aquaculture establishments. It may be used as a routine practice in biosecurity programs designed to exclude specific diseases, as well as a routine sanitary measure employed to reduce disease incidence within farms, or it may be used in disease eradication efforts. A better understanding of importance of disinfection among the fish farmers has to be needed to control and avoid the spread of infectious diseases in aquaculture.

**Reference**

Fischbach, F.T., Dunning, M.B., 2009. A manual of laboratory and diagnostic tests. Lippincott Williams & Wilkins.

Health (OIE), W.O. for A., 2009. Methods for disinfection of aquaculture establishments, Manual of Diagnostic Tests for Aquatic Animals. Office international des epizooties Paris, France.

Noga, E.J., 2010. Fish disease: diagnosis and treatment. John Wiley & Sons.

Torgersen, Y., Håstein, T., 1995. Disinfection in aquaculture. Rev. Sci. Tech. Int. Off. Epizoot. 14, 419–434.

Yanong, R.P., Erlacher-Reid, C., 2012. Biosecurity in aquaculture, part 1: an overview. SRAC Publ. 4707, 522. □

# Eco-acoustics: *Sound's ecological significance in aquatic ecosystems*

**Email: rinkeshwanjari0712@gmail.com**

***Rinkesh N. Wanjari[1], Karankumar K. Ramteke[2] and Dhanalakshmi M[3].***

*ICAR- Central Institute of Fisheries Education, Mumbai- 400 061.*

*[1]Master of fisheries science in the department of fisheries resource management*
*ICAR- Central Institute of Fisheries Education, Mumbai.*

*PhD scholar at SKUAST-K, Faculty of fisheries, Rangil (J&K)*
*[2]Scientist at Central institute of fisheries education, FRHPHM Division, Mumbai.*
*PhD in the department of fisheries resource management*

*[3]Master of fisheries science in the department of fisheries resource management*
*ICAR- Central Institute of Fisheries Education, Mumbai.*

*PhD scholar at ICAR- Central Institute of Fisheries Education, Mumbai.*

**Introduction**

The global marine and freshwater ecosystems are experiencing an drastically decline and re-distribution of biodiversity, due to far reaching effects of human activities, including accelerated climate change and over-exploitation. Such Change in baselines in terms of species abundance and distribution will result from changes in aquatic diversity patterns, which must be monitored immediately. As a consequence, ecoacoustics is important for tracking large-scale changes. Ecoacoustics, also known as acoustic ecology or soundscape studies, is a discipline that studies the relationship between humans and their surroundings as mediated by sound. Ecoacoustics is the study and understanding of ambient sound from an ecological perspective. Is a field of study that is applicable to long-term monitoring, habitat health, biodiversity assessment, soundscape protection, and ecosystem management, as well as the uses of sound in aquatic ecosystems, methods for measuring aquatic animal sound, and ecoacoustics metrics for data analysis (Sueur and Farina, 2015). Sound of biological and physical origin has recently been recognised as an important component of ecological research, with researchers discovering, for example, that the changing sound output of many species that use sound to communicate, mate, and control social conflicts represents early signs of animal stress linked to climate change (Krause and Farina, 2016). The time it takes for a species to adapt to a new life trait is likely to be determined by its adaptive potential, and this mechanism necessitates a long period of system equilibrium in order for evolutionary changes to take place. Underwater noise has the potential to weaken and alter a habitat's natural acoustic signature (for example, through species migration and biodiversity loss), a process that can be documented using eco-acoustic methods. Beyond the continental shelf depths of 200 metres, open ocean and deep seafloor environments make up more than 70% of the total surface area of our world, but many of these regions are understudied due to their remoteness from land, with extreme depths reaching 10,000 metres in some areas of the deep ocean. Ecoacoustics is widely used in environmental science to measure the degree of acoustic complexity, and is thought to be a strong predictor of biodiversity. Ecoacoustics is a promising field that is gaining the recognition and appreciation it deserves as a realistic

**Highlight Points**

- Disinfection is of the biosecurity measures followed in aquaculture.
- It reduces the risk of introducing infectious disease and its occurrence and transmission in the fish and shrimp culture.
- It also minimizes the stress on animals thus it provide less susceptible to disease. It eventually increases the health status of fish. Proper disinfection methods minimize the critical situation faced by farmers.

science for investigating and analysing environmental degradation levels. Ecoacoustic codes are obligate and special mechanisms that transmit voluntary or involuntary information to an active listener from individuals, species assemblages, and the environment. Their ontogenesis, evolution, and adaptation vary by species, typology, local background of soniferous assemblages, geomorphology, vegetation conditions, and human intrusion degree (Francis et al., 2009, Wong and Candolin, 2014). Ecoacoustics may also look at the effects of the growing influence of anthropogenic sounds (noise) on the biogeography, biodiversity, and ecology of organisms living in both human-modified and unaltered terrestrial and marine systems (Lomolino et al., 2015).

**Historic background**

Leonardo da Vinci is credited with the earliest known reference to underwater sound in 1490.Muller (1857) wrote a systematic overview of 'piscesvocales' (vocal fishes) in the mid-nineteenth century. Representatives from seven mostly marine families were on his list-dactylopterids, balistids, sciaenids, triglids, zeids, batrachoidids,cottids, tetraanddiodontids-and three freshwater families' cyprinids, mochokids, and cobitids.The use of the term "ecoacoustics" was suggested at a meeting in June 2014 at the museum of natural history in Paris where "soundscape ecology" was also suggested as an alternative.Sound waves actually travel five times faster in water than in air. The acoustic character of the environment has a long history, with research dating back at least 50–60 years.Sounds propagate in the air at 343 m/s at 0□, and propagate five times faster (1484 m/s) in water with high variability. Courtship, spawning, agonistic action, competitive feeding, and when disturbed are all situations when fish make sounds. As a result, major types of sound-producing mechanisms were identified at the turn of the twentieth century, although others were only recently discovered.

**Classification of sound and measuring tools**

Sound can be divided into three categories: geophysical, biological, and anthropic. Geophysical sounds include waterfalls, ocean waves, winds, thunderstorms, lightning, and volcanoes (geophonies). Biological sounds(biophonies) are produced by active vocalisations of soniferous organisms(e.g., tymbals in cicadas, vocal chords in mammals, vocal sacs in frogs, syrinx in birds, etc.). Synthetic technologies/activities such as machineries and music, fires, cars, urban environments, and factories produce anthropogenic sounds (technophonies). Sonagrams, which show frequency against time; oscillograms, which show amplitude against time; and frequency spectra, which show amplitude against frequency and indicate dominant frequencies within a sound, are three important tools for describing fish sounds.

**How do fish make sounds?**

Fish make a variety of sounds, each using a different mechanism and for different purposes. Sounds (vocalisations) may be created for a variety of reasons, including threatening predators or rivals, attracting mates, or as a fright response. Unintentional sounds are also produced, such as those made as a by-product of feeding or swimming. Drumming (using sonic muscles located on or near the swim bladder), striking or rubbing together skeletal components (stridulation), and rapidly shifting speed and direction when swimming are the three main ways fishes emit sound (hydrodynamics). Fishes make low-frequency sounds, usually less than 1000 Hz.

**How is sound used to detect fish?**

Sonars deliver sound waves or signals into the water, which bounce back when they hit something. Part of the signal is reflected back to the boat by the fish, while the rest is carried to the seafloor and then bounced back to the boat. Fish finding sonar units send and receive signals many times per second. They concentrate sound into a beam that is transmitted from a transducer. These units include visual displays that print the echoes. The bottom appears as a continuous line drawn across the display. In addition, any objects that are in the water between the surface and the bottom may also be displayed.Sound transmitted from the boat's transducer spreads out in a conical shape. Fish that swim within this cone may reflect some of the sound back to the transducer. The sonar's chart screen displays the reflected signal or echo. Depending on how much of the school is inside the transducer's cone, a school of fish will appear in a variety of shapes or formations.A fish arch forms as the fish moves through the sonar beam. A mark appears on the chart display when the fish enters the outer edge of the cone. Fish finders operate at high frequencies of sound, approximately 20-200 kHz (20-200,000 cycles per second).Many marine and freshwater animals rely on sound for survival, and they have developed special adaptations that enable them to communicate, defend themselves, find food, navigate underwater, and/or understand their surroundings. They can make noises as well as listen to the sounds around them

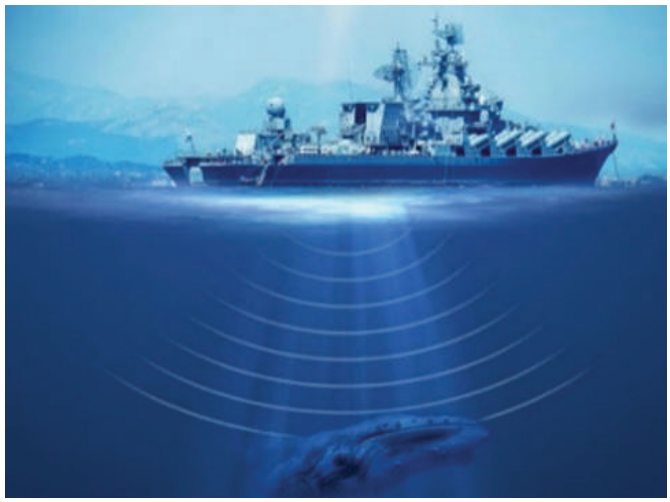


*Fig. 1Detection of fish shoals*

**Sound Emissions and their Ecological Role in aquatic ecosystem.**

The first fish detection using active acoustics were reported in 1926 by the French explorer Rallier du Batyafterwards the first echogram to be published was recorded by Bokn in Frafjord, showing sprat schools.In 1929, the Japanese

scientist Kimura reported disruptions in a continuous acoustic beam by sea bream swimming in an aquaculture pond.In 1935, Norwegian scientist Oscar Sund reported observations of cod schools from the research vessel.Fish Catalog underwater sounds were first conducted in the 1960s and 1970s, by Fish and Mowbray (1970) systematically cataloged sounds of western North Atlantic fishes, both in situ and in aquaria.Bony fishes have evolved a diversity of sound generating mechanisms and produce a variety of sounds. By contrast to sound generating mechanisms, which are lacking in several taxa, all fish species possess inner ears for sound detection. Fishes may also have various accessory structures such as auditory ossicles to improve hearing.

**Uses of sound in aquatic ecosystem**

- Communication
- Protect themselves
- To locate food
- To navigate under water Environment
- To attract mates

**Marine mammals**

Among all aquatic species, marine mammals, especially dolphins, have developed the most sophisticated and specialized sound-producing and receiving system in nature. Dolphins communicate using a combination of visual, tactile, acoustic, and possibly chemosensory channels (Herman and Tavolga, 1980). The echolocation clicks of most dolphin species are extremely short (from 50 to about 100 µs) and generally show a wide frequency band which extends from 2 to over 200 kHz, and a source level variable between 140 and 220 dB 1 µPa at 1 m, as reported by Au (1993). Sounds at high frequency emitted by whales and dolphins are used as sonar to locate food and obstacles (Au, 1993 and Griffin, 1959). Sound is a primary vehicle used by soniferous species to provide information on individual fitness and can be considered an honest signal (Buchanan et al., 1999;2002).

Fig. 2a *Delphinus spp.*

*Fig.2bToothed whales (odontocetes)*

**Finfish and Shellfish (Lobster, Shrimp, Crab etc.)**

Several marine invertebrates, such as spiny lobsters and fiddler crabs, have been reported to produce sounds for defence and courtship. Sound is used by some marine invertebrates for a variety of purposes. The cleaner shrimp announces itself as a cleaner and advertises its services by clapping one pair of its claws when reef fish approach.Fish produce sounds for several reasons, including staying in contact with the school, alerting conspecifics about the presence of treats, to attract, stimulate and communicate with conspecifics, to intimidate predators which might consume their eggs and juveniles and probably, in few species, to perform echolocation activity. Several catfish families have an enhanced first pectoral fin ray (pectoral spine) that can generate stridulatory sounds when rubbed against a groove of the shoulder girdle.The marine group of codfish also contain a large number of vocal species that emit sounds in agonistic and reproductive contexts. Agonistic sounds have been described for the cod (*Gadusmorhua*), the Pollack (*Pollachiuspollachius*), and the haddock (*Melanogrammus aeglefinus*), the more distantly related gadiformes. Pollack and tadpole fish emit grunts, cod and haddock produce knocks and grunts, and shore rockling makes thump-like sounds in agonistic or alarm situations (Almada et al.,1996; Amorim 1996; Fish and Mowbray 1970; Hawkins and Rasmussen 1978; Midling et al., 2002).Several marine crustacean organisms have evolved a variety of sound-producing mechanisms such as stridulation (Boon et al.,2009), stick and slip friction (Meyer-Rochow and Penrose 1976; Patek 2001; Patek and Baio 2007), carapace vibrations (Patek and Caldwell 2006), snaps (Knowlton and Moulton 1963), percussion or rubbing (Imafuku and Ikeda 1990 mandible grinding (MeyerRochow and Penrose 1976), emission of bubbles (Crane 1966), and contraction of internal muscles (Henninger and Watson 2005). Spiny lobsters are able to produce highly specialized acoustic signals called rasp.Only the species of snapping shrimp belonging to the genera Alpheus and Synalpheus are capable of making loud snapping sounds (Johnson et al., 1947). Crabs that live on the surface make sounds that are transmitted through the air and the substrate. Some animals perceive airborne sound through pressure sensitive mechanoreceptors, while others perceive substrate vibration through mechanoreceptors.


*Haddock fish Snapping shrimp*


*Mangrove crab* *Spiny lobster*

**Fig. 3*Finfish and Shellfish species***

**Eco-acoustics characteristics**

**Diurnal and seasonal change of acoustic activity**

Sound generated from a location may be used to assess daily patterns of change in animal behaviour (Farina & Gage, 2017). Seasonal variations in animal behaviour occur in temperate regions as the seasons alter.Migratory populations of marine and terrestrial animals (mammals, fish, birds, etc.) migrate from overwintering environments to breeding habitats that can be far away and require a significant amount of energy expenditure in the spring.

- **Acoustic interactions between species**

Fish produce sounds for a number of reasons, including keeping in contact with their school, announcing the existence of treats to conspecifics, and attracting, enticing, and interacting with one another.

- **Level of habitat health**

  The types of sounds emitted from a site are determined by habitat health, and these signals may indicate the quality of that location.

- **The number of species present**

  Ecoacoustics measures the ecosystem's species diversity and richness.

- **Trophic interactions**

  We may conclude that there are food resources nearby when we hear the thrush's song, and thus recognize trophic interactions.

- **Biological diversity**

  It necessitates the documentation of all species found in a given area. Due to seasonal changes can also alter biological diversity (Farina & Ceraulo, 2017; Sueur et al.,2008; Tucker et al.,2014).

- **Level of disturbance**

  The ecoacoustics can be determined by the amount of underwater background noise.

- **Time arrival and migration of species**

  Sound measurements along routes can also be used to assess shifts in the areal pathways used by migratory animals to travel from wintering to breeding sites.

**The Eco-acoustic theatre new experience of nature through sound**

The first permanent Eco-acoustic Theatre opened to the public in 2017 at Naturama Natural History Museum, Denmark. The theatre features specific programs of Fragments of Extinction, as immersive listening experiences and educational documentaries on the consequences of the biodiversity crisis on soundscape heritage. The theatre is a unique facility dedicated to immersive listening experiences.

**Fig. 4*Eco-acoustic theatre, Denmark***

**Eco-acoustic benefits and drawbacks**

**Benefits:**

- The measurement of fish abundance is probably the most important application of acoustics in fisheries research.
- It eliminates visual sampling bias.
- Helps the fish for navigation, communication, predator-prey relationship, trophic interaction.
- Studying the effects the anthropogenic noise which can affect fish in multiple ways: by increasing stress levels, changing dispersal behaviours and interfering with communication.

**Drawbacks:**

✓ Lack of appropriate equipment for underwater playback experiments in the field.

✓ Cost of equipment is very high.

✓ The acoustic methods of observation are unsuited to the flatfish and other species which live in close association with the sea-bed.

✓ One of the reasons for the current lack of automatic detection methods requires a prior knowledge of the recorded sounds.

**Conclusions**

Global marine and freshwater ecosystems, like many terrestrial ecological environments, are experiencing unprecedented biodiversity and species abundance loss and relocation, which must be managed and taken into account into future conservation planning.As a result, many aspects of acoustic communication in both terrestrial and

aquatic organisms remain to be studied, which we hope will lead to many exciting advancements in the future.To determine the modalities of polluting noise transmission, control noise abatement behaviour, examine and better understand animal communication for conservation purposes, and ensure sustainable growth, knowledge of the sonic characters is essential.Exploring the ecology of sounds is a great way to better understand adaptive processes and evolutionary exposure of organisms in the respond to environmental change since sounds play such a broad role in the environment. Ecoacoustics may address these concerns on a qualitative and quantitative level at a variety of functional scales, including individuals, populations, societies, habitats, and environments, as well as across a variety of epistemological domains.The key factors responsible for sonifeorus species' acoustic emission adaptation to environmental variability over time are defined in the acoustic adaptation domain. From a theoretical and applied perspective, ecoacoustics represents a modern and exciting ecological discipline that can ensure an effective and up-to-date environmental assessment and long-term monitoring.

**References**


Almada, V.C., M.C.P. Amorim, E. Pereira, F. Almada, R. Matos and R. Godinho. 1996. Agonistic behaviour and sound production in *Gaidropsarusmediterraneus* (Gadidae). J. Fish. Biol. 49: 363–366.Amorim, M.C.P. 1996. Acoustic communication in triglids and other fishes. Ph.D. thesis. Univ. Aberdeen, UK.

Au, W.W.L. The Sonar of Dolphins; Springer: New York, NY, USA, 1993; Volume Xii, p. 278.

Boon, P. Y., Yeo, D. C. J., & Todd, P. A. (2009). Sound production and reception in mangrove crabs Perisesarma spp.(Brachyura: Sesarmidae). *Aquatic Biology*, 5(2), 107-116.

Buchanan, K.L.; Catchpole, C.K.; Lewis, J.W.; Lodge, A. Song as indicator of parasitism in the sedge warbler. Anim. Behav. 1999, 57, 307–314.

Buchanan, K.L.; Spencer, K.A.; Goldsmith, A.R.; Catchpole, C.K. Song as an honest signal of past developmental stress in the European starling (*Sturnus vulgaris*). Proc. R. Soc. Lond. Ser. B Biol. Sci. 2002, 270, 1149–1156.

Crane, J. (1966). Combat, display and ritualization in fiddler crabs (Ocypodidae, genus Uca). *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, *251*(772), 459-472.

Farina, A., & Ceraulo, M. (2017). The acoustic chorus and its ecological significance. *Ecoacoustics: The ecological role of sounds*, 81-94.

Farina, A., & Gage, S. H. (2017). Ecoacoustics: a new science. *Ecoacoustics: The Ecological Role of Sounds*, 1-11.

Fish, M. P., & Mowbray, W. H. (1970). *Sounds of western North Atlantic fishes. A reference file of biological underwater sounds*. Rhode Island univkingstonnarragansett marine lab.

Francis, C.D., Ortega, C.P., Cruz, A., 2009. Noise pollution changes avian communities and species interactions. Current Biology 19, 1415-1419.

Griffin, D.R. Listening in the Dark; Yale University Press: New Haven, CT, USA, 1959.

Hawkins, A.D. and K.J. Rasmussen. 1978. The sounds of gadoid fish. J. Mar. Biol. Assoc. UK 58: 891–911.

Henninger, H. P., & Watson, W. H. (2005). Mechanisms underlying the production of carapace vibrations and associated waterborne sounds in the American lobster, Homarus americanus. *Journal of Experimental Biology*, *208*(17), 3421-3429.

Herman LM &Tavolga WN (1980) Communication systems of cetaceans. In: Herman LM (ed) Cetacean Behavior: Mechanisms and Function. New York: John Wiley & Sons, pp. 149-197.

Imafuku, M., & Ikeda, H. (1990). Sound production in the land hermit crab *Coenobitapurpureus*Stimpson, 1858 (Decapoda, Coenobitidae). *Crustaceana*, 168-174.

Kimura, K, 1929. On the detection of fish-groups by an acoustic method. Journal of the Imperial Fisheries Institute, Tokyo.

Knowlton, R. E., & Moulton, J. M. (1963). Sound production in the snapping shrimps Alpheus (Crangon) and Synalpheus. *The Biological Bulletin*, *125*(2), 311-331. □


***More references can be provided on request.***


**AVAILABLE FROM OUR READY STOCKS**

*AVAILABLE FROM OUR READY STOCKS:*

- *SPIRULINA POWDER SPRAY DRIED, CHOLESTROL*
- *YUCCA SCHIDEGERA - 80% & 30%*
- *SODIUM PERBORATE MONO, SODIUM PER CARBONATE, CALCIUM, PEROXIDE, TRIPLE SALT, HYDROGEN PEROXIDE, etc.*
- *BKC - 50%, GLUTRALDEHYDE - 50%, FORMAL DEHYDE - 37%, CETRAMIDE SOLUTION, PROPIONIC ACID etc.*
- *IODINE, POTASSIUM IODIDE, EMULSIFIER*
- *FERROUS SULPHATE, MANGANESE SULPHATE, MAGNESIUM, SULPHATE, ZINC SULPHATE, COPPER SULPHATE, COBALT SULPHATE, ZINC OXIDE, MAGNESIUM OXIDE, SODIUM SELENATE, AMMONIUM, MOLYBDATE, CHROMIUM etc. FLAVOURS, COLOURS, VITAMINS*
- *PROBIOTICS & ENZYMES*
- *PEPTONE, BEEF, BILE, MALT, PROTEIN, LIVER & YEAST EXTRACTS*
- *STARCH, DEXTROSE, DCP, TALC, KAOLIN, TSP, CALCIUM & OTHER BASE MATERIALS*
- *CHARCOAL, VITAMIN C, CALCIUM PROPIONATE, EDTA, CMC, GELATIN, GENTION VIOLET, MALCHITE GREEN.*

*Kindly contact for any requirements in Aqua Culture, Veterinary and Poultry Industry.*

**NIHAL TRADERS PVT LTD**

3-3-66, Flat no. 103, Sikhara Heights, Besides Manjira Hotel,
Chappal Bazar, Hyderabad - 500 027 T.S., India.
Ph: 040-24656968, 24746534, 24650253
Tele Fax: 040-24658097; Mobile: 9848040025
Email : nihaltraders@yahoo.com; www.nihaltraders. com

FECPI

SOLUTION FOR SUSTAINABLE

AQUA CULTURE....


Our all Products are Registered with CAA as Antibiotic-free Product

Imported and Marketed by

FECPI India Pvt. Ltd.

Admin. Off. : D-Block, Ground Floor, Sripati Nilayam,
No.85, Vallalar Street (School Road), Keal Ayanambakkam,
Chennai - 600 095. Mob : +91 99449 88192, Ph : 044 49523456

visit us at : www.fecpi.in

Postal Regn. No. HD/1068/2021-2023
Published on 7 April 2023

FUBON
Angel Animal Nutrition

# YeaMOS

*Natural source of Beta-Glucan & MOS*

- Relieve stress such as high density, water quality fluctuation(low oxygen, pH and temperature change) etc.
- Enhance non-specific immunity and reduce mortality.
- Regulate intestinal flora, reduce the risk of pathogens infection.

Andy Xiao (Mr.) Mobile/WhatsApp: +86 135 1727 2877 xiaoxt@angelyeast.com
168 Chendong Auenue, Yichang, Hubei, P.R. China +86-717-6306097 en.angelyeast.com

Angel