

# SAP initiative to **ZAP** Antibiotics usage in Shrimp Aquaculture

One of the primary reasons for the severe shrimp price crisis that the shrimp farming sector in India faced in the period from March to July this year is the lack of access for Indian farmed shrimp to all the major global markets in the world. Almost 70% of the total shrimp exported from India during 2017-18 found its way only to the US and to South East Asia markets. Stringent quality norms specified by EU and Japanese markets that are primarily driven by consumer demand, i.e., zero tolerance to the presence of any antibiotic residues or pathogens in the product was a hurdle that Indian exporters were not able to overcome.

Taking a lead to do away with the usage of antibiotics in shrimp aquaculture systems in the country, Society of Aquaculture Professionals (SAP), jointly with the All India Shrimp Hatchery Association (AISHA) and the Marine Products Export Development Authority (MPEDA) proposed to sensitize various stakeholder groups on the issue. To begin with, a series of one day Seminars specifically for the benefit of Hatchery operators, entitled "**Production of healthy shrimp PL free of antibiotics**", was organized in major hatchery hubs of the country viz. Chennai, Ongole and Kakinada on the 24<sup>th</sup>, 26<sup>th</sup> and 28<sup>th</sup> September 2018 respectively. Key resource persons from the sector were invited to deliver presentations on why antibiotics are to be avoided and the different ways through which shrimp hatcheries could produce seed without the use of antibiotics.



P. Anil Kumar Joint Director MPEDA

**P. Anil Kumar Joint Director MPEDA** gave a detailed presentation on “**Why no Antibiotics**”, discussing on the subject of export rejections, the loss of reputation for the country in the global market, Anti-Microbial Resistance (AMR) etc. Anil informed that, Indian shrimp products were very popular in the EU but it was only the Antibiotic residue issue that stood between the country and the EU market. Out of the EU 13 rejections last year, 12 were from India and the country's share in EU rejections stood at 62, 71 and 83% in the years 2015, 2016 and 2017 respectively. Due to this, EU had increased the percentage of sampling from 10-20% earlier to 50% with effect from October 2017. If there was no reversal in this trend, EU could either make 100% testing mandatory or even place a ban on shrimp products from India, Anil added.

Anil also touched upon the results of MPEDA's NRCP – National Residue Control Plan – antibiotic monitoring programme where significant antibiotic residues were found in hatchery seeds. If addressed immediately, our shrimp exports can easily cross the 10 billion mark, but if not, exports would suffer and bring in stringent regulations, inspections, penalties which meant an increased cost in doing business.



Dr. Peter De Schryver, Health Expert from INVE Technologies Belgium

**Dr. Peter De Schryver**, Health Expert from the Innovations Department of INVE Technologies Belgium made a presentation entitled “**A balanced health approach for shrimp larvi-culture is the best alternative to antibiotics**”. He remarked that keeping aside consumers requirement for antibiotic free shrimp, it is important to note that pathogenic bacteria were developing resistance to antibiotics at a faster pace than at the rate new potent antibiotics were being developed. Hatcheries

were therefore losing out on the option to use antibiotics as they no longer worked all the time and would be ineffective.

Peter explained that the Microbiota composition in shrimp gut which was responsible for digestion, metabolism and immunity in the animal, changed with shrimp age, the environment they are in and feed used. Changes in environmental parameters have an impact on immunity of shrimp. The idea therefore is to have a balanced health approach to minimise disease risk. This can be achieved by providing the best and balanced nutrition, enhancing immunity in shrimp through yeast based products and plant extracts and use probiotics containing strains of bacteria that have anti vibrio properties, throughout the rearing period to keep the levels of good bacteria well over the bad bacterial and opportunistic mutant bacterial levels, in addition to getting better growth and better survival.



Dr. Stephane Ralite, Lallemand Animal Nutrition, France

**Dr. Stephane Ralite**, Aquaculture Product Manager Lallemand Animal Nutrition, France in his presentation entitled “**Microbial and health management in Shrimp Hatchery, with an antibiotic replacement objective**” stressed on the need for Gut microbiota manipulation, water bacteria control and biofilm control in maintaining optimum health of shrimp larvae in hatchery operations. He pointed out that antibiotics reduced microbial flora in the gut leaving the space open for opportunistic pathogens to occupy especially during the Zoea stage which is a very critical stage with high risk of vibrio bloom, where it multiplies at a higher rate than other bacterial competitors. By limiting contamination, providing clean inputs

including clean nauplii, clean feed (Artemia, algae), adequate biosecurity, use of probiotics and limiting the food for vibrios to maintain a water-bacterial community balance, a healthy environment for larval rearing can be achieved.

Dr. Ralite informed that the critical target for a typical water probiotic was; Vibrio control, algal control, organic waste degradation, nitrogen control, resilience (Gas pH competition) and the speed of growth. He added that such advanced probiotic formulations that were capable of surviving in the intestinal tract of shrimp, decreasing vibrio loads in rearing water and shrimp larvae, support gut enzymatic activity and modulate immune and antioxidant status were available that could comfortably replace antibiotic usage in shrimp hatchery operations.



D. Ramraj, President All India Shrimp Hatchery Association (AISHA)

**D. Ramraj, President All India Shrimp Hatchery Association (AISHA)** gave a brief presentation on “Antibiotic Residues in PL - Understanding their source and adopting a pragmatic approach for their control”. Mentioning the historic background of antibiotic usage in shrimp hatcheries and the kinds of antibiotic used, Ramraj stressed on the need to understand that there is nothing as permitted antibiotics.

Ramraj stressed that even in cases where hatcheries did not use antibiotics, residues continued to be detected when sampled during the NRCP programme and suspected these results to be false positives from products that mimic antibiotics as in the case of Semi carbazide (SEM). Ramraj reiterated that Hatcheries were committed to abide by the demands of the consumer and adopt the norms

stipulated by the EIC, MPEDA and CAA. However, it was necessary that concerns of the hatchery operators, such as the issues in testing procedures and false positives in samples tested also be addressed. Ramraj also expressed the need for training of hatchery technicians in non-antibiotic therapies.

**Dr. C. R. Subhashini**, Director Aristogene Biosciences Pvt. Ltd., in her presentation entitled “**Bacteriophages: A substitute to antibiotic usage in Shrimp farming**” outlined that Phage therapy was a proven eco-friendly alternative approach to prevent and control pathogenic bacteria in aquaculture.



Dr. C. R. Subhashini, Director Aristogene Biosciences Pvt. Ltd., Bangalore

She explained that Bacteriophages; obligate intracellular parasites that multiply inside bacteria, was a natural enemy of bacteria and had several characteristics (such as highly specificity and effectiveness in lysing targeted pathogenic bacteria, safe to use and rapidly modifiable to combat newly arising bacterial threats), that made them potentially attractive therapeutic agents. The best part about Phages was that they were specific to the target bacteria and did not multiply when the bacteria get eliminated. And as these do not have any impact on the environment, unrestricted use, without limitations can be practiced. Shrimp could also be harvested irrespective of when the phage based products were applied

Dr. Subhashini added that several potent bacteriophages had been tested against vibriosis causative agents, such as *V. harveyi*, *V. parahemolyticus*, *V. splendidus* and *V. anguillarum* and in all cases, it lead to increased survival rates of cultured animals.

Phage therapy is capable of elimination of harmful bacterial infections even in those cases when antibiotics are ineffective.



Ravikumar Yellanki, President, Society of Aquaculture Professionals

All the three programmes had a tremendous response with a participation of around 100, 140 and 202 persons at the programme in Chennai, Ongole and Kakinada respectively. Officials from the Department of Fisheries, Andhra Pradesh including the Commissioner of Fisheries, Rama Shankar Naik actively participated in the Ongole and Kakinada legs of the programme. SAP proposed to carry this initiative forward and conduct similar seminars for the benefit of farmers in the major farming hubs of India in the coming months.

The Society of Aquaculture Professional (SAP) is a non-profit, non-government organization established for and by a group of aquaculture professionals in India in the year 2003 with a view to help aquaculture professionals advance the art science and practice of aquaculture by providing opportunities for continuous professional development of individuals and being the voice of professionals to all stakeholders in the aquaculture industry.