



No confirmed case of Early Mortality Syndrome (EMS) in India

Since 2009, an emerging threat, popularly known as early mortality syndrome (EMS, also termed as acute hepatopancreatic necrosis syndrome or AHPNS) has severely affected shrimp farming in the Southeast Asian region. The disease is reported to affect both tiger and Pacific white shrimps, and is characterized by mass mortalities (reaching up to 100% in many cases) during the first 20-30 days of culture (post-stocking in grow-out ponds). This new syndrome was first reported from China in 2009, followed by Vietnam in 2010, Malaysia in 2011, and in Thailand since 2012. So far no specific disease causing agent (infectious or toxic) has been identified. The syndrome has caused severe economic losses throughout the region. Considering the severity of the disease, the Network of Aquaculture Centres in Asia-Pacific (NACA) jointly organized an emergency regional consultation on EMS/AHPNS with the Australian Department of Agriculture, Fisheries and Forestry (DAFF), Australia, in Bangkok, on 9-10 August 2012, involving international shrimp health experts, regional governments and industry to share information on this emerging disease, its occurrence, pathology and diagnosis, and to develop a coordinated regional response to the issue. Five personnel including representatives from Coastal Aquaculture Authority (CAA), Marine Products Export Development Authority (MPEDA), Rajiv Gandhi Center for Aquaculture (RGCA), and Central Institute for Brackishwater Aquaculture (CIBA) participated and were benefited from the consultation.

What is EMS or AHPNS?

The early mortality syndrome in shrimp has been named based on unusually high mortality within the first 30 days of shrimp grow-out culture, due to a variety of pond management and pathogen related factors. During the consultation held at Bangkok, Prof. Lightner, one of the leading shrimp disease experts in the world proposed the following farm-level case definition for presumptive diagnosis.

- Onset of clinical signs and mortality starting as early as 10 days post stocking.
- Moribund shrimp sink to bottom.
- Often soft shells and partially full to empty guts.
- Hepatopancreas (HP) often appears pale to whitish due to loss of pigment.
- Significantly emaciated HP (shrunken, small, swollen or discoloured).
- HP does not squash easily between thumb and finger.
- Sometimes black spots or streaks within the HP may be visible.

These pond-level observations have to be further confirmed as EMS by laboratory investigations conforming to characteristic histopathology of HP as described by Dr. Lightner. **It is reiterated that at present the histopathological investigations are the only means of confirming the presence of EMS and the present communication is based on such examinations. The farmers are advised not to believe reports of EMS presence in India and to ensure that samples are confirmed by histopathological investigations.**

Causative Agent of EMS is unknown

So far no potential causative pathogen has been identified despite intensive efforts by many leading scientists. It is possible that some toxin (biotic or abiotic) or bacteria or virus may be involved. Preliminary transmission trials using tissue filtrates of affected shrimp have failed to demonstrate that the disease is caused by a virus or any other infectious agent. Further, no toxic agent has been identified. The possible role of feeds and two crustaceacides including cypromethrin was examined and was ruled out. Pond management practices and various well studied pathogens like White Spot Syndrome Virus (WSSV), Yellow Head Virus (YHV) and vibriosis have been commonly linked to EMS, however conclusive evidence has not emerged. Hence, at this stage the cause of this new syndrome in farmed shrimp is unknown.

What has been done internationally to prevent the spread of disease?

Systematic epidemiological studies have not been reported so far from any country. However, farming in plastic-lined ponds, and employing proper pond and water disinfection protocols (for both viruses and bacteria) prior to stocking have been indicated to help in reducing incidence of EMS. During the consultation at Bangkok, one of the important recommendations was that it was necessary to impose restrictions on the movement of live affected animals to areas free from EMS, and extreme care should be taken (disinfection protocols) while processing EMS affected produce. Further, processing plants located in regions free from EMS should avoid processing shrimp from EMS affected areas. So far, Vietnam has suffered great losses due to EMS outbreak. The Food and Agriculture Organization of the United Nations (FAO) undertook an emergency mission in 2011 to assess the disease situation in the country in collaboration with national as well as international shrimp health experts. As a follow-up on this emergency mission, FAO also developed a national technical cooperation programme (TCP) on emergency assistance to control the spread of this shrimp disease. Implementation of the national TCP in Vietnam has commenced in April 2012, and research on epidemiology, identification of causative agent, disease spread, measures of prevention and control is underway.

What CIBA is doing?

During Oct 2012 to Jan 2013, mass mortality that occurred in nineteen vannamei farms and two monodon farms (in Kalpakkam, Kattur and Nagapattinam area of Tamil Nadu and Nellore, Gudur, Bhimavaram, Gangapattinam and Ramudupalaem areas in Andhra Pradesh) were investigated. These mortalities of shrimp occurred during 20-72 days post stocking and the shrimps were harvested by 47-72 days. Affected shrimp had partially full gut and the hepatopancreas was normal in most cases, although few had some signs of melanisation. The investigations of CIBA so far has not indicated the presence of EMS in India. However, investigations of more mass mortality cases have to be carried out to conclude whether such mortalities are due to EMS/AHPNS.

Under 12th plan, ICAR is investing adequate funds on fish health and CIBA is gearing up with resources for undertaking in depth investigations on aquatic health aspects along with other fisheries research Institutes and Fisheries Colleges. The plan of investigations would involve detailed epidemiology and detection of etiology using modern molecular tools. National Bureau of Fish Genetic Resources (NBFGR) is starting a surveillance project with the help of other fisheries institutes.

Measures suggested for Prevention and Control of EMS

Since the primary causative agent of EMS/ AHPNS is not yet known, it is difficult to suggest preventive measures. CIBA has been creating awareness among aquaculture professionals and farmers on possibilities of EMS emergence in India and preventive measures. One of the most important preventive measures suggested at farm-level to prevent any disease is that farmers should follow better management practices, especially those related to selecting SPF seed from approved hatcheries after ascertaining their pathogen status for stocking and having proper pond preparation. Ponds that are completely dried without any wet patches, including areas near sluice gates are likely to help in reducing mortalities during early DOCs.

How farmers could help?

Considering the great extent of economic loss that EMS is likely to cause, shrimp farmers in India should cooperate by consulting with the agencies such as fisheries research institutes and government officials by promptly reporting any mass mortality and sending samples to enable investigation of the problem and to ascertain the actual cause. Farmer groups may approach CIBA for the preservatives for storing samples of shrimp from such mortalities and for the proper procedures to be adopted. They are advised to send such samples to CIBA for histopathological investigations and virus screening of known viruses. Dead and frozen samples cannot be processed for these investigations and morbid shrimp samples suitably preserved need to be used.

At this stage what is required is to identify the cause of mass mortalities of shrimp that farmers are facing. Some news reports have been widely circulated that have led to baseless speculations and conclusions on EMS emergence in India. Such baseless conclusion and media hype should be avoided and we must focus first on investigating the problem.

In case mass mortality of shrimp in grow-out ponds is observed between 10-35 days of stocking, contact the following scientist so that a team can be sent for collecting samples.

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