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An overview of Hepatopancreatic Microsporidiosis (HPM) in Shrimp Farming

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Introduction

EHP or Enterocytozoon Hepatopenaei is an yeast-like fungus belonging to a group called "microsporidia", which are obligate intracellular parasites. EHP is widespread in most of the Southeast Asian countries, including India. It is referred as Hepatopancreatic Microsporidiosis (HPM) since the parasite is confined to the shrimp hepatopancreas (HP). The economic losses to aquaculture seem to be substantial, mainly due to retarded growth of shrimp and overall reduction in farm production. Infectious diseases caused by viruses, bacteria and Microsporidia continue to be a threat for shrimp aquaculture in Asia. The microsporidian, Enterocytozoon hepatopenaei (EHP) has become a significant threat to shrimp aquaculture in recent years globally and has been widely reported from major shrimp producing countries.

Causes:

- Hepatopancreatic microsporidiosis (HPM) is an infectious shrimp disease caused by, Enterocytozoon hepatopenaei (EHP).
- EHP can be transmitted directly from shrimp to shrimp by cannibalism and cohabitation.
- Shrimps become infected by ingesting spores from the water, from sediment, from eating EHP-infected live feeds (Polychaetes, Molluscs, Frozen Artemia biomass etc).

Clinical Signs:

- The target organ of EHP is hepatopancreas and affects its digestive and absorptive functioning resulting in poor growth and immunity.
- EHP infected shrimp may have a thin cuticle, white muscle as a stress response, black spots on their eyestalks, in their muscle tissue and along the hind gut.
- It is associated with severe growth retardation in P.vannamei exhibits high size variability.
- Causes chronic mortality in severe cases.
- Associated with White Faecal Disease.
- Severe infections by EHP can increase the susceptibility to other bacterial infections due to Vibrio spp. in shrimp farms and could manifest in mortality.
- Affected shrimp also become increasingly susceptible to secondary bacterial and viral infections and leading to substantial economic loss.

Fig 1: Growth retardation in P.vannamei exhibits high size variability due to EHP

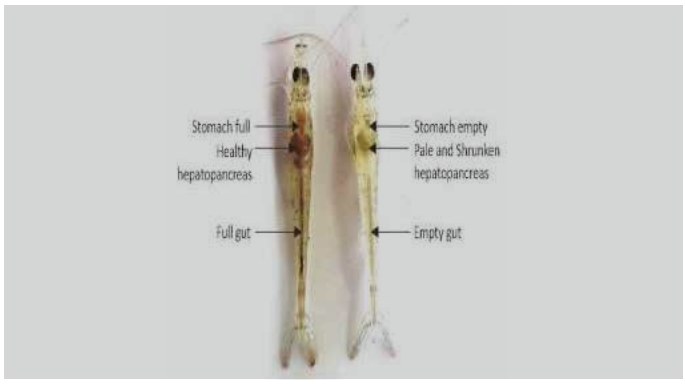

Fig 2: Normal Shrimp *vs* EHP infected shrimp

Diagnostic Measures:

- Infection can be checked by microscopic examination (at x 100 oil immersion) of the hp and the gut of the shrimp.
- Infection can also be confirmed by molecular testing of the hp by PCR.

Prevention:

To keep the parasites away, its recommended to use better management practices (BMPs) and proper bio security in the shrimp farms. After harvesting, disinfection, ploughing and drying of pond is important to make sure the destruction of EHP spores and their carriers before stocking. Even SPF shrimp broodstock can harbor EHP spores, hence only PCR tested EHP free seeds should be stocked. Only EHP free seed should be stocked in the ponds. Once spores are in ponds it is very difficult to eradicate the disease. Hence farmers should adhere to strict biosecurity protocols and adopt better management practices (BMPs). Pond preparation should be carried out properly by drying and disinfection after every harvest to ensure that the EHP spores along with the carriers are destroyed. To control the EHP infestation.

Conclusion:

Occurrence and prevalence of EHP in shrimp farm is of great concern for shrimp farmers due to its contribution in greater loss in economy and productivity. Increase in incidence of disease outbreak is mainly regulated by the interaction of ecological condition with shrimp health status and epizootics of EHP pathogen. Therefore, it is crucial to concentrate on better management practices for shrimp farming using high quality EHP free seeds, and strictly following farm bio security measures. It is required to prevent the spread of EHP pathogens to avoid the disease in subsequent culture operations and to improve the production and sustainability of shrimp culture. It is important for shrimp farmers to realise that following custom rules and regulations in shrimp farming is the need of the hour for responsible aquaculture practices.

Treatment:

Pathostat Blu – 15g to 20g/kg of the feed for one week

Fepromix – 5g/kg of the feed