

MANAGING HEPATOPANCREATIC MICROSPORIDIOSIS

An emerging threat to shrimp farming



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What is microsporidiosis and EHP?

Hepatopancreatic microsporidiosis (HPM) is caused by *Enterocytozoon hepatopenaei* (abbreviated as EHP). The microsporidian parasite was reported to affect black tiger shrimp *Penaeus monodon* in Thailand in the year 2009. Since then, EHP has been 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 slow growth and overall reduction in farm production.

What are the Clinical signs of EHP infection?

There are no specific clinical signs for EHP infection, but reported to be associated with stunted growth and white faeces syndrome. Hence infection may be suspected with the occurrence of unusually retarded growth in the absence of other gross signs in pond. Severe infections by EHP can increase the susceptibility to other bacterial infections like *Vibrio* spp. in shrimp farms and could manifest mortality.



Farm level observations on samples of *Penaeus vannamei*



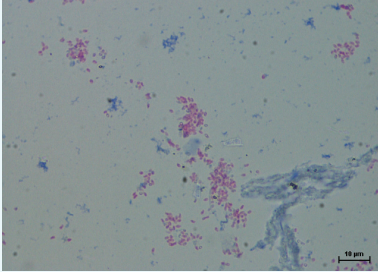
Floating white faecal strings in pond water

How to Diagnose EHP ?

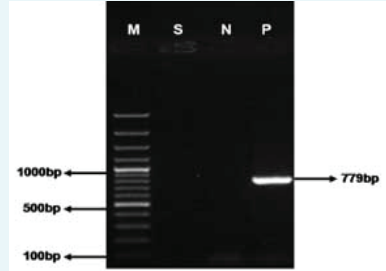
Diagnosis can be achieved by the demonstration of spores in faecal samples as well as in the HP tissues by microscopic examination of wet smears and histology of hepatopancreas. Further, molecular diagnostic techniques like PCR and *in situ* hybridization are used for



routine diagnosis and monitoring of shrimp farms. Hence preferred samples for disease diagnosis are fresh or fixed shrimp for PCR and histopathology, respectively. Faecal samples from broodstock can be tested for EHP by microscopy or PCR.



Wet mounts stained by modified trichrome stain



PCR for confirmatory diagnosis of EHP

How EHP is Transmitted?

EHP is an intracellular spore-forming parasite; it replicates within the cytoplasm of the tubular epithelial cells of the hepatopancreas. Transmission of the disease is mainly by horizontal mode; primarily through oral route (contamination through faeces and cannibalism of infected shrimp); spores present in the pond sediment are likely to cause fresh infection by ingestion.

Prevention and Control of Hepatopancreatic Microsporidiosis (HPM)

Hepatopancreatic microsporidiosis (HPM) can be kept at bay by good management practices and proactive approach towards biosecurity measures in the farm. 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. Treatment of pond sediments by application of CaO (quick lime) @ 6 ton/ha has been recommended.



However, this may not be often possible. Stock only PCR tested seeds in ponds with good plankton/bloom. In hatcheries, live feed may be tested by PCR to ensure absence of EHP.



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