Infectious Myonecrosis (IMN)

What is Infectious myonecrosis ?

Infectious myonecrosis (IMN) is an emerging viral disease in shrimp aquaculture industry. caused by Infectious myonecrosis virus (IMNV). The disease was first recorded in Pacific white shrimp, *P. vannamei* in Brazil in 2002 and then in 2006 in Indonesia including Java island. The disease causes significant economic losses to aquaculture due to associated mortalities in *P. vannamei* in grow out ponds. The estimated loss caused by IMNV infection exceeded $100 million from 2002 to 2006 in Brazil and $1 million by 2010 in Indonesia. Recently, occurrence of IMN in *P. vannamei* has been recorded in India in some shrimp farms.

What is the causative agent of IMN?

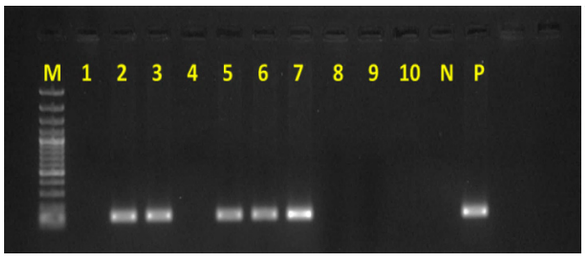
Infectious myonecrosis (IMN) is caused by a virus called infectious myonecrosis virus (IMNV). IMNV is a double stranded RNA virus and closely related to the family Totiviridae.

What are the symptoms of IMN?

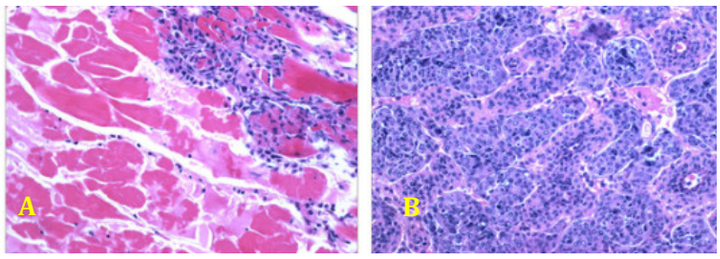
Affected shrimp become sluggish, show disoriented swimming behaviour on the surface of water, with abrupt drop in feeding rate. Whitish and reddish necrotic areas can be seen in the distal abdominal segments and tail fan and shrimp may show cooked appearance. FCR of affected populations may increase. Mortalities can be instantaneously high and continue for several days. Generally mortalities range from 40 to 70% in cultivated *P. vannamei*. Clinical signs may suddenly appear following stressful events such as sudden changes in temperature or salinity. Sometimes disease may progress to a chronic phase with persistent low-level mortalities.

White necrotic areas in the distal abdominal segments of diseased shrimp

Extensive whitish necrosis appearing like cooked shrimp with reddish distal segments and tail fans.



RT –PCR Screening of shrimp samples for IMNV



A Coagulative necrosis of muscle fibres, B Lymphoid organ spheroids
Courtesy : Agus Sunarto

How IMN is diagnosed?

IMN is diagnosed using a nested RT-PCR protocol. IMN can be confirmed by histopathology. The principal target tissues for IMNV include the striated muscles, connective tissues, haemocytes, and the lymphoid organ parenchymal cells. Characteristic lesions of IMNV are myonecrosis with coagulative necrosis of striated (skeletal) muscle fibres often with marked oedema among affected muscle fibres and significant hypertrophy of the (LO) caused by accumulations of lymphoid organ spheroids (LOS).

How is IMN Transmitted?

IMN is horizontally transmitted through cannibalism. Vertical transmission especially from female broodstock to progeny is also likely to occur. *Artemia franciscana,* bivalves and polychaete worms may act as vectors or carriers for IMNV.

How IMN can be prevented /controlled?

Being a viral disease, there is no treatment for IMNV. Prevention is the only way to circumvent the disease.

Following practices help to avoid the disease

- Use of IMNV-free brood stock is an effective prevention measure to minimize IMNV propagation in *P. vannamei* farming. Stock post larvae (PL) of at least PL15 stage. Select healthy PL using stress tests and make sure that the PL are negative for the IMN virus by RT-PCR.
- Tilling and restocking of affected farms with IMNV-free stocks of *P. vannamei* help in preventing its recurrence.
- Adopt strict biosecurity measures by providing reservoir ponds, bird and crab fencing, proper sanitation of men, material and machines.
- Implement best management practices (BMP) to maintain good water quality, proper feed usages and good health of shrimps through regular monitoring.

Farmers may consult CIBA to confirm any new diseases

IMNV was detected in farming areas in AP and TN during the years 2017 and 2018 while disease investigations were carried out by ICAR-CIBA. Farmers may contact CIBA when they come across symptoms similar to IMNV in rearing ponds for detailed investigation and confirmation. Samples of affected shrimp showing signs of disease must be suitably preserved for investigation. Dead shrimp samples cannot be processed. Live and moribund samples collected in RNA later can be sent for IMNV testing. It is necessary that IMNV like new diseases require to be investigated in depth with intensive surveillance. On confirmation of a positive IMNV case, the pond water should be disinfected by chlorination within the pond. The treated water should only be discharged after proper deactivation of the disinfectant.

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