

# White Spot Disease



## White spot disease

White spot disease (WSD) is a serious viral disease of farmed shrimp globally. Most crustaceans including all penaeid shrimps (monodon, vannamei, indicus etc.) and crabs can be affected by WSD. All the life stages of shrimp may get infected by this virus.



Circular White spots on the carapace of *P. monodon*

White spot disease is caused by a virus called as White Spot Syndrome Virus (WSSV). This is a double stranded DNA virus of the genus *Whispovirus* and family Nimaviridae.

## What are the symptoms of WSD disease?

Affected shrimp exhibit anorexia, lethargy, reddish discoloration and presence of circular white spots on the carapace and other exoskeletal parts. In Pacific white shrimp, or vannamei shrimp, white spots may not be clearly visible. Mortality of shrimp may start 2-3 days after infection and reach 80-90 per cent within 5-7 days of onset of first mortalities.



*P. vannamei* infected with WSSV



White spots on the carapace

## How WSD is transmitted?

WSD can be transmitted both horizontally as well as vertically.

The vertical transmission of WSD occurs from infected brood stock to postlarvae. Hence, it is always advisable that PCR tested seeds only be stocked in the ponds.

The major route of horizontal transmission is through carrier animals or through cannibalism of infected organisms. Many crustaceans such as crabs, squilla, copepods from marine and brackishwater are either hosts or carriers of WSSV. Crawfish and freshwater prawn, scampi can also serve as carrier for WSSV. Non-arthropod crustaceans such as *Balanus sp* and annelid such as polychaete worms can also act as carriers. These carrier animals are capable to transmit WSSV virus to cultured shrimp. Therefore, it is advisable to prevent the entry of carrier animals to the ponds by water filtration and fencing.

### Vertical transmission



### Horizontal transmission

- ▶ Carriers
- ▶ Cannibalism
- ▶ Waterborne
- ▶ Fomites



*P. monodon* infected with WSSV



Emergency harvest of WSSV infected pond

### How to prevent the WSD?

**There is no treatment for WSD. Therefore, prevention is the only way to avoid the disease. Following practices can help to avoid the disease**

- WSSV can persist in wet soil. Pond preparation should be properly done by removing black soil, drying, applying lime etc. Sufficient time of at least 3 to 4 weeks should be provided between the culture cycles to enable the pond soil dry completely.
- Virus carriers such as wild shrimp, crabs, mysids, copepods and other crustaceans must be avoided in the farm.
- Every drop of intake water must be disinfected with 30 ppm calcium hypochlorite.
- PCR tested WSSV free healthy post-larvae only should be stocked in the ponds.
- Strict biosecurity measures should be put in place by providing reservoir ponds, bird and crab fencing, proper sanitation of men, material and machines.
- Best management practice (BMP) must be practiced to maintain good water quality, proper feed usage and good health of shrimps through regular monitoring.
- Stressful conditions such as low water depth, excessive stocking, poor water quality and high temperature should be avoided.
- Usage of appropriate and proven probiotics and immunostimulants may be helpful.
- Shrimp should be tested for WSSV during the culture period. Live and moribund samples collected in ethyl alcohol can be sent to the laboratories for testing

### What should be done in case of WSSV outbreak?

- During WSSV outbreak, feeding may be reduced to maintain water quality in the pond. Liming may be done to maintain the pH above 7.5.
- To avoid the cross contamination during outbreak, surrounding farmers should avoid water exchange and should not use any equipment (nets, tanks, pumps, boat, etc) from affected farms.
- If the mortality rate is increasing rapidly, emergency harvest should be carried out using cast netting to avoid discharge of infected water into the main water source.
- Remove dead animals and bury them away from the ponds.
- Pond water should be disinfected by bleaching powder (50 ppm chlorine for 2-3days), before bleaching followed by rapid aeration for one day.
- Neighboring farmers should be kept well informed about shrimp disease problems, emergency harvesting and the time and date of water discharge.
- The pond water should be treated in an effluent treatment system (ETS) before discharging to a common water source.

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