

Identification of possible carrier species responsible for horizontal transmission of white spot syndrome virus (WSSV) disease to cultured *Penaeus monodon*

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White spot syndrome virus (WSSV) is the most important viral pathogen of farmed shrimp which often leads to severe economic loss to the farmers. The WSSV disease can cause up to more than 80% mortalities in cultivated penaeid shrimp stocks within 3 to 10 days. The WSSV has a wide host range, which extends to crustaceans, molluscs and arthropods which also act as apparently healthy carriers of the infection. The aim of this study was to investigate the pathogen carriers in the surrounding environment of shrimp farms in Northwestern Province of Sri Lanka from 2015 to 2016. A total of 561 tissue samples of nine different species of crustaceans and one species of mollusk were subjected to screening for the horizontal transmission studies. Disease prevalence areas were mapped from Wattala to Kalpitiya along the shrimp farming area of the Northwestern coast. Out of 561 samples screened through 2-step nested PCR, 53 individuals were found positive for the WSSV. The occurrence of infection was significantly low (2.2%) in wild shrimps (*Penaeus indicus*, *P. semisulcatus*, *P. mergensis*, *Meganyctiphanes norvegica*). Occurrence of infection in mole crabs (*Emerita analoga*), blue swimming crabs (*Portunus pelagicus*), mangrove crabs (*Scylla serrata*), brine shrimp/artemia (*Artemia salina*), mud crabs (*Scylla olivacea*) and sand white ghost crabs (*Ocypode ceratophthalmus*) were 4.7%, 14.6%, 18.2%, 20.1%, 37.8% and 43.7% respectively. No actual incidences were recorded in three spotted swimming crabs (*Portunus sanguinolentus*) or in unidentified small crabs or in coastal bivalves (*Marcia opima*). The information generated from this study could lead to new approaches towards controlling the WSSV in a cost effective manner. As the precautionary measures and to control further contaminations from the wild, strict biosecurity measures should be adhered during WSSV outbreaks. Moreover, further studies with more sampling and to compare WSSV genotypes of possible species with that of WSSV infected shrimps would be required to determine the precise pattern of transmission.

Keywords: carriers, crabs, crustaceans, shrimp, white spot syndrome virus

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