

Susceptibility of Different Life-stages of Freshwater Prawn, *Macrobrachium rosenbergii* to White Spot Syndrome Virus: An Experimental Study

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Introduction

White spot syndrome virus (WSSV) causes the most serious epizootic in cultured penaeid shrimp. The epizootic started in 1992, and spread through east and south east Asia and into other shrimp growing countries of the region. In order to circumvent the epizootic, in many Asian countries, freshwater prawn, *Macrobrachium rosenbergii* is being widely considered as an alternative species to marine shrimp. Although, the adult stage of the prawn has been reported to be susceptible to WSSV (Rajendran et.al, 2000), susceptibility of the early life-stages has not been a subject of study, so far. In this background, a study has been undertaken to assess the susceptibility of different life stages of *M. rosenbergii* to WSSV. This paper presents the mortality pattern, histopathological changes, cross-infection bioassay results and PCR-based detection of WSSV in four life-stages of *M. rosenbergii*.

Materials and Methods

Four life stages were used in the experiment, viz., post-larvae, juveniles, sub-adults and adults. Experimental infection trials were carried out, by feeding and/ or injecting the virus derived from infected *Penaeus monodon*, according to the method followed by Rajendran et al. (2000). Mortality pattern and cannibalism in the infected and control groups were recorded. Specimens fixed in Davidsons fixative were subjected to histological examination according to the procedure outlined by Bell and Lightner (1988). Challenge bioassay trials were carried out to check the presence of the virus in the experimentally infected prawn. Healthy, uninfected *P. monodon* were fed and/ injected with the tissue filtrate derived from infected prawns. DNA extracted from experimentally infected animals viz.adults,

sub-adults, juveniles and post-larvae, was subjected to PCR amplification using WSSV-specific primers reported by Kimura et al., (1996)

Results and Summary

All the stages of *M. rosenbergii* used in the experimental infection were found susceptible to WSSV. However, degree of susceptibility showed variation among different stages. The percentage of survival recorded was: post-larvae- 54%; juveniles- 62%; sub-adults- 83.2% and adults, 83%. Cannibalism was found to be pronounced in experimentally infected post-larvae, juveniles and sub-adults. Presence of white spots on the carapace was observed to be of a consistent occurrence in all stages, but was more prominent in adults. Histologically, all the stages showed manifestations similar to that of spontaneous WSSV infection in penaeid shrimp. Gills, stomach wall and cuticular ectodermal layer showed degenerative changes and eosinophilic to basophilic inclusions similar to the WSSV infection in penaeid shrimp. Healthy uninfected *P. monodon*, upon feeding with experimentally infected prawn tissues, showed the typical signs of WSSV infection in 10 d post-infection. All the stages of *M. rosenbergii* used in the experiment revealed the presence of WSSV DNA in a two-step PCR. The agarose gel electrophoresis showed 540 bp product in all the stages.

The study showed that all the life stages of *M. rosenbergii* are susceptible to WSSV infection. However, when compared to penaeid shrimp, freshwater prawns were able to tolerate WSSV infection to a large extent. Nonetheless, increased susceptibility and the resultant increase in cannibalism in the early stages would be of great significance.

References

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