

Notes

Bamboo Back Disease in Tiger Shrimp, *Penaeus monodon*

Eleonor A. Tendencia

Aquaculture Department Southeast Asian Fisheries Development Center, Tigbauan 5021, Iloilo, Philippines. e mail: sidgigit@iloilo.net

Abstract

This report describes bamboo back disease affecting *Penaeus monodon* in the Philippines. Affected and normal shrimps were processed for bacterial isolation and histopathology. Morphological changes in the external anatomy were also noted. The cuticle of the abdominal segments of shrimp with bamboo back disease do not overlap properly which gives them a bamboo-like appearance. The appendages are shorter compared with normal shrimps. No bacteria were recovered from the hepatopancreas, lymphoid organ, and hemolymph thus ruling out bacterial infection. Histopathology shows normal hepatopancreas, but the muscle fibers of the abdominal segments are fragmented and necrotic.

Brackish water pond culture of *Penaeus monodon* in the Philippines has undergone rapid intensification and this is accompanied by increased incidence of disease. One of these diseases is bamboo back disease (BBD), which is observed not only in intensive but in extensive-culture systems. Affected shrimps have bamboo-like appearance and in advanced stage may die. There is little published information available. There is also no official documentation of the disease, although 7% of the total Philippines stock may be affected.

In this study, healthy *P. monodon*, 20 ± 10 g in weight (10 shrimp) and those affected with bamboo back disease (10 shrimp) were taken from brackish water ponds in Iloilo, Philippines. Morphological changes in the external anatomy of the shrimp were noted and re-

corded. External morphology of affected shrimp showed that the cuticle of each abdominal segment did not overlap properly, allowing the muscle to protrude. In mild cases, the muscles did not protrude but humps were observed in the junction where the abdominal segments overlap. This gives the shrimp a bamboo-like appearance. Carpenter (1992) reported the same clinical sign observed in shrimp with bamboo back disease. He also mentioned that the symptom also allowed the muscle to be cut-off. However, in this study, samples in such advanced condition was not encountered. This may be because during sampling only live and swimming shrimps were taken and the pond bottom was not investigated for the presence of severely affected individuals. In addition to the bamboo back appearance, the rostrum, pleopods, pereopods and tail region of af-

affected animals were shorter compared to those which were not affected. Primavera and Qunitio (2000) reported shorter rostrum and uropods in *P. monodon* with runt deformity syndrome (RDS). However, instead of the bamboo back appearance of the abdominal segments in shrimp with BBD, shrimp with RDS have a narrower abdomen which gives the shrimp a dwarf appearance.

To determine the possible role of bacteria in the development of the disease. Affected shrimp and those which appeared normal were processed for bacterial isolation. Samples were taken aseptically from the hepatopancreas, antennal hemolymph and lymphoid organ and streaked onto bromothymol blue teepol agar (BTB) (Eiken's) and trypticase soy agar (TSA) (BBL) with 1.5 % sodium chloride. Samples were incubated for 24 h at room temperature. No bacteria were recovered from the hepatopancreas, antennal hemolymph and lymphoid organ of healthy shrimp or shrimp affected with bamboo back disease.

Histopathological examination of the hepatopancreas, as monitor organ in shrimp, of both normal and affected shrimp was also carried out. Davidson's fixative was injected into the shrimp body as described by Bell & Lightner (1988). The hepatopancreas and the portion between the second and third abdominal segment was then processed for routine paraffin embedding and stained with Mayer's haematoxylin and eosin (H&E) (Humason, 1967). Stained hepatopancreas and muscle tissues were ex-

amined for histopathological changes under the light microscope. Histopathological study showed that except for some disrupted B- and R- cells, the hepatopancreas of affected shrimp appeared normal. The disrupted R- and B- cells observed in shrimp with bamboo back disease was also observed by Baticados, Coloso, and Duremdez (1987) in shrimp with chronic soft-shell syndrome, which is a nutritional disorder.

The fibres in the abdominal muscle of shrimp affected with bamboo back disease were fragmented and necrotic with large interfibrillar space. Fragmentation and necrosis of the muscle fibre observed in shrimp with bamboo back disease in this study was also reported by Nash, Chinabut and Limsuwan (1987) in shrimp with milky white opacity of the entire body. These muscle fibre fragmentation and necroses, also called exertional myopathies, have been reported in mammals initiated by intensive or exhaustive activity (Rigodon and Baxter, 1979).

This is the first report on bamboo back disease of penaeids in the Philippines. Although this report did not point to the exact cause of bamboo back disease, it has described the morphological abnormalities observed in affected shrimp. The possible role of nutritional imbalances, genetic and environmental factors in the development of bamboo back disease warrants investigations.

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