

Shrimp Biodiversity in Pristine and Disturbed Mangrove Areas along the West Coast of Peninsular Malaysia

Mohamed Fouzi

Mohamed Shariff*

Fatimah Md Yusoff

Abdul Rahman Omar

Aquatic Animal Health Unit
Faculty of Veterinary Medicine, Universiti Putra Malaysia
43400 UPM, Serdang, Selangor, Malaysia
E-mail Address: shariff@vet.upm.edu.my

Rapid developments of coastal areas and land reclamation have caused the destruction of mangroves, elevation of nutrient loading in the coastal environment and reduction in the biodiversity of wild aquatic animals. The present study was aimed to assess the biodiversity of wild shrimp population in pristine and disturbed mangrove areas. Coastal waters off Matang (N-4°42'51.88" to 4°45'16.83", E-100°32'47.91" to 100°34'18.91") and Kuala Selangor (N-3°15'19.86" to 3°17'48.09", E-101°13'06.32" to 101°16'12.88"), along the Straits of Malacca, were selected as pristine and disturbed mangrove areas respectively. Monthly samplings of shrimp and water were done for the first 6 months during high tide and for the following 6 months during low tide.

A total of 11,099 shrimp belonging to 12 penaeids and two palaemonids species were collected over 12 months from both sites. Mean number of species (7.44 ± 0.35), density (0.78 ± 0.1 shrimp/m²) and Shannon-Wiener diversity index (1.4 ± 0.1) of shrimp caught in the coastal waters off Matang were significantly higher ($p < 0.01$) than that of Kuala Selangor (6.29 ± 0.35 , 0.49 ± 0.07 shrimp/m² and 1.1 ± 0.1 respectively). Cluster analysis showed that shrimp communities of Kuala Selangor and Matang were separate groups during high tide at the similarity threshold of 70% and during low tide at the 60% similarity threshold. This different grouping of shrimp communities was due to hierarchical composition of shrimp species in Kuala Selangor and Matang during both tides when SIMPER analysis was performed on selected species during high and low tides. SIMPER analysis showed that *Penaeus penicillatus*, *P. indicus* and *Parapenaeopsis sculptilis* were strongly associated with pristine mangrove areas of Matang, and *Parapenaeopsis*



hardwickii was strongly associated with mangrove disturbed areas of Kuala Selangor. Nutrients (total ammonia, total nitrogen, and total phosphorous) and chlorophyll a were significantly higher in the coastal waters off Kuala Selangor than that of Matang. Shrimp biodiversity indices were negatively correlated with total ammonia nitrogen, total nitrogen and chlorophyll a.

Higher nutrients and lower wild shrimp biodiversity in the coastal waters off Kuala Selangor compared to that of Matang could probably be due to the unfavourable environmental conditions associated with loss of mangrove forest.