Heavy metal contamination and physical barrier are main causal agents for the genetic differentiation of Perna viridis populations in Peninsular Malaysia

ABSTRACT

A total of 19 polymorphic microsatellite loci were used to analyze the levels of genetic variations for six geographical populations of green-lipped Perna viridis collected from the coastal waters of Peninsular Malaysia. In addition, the total soft tissues of all mussel populations were determined for heavy metals (Cd, Cu, Pb and Zn). FST values revealed that all the six populations of P. viridis in Peninsular Malaysia were categorized as showing 'moderate genetic differentiation' according to the classification of Wright (1978). Cluster analysis revealed that three populations which were located in the western part of the Johor Causeway were clustered differently from the other three populations located in the eastern part. Hierarchical F-statistics and cluster analysis indicated that the Johor Causeway which blocked the free flow of the pelagic larvae swimmers of P. viridis and a distinct effect of heavy metal contamination on the Kg. Pasir Puteh population, were the two main causal agents for the genetic differentiation of the P. viridis populations investigated in this study.

Keyword: Heavy metal contamination; Microsatellite markers; Perna viridis