



## Utilization of molecular markers for the conservation of blood cockles, *Anadara granosa* (Arcidae)

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**ABSTRACT.** We examined genetic variation in blood cockles in an effort to obtain information useful for the sustainability, management, and the stability of this species as a major commodity in the fisheries sector. Ten populations of cockles were sampled from the north to the south of the west coast of peninsular Malaysia. The cockles were collected in collaboration with the Fisheries Research Institute, Penang. The population genetic analysis of the cockles were studied via RAPD-PCR and mtDNA sequencing. Three hundred individuals were analyzed with RAPD-PCR experiments. High gene diversity over all loci was observed (Shannon index =  $0.549 \pm 0.056$  and Nei's gene diversity =  $0.4852 \pm 0.0430$  among 35 loci). The second method, mtDNA sequencing, was employed to complement the information obtained from RAPD-PCR. The gene selected for mtDNA sequencing was cytochrome c oxidase I (COI). One hundred and fifty individuals were sequenced, yielding a partial gene of 585 bp. Statistical analysis showed homogeneity in general but did reveal some degree of variability between the populations in Johor and the rest of the populations. The Mantel test showed a positive but nonsignificant correlation between geographic and genetic distances ( $r = 0.2710$ ,  $P = 0.622$ ), as in the RAPD

analysis. We propose that the homogeneity between distant populations is caused by two factors: 1) the translocation of the spats; 2) larvae are carried by current movement from the north of the peninsula to the south. The different genetic composition found in Johor could be due to pollution, mutagenic substances or physical factors such as the depth of the water column. This population genetic study is the first for this species in peninsular Malaysia. The data from this study have important implications for fishery management, conservation of blood cockles and translocation policies for aquaculture and stock enhancement programs.

**Key words:** RAPD; mtDNA; *Anadara granosa*; Population study