

Genetic diversity of the mud crab *Scylla olivacea* in Pakistan and its connectivity throughout the Indian Ocean

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Scylla spp., commonly known as mud crabs, are large edible crabs well known for their importance in fisheries. Previously, both *S. serrata* and *S. olivacea* were described for Pakistani waters. Differentiation of both species based on morphology, however, is difficult, pressing the need for molecular identification. Furthermore, a better understanding of the genetic diversity and connectivity of mud crabs throughout the Indian Ocean is necessary for the optimal management of this resource. Sampling of 157 mud crabs was conducted from five different sites along the Pakistani coast. A fragment of 470 base pairs of the mitochondrial cytochrome oxidase subunit I gene (COI) was sequenced and aligned with 235 sequences retrieved from GenBank. Population structure in Pakistan was further analysed using 19 microsatellite loci. Based on the COI sequences, all collected individuals were identified as *Scylla olivacea*. In the data set of 392 COI sequences 268 haplotypes were identified. Nucleotide diversity was low, whereas haplotype diversity was high. Neutrality tests indicated a possible recent population expansion event in nearly all populations. We detected significant population structure using COI and identified five differentiated groups throughout the Indian Ocean: Northwest-Pakistan, Southeast-Pakistan, India/Bangladesh, Myanmar/Malaysia, and Indonesia. Population structure within Pakistan was confirmed with microsatellites. Possible explanations for these groupings are different environmental conditions on both sides of the Pakistani coast and physical barriers to dispersal, such as the Ganges River outflow and complex current pattern along the Indonesian coast.

Keywords

Mud Crab; *Scylla Olivacea*; Genetic Diversity; Phylogeography; Pakistan; Indian Ocean