

Genetic structure of populations of the mangrove crab *Ucides cordatus* (Decapoda: Ocypodidae) at local and regional scales

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Abstract The crab *Ucides cordatus* (Decapoda: Ocypodidae) is a species of considerable economic and ecological importance in mangrove areas of the Western Atlantic coast. However, habitat loss, overfishing, and a new infectious disease are causing substantial reductions in local stocks of this species, leading to a pressing need to design efficient management strategies. A crucial step in this design is an understanding of how the genetic variability of *U. cordatus* is distributed among estuaries throughout its range. In this study we assess the degree of spatial structure in the pattern of genetic variation of *U. cordatus* over local (estuaries located within 100 km from each other) and geographical scales (estuaries

located farther than 2700 km from each other). Ninety individuals were collected from nine estuaries and analyzed using PCR-RFLP and RAPD techniques. The percentage of polymorphic bands within populations ranged from 15% to 46% for RFLP markers and from 40% to 70% for RAPD markers. Our results failed to demonstrate significant geographical structure in the pattern of genetic variation, indicating that populations of *U. cordatus* are capable of extensive gene flow among estuaries. The implications of these results for the management of *U. cordatus* populations are discussed.

Keywords Phylogeography · RAPD · RFLP · AMOVA · Nested Clade analysis

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Introduction

Mangroves play essential roles in the dynamics of the estuarine systems where they are found, serving not only as nursery and feeding areas for a variety of fish and shellfish species, but also in the enrichment of coastal waters, in the stabilization of the shoreline, and in trapping silt and wastes from upland runoff (Marshall, 1994, Beck et al., 2001, Holguin et al., 2001). Despite the consensus among scientists regarding their importance, mangrove environments are being destroyed at an alarming rate in many parts of the