

High level of genetic subdivision along the East African coast for the stony coral *Seriatopora hystrix*

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Coral reefs are declining at an alarming rate, due to local disturbances as well as global events such as mass bleaching. The ability of coral reefs to adapt to, and recover from such environmental stressors depends highly on population genetic diversity and connectivity among reefs. Connectivity between coral populations can be influenced by the life history of coral species, the geographic location of reefs and oceanographic barriers between populations. The aim of this study is to determine the genetic diversity, population structure and connectivity of the widespread reef-building coral *Seriatopora hystrix* in the Western Indian Ocean and Red Sea. It is hypothesised that the life history traits of *S. hystrix*, such as the brooding reproduction mode and short pelagic larval duration, lead to short-distance dispersal resulting in high levels of genetic subdivision. A total of 341 samples were collected from 14 sites in Saudi Arabia, Kenya, Tanzania, Mozambique and Madagascar. Coral fragments were genotyped using 10 microsatellite markers. A clear genetic break was found between populations in the Red Sea and East Africa. Sites in Madagascar are also highly differentiated, showing limited exchange with sites in Mozambique. The Bayesian cluster analyses revealed no obvious genetic break along the East African coast, but clearly indicate a latitudinal gradient, which can be explained by the influence of the northbound EACC carrying larvae northward. Sites adjacent to the Northern Mozambique Channel had a higher genetic diversity compared to other locations, congruent with the higher species diversity found in this area. These results indicate that it is essential to implement or extend several marine protected areas to maintain connectivity between populations of this species over short distances and emphasise the need for protection of the reefs in the Northern Mozambique Channel as these can act as a source of genetic diversity for downstream reefs.