Connectivity of coral reefs in the Western Indian Ocean and Indo-Pacific

M. Kochzius
Marine Biology, Ecology and Biodiversity, Biology Department, Vrije Universiteit Brussel (VUB), Belgium
marc.kochzius@vub.ac.be

A fundamental question in marine ecology is the connectivity of populations: are they open or closed? Most marine animals of coral reefs are rather sedentary. Adults are strongly site attached and connectivity among populations can only be facilitated by pelagic early life history stages (eggs and/or larvae). In an open population the majority of the offspring will not recruit to the parental population, but will disperse and recruit to other populations. In the contrary, offspring of a closed population will mainly recruit to the parental population, which is also called self-recruitment. Connectivity of populations is a key element for resilience, which is the ability of ecosystems to absorb shocks, resist phase-shifts, and regenerate after disturbances. Therefore, the degree of connectivity among populations is crucial for re-colonisation and knowledge about connectivity is important for the management of marine protected areas. Since the open ocean does not show any obvious barriers for dispersal, it was generally assumed that marine populations are open. However, recent studies have shown restricted connectivity in many different coral reef taxa and a substantial amount of self-recruitment in coral reef fish. Examples of different taxa, such as anemonefish, sea stars and giant clams show congruent patterns of genetic population structure in the Indo-West Pacific, which can be attributed to Pleistocene sea level fluctuations separating populations, as well as contemporary ocean currents.