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Molluscan life and death assemblages of a sheltered lagoon in the northern Red Sea: Implications for paleoecology, regional diversity and conservation

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Life–death (LD) studies of shelly macrofauna are important to evaluate how well a fossil assemblage can reflect the original living community, but can also serve as a proxy for recent ecological shifts in marine habitats. In addition, death assemblages (DAs) also preserve important information on regional diversity which is not available from single censuses of the life assemblages (LAs). Most case studies on LD agreement were performed in temperate environments. We studied the distribution and abundance of living and dead bivalve and gastropod species in the physically stressful environments (tidal flat and shallow sublittoral soft bottoms) of a sheltered lagoon in the northern Red Sea, which is under increasing anthropogenic pressure from tourism. A total of 3,566 molluscs from nine tidal flat and nine sublittoral stations were analyzed for species composition and distribution of living and dead molluscs. Of 97 recorded species, one potamidid gastropod dominated strongly and another 4 species were numerically abundant. There were many more dead (70.3%) than living individuals, with large differences between gastropods (57.5% dead) and bivalves (95.5% dead), and between the intertidal (49.3% dead) and the subtidal (96.2% dead). The mean number of species per sample is lower in the intertidal than in the subtidal, and this difference is much higher in the death assemblage than in the life assemblage. Distinct assemblages characterized intertidal and sublittoral habitats, however, and the distribution and abundance of empty shells generally corresponded to that of the living species. More samples would be necessary to account for the diversity of living molluscs in the study area, which is, however, well recorded in the death assemblages. There is no indication of a major environmental change over the last decades in this area.