Spatial and seasonal variations of fish assemblages in mangrove creek systems in Zanzibar (Tanzania). Estuarine, Coastal and Shelf Science

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Abstract

Spatial and seasonal variations of fish assemblage composition were studied in three non-estuarine mangrove creeks of Zanzibar (Tanzania). Fish were collected monthly for one year at three sites (lower, intermediate and upper reaches) in each creek using a seine net (each haul covering 170 m2). Density, species number and diversity of fish were all higher at sites with dense cover of macrophytes (seagrass and macroalgae) than over unvegetated sandy sites. In general, fish assemblages mainly comprised juveniles of a few abundant taxa, e.g. Mugil cephalus, Mugilidae spp. and Leiognathus equulus at sites with mud substratum and Gerres oyena, Lethrinus harak and Sillago sihama at sites dominated by macrophytes. Multivariate analyses revealed significant separations in fish assemblage composition within the two creeks where the bottom substratum differed among sites. Overall, season seemed to have little effect on density, species number, diversity index (H′) and assemblage structure of fish. Water condition variables were also relatively stable across the season, although a short-term fluctuation primarily induced by decreased salinity, occurred during the heavy rains in April and May. Fish assemblage structure was not significantly affected by any of the abiotic factors tested. However, significant regressions were found between the other fish variables and environmental variables, but since these associations were mostly species-specific and generally inconsistent, we suggest that the overall distribution patterns of fish were mainly an effect of particular substrate preferences of fish species rather than contemporary water conditions.

Key Word mangrove creek systems, seasonal variations