Abundance and diversity of seagrass and macrofauna in the inter-tidal areas with and without seaweed farming activities in the east coast of Zanzibar.

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Abstract

The diversity and abundance of seagrass and associated macrofauna were studied in transects with and without seaweed farms at Chwaka Bay and Jambiani, in the East Coast of Zanzibar. Eight seagrass species, namely Cymodocea rotundata, Cymodocea serrulata, Thalassia hemprichii, Thalassodendron ciliatum, Syringodium isoetifolium, Halodule uninervis, Halophila ovalis and Enhalus acoroides were recorded in the transects. The mean total biomass of seagrass at Chwaka Bay ranged from 142.4 ± 70.71 to 1652 ± 772.7 g dw/m2 and 212.9 ± 146.2 to 1829 ± 1692 g dw/m2 in station with and without seaweed farms, respectively. At Jambiani, the mean total biomass ranged from 880.4 ± 336.8 to 3467 ± 549.9 and 203.4 ± 102.4 to 3810 ± 2770 g dw/m2 in station with and without seaweed farms, respectively. The overall total biomass of seagrass was significantly lower (KW = 108.7, $p < 0.0001$) in station with seaweed farms than in stations without seaweed farms. A total of 93 macrofauna species representing 60 families were encountered and the mean density ranged from 910 to 6990 individuals/m2 at Chwaka Bay and Jambiani in stations with and without seaweed farms respectively. The most common macrofauna species were Codakia punctata, Meropesta nicobarica, Echinometra mathaei, Pinna muricata and Clibanarius emystemus. It was shown that the macrofauna abundance and diversity was higher in stations without seaweed farms than in the stations with seaweed farms, which could be due to activities associated with seaweed farming which contributed to the loss of diversity and biomass of flora and macrofauna of the seagrass meadows.

Keyword macrofauna, inter-tidal areas, east coast of Zanzibar