Effects of Intensive Seaweed Farming on the Meiobenthos in a Tropical Lagoon

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Abstract

Open water aquaculture of the seaweed *Eucheuma spinosum*, imported to Zanzibar from the Philippines in 1989, is presently a large scale operation on the island, with algal farms covering around a 1000 ha of the intertidal area. To assess the effects of the farming on benthic communities both field and laboratory studies were conducted. Two field studies conducted at different times showed that all major meiofaunal taxa were found in significantly lower numbers within the farm area compared with control areas. Multidimensional scaling ordination of nematode species, genera and family abundance data separated samples from farmed and control areas. There was a significant difference in the nematode assemblage structure among areas in pairwise comparisons using ANOSIM. The trophic structure of the nematode assemblage was characterised by a high number of epistrate feeders in all areas ranging from 73 to 96% of total numbers in the samples. To test the hypothesis that toxic substances excreted by the seaweed were responsible for lower abundance inside the farm area, a laboratory experiment was conducted. *Eucheuma* plants were added to several microcosms and allowed to grow there for 40 days. The results indicated no effects of the seaweed on the density of the major infauna taxa as no significant difference was found among the treatments. It is concluded that other factors such as increased predation by benthic feeding fish and the mechanical disturbance of the sediments may better explain the observed differences in infauna abundance inside and outside the algal culture farms.

Keywords
Meiofauna;
Seaweed aquaculture;
Soft-sediment community ecology;
Tropical lagoon