Effect of Fishing on Sea Cucumber Ecology

Autho(s)
Twalibu Mmbaga Kithakeni

Abstract
Abstract Two species of sea cucumber in the selected sites were studied in 2006-2008 and compared with MPA. The work assesses abundance, density, distribution, size structure of two commercially important species (Holothuria scabra, and Holothuria nobilis) in 3 different habitats in 4 selected sites from April, 2006 to April 2008. The site selection was based on separate geographical locations Dar Es Salaam and Mafia; different levels of fishing pressure; MPA – (Kitoni), LFA (Buyuni) and IFA (Kunduchi and Magemani) but with similar types of substrata (sand, mud and rock) habitats of sea cucumbers thus providing an important and unique opportunity to envisage effects of exploitation on the sea cucumber ecology. Mean abundance, distribution and modal sizes differ among sites for both H.scabra and H. nobilis indicating the different levels of fishing distruction among sites. Significant difference in size was on Kunduchi – Buyuni ($p<0.01$), Kunduchi – Kitoni ($p<0.001$), Buyuni – Magemani ($p<0.001$) and Magemani – Kitoni ($p<0.001$,) while that of H. nobilis the significant difference was only between Kunduchi – Magemani ($p < 0.05$) and Kunduchi – Kitoni ($p < 0.05$). Temperature, salinity, organic matter and bio-cover correlated variably with density of H. scabra and H. nobilis. Based on these results the estimated a stock of 11109 individuals for H. scabra and 2841 for H. nobilis. The study revealed reduced modal sizes, diversity and density of sea cucumbers in the areas outside MPA and inaccessible sites as a result of overfishing and the biological constraints. Other factors e.g. processes affecting the input of planktonic larvae and physical oceanographic features can as well shape local patterns of abundance. The results envisage the need for spatial planning of fisheries management and conservation.

Keywords:
Abundance,
Distribution,
Fishing pressure,
Size structure,
H. nobilis,
H. scabra