Population Structure of the Areolate Grouper *Epinephelus areolatus* Stock in the Gulf of Suez

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Abstract

Groupers are widespread in the Red Sea; they are among the most commercially important fishes in the region. The demographic structure and fishery status of the areolate grouper *Epinephelus areolatus* in the northern Red Sea, Gulf of Suez, were studied using a combination of length frequency and size at age data to derive information required for its management. 597 fishes with total lengths ranged from 11.2 to 50.5 cm were analyzed. The growth curve was derived from previous length at age data. The age composition results showed that the fishery depends on young individuals < 24 cm 2 years old. Parameters of the von Bertalanfy growth function were $L\infty$ = 66.5 cm, K = 0.2 and t_o = -0.91 years. The mean size at first capture (20.2 cm LT) was considerably smaller than both the mean size at sexual maturity for females (25.5 cm LT) and the size at which yield per recruit would be maximized (28.5 cm LT). The fishing mortality rate (F = 0.68 $year^{-1}$) was by far in excess of the precautionary target (F_{opt} = 0.19 year−1) and limit (F_{limit} = 0.25+ $year^{-1}$) biological reference points. In addition to growth overfishing, the stock was considered to be recruitment overfished as the biomass per recruit was less than 10% of that at the theoretical unexploited level. The results suggest that a substantial reduction in fishing effort will be required for the resource conservation and stock rebuilding of *E. areolatus* in the Gulf of Suez.

Keywords:
Mortalities* Exploitation rate* yield per recruit* Epinephelus areolatus* Gulf of Suez.