Growth, mortality, exploitation rate and recruitment pattern of the Octopus cyanea (Mollusca: Cephalopoda) of the WIO region: a case study from the Mafia Island, Tanzania

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Abstract

This paper reports on the population growth, mortality, and exploitation rate and recruitment pattern of the big blue octopus ‘Octopus cyanea’ of the Western Indian Ocean (WIO). O cyanea is the dominant and most traded cephalopod in the region. However, limited scientific information on the octopus biology limits the octopus fisheries management plan (including temporal closures) and octopus Marine Stewardship Council certification. This study investigated the growth, mortality, and exploitation rate and recruitment pattern of the O. cyanea in the Mafia Island specifically at Bwejuu and Jibondo landing sites. The majority of the small-scale fishers in the named sites are obligate octopus reliant, therefore any management measure enacted would affect fishing communities and way of life. In every two spring tide of the month, a minimum of sixteen days were spent collecting individual octopus weight and length data (morphometric) for the two study sites between the period 2014, 2015 and 2018. Von Bertalanffy growth function (K) and the asymptotic length (L∞), the annual instantaneous rate of mortality (Z), and annual instantaneous rate of natural mortality (M) from the empirical equation by Pauly’s were computed from the data. Virtual population analysis (VPA) indicated the highest fishing mortality at Jibondo (F = 2.7yr-1) which was at a lower octopus mantle length (ML) of 8-12cm. The fishing mortality at Bwejuu was lower (1.5yr-1) and found to be at a higher octopus ML of 18-20cm. Furthermore, the study revealed, most octopus fish stock-recruit continuous all year round with peak between May and July. Since the peak recruitment of both areas coincides with the south-east monsoon (SE Monson), we recommend active management plans for the season (e.g. temporal octopus closures).

Keywords: Octopus cyanea, growth, mortality, exploitation rate, recruitment, small-scale fisheries and Tanzania

Oral presentation