Population dynamics of yellowtail scad, Atule mate (Cuvier 1833) in Marudu Bay, Sabah, Malaysia

ABSTRACT

The yellowtail scad, Atule mate, forms important fisheries throughout the Indo-Pacific region. To know about the stock status of A. mate in Malaysia, various population parameters were measured, by utilizing length-frequency data, that included asymptotic length ($L_\infty$), growth coefficient ($K$), mortality rates ($Z$, $F$ and $M$), exploitation level ($E$) and recruitment pattern of this species from Marudu Bay, Sabah, Malaysia. Total length and body weight relationship was estimated as $W = 0.007TL^{3.148}$ ($R^2 = 0.937$). The asymptotic length ($L_\infty$) and growth coefficient ($K$) were estimated 27.80 cm and 1.50 yr$^{-1}$, respectively. Total mortality ($Z$), natural mortality ($M$) and fishing mortality ($F$) were found to be 4.53, 2.46 and 2.07 yr$^{-1}$, respectively. The exploitation level ($E$) was estimated 0.46. It was showed that the recruitment pattern was continuous with two major peaks per year. Relative yield per recruit predicted a maximum exploitation rate ($E_{\text{max}}$) which was 0.55. The current $E$ value (0.46) is lower than the optimum exploitation ($E = 0.50$) as well predicted $E_{\text{max}}$. Therefore, it could be concluded that stock of A. mate in the investigated area of Marudu Bay, Sabah is under exploited.

Keyword: Atule mate; Marudu Bay; Malaysia; Population dynamics; Sabah