Population dynamics and condition index of natural stock of blood cockle, Tegillarca granosa (Mollusca, Bivalvia, Arcidae) in the Marudu Bay, Malaysia

ABSTRACT

The population parameters of blood cockles, Tegillarca granosa in the intertidal zone of Marudu Bay, Sabah, Malaysia were investigated based on monthly length-weight frequency data (July 2017 to June 2018). A total of 279 cockle individuals with shell length and weight ranging from 27.7 mm to 82.2 mm and 13.11 g to 192.7 g were subjected to analysis. T. granosa in Marudu Bay showed a consistent moderately high condition index 4.98±0.86 throughout the year. The exponent b of the length-weight relationship was 2.6 demonstrating negative allometric growth. The estimated asymptotic length ($L\infty$), growth coefficient (K) and growth performance (ϕ) of the T. granosa population in Marudu Bay were estimated at 86.68 mm, 0.98 a^{-1} and 3.87, respectively. The observed maximum shell length was 82.55 mm and the predicted maximum shell length was 84.44 mm with estimated maximum life span (tmax) of 3.06 years. The estimated mean lengths at the end of 2, 4, 6, 8, 10 and 12 months of age were 21.31 mm, 31.16 mm, 39.53 mm, 46.63 mm, 52.67 mm and 57.79 mm. Total, natural, and fishing mortalities were estimated at 2.39 a^{-1}, 1.32 a^{-1} and 1.07 a^{-1}. The exploitation level (E) was 0.45. Results of the current study also demonstrated that T. granosa in the Marudu Bay has two major recruitment peaks; one in March and another in October. The exploitation level revealed that natural stock of T. granosa in the Marudu Bay was approaching the maximum exploitation level. If such trend continues or demand for T. granosa is increasing, coupled with no effective fisheries management in place, possibility of the T. granosa population in the Marudu Bay to collapse is likely to elevate.