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Evaluating Biometric Indices and Life-History Traits of Climbing Perch, *Anabas testudineus* of Baluhor Oxbow Lake in Southwestern Bangladesh: Implication for Sound Management

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Abstract

In Bangladesh, the freshwater climbing perch, *Anabas testudineus*, is a food fish with significant economical and nutritional value. To create long-term management and conservation strategies for this species, it is essential to investigate the life-history characteristics of *A. testudineus*. The present research provides the comprehensive explanation of the life-history traits (LHT), containing length-frequency distribution (LFD), length-weight and length-length relationships (LWR and LLR), form factor ($a_{3.0}$), condition factors, length at first sexual maturity (L_m), natural mortality (M_w), maximum life span (t_{max}), optimum age, where fish reaches its maximum biomass and optimum catchable length (L_{opt}) of *A. testudineus* from the Baluhor Oxbow Lake in Southwestern Bangladesh. Fish samples (n=102) were collected from May to July 2024, using various types of traditional fishing gears. Digital slide calipers and an electronic balance with an accuracy of 0.01 cm and 0.01 g, respectively, were used to measure total length (TL) and whole-body weight (BW). During this investigation, 102 specimens with measurements ranging from 6.96-13.49 cm TL and 9.59-35.07 g BW were examined. The calculated b values of *A. testudineus* showed a trend of negative allometric growth ($b<3.0$). The LWRs were highly significant ($p<0.001$) with r^2 values >0.8117. Among the four categories of condition factors in the Baluhor Oxbow Lake, K_F represented the best for well-being of *A. testudineus*. Significant dissimilarity from 100 was found in a Wilcoxon sign-ranked test for WR, indicating that habitat is uneven of *A. testudineus*. The determined $a_{3.0}$ was 0.00861, and L_m was calculated as 8.2383 (~8.30) cm TL in the Baluhor Oxbow Lake. The M_w of *A. testudineus* was 1.26 $year^{-1}$, optimum age of maximum biomass was 2.60 years and maximum life span, t_{max} was 9.65 years according in this study. The outcomes sought to help Southwestern Bangladesh and its surrounding environments in effective management of *A. testudineus* species sustainably.

Key words: *Biometry, Life-history traits, Anabas testudineus, Oxbow Lake, Bangladesh*