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COMPARATIVE STUDY OF WLR OF *Channa striatus* OF FRY-FINGERLING, GROW-OUTS AND ADULTS OF GANGETIC PLAINS

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ABSTRACT: *In the present study the Weight – Length relationships (WLR) are described for the three stages of life of the Snakehead, Saul, Channa striatus, collected from the districts of Barabanki, Lucknow and Unnao in Uttar Pradesh in 2008-09. Method used for analysis of fisheries data on the WLR is ($W=aL^b$) and this study reports the parameters 'a' and 'b' of the length–weight relationships for one hundred numbers of fry/ fingerlings, thirty-seven grow-out fishes and eighty-nine number of adult fishes collected from the same geographical area. The weight and total length of fry/ fingerlings ranged from 340 to 650 mg and 35 to 45 mm respectively ($a=W/L^3$, 0.0060 to 0.0088; log W=log a + b*(log L), 3.92821 to 4.72919; b=(log W-log a)/log L, 3.89643 to 4.11143). The recorded weight and total length of the grow-outs ranged between 9 to 93g and 10.9 to 25.4 cm respectively ($a=W/L^3$, 0.0082 to 0.0146; log W=log a + b*(log L), 0.95424 to 1.96848; b= (log W-log a)/log L, 3.0). In case of adults the weight and total length recorded ranged between 74 to 476g and 22.9 to 42.4 cm respectively ($a=W/L^3$, 0.0054 to 0.0121; log W=log a + b*(log L), 2.39029 to 4.17039; b=(log W-log a)/log L, 3.40747 to 3.95845). Since fishes were collected during the months of April - May, 2008 and November, 2009, the parameters estimated in this study are considered only for these seasons, because WLR are not constant over the entire year and vary according to factors such as temperature, food availability, feeding rate, gonadal development and spawning period. The result suggests that these fishes grow in a pattern from early life stage to adult if grown in the same environmental conditions.*

ORIGINAL ARTICLE

Key words: *Weight-Length, Channa striatus, Fry, Fingerlings, Grow-outs, Adults, Gangetic plains*

INTRODUCTION

Snakeheads (genus *Channa*) are one of the best known and most successful freshwater food fish in Southeast Asia (Ng and Lim, 1990). The Snakehead, *Channa striatus*, a carnivorous, air-breathing fish, belonging to family Channidae. It is one of the valuable food fish, found in rivers, canals, lakes, swamps, marshes and rice fields. The values of the parameter b mostly remained within the expected range of 2.5–3.5. Length (L)–weight (W) relationship parameters (a, b) are important in stock assessment studies (Moutopoulos and Stergiou, 2002) for conversion of length observations into weight estimates to provide some measurements of biomass (Froese, 1998), for between-region comparisons of growth of fish species (Petrakis and Stergiou, 1995), and as a practical index of the fish condition (Barros et al., 2001).

The L–W relationship is usually fitted to the potential equation ($W = aL^b$), where a represents the nutritional condition of the fish (Anderson and Neumann, 1996), and varies according to the geographical regions and gonadic development phases (Barros et al., 2001). Weight-length relationship (WLR) is an important tool in fish biology, physiology, ecology and fisheries assessment (Oscoz et al., 2005). Parameter b is an expression of the type of growth and usually falls between 2.5 and 3.5 (Prager et al., 1989). The obtained coefficients were analyzed with ANOVA.

Studies on length–weight relationships of commercially important fishes are highly significant for management and conservation of populations in natural water-bodies. Scanty reports are available in the literature on the biological aspects, especially length–weight relationships, of *Channa striatus* from different pond

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populations. Aim of the study was, therefore, to investigate certain biometric characters with special reference to length–weight relationship in three different stages of life.

MATERIAL AND METHODS

Fishes were collected by using different fishing gear. Fisheries management and research often require the use of biometric relationships in order to transform data collected the field into appropriate index (Anderson and Gutreuter, 1983; Ecoutin and Albert, 2003). One of the most commonly used in any analysis of fisheries data is the WLR ($W=aL^b$).

The WLR was calculated using the equation $W = aL^b$, where W is the total weight in g and L is the total length in cm, while 'a' and 'b' are constants and 'a' is a coefficient related to body form and 'b' is an exponent indicating isometric growth when equal to 3. The parameters a, and b were estimated by linear regression of the transformed equation: log W = log a + b x log L. Additionally, the statistical significance level of r^2 was estimated (Ricker, 1975) and the b-value for each species was tested by t-test. The exponent b often has a value close to 3, but varies between 2 and 4 and a value of 3 indicates that the fish grows isometrically; values other than 3 indicate allometric growth (Tesch, 1971).

RESULTS AND DISCUSSION

The weight and total length of fry/ fingerlings ranged from 340 to 650 mg and 35 to 45 mm respectively ($a=W/L^3$, 0.0060 to 0.0088; log W=log a + b*(logL), 3.92821 to 4.72919; b=(log W-log a)/logL, 3.89643 to 4.11143). The recorded weight and total length of the grow-outs ranged between 9 to 93g and 10.9 to 25.4 cm respectively ($a=W/L^3$, 0.0082 to 0.0146; log W=log a + b*(logL), 0.95424 to 1.96848; b= (log W-log a)/logL, 3.0). In case of adults the weight and total length recorded ranged between 74 to 476g and 22.9 to 42.4 cm respectively ($a=W/L^3$, 0.0054 to 0.0121; log W=log a + b*(logL), 2.39029 to 4.17039; b=(log W-log a)/log L, 3.40747 to 3.95845). The patterns of length and weight relation are shown in Figures 1, 2 and 3. The r^2 of fry-fingerling, grow-out and adult are 0.805922, 0.891838 and 0.933348 of the captured fish from wild-stock.

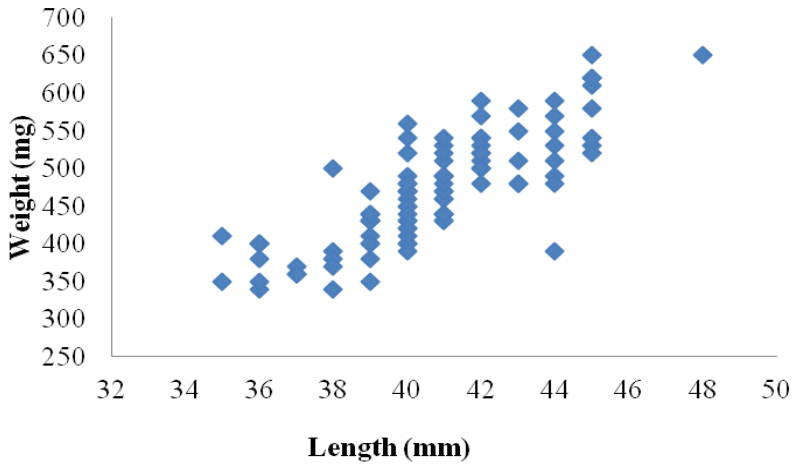

Figure 1 - Pattern of growth in terms of length and weight in fry/fingerlings of *Channa striatus*

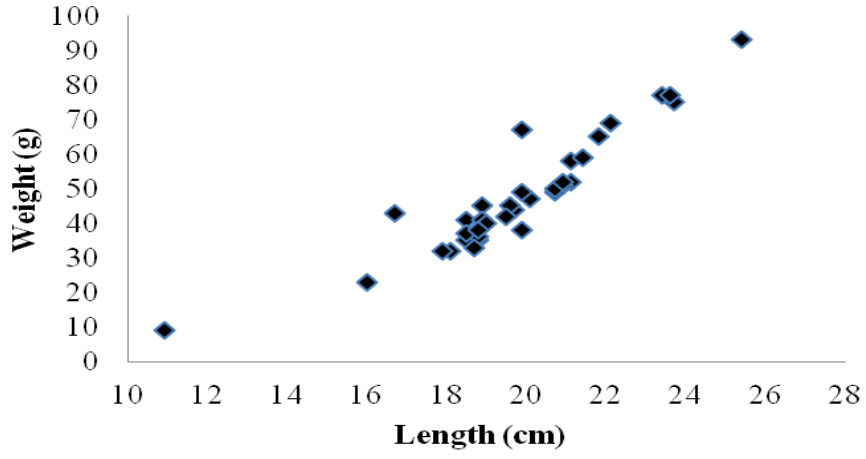

Figure 2 - Pattern of growth in terms of length and weight in grow-outs of *Channa striatus*

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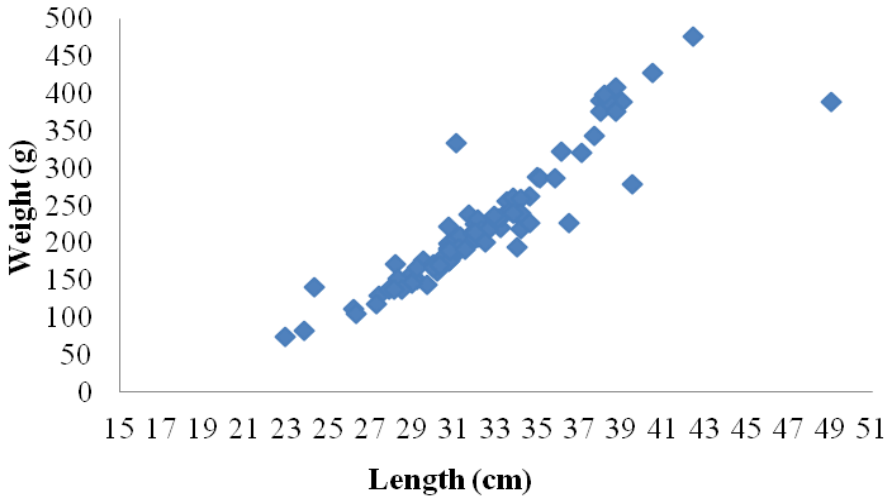

Figure 3 - Pattern of growth in terms of length and weight in Adults of *Channa striatus*

Since fish were captured in summer, the parameters estimated in this study should be considered only for this season, because WLR are not constant over the entire year and vary according to factors such as food availability, feeding rate, gonad development and spawning period (Bagenal and Tesch, 1978). The results of the length–weight analysis of all the fishes of same species are given in Table 1. This study reports the parameters 'a' and 'b' of the length–weight relationships for 89 number of adult fishes, 37 grow-out fishes and 100 numbers of fry and fingerlings captured from the adjoining districts of the same environment.

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