

Study on length–Weight Relationship and Condition Factor of *Capoeta trutta* in Gamasiab River (Iran)

Alireza Radkhah¹, hashem nowferesti² and shaghayegh asgardun²

¹University of Tehran, Faculty of Natural Resources, Department of Fisheries, Karaj, Iran

²University of Gorgan, Faculty of Natural Resources, Department of Fisheries, Gorgan, Iran

*Corresponding author: Alireza Radkhah, E-mail: radkhahalireza@yahoo.com

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ABSTRACT

The present study aims to study the length-weight relationship and condition factor of *Capoeta trutta* in Gamasiab River from Iran. A total of 40 individuals of *C. trutta* were sampled from Gamasiab River by Electro fishing on September 2014. Total Length (cm) and body weight (g) for each specimen was taken by a digital slide caliper and balance, respectively. In the present study, Total length and weight ranged from 10.5 to 19.8 mm and 11.86 to 76.82 g, respectively. Average total length and weight was 14.41 ± 0.91 (SD) mm and 34.7 ± 0.86 (SD) g, respectively. The b value was 3.054 that is significantly larger than 3, indicating a positive allometric growth for the considered group. In this study, condition factor (K) of fish was 0.93. This study provides basic information on *C. trutta* for fishery biologists in Iran.

Key words: Length, Weight, Relationship, Condition factor, *C. trutta*.

INTRODUCTION

The genus *Capoeta* is found in Eastern Europe and southwestern Asia [1] and contains about 10 species, of which 7 occur in Iran [2]. *Capoeta trutta* belongs to the genus *Capoeta* and Cyprinidae family [3]. In the species, the mouth is slightly arched or even straight in ventral view. The horny edge to the lower jaw is usually well-developed but may be lost in preserved specimens [2]. This species is found in the Tigris-Euphrates basins from Iran. *C. trutta* is present in Dez River near Dezful and Gheshlagh Dam Lake [2-3].

Length-weight relationship (LWR) of fishes are important in fisheries and fish biology because they allow the estimation of the average weight of the fish of a given length group by establishing a mathematical relation between them [4]. LWR helps to figure out the condition, reproduction history, life history and the general health of fishing species [5]. The length-weight relationship are provide information on the condition of fish and to determine whether somatic growth was isometric or allometric [6]. Therefore, Length–weight Relationship (LWR) is useful tool in fish growth pattern or age determination and fishery assessment [7]. The condition factor (k) is a quantitative parameter of the well-being, state of the fish and reflects recent feeding conditions [8]. The results of condition factor can be used to compares the wellbeing of fish [9].

The present study has been under taken to establish a length-weight relationship and condition factor of *C. trutta* in Gamasiab River. This study will be helpful in the future studies on *C. trutta* in this region.

MATERIALS AND METHODS

A total of 40 individuals of *C. trutta* were randomly sampled from Gamasiab River by Electrofishing on September 2014.

The total lengths were measured with a meter rule on measuring board. Also, body weights were measured to the nearest 0.01 g using a digital weighing scale. The length-weight relationship was estimated by using the equation provided by Ricker (1973): $W = aL^b$ [10], where W=Weight of fish (g), L= Total length of fish (cm), b = Regression coefficient or slope and a = Regression constant or intercept. The condition factor was calculated using the means of the total length and weight of fish as provided by Gayanilo and Pauly (1997) with the equation: $K = 100w/L^3$ [11], where W= Mean body weight of fish (g), L= Mean total length of fish (cm), K= condition factor.

RESULTS AND DISCUSSION

In the present study, Total length and weight ranged from 10.5 to 19.8mm and 11.86 to 76.82g, respectively. Average total length and weight was 14.41 ± 0.91 (SD) mm and 34.7 ± 0.86 (SD) g, respectively. Length-weight relationship was $W = 0.0009L^{3.054}$ (Figure 1). The obtained b value for LWR was 3.054. The fish exhibited positive allometric growth pattern. The LWR was highly significant ($P < 0.01$), with coefficient of determination values = 0.97. There was a higher correlation coefficient value in the length-weight for *C. trutta*.

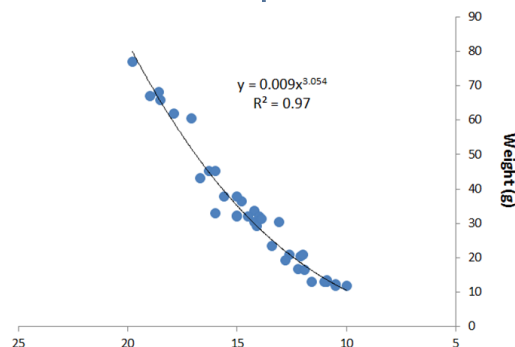


Fig. 1: The length-weight relationship curve for *C. trutta* in Gamasiab River.

Length-weight parameters are affected by a series of parameters such as season, habitat, health, habitat, diet, gonad maturity, degree of stomach fullness, sex, health and preservation technique [12]. Moradinasab *et al.* (2012) [13] study length-length relationship of *H. leucisculus* in Anzali wetland. In this study, the values of a, b and r^2 were 0.409, 0.927 and 0.93 respectively for length-length relationship of *H. leucisculus* from the Anzali wetland. Hashemzadeh Segherloo *et al.* (2015) [14] study length-weight relationships of *Garrarufa*, in the Tigris and Persian Gulf basins of Iran. In their study, the value of exponent b ranged from 2.74 to 3.19 with average of 2.99 in the Tigris basin and 2.96 in the Persian Gulf basin which was in normal range (2.5-3.5). Also, Haque and Biswas (2014) [15] study length-weight relationship of *Botiadarío* from wetland of Sivasagar district. In this study, the 'b' value ranged from 3.06 in male and 3.128 in female lengthwise. Seasonally, 'b' value for male is 2.02 to 3.45 and for female is 2.4 to 3.17.

In the present study, condition factor (K) of fish was 0.93. According to LeCren (1951) [8] the relative condition factor K is an indicator of general well-being of the fish. Tabassum *et al.* (2015) [16] study condition factor of *Hemiramphus archipelagicus* (Family: Hemiramphidae) from Karachi Coast in Pakistan. In this study, the highest mean condition factor (0.257 ± 0.031) was recorded in samples of length of 11-20 cm. Also, the lowest mean condition factor (0.197 ± 0.016) was recorded in 21-30 cm. The results showed that K varied mainly with size classes. The condition factor of fishes has been reported to be influenced by a number of factors such as the spawning and maturity, sex, availability of feeds and season [17].

CONCLUSION

The present study provides useful information for biologists and the direction for the future management models for the continued sustainable exploitation of *Hemiramphus archipelagicus* in the Gamasiab River (Iran).

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