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Length-Weight Relationship of *Cyprinion macrostomus*, (Heckel, 1843) in Dalaki River and Shahpur River in South of Iran

[1]*Mehdi Bibak,* [1]*Seyed Abbas Hosseini and* [2]*Gholam Reza Izadpanahi*

[1]Department of Fisheries,
Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran
[2]Iran Shrimp Research Centre, Iran

Abstract: The aim of this study was to record the length-weight relationship of *Cyprinion macrostomus* in two rivers (Dalaki River and Shahpur River) in south of Iran for the first time in the worldwide and it provides basic information for fishery biologists in Iran. Sampling was done between April to August of 2012 using scoop net. The relationship between total length and weight was for Dalaki River W= 0.015 L3.129 (R2 = 0.980, n=91) and for Shahpur River W=0.027 L2.935 (R2 = 0.997, n=80). We determined a positive allometry (b>3) length-weight relationship for *Cyprinion macrostomus* in Dalaki River and negative allometry (b<3) in Shahpur River.

Key words: *Cyprinion macrostomus* · Dalaki River · Shahpur River · Length-Weight Relationship

INTRODUCTION

Dalaki River near Dashtestan city (latitude: 29°28' and longitude: 51°17'). Dalaki River is a permanent river with average depth of 70 cm and bed mud [1]. The length of Dalaki River in the province Bushehr has 115 kilometers, which this river is permanent river in south of Iran [2]. Shahpur River near Kazerun city (latitude: 29°19' 30" and longitude: 50°55'). The length of Shahpur River in the province Fars has 262 kilometers.

Cyprinion macrostomus, also known as the kangafish, is a ray-finned cyprinid doctor fish, similar to another species of carp, *Garra rufa*. It is native to Iran, Syria and Turkey [3].

Length-weight relationship (LWR) is of great importance in fishery assessments [4].

Length-weight relationships drastically help scientists to convert growth-in-length equations to growth in weight in stock assessment models [5]. To estimating growth rates, age structure, to obtain the condition of fish and comparative growth studies [6-8], to estimate biomass from length frequency data and for the estimation of fish condition [7]. In addition, these relationships contribute to the compare of life history and morphological aspects of populations between different regions of the same country.

In Iranian waters (freshwater and sea water), fish have been poorly studied and little biological information is available [9-13].

The present study describes the length-weight relationship *Cyprinion macrostomus*, (Heckel, 1843) in Dalaki River and Shahpur River (in south of Iran) for the first time in the worldwide [14].

MATERIALS AND METHODS

The sampling was carried out in Dalaki River and Shahpur River at monthly intervals between April to August of 2012.

Sampled fishes were fixed with 10% formalin and transferred to the laboratory. Fishes were caught by means of scoop net with mesh size 1.5 mm (bar). Fishes were fixed with 10% formalin and transferred to the laboratory. For each specimen, total length (TL), whole body wet weight (g) was recorded. The length-weight relationship was estimated by using following equation:

$$W = a L^b$$

where W is the whole body weight (g), L is the total length (mm), a is the intercept of the regression and b is the regression coefficient (slope) [15].The parameters a

Corresponding Author: Mehdi Bibak, Department of Fisheries, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran.

and b of the length-weight relationship was estimated by the least-squares method based on logarithms [16]:

$$\text{Log } (W) = \log (a) + b \log (L)$$

when b = 3, increase in weight is isometric. When the value of b is other than 3, weight increase is allometric (positive if b > 3, negative if b < 3). This parameters (a, b) are important in stock assessment studies [17]. Data analysis was done by Excel and SPSS 19 software.

RESULTS AND DISCUSSION

Overall 171 fish were measured. The sample size, the minimum, maximum and mean length and weight (±STD) of *Cyprinion macrostomus* in Dalaki River are presented in Table 1. And the sample size, the minimum, maximum and mean length and weight (±STD) of *Cyprinion macrostomus* in Shahpur River are presented in Table 2.

Relationship between length-Wight of *Cyprinion macrostomus* in Dalaki River is presented in Figure 1 and Table 3. And relationship between length-weight of *Cyprinion macrostomus* in Shahpur River is presented in Figure 2 and Table 3.

Overall 171 fish were measured. The minimum and maximum length in Dalaki River was respectively 2.8 and 17.7 (cm). and minimum and maximum weight in this river was respectively 0.51 and 126.15 (g) (Table 1). The minimum and maximum length in Shahpur River was respectively 2.5 and 15.5 (cm) and minimum and maximum weight in this river was 0.43 and 85.21 g (Table 2).

The relationship between total length and weight was described as: for Dalaki River W= 0.015 L3.129 (R2 = 0.980, n=91) and for Shahpur River W=0.027 L2.935 (R2 = 0.997, n=80).

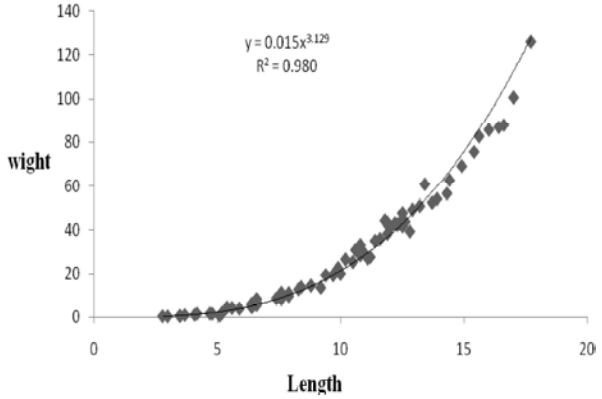

Fig. 1: Length-weight relationship of *Cyprinion macrostomus* (Heckel, 1843) in Dalaki River Bushehr, in south of Iran

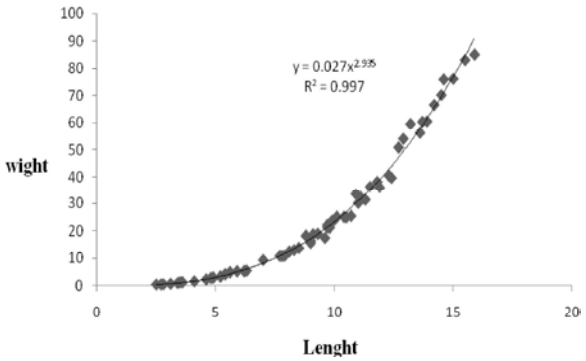

Fig. 2: Length-weight relationship of *Cyprinion macrostomus* (Heckel, 1843) in Shahpur River Fars, in south of Iran

Table 1: Length characteristics (cm) and weight characteristics (g) of *Cyprinion macrostomus* in the Dalaki River Bushehr, Iran

	Min	Max	Mean ± STD
Length	2.8	17.7	9.7±3.2
Wight	0.51	126.15	30.4±28.29

Table 2: Length characteristics (cm) and weight characteristics (g) of *Cyprinion macrostomus* in the Shahpur River Fars, Iran

	Min	Max	Mean ± STD
Length	2.5	15.5	9.15±3.67
Wight	0.43	85.21	26±23.81

Table 3: Length-weight relationship of Cyprinion macrostomus, (Heckel 1843) in Dalaki River and Shahpur River, in south of Iran

	n	a	b	R^2
Dalaki River	91	0.015	3.129	0.980
Shahpur River	80	0.027	2.935	0.997

The parameter b in Dalaki River was 3.129 and in Shahpur River was 2.935 (Table 3). We determined a positive allometry (b>3) length-weight relationship for *Cyprinion macrostomus* in Dalaki River and negative allometry (b<3) in Shahpur River.

CONCLUSION

Although there is little information about biological characteristics of *Cyprinion macrostomus* in Iranian waters, present study provides basic information for fishery biologists and managers in this region.

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