



International Journal of Fisheries and Aquatic Studies

ISSN: 2347-5129

(ICV-Poland) Impact Value: 5.62

(GIF) Impact Factor: 0.352

IJFAS 2015; 2(6): 224-226

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www.fisheriesjournal.com

Received: 19-05-2015

Accepted: 20-06-2015

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Length-weight relationship of *Gobio sakaryaensis* (Teleostei: Cyprinidae) from Camkoru Pond (Ankara-Turkey)

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Abstract

This study describes the length–weight relationship (LWR) of *Gobio sakaryaensis* Turan, Ekmekçi, Luskova & Mendel, 2012 from the Camkoru Pond (Ankara-Turkey). A total of 40 specimens were obtained by different nets throughout one year between August 2002 and August 2003. Total lengths ranged from 4 to 13 cm. The length–weight relationship showed a positive allometric growth ($b = 3.217$; $R^2 = 0.97$). This study presents the first reference on LWR for this species. The results also indicate a new maximum total length not previously reported in the international literature.

Keywords: *Gobio sakaryaensis*, Camkoru Pond, length weight relationship.

1. Introduction

The cyprinid genus *Gobio* is widely distributed in Europe and northern Asia. The genus *Gobio* is represented in Turkey by ten species^[1]. *Gobio sakaryaensis* is one of the endemic species in the Sakarya River Basin. *G. sakaryaensis* is affected in Çamkoru Pond by anthropogenic pressures such as; habitat modification resulting from dam construction, and fish introductions. In the Çamkoru Pond, *G. sakaryaensis* coexist with the five fish species. *G. sakaryaensis*, *Squalius cephalus* and *Alburnus escherichii* are the native fish species of Camkoru Pond. After the reservoir construction *Tinca tinca*, *Cyprinus carpio* and *Onchorynchus mykiss* were introduced into Camkoru Pond^[2]. No studies are available in the literature on the biological aspects, especially length–weight relationships, of *G. sakaryaensis* from different populations in Turkey^[3]. To the best of the authors knowledge, this is the first study on length weight relationships of *G. sakaryaensis* in Çamkoru Pond.

2. Material And Methods

The study was carried out on the determination of Length-weight relationship of *G. sakaryaensis* population in Camkoru Pond (Camlidere-Ankara) located on the Kadimboğazi Creek, 105 km northwest of Ankara with a surface area of 7 ha. Fish species were caught monthly with nets of various mesh sizes (10 and 17 mm) and fish traps between August 2002 and August 2003. Specimens were measured to the nearest 0.1 cm total length and weighed to the nearest 0.1 g total weight. The total length–weight relationship was determined using the equation $W = a L^b$ and logarithmically transformed into $\log W = \log a + b \log L$ where W is the length of the fish in grams and L is the length of the fish measured in centimeters. “ a ” the intercept of the regression and “ b ” the slope or regression coefficient. The significance of the b value was tested by t-test. The Kolmogorov–Smirnov test was used to analyse size frequency distributions of both sexes.

3. Results and Discussion

40 specimens of *G. sakaryaensis* were collected during the study period. Of all the *G. sakaryaensis* examined, 4 were immature, 24 were female, and 12 were male. Sample size, length, weight, parameters for a and b , and r^2 values are given for males, females and both sexes combined in Table 1. Length-weight relationships and frequency distributions for both sexes combined are given in Figure 1.

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Table 1: Length-weight relationship for *G. sakaryaensis*; Sample size, total length(TL), weight (W) and equation parameters for a and b, as well as r² values (n; sample size; a, intercept of the regression; b, slope or regression coefficient, r², coefficient of determination)

Sex	n	TL (cm)	W(g)	a	b	range (b)	r ²
		min-max	min-max				
Females	24	6.8-13	3,6-30,1	0.0041	3,4846	3,421-3.669	0.95
Males	12	4,8-28,5	0,9-28,5	0.0044	3,4373	3.389-3.508	0.98
All individuals	40	4-13	0,9-30,1	0.0075	3,2172	3,139-3.453	0.97

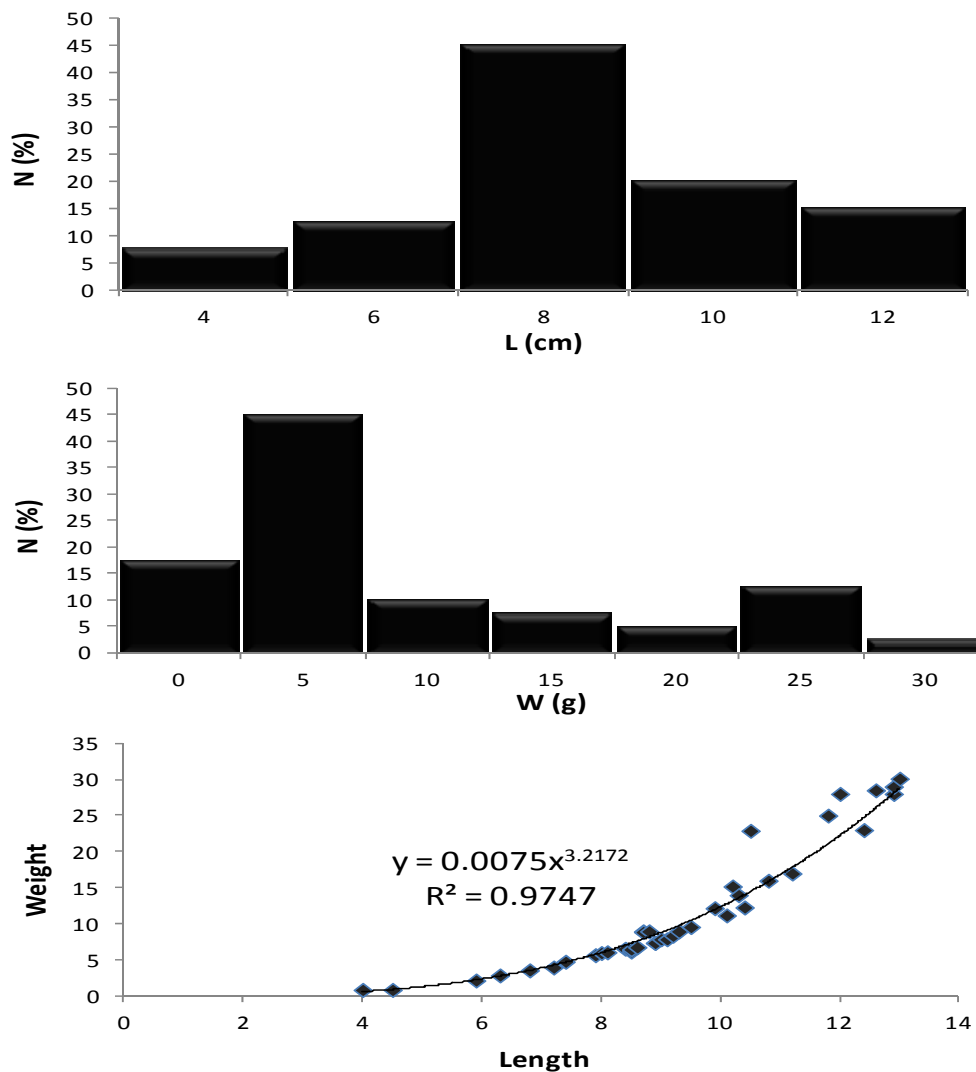


Fig 1: Length-weight relationships and frequency distributions for both sexes combined.

A total of 40 individuals of *G. sakaryaensis*, ranging in size between 4 and 13 cm total length, 0.9 and 30.1 g total weight, was examined. Slope value (b) estimated for combined sexes was 3.2172. The regression equation calculated $\text{Log } W = -2.1249 + 3.2172 \text{ Log } L$.

The size frequency distributions of males and females were not significantly different (Kolmogorov–Smirnov test, $p > 0.10$). Length–weight relationships were fitted by the equation $W = 0.0041xL^{3.4846}$ ($R^2=0.95$) for females and $W = 0.0044xL^{3.4373}$

($R^2=0.98$) for males and $W = 0.0075xL^{3.2172}$ ($R^2=0.97$) for both sexes combined. Except one female individuals The value of b were within the limits of 2.5-3.5 commonly reported for teleosts by Froese (2006) [4]. The length–weight relationship showed a positive allometric growth ($b = 3.2172$; $R^2 = 0.97$, $p < 0.05$). The slope (b) value of the length weight regression of *Gobio* populations is presented in Table 2. The b value of *Gobio* species in Turkey has been shown to range from 2.83 to 3.45.

Table 2: Length-weight relationship for *Gobio* species in Turkey.

Species	Locality	Length range (cm)	a	b	r ²	References
<i>Gobio gymnotethus</i>	Melendiz Creek, Aksaray	8,1-14,1	0.014	2.894	0,96	[5]
<i>Gobio hettitorum</i>	Incesu Creek, Karaman	5,3-15,3	0.004	3.446	0,95	[5]
<i>Gobio insuayanus</i>	Insuyu Creek, Konya	6,9-13,6	0,0088	3,132	0,95	[6]
<i>Gobio battalgilae</i>	Üçpınar Creek, Konya	10,4-17,2	0,0191	2,825	0,95	[6]
<i>G. sakaryaensis</i>	Camkoru Pond, Ankara	4-13	0.0075	3,217	0,97	Present study

In conclusion, this study provides basic information on LWR for this species not yet available in the international literature. The data would also be useful for fishery biologists and managers in Turkey.

4. References

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