



Asiye Başusta

Firat University, agirgin@firat.edu.tr, Elazığ-Turkey

Nuri Başusta

Firat University, nbasusta@firat.edu.tr, Elazığ-Turkey

Levent Sangün

Çukurova University, leventsangun@gmail.com, Adana-Turkey

DOI	http://dx.doi.org/10.12739/NWSA.2018.13.3.5A0100	
ORCID ID	0000-0002-9903-1418	0000-0002-4260-4772
	0000-0002-2363-8977	
CORRESPONDING AUTHOR	Nuri Başusta	

LENGTH-WEIGHT RELATIONSHIP OF STREAKED GURNARD (*Trigloporus lastoviza* (BONNATERRE, 1788)) CAUGHT FROM NORTH-EASTERN MEDITERRANEAN

ABSTRACT

Aim of this study is to determine the length-weight relationships of streaked gurnard, *Trigloporus lastoviza*, caught from northeastern Mediterranean. *T. lastoviza* specimens were captured by commercial bottom trawler at depth of 155 to 212m off the Iskenderun Bay, Turkey. A total of 84 specimens (52 females and 32 males) were collected. Minimum-maximum length and weight of them were determined as 10.5-26.1cm and 5.92-163.8g for females and 6.41-22.0cm and 4.91-92.96g for males respectively. Length-weight relationships of *T. lastoviza* were found as $W=0.0055*L^{3.104}$, $R^2=0.793$, $SEb=0.175$ for all individuals, $W=0.0076*L^{2.972}$, $R^2=0.84$, $SEb=0.258$ for females and $W=0.0076*L^{2.972}$, $R^2=0.75$, $SEb=0.245$ for males. The type of growth for all individuals, females and males were isometric growth ($b=3$).

Keywords: Streaked Gurnard, *Trigloporus lastoviza*, Length-Weight Relationship, Iskenderun Bay, Northeastern Mediterranean

1. INTRODUCTION

The streaked gurnard *Trigloporus lastoviza* (Brünnich, 1768) can be regarded as one of the living species on a large scale and with the widest geographical distribution. *T. lastoviza* is distributed in Turkey; Aegean and Mediterranean Seas, in the world; it spreads from the British Isles to Mozambique in the Indian Ocean [1]. This species is a benthic species found on sandy or muddy bottom to depth of 225m [1]. The streaked gurnard is assessed as Least Concern (LC) globally by the International Union for Conservation of Nature (IUCN) [2]. The length-weight relationship studies also become very important for paleobiology and osteoarchaeology science as well as fisheries studies [3].

2. RESEARCH SIGNIFICANCE

T. lastoviza were studied satisfactorily on the distribution and length-weight relationships (LWRs), by some researchers during recent years in the other areas of the Mediterranean [4, 5, 6, 7, 8, 9, 10, 11, 12, and 13]. There is no more biological data for *T. lastoviza* from the northeastern Mediterranean. Length-weight relationships of streaked gurnard were examined detailed for each sex in a population of the northeastern Mediterranean Sea.

How to Cite:

Başusta, A., Başusta, N., and Sangün, L., (2018). Length-Weight Relationship of Streaked Gurnard (*Trigloporus Lastoviza* (Bonnaterre, 1788)) Caught From North-Eastern Mediterranean, **Ecological Life Sciences (NWSAELS)**, 13(3): 114-118.
DOI: 10.12739/NWSA.2018.13.3.5A0100.

3. MATERIALS AND METHODS

Trigloporus lastoviza individuals were captured by commercial bottom trawler at a depth of 155 to 212m off the Iskenderun Bay (36°13'650 N-035°23'032 E, 36°16'622 N-035°18'509 E) in 2015 fishing season (Figure 1). A total of 84 specimens (52 females and 32 males) were collected and transported to the laboratory on ice. Each fish was measured for total length to the nearest 0.1cm, weight (W) was weighted to the nearest 0.1g and the sex was determined by macroscopic observation of the gonads at the laboratory in Fırat University. In the length-weight equation "a" and "b" are intercept and the slope (=exponent) of the length-weight curve, respectively. Data were subjected to statistics analysis by using the IBM SPSS Statistics ver. 22.0 for Windows. Total lengths and weights were fitted to the length-weight equation: $W=aL^b$, by using least square methods with Statistical software [14]. The "b" value for this species was tested by a t-test at the 0.01 significance level to verify if it was significantly different from 3 [15].



Figure 1. Sampling area (O), Northeastern Mediterranean sea

4. RESULTS AND DISCUSSION

Minimum-maximum lengths and weights of caught fishes were determined as 10.5-26.1cm and 5.92-163.8g for females and 6.41-22.0cm and 4.91-92.96g for males, respectively. Length-weight relationships of *Trigloporus lastoviza* were found as $W=0.0055*L^{3.104}$, $R^2=0.793$, $SEb=0.175$ for combined sexes, $W=0.0076*L^{2.972}$, $R^2=0.84$, $SEb=0.258$ for females and $W=0.0076*L^{2.972}$, $R^2=0.75$, $SEb=0.245$ for males (Figure 2). 95% Confidence intervals of b were found as 2.65175- 3.34825, t-test $P<0.05$. The type of growth for combined sexes, females and males were isometric growth ($b=3$).

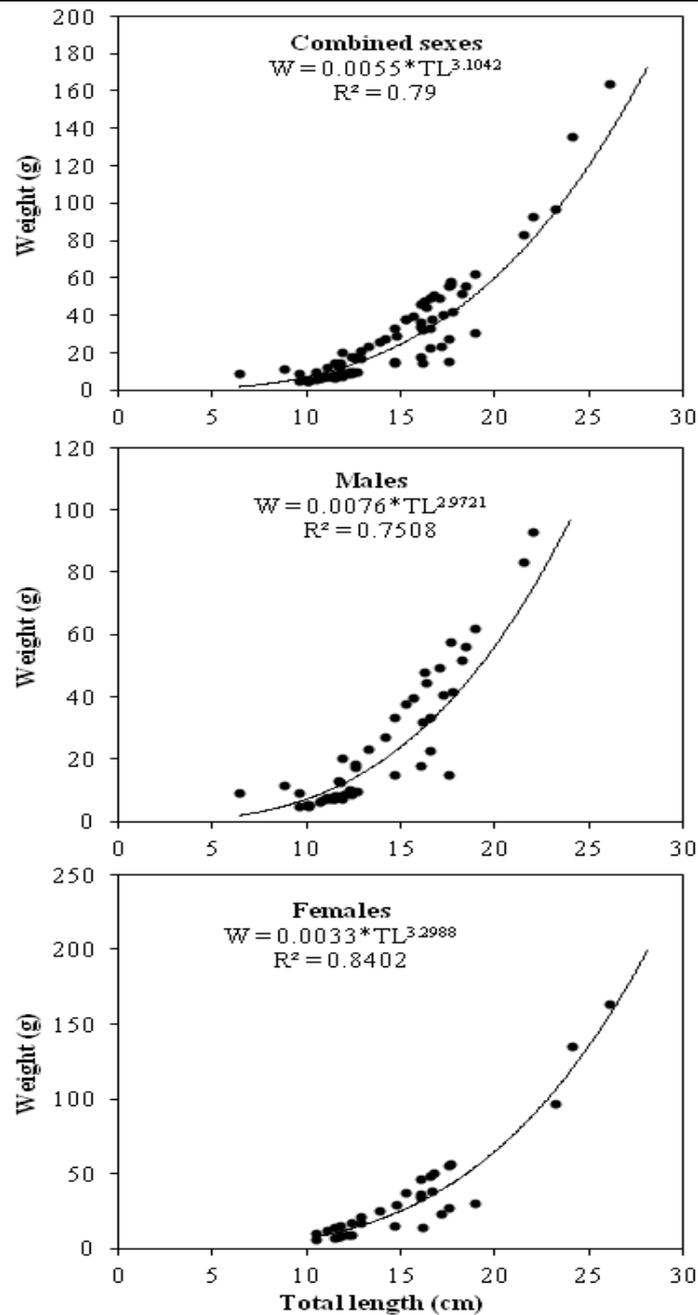


Figure 2. Length-weight relationship of *Trigloporus lastoviza*, combined sexes, males and females

According to regression analysis, fish length has significant correlation with weight ($R=0.89$, $R^2=0.79$, $F_{1, 84}=313.732$, $P<0.001$) and it can be said that 79% increase in weight was due to total length increase. Otherwise, when the t-test results were analyzed for the significance of regression coefficients (t-test=17.712, $P<0.01$), it was found that total length data of this species could be used in high precision to forecast fish weight. According to regions calculated b values were found very close in our study for this species [5, 6, 7, 8, 9, 10, 11 and 12]. Only one b value was reported 2.64 for Gulf of Antalya by Özvarol et al [13]. Reported this value was different from



our study. These differences may be caused by the lower sample size, sampling season, different or fishing techniques.

Table 1. Total length-weight relationship values for *T. lastoviza* species from different locations

Region	Sex	N	L _{MIN} - L _{MAX} (cm)	W _{MIN} - W _{MAX} (g)	a	b	r ²	Researchers
Saros Bay, Turkey	Σ	88	11.5-21.2	18.00-108	0.01056	3	0.97	Ismen et al., 2007
Central Aegean Sea	Σ	67	10.1-19.8	-	0.00800	3.13	0.97	Ilkyaz et al., 2008
North Aegean Sea	Σ	7	15.2-19.5	-	0.0043	3.33	0.85	Karakulak et al., 2006
Edremit Bay, Turkey	Σ	128	7.5-28	11.39-116.14	0.00011	3.04	0.96	Türker-Çakır et al., 2008
Gulf of Antalya, Turkey	Σ	28	10.1-20	-	0.0720	2.64	0.97	Özvarol, 2014
Greek Marine Waters	Σ	707	4.5-29.3	-	0.01132	3.054	0.98	Stergio & Moutopoulos, 2002
Gulf of Biscay, France	Σ	192	11-42	-	0.0128	2.96	0.988	Dorel, 1986
Eastern Adriatic	Σ	52	7.4-35	5-460	0.0000248	3	0.98	Dulcic & Kraljevic, 1996
North Eastern Mediterranean	Σ	75	6.5-19.3	2.49-85.86	0.0085	3.08	0.99	Sangün et al., 2007
Off Iskenderun Bay, North Eastern Mediterranean	Σ	84	6.41-26.1	4.91-160.8	0.0055	3.1042	0.79	This study
	♀	52	10.5-26.1	5.92-160.8	0.0033	3.2988	0.84	
	♂	32	6.41-22	4.91-92.96	0.0076	2.9721	0.75	

5. CONCLUSION AND RECOMMENDATION

In this study, the data did not represent a total year, thus, these calculated parameters should be considered to represent only for 2015 summer season.

NOTICE

This work is oral presented at 5-8 September 2017, 2nd International Science Symposium (ISS2017) in Tbilisi-Georgia.

REFERENCES

1. Golani, D., Öztürk, B., and Başusta, N., (2006). Eastern Mediterranean. Turkish Marine Research Foundation, Istanbul, Turkey. Pub. Number:24, pp:259.
2. Nunoo, F., Russell, B., Bannermann, P., and Poss, S., (2015). *Trigloporus lastoviza*. The IUCN Red List of Threatened Species 2015: e.T15623273A15623532.http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T15623273A15623532.en. Downloaded on 17 April 2018.
3. Girgin, H. and Başusta, N., (2016). Kuzeydoğu Akdeniz'de Yakalanan Berlam Balığı (*Merluccius merluccius*)'nın Boy-Ağırlık İlişkisi, International Science Symposium, (September 01-04, 2016), Istanbul-Turkey (ISS2016), 5A6PB; pp:319-324.
4. Başusta, N. and Erdem, Ü., (2000). İskenderun Körfezi Balıkları Üzerine Bir Araştırma. (A study on the pelagic and demersal fishes of İskenderun Bay). Turkish Journal of Zoology 24 (Suppl.):1-19. (In Turkish).



5. İşmen, A., Özen, Ö., Altınağaç, U., Özekinci, U., and Ayaz, A., (2007). Weight Length Relationships of 63 Fish Species in Saros Bay, Turkey. *J Appl Ichthyol*, 23:707-708.
6. Sangün, L., Akamca, E., and Akar, M., (2007). Weight-length Relationships for 39 Fish Species from the North-Eastern Mediterranean Coast of Turkey. *Turk J Fish Aquat Sci*, 7:37-40.
7. Dulcic, J. and Kraljevic, M., (1996). Weight-length relationship for 40 Fish Species in the Eastern Adriatic (Croatian waters). *Fish. Res.* 28(3):243-251.
8. Dorel, D., (1986). Poissons de l'Atlantique nord-est Relations Taille-Poids. Institut Francais de Recherche pour l'Exploitation de la Mer. Nantes, France. 165 p.
9. Stergiou, K.I. and Moutopoulos, D.K., (2001). A review of length-weight Relationships of Fishes from Greek Marine Waters. *Naga ICLARM Q.* 24(1&2):23-39.
10. Karakulak, F.S., Erk, H., and Bilgin, B., (2006). Length-weight Relationships for 47 Coastal Species from the Northern Aegean Sea, Turkey. *J Appl Ichthyol*, 22:274-278.
11. Türker-Çakır, D., Torcu-Koç, H., Başusta, A., and Başusta, N., (2008). Length-Weight Relationships of 24 Fish Species from Edremit Bay Aegean Sea. *Naturel Applied Science.* 3:47-51.
12. Ilkyaz, A.T., Metin, G., Soykan, O., and Kinacigil, H.T., (2008). Lengthweight Relationship of 62 Fish Species from the Central Aegean Sea, Turkey. *Journal of Applied Ichthyology*, 24(6):699-702.
13. Özvarol, Y., (2014). Lengthweight Relationships of 14 Fish Species from the Gulf of Antalya (Northeastern Mediterranean Sea, Turkey) *Turk J Zool*, 38:342-346.
14. Ricker, W.E., (1975). Computation and Interpretation of Biological Statistics of Fish Populations. *Bulletin of the Fisheries Research Board of Canada*, 191:1-382.
15. Zar, J.H., (1999). *Biostatistical Analysis* 4th ed. Prentice Hall. New Jersey, pp:929.