LENGTH AND GROWTH PARAMETERS OF SCALDFISH (*ARNOGLOSSUS LATERNA* (WALBAUM, 1792)) IN IZMIR BAY, AEGEAN SEA

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Abstract
Length frequency distribution and growth parameters of the scaldfish (*Arnoglossus laterna* (Walbaum, 1792)) were investigated based on samples collected monthly in Izmir Bay (Aegean Sea) between January 2005-May 2006. Fork length and total weight ranged from 4.5 to 14.9 cm and from 0.68 to 24.53 g respectively. The length-weight relationships were W=0.0081*$L^{2.986}$, W=0.0093*$L^{2.925}$and W=0.0087*$L^{2.949}$, and the von Bertalanffy growth parameters were L_∞=16.34, 14.07 and 16.70 cm; k=0.388, 0.212 and 0.392 t_0=0.502, 0.980 and 0.494 for females, males and sexes combined, respectively.
Keywords : Aegean Sea, Fishes, Growth.

Introduction
The scaldfish, *Arnoglossus laterna*, is a small bothid flatfish whose geographical distribution extends from the Black Sea and the Mediterranean along the west coast of Europe to Norway [6]. It is a bentic species which extends from the shallow sublittoral zone down to about 200 m. The biology of scaldfish was investigated by Gibson and Ezzi [3] on the west coast of Scotland. Deniel [2] studied its growth in Brittany. Karakulak et al. [4] and Çiçek et al. [1] examined its length-weight relationship in Northeastern Mediterranean and Aegean Sea, respectively. The present study provides preliminary information on the biology of scaldfish in Izmir Bay.

Materials and Methods
A total of 1274 specimens were caught during trawl surveys carried out monthly between January 2005 and May 2006 in Izmir Bay. Individuals were measured in mm (fork length, FL), and weighed to the nearest 0.01 g (total weight, W), and dissected in the laboratory. Sex and maturity stages were determined macroscopically. von Bertallanfy growth parameters $L_\infty$and k were estimated by analyzing monthly length frequencies with the ELEFAN I routine incorporated in the FISAT II Software. t_0 was estimated using the empirical equation of Pauly (7) for growth fitting; Log ($-t_0$) = (0.03922) - 0.2752 logL_∞-1.038 log k. The length-weight equation, W=a.L^b, was estimated [8], where W is the total weight (g), L is the total length (cm), and a and b are the regression coefficients. Growth performance index (logk + 2log$_\infty$) values were computed with FISAT II software.

Results and discussion
The sex composition for the 1274 specimens sampled was 25.31% females, 43.42% males and 31.27% undetermined sex. Females ranged from 6.0 to 14.9 cm in size and from 4.8 to 13.5 g in weight. Males ranged from 4.8 to 13.5 cm in length and from 0.78 to 22.88 g. The most abundant size class was 8 cm and 9 cm for females and males, respectively (Figure 1).

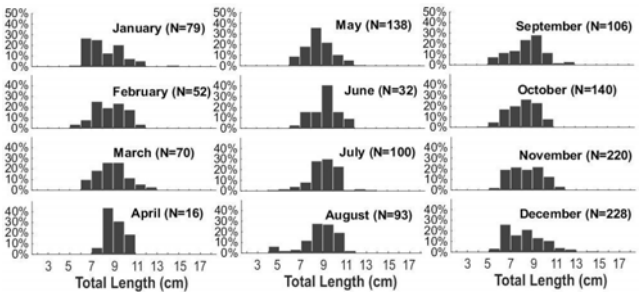

Fig. 1. Montly length frequency distributions of scaldfish in Izmir Bay.

The von Bertalanffy growth parameters for females, males and combined sexes were: L_∞= 16.34 cm, 14.07 cm and 16.70 cm; k= 0.388, 0.212 and 0.392 year^{-1}, t_0=0.502, 0.980 and 0.494 years. The length-weight reationships were: W=0.0081*$L^{2.986}$, W=0.0093*$L^{2.925}$and W=0.0087*$L^{2.949}$, for females, males and sexes combined respectively. Positive allometric growth was observed in all cases. The growth performance index was 2.015, 1.623 and 2.039 for females, males and sexes combined, respectively.

Length-weight relationships for different studies are shown in Table 1. The b values in the present study are lower than those in Italian waters.

Tab. 1. Length - weight relationship coefficients of scaldfish in different localities.

Author	Area	N	a	b	r
Matta (1959) (5)	Tuscan archipelago (Italy)	-	0.00000046	3.534	-
Çiçek et al. (2006)	Babdillimani Bight (NE Meditterranean)	594	0.0080	3.007	0.986
Karakulak et el. (2006)	Northern Aegean Sea	8	0.0150	2.747	0.995
This study (2006) F	Izmir Bay	323	0.0081	2.986	0.974
M	(Aegean Sea)	554	0.0093	2.925	0.980
T		877	0.0087	2.949	0.980

N, number of specimens; **a**, intercept of the relationship; **b,** slope of the relationship; **r,** corelation coefficient.

The L_∞ values were 16.34 cm and 14.07 cm for females and males. For the West Coast of Brittany Deniel [2] calculated L_∞ values as 15.8 and 15.2 cm. When we compare the growth performance index values estimated in the present study with those from other studies, our data (2.015 and 1.623) are lower than those reported by Deniel [2] (2.322 and 2.377).

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