

The fork-beard is a demersal fish occurring on the continental shelf of the Mediterranean Sea and N.E. Atlantic from Iceland, Norway and Kattegat to Morocco (WHITEHEAD *et al.*, 1986). Almost nothing is known about its life history and ecology (NONY, 1983). The fork-beard is of limited commercial importance in the greek seas. This study was undertaken in order to determine the age and length composition, to obtain growth estimates and to indicate some of the factors which determine its population structure.

**Material and methods**

The study was based on 850 fork-beards caught seasonally in the N. Aegean Sea from June 1990 to March 1991. Sampling was performed by a commercial bottom trawler of 500 HP, using a net with a cod-end mesh size of 14 mm from knot to knot. The duration of each trawl haul varied between 45 and 60 min. Total length to the nearest mm, body weight to the nearest g., sex and maturity, when possible, were recorded. Age determination was based on otolith readings. The procedure for making otolith sections ready to be read was to place them in cold mounting resin and cut them longitudinally through the nucleus with an electric law-speed saw.

**Results and discussion**

Total length ranged from 75-450 mm TL; the main part of the stock consisted of specimens with lengths between 145 and 275 mm. Young individuals 75-145 mm TL were mainly collected in the summer and early autumn. The young-of-the-year recruit in the N. Aegean Sea mainly in summer, exhibiting a smaller presence in the autumn catches (Fig.1). A shifting of the mode 115-145 mm towards greater lengths is obvious in early autumn, as well as in the following winter and spring; this shift possibly reflects fish growth during the first year of life, since the completion of the first annulus takes place in winter. The length frequency distribution suggests that the population consists of six year classes, but only the modes 175-195, 245-265 and 275-285 mm seem to represent individuals belonging to age groups I, II and III.

Back-calculated lengths at each age were estimated using the otolith radius/fish length regression derived by plotting the radius of the otolith section on total fish length. The correlation coefficient, and the standard error estimates justify the linear fit to the data. The relationship between TL (mm) and otolith radius (R), obtained from 165 individuals was :  $TL = 35.0 + 5.8 \times R$ . The -39.0% of the maximal size was attained at age I year, while a relatively slow reduction of growth rate occurred during the following years. The great difference between observed and back calculated lengths could be attributed to the fact that otolith measurements were made on fish collected in June, which had already completed at least a half-year increment.

Table I. Back-calculated TL in mm of fork-beard from the N.Aegean Sea.

Age group	Numbers of individuals	Length at capture	Calculated length at end of year						
			I	II	III	IV	V	VI	
1	79	203	155						
2	48	251	141	215					
3	28	292	144	210	262				
4	7	341	149	213	263	307			
5	2	398	157	233	279	317	349		
6	1	431	151	215	267	314	355	388	
Mean back-calculated lengths			149	213	263	310	351	388	
Percentage of growth (%)			38.9	16.5	12.9	11.1	10.5	9.5	

The growth parameters were obtained from calculated lengths for all fish and were used to calculate the von Bertalanffy equation. The asymptotic length ( $L_{\infty}$ ) was found to be 658 mm and the growth coefficient (K) was 0.128 and  $t_0 = -1.01$ . During the course of the survey a total of 293 specimens were weighed and the length-weight relationship was computed:  $W = 0.00011 \times TL^{3.364}$ , where W= weight in g., and TL=total length in mm.

Natural mortality (M= 0.26) of fork-beard was estimated according to Pauly's equation, using as mean yearly temperature  $T = 13^{\circ}C$  Total mortality (Z=0.84) was estimated according to the catch curve method (RICKER, 1975). Fishing mortality was (F) =0.58 and the exploitation rate was E=0.69.

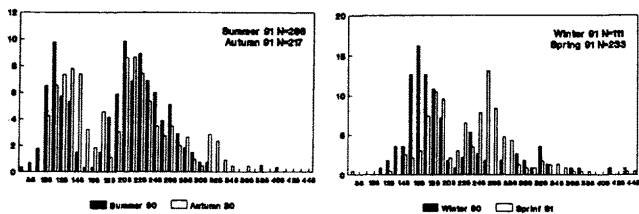


Fig. 1. Length composition of fork-beard in N. Aegean Sea.

REFERENCES

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 RICKER W. E., 1975. - *Bull. Fish. Res. Boa. Can.*, No 191, 382 p.  
 WHITEHEAD P.J.P. *et al.*, 1986. - UNESCO Ed. Vol I, II, III, 1473 p.