

# AGE AND GROWTH OF COMBER, *SERRANUS CABRILLA* (L., 1758), IN THE THRACIAN SEA AND THE THERMAEKOS GULF (NORTHERN GREECE)

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Comber *Serranus cabrilla* is a commercial fish with a distribution ranging from the North Atlantic Sea, up to the North Sea, to the Mediterranean Sea. It is a permanent hermaphrodite species. Aspects of its biology have been reported for the waters of Tunisia (BOUAIN, 1981, 1983), whereas no other references concerning the biology of the species exist. This paper deals with the age and growth of comber in greek waters, since the knowledge of growth parameters is of high importance in biology and fisheries studies.

Sampling was conducted seasonally between June 1992 and December 1993 using a commercial trawler towing a net with a cod-end of 16 mm mesh size (knot to knot). The fork length (FL) of the specimens collected ranged between 102 and 244 mm. The age was studied by otolith reading under reflected light. After counting the number of rings, the distance was measured from the focus to the distal edge of each annulus and to the otolith edge. A marginal increment analysis showed the formation of an annual ring during summer. The back-calculated lengths were fitted to the von Bertalanffy model using the nonlinear least square method.

Otolith reading showed that 8 age groups were present in our samples: 1 to 8. The 0 group was not captured by the gear. The relationship between body length (FL) and otolith radius (R) was expressed by a linear regression, which fitted the data well:  $FL = -18.05 + 4.40R$ ,  $r^2 = 0.85$ ,  $N=469$

The formula of FRASER (1916) and LEE (1920) was used to calculate the fish length at the time of the formation of each ring and the results obtained are shown in table 1.

Age	N	FL (mm) observed	Back-calculated FL (mm)									
			1	2	3	4	5	6	7	8		
1	33	112.7 (8.62)	81.0 (10.16)									
2	183	136.6 (12.83)	78.1 (8.65)	120.3 (10.40)								
3	141	158.9 (12.12)	79.1 (9.51)	122.1 (10.81)	147.8 (11.23)							
4	53	183.1 (9.33)	80.9 (9.28)	123.4 (9.81)	150.9 (10.27)	171.2 (9.77)						
5	25	196.7 (9.02)	83.6 (11.67)	127.6 (11.66)	155.7 (10.67)	174.4 (11.00)	188.2 (10.16)					
6	25	212.6 (13.61)	85.1 (8.55)	130.0 (8.43)	157.5 (10.29)	177.5 (10.67)	193.4 (12.35)	206.1 (13.16)				
7	7	217.6 (16.42)	78.7 (7.60)	123.5 (10.69)	149.3 (11.14)	169.6 (12.36)	187.5 (13.38)	201.4 (13.84)	212.3 (15.62)			
8	2	217.0 (8.00)	73.1 (6.04)	119.9 (12.28)	149.8 (17.79)	167.6 (15.39)	181.3 (12.81)	195.9 (9.21)	206.5 (9.66)	215.0 (10.03)		
Mean FL/age			79.6	122.3	150.3	173.2	190.1	204.5	211.0	215.0		
CL 95%			0.87	1.03	1.44	2.06	3.13	4.60	11.28	30.49		
N			469	436	253	112	59	34	9	2		
Mean annual increment			79.6	42.7	28.0	22.9	17.0	14.4	6.5	4.0		

Table 1. Mean observed and back-calculated lengths of *Serranus cabrilla* in northern Greece. In parentheses the standard deviation; N = number of fish examined  
CL 95% = 95% confidence limits.

The back-calculated lengths agreed reasonably with lengths at capture. Differences, such as larger mean observed than back-calculated length, are attributed to growth following mark formation or to recruitment of the larger specimens only for the first age group. Apparently back-calculated lengths did not display Lee's phenomenon.

The von Bertalanffy model applied for comber gave the following growth parameters:  $L_{\infty} = 238.1$  mm,  $K=0.3$ ,  $t_0=-0.367$

The mean square error between back-calculated lengths and those estimated using the von Bertalanffy model was low (1.04) indicating a good fit of the model to the data.

The maximum length calculated for comber in northern Greece was lower than that obtained for the south-east coast of Tunisia, where older specimens (9 years old) were also found.

Finally the length (FL) - weight (W) relationship was computed and expressed by the following regression:

$$W = 0.0000521 * FL^{2.725}, r^2=0.90, N=665$$

## REFERENCES

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