

GROWTH PARAMETERS OF THE BLACK GOBY (*GOBIUS NIGER* L.) IN
THE ADRIATIC SEA, BASED ON OTOLITHS READING

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ABSTRACT: - Growth of *Gobius niger* was studied by otoliths reading. Five age classes were found in males, four in females. Parameters of the Von Bertalanffy growth equation were separately computed for males and females. Males have a higher growth rate.

RESUME : - On a étudié la croissance de *Gobius niger* en Adriatique à partir de la lecture des otolithes de 774 poissons de longueur totale comprise entre 2,2 et 16,5 cm.

On a observé un certain dimorphisme sexuel dans la croissance; les paramètres de l'équation de Von Bertalanffy obtenus pour les deux sexes sont: Males: $L_{\infty} = 18,52$ (cm) $K = 0,2953$ $t_0 = -1,689$ (ans)
Femelles : $L_{\infty} = 16,86$ (cm) $K = 0,1905$ $t_0 = -2,571$ (ans)

Black Goby, a small fish very common on sandy and muddy bottoms of the Western Adriatic sea, is actively exploited by bottom trawlers fishing in the coastal areas.

In the Central Adriatic *G. niger* spawns once per year; ripe females are found from april to august. Sexual maturity is reached at the end of the first year of life (FABI & FROGLIA, 1984).

Owing to the long spawning season and the different growth rate of the two sexes, the analysis of Length frequency data is an unsuitable method to study growth of this species. Otoliths reading, also if difficult, appeared more profitable for age determination.

"Sagittae" were collected from 774 individuals, ranging in size between 2.2 and 16.5 cm (Total Length), obtained during trawl fishery investigations carried on from june 1983 to may 1984 in a coastal area North of Ancona.

Fishes Total Length was measured to the millimeter below and weight to the 0.1 gram.

Otoliths were mounted on black slides with "Eukitt" and examined under

reflected light with a stereomicroscope by both authors; discordant readings were discarded.

Finally 692 otolith readings were retained for length-age computations (TAB.1).

The otolith of *G. niger* shows seasonal appearance of opaque and hyaline rings in agreement with that reported for other species of Gobidae of Northern and temperate zone (MILLER, 1961).

TAB.1 - Experimental data used to compute Von Bertalanffy growth equations for males and females of *Gobius niger*.

LT cm	AGE 0		AGE 1		AGE 2		AGE 3		AGE 4		AGE 5	TOT	
	M	F	M	F	M	F	M	F	M	F	M	M	F
5		2											2
6	2	7	1	6								3	13
7	2	2	4	7								6	9
8	2	1	12	15		13						14	29
9	3		15	10	1	35		9				19	54
10			19		3	32		31		1		22	64
11			12		33	13		21		8		45	42
12			2		55		8	8		14		65	22
13					35		85		1	2		121	2
14							90		30	2		120	2
15							7		27		1	35	
16									2		1	3	
TOT	9	12	65	38	127	93	190	69	60	27	2	453	239
\bar{L}_T	7.7	6.2	9.4	7.8	11.9	9.5	13.5	10.4	14.5	11.8	15.5		

In april the hyaline ring is completely formed in all otoliths; in the same month the otoliths of the younger fishes have already an evident narrow marginal opaque ring.

In june marginal opaque ring is present in all otoliths.

Conventional birthday was allocated at the first of june and age was computed in years.

Parameters of the Von Bertalanffy growth equation for males and females separately were computed by a BASIC version of the program BCG 3 (ABRAMSON, 1971) (FIG.1).

Males $L_{\infty} = 18.52$ (cm) $K = 0.2953$ $t_0 = -1,689$ (years) $n = 453$
 Females $L_{\infty} = 16.86$ (cm) $K = 0.1905$ $t_0 = -2.571$ (years) $n = 239$

A significant difference between males and females growth curves can be noted. At the same age males attain a bigger size than females. The oldest male recorded was in age group 5, with a Total Length of 16.5

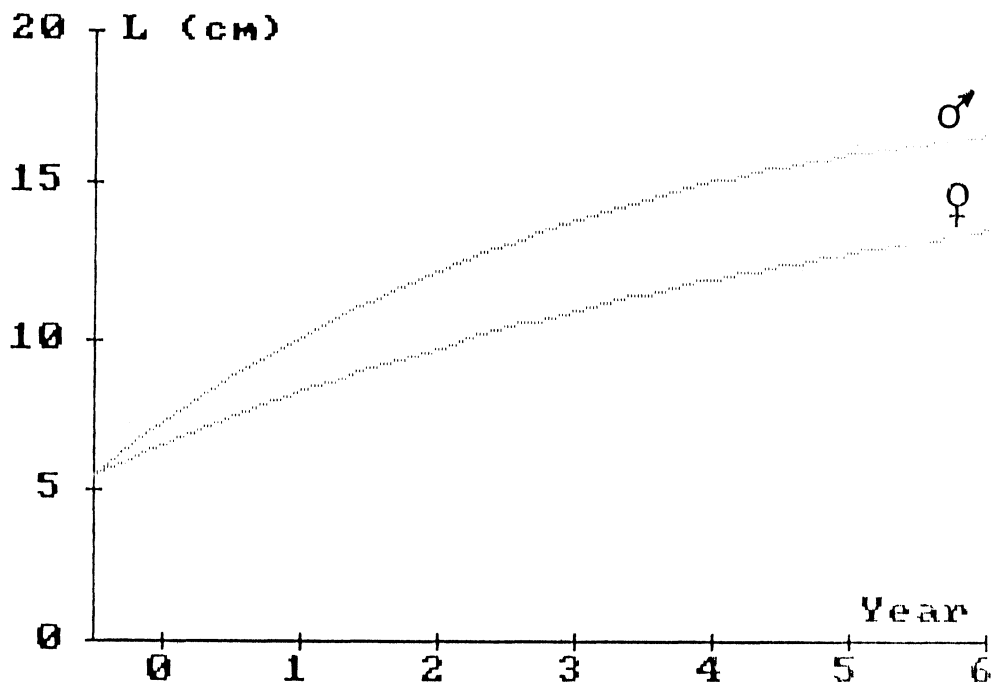


FIG.1 - Theoretical Von Bertalanffy growth curves for males and females of *G. niger*.

cm, the oldest female was in age group 4 with a Total Length of 14.3 cm. From our results appears that *G. niger* in the Adriatic sea has a higher growth rate and attains a bigger size than in the West Coast of Ireland (KING et al., 1980) and in the Veerse Meer of Holland (VAAS et al., 1975). Finally a length-weight relationship was computed, for both sexes pooled together, as GM Functional Regression:

$$W = 0.00805 \cdot TL^{3.135}$$

where W is weight in grams and TL is Total Length in centimeters.

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