# OBSERVATIONS ON GROWTH OF *TRISOPTERUS MINUTUS CAPELANUS* (RISSO) (PISCES, GADIDAE) IN THE CENTRAL ADRIATIC SEA °

FROGLIA CARLO and ZOPPINI ANNA MARIA

Istituto di Tecnologia della Pesca (C.N.R.) - Ancona, Italy

ABSTRACT - Analysis of size frequency distributions, obtained during fishery investigations in the central Adriatic sea, made possible to follow the growth in the first two age classes of *T. minutus capelanus*.
It was also evidenced that this species reaches sexual maturity at the end of its first year of life, around a Total Length of 13 cm and that spawning season extends from end of January to early May.


RESUME - Les distributions de taille de *T. minutus capelanus* recueillies au course des recherches sur la pêche dans l'Adriatique centrale ont été etudiées par la methode de CASSIE. De cette façon la croissance a pu être suivie avec une précision suffisante.
A' la fin de la première année les individus ont une longueur total d'environ 13 cm et sont deja mûrs. La ponte se deroule de la fin de Janvier à May.

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The Poor Cod (*Trisopterus minutus capelanus*) is one of the most abundant fishes on soft bottoms of the central Adriatic sea, from 40 m down to 250 m. In some areas and seasons this species alone represents over one third of commercial catches of bottom trawlers.
In our investigations on adriatic "Nephrops grounds" in the years 1976-
-80, this species was found to be very common on circalittoral muddy bottoms off Ancona and, to a lesser extent, in the western Pomo pit.
Size frequency distributions obtained in this period (Fig. 1), and in previous investigations, were analysed on probability paper with the method developed by CASSIE (1954),in order to identify the gaussian components, considered as age classes, and thus to estimate growth of this species.
Twentyseven size frequency distributions from a wide area off Ancona and eleven from the western Pomo pit were analysed.
Maximum size (Total Length) recorded was 30 cm, but on the average individuals longer than 20 cm represented less than 3 % of the catch of this
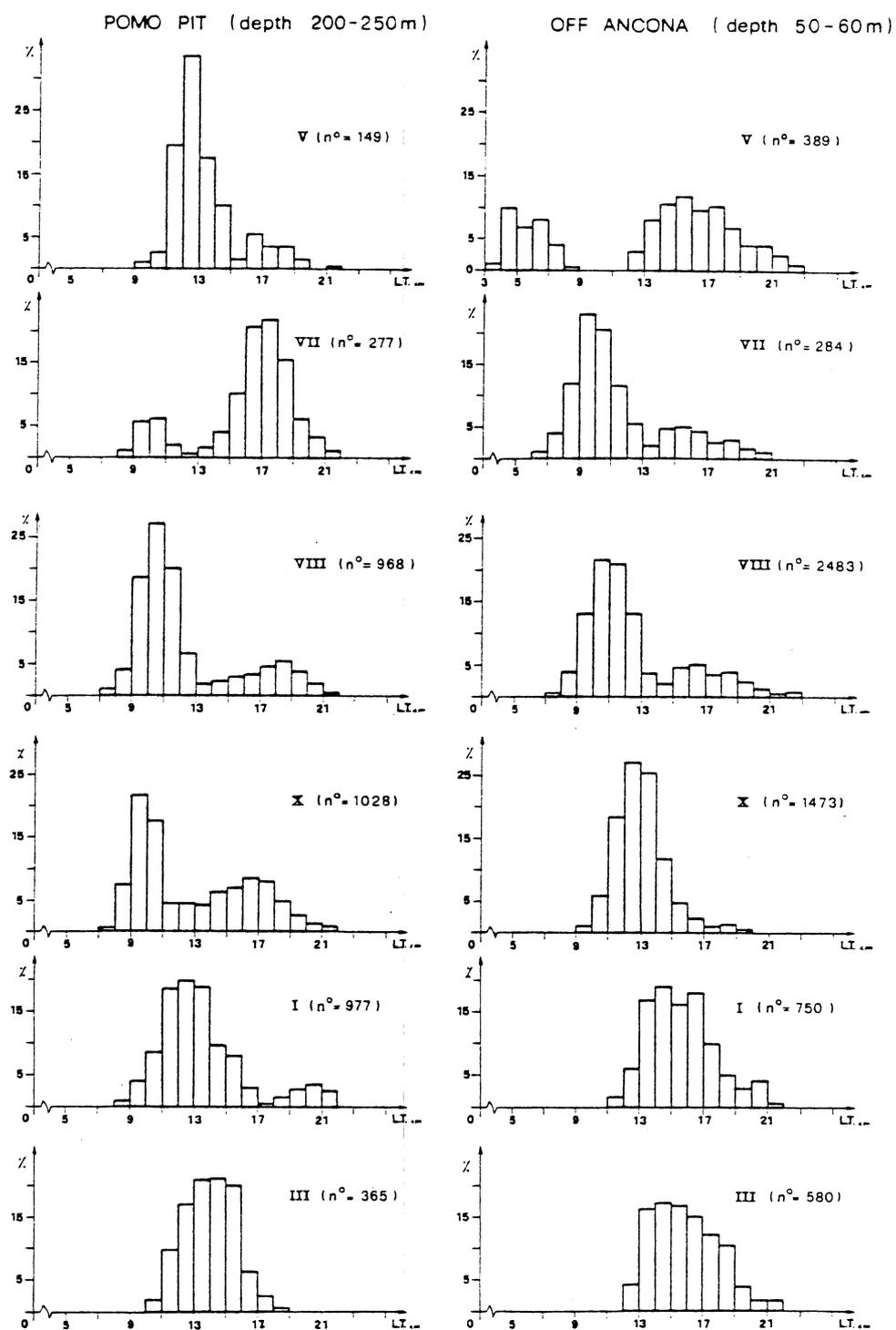
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Fig. 1 - Length frequency distributions in selected months (under brackets number of individuals measured).

species; make exception few samples, obtained near shipwrecks, where adults seem to congregate.

Similar size frequency distributions were reported also by MATTA (1959) for the Tyrrhenian sea and by VIVES and SUAU (1956) off Spanish Mediterranean coasts.

In each sample it was possible to discriminate one or two age classes, according to season.

Mean lengths obtained are reported in Fig.2. The fact that lengths obtained in different years were pooled together partly explains the scattering of experimental values. A line expressing the average growth pattern of *T. minutus capelanus* in the central Adriatic sea was thus drawn by eye.

Spawning season of *T. minutus capelanus* in the central Adriatic sea extends from end of January to early May. Off Ancona juveniles are very abundant in trawl catches from May onward.

Macroscopic examination of gonads in some subsamples,obtained in winter months (251 individuals), evidenced the species reaches sexual maturity around a T.L. of 13 cm; i.e. at the end of its first year of life. From these subsamples a sex-ratio (males/females) of 1.4 was obtained for the first age class, but among older individuals females outnumbered males, extremely rare among individuals longer than 20 cm.

Similar differencies in sex-ratio were already reported by MATTA (1959) for the Tyrrhenian sea.

Assuming hatching in March, results *T. minutus capelanus*,at the end of its first year of life, has a T.L. of about 14 cm, and at the end of second year a T.L. of about 18 cm.

Individuals bigger than this size were scarcely represented in our samples and their age could not be identified with present method. On the other hand it was impossible to reach reliable estimates of age from otoliths. Difficulties in otoliths reading in this species were experienced also by VIVES and SUAU (1958); their extimates of growth, based on size frequency distributions, are in good agreement with our data.

Finally from three samples collected in summer and winter (total 887 individuals, size range 6 - 25 cm) the equation relating Length to Weight was computed, as GM functional regression :

$$P = 0.00587 \ T.L.^{3.224}$$

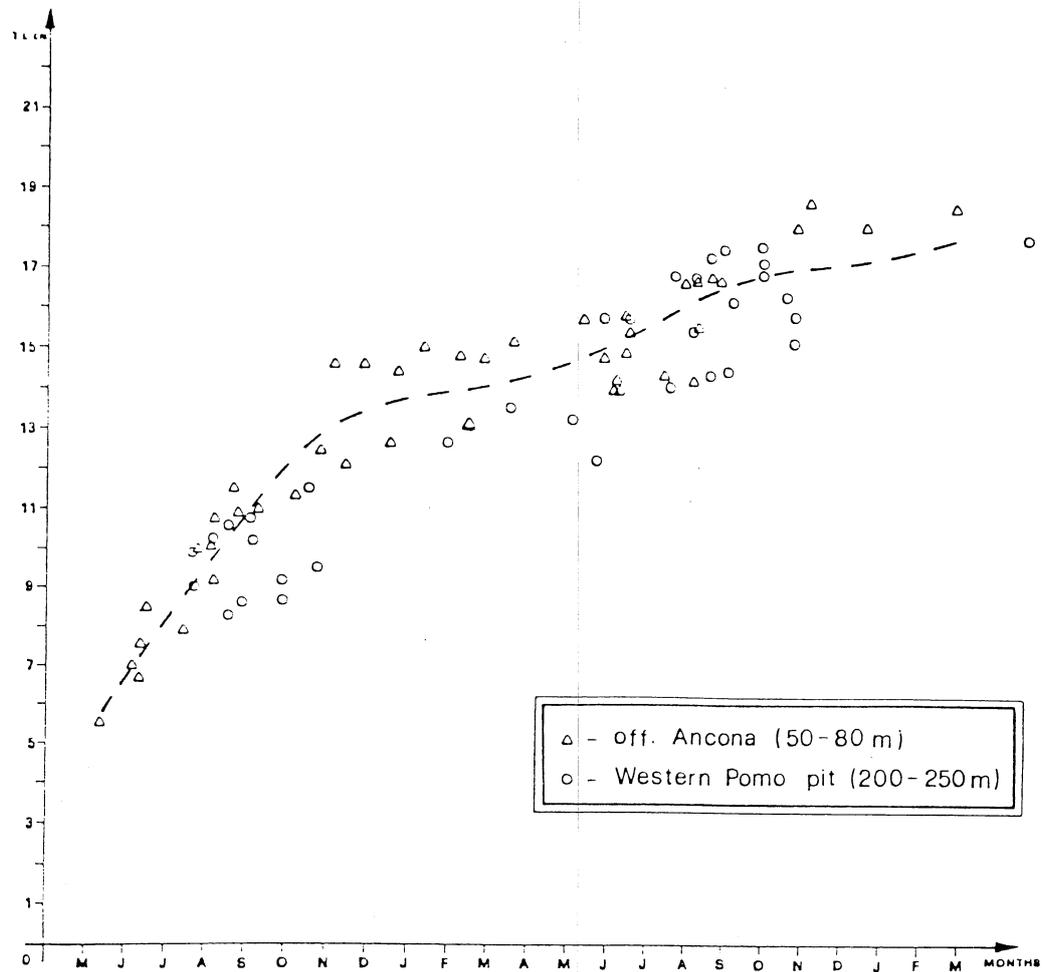where P is weight in grams and T.L. is total length in cm.

Fig.2 - Growth of *T. minutus capelanus* in the Central Adriatic sea.

## BIBLIOGRAPHY

CASSIE R.M.,1954- Some use of probability paper in the analysis of size frequency distributions. *Aust.J.Mar.Freshw.Res.*,5::513-522.

MATTA F.,1959- La pesca a strascico nell'Arcipelago Toscano.*Boll.Pesca Piscic.Idrobiol.*,13 (1-2): 23-371.

VIVES F. & SUAU P.,1956- Sobre la biologia de la mollera (Gadus capelanus Risso).*Inv.Pesq.*,5 : 17-30.