

The reproductive niche of an isolated population of the mesopelagic Fish *Maurollicus pennanti* (Walb.) LTKN

A. YANNOPOULOS and C. YANNOPOULOS

Department of Zoology, University of Athens, Athens 15784 (Greece)

An isolated population of the mesopelagic fish species *Maurollicus pennanti* has been detected because of its spawning activity. This population occupies the Western deep basin of the Saronikos Gulf, Aegean Sea. The reproduction takes place from December to June, with a regular peak around March. Four reproductive cycles have been observed, during the exploitation period and the maximum egg densities seem to vary, from year to year, considerably. This fact could signify that, either drastic alterations of the population size, take place, or, the reproductive niche of the species, has not been adapted to the peculiar environmental conditions of the basin.

This study has been based on zooplankton samples, collected with a WP-2 nylon net, mesh size 0.24 mm, during 19 oceanographic campaigns in the Saronikos Gulf, Aegean Sea, from December 1972 till March 1976.

The marine ecosystem of the Western basin presents several special features; an underwater ridge, at a depth varying from 50 to 80 meters, forms this boundary and keeps it isolated from the rest of the Saronikos Gulf. In fact, this elevation, together with the cluster of the surrounding islands, prevents the usual water

circulation. The flow levels are low and almost close to zero, when the deeper layers of the basin are considered. A stagnant water mass is present all year round, below the 350 meters approximately. Another important factor is the low concentrations of the dissolved oxygen, close to the bottom layers of the main basin where the maximum depth is 400 meters. This decline is more

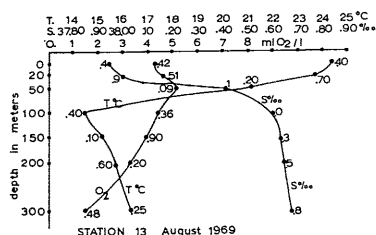


Fig. 1. (Yannopoulos et Yannopoulos, 1973)

severe during the Summer period (fig. 1). Primary and secondary production presents very low values, in comparison with the other vicinities of the Saronikos Gulf, in spite of the higher amounts of nutrients, at the layers below 100 meters.

In the main basin where the maximum depth and the location of station A is, the eggs of *Maurollicus pennanti* have been obtained, on a regular basis, during the forementioned spawning period (fig. 2). This fact, together with the simultaneous absence of *Maurollicus pennanti* eggs, from the other stations, most of the sampling periods, when reproduction occurs, signifies that the main reproduction site is the one of station A, even if the numbers of the eggs deposited are not very high.

During January and December 1973, an extremely high abundance of *Maurollicus pennanti* eggs has been

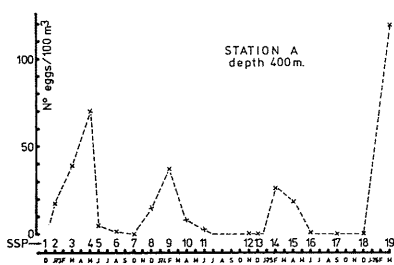


Fig. 2

observed, but their presence do not coincide with the vicinity of the main basin. In these two cases, the eggs of *M. pennanti* are scattered at considerable distances from A station.

Figure 3, presents the distribution and abundance of *Maurollicus pennanti* eggs during January 1973. It is difficult to understand the appearance of *M. pennanti*

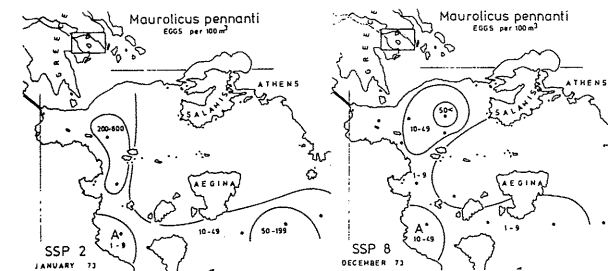


Fig. 3

explanation for these egg distributions out of the boundary of the basin, may be that either *M. pennanti* performs small scale spawning migrations out of its main habitat, or, that short lasting but strong surface water movements are the cause for these egg displacements.

References.

Yannopoulos C. et Yannopoulos A. 1973. *Pelagos*, 4, 2, 73-81.

Maturity of family *Sphyraenidae* in the South Eastern Mediterranean Sea

W. WADIE*, S. RISKALLA* and N. DOWIDAR**

* Institute of Oceanography and Fisheries, Alexandria (Egypt)

** Faculty of Science, Oceanography Department, Alexandria University, Alexandria (Egypt)

Abstract

This study is concerned with the reproduction of the important economic fishes belonging to family *Sphyraenidae* in the south-eastern Mediterranean; *Sphyraena sphyraena* (Linnaeus, 1758) and *Sphyraena chrysotaenia* (Kluzinger, 1884).

We adopted a modified scheme comprising five maturity stages immature; mature; nearly ripe; ripe and spent.

Analysis of the monthly distribution of maturity stages showed that in *Sphyraena sphyraena*, the spawning season lasts from April to September, while for *Sphyraena chrysotaenia*, the breeding season extends from May to October. The monthly variation of the gonadosomatic index revealed that for both sexes, the index increases towards the spawning season. The maximum values for *Sphyraena sphyraena* are found in May and June while for *Sphyraena chrysotaenia*, the maximum value of gonadosomatic index is observed in June and July. *Sphyraena sphyraena* and *Sphyraena chrysotaenia* are fractional spawners with prolonged spawning season (mainly characteristic of tropical and subtropical fishes).

Our results revealed that the analysis of ova diameter could predict the breeding cycle of a fish and determine whether the species has short or prolonged spawning.

The minimum size at first sexual maturity is detected by monthly analyses of maturity stages. The males and females of *Sphyraena sphyraena* attain their first sexual maturity at lengths 23.0 and 26.0 cm respectively while for *Sphyraena chrysotaenia*, males and females reach their first sexual maturity at 19.0 and 20.5 cm respectively. It was found that males and females of *Sphyraena sphyraena* are sexually mature at slightly less than one year old, whereas both sexes of *Sphyraena chrysotaenia* reach their sexual maturity at age over than one year old.

The absolute fecundity of *Sphyraena sphyraena* varies between 27,093 and 121,927 at lengths from 28.0 to 42.0 cm respectively. The absolute fecundity of *Sphyraena chrysotaenia* fluctuate from 68,783 and 225,971 for lengths from 23.0 and 27.0 cm respectively.

In *Sphyraena sphyraena* the absolute fecundity increases at a rate slightly more than one time the weight of the fish, while it increases to about three times (3.4) the length of the fish.

The relation between relative fecundity and gutted weight in *Sphyraena sphyraena* showed that the number of ova per gram body weight varied between 345 and 535. In *Sphyraena chrysotaenia* the total fecundity increases at a rate twice the weight and seven times the length of fish.

The relation between absolute fecundity and age (determined by otolith) revealed that the average number of eggs increased as the fish gets older, however in a certain age group, the number of eggs produced varied from one fish to another. These individual variations depend on ecological conditions and genetic factors (Bagenal, 1978).