

The Transparent Goby Fishery in the Northern Tyrrhenian Sea

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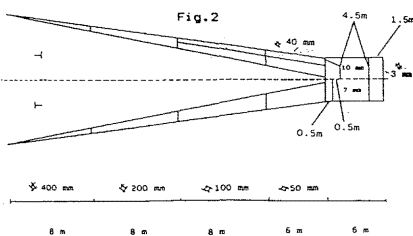
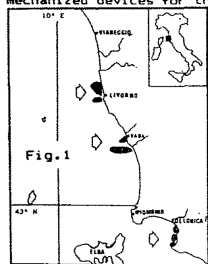
RESUME.

Ce travail aborde l'exploitation des stocks du "rossetto" *Aphia minuta* dans le Tyrrhénien septentrional. La pêche au rossetto est effectuée seulement de jour avec un type particulier de senne très sélectif. La présence de espèces accessoires est toujours négligeable.

On décrit les caractéristiques de la flotille et modalité de pêche. Données concernant statistiques de pêche et sur la reproduction et recrutement de l'espèce sont adjointes.

The fishery of the transparent goby *Aphia minuta* takes place in the Northern Tyrrhenian Sea from October to April with a maximum effort between December and February. This fishery was studied by analysing the activity of the 30 vessels which operates in the coastal waters off Livorno and the northern portion of the Grosseto provinces throughout the fishing seasons 1988-89 and 1989-90. These vessels have been considered as representative of the whole tuscanian *Aphia* fishery.

Fig.1 shows the main fishing grounds in the considered area. The fishing vessels are quite small (from 20 to 100 HP and 5-10 GRT) and furnished of acoustic equipment for the localization of schools and mechanized devices for the recovery of the net.



The main concentrations of *Aphia* are located at depths between 5 and 40m on muddy-sandy bottoms close to the mouth of the rivers or at the edge of the *Posidonia* beds. The fishing operations take place only during the light hours because at night, the fish schools are not vulnerable, being disposed in scattered layers.

The annual total landings of the goby were estimated from data supplied by the Livorno fishermen's cooperative society: during the last 10 years the number of fishing boats remained constant and the catch was very fluctuating (range from 4.7 to 22.4 tons/year, with a maximum in the seasons 1981-82 and 1982-83). Considering the species very short lifespan, those important fluctuations in catch can be related with different amounts of the annual recruitment.

The only gear utilized by the *Aphia* fishery in the area is a special seine net called "sciabichella" (fig.2). It has 30 m long wings composed by several pieces of different mesh sizes which diminish from the extremes of the wing in direction to the "tulle" codend (3mm stretched mesh size).

As soon as the school has been localized with the echosounder, the extreme of one wing is fixed to a buoy and the net is set with its mouth opening in the direction of the current. The seine retains the fish that swims actively against the current. Because of the very particular characteristics and use of the net and of the very easily recognizable fish schools normally located very close to the bottom, this fishery is highly selective and the catch is practically monospecific. Occasionally, have been found in the catch some isolated individuals of *Coris julis*, *Serranus cabrilla*, *Engraulis encrasicolus*, *Diplodus annularis*, *Mullus surmuletus*, *Bobius sp.*, *Labrus sp.*, *Palaemon serratus*, *Pisa spp.*, Amphipods, *Alloteuthis media*, *Spatangus sp.*, as well as of marine vegetation: *Posidonia oceanica*, *Cymodocea nodosa*, *Acrothamnion preissii*, *Udotea petiolata*, *Caulerpa prolifera*. In no case the presences are of some quantitative significance.

At the beginning of the fishing season, the *Aphia* catch is composed exclusively by females because of the smaller size of males which will recruit to the fishery only in January. In the Tyrrhenian Sea, according with the results of the biological samples, spawning apparently begins earlier than in the Adriatic Sea. In fact, a conspicuous number of mature females were found in April-May instead of in June-July as are normally found in the Adriatic Sea.

For *Aphia minuta* the Pauly's nomogram has been utilized to estimate the length at first capture. It expresses the selection factor (SF) as a function of the fish depth ratio (standard length/maximum body depth) or the girth factor (maximum girth/total length) and of the mesh size of the codend (fig.3)

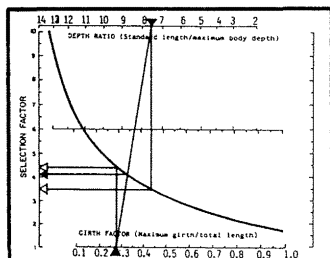


Fig.3

By means of this method, a SF value between 3.5 and 4.4 was calculated for the species. For a mesh size of 3mm these values correspond to a $L_c = 10.5$ and 13.2 respectively. The selection curve derived from the length-converted catch curve gave a bigger L_c (25.3mm). This discrepancy suggests that the absence in the catch of more important quantities of fish smaller than 25mm is not due to mesh selection but related with the species life history. In fact, the individuals of *Aphia minuta* of lengths up to 25mm are mainly pelagic and not vulnerable with this fishing technique. In this way, a conspicuous proportion of the individuals of lengths from 10 to 25mm that should be potentially retained by the net are not caught because they are not really recruited to the fishery.