

NURSERY AREAS AND SOME BIOLOGICAL INFORMATION OF TUB GURNARD (*TRIGLA LUCERNA* L. 1758) OFF TUSCANY COASTS (ITALY)

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Abstract

Trigla lucerna is a demersal species that lives on the shelf up to 150 metres. Data proceed from several trawl surveys carried out in the North Tyrrhenian Sea; the major concentration zones and the nursery areas are defined. The length/weight relationship and the von Bertalanffy growth parameters are estimated: $W = 0.0139 * L^{2.8592}$; $K = 0.39$ $L_{\infty} = 65.9$ $t_0 = 0$. The growth performance results similar to that estimated for Atlantic French coasts, but a clear time shift for the reproductive processes is observed.

Key-words: *Fishes, recruitment, Tyrrhenian Sea, growth*

Introduction

Trigla lucerna is a species that, in the northern part of Tuscany, has a certain commercial importance. It is often landed as a part of boxes composed by different species mixtures. Large sized fish are also landed but in this case, due to their greater commercial value, the boxes are composed exclusively by individuals of this species. In this note, the high density zones as well as the nursery areas, positioned on the northern portion of the studied area, are described. Moreover estimates of the parameters for both, von Bertalanffy growth equation and length/weight relationship are given.

Material and methods

From 1985 to 1996, several bottom trawl-surveys have been carried out in the northern portion of the Tuscan Archipelago (North Tyrrhenian Sea). Some of these surveys were done monthly and utilising an extremely small meshed cod end (mesh size = 3 mm). This allowed us to catch the fish immediately after they were recruited to the ground. For the estimation of the length/weight relationship, morphobiometric data of 538 individuals separated by sex and ranging from 2 to 70 cm of total length were utilised. The von Bertalanffy growth parameters were estimated by means of the analysis of the length distributions, utilising the program MULTIFAN (1).

Results and Discussion

a) The analysis of the trawl-surveys data carried out in the area defined by the Magra River towards the North and the Elba Island towards the South (GRUND Program) (2) allowed to define a major concentration of individuals of *T. lucerna* just off the Versilian coasts (3) (fig. 1). The species was found on a wide depth range from shallow waters to 150 meters, but the higher densities were observed near shore, between 10 and 70 m. Moreover the existence of a clear relationship between the abundance of certain size classes and the depth has been observed. In fact, the younger individuals have been more frequently found in shallow waters while the adults more dispersed towards off shore and a consistent nursery area was identified along the coastal area where several river mouths (Arno, Magra and Serchio rivers) are positioned (4) (fig. 1).

This is in agreement with what has been observed in other Mediterranean and Atlantic areas. In fact, in these areas, juveniles of *T. lucerna* are concentrated in shallow waters, mainly in estuarine waters where food is abundant (5, 6, 7, 8). The geomorphologic and biological characteristics of the bottom make the environment suitable for the juveniles needs. Along the Versilian coasts, the presence of the above mentioned river mouths produces a very high nutritional loading (9) and very specific bio-sedimentological characteristics. In shallow waters up to 10 m, the medium sandy bottoms prevail; towards higher depths, the muddy component increases, reaching practically the 100% level at depths higher than 50 m (10). Moreover marine phanerogams prairies are not locally present and the benthic assemblage is that characteristic of the circalittoral zone, mainly composed by shelf terrigenous mud (11). These facts should explain the massive presence of the species in this area.

b) 11025 individuals of tub gurnard were caught, with a strong dominance of individuals smaller than 15 cm TL. The following parameters of the length/weight equation were obtained:

$$W = 0.0139 * L^{2.8592} \quad (r^2 = 0.994),$$

where W = weight in grams and L = total length in cm.

There were not found statistically significant differences between sexes. This is in agreement with the Papaconstantinou (6) results.

The von Bertalanffy growth parameters, estimated with the MULTIFAN program utilising length distributions (fig. 2) are:

$$K = 0.39 \quad L_{\infty} = 65.9 \quad t_0 = 0$$

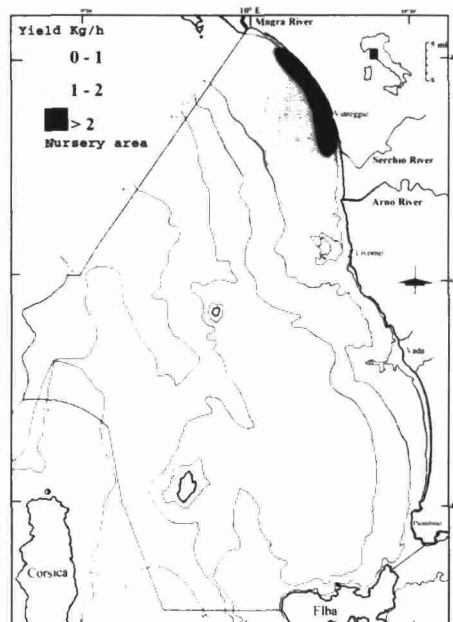


Fig. 1 Geographical distribution and nursery area of *T. lucerna*.

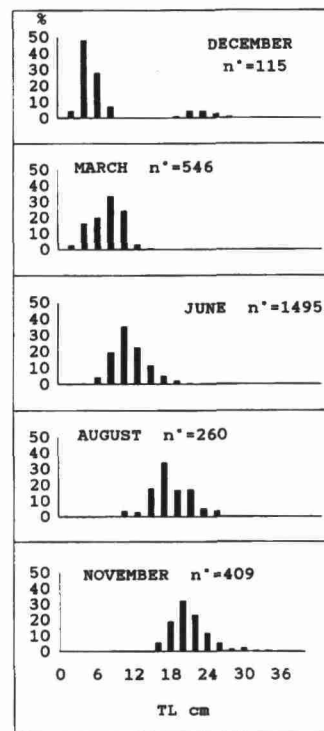


Fig. 2 Length distributions (T.L.) of *T. lucerna*.