

SPATIAL DISTRIBUTION AND SEASONAL CONCENTRATION OF EUROPEAN HAKE'S JUVENILES, *MERLUCCIVS MERLUCCIVS* (L. 1758), IN THE NORTH TYRRHENIAN SEA

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Abstract

Data on abundance and size frequency distribution of European hake, *Merluccius merluccius*, collected in the northern Tyrrhenian Sea during trawl surveys carried out from 1985 to 1998, were analysed using the Geographical Information System. The areas of concentration of individuals smaller than 12.5 cm of Total Length were identified; charts of bimonthly distribution of the juveniles were produced.

Keywords : Fisheries, demersal, population dynamics, Tyrrhenian Sea, Teleostei.

Introduction

The European hake, *Merluccius merluccius*, is one of the most important species exploited by the Mediterranean demersal fisheries. Trawl catches are characterised by a high percentage of small specimens; thus, for a better management of this species is important to improve the knowledge of this phase of life. The purpose of the present study is to provide additional data on the spatial distribution and seasonal concentration of the specimens in the first year of life (0 group, individuals smaller than 12.5 cm of Total Length, TL), i.e. to localising the nursery area.

Material and methods

The investigated area was the northern Tyrrhenian Sea, where the juveniles of European hake are exploited by the bottom trawlers. Data on size composition and abundance of juveniles were gathered by means of several trawl surveys, funded by the Italian Government, carried out from 1985 to 1998, during spring, summer and autumn, generally following a stratified random design (1, 2). Abundance data were standardised to number of specimens per surface unit (km²), using the swept area method. Data were converted in an ARCHVIEW compatible format and interpolated by means of kriging (linear function) in order to produce maps of bimonthly abundance of juveniles (3). Further monthly data (from 1991 to 1998) on hake of Porto Santo Stefano, the most important landing place of this area, were collected.

Results

The size frequency distributions of the catches of the trawl surveys were characterised, in all the considered periods, by a high percentage of small specimens, particularly in September - October where the individuals measuring less than 12.5 cm TL represented about 85% of the total abundance. Juveniles were mostly distributed from 100 to 200 m depth and concentrated in areas around the Giglio Island and between Elba and Montecristo Isles (Fig. 2,3,4,5).

The landing of hake is commercialised in three different categories, according to the size of the specimens: the juveniles belong to the third category (individuals smaller than 15 cm TL). The monthly landing per unit effort of small specimens of *M. merluccius* in Porto Santo Stefano (Fig.1) confirmed the seasonal trend in the abundance of juveniles observed through the experimental surveys: highest values were found in the period late summer - early autumn, with a maximum in September.

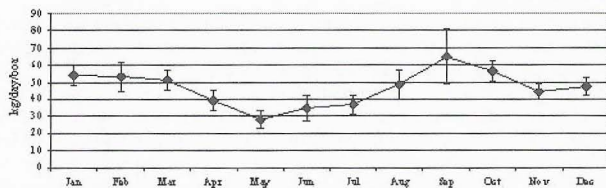


Figure 1. Mean monthly landing per unit effort (kg/day/boat) of small hakes (<15 cm TL) in Porto Santo Stefano 1991-1998.

March - April

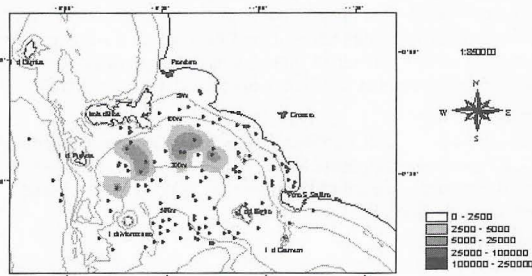


Figure 2. Spatial distribution of juveniles (specimens<12.5 cm TL per km²) in the period March-April.

May - June

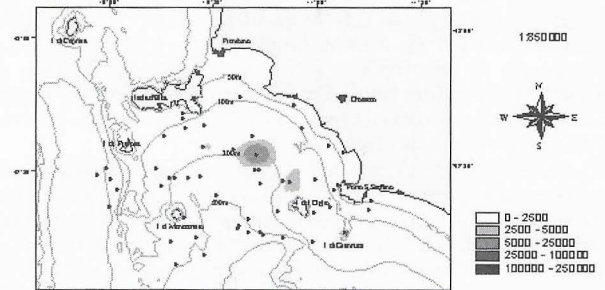


Figure 3. Spatial distribution of juveniles (specimens<12.5 cm TL per km²) in the period May-June.

July - August

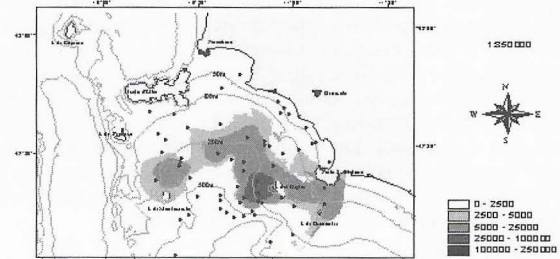


Figure 4. Spatial distribution of juveniles (specimens<12.5 cm TL per km²) in the period July-August.

September - October

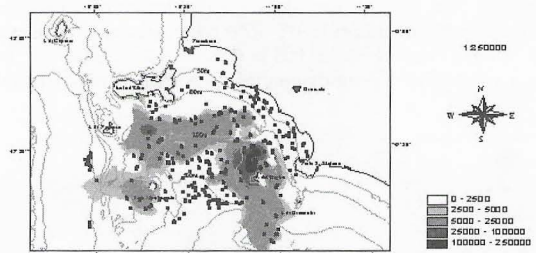


Figure 5. Spatial distribution of juveniles (specimens<12.5 cm TL per km²) in the period September-October.

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