SEASONAL RECRUITMENT OF HAKE IN THE ALBORAN SEA (SW MEDITERRANEAN)

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Abstract
In this study, the recruitment of the European hake (Merluccius merluccius) in the Alboran Sea was examined based on data collected from five trawl surveys carried out on the shelf and upper slope of the Alboran Sea during 2001-2002. Abundance of recruits was highest in spring 2002 and autumn 2001 at depths between 100 and 200 m.

Key words: hake, recruitment areas, Alboran, Mediterranean

Introduction

The catches of hake in the Alboran Sea are derived almost exclusively from trawl fishing and composed mainly of juveniles. The description of the main recruitment areas and recruitment variability are important for managing this resource, which is targeted by the Alboran trawl ?eet (1)

Material and methods

This study is based on data obtained from five seasonal trawl surveys carried out in the Alboran Sea. Two of them were conducted by the R/V Cornide de Saavedraduring spring 2001 and 2002 (MEDITS time series: 2). The remaining ones were conducted by the R/V Fco. *de Paula Navarroduring summer, autumn and winter between both* spring cruises. A total of 190 hauls were made in the study area at depths ranging from 40 to 796 m, based on random stratified sampling. A GOC73 gear with a mesh size of 40 mm was used in every survey following the same protocol (2). Catches were standardized per 1h of trawling and abundances were weighted to the number of fish per trawling hour. The spatial representation of recruit abundance was analysed using geostatistis (ordinary kriging method: 3). Nodes each 5x5 nautical miles were considered for density estimations and spherical variograms were fitted, using SURFER 7.0 software.

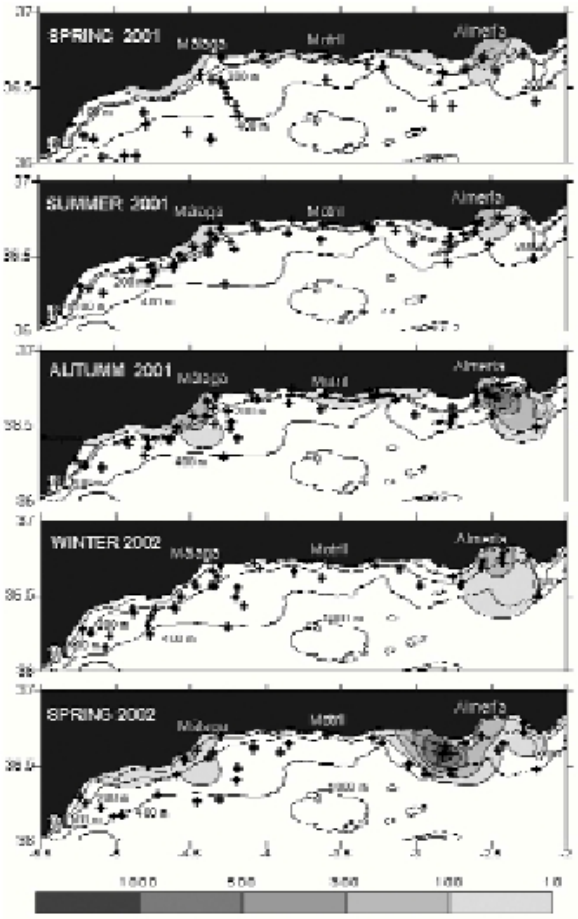

Fig. 1. Seasonal distribution of hake recruits (<17 cm) expressed as number of individuals per trawling hour.

Results and discussion

Hake recruits were concentrated mainly between 100 and 200 m, although individuals of total lengths up to 17 cm were found between 42 and 261 m.

The highest abundances were recorded in spring 2002 and autumn 2001, with maxima of 1800 and 1400 recruits/h, respectively. Maximum abundance in winter 2002, and spring and summer 2001, was 340, 280 and 180 recruits/h, respectively. Throughout the whole year maximum abundances were reached in the eastern part of the Alboran Sea.

Although individuals with lengths <17 cm were found at all stations, they dominated the spring and autumn 2001 catches, comprising >80% of the total number of specimens caught. In spring 2002, juveniles made up 99% of the total catch by number.

In the Iberian Mediterranean (from Gibraltar to cape of Creus), the recruitment of hake increases with latitude, with the highest concentrations found at the Catalan shelf (4).

Some studies have pointed out that hake recruitment strength is strongly in?uenced by oceanographic variables in the Atlantic (5) and the Mediterranean (6). The exceptional circulation pattern in the Alboran Sea (7) should explain anyhow these results though further studies are needed in the area in order to improve the management of this target species.

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