

# DISTRIBUTION AND ABUNDANCE OF SARDINE AND ANCHOVY LARVAE IN THE EASTERN MEDITERRANEAN SEA

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## Abstract

The distribution, abundance and size structure of sardine and anchovy larvae were collected in the northern Levantine Sea (eastern Mediterranean) in an ichthyoplankton survey between 5-18 June 2004. Sardine and anchovy larvae showed a wide distribution off the Turkish continental shelf. Especially Mersin Bay was an important spawning area in the northern Levantine Sea.

**Keywords:** *Ichthyoplankton, Fishes, Pelagic, Larvae, Eastern Mediterranean*

## Introduction

Anchovy, *Engraulis encrasicolus* (Linnaeus, 1758), one of the most import pelagic species of the Turkish fishery taking the first place with 385000 tons/year, and sardines, *Sardina pilchardus* (Walbaum, 1792), with 21000 tons/year ranges third after the Atlantic horse mackerel [1]. Anchovy are caught mostly in the Black Sea. The sardine catch is concentrated mainly in the Aegean Sea. 13.7% of the total sardine and 0.04% of anchovy catch comes from the northern Levantine Sea. Research has been carried on the distribution of the eggs and larvae of anchovy and sardine in the Marmara, Aegean and Black Seas ([2], [3]) but no investigations was done on these important pelagic species in the eastern Mediterranean Sea. The aim of this paper is to give the results of larval research on the distribution and abundance of the sardine and anchovy larvae in the northern Levantine Sea.

## Material and Methods

The ichthyoplankton samples were collected in the TUNALEV survey on board of the Turkish trawler 'Emicaoglu' from 05-18 June 2004 in the northern Levantine Sea (Fig. 1).

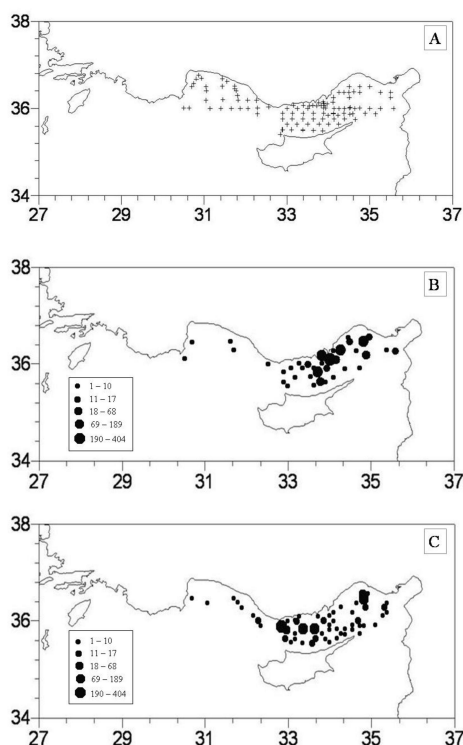


Fig. 1. A) Map of the study area, B) Distribution and abundance of sardine larvae (larvae/1000m<sup>3</sup>), C) Distribution and abundance of anchovy larvae (larvae/1000 m<sup>3</sup>)

A total of 104 sub-surface plankton horizontal tows with a Bongo 90 cm of quadrangular mouth opening with a 1 mm mesh for horizontal surface tows

and a Bongo net of 60 cm inlet diameter equipped with 250 µm mesh for oblique tows were made. The distance between each station was chosen as 10-15 nautical miles. All tows were fixed at 10 minutes duration. The collected ichthyoplankton material was then preserved in 5% neutralized formalin.

## Results and Discussion

During the ichthyoplankton survey, the sea water temperature was measured as 21.8– 29.3°C, where by the salt content varied between 34.9 – 38.8‰, the water depth being 63-2448 m. In this larval survey, 1779 larvae of *Sardina pilchardus* and 744 *Engraulis encrasicolus* were collected. Fig. 1B-C shows the distribution of sardine and anchovy larvae. High abundance of these fish larvae was observed in the Cilician Basin, between Turkey and northern Cyprus and in Mersin Bay. The larvae of these fish species were observed in very small numbers in Antalya Bay.

During the larval survey; ichthyoplankton was sampled in 104 stations. The sardine larvae were collected in 39 stations where by the 10-14 mm SL larvae comprised 65% of the sardine individuals. The length of the sardine larvae was 4.0 – 22.0 mm SL, the medium length being 12.4 ± 0.06 (SE) mm. The anchovy larvae were found in 58 stations. The 10-14 mm SL individuals comprised 55.5% of the anchovy larvae. The length of the anchovy larvae was 4.0 – 22.0 mm SL, the medium length being 12.2 ± 0.12 (SE) mm. The sardine and anchovy larvae were distributed in a wide area. The water depth of the sampled stations, where sardines were collected was 80-1170 m. The anchovy larvae were observed at sampling stations in water depths of 60-2000 m. The sardine and anchovy larvae were abundant in shelf. The number of the larvae decreased in off shore areas. According to Murua and Saborido-Rey [4], the reproduction of sardine occurs in the open sea or in the shelf areas. The presence of larvae in our research deeper than 1000 m could possibly be related to advection by sea currents in the study area.

In the previous papers, the distribution and abundance of the tunas (large pelagic species) in Mersin Bay, *Thunnus thynnus*, *Thunnus alalunga*, *Auxis rochei*, *Euthynnus alletteratus*, *Scomber scombrus*, *Scomber japonicus*, *Katsuwonus pelamis* have been reported [5]. The results of this survey confirm that Mersin Bay is an also spawning ground of small pelagic fish; namely of sardine and anchovy.

This important spawning ground should stay under protection. Excessive fishing should not be exercised. Pollution and introduction of energy sources leading to ecological changes in Mersin Bay should be avoided. Renewable energy such as solar, and wind energy should be preferred.

## References

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