

SPATIAL DISTRIBUTION OF ICHTHYOPLANKTON IN THERMAIKOS AND CHALKIDIKI GULFS DURING JUNE 2004

Maria Danelli¹, Apostolos Siapatis^{2*}, Athanasios Machias² and Marianna Giannoulaki²

¹ Hellenic Center for Marine Research - siapatis@ath.hcmr.gr

² Department of Marine Sciences, University of the Aegean

Abstract

The spatial distribution of fish larvae was studied in Thermaikos and Chalkidiki gulfs during June 2004. Samples coming from the 500-mesh size Bongo net were analyzed and 42 taxa belonging in 29 families were identified. Spatial heterogeneity depended on the combined effects of topography and hydrographic features of the region. Classification of stations into groups established three distinct groups of stations, which basically corresponded to the bathymetry of the study area.

Keywords: Aegean Sea, Ichthyoplankton

Introduction

Marine fish larvae play an important role in understanding the ecology and evolution of fishes and their populations [1]. The interpretation of spatial patterns in the ichthyoplankton involves consideration of many factors pertaining to the biology and early life history of fish species and the environment in which they live and reproduce. A complex suite of environmental factors interacts with the biology of fish populations at different temporal and spatial scales to influence the occurrence, distribution, and abundance of the larvae.

Materials and methods

A grid of 13 stations (Fig. 1) was sampled in 15-20 June 2004, with a 60 cm bongo-net (0.250 and 0.500 mm meshed nets) towed obliquely from just above the sea bottom to the surface (maximum to 200 m). Hydrographic profiles were collected on a denser grid of 42 stations. The early life stages of fishes were sorted and identified into families and species. To define ichthyoplankton assemblages, a hierarchical cluster analysis of a Bray-Curtis similarity matrix calculated between species by ranked larval abundance was performed [2], considering only those species or groups that represented 1% of the total catch.

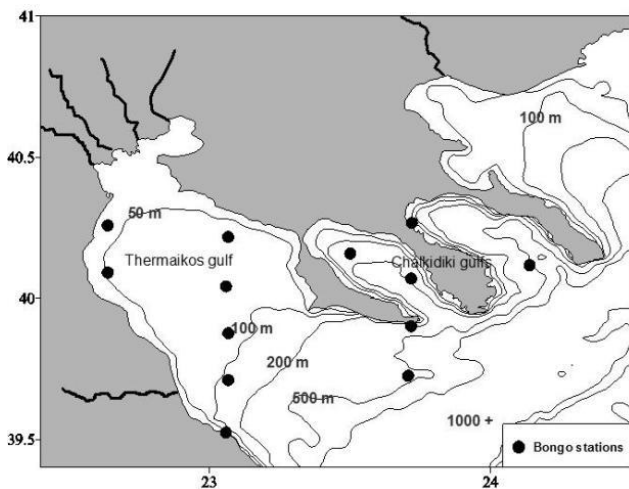


Fig. 1. Map of the study area showing the location of sampling stations

Results and discussion

A total of 3,617 fish larvae were sorted from the 0,500 mm cod-end of the net that were categorized under taxonomy levels of 38 species, 7 genera, and 1 family. European anchovy (28%) composed the highest level in larval distribution and *Sardinella aurita* (14 %) was in the second place. The myctophiids *Ceratoscopelus maderensis* (14%) and *Hygophum hygommii* (10%) were the most abundant mesopelagic taxa. Other taxa caught at high percentages were *Gobiidae* (5%), *Trachurus mediterraneus* (4%), *Serranus hepatus* (3%), *cepola macrophalma* (3%) and *Arnoglossus sp.* (2%). Using cluster analysis three different groups of taxa were classified (Fig. 2). The first group contains bathypelagic specie/families like *Myctophidae*, *Sternoptychidae* and *Paralepididae* whereas their larvae caught mainly at the offshore stations of Chalkidiki gulfs. The second group contains neritic species like *Diplodus*

annularis, *Coris julis*, *Chromis chromis* and *Symphodus sp.* exhibit an inshore distribution in the coastal band of Thermaikos gulf. Finally, the last group contains taxa characterized by wide dispersal patterns like the pelagic *Engraulis encrasicolus*, *Sardinella aurita*, *Trachurus mediterraneus*, the demersal *Serranus hepatus*, *Gobiidae* *Cepola macrophalma* and mesopelagic *Ceratoscopelus maderensis* and *Hygophum hygomi* whereas their larvae caught in extremely high densities and distributed over the majority of the sampling stations. The presence of mesopelagic fish larvae over the shelf, occasionally in quite shallow water, therefore, may be the result of some passive mechanism or of shore wards migration by the larvae themselves [3].

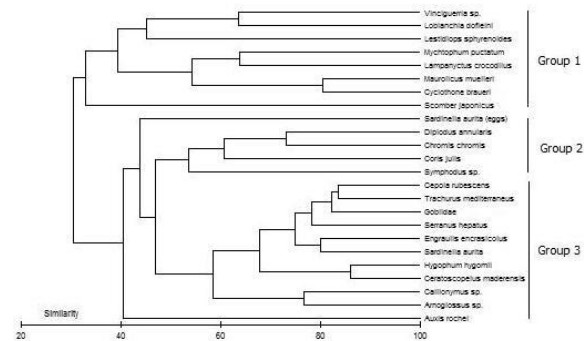


Fig. 2. Dendrogram of similarities (cluster analysis, group-average linkage, fourth root transformation) of the taxa sampled in June 2004

References

- 1 - Moser, H.G., and P.E. Smith. 1993. Larval fish assemblages and oceanic boundaries. *Bull. Mar. Sci.* 53: 283-289
- 2 - Field, G.R., K.R. Clarke and R.M. Warwick. 1982. A practical strategy for analyzing multispecies distribution patterns. *Mar. Ecol. Prog. Ser.*, 8: 37-52.
- 3 - Olivar M.P. and Sabates A., 1997. Vertical distribution of fish larvae in the north-west Mediterranean Sea in spring. *Mar. Biol.*, 129: 289-300.