

DISTRIBUTION OF DEMERSAL FISH SPECIES IN THE BLACK SEA, SEA OF MARMARA AND NORTH AEGEAN SEA

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Abstract

Fish species richness decreases from the Aegean Sea, Sea of Marmara to Black Sea. In this study, biogeographic differences between three areas were approved in terms of demersal fish species. Some endemic species such as *Mezogobius batrachocephalus* and *Neogobius melanostomus* obtained only less saline and temperate water in the Black Sea.

Keywords: Fishes, Biogeography, Eastern Mediterranean

Introduction

Geologic history and hydrologic characteristics of Turkish Straits System (Bosphorus, Sea of Marmara and Dardanelles) are main factors indicating to the fauna and flora characteristics in the Northeastern Mediterranean from the Aegean Sea to the Black Sea. This system is important as a biological barrier or corridor and acclimatization zone for Mediterranean Sea and Black Sea species [1]. This study is a preliminary emphasis on the zoogeography of demersal fish species in the Black Sea, Sea of Marmara and North Aegean Sea.

Materials and Methods

Fish samples were collected with bottom trawl net. A total of 17 hauls was carried out during autumn periods in 2006 and 2007 on board the R/V *Yunus-S* in the North Aegean Sea (AS), Sea of Marmara (SM) and Black Sea (BS), depth ranging from 22 m to 72 m (Fig. 1). Species presence/absence matrix was used to classify hauls with similar species composition. Cluster based on Bray-Curtis similarity index. SIMPER analysis was applied in order to identify the percentage contribution of each species to the overall similarity.

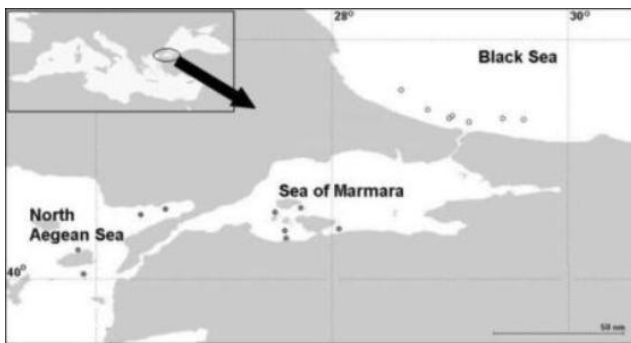


Fig. 1. Samplings in the Black Sea, Sea of Marmara and North Aegean Sea during autumn periods in 2006 (dark circles) and 2007 (white circles).

Results and Discussion

A total of 67 fish species were collected during this study. Species richness showed a decrease from the AS, and SM to BS (38, 30 and 27, respectively). Considering to the zoogeographical origin of the species, there were 55 Atlantic-Mediterranean species, 8 endemic species and 4 cosmopolitan species. The number of endemic species was higher in the BS, the Atlantic-Mediterranean species higher in the AS and SM. Cluster analysis of 17 hauls showed a clear separation according to area (Fig. 2). Samples in the BS separated from in the AS and in the SM at the level of similarity around 18.55%. Samples in the AS separated from the SM at the level of similarity around 51.66%. According to SIMPER results, the average similarity within group AS was 70.90%; *Mullus barbatus*, *Serranus hepatus*, *Citharus linguatula*, *Scyliorhinus canicula*, *Arnoglossus laterna*, *Lophius budegassa* and *Serranus cabrilla* were responsible species with high contribution (9.15% each) 50% to the similarity of this group. The average similarity within group SM was 77.07%, and within group 50% similarity was attributed to *Merlangius merlangus euxinus*, *S. hepatus*, *Merluccius merluccius*, *A. laterna*, *Raja clavata*, *Chelidonichthys lucernus*, *M. barbatus* and *Gobius niger* with relatively high contributions each (from 5.22% to 8.69%). The average similarity within group BS was 61.23%, and *Trachinus draco*, *Scorpaena porcus*, *M. barbatus*, *Mezogobius batrachocephalus* and *Neogobius melanostomus* were highly contributing species (from 9.18% to 19.27%) 50% to the similarity of this group. Fish

species richness decreases from AS, SM to BS along the Turkish coast [2]. Similar results obtained in this study. Also, the results supported to identification of biogeographically distinct between three areas. Species composition in the BS was highly dissimilar to the species composition in the AS and in the SM. Some endemic species such as *M. batrachocephalus* and *N. melanostomus*, pontian relic species, occurred only less saline and temperate water in the BS, Atlantic-Mediterranean species such as *C. linguatula*, *S. hepatus*, *A. laterna*, *S. canicula* and *M. merluccius* were common species in the AS and in the SM at least during the sampling period of this study. High similarity between the AS and SM can be explained by the water characteristics of sampling stations in the SM, in which salinity and temperature were more close to the Mediterranean water considering to the depth range (deeper than 40 m). These results support to the separate management plans for demersal fish species in the three areas in terms of ecosystem [3].

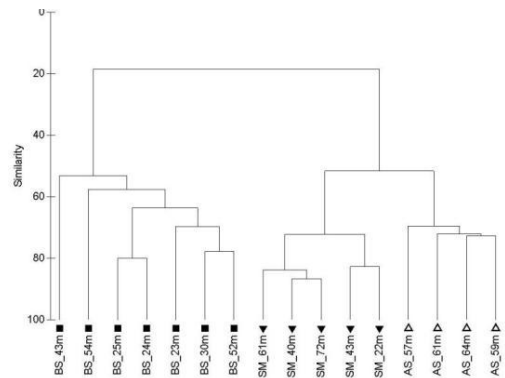


Fig. 2. Dendrogram of similarities for 17 hauls (cluster analysis, group average linkage) sampled during autumn periods in 2006 and 2007.

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