A PRELIMINARY STUDY OF ZOOPLANKTON DYNAMICS COUPLED WITH ENVIRONMENTAL PARAMETERS IN AN URBANIZED HARBOR

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Abstract

Coastal systems exhibit a wide array of anthropogenic impacts which can alter ecosystem components. Therefore, a through knowledge of the system and the processes affecting it is required to understand the individual and/or mutual effects of physical and biological environments. Field samplings were performed to gather information on the zooplankton community and the environmental parameters of an urbanized harbor located at Kepez-Dardanelles. Weekly observations (between 26 April 2005 and 12 July, 2005) of on site measurements and microscopic analysis showed that environmental parameters and zooplankton community composition changed considerably among sampling depths.

Keywords : Zooplankton, Dardanelles, Coastal Systems.

Zooplankton biomass, distribution and abundance are of extreme importance in aquatic systems. They maintain a crucial role as the secondary production of aquatic habitats in allowing energy to flow up the food web. Zooplankton are also very sensitive to disturbances, such as nutrient enrichment, fish introductions, thermal discharges, or toxic effluents, therefore make ideal indicators of a healthy aquatic system. In this study we examined the relations between zooplankton abundance and some environmental parameters in Kepez Harbor (Dardanelles). Located between the Sea of Marmara and the Aegean Sea, the flow dynamics in the Dardanelles Strait is complex in many ways. The unique flow dynamics and localization of Kepez Harbor in the Dardanelles Strait makes it an excellent test area for the effects of anthropogenic stress on the water quality and the ecosystem components.
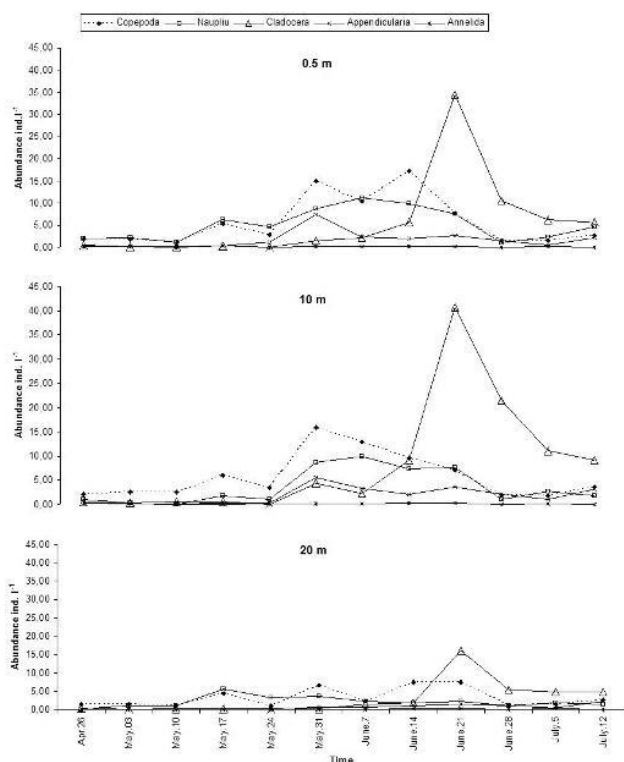

Fig. 1. Zooplankton abundance placed into generic taxonomic groups in the surface, 10 m, 20 m depths in Kepez Harbor between 26 April-12 July 2005.

For this research, water quality and zooplankton data were analyzed from one station located at Kepez Harbor, Dardanelles (40° 09' N, 26° 24' E). Samples were collected from the surface, 10 m and 20 m depths. Sampling trips were conducted weekly between 26 April 2005 and 12 July, 2005. Water-quality parameters such as temperature, salinity, pH and dissolved oxygen (DO) were measured in situ using an YSI 6600 MPS. Zooplankton samples were collected using a closing plankton net and preserved with 4 % buffered formalin (v/v). Zooplankton species identification was performed according to [1].

Water quality parameters varied considerably among sampling depths. Temperature ranged between 14.2 and 20.5 °C while salinity changed between 20-39 ppt. When different depths were considered pH was less variable changing between 8.7 and 9.3 while DO ranged between 3.3 and 7.1 mg L^{-1}. Results showed that all zooplankton groups increased in number starting from the end of May through June (Fig. 1). During this period, Oithona and Acartia species dominated the copepods while *Oikopleura dioica* (Fol, 1872) was abundant in Appendicularians. Considering cladocerans, *Pleopsis polyphemoides* (Leuckart, 1859) was the dominant species by the end of May through early June. However, after 21 June 2005 *Penilia avirostris* (Dana, 1849) was the common species in all sampling depths. Copepod nauplii showed an increase parallel to an increase in copepod adults in the surface and 10 m depths while numbers were less pronounced in 20 m.

The natural zooplankton community structure in Kepez Harbor was diverse and community structure changed depending on the changes in environmental parameters, i.e., changes in temperature.

Reference

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