

PICOPLANKTON ABUNDANCE AND BIOMASS DISTRIBUTION IN TURKISH SEAS

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Abstract

Comparison of the heterotrophic bacteria and cyanobacteria (*Synechococcus* sp.) abundance and biomass in highly contrasting water bodies composed primarily of the Eastern Mediterranean (Cilician and Levantine basins), the Sea of Marmara including Bosphorus and Dardanelles and the Black Sea were made within the framework of SESAME (Figure 1). Changes in picoplankton abundance and biomass in contrasting environments were investigated in relation to their unique physical, chemical and biological properties. Seawater samples were collected from the SESAME cruises carried out during spring and fall 2008.

Keywords: *Marmara Sea, Eastern Mediterranean, Cyanobacteria, Bacteria*

Picoplankton including photosynthetic picoplankton and heterotrophic bacteria, are important members of marine microbial food webs [1]. They are also important because of their sensitivity to environmental factors. The Mediterranean Sea, the Sea of Marmara and the Black Sea, which are connected to each other via the Turkish Strait System have very distinctive physical, chemical and biological properties. Heterotrophic bacteria and cyanobacteria (*Synechococcus* sp.) components of the picoplankton of these highly contrasting water bodies were studied (Figure 1).

References

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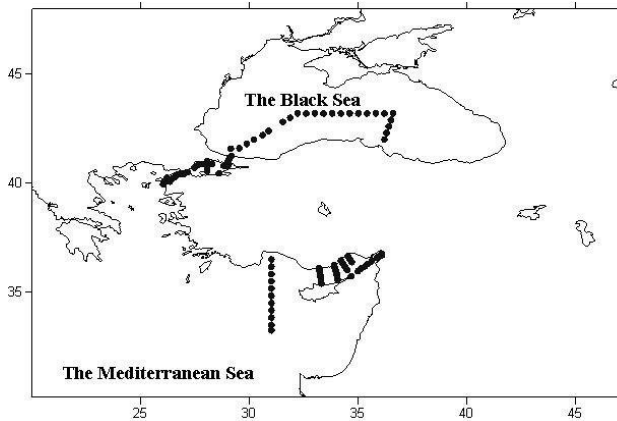


Fig. 1. Map of the stations

Seawater samples were fixed with glutaraldehyde, stained with acridin orange and filtered through 0.2 µm pore sized nucleopore membrane filter. Filters covered with immersion oil were counted using an epifluorescent microscope. The Image-Pro Plus V 5.0, image analysis program was used for calculating cell volume. 77 fgC/l [2] and 120 fgC/l [3] carbon conversion factors were used for heterotrophic bacteria and cyanobacteria (*Synechococcus* sp.), respectively.

Maximum heterotrophic bacterial and cyanobacterial abundance and biomass were observed in the Sea of Marmara during fall, with the values ranging between 2.6×10^6 cells/ml and 14.4 µgC/l for heterotrophic bacteria and 2.1×10^5 cells/ml and 25.3 µgC/l for cyanobacteria. In contrast, lowest levels were attained during fall in the Levantine Basin with the values ranging between 4.1×10^4 cells/ml and 0.24 µgC/l for heterotrophic bacteria and 2.5×10^1 cells/ml and 0.02 µgC/l for cyanobacteria. Both the surface bacterial and cyanobacterial abundance and biomass averages peaked in fall compared to spring in all regions with the exception of the Sea of Marmara where an apparent decrease in heterotrophic bacterial abundance and biomass was detected.

The Sea of Marmara held the highest bacterial population during both seasons followed by the Black Sea and the Eastern Mediterranean. The Mediterranean Sea is oligotrophic and the high bacterial abundance and biomass observed in Cilician Basin is due to the sampling of productive coastal shelf waters during the cruises. Both populations were more homogeneously distributed with depth during spring when the water column was mixed thoroughly.