PICOPLANKTON DYNAMICS IN THE LEVANTINE BASIN

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Abstract
Abundance and biomass of picoplankton (heterotrophic bacteria and cyanobacteria *Synechococcus*) were monitored monthly at three stations over a year in the northern Levantine Basin shelf waters. Relationships with other ambient chemical and physical parameters were also sought. An apparent decreasing trend in picoplankton content from inshore towards offshore was observed Bacterial population was found relatively low during winter. *Synechococcus* was most abundant at or near surface waters during the summer. In general, heterotrophic bacterial biomass surpassed the cyanobacterial (*Synechococcus*) biomass in the water column throughout the year.
Keywords : Cyanobacteria, Biomass, Levantine Basin.

Picoplankton samples for this study were collected from three stations offshore the Institute of Marine Sciences of Middle East Technical University, Turkey, located on the norteastern coast of the Mediterranean (Figure 1). Seawater samples taken from standard depths for picoplankton analysis were filtered onto 25 mm diameter, black, polycarbonate, nuclepore membrane filters with 0.2 μm pore size. Total bacterial as well as the cyanobacterial abundance were estimated by acridine orange direct counts with epifluorescence microscopy (1). Counts were performed under a Nikon epifluorescence microscope with a filter combination of B-2A (blue excitation, dichroic mirror DM 505, excitation filter EX 450-490, barrier filter BA 520) and G-1A (green excitation, dichroic mirror DM 575, excitation filter EX 546/10, barrier filter BA 580). The main light harvesting pigment of *Synechococcus* is phycoerythrin which is responsible for the orange fluorescence of *Synechococcus* when excited with green light. Mean cell volumes were estimated using image analysis system composed of a digital camera, computer and the image analysis software. Cell volumes were determined using the volume formula for an ellipsoid (2). To calculate carbon content of bacteria and *Synechococcus*, 77 and 123 fg carbon per cubic micron were used, respectively (3, 4).

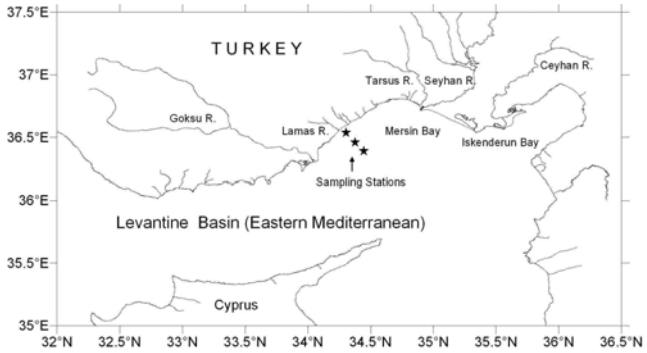

Fig. 1. Location of the sampling stations in the Levantine Basin.

In general shelf waters have a dynamic nature and strong mixing during winter effect greatly the concentration of nutrients as well as the distribution of suspended matter in the water column. Winter bacterial population was low in abundance and cells were distributed homogeneously in the water column. At the nearshore station surface bacterial biomass ranged from 3.05 μgC l^{-1} in December to a maximum of 32.27 μgC l^{-1} in September. The minimum and the maximum bacterial biomass ranged between 2.81 (at 100m depth in October) and 12.11 μgC l^{-1} (at 20m depth in September) at the middle station. At the offshore station bacterial biomass ranged from a low level of 0.99 μgC l^{-1} at 175 m in October to a high level of 10.7 μgC l^{-1} achieved at surface in September. In general, heterotrophic bacterial biomass surpassed the cyanobacterial (*Synechococcus*) biomass in the water column throughout the year. Size of bacteria varied greatly with depth at all three stations. Cyanobacteria *Synechococcus* was found most abundant at or near surface waters during the summer. Changes in cell abundance with depth was insignificant during winter due to intense vertical mixing and remained at lowest levels compared to other seasons. At the nearshore station *Synechococcus* biomass ranged from 1.08 μgC l^{-1} (at 10 m depth in January) to a maximum of 11.59 μgC l^{-1} obtained at surface in July. At the middle station cyanobacterial biomass ranged between 0.04 (at 100m depth in October) and 7.55 μgC l^{-1} observed at 20 m depth in July. At the offshore station, to a highest value was reached in July at 20 m depth (6.31 μgC l^{-1}).

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