NUTRIENT CHANGES IN SURFACE WATERS OF THE IZMIT BAY (THE MARMARA SEA) IN 2010-2011

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Abstract
In this study, it was aimed to examine the relationship among chl-a, oceanographic parameters such as temperature, salinity (ppt), pH, dissolved oxygen (DO), electrical conductivity (mS/cm) and Total nitrogen (TN), Total Phosphorus (TP), Ammonia-nitrogen (NH₄) and Silicate (SiO₂) between October 2010 and December 2011 in Izmit Bay. Samples were taken once per a month (October 2010-December 2011) in the surface waters (inner and outer bay of the Izmit-Marmara Sea). NO₂, NO₃, NH₄, PO₄ and SiO₂ concentrations were determined spectrophotometrically. The lowest and highest concentrations TN, PO₄-P, SiO₂-Si and chl-a were 0.01-0.79 mg/L, 0.03-0.21 mg/L and 0.72-14.82 mg/L, respectively. Mean atomic ratio of N/P was lower than the Redfield ratio of 16 for ocean phytoplankton expect July and August 2011, and N was the limiting nutrient.

Keywords: Marmara Sea, Nutrients, Phytoplankton, Chlorsphyll-A

Fig. 1. Sampling stations in the Izmit Bay

Samples were taken once a month (from October 2010 to December 2011) in the surface waters (inner and Outer Bay) of the Izmit Bay (Fig. 1). Nitrate (NO₃), nitrite (NO₂) ammonium (NH₄) phosphate (PO₄) and silica (SiO₂) concentrations were determined spectrophotometrically. Also spectrophotometric techniques were used for determination of Chl-a (µg/L). Dissolved Oxygen (mL/L), Temperature (°C), pH, Electrical Conductivity (mS/cm) and Salinity (ppt) were determined by Hydrolab DS-5 Data Sonda. These data were given as average value in the table 1. The ratio between nitrogen and phosphorus varied between 0.15-61.46. Based on the present results, N/P ratio has reached its maximum levels in summer months (i.e. July 2011 and July 2011). Mean atomic ratio of N/P was lower than the Redfield ratio (i.e. 16) for ocean phytoplankton (except July and August 2011, and N was the limiting nutrient). Since 1950’s increasing industry and a growth of human population resulted in a dramatic increase of contaminant discharge to the Izmit Bay. Although treatment plants established in the region substantial level of discharges remain untreated and presents results reveal that nutrient input to the surface waters of the bay is still effective on the conditions that can be stimulate plankton bloom. Following experiments should be composed to understand ecosystem structure and determine recent changes. Long-term monitoring studies in the Izmit Bay are necessary for better understanding in nutrient cycle and plankton distributions.

Acknowledgment: This study was funded by Kocaeli University Scientific Research Unit (BAPB 2009/40).

References