



A case study performed in Küçükçekmece Lagoon channel/Istanbul, Turkey: how the heavy metal contamination and the seasonal variations on phytoplankton composition influence water quality

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ABSTRACT

In this work, the experiments related to seasonal variations of phytoplankton composition and heavy metal contamination along with some water quality parameters were carried out throughout the channel, serving as a waterway between Lake Küçükçekmece and the Sea of Marmara. Considered as a Class B wetland, the lake has been stayed within the metropolitan area of Istanbul overtime. The samples from the surface water were taken monthly by using Nansen bottles at 5 sampling sites through the period of March–November. After experimental procedures, a total of 46 taxa were recorded belonging to Bacillariophyta (20), Charophyta (4), Chlorophyta (6), Cryptophyta (1), Cyanobacteria (4), Euglenozoa (3), and Miozoa (8) divisions. The phytoplankton densities were found to be varied from 76 individual cm⁻³ to 3,283 individual cm⁻³ throughout the channel and the variation for chlorophyll-a contents was between 0.99–55.32 mg m⁻³. From our results, the heavy metal and nutrient concentrations were found to be as: 0.78–1.55 mg L⁻¹ for Al, 4.28–13.88 mg L⁻¹ for B, 1,201–1,693 mg L⁻¹ for Ca, 45.20–120.40 µg L⁻¹ for Cd, 432.40–1,398.40 µg L⁻¹ for Cr, 232.00–1,043.00 µg L⁻¹ for Cu, 663.40–2,315.60 µg L⁻¹ for Fe, 626.20–1,435.20 mg L⁻¹ for K, 738.00–1,113.00 mg L⁻¹ for Mg, 1,882–6,084 mg L⁻¹ for Na, 30.00–317.80 µg L⁻¹ for Ni, 17.40–158.00 µg L⁻¹ for Pb, and 440.20–1,186.20 µg L⁻¹ for Zn. According to the data obtained in this study, the area where research conducted was determined as having eutrophic characteristics.

Keywords: Phytoplankton composition; Heavy metal pollution; Water quality; Küçükçekmece Lagoon; Istanbul

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