

Heavy Metal Pollution in Surface Marine Sediment of the Bay of Izmit, the Marmara Sea (Turkey)

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Aim of the study: The Marmara Sea is semi-enclosed deep basin and together with Bosphorus and Dardanelles straits are a channel between the Black Sea and Mediterranean Sea. The pollutants are introduced through water way into the Izmit Bay by a surface and deep currents from the Black Sea and Mediterranean Sea. This study was undertaken to investigate the current heavy metal contamination in sediment in the Izmit Bay. The Izmit Bay is influenced by factors such as industry, refinery, port activities, rapid urbanization, coastal traffic, agricultural activities.

Material and Methods: In this study, samples of costal sediments collected from the Izmit Bay aimed to determine the level of heavy metals. The sediment samples were collected from 7 sites. Seasonal sampling was performed between August 2011 - May 2012. The microwave digestion and ICP-OES was used in the analysis. Samples were digested in a microwave digestion system with a HNO₃-HClO₄-HCl acid mixture for heavy metal analyses (Cr, Ni, Cu, Zn, Fe and Cd). The accuracy of the analysis was verified by analyzing the Certified Reference Material (Inorganic marine sediment) (NIST 2702). The results showed good agreement between certified and analytical values.

Results: The costal marine sediment samples from the Izmit Bay, the Marmara Sea, Turkey was examined. Concentrations of the heavy metals in the sediment was as follows; Cr 2,4-40,68; Ni 7,4-26,08; Zn 4,68-154,36; Cu 3,42-44,36; Cd < 0,02-0,82; Fe <0,001 µg g⁻¹ dry weight. The heavy metal concentrations in costal sediment samples was Zn>Cu>Cr>Ni>Cd>Fe.

Keywords: Sediment, heavy metal, Izmit Bay, Marmara Sea