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Effect Of Grain Size Fractions On The Distribution Of Cr In Sediment

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Estuarine -deposited sediments is an important environmental medium that is widely used for characterizing anthropogenic contaminant levels in urban systems. It has significant implications for human health, and can directly impact aquatic biota. Assessment of Cr contamination and its distribution in different grain size fractions of the surface sediments of Abu Qir Bay, one of the Mediterranean coastal bays, as industrial development area has been investigated. Since the persistent toxic metals pose serious health risks, this research concentrated on investigating the concentrations and spatial distribution of Cr in Abu Qir Bay. Ten sampling points were selected and approximately 500 g of surface sediments were obtained from different depths. Samples were sieved and six grain size fractions (1.0, 0.5, 0.25, 0.125, 0.063 and <0.063 µm) from each sample were selected for the analysis of Cr. Data indicate significant Cr contamination in all samples. The finest sediment fractions (0.063 and <0.063 µm) contained the highest concentrations of Cr and organic matter. The concentration of this metal was generally four times greater than in coarse grained-fractions. Silt plus clay (<0.063 µm) was the single most important mass component with >40% of the total sediment stored in this fraction. Mass of sediment <63 mm combined with a median labile Cr concentration of 239.1 µg/g accounted for 45% of the total Cr load stored in road sediments. These findings are significant from an environmental management perspective, and these issues are discussed in light of street sweeper sediment grain size removal efficiencies. This indicates anthropogenic origins of these metals. Principal Component Analysis was used to interpret the variations of trace metals and organic matter concentrations in the sediment samples. Enrichment factor and correlation analysis were also applied to the data set. The overall results indicate that sediment grain size played important role in controlling the distribution of heavy metals in surficial sediments of Kazipalli Lake