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Episodic Sedimentation of Heavy Metals and Iron in Bizerte Lagoon, Northern Tunisia

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ABSTRACT

The correlations between various sedimentological and geochemical parameters permit to identify the main sedimentation phases of pollution carriers, especially those related to the sediment cores lithology in Bizerte Lagoon. A close relationship exists between the TOC distribution and the fine fraction ($r = 0.70$; threshold 5%). This is to identify the formation of organic minerals aggregates. Significant correlations between specific organic matter and heavy metals have been identified. Indeed, the calculated correlation coefficient varies between 0.4 for Zn and 0.85 for Mn. The enrichment of the intermediate horizons in heavy metals result in specific sedimentations episodes of the prodeltaic zones. Under these conditions, the surface sediments profit from a "salting-out" phenomenon, which explains the excess of lead observed on the surface. The enriched zones in manganese and zinc correspond to the strongest contents of kaolinite and in smectite, thus, there would be an association with the finest phyllosilicates and/or the colloidal oxyhydroxy des. This is primarily due to the formation of an organic minerals complex via the trapping phenomenon of the argillaceous particles (smectite) and the organic matter of anthropogenic origin. It is to be specified that the presence of metal elements of natural origin (Mn) or anthropogenic origin (Fe, Zn, Pb and Ni) which induce the consolidation of these organic minerals complexes.

KEYWORDS

Core; Clay Minerals; Organic Matters; Heavy Metals; Bizerte Lagoon; Tunisia

Cite this paper

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