Assessment of heavy metals contamination in sediment from the Khnifiss lagoon (SW-Morocco)

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The heavy metals (Pb, As, Cu, Cr, Cd, Ni and Co) content of sediments (including core samples) from the Khnifiss Lagoon (Morocco, Saharan coast), was investigated to the aim of assessing the eventual anthropogenic input. This ecosystem is the second largest coastal lagoon in Morocco (65 Km^2). ICP-MS analyses show average concentrations for Pb, As, Cu, Cr, Cd, Ni and Co of 7.0, 9.6, 7.3, 28.3, 0.2, 16.8 and 4.4mg/kg, respectively. The comparison with concentrations measured for core samples dated (by Pb isotopes) to a period prior to possible contaminations (background), indicates that no (or very slight) anthropogenic input impacted the Khnifiss Lagoon sediments. The results of Geoaccumulation Index (Igeo) and Pollution Load Index (PLI) calculated for these sediments clearly prove no evidence of pollution for this environment, while Contamination Factor (CF), and Enrichement Factor (EF) suggest a low to moderate contamination from diffuse anthropogenic sources. Total Organic Carbon (TOC) and grain size show a strong correlation with heavy metals content.

These results are the first available data for this lagoon and represent a reference point to define the contamination trends, allowing a better understanding of Khnifiss Lagoon ecological system to enable optimal management and protection practices.