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EVALUATION OF ENVIRONMENTAL POLLUTION BY HEAVY METALS IN THE SEDIMENTS OF AL-EZZ RIVER, NORTH OF BASRA

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Abstract
Seasonal sediment samples were collected from the fall of October 12, 2022, until the summer of June 25, 2023, at five stations along the Al-Az River in the Qurna district, north of Basra city. The purpose was to assess the river's pollution with heavy metals, namely lead (Pb), cadmium (Cd), copper (Cu), manganese (Mn), zinc (Zn), chromium (Cr), cobalt (Co), and iron (Fe), using the sequential extraction phase. Additionally, pollution factors (CF), enrichment factors (EF), and the geochemical accumulation index (I-geo) were calculated to evaluate the degree of heavy metal contamination in the study area's sediments.The study results revealed that the annual average concentrations of the aforementioned heavy metals in the sequential extraction phase were as follows (g/g dry weight): lead (Pb) - 95.842, cadmium (Cd) - 8.549, copper (Cu) - 21.918, manganese (Mn) - 111.016, zinc (Zn) - 23.175, chromium (Cr) - 61.749, cobalt (Co) - 10.826, and iron (Fe) - values not provided.The pollution factor (CF) values indicated that the soil was highly contaminated with lead and cadmium, while copper, iron, and manganese showed low contamination. Chromium and cobalt exhibited high contamination. According to the geochemical accumulation index (I-geo) values, the sediments of the Al-Ezz River were classified as heavily polluted with lead and extremely too heavily polluted with cadmium. They ranged from not polluted to moderately polluted with copper, and were not polluted with manganese, zinc, and cobalt. The environment exhibited moderate pollution with cobalt

Key word: pollution, heavy metal, sediment

Introduction

Pollution is one of the significant challenges facing both humans and the environment, particularly due to the industrial advancements accompanying modern life. Pollution occurs in various forms, whether in the air, water, or soil, resulting from the presence of harmful substances or imbalances in essential environmental components compared to their natural levels. This occurs through both human interventions and natural phenomena (Aiello et al., 2021). The development of human capabilities and mismanagement of water resources, especially in recent decades, have contributed to the escalating problem of pollution. This issue has evolved alongside population growth and increased water demand, to the extent