

An assessment of metal contamination in the Ishmi River sediments using XRF spectrometry

Thursday 10 July 2025 16:35 (20 minutes)

River sediments function as significant conduits and repositories for metallic materials originating from diverse sources, including agricultural treatments, industrial effluents, sewage discharge, and atmospheric deposition. In the presence of specific environmental conditions, the release of these metallic materials into the aquatic ecosystem can occur, thereby posing a risk of entry into the food chain and, consequently, endangering the health of organisms.

This study is based on a four-month monitoring of Ishmi river water quality, including the presence of microplastics and the presence of metallic materials. The geochemical status of the Ishmi River (Central Albania) sediments is hereby presented. The X-ray fluorescence (XRF) technique was employed to ascertain the concentrations of major and trace metallic elements.

In order to interpret the data, this study employed a multi-faceted approach. First, a quantitative analysis was performed using empirical coefficients. Second, an assessment of contamination was conducted using the Enrichment Factor (EF) and the Geoaccumulation Index (I_{geo}). Third, an analysis of elemental relationships using Pearson's correlation coefficients was used. The results revealed significant enrichment of specific trace metals when normalized against the natural geological background.

The correlation analysis facilitated the differentiation between probable natural and anthropogenic sources of these pollutant elements in the Ishmi River, thereby offering a more nuanced understanding of the environmental pressures exerted on the river system.

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Session Classification: Condensed Matter, Materials and Applied Physics

Track Classification: S03 –Condensed matter, Materials and Applied Physics