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Assif El Mal River: source of human water consumption and a transfer vector of heavy metals

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ABSTRACT

The mining and metallurgical mines that were abandoned with their residues constitute a source of metal pollution affecting the quality of water resources and soil. It is the case of an abandoned mining site Assif El Mal drained by the Assif El Mal River. In fact, these waters are a source of consumption without any treatment by the local population either directly or through their storage in reservoirs. A spatial variation of physicochemical parameters is determined to follow and monitor the behavior of some metals (Pb, Zn, Cu, and Al), from the abandoned mining district, in water and sediment samples along the river till the reservoirs. Also, an assessment of metal contamination level and toxicity of water is studied using the sequential extraction procedure (BCR). The results showed that the metallic load in water exceeds standards for human consumption, especially in the vicinity of the mine and the storage tanks. These levels range from 0.3–17, 0.02–0.05, 0.3–2.8, 0.03–0.1, 2.6–5.1 mg L1, respectively, for Al, Ni, Fe, Pb, and Zn. The potential toxicity of heavy metals in sediment is due to their mobile fraction exchangeable/acid soluble often high (averaging 41 Pb, 52 Zn, and 68% Fe).

Keywords: Assif El Mal River; Heavy metals; Water quality; Sediment; Sequential extraction

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