

## **Assessment of the levels of potentially toxic substances around a transect of anthrosols in Aqaba shoreline, Jordan**

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Soils are the major sink for potentially toxic substances (PTSs) such as heavy metals released into the environment by emissions from the quickly increasing of human impact including industrial mine tailings, disposal of high metal wastes, land misuse, wastewater irrigation, spillage of petrochemicals, and atmospheric deposition. The present study concerns the properties variability and soil biological health status in abandoned salt transportation port site in the Jordanian coast of the Gulf of Aqaba, Red Sea.

Seven sites were selected according to different morphological and pedological conditions, anthropogenic impact and the same climate conditions. Successively, all locations were sampled for topsoil in the period between spring-summer 2014.

Field observations as well as laboratory analysis including heavy metal concentrations (Cd, Cr, Cu, Fe, Mn, Ni, Pb and Zn); soil chemo-physical parameters (pH, soil dry mass, carbonate, water holding, organic carbon content, soil particle size distribution), and quality of soil's biological community were determined.

The anthropogenic influence related to former port activity on soils of the studied area is evident. Soils in the studied area site are highly contaminated by PTSs, mainly Cu and Zn, by 648, 298.6 mgKg<sup>-1</sup> respectively. Former activities proved to affect the microarthropods community altering both quantity and quality of soil and the chemo-physical structure of the microhabitats. The evaluation of soil biological quality index (QBS-ar) of the surface horizons from the study area is demonstrated that the area is “sufferings” since it is affected by PTSs contamination resulting in a failure in the ecological success of secondary recolonization after abandonment. However, there is an increasing need for further research in the soils of Aqaba focusing on soil health management , combining QBS-ar index with soil chemo-physical properties.

**Key words:** Potentially Toxic Substances, Heavy Metals, Soil Quality.