

## ***Plant and microbial contribution to metal mobilization from a Technosol developed on waste dump***

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Technosols are soils whose properties have been largely modified by human activity. Various types of man-made materials, including industrial wastes, are very common within them. Such soils, often containing elevated contents of potentially toxic metal(loid)s, are distributed globally where human activity is intensified and may pose a risk to the environment. In order to fully understand such risks bioweathering processes ongoing on waste piles and associated Technosols should be characterized, requiring complex experimental approaches.

In this regard, this study was aimed at (1) chemical and mineralogical characterization of a Technosol developed on a waste dump, (2) experimental evaluation of metal leaching rates under abiotic and biotic weathering conditions, (3) investigation of plant and microbial contributions to weathering of industrial wastes, (4) analyzes of plant and microbial biomass in terms of metal accumulation capacity, (5) description of the weathering features of the wastes present in the Technosol.

This study demonstrated that (1) pedogenesis in the Technosol studied is reflected in the accumulation of organic matter in surface horizon and more advanced weathering is observed at the bottom of soil profile, (2) microorganisms enhance element release from the Technosol and metallurgical wastes, (3) reactivity of metallurgical wastes in a real-time soil is much slower than bioweathering under laboratory conditions, (4) the plant *Brassica juncea* is more suitable for remediation of waste piles due to accumulation of contaminants in above-ground plant tissues (5) the plant *Festuca rubra* is a good candidate for phytostabilization, because its roots have a large biomass causing deep entry into polluted soil containing waste admixtures, consequently stabilizing pollutants migration. Furthermore, *Festuca rubra* grass covering the pile serves as protective layer preventing dispersal of fine soil particles.

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