

## **Biogeochemistry of meta(loid)s in contaminated soils from former smelting and mining areas**

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### **Introduction**

In the context of ecological risk assessment as well as phytomanagement of contaminated soils, the simultaneous investigation of the biogeochemistry of metal(loid)s and their ecotoxicological effects shows several advantages compared to the determination of the total metal(loid) concentrations in soils establish the hazard source but delivers little information on the risks. Several investigations were performed to assess the speciation, phytoavailability and potential remobilisation of metal(loid)s such as Zn, Pb, Cd, As and Sb in contaminated soils.

### **Material and methods**

Surface soils were sampled from a metallophyte grassland contaminated with Zn, Pb and Cd located at Mortagne-du-Nord (MDN) (North France) and from a former mining settling basin contaminated with As, Pb and Sb located at la Petite Faye (LPF) (Limoges district, France). Two sequential extraction schemes were used to evaluate the metal(loid)s speciation. Soil solution was extracted by Rhizons and DGT (diffusive gradients in thin films) were deployed in the soils to assess the remobilisation of metal(loid)s. To assess the metal(loid)s phytoavailability, a series of selective single extraction procedures were used together with short-term germination tests with dwarf beans whose shoots were analyzed for their biometrical parameters, metal(loid)s concentration and mineralomass.

### **Results and conclusion**

Results indicates that Zn, Cd and Pb were mainly associated with the acid soluble and reducible fractions for MDN, while As, Sb and Pb were mostly associated with residual fraction for LPF. Metal(loid)s concentrations in the bean shoots showed a positive correlation with their extractable concentrations and also soil exposition determined by DGT.