Land contamination by toxic elements in abandoned mine areas in Italy

Abstract
Purpose: The present paper concerns the distribution and mobility of heavy metals (Cu, Pb, Zn and Fe) in the soils of some abandoned mine sites in Italy and their transfer to wild flora. Materials and methods: Soils and plants were sampled from mixed sulphide mine dumps in different parts of Italy, and the concentrations of heavy metals were determined. Results and discussion: The phytoremediation ability of Salix species (Salix eleagnos, Salix purpurea and Salix caprea), Taraxacum officinale and Plantago major for heavy metals and, in particular, zinc was estimated. The results showed that soils affected by mining activities presented total Zn, Cu, Pb and Fe concentrations above the internationally recommended permissible limits. A highly significant correlation occurred between metal concentrations in soils. Conclusions: The obtained results confirmed the environmental effects of mine waste; exploring wild flora ability to absorb metals, besides metal exploitation, proved a useful tool for planning possible remediation projects.