



## **Thallium in fractions of soil formed on glaciofluvial sands and gravel of a Zn-Pb mining and smelting area**

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Thallium is an element highly toxic to animals, plants, microorganisms and humans. It is an accompanying element in lead-zinc ores and is introduced to the environment in the processing of these ores. The concentration of the element in soil strongly depends on the lithology of the parent rock on which the soil was derived. The highest total concentration of thallium in soil was found in soil derived from dolomites, ore-bearing dolomites, limestones and marls and the lowest in soil derived from glaciofluvial sands and gravel. A crucial factor for the potential toxic effect of thallium in the investigated soils is thallium mobility. This can be determined by a sequential extraction of soil. Soil formed on the zinc-lead ore exploration area polluted with thallium was investigated in terms of thallium distribution between soil fractions. The total thallium concentration of this soil was 0.11 ppm. A sequential extraction of soil according to the BCR protocol was performed with an additional initial stage of extraction with water. Apart from labile thallium, thallium entrapped in the residual parent matter was also determined. Thallium was determined by flow injection-differential pulse-anodic stripping voltammetry. The results were compared with those for thallium in fractions of soil formed on the ore-bearing dolomites (containing 1.2 ppm of thallium).

The major fraction of the investigated soil is thallium entrapped in indigestible parent matter (61.9 %). The oxidisable fraction contains 12.4 % of thallium, and the reducible fraction contains 11.5 %, with the carbonate fraction containing 8.5 %, while the water soluble fraction contains 5.7 %. In the case of soils formed on the ore-bearing dolomites, thallium is almost equally distributed between reducible (32.1 %), oxidis-

able (26.4 %) fractions and fraction entrapped in indigestible parent matter (36.3 %).