

## SUMMARY

General aspects and basic research trends on the trace element content of high mushrooms (macromycetes) are presented. Factors influencing the trace element content of mushrooms and the possibilities of using mushroom samples for biogeochemical prospecting are discussed. A broad review on arsenic, gold, antimony and silver content of mushrooms is herewith presented. A large set of analytical results obtained from literature data is presented and statistically elaborated.

In the experimental part, the content of As, Au, Sb, Ag and U in dry weight mushroom fruiting bodies was measured. Samples of soil substrates were analyzed as well. Instrumental neutron activation analysis (INAA) was used as an analytical method. Mushroom samples were collected from 4 localities in general, often with high soil contents of the above mentioned heavy metals. These elevated concentrations are influenced by mining and smelting activities (Příbramsko, Rožná) or by an outcrop of auriferous deposit (Mokrsko). In addition, one clear (unpolluted) area was chosen for study (Káraný).

The arsenic, gold and silver content of mushroom samples depends on the ecological strategy of a particular mushroom species. Terrestrial saprophytes have the highest ability to concentrate arsenic, gold and silver. The trace element content of lignicolous saprophytes is close to that of the mycorrhizal species. Mycorrhizal mushrooms are useful as bioindicators of arsenic, antimony or silver contamination.

The uranium content of mycorrhizal and saprophytic species is low, usually under the detection limit of INAA (0,2 mg/kg). Mushroom samples from extremely polluted localities (dumps) have somewhat higher concentrations, usually under 1 mg/kg U. The antimony content in mushroom samples of both of the above mentioned ecological groups of mushrooms is usually under 300 µg/kg. Samples of mycorrhizal species from extremely polluted areas have significantly higher antimony content, amounting to units mg/kg.

Extremely high concentrations of various elements were found in some mushroom species: *Lycoperdon perlatum* (6955 and 7739 µg/kg Au, Mokrsko), *Paxillus involutus* (9859 and 4917 µg/kg Sb, Mokrsko), *Suillus* cf. *collinitus* (19122 µg/kg Sb, Příbramsko) and *Inocybe* cf. *dulcamara* (14,7 mg/kg U, Rožná). These values are the highest concentrations that have ever been determined!

The trace element content of macromycetes depends on their systematical position. Therefore, there is a theoretical possibility that this feature may be used for taxonomic purposes.

The especially high silver content of many of the edible wild mushroom species (*Agaricus* spp.) represents a possible risk for mushroom consumers.