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Edible Plants and Aquatic Systems in Serpentine Region in Bulgaria

M. Karadjov,[a*] D. Pavlova,[b] M. Marinov,[c] and I. Karadjova[d]

[a] *Geological institute, Bulgarian Academy of Science, Sofia, Bulgaria*

[b]*Department of Botany, Faculty of Biology, University of Sofia, Bulgaria*

[c]*Institute of fisheries and aquaculture, Plovdiv, Bulgaria*

[d]*Department of Analytical chemistry, Faculty of chemistry and pharmacy, University of Sofia, Bulgaria*

*metody@geology.bas.bg

The serpentine soils are formed due to the weathering of ultramafic rock types (peridotites (dunite, wehrlite, harzburgite, lherzolite) and the secondary alteration products formed by their hydration including serpentinite. These soils are generally deficient in plant essential nutrients, have a calcium-to-magnesium (Ca:Mg) molar ratio of less than 1 and have elevated levels of toxic elements such as nickel, cobalt, and chromium. Ecosystems with serpentine soils are generally less productive, however these type of soils might be also used for edible plants growing and the question arising is –what will be the content of essential and toxic content in the plants as well as what will be the influence on the local aquatic systems frequently used for the irrigation of agriculture field. In the present study the concentration of chemical elements (Ca, Mg, Fe, Mn, Zn, Cr, Cd, Pb, As) was determined in aqueous phase and biota in rivers from serpentine region in Bulgaria, situated also in the vicinity of abandon chromium mines. The content of essential and toxic elements (Ca, Mg, Fe, Mn, Zn, Cr, Cd, Pb, As) was determined in edible plants (*P. vulgaris*, *Cucumis sativa*, *Capsicum annuum*, *N. tabacum*, *Lycopersicon esculeutum*, *Solanum tuberosum*) grown in the same region. Samples are collected in one season, chemical elements in all samples (river water, plant and biota) were determined by ICP-MS/ICP-OES. Results obtained will be discussed from the view point:

- Correlation between bioavailable concentration of chemical elements in soil and their content in edible plants.
- Correlation between bioavailable concentration of chemical elements in soil and in aquatic systems –aqueous phase used for plant weathering and biota.

Conclusions will be directed to hazard assessment of toxic elements content in edible plants and in biota used for human consumption.

Keywords: serpentine soil, chemical element, river water, biota.