

Abstract

Purpose: In the course of our investigation, we analyzed physical and chemical parameters as well as heavy metal contents in the urban soils of Sopron, Hungary. Our aim was to identify the main feedback effects between the town and its environment. **Materials and methods:** Altogether, 208 samples were collected at 104 sites at depths of 0–10 and 10–20 cm in a standard network. The results have been represented in a GIS system, providing a useful basis for the research. We measured the following chemical and physical parameters: soil pH (pH(H₂O), pH(KCl)), calcium carbonate content, particle size distribution, humus content, ethylenediaminetetraacetic acid (EDTA) or diethylenetriaminepentaacetic acid (DTPA) soluble Mn, Cu, Zn, and Fe contents. In addition, 24 heavy metals, including Co, Cd, Cu, Pb, Zn, and Ni, were also measured following the method of Lakanen-Erviö. Relationships between these elements were evaluated in both soil layers. **Results and discussion:** In the downtown, most of the soils we investigated were alkaline. Therefore, the pollution of these soils has not yet leached into deeper layers. The Pb content was very high in both layers throughout the whole area of the town. Urban soils with high Cu content have been found mostly from garden and viticulture areas. Cd contents were the highest in the traffic zones, confirmed by the literature, reaching 3 mg Cd/kg soil. The Co and Zn results were below the Hungarian background and pollution limits (discussed below). **Conclusions:** According to the results, we have found the highest average values of heavy metals in the soils of parks, possibly originating from traffic contamination, binding in the soil of urban green spaces, thus possibly affecting human health. In the future, a detailed analysis of these polluted green areas will be carried out. © 2014 Springer-Verlag Berlin Heidelberg.

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