



Heavy metals in garden soils along roads in Szeged, Hungary

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The soils of the urban environment, owing to the various anthropogenic activities, can be contaminated by heavy metals. The traffic is well-known for more decades to be main source of heavy metals mostly in cities. The accumulation of these elements can have different effects, either directly endangering the natural soil functions, or indirectly endangering the biosphere by bio-accumulation and inclusion in the food chain. The hobby gardens and the vegetable gardens directly along roads can be potential risky for people since unknown amount of heavy metals can be accumulated into organization of local residents due to consumption of vegetables and fruits grown in their own garden.

The aim of this study was to determine the heavy metal content of garden soils directly along roads with heavy traffic in order to assess possible risk for human health. The total content and the mobile content of Cd, Co, Cr, Cu, Ni, Pb and Zn have been determined in samples from garden soils along 5 busy roads of Szeged, South Hungary. Enrichment factor has been calculated with the help of control soil samples far from roads. The soil properties basically influencing on metal mobility have also been examined. Finally, the human health risk of these garden soils has been modelled by determination of health risk quotient (HRQ).

As a result of our investigations, it can be claimed that mostly Cu, Zn and to a lesser degree the Ni, Cr and Pb accumulated in garden soils along roads depending on the traffic density. In general, the topsoils (0-10 cm) had higher amount of these metals rather than the subsoils (40-50 cm). Ni of these metals has approached; Cu has exceeded limit value while Pb is under it. Cd is very high in both soils along roads and control ones far from roads. Garden soils along the roads have such basic soil parameters (pH, mechanical soil type, humus content) that prove fairly high metal-binding capacity for these soils. Total risk of usage of these gardens (ingestion of soil, dermal contact, consumption of vegetables) has not exceeded the moderate level in normal case. However, the degree of risk has considerably increased if you consume exclusively vegetables in contaminated garden soils. In this case the risk can be relatively high for the more sensitive children.