
Assessment of Pollution Levels and Human Health Risk of Heavy Metals in Dust Deposited on Urban Tree Leaves (case study: Yerevan)

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Today in urban areas higher plants can become passive biomonitors. Via atmospheric precipitation they deposit airborne particles and associated heavy metals on the surface of tree leaves. The goal of this study was to assess pollution levels and human health risk of heavy metals in dust deposited on Yerevan's tree leaves.

25 tree leaf samples were collected from Yerevan's entire area (2011). The most widespread tree species (*Ulmus laevis*, *Ulmus parvifolia*, *Juglans regia*, *Platanus orientalis*, *Syringa vulgaris*, *Populus alba*, *Morus alba*) having relatively good dust absorption properties were sampled from 1.5 -2 m above the ground, from at least three trees of the same species per sampling site. After pretreatment in the filtrate Cd, As, Pb, Cr, Ni, Co, Zn, Cu, Ag, Hg and Mo were determined by atomic absorption spectrometry (AAAnalyst PE 800).

Heavy metal pollution levels were evaluated by calculating geo-accumulation (Igeo) and summary pollution (Zc) indices. Human health risk was assessed using US EPA Human Health Risk Assessment Model.

The results indicated that mean contents of all elements (except Ni) were higher than local background values. According to the Igeo Yerevan territory is from strongly to extremely polluted by As, Ag, Hg, Mo and Cd. Zc has shown that pollution levels are very high in 36%, high – in 32%, mean -in 12%, and low - in 20% of samples. Health risk assessment has indicated that there exists a probability of noncarcinogenic risk both for children and adults. For children the risk is determined by Mo, Cd, Co, As, for adults – by Mo. Carcinogenic risk via ingestion showed that Cr pose from low to medium, while As from very low to high risk levels. Carcinogenic risk via inhalation pathway was not observed.