

Assessment of heavy metal content in leaves of urban trees in Debrecen (Hungary) and Bangkok (Thailand)



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Abstract

Urban tree species are commonly used for indirect monitoring of heavy metal pollution in urban environments due to their distribution and the cost-effectiveness of the analysis methods. We aimed to determine the spatial variation of heavy metal content in tree leaves at urban, rural and industrial sites in the central provinces of Thailand and also in the city of Debrecen, Hungary. Leaf samples were collected from *Mimusops elengi* and *Ficus religiosa* in Thailand, and *Celtis occidentalis* and *Tilia × europaea* in Hungary. Comparing the two species from Thailand, *M. elengi* contained Al, Cr, Fe, Na and Pb in significantly higher concentrations than *F. religiosa*. Meanwhile, *F. religiosa* contained Ca, Cu, K, Mn and Zn in significantly higher concentrations than *M. elengi*. Between the two species in Hungary, *C. occidentalis* contained significantly more Ba, Ca and Cr, while *T. europaea* contained significantly more Al and Ni. The species showed varying trends in metal content at the urban, rural and industrial sites as well. Ba content was the highest at the rural sites. *T. europaea* samples from the industrial areas contained significantly more Al, Cr and Fe than those from the urban and rural sites. Elemental concentrations for *M. elengi* and *F. religiosa* were consistent at the different sites. Our results highlight the importance of prior assessment and selection of the most appropriate species for biomonitoring studies. Metallic elements can be specific to certain species, while native and invasive species often accumulate pollutants at different rates as well.



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Biography:

Vanda Eva Molnar is a PhD student at the University of Debrecen, in Hungary. She has a master's degree in Environmental sciences, and she is now studying Physical geography and geoinformatics.

Speaker Publications:

1. Pollution Assessment Based on Element Concentration of Tree Leaves and Topsoil in Ayutthaya Province, Thailand
2. Air pollution induced vegetation stress – The Air Pollution Tolerance Index as a quick tool for city health evaluation
3. Ecological Assessment of Particulate Material (PM5 and PM10) in Urban Habitats.
4. Pollution assessment in urban areas using air pollution tolerance index of tree species
5. Urban tree leaves' chlorophyll-a content as a proxy of urbanization

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