Vegetation Pattern and Heavy Metal Accumulation at a Mine Tailing at Gyöngyösoroszi, Hungary

János Tamás and Elza Kovács*

Department of Water and Environmental Management, Centre of Agricultural Sciences, University of Debrecen, H-4015 Debrecen, P.O. Box 10, Hungary. Fax: 36-52-508456.
E-mail: ekovacs@gisserver1.date.hu

* Author for correspondence and reprint requests

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Vegetation at an abandoned heavy metal bearing mine tailing may have multifunctional roles such as modification of water balance, erosion control and landscape rehabilitation. Research on the vegetation of mine tailings can provide useful information on tolerance, accumulation and translocation properties of species potentially applicable at moderately contaminated sites. Analyses of the relationship between heavy metal content (Pb, Zn and Cu) and vegetation in a mine tailing were carried out. These analyses included: (1) spatial analysis of relationship among heavy metal distribution, pH and vegetation patterns, and (2) analysis of heavy metal accumulation and translocation in some plant species. Presence of vegetation was found to be significantly dependent on pH value, which confirms that phytotoxicity is a function of element concentration in solution, which is primarily controlled by pH value in mine tailings. Among the most abundant plant species, dewberry (*Rubus caesius*), vipersbugloss (*Echium vulgare*), scarlet pimpernel (*Anagallis arvensis*) and narrowleaf plantain (*Plantago lanceolata*) accumulate significant amounts of Pb, Cu and Zn, while in the case of annual bluegrass (*Poa annua*) only Pb can be measured in elevated contents. Considering the translocation features, scarlet pimpernel, narrowleaf plantain, and dewberry accumulate heavy metals primarily in their roots, while heavy metal concentration in vipersbugloss and annual bluegrass is higher in the shoots.

Key words: Heavy Metal, Mine Tailing, Vegetation