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Enchasing Anthropogenic Element Trackers for Evidence of Long-Term Atmospheric Depositions in Mine Environs

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Abstract

In this work several bioindication markers were examined as present *vs*. historical archive of anthropogenic emissions, with the aim of elucidating the pathways of enrichments associated with exploitation of Cu, Pb, and Zn minerals deposits in the Bregalnica river basin region. Moss samples and attic dust samples were collected in the investigated area. At each location for attic dust sampling, topsoil samples from the house yards were also collected. Mass spectrometry with inductively coupled plasma (ICP-MS) was applied as analytical technique for determination of of metals content. The Universal Kriging method with linear variogram interpolation was applied for the construction of spatial distribution maps. These elements are normally associated with air pollution (Cd-Pb-Zn), and usually are not influenced by lithological background. This investigation fortifies an extended anthropogenic association (Ag, Bi, In, and Mn) that implement some other anthropogenic activities such as agricultural activities (use of urban sludge, manure and fertilizers) or their occurrence can be a secondary affection from mine poly-metallic pollution. Spatial patterns showed intensive deposition in the areas of Pb-Zn mining activities and copper mine. Long-distance distributions of higher contents of these elements from the mines were not detected.

Keywords: moss; attic dust; soil, metals; ICP-MS; pollution