

Trace element composition of woody vegetation in W-Mo mining area

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The impact of the non-ferrous metals mining on the environment expresses in the involvement of a large amount of heavy metals and metalloids (HMM) into the migration flows and their accumulation in soils, plants and natural waters. The goal of this work is to analyze changes in the trace element composition of the assimilating (needles, leaves) and perennial (bark) organs of Siberian larch (*Lárix sibirica Ledeb.*) and Asian white birch (*Bétula platyphýlla Sukacs*) under the influence of the Dzhida W-Mo mining (DTMM) and processing enterprise in Zakamensk (Russia).

In the background trees, concentrations of the non-ore and accessory metals such as Ba, Mn, Cd, Zn, Sr, Pb typical for the Dzhidinsky complex of soil-forming rocks, were increased in comparison with the global clarks. All the elements, except for Mn in the larch and Sr, Ba, Ni in the birch, have an acropetal distribution pattern, i.e. their content in the ash of the perennial organs considerably exceeds concentrations in the ash of the assimilating ones.

At the Zakamensk territory, the organs of larch and birch are enriched in Cr, W (enrichment factor *EF* equals 86 and 34 respectively), V, Pb, Bi, Sb, Mo (*EF* 13-8), Ni, Cd, Sn, As, Sr (*EF* 6-2) in comparison with the local background. This is due to the uncontrolled disposal of the plant's tailings and emissions from the thermal power and metal smelting plants.

In the impact zone of the DTMM the ontogenetic specialization of the woody plants changes, the accumulation of the cationic elements (Cu, Zn, Sr, Cd, Ba), and specific for the ore occurrences anions (W, Mo) in leaves and needles increases. Besides, the toxic elements accumulate more intensively than the essential ones, which indicates a high level of the environmental stress in the plants. An important feature of larch is the *EF* high values in the needles due to the presence of the wax layer on its surface which firmly binds HMM, along with the sample preparation method.

The intensity of bioabsorption characterized by the ratio of the amount of an element in the plant ash to its amount in the soil, for all HMMs is greater than 1, which specifies the formation of a phytobarrier. Species differences in the metals accumulation are significant: deciduous plants are more selective for Cd and Zn.