

ACTIVE BRYOMONITORING OF INDUSTRIAL ATMOSPHERIC FALLOUT USING DIFFERENT SPECIES OF MOSSES

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A study of atmospheric deposition of chemical elements in the area affected by metallurgical enterprises and highways was carried out using the active bryomonitoring technique by applying two species of Bryaceae and one species of sphagnum moss: *Pleurozium schreberi*, *Dicranum polysetum* and *Sphagnum fallax*. The moss bags were exposed for three months from November to February at a distance of 200-600 m from large metallurgical enterprises Kosogorsk metallurgical plant (production of ferromanganese and steels), Tulachernet, Evraz vanadium - Tula and Polema (production of alloyed steels, cast iron, ferrovanadium and vanadium pentoxide, high-purity chromium, molybdenum, tungsten, metal powders and composite materials) and also at a distance of 2-5 m from the central highways of the city. The concentrations of elements in mosses were determined using ICP-AES.

All the studied species of mosses showed a high level of accumulation of individual elements - pollutants of each metallurgical production. However, the species differed in the degree of accumulation of individual elements. Thus, *Dicranum polysetum* and *Sphagnum fallax* differed in the accumulation of Al, Fe, Mn, V, Cr in the zone of emissions from metallurgical industries. Pb and Hg were actively accumulated by green (Bryaceae) mosses. *Pleurozium schreberi* showed greater sensitivity to the pollution with S, Ni, and Zn. Actively and regardless of the degree of Cu pollution, the element accumulated was accumulated by *Sphagnum fallax*.

The amount of accumulated metals in the area of impact of metallurgical production decreased in the following order: *Dicranum polysetum* > *Pleurozium schreberi* > *Sphagnum fallax*.

Pleurozium schreberi accumulated elements most actively in the area affected by motor vehicle emissions. In the zone of the most active and severe pollution from several sources, a greater degree of accumulation was characteristic for *Dicranum polysetum*. According to the sum of accumulated elements-pollutants, it can be concluded that among the studied species of mosses *Dicranum polysetum* is the most suitable for active bryomonitoring of atmospheric deposition in technogenically polluted urban ecosystems with a high level of industrial pollution.