

Monitoring of Airborne Potentially Toxic Elements Using Moss Bag Technique on Territory of Moscow Parks

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Active biomonitoring using moss bag technique was applied to examine atmospheric deposition of potentially toxic elements and other elements in recreational areas of Moscow. Moss bags with *Sphagnum girgensohnii* were exposed on territory of seven parks (Elk Island, Victory Park, Ostankino, Sokolniki, Izmailovo, Kuzminki-Lublino, Tsaritsyno) at three locations in each park from June to September 2018. The content of 32 chemical elements: Na, Mg, Al, Cl, K, Ca, Sc, V, Mn, Fe, Co, Zn, As, Br, Rb, Sr, Mo, Sb, Cs, Ba, La, Sm, Tb, Hf, Ta, W, Au, Th, U, Cu, Pb and Cd) in moss samples was determined by instrumental neutron activation analysis and atomic absorption spectrometry. After three-month exposure period in some moss samples high uptake of Sb, U, Th, Sm, La, Mo, Zn, Co, Fe, V, Sc, ect. was noticed. Physiologically active elements Cl, K, and the alkali elements Rb and Cs were depleted from the moss tissue during the time of exposure. The high accumulation of Zn, Pb, Cu, Co, V and Sb in moss samples evidence the anthropogenic impact on parks, mainly associated with road traffic. A set of environmental indexes: contamination factor (CF), enrichment factor EF, total pollution index (TPI) and relative accumulation factor (RAF) were calculated in order to reveal the level of pollution. The highest RAF values were obtained for Sb on the territory of all parks. According to EF the samples were enriched in Al, Fe, U, Pb, Cd, Au, Sb, Th, Ta. The high CF values were obtained for sites located close to road traffic in Elk Island, Izmailovo, Tsaritsyno and Kuzminki-Lublino. According to TPI the level of air pollution on territory of abovementioned parks varies from moderate to high. In order to identify the major sources of pollution correlation and principal components analyses were applied.