



## Multifactorial biogeochemical monitoring of linden alley in Moscow

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The ecological and biogeochemical assessment of the linden alley within the Kosygin Street was conducted by means of an integrated comparative study of soils, their chemical composition and morphological parameters of leaf linden. For this purpose 5 points were tested within the linden alley and 5 other points outside the highway. In soils, water extract of soil, leaf linden the content of Cu, Pb, Mn, Fe, Cd, Zn, As, Ni, Co Mo, Cr and Se were determined by AAS and spectrofluorimetric method [1]. Macrocomponents (Ca, Mg, K, Na, P, sulphates, chlorides), pH and total mineralization of water soil extract were measured by generally accepted methods. Thio-containing compounds in the leaves were determined by HPLC-NAM spectrofluorometry [2]. On level content of trace elements the soils of "contaminated" points different from background more high concentrations of lead, manganese, iron, selenium, strontium and low level of zinc. Leaf of linden from contaminated sites characterized by an increase of lead, copper, iron, zinc, arsenic, chromium, and a sharp decrease in the level of manganese and strontium. Analysis of the aqueous extracts of the soil showed a slight decrease in the pH value in the "control" points and lower content of calcium, magnesium, potassium, sodium and total mineralization of the water soil extract. The phytochelatins test in the leaves of linden was weakly effective and the degree of asymmetry of leaf lamina too. The most differences between the variants were marked by the degree of pathology leaves (chlorosis and necrosis) and the content of pigments (chlorophyll and carotene). The data obtained reflect the impact of the application of de-icing salts and automobile emissions.

### References

1. Ermakov V.V., Danilova V.N., Khyshvakhtova S.D. Application of HPLC-NAM spectrofluorimtry to determination of sulfur-containing compounds in the environmental objects// Science of the biosphere: Innovation. Moscow State University by M.V. Lomonosov, 2014. P. 10-12.
2. Ermakov V.V., Tyutikov S.F., Khushvakhtova S.D., Danilova V.N., Boev V.N., Barabanschikova R.N., Chudinova E.A. Peculiarities of quantitative determination of selenium in biological materials// Bulletin of the Tyumen State University Press, 2010, 3, 206-214.

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