



## Evaluation of soil texture and change in amounts of heavy metals in soil under industrial pressure

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**A b s t r a c t** Long lasting industrial pressure causes adverse changes in the soil: changes in its texture, increase in amounts of heavy metals, etc [1,2,3,4]. The main goal of this work is to investigate changes in texture of polluted soil and the increase in amounts of Mn, Cu and Zn, the dominant heavy metals in the soil at the Creosote Saturation Plant (CSP) in the vicinity of Primeval Forest in Białowieża, Poland. The CSP has been the main source of chemical pollution of soil in the area since 1939. The control site is located near the CSP along the river Nurczyk on the same type of soil.

The methodology applied to the analysis of soil samples from the polluted and control sites consists of connecting two procedures [3]: 1) division of the soil mass into partial mass referring to each fraction of soil grains by the sieve method and 2) determination of the amounts of heavy metals in each fraction of the grains by the ICP method. The mass of the fraction is proportional to the number of grains in it. The changes of the fraction mass and changes in amounts of heavy metals in the polluted soil are determined from the comparison of measurements from polluted and control soils.

Analyses of the distribution of the mass of fractions from the area of the CSP indicated a noticeable “shift” in the fractions of soil grains of larger size into the fractions of the grains of smaller size. Analysis of heavy metal distribution shows that the majority of increased amounts of Mn, Cu, Zn are concentrated mostly in the fraction of the grains with diameters < 0,2 mm, and that the rate of change of their amount is almost identical as the rate of change of the mass of the fractions of the same grains. The overlap between the two rates indicates a motion of ions and atoms of Mn, Cu and Zn from the topsoil into the deeper layers.

**K e y w o r d s:** industrial pressure, soil texture, soil grains, heavy metals.

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