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AVAILABILITY OF LEAD IN THE PINE SEEDLINGS GROWING IN THE POLLUTED SOIL

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ABSTRACT

To provide an effective evaluation of the pool of bioavailable trace elements, therefore, techniques based on both soil tests and plant analyses should be used together. One of the most important factors that determine the biological availability of a trace element is its binding to soil constituents. The rate of these toxically elements in the plant depends strongly of the pH and other ions.

The aim of current investigations is to define absorption process of lead in the pine seedlings using different experimental conditions. Two year's old pine seedlings were taken from Valkas hatchery. Each tree was planted in the polyethylene bag in the control area to ensure the similar conditions for all experiments. These trees were grown in Botanical garden of University of Latvia three years till the beginning of current experiment. During the spring in April the solution of different concentrations of lead nitrate and nitric acid mixture were added in the soil of each pine seedling. A small pit around the tree was made and the prepared solution was poured in the soil.

Samples of treated pine seedlings were collected in autumn. Roots, trunks, needles and soil were taken as samples for analyses. Soil samples were air dried and for the extraction of lead the mixture of 1M nitric acid with 30% hydrogen peroxide were chosen. Fine root samples, needles, trunks were also air dried. The samples for the analysis were prepared using dry mineralization. The total concentration of lead in the all seedling samples and soil extracts was determined by flame atomic absorption spectrometry.

To evaluate efficiency of tree pollution with lead in the environment it is necessary to collect the samples collect twice a year in spring (April) and in autumn (September). The intake efficiency can by affected by dormancy period. It is clearly shown from the current experiments that fine roots serves as natural barrier of toxic elements. The rather high concentrations of lead do not influence it the appearance in the pine needles. Pine needles are green and stretch from spring till autumn. In our opinion some part of roots die off, but other fine roots which are in deeper layer, can suck water and mineral substances from non – polluted local area.