HEAVY METAL ACCUMULATION IN ROOTS OF *TARAXACUM OFFICINALE* WIGG

Irina Komarova
Kryvyi Rih State Pedagogical University, Kryvyi Rih, Ukraine
Irinysich@i.ua

Soil is an active acceptor for some elements, heavy metals in particular. Microelements are firmly sorbed and interact with soil humus layer. At the same time some plants are resistant to soil contamination and can be used as bioindicators. For this very reason the use of the most common urban flora species in the system of ecological monitoring enables to assess pollution level of various cities and industrial agglomerations.

The objective of the paper is to assess protective attributes and specifics of translocation of different threat level elements of a synanthrope – *Taraxacum officinale* Wigg. The object of the study is the roots of *Taraxacum officinale* and the soils of plant habitat. Soil sampling from 0–10 cm layer and plants roots were taken in late September, sample preparation was performed according to established practices. The content of total and mobile (in ammonium acetate extraction pH=4.8) forms of Zn Pb Cu Ni Cd in soils and elements in plant material was determined by atomic absorption spectrophotometer C-115 (manufacturer Ukraine). Translocation coefficient was calculated as ratio of element content in plants roots to its mobile forms content in soil (Barman et al., 2000; Gupta et al., 2008). Statistical processing of experimental data was conducted according to standard methods of parametric statistics at 95% significance level (Yegorshyn, 2005).

Technogenicity of heavy metal mobile forms for the areas of high and moderate contamination forms a falling row which is ranked as follows: Zn>Pb>Cu>Ni>Cd. For sampling sites of insignificant level and conditional control heavy metal accumulation row is ranked as follows: Zn>Ni>Pb>Cu>Cd.

The results of the determination of Ni Cu Zn Pb and Cd content in plants roots indicate that *Taraxacum officinale* is capable of their accumulation. A consistent pattern of HM accumulation for the areas with varying degrees of contamination isn't observed. The conditional control forms a falling row, which is ranked as follows: Zn>Ni>Pb>Cd>Cu, that is congruent with mobile forms content, apart from cadmium and copper. Similar accumulation series, which are ranked as follows Zn>Cd>Ni>Pb>Cu, was observed for the sites near the passage leading to rolling mills in Ryazanov street. Concurrently the content of Ni and Cu for a slightly contaminated area is statistically inaccurate.

However, the characteristics of environment contamination level requires ascertaining of both mobile forms of pollutants in the soil and the index of metal transition in the system "soil-plant". In view of this, translocation factors were calculated or barrier block "soil – plants roots". Strong anticoncentration barrier subject to control and pollution (translocation indices < 1.0), was proved for cadmium only. However, at one of high-level sampling sites it is > 1. Under contamination conditions *T. officinale* does not concentrate copper and zinc (translocation indices > 2.0). Consequently, Zn is an absolute leader in accumulation and bareer-free migration in the system "soil-plants roots".

In conditions of heavy metal technogenic pollution environmental driver of plants ultimate composition forming plays a significant part. In our research we were observing mobility decrease of one of the most dangerous elements – Cd. Although its content in roots makes which difference, strong anticoncentration barrier is fixed subject to control and pollution. The leader in accumulation in both soil and plants roots is Zn, which reaches vegetative organs in bareer-free manner.

The interrelation between heavy metal accumulation in soil and plants roots enables to use *Taraxacum officinale* for applying phytoindication. We consider it essential to conduct further detailed research of *Taraxacum officinale* adaptive reactions with a view to further creating of bioindication scales.

Key words: Phytoremediation, Heavy Metals, *Taraxacum officinale*