

DYNAMICS OF RESISTANCE OF LOCAL DANDELION POPULATIONS TO HEAVY METAL POLLUTION OF SOILS

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Abstract. *Background.* The toxicity of heavy metals (HMs) ions contributed to the development of homeostasis mechanisms and/or determinants of resistance to HMs in living organisms. In contaminated environment, the development of HM-tolerant ecotypes occurred relatively fast. However, there is very little information about the adaptation rate of plant populations to anthropogenic pollution of HMs. The research traced the long-term dynamics of the local *Taraxacum officinale* Wigg. s. l. populations resistance to anthropogenic soils pollution with HMs in the conditions of a geochemical anomaly with an increased Zn and Ni content in the parent rocks. *Materials and methods.* The test sites were placed in biotopes, differing in the degree of anthropogenic load on the territory of the Mordovia Republic (Saransk-Ruzaevka urban agglomeration) and of the Nizhny Novgorod region (the cities of Sarov and Pervomaisk). At each test site HMs concentrations were measured in soil samples, and dandelion seeds were collected. The seeds were germinated under controlled conditions on water (control) or on media containing from 10 to 1,000 μM of Cu^{2+} , Ni^{2+} , Zn^{2+} or Pb^{2+} ions. After 21 days of the experiment, the HM-sensitive adaptive parameters of plants were measured. Descriptive statistics was made in the MS Excel program. The significance of the differences between the experiment variants was assessed by the Duncan test at $p \leq 0.05$. To assess the plants adaptation degree to HMs, the adaptation index (IA_{HM}) was used. *Results and conclusions.* Seventeen-year monitoring of local populations from different locations in Mordovia and the Nizhny Novgorod region allowed us to conclude that formed populations of *Taraxacum officinale* Wigg. s. l. are in different stages (from oecads to edaphotypes) of adaptation to HMs. In most of the studied locations, the tolerance of populations increased if the soils HMs concentrations increased. However, in almost all the studied locations, the degrees of adaptation of local dandelion populations to Ni^{2+} and Zn^{2+} ions were higher than those to Pb^{2+} and Cu^{2+} .

Keywords: *Taraxacum officinale* Wigg. s. l., adaptation index, heavy metals, geochemical anomaly, oecad, edaphotype

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