International Journal of Academic Scientific Research
ISSN: 2272-6446 Volume 9, Issue 1 (February - March 2021), PP 19-27

Bioaccumulation and translcation of metals in selected plants from fam Apiaceae

Gorica Djelic[1]*, Sinisa Timotijevic, Zoran Simic[2]

[1]*University of Kragujevac, Faculty of Sciences,* Department of Biology and Ecology
R. Domanovic 12, 34000 Kragujevac, Serbia
[21]*University of Kragujevac, Faculty of Sciences,*Department of Chemistry,
R. Domanovic 12, 34000 Kragujevac, Serbia

** Corresponding author: Gorica Djelic, e-mail gorica.djelic@pmf.kg.ac.rs*

Abstract: *The paper analyzes heavy metals (Mn, Ni, Fe, Cu, Zn, Ca, Mg) in plant species Petroselinum crispum Mill., Daucus carota L., Conium maculatum L. and in the land on which they grow. The aim of the research is to determine the differences in the acceptance, distribution, and accumulation of metals between the investigated species, based on the content of metals in the plant organs (root, tree, leaf, and fruit), based on the bioaccumulation coefficient, bioconcentration and translocation factor. The atomic absorption spectrophotometer determines the amount of metal in the soil and plant material. Results showed that in the investigated soil there were the highest Fe levels, but in quantities not exceeding the maximum permitted concentrations. The content of Mn, Fe, Cu in all analyzed plants is elevated. Follows the sequence of heavy metals on the basis of total quantity in the species P. crispum Ca>Mg>Fe>Mn>Zn>Ni>Cu, and for the species D. carota, C. maculatum, Ca>Mg>Fe>Zn>Mn>Cu>Ni. There is a significant intraspecies difference in the distribution of the examined elements.*

Keywords: *Apiaceae, metals, bioaccumulation, bioconcentration, translocation*

I. INTRODUCTION

At the beginning of the 20th century, contamination of an environment with heavy metals rapidly increased and represented a major ecological and health problem worldwide. [1]. Natural, heavy metals are widely represented in the Earth's crust and originate from metamorphic walls [2] [3]. Although natural constituents of the geological substrate, the higher level of heavy metals in the substrate are also caused by human activities and is a far more serious problem. Every type of heavy metal pollution has a negative impact on plants, animals, and human health. Heavy metals in the environment are often carcinogens and mutagens [3].

Plant species can absorb accumulated harmful substances (including heavy metals) from the soil. Therefore, they play an important role in soil Plant species can absorb accumulated harmful substances (including heavy metals) from the soil. Therefore, they play an important role in soil bioindication[4].

The uptake potential of heavy metals in plants depends on the amount of metals in the soil, their bioavailability [5] [6]. They develop mechanisms (accumulation and exclusion) that protect them from the toxic effects of metals. Adopted pollutants are retained at plant roots and/or translocated to the aboveground parts [7]. Due to the ability to absorb heavy metals from the external environment, plants have found great application in biotechnologies for remediation of polluted habitats. [7]. However, due to the accumulation of heavy metals, the use of plants from contaminated terrains in nutrition and treatment is not allowed.

The aim of the research is to determine the differences in the absorption, distribution, and accumulation of heavy metals (Mn, Ni, Fe, Cu, Zn, Ca, Mg) in *Petroselinum crispum* Mill., *Daucus carota* L., *Conium maculatum* L., based on quantitative content of Mn, Ni, Fe, Cu, Zn, Ca, Mg in the underground and above-ground organs of species, bioaccumulative factor (BAF), bioconcentration factor (BCF) and translocation factor (TF) for all metals in the investigated species.