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RESEARCH ON WASTEWATERS BIOREMEDIATION WITH AQUATIC SPECIES FOR CONSTRUCTED WETLANDS

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Abstract

With the aim of contribute to a bioremediation technology drafting, this paper presents a preliminary research on bioremediation of wastewaters polluted with heavy metals and other toxic contaminants. Bioremediation tests were performed with aquatic species *Lemna minor*, *Vallisneria spiralis*, *Eichhornia crassipes*, *Hydrilla verticillata*, *Pistia stratiotes*, *Cladophora glomerata*, on samples of contaminated waters resulting from the toxic pond of waste landfill Șomârd-Mediaș, Sibiu County, Romania, during the 2012-2013 period. The studies were conducted in microcontainers with contaminated water using constructed wetlands. In order to check the phytoextraction and bioremediation potential of these species, a comparative analysis of water samples was performed, based on the determination of heavy metals and different pollution parameters. The results on phytoextraction tests have shown that: *L. minor* plants were able to extract Cu, Fe and Pb; *V. spiralis* plants were able to extract Cu, Fe, Zn and Ni; *H. verticillata*, *E. crassipes*, *P. stratiotes* and green algae *C. glomerata* were able to extract Cu, Fe and Zn. This research has shown that the aquatic plants grown for two weeks in the toxic pond water have important effects on wastewater bioremediation. All species have shown a significant decrease of NH_4^+ concentration. *L. minor*, *V. spiralis*, *H. verticillata*, *E. crassipes*, *P. stratiotes* have determined the increase of Eh and the decrease of CCO-Mn, TDS, EC. Stronger effects of bioremediation in the tests with ½ diluted water from the toxic pond were recorded. The results prove the significance of the bioremediation of contaminated waters using aquatic species for constructed wetlands in order to implement this biotechnology.

Key words: bioremediation, *Eichhornia crassipes*, *Lemna minor*, *Pistia stratiotes*, *Vallisneria spiralis*

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