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ENHANCEMENT OF PHYTOREMEDIATION ABILITY OF *Medicago sativa* BY THE MYCORRHIZAL FUNGUS *Glomus intraradices*

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Abstract

Phytoextraction and phytoimmobilization are promising technologies for the reclamation of heavy metals polluted areas based on the ability of plants to extract metals from the soil and accumulate/ immobilize them in their tissues. Arbuscular mycorrhizal (AM) fungi (AMF) are key organisms of the soil/plant system able to increase plant nutrition and soil physico-chemical characteristics and are considered a promising tool for improving the efficiency of phytoremediation. AMF, that form symbioses with most of terrestrial plant species, occur also in heavy metal rich soils, where they may alleviate plant metal stress as a result of a better nutritional status of mycorrhizal plants. Moreover, they may directly interact with soil metals by means of dense extraradical hyphal networks producing, glomalin, a metal binding protein. Here we tested the effect of a strain of the AM fungus *Glomus intraradices*, isolated from serpentine soils, on the growth and metal accumulation of the common forage legume lucerne *(Medicago sativa* L.) grown in a multi-metal (Cd, Cu, Pb) polluted substrate. Plant biomass, mycorrhizal colonization and metal concentration in the plants organs were measured after 4 months' growth. Substrate multi-metal pollution strongly affected plant growth and mycorrhizal colonization. Plants biomass as well as the distribution of the metals in plant organs were significantly different between mycorrhizal and non-mycorrhizal plants. Mychorrizal plants showed larger growth and higher content of heavy metals both in shoots and roots, compared with non-mycorrhizal plants.