

Efficacy of *Pisum sativum* and Arbuscular Mycorrhizal Symbiosis for Phytoextraction of Heavy Metalloids from Soil

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Abstract : A pot experiment was conducted to investigate the effect of Arbuscular mycorrhizal fungus (AMF) on metal(loid) uptake and accumulation efficiency of *Pisum sativum* along with physiological and biochemical response. Plants were grown in soil spiked with 50 and 100 mg kg⁻¹ Pb, 25 and 50 mg kg⁻¹ Cd, 50 and 100 mg kg⁻¹ As and a combination of all three metal(loid)s. A parallel set was maintained and inoculated with arbuscular mycorrhizal fungus for comparison. After 60 days, plants were harvested and analysed for metal(loid) content. A steady increase in metal(loid) accumulation was observed on increment of metal(loid) dose and also on AMF inoculation. Plant height, biomass, chlorophyll, carotenoid and carbohydrate content reduced upon metal(loid) exposure. Increase in enzymatic (CAT, SOD and APX) and nonenzymatic (Proline) defence proteins was observed on metal(loid) exposure. AMF inoculation leads to an increase in plant height, biomass, chlorophyll, carotenoids, carbohydrate and enzymatic defence proteins ($p \leq 0.001$) under study; whereas proline content was reduced. Considering the accumulation efficiency and adaptive response of plants and alleviation of stress by AMF, this symbiosis can be applied for on-site remediation of Pb and Cd contaminated soil.

Keywords : heavy metal, mycorrhiza, pea, phytoremediation

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