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EFFECTS OF ALUMINUM AND LEAD ON THE DEVELOPMENT OF *Rhizophagus irregularis* AND ROOTS IN ROOT CULTURES

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Abstract

Most studies exploring the contribution of the mycorrhizal symbiosis to plant metal tolerance focus on plant-metal uptake and disregard metal effects on the symbiotic fungi. We examined the tolerance of the model arbuscular mycorrhizal fungus *Rhizophagus irregularis*to Al and Pb *in vitro* cultures with transformed carrot (*Daucus carota* L.) roots that exclude the interference of other microbiota. We studied the development of roots and external mycelium of *R. irregularis* in monoxenic and axenic cultures with increasing concentrations of Al and Pb. Structures (roots, hyphae, spores) were quantified every month and root and extra-radical mycelium dry biomass were determined in final harvests. Root biomass tended to decrease with increasing Al concentrations and to increase with the highest Pb concentrations. These trends were similar for nonmycorrhizal and mycorrhizal carrot roots. Al or Pb did not reduce biomass of the external mycelium of *R. irregularis*. On the contrary, both metals promoted fungal growth at the highest concentrations. These results show a differential response of roots and mycorrhizal mycelium to metal exposure. They suggest that mycorrhizal mycelium development is more likely constrained indirectly through root growth inhibition and plant carbon shortage than by their own tolerance limits to aluminum.

Key words: aluminum, arbuscular, fungi, lead, metal, mycorrhizal, root

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