

Effects of Arbuscular Mycorrhizal Fungi on Soil Glomalin and Carbohydrate Concentration at Different Salinity Levels

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Abstract

Arbuscular mycorrhizal fungi (AMF) are widespread endosymbionts in terrestrial ecosystems and their exudates have important effects on soil properties. A greenhouse experiment was conducted with six AMF treatments including four exotic species inoculums (*Funneliformis mosseae*, *Claroideoglomus claroideum* and *Rhizophagus irregularis* and a mixed isolate of three species), one mixed native AMF species treatment and a sterilized soil (control) with four salinity levels (1, 5, 10 and 15 dS m⁻¹). AMF increased the soil (EEG) and total (TG) extractable glomalin, and also the hot water (HWC) and diluted acid (DAC) extractable carbohydrates compared to control treatment in all salinity levels. The native AMF species had the greatest effects on EEG, TG, HWC and DAC at 10 and 15 dS m⁻¹. Soil EEG and TG concentrations were higher in the mixed exotic AMF treatment than in each AMF species. The greatest glomalin concentration was related to *F. mosseae* at 1, 5 and 15 dS m⁻¹ but at 10 dS m⁻¹ the greatest glomalin concentration was related to *C. claroideum*. The greatest carbohydrate concentration was related to *F. mosseae* at 1 and 5 dS m⁻¹ but at 15 dS m⁻¹ significant differences were observed among the three AMF species. Our results showed that there is an interaction between salinity and different AMF species, and a combination of them determines the function of AMF.

Keyword: Arbuscular mycorrhizal fungi, salinity, glomalin, carbohydrate.

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