

Publication

Impact of water regimes on an experimental community of four desert arbuscular mycorrhizal fungal (AMF) species, as affected by the introduction of a non-native AMF species

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Author(s) Symanczik, Sarah; Courty, Pierre-Emmanuel; Boller, Thomas; Wiemken, Andres; Al-Yahya'ei, Mohamed N

Author(s) at UniBasel [Boller, Thomas](#) ; [Wiemken, Andres M.](#) ; [Symanczik, Sarah](#) ; [Courty, Pierre-Emmanuel](#) ; [Al-Yahya'ei, Mohamed](#) ;

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Field studies have revealed the impact of changing water regimes on the structure of arbuscular mycorrhizal fungal (AMF) communities, but it is not known what happens to the abundance of individual AMF species within the community when the water conditions in the rhizosphere change. The behavior of four AMF species isolated from the Arabian desert (*Diversispora aurantia*, *Diversispora omaniana*, *Septoglomus africanum*, and an undescribed *Paraglomus* species) was investigated when assembled in microcosms containing *Sorghum bicolor* as host plant, and treated with various water regimes. Furthermore, the impact of invasion of these assemblages by *Rhizophagus irregularis*, an AMF species widely used in commercial inocula, was studied. The abundance of each AMF species in sorghum roots was measured by determining the transcript numbers of their large ribosomal subunit (rLSU) by real-time PCR, using cDNA and species-specific primers. Plant biomass and length of AMF extraradical hyphae were also measured. The abundance of each AMF species within the sorghum roots was influenced by both the water regime and the introduction of *R. irregularis*. Under dry conditions, the introduction of *R. irregularis* reduced the total abundance of all native AMF species in roots and also led to a reduction in the amount of extraradical mycelium, as well as to a partial decrease in plant biomass. The results indicate that both water regime and the introduction of an invasive AMF species can strongly alter the structure of an AMF native assemblage with a consequent impact on the entire symbiotic mycorrhizal relationship.

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