

Abstract

The importance of arbuscular mycorrhizal (AM) symbiosis for survival and growth of many plant species is generally recognized. It has been repeatedly shown that symbiosis with mycorrhizal fungi can increase the fitness of many plant species. This increasing fitness is caused by increased uptake of phosphorus and other nutrients or pathogen protection. Most studies on mycorrhizal associations explore these types of relationship using single plant population and single fungal species. This contrasts with many studies that show local adaptations of plant populations to environmental conditions. Recently it has also been shown that fungal species may have themselves different adaptations at different localities. In spite of this knowledge only few recent studies consider both differences between plant populations and their possible local adaptations to environmental conditions at their localities as well as differences in the abundance and composition of AM fungal communities and possible local adaptations of plants directly to these communities.

We studied interactions of plants from different populations of *Aster amellus* (an endangered species of the Czech Republic) with AMF in their natural habitats and in a pot experiment where plants from different populations were inoculated with two different AMF isolates (*Glomus mosseae* BEG25 or *G. intraradices* BEG75) and cultivated either in the soil of the population origin or in soil for other *A.amellus* population.

Results of both field sampling and pot experiment indicate that mycorrhizal colonisation of plant roots differs significantly depending on plant identity and the soil origin. In addition, growth response of plant populations differs between the AMF isolates. All this indicates that differences in root colonization are result of local adaptations of plants to AM symbiosis and that conclusion on species response to AM fungi must be based on studies at multiple sites. I repeated the pot experiment with all 3 populations from each region, their soils and indigenous fungal isolates. Due to the long process of fungal isolation, the experiment was started in the spring 2006, so the results are not complete yet. Preliminary results indicate that there are differences in growth between different fungi, soil and populations. There is, however, no agreement in conclusion between populations within regions.