

ABSTRACT

The thesis deals with the effect of arbuscular mycorrhiza (AM) on the growth of selected plant species at a locality in České středohoří. This locality is characterized by close neighborhood of a semi-natural dry grassland and a former field abandoned in the 1990s, typical for the mosaic of biotopes in the region. The study is based on previous findings that some plant species, which are common at the semi-natural dry grasslands, do not colonize the abandoned fields. As AM is an important factor affecting diversity and productivity of plant communities we hypothesized that this phenomenon could be related to changes in AM fungal communities at the abandoned field.

The hypothesis was tested in a greenhouse pot experiment with three taxonomically related pairs of plant species, always one species growing at the abandoned field and the second one not. Growth and phosphorus uptake of the plants was followed in soils of both biotopes after factorial inoculation with AM fungal communities from both biotopes. The experiment was complemented by description of AM fungal communities in the roots of six plant species pairs from the locality using terminal restriction fragment length polymorphism (T-RFLP).

The greenhouse experiment revealed positive mycorrhizal response in all plant species, but the origin of inoculum did not have any substantial effect. Plants grew better in the soil from the dry grassland, but mycorrhizal response was more pronounced in the soil from the abandoned field. The mycorrhizal response of a plant species depended on taxonomic group, plants of the two ecological groups did not consistently differ in mycorrhizal response. The composition of AM fungal communities was affected rather by biotope than by plant species. Root samples from the abandoned field had higher diversity and frequency of AM fungal taxa.

Thus, AM symbiosis probably does not influence the ability of plants to colonize the abandoned field. The composition of AM fungal communities at this biotope indicates their restoration after previous intensive agricultural practice.

KEY WORDS: arbuscular mycorrhizal symbiosis, arbuscular mycorrhizal fungi, abandoned field, mycorrhizal growth response, T-RFLP