

Does the mycorrhizal fungi distribution limit the orchid establishment in restored meadows?

Tamara TĚŠITELOVÁ¹, Hélène VOGT-SCHILB^{1,2,*}, Lada KLIMEŠOVÁ¹,
Pavel SUCHÁČEK¹, Milan KOTILÍNEK¹, Jana JERSÁKOVÁ¹

¹ Faculty of Science, University of South Bohemia, České Budějovice, Czech Republic

² Centre d'Ecologie Fonctionnelle et Evolutive, Montpellier, France

* helene.vogtschilb@gmail.com

In the Czech Republic, vast areas of former species-rich grasslands converted into arable land are undergoing restoration using seeding of regional plant species and regular mowing. Recovery of species with complicated life cycles, such as orchids, is particularly slow though the seed source populations grow in close vicinity. Orchids are obligately mycorrhizal plants which need mycorrhizal fungi (mainly saprotrophic fungi from Tulasnellaceae, Ceratobasidiaceae or Serendipitaceae) for germination. We focused on seven both rare and common orchid species and investigated (i) *in situ* germination and (ii) *in vitro* germination and specificity. Only two rather common orchid species (*Neottia ovata* and *Gymnadenia conopsea*) germinated in the restored grasslands while others germinated only in undisturbed natural grasslands with established orchid populations. *Gymnadenia conopsea* showed also lowest specificity to mycorrhizal fungi during *in vitro* germination. Thus, diversity of orchid mycorrhizal fungi in restored habitats may be one of the factors limiting the establishment of some orchid species. The slow restoration of orchid species due to absence of appropriate fungi could be potentially overwhelmed by targeted introduction of fungi and substrate amelioration of restored sites.