Abstract

Semi-natural grasslands are among the most threatened habitats in Europe, endangered mainly by cessation of former management practices and conversion into other types of land use. Extensive research has been carried out in European grasslands in last decades, to explain origins of diversity and to provide guidelines for its conservation. However, the very slow response of perennial plants to landscape changes often impedes to accurately evaluate why species occur just where they occur and not elsewhere. Abandoned fields are perceived as potential habitats for species from declining grasslands. Indeed, many species are able to spontaneously colonise abandoned fields, but many other species are absent from communities that develop there. An important question remains what limits their successful establishment. By answering this question, we can gain also important insights into factors determining species distribution in grasslands because colonization of recently abandoned fields by grassland species is the ongoing process which is not obscured by historical changes in landscape structure. The very basic aim of this thesis was to evaluate the *status quo* of dry grassland plants in fields abandoned in last two decades. And in the second step, to identify what are the main constrains of successful colonization, both at the level of environment and of species traits.

I proved that abandoned fields in the study region could be successfully colonized by species that are also common in dry grasslands (Chapter 1 and 4). For these species, abandoned fields likely represent suitable habitat. However, rare dry grassland species occur only sporadically in these fields and mainly in edges only. These species are presumably much more restricted to dry grasslands, either due to narrow habitat requirements or poor dispersal, and their conservation therefore relies on proper management of their current habitats. According to seed addition experiment (Chapter 2) the probability of establishing a viable and fertile population is largely constrained by the vigour of resident vegetation. The effect of seasonal variability emphasizes the necessity of temporal replication of seed addition experiments.

I have successfully tested novel approach for measuring habitat isolation, using distance and species richness of source habitats (Chapter 1). I have also shown that inclusion of habitat characteristics when testing for the effect of habitat isolation might considerably alter conclusions. I therefore recommend using both tests with and without inclusion of habitat characteristics in the future. I believe that these methodological improvements might push forward our understanding of factors that influence species richness not only in grasslands but also in other communities of perennial plants restricted to fragmented habitats.

In general, I found that species colonization success can be only hardly predicted based on traits related to dispersal, habitat requirements or competitive ability. The best predictor I found was niche width (Chapter 3), which also partly correlated with species frequency in source grasslands. The latter was by far the most strongly related to species frequency in abandoned fields (Chapter 3) and also to species ability to equally colonize field edges and interiors (Chapter 4). I think that it is unlikely that despite a wide range of traits under study there are still some very influential hidden traits that determine species abundance in both source and target habitats. Rather, this tight relationship between species frequency in dry grasslands and in abandoned fields implies some kind of positive feedback and indirectly confirms the role of neutral mechanisms in community assembly.

I have assessed number of factors that influence colonization process, both from environmental and species perspective. Nevertheless, the study system of dry grasslands and abandoned fields still offer challenges for future research and provide opportunities for testing interesting ecological hypotheses.