Successional changes of sub-mountain grassland vegetation of the Horné Požitavie region (Slovakia)

Andrej Bača
Institute of Landscape Ecology – Slovak Academy of Sciences (Bratislava - branch Nitra),
Akademická 2 (P.O.BOX 23/B) 949 01 Nitra, Slovak Republic
Tel. +421-37-7335-601, e-mail: *andrej.baca@savba.sk*

ABSTRACT:
This PhD-thesis (not yet completed) deals with structural changes of plant communities in the first stage of secondary succession on partially or completely abandoned grasslands where woody vegetation does not prevail yet and the localities are still interesting for re-applying of management. Used meadows and pastures provide to society several kinds of services that are vulnerable to abandonment because of various economic and social reasons. This study aims at evaluation of the level and the rate of changes in vegetation structure and species diversity (comprised their equitability) of different vegetation types in the selected region. Changes of community structure will be assessed through plant functional types to allow interregional comparisons. Some management and ecological factors (e.g. distance from the village, soil quality a. o.) that underlie the reasons of abandonment will be analysed as well.


Photo: Juraj Hreško

INTRODUCTION

Grasslands constitute a significant component of many landscapes. They exist on places suitable for herbs and grasses where soil is not ploughed and woody vegetation cannot grow under natural conditions or was secondarily removed and its comeback is hindered usually by mowing or grazing. Grasslands have **several functions** that provide to society various services: production of biomass (for different use), soil protection, water regime regulation, maintaining of biological richness and ecological balance in the landscape, health, recreation and cultural functions.

Majority of grasslands in Europe depends on their management and when this becomes less intense or ceases at all, their vegetation starts changing towards woods, what is called **secondary succession**. This process is expressed mainly in changes of species diversity (the number of species in an area and their relative abundance) as well as of functional diversity (regarding biotic processes and components that influence them). The latter may be represented by plant functional types (PFT) that are categories of species with different plant traits that influence the abundance of species and ecosystem functioning. Moreover PFT allow interregional comparisons of vegetation.


Photo: Andrej Bača

After abandonment, competitive grasses begin to prevail and not removed dead biomass hinders several other plants' growth.


Photo: František Petrovič

Land-use change affects species diversity.

METHODS AND WORK DONE

The research is based on **vegetation records** taken representatively from different managed and abandoned localities throughout the area. Ecological and management **factors** (geographical, soil and moisture parameters, time of abandonment) are identified for each locality for further analyses. Vegetation from records will be classified into **vegetation types** with the help of statistic methods (gradient analyses). In 2004-2005, about 60 vegetation records were taken together with data on factors. Now they will be processed and analysed.

Vegetation changes are to be assessed within distinguished vegetation types. **Species diversity** changes will be identified through a biodiversity index (complemented by equitability index) and qualitative and quantitative changes of vegetation structure through **plant functional types** based on traits like: life history, life form sensu Raunkiaer, number of starting leaflets (cotyledons), life strategy sensu Grime, shadow tolerance, leaf size, overall height, kind of pollination, seed dispersal and vegetative propagation. In a chosen cadastre, an analysis of geographical and soil factors (distance from village, orientation, slope, soil quality) that may be connected to the **reasons** of abandonment will be done.

CONCLUSION

This poster offers a brief presentation of the project of the PhD-thesis on changes in vegetation structure of grasslands following **land-use changes** like abandonment and extensive management in agriculture – affecting many European landscapes. These vegetation changes are studied in relation to some of the reasons of land-use change. The work is at the moment of passing from data collection to first complex analyses.

This work is done under the Slovak Grant Agency VEGA projects GP2/5063/25 and GP2/2092/22.


Photo: František Petrovič

The most distant localities are among the first ones to be abandoned.