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Spatio-temporal dynamics of wet meadow vegetation on the example of Hrnčířské louky Natural Reserve.

The changes of vegetation in a wet meadow complex are described by comparing „old“ phytosociological relevés taken from 1986–1987 and „new“ phytosociological relevés taken from 2005–2006. The data were analysed using direct and indirect gradient analyses. Relative changes in species density, changes in species diversity and average species density in species community were counted. A homogeneity of vegetation was elaborated using Mantel test. Ellenberg’s indicator values were used to express and interpret environmental changes.

The impact of crop fields and abandoned fallows on the quality of soil conditions and vegetation composition of the wet meadow complex was assessed. For this purpose nine transects were laid out. To evaluate soil conditions within edge stands, several factors were measured throughout these transects: soil reaction, total carbon and organic nitrogen contents, N:P ratio, available phosphorus. Real measurements were supplemented with Ellenberg’s indicator values. The change in vegetation composition on transects was estimated using species diversity index and by employment of ordination techniques.

The obvious increase in species diversity and higher average species density in meadow communities, as compared with the past situation, is probably caused by regular mowing. The main trend in vegetation composition is replacement by some hygro- and meso-philous species by leafy species, robust marshy grasses, tall grasses and tall sedges. Decline and disappearance of some species is caused by human activities as is reduction of area by building-up, fragmentation of wet meadows and water extraction. Some of the species, e.g. *Phalaris arundinacea*, *Urtica dioica*, *Deschampsia cespitosa*, *Calamagrostis epigejos*, *Elymus repens* and partly *Alopecurus pratensis* represent certain threat for valuable species richness. The important parameters which mainly shape contemporary vegetation, are as such: light, temperature, continentality and moisture.

The crop fields and agricultural fallows showed conspicuous impact on the structure of soil conditions and vegetation composition of the wet meadow complex studied. At the edges of meadows low soil reaction which indicates acidification of these parts, was

detected. Low values of carbon, nitrogen and N:P ratio are presumably caused by drier conditions and higher biomass production. The decline in soil reaction, changed water regime (as lowering of water table) and application of fertilizers caused increase in available phosphorus. At these parts the lower species diversity which is attributable to neighbouring agricultural pressure was shown. Due to this pressure the sustained occurrence of competitively strong species, adapted to ruderal and nutrient rich soils takes place. To attenuate the agricultural pressure the spatial extent of wet meadows complex should be enlarged.

Keywords: Wet meadows, Change in vegetation composition, Ellenberg's indicator values, edge effects, repeated sampling.