Introduction

The intramontanic Middle Ciuc Basin is known as a favorable location for agriculture. In many parts of Romania, subsistence and small-scale agriculture is still typical, as well as it is in the Basin. But while the arable farming is of great importance on a nationwide level, Harghita county is dominated by hay meadows and grassland farming, which are well known for their rich biodiversity (Demeter et al. 2011). The main aims of this study have been to stress out the importance of the vegetation from arable fields by quantifying the richness of the segetal vegetation in the basin and survey possible connections between the vegetation and different local factors.

Material & Methods

Within an area of 35.8 km² in the Middle Ciuc Basin different factors (Fig.1) have been included in the evaluation to characterize the region:

Impact factors from literature

Information about local factors such as climate, geology and the different Ellenberg categories (1991) has been selected. The Ellenberg indicator values include valuations about nitrogen, moisture and pH ranges. Also, the vegetation can be assigned to different social behavior, life forms and leaf endurance. These values have been evaluated from established literature sources.

Impact factors from field samples

By applying the Braun Blanquet method, 200 different arable fields, have been analyzed, each plot measuring a size of 25 m². On each analyzed field, the soil type was classified according to the guidelines from geological mapping of soils (2005). Slope, height above sea level and height of the crops were documented as well. On 48 random fields, pH-samples were taken with a Neudorff soil test kit. Furthermore, 10 nutrient analyses were made randomly, concerning nitrogen, phosphorous and potassium.

Vegetation analysis

For further interpretation of the examined factors, a Detrended Correspondence Analysis (DCA) and an Indicator Analysis have been conducted.

Results

Local Factors, nutrition supply and Ellenberg Indicators

In the area, a moderate continental climate with influence of the mountains prevails. The Average temperature is around 5.8°C with an average precipitation of 600 mm/a and a low vegetation in the basin aims of this study have been to stress out the importance of the vegetation from arable fields by quantifying the richness of the segetal vegetation in the basin and survey possible connections between the vegetation and different local factors.

Social behavior

And into the Papaveretalia rhoeadis association on base dominated habitats with a more frequent and higher continuity. Due to the Ellenberg categories referring to social behavior only, 24.1% of the vegetation can be ranked among Chenopodieae and only 26.3% among Scandaceae. However, over 49.6% belong to another social classification, which implies a high impact on extensive agriculture. Also, there is a high diversity of different main crops.

Vegetation analysis

133 different species have been found on the 200 fields. For example, common or problematic weeds like Gallium aparine, Corvolivus arvensis or Lathyurus tuberosus have been found frequently, or with low frequency Rumex acetosa and Galium mollugo ssp. album as well as typical species of the submontane zone (Galeopsis triplata) and also 9 species on the german Red Lists like Consolida regalis ssp. Regalis or Adonis aestivalis.

Interrelations between Vegetation and other impact factors

The DCA shows the species inventory in dependence of the local factors and farming. This indirect gradient analysis and the mean Ellenberg Indicator values have been included as environmental factors. “Outliners” influence the result with great impact. The DCA showed a clear difference between summer and winter green plants, these results have also been confirmed with an indicator analysis. Furthermore there is a significant impact of the crops height. No significant interrelation could be found between vegetation and the Ellenberg Indicator values, height above sea level, pH-Values, soil types, slope or number of species. Some species in the center of the diagram, occur on many plots like Gallium aparine. Other species, at the margin, occur only on a few plots, like Achillea millefolium. Species on the left side have been found more often on fields with summer crops and species on the right side on winter crops.

Conclusion

The Ellenberg Indicator values are specialized on the vegetation of Germany. Which complicates the interpretation if they are used in other countries, currently there is a great biodiversity within the segetal vegetation with 13.1 species per plot. Most analyzed factors indicate an extensive agriculture which favors a high biodiversity. The continuity of the species from the Red Lists vary highly as there are no official Red Lists for the segetal vegetation in Romania, the interpretation whether the species are endangered or not remain as a challenging aspect.

Literatur


