Plant species diversity in the Bavarian alpine grasslands

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Introduction and methods

In Bavaria permanent grassland covers 35 % of the agricultural land. It is an important source of animal feed. Large habitat gradients within the Bavarian landscape from the Franconian lowlands (150 m a.s.l.) to the alpine region (>1200 m a.s.l.) cause considerable regional differences in grassland species composition. Based on more than 6000 vegetation relevés (25 m²-plots) of the Bavarian grassland monitoring this study analyses interactions of species diversity of lowland and mountain grassland in Bavaria with site and management conditions.

Elevation and slope

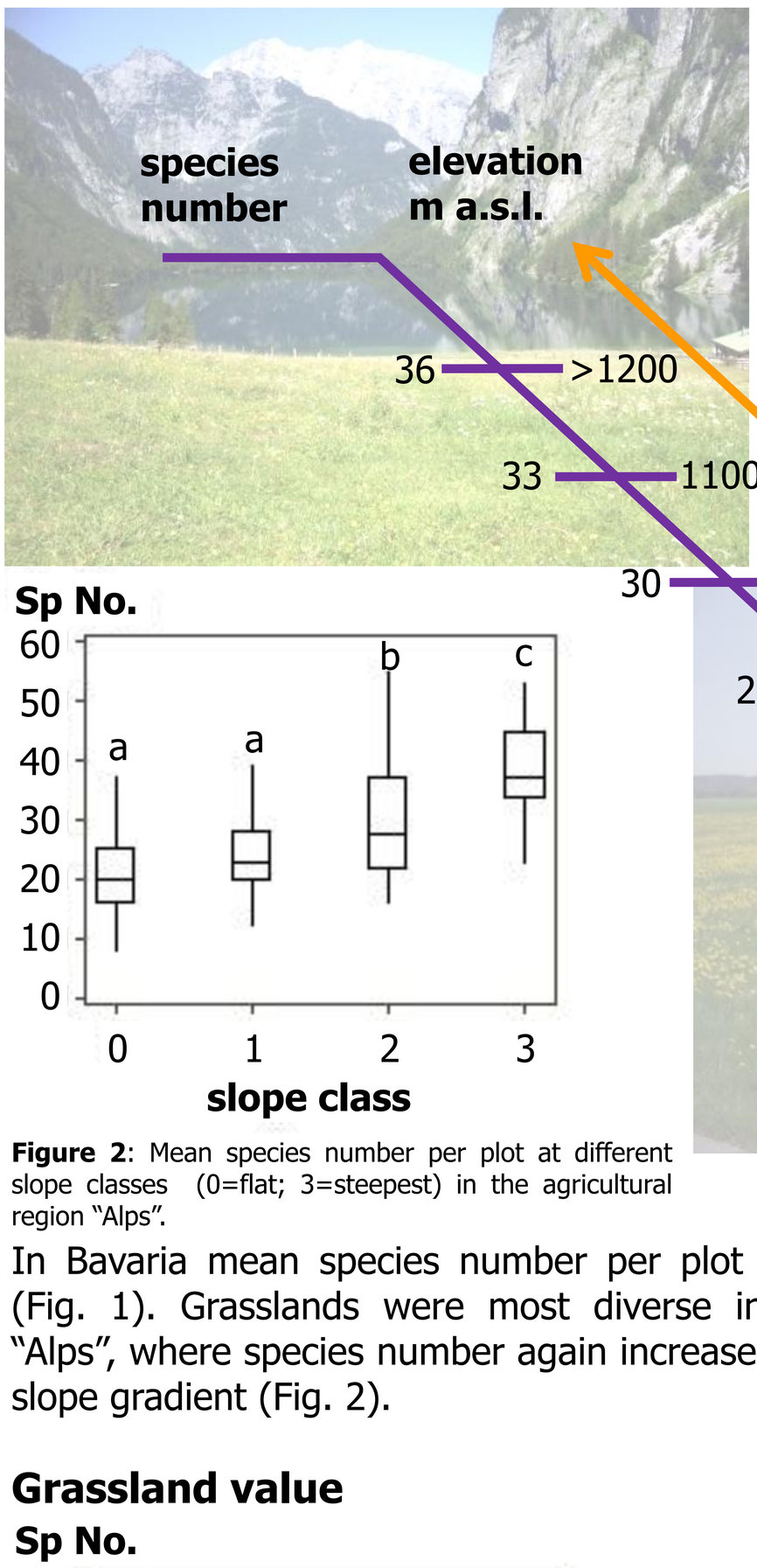

Figure 2: Mean species number per plot at different slope classes (0=flat; 3=steepest) in the agricultural region "Alps".

In Bavaria mean species number per plot increased with elevation (Fig. 1). Grasslands were most diverse in the agricultural region "Alps", where species number again increased with elevation and with slope gradient (Fig. 2).

Management type and intensity

In Bavaria alpine pastures presented most species per plot as well as grassland of farms with a low stocking rate. Within the region "Alps" the grazed grassland and the litter meadows – the low intensity management types – were most species-rich. But referring to the "Alps" management intensity (the farm`s stocking rate) did not influence species number significantly.

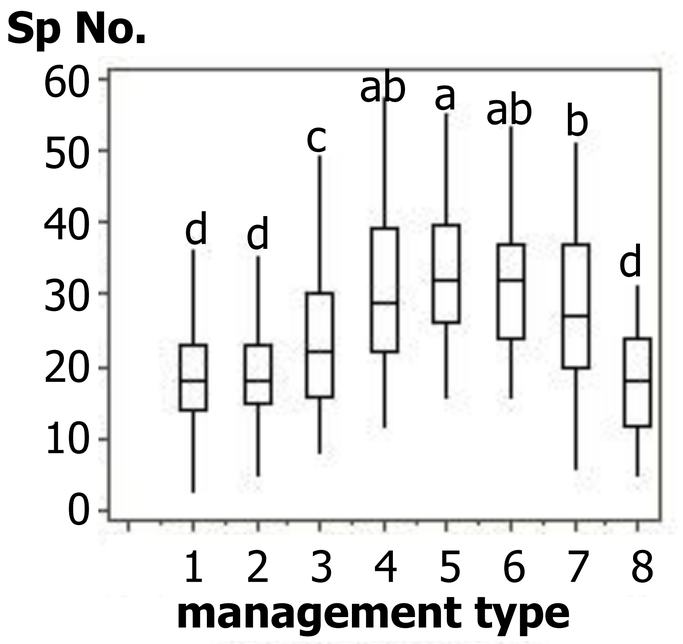

Figure 3: Mean species number per plot at different management types (1: meadow; 2: mowing pasture; 3: pasture; 4: rough grazing; 5: alpine pasture; 6: migratory herding; 7: litter meadow; 8: fallow land) in Bavaria.

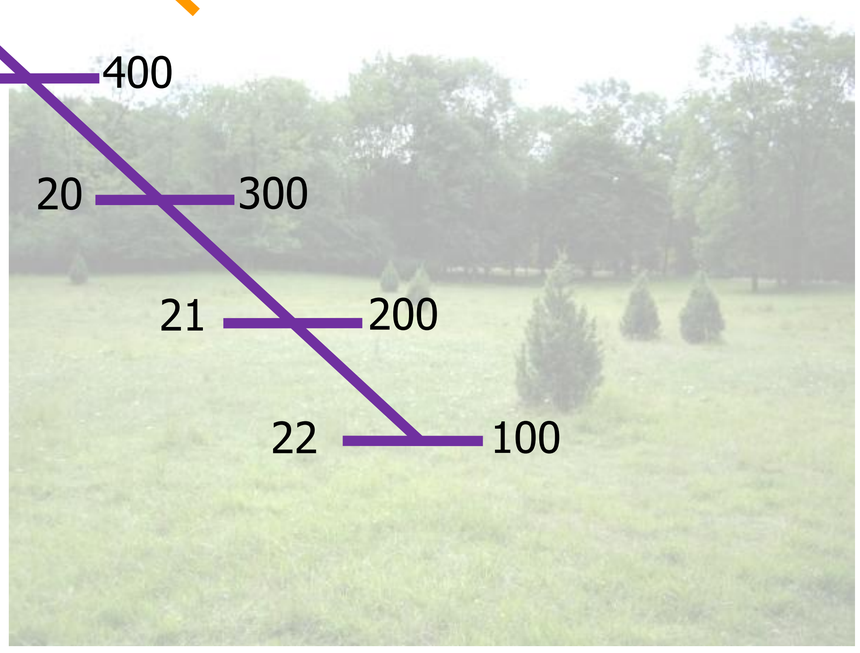

Figure 1: In Bavaria mean species number per plot increased with elevation (species numbers refer to the 100 m altitude difference above the label).

Grassland value

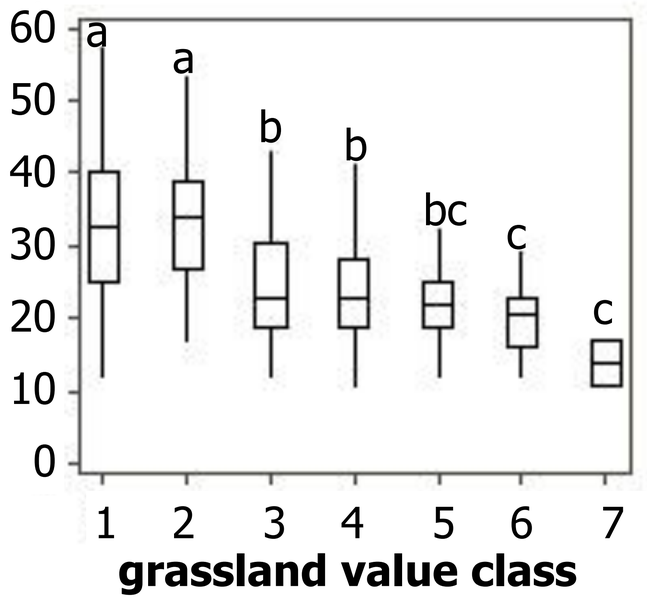

Figure 4: Mean species number per plot at different grassland value classes in the agricultural region "Alps".

Both in Bavaria and in the region "Alps" the grassland value had an effect on species richness. The more fertile the soil and the better climatic conditions the lower the species number (Fig. 4).

Conclusion

High elevated, steep alpine pastures on sites with a low grassland value and of farms with a low stocking rate are the most species-rich grasslands in Bavaria. Within the region "Alps" management intensity (farm`s stocking rate) had no effect on grassland species number.