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Abstract

The effect of light conditions on herbs, bryophytes and seedlings of temperate mixed forests in Őrség, Western Hungary

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The effect of light on different understory plant groups (herbs, ground floor bryophytes, trunkdwelling bryophytes and seedlings) was studied in a deciduous-coniferous mixed woodland in Western Hungary. The correlation of cover and species richness in each group and the cover of individual species to relative diffuse light were analyzed at different spatial scales. The study was carried out in 34 forest stands with different tree species composition. The importance of light in determining species composition was investigated by redundancy analysis. Species within each plant group were classified based on their light response. Light was positively correlated with species richness of herbs, cover of ground floor and trunkdwelling bryophytes, and species richness and cover of seedlings. In redundancy analysis, the variance explained by light was 13.0% for herbs, 15.0% for bryophytes and 8.6% for seedlings. Within the group of herbs, species preferring open conditions and light-flexible (gap) species were separated on the basis of the spatial scale of the analysis, while shade-tolerant species were not correlated positively with light. Among bryophytes mainly terricolous, opportunistic and mineral soil-inhabiting species showed significant positive correlations with light, while epiphytic and epixylic species did not respond to light. Seedlings of *Quercus petraea* and *Pinus sylvestris* were positively related to

light, while most other seedling species were shade-tolerant. In case of vascular plants, the species' correlations with light were in agreement with their light indicator values; however, they were independent in the case of bryophytes. This study proved that the extent and spatial pattern of light influenced strongly the understory plant groups. Species within each group respond to light conditions differently, concerning the strength, direction and spatial scale of the relationships.

biodiversity: moss

forest ecology

forest structure: herb layer

methodology: analysis, statistics

Notes

Relative diffuse light, Diversity, Composition, Environmental relationships, Epiphytes, Seedlings, Herbaceous plants, Light indicator values, Temperate mixed forests

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