

Tinya, F and P Ódor (2016) Congruence of spatial pattern of light and understory vegetation in an old-growth, temperate mixed forest

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Abstract

Aim - Light is one of the most important drivers of understory vegetation in forests, influencing the patterns of total cover as well as the abundance of individual species. Based on a multi-scale approach, the relationships between the amount and pattern of relative diffuse light and forest understory were studied in an old-growth, temperate mixed forest (Hungary).

Methods - The recorded vegetation variables were the cover of the vascular understory (herbs, woody seedlings), the bryophyte layer, and some selected vascular understory species.

Results - The pattern of light showed aggregations at two scales: 10 10 and 25 25 m. Both vascular understory and bryophyte cover had significant positive correlations with light availability, and their spatial pattern was related to it. The pattern of seedlings displayed the strongest relationships with that of light at a coarser scale (25 25 m) than herbs and bryophytes (10 10 m). At the species level, *Festuca heterophylla*, *Fragaria vesca* and *Poa nemoralis* were characterized as light-demanding herbaceous species (their spatial pattern was congruent with light), *Brachypodium sylvaticum* and *Carex pallescens* were transitional, while some species proved to be shade-tolerant (e.g. *Ajuga reptans*, *Dryopteris carthusiana*, *Viola reichenbachiana*).

Regarding seedlings, the patterns of *Betula pendula*, *Carpinus betulus*, *Pinus sylvestris* and

Quercus petraea were related to the pattern of light.

Main conclusions - According to our observations, diversity and composition of vascular forest understory and bryophytes were related to heterogeneous light conditions. Forest management should maintain continuous shelter on the stand level; however, smaller gaps are necessary for the survival of light-demanding forest herbs and bryophytes, and larger gaps for tree seedlings.

forest structure: herb layer

forest structure: regrowth

forest ecology

habitat: oak-hornbeam forests, beech forests

habitat: coniferous mixed woodlands

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