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Differential distribution of corticolous lichens with respect to tree species and height

Abstract

Great biodiversity is usually a criterion for conservable forest and long continuity is thought to be a primary reason for the development of species richness in an ecosystem. However, interaction and symbiotic relationships between species are important drivers of biodiversity gain, which can be more efficiently studied in forest experiments than in complex natural habitats.

In this study, species richness and vertical distribution of corticolous lichens were examined in common garden experiments in Denmark on 159 stems from *Acer pseudoplatanus*, *Alnus glutinosa*, *Betula pendula*, *Fagus sylvatica*, *Fraxinus excelsior*, *Quercus robur*, and *Tilia cordata*. All trees were 44 years old. Species richness and Shannon diversity of lichens were compared among the tree species and their distribution in relation to relative tree height modelled by nonparametric multiplicative regression (NPMR).

Acer pseudoplatanus and *Fraxinus excelsior* provided the highest lichen species richness and diversity, while it was significantly lower on *Betula pendula* and *Fagus sylvatica*. The height distribution of individual lichen species was found to differ significantly ($P < 0.001$). *Lepraria incana*, *Pseudosagedia aenea* and *Opegrapha atra* showed high abundance at the stem base, while *Lecanora carpinea*, *Physcia tenella*, *Xanthoria parietina*, *Lecanora chlorotera* and *Lecidella elaeochroma* were mostly present around 70% of the tree height. For each lichen species, age determination of different heights in the trees allows us to estimate how old the bark is at the time of colonization and how long time the lichen is able to grow and live on the trees.

Keywords: biodiversity, tree-lichen interaction, time/age factors.

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