Abstract

Nordén, B. 2000. *Dispersal Ecology and Conservation of Wood-Decay Fungi.* Doctoral dissertation. Department of Evolutionary Botany, Göteborg University, Box 461 SE 405 30 Göteborg, Sweden. bjorn.norden@systbot.gu.se

Many wood-decay fungi are threatened by forestry and several are used as bioindicators in nature conservation, but little is known about their dispersal capacities and dynamics in the landscape. The major question in this thesis is if abundances of wood-decay fungi are restricted mainly by dispersal constraints or by microhabitat availability.

Dispersal of basidiospores and its consequences are studied at the population and community level, and previous literature is reviewed. In the first study, spore-trapping with homokaryons as bait is used to study dispersal in the red-listed old-growth fungus *Phlebia centrifuga*. In the next two studies, genetic population structure is investigated for the common species *Fomitopsis pinicola* and the rare species *Steccherinum robustius*, using molecular markers (RAPD). Comparison of the biodiversity of wood-decay fungi in stands of hazel *Corylus avellana* of different age and with different dead wood qualities is presented in the forth paper. The final paper discusses conservation terminology, especially Ecological Continuity (EC), and bioindicators in relation to dispersal ecology.

Basidiospores of *P. centrifuga* were dispersed at least one kilometre in 24 hours, suggesting that dispersal over greater distances is possible over an entire season of fructification. For *F. pinicola*, low population differentiation was found, suggesting gene flow over c. 30 kilometres. Isolated populations of *S. robustius* showed relatively great differentiation (F_{st}=0.17) over much greater distances (330-640 kilometres). There was no positive correlation between stand age and species richness for hazel wood fungi, indicating that many species colonise new forest patches soon after dead wood formation. In the last study, it is argued that EC, or several tree generations at a single site, is not important for wood-decay fungi and other species with high dispersal capacity.

In wood-decay fungi, strong genetic isolation effects are indicated at distances of more than c. 300 kilometres and weak effects at c. 50 km. The few studies performed have failed to show that wood-decay fungi are sensitive to fragmentation due to dispersal limitation. Many species may therefore be substrate limited rather than dispersal limited in southern Sweden. Within this landscape, the most important management measures to obtain high biodiversity of wood-decay fungi is probably the formation of new habitat.

Key words: Wood-decay fungi, population structure, genetic variation, dispersal, conservation biology, bioindicators.

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