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Finnish Forest Research Institute, Vantaa Research Unit

Community of wood-inhabiting fungi in relation to quality of decaying logs

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Dead wood and wood-decaying fungi have a major importance in boreal forest ecosystems in the context of biodiversity, global CO_2 dynamics, nutrient cycling and forest regeneration. Currently information about habitat preferences of wood-inhabiting fungi is mainly based on the production of visible fruit bodies and our view of wood-inhabiting community is limited.

We investigated fungal communities inhabiting dead fallen logs in unmanaged Norway spruce dominated forests in Southern Finland. Altogether, 600 spruce logs from 5 sites were sampled and measured. Diversity and composition of wood-inhabiting fungi were analyzed by direct DNA extraction and PCR-DGGE profiling coupled with Sanger sequencing. Also physico-chemical properties of logs were determined (C/N ratio, water and ethanol extractives, Klason lignin, moisture, density and decay stage).

The results demonstrated that diverse, yet largely unknown fungal communities inhabit decaying wood in boreal forests. We observed succession in wood-inhabiting fungi along with wood decomposition; fungal community structure was related to decay stage, density, moisture, C/N ratio and lignin content of wood. Proportion of Basidiomycetes tended to increase with decay as well as proportion of mycorrhizal species. Further, tree species harbored different fungal species, and Ascomycetes were more common with deciduous trees than with conifers.