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Abstract

Fungal community ecology and wood decomposition processes in angiosperms: from standing tree to complete decay of coarse woody debris

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Decomposition of coarse woody debris (CWD), be it naturally occurring or resulting from forestry activity, begins long before it hits the ground. Obvious and well-known examples of decay in the standing tree result from heartrots, pathogens leading to root, butt and top rots, and wounding, and are only covered briefly here. Even more common, but as yet less well known, is decay developing from fungal propagules latently present within functional sapwood. These propagules do not develop overtly until the high water content stress obtaining in functional sapwood is reduced (e.g. following drought, root damage, light suppression). Which of the several (many) species/genotypes develop depends on temperature, gaseous and drying regime, and host tree species amongst others. Pioneer communities in sapwood, be it in standing trunks, attached branches, felled timber, or windthrown wood, develop from these fungi which are latently present. If dysfunctional wood remains attached to the tree then these fungi develop forming closed communities which can effect substantial decay. Subsequently secondary colonisers may arrive and continue the decay process, until wood becomes sufficiently weakened and falls to the floor where decay of CWD continues. Decay of felled CWD also begins with fungi which develop from latent propagules though they do not always get the opportunity to establish large domains, as other primary colonizers from outside establish rapidly, and

both types of primary colonizers are often relatively rapidly replaced by secondary colonizers. On the forest floor later colonizers can arrive as spores or as mycelium, and effects of these different modes of arrival on community development are discussed. Factors affecting community development and species richness are considered, including interspecific interactions and direct and indirect effects of abiotic variables. The mycelium is emphasised throughout, and dangers of overemphasis on carpophores are highlighted.

Decay rate of CWD is commonly approached from an overall process viewpoint, and the effects of abiotic variables on overall decay can be modelled. Ultimately it is the decomposer organisms which effect decay and complex communities can result in extremely heterogeneous decay rates at different spatial and temporal locations within wood. Examples of such differences resulting from presence of different species, interactions between species, and microclimatic variation are presented. Examples are largely taken from temperate angiosperm woodland, but principles are likely to be broadly similar in forests throughout the world, including boreal forests.

biodiversity: fungus, lichen

deadwood

ecosystem: decay, rot, decomposition

Notes

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Tartalom:

Origins of decay

Decay originating from heartrots, pathogens and unspecialized opportunists

Sapwood decay originating from latent fungal propagules

Specificity of pioneer fungi

Fungal community structure and development

Principles

Community development and decay initiated in the canopy

Community development in felled wood on forest floor

Relevance of fruit body surveys

Overall decomposition processes

Major determinants of decay

Heterogeneity of decay within wood

Conclusions

References

Címszavazva - GE

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