

EFFECTS OF AN INTRODUCED PATHOGEN ON RESISTANCE TO NATURAL DISTURBANCE: BEECH BARK DISEASE AND WINDTHROW

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Introduced pathogens have caused widespread declines in a number of important tree species in forests of eastern North America, including dominant species such as beech (*Fagus grandifolia* Ehrh.). Most studies have focused on changes in forest composition and structure as a direct result of mortality caused by the pathogen. Our studies of windthrow resistance in forests of northern New York and northern Michigan demonstrate that resistance of beech trees to windthrow is severely reduced by beech bark disease (BBD). Beech and sugar maple (*Acer saccharum* Marsh.) have identical resistance to windthrow in forests of northern Michigan, where BBD is absent, whereas beech has much lower resistance in northern New York, where BBD is present. Within New York, the severity of BBD infection on individual trees has a significant negative effect on resistance to windthrow. We tested potential consequences of this to long-term composition and structure in these forests using a simulation model, SORTIE. We found that species such as yellow birch (*Betula alleghaniensis*) and hemlock (*Tsuga canadensis*) increased dramatically in basal area, and that species evenness early in succession increased due to the effect BBD has on the creation of new seedbed substrates. Our results highlight the indirect effects that host-specific pathogens can have on community dynamics and species coexistence in forests.

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