Geophysical Research Abstracts, Vol. 9, 05965, 2007
SRef-ID:
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Mound-building ants aggregate and redistribute carbon and nutrients in boreal forest floor

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Wood ants (*Formica rufa* group) are key species which due to their high abundance and wide distribution in boreal forests of Eurasia have large impacts on other forest organisms and ecosystem functions. Mound-building ants, particularly wood ants, accumulate carbon (C) and nutrients by building large above-ground mounds out of forest litter and resin. We found earlier that wood ant mounds, both above- and belowground materials, have higher C and nutrient concentrations than the surrounding organic layer and mineral soil, respectively. The concentrations increase slightly and C and nutrient pools in the ant mounds increase remarkably with forest succession. Clear-cutting can destroy wood ant colonies, and the species, abundance, size and locations of ant mounds change as forest structure changes during forest succession. Currently we are studying how ant mounds are located within 16 medium-fertile Norway spruce (*Picea abies* L. Karst.) dominated forest stands (5, 30, 60 and 100 years old) in eastern Finland. Ant mounds were larger and more numerous in older forests, with large mounds usually situated further away from each others than smaller ones. In some stands the mound distribution was clustered mainly due to the occurrence of multinest colonies of *Formica aquilonia* Yarr., the most common ant species encountered. Light availability is also an important factor determining the mound location. Smaller active ant mounds were situated more often in well-lit locations than larger

active mounds that survived also in shade. On average 47 % the mounds were located within ten metres from stand edge, while this zone was 23 % of the studied area. This may increase the light-induced, already higher productivity of forest edges because the edge mounds, that accumulate resources both from forest interiors and the surrounding habitat, become nutrient sources after abandonment. Thus, mound-building ants increase the spatial and temporal heterogeneity in C and nutrient distributions at the forest stand level.