

Red Wood Ants (*Formica-rufa* Group): their Contribution to Soil C and N Stocks and CO₂ Emissions in Subalpine Forests. (3298)

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Abstract:

Red wood ants (*Formica rufa* group) are ubiquitous in many European conifer and mixed conifer-hardwoods forests. They build large above-ground mounds composed of litter collected from the surrounding forest stands. Although mound density of RWAs can be high, very little is known on the contribution of these mounds to forest soil nutrient cycling. Consequently, a study was established to gain information on the distribution of red wood ants in various European forest ecosystems, and to estimate their contribution to ecosystem C and N pools and CO₂ emissions. We found that RWA mound density (number per ha) was linked to forest tree species composition, slope aspect, and canopy closure. The size of RWA mounds was positively correlated with successional age of the stands. Carbon and N concentrations of mound material were significantly higher than in the forest floor, while C:N ratios were not. RWA mounds were “hot spots” for CO₂ emissions but only contributed little to total forest soil CO₂ emission. Consequently, the contribution of RWA to total forest soil C and N pools and forest CO₂ emission is minor and likely not important when calculating or modeling C and N pools or C fluxes. Yet, RWAs increase the spatial heterogeneity of soil C and nutrients and alter the flow of energy within their habitat.

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