



## **Do red wood ants (*Formica rufa* group) play an important role in carbon and nutrient dynamics in boreal forest soils?**

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Red wood ants (*Formica rufa* group) (RWAs) are a prominent feature in boreal forests of Eurasia. RWAs can have an important role in many forest ecosystems by building large nests, both above- and below-ground. While there has been much research on the social biology of these ants, our knowledge of their impact on forest soils is still very limited. In this paper we will present an overview of how RWAs can affect C and nutrient pools in boreal forest soils by using four-year results from Finland as a case study. RWA mounds have lower bulk densities and higher C, N, and P concentrations/contents than the surrounding forest floors. Soil under RWA mounds also has higher C and N content than in the surrounding mineral soil. Inputs of N and P to the RWA mounds (mainly as honeydew) are 2 – 3 times higher than amounts of N and P in annual litterfall to the forest floor. RWA mounds are drier and warmer than the forest floor, and so decomposition of OM inside the mound is slower than in the forest floor. However, CO<sub>2</sub> efflux from RWA mounds is much higher than CO<sub>2</sub> emissions from the surface of the forest floor. The results from our Finnish study and the literature indicate that RWAs create “hot spots” for C and nutrient cycling, and increase the spatial heterogeneity of forest soil. However, at the ecosystem level, the impacts of RWAs on soil C and nutrient levels were not large in the boreal forests studied.