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Wood ant nests as hot spots of microbial activity in forest ecosystems

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Wood ants build large and long-lasting nests from organic materials and mineral soil which have a very special structure. Nests are well-aerated due to numerous chambers and galleries and stable temperature and moisture are maintained there thanks to ant activities. These conditions together with the constant input of easily available nutrients from food of ants support microbial activity. Due to respiration of ants and microbes, wood ant nests are known as hot spots of CO_2 production in forest ecosystems. Although the main source of CO_2 is represented by ant respiration, a significant amount of CO_2 originates also from microbial decomposition of organic materials. Several conditions affect microbial respiration, such as moisture of nest material, changes in temperatures or food input. As mineral nutrients are released from organic materials, wood ant nests represent hot spots of mineral nutrients in forest ecosystems which can be exploited by other organisms, such as roots of trees, and can also cause heterogeneity in species abundance and composition.