



What ant-induced soil modification is most important for the formation of the vegetation pattern?

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Lasius flavus is a typical ant species of temperate grasslands which builds pronounced soil nests. These nests may last for several decades and occupy large fraction of the grassland area (up to 13 % of grassland surface). Ground nesting significantly changes soil properties, which contributes to the vegetation differences between ant nests and their surroundings. Multiple ant activities are involved in the modification of soil processes, but their individual importance for the formation of vegetation pattern has been rarely separated.

In our study we wanted to separate the effect of nutrient enrichment due to food accumulation from the effect of nest construction activities on the differences in plant performance and vegetation composition between nest and non-nest microhabitats.

We found evidence for both nutrient enrichment and mechanical disturbance due to construction activities in the nests (soil transport and modification). Soil from the nests has a better nutrient status and decreased bulk density; further, there is no vertical nutrient gradient in the nest soil. In addition, plant growth on the nests is strongly affected by the soil heaping activity itself, which buries parts of plants close to the soil surface.

Although both different mechanisms altering the soil properties have been shown to affect plant performance in experimental garden, only the construction activities seem to have significant effect on the plant performance and vegetation pattern in the field. Soil-heaping during nest construction selected for clonal species and within them to genotypes capable to withstand permanent disturbance. In spite of their higher nutrient

status, the nests are a difficult environment to live in, as shown by reduced survival of implanted plants of *Agrostis capillaris*, probably due to increased aeration and soil disturbance.