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The influence of red wood ants Formica polyctena on nutrient availability ant growth of spruce tree.

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The effect of *Formica polyctena* ant nests on distribution of nutrients and growth of young seedlings and adult trees was studied in laboratory experiment and field survey.

Growth of young seedlings and nutrient content were compared between nest material and surrounding soil. In general nest material showed higher availability of nutrients and supported faster growth of seedlings. However these findings were not supported by field observation of seedlings growth and survival in ant nest and surrounding soil.

To evaluate effect of nest on soil nutrient content and growth of adult trees growth, four distance categories from the closest ant hill (0-1m, 5-10 m 50m and more than 200 m) were sampled for tree ring analysis. At the same places soil samples were taken to analyze available P, N, K, Ca, and pH. Soil in close vicinity of the nest showed significantly higher content of nutrients and higher pH, then samples in the larger distances from the ant nests. Analysis of the tree rings indicated the fastest growth for trees that were located more than 200m from the ant nest. The second highest growth was observed in the trees that were in close vicinity of the nest. The weakest growth was found for trees growing in intermediate distances from the nests. We expect that depletion for nutrients by honeydew collection from the trees in vicinity of the nest may slow the tree growth. The tree, that grow in close vicinity of the nests may compensate for this nutrient depletion by surplus of available nutrients in immediate surrounding of the nest.

The results are discussed in respective of nutrient cycling in forest ecosystem and cost and benefits for tree growth.