



N and C transformations in the organic layer under two tree species, silver birch and Norway spruce

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The aim was to study soil N and C transformations and the characteristics of dissolved organic matter in soils under different tree species. Samples were taken from the organic layer of five tree species experiments, located in different parts of Finland, with silver birch (*Betula pendula*) and Norway spruce (*Picea abies*) as the dominant tree species. The stands were growing on different site types and the stand age varied from about 20 year-old to 75 year-old. All soils were podzols and humus types mor. Microbial biomass C and N, and the rates of C mineralization, net N mineralization and net nitrification were measured. From the same organic layer samples, water extracts were analyzed for the concentrations of dissolved organic C (DOC) and N (DON) and characterized according to molecular size by ultrafiltration and according to chemical composition using a resin fractionation technique. In the organic layer of all older stands, the amounts of both microbial biomass C and N were highest under birch. The rate of C mineralization was not much dependent on tree species. Although the concentration of $\text{NH}_4\text{-N}$ and the proportion of $\text{NH}_4\text{-N}$ of soil total N were always highest under birch, there was no consistent effect of tree species on net N mineralization. Net nitrification was always negligible, except in some birch plots. The distribution of DOC and DON into different fractions based on chemical composition and molecular size was rather similar in all soils, regardless of the tree species. DON-to mineral N ratio was always lowest under birch. The mineralization of N and especially C in the organic layer correlated positively with the concentrations of both DOC and DON.