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Dissolved organic matter and microbial activities in soils under different tree species

A. Smolander and V. Kitunen

Finnish Forest Research Institute, Vantaa Research Centre, Vantaa, Finland
(aino.smolander@metla.fi)

The aim of this study was to compare soil C and N transformations and the characteristics of disolved organic matter in soils under different tree species. Samples were taken from the humus layer of several tree species experiments with silver birch (Betula pendula), Norway spruce (Picea abies) and Scots pine (Pinus sylvestris) in different parts of Finland. The soils were podzols and humus type mor. 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. Microbial biomass C and N, and the mineralization of C and N were measured from the same samples. The distribution of DOC and DON into different fractions based on chemical composition and molecular size was rather similar in all soils. The most abundant chemical fraction of DOC was hydrophobic acids, and the most abundant molecular size fraction was 10-100 kD. There was a highly positive correlation between the mineralization of C and the concentration of DOC.