



## **The effects of Scots pine and Norway spruce resin on C and N transformations in birch soil**

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Terpenes are a complicated group of secondary metabolites that occur in almost all plants. They are hydrocarbons built up of various numbers of isoprene (isopentane) C<sub>5</sub> units and their composition is species dependent. Our previous studies showed that monoterpenes were common in soil atmosphere under Scots pine (*Pinus sylvestris* L.) and Norway spruce (*Picea abies* L.), main monoterpene being alphapinene, whereas in silver birch (*Betula pendula* L.) soil atmosphere volatile monoterpenes were scarce. There is evidence that monoterpenes may play an important role in controlling N cycling in forest soils. In this study, we examined the effects of volatile compounds of Scots pine and Norway spruce resins on C and N transformations in silver birch soil. Birch soil was incubated in airtight glass bottles. Inside the bottles was hanging an asbestos net with pine resin, spruce resin, alphapinene or nothing (as control) absorbed in the net. CO<sub>2</sub> and VOC concentrations on bottle headspaces were determined during incubation with GC and GC-MS. After 14 and 28 day incubation periods microbial biomass C and N, net N mineralization and net nitrification were determined. Volatile compounds from pine and spruce resins were mainly monoterpenes, alphapinene being the main component in both. Alphapinene decreased net N mineralization but simultaneously increased C mineralization. Alphapinene also considerably decreased soil microbial biomass. The effects of resins were similar to effects of alphapinene, but to a lesser extent. Based on this, we concur that volatile monoterpenes in resins affect C and N transformations in soil. The extent of this effect requires further studies. We are currently studying the chemical composition of these resins and the effects of water-soluble resin compounds on soil C and N transformations.