



Volatile compounds emission from canopy fine litterfall in a hemiboreal mixed forest at Järvselja

Miguel Portillo-Estrada, Beate Noe, and Steffen M. Noe

Estonian University of Life Sciences, Institute of agricultural and environmental sciences, Dept. of Plant Physiology, Tartu, Estonia (miguel.portillo@emu.ee)

The seasonal distribution of biogenic volatile organic compounds (BVOC) emissions from canopy fine litterfall was investigated over a period of two years.

Three stands of a hemiboreal mixed forest were studied. The stands presented different dominant tree species: (1) Norway spruce, (2) Scots pine, and (3) Silver birch and Downy birch. The litterfall was monthly collected in litter traps. The BVOC emission of litter was sampled by placing the litter into a glass jar equipped with a vent tube and pumping the head space air through a VOC adsorbing tube (carbotrap). Adsorbed BVOCs were analyzed in a GC-MS. Fifteen compounds were quantified.

Seasonal differences in the total emission of BVOCs were found, defined by a maximum in summer and a minimum in autumn and winter. During summer months, litter emissions were dominated by limonene, α -pinene, camphene and 3-carene in the three litter types, accounting for 70-75 % of total BVOC emitted in June. 3-Carene, α -pinene and β -pinene were the main compounds emitted during winter time, accounting for 50-60 % of total BVOC emitted in January.

Stand to stand differences were assessed. The spruce and birch dominated stands showed more similarities in their BVOC emission pattern if compared to the pine dominated stand. Together with the litterfall data, an estimation of the annual total BVOC emitted by the soil litter layer is presented for each stand type.