Geophysical Research Abstracts
Vol. 12, EGU2010-8018, 2010
EGU General Assembly 2010

Non-cellulosic neutral sugar contribution to mineral associated organic matter in top- and subsoil horizons of two acid forest soils

Cornelia Rumpel (1), Karin Eusterhues (2,3), and Ingrid Kögel-Knabner (2)

(1) CNRS, BIOEMCO, Thiverval-Grignon, France (cornelia.rumpel@grignon.inra.fr), (2) Lehrstuhl für Bodenkunde, Wissenschaftszentrum Weihenstephan, Freising-Weihenstephan, Germany, (3) Institut für Geowissenschaften, Friedrich-Schiller-Universität Jena, Germany

It is generally accepted now that chemically recalcitrant plant-derived molecules, such as lignin, are not preserved in high amounts in soil for more than a few decades. In contrast, labile polysaccharides may be stabilised in greater proportions and for longer timescales probably due to their ability to interact with the mineral phase. The aim of the study was to investigated sugar composition of density fractions of a whole soil profile and to related total sugar content and composition to 14C age of SOM. We investigated the polysaccharide composition of bulk soil and mineral-bound (density fractions > 2g cm-3) organic matter in topsoil and subsoil horizons of a Podzol and a Cambisol.

Our results showed that total sugar contents were generally higher in the Cambisol than in the Podzol. For most horizons of both soils, the sugars were enriched in the mineral-bound organic matter fraction. This fraction showed a monosaccharide distribution typical for microbial sugars, whereas in bulk soil horizons higher contributions of plant-derived sugars were observed. A strong relationship with the 14C activity of the dense fraction suggests that microbial-derived polysaccharides are most likely stabilized preferentially by mineral interactions compared to plant-derived polysaccharides.