Applications of Non-discriminated Pyrolysis to Study Soil and Soil Microorganisms by means of Fatty Acid, Sterol and Hopane Patterns. (S02-poerschmann111644-Oral)

Authors:

- J.Poerschmann* - *Center for Environmental Protection, Lepizig, Germany*
- T.Gorecki - *University of Waterloo, Ontario, Canada*
- Z.Parsi - *University of Waterloo, Ontario, Canada*
- J.Augustin - *Center for Agricultural Land Use and Landscape Research, Müncheberg, Germany*
- M.M. Gerzabek - *Austrian Research Centers, Division of Life and Environmental Sciences, Seibersdorf, Austria*

Abstract:

Conventional pyrolysis suffers from discrimination effects, due to which the high molecular weight products providing the most significant structural information cannot be observed in the pyrograms. In our approach, pyrolysis is carried out in deactivated stainless steel tubing connected in line with the GC column. The technique was applied to study soil organic matter (SOM) transformations. A significant response of SOM composition to green manure, animal manure and peat amendments in comparison with the reference samples was observed. Characteristic biomarkers included fatty acids, sterols, as well as lignin- and polysaccharide-related markers. Fatty acids were overwhelmingly located in the silt

fraction rather than in the clay fraction. Green- and animal manure amended samples showed high proportions of markers characteristic for aerobic eubacteria. Peat-amended soil showed a distinctive hopane pattern including cross-linked hopanoic acids, as well as signature fatty acids of group II methanotrophs. The high recalcitrance of the hopane backbone might be one reason for the slow organic carbon turnover of peat-amended soil in comparison with the other samples.

Corresponding Author Information:

Juergen Poerschmann
Umweltforschungszentrum
Permoserstr.15
Leipzig D-04318
Germany

phone: (1) 49 341 235 2242
fax: (1) 49 341 235 2791
e-mail: poerschm@rz.ufz.de

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 2:45 pm

Keywords:

Analytical pyrolysis, Soil characterization, Fatty acids, Hopanes