
*S11.01-P -6*

## *BIOLOGICAL CHARACTERISATION OF HUMUS PROFILES ALONG A CLIMOSEQUENCE OF SUBALPINE FOREST SOILS*

Ulfert Graefe*[1], Judith Ascher[2], Giacomo Sartori[3], Barry Thornton[4], Maria Teresa Ceccherini[2], Giacomo Pietramellara[2], Markus Egli[5]

*[1]IFAB ~ Institute for Applied Soil Biology ~ Hamburg ~ Germany [2]University of Florence ~ Department of Soil Science and Plant Nutrition ~ Firenze ~ Italy [3]Museo Tridentino di Scienze Naturali ~ - ~ Trento ~ Italy [4]The James Hutton Institute ~ - ~ Aberdeen ~ United Kingdom [5]University of Zurich ~ Department of Geography ~ Zürich ~ Switzerland*

*Global warming primarily affects topsoil processes such as organic matter turnover observable as changes of the humus form. We studied the influence of pedoclimate on the biological and morphological development of humus profiles in spruce forests on basaltic latite debris in the Southern Alps (Val di Fassa, Trentino, Italy). Four sites were selected differing in exposure (south-facing, north-facing) and altitude (1600 m, 1900 m) allowing paired comparisons (same altitude, different exposure vs. same exposure, different altitude). Measurements included abundance, species composition and vertical distribution of microannelids as well as polyphasic biochemical fingerprinting of soil microbial communities by denaturing gradient gel electrophoresis and phospholipid fatty acid analysis. The vertical distribution of microannelid abundance and microbial biomass showed similar patterns and provided evidence that the organic layer is the hotspot of biological activity in the studied humus profiles. Highest similarities in community structure were found to be between sites with same exposure. Along the elevation gradient to higher altitude the humus forms at south-facing sites shifted from Mull to Amphi. At north-facing sites a shift from Moder to Mor took place. The thickness of the organic layer increased inversely to the thickness of the A horizon along the gradient of decreasing mean annual temperature indicated by the sequence Mull, Amphi, Moder, Mor. The same gradient is shown by the activity of microannelids predominantly located in mineral horizons at the Mull site and exclusively in the organic layer at the Mor site. Implications for organic matter stability under warming scenarios are highlighted.*