# Edaphic conditions influence the preservation of soil organic matter compounds

Karen Vancampenhout

KU Leuven, Campus Geel, Cluster for BioEngineering Technology, Geel, Belgium (karen.vancampenhout@kuleuven.be)

Molecular proxies based on the organic matter preserved in soils and sediments form an essential part in understanding soil carbon cycles and soil carbon transport, and in reconstructing past vegetation and climatic patterns. Nevertheless, the effect of edaphic and ecosystem-specific conditions on the preservation of specific soil organic matter compounds remains poorly understood. This is especially true for profiles in sediment-palaeosol sequences, where supporting information on past conditions is scanty. This contribution therefore muses on the effects of acid conditions, waterlogging, soil temperature, bioturbation, soil depth, wildfires and post-burial effects on the overall organic matter composition of present-day forest soils in different biomes and of organic material from the Early Weichselian A-horizons of the Rocourt palaeosol, a major palaeostratigraphic marker for the Eemian and Early Weichselian in Western Europe. By comparing the soil organic carbon compositions of soils from different ecosystems to their geochemical constraints, we evaluate if ecosystem-specific mechanisms of selective degradation and preservation could influence the relevance and distribution of soil molecular proxies. Similarly, we evaluate the effect of long-term burial on the organic matter composition of loess-palaeosols from different landscape positions, and compare the results to palaeo-pedological evidence on contemporary edaphic conditions. Results suggest that the admixture of microbial SOM is considerable in loess-paleosols and that differences in slope position, soil moisture and exposure to fire should therefore be considered when interpreting biogeochemical proxies.