



Compound-specific radiocarbon dating of leaf waxes in loess-paleosols

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Loess-paleosol sequences (LPS) are valuable terrestrial archives for paleoenvironmental reconstructions. They form by temporarily variable dust accumulation, pedogenesis, and potentially local sediment reworking. It is not trivial to (i) obtain quantitative information about past climate and environmental changes from LPS, and (ii) establish high-resolution numeric chronologies. Long-chain n-alkanes are essential components of leaf waxes. Their homologue (i.e. chain length) patterns can be used to infer past changes in vegetation, and compound-specific deuterium/hydrogen analyses have great potential to reconstruct paleohydrological conditions (e.g. Zech et al. 2011, 2013).

A first study using compound-specific radiocarbon analyses on leaf waxes corroborated their synsedimentary nature and illustrated the high potential of this new technique to obtain high-resolution chronologies for loess-paleosol sequences (Häggi et al., 2014). We now present first tests and analyses that we started on our new preparative gas chromatograph (modified Prep9000, Brechbühler AG). This instrument allows obtaining sufficient amounts of specific leaf wax molecules (~10 to 50 µg) to run radiocarbon analyses on the EA-AMS instrument (MICADAS) at the University of Bern. We aim at establishing and presenting a first high-resolution radiocarbon chronology for the LPS Krems-Wachtberg, Austria (~40 ka to ~20 ka, Terhorst et al. 2014), in order to assess the continuity of loess accumulation. This might help to evaluate the hypothesis that loess may not necessarily reflect arid paleoenvironments, but simply high dust accumulation rates (Zech et al., 2013).

Häggi et al. (2014). On the stratigraphic integrity of leaf-wax biomarkers in loess paleosols. *Biogeosciences* 11, 2455–2463.

Terhorst et al. (2014). Paleoenvironmental fluctuations as recorded in the loess-paleosol sequence of the Upper Paleolithic site Krems-Wachtberg, *Quaternary International* 351, 67-82.

Zech et al. (2013). Humid glacials, arid interglacials? Critical thoughts on pedogenesis and paleoclimate based on multi-proxy analyses of the loess-paleosol sequence Crvenka, Northern Serbia. *Palaeo* 3 387, 165–175.

Zech et al. (2011). High carbon sequestration in Siberian permafrost loess-paleosols during glacials. *Climate of the Past* 7, 501-509.