THE POTENTIAL OF LEAF WAX BIOMARKERS IN FLUVIAL SEDIMENT-PALEOSOL SEQUENCES – A CASE STUDY FROM THE UPPER ALAZANI RIVER, GEORGIA (CAUCASUS)

M. Bliedtner[1], R. Zech[1], H. v. Suchodoletz[2]

[1] *Institute of Geography, Friedrich Schiller University Jena, Germany, marcel.bliedtner@uni-jena.de*
[2] *Institute of Geography, Friedrich Schiller University Jena, Germany, roland.zech@uni-jena.de*
[3] *Institute of Geography, University of Leipzig, Germany, hans.von.suchodoletz@uni-leipzig.de*

Quantitative paleoclimatic and -environmental reconstructions are the key for a better understanding of how climate and environmental conditions have developed during the past and will develop in the future. In this context, biomarker analyses became a novel and innovative tool during the last decades. Long-chain *n*-alkanes (>C_{25}), for example, are leaf wax biomarkers that are produced by higher terrestrial plants and stay well preserved in sediment archives for millennia [1]. Their homologue pattern as well as their carbon and hydrogen isotopic composition can be used to reconstruct past changes in vegetation and paleohydrological conditions [2, 3]. While leaf wax biomarkers were successfully applied in lacustrine sediments and loess-paleosol sequences during the last years, no studies explored their potential for paleoenvironmental reconstructions in fluvial sediment-paleosol sequences so far. However, the latter kind of sediment archives are found ubiquitously in most regions of the world. Therefore, biomarker analyses in fluvial sediment-paleosol sequences have the potential to strongly enhance our knowledge of former climatic and environmental conditions in different landscapes and climate zones.

Here we present an explorative study that evaluates for the first time the potential of leaf wax biomarkers for paleoenvironmental reconstructions in fluvial sediment-paleosol sequences by studying a Holocene fluvial sediment sequence from the upper Alazani River in eastern Georgia (southern Caucasus). Since leaf wax biomarkers were not investigated in the Caucasus region so far, in a first step their regional applicability was evaluated on modern reference material from plants and topsoils prior to their application to the Holocene fluvial sediments. Subsequently, we carefully discussed potential archive-related limitations and investigated the age and origin of the leaf waxes in the fluvial sediments by compound-class ^{14}C-dating. Following those general considerations, we finally reconstructed the regional paleovegetation by leaf wax homologue patterns and paleoclimatic conditions by compound-specific $\delta^{13}C$ and $\delta^{2}H$ of those biomarkers.

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