



A unique Late Saalian (MIS 6) loess accumulation in the Lower Danube at Harletz (Bulgaria)

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A 20 m high loess-palaeosols section at Harletz in NW Bulgaria on the western bank of the Ogosta River (tributary of the Danube) was cleaned and sampled for a multi-disciplinary study and detailed pedostratigraphic approach. High-resolution continuous bulk sampling (5cm) was carried out to characterise grain-size, magnetic susceptibility, various parameters of the magnetic mineral assemblage, colour reflectance (2cm), and organic carbon (in progress). Geochronological control is based on 16 samples collected for OSL dating. Using a cyclo-stratigraphic approach of the sequence combined with dating constraints provided by both OSL dates and the age of a tephra layer occurring at a depth of -12m within the main loess unit, we can demonstrate that the Harletz section exhibits a 10m thick Late Saalian (MIS 6) loess accumulation unique in Europe. The lower part of the main loess unit (4 m), overlying the basal brown soil complex allocated to MIS 7, includes an exceptionally thick (4 m) and detailed succession of loess and four incipient soil horizons never described in European loess until now. The closest and best-dated high-resolution palaeoenvironmental archive suitable for comparison is the Lake Ohrid located (~ 400 km to the SW). The Ohrid palynological record testifies of a progressive step-by-step evolution in climate and in environmental change during the transition between MIS 7 and MIS 6 from which a parallel with the Harletz pedosedimentary succession can be made. During the younger part of MIS 6 (160-129ka), steppe vegetation with overwhelming herbs (*Artemisia*) is dominant in the Lake Ohrid record, in good accordance with a global enhancement of the aeolian dynamics, especially well recorded in sections located close to the Danube River from Serbia to Bulgaria and Romania (L2 loess). According to this study, the silts and fine sands building the Harletz loess section would have been transported from the Danube braided river system located (at that time) at about 4.5 km to the NW. Based on our data, the main loess units are characterised by a very low to a total absence of coarse sand particles. By contrast, during the Eemian interglacial, and in a lesser extent during MIS 5 and 3 interstadials, the long distance transport of silt and fine sand particles is stopped and a weak aeolian sedimentation is likely driven by northerly winds transporting coarse sand grains from the proximal Ogosta River sandy banks. Finally, the weak development of Last Glacial loess (4m max.) likely results from a rapid infilling of the sedimentary trap during the Saalian, then followed by a strong anthropogenic erosion of the topsoil and of the upper part of the loess profile since the Early Holocene (Neolithic).