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Paleoenvironmental conditions at the loess paleosol sequence Bodrogkeresztúr in NE Hungary

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Loess paleosol sequences (LPS) have the ability to preserve past environmental and climatic conditions. Therefore, they are a widely used terrestrial archive for the reconstruction of paleoclimatic dynamics. In this study, we use several proxies (grain size distributions, geochemical analysis, rock magnetism, and color measurements) to study past environmental changes in a LPS covering the MIS 2/MIS 3 transition. Geochronological control is given by post infrared infrared stimulated luminescence dating of polymineral fine grains. The research aim lies in the reconstruction of the paleoenvironmental conditions at the loess-paleosol sequence Bodrogkeresztúr in northeastern Hungary using a multi-proxy approach.

The sequence is located at the foot of the Kopasz hill, the southernmost part of the Tokaj Mountains, which belong to the Carpathian mountain range. The area is famous for the Bodrogkeresztúr-Henye Gravettian site (Lengyel, 2015). The profile contains eolian loess deposits intercalated by two paleosols. The lower paleosol overlays possibly fluvial clay (fine overbank deposits) forming the base of the profile. The luminescence samples have been tested thoroughly and have been measured with the pIR50IR290 protocol (Thiel et al., 2011). The final age assessment between 28.0±2.1 ka and 33.5±2.5 ka fits well to the established geochronologies of the Kopasz hill (Sümegi and Hertelendi, 1998) and the Tokaj section (Schatz et al., 2012).

Paleoenvironmental conditions are investigated through the multi-proxy approach. The measurement of the anisotropy of magnetic susceptibility is interpreted in regard of paleowind directions. The magnetic susceptibility is enhanced in paleosols, especially in the lower one, indicating strong pedogenesis. Grain size parameters also show high clay contribution in the lower paleosol, but also indicate two distinct features of stronger wind dynamics in the loess layer in the middle of the profile (double sigmoidal fluctuations in all grain sizes), which is also visible in the color trends. Similarly, geochemical data indicate increased weathering in the lower paleosol. Accordingly, it can be deduced that MIS 3 was likely more humid at Bodrogkeresztúr in comparison to the inner parts of the Carpathian Basin. This underlines the assumption that Anatomically Modern Human migration followed the foothills of the Carpathians.

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