

New geochronology of the Stalać section at the southern limit of European loess occurrence through pIR50IR290 dating

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A new geochronology was established for the Stalać loess-paleosol section in central Serbia. The section is located in the Central Balkan, at the transition zone between Atlantic, continental and Mediterranean climate regimes and is therefore potentially extraordinary sensitive to past and present climatic changes. Especially in the context of early human migration, this region is not intensively studied and has potential to contribute valuable information. This is the reason why it is investigated in the frame of the CRC 806 “Our Way to Europe” project. This project focuses on the climatic changes and their influence on the dispersal of anatomically modern human (AMH). For the loess-paleosol sequence exposed in a quarry in Stalać, a multi-proxy approach combining geochemical and sedimentological analysis and luminescence dating is applied. This contribution focusses on the luminescence investigations.

The luminescence characteristics of six samples were analyzed using the optically stimulated luminescence signal of quartz by means of the single-aliquot-regenerative-dose (SAR) protocol and the infrared stimulated signal of feldspar (within polymineral samples) by means of the post-infrared-infrared (pIRIR) protocol. While the fine quartz grain (4-11 μ m) samples show a preheat dependency of equivalent doses that makes them unsuitable for dating, the polymineral fine grain samples measured by pIR50IR290 behave satisfactorily: plateaus within a first IR stimulation temperature test, good dose recovery ratios, low residual doses, high precision and low uncertainty support the established age chronology ranging from 35.2 ± 1.8 ka to 168 ± 9 ka. A tephra within the MIS 6/L2 loess layer was bracket dated, and combining these ages suggests an age between ca. 140 and 175 ka (2σ).

Based on the presented results we introduce a new geochronology of the Stalać section, indicating that the previously suggested correlative stratigraphy (Kostić and Protić, 2000) requires significant revision. By using luminescence dating we demonstrate that the sediments found are older than previously proposed. This reveals that environmental conditions during the last two interglacials (MIS 7 and MIS 5) were different, but it also shows that MIS 5 and MIS 3 had relatively similar conditions.

Reference

Kostić, N., and Protić, N. (2000). Pedology and mineralogy of loess profiles at Kapela-Batajnica and Stalać, Serbia. *CATENA* 41, 217–227.