Grain-size analysis of loess-paleosol sequences from the Carpathian Basin

Ágnes Novothny (1,2)
(1) ELTE Eötvös Loránd University, Budapest, Hungary (agnes.novothny@gmail.com), (2) Leibniz Institute for Applied Geophysics (LIAG)

Ágnes Novothny1,2, Tamás Országh3, György Varga4, Gabriella Barta1, Diána Csonka1, Tamás Végh1, Erzsébet Horváth1

1 Eötvös Loránd University, Institute of Geography and Geology, Department of Physical Geography, 1117 Budapest, Hungary
2 Leibniz Institute for Applied Geophysics (LIAG), 30655 Hannover, Germany
3 Eötvös Loránd University, Faculty of Informatics, 1117 Budapest, Hungary
4 Research Centre for Astronomy and Earth Sciences (HAS), Geographical Institute, 1112 Budapest, Hungary

Loess-paleosol records in the Carpathian Basin provide excellent archives for studying paleoclimate- and paleoenvironment changes.
Five loess-paleosol sequences (Süttő, Basaharc, Hévízgyörk, Villánykővesd, Beremend; Hungary) were sampled high resolution and detailed grain-size investigation was carried out on the samples. Time frame for the investigation was elaborated by luminescence (post-IR IRSL) and Amino Acid Racemization (AAR) dating. The samples were only treated by 1% ammonium hydroxid, therefore they can be considered bulk samples. Grain-size distributions were determined using a Beckman-Coulter LS 13320 PIDS laser diffraction particle size analyzer, covering the range of 0.02-2000 µm, at the Leibniz Institute for Applied Geophysics (LIAG), in Hannover.
Clay- and sand content and U-ratio were calculated from the grain-size distribution of each sample and these values were plotted against the depth of the profiles. Comparing the variation of these values and trends, temporal and spatial changes could be concluded. Numerical partitioning was applied using Weibull distribution to separate finer and coarser components of each curve. Changes in the relative proportions of these components throughout all sequences can be interpreted as temporal and spatial changes of the different transport mechanism. Limitations, practicability of the method, as well as results and their interpretation will be presented in this study.

Thanks to the Leibniz Institute for Applied Geophysics, Hannover for the grain size measurements and to the Hungarian NRDIO projects K119366 and 100315. This study was also funded by the ÚNKP-17-4 and ÚNKP-18-4 New National Excellence Program of the Ministry of Human Capacities.