

Disentangling millennial-scale climate variability in south-eastern European loess-paleosol sequences

D. Veres¹, U. Hambach², S. Pötter³, I. Obreht⁴, C. Zeeden⁵, J. Böskén³, Y. Baykal⁶,
C. Laag^{2,5}, A. Timar-Gabor^{7,8}, T. Stevens⁶, F. Lehmkuhl³, S. B. Marković⁹

¹Romanian Academy, Institute of Speleology, Cluj-Napoca, Romania; ²Chair of Geomorphology, University of Bayreuth, Germany; ³Department of Geography, RWTH Aachen University, Germany; ⁴Organic Geochemistry Group, MARUM-Center for Marine Environmental Sciences and Department of Geosciences, University of Bremen, Germany; ⁵Leibniz Insititute for Applied Geophysics, Hannover, Germany; ⁶Department of Earth Sciences, Uppsala University, Sweden; ⁷Faculty of Environmental Science and Engineering, Babes-Bolyai University, Cluj-Napoca, Romania; ⁸Interdisciplinary Research Institute on Bio-Nano-Science of Babes-Bolyai University, Cluj-Napoca, Romania; ⁹Department of Physical Geography, University of Novi Sad, Serbia

DOI: 10.18154/RWTH-2019-10436

Owing to the nature of their formation, loess-paleosol sequences are valuable terrestrial archives in investigating past variability in the long-term global dust dynamics. As the primary constituent of loess and a major component of global climate forcing, mineral dust serves as a proxy that allows for direct comparison of loess data with chronologically better resolved ice and lacustrine records. Motivated by the recent emergence of high-resolution magnetic and sedimentological data on Lower Danube loess-paleosol profiles, we explore advances and drawbacks in comparing regional paleoenvironmental response to millennial-scale climate variability during last glacial cycle. We show that the Lower Danube loess preserves a convincing record of millennial-scale variability that resembles the Greenland interstadials/stadial variability. In order to explore regional patterns of change, we also focus in comparing loess records with better-established lacustrine and marine records from southeastern Europe. As reliable chronological control is still the major limiting factor in exploring the full paleoclimate potential of loess records, we also discuss regional implications in defining an improved loess chronostratigraphic framework based on several lines of chronological evidence, including tephrochronology.