



## Concurrent and opposed environmental trends during the last glacial cycle between the Carpathian Basin and the Black Sea coast: evidence from high resolution enviromagnetic loess records

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Aeolian dust sediments (loess) are beside marine/lacustrine sediments, speleothemes and arctic ice cores the key archives for the reconstruction of the Quaternary palaeoenvironment in the Eurasian continental mid-latitudes. The Eurasian loess-belt has its western end in the Middle (Carpathian) and the Lower Danube Basin where one can find true loess plateaus dating back more than one million years and comprising a semi-continuous record of Pleistocene environmental change. The loess-palaeosol sequences (LPSS) of the region allow inter-regional and trans-regional comparison and, even more importantly, the analysis of temporal and spatial trends in Pleistocene environments, even on a hemispheric scale. However, the general temporal resolution of the LPSS seems mostly limited to the orbital scale patterns, enabling the general comparison of their well documented palaeoclimate record to the marine isotope stages (MIS) and thus to the course of the global ice volume with time.

Following the widespread conventional wisdom in loess research, cold and more importantly dry conditions are generally assumed to lead to relatively high accumulation rates of loess, whereas during warmer and more humid environmental conditions the vegetation cover prevents ablation and clastic silt production. Moreover, symsedimentary pedogenesis prevails and hence, (embryonic) soils are formed which are rapidly buried by loess as soon as the climate returns to drier conditions. In the last decades, mineral magnetic parameters became fundamental palaeoclimate proxies in loess research. The magnetic susceptibility ( $\chi$ ) and its dependence on the frequency of the applied field ( $\chi_{fd}$ ) turned out to be beside grain size and geochemical indices a highly sensitive proxy especially for soil humidity during loess accumulation.

Here we present the first results of an ongoing study on two Late Pleistocene LPSS from the southern Carpathian Basin (Titel-Plateau, Vojvodina, Serbia) and the eastern Lower Danube Basin near to the Black Sea (Urluia quarry, Dobrogea, Romania). In order to investigate the potential of Danubian loess in recording millennial-scale palaeoclimate variability, a 22 m deep drill-core from the Titel loess plateau and a more than 15 metres thick LPSS from the Urluia quarry were contiguously sampled. Both sides provide improved insight into past climate evolution of the regions down to MIS 6. The presentation will focus on the down-core/down-section variability of  $\chi$  and  $\chi_{fd}$  as environmental proxy parameters. Based on these mineral magnetic proxies we can already draw the following conclusions:

- 1) The dust accumulation rates in both regions were relatively constant over the past c. 130 kyrs, even during full interglacial conditions.
- 2) In the studied sections, the pedo-complex S1 represents  $\pm$  the Eemian and not the entire MIS 5, as previously assumed.
- 3) There are a lot of similarities between the mineral magnetic records of the Titel-Plateau (Vojvodina, South Carpathian Basin) and the Urluia quarry (Dobrogea, Lower Danube Basin) and also between these records and those from the Chinese Loess Plateau, but also fundamental differences.
- 4) During the early glacial (end of MIS5) we find no evidence for soil formation in the South Carpathian Basin whereas in the Dobrogea near to the Black Sea coast embryonic soils developed. On the contrary, during the younger part of MIS 3 ( $\leq$  40 ka) near to the Black Sea coast soil humidity sharply decreased towards the LGM whereas in the South Carpathian Basin the mineral magnetic proxies indicate a relative maximum in pedogenesis/soil humidity.

Sedimentological, geochemical, geochronological and palaeomagnetic investigations are in progress. They will provide further high quality data sets leading to an improved understanding of the Late Pleistocene environmental

evolution in the Danube Basin.