



On the past climate of the Dobrogea (Romania) during the late Quaternary as reflected by loess geochemistry

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Ten samples of loess and paleosoil collected from the Costinesti – Dobrogea (Romania) loess deposit that are covering a time span of about 690 ± 90 ky were analyzed by X-ray diffraction (XRD), Instrumental Neutron Activation Analysis (INAA) and X-ray Fluorescence (XRF) in order to evidenciate the origin as well as the climatic conditions during the formation of loess material. The presence of illite and calcite, suggests reduced weathering. This was confirmed by further climate proxies as Chemical Index of Alteration (CIA) whose values are between 54.6 and 64.0, Chemical Index of Weathering (CIW) between 65.7 and 71.7 as well as Rb/Sr ratio between 0.26 and 0.47, lower than the neighboring Hungarian loess, but closer to the average Chinese and European loess.

No statistical significant differences were observed between average values of loess and palaeosol samples regarding these proxies. The content of 27 trace elements, including 10 REE were, excepting Cr, Ni, Zr and Hf, very close to average rocks composition as Upper Continental Crust (UCC), North America Shale Composite (NASC) and Post-Archean Average Australian Shale (PAAS).

Both mineralogical and geochemical data from Costinesti loess and palaeosol samples support a continental origin of loess material deposited in a rather arid and cold climate during the past 690 ± 90 ky.