



## The Middle Danube Valley: key location in the last glacial atmospheric circulation pattern

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Isotopic organic geochemistry ( $\delta^{13}\text{C}_{\text{org}}$ ) study has been performed in the Surduk loess-paleosol sequence in Serbia, from a record extending from the last interglacial through the present interglaciation with a sedimentation rate as high as  $0.6 \text{ mm.yr}^{-1}$  at the onset of the Pleniglacial.

The Serbian sequence provides a high temporal resolution isotopic record that characterizes paleoclimatic rapid events of the last glaciation in the Middle Danube Valley. Indeed, it has been shown that, due to the specific sedimentation conditions (high accumulation, cold and arid meteorological conditions), typical loess  $\delta^{13}\text{C}_{\text{org}}$  nicely reflects the original vegetation isotopic composition, whereas paleosol  $\delta^{13}\text{C}_{\text{org}}$  can only be interpreted in terms of qualitative paleoenvironmental variations because of pedogenesis impact on original vegetation isotopic signature. Not only defining predominant vegetation shift from C3 to C4 photosynthetic pathway plants, typical loess

$\delta^{13}\text{C}_{\text{org}}$  record can be quantitatively transcribed in terms of precipitation (annual amount and distribution).

We highlight here the cornerstone location of the Middle Danube Valley in the past atmospheric circulation pattern. Indeed by showing the first definitive punctual occurrence of C4 plants whereas other further westward European loess sequences only show the occurrence of C3 plants throughout the past glaciation, the Surduk  $\delta^{13}\text{C}_{\text{org}}$  record underlines fluctuations of relative influences of both oceanic and arctic air masses in the past Serbian atmospheric pattern. The development of C4 plants is linked to settlement of very long dry seasons that do not allow C3 plants growth. Besides this result on annual distribution of precipitation through glacial times, quantitative reconstruction of annual precipitation amount is shown that corroborates the extreme aridity of some well-defined episodes.