

Interactive
Comment

Interactive comment on “Excursions to C₄ vegetation recorded in the Upper Pleistocene loess of Surduk (Northern Serbia): an organic isotope geochemistry study” by C. Hatté et al.

C. Hatté et al.

christine.hatte@lsce.ipsl.fr

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see attached doc

Please also note the supplement to this comment:
<http://www.clim-past-discuss.net/9/C344/2013/cpd-9-C344-2013-supplement.pdf>

Interactive comment on Clim. Past Discuss., 9, 187, 2013.

Interactive
Comment1 Excursions to C4 vegetation recorded in the Upper Pleistocene loess
2 of Surduk (Northern Serbia): an organic isotope geochemistry study.

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5 Hatté Christine [1], Gauthier Caroline [1], Rousseau Denis-Didier [2,3], Antoine Pierre
6 [4], Fuchs Markus [5], Lagroix France [6], Marković Stobdan B. [7], Moine Olivier [4],
7 Sima Adriana [2]8 [1] Laboratoire des Sciences du Climat et de l'Environnement, CEA-CNRS-UVSQ, F-91198
9 Gif-sur-Yvette, France10 [2] Laboratoire de Météorologie Dynamique, UMR CNRS-ENS 8539, F-75231 Paris,
11 France

12 [3] Lamont-Doherty Earth Observatory of Columbia University, NY Palisades, USA

13 [4] Laboratoire de Géographie Physique, CNRS-Univ. Paris 1, F-92195 Meudon, France

14 [5] Department of Geography, Justus-Liebig-University Giessen, D-35390 Giessen,
15 Germany16 [6] Institut de Physique du Globe de Paris, Sorbonne Paris Cité Univ Paris Diderot, UMR
17 7154 CNRS, F-75005 Paris, France18 [7] Chair of Physical Geography, University of Novi Sad, Novi Sad, Serbia
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21 Abstract:

22 Loess sequences have been intensively studied to characterize past glacial climates of
23 the 40–50° North and South latitude zones. Combining different approaches of
24 sedimentology, magnetism, geochemistry, geochronology and malacology allows the
25 general pattern of the climate and environment of the last interglacial-glacial cycle in
26 Eurasia and America to be characterized. Previous studies performed in Europe have
27 highlighted the predominance (if not the sole occurrence) of C3 vegetation. The
28 mean annual precipitation was relatively high during the last glacial times in Europe.
29 Therefore, even if the mean annual precipitation remained very low during the most
30 extensive glacial times, free water was available for more than 2 months per year.
31 Contrarily, the $\delta^{13}\text{C}$ record of Surduk (Serbia) clearly shows the occurrence and
32 dominance of C4 plants during at least 4 episodes of the last glacial times at [28.0–26.0],
33 [31.4–30.0], [53.4–51.0] and [66.4–64.0] (in kyr cal. B.P.). The C4 plant development
34 is interpreted as a specific atmospheric pattern that favored northerly over
35 summer conditions. As possible explanation, we propose that during “C4 episodes” the
36 Mediterranean Sea would have been under the combined influence of the following: i- a
37 strong meridional circulation unfavorable to water evaporation that reduced the
38 Mediterranean precipitation on the Balkans; and ii- a high positive North Atlantic
39 Western Russian (NAWR)-like atmospheric pattern that favored northerlies over
40 southerlies and reduced Arctic precipitation over the Balkans. This configuration would
41 imply very dry summers that did not allow C3 plants to grow, thus supporting C4
42 development. The intra “C4 episodes” period would have occurred under less direct
43 oceanic and atmospheric patterns that made the influence of westerlies on the Balkans
44 possible.

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Interactive Discussion

Discussion Paper



Fig. 1.