

## ***Interactive comment on “Excursions to C<sub>4</sub> vegetation recorded in the Upper Pleistocene loess of Surduk (Northern Serbia): an organic isotope geochemistry study” by C. Hatté et al.***

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see attached doc

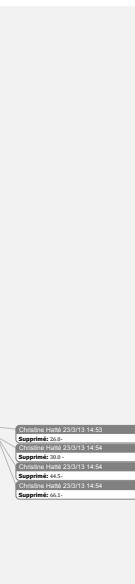
Please also note the supplement to this comment:

<http://www.clim-past-discuss.net/9/C344/2013/cpd-9-C344-2013-supplement.pdf>

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

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1 Excursions to C<sub>4</sub> vegetation recorded in the Upper Pleistocene loess  
2 of Surduk (Northern Serbia): an organic isotope geochemistry study  
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21 **Abstract:**  
22 Loess sequences have been intensively studied to characterize past glacial climates of  
23 the 40–30° North and South latitudes 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 the Balkans to be reconstructed. The paleoenvironmental patterns are  
27 highlighted by the predominance (if not the sole occurrence) of C<sub>3</sub> vegetation. The  
28 presence of C<sub>3</sub> plants suggests a regular distribution of precipitation along the year.  
29 The presence of C<sub>4</sub> plants suggests a more irregular precipitation with very low during the most  
30 extensive glacial times. Free water was available for more than 2 months in winter.  
31 Contrarily, the δ<sup>13</sup>C record of Surduk (Serbia) clearly shows the occurrence and  
32 dominance of C<sub>4</sub> plants during at least 4 episodes of the last glacial times at [28.0–26.0],  
33 [24.0–22.0], [19.0–17.0] and [14.0–12.0] cal. kyr. The last one is the most intense.  
34 is interpreted as a specific atmospheric circulation pattern that induces short and dry  
35 summer conditions. As possible explanation, we propose that during “C<sub>4</sub> episodes”, the  
36 Mediterranean Sea would have been under the strong influence of the North Atlantic, i.e. a  
37 strong meridional circulation that would have water evaporation and reduced  
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 the Balkans. The presence of C<sub>4</sub> plants during the last glacial times at Surduk  
41 imply very dry summers that did not allow C<sub>3</sub> plants to grow, thus supporting C<sub>4</sub>  
42 development. The intra “C<sub>4</sub> episodes” periods would have occurred under less drastic  
43 oceanic and atmospheric patterns that made the influence of westerlies on the Balkans  
44 possible.



**Fig. 1.**

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