

Interactive comment on “On the stratigraphic integrity of leaf-wax biomarkers in loess-paleosols” by C. Häggi et al.

Anonymous Referee #1

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General comments:

Häggi et al. investigated the long-term stability of leaf-wax biomarkers using n-alkanes and fatty acids in loess-paleosols in two different set-ups. In the first study, they examined the biomarker concentrations along two soil profiles on the Swiss Plateau and in the second study they compared compound-specific radiocarbon ages with independent ages for a loess section in Serbia. n-Alkanes and fatty acids are often applied in paleoenvironmental and paleoclimate reconstructions postulating their long-term stability, but only a few studies really fathomed the integrity of these biomarkers. The originality of this paper lies in the combination of the two approaches to assure the stability of leaf-wax biomarkers. The manuscript is well written and the presented data improves our understanding and appreciation for these biomarkers and their potential

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usage in further paleoenvironmental or paleoclimate reconstructions. Therefore, this work is appropriate for publication. However, I've made a few comments for the authors (see below).

Specific comments:

If you use a prepGC system to isolate the specific n-alkanes and fatty acids, respectively, you should proof that there is no change in the radiocarbon age occurring during the preparation. Can you evaluate the critical steps in sample preparation (e.g. separation, solvent removal and graphitization) and quantify their effects on the ^{14}C content? Did you use any standard material for validation? Please, give more detailed information or cite studies, where the method is examined.

16907-Lines 27-28: What happened to the Crvenka samples? Are they homogenized and sieved, too?

16908-Lines 1-2: How many cycles did you use for extraction and how long did you extract the samples? Please give more information on the method.

16908-Line 21: Could you really remove all the solvent? I know it's not easy – there may be some remains which add dead carbon and increase the age of your sample.

16912-Lines 24-25: Sample Cr 10 shows the opposite trend with younger ages for the long-chain compounds. You should mention this divergent pattern and shortly explain the difference.

Technical corrections:

26904-Lines 18-19: “. . . in the two investigated systems.”

16906-Line 13: Please homogenize the way of describing the locations in the manuscript: north-western or northwestern. Compare with lines 20 (southwestern) and 21 (northwest).

16906-Lines 21-22: Please homogenize the way of describing the locations (altitude

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and coordinates) in the manuscript. Compare with line 7 (site Niederbuchsiten) and line 8 (site Steinhof). First mention the altitude of the study site and then the coordinates in the same way (Degree Decimal, Minute Decimal).

16906-Line 24: Check the sentence: "A weakly developed paleosol complex formed during MIS 3 (i.e. between \sim 58 and 28 ka) is found ...".

16907-Line 24: Please mention some studies where this chronostratigraphic concept is also used for terrestrial records.

16908-Lines 1-2: "... using dichloromethane and methanol (DCM : MeOH; 9 : 1) at ..."

16910-Lines 10-13: I would shift this part to the discussion, because you're already explaining the results.

16910-Line 22: Please check the sentence. Something is missing there. "... ,respectively, in good agreement with ..."

16911-Lines 2-3: Already kind of discussion again.

16912-Line 16: Please refer to Table 1.

16914-Lines 1-4: What's the reference for these explanations? Matsumoto et al., 2007?

Fig. 1a: You mentioned that the C horizon in the soil profile Niederbuchsiten is developed below 3 m (16906-Lines 11-12). What does the line in the depth of \sim 2.10 m indicate? Just regarding the figure, I would expect the change from Bt to C horizon at this line.

Fig. 1c: I would plot the ages on the right side of the figure just for a better overview.

Interactive comment on Biogeosciences Discuss., 10, 16903, 2013.