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Biogeosciences Discussions

Interactive comment on "Technical Note: *n*-Alkane lipid biomarkers in loess: post-sedimentary or syn-sedimentary?" *by* M. Zech et al.

M. Zech et al.

michael_zech@gmx.de

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We are very grateful for your review, Dr. Chikaraishi, and fully agree that compound-specific 14C-dating of individual n-alkane homologues would be highly desirable in addition to bulk n-alkane fraction 14C-dating. However, the respective technique (prep-GC and 14C-dating of very low amounts of carbon) is not easily available for all working groups. Furthermore, as you already know, it is analytically highly sophisticated but at the same time also very challenging. And finally, it is very time consuming. In contrast, bulk n-alkane fraction 14C-dating as carried out in our study is much less time consuming and less challenging. So both methodological approaches have advantages and disadvantages. We acknowledge that with the bulk n-alkane fraction approach we cannot quantify the post-sedimentary contamination of individual n-alkane homo-

logues. Nevertheless, our study is a highly innovative and important contribution to biogeosciences in general and to loess research in particular and therefore deserves publication. We suggest to include a statement in our revision emphasizing the need for compound-specific 14C-dating of individual n-alkane homologues in future studies.

We also appreciate your comment that additionally to long-chain n-alkanes, the 14C-dated n-alkane fractions contain short-chain n-alkanes and UCM (unresolved complex mixture) humps. Concerning multiple sources (you mentioned C18 and C20 being produced by lichen and moss), we do not see that this prohibits our approach, because also the short-chain n-alkanes are a mixture of syn-sedimentary and post-sedimentary n-alkanes (presumably by root input). Similarly, provided that the UCM derives from plant biomass burning/charring, it features a syn-sedimentary age. Nevertheless, we fully agree with you that the UCM introduces an uncertainty, which is however difficult to quantify using the bulk n-alkane approach. We will include this in our revision.

In your review you finally suggested that a careful estimation of the error of our "quantitative estimation" is necessary. In chapter 3.3 and in Table 2 we present respective errors based on the errors of the luminescence data. Please let us know if/how further error estimates should be done.

Interactive comment on Biogeosciences Discuss., 9, 9875, 2012.