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Discussions

Interactive comment on "Sediment history mirrors Pleistocene aridification in the Gobi Desert (Ejina Basin, NW China)" *by* Georg Schwamborn et al.

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Dear Editors and Authors,

I recently read the discussion paper "Sediment history mirrors Pleistocene aridification in the Gobi Desert (Ejina Basin, NW China)" by Schwamborn et al. with much interest. In doing so, I noticed that many details regarding the organic geochemical analyses are currently missing. The one methods reference cited is a textbook chapter that discusses only in very general terms how biomarkers are analyzed instead of the specific methods information pertinent to this study. Thus, I'd like to suggest the following additions to strengthen the biomarker portion of this manuscript.

1. Leaf wax concentrations: what were the methods used for extraction and column

chromatography? How much sample was extracted? Were additional cleanup steps required to separate saturated and unsaturated alkanes prior to isotopic analysis? Where were the organic geochemical analyses preformed and what make/model instrument was used? Details including type of column, the oven temperature program and flow rates, and the types of internal standards run should be given.

2. Leaf wax deuterium isotopes: The instrument make/model, column type, reactor conditions (temperature, carrier gas and flow rate), and isotopic standards analyzed should be reported. Were the samples analyzed in duplicate or triplicate? What was the minimum peak size used (1000 mV)? How was instrumental error assessed? How often was the H3+ factor determined and what was its range during the analytical period? Was hydrogen isotope drift throughout the life of the reactor evaluated? The recent publications of Goldsmith et al., 2019 JGR Biogeosciences and McFarlin et al., 2019 Quaternary Science Reviews are good examples of the level of detail that should be included when publishing leaf wax δ2H data.

3. In Figure 8, the top two panels should plot the error for the δ2H measurements. For the other panels, it is unusual to present leaf wax concentrations as centered-log ratios. Plotting it in this manner makes it difficult to compare these data with other studies. Usually leaf wax data are presented as concentrations (ng or mg per g sediment extracted) or fractional abundances of the different chain lengths – adding such a plot would be helpful.

I believe that adding this critical information will make these data more readily comparable with other existing leaf wax datasets, which I think will help this work to become better cited in the long-term.

Finally, given that this is an endorheic basin, which should be highly sensitive to changes in aridity, and given that leaf wax δ2H at this location likely reflects both temperature change and shifting moisture sources, has the δ2H difference between a terrestrial compound (nC31) and an aquatic (nC19 or nC21) compound (εter-aq) been

examined? This approach has been used by a number of studies to help identify past arid intervals (e.g. Thomas et al., 2018 GRL; Rach et al., 2017; Sachse et al., 2004) and it might work well in an endorheic basin.

Sincerely,

Isla S. Castañeda

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