

Interactive comment on “Sporopollen evidence for Late Miocene stepwise aridification on the Northeastern Tibetan Plateau” by J. Liu et al.

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GENERAL

This is a good paper providing a substantiated record of the late Miocene vegetation development in central Asia. The paper also uses the evidence from mammal fossils resulting in a rich description of the biomes. An appropriate comparison with other records from the area is given leading to the conclusion that around 7.5 Ma, biomes shifted indicating drier conditions. I have two main points that should be addressed.

1. The timing of the aridification is discussed in the context of the Miocene cooling as recorded in benthic foraminifera and in the context of the uplift of the Himalaya. The discussion about the foraminifer record is not very clear and I have some questions put

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on the annotated manuscript (page 5255). The discussion is illustrated with Figure 4 and, although I have some issues with its caption (see specific remarks), the message seems to be clear: the aridification of central Asia between 7 and 8 Ma falls during a period of major Tibetan Plateau uplift but not during the strong Miocene global cooling trends. This is at odds with the conclusion 'that global cooling may have been a potential driving force for aridification of the Asian interior, and that TP uplift probably enhanced this process'. Therefore, I suggest clarifying the discussion and altering the conclusion as to present the uplift as the main driver of aridification during the late Miocene to which global cooling might have helped.

2. In the discussion, the magnetic susceptibility record of the section is mentioned (and shown in Figure 4). However, there is no reference indicating that the susceptibility data have not been properly published, yet. If that is the case, please describe the measurement and the results in the appropriate sections.

SPECIFIC REMARKS

RESULTS. Please add the depth (in meters) to the description of the zones in the results section. Do not give percentages with a precision that is not warranted. Round all percentage values to the nearest integer. The sentence “This diagram principally demonstrates that tree pollen decline stepwise as herbaceous pollen increases” is bad for several reasons. Not the POLLEN decline but the PERCENTAGES decline. The more important objection concerns the meaninglessness of the remark. Because the values are expressed in percentages of the total, the values of the one always will decline if those of the other increase. The Euphorbiaceae is a large plant family with many representatives, some of them ubiquitous. I cannot believe that no Euphorbiaceae are growing in the area.

DISCUSSION. I do not understand the argument about global cooling leading to a gradual aridity increase (page 5255, line 15-16) in contrast to a stepwise one. Please clarify.

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FIGURE CAPTIONS. Please add an explanation of 'GPTS' in the caption of Figure 2. The reference Li et al. (2007) is not listed in the reference list. Please delete the names of the mammals in the caption of Figure 4 as these details are beyond the scope of the paper. Add an explanation for panel (g).

LANGUAGE. Sporopollen is a casual term that might better be substituted by 'pollen and spores' or 'palynomorphs' in writing. In the title I suggest to use 'palynological'. As the paper does not disclose any spore data, you also could just write 'pollen'. The use of the word 'spectrum' might induce associations with spectral analysis and for that reason, I advise not to use it. Please refrain from the use of vis-à-vis. Often 'low abundance' is preferable to 'low content'. The use of the word 'content' in the meaning of 'percentages' might be confusing. I learned that in English (I am not a native speaker) 'this' is used sparingly and in many cases can be replaced by 'the'. The Chinese Loess Plateau is only mentioned three times and, therefore, it does not have to be abbreviated.

All specific comments and suggestions can be found on the annotated manuscript.

Please also note the supplement to this comment:

<http://www.clim-past-discuss.net/11/C2559/2015/cpd-11-C2559-2015-supplement.pdf>

Interactive comment on Clim. Past Discuss., 11, 5243, 2015.