

***Interactive comment on “The relative roles of CO<sub>2</sub> and palaeogeography in determining Late Miocene climate: results from a terrestrial model-data comparison” by C. D. Bradshaw et al.***

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General comments:

Bradshaw et al. provide the results and interpretations for palaeoclimate sensitivity studies for the late Miocene (Tortonian and Messinian). The paper is within the scope of Climate of the Past. I will not comment on technical aspects of the modeling part, as I am not a modeler. For comparison the authors use different palaeozoological and palaeobotanical proxies, utilizing, as far as I see, the most complete data-base used so far in comparable studies.

Although I will not comment on technical aspects of the modeling I have the strong  
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impression that this part, especially the methodological part, can be shortened without loss of information for non-modellers. In contrast it would be good to have a little bit more information about the methods used for the reconstruction of palaeoclimate data based on proxies, especially for modelers. It would also be good if the authors could include a short paragraph about the comparability of palaeoclimate reconstructions obtained by different techniques from the same type of proxy at an individual locality. The use of different techniques may introduce a lot of noise into the proxy data-set, as it is known that, for example, CLAMP produces consistently lower temperature estimates when applied to European Neogene floras than the Coexistence approach (which is based on the nearest living relative concept) (e.g. Mosbrugger & Utescher, 1997; Uhl et al., 2003, 2006, 2007; Thiel et al., 2012).

All in all I am convinced that this manuscript should be published but there are some (minor - moderate) issues which should be solved before publication.

Specific comments:

Although it seems that the authors covered (almost) as many Late Miocene proxy data for comparison as possible (there is still the danger that a few data points have been overlooked) I was surprised to see a number of localities in the online supplement which are definitely not Late Miocene but Middle Miocene. I will not get into too much detail with all localities but will provide one example from my own work: the locality Schrotzburg is cited with an age assignment of 11 – 14.8 million years. This is really surprising for me. As stated in Uhl et al. (2006) (cited by the authors) the flora belongs to mammal zone MN6 or basalmost MN7. This implies Langhian or basal Serravallian and definitely not Tortonian! There seem to be more Middle Miocene localities (e.g. Erdobenyé-Kovago-oldal, which is Serravallian) which are erroneously labeled as Late Miocene. Here the authors should either provide a reasonable explanation why they included these Middle Miocene localities or carefully check the age assignments of their proxy localities.

Another small thing that should be noted here: There are some data points (e.g. 724 and 924; both Schrotzburg [sorry, but I did a lot of work there]) of the online supplement which suggest that fruit and seeds may be the base for leaf physiognomy and CLAMP (a leaf physiognomic technique). This may be a typo, but I would suggest to re-check the supplement whether these are the only typos or not.

Technical comments:

Physiognometric is not a term used in palaeobotany in general or by people working on palaeoclimate reconstruction with the aid of leaf physiognomy. What do the authors mean with this very strange term? I would suggest to us a more established term.

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