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Climate of the Past Discussions

Interactive comment on "Aridification signatures from middle–late Eocene pollen indicate widespread drying across the Tibetan Plateau after 40 Ma" *by* Qin Yuan et al.

Anonymous Referee #2

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This manuscript, entitled, "Aridification signatures from middle-late Eocene pollen indicate widespread drying across the Tibetan Plateau after 40 Ma" by authors Yuan et al., presents a detailed and well-written new palynological study worth of publication in Climate of the Past. The new work on the RZ section from the Nangqian Basin may become a valuable contribution to the understanding of the climatic and tectonic histories of Tibet. This work does, however, require substantial revision in order to make a more compelling argument and to better communicate their findings to a broad audience. First, the authors should do a better job disclosing, both in the text as well as figures, where in the stratigraphic sections and to which zone each of the 21 productive samples belongs. For example, this should be clear for zone II, which the authors interpret

as MECO. . .are these interpretations based on a single sample? Such bold regional or global claims should be substantiated not only by robust evidence within the section but also corroborating evidence published elsewhere. I suggest the authors not only plot their samples on their stratigraphic sections (e.g. Figs 2, 3 and 4) but also discuss the statistical limitations of their samples (Zone II has only 2 samples; Zone III has 3). Further, I think the manuscript could benefit from additional discussion and a new figure similar to figure 3 that compares the palynological record presented here with non-palynological data such as stable isotope data from the region.

Second, there are ample opportunities to help this manuscript reach a broader audience. As a non-palynologist familiar with paleoclimate, I repeatedly found myself searching for the significance of some of the findings or the implications of a particular species abundance. This is particularly true for the paleoclimate discussion sections. For example: 1) Line 65: Explain the I-AM more; 2) Figure 1: These index maps aren't particularly useful. Perhaps something that is more (paleo)geographical or a vegetation map would help with the paleoclimate reconstructions to come?; 3) Figure 2: The ecological groups (e.g. Pteridophytes) could be better annotated for non-specialists, NLR should be explained, and N/E ratios could be labeled desert/semi-desert and steppe-desert; 4) Figure 3: Index map could be greatly improved and this study could be highlighted with a different marker. The plant functional types listed here aren't being consistently used throughout the paper (e.g. "temperate broad-leaved forest" etc in figure 2). These should be consistent throughout; 5) Figure 4: These taxa should be explained, especially as you go on to stress the importance of Ef/Ed ratios later; 6) Background on MECO should be developed earlier; 7) PFTs should be developed earlier and consistent throughout the text; 8) More explanation is needed as to why you favor N/E over Ef/Ed; 9) Age constraints should include Ma throughout in addition to just stratigraphic stages e.g. line 423.

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