

Interactive comment on “Postglacial fire history and interactions with vegetation and climate in southwestern Yunnan Province of China based on charcoal and pollen records” by Xiayun Xiao et al.

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Response to professor S.A.G. Leroy:

General comments:

This manuscript reports an interesting investigation of fire history combining not only charcoal but also various palynological parameters (including diversity). The results are robust and show clearly data that are different from global syntheses. This highlights the need to work also at a regional scale and understand the intricacies of climate change and vegetation types at a regional level.

Response: We are very pleased to have received a review from Professor S.A.G. Leroy

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and we are grateful for her positive feedback on the manuscript. We address each comment with explanation as follows.

My main scientific comment is:

1) Why not use concentrations in addition (or even instead) of percentages for the pollen taxa (page 10, lines 18 and foll.). It could be more informative.

Response: Yes, we usually use pollen concentration as a proxy indicator of vegetation density or biomass productivity and thus climatic condition. However, apart from biomass productivity, some other factors such as the lithology, the sedimentation rate, input of inwashed material, detritus content, within-lake sedimentary processes et al. may confuse the records of real changes in pollen concentration (Hicks and Hyvärinen, 1999). In this study, biomass productivity and climatic conditions revealed by total pollen concentration are not exactly consistent with those disclosed by pollen percentage assemblage (Fig. S1). For example, the lowest pollen concentrations during the period 14.5-13.0 ka BP might not indicate unfavourable climatic conditions, and might be caused by the high detritus content under conditions of rising humidity and intensified surface run-off. In addition, the tendencies of the concentrations and percentages for the 6 main pollen taxa are almost consistent except for some differences during the period 14.5-13.0 ka BP (Fig. S2). Thus, considering that the impact factors of the pollen concentration are complicated in this study, we use only pollen percentages for the pollen taxa. Hicks S, Hyvärinen H, 1999. Pollen influx values measured in different sedimentary environments and their palaeoecological implications. *Grana* 38: 228-242.

2) Page 11, Lines 19-21: is not it the reverse? when there are fires only fire-adapted taxa survive?

Response: It concerns the following sentence: high fire-episode frequency occurs in conjunction with forests comprised primarily of fire-adapted taxa and lower fire-episode frequency is associated with forest dominated by fire-sensitive taxa. Fire-adapted taxa

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are defined as “plant species are able to withstand a degree of burning and continue growing despite gradual damage from fires”. Fire-sensitive taxa are defined as “plant species whose abundance will decrease rapidly when they undergo frequent and intensive fire”. In this study, evergreen oaks and *Alnus* are fire-adapted taxa, and are flammable plants. *Lithocarpus/Castanopsis* and tropical arbors are fire-sensitive taxa, but they are not easy to ignite. Thus, we draw the above conclusion. There is a difference between frequent and intensive fire events and fire events in terms of strength and frequency. Forests are primarily comprised of fire-adapted taxa, which can not be considered as only fire-adapted taxa survive. Thus, we can not say that when there are fires only fire-adapted taxa survive.

Technical comments:

1) Page 3, lines 8-10: add a call to reference

Response: A reference is added. Wang, Y. F., Zhu, Y. X., Pan, H. X., Yin, Y.: Environmental characteristics of an acid Qinghai Lake in Tengchong, Yunnan Province, *Journal of Lake Sciences*, 14(2), 117-124, 2002 (in Chinese).

2) Page 3, Line 12: I suppose you mean the Westerlies

Response: Yes, thanks, it is done.

3) Page 4, line 10 (and elsewhere): is not

Response: Done.

4) Page 12, line 11: lack of inflammability, or uninflammability. Is this what you mean?

Response: Yes, it is uninflammability. Thank you very much for your careful observation.

5) Page 12, line 24: replace “correlations” by “comparisons” or “parallel”. Avoid “correlation” that suggests statistics were applied.

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Response: Thank you very much for your suggestion. We replace “correlations” with “comparisons”.

6) Page 16, line 5: add italics to Latin names

Response: Done, thanks.

7) Figure 3: use the same major and minor ticks for a and b.

Response: We delete Figure 3 in the origin manuscript according to Referee2' comments.

Interactive comment on *Clim. Past Discuss.*, doi:10.5194/cp-2016-61, 2016.

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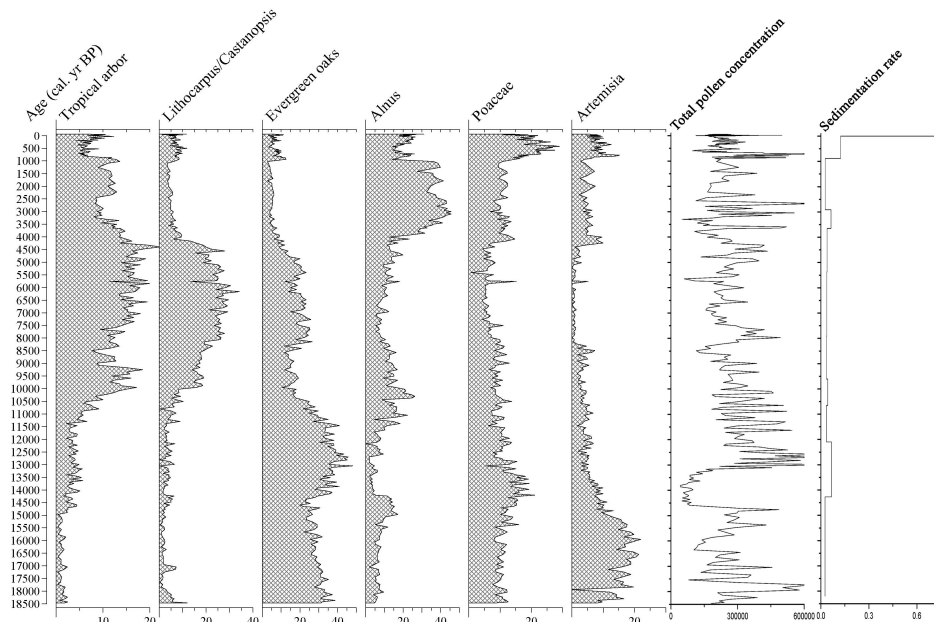


Fig. 1. A comparison of pollen percentages for 6 main pollen taxa and total pollen concentration

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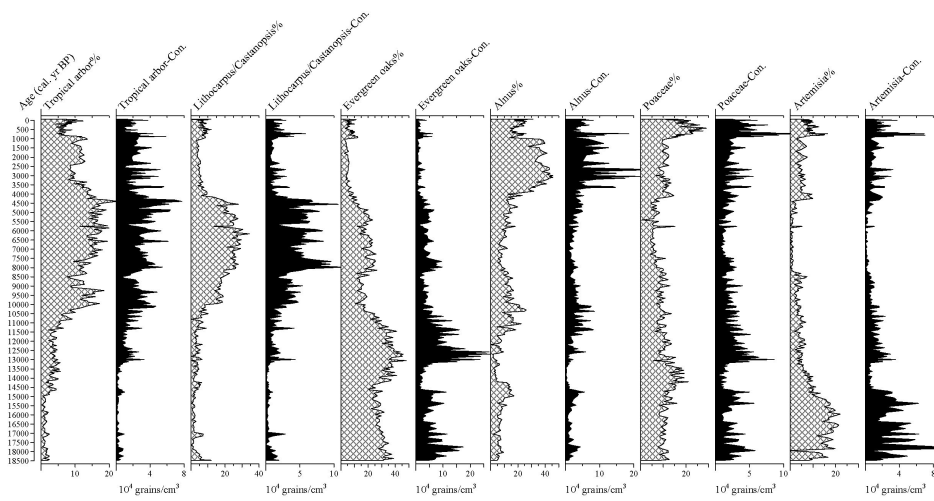


Fig. 2. A comparison of pollen percentages and concentrations for 6 main pollen taxa

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