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Climate of the Past Discussions

Interactive comment on "Climate variability since MIS 5 in SW Balkans inferred from multiproxy analysis of Lake Prespa sediments" *by* K. Panagiotopoulos et al.

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The manuscript "Climate variability since MIS 5 in SW Balkans inferred from multiproxy analysis of Lake Prespa sediments" by Panagiotopoulos et al. contains the findings and interpretation of new multiproxy investigations of lake sediments from the Balkan Peninsula. The manuscript contains a wealth of original palynological data, accompanied by geophysical and geochemical proxies, that provides indications of local and regional environmental change during the last 90 ka. The study is based on a sound methodology, and is supported by a detailed chronology that has been previously published in Climate of the Past (Damaschke et al., 2013, Clim. Past. 9:267-287). The study

examines local vegetation and limnological changes in considerable detail. These in general support the prevailing views of environmental and climatic change for the last glacial. Nevertheless, the study represents an important contribution to the growing understanding of spatial variability in environmental records of the last glacial from southern Europe. The manuscript is clearly written and supported by relevant, high-quality figures. I would recommend publication, taking into consideration the following comments:

Section 1. The authors suggest that the value of the new record relates to "the limited number of glacial records originating from the Balkans in comparison with the Italian and Iberian peninsulas". I don't entirely agree with this, as records spanning the full glacial are not really abundant anywhere, and one could argue that the Greek records (e.g. Ioannina, Kopais, Tenaghi Philippon, Xinias) constitute one of the greatest densities of long pollen records anywhere in the world. In fact, one of the key messages of the manuscript (presented, for example, in the final lines of section 5.3 and figure 6) is the interest in developing a "dense network" of sites to examine intra-regional patterns of environmental and climatic conditions. I would recommend that the authors modify the introduction to prioritise this valuable point.

Section 2. Although the vegetation has been described in detail elsewhere, I would encourage the authors nevertheless to include 1-2 sentences here to indicate the dominant vegetation cover in the vicinity of the site, so as to provide some context for the vegetation reconstruction. Mentioning the present-day role of Quercus and Pinus species would be beneficial, for example.

Section 4.2. Paragraphs 2 and 3 of this entire section could be better presented in a table. The text would flow naturally into section 5.1, and it would be easier to cross-reference between the key data and the interpretations in later sections.

Section 5.1.1. I'm not convinced that the title of this section accurately reflects the content, particularly the concept of feedbacks. "Vegetational and limnological feedbacks

to climate climate variability at a local scale" suggests that the text will explore how local environmental change amplified or dampened climate signals through biophysical or biogeochemical feedbacks. I think the title should read "responses to climate variability".

P1332. Line 8. The authors could show the curve for AP concentration in Figure 5 to support the argument here.

Section 5.1.2. This section is quite long, very descriptive and focused entirely on the findings from the site; as such I'm not convinced that it's really "discussion" as such. I would be interested to see the section either supported by references to the wider literature on glacial environments, or condensed.

Section 5.2.1. The detailed comparisons with Monticchio and Ioannina are clearly justified in terms of altitudinal/ecological setting, but I think this section could be enhanced by bringing other key regional glacial records into the discussion, such as the high-resolution vegetation record from Tenaghi Philippon (Müller et al., 2011) and the speleothem record of Fleitmann et al. (2009). What can be learned about intra-regional spatial gradients or temporal trends and variability?

Section 5.3 (especially lines 15-19) The authors correctly note that the severity of H5 in the record is subject to dating and sampling constraints – and this caveat might be stressed earlier in the manuscript, too (cf. Section 5.2.2.). An average sampling resolution of 500yr will detect millennial-scale variability, but will not provide a systematic detection of all events or robust characterisation of amplitude (i.e. maximum and minimum values).

Corrections/Clarifications

P1323. Line 5. Spelling "Oeschger"

P1325. Line 6. It's not clear what "the annual lake level change" refers to. . . this hasn't been specified.

P 1343. Line 15. "values in specific in" – change to "values, in particular in"

P1347 Line 13. Replace "invaded" (value-laden term) by "entered" (neutral).

P1348. Line 1. Change "self" to "shelf"

P1348. Line 2-3. Can a reference be given to support the use of continental shelf areas for dispersal routes? If not, it's not clear that the phrase "In most certainty" is warranted, and perhaps should be changed to "It is possible. . ." or similar.

P1348. Line 6. Indicate reference for Lateglacial study here.

P1349. Line 11. Give references for "speleothem record(s?)"

References

Fleitmann, D., Cheng, H., Badertscher, S., Edwards, R.L., Mudelsee, M., Göktürk, O.M., Fankhauser, A., Pickering, R., Raible, C.C., Matter, A., Kramers, J., and Tüysüz, O., 2009, Timing and climatic impact of Greenland interstadials recorded in stalagmites from northern Turkey: Geophys. Res. Lett., v. 36, p. L19707.

Müller, U.C., Pross, J., Tzedakis, P.C., Gamble, C., Kotthoff, U., Schmiedl, G., Wulf, S., and Christanis, K., 2011, The role of climate in the spread of modern humans into Europe: Quaternary Science Reviews, v. 30, p. 273-279.

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