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Climate of the Past Discussions

Interactive comment on "Potential impact of the 74 ka Toba eruption on the Balkan region, SE Europe" *by* B. Wagner et al.

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Abstract

Seismic and sedimentologic data acquired at Lake Prespa on the Balkan Peninsula indicate a lake level lowstand occurred at 73.6 ± 7.7 ka BP according to ESR dating and extrapolation of tephrostratigraphy and radiocarbon geochronology. Taking into account the chronological correspondance to the Toba eruption, the authors propose a climatic and environmental impact of this event in the northern Mediterranean region.

General comment

The present debate on the regional and global climatic and environmental impacts of the 73-75 ka Toba eruption relies on the lack of a precise and accurate chronology of the investigated successions, given the resolution of many currently used climate prox-

ies. Indeed, many of them lack the chronological resolution necessary to reveal a short-term impact and in some cases are too imprecise even to allow long-term impact to be identified with any confidence. Most current research, then, seems to be addressed for the future towards high-resolution archives among which there are annually laminated pollen-bearing lake sediments with the Youngest Toba Tephra (YTT) occurrence located in climatically sensitive localities. The dataset for Lake Prespa available from this paper and other already published, is certainly large and multidisciplinary giving evidence of a sedimentary record (Co1215) very sensitive to environmental changes. However, despite this, along with the absence of the YTT, the analysed succession has not the centennial, or even the decadal resolution required to detect and investigate the potential impact of the Toba eruption at this latitude. On the contrary, the interested stratigraphic interval is very poorly constrained, since it lacks of direct age control a part from the ESR dating result of 73.6±7.7 ka BP obtained from the Dreissena sp. The error associated to the age is too large to accept it as a main tool to infer a relation with the Toba eruption, as the authors did. If the authors take into account the mean age of 73.6 ka, then they should take into account as a reference also the 40Ar/39Ar age for the Toba eruption proposed recently by Mark et al. (2013; Quaternary Geochronology) of 75±0.9 ka BP, obtained from both proximal and distal deposits. Moreover, the authors did not clearly explain the depositional mechanisms responsible of the occurrence of the Dreissena sp. in deeper environments. Actually, they report an explanation differing from that reported in Panagiotopoulos et al. (2013).

A few more comments:

The paper suffers of an uncorrect structuration since presentation and interpretation of data are mixed.

It is not very clear to me from this research paper which are the new data and the ones already published. The authors aim to present new seismic and sedimentologic data (as written in the final part of the Introduction) but all I see in the figures is a collection of previously published data. Which is the original contribution?

Along with the interpretated seismic profiles, I always like to see the original ones also. This may allow the reader to think about other possible interpretative solutions (if they are, of course!).

The authors sometimes make suppositions without providing any evidence, e.g. in the case of the duration of the hiatus at lake Ohrid, in other cases they exclude some hypotheses without providing any explanation (e.g. to explain the lowstand at Lake Prespa).

The authors use the tephrostratigraphy, among other tools, to constrain the ESR age result. However, the older tephra correlated with an age-dated volcanic event onland (Y6) occurs at least 550 cm above the dated point; therefore this cannot be considered a very strong constraint.

All the above considerations point to a too speculative discussion in the current version of the manuscript. In short, the reported evidence from Lake Prespa neither proves nor disproves the concept of a significant environmental impact from the Toba eruption.

There is mismatch between cited articles in the text and reference list. Please, check:

Timmreck et al., 2012-cited in the text but not reported in the reference list. Dumurdzanov et al., 2005 and Fluckiger et al., 2004- reported in the reference list but not in the text.

I recommend major revision before the publication.

Interactive comment on Clim. Past Discuss., 9, 3307, 2013.