

Interactive comment on “First tephrostratigraphic results of the DEEP site record from Lake Ohrid, Macedonia” by N. Leicher et al.

S. Davies (Referee)

Siwan.Davies@swansea.ac.uk

Received and published: 20 October 2015

This manuscript provides a summary of the initial tephrostratigraphic results from the DEEP record, Lake Ohrid, Macedonia. It is well-placed in this special issue on Lake Ohrid results. The tephrostratigraphy is largely based on visible tephra deposits and geochemical results are presented to support the most likely correlations to known events. The record extends back to Marine Isotope Stage 15 and thus represents an important template or framework of volcanic events in the Eastern Mediterranean region. In some instances, this paper outlines some of the first discoveries of Italian tephras in the Balkans. The tephras are also used to develop an age-depth model which is presented by Francke et al. in the same special issue. The paper is largely descriptive in scope and focuses on identifying potential tephra correlations. A dis-

C6817

cussion on the implications of these discoveries is somewhat brief and confined to the construction of an age-depth model. I believe that the manuscript is worthy of publication, but I feel revisions are necessary to strengthen the discussion of geochemical results and to emphasize the importance and implications of these results.

Specific comments 1. Please consider merging the results (4) and discussion sections (5.1-5.13) so that descriptions of the tephra deposits can be discussed in tandem with the geochemical signatures and potential correlations. This will shorten the paper and allow the Discussion section to focus on the implications of the results.

2. I would suggest re-structuring the Discussion to two sub-sections. The first should describe the intricacies of the age-depth model for the Lake Ohrid record. The second section needs to focus on the implications of the tephra results beyond just the development of the Ohrid age-depth model. In its current form, the value of this tephra framework to other studies and researchers is somewhat lost. Some important but brief points are made in the conclusions e.g. clarifying the eruptive order of events, new insights on tephra distribution patterns, potential for linking different palaeorecords, evidence of large-magnitude eruptions and new records of previously unknown events. These points should be expanded in a section on the implications of these discoveries. This sub-section would greatly benefit from a figure of the tephra record or template plotted alongside an appropriate climato-stratigraphical framework extending from MIS1-15. This would represent a focus for discussing the implications of these results. For instance, key marker horizons for different climatic periods could be identified that could aid in the interpretation of other Middle and Late Pleistocene records in the Eastern Mediterranean region and beyond. Other points touched upon in the Conclusions and mentioned above could also use the visualization of the tephra framework as a focus.

3. Figure 3 is very difficult to see and interpret. Further figures and additional biplots are needed to support the proposed correlations. In most cases, only the data that support a correlation are provided. Are there other tephras of similar ages and com-

C6818

position that should also be plotted to test other potential correlations? For instance, how does the data for OH-DP-0169 compare with pre-CI data presented in Tomlinson et al. 2012 (*Geochimica et Cosmochimica Acta*). Further consideration of other potential matches is required and should be shown on plots, where appropriate.

4. Please provide average secondary standard data alongside the WDS data summarized in Table 1 (average) and individual analyses in the supplementary file.

5. It would be useful to provide some context for the cryptotephra discovery (OH-DP-0027). What is the shard concentration and how does the concentration profile vary around the peak concentration? Are the glass shards confined to a few centimetres or dispersed within the profile? This is important to pinpoint the exact stratigraphic position of the tephra for age-modeling purposes.

Technical corrections 1. Page 15414 line 4 replace Rosetta stone with template or framework. 2. Page 15417, line 16 change to “opened lengthwise” and “visually described” 3. Page 15419 line 1 – grammar - revise sentence. 4. 15419, line 10 – grammar revise sentence 5. Page 15420, line 4 – grammar – revise sentence 6. Page 15423, line 26 – should this be OT0702-3 as shown on figure 3? 7. Page 15424, line 26 - grammar, revise sentence. 8. Page 15425, line 3 delete the “in light of new geochemical data” 9. Figure 3g – should this be OH-DP-0624? 10. Page 15440, line 5-7 – grammar please revise.

Interactive comment on *Biogeosciences Discuss.*, 12, 15411, 2015.

C6819