Biogeosciences Discuss., 7, C2091–C2095, 2010
www.biogeosciences-discuss.net/7/C2091/2010/

Biogeosciences Discussions

Interactive comment on "Tephrostratigraphy and tephrochronology of lakes Ohrid and Prespa, Balkans" *by* R. Sulpizio et al.

B. Giaccio (Referee)

biagio.giaccio@igag.cnr.it

Received and published: 29 July 2010

General comment

The short paper by Sulpizio et al. is an important step forward the tephrostratigraphic knowledge in the promising, but hitherto poorly studied, Balkan region. The authors present a composite tephrostratigraphic section through the integration of six cores which have been drilled in lakes Ohrid and Prespa. They recognised twelve tephra layers spanning the past ca. 130 ka, several of which acting as important stratigraphic markers for correlation at scale of the central Mediterranean area.

Indeed, the relevance of this kind of studies exceeds the regional and specific field interests. The reliable inter-regional correlations that the tephrostratugraphy may pro-

vide, allow to investigate at very fine chronological resolution the complex spatial-temporal paleoclimatic and paleoenvironmental variability as well as their potential connections with other processes. In this broad perspective, the paper by Sulpizio et al. is a valuable contribute and in my opinion may be accepted for publication after minor revisions.

Specific comment

There is a single specific point that in my opinion requires further discussion and clarifications. In their composite section, the Taurano tephra, recognised in the core 1216 from Lake Prespa, occurrs between the Y3 (ca. 30 ka) and Codola (ca. 33 ka) layers. However, so far in the proximal area there are not really compelling stratigraphic data to establish the position of this poorly known tephra, possibly from Somma-Vesuvius volcano (e.g. Di Vito et al., 2008; Santacroce et al., 2008), with respect to the Y3 and Codola tephras.

Indeed, the unique record that at moment allows to hypothesize the Taurano stratigraphic position, is that of Monticchio (e.g. Wulf et al., 2004). Here there is a cluster of tephras, TM-17 layers, previously attributed to the late activity of the Colli Albani (Wulf et al., 2004), that chemically and stratigraphically are compatible with Taurano pyroclasts (Santacroce et al., 2008; Fig. 1). In particular the TM-17 cluster may be divided in two different groups: the first –which preceded the deposition the Codola tephra (TM-16 layer) of ca. 2500-3000 years– comprises the TM-17c, TM-17d and TM-17e, while the second, ca. 1000-1200 years younger than Codola, includes the TM-17a and TM-17b. All these five tephras chemically fall in the large compositional field of the Taurano proximal deposits (Santacroce et al., 2008; Fig. 1), but while the layers of the older group have compositions relatively low in alkali, the two younger tephras have a significantly higher alkali content. On this ground, as a provisional tephrostratigraphic framework, the Taurano eruption(s) could be distinguish at least in two different tephras or phases: e.g. an early alkali-poor Taurano eruptive phase, ca. 3000 years older than Codola, and a late alkali-rich Taurano eruptive phase, ca. 1000 years younger than

BGD

7, C2091–C2095, 2010

Codola.

In particular some of the glasses from the crypto-tephra found in core 1216, matches the composition of the layer TM-17d and TM-17e, and therefore could be correlated to the early alkali-poor Taurano eruptive phase, which stratigrafically occurs below Codola tephra.

In conclusion, I suggest to present, on one side, the current volcanological and stratigraphic uncertainties on the Taurano eruption or eruptions, and, on the other one, the best framework that at present may be drawn around these poorly known but potentially relevant tephras.

Technical comment

My few suggestions are directly annotated on a PDF file.

References

Di Vito, M., Sulpizio, R., Zanchetta, R., and D'Orazio, M.: The late Pleistocene pyroclastic deposits of the Campanian Plain: new insights on the explosive activity of Neapolitan volcanoes, J. Volcanol. Geoth. Res., 177, 19–48, 2008.

Giaccio, B., Isaia, R., Fedele, F. G., Di Canzio, E., Hoffecker, J., Ronchitelli, A., Sinitsyn, A., Anikovich, M., and Lisitsyn, S. N.: The Campanian Ignimbrite and Codola tephra layers: two temporal/stratigraphic markers for the Early Upper Palaeloithic in Southern Italy and Eastern Europe, J. Volcanol. Geoth. Res., 177, 208–226, 2008.

Santacroce, R., Cioni, R., Marianelli, P., Sbrana, A., Sulpizio, R., Zanchetta, G., Donahue, D. J., and Joron, J. L.: Age and whole rock-glass compositions of proximal pyroclastics from the major explosive eruptions of Somma-Vesuvius: a review as a tool for distal tephrostratigraphy, J. Volcanol. Geoth. Res., 177, 1–18, 2008.

Wulf, S., Kraml, M., Brauer, A., Keller, J., and Negendank, J. F. W.: Tephrochronology of the 100 ky lacustrine sediment record of Lago Grande di Monticchio (Southern Italy),

BGD

7, C2091–C2095, 2010

Quatern. Int., 122, 7–30, 2004.

Figure caption

Figure 1 – Total alkali silica diagram of the glasses from Taurano proximal deposits (EDS analyses, Santacroce et al., 2008) and TM-17 tephra cluster from Monticchio record (EMP analyses, Wulf et al., 2004), the latter occurring immediately below (TM-17e, TM-17d and TM-17c) and above (TM-17b and TM-17a) the Codola distal equivalent (TM-16). For comparison, the compositional field of the Codola proximal deposits (orange area; combination of EMP analyses from Giaccio et al., 2008 and EDS analyses from Santacroce et al., 2008) is also shown. See text for details.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/7/C2091/2010/bgd-7-C2091-2010-supplement.pdf

---

Interactive comment on Biogeosciences Discuss., 7, 3931, 2010.

BGD
7, C2091–C2095, 2010

Interactive Comment

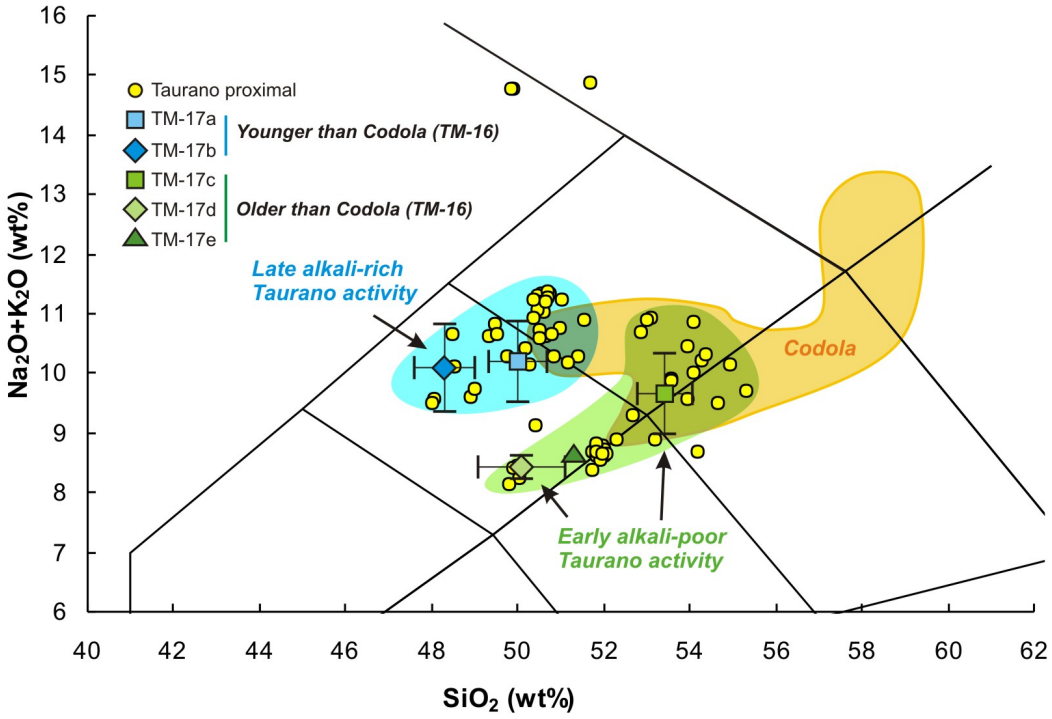

Fig. 1.

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper