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Developing a multi-methods dating framework for the Eastern Mediterranean region over the Late Quaternary

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The Eastern Mediterranean is an important region for understanding the late Quaternary, as there is evidence for a complex pattern of climatic and environmental change, influenced by orbital forcing and complex feedback mechanisms (Rohling et al., 2013). It is also a key region for examining the dispersal of humans out of Africa. Consequently, it is important to develop robust chronologies for palaeoclimatic, environmental and archaeological records in the region, to allow synchronisation, comparison and hypothesis testing. Tephrochronology is a vital tool for correlating such records, but the fine detail of the Eastern Mediterranean tephra depositional history is not yet well defined. Part of the problem relates to a lack of cryptotephra (non-visible ash) studies on long stratigraphic records. It is well known from the Atlantic and Central Mediterranean that cryptotephra studies can significantly improve tephra inventories, and constrain the relationship between key tephra markers and important environmental transitions. Another key problem for the region is that for distal tephra there is a relatively limited geochemical database from different volcanic centres, especially in terms of trace element compositions. One important method for addressing this problem is to develop detailed tephrostratigraphic records and tephra geochemical inventories from long sediment sequences (e.g. Bourne et al., 2010; Satow et al., 2015).

Here we present the first marine crypto-tephrostratigraphy from the Levantine Sea, covering approximately the last ~200,000 years, from a long marine core (MD81-LC31). The new data for the core include tephra shard concentrations, major and trace element geochemistry, correlations to the eruptive record of the Aegean and Anatolian volcanic centres, and new radiometric age information. Our new data is compared to existing chronological information from LC-31, including sedimentological, geochemical, paleomagnetic and radiocarbon evidence. Our data helps to refine the chronology for this important record and will underpin ongoing studies into the detail of palaeoceanographic and environmental change in the region.

Bourne, A.J., Lowe, J.J., Trincardi, F. et al. 2010. Distal tephra record for the last ca 105,000 years from core PRAD 1-2 in the central Adriatic Sea: implications for marine

tephrostratigraphy. Quaternary Science Reviews, 29(23-24), 3079-3094.

Rohling, E.J., Grant, K.M., Roberts, A.P. et al. 2013. Paleoclimate variability in the Mediterranean and Red Sea regions during the last 500,000 years: implications for hominin migrations. Current Anthropology, 54(S8), S183-S201.

Satow, C., Tomlinson, E.L., Grant, K.M. et al. 2015. A new contribution to the Late Quaternary tephrostratigraphy of the Mediterranean: Aegean Sea core LC21. Quaternary Science Reviews, 117, 96-112.