Goldschmidt 2022 Abstract
https://doi.org/10.46427/gold2022.10123

Aegean magmatism: Subduction or post-subduction?

LAUREN TUFFIELD

British Geological Survey

Presenting Author: laurentuffield@gmail.com

The Aegean region has a long and complex geodynamic and tectonic history, which is characterised by the subduction of the African plate below Eurasia, accompanied by the southwards migration of the Hellenic trench and its associated magmatic arc, currently defined by the South Aegean Volcanic Arc (SAVA). The Aegean is currently characterised by an extensional regime, which has been in effect since 35 Ma (e.g. [1]). The extension has developed from a combination of slab rollback, slab detachment, slab delamination and compression melting of deep asthenospheric mantle. There is debate over whether the magmatism in the Aegean (not including the SAVA) is subduction (e.g. [2, 3]) or post-subduction (e.g [4]) in origin.

The Aegean also hosts a range of mid-Miocene to recent porphyry and epithermal Cu-Au deposits [5]. Whether they are post-subduction or subduction related has a big impact on our knowledge of their formation and, therefore, their characteristics and discovery, which is more important than ever in the growing use of copper in the transition to green electricity generation.

Many of the rocks of the Aegean are high-K calc-alkaline to shoshonitic, which is indicative of the small volumes of partial melting found in post-subduction settings. However the highly alkaline nature of the rocks has also been interpreted as a product of continental subduction [2]. To resolve this debate, we collected material from the Miocene shoshonitic magmatism on Lesvos in the Northern Aegean. Accessory minerals such as zircon and apatite are utilised in this study, as they can give more detailed information on individual magmatic processes and events, including magma sources. Zircon is especially useful in this context due to its refractory nature, as a high percentage of the samples collected are moderately to highly altered, due to their association with porphyry and epithermal mineralisation.

[1] Jolivet & Brun (2008), *International Journal of Earth Sciences* 99, 109-138.

[2] Schaarschmidt et al. (2021), *Geochemistry, Geophysics, Geosystems* 22, e2020GC009565.

[3] Fytikas et al. (1984), *Geological Society, London, Special Publications* 17, 687-699.

[4] Pe-Piper & Piper (2001), *Geological Magazine* 138, 653-668.

[5] Voudouris et al. (2019), *Ore Geology Reviews* 107, 654-691.