

The origin of ultramafic enclaves and their basanitic host rock from Kula Volcano, Turkey

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The Na-alkaline anorogenic volcanism of Kula includes exposures of around 80 cinder cones, lava flows and tuffs, representing one of the youngest volcanic activities in Western Anatolia (1.7–0.025 Ma). The magmatism is related to an extensional regime and is interpreted as being derived predominantly from the asthenospheric mantle. Basanitic lava flows in Kula rarely host ultramafic enclaves. Their genesis was interpreted in many different ways, but remained unclear.

This study presents new analytical data proofing a comagmatic character for the enclaves. Whole-rock analyses were done via X-ray fluorescence and (LA)-ICP-MS. Mineral analyses were done via (LA)-ICP-MS, as well as EMPA.

Comparing enclaves and lava, it is possible to find out more about the fast ascent of Kula magmas (<11 days through about 35km of crust) and their evolution. In the initial phases of Kula volcanism, mantle-derived primary melts underwent deep-pressure fractionation of pyroxenites and amphibolites at the base of the crust. Early magma-mixing formed green-core clinopyroxenes in mantle depths, while the enclaves were stored close to the Moho at the wall of feeder dykes. Multi-episode intrusions within the same dyke system are necessary to transport the enclaves to the surfaces. Based on the fast lava ascent, Cpx-thermobarometry (1150–1200 °C at 12–15 kbar) and a small PT-stability field for the break-down corona around kaersutite, we can assume little cooling during ascension and estimate the eruption temperature to be about 1100°C.

Grützner T., Prelević D., Akal C., 2013. *Lithos* **180-181**, 58-73.