

The Quaternary Rodderberg Volcano (Bonn, Germany): The northernmost outlier of the East Eifel Volcanic Field

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The Rodderberg Volcanic Complex (RVC) is located within the city limits of Bonn (Germany) approximately 20 km to the north of the Quaternary East Eifel Volcanic Field (EEVF). It is the product of intense phreatomagmatic volcanism forming a 90 m deep maar crater and strombolian eruptions. Deposit features indicate that the location of the vent(s) shifted from N to S during the strombolian phase. The erupted leucite-nephelinite magma (on the order of ca. 0.025 cubic km) was largely homogenous with minor, stratigraphically controlled, variation in olivine and clinopyroxene microphenocryst content.

Stratigraphic evidence and thermoluminescence dating indicate that the RVC erupted during the glacial MIS 8 at around 300 ka (Paulick et al., accepted). During this time, the EEVF experienced a transitional stage between two major phases of volcanic activity involving a change in magma sources. This is consistent with the RVC geochemical data which show affinities to both the older EEVF leucite-nephelinite association (430 to 380 ka) and the younger basanite association (<215 ka).

In the Eifel, magma ascent through the upper crust is apparently linked to tectonic fractures. It may be speculated that a tectonically controlled dike event channeled magma to the north of the main EEVF and that the RVC represents an exceptional surficial expression of a significantly larger subsurface intrusion. This scenario would be consistent with recent observations of dike-related volcanism in the East African Rift zone (Wright et al., 2006) and previously inferred models for magma ascent in similar intraplate volcanic fields.

References

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Wright TJ, Ebinger C, Biggs J, Ayele A, Yirgu G, Keir D, Stork a (2006) Magma-maintained rift segmentation at the continental rapture in the 2005 Afar gyding episode. *Nature* 442: 291-294

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