Depositional processes of the Kuner ignimbrite from the Cubukludag graben, western Turkey: implications for generation of the phretomagmatic eruptions triggered by dome emplacement

Zekiye Karacik, S Can Genc

Istanbul Technical University, Turkey

E-mail: zkaracik@itu.edu.tr

The subaerial silicic volcanism (the Cumaovasi volcanic succession) Neogene in age, occurs within the Cubukludag graben, which is delimited by the NE-SW -orientated faults that reflect a crustal fissure-fracture zone between Izmir and Kusadasi in west-central Turkey. The volcanic products are represented by cluster of rhyolite domes and lava flows together with pyroclastic deposits in the graben basin that form the upper part of the graben infill. The pyroclastic deposits dominate of this volcanic association which is an excellent example of dome triggered phreatomagmatic eruptions and related volcanic products.

The early phase is fine-grained pumice and ash-rich deposits, which are partly deposited in a lacustrine environment. The main part of the volcanic succession, Kuner ignimbrite, was derived from pyroclastic density currents. They represent various structural features in different layers of the succession. They are fine-grained and laminated at the base and pass laterally and vertically to the deposits which show well-developed traction structures. Alternation of diffuse stratified and massive lapilli, ash deposits are the common products of the later explosive stage which formed from abundant pumices, cognate and accidental lithic fragments displaying typically chaotic flow structures. Massive lithic breccias forming the top of the sequences are the proximal facieses of the pyroclastic density current.

The lava phase, mainly rhyolitic lavas, extruded from domes and fissures which are aligned along NE-SW trending faults and the extensional cracks nearly perpendicular to the main faults within the graben and form spacely-developed hills. Main lithologies of the domes are foliated stony rhyolite, rhyodacite, dacite, obsidian, perlite and autobrecciated flows. The Cumaovasi volcanic succession is co-eval with the sedimentation of the NE-SW trending cross-grabens which were developed under the extensional tectonic regime of the western Turkey.

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