



## **Nature of post-collisional phreatomagmatic volcanism in the Cappadocian Volcanic Province: Cora Maar, central Anatolia, Turkey**

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The Neogene Central Anatolian Volcanic Province (CAVP), largely confined by distinctive transtensional zones such as sinistral Central Anatolian Fault Zone and dextral Eskişehir Fault Zone, contains several volcanic centers. The CAVP volcanism is influenced by the intracontinental convergence associated with collision of the African plate with the Eurasian plate, and produced hundreds of monogenetic volcanoes such as Meke, Acı göl (Karapınar) and Cora Maars. These are genetically related to basaltic to andesitic magmatism with a distinctive subduction component inherited from an earlier subduction. Of these, Cora Maar (CM) located to the 20 km northwest of Erciyes stratovolcano is a typical example to maar volcanism -and hence a proposed geological heritage- in CAVP with its circular crater 1.2 km in diameter, quite large compared to its counterparts in the world.

The CM is a large scale maar-diatreme volcano surrounded by a well-bedded base surge tephra rim sequence up to 40 m in thickness. Quaternary andesitic lava flows of Mount Erciyes predating the formation of the maar crop out in the crater walls. Tephra sequence is not indurated, and consists of juvenile (scoria and cauliflower bombs) and lithic clasts, accretionary lapilli, and ash-lapilli sized volcanic material.

Variation in the degree of vesiculation and shape of the vesicles within the juvenile components may reflect the complex fragmentation history of the CM. Juvenile clasts include lithic fragments with different textures. Disequilibrium crystallization textures such as skeletal olivine, reaction rims to hornblende crystals, embayed pyroxene, sieve

texture of plagioclase crystals, and coexistence of sieved and non-sieved plagioclase crystals are commonly observed in both the juvenile and lithic block samples.

The CM scoria is classified as subalkaline, calc-alkaline and belong to medium-K series, and have a uniform composition ranging from basaltic andesite to andesite. Lithic clasts are mainly andesitic to dacitic in composition.

The CM is enriched in LREE compared to HREE which might indicate fractionation of hornblende, or hornblende being held as restite in the source. A trough in Nb-Ta, and a positive anomaly in Th in chondrite-normalized spidergrams are indicative of the continental crust contamination and/or may suggest that the magma was derived from an asthenospheric mantle metasomatized probably by an earlier subduction component.

Although, regional geological evidence do not verify, CM tephra products are classified as volcanic arc owing to their calc-alkaline nature. Compared to previously published CVP monogenetic volcanoes, CM display similar trace element ratios to Hasandağ and Erciyes stratovolcanoes. Although Hasandağ and Erciyes volcanics are likely to have more mantle enrichment/within plate array, CM is more akin to the subduction zone enrichment on corresponding diagrams. Therefore, an enriched lithospheric mantle source with a relict subduction signature is proposed for the generation of the Quaternary post-collisional CM tephra.