



Bosphorus Volcano; Signs of an Ancient Volcano on an Ancient City

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In many ancient and active volcanic provinces dyke systems represent radial and concentric patterns. In İstanbul, NW Turkey, late Cretaceous dykes, which are emplaced in pre-Cretaceous basement rocks consisting of sedimentary rocks of Palaeozoic and Triassic ages, have both patterns. In the region, late Cretaceous volcanism is represented by three elements, (1) The Çavuşbaşı granitoid, (2) volcano-sedimentary units and (3) dykes.

Age of the Çavuşbaşı granitoid is given as 67.91 ± 0.63 to 67.59 ± 0.5 Ma. It is emplaced in shallow depth and has an indistinct contact aureole. Volcano sedimentary units were deposited in an intra-arc basin. Three types of dykes are reported in the region: lamprophyre, diabase and intermediate to felsic dykes (72.49 ± 0.79 to 65.44 ± 0.93 Ma). Different petrology and the crystallization depths of the crystals in the dykes and the Çavuşbaşı granitoid suggest two different magma chambers emplaced at two different depths, the Çavuşbaşı granitoid representing the shallower one.

Upper Cretaceous dykes are concentrated around the Çavuşbaşı granitoid and extend almost as far as 30 km away from the pluton. The intrusion of the plutonic body of the Çavuşbaşı granitoid caused a dome structure in the basement rocks. The formation of this dome structure may have controlled the stress field and the orientation of the dyke system. Similar patterns are observed in the British Tertiary igneous province, Galapagos volcanoes, Boa Vista (Cape Verde), Summer Coon volcano, Spanish Peak Mountain and Dike Mountain (Colorado), Vesuvio, Etna and Stromboli (Italy).

We suggest that Upper Cretaceous volcanic edifice in the İstanbul region is related to an arc volcano similar to the andesitic volcanoes in the Sumatra Island; we name it the Bosphorus Volcano.