

Geology and Magmatism of Gülşehir Area, City of Nevşehir, Central Anatolia, Turkey

Uğur Can Bayhan (1), İlayda Miyak (2), and Mehmet Keskin (3)

(1) Department of Geological Engineering, Faculty of Engineering, Istanbul University, Istanbul, Turkey (1301110026@ogr.iu.edu.tr), (2) Department of Geological Engineering, Faculty of Engineering, Istanbul University, Istanbul, Turkey (1301110031@ogr.iu.edu.tr), (3) Department of Geological Engineering, Faculty of Engineering, Istanbul University, Istanbul, Turkey (keskin@istanbul.edu.tr)

Basement of the study area is represented by the Kırşehir Massif, which is one of important metamorphic massifs in Turkey. This metamorphic basement is unconformably overlain by clastic sediments which were deposited in Paleogene basins and then heavily deformed due to the closure of the Neotethys Ocean in the North. Paleogene deposits are, in turn, overlain by younger post-collisional sediments and volcano-sedimentary units, ranging in age from Tertiary to Quaternary.

The apparent lowermost part of the Kırşehir Massif in the study area is represented by the Kaman Group, which is made up of quartz mica schists and marbles and is thought to be pre Mesozoic in age. The Kaman Group is cut by a granitoid pluton (i.e. Ortaköy granitoid) which is Maastrichtian in age and subvolcanic bodies (i.e. Kızıltepe volcanics) which are also Cretaceous in age. Both the metamorphic basement and the magmatic intrusions are unconformably overlain by a volcano-sedimentary succession (i.e. Akmezardere formation), deposited in a marine environment during the Lutetian. The Akmezardere formation contains fold and thrust structures as well as slumps related to the closure of the northern branch of the Neotethys Ocean. Most part of the region was uplifted and as a result, turned into a continental subaerial environment after Oligocene. The Oligocene-Miocene sediments were precipitated in lakes and lagoons. The region was subjected to intense post-collisional volcanism initiated during the Miocene. During the Upper Miocene, the Cappadocia volcanic province started to be formed. The lithospheric delamination and slab breakoff processes were possibly responsible for both the regional uplift and intense calc-alkaline to alkaline volcanism across the region.

The Cappadocia volcanic province includes a wide range of volcanic units, (i.e. lavas and pyroclastics displaying the characteristics of fall, flow and surge processes) ranging in composition from basalt to rhyolite and in geochemical character from calc-alkaline to alkaline. Pyroclastic flow deposits (i.e. ignimbrites with rhyolitic to dacitic compositions) and low-viscosity sub-alkaline/alkaline basaltic lava fields are widely exposed in the study area. Geomorphology of the region is controlled by strike-slip faults related to the neotectonics of Central Anatolia and the erosion/deposition of the Kızılırmak River. Quaternary terraces which are composed of coarse-grained thick sedimentary beds are the products of the Kızılırmak River.

In this study, we will present the preliminary results of our new studies in the northwest of the Gülşehir area, specifically aiming to reveal the geology, petrology and tectonic evolution of this part of Central Anatolia.