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Neogene Sequence Along the Eskişehir Fault Zone (EFZ), NW Turkey

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This study aims to explore the stratigraphy and structural features of Neogene units located in the Bozüyük (Bilecik) and Oklubalı (Eskişehir) area in southern Marmara, which lies on the collision zone between the Sakarya and Tauride-Anatolide blocks. Pre-Mesozoic marbles, schists and granodiorites, Mesozoic marbles, schists, ophiolitic units and limestones are basement rocks. Cover units include Neogene age formations. From the bottom to top, they are named the Porsuk Formation and the Akpınar Limestone, the İnönü Volcanics and the Ilıca Formation. Paleontological data which could yield a geological age have not been observed in fluvial sediments of the Porsuk Formation and lacustrine deposits of the Akpınar Limestone. The 40K/40Ar dating analyses on trachy-andesite of the overlying İnönü Volcanics have yielded middle Miocene ages (15.0-15.5 Ma), suggesting the underlying sedimentary units namely the Porsuk Formation and the Akpınar Limestone to be lower-middle Miocene in age. Fossils have been discovered in the lacustrine limestone of the Ilıca Formation in Oklubalı (İnönü-Eskişehir) village, and the age is determined to be lower Pliocene.

The Eskişehir Fault Zone (EFZ) transects the Neogene formations and Quaternary sediments along an E-W'ly orientation. The Ormangüzle, Bozalan, Kandilli and İnönü Faults are segments observed from the west to east inside the Eskişehir Fault Zone. Some of these faults have NW-SE and others WNW-ESE orientations. The faults in NW-SE directions were effective for the formation of the Neogene sequence based on NE, SE and SW-oriented paleo-flow orientations and abrupt facies changes. The faults with WNW-ESE orientations, as noted in the Çukurhisar earthquake of February 2, 1956 (M=6.4), still keep their seismic activity and have a potential of producing earthquakes.

Keywords: Neogene sediments, 40K/40Ar dating, the Eskişehir Fault Zone, active fault, Çukurhisar earthquake