



Stratigraphy and Hydrocarbon Potential of Tertiary Sequences in Edremit Gulf and Surrounding Areas (Northwestern Turkey)

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Stratigraphy and hydrocarbon potential of Tertiary clastic sediments of Edremit Gulf and surroundings (north-western Anatolia) are evaluated in this study. Miocene and Pliocene-aged lacustrine sediments and volcanic rocks are widely exposed in the north and south of the Gulf of Edremit. Lower-Middle Miocene-aged Küçükuyu Formation consists of fault-controlled alluvial and lacustrine clastic deposits. Lower parts of the formation consist of alluvial fan and braided-river sediments (Kızılyar Conglomerate). Above this, it continues with alternation of sandstone-shale. The shales are greenish-brownish grey, dark grey and black in organic-rich levels. Syn-sedimentary and post-sedimentary tectonic structures are observed in turbiditic-characterized lacustrine sandstone-shale alternation. Ignimbritic tuff (Arıklı Tuff) and coarse grained sandstone (Adatepe Sandstone) are occurred upper levels of the formation. The Küçükuyu Formation is overlain unconformably by the İlyasbaşı Formation (Mutlu Formation in south of the Gulf of Edremit) in north of the Gulf of Edremit. This unit is represented by lacustrine clastic and carbonate deposits with thin coal levels.

Shales of the Küçükuyu Formation are generally bituminous and represent a potential source rock in the region. Average TOC content of the shales are 1.6 wt%. Kerogen type II-III is oil and gas-prone. Maturity of the Küçükuyu Formation ranges from immature to early mature. Arıklı Tuff and Adatepe Sandstone is potential reservoir in the region. Porosities range from 22 to 30% in Arıklı Tuff and from 11 to 15% in Adatepe Sandstone. Permeabilities are in the range of 13-18 mD in Arıklı Tuff and of 5 to 12 mD in Adatepe Sandstone. Porosity and permeability values show that these units are medium to good reservoir rock. Shales of the Küçükuyu Formation, clayey levels of the İlyasbaşı Formation and volcanic rocks form the seals. Although mainly structural traps are available in the region, stratigraphic traps may also be considerable.