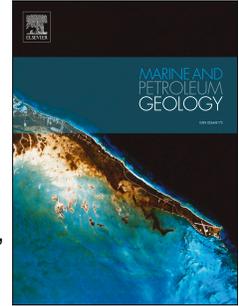


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Crude oil families in the Euphrates Graben (Syria)

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ABSTRACT

The most petroliferous province in Syria is the Euphrates Graben system in the eastern part of the country. The source of the produced light and heavy oils has been a matter of debate from a petroleum geochemistry perspective as there are several possible source rock and just one proven source rock (R'mah formation). Based on gross composition and oil-oil correlation of biomarker and non-biomarker characteristics, three oil families have here been identified in the study area. Crude oils of Family 1 have been found to be generated from a marine and clay-rich source rock that is older than Jurassic in age based on age-related biomarker parameters (steranes and nordiacholestane ratios). Maturity-related parameters (aliphatic biomarkers and diamondoids) signal that the source of this oil family had a high maturation level. These features fit very well to the Tanf Formation (Abba Group) which is equivalent to Lower Silurian Hot Shales found elsewhere in the Middle East and North Africa. However, the Upper Cretaceous R'mah Formation and Shiranish Formation were found to be responsible for generating the majority of the crude oils studied (Family 2). Compositional and molecular differences between Families 2A and 2B were attributed to facies and subtle maturation variations. Geochemical oil-source rock correlations indicate that Family 2A was most likely sourced from the Shiranish Formation, while Family 2B was sourced from the R'mah Formation. Secondary alteration processes influenced bulk petroleum composition, most notably the depletion of light ends and the lowering of API gravity, particularly in the north-western part of the graben.

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