



## **The reservoir potential of the Eocene carbonates in the Bolu Basin, West of Turkey**

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Abstract The limestone of Eocene Tokmaklar Formation is approximately 18 km in length, about 5 km in width, and up to 700 m thick in the Bolu Basin.

The Eocene Tokmaklar Formation consists mainly of shallow water carbonates and five principal depositional microfacies have been identified: 1) Benthic foraminiferal packstone-grainstone, 2) Oolitic packstone-grainstone 3) Algal-intraclastic packstone-grainstone, 4) Coral-benthic foraminiferal grainstone, 5) Peloidal packstone-grainstone.

A depositional model has been proposed based on the fossil and lithofacies assemblages which suggest that tidal flat supplies stromatolites and intraclasts and that lagoon supplies pellets to the reef core and fore reef.

The carbonates of the Tokmaklar Formation have been altered by the following diagenetic processes; micritization, dissolution, fracturing and cementation. As a result of these diagenetic processes, reefal limestones of the Tokmaklar Formation have lost most of their primary porosity. Secondary porosity formed through the dissolution of micritic cement skeletal and non-skeletal (oolitic) grains during early meteoric diagenesis. Oolitic packstone-grainstone facies have moldic porosity, but was probably limited in extent due to a lack of diagenetic pathways. Also in most microfacies fractures tend to be completely filled by sparry calcite. Consequently fractures reduce the porosity of the Tokmaklar limestones.

Keywords: Limestone; Microfacies; Dissolution porosity; Permeability; Pore throat