



Dolomitization in Late Jurassic-Early Cretaceous Platform Carbonates (Berdiga Formation), Ayralaksa Yayla (Trabzon), NE Turkey

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ABSTRACT

Pontides constitute an E-W trending orogenic mountain belt that extends about 1100 km along the northern side of Turkey from the immediate east of Istanbul to the Georgian border at the east. Tectono-stratigraphically, the Pontides are divided into three different parts: Eastern, Central, and Western Pontides. The Eastern Pontides, including the studied area, comprise an area of 500 km in length and 100 km in width, extending along the southeast coast of the Black Sea from the Kizilirmak and Yesilirmak Rivers in the vicinity of Samsun to the Little Caucasus. This area is bordered by the Eastern Black Sea basin to the north and the Ankara-Erzincan Neotethyan suture zone to the south.

The Late Jurassic-Early Cretaceous platform carbonates are widely exposed in E-W direction in the Eastern Pontides (NE Turkey). The Platform carbonates shows varying lithofacies changing from supratidal to platform margin reef laterally and vertically, and was buried until the end of Late Cretaceous. The studied Ayralaksa Yayla (Trabzon, NE Turkey) area comprises one of the best typical exposures of formation in northern zone of Eastern Pontides. In this area, the lower parts of the formation are pervasively dolomitized by fabric-destructive and fabric-preserving replacement dolomite which are Ca-rich and nonstoichiometric (Ca₅₆₋₆₆Mg₃₄₋₄₄). Replacement dolomites (Rd) are represented by D18O values of -19.0 to -4.2 (VPDB), D13C values of 4.4 to 2.1 ‰ (VPDB) and 87Sr/86Sr ratios of 0.70889 to 0.70636. Petrographic and geochemical data indicate that Rd dolomites are formed prior to compaction at shallow-moderate burial depths from Late Jurassic-Early Cretaceous seawater and/or partly modified seawater as a result of water/rock interaction and they were recrystallized at elevated temperatures during subsequent burial. In the subsequent diagenetic process during the Late Cretaceous when the region became a magmatic arc, as a result of interaction with Early Jurassic volcanic rocks of basic composition, Rd dolomites were recrystallized by hydrothermal fluids of marine origin.

Key words:

Dolomitization; Geochemistry; Seawater origin; Recrystallization; Late Jurassic-Early Cretaceous, Platform carbonates; Berdiga Formation; Eastern Pontides, NE Turkey.