



**CURRENT DEBATES ON
NATURAL AND ENGINEERING
SCIENCES**

9

**HİKMET Y. ÇOĞUN
İŞHAK PARLAR
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Sedimentary Features Of The Uzunçarşidere Formation (Paleocene-Lower Eocene) Around Lezgi (Ankara, Türkiye)

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Introduction

Offering a wide spread in the study area; The unit, which consists of conglomerate, sandstone, mudstone, clayey limestone marl, and andesitic lava spread, took its name from Uzunçarşı Creek in the south of Orhaniye Village. Gökten et al. (1988) first defined and named this unit under the name of Uzunçarşidere Formation. In this study, the unit was studied under the name of Uzunçarşidere Formation.

The formation crops out in the study area, on the slopes of Uzunçarşı Creek, Lülük Hill, Yayla Hill, Asmalı Hill, east of Güvenç Village, Lezgi Village, and its surroundings, Tabyebayır Hill and Deveboynu Hill (Figure 1).

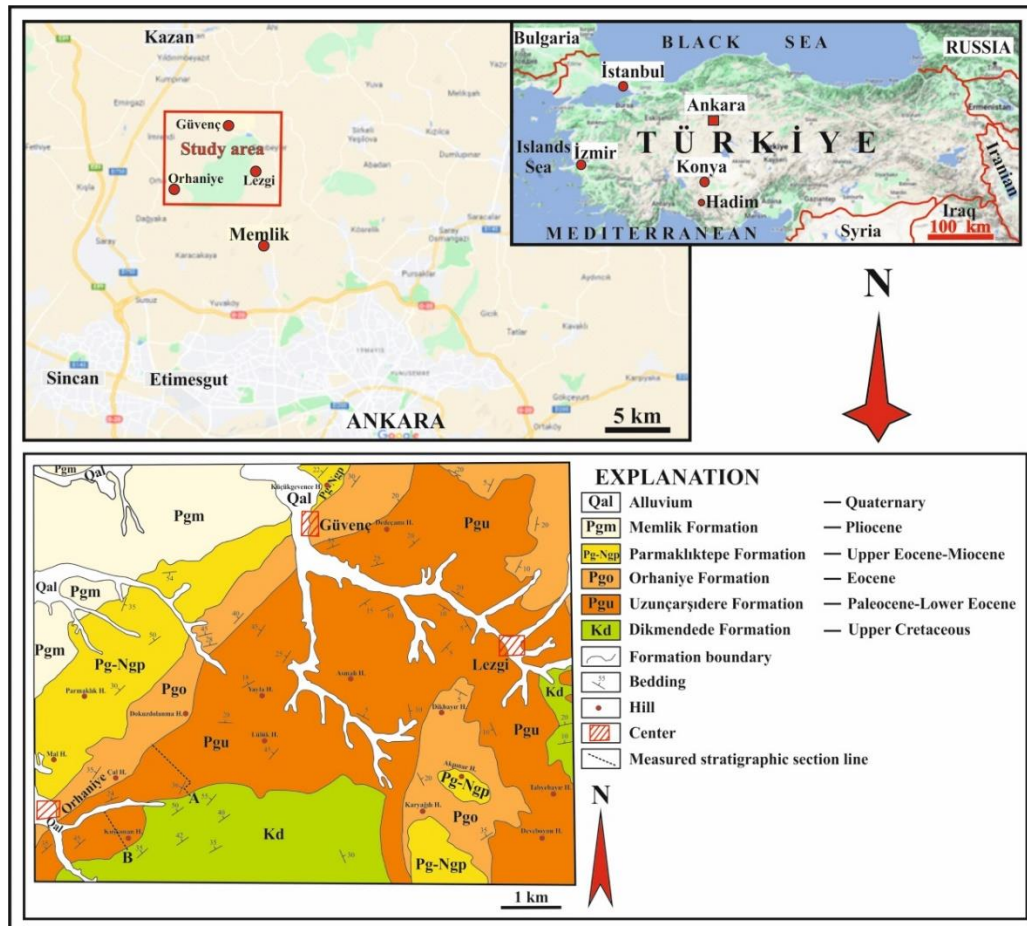


Figure 1. Location (GoogleMaps) and geological map of the study area (modified from Özkan and Ayaz, 2004)

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Sedimentary Characteristics of Uzunçarşidere Formation

The Uzunçarşidere Formation is predominantly composed of yellow, red, and gray colored conglomerate, green, red, gray colored sandstone, red, green, purple mudstone, yellow, beige limestone, and beige marls.

Conglomerates, which are generally observed at the base of the formation, are grain-supported, polygenic, poorly sorted, medium-tight calcite cemented. The pebbles of the polygenic conglomerate are composed of gray-colored limestone, white and gray-colored chert, burgundy-colored phyllite, green metasandstone, and black gabbro pebbles. The maximum grain diameter of the conglomerate is 40 cm and its matrix is sand. Normal grading, reverse grading, and imbricated structure are observed at some levels within the conglomerates (Figures 2, 3, 4). Sandstones overlie the conglomerates with a gradual transition. Conglomerates and sandstones continue for several hundred meters laterally.

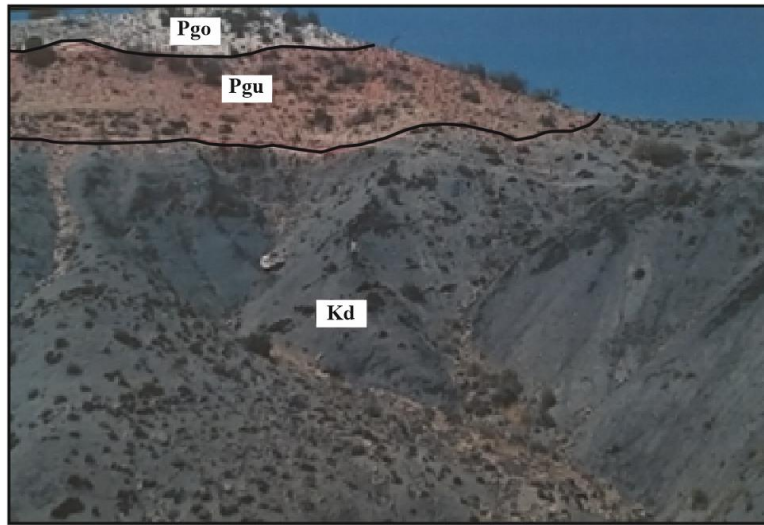


Figure 2. Boundary relationship of Dikmendede (Kd), Uzunçarşidere (Pgu) and Orhaniye (Pgo) formations (looking northeast from the northeast hillside of Kuşkonan Tepe)



Figure 3. Normal grading was observed in the conglomerates of the Uzunçarşidere Formation (west of Lezgi). Scale (hammer length: 28 cm)

Sandstones with medium-fine-grained and widespread cross-bedding also contain tuffite units at some levels. The succession first passes to yellow and red colored mudstones towards the top, followed by white-colored lacustrine limestones that show little laterally spread. At the

top, the unit ends with an alternation of cream-colored limestone and marl containing gray and white colored chert bands (Figures 5, 6, 7).



Figure 4. Reverse gradation observed in the conglomerates of the Uzunçarşidere Formation (north of Asmalı Tepe). Scale (hammer length: 28 cm)



Figure 5. The imbricate structure observed in the conglomerates of the Uzunçarşidere Formation (west of Lezgi). Scale (hammer length: 28 cm)



Figure 6. Convoluted lamination observed in the sandstones of the Uzunçarşidere Formation (northeast of Kayaönü Dere). Scale (pencil length: 14 cm)



Figure 7. The cherty (Ch) limestone (Ls) observed in the Uzunçarşidere Formation (east of Dedeçami Tepe). Scale (hammer length: 28 cm)

The Uzunçarşidere Formation also includes an andesitic lava deposit south of Orhaniye Village. This lava bed, which is less widespread laterally, is brown, gray in color, and massive (Figure 8).



Figure 8. Yellowish gray colored mudstone (Ms), sandstone (Ss), and red-colored sandstone alternation and gray-colored andesitic lava (Al) spread observed in Uzunçarşidere Formation (looking northwest from the north of Dam Dere)

To the south of Güvenç Village, the Uzunçarşidere Formation shows a green-colored sandstone-shale alternation (Figure 9).

In the sandstone samples taken from the Uzunçarşidere Formation, 10-30% monocrystalline quartz, 0-10% polycrystalline quartz, 1-10% feldspar, 5-25% rock particles, 1-4% mica, 1-3% heavy mineral, 20-40% sparry calcite cement, 1-50% iron oxide cement, 3-10% clay matrix were observed. Sandstones are named litarenite according to Folk's (1968) classification.

Monocrystalline quartzes are mostly flat extinction and slightly wavy extinction. Quartz grains are mostly angular and less often round in shape. Polycrystalline quartzes are mostly in the form of semi-round and less angular grains. Feldspar minerals are mostly composed of plagioclase and lesser orthoclase. Plagioclases are generally albite twinned and exhibit semi-

angular and angular shapes. Orthoclases are generally wavy extinction and are observed as semi-round and round. The rock particles in our samples are mostly composed of carbonate and chert grains, with lesser volcanic and metamorphic grains. Mica minerals are mostly muscovite and less biotite. Muscovites are in the form of highly birefringent and platy crystals and exhibit unidirectional cleavage. Biotite is observed as brown and plate-like crystals. Generally, opaque minerals and epidotes were observed as heavy minerals. In our samples, mostly druse sparry calcite and amorphous iron cement, and very little clay cement were encountered.



Figure 9. Sandstone (Ss)-shale (Sh) alternation observed in the Uzunçarşidere Formation. A dark brown color is observed in the sandstones due to oxidation at the lower levels, while a yellowish color is observed at the upper levels (South of Güvenç Village)

Another component of the Uzunçarşidere Formation includes marl, 40-50% carbonate particles, 50% clay, 2-4% intraclast, and 1-2% extraclasts. Grain-supported carbonate particles in the clay matrix and a few quartz and plagioclase particles were observed in marls. In some levels of the marls, lamination consisting of intercalation of bioclastic fragments and clay is also observed (Figure 10).

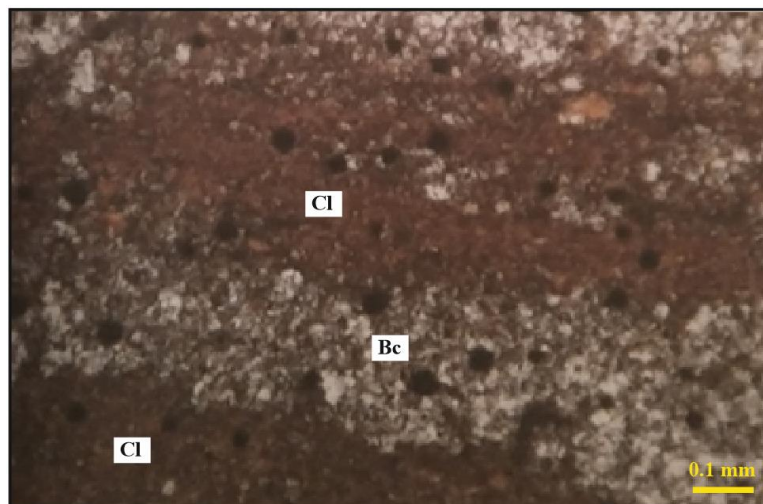


Figure 10. Lamination consisting of an alternation of bioclasts (Bc) and clay (Cl) observed in marls of the Uzunçarşidere Formation (PPL)

Another component of the Uzunçarşidere Formation consists of limestones, 35% intraclast, 4-6% pellet, 7-9% micritic matrix, and 50-52% sparry calcite cement (Figure 11). Limestone was named packstone according to Dunham's (1962) classification.

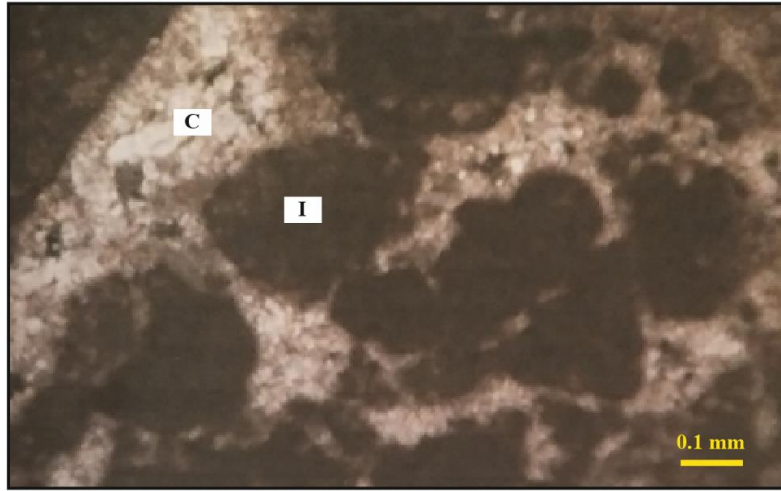


Figure 11. Sparicalcrite druse cement (C) and intraclasts (I) observed in the limestones of the Uzunçarşidere Formation (PPL)

The type section of the Uzunçarşidere Formation was measured from approximately 2 km east of the Orhaniye Village to the northeast of Çal Tepe in the northwest direction (Figures 1 and 12; Özkan and Ayaz, 2004). A reference section from the Uzunçarşidere Formation was taken from the southeast of the Orhaniye Village, from the south of Kuşkonan Tepe, to the northwest (Figures 1 and 12).

While the Uzunçarşidere Formation overlies the Dikmendede Formation (Upper Cretaceous) with an angular unconformity from the bottom, it is overlain by the Parmaklıktepe Formation (Paleocene-Lower Eocene) conformably (Figure 2). While the thickness of the Uzunçarşidere Formation is 260 m according to the type section, it was expressed as 500 m by Ocakoğlu (1998).

In this study, no fossils that could give an age from the formation were found. Gökten et al. (1988) found ostracod shell sections in the lacustrine limestones of the Uzunçarşidere Formation and stated that the clayey parts of the formation were sterile in terms of spores and pollen. Gökten et al. (1988) evaluated the age of the Uzunçarşidere Formation as probably Paleocene-Lower Eocene based on stratigraphic relationships. In this study, the age of the Uzunçarşidere Formation was determined by Gökten et al. (1988), it was considered as Paleocene-Lower Eocene.

The Uzunçarşidere Formation was developed in a braided stream and lacustrine environment as a depositional environment.

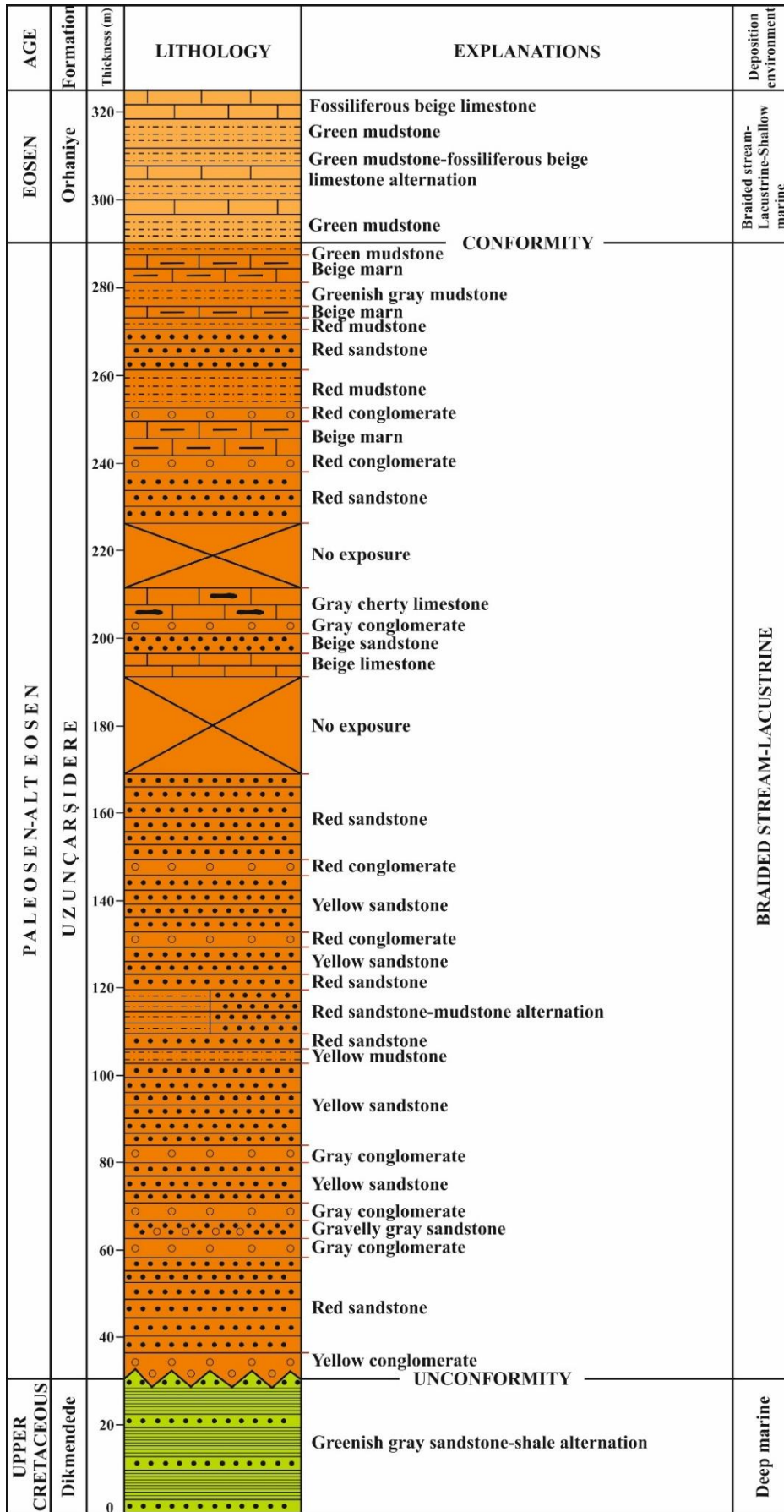


Figure 12. Uzunçarşidere Formation type section (modified from Özkan and Ayaz, 2004)

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