

## **Facies, depositional environment and sequence stratigraphy analysis of the Kazhdumi formation (middle Cretaceous) in the central Zagros mountains**

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**Received: 2020/10/12    Accepted: 2020/12/2**

### **Abstract**

The Kazhdumi Formation (Aptian-Albian) comprises the lowermost lithostratigraphic unit of the middle Cretaceous in the eastern and central regions of the Zagros mountain chain and one of the richest known source rocks in the world. To investigate facies and sedimentary environment as well as sequence stratigraphy analysis of this formation in the central Zagros, this study focuses on the Payon anticline surface section in Izeh zone and a subsurface section of the Ahwaz oilfield in the Dezful embayment. Field, laboratory and well logging data showed that the Kazhdumi Formation composed mainly of dark bituminous shales and thin-bedded carbonates rich in pelagic fauna with subordinate horizons of radiolarite, glauconite and phosphate. This sedimentary succession deposited in a low energy and organic-rich intra-shelf basin which was limited to the southeast by the Fars Platform (Dariyan Formation) and extended into the Burgan delta (Azadegan sandstone member) in the south of Khuzestan. To the north, the Kazhdumi depression is bounded by the Balarud fault and separated from the Lurestan basin (Garau formation). The creation of the Kazhdumi deep marine basin and sedimentation of the organic-rich deposits are the result of a rapid increase in accommodation due to sea-floor subsidence along the preexisting Kazerun and Hendijan regional fault systems and eustatic sea-level fluctuations as well as the influx of siliciclastics. Deposition of organic-rich sediments of the Kazhdumi Formation coincides with the globally recognized Aptian and Albian Oceanic Anoxic Events (OAE1a and 1b). Vertical changes of the sedimentary facies and geophysical logs indicate that the sedimentary succession of the Kazhdumi Formation comprises the main part of a second-order depositional sequence (50-5 Ma) completed by platform carbonates of the upper part of the Dariyan Formation (Aptian) and lower part of the Sarvak Formation (Albian). This supersequence correlates with the upper part of the Mehrdad sequence of the Zagros mountains and encompasses 3 third-order sequences (5-0.5 Ma).

**Keywords:** Sequence stratigraphy, Kazhdumi formation, Central Zagros, Intra-shelf basin