

# Biostratigraphy of the Pabdeh Formation in Qaleh Nar oil field based on Calcareous nannofossils

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## Introduction

Biostratigraphic analysis was carried out for the Pabdeh Formation based on calcareous nannofossil in the Qaleh Nar oil field, Zagros Basin located in southwest Iran. Type section of the Pabdeh Formation was introduced in the North of Lali oilfield by Wynd in 1965. In this study, Pabdeh Formation in the north Dezful Embayment consists of marl, argillaceous limestone and shale, and conformity covered by Asmari Formation. The aim of the present study is to determine the exact age of the studied interval with regard to the calcareous nannofossils.

## Material and Methods

In this study, 101 samples from Pabdeh Formation have been studied. Samples were prepared following a standard smear slide method (Bown and Young 1998). Calcareous nannofossils nomenclature follows the taxonomic schemes of Perch-Nielsen (1985). As a result of this study, 23 genera and 62 species of calcareous nannofossils have been identified.

## Discussion

Calcareous nannofossils recorded in the Cenozoic strata are believed to be an appropriate means for biostratigraphic studies. Abbreviations used in this study are the FO (first occurrence) and the LO (last occurrences). The nannofossil zonation used in the present study is based on the Nannoplankton Paleogene zonation of Martini (1971). According to our biostratigraphic data, NP10 to NP23 biozones are introduced as follows:

***Tribrachiatus contortus* Concurrent range Zone:** The first nannofossil unit recorded in this study is the NP10 zone. This bio zone is recorded from the FO *Tribrachiatus bramlettei* to the LO of *Tribrachiatus contortus*. The age of this zone is Ypresian

***Discoaster binodosus* Concurrent range Zone:** The second nannofossil unit recorded in this study is the NP11 zone. This bio zone is recorded from the LO *Tribrachiatus contortus* to the FO of *Discoaster lodoensis*. The age of this zone is Ypresian.

***Tribrachiatus orthostylus* Concurrent range Zone:** This zone spans the interval from the FO of *Discoaster lodoensis* to the LO of *Tribrachiatus orthostylus*. The age of this zone is Ypresian.

***Discoaster lodoensis* Concurrent range Zone:** The other bio event recorded in this study is the *Discoaster lodoensis* zone. This zone spans the interval from the LO of *Tribrachiatus orthostylus* to the LO of *Toweius crassus*. The age of this zone is Ypresian.

***Discoaster sublodoensis* Concurrent range Zone:** This zone spans the interval from the LO of *Toweius crassus* to the FO of *Nannotetrina fulgens*. The age of this zone is Lutetian.

***Nannotetrina fulgens* Concurrent range Zone:** The NP15 zone spans the interval from the FO of *Nannotetrina fulgens* to the FO of *Reticulofenestra umbilica*. The age of this zone is Lutetian.

***Discoaster taninodifer* Concurrent range Zone:** The NP16 zone spans the interval from the FO of *Reticulofenestra umbilica* to the LO of *Discoaster bifax*. The age of this zone is Lutetian/Bartonian.

***Discoaster saipanensis* Concurrent range Zone:** The NP17 zone spans the interval from the LO of *Discoaster bifax* to the FO of *Reticulofenestra bisecta*. The age of this zone is Bartonian.

***Chiasmolithus oamaruensis* Concurrent range Zone:** The other bio event recorded in this study is the *Chiasmolithus oamaruensis* zone. This zone spans the interval from the FO of *Reticulofenestra bisecta* to the FO of *Isthmolithus recurvus*. The age of this zone is Priabonian.

***Isthmolithus recurvus* Concurrent range Zone:** The NP19 zone spans the interval from the FO of *Isthmolithus recurvus* to the FO of *Sphenolithus pseudoradians*. The age of this zone is Priabonian.

***Sphenolithus pseudoradians* Concurrent range Zone:** The other bioevent recorded in this study is the NP20 zone. This zone spans the interval from the FO of *Sphenolithus pseudoradians* to the LO of *Discoaster barbadiensis*. The age of this zone is Priabonian.

***Ericsonia subdisticha* Concurrent range Zone:** The NP21 zone spans the interval from the LO of *Discoaster saipanensis* to the LO of *Ericsonia formosa*. The age of this zone is Rupelian.

***Helicosphaera reticulata* Concurrent range Zone:** The NP22 zone spans the interval from the LO of *Ericsonia formosa* to the LO of *Reticulofenestra umbilica*. The age of this zone is Rupelian.

***Sphenolithus predistentus* Concurrent range Zone:** The last bioevent recorded in this study is the NP23 zone. This zone spans the interval from the LO of *Reticulofenestra umbilica* to the FO of *Sphenolithus ciperoensis*. The age of this zone is Rupelian.

## Conclusion

The detail study of Pabdeh Formation at Lali Oilfield, based on calcareous nannofossils, enables the subdivision of the studied deposits into fourteen bio zones. The biostratigraphic analysis provides an age of the Ypresian to Rupelian in this section.

**Keywords:** Paleogene; Pabdeh Formation; Dezful Embayment; calcareous nannofossils.

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