

# **PS Investigating the Sediments of the Pabdeh Formation in Zagros Basin, Iran**

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## **Abstract**

In this research, we investigated the environment of Pabdeh formation from the age of Paleocene to the end of the Oligocene, which is part of carbonate reservoirs in the Zagros basin. Four lithofacies were identified based on core and cutting observations, as well as petrographic and facies analysis of the Pabdeh Formation in the Karanj oil field: (i) Plagic Foraminifera Packstone with Phosphate and Glauconite (Microfacies A1) (ii) Plagic Foraminifera Wackestone, Mudstone with Phosphate and/or Glauconite (microfacies A2) (iii) Bioclast, Ooid, Intraclast Packstone-Wackestone (Microfacies A3), and (iv) Mudstone with interlayer wackestone-packstone with silt fossils (microfacies B). Therefore, it is concluded that the sedimentation environment of the Pabdeh Formation was a deep outer-ramp environment that gradually changed from an outer ramp to a middle ramp influenced by storms.

**Keyword:** Pabdeh formation, sedimentary environment, Microfacies, Tempestite deposit, petrography

## **Reference**

- Saberi, F., Asoude, P., Barati, M.B., Kadkhodaie, A. and Soleimani, B., 2023. Determination of reservoir parameters of the upper part of Dalan Formation from NMR log and core in South Pars oil field. Journal of Petroleum Research.

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# Investigating the sediments of the Pabdeh Formation in Zagros Basin, Iran



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## Introduction

The purpose of studying the petrography of this formation is to know the components and abundance and investigate the turbidite evidence in these sediments to interpret the sedimentary environment history of the Pabdeh Formation.

## Method

A study focusing on the Pabdeh Formation in the Karaj oil field was conducted. A total of 159 thin sections were examined at 2-meter intervals along a 365-meter section. The thin sections were studied using a polarized microscope. Dunham's method was employed to classify the microscopic facies. The examination included the analysis of characteristics and the interpretation of the model and sedimentary environment.

## Results

### Description of microfacies:

#### Outer ramp:

**Pelagic Foraminifera Packstone with Phosphate and Glauconite (Microfacies A<sub>1</sub>):**

Pyrite/ phosphate/ Glauconite/ planktonic foraminifera These microfacies deposited in the **upper part of the outer ramp** during sea level rise and low sedimentation rate (Saberi et al, 2023, Saberi et al, 2021, Saberi et al, 2021).

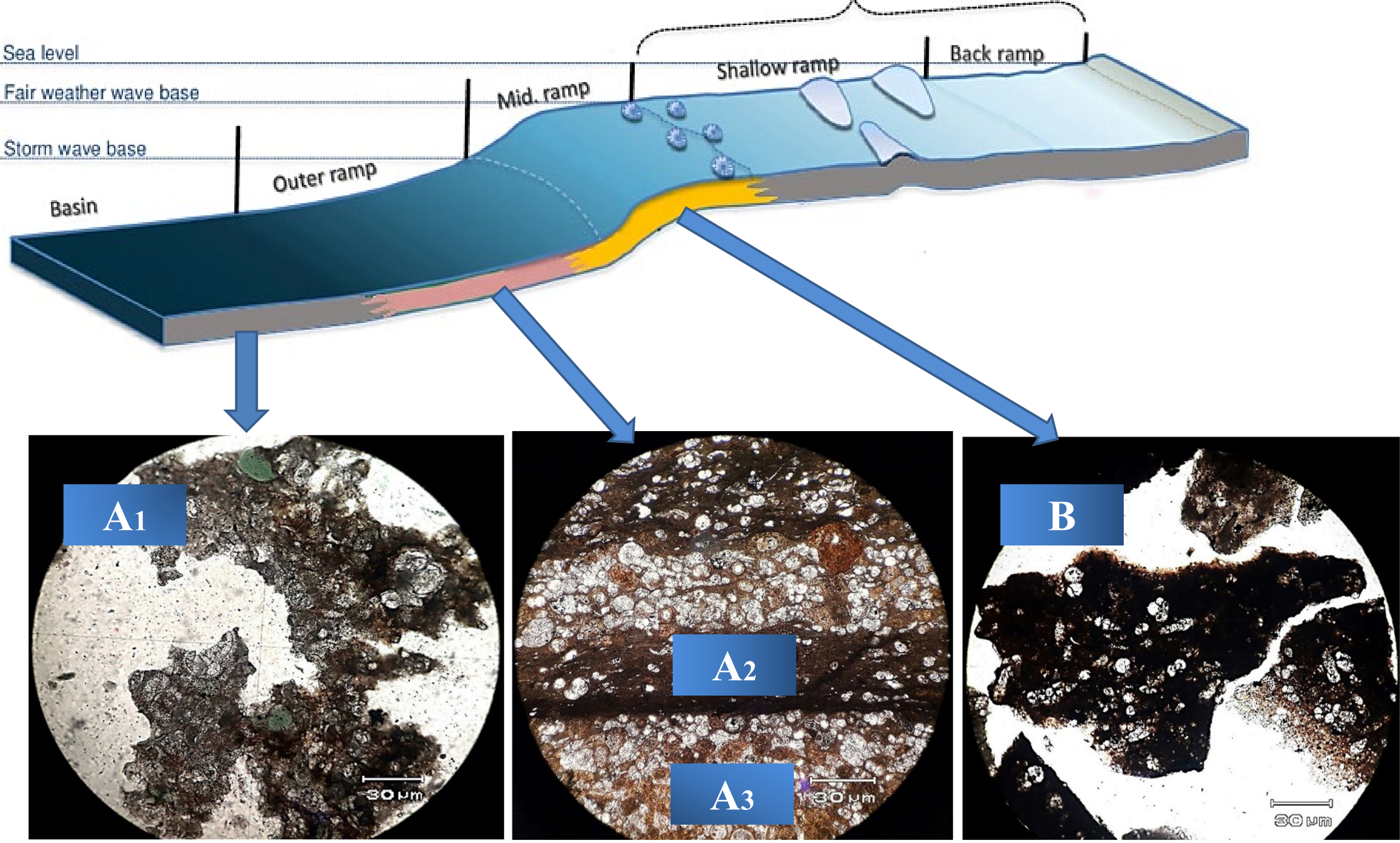
**Pelagic Foraminifera Wackestone-Mudstone with Phosphate and Gluconate (Microfacies A<sub>2</sub>):**

Ooid/intraclast/Glauconite/Pyrite/phosphate/These microfacies, **like microfacies A<sub>1</sub>**, belong to a **deep environment**

**Bioclast, Ooid, Intraclast Packstone-Wackestone (Microfacies A<sub>3</sub>)** plankton fossils/ phosphate/ pyrite- These microfacies were deposited in the **upper part of the outer ramp**.

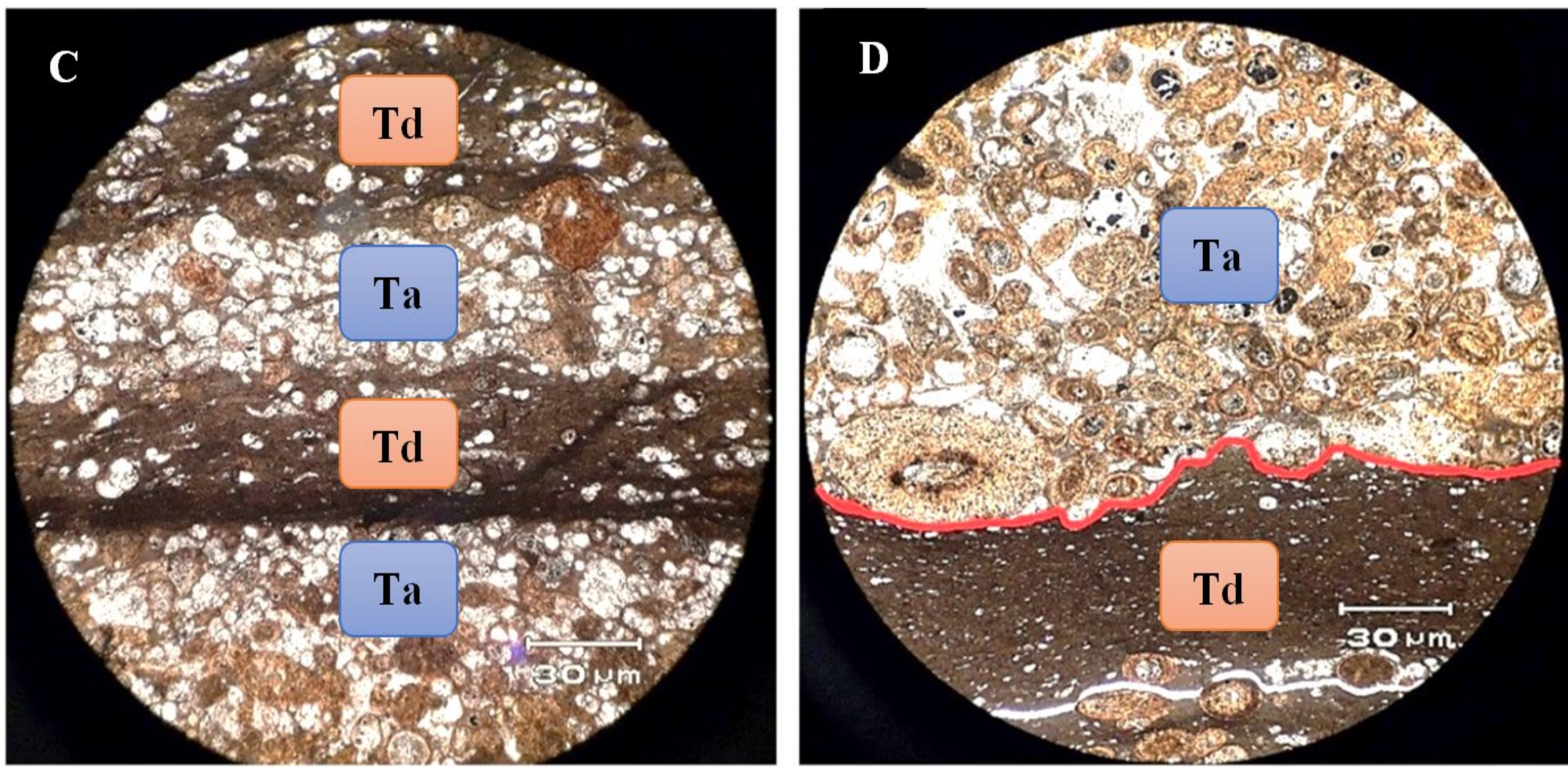
**Middle ramp microfacies Mudstone with interlayer wackestone-packstone with silt fossils microfacies B:** Benthic fossils/ Detrital quartz particles/ these facies indicate sedimentation in a **shallow marine environment**

## Results

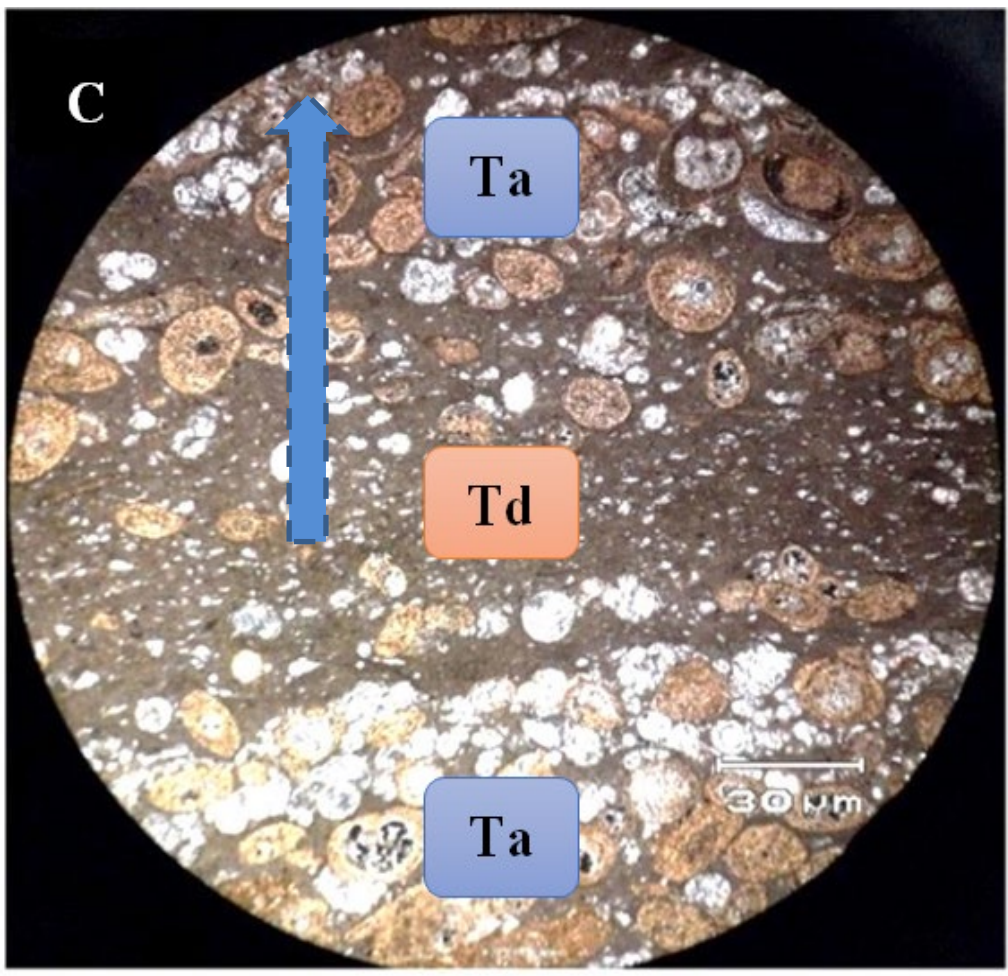


The following evidence confirms the formation of these facies by turbidite current:

❑ The existence of Packstone-Wackestone bioclast layers with sharp erosional contact represents part A (Ta) of the Bouma sequence, which is mainly the size of these bioclast fragments in the fine sand. Interchanging of coarse and fine laminates on the millimeter scale shows the trend of decreasing turbidite current energy.



❑ The existence of Packstone-Wackestone bioclast layers with normal graded bedding (fine-grained upwards) indicates the A (Ta) or B (Ta) part of the Bouma sequence.

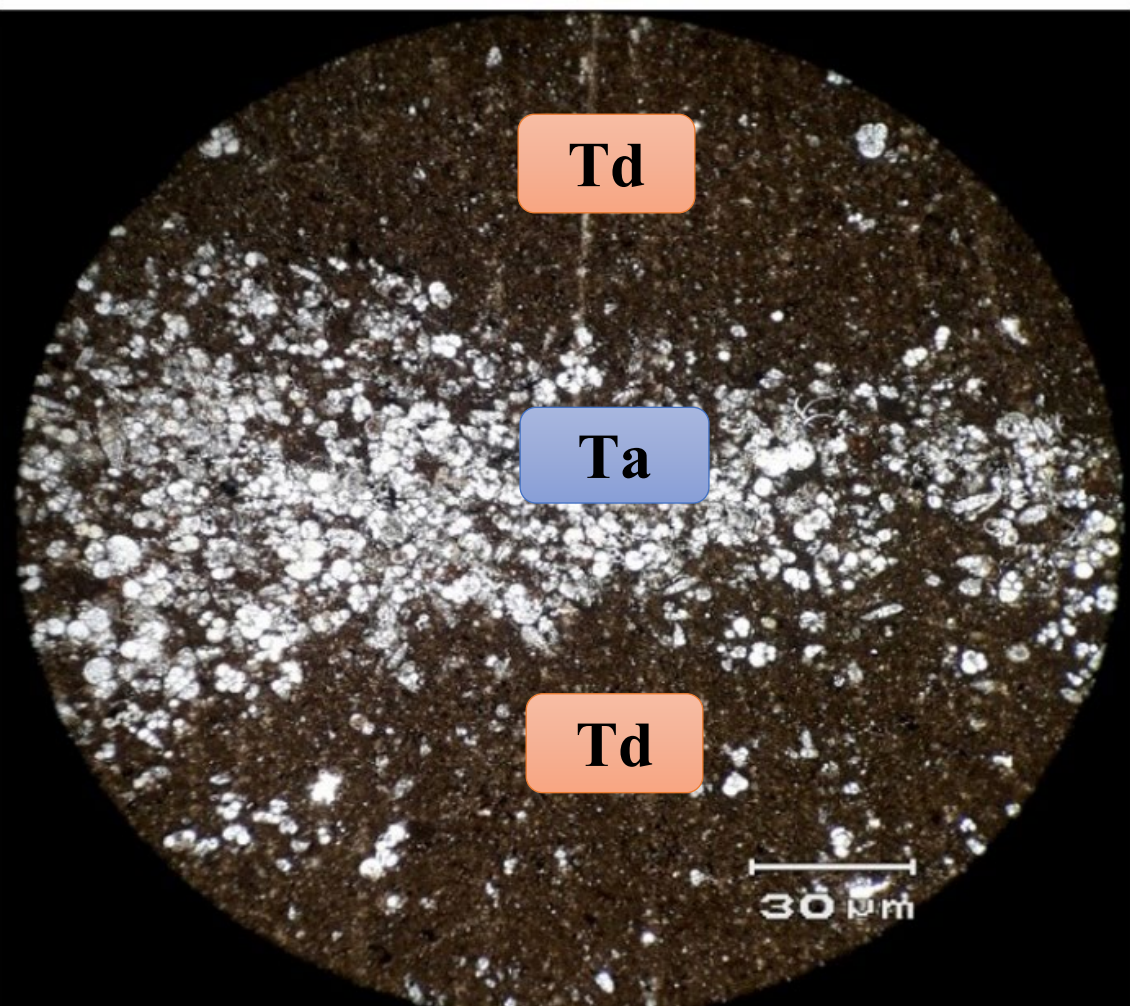


## Results

❑ The placement of lithoclast fragments from the Mudstone facies within the Wackestone-mudstone facies represents part of the Bouma sequence (Ta).



❑ The parallel arrangement of bioclastic components (lamination) in the Packstone-Wackestone facies representing the (Ta) section (high energy) and parallel arrangement of bioclastic components in the Mudstone facies representing the (Td) section of the Bouma sequence (low energy).



## Conclusions

We concluded that the depositional environment of the Pabdeh Formation is a ramp environment that gradually transformed from an outer ramp to a middle ramp through the action of storms. In other words, the primary depositional environment of the Pabdeh Formation is a storm-influenced carbonate ramp.

## References

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