

Microbiostratigraphical and microfacies study of the Jahrom Formation, north of Shiraz (Lapouei Section)

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Abstract

In this paper, a section of the Jahrom Formation was selected and its prominent microfacies and foraminifera were identified. The section of Zarghan Mountain (Lapouei) with 199 meters of the Jahrom Formation sediments were studied through 109 microscopic sections. On the whole, the prominent microfacies of the section under study are Packestone, Wackestone, Grainstone, Microfacies Dolomite. The and destructive elements of these microfacies are Intra claste, bioclaste, and peloide.

Altogether, the amount bioclast is more than the other Allochem elements. The prominent foraminifera identified in this section, in top-down order, are as follows:

Miscellanea globularis Pfender, Planorotalites sp., Rotalia aff trochiformis Lamark, Somalina stefanina silvestri, Miscellanea sp., Morzovella sp., Fallotella sp., Kathina sp., Glomoalveolina sp., Valvulammina sp., Orbitolites sp., Spirolina sp., Lockhartia sp., Rhapydionina sp., Dictyocouns sp., Nummulites sp.

Regarding the above-mentioned foraminifera in this section, the ages of the microfacies are different from each other. But, on the whole, the age of the Jahrom Formation in this section ranges from Middle Eocene to Middle Paleocene.

Keywords: *Jahrom Formation; microfacies study.*

1- Introduction

The subject of this paper is the study of lithostratigraphic and biostratigraphic characteristics of the Jahrom formation, Fars, owing to its paramount importance. Since long ago and during different stratigraphic stages, this formation has received great attention owing to its wide expanse and biostratigraphic and lithostratigraphic diversity. In the studies first carried out by James and Wynd (1965) and later by H. Motiee (1993), this formation was found to date from Paleocene-Eocene. This paper is organized as follows. In Section 2, the geographical location and stratigraphic description of the section under study are pointed out. Section 3 considers the microbiostratigraphic units of the Jahrom formation, and in Section 4, the microfacies of Lapouei stratigraphic section (Zarghan Mountain) are quantitatively studied.

2- Geographical location of the section under study

The stratigraphic section considered in this study lies in the Zagros structural zone, and is located between 52° 50' E and 29° 50' N. This section is located 20 km to the north of Shiraz, Fars Province, and can be accessed through the main Shiraz-Zarghan road.

2.1- Description of the stratigraphic section

The study of the foraminifera in the Jahrom formation in Lapoui section reveals an age of middle Paleocene-lower Oligocene. (See Table 1). This formation can thus be stratigraphically divided into three main parts:

- a) Lower part: containing 87 m thick-layer to massive dolomite lime rock. The foraminifera identified are: *Lithuonella roberti*, *Morzovella* sp., *Planorotalites* sp., *Miscellanea* sp., *Fallotella* sp., *Kathina* sp., *Glomoalveolina* sp., *Opertoorbitolites* sp., with an age of middle Paleocene to lower Eocene (Jahrom formation)
- b) Middle part: containing 72 m middle- to thin-layer limestone and dolomite lime. The foraminifera identified are: *Somalina stefani*, *Alveolina* sp., *Nummulites* sp., *Lockhartia* sp., *Rhapydionia* sp., *Coskinolina* sp., with an age of lower to middle Eocene (Jahrom formation).
- c) Upper part: containing 40 m middle-layer limestone, with the following foraminifera: *Astrotrillina asmaricus*, *Archiacia* sp., *Triloculina* sp., *Rhapydionina* sp., with an age of lower Oligocene (Asmari formation).

3- Introducing microbiostratigraphic units of the Jahrom formation in the stratigraphic section under study

Biozones of Lapoui stratigraphic section (Zarghan Mountain)

The biozones of the Jahrom formation in the Zagros region were identified by James and Wynd in 1965. In Lapoui section, two biozones can be introduced according to their study:

- 1) Nummulites-Alveolina assemblage zone: identified by the extension and abundance of *Nummulites* sp. and *Alveolina* sp., with associated fauna in the middle Eocene part of Lapoui section with *Somalina stefanini*, *Dictyoconus* sp., *Olssonina* sp., *Valvulammina* sp., *Lockartia* sp., *Coskinolina* sp.
- 2) Operorbitolites sub-zone: identified by abundance of *Operorbitolites* sp., and accompanied by the following bioaccumulation (assemblage fauna) in the lower Eocene part of Lapoui section:

Lithuonella roberte, *Rhapydionina* sp., *Valvulammina* sp., *Alveolina* sp., *Coskinolina* sp., *Dictyoconus* sp.

Moreover, this biozone is in agreement with the biozone introduced by James and Wynd (1965), considered as a sub-zone.

4-Quantitative study of the microfacies of Lapoui stratigraphic section (Zarghan Mountain)

In the quantitative statistical study of the elements constituting the microfacies, orthochem elements, allochem elements and destructive elements were considered. The amounts of these elements were different in the samples taken from the stratigraphic section under study. In this section, the bioclast distribution curve undergoes great variation in the middle part. The minimum amount of bioclast is observed in the beginning of the lower part (0%), and the maximum amount is observed in the upper part (50%). The intraclast distribution curve exhibits the minimum amount (0%) in the beginning of the lower part, and the maximum amount (40%) in the upper part. The peloid percentage curve exhibits an almost uniform variation, with little variation in the lower part but the greatest increase in the percentage of

peloids (60%) in the beginning of the middle part. At the upper contact of this section with the Asmari formation, an increasing trend is observed in the bioclast-intraclast curve.

5-Conclusion

The findings of the study of this stratigraphic section reveal that the amount and diversity of bioclasts (especially bentic foraminifera) increases in the direction from open sea to subtidal and intertidal regions. Bioclast diversity is in direct relation with factors such as depth, temperature, pressure, and ambient energy. The increase in the bioclasts in the middle and upper parts of this section is related to the extension of bioclast elements. The greatest extension of bioclasts coincides with packstone and grainstone faces, both of which are related to subtidal and intertidal regions. The smallest amount of bioclast is related to wackestone face, which is related to open sea and probably lagoon sides. Altogether, the middle and upper parts of the section under study feature a more suitable environment for the growth of organisms, considering the percentage of bioclasts.

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Table 1. STRATIGRAPHIC COLUMN SECTION OF LAPUIE

PALEOCENE		EOCENE				Oligocen	TIME ROCK UNITS
MIDDLE	UPPER	LOWER	MIDDLE		LOWER	Block Units	
JAHNUM FORMATION					ASMARI F.		
							(X: E52 50 , Y: N29 50)
<p>sample no.</p> <p>FIELD DESCRIPTION</p> <p>light grey,medium bedded limestone</p> <p>light grey,medium bedded limestone</p> <p>Grey,thin to thick bedded limestone</p> <p>Grey,medium bedded limestone</p> <p>Blue,finis and medium bedded limestone</p> <p>light grey massive limestone</p>							



Table2. Microfacies Distribution curve in Lapoui section

