

SEDIMENTARY STUDY OF SHIRANISH FORMATION AT HIJRAN SECTION- NORTH IRAQ

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ABSTRACT

Shiranish has been studied at Hijran section near Erbil city, NE Iraq. Fifty two thin-sections were prepared to study them under polarized microscope, to determine the petrographic component, organic content and diagenetic processes. Rock units subdivided into four rock beds, as follows: dolostone, foraminiferal biomicrite, poorly washed biomicrite and micrite. Vertical succession of Shiranish Formation refers to off-shore quite marine environment.

INTRODUCTION

Shiranish Formation cropping out at the high- folded zone North Iraq, and also within subsurface sections during the wells reaching Upper Cretaceous (Dunnington,1958). It's thickness about 225 m in type section near Shiranish Islam village north east Zako, Dahuk Governorate and comprises blue marl and thin bedded marly limestone. It has conformable lower contact with Beckme Limestone Formation, and upper contact with Aliji Formation that seem to be conformable surface, but there is fossils break indicate to Cretaceous- Tertiary boundary (Bellen, et al. 1959). Bed rocks of this formation enriched by planktonic foraminifera that refer to off- shore depositional environment (Bellen, et al., 1959); (Buday, 1980). This study aims to determine paleoenvironment according to petrography, organic content and diagenetic processes.

MATERIALS AND METHOD

Fifty two rock samples were collected from Shiranish Formation at Hijran section near Shaqlawa Town, Erbil Governorate, North Iraq. Sample interval ranged from 1- 1.5 meters (Kidwell and Holland, 1991) and thinned section (Voelkel, 1967) to study the petrography, organic content and diagenetic processes by polarized microscope.

RESULTS AND DISCUSSION

Shiranish Formation has been subdivided to four beds according to petrography, organic content and diagenetic processes (Folk, 1974), as follow:

- 1- dolostone bed: this bed composed of sugary dolomite of equal sizes and similar texture (plate 1-1), which composed by diagenetic replacement of carbonate sediments, so this bed considers secondary origin (Schoole, 2003). Secondary dolomite indicates postdepositional replacement of limestone or calcareous sediment by the progressive slow growth. Secondary dolomite characterized by sugary texture may be formed at different diagenetic stages. The boundaries of dolomite may cross original texture, thereby can't preserve depositional interpretations (Nichols and Silbering, 2010). Dolostone bed deposits under supra tidal environment due to organic absence and composed the lower part of Shiranish Formation (Moore, 2001).
- 2- Foraminiferal biomicrite bed: it is characterized by the abundance of planktonic foraminifera at micrite (plate 1-2), spary calcite cement filled chambers of some fossils but

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rarely appeared between skeletal grains. Cement was deposits within fractures and joints during late diagenetic processes due to tectonic uplift (Bathrust, 1975). The abundance of planktonic foraminifera and micrite of brown to dull color refer to quite deep marine environment (Flugel, 2010). Iron oxide has been observed in the some pores, and also pyrite as cubic shape (Plate 1-3), and as scattered in micrite and in fossil chambers (Siesser, 1976).

- 3- Poorly washed biosparite bed: this bed characterized by the abundance of planktonic foraminifera such as *Globotruncana* sp. (Plate 1-4) and *Gobigerina* sp. Chambers of most fossils filled by micrite (Plate 2-1), while the pores of micrite filled by iron oxides (2-2). This refers to quite deep marine environment (Wilson, 1975). This bed composed the main component of the formation.
- 4- Micrite bed: this bed composed mainly of partly or completely recrystallized micrite (Plate 2-3) and transformed to microspare under newformism process and minor amount of unidentified skeletal grains are present. The pores are filled by pyrite (Plate 2-4). Planktonic and benthonic foraminifera are the most important fossils of this bed (Pisera, 2002).

CONCLUSIONS

Shiranish Formation at Hijran Section subdivided into four beds: dolostone bed, foraminiferal biomicrite bed, poorly washed biosparite bed and micrite bed. Some of beds contains planktonic foraminifera, and the main diagenetic processes are the cementation and recrystallization. This formation deposited at quite marine environment.

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Fig. 1: Study area on the map of Iraq.

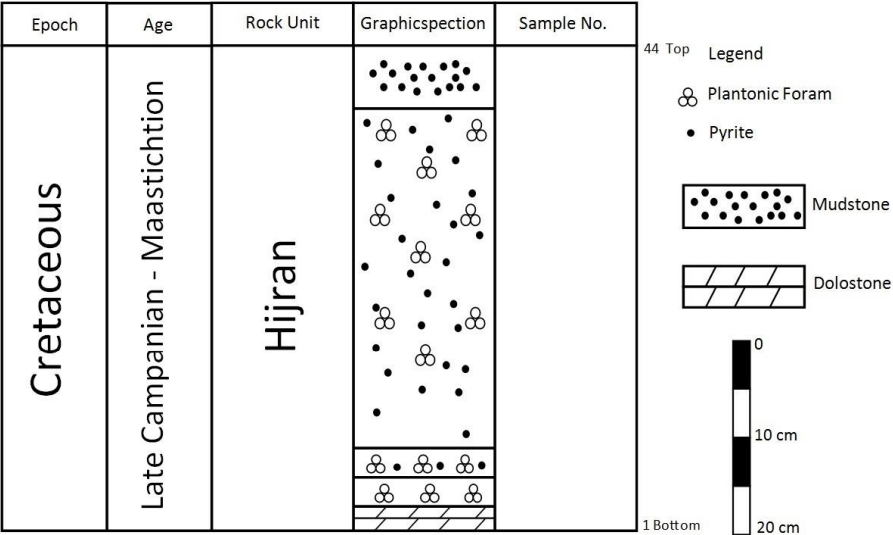


Fig. 2: Lithologic section of Shiranish Formation at Hijran.

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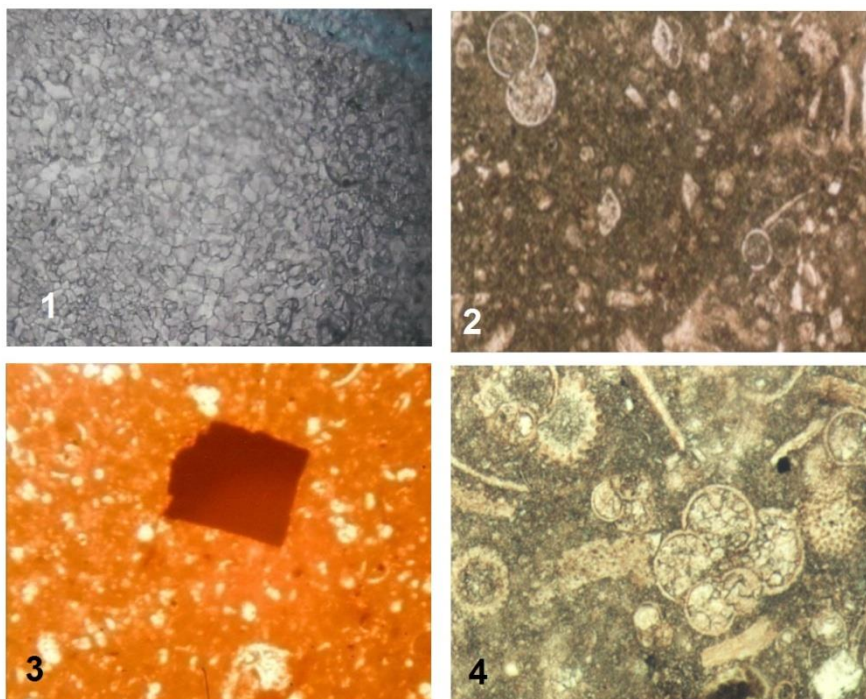


Plate-1

1- Sugary texture 100x.

2- Planktonic foraminifera in micrite 100x.

3- Cubic pyrite in foraminiferal biomicrite bed 100x.

4- Chambers of planktonic foraminifera, *Glopotruncana* sp. Filled by calcite 100x.

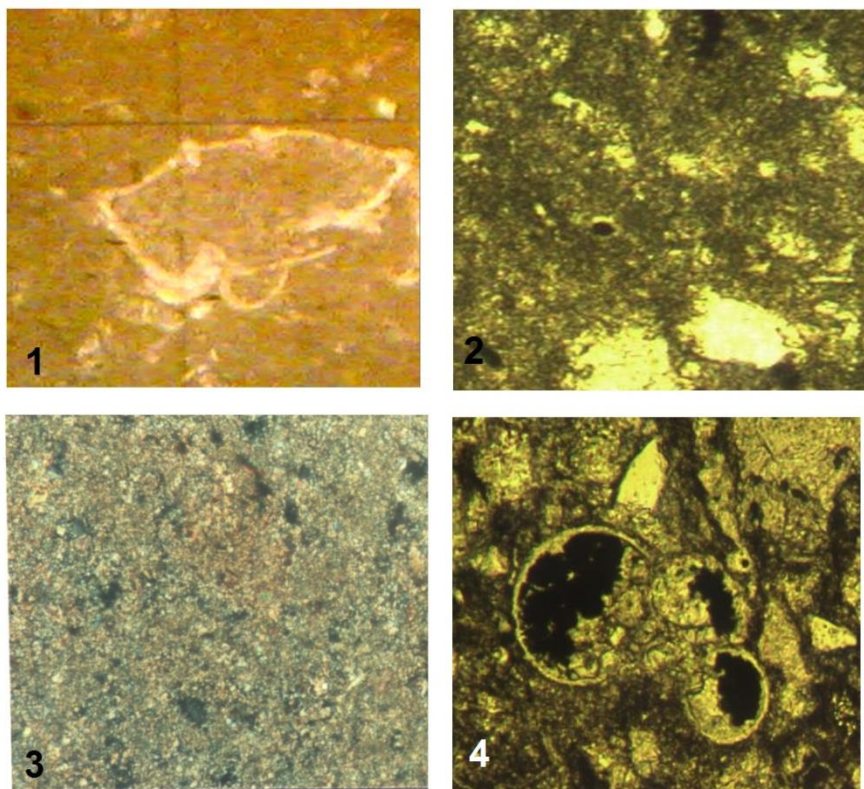


Plate- 2

- 1- Foraminiferal chamber filled by micrite in the poorly washed biosparite bed 100x.
- 2-Iron oxides filled pores in micrite 100x.
- 3-Recrystallized micrite 100 xs.
- 4-Pores filled by pyrite 100x.

دراسة رسوبية لتكوين شيرانش في مقطع حجران شمال العراق

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الملخص

درس تكوين شيرانش في مقطع حجران قرب مدينة اربيل، شمال شرق العراق، بعد تحضير ٥٢ شريحة رقيقة ثم درست تحت المجهر المستقطب، لتحديد المكونات الصخرية، والمحتوى الاحيائي والعمليات التحويرية. وبعد ذلك قسمت الى اربع طبقات صخرية هي: طبقة الحجر الدولومايتي، وطبقة الحجر المكريتي الحياتي الفوراميفري، وطبقة الحجر الحياتي ضعيف الغسل، وطبقة الحجر المكريتي. اشار النتائج العمودي لطبقات صخور تكوين شيرانش على انها مترسبة في بيئة بحرية هادئة بعيدة عن الساحل.