MICROFACIE STUDY OF SUBSURFACE SECTION OF BEKHME FORMATION (NORTH IRAQ)

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ABSTRACT
Bekhme formation, Dernir Dagh well-1 has been divided into two facies units using core sample slides and depending on sedimentary structures and diagenetic processes. The facies reflect the environment of the foreslope. This work proves the absence of Bekhme formation in Dernir Dagh Well-1 as a tongue as reported by the Oil Exploration Company. Some species and genera of bentonic foraminifera were identified. The age of Bekhme formation was estimated depending on the recognized index fossils to be lower Maastrichtian.

INTRODUCTION
Bekhme limestone formation was first defined and described by Wetzel (1950) in a gorge of the greater Zab river in the high folded zone. Bellen et al. (1959) mentioned that the Bekhme Formation in its upper division composed of bituminous secondary dolomites, replacing organic detrital limestone; in its middle division as reef detrital limestone, alternating with reef shoal limestone and its lower division as basal breccia conglomerates.

The studied area situated 25 km west of Arbil City, north of Iraq (fig. 1). The aim of the present study is the identification of the sedimentary facies of Bekhme formation and to know the lithological nature and the fossil groups present in the rocks to determine the environment of Bekhme Formation. A total of 41 thin section slides were examined.

BIOSTRATIGRAPHY
Most of the fossils present in Bekhme Formation are Rudists and species of bentonic foraminifera as Cosinella sp., Cuneolina cyctylindrica, Dictyoconella Complanata, Ephidicella multiscissuriata, Dicyclina schumbergeri. In addition, fragments of echinoid spines, ostracods and mussel shells, are present.

MICROFACIES
Bekhme formation was divided, depending on sedimentary structures and diagenetic processes, into diagenetic and non-diagenetic sedimentary facies as described by Wilson (1975) and Fluegel (1982).

1. Bioclast packstone with Rudists -Echinoderm fragments facies: Thickness of this facies 95 ft and represents 56.5% of the total thickness of the formation. It contains a high Ration of rudists and broken fragments of echinodonts, ostracods and mollusca shells, the extraclast presents in a small ratio. This facies is affected by cementation of some shells especially ostracods filled with cement -B. In the upper part of the formation with thickness of 24 ft, the authogenic dolomite scattered in a micritic matrix. The
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authogenic glauconite is also observed. This facies represents the standard microfacies (SMF-3) of the facies zone (FZ-3) fore slope.

2. Recrystallized Rudists - Echinoderms fragments: The thickness of this facies is 73 ft and represents 43.5% of the total thickness of the formation. It contains broken fragments of rudists, echinoderms, and some bentonic foraminifera and mollusca. This facies is composed of recrystallized microsparite as it appeared in some indefinite fossils because of filling their chambers with sparite. This facies characterized with presence of authigenic minerals as glauconite which increased in ratio with the depth until it become 5% in the bottom of the formation. The presence of glauconite indicates a marine environment with a very slow deposition. There is also pyrite spreaded in all of the formation parts filling cracks as inoldic pyrite. The stylolite is also observed in the formation bottom, it intersects minerals initiated after diagenetic processes like calcite cement and secondary dolomite. This facies represents the standard microfacies (SMF-4) of the facies zone (FZ-4) fore slope, fig. 2 shows the distribution of microfacies in the well.

CONCLUSIONS

1. The Bekhme formation in Demir Dagh well-i is not present as tongue as it reported by the Oil Exploration Company.
2. The separation limit between Bekhme formation and shiranish formation is estimated at the depth 5540 ft; and between Bekhme formation and kometan formation at the depth of 5708 ft.
3. The Bekhme formation is divided into two facies: a-Bioclast packstone with Pudisten-Echinoderms fragments, b-Recrystallized Rudisten-Echinoderms packstone.
4. The stylolite present in the bottom of the formation filled with pyrite was formed after solidification since the stylolite intersects minerals formed after the diagenetic processes like cacite-cement and secondary dolomite.
5. The most important diagenetic processes is the affection of micritic matrix by the recrystallization. The dolomite rhomboïdes appear to replace micritic matrix, and the fossil chambers remain empty of these rhomboides. This indicate authigenic dolomization since dolomitecrystals extracted Magnesium ions from the same place growing on.
6. The age of the Bekhme formation, depending on index fossils, is estimated to be lower Maasrichtian.

LITERATURE CITED


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Fig. 2: Microfacies chart of Bekhme formation in Demir Dagh-well - 1
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Plate 1

1. Recrystallized Echinoderm Packstone  20X

2. Bioclast Packstone with Exoclast  20X
Plate 2

1. Microlast packstone with Radiolaria-Echinoidea fragments and glaçonite grains 20X

2. Stylolith in micritic matrix 20X
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Plate 1:
1. Recrystalliaed echinoderms packstone 20X
2. J3iociaast Packitone with )ectraclat 20X

Plate 2:
2. Sty)olith in IL:Scritio ma’c 20X
حصود فقاعة لنبض وتصدع نزيف نسيم ساري حكمة مبتسمة (فلوج الام)

نافذ معبد

ألف نافذ 

لدنه بفي ما

ضلالاً

بوقرلما دلدا ملماً لياً تحسين تحوّل اغفال في معداً وحصفتقم

 العمولة لتمادح الحبار الصخري وذلك بالاعتماد على نوعية الرباب الصخري والعمليات

التحويرية.

لقد امكنا من الابات عدم تواجد تكوين البخمة في بعر دمراغ على شكل لسان كما هو وارد

في تقرير الخفر النهائي لشركة الاستكشافات النفطية، لقد امكنا من تميز عدد من انواع واختيار

الفؤادينغرا العلمية، وتم تقدير عمر تكوين البخمة في المنطقة التي نشرها البحث الى المستعرضي

العشري.