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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.

INRODUCTION

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 secondaryT 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 Bekiune formation and to know the litholoicain 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.

BIOSTRTIGRAPHY

Most of the fossils present in Bekhme Formation are Rudists and species of bentonic foraminifera as Cosinella sp. Cuneolina cytcylindrica , 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 descrided by wilson (1975) and fluegel (1982).

1. Bioclast packstone with Rudists -Echinodermis fragments facies : Thickness of this facies 95 ft and represents 56 . 5% of the total thickens of the formation. It contains a high Ration of rudists and broken fragments of echindenns , 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

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 thikness 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 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 standart 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 Bekhrne 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 rhompoides appear to replace mnicritic matrix, and the fossil chambers remain empty of these rhomboides This indicate authigenic dolornization since dolomitetcrystals 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..

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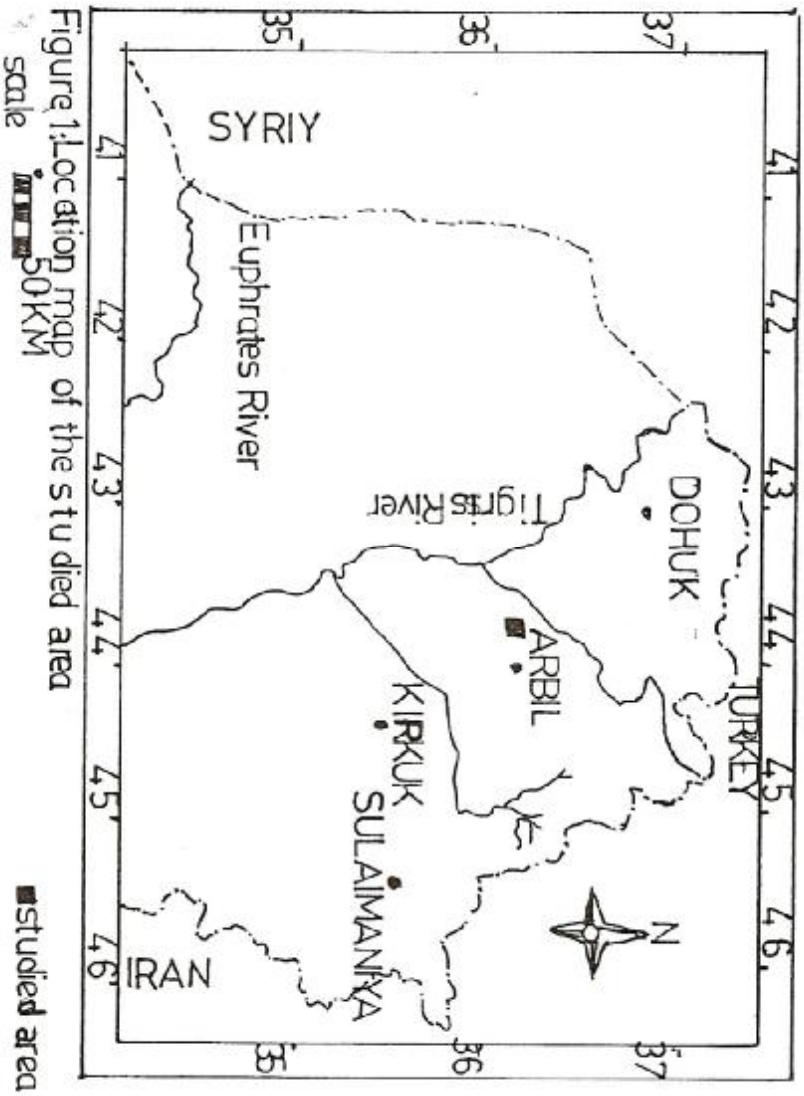


Figure 1: Location map of the studied area
scale 50KM

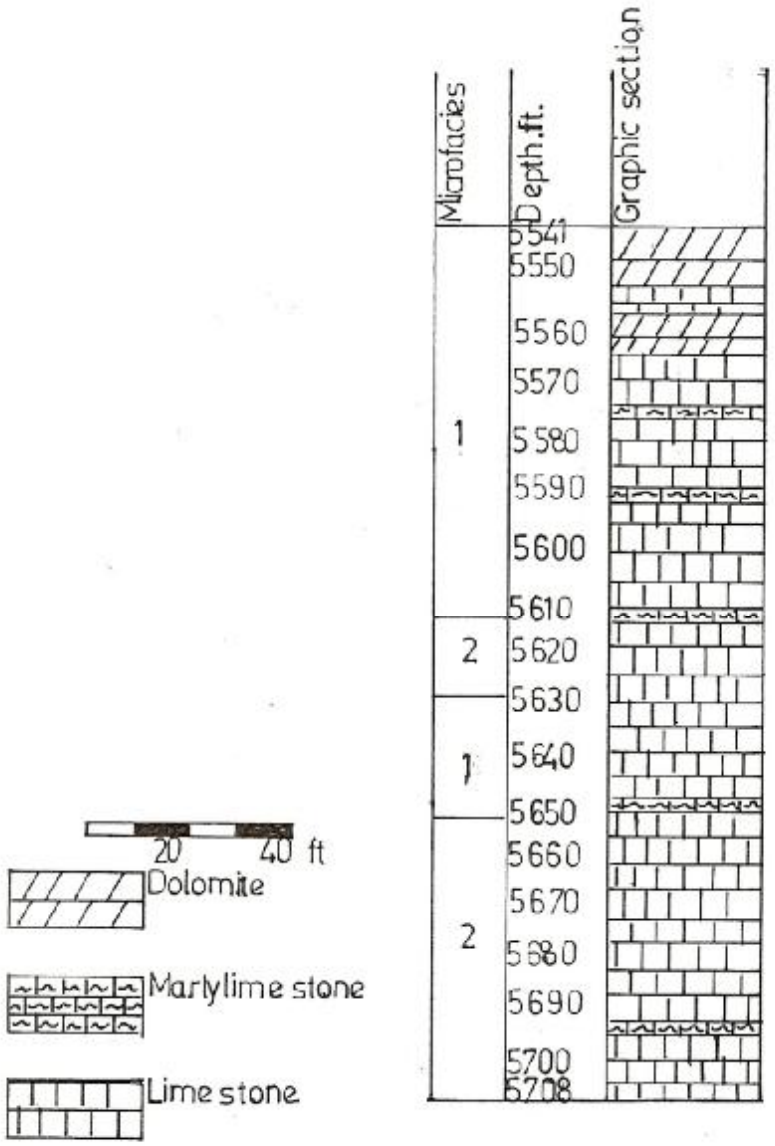
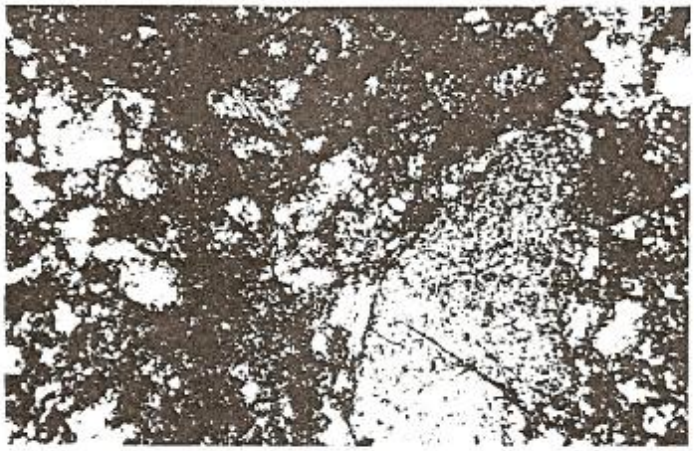


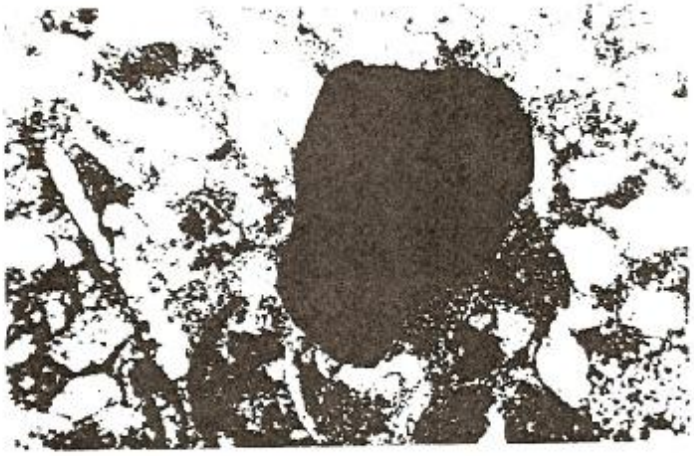
Fig. 2; Microfacies chart of Bekhme formation in Demir Dagh-well - 1

Microfacie Study of Subsurface Section

Plate 1



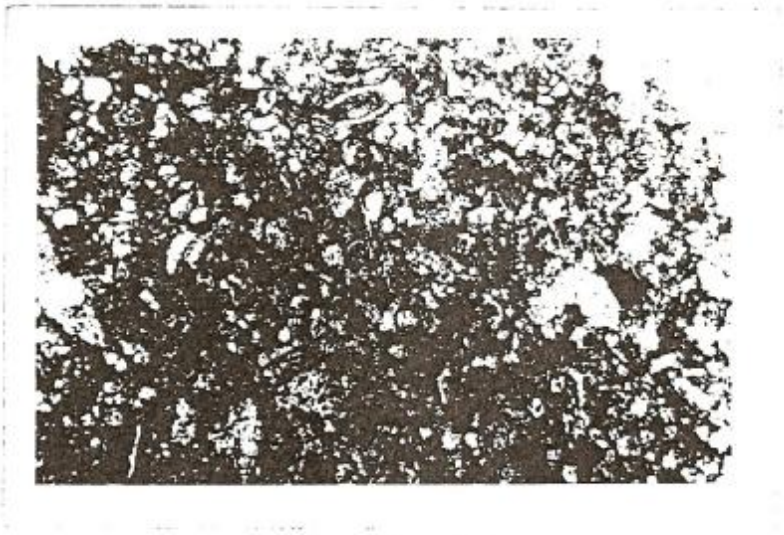
1. Recrystallised Echinoderms Packstone 20X



2. Bioclast Packstone with Extraclast 20X

Plate 2

1. Bioclast Packstone with Rudists-Echinoderms fragments and glauconite grains 20X



2. Stylolith in micritic matrix 20X

Plate 1:

1. Recrystalliaed echinoderms packstone 20X
2. J3iociast Packitone with)ctraclat 20X

Plate 2 :

1. Moc).atic Paokstone with Rudists.-Echinoderms fragment and glauconite grains 20Z
2. Sty)olith in IL:5critio ma’c 20X

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عطقم في ةمخبلا نيوكتل يرهجملا تانحتملاو سارديحطت ةسارد (قارعلا لامش)

ناج ديعس
يعيبطلا خيراتلا فحتم
دادغب ةعماج

ةصلاخلا

ة يقرلا ح ئلر لا م لد تة ابت تيحسين ت حولى ا غ لدرم ئبفي تخ لا وخصميقتتم العمولة لنماذج اللباب الصخري وذلك بالاعتماد على نوعية الريب الصخري والعمليات التحويرية.

لقد امكن من اثبات عدم تواجد تكوين البخمة في بئر دمرداغ على شكل لسان كما هو وارد في تقرير الحفر النهائي لشركة الاستكشافات النفطية، لقد امكن من تمييز عدد من انواع واجناس الفورامينغيرا العلمية، وتم تقدير عمر تكوين البخمة في المنطقة التي شملها البحث الى الماسترختي الاسفل.