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MICROFACIES STUDY OF HADIENE FORMATION (NORTH IRAQ)

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ABSTRACT

In the region of the north of Iraq using the method of analyzing thin section microfacies to 38 of rockyslices which were gathered from a place near Aqra city. These slides are divided into seven microfacies depending on lithologcal component and fossils.

1) Dolostone facies.
2) Recrystallized bioclastic wackestone facies.
3) Bioclastic packstone microfacies
4) Sucrosic dolomite facies.
5) Bioclastic grainstone in microfacies.

According to water energy, these facies were divided to three zone:

a) Low energy environment.
b) Transitional zone.
c) High energy environment.

INTRODUCTION

Hadiene formation was first described by (Wetzel, 1950), North west of Iraq. This formation was divided into three parts. The lower part is formed of dolomite limestone in addition to few conglomeratic rocks. The middle part of the formation is formed of (silt), calcareous marls, (sandy limestone) and grains from (chert). The upper part of the formation is formed of (conglomeratic) and fragmental limestone with some little of grains of Quartz.

(Bellen *et al*., 1959) have described the most important fossils in this formation (Clobotru ncana sp.) and (Inoceramus inconstans), (Globigerina ssp.) and (orbitoides media). The age of the formation was determined as Upper Companion with a possibility of Maastrichtian in the top. (Budy, 1980) span on the other hand has let the name of the formation and its definition as it is without any change. The recent study concentrate on division of the micro lithiologal facies of this formation.

MICROFACIES

Hadiena formation in the north of Iraq was divided as in Fig.1 into seven facies units after the test of the thin sections by polarized microscope, depending on the classification of (Dunham, 1962) and according to the specification of (Fluegel, 1972) wich is modified by (Wilson, 1975). The process is done depending on lithological components and some fossils (Fluegel, 1978) (Fig.2) also divided the microfacies, depending on water energy, into three zones:

a) Low-energy Environment.
b) Transitional Zone.
c) High-energy Environment.

The sedimentary microfacies and its water energy was as follow:

1) Doloslone facies.
   This facies lies in the lower formation where the dolomite is formed as a shown in plate (1-1) as result of the reciprocal modification process of the calcite precipitate therefore,this facies is considered of secondary origin. It exists in the shape of Rhombohydral of different size and of different clarity whose percentage reaches.
   More than 90%, it consists of rounding Quartz, which indicates its precipitation in regions near the coast. This facies represents the standard microfacics (S.M.F21) in the zone (F.Z.8).
2) Recrystallized bioclastic wackcstone microfacies.
   This facies is characterized by (he abundance of (planktonic foram.) like (Glohotruncana sp.) which destroyed the most of them because of the Recrystallisation plate (1-2), there is also the metal of precipitate Pyrite in some of areas and chambers of (planktonic foram.), the last one represents a suitable precipitate environment for the precipitate (pyrite). This facies represents the standard microfacics (S.M.F.9) of the zone (F.Z.2) below normal wave base open water circulation. The water energy of this facies lies within (A) because of the existence of micrite and bad rounding.
3) Bioclastic packstone microfacies.
   This facies Consists of (Milliolids), (Echinoderms), and the (plaktonic foram.) chambers fullin with calcite cement. Plate (1-3) and (Cortoids) which came from by transport from high in Matrix-Micrite. The water energy of (his facies lies within zone (A). This facies represents the standard microfacies (S.M.F.4) of the zone (F.Z.4) for slope.
4) Sucrosic dolomite facies.
   This facies lies in the lower formation. The rocks of this facies sucrosic dolomite with equal crystal plate (l-4) there are some traces of (planktonic forams.). Especially (Globigerina sp.). This facies is deep shelf margin below the wave base directed by the open sea. This facies represents the standard microfacies (S.M.F.3) of the zone. (F.Z.3). The facies later faced the process of dolomization because of the passing of magnesium loaded Iiquids. The water energy of this facies lies within zone (B) because of the good sorting of the grains and the non existence of micrite.
5) Crianstone microfacies with pellets.
   This facies is characterized by the plentiful presence of pellets plate (2-1) in addition to little quantity (planktonic forams.), some of its chambers are filled (cemen (-B)). The water energy of this facies is (C). because of the non existence of (Micrite-Matrix) and the very good sorting advance of the grains in addition to the very good rounding as well as non fine grain materials. This facies represents the standard microfacies (S.M.F.16) of the zone (F.Z.8), that is to say in very warm water with only moderate water circulation zone.
6) Dolomitized foraminiferal packstone microfacies.
   The most important fossils which are existed in this facies is (planktonic forams.) like (Globotruncana sp.), (Globigerina sp.) plate (2-2) and there is also (Echinodcrms, lithoclast) plate (2-3) q, which is precipitated in some of its chambers calcite cement and (Pyrite), in addition to (Dolomite Rhombohydral) which are scattered in Matrix-Micrite whose quantity increases in the upper part of this facies. Finally there is a little presence of (Chert). This facies was equivalent to the standard microfacies (S.M.F.4) in the zone facies (F.Z.3). The water energy of this facies lies within zone (B) because of the partial presence of fine micro grains and the sorting is enclosed between bad and medium g.
7) Bioclastic grainstone microfacies.
   This facies consists of (Echinoderms) in addition to (Milliolids) and very little of (phaktonic forams.) in the base of (sprite). as well as (Chert) and (Quartz) which indicates the effect of the mainland on this facies, also we found (interclast) and (Pellets) plate (2-4). The most important diagentic processes are the precipitation of calcite cement and (Pyrite)

in petrified chambers amid there is also some little of Dolomite Mineral in this facies. This facies was equivalent to the standard microfacies (S.M.F.11) in the zone facies (F.Z.6). In other word the precipitation in an area with a consistent the water movement. The water energy of this facies lies within zone (C) because of the good sorting advance of the grains as well as the non existence of micrite, fein grain material in addition to the good rounding of these grains.

CONCLUSION

The limestone were divided into seven micro sedimentary facies so as to from a Hadiena formation they are:

1) Dolostone facies.
2) Recrvstallized bioclstic wackestone facies.
3) Bioclastic packstone microfacies.
4) Sucrosic dolomite facies.
5) Grianstone microfacies with pellets.
6) Dolomitized foraminiferal packstone microfacies.
7) Bioclastic grainston.

These facies was divided according to water energy into three zones low (A), middle (B) and high (C).

The most important diagenesis processes were crystallization and deposit of calcite cement in fossils chambers and late dolomatization process.

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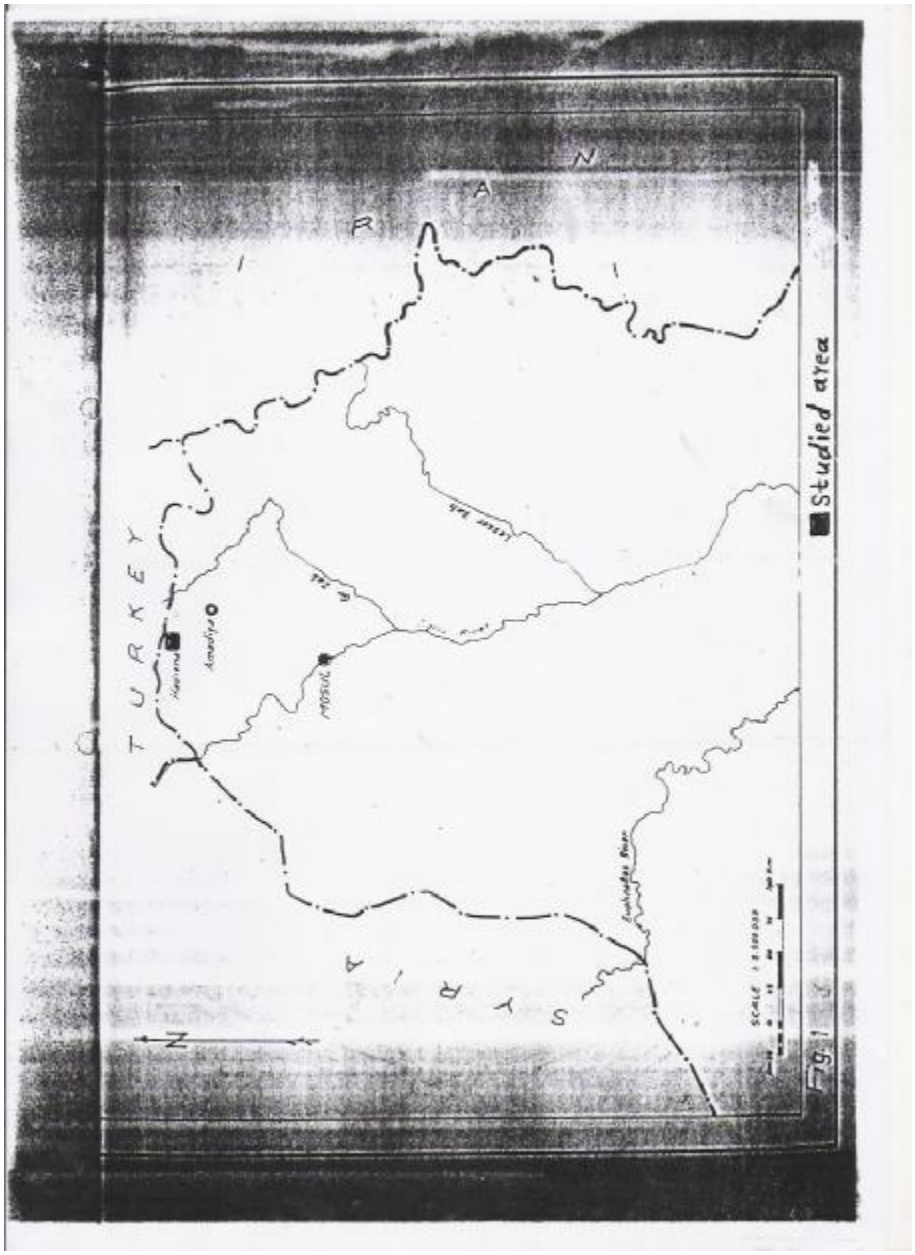
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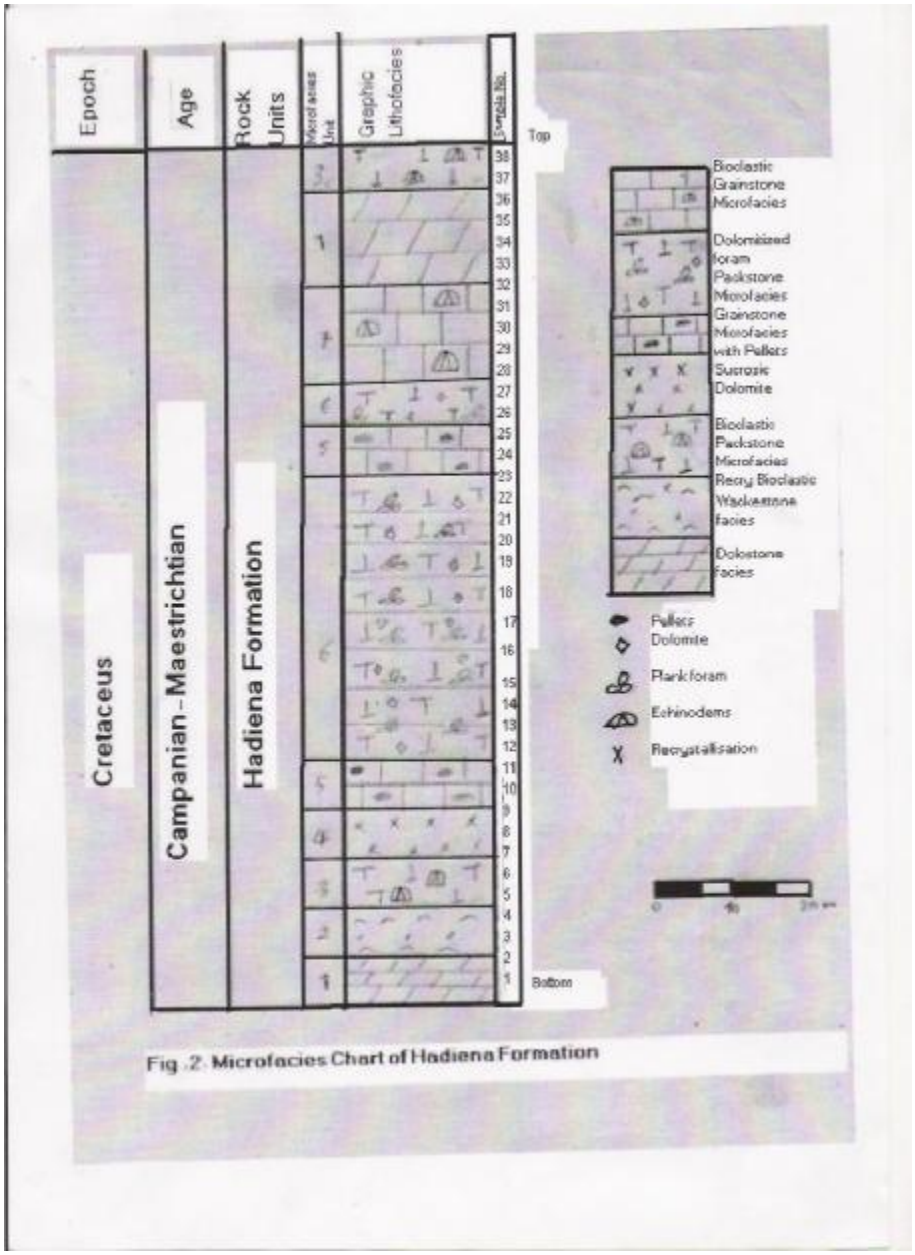

Fig. 2. Microfacies Chart of Hadiena Formation

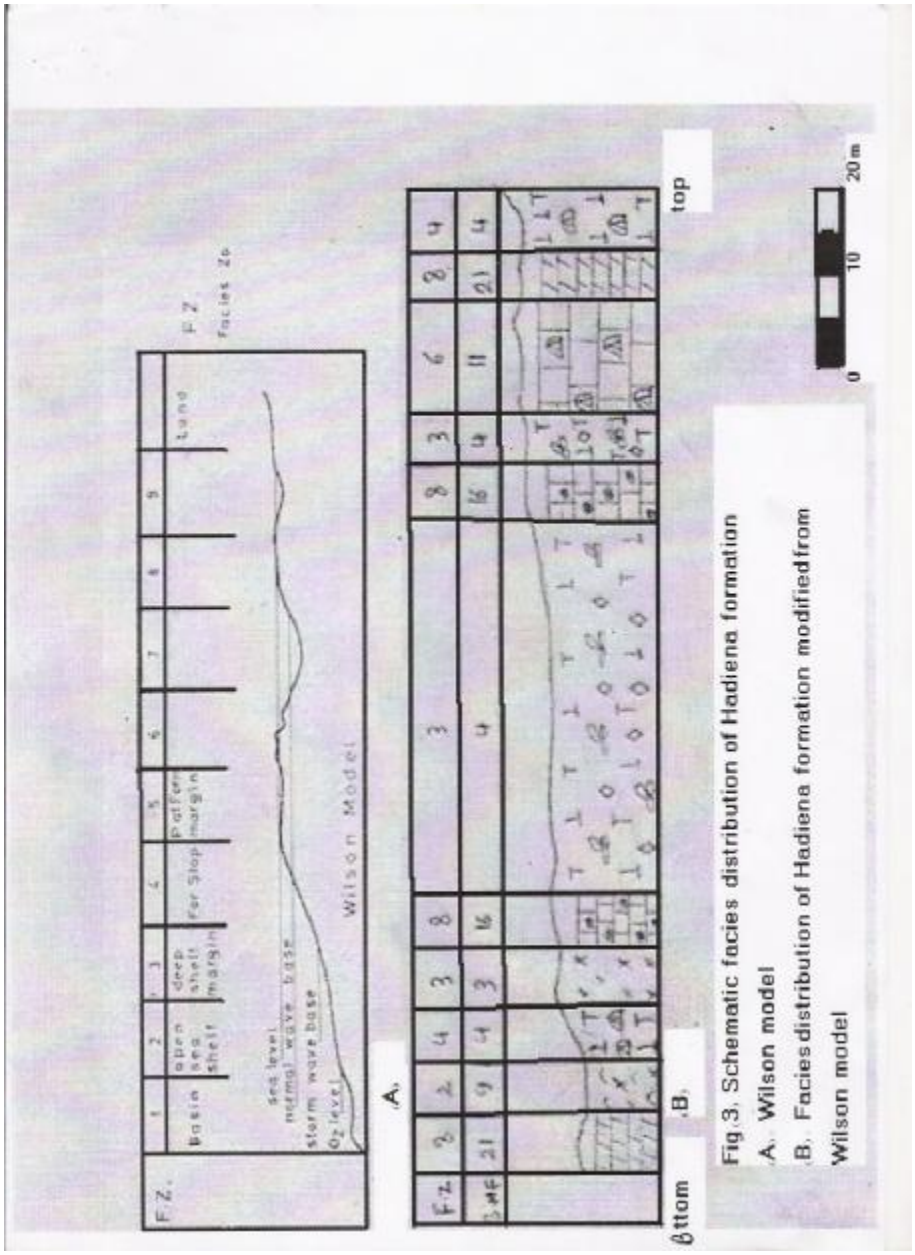

Fig.3. Schematic facies distribution of Hadiena formation
A. Wilson model
B. Facies distribution of Hadiena formation modifiedfrom Wilson model

Plate(1)

1-1-Dolostone facies 40x
1-1-Recrstallized microfacies 40x
1-3-Some fossils chambers filled with calcite-cement 40x
1-4-Sucrosic dolostone facies 40x

Plate(2)

2-1-Grianstone microfacies with pellets 40x
2-2-Globigerina sp.in Micrite-Matrix 40x
2-3-Lithoclastic in Micite-Matrix 40x
2-4-Bioclasxtic Grainstone with pellets 40x

Plate 1

1

2

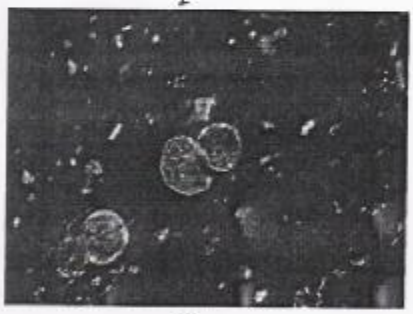

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Plate 2

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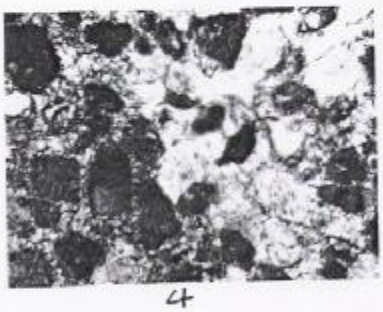

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قا رعلا لمشيف يدهن يكتل قي دلا لمحصا ا

ناج لح لمعس

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الخلاصة

.ل قيقل تلحد ل ةقطبقا علالا في قنيدن يكتد(٣٨) تم ةي خصيخ ش لهميسقتل إ مبر لاب ا عجمتم يخصتخ ةعسس تمد و ق ع ة يم نالهميل إ قعبس ي هو يضعلاويصلا انكل ليلاع دمتعلاا ب قيق دت خس:

١) لودل ة نحوتيا م.
٢) ر ولبل ا لد اع لم ليكو ل يلجا رلحاقنحم.
٣) يعضا تافلل ملحا اصصرلما يلجار جا ة خس.
٤) ي رلكسلت ياموول لد ا ة خس.
٥) ة نحمق ل امل ل لالحابي بلجا يلجا يجحا.
٦) ا رفييم ارفلل ملحا يلجا يلجاحلاةنحم.
٧) يعضا تافلل ملحا يلجا يلجار جا ة خس.

قيئ لم ة قلط ا حميسة تمدقولى إ ة لأثقط ناة:

١) ةطالا ةقالاة ئيرب.
٢) قطولما ةقالاة ئيرب.
٣) ةيلالا ةقالاةئيرب.