

“New Determination of Ostracoda Fauna from Khanoqa Area, Northern Iraq”

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Abstract:

Five Ostracode species have been described from the Fat'ha Formation from Khanoqa area, Northern Iraq. These are : *Cytherella rajui* and *Cytherelloidea* sp. belonging to Cytherellidae Family Sars, 1866; *Loxoconcha lienenklausi* belonging to the Loxoconchidae Family Sars, 1925; *Miocyprideis sarmatica* belonging to the Cytheroidea Family Sars, 1925 and *Semicytherura* sp. belonging to the Cytheruridae Family Muller, 1894. Ostracoda from Fat'ha Formation shown variation in the ornamentation, this result that the Fat'ha Formation was deposited in a lagoonal ecology.

Keywords: Ostracoda; Khanoqa Area; Northern Iraq.

Introduction:

The Fat'ha Formation (previously Lower Fars Formation) Middle Miocene forms in the north Iraq was deposited in a wide and shallow basin bordering the Zagros and River Taurus Mountains, and it covers large parts of Iraqi lands, especially in the western-central part and the north-central part as well.

Six samples were taken from Fat'ha Formation, Khanoqa area North Iraq (Fig.1), the thickness of studied section about 60 meters, consists of different beds: light red claystone has chonchoidal fracture, fine grained sandstone, richen material carbonate, light gray hard Limestone that contains spots of oxides iron. (Fig. 2)

There are many studies Ostracoda in Fat'ha Formation from many different areas from these studies: Khalaf (1984), Hawramy (2012), Hawram and Hazhar (2018), Al-Hadithi (2019) and Thabit (2020).

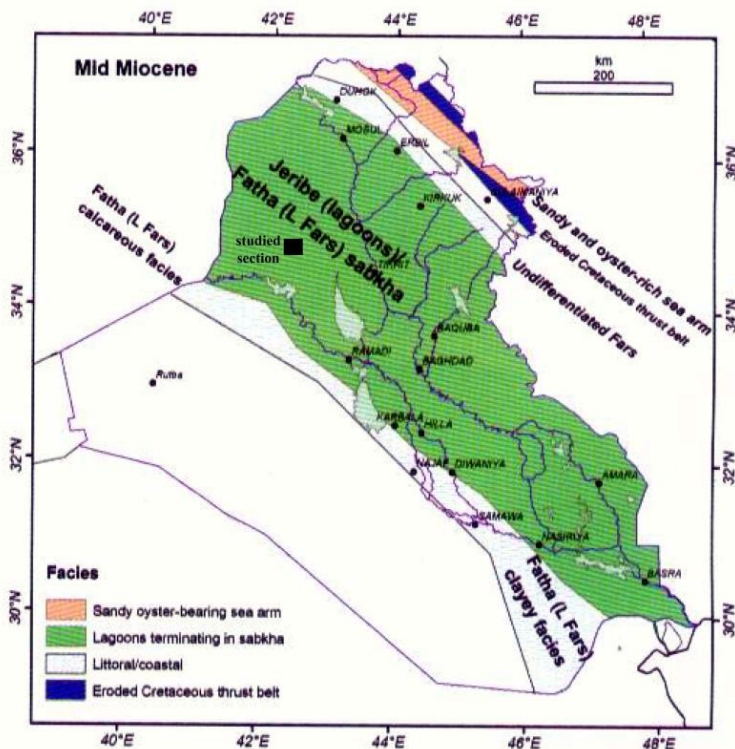


Fig.1: Middle Miocene Paleogeography map showing the location of studied section

Methodology

The extracted Ostracoda fauna from samples used methods by (Sohn) 1970, that followed in the present study with careful during the preparation steps due to the thin shell of Ostracoda.

Result and Discussions

1 - Systematic Paleontology

Phylum Crustacea Pennant, 1777

Family Cytherellidae Sars, 1866

Description: The surface ornamentation smooth or consists of pores light, dorsal margin convex, ventral margin concave, overlap right valve larger than left valve, hinge line adont type.

Genus Cytherella Jones, 1849

Type species: Cytherina ovate Roemer, 1840

Species : Cytherella rajui

Description: Shell ovate, anterior end rounded broadly compared to Posterior margin narrowly. Dorsal margin nearly convex and curving toward posterior margin. Ventral margin slightly concave. Lateral surface smooth, right valve larger than left valve as show (Fig.3a)

Genus Cytherelloidea Alexander, 1929

Type species: Cythere (Cytherella) williamsoniana Jones, 1849

Species : Cytherelloidea sp.

Description: Shell sub rectangular, elongate, greatest high near anterior region, greatest length at the mid height, anterior end broadly rounded, posterior end narrow than the anterior, dorsal margin nearly straight, ventral margin straight and slightly concave in the middle. Outer surface ornamentation thick circular ridge starts near from anterior margin and towards above the ventral margin, right valve larger than left valve as show (Fig.3b).

Comparison: The present species different about all other species belonging to the Genus Cytherelloidea by distinct circular ridge and form posterior margin The present species due to the lack of material the species left under open name.

Family Loxoconchidae Sars, 1925

Description: Shell rhomboidal, posterior end caudal process and surface ornamentation reticulate or finely to coarsely pitted, marginal pore canals straight, simple, hinge line adont or compound type.

Genus Loxoconcha Sars, 1866

Type species Cythere rhomboidea Fischer, 1855

Species : Loxoconcha lienenklausi Bold, W. A. Van Den, 1961

Description: Shell sub quadrangular; greatest height in the middle, greatest length at the middle height, Anterior margin angled about the middle, dorsal margin straight, ventral margin nearly straight, posterior end short caudal process at the middle, find finly pitted in the lateral surface left valve larger than right valve as show (Fig.3c).

Family Cytherideidae Sars, 1925

Description: This family shapes ovate or elongated in lateral view, anterior margin round, wide relative to posterior end rounded and narrow without caudal process, outer surface ornamentation pores or smooth, hinge line kinds merodont occasionally modified archidont. Left valve larger than right valve.

Genus Miocyprideis Kollmann, 1960

Type species *Miocyprideis janoscheki* Kollmann, 1960

Species :*Miocyprideis sarmatica* Zalanyi, 1913

Description: Shell large in size, subrectangular in lateral view, anterior end broadly rounded compare with the narrower posterior end, dorsal margin simple convexe nearly in the middle and curving to the posterior end, ventral margin slightly concave, outer surface smooth. as show (Fig.3d).

Family Cytheruridae Muller, 1894

Description: This family is distinguished find marginal pore canals of the simple or branched type. Hinge line adont or compound type and surface ornamentation consists of longitudinal ribs, posterior end distinguishes caudal process.

Genus Semicytherura Wagner, 1957

Type species: *Cythere nigrescens* Baird, 1838

Species :*Semicytherura* sp.

Description: Shell elongate in lateral view. Anterior end broadly rounded, Posterior end slightly angled at the middle with short caudal process. Dorsal margin convex and curving down towards the posterior margin, ventral margin straight, lateral surface cover with fine pits. left valve larger than right valve as show (Fig.3e).

Comparison: the present species different about all other species belonging the genus *Semicytherura* by distinct form caudal process in posterior end, The present species left under open name due to the lack of material.

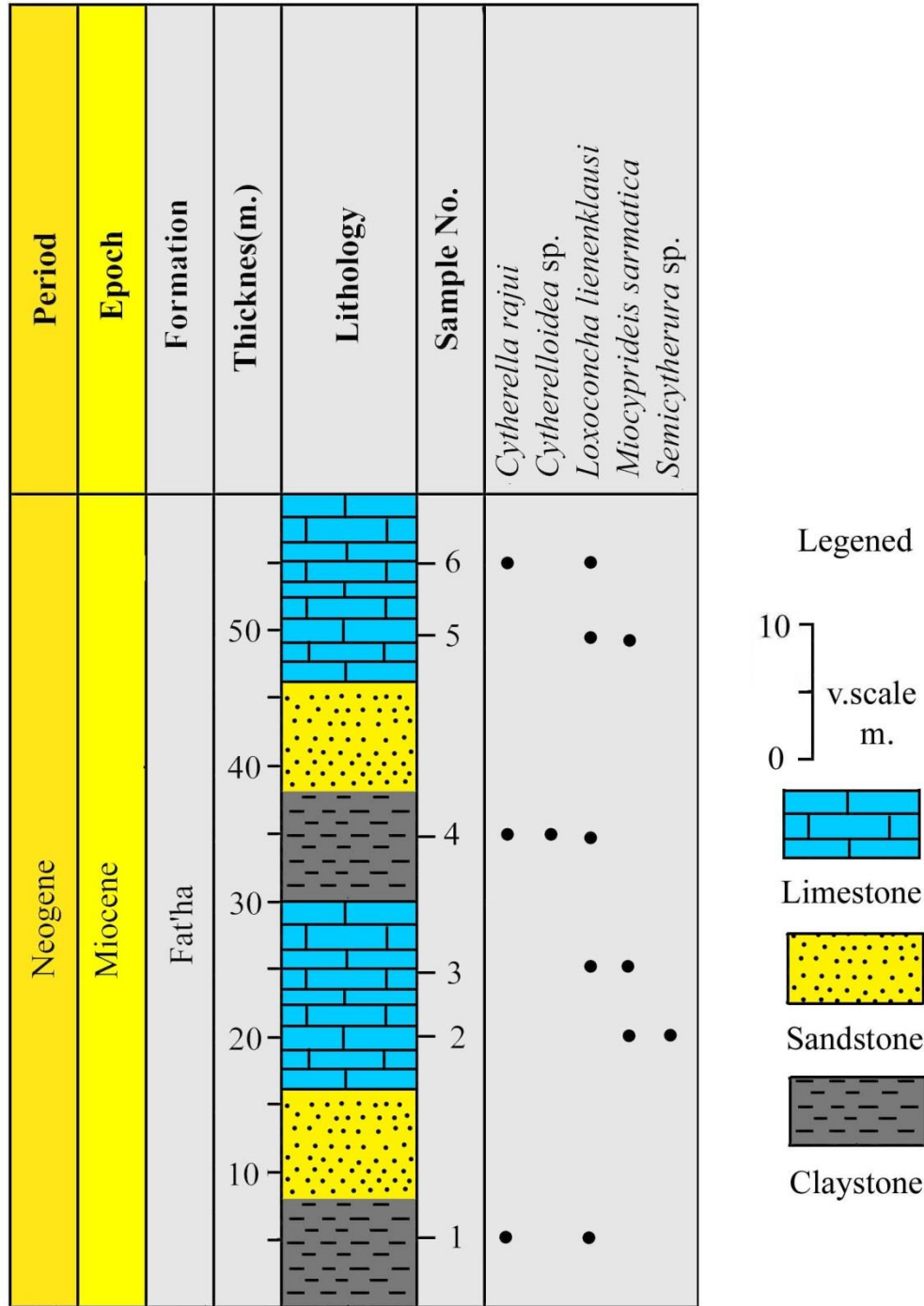


Fig. 2 Distribution chart for ostracoda through the studied section

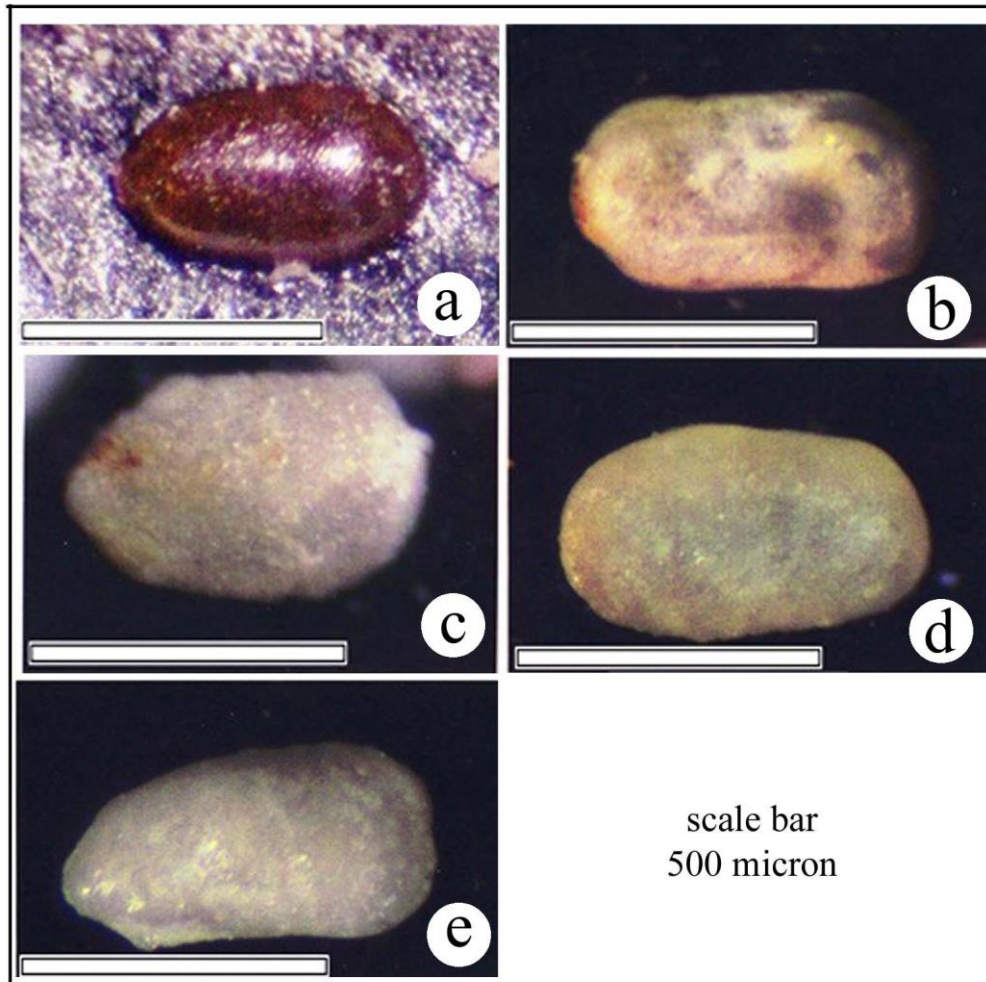


Fig.3 Normal photos of significant Ostracoda fauna from Fat'ha Formation. (a) *Cytherella rajui*; (b) *Cytherelloidea* sp.; (c) *Loxoconcha lienenklausi*; (d) *Miocyprideis sarmatica*; (e) *Semicytherura* sp.

2 - Paleoenvironment

The Ostracoda is fossils that are characterized by their indicator to environmental conditions. Ostracoda species have adapted to live in many environments. It is known as one of the important tools used to reconstruct the paleoenvironments by being adaptive to various environmental factors such as depth, temperature, salinity, and the nature of the substrate.

The present study of Ostracoda assemblages in the Fat'ha Formation recorded about five species belonging to three families, through which it was performed over that the paleoenvironmental conditions in which they live are inferred.

Through the distribution of the recorded species of Ostracoda in the present study, which were compared in terms of age with those from previous studies, all the recorded species within this study showed a close age range and have been previously recorded mostly from the Middle Miocene beds. The age of the Fat'ha Formation was confirmed as the Middle Miocene and conforms with the equivalent strata of this formation or other equivalent formations in different localities in Iraq and adjacent areas. It is shown variation in the ornamentation to the Fat'ha Formation was deposited in a lagoon ecology.

Conclusions

1- Five Ostracoda species belonging to five genera are described of which (three) species described from other regions. (two) species left under open name due to the lack of material.

2- Most Ostracoda you get it was the color of Shell Ostracoda White and this indicates that the Formation deposition in the environment normal in addition to the presence of the environment oxidizing in terms of the emergence Cytherella rajui which color Red.

3- Ostracoda from Fat'ha Formation shown variation in the ornamentation, this result that the Fat'ha Formation was deposited in a lagoonal ecology.

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الملخص:

تم وصف خمسة أنواع من الأوستراكود لتكوين الفتحة في منطقة خانوكة شمال العراق وهذه الانواع هي *Cytherella rajui* : و *Cytherelloidea sp.* التي تنتمي إلى عائلة *Cytherellidae* و *Loxoconcha lienenklausii* الذي ينتمي إلى عائلة *Loxoconchidae* و *Miocyprideis sarmatica* الذي ينتمي إلى عائلة *Cytherideidae* و *Semicytherura sp.* الذي ينتمي لعائلة *Cytheruridae*. وقد أظهرت أوستراكودا تكوين الفتحة تبايناً في الزخرفة ونتيجة لذلك ترسب تكوين الفتحة في بيئة لاغونية.