



## On Some New Ostracode Species from the Upper Part of Kolosh Formation (Paleocene – E.Eocene) in Bekhair Anticline, Duhok, North Iraq

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### ABSTRACT

The present study included identification and systematic description of four new ostracoda species from the upper part of Kolosh Formation (Paleocene – E.Eocene), in the northern limb of Bekhair anticline, north Iraq. The studied species recorded for the first time belong to four genera and three families. These species are, *Bairdia badiensis* sp.nov, *Neonesidea iraqiensis* sp. nov, *Schizocythere bekhairensis* sp. nov and *Paragrenocythere badiensis* sp.nov

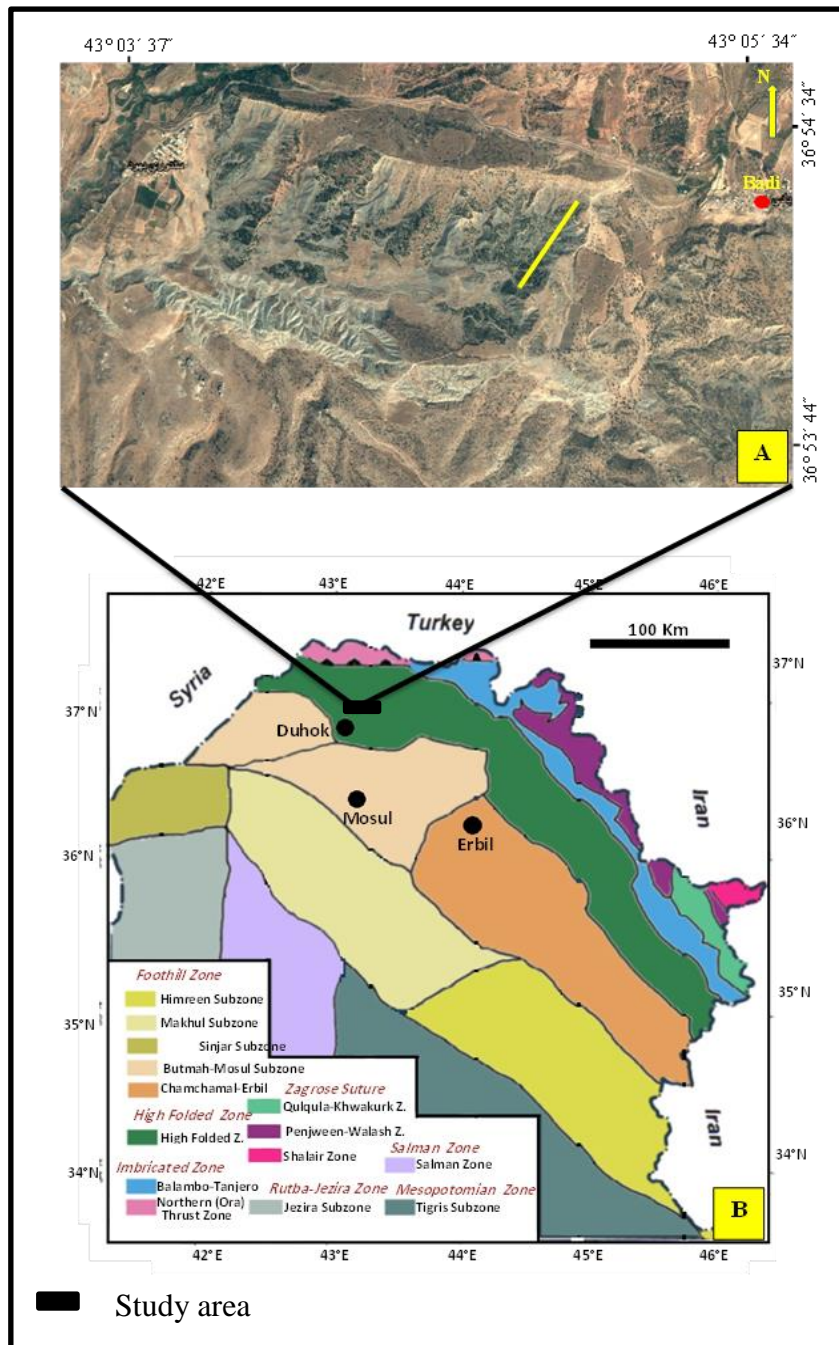
### Introduction

The present work is based on surface samples collected from upper part of Kolosh Formation (Paleocene – E.Eocene), Northern Iraq, Bekhair anticline, Badi village, about (8 km) northeastern Dohuk city. The coordinates of midpoint of the section at (36° 54' 15" N) Latitude and (43°04' 55" E) Longitude,(Fig.1). Kolosh Formation (Paleocene) was first defined by Dunnington 1952 in [1] from Kolosh village, north of Koi Sanjak, in the high folded zone of north Iraq. The formation at its type locality is about 777m thick (including the overlaps of the Sinjar limestone formation) [2]. It is consisting

of a succession of shale, and sandstone rocks, in addition to thin beds of limestone [1].

Lithology of Kolosh Formation in Badi section is composed about 260 m thick of alternation beds of dark gray to olive sandstone, black shale, siltsone and green marl with a few yellowish sandy limestone (Fig. 2). The upper boundary is gradational with the overlying Khurmala Formation (Paleocene-E.Eocene).

**Repository:** All samples deposited at Geology Department, University of Mosul under prefix.MO:T.K.F.MO: Mosul University. T: Tertiary. Kf.: Kolosh Formation.



**Fig.1: Location of the studied section**  
**A: Satellite Image of studied section Bekhair anticline, northern Iraq**  
**B: Tectonic Map of North Iraq after (Jassim and Budy, 2006).**

**Systematic Descriptions**

The classification of ostracoda in this study followed by [3,4, 5].

**Subclass:** OSTRACODA Latreille, 1806

**Order:** PODOCOPIDA Muller, 1896

**Suborder:** PODOCOPA Sars, 1866

**Family:** BAIRDIIDAE Sars, 1888

**Genus:** *Bairdia* Mc Coy, 1884

**Type-species:** *Bairdia curtus* Mc Coy, 1884

***Bairdia badiensis* sp.nov.**

Pl.1 , figs. (1-4)

**Derivation of name:** From its type locality (Badi village), Dohuk Area, northern Iraq.

**Diagnosis:** Thick and very tumid carapaces which distinguish from other species, also with distinctive strong arched dorsal margin, anterior is rounded and inflated .

**Holotype:** Carapace, MO. T. K. F (1.1) (pl.1, fig.1).

**Paratype:** Three carapace, MO.T.Kf (1-4) (pl.1, figs.2-4)

**Type horizon:** Kolosh formation (Paleocene – E.Eocene), Dohuk area, Bekhair anticline, Badi section.

**Material:** (20) Carapaces.

**Descriptions:** Carapace very tumid and thick, relatively large-sized, subdeltoid shape in lateral view, Dorsal margin tripartite angle at the maximum height , ventral margin slightly convex, anterior end broadly rounded, posterior end narrowly rounded, left valve larger than right valve, the larger left valve overlapping the smaller right one around the all margins, lateral surface smooth, greatest height in the middle, greatest length passes below mid – point, maximum width in the middle, in dorsal view the anterior is rounded and inflated. Sexual dimorphism not observed.

**Dimensions of figured**

**species (mm):** L. H. W. L/H

MO.T.Kf.1,Pl.1,fig.1

Carapace lateral view 1.4 1.0 0.9 1.4

MO.T.Kf.2,Pl.1,fig.2

Carapace lateral view. 1,2 0,92 0,84 1,3

MO.T.Kf.3,Pl.1, fig.3

Carapace dorsal view -- -- 0.9 --

MO.T.Kf.4, Pl.1, fig.4

Carapace ventral view -- -- 0.9 --

**Remarks:** The present species is differing from the *Bairdia eocaenica* [6], from Avanah Formation (Middle Eocene) northern Iraq in having broadly anterior end and the posterior more pointed, and the dorsal margin more convex like tripartite angle, and the carapace more thickness. The present species shows some affinities with *Bairdia bhatiai* [6] from Avana Formation (Middle Eocene) northern Iraq, but differs in having narrower anterior in the middle, and the carapace more elongated and more tumid, and the ventral margin more convex. The present species differs from *Bairdia* sp.1 described by [7] from Maastrichtian of Northren Somalia in having wider posterior and anterior end, and the ventral margin

more convex, and the carapace more high and thickness than *Baridia* sp.1.

**Genus:** *Neonesidea* Maddock, 1969

**Type-species:** *Triebelin schulzi* Hartmann, 1962

***Neonesidea iraqensis* sp.nov.**

**Pl.1 , figs. (5-8)**

**Derivation of name:** From its first occurrence in Iraq.

**Diagnosis:** Elongate, subdeltoid carapace in lateral view , dorsal margin tripartite, ventral margin straight .

**Holotype:** Carapace, MO.T.Kf.5 (pl.1, fig.5).

**Paratype:** Three carapace, MO.T.Kf.6-8 (pl.1, figs.6-8)

**Type horizon:** Kolosh formation, Duhok area, Badi section.

**Material:** (8) Carapaces.

**Descriptions:** Carapace elongated subdeltoid in lateral view, anterior end narrowly rounded above the middle, posterior end narrowly rounded in the ventral margin, dorsal margin tripartite in maximum height, ventral margin straight, left valve larger than right valve, lateral surface ornamented with finely punctate, in dorsal view the anterior and posterior are pointed, maximum height in front of the middle; maximum length below the middle. Sexual dimorphism not observed.

**Dimensions of figured**

**species (mm):** L. H. W. L/H

MO.T.Kf.5,Pl.1,Figs.5

carapace lateral view. 1.1 0.63 0.54 1.74

MO.T.Kf.6,Pl.1,Figs.6

carapace lateral view 0.9 0.5 0.51 1.8

MO.T.Kf.7,Pl.1,Figs.7

carapace dorsal view -- -- 0.54 --

MO.T.Kf.8,Pl.1,Figs.8

carapace ventral view -- -- 0.54 --

**Remarks:** This species shows some resemblance to *Neonesidea shillongensis* [8] from M-L Eocene of India but differing in having narrower anterior end, and the dorsal margin more convex, and the posterior end rounded in the ventral margin. The present species show some similarity to *Neonesidea?*sp [9] from Early Eocene of USA, but differing in having more elongated carapace, and narrower anterior and posterior end, and the dorsal margin less convex than *Neonesidea?*sp.

**Super family:** CYTHERACEA Baird, 1850

**Family :** CYTHERIDAE Baird, 1850

**Subfamily:** CYTHERINAE Baird, 1850

**Genus :** *Schizocythere* Triebel, 1950

**Type species:** *Schizocythere hollandica* Triebel, 1950

***Schizocythere bekhairensis* sp.nov.**

**Pl.2 , figs. (1-3)**

2013 *Schizocythere* sp.B Aziz, p.60, pl.2,fig. 14.

**Derivation of name:** From first described occurrence in Bekhair anticline, Dohuk, Northern Iraq.

**Diagnosis:** small thick and elongate carapace in lateral view, posterior end without caudal process.

**Holotype:** Carapace, MO.T.Kf.9 (pl.2, fig.1).

**Paratype:** two carapace, MO.T.Kf.10,11 (pl.2, figs.2-3)

**Type horizon:** Kolosh formation, Duhok area, Badi section.

**Material:** (25) carapaces.

**Descriptions:** Carapace elongated thick and small in lateral view, with maximum length in the middle, anterior end thickens and broadly rounded, posterior end rounded and without caudal process, dorsal margin straight, ventral margin slightly convex, left valve larger than right valve, eye tubercle distinct, reticulation with deep and regular pitted, maximum height in the eye tubercle. Sexual dimorphism not

observed.

**Dimensions of figured**

**species (mm):** L. H. W. L/H

MO.T.Kf.9,Pl.2,Fig.1. 0.29 0.2 0.21 1.45 Carapace lateral view.

MO.T.Kf.10,Pl.2,Fig.2. 0.28 0.20 0.21 1.4 Carapace lateral view.

MO.T.Kf.11,Pl.2,Fig.3. -- -- 0.21 -- Carapace dorsal view.

**Remarks:** This species is differs from other species of genus *Schizocythere* was recorded by many researchers by lack of development caudal process, The present

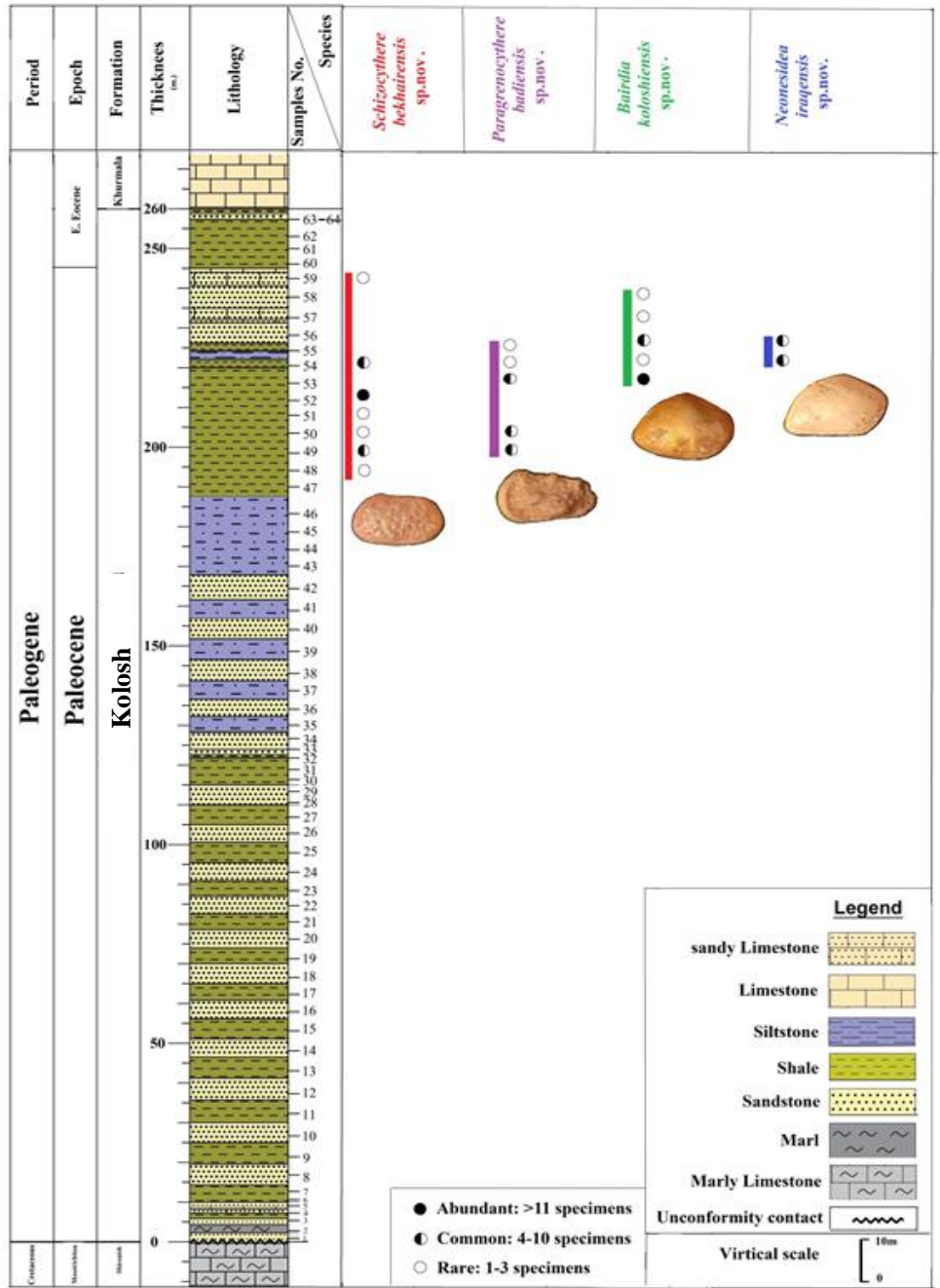


Fig. 2: Stratigraphic column of the Kolosh Formation in Badi section, Bekhair Anticline, Duhok, Northern Iraq



1 Bar = 250  $\mu$ m

**Plate (1)**



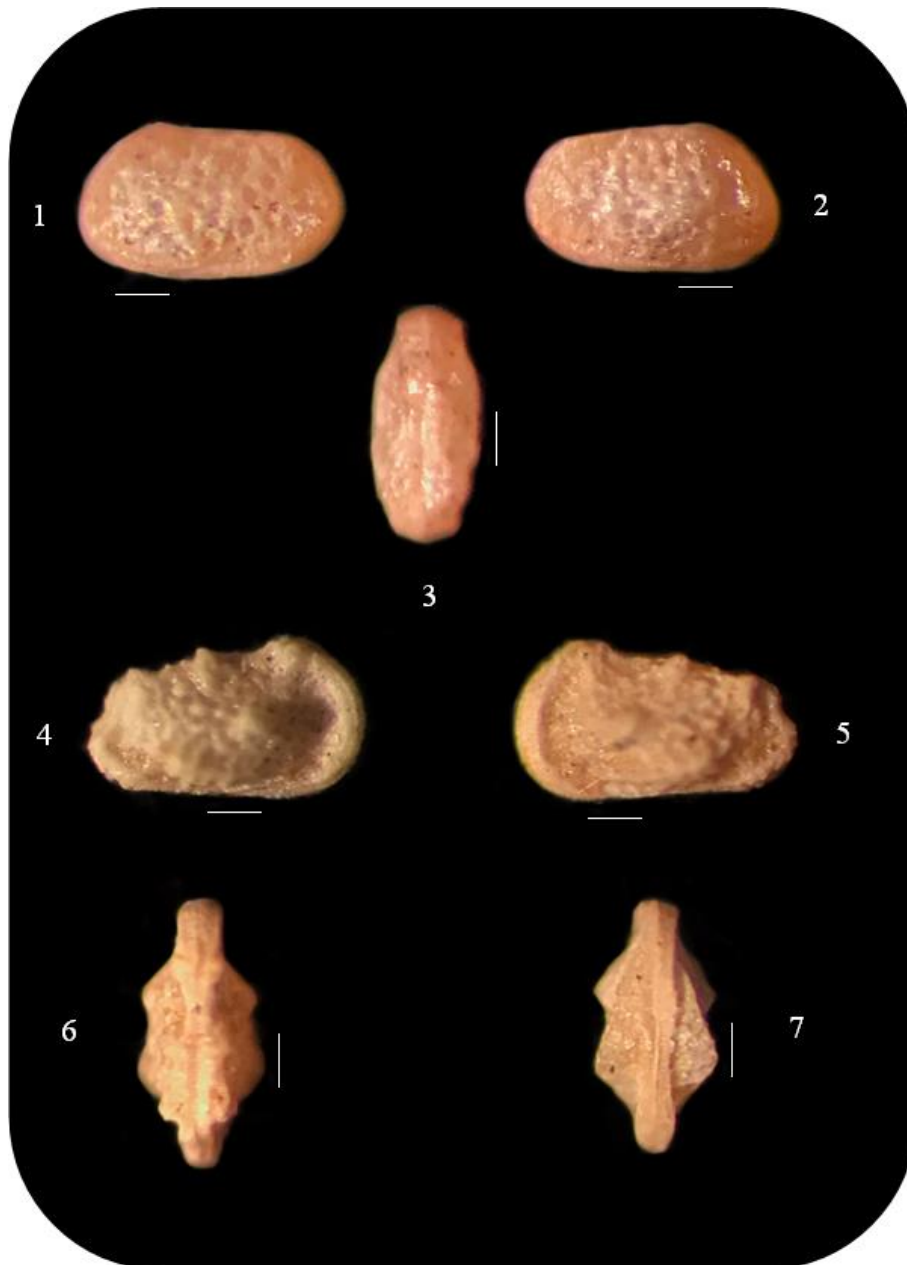


Plate (2)

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## بعض الانواع الجديدة من الاوستراكودا من الجزء العلوي من تكوين كولوش (الباليوسين – الايوسين المبكر) في طية بيخير, دهوك, شمال العراق

نسرين مال الله عزيز ، مؤمن راوي العباسي

قسم علوم الارض، كلية العلوم، جامعة الموصل، الموصل، العراق

### الملخص

تضمن البحث الحالي تشخيص ووصف اربعة انواع جديدة من الاوستراكودا في الجزء العلوي من تكوين كولوش (الباليوسين – الايوسين المبكر) ضمن الجناح الشمالي لطية بيخير المحدبة، شمال العراق. ان الانواع الموصوفة لأول مرة في الدراسة الحالية تعود الى اربعة اجناس وثلاثة عوائل، وهذه الانواع هي:

*Bairdia badiensis* sp.nov, *Neonesidea iraqiensis* sp. nov,  
*Schizocythere bekhairensis* sp. nov and *Paragrenocythere badiensis* sp.nov