

## Systematic Study of Some Recent Pelecypods From Hajam Island in Khor Al- Zubair, Southern Iraq

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### ABSTRACT

Khor Al-Zubair is a shallow arm, semi restricted channel, located at the northwestern part of the Arabian Gulf. The study area ( Hajam island ) is situated at the southern part of the channel, comprised sandy, silty and muddy sediments.

Systematic description is made for the studied pelecypod shells assemblage, which are collected from the Hajam island in Khore Al-Zubair. These assemblage include nine species belonging to seven genera and six families. These species are; *Barbatia helblingii*, *Pinctada margaritifera*, *Pinctada radiate*, *Spondylus (Spondylus) gaederopus*, *Diplodonta (Diplodonta) rotundata*, *Semele sinensis*, *Circe (Circe) scripta*, *Circe (Circe) intermedia* and *Bassina (Bassina) calophylla*.

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### دراسة تصنيفية لبعض المحاريات الحديثة من جزيرة حجام في خور الزبير جنوب العراق

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### الملخص

تعتبر قناة خور الزبير قناة ضحلة وشبه مغلقة واقعة في الجزء الشمالي الغربي من الخليج العربي وتقع المنطقة المدروسة فيها والمتمثلة بجزيرة حجام في الجزء الجنوبي منها، وتتألف هذه الجزيرة من تتابعات من الرمل والسلت والطين.

تم خلال هذا البحث وصف وتصنيف عدد من أصداف المحاريات الحديثة والتي تمثلت بتسعة أنواع تابعة لسبعة أجناس وستة عوائل وهذه الأنواع هي:

*Barbatia helblingii*, *Pinctada margaritifera*, *Pinctada radiate*, *Spondylus* (*Spondylus*) *gaederopus*, *Diplodonta* (*Diplodonta*) *rotundata*, *Semele sinensis*, *Circe* (*Circe*) *scripta*, *Circe* (*Circe*) *intermedia* and *Bassina* (*Bassina*) *calophylla*.

## INTRODUCTION

Khor Al-Zubair is a shallow arm branching of the Arabian Gulf, represents a semiclosed, land locked environments (Elewi and Safawee, 1987). Its extended for about (40) km long and (1.0 to 1.5) km wide, located between ( 30° and 30° 20' N latitude) and between (47° 50' and 48° E longitude). Its connection with the Arabian Gulf at its northwestern part with constricted mouth like shape ( Fig. 1). The main aim of the present study to illustrate the systematic description of some recent pelecypod organisms, which were mainly occur as articulated and well preserved two valves.

The studied pelecypod shells with the other associated organisms such as; Gastropoda, Ostracoda and benthonic foraminifera, were randomly distributed in sandy and muddy facies within the circumference of the Hajam island, from where the organism shells were collected, these collection indicate a shallow marine environment with low salinity value as men tioned by Vrsaljlo *et al.*, 2006.

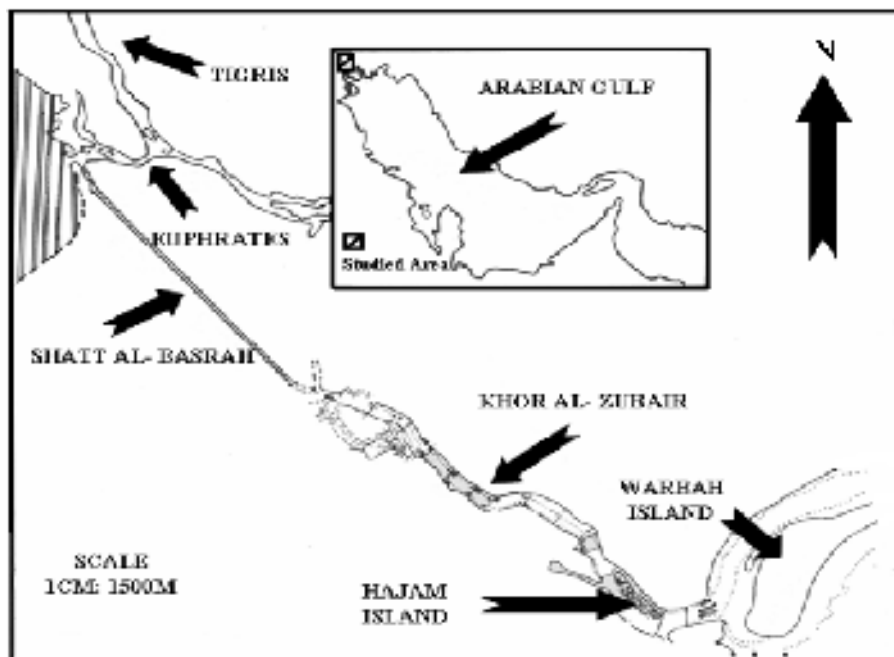


Fig. 1: Location map (modified from Elewi and Safawee, 1989).

## SYSTEMATIC DESCRIPTION

The specimens were identified and fully described depending on their external and internal shell features, using (Cox *et al.*, 1969), (Cox *et al.*, 1969a), (Stenzel, 1971), ( Campbell, 1982) and (Mondadori, 1982).

Nine species belonging to seven genera and six families were identified in this study. The measured shell parameters (shell height and shell length) were shown on the sketch diagram ( Fig.2 ).

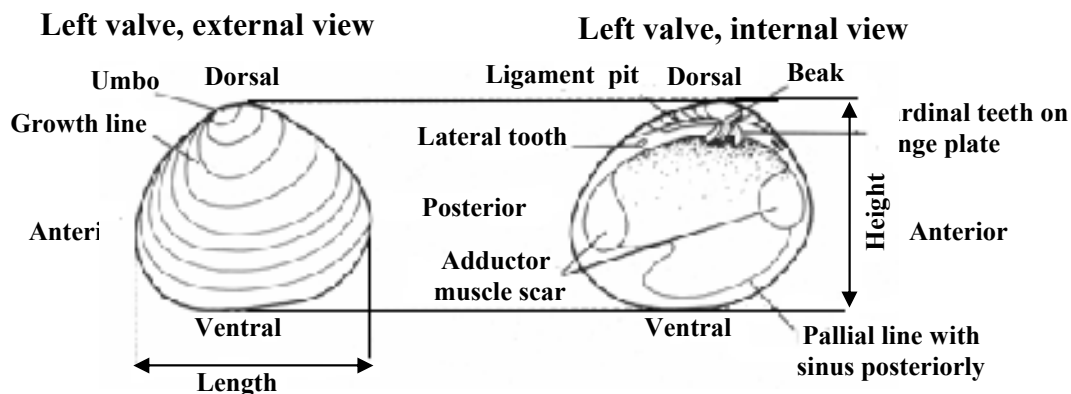


Fig. 2: sketch diagram showing the measured pelecypod shell parameters; height and length means ( H and L ) respectively.

#### DEPOSITARY

All the specimens were deposited in the Mosul University, Department of Geology, lab. number (201), under the specimens numbers (HJ.1 – HJ.37).

**Phylum: MOLLUSCA**

**Class: BIVALVIA LINNE, 1758**

**Subclass: PTERIOMORPHIA BEURLEN, 1944**

**Order: ARCOIDA STOLICZA, 1871**

**Super family: ARCACEA LAMARCK, 1809**

**Family: ARCIDAE LAMARCK, 1809**

**Subfamily: ARCINAE LAMARCK, 1809**

**Genus: *Barbatia* GRAY, 184<sup>v</sup>**

**Type species: *Arca barbatia* LINNE, 1758, SD by GRAY**

***Barbatia helblingii* (BRUGIERE, 1789)**

**(Plate 2, Fig. 3a, 3b)**

**SYNONYMY:**

**1789 *Arca helblingii* BRUGIERE, P. 99**

**Dimensions:**

Specimen numberes(n)	height	length
1	0.9	1.5
2	0.7	1.4
3	1.0	1.7
4	1.0	1.6
5	0.8	1.2
6	0.9	1.3

**Description:**

Small sized shell averaging about 56% as height as length (H= 0.9 cm, L= 1.6 cm, n= 6), subtrapezoidal to subquadrate, semiequivalent conjugated valves, the left valve slightly larger than the right valve. Dorsal shell margin almost straight, posterior and anterior margins are mostly subparallel, curved towards the ventral margin, which is oftenly straight with a sulcation in the middle. Umbo moderately raised, curved towards the anterior margin. Cardinal area straight, teeth are heterodonta to taxodonta, numerous radial coarse ribs radiating from the umbo towards the anterior shell margin, growth lines are mostly faint and concentric making a reticulate type of ornaments with the ribs.

**Remarks:**

*Barbatia helblingii* BRUGIERE, 1789 is slightly differs from *Barbatia lacerate* BRUGIERE, 1789 in having a higher and widen ligament area.

**Order: PTERIOIDA NEWELL, 1965**

**Suborder: PTERIINA NEWELL, 1965**

**Super family: PTERIACEA GRAY, 1847**

**Family: PTERIACEA GRAY, 1847**

**Genus: *Pinctada* RODING, 1798**

**Type species: *Mytilus margaritiferus* LINNE, 1758,P.704,SD IREDALE 1915,P.30**

***Pinctada margaritifera* (LINNE, 1758)**

**(Plate 2, Fig. 5a)**

**SYNONYMY:**

**1758 *Mytilus margaritifera* LINNE, P.704**

**1869 *Meleagrina margaritifera* ISSEL, P.95**

**1907 *Margaritifera Margaritifera* MELVILL and STANDEN P.803**

**Dimensions:**

Specimen numberes(n)	height	length
1	5.1	5.0
2	5.0	4.9
3	5.3	5.1
4	5.2	5.0

**Description:**

Medium sized shell, averaging about 96% as length as height (H = 5.2 Cm, L= 5.0 cm, n= 4), subquadrate, inequivalent valves with the convex left valve is slightly larger than the concave right valve. umbo Prosogyral (peak directed forward), anterior margin straight, posterior margin almost inclined, both margins attached with the dorsal straight margin, making a subtriangular alates, then towards the ventral margin. The external shell surface is well ornamented by numerous concentric growth lines, arranged themself like crenulated an overlap laminae, radial ribs radiated from the umbo towards the ventral margin. Shell outline is mostly plicated. hingement attached only by ligament (no hinge teeth), monomyrian adductor muscle scar, particularly occur at the posterior shell margin and become occasionally central in position.

**Remarks:**

It differs from the genus *Pteria*, with the type species *P. hurunda* (LINNE) in (Cox *et al.*, 1969, P.303, Fig. C38,4) which shows in its distinguishable elongated posterior wing.

***Pinctada radiata* LEACH, 1814 (Plate1, Fig. 4a, 4b)**

**SYNONYMY:**

**1814 *Pinctada radiata* LEACH, P.98, PL.43**

**1817 *Perlamater vulgaris* SCHUMACHER, P108**

**1939 *Pteria (Pinctada) vulgaris* MOAZOO, P.42, PL.4, Fig.1.**

**1973 *Pinctada radiate* LEACH in BIGGS, P.384**

**Dimensions:**

Specimen numberes(n)	height	length
1	4.9	4.7
2	5.1	4.9
3	5.0	4.8
4	4.7	4.5

**Description:**

Medium sized shell averaging about 96% as length as height (H= 4.9 Cm, L= 4.7 cm, n= 4), semiequivalent to subquadrate conjugated valves. Left valve is almost plane to slightly concave, right valve moderately convex, Dorsal margin straight, umbo Prosogyral, slightly projecting upward, occur at 1/3 of the anterior margin. Posterior and anterior margins are strongly concave towards at about 1/4 from the dorsal margin making subtriangular to a triangulate alates (ears), becoming subparallel and then curved towards the circular ventral margin. External shell surface are well ornamented by numerous growth lines and faint concentric fila crossed by moderately plicated radial ribs, radiating from the umbo towards the crenulated ventro- lateral shell outlines. Internal shell features are composed of a strong ligament (disodont teeth) and by a pearly like shape monomyrian adductor muscle scar, occur near the posterior shell margin.

**Remarks:**

This species shows resemblance to species *Pinctada margaritifera* (LINNE, 1758) in external view, but its distinguished by having tow alates.

**Super family: PECTINACEA RAFINIESOUE, 1815**

**Family: SPONDYLIDAE GRAY, 1826**

**Genus: *Spondylus* LINNE, 1758**

**Type species: *Spondylus gaederopus* LINNE, 1758 SD by SCHMDIT, 1818.**

**Subgenus: *Spondylus s. st***

***Spondylus (Spondylus) gaederopus* LINNE, 1758**

**(Plate1, Fig. 3a, 3b)**

**SYNONYMY:**

**1758 *Spondylus gaederopus* LINNE, ed 10, P. 690; ed. 12, 1767, P.1136.**

**1968 *Spondylus aculaeatus* CHEMNITZ in STEININGER PL. 2, Fig. 8a,b.**

**Dimensions:**

Specimen numberes(n)	height	length
1	3.6	4.6
2	3.8	4.5

**Description:**

Medium sized shell, averaging about 80% as height as length (H= 3.7 Cm, L= 4.6 cm, n= 2). Orbicular shell shape and semiequivalent valves with the moderately convex right valve, dorsal margin straight occupied about half of the shell length, umbo small and slightly raised upward, posterior and anterior shell margins are nearly equilateral, converging toward the ventral margin. Shell ornamented by distanced laminated growth lines, crossed by strong numerous radial ribs of an plicae bears type many spines and nodules on the external shell surface, lateral and ventral margins are strongly crenulated. Teeth are of isodont type, two obvious prominent subequal teeth occure at the hingment area, muscle scar monomyrian, oval like shaped, placed at the posterior side and tending to be central in position.

**Remarks:**

The present species cannot resemble the subgenus *Eltopera* with its type species *S. fortior* in (Cox *et al.*, 1969, P.380, FigC99,3) because the latter shows aless inflated shell and more delicate radial ornament.

**Subclass: HETERODONTA NEUMAYER, 1884**

**Order: VENEROIDA H. ADAMS and A. ADAMS, 1856**

**Super family: LUCINACEA FLEMING, 1828**

**Family: UNGULINIDAE ADAMS and ADAMS , 1857**

**Genus: *Diplodonta* BRONN, 1831**

**Type species: *Venus lupinus* BROCCCHI, 1814**

**Subgenus: *Diplodonta* s. st**

***Diplodonta (Diplodonta) rotundata* ( MONTAGU, 1803)**

**(Plate2, Fig.2a,2b)**

**SYNONYMY:**

**1803 *Tellina rotundata* MONTAGU, P.71**

**Dimensions:**

Specimen numberes(n)	height	length
1	1.3	1.4
2	1.1	1.4
3	1.1	1.3

**Description:**

Small size shell averaging about 85% as height as length (H= 1.2 Cm, L= 1.4 cm, n= 3), subquadrated to semi circular in outline with equivalent conjoined valves. Dorsal margin curved, umbo Prosogyral moderately large Prosogyral, lateral shell margins are inequilateral and subparallel, curved toward the ventral margin, to give the circular outline to the shell. Shell surfaces are well ornamented by numerous concentric growth lines, teeth heterodont, ainomyrian muscle scars with an obvious anterior scar.

**Remarks:**

The present species is slightly similar in their shell outline to the genus *phlyctiderma* DALL, 1899 in (Cox *et al.*, 1969a, P.517) but it differs in lacking the numerous orders of teeth and the punctuate or reticulate ornament.

**Super family: TELLINACEA DE BLAINVILLE, 1814**

**Family: SEMILIDE STOLITZKA, 1870**

**Genus: *Semele* SCHUMACHER, 1817**

**Type species: *Tellina proficua* PULTENY, 1799**

***Semele sinensis* ADAMS, 1853**

**(Plate 2, Fig. 1a, 1b)**

**SYNONYMY:**

**1853 *Semele sinensis* ADAMS, Vol. XXI, P.253.**

**Dimensions:**

Specimen numberes(n)	height	length
1	3.2	3.3
2	3.0	3.2
3	3.2	3.4
4	3.3	3.5
5	3.1	3.2

**Description:**

Medium sized shell, averaging about 96% as height as length (H= 3.2 cm, L= 3.3 cm, n= 5), circular in outline, inequivalent conjugated valves, dorsal margin convex (anterior side of dorsal margin slightly lower than posterior side), lateral shell margins converging towards the ventral margin, ornamentation shows concentric growth lines crossed by radials ribs, radiating from the umbo to the ventrally margin, teeth heterodont (hingeiment bears two small cardinal teeth, occur just below the umbo and one more lateral tooth on each side of them), muscle scars sub equal, large and pear – shaped, pallial sinus sub rectangular and ascendant, pallial line not confluent.

**Remarks:**

The studied species cannot be included in the genus *Semelina* DALL, 1900 with its type species *Amphidesma nuculoides*, CONARD in (Cox *et al.*, 1969a, P.637, Fig. E120-9), because the shell outline and diagnostic features related to genus *semele* rather than to the genus *semelian*.

**Super family: VENERACEA RAFINSQUE, 1815**

**Family: VENERIDAE RAFINSQUE, 1815**

**Subfamily: CIRCINAE DALL, 1896**

**Genus: *Circe* SCHUMACHER, 1817**

**Type species: *Circe violacea* SCHUMACHER, 1817**

**Subgenus: *Circe s. st***

***Circe (Circe) scripta* (LINNE, 1758)**

**(Plate 2, Fig. 4a, 4b)**

**SYNONYMY:**1758 *Venus scripta* LINNE, P.1135**Dimensions:**

Specimen numberes(n)	height	length
1	3.4	3.6
2	3.4	3.7
3	3.5	4.0
4	3.7	4.1
5	3.3	3.8
6	3.6	4.1

**Description:**

Medium size shell averaging about 90% as height as length (H= 3.5 Cm, L= 3.9 cm, n= 6), subtriangular to semicircular in outline, equivalent Conjugated valves. Dorsal margin triangular, posterior and anterior sides subparallel converging ventrally. Umbo prosogyral, moderately large and curved upwards, shell surfaces are well ornamented by numerous intercalating concentric growth lines faint brownish colored zigzag lines. Escutcheon narrow, larger than lunula. Teeth are heterodont (right and left valves with three and four cardinal teeth respectively). The large posterior and the small anterior muscle scars are almost elongated and oval in shape respectively. Pallial sinus is very shallow.

**Remarks:**

STEININGER, 1968 identified the present species as *C. rivularis* BORN, which is considered to be synonym with the former. REEVE 1864, established the same identification.

*Circe (Circe) intermedia* REEVE, 1863

(Plate1, Fig. 2a, 2b)

**SYNONYMY:**1863 *Circe intermedia* REEVE, Vol. 14, Sp26**Dimensions:**

Specimen numberes(n)	height	length
1	4.4	4.8
2	4.2	4.6
3	4.1	4.5

**Description:**

Medium shell size, averaging about 91% as height as length (H= 4.2 Cm, L= 4.6 cm, n=3), subcircular to subtriangular in outlines, Inequilateral dorsal margin is moderately triangular, umbo prosogyral, curved upward towards dorsal margin, ligament area opisthodontic. Posterior and anterior margins are slightly rounded, curved ventrally. Shell is well ornamented by numerous well spaced concentric growth lines crossed by few faint radial ribs. Teeth heterodont with three cardinal teeth on both valves, occur below the umbo and one extra anterior lateral tooth on the right valve. The large posterior and the



small anterior muscle scars are almost elongated and oval in shape, pallial line is faint and curved.

**Remarks:**

*Circe intermedia* is more likely resembled *Circe scripta*, but it differs in having the distinct divercating sculpture on the umbonal area.

**Subfamily: CHIONINAE FRIZZELL, 1936**

**Genus: *Bassina* JUKES BROWNE, 1914**

**Type species: *Venus pachyphylla* JONAS, 1845, OD.**

**Subgenus: *Bassina s. st***

***Bassina (Bassina) calophylla* (PHILIPPI, 1836)**

**(Plate1, Fig. 1a, 1b)**

**SYNONYMY:**

**1836 *Venus calophylla* PHILIPPI, P.229, Pl.8, Fig. 2.**

**Dimensions:**

Specimen numberes(n)	height	length
1	1.8	2.0
2	1.9	2.1
3	1.6	1.8
4	1.7	1.9

**Description:**

Small sized shell, averaging about 90% as height as length (H= 1.8 Cm, L= 2.0 cm, n= 4), ovaly triangular in outline , equivalent conjugated valves, dorsal margin convex, posterior margin strongly curved and pointed than anterior margin, ventral margin subrounded, umbo prosogyral, umbonal area in flated, escutcheon long, shell surfaces are well ornamented by numerous widely spaced concentric growth lamina making an obvious crenulations with the shell outline, teeth heterodont (with only three cardinal teeth on each valve), muscle scars anisomyrin with pear like shaped anterior muscle scar and semiquadrate posterior scar, pallial sinus shallow and pointed.

**Remarks:**

This species is distinguished by sub triangular to ovaly equilateral shell shape and their concentric growth lamina ornaments.

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### PLATE 1

- Figs. 1a and 1b: *Bassina (Bassina) calophylla* (PHILIPPI, 1836), illustrating the internal and the external features of left and right valves respectively, Hajam Island, X= 2.9
- Figs. 2a and 2b: *Circe (Circe) intermedia* REEVE, 1863, Showing the internal and the external features of right and left valves respectively, Hajam Island, X= 1.2
- Figs. 3a and 3b: *Spondylus (Spondylus) gaederopus* LINNE, 1758, revealing the internal and the external features of left and right valves respectively, Hajam Island, X= 1.4
- Figs. 4a and 4b: *Pinctada radiata* LEACH, 1814, demonstrating the internal and the external features of right and left valves respectively, Hajam Island, X= 0.9

### PLATE 2

- Figs. 1a and 1b: *Semele sinensis* A. ADAMS, 1853 , showing the internal and the external features of right and left valves respectively, Hajam Island, X= 1.6
- Figs. 2a and 2b: *Diplodonta (Diplodonta) rotundata* ( MONTAGU, 1803) , demonstrating the internal and the external features of right and left valves respectively, Hajam Island, X= 3.8
- Figs. 3a and 3b: *Barbatia helblingii* (BRUGIERE,1789) revealing the internal and the external features of right and left valves respectively, Hajam Island, X= 4.3
- Figs. 4a and 4b: *Circe (Circe) scripta* LINNE, 1758 illustrating the internal and the external features of right and left valves respectively, Hajam Island, X= 1.3
- Fig. 5a: *Pinctada margaritifera* (LINNE, 1758) demonstrating the external features of left valve, Hajam Island, X= 0.8

# PLATE 1



## PLATE 2

