Rivista Italiana di Paleontologia e Stratigrafia	volume 111	no. 1	1 pl.	pp. 191-195	April 2005

SHORT NOTE - NOTA BREVE

THE HETERODONT BIVALVE *APHRODINA DUTRUGEI* (COCQUAND, 1862) FROM THE CENOMANIAN OF JORDAN

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Received: May 8, 2003; accepted: November 23, 2004

Key words: Bivalves, Cretaceous, Jordan.

Abstract. The almost equivalved, strongly inequilateral *Aphrodina dutrugei* (Coquand, 1862) from the Shuayb Formation of the Zarqa area, Jordan, is described. The ammonites collected in the same unit indicate a Late Cenomanian- Early Turonian age.

Riassunto. Viene descritta *Aphrodina dutrugei* (Coquand, 1862) dalla formazione Shuayb dell'area di Zarqa in Giordania. È una forma quasi equivalve, ma fortemente inequilaterale. Le ammoniti che si rinvengono nella stessa formazione indicano un'età tardo Cenomaniana o eo-Turoniana.

Introduction

A large number of bivalves was collected by the author in the Zarqa area (Fig. 1) in 2001, during a biostratigraphical study of Cretaceous strata. The specimens described belong to *Aphrodina dutrugei* and represent the bulk of the bivalves retrieved from the Cretaceous sediments of the Shuayb Formation. The associated species occur in small numbers, are very poorly preserved, or fragmented. Ammonites collected from the section indicate a Late Cenomanian- Early Turonian age.

The Shuayb Formation was described by Powell (1989) as a soft-weathering unit. It forms a broad, talus-covered slope above the prominent Hummar Limestone Formation and below the well-exposed Wadi As Sir Limestone Formation. Many other researchers (Abed & Kraishan 1991; Ahmad & Al-Hammad 2002; Aqrabawi 1993; Bandel & Geys 1985; Nazzal & Mustafa 1993; Sabaheen & Mustafa 2000; Shinaq & Bandel 1998; Bandel et al.1999; and Neumann 1999) studied these sediments, but payed little attention to their fossil content.

Material

Four hundred thirty-five specimens of *Aphrodina dutrugei* were available for study. The specimens were found only in a single horizon, about 20 m thick, in the marly limestones of the Shuayb Formation, within the Zarqa section (Fig. 2). All specimens are internal moulds and none was found in life position.

The material illustrated is housed in the collections of the Department of Earth and Environmental Sciences, Faculty of Natural Resources and Environment, The Hashemite University (prefix: ESH2002 I)

Systematic Palaeontology

Class **Bivalvia** Linnaeus, 1758
Subclass **Heterodonta** Neumayr, 1884
Order **Veneroida** Adams & Adams
Superfamily Veneracea Rafinesque, 1815
Family Veneridae Rafinesque, 1815
Subfamily Pitarinae Stewart, 1930
Genus *Aphrodina* Conrad, 1869
Type species: *Meretrix tippana* Conrad, 1858

Aphrodina dutrugei (Coquand, 1862)
Pl. 1, figs 1- 9

1862 *Venus Dutrugei* Coquand, p. 193, pl. 7, figs 5, 6.

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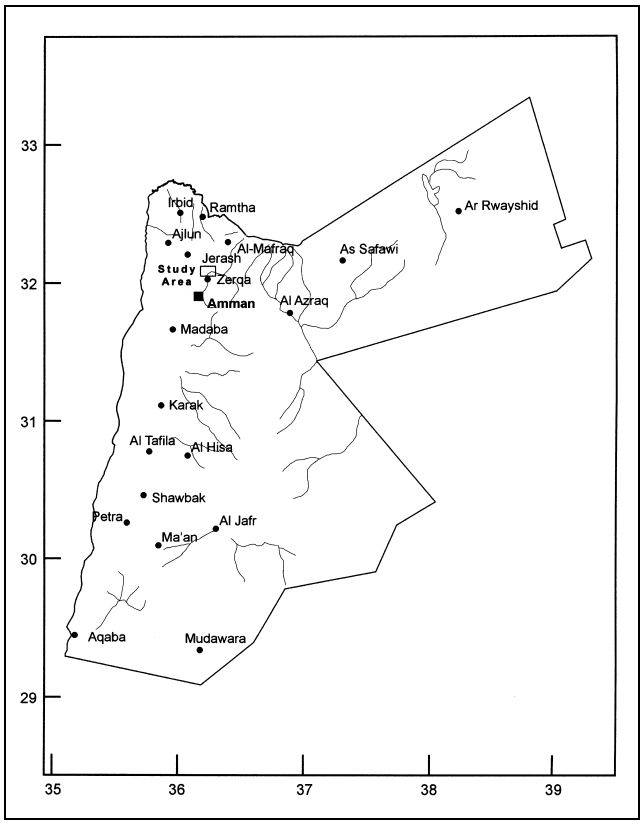


Fig. 1 - Location map of the study area.

1917 *Venus Dutrugei* Coquand - Fourtau, p. 88.
1962 *Meretrix dutrugei* (Coquand) - Abbass, p. 147, pl. 22, fig. 22.
1963 *Venus Dutrugei* Coquand - Fawzi, p. 79.

Materials. 435 articulated internal moulds from the Shuayb Formation.

Description. Oval to elongated, elliptical internal mould, almost equivalved, strongly inequilateral. In some specimens length slightly exceeds height, while in others length strongly exceeds height.

Pallial sinus and imprints of the muscles present. Lunule and escutcheon well delineated. The slightly curved umbo is opisthogyrate. Anterior margin straight to slightly curved. Posterior margin rounded. The surface of most of the specimens shows signs of encrustation. Some specimens are bored and no shell material is preserved.

Measurement (in mm) (Fig. 3).

	L	H	I
ESH2001I81	41	34	16
ESH2001I82	37	31	15
ESH2001I83	33	31	15
ESH2001I84	32	27	14
ESH2001I85	44	34	16
ESH2001I86	48	41	19
ESH2001I87	49	41	19
ESH2001I88	51	41	20
ESH2001I89	46	42	19.5
ESH2001I90	45	39	18.5
ESH2001I91	46	37	16
ESH2001I92	26	23	10
ESH2001I93	31	28	13
ESH2001I94	22	21	11
ESH2001I95	30	29	16
ESH2001I96	41	39	18

Palaeoecology. This assemblage, dominated by the shallow infaunal bivalve *Aphrodina dutrugei*, was found only in one horizon. The preservation as articulated specimens, and evidence of encrustation, indicate that after early diagenetic cementation, infilling and subsequent dissolution of the aragonitic shell, leaving the internal moulds. The absence of fragmentation indicates that the shell was not transported. *Aphrodina dutrugei* must have been adapted to live in a wide range of environments provided that the substrate was suitable. It was probably an opportunistic species which took over when other species of the same ecological niche could no longer compete, due to unfavourable conditions. The low diversity and the monospecific nature of the *Aphrodina dutrugei* association indicate an unstable environment.

Age. All samples come from the Shuayb Formation, of Late Cenomanian-Early Turonian age according to the associated ammonites. These are *Pseudocalycoceras alaouitense* Basse, described by Basse 1940 from Alaouites (Sleunfee), 40 km ENE of Latakia in Syria and *Calycoceras harpax* Stoliczka, *Calycoceras haugi* Pervinquière, *Calycoceras boulei* Collignon, *Calycoceras newboldi* Kossmat described by Avnimelech & Shoresh (1962) from Jerusalem.

Acknowledgements. The study was financially supported by the Hashemite University, Zarqa, Jordan. The author is thankful to Prof. Dr. Franz Fürsich, Institut für Paläontologie der Universität Würzburg, for reviewing the manuscript. Many thanks are due to Dr. Nezar Hammouri and teacher assistant Jahfar Abu Rajab from The Hashemite University, Jordan, for assisting in drawing the figures.

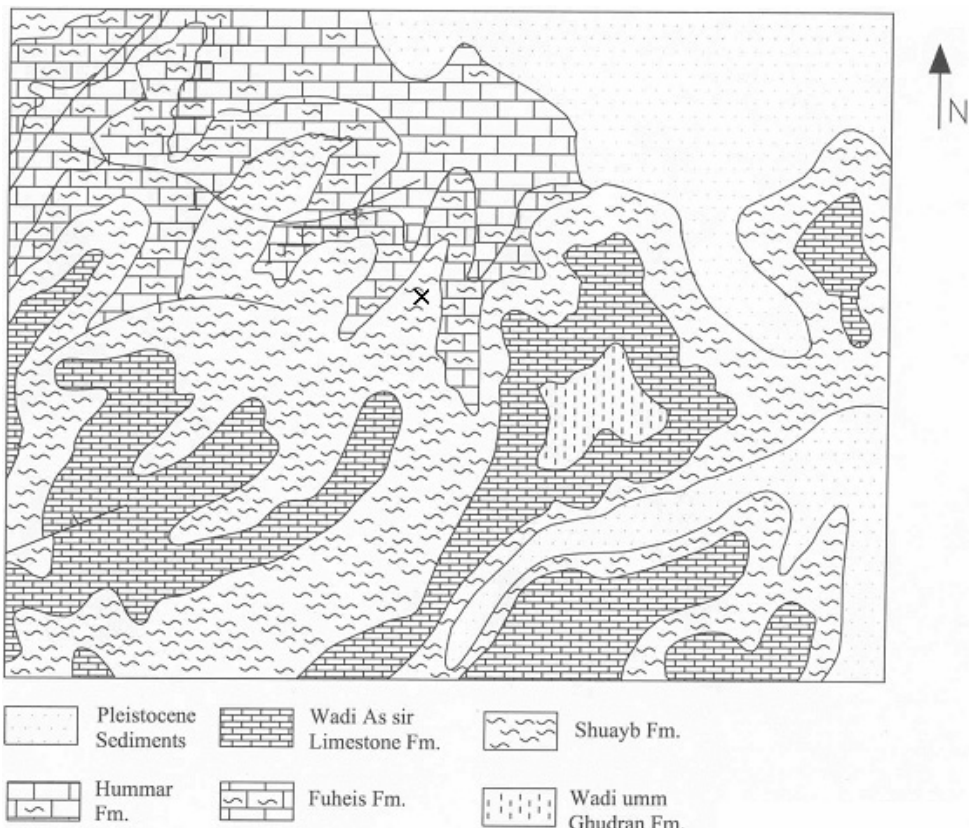


Fig. 2 - Geological map of the study area, and location where the fossils were collected (X).

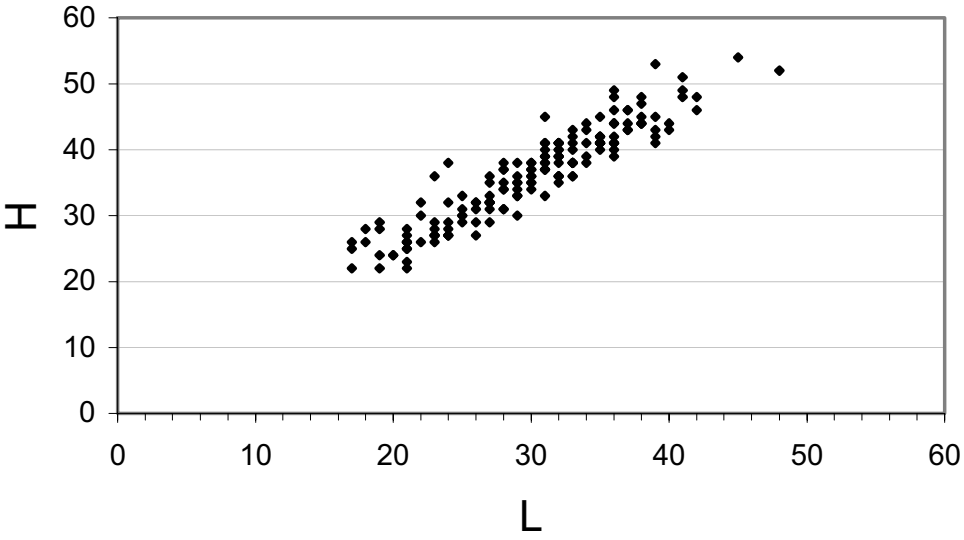
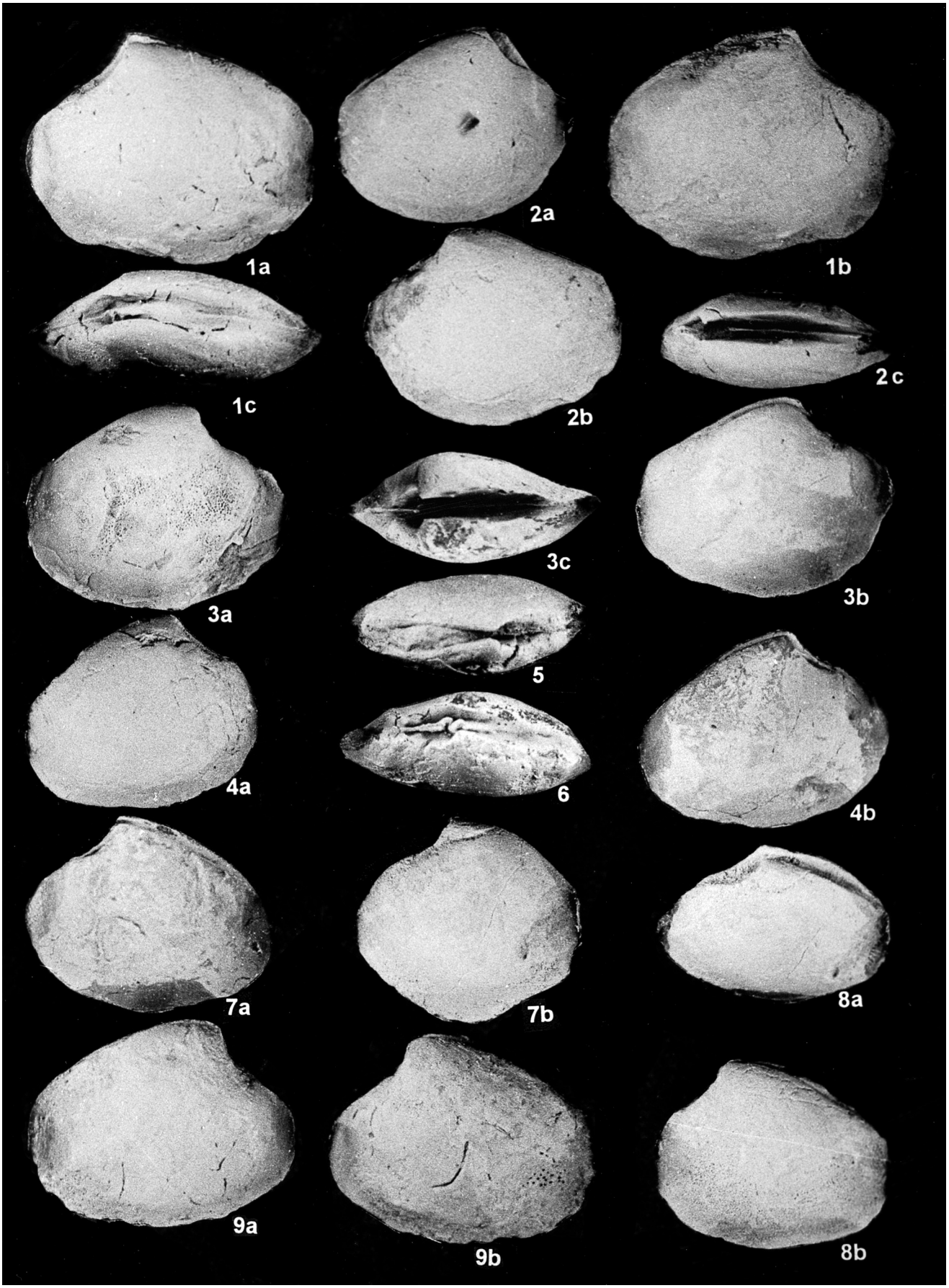


Fig. 3 - Height / length ratio (n= 435) of *Aphrodina dutrugei* (Cocquand, 1862) (in mm).

PLATE 1

Fig. 1-9. - *Aphrodina dutrugei* (Coquand, 1862).

1. - Articulated specimen; a: left valve, b: right valve, c: dorsal view. Shuayb Formation; x1.- ESH2001I70.
2. - Articulated specimen; a: right valve, b: left valve, c: dorsal view. Shuayb Formation; x1.- ESH2001I71.
3. - Articulated specimen; a: right valve, b: left valve, c: dorsal view. Shuayb Formation; x1.- ESH2001I72.
4. - Articulated specimen; a: right valve, b: left valve. Shuayb Formation; x1.- ESH2001I73.
5. - Articulated specimen; dorsal view. Shuayb Formation; x1.- ESH2001I74.
6. - Articulated specimen; dorsal view. Shuayb Formation; x1.- ESH2001I75.
7. - Articulated specimen; a: left valve, b: right valve. Shuayb Formation; x1.- ESH2001I76.
8. - Articulated specimen; a: left valve, b: right valve. Shuayb Formation; x1.- ESH2001I77.
9. - Articulated specimen; a: right valve, b: left valve. Shuayb Formation; x1.- ESH2001I78.


1a
2a
1b
1c
2b
2c
3a
3c
3b
5
4a
6
4b
7a
7b
8a
9a
9b
8b

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