

# CONCHYLIA

ISSN 1869-5302

NEUBESCHREIBUNGEN

**BOTHRIEMBRYONTIDAE, CAMAENIDAE,  
CLAUSILIIDAE, CONIDAE, CYPRAEIDAE,  
FERUSSACIIDAE, HARPIDAE, OVULIDAE,  
RAPHITOMIDAE, TRIVIIDAE**

REGIONEN

ÄGYPTEN, AUSTRALIEN, OSTCHINESISCHES MEER, GRIECHENLAND,  
KANARISCHE INSELN, LAOS, LIBYEN, MAURITIUS, PHILIPPINEN,  
ROTES MEER, RUMÄNIEN, TAIWAN, WESTAFRIKA

FOSSILIEN

EOZÄN AUSTRALIEN, USA



urn:lsid:zoobank.org:pub:CE5C1557-4EFC-49A4-BF3E-89DA78B551C7

## A Peculiar Cypraeidae (Mollusca: Gastropoda) from the Eocene of Australia

By DIRK FEHSE, D-Berlin, FELIX LORENZ, D-Buseck-Buern,  
ANGUS HAWKE, AUS-Notting Hill & KORNEL KOVACS, AUS-Matraville

With 2 Maps, 6 Text-Figures, 3 Tables and 42 Figures on Plates 1-5

### Keywords

Mollusca, Gastropoda, Cypraeidae, *Ponticypraea* n. gen., Late Eocene, new genus, new species, Victoria, Australia.

### Abstract

A peculiar Cypraeidae is described from the Late Eocene of Victoria, Australia. The species unites features that are found in the Eocypraeidae and Triviidae.

### Zusammenfassung

Eine eigentümliche Cypraeidae wird aus dem späten Eozän von Victoria, Australien beschrieben. Diese Art vereint in sich Merkmale, die bisher nur von den Eocypraeidae und Triviidae bekannt waren.

### Introduction

This paper provides a taxonomic description of a strange new Cypraeid species, from a previously unknown genus, which was recently collected from the late Eocene clays of Browns Creek in Southwest Victoria that is a well-known Late Eocene locality in SE-Australia. Many of the species, which occur in the Browns Creek clays, also occur at the Blanch Point formation in South Australia and a few other locations of similar age, although most of the species in common with Blanch Point have slight recognizable differences, which could be due to the geographical isolation or differences in the environment. The late Eocene beds of Eucla Basin in WA contain the largest diversity of species from the late Eocene, with over 130 species of gastropods, which is more than twice the number of species recorded from Browns Creek, which only contain around 50 species. The field work during the past years delivered two new taxa of *Triviella* JOUSSEAUME, 1884 (FEHSE & GREGO 2018), and now a new genus, which is a transition between Cypraeidae and Triviidae. DORMAN (1968) measured the oxygen isotope of *Pycnodonte tarda* (HUTTON, 1873) from Browns Creek to work out the ocean temperature at the time these were alive, which is believed to be around +16.5°C; suggesting a sub-

tropical environment. The discovery of *Ponticypraea* n. gen. was quite a surprise as it is a remarkable new addition to the fauna of this region and superficially resembles both *Cyproglobina* DE GREGORIO, 1880 and *Triviella*, although it is easily differentiated from the latter by the joining of the fossula with the teleoconch (FEHSE 2018a).

### Abbreviations and Acronyms

AHA	collection ANGUS HAWKE, Notting Hill, Australia.
DFB	collection DIRK FEHSE, Berlin, Germany.
KKA	collection KORNEL KOVACS, Matraville, Australia.
NMV	National Museum of Victoria, Melbourne, Australia.
L	length
W	width
D	height
CT	number of columellar teeth
LT	number of labral teeth
RR	number of dorsal ribs

### Systematics

Family Cypraeidae RAFINESQUE, 1815

Subfamily Cypraeovulinae  
F. A. SCHILDER, 1925

Tribe Cypraeovulini F. A. SCHILDER, 1925

Genus *Ponticypraea* n. gen.

Type species: *Ponticypraea egregia* n. sp., by original designation. Priabonian, Late Eocene; Johanna, Victoria, Australia.

### Description

Small-sized, fragile, spherical, with spaced, strong apertural dentition; denticles continued as short folds onto ventrum; the labral denticles usually exceeding the columellar denticles in number; maximum globosity at mid-portion; apex covered by callus.

*Ponticypraea egregia* n. sp.

(Pl. 1, Figs 1-4)

**Type Locality**

Forked Gully nearest Johanna River mouth, Johanna, Victoria, Australia.

**Type Stratum**

Browns Creek Clay, Priabonian, Late Eocene.

**Material**

Holotype: NMV, paratype 1: coll. AHA, paratype 2: coll. DFB, No. 12101, paratype 3: coll. KKA, paratype 4: coll. DFB, No. 12135; all from type locality.

**Description**

Small sized; fragile, almost spherical; length exceeds width and height; anterior terminal short, posterior obscured; posterior terminal tip slightly indented, anterior tip almost blunt; dorsum round, evenly elevated; ventrum convex with straight anterior terminal; spire elevated; protoconch and apex covered by callus, suture visible; aperture oblique, almost straight, posteriorly curved, somewhat widened especially at fossular section; anal canal simple, indented, bordered by projecting callus; siphonal canal deeply indented, funnel-like widened, bordered by terminal ridge and edged labral callosity; labral denticles 14 in average, moderately strong, spaced, continued as strong, short folds onto labrum; columellar denticles 13 in average, moderately strong, spaced, continued as short folds onto ventrum, fossula and anterior columella, posterior columella smooth; labrum essentially widened at mid-portion; inner labral margin straight, posteriorly curved; outer labral margin heavily callused, edged, protruded at mid-portion; parietal lip slightly callused, edged, slightly projected, sinuous; columella curved, convex, broad, tapering steeply inwards; fossula slightly concave, broad, inner edge slightly protruded, separated by slight indentation from columella; terminal ridge strong.

**Variation**

The shell inflation varies considerably. Columellar and ventral folds more or less extended onto ventrum and labrum. Aperture sometimes narrowed. Dorsal elevation varies somewhat.

L = 3-15, W = 81-94 % of length, D = 62-70 % of length, LT = 13-15, CT = 11-14.

**Etymology**

From the Latin, *pons*, referring to a bridge between three Cypraeoidean families, and *egregia*: extraordinary that means 'unique in its kind'.

**Table 1:** Dimensions of *Ponticypraea egregia* n. sp.

Specimen	L	W	H	CT	LT
holotype	14.5	12.3	10.2	14	14
paratype 1	14.8	13.0	9.6	13	15
paratype 2	13.2	12.3	9.2	11	13
paratype 3	14.0	11.4	8.8	13	13
paratype 4	13.3	12.5	8.5	12	14

**Distribution**

Known only from type locality.

**Discussion**

The new genus and its sole species cannot be confused with any living or fossil member of the Cypraeoidea, because of the strange combination of conchological features: the dentition (Cypraeidae), the labrum and its microstructure (Eocypraeidae: Sulcocypreaeinae) and the general appearance of the shell ad its tall spire (Triviidae). Its assignment to the Cypraeidae is tentative, as a number of its shell-features, does not fit in the concept of a "true cowry". The oval, inflated shell without pronounced extremities is closer to members of the family Triviidae, e.g. the recent members of *Triviella* from South Africa and the Eocene *Triviella pompholugota* (TATE, 1890) from Victoria in Australia. The proportion between the elevated spire and the actual shell's dimensions agrees more with that of *Triviella* than any living or fossil member of Cypraeidae, in which the spire is usually smaller and not exceeding the length of the posterior extremity. However, Triviidae are easily separable from Cypraeoidea by the shape of the siphonal canal and the connection of the fossula with the teleoconch (FEHSE 2018a). The fossula is directly connected with the teleoconch and the siphonal canal is just formed through the anterior terminal tip. In contrast, Cypraeoidea forming a half-pipe siphonal canal that separates the fossula from the teleoconch (FEHSE 2018a).

The labral marginal callosities show a surface sculpture consisting of microscopic tubercles as in the Eocypraeidae subfamily Sulcocypreaeinae and more precisely, the Oligocene and Miocene members of *Willungia* POWELL, 1938 from Victoria and Tasmania. These have a similar

shape, and the structure of the anterior terminal ridge and the way it is connected to the fossula is similar (FEHSE 2013). However, in *Willungia*, the terminal ridge consists of two or more plicae and a much wider and more indented gap separates it from the anterior columellar teeth. These are sloping into the aperture in *Willungia* and do not form an angular border of the aperture (FEHSE 2018b). The assignment to the family Cypraeidae is mainly based on this feature of the dentition, and the formation of the terminal ridge.

The senior author and the second author do not fully agree on the assignment of *Ponticypraea* n. gen. to the Cypraeidae. "Whatever it is, this is not a cowry" was the "blink" reaction of the second author when first seeing the new species. The analytical approach of the senior author holds the convincing argument of the structure of the anterior columellar area being genuinely those of a member of Cypraeidae. Trying to assign this peculiar fossil to another living or fossil member of this family is, however, highly problematic – the short, coarse columellar teeth and the spherical shape somewhat resemble taxa of *Cypraeovula* (e.g. *connelli peela* LORENZ, 2002), but the large, pointed spire, the blunt posterior extremity and the sculpture of the labral margin in *P. egregia* n. sp. do not even remotely resemble any member of this South African endemic genus.

For the time being, we are not sure what we are looking at: a highly modified member of Triviidae in which the anterior columellar area has developed cowry-like features as a product of convergent evolution, or may be an early member of *Willungia* in which the terminal ridge consists of just one rib, hence resembling a true cowry, or a completely aberrant lineage of the Cypraeidae? We will never know unless missing links can be found which explain how the assembly of conchological details characteristic of three different families could take place in this remarkable fossil.

## References

- DORMAN, F.H. (1968): Some Australian oxygen isotope temperatures and a theory for a 30 million-year world-temperature cycle. – *The Journal of Geology*, **76** (3): 297-313.
- FEHSE, D. (2013): The genus *Willungia* POWELL, 1938 (Mollusca: Gastropoda: Cypraeoidea) and its assignment to the higher systematics. – *Palaeontographica, Abteilung A*, **299** (1-6): 149-157, pl. 1, text-figs 1-4.
- FEHSE, D. (2018a): Unterschiede in der Gehäusemorphologie bei Cypraeoidea und Triviidae. – *Club Conchylia Mitteilungen*, **30**: 54-55, text-fig. 1.
- FEHSE, D. (2018b): A new species of the genus *Willungia* POWELL 1938 (Mollusca: Gastropoda: Cypraeoidea) from Tasmania. – *Conchylia*, **48** (3-4): 59-63, pls 1-2.
- FEHSE, D. & GREGO, J. (2018): Contributions to the knowledge of the Triviidae, XXXVI: New fossil species in the genus *Triviella* JOUSSEAUME 1884 (Mollusca: Gastropoda: Trivioidea) from South Australia. – *Conchylia*, **49** (1-2): 29-34, pls 1-2, text-figs 1-2.
- LORENZ, F. (2002): New Worldwide Cowries. Descriptions of new taxa and revisions of selected groups of living Cypraeidae (Mollusca: Gastropoda). – *Schriften zur Malakozoologie*, **20**: 1-292, pls 1-40, text-figs 1-38 + num. unnumb., maps 1-37.

## Addresses of the authors:

DIRK FEHSE  
Zoological State Collection Munich (ZSM)  
Dept. Mollusca  
Münchhausenstr. 21  
D-81247 München, Germany  
E-mail: triviidae@gmail.com

Dr. FELIX LORENZ  
Friedrich-Ebert-Str. 12  
D-35418 Buseck-Beuern, Germany  
E-mail: felix.lorenz@t-online.de

ANGUS HAWKE  
1 Trent Court  
Notting Hill, Victoria 3168, Australia

KORNEL KOVACS  
16/581 Bunnerong Road  
Matrville, New South Wales 2036, Australia

Received: 02. 05. 2019 Accepted: 05. 05. 2019

## Plate 1 (on p. 146)

**Fig. 1:** *Ponticypraea egregia* n. sp. Holotype. Coll. NMV. Length: 14.5 mm. Forked Gully, Victoria, Priabonian.

**Fig. 2:** *Ponticypraea egregia* n. sp. Paratype 1. Coll. AHA. Length: 14.8 mm. Forked Gully, Victoria, Priabonian.

**Fig. 3:** *Ponticypraea egregia* n. sp. Paratype 2. Coll. DFB, No. 12101. Length: 13.2 mm. Forked Gully, Victoria, Priabonian.

**Fig. 4:** *Ponticypraea egregia* n. sp. Paratype 3. Coll. KKA. Length: 14.0 mm. Forked Gully, Victoria, Priabonian.

Plate 1



Explanation on p.145