

A new *Pionoconus* from off Strickland Bay, Kimberly Region, Western Australia

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ABSTRACT A new species of Conidae in the genus *Pionoconus* is named from the Exmouthian Subprovince of the Damperian Molluscan Province of Western Australia and the Kimberly region of the Northern Territory. This new cone has been found to be a geographically isolated and morphologically distinct population of *Pionoconus* living at the mouth of Aveling Island in Strickland Bay, Kimberly Region, Western Australia.

KEY WORDS Conidae, *Pionoconus*, *P. achatinus*, *P. barbara*, *P. sheenae*, Exmouthian Subprovince, Damperian Molluscan Province, Aveling Island, Strickland Bay, Kimberly Region, Western Australia

INTRODUCTION

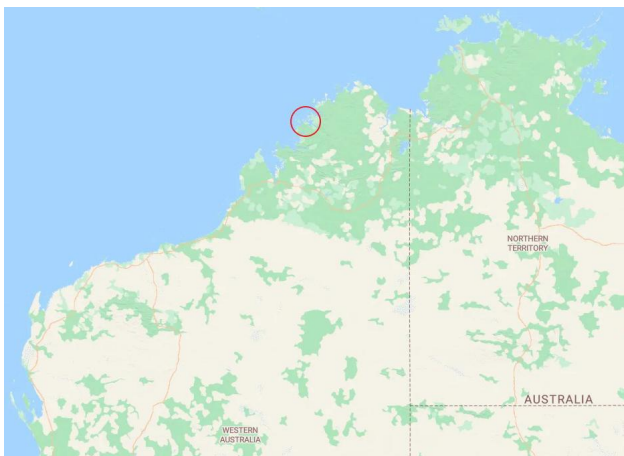
The genus *Pionoconus* comprises a number of piscivorous species distributed throughout the Indo-Pacific, which are often brightly colored. The North Australian Tropical Region extends from Shark Bay, Western Australia to Cape Morton, Queensland in the east, and includes all of the eutropical marine environments on the Australian continent (Petuch & Berschauer, 2021). The new *Pionocous* species discussed herein, *P. sheenae* n. sp., is an endemic species from the Exmouthian Subprovince of the Damperian Molluscan Province of Western Australia and the Northern Territory, along with the endemic *P. barbara*. Some of the classic Exmouthian endemic gastropod species include the cowries *Cribrarula exmouthensis*, *Cribrarula exmouthensis magnifica*, *Cribrarula abaliena australiensis*, *Erronea (Ipserronea) garyi*, *Erronea (Ipserronea) smithi*, and *Leporicypraea geographica rovae*, the strombid *Euprotomus iredalei*, the muricid *Timbellus bednalli*, the olivid *Acutoliva kurzi*,

the volutids *Amoria dampieria*, *Amoria macandrewi*, *Volutoconus hargreavesi* and *Volutoconus coniformis*, the cone shells *Eremiconus dampierensis*, *Floraconus novaehollandiae*, *Pionoconus barbara*, and *Calamiconus garywilsoni*, as well as a deep water offshore species radiation of cowries in the genus *Zoila*, including *Zoila perlae*, *Z. jeaniana aurata*, *Z. jeaniana inscripta*, *Z. eludens*, *Z. decipiens*, *Z. decipiens suprasinum*, and *Z. marginata ketyana* (Petuch & Berschauer, 2021).

Pionoconus barbara (Brazier, 1898) is an endemic piscivorous conid gastropod from the Exmouthian Subprovince which is found in Northwestern Australia where it lives in very shallow water (Monnier *et al.* 2018; Petuch & Berschauer, 2021). The type locality for *P. barbara* is Entrance Point, Broome, Western Australia (Monnier *et al.* 2018). *P. barbara* is a member of the morphologically closely-knit Indo-Pacific radiation known as the “*achatinus* complex” which includes: *Pionoconus*

achatinus (Gmelin, 1791), *P. monachus* (Linnaeus, 1758), *P. vinctus* (A. Adams, 1854), *P. koukae* Monnier, Limpalaër & Robin, 2013, *P. arafurensis* Monnier, Limpalaër & Robin, 2013, *P. rouxi* Monnier, Limpalaër & Robin, 2013, and *P. barbara* (Brazier, 1898). The most well known species in this radiation is *Pionoconus achatinus* (Gmelin, 1791), which is a wide spread tropical Indo-Pacific species. For a review of the “*achatinus* complex” see Monnier, Limpalaër & Robin, 2013.

A geographically isolated and morphologically distinct population of *Pionoconus* has been discovered living off Aveling Island in Strickland Bay, Kimberly Region, Western Australia (Maps 1 and 2). This conid population lives in an extremely rough environment, on a hard rock reef platform under coral heads and rocks in an area locally known as “the Graveyard” in a heavy surge zone where the tide comes through hard and fast with 10 to 11 meter tidal changes (Josh Akerman, personal communication). In their well received treatise on the Conidae, Monnier *et al.* 2018 recognized that this *Pionoconus* was distinct, and illustrated its protoconch and early telococonch whorls along with a number of



Map 1. Map of Western Australia with red circle denoting the Strickland Bay area.

specimens (*id.* at p. 663). We herein name this Strickland Bay endemic cone *Pionoconus sheenae* as the newest member of the “*achatinus* complex”.

SYSTEMATICS

Class	Gastropoda Cuvier, 1795
Subclass	Sorbeoconcha Ponder and Lindberg, 1997
Order	Prosobranchia Milne-Edwards, 1848
Infraorder	Neogastropoda Wenz, 1938
Superfamily	Conoidea Fleming, 1822
Family	Conidae Fleming, 1822
Subfamily	Coninae Tucker and Tenorio, 2009
Genus	<i>Pionoconus</i> Mörch, 1852

Pionoconus sheenae Berschauer & Waller, new species
(Plate 1, Figures A-E)

Description. Shell slightly smaller than average size for genus between 35 to 50 mm in length; ovate to elongated cylindrical in shape; aperture proportionally narrow, widening slightly toward anterior end; anal notch moderate in depth; rounded shoulder edge moderately defined; suture sharply defined; whorl tops ornamented with six to seven concentric raised finely beaded cords; short white multispiral protoconch; first two telococonch whorls mildly stepped; body whorl smooth, light bluish-gray color ornamented with 25 to 30 dark brown spiral lines articulated with white dashes, which overlays irregular olive-tan blotches; aperture light blue with darker mottled patches.



Map 2. Close up map of the Strickland Bay area, showing Aveling Island and “The Graveyard”. The red circle denoted the area where the type lot of *Pionoconus sheenae* were collected.

Type Material. HOLOTYPE - length 36.7 mm, width 19.3 mm, LACM No. 3990. PARATYPES - paratype No. 1 length 34.6 mm, width 17.4 mm; paratype No. 2 length 37.3 mm, width 19.7 mm, in the Berschauer collection.

Type Locality. Found live on reef platform in “The Graveyard” near Aveling Island, Strickland Bay, Kimberly Region, Western Australia.

Distribution. At present only known from the mouth of “the Graveyard”, near Aveling Island,

Strickland Bay, Kimberly Region, Western Australia.

Habitat and Ecology. Low tide on hard rock reef platform under coral heads and rocks in heavy surge zone where the tide forcefully rushes in and out and scours the reef platform with a 10 to 11 meter tidal change. The egg capsules of Western Australian *Pionoconus* have been studied by Kohn & Perron (1994) and are the largest of any known Indo-Pacific species (Kohn 2012; Monnier *et al.* 2018), which suggests that they are direct developers

with limited dispersal ability. Belonging to a piscivorous genus, the new species is assumed to be a predator on small blennioid and gobioid fishes as are other species in the complex.

Etymology. Named for Josh Akerman's patient, understanding, and lovely wife Sheena Renee Akerman.

DISCUSSION / DIAGNOSIS

The body whorl on *Pionoconus achatinus* is more inflated and rounded than the new species *P. sheenae*, and its aperture is bright white rather than light blue. Additionally, *P. achatinus* has a larger and stockier shell overall, its protoconch is proportionately higher than *P. sheenae* and its protoconch is medium to dark brown rather than white as in *P. sheenae*, followed by three to five telococonch whorls, which are clearly stepped and ornamented with fine bumps, unlike *P. sheenae* in which only two telococonch whorls are mildly stepped and smooth (Plate 1, Figures E and G).

In shape, size, and basic color pattern, *Pionoconus sheenae* is most similar to *P. barbara* (Brazier, 1898) which is endemic to northwestern Australia where it lives in very shallow water on sandy bottoms close to rocks (Monnier, Limpalaër & Robin, 2013). By comparison, *P. barbara* has a pinkish-brown to white protoconch which is proportionately higher than *P. sheenae*, its telococonch whorls are smooth and not stepped (Plate 1, Figures E and I), its whorl tops are ornamented with four to six concentric cords, *P. barbara*'s body whorl is frequently pustulated (Josh Akerman, personal communication), and is light gray with darker bluish-gray and olive green-brown patches organized in two distinct bands.

ACKNOWLEDGEMENTS

We recognize and thank Josh Akerman for collecting and bringing this new cone to our attention. We further thank Thierry Vulliet for donation of valuable research specimens for use as the type lot. We thank Marcus Coltro of Femorale for sharing images of dozens of *P. achatinus* and *P. barbara* in their database for use in our study. We thank Loïc Limpalaër for technical assistance with the closely related taxa of "the *achatinus* complex", for sharing images numerous specimens, as well as images of the protoconchs and early whorls of the three closely related species for our use in this paper. Finally, we thank Edward J. Petuch for mentoring and assisting us in this project.

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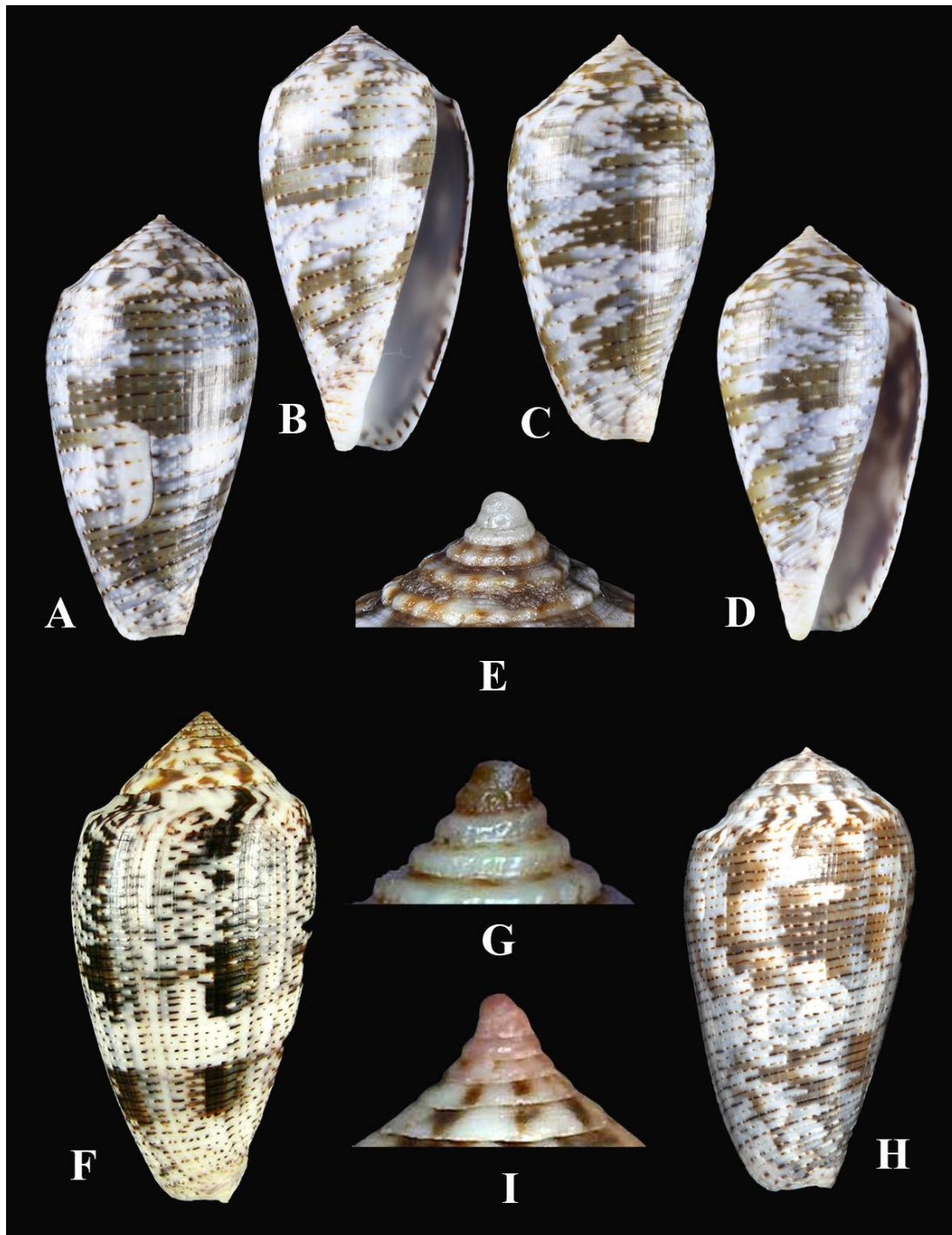


Plate 1. Comparison of *Pionoconus sheenae* n. sp. with closely related taxa.

A, B = *Pionoconus sheenae* n. sp., holotype LACM 3990, measuring 36.7 mm in length; **C, D** = *P. sheenae* n. sp., Paratype No. 1, measuring 34.6 mm in length; **E** = *P. sheenae* n. sp., macrophoto view of protoconch and early teloconch whorls; **F** = *Pionoconus achatinus* (Gmelin, 1791), measuring 56.4 mm in length, from the Philippines; **G** = *P. achatinus*, macrophoto view of protoconch and early teloconch whorls; **H** = *Pionoconus barbara* (Brazier, 1898), measuring 50.0 mm in length, Burrup, Dampier Peninsula, Western Australia, Australia; **I** = *P. barbara*, macrophoto view of protoconch and early teloconch whorls. (Credit is given to Loïc Limpalaër for the use of his macrophoto images of protoconchs and early teloconch whorls in Figures E, G, and I, which are reproduced herein with permission.)