

## A New Endemic Species of *Miliariconus* Tucker & Tenorio, 2009 (Gastropoda: Conidae) from Western Australia

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**ABSTRACT** A new species of *Miliariconus* from tropical Western Australia, is described based on morphological differences with known taxa from that region. The new species differs from known Australian species in sculptural form and colour. This species further highlights the endemism of much of the new taxa that is being discovered in remote northern Australia.

**KEY WORDS** Gastropoda, Conidae, *Miliariconus*, *M. cantamessae*, Western Australia, new species, endemism

### INTRODUCTION

The cone complex *Miliariconus* is characterised by a high degree of localised endemism with half of all known taxa restricted to small geographical areas or islands (Tucker & Tenorio, 2013). It has been hypothesised that this high degree of endemism is a consequence of the loss of the planktotrophic larvae stage and the utilisation of direct development (Petuch & Berschauer 2016). This endemism and the developmental life of *Miliariconus* taxa has implications for assessing the biodiversity particularly from isolated islands (Petuch & Berschauer 2016).

The Dampierian Molluscan Province, within the North Australian Tropical Region as described in Petuch & Berschauer, 2020, is home to many endemic species including: *Chicoreus cervicornis* (Lamarck, 1822), *Amoria praetexta* (Reeve, 1849), *Proxoliva bretteinghamsi* (Bridgman, 1909) and *Plicaustraconus trigonus* (Reeve, 1848). Notwithstanding, the region has hitherto remained relatively under-reported in

terms of published taxonomic molluscan surveys. One of the primary reasons for the discovery of new taxa in this region is the improved accessibility to formally isolated regions of the coastline via guided boat tours to reefs and islands typically not visited. New age explorers have returned from expeditions with a wealth of information on range extensions of well-known species, as well as uncovered many new taxa including gastropods. This paper describes a new morphological species of *Miliariconus* that was found on one such expedition.

### METHODS

Specimens of a purported new species were observed in the Valda Cantamessa Collection (n = 9). These were identified as self-collected material taken in September of 2013. The form and sculpture, as well as the level of variability in colour and pattern were used as comparative characteristics. The new species was described with consideration of the localised and remote

known distribution: endemicity is not uncommon in the direct developing Conidae.

## SYSTEMATICS

Class	Gastropoda Cuvier, 1795
Subclass	Sobreoconcha Ponder & Lindberg, 1997
Order	Prosobranchia Milne-Edwards, 1848
Infraorder	Neogastropoda Wenz, 1938
Superfamily	Conoidea Fleming, 1822
Family	Conidae Fleming, 1822
Subfamily	Puncticulinae Tucker & Tenorio, 2009
Genus	<i>Miliariconus</i> Tucker & Tenorio, 2009

*Miliariconus cantamessae* Maxwell and Berschauer, new species  
(Figure 1; Plate 1 Figures A-D, Plate 2 Figure B)

**Description.** Shell of average size for genus (holotype length 24.5 mm, width 15.6 mm), vasiform, turbinata, inflated, stocky, with distinctly rounded sides; spire proportionally low, broadly subpyramidal; sutural ramps with three spiral grooves which are even and proportionally similar; spiral grooves on sutural ramps form boundary for three cords, which reduce in size by approximately half with each subsequent cord from suture; lacking sutural ramp spiral lines on later whorls; adapical half of body whorl with even distinctive smooth bands approximately one millimetre wide; interspaces of bands smooth, quadrate, uniform and without crenulations; shell body uniformly light blue with lighter band on lower third of body whole, otherwise without pattern; top of shell from shoulder uniformly creamy-white; inner aperture with dark brown-purple interior divided in half by axial cream band; top of aperture and outer lip is reflective of outer spire colouration.

**Type Material.** Holotype – Deposited in the Blue Sky Research Foundation Collection, No. TC009, Cassini Island, Australia (length 24.5 mm, width 15.6 mm) (Figure 1). All paratypes were found intertidally off Cassini Island, and are maintained in the Valda Cantamessa Collection. Paratype 1: length 32.2 mm, width 20.3 mm; Paratype 2: length 29.0 mm, width 17.0 mm; Paratype 3: length 25.3 mm, width 17.4 mm; Paratype 4: length 26.8 mm, width 16.7 mm; and Paratype 5: length 25.3 mm, width 15.9 mm.

**Type Locality.** Cassini Island, Kimberly Coast, Northern Western Australia, due north of the Kimberley Coral Reefs (13°56'43''S: 125°37'52''E) (Figure 2).

**Habitat.** Found intertidally in sand on reef in association with coral.

**Distribution.** At present this species is known only from Cassini Island, due north of the Kimberly Coastal Reefs of the Damperian Province in NW Australia.

**Variability.** There is very little variability found in the type population. All specimens examined show a distinctive lack of patination of the shell as well as uniformity in structural presentation.

**Etymology.** This species is named in honour of Valda Cantamessa from Proserpine, Queensland. Mrs. Cantamessa found the types while on a private expedition to North Western Australia. Furthermore, Mrs. Cantamessa has been a collector of shells for over 30 years and has a long history of active participation in numerous shell clubs in Queensland, and a Life Member of the Townsville Shell Club. Mrs. Cantamessa has supported malacological research through her generous donations of specimens from her private collection.

**Comparison and Remarks.** One of the most significant distinguishing features of the new species is the colouration; however, it does differ structurally from other members of *Miliariconus*. In Australia, there are three

currently recognised members of the *Miliariconus* (Plate 1): *Miliariconus aristophanes* (Sowerby I, 1857); *M. coronatus* (Gmelin, 1791) (not *Conus coronatus* Reeve, 1849) and *M. miliaris* (Hwass in Bruguière, 1792) (Röckel *et al.*, 1995; Tucker & Tenorio, 2013; Petuch & Berschauer, 2016). While the number of sutural ramp grooves varies in *M. coronatus* from 1-7 and in *M. miliaris* from 4-5 the new species is restricted to three (Röckel *et al.*, 1995). The new species differs from *M. aristophanes* in having finer spiral ribbing on the lower half, and with rounder shoulder coronations. Furthermore, the new species lacks the shell colouration and patterns typical of *M. aristophanes*, *M. coronatus* and *M. miliaris*.

The *Miliariconus* can be divided into two groups based on the distribution pattern of the species. The first group is broadly distributed (Petuch & Berschauer 2016) and includes: *Miliariconus aristophanes* = Philippines, Melanesia, Polynesia, and Queensland; *Miliariconus coronatus* = Indo-Pacific; *Miliariconus miliaris* = Africa to Polynesia; *Miliariconus taeniatus* (Hwass, 1792) = Red Sea and coast of Oman; *Miliariconus tiaratus* (Sowerby I, 1833) = Gulf of California to the Galapagos (Plate 2). The second group consists of endemics, which have limited ranges often restricted to islands or small connected geographical areas and contains (Petuch & Berschauer 2016): *Miliariconus abbreviatus* (Reeve, 1843) = Hawaiian Islands; *Miliariconus canatmessae* = North Western Australia; *Miliariconus encaustus* (Kiener, 1845) = Marquesas Islands; *Miliariconus fulgetrum* (Sowerby I, 1834) = Japan and the Ryukyu Islands; *Miliariconus pascuensis* (Rehder, 1980) - Easter Island; *Miliariconus roosevelti* (Bartsch & Rehder, 1939) = Clipperton Island; *Miliariconus sinaiensis* Petuch & Berschauer, 2016 = Northern Red Sea (Plate 2). This indicates that the genus has a high propensity

toward endemism, and therefore we may expect more species to be added the complex through time. As we previously noted, the taxonomic status of some of these endemics are in contention, and their validity is outside the scope of this paper.

## CONCLUSION

We present a new endemic species of *Miliariconus* from North Western Australia. *Miliariconus cantamessae* differs in sculptural form and is remarkable for its lack of variability in colouration; rarely deviating in design or colour. The new species is typical of most members of the genus in being endemic. However, now that the species has been described that this range may well expand as additional field collecting is expected. The form of the shoulder of the body whorl and other morphological characteristics enable the species to be separated from many of its sister taxa that are known to come in rare colour forms, some of which may mimic the new species (for comparison photos see Plate 2, Figure C).

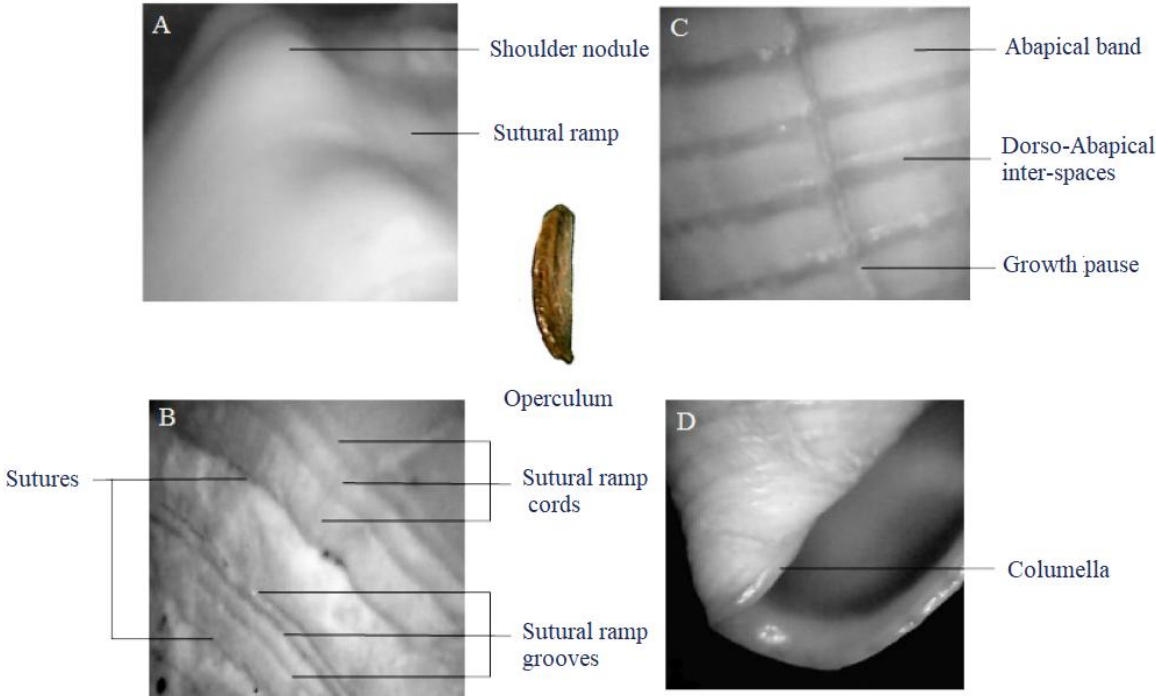
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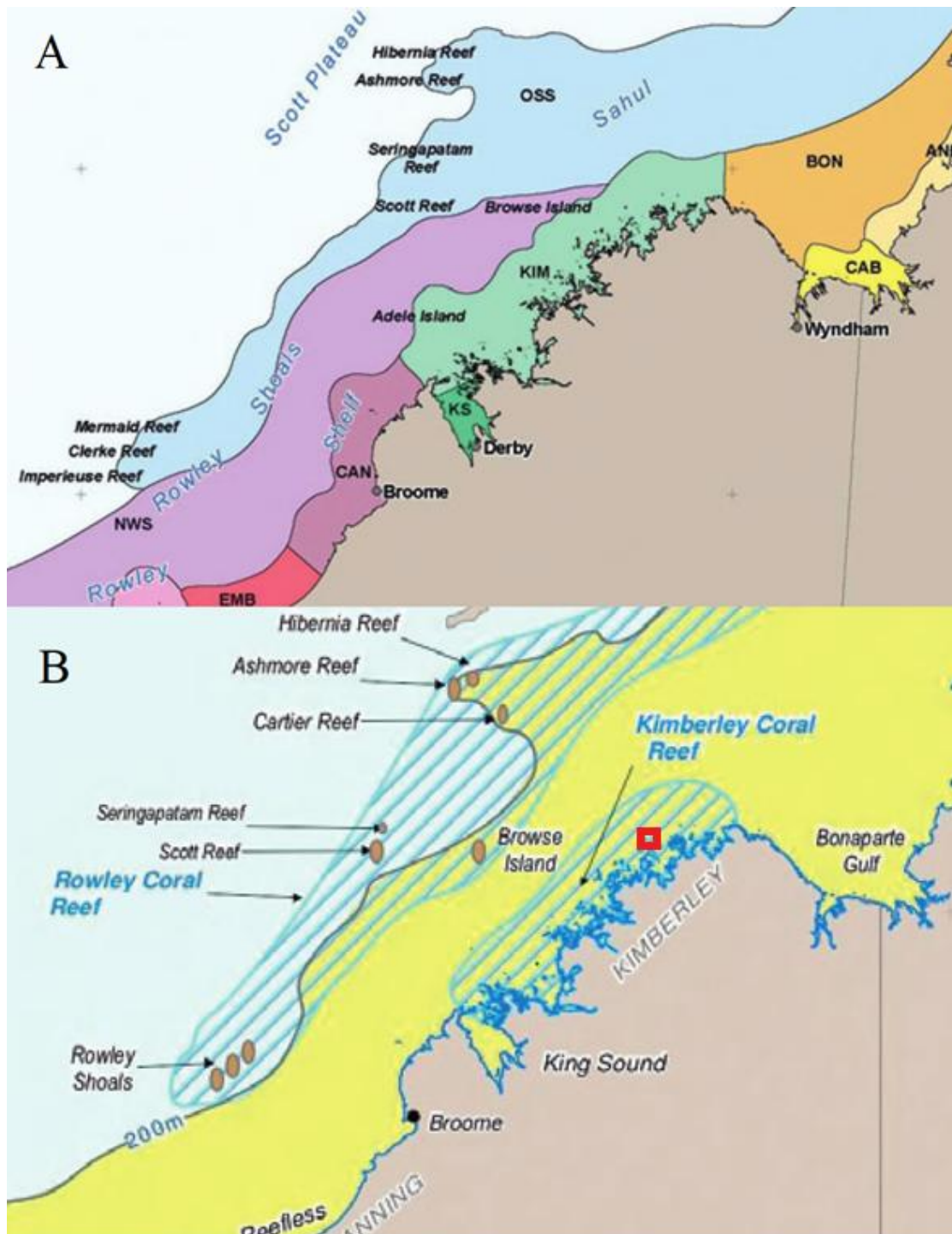
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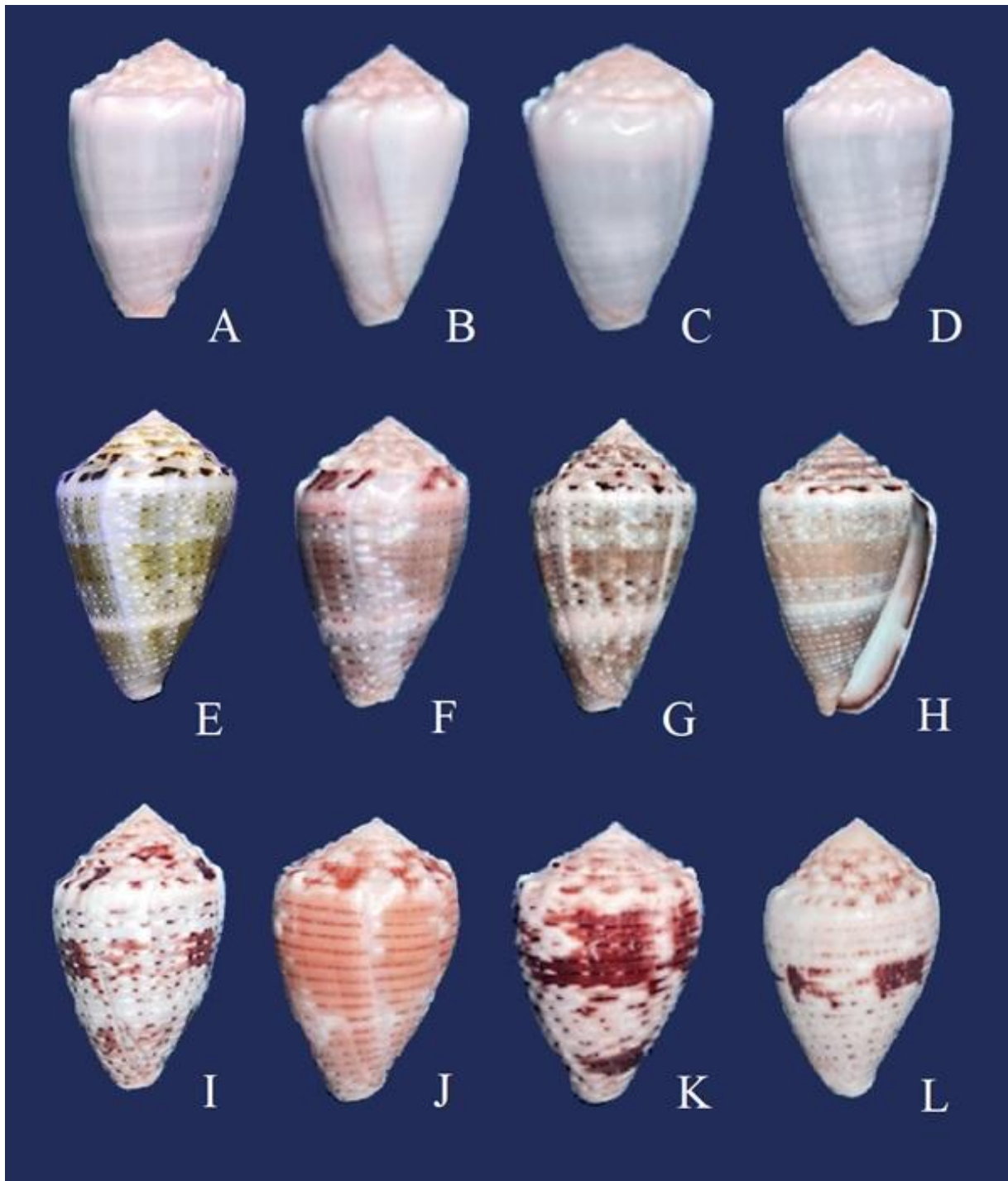


**Figure 1.** The holotype of *Miliariconus cantamessae* n. sp. (TC 009) Cassini Island, Western Australia, length 24.5 mm, width 15.6 mm and enlarged image of the operculum and: **A**= The shoulder; **B**= the spiral sculpture; **C**= the body whorl sculpture; and **D**= the anterior of the shell.

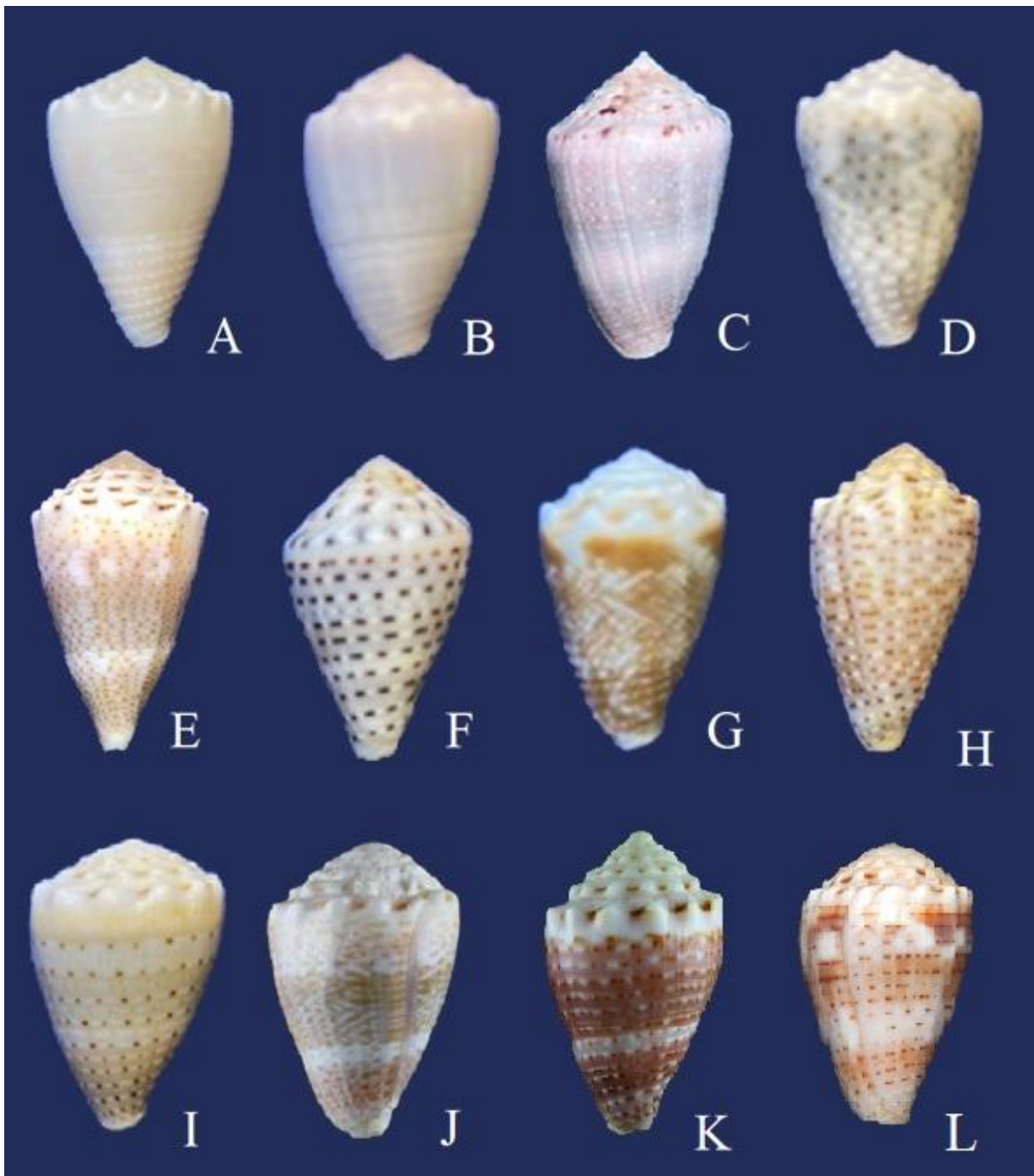




**Figure 2.** Within the Damperian Molluscan Province (Petuch & Berschauer 2020), *Miliariconus canatamessae* is known from Cassini Island (shown by the red square), which is located north of and offshore from the Kimberly Coral Reefs (of the Australian government's Integrated Marine and Coastal Regionalisation of Australia mesoscale bioregion, which is associated with the Kimberly Coral Reefs area). **A=** The coastal mesoscale bioregions (map adapted from Wilson 2013, fig. 1.5): ANB - Anson-Beagle; BON - Bonaparte Gulf; CAB - Cambridge-Bonaparte; OSS - Oceanic Shoals; KIM - Kimberley; KS - King Sound; CAN - Canning; NWS - North West Shelf; EMB - Eighty Mile Beach. **B=** The reef systems and their distribution in north West Australia of the new species (map adapted from Wilson 2013, fig. 4.1).



**Plate 1. Comparative images to the new species. *Miliariconus cantamessae*:** A= Paratype 1 – Cassini Island, WA, length 32.2 mm, width 20.3 mm; B= Paratype 2 – Cassini Island, WA, length 29.0 mm, width 17.0 mm; C= Paratype 3 – Cassini Island, WA, length 25.3 mm, width 17.4 mm; D= Paratype 4 – Cassini Island, WA, length 26.8 mm, width 16.7 mm. ***Miliariconus coronatus*:** E= Yule Point, Qld, 36.3 mm; F= Cassini Island, WA, 38.2 mm; G= Oak Beach, Qld, 44.2 mm; H= Heron Island, Qld, 37.4 mm. ***Miliariconus aristophanes*:** I= Wilson Island, Qld., 43.7 mm; J= Wilson Island, Qld., 30.3 mm; and K= Heron Island, Qld, 35.6 mm; L= Oak Beach, Qld, 47.8 mm. (All specimens from the Valda Cantamessa collection).



**Plate 2. A comparative plate of *Miliariconus* species.** A= *Miliariconus miliaris*, Feather Reef, Qld, 22.4 mm; B= *Miliariconus cantamessae*, Paratype 5 - Cassini Island, WA, length 25.3 mm, width 15.9 mm; C= *Miliariconus coronatus*, Saddleback Island, Qld, 35.5 mm; D= *Miliariconus aristophanes*, Green Island, Qld, 28.4 mm; E= *Miliariconus encaustus*, Marquesas, 32.5 mm; F= *Miliariconus taeniatus*, Arabian Gulf, 29.6; G= *Miliariconus fulgetrum*, Horseshoe Reef, Japan, 22.6 mm; H= *Miliariconus tiaratus*, Santa Cruz Island, Galapagos, 35.7 mm; I= *Miliariconus abbreviatus*, Kahulau, Hawaii, 34.78 mm; J= *Miliariconus sinaiensis* Sharm el-Sheikh, Egypt, paratype 1, 28.2 mm (image taken from Petuch & Berschauer, 2016, fig. 1g); K= *Miliariconus roosevelti* northwestern side of Clipperton Island, 20.0 mm (E.J. Petuch research collection); L= *Miliariconus pascuensis*, Ana Kakenga, Easter Island, 27.0 mm (E.J. Petuch research collection). All specimens are from the Valda Cantamessa collection unless otherwise stated.