

New *Tudivasum* Rosenberg & Petit, 1987 (Mollusca: Vasidae) from Queensland and the first report of sinistralism in that genus

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ABSTRACT Five new *Tudivasum* species are described from Queensland, Australia. Currently, only *Tudivasum armigerum* (Adams, 1856) and *Tudivasum rasilistoma* (Abbott, 1959) are recognized from the east Australian Coast, and are of comparable size to the new species. An additional species, *Tudivasum kurtzi* (Macpherson, 1964) from northwestern Australia is included in this study as it is also of comparable size to the new species described here, although it is not found in the same biogeographical area. A coastal species, *Tudivasum annettae* n. sp. is described from Shoal Point, Central Queensland, where it has been found on intertidal sand/mud flats and near shore reefs. *Tudivasum barbaracollinsae* n. sp. is described from the far northern region of Queensland off the Cairns coastal trawler grounds. *Tudivasum glendae* n. sp. is described from the northern Queensland trawling grounds off Townsville. *Tudivasum amandacantamessae* n. sp. is described from the central Queensland trawler grounds off Bowen. *Tudivasum variabilis* n. sp. is taken from the southern Queensland trawler grounds off Yeppoon. The first example of a sinistral *Tudivasum* from Australia is also presented.

KEYWORDS Biogeography, Queensland, Mollusca, *Tudicula*, *Tudivasum*, *T. amandacantamessae*, *T. annettae*, *T. barbaracollinsae*, *T. glendae*, *T. variabilis*, sinistral, Vasidae.

INTRODUCTION

In the last decade much interest has been generated in the Vasiniae Adams and Adams, 1853 taxonomy. A number of revisions in Vasiniae have resulted in the description of new taxa (Petuch 2013; Dekkers and Maxwell 2018; Maxwell and Dekkers 2019; Cooper and Maxwell 2020; Morrison *et al.* 2021; Cossignani 2024). These revisions were followed by the reorganization of the higher taxonomic arrangements (Vermeij 2024). This paper expands on this knowledge through the exploration of the diversity of this complex in

Queensland, and in particular the larger *Tudivasum* Rosenberg & Petit, 1987.

Tudivasum Rosenberg & Petit, 1987 was erected to replace the older *Tudicula* Adams and Adams, 1864, which is a junior homonym of *Tudicula* Ryckholt, 1862; *Tudicula* Ryckholt, 1862 is an unjustified emendation of *Tudicla* Röding, 1798 (Tudicidae) (ICZN 1999, article 10.6) and is unavailable. Similarly, *Tudicla* Adams, 1856 is a junior homonym of *Tudicla* Röding, 1798 (Tudicidae). There are currently three larger species of Australian *Tudivasum*: *T. armigerum* (Adams, 1856) from along the

Queensland coast; *T. kurtzi* (Macpherson, 1964) from northwestern Australia; and *T. rasilistoma* (Abbott, 1959) from southern Queensland and northern New South Wales. In addition to these larger *Tudivasum* species there are five smaller species recognized that will be addressed in a later paper: *T. ashmoreense* Morrison, 2021; *T. chaneyi* Morrison, 2021; *T. inerme* (Angas, 1878); *T. spinosum* (Adams and Adams, 1863); and *T. westrale* Morrison, 2021. In this paper, five new species are presented based on morphology and biogeography.

METHODS

Specimens for this study were obtained from private collections and highlights the importance of well-curated collections that fall outside institutional repositories. Much of the intertidal material was self-collected and the localities are considered sound. Trawled material was originally obtained from the source and the data that accompanied it was provided by the fishermen, which must be considered within the context of trawling operations and the coverage of the boats (Maxwell and Berschauer 2023).

This paper follows the higher taxonomic classification of Vasidae contained within the most recent revision (Vermeij 2024). Species were differentiated based on distribution data and morphology with the use of species rank reflecting observable differences (Maxwell *et al.* 2021). The patterns in morphological variability within a species that are drawn from across the range will be dealt with in subsequent papers.

ABBREVIATIONS

BSRF	BlueSky Research Foundation Collection, Yorkeys Knob, Qld, Australia.
AMD	Aart Dekkers Collection, Oasestraat, Netherlands.
BCC	Barbara Collins Collection, Machans Beach, Qld, Australia.
CTC	Charlie Taylor Collection, Julatten, Qld, Australia.
DBC	David Berschauer Collection, Cairo, Georgia, USA.
HDC	Henk Dekker Collection, Amsterdam, Netherlands.
UWC	Uwe Weinreich Collection, Carins, Qld, Australia.
VCC	Valda Cantamessa Collection, Proserpine, Qld, Australia.
YZC	Yao Zheng Collection, Kardinya, WA, Australia.

SYSTEMATIC PART

Superfamily	Turbinelloidea Swainson, 1835
Family	Vasidae Adams & Adams, 1853

Tudivasum Rosenberg & Petit, 1987

Supplementary Description. “Shells medium in size, 30-70 mm in length, moderately solid, usually pyriform or fusiform, sometimes spinose, and with a long, narrow, anterior siphonal canal. Whorls 4 to 7, usually spinose, rarely smooth, but always with fine spiral threads. Nuclear whorls rather large and slightly mammillate. Parietal shield usually well developed. Lower third of columella with 3 or rarely 4, moderately developed, slanting plicae. Operculum corneous, unguiculate, brown, and with a terminal nucleus. Radula rachiglossate, the central tooth with 3 cusps, the lateral teeth with two cusps. Body and penis similar to those in *Vasum*” (Abbott 1959, p. 27).

Type species. *Tudicula armigerum* A. Adams, 1856 (Wenz 1943, p. 1303)

Synonymy.

Tudicla Adams, 1856, p. 211.

Tudicla (*Tudicula*) Adams and Adams, 1864, p. 429.

Turbinella (*Turdicula*) Abbott, 1959, p. 27.

Tudivasum Rosenberg & Petit, 1987, p. 5.

Tudivasum armigerum (Adams, 1856)
(Figure 1; Plate 1, Figure C)

Original Description. “*T. testa turbinato-fusiforimi, epidermide fulvicante induta, spira obtusiuscula, apice mamillato; anfractibus planis, in medio serie spinarum ornatis, spinus tubulosis, regularibus, subrecurvatis, liris transversis, elevatis, squamulis, aculeatis instructis, et interstitiis lineis elevatis simplicibus; anfractu ultimo serie secundo spinarum ad partem anticam ornato; apertura ovali, intus alba, columella triplicata, canali recto product; labro intus lirato*” (Adams 1856, p. 221).

Supplementary Diagnosis. “Adult shell 55-72 mm in length, solid pyriform with a long, thin anterior siphonal canal, and spinose. Colour white to yellow cream, with or without light-brown to purplish brown flecks or small maculations. Nuclear whorls 1.5, proportionately large, rounded, smooth, semi-glossy, and white to purple-brown. First post-nuclear whorl weakly cancellate; the next 5 whorls bearing 6 to 7 raised, finely fimbriated, spiral threads; the lowest thread, located just above the wavy, well indented suture, bears increasingly longer, open-faced spines (10-12 per whorl). The long siphonal canal bears 2 spiral rows of long delicate spines. The numerous spiral threads on the body whorl may bear numerous, very small spines. Axial sculpture of 10 to 12 low rounded folds. Aperture ovate. Outer lip slightly reflected,

thickened, glazed and weakly crenulate. Parietal shield well developed, raised, glossy white to cream. Lower third of columella with 3 (rarely with a weak fourth), slightly plicate, the lowermost being the broadest. Operculum corneous, chestnut, brown, unguiculate, and with a terminal nucleus” (Abbott 1959, p. 27-28).

Type Material. Museum of Natural History, London NHMUK 1992160 (Figure 1).

Type Locality. Moreton Bay, Queensland, Australia (Adams, 1856).



Figure 1. Holotype of *T. armigerum* (Adams, 1856) Moreton Bay, Queensland est. 68 mm (NHMUK 1992160) (source Morrison *et al.* 2021, Fig. 3F).

Tudivasum kurtzi (Macpherson, 1964)
(Plate 1, Figure F)

Original Description. “Adult shell approximately 60 mm. in length, white, spinose with a long anterior syphonal canal. Whorls rounded seven to eight including smooth, mammillate protoconch of the whorls; the first two post nuclear whorls are sculptured with radial growth lines crossed by nodulose encircling ribs giving a cancellate appearance. The nodules of the upper encircling rib elongate into spines at about the third whorl and become progressively longer as the rib is followed down the whorls. The body whorl has ten shoulder spines. The number of the additional ribs on each whorl increases as the whorls enlarge until there are eight to nine on the body whorl and they become spinose but the spines are short (2.5 to 3 mm long) and set close together. The anterior canal also bears long encircling spines the size of which decrease towards the tapering anterior end of the canal. Mouth elongate oval constricted and continuous with anterior canal. Outer lip not expanded and with the interior showing ribs, which correspond to the lines of fine spines on the exterior. Parietal shield well developed and free from the body whorl giving the aperture a tube-like appearance. Columella with three small distinct plaits towards the anterior end followed posteriorly by two or three indistinct ridges” (Macpherson 1964, p. 209).

Type Material. National Museum (Victoria), No. F 23320.

Type Locality. Deep water Shoal Bay, Darwin, Northern Territory, Australia (Macpherson, 1964).

Tudivasum rasilistoma (Abbott, 1959)
(Plate 1, Figure G)

Original Description. “Adult shell 56 to 72 mm in length, solid, fusiform, weakly spinose, and with a moderately short, stout siphonal canal. Color chalky pinkish cream to whitish and overlaid with irregular bands of various shades of brown. Nuclear whorls 1.5 smooth, rounded and opaque-white. Body whorl with two closely set peripheral rows of 7 (or rarely 8) blunt nodules. The midpoint of the stout anterior canal bears a row of 5 or 6 fairly long, slender open faces spines, below which maybe a second row of obsolete spines. Lower third of siphonal canal an almost solid, dark chocolate-brown. Umbilicus chink-like, shallow or absent. Parietal wall well-developed, raised, glossy, cream to pinkish and with a brown blotch on the left center and at the posterior or upper end. Columellar plicae 3, the middle one being the largest and most distinct. Outer lip slightly reflected, sharp, strong, but finely and unevenly crenulate. Inner wall behind the outer lip, with weakly developed, raised, spiral lirae. Periostracum grayish brown, translucent, thin, and microscopically fimbriated. Operculum corneous, unguiculate and dark-brown in color” (Abbott 1959, p. 29).

Type Material. National Museum (Victoria), No. F18189.

Type Locality. Tweed Heads, Northern New South Wales (Abbott 1959)

Tudivasum amandacantamessae Maxwell,
Yao & Berschauer n. sp.
(Plate 1, Figure A; Plates 2-3)

Description. Of average size for genus, measuring 64 to 80 mm in length; protoconch large, smooth, bulbous consisting of 1½ to 2 whorls; teleoconch sculpted with fine vertical ribs, followed by 4 body whorls; shoulders with 8 to 9 fine long spines; fine line suture between

whorls; body shape elongated, delicate in appearance with long siphonal canal; body whorls ornamented with 16 to 18 fine radial ribs, last two rows of radial ribs with short spicules; 2 rows of 5 long delicate spines on siphonal canal, first row longest; aperture elongate-oval, smooth, white; outer lip not expanded; parietal shield well developed, smooth, white; body color varying from pink, tan to porcelain white.

Type Material. Holotype – Bait Reef, central Queensland: length 64.8 mm (BSRC TC025). Paratype 1 – Bait Reef, central Queensland, length 80 mm (VCC); Paratype 2 – Trawled off Old Reef, length 65 mm (BCC); Paratype 3 – Trawled off Square Reef, length 68 mm (DBC).

Type Locality. Trawled off Bait Reef, Queensland.

Etymology. Named in honour of Amanda Cantamessa for her kindness, support and encouragement to keep going despite the never-ending vicissitudes of life enabling the first author's continued malacological endeavours.

Material Examined. Trawled off Bait Reef (VCC x 2); Trawled off Old Reef x1 (BCC x 1); Trawled off Square Reef (BCC x 1; VCC x 3); Fairy Reef (VCC x 2); Tideway Reef (VCC x 1); Trawled off Bowen (VCC x 4); trawled off Gould Reed (VCC x 2); Hunter Reef (VCC x 2).

Remarks. *Tudivasum amandacantamessae* differs from others in the genus in having a more graceful and delicately appearing shell than *T. annettae*, which is both robust and more fusiform in shape than the popsicle-like *T. amandacantamessae* or *T. variabilis*. The body whorl of *T. amandacantamessae* is highly variable in the number and strength of spines in axial rows below the shoulder; however, these are not as irregular as in *T. amigerum*, which develops these rows into longer spines. The body whorl is more ovate than that of *T. variabilis*, which is more angular in form. The northern species, *T. glendae* is larger and has a relatively shorter anterior canal to body whole length than *T. amandacantamessae*.

Tudivasum annettae Maxwell, Yao & Berschauer n. sp.

(Plate 1, Figure B, and Plates 4-6)

Description. Of average size for genus, measuring 47 to 73 mm in length; protoconch large, smooth, bulbous, consisting of 1½ to 2 whorls; teleoconch sculpted with fine vertical ribs, followed by 4 somewhat rounded body whorls; shoulders with 10 to 11 relatively short spines; fine line suture between whorls; body shape robust with relatively short siphonal canal; body whorls ornamented with undulating vertical knobs from shoulder spines down, crossed with 10 to 12 coarse radial ribs, producing somewhat cancellate appearance; 1 to 2 rows of 4 short spines on siphonal canal, first row longest; aperture elongate-oval, smooth, white; outer lip not expanded; parietal shield well developed, smooth, white; body color ivory with light tan to gold streaks.

Type Material.

Holotype – Shoal Point, Central Queensland, length 67.7 mm (BSRF TC026); All paratypes are from Shoal Point, Central Queensland: Paratype 1 – length 47.9 mm (VCC); Paratype 2 – 58.5 mm (DBC); Paratype 3 – length 47.3 mm (VCC); Paratype 4 – length 55.2 mm (VCC); Paratype 5 – 58.3 mm (VCC); Paratype 6 – length 55.3 mm (VCC); Paratype 7 – length 72.7 mm (VCC); D) Paratype 8 – length 58.9 mm (VCC); Paratype 9 – length 63.4 mm (YZC).

Type Locality. Shoal Point, Mackay.

Etymology. Named after Annette Whitney who found the first sinistral specimen, and who also provided many specimens for this project.

Material Examined: Shoal Point, Mackay (BCC x 2; DBC x 1; VCC x 19; YZC x 1); Armstrong Beach, Sarina (VCC x 1); Clairview (SMC x 1); Pancake Creek (UWC x 1).

Remarks. The habitat of *Tudivasum annettae* differs from other members of the *Tudivasum* in that it is encountered intertidally. The shell of *T.*

annettae is more robust and thickened than *T. amandacantamessae* or *T. armigerum*, and further differs from those species in lacking the regularity of long spines on the shoulder. Found on exposed silty/muddy expansive sand flats at low tide, and in areas with nearshore intertidal reefs along the central Queensland coast. All material examined in this study was obtained intertidally.

Tudivasum barbaracollinsae Maxwell,
Yao & Berschauer n. sp.
(Plate 1, Figure D and Plate 7)

Description. Of average size for genus, measuring 71 mm in length; protoconch large, smooth, cream-ivory color, bulbous consisting of 2 whorls; teleoconch faintly sculpted with fine vertical ribs, followed by 3 body whorls; shoulders with 8 to 9 fine hollow slightly open spines; fine line suture between whorls; body whorl broad, robust, sharply tapering to relatively broad siphonal canal of average length for genus; body whorl faintly ornamented with 6 to 8 fine, slightly scabrous radial ribs below shoulder spines, followed by two rows of 14 to 16 short white hollow slightly open spines; 3 rows of 5 to 6 spines on siphonal canal, first row longest, later rows shorter; aperture elongate-trapezoidal, smooth, white; outer lip not expanded; smooth, white; body color cream-ivory color with faint light-brown band above first of two rows of 14 to 16 short hollow slightly open spines, with tan-brown flammules on siphonal canal; spines cream-ivory to faint light-brown in color.

Type Material. Holotype – off Fitzroy Island, off Cairns, Queensland, length 71 mm (BSRF TC027).

Type Locality. Trawled near Fitzroy Island, off Cairns.

Etymology. Named after Barbara Collins for her dedication to advancing malacology and providing many specimens for this project.

Material Examined: Known only from the Holotype.

Remarks. This rare and larger species lives in deep water, has a less spinose body whorl has fewer spines and ornamentation than other members of the genus as well as having a wider rostrum in the same form as *Tudivasum rasilistoma* (Abbott, 1959), although not as robust as that species.

Tudivasum glendae Maxwell, Yao &
Berschauer n. sp.
(Plate 1, Figure E, Plates 8 and 9)

Description. Large size for genus, measuring 83 to 98 mm in length; protoconch large, projecting, smooth, bulbous consisting of 2 to 2½ whorls; teleoconch faintly sculpted with fine vertical ribs, followed by 4 body whorls; spire whorls with prominently angled shoulders, shoulder of body whorl distinct; shoulders with 8 to 9 robust, medium length, hollow slightly open spines; sharply defined suture between whorls; body whorl broad, robust, gently tapering to siphonal canal of relatively below-average length for genus; body whorl faintly ornamented with 4 distinct radial ribs below shoulder spines, followed by two to three rows of 16 to 18 very short hollow spines with 1 to 2 distinct radial ribs between rows of spines; 3 rows of 5 to 6 long spines on siphonal canal, first row longest, later rows shorter, with 2 to 3 distinct radial ribs between rows of spines; aperture elongate-oval to trapezoidal, smooth, white; parietal shield well developed, smooth, white; base body color light-brown to tan-gold; spines cream-ivory to white in color.

Type Material. Holotype – Trawled Keeper Reef, off Townsville, Queensland, length 71mm (BSRF TC028). All paratypes are trawled of Townsville: A) Paratype 1 – length 83 mm (CTC); B) Paratype 2 – length 94 mm (CTC); Paratype 3 – length 85 mm (VCC); Paratype 4 –

length 98 mm (CTC); Paratype 5 – length 86 mm (VCC).

Type Locality. Trawl grounds off Keeper Reef, Townsville.

Etymology. Named after Genda Rowse for her lifelong contributions to shell collecting and the Townsville Shell Club.

Material Examined: Trawled off Keeper Reef (BCC x 1; VCC x 1); Trawled off Townsville (VCC x 13; CTC x 3); Trawled off Loadstone Reef (VCC x 3).

Remarks. This is a deep-water species (320 m) found in the near reef trawling grounds east of Townsville. It is larger than the other members of the genus found in Queensland. It is variable in ornamentation; however, the inflated body of the shell is often the same length as, or longer than, the rostrum is a distinguishing feature from others in the complex. The spire and the body whorl are more angular in form than the rounded *T. amandacantamessae* or *T. variabilis*.

Tudivasum variabilis Maxwell, Yao &
Berschauer n. sp.

(Plate 1, Figure H, Plates 10 and 11)

Description. Of average size for genus, measuring 53 to 68 mm in length; protoconch large, tan-gold in color, smooth, bulbous, consisting of 1½ to 2 whorls; teleoconch faintly sculpted with fine vertical ribs, followed by 4 body whorls; shoulders with 8 to 9 fine relatively short to medium length, hollow and slightly open spines; fine line suture between whorls; body shape robust tapering to relatively broad siphonal canal of average length for genus; body whorl faintly ornamented with 3 to 4 undulating, slightly scabrous radial ribs below shoulder spines, followed by three to four rows of 18 to 24 very short white hollow slightly open spines, with 1 to 2 undulating, slightly scabrous radial ribs between rows of spines; 2 rows of 5 to 6 long spines on siphonal canal, first row longest, with 2 to 3 distinct radial ribs

between rows of spines; aperture elongate-oval to trapezoidal, smooth, white; parietal shield well developed, smooth, white; base body color light-brown to tan-gold; spines cream-ivory to light-brown in color.

Type Material. Holotype – Trawled off Keppel Bay, Queensland, Queensland, length 53 mm (BSRF TC029); Paratype 1 – Trawled of Keppel Bay, length 67 mm (CTC); Paratype 2 – Trawled of Keppel Bay, length 68 mm (VCC); Paratype 3 – Trawled Central Queensland (= off Yeppoon), length 63.6 mm (HDC); Paratype 4 – Trawled of Keppel Bay, length 71 mm (AMD); Paratype 5 – Trawled North West Island, Capricornia Cays, length 63 mm (AMD); Paratype 3 – Trawled Central Queensland (= off Yeppoon), length 70 mm (AMD).

Type Locality. Trawled off Keppel Bay, Queensland.

Etymology. The name is the Latin for variable, *variabilis*, reflecting the diversity in morphology of the species spination.

Material Examined: Sandy Cape (VCC x 1; CTC x 2); Keppel Bay (CTC x 4); Swain Reefs (CTC x 1); Lady Musgrave Island (VCC x 6); Central Queensland (= off Yeppoon) (HDC x 1; AMD x 1); Trawled North West Island, Capricornia Cays (AMD x 1).

Remarks. This is a moderately shallow water species (5-50 m) found in the near reef trawling grounds east of Keppel Bay down to the Sandy Cape. The species is most similar to *T. amandacantamessae*, but differs from that species in having a more spatulate form body whorl.

DISCUSSION

A species “flock” or “swarm” is defined as an endemic and monophyletic assemblage of taxa that rapidly evolved in a small defined geographic area with no obvious barriers to dispersal (Duda and Rolan 2005). The coastline of northern Queensland is geologically

relatively new with most of the known habitat of these species being above sea level in the living cultural memory of the Aboriginals who first inhabited this land and hunted kangaroos in some areas where we find *Tudivasum* today.

This area of Queensland is known as the Solanderian Molluscan Province and is marked by offshore reef tracts crossed by deep channels that effectively create bathymetric high variability, which forms dispersal barriers for non-vagile mollusks with direct development for many reef species (Petuch and Berschauer 2020). However, with this Province the deeper waters are characterized by areas of colonization, rather than bathymetric isolation, creating bottlenecks and sowing the seeds for rapid divergent evolution. This allopatric pattern has led to the evolution of many species of gastropods in the Solanderian Molluscan Province, resulting in individual species being restricted in some form by discrete island chains, coastal ecological barriers, areas of deep water or isolated reef systems (Petuch and Berschauer 2020; Maxwell and Berschauer 2023). *Tudivasum* have large bulbous protoconchs and this is indicative of non-vagile mollusks with direct development, which have limited connectivity, and conditions that are conducive to regional speciation processes, such as genetic drift. We hypothesize that the *Tudivasum* contained within this paper have evolved in a species flock or swarm in isolated coastal and offshore regions in the Solanderian Molluscan Province as a consequence of distance and regional bathymetric effects on dispersal (Petuch and Berschauer 2020).

The northern portion of the Province, from the Torres Strait of northernmost Queensland, south to Yeppoon in southern Queensland is the Cairnsian Subprovince of the Solanderian Molluscan Province (Petuch and Berschauer 2020). Within this province along the coast,

from north to south, are the following *Tudivasum* species: *T. barbaracollinsae* (map labeled far northernmost), and *T. glendae* (map labeled northern), *T. amandacantamessae* (map labeled central); see Figure 2 for distribution maps of individual species. The southern portion of the Province from Yeppoon to Tweeds Head in northernmost New South Wales is the Moretonian Subprovince of the Solanderian Molluscan Province (Petuch & Berschauer. 2020). Within this province along the coast, from north to south, are the following *Tudivasum* species: *T. annettae* (map labeled coastal), *T. variabilis* (map labeled southern), and *T. armigerum* (map labeled far southern); see Figure 2 for distribution maps of individual species. The internal references to those portions of the Cairnsian Subprovince and the Moretonian Subprovince of the Solanderian Molluscan Province are not intended to name any new biogeographical regions but are merely listed herein for ease of reference to the individual species' distributions as shown on the maps in Figure 2.

Furthermore, this paper presents a rare example of a sinistral Vasidae, and possibly unique to the *Tudivasum* complex (see Plate 5, Figure D). Coiling direction is controlled and strongly bound by a single gene in some Mollusca (Abe and Kuroda 2019). This genetic factor is an example of delayed material inheritance meaning the animal's own coiling genotype may not be used to predict its coiling direction (Schilthuizen and Haase 2010). In some complexes such as *Amphidromus* the species may exhibit chirality in similar numbers (Schilthuizen and van Heuven 2011). However, the sinistral example of *T. annettae* is considered to be a rare mutation.

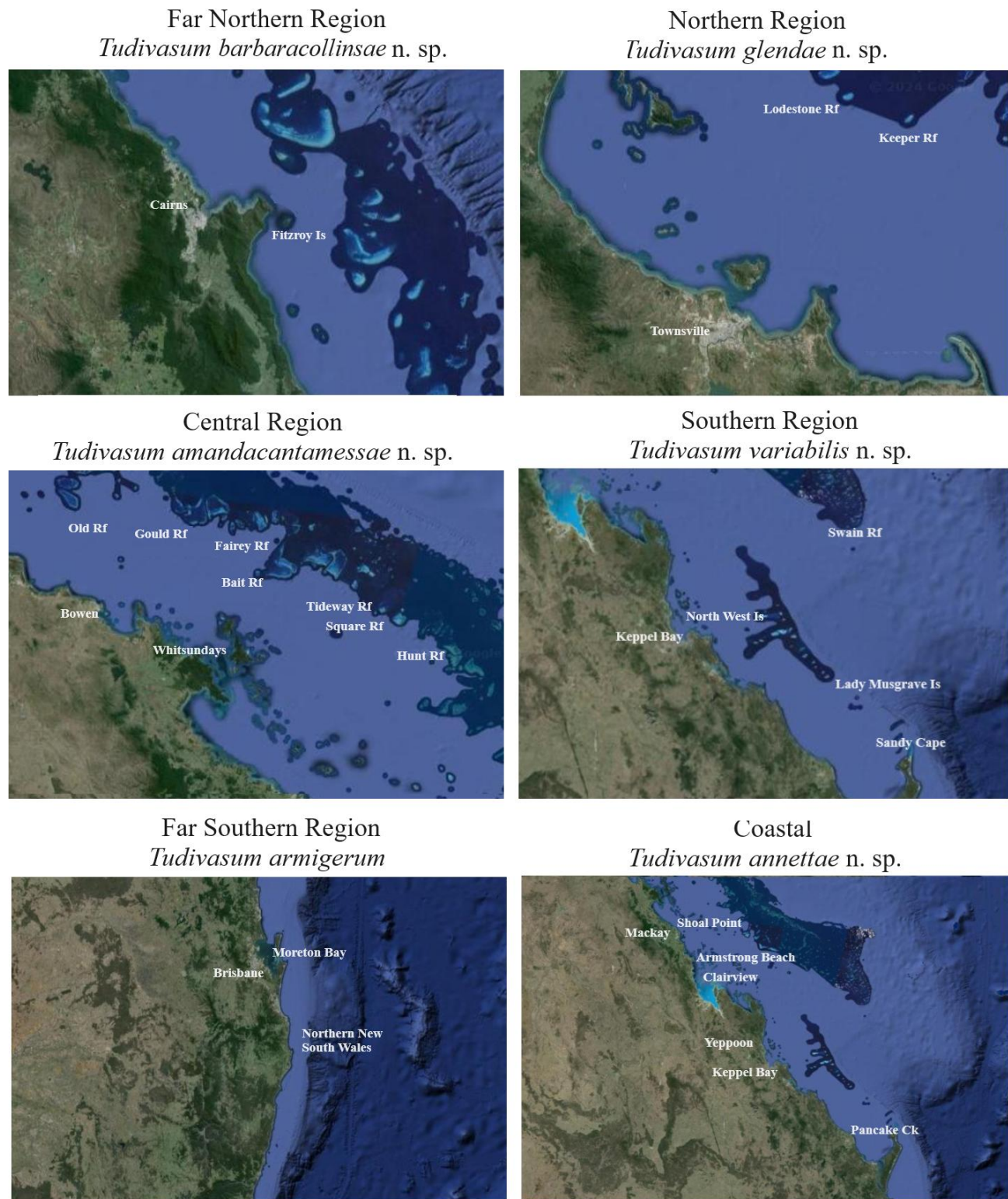


Figure 2. The locations of examined material of the Queensland larger *Tudivasum* and the generalized and trawler regions of operation.

CONCLUSION

This paper used biogeographical and morphological differences to differentiate five new *Tudivasum* which have previously been aggregated within *T. armigerum*. This study also revealed the first example of an Australian sinistral *Tudivasum*. This study highlights the need to examine species with large distributions that have not undergone recent revision. Such revisions are expected to uncover more species that have remained buried within large complexes. Furthermore, this study highlights the importance of the citizen scientists and their private collections in Queensland that have been curated and added to for many decades, and it is important therefore, that these collections further be mined before they are broken up and scattered and sadly go the way of many previously.

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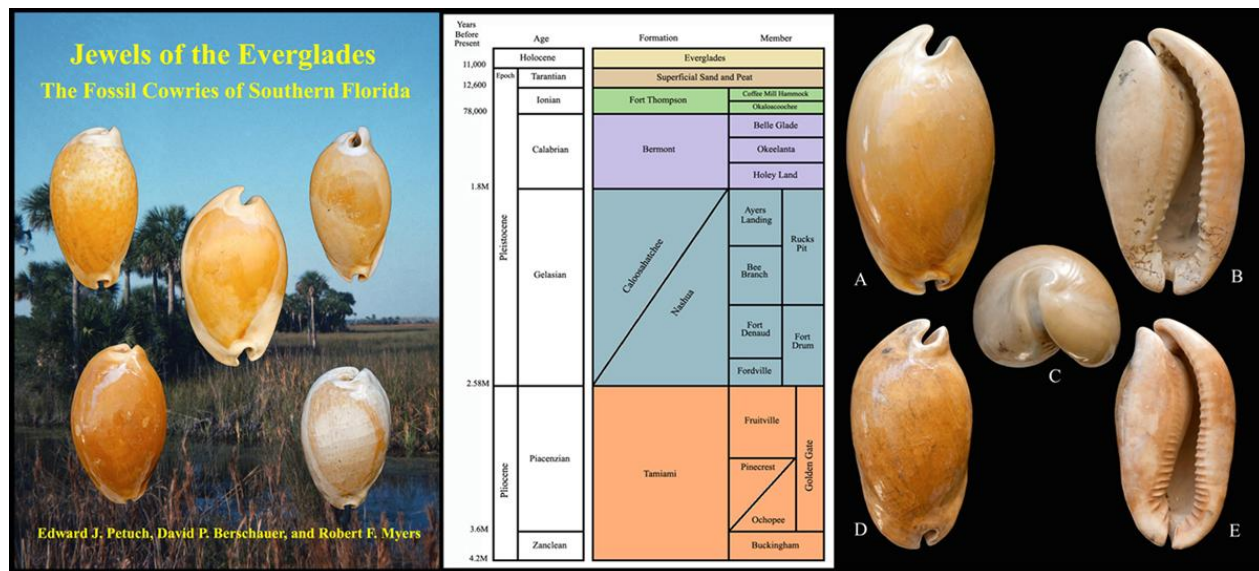
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Plate 1. Comparative images of Australian larger species of *Tudivasum*: **A**= *T. amandacantamessae* n. sp. Bait Reef, length 64.8 mm, Holotype (BSRF TC025); **B**= *T. annettae* n. sp. – Holotype Shoal Point, length 67.7 mm (BSRF TC026); **C**= *T. armigerum* (A. Adams, 1856) – Off northern NSW, length 87 mm (BCC); **D**= *T. barbaracollinsae* n. sp. off Fitzroy Island, length 71 mm, Holotype (BSRF TC027); **E**= *T. glendae* n. sp. trawled off Townsville, length 98 mm, Holotype (BSRF TC029); **F**= *T. kurtzi* (Abbott, 1959) Scott Reef, Western Australia, length 89 mm (VCC); **G**= *T. rasilistoma* (Macpherson, 1964) Moreton Bay, length 92 mm, (BCC); and **H**= *T. variabilis* n. sp. Trawled off Keppel Bay, length 53 mm, Holotype (BSRF TC029).

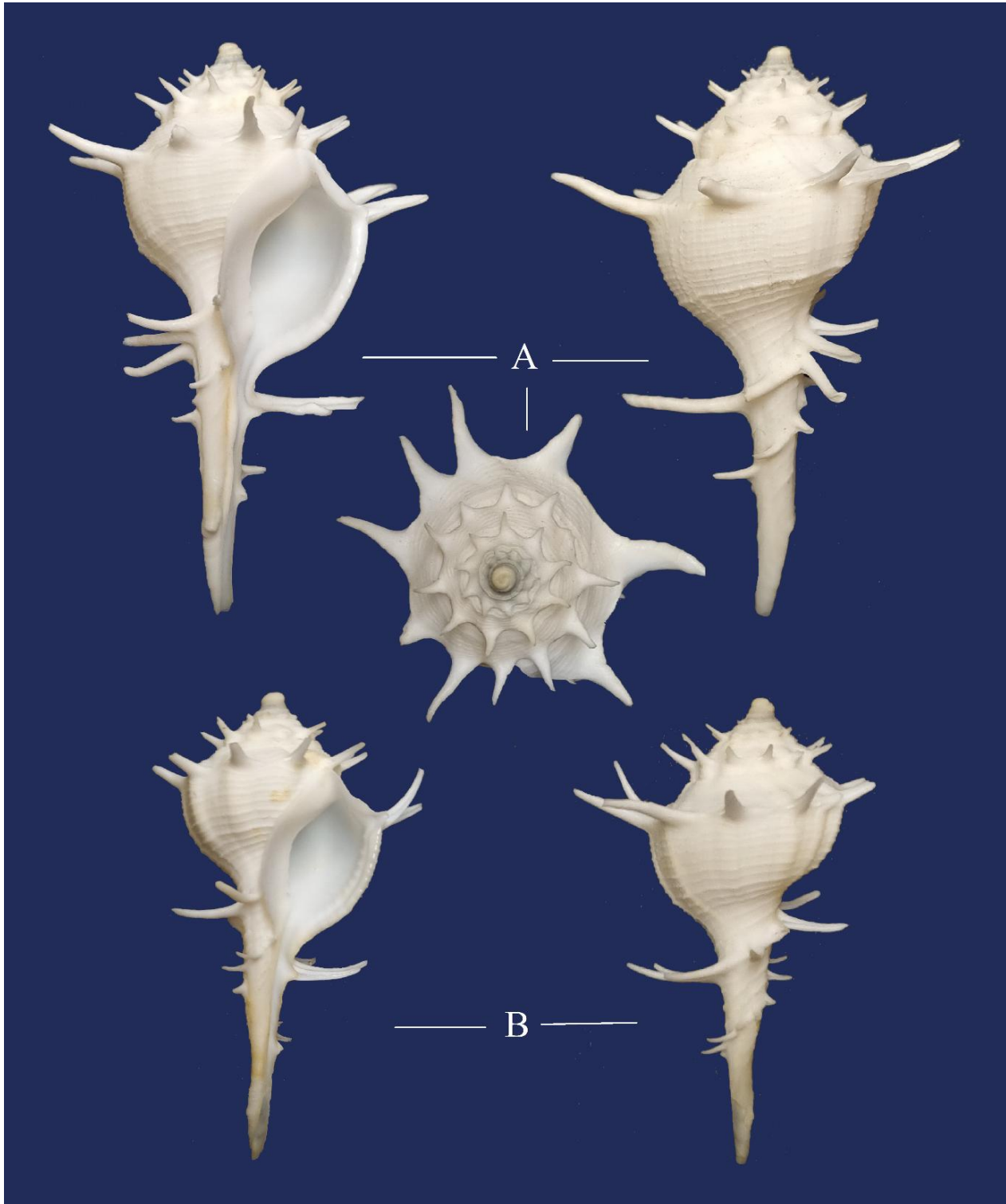


Plate 2. Type material of *Tudivasum amandacantamessae* n. sp. from Bait Reef, central Queensland: **A**= Paratype 1 – length 80 mm (VCC); and **B**= Holotype – Bait Reef, central Queensland: length 64.8 mm (BSRC TC025).

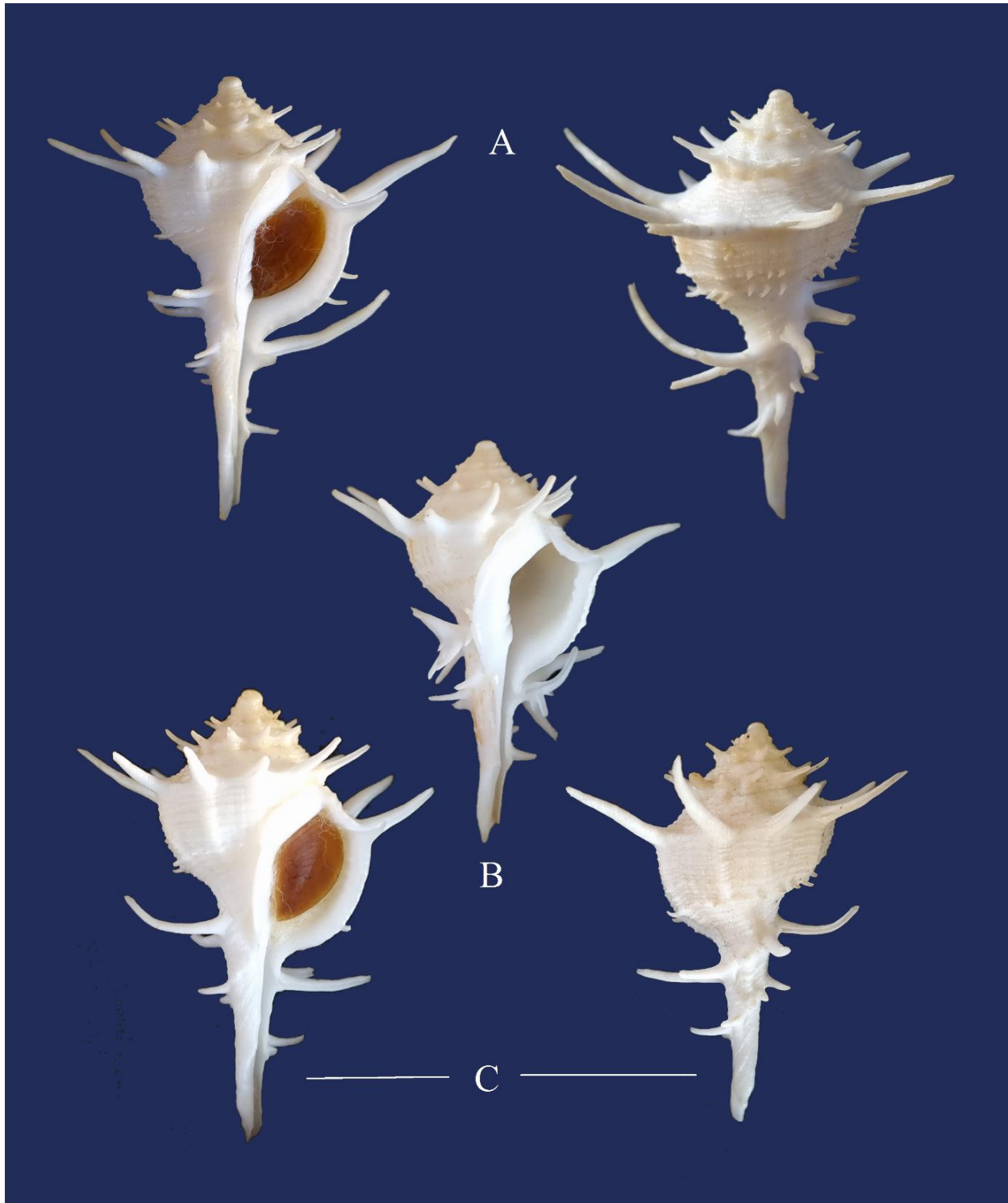


Plate 3. *Tudivasum amandacantamessae* n. sp: **A**= Paratype 2 - Trawled off Old Reef, length 65 mm (BCC); **B**= Trawled off Old Reef, length 65 mm (BCC); **C**= Paratype 3 - Trawled off Square Reef, length 68 mm (DBC) .

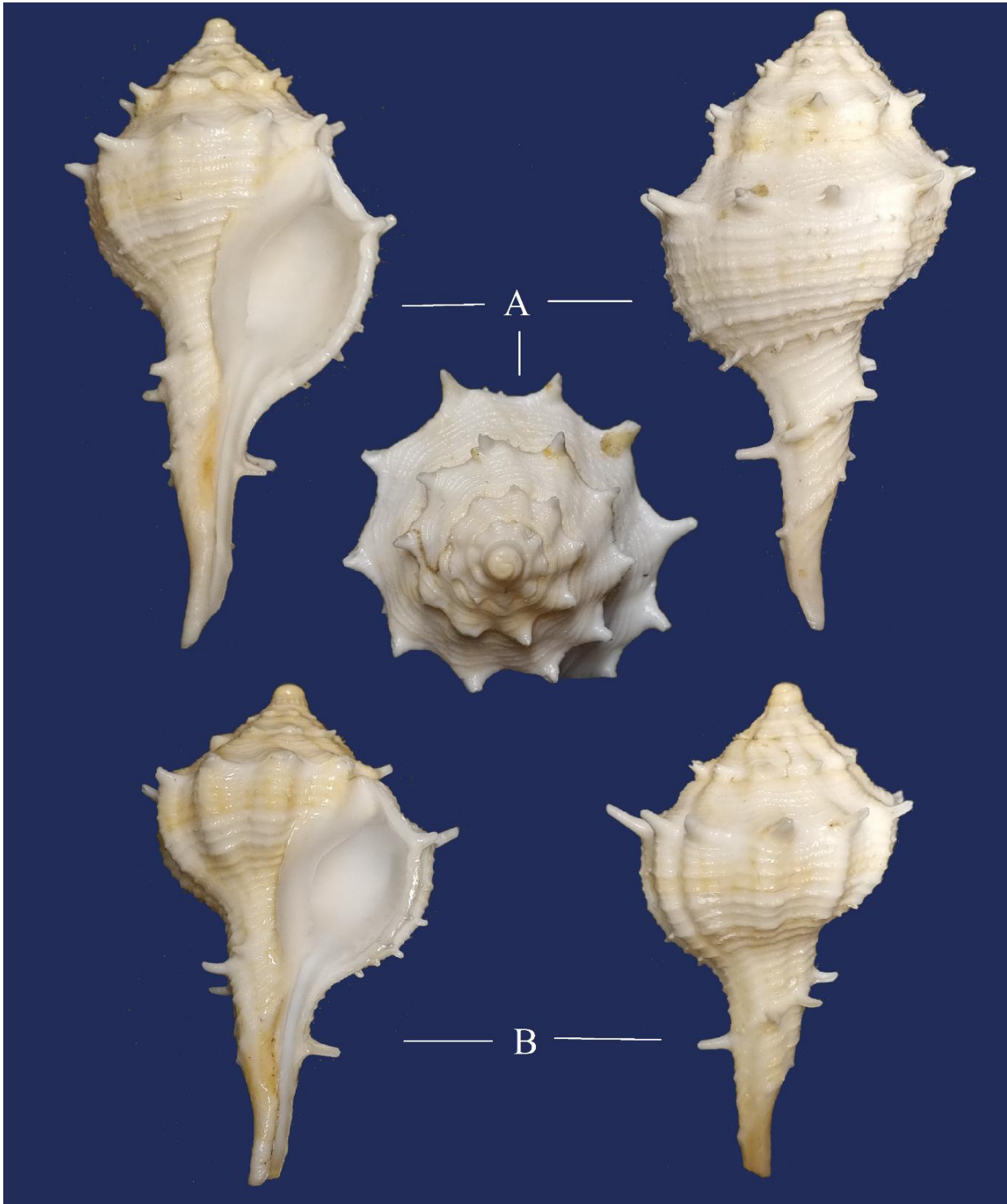


Plate 4. Type material of *Tudivasum annettae* n. sp. from Shoal Point, Central Queensland: A= holotype – length 67.7 mm (BSRF TC026); and B= Paratype 1 – length 47.9 mm (VCC).

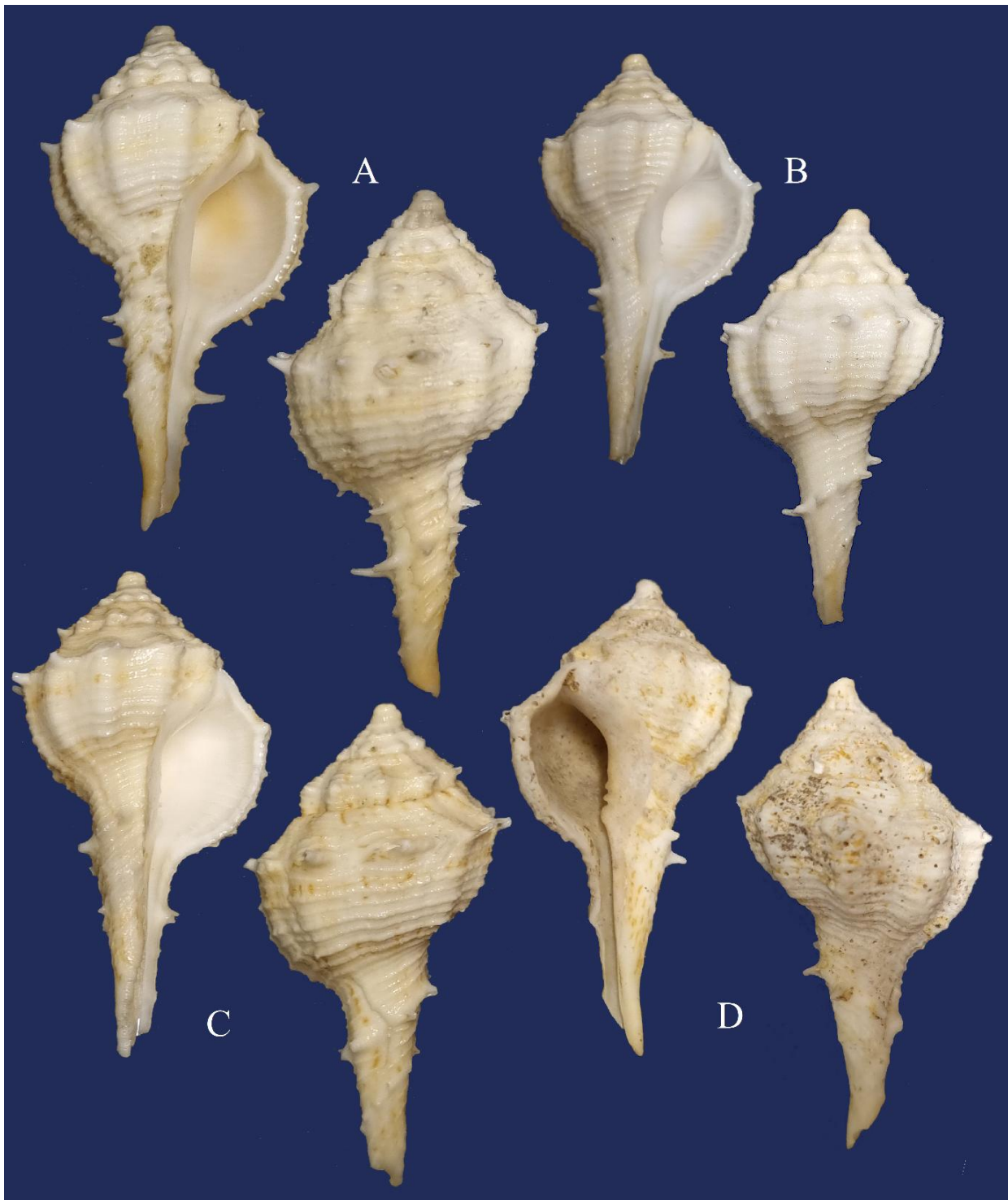


Plate 5. Type material of *Tudivasum annettae* n. sp. from Shoal Point, Central Queensland: **A**= Paratype 2 – length 58.5 (DBC); **B**= Paratype 3 – length 47.3 mm (VCC); **C**= Paratype 4 – length 55.2 mm (VCC); and **D**= a sinistral example from Armstrong Beach, Queensland, length 54 mm (VCC).

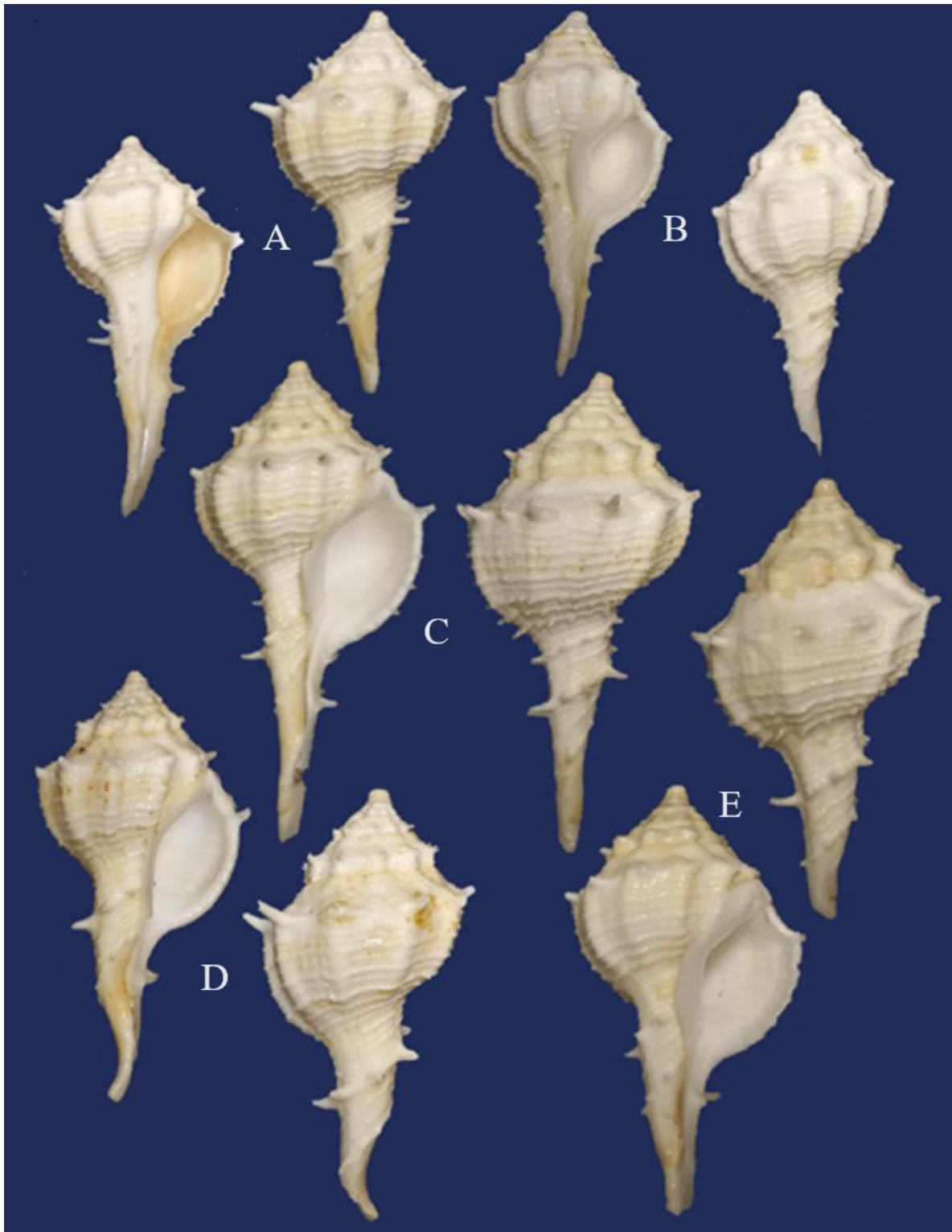


Plate 6. Type material of *Tudivasum annettae* n. sp. from Shoal Point, Central Queensland: **A**= Paratype 5 – length 58.3 mm (VCC); **B**= Paratype 6 – length 55.3 mm (VCC); **C**= Paratype 7 – length 72.7 mm (VCC); **D**= Paratype 8 – length 58.9 mm (VCC); **E**= Paratype 9 – length 63.4 mm (YZC).



Plate 7. Type holotype of *Tudivasum barbaracollinsae* n. sp trawled off Fitzroy Island, length 71 mm (BSRF TC027).

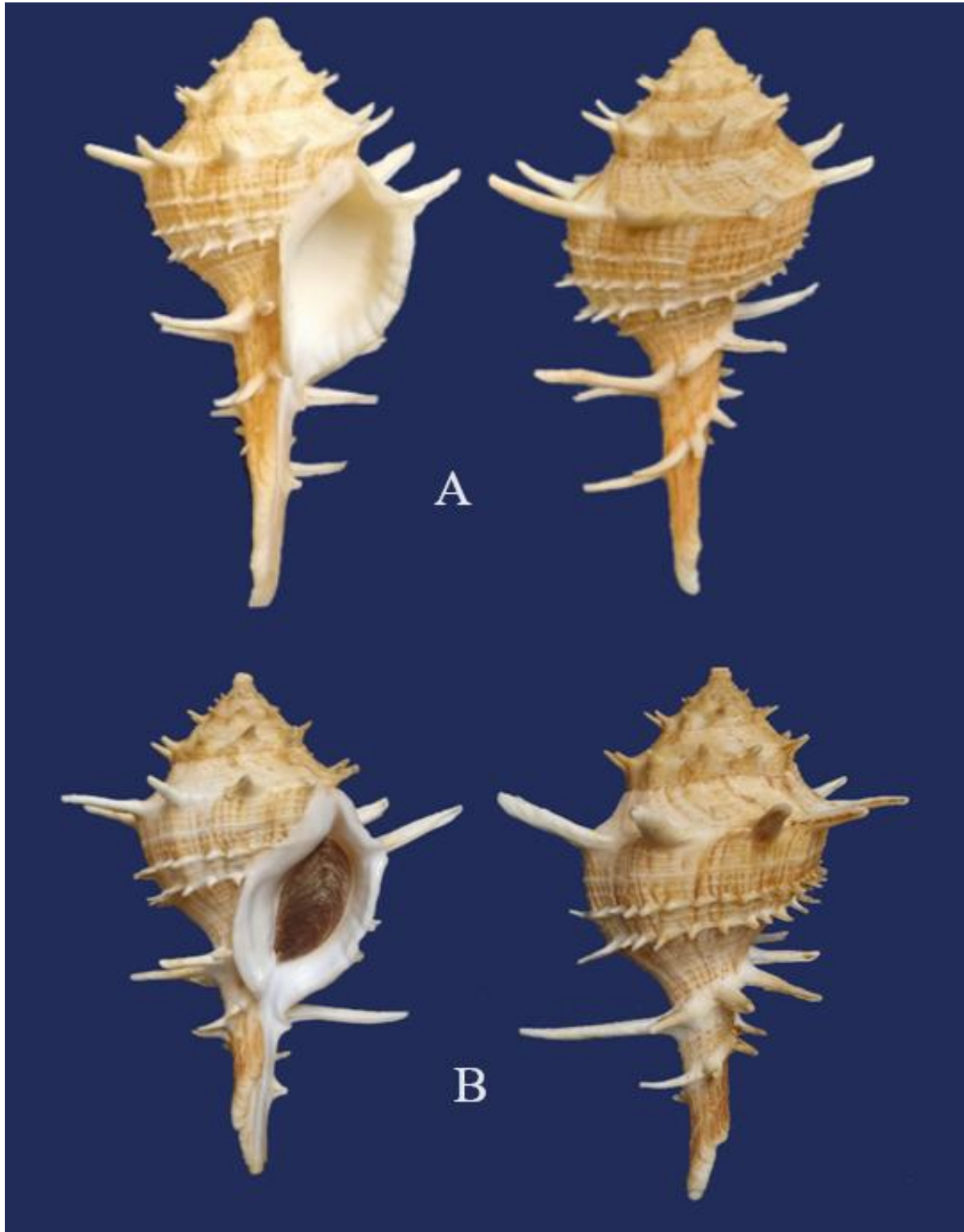


Plate 8. A comparative plate showing the variability of *T. glendae* n. sp.: A= Paratype 1 – Trawled off Townsville, length 83 mm (CTC); B= Paratype 2 – Trawled off Townsville, length 94 mm (CTC).



Plate 9. A comparative plate showing the variability of *T. glendae* n. sp.: A= Paratype 3 – Trawled off Townsville, length 85 mm (VCC); B= Paratype 4 – Trawled off Townsville, length 98 mm (CTC); C= Holotype – Trawled off Keeper Reef, length 98 mm (BSRF TC028); D= Paratype 5 – Trawled off Townsville, length 86 mm (VCC).

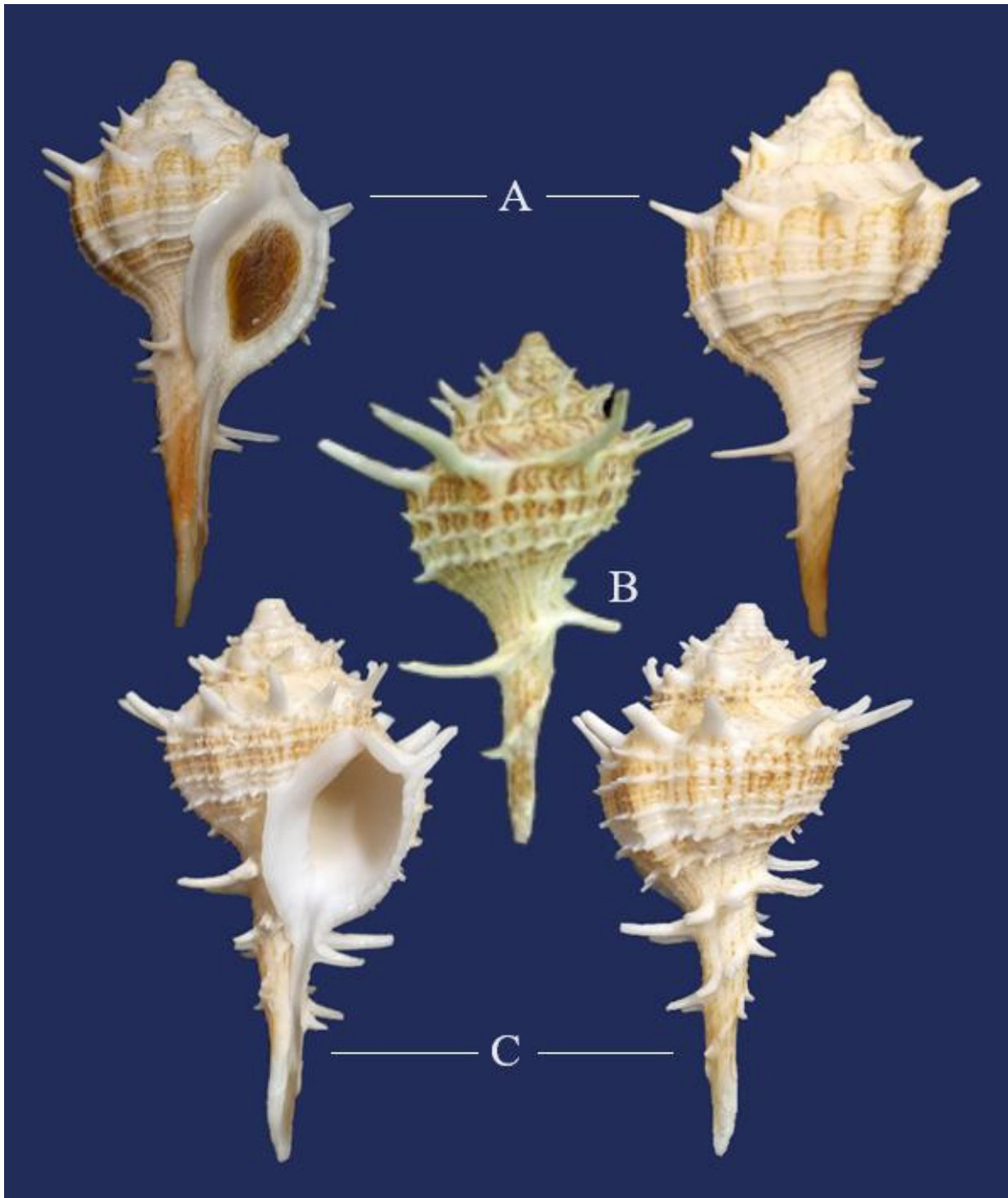


Plate 10. A comparative plate showing the variability of *T. variabilis* n. sp.: A= Trawled off Sandy Cape, Queensland, length 68 mm (BCC); B= Paratype 4 – Trawled of Keppel Bay, length 71 mm (AMD); C= Paratype 1 – Trawled Keppel Bay, length 67 mm (CTC).



Plate 11. A comparative plate showing the variability of *T. variabilis* n. sp.: A= Dredged 5-10m, Swain Reefs, length 62 mm (CTC); B= Paratype 2 – Trawled Keppel Bay, length 68 mm (VCC); C= Holotype – Trawled Keppel Bay, length 53 mm (BSRF TC029); D= Paratype 3 – Trawled Central Queensland (= off Yeppoon), length 63.6 mm (HDC); E= Paratype 5 – Trawled North West Island, Capricornia Cays, length 63 mm (AMD).