

New *Tudivasum* Rosenberg & Petit, 1987 (Mollusca: Vasidae) from the Coral Sea, Australia

Yao Zheng¹ & Stephen J. Maxwell²

¹ Junior Research Fellow, Blue Sky Research Foundation, Trinity Beach,
Cairns, Qld. 4789 Australia. Email: yz19454@gmail.com

² College Business Law and Governance, James Cook University, Cairns Qld 4870, Australia.
Corresponding author: stephen.maxwell@my.jcu.edu.au

ABSTRACT A new *Tudivasum* endemic to the Saumarez Reef system of the Queensland coast is described. *Tudivasum gracelumwanae* is a shallow water lagoon and reef dwelling mollusc that can be differentiated from others within that genus by its golden-coloured aperture and distinctively flared posterior columella. The species is described based on morphological differences and compared to others in the genus, both in terms of their morphology and distributions. The recognition of this new species further enables an understanding of the relationships between other *Tudivasum* species to be explored with reference points for the known biographically and morphologically distinctive taxa.

KEYWORDS Biogeography, Coral Sea, Queensland, Mollusca, *Tudicula*, *Tudivasum*, *T. gracelumwanae*, Vasidae

INTRODUCTION

Recent studies into the biodiversity of Queensland coral reef systems in terms of Mollusca have demonstrably been understated and in need of significant review across all taxonomic groups (Maxwell & Berschauer 2023; Maxwell *et al.* 2024). This is particularly the case as most taxa that have been observed have migrated after retreating during glacial fluctuations. This has meant that most of the taxa that have been observed on the inside of the reef system, and on the reef itself, are of a recent migration less than < 5000 years. Consequently, it is important to understand that many Molluscan complexes are actively diverging within distinct bioregions (Petuch & Berschauer, 2021; Maxwell & Berschauer 2023; Maxwell *et al.* 2024).

Australian Vasidae have undergone a major taxonomic revisions, particularly the *Altivasum* (Dekkers & Maxwell 2018; Maxwell & Dekkers 2019; Cooper & Maxwell 2020) and

Tudivasum (Maxwell *et al.* 2024). These revisions have created a new understanding of the diversity within each of those taxonomic complexes and erected a framework upon which a comprehension of the evolutionary progression of each group can be advanced. This study introduces a new *Tudivasum* taxon, which is both biographically isolated from the mainland species and has distinctive morphology.

METHODS

The material used in this study was drawn from private citizen science collections. The material is believed to have been collected on a single trip to Saumarez Reefs led by the Coucom's on the boat "Coralita" in 1975 (AFC). Labels noting John Boyle and Sian Houghton as the source for the material at hand (VCC). The source information was not with the holotype.

The systematics of the *Tudivasum* were dealt with in Maxwell *et al.* (2024), and further

information is contained within that paper, including a description of all then-known Australian *Tudivasum*. The new species was differentiated based on distribution data and morphology, with the use of species rank reflecting observable differences (Maxwell *et al.* 2021).

While genetic testing would enable the testing of the cladistic structure within *Tudivasum*, this is outside the funding scope of this project.

Abbreviations:

AFC	Ashley Field Collection, Smithfield, Qld, Australia
BCC	Barbara Collins Collection, Machans Beach, Qld, Australia.
BSRF	BlueSky Research Foundation Collection, Yorkeys Knob, Qld, Australia
VCC	Valda Cantamessa Collection, Proserpine, Qld, Australia

SYSTEMATIC PART

Class	Gastropoda Cuvier, 1795
Order	Neogastropoda Wenz, 1938
Superfamily	Turbinelloidea Swainson, 1835
Family	Vasidae Adams & Adams, 1853

Tudivasum Rosenberg & Petit, 1987

Type species. *Tudicula armigerum* A. Adams, 1856.

Original Description. “*T. testa turbinatofusiformi, epidermide fulvicante induta, spiraobtusiuscula, apice mamillato; anfractibusplanis, in medio serie spinarum ornatis, spinustubulosis, regularibus, subrecurvatis, liristransversis, elevatis, squamulis, aculeatisinstructis, et interstitiis lineis elevatissimplicibus; anfractu ultimo serie secondospinarum ad partem anticam ornato; aperturaovali, intus alba, columella triplicata,*

canalirecto product; labro intus lirato” (Adams 1856, p. 221).

Tudivasum gracelumwanae Zheng & Maxwell, new species
(Plate 1 and 2)

Description. Shell typically under 80 mm; protoconch bulbous comprising two whorls, white and unornamented; teleoconch with strong axial ridges that form short spines at the shoulder, suture distinctive located below the row of spines and creating a moderate ramp to the shoulder; body whorl structured with fine spiral striae the largest of which are on the sutural ramp and mid-body, where the three largest the mid-body spiral striae may bear short prickles, shoulder with approximately eight distinctive sharp triangular spines that are slightly angled towards the spire; aperture with three distinctive columella plaits anteriorly and flared posteriorly; outer lip thickened, lip margin with is slightly reflected dorsally forming a thin edge, margin with dent at the shoulder and internally with approximately ten well-formed straight lirae that form below the shoulder and do not reach the outer lip margin, where the shoulder meets the aperture there is a distinctive depression in the lip, posterior sinus shallow rising to the shoulder of the shell, inner margin white with a deep golden colour internally; anterior canal approximately half the length of the shell, straight with two spiral rows of spines, anterior row being shorter; external colour white with brown flecks.

Type Material. Type material of *Tudivasum gracelumwanae* dredged in the lagoons of the Saumarez Reef system: Holotype, length 65 mm (BSRF 0012); Paratype 1, length 72.5 mm (AFC); Paratype 2, length 72 mm (VCC); Paratype 3, length 76.5 mm (AFC).

Type Location. At present, *T. gracelumwanae*, is restricted to the lagoons and the intertidal

reef flat of the Saumerez Reef system, Australia, Coral Sea.

Etymology. Posthumously named for Mrs. Grace Lumwan of Proserpine and Bowen, one of the most significant influences, and who ignited the second author's passion for shells. A tireless worker in the Port Denion (Bowen), Proserpine, Mackay, Yeppoon and Townsville Shells Clubs.

DISCUSSION AND COMPARATIVE REMARKS

At present, the yellow aperture is restricted to *T. gracelumwanae*, with no coloured examples in other *Tudivasum* taxa known to the authors. The columella of *T. gracelumwanae* is posteriorly flared, which is not found in other *Tudivasum* taxa that have a uniform width of the columella.

Morphologically, there are similarities between the shallow lagoon and reef system complex of *Tudivasum* that share similar depth preference to *T. gracelumwanae*. This includes coastal muddy and sand reef systems of central Queensland, that is *T. annettae* Maxwell, Zheng & Berschauer, 2024, and the shallow water and reef dwelling *T. barbaracollinsae* Maxwell, Zheng & Berschauer, 2024: short spines and robust axial ridges not as long or elegant in form as the other species in the complex with longer narrower anterior canals. Since Maxwell *et al.* (2024), a number of photographs have emerged showing *live T. barbaracollinsae* on the reefs near Cairns, Vlassoff and Sudbury, as well as a juvenile from Tongue Reef, which conformed to the description for that species (Plate 2). While similar in basic form to the shallow-water *Tudivasum* species, the deep water *Tudivasum amandacantamessae* Maxwell, Zheng & Berschauer, 2024, is not dissimilar to the new species. *Tudivasum amandacantamessae* shares the robustness of its axial ridges with *T.*

gracelumwanae; however, it differs in the substantive form, being more delicately and longer spined and a more lollypop-like shape (Plate 2).

Tudivasum gracelumwanae differs from the deeper water *T. glendae* Maxwell, Zheng & Berschauer, 2024 and *T. variabilis* Maxwell, Zheng & Berschauer, 2024: being less spinose and smaller than *T. glendae*, while in body whorl to rostrum length and lack of spines more akin to *T. variable*, but it lacks the spines of that species. The Western Australian *T. kurtzi* (Abbott, 1959), and southeastern Australian *T. armigerum* (A. Adams, 1856), are both more fusiform and spinose than to *T. gracelumwanae*.

CONCLUSION

We present a new species of *Tudivasum* from the coral atolls of the Queensland coast. This study highlights the importance of re-examining our current understanding of many of the neglected taxonomic groups in Australian waters. As more collections are opened, it is expected that much of what is known about many complexes will be revealed to be inadequate to understanding the diversity evolutionary progression of the organisms that surrounds us.

ACKNOWLEDGMENTS

Thanks go to Valda Cantamessa and Dr. Ashley Field for access to material that enabled this study to proceed, and the authors acknowledge the difficulty in acquiring these specimens, as well as information on original data you have provided to the authors. We thank Trevor and Marguerite Young, thanks for your keen eye for our many errors and advice on improving the paper, which is treasured.

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ADDITIONAL READING MATERIAL

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Cite as:

Zheng, A. & S.J. Maxwell. 2025. New *Tudivasum* Rosenberg & Petit, 1987 (Mollusca: Vasidae) from the Coral Sea, Australia. *The Festivus* 57(3):171-176.
<http://doi:10.54173/F573171>



Plate 1. Type material of *Tudivasum gracelumwanae* dredged in the lagoons of the Saumarez Reef system: **A**= Holotype, length 65 mm (BSRF 0012); **B**= Paratype 1, length 72.5 mm (AFC); **C**= Paratype 2, length 72 mm (VCC); **D** – Paratype 3, length 76.5 mm (AFC).

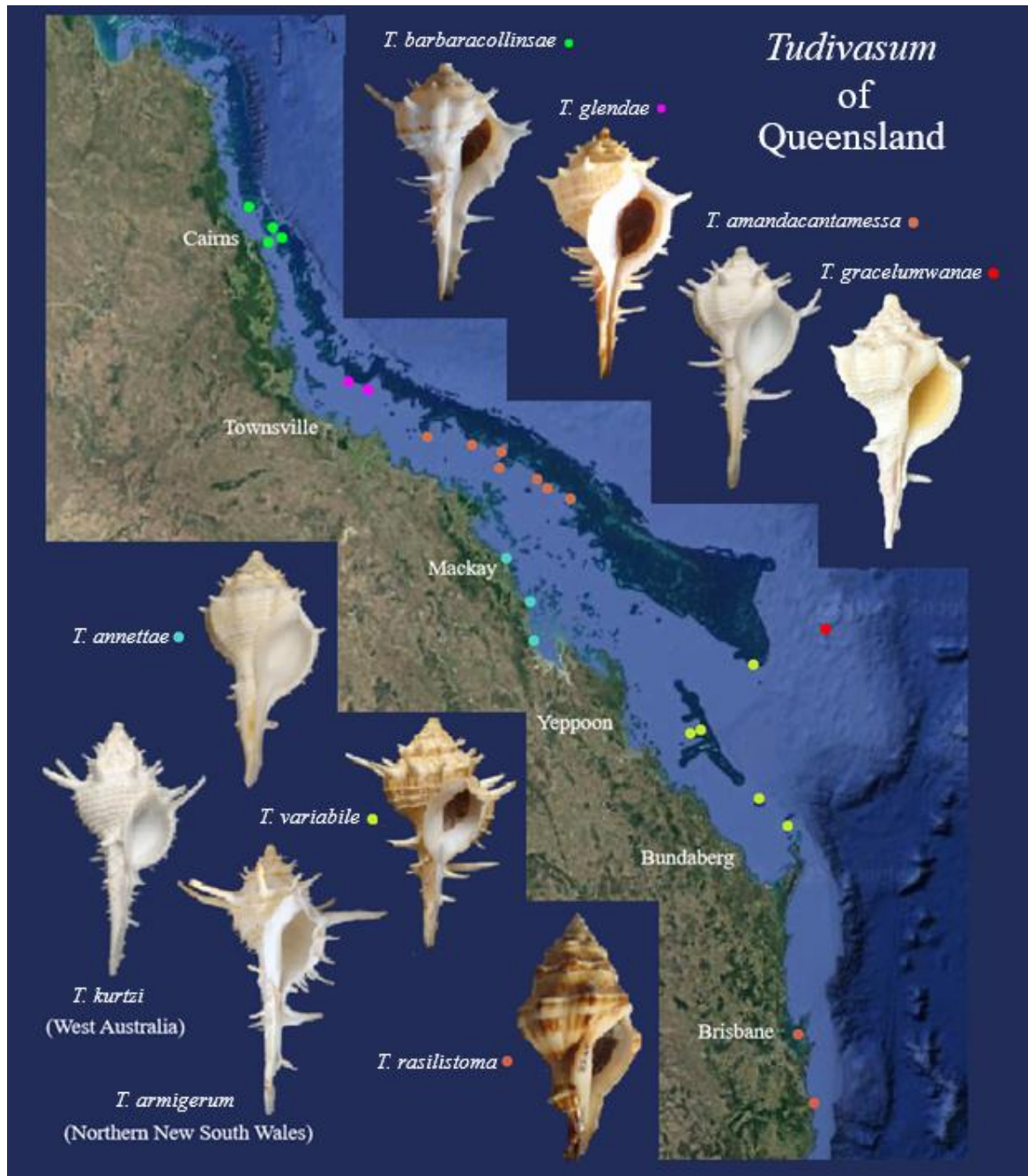


Plate 2. *Tudivasum* of Central Queensland showing main population centres and the type locations for the described species and comparing those found outside that region with the new species: *T. gracelumwanae* n. sp., *T. amandacantamessa* Maxwell, Zheng & Berschauer, 2024, Bait Reef, length 64.8mm, Holotype (BSRF TC025); *T. annettae* Maxwell, Zheng & Berschauer, 2024, Shoal Point, length 67.7 mm, Holotype (BSRF TC026); *T. armigerum* (A. Adams, 1856), Off northern NSW, length 87 mm (BCC); *T. barbaracollinsae* Maxwell, Zheng & Berschauer, 2024, off Fitzroy Island, length 71 mm, Holotype (BSRF TC027); *T. glendae* Maxwell, Zheng & Berschauer, 2024, trawled off Townsville, length 98 mm, Holotype (BSRF TC029); *T. kurtzi* (Abbott, 1959), Scott Reef, Western Australia, length 89 mm (VCC); *T. rasilistoma* (Macpherson, 1964), Moreton Bay, length 92 mm, (BCC); *T. variabile* Maxwell, Zheng & Berschauer, 2024, Trawled off Keppel Bay, length 53 mm, Holotype (BSRF TC029).