

A new *Columbarium* von Martens 1881 (Columbariidae) from Queensland with notes on modern taxonomic practice

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 This paper presents a new species of deepwater Queensland *Columbarium*. *Columbarium ashleyfieldi* n sp. differs from its southern sister species *C. spinicinctum* and *C. caragarang* in morphology and range. *Columbarium ashleyfieldi* is known from a few specimens taken during trial trawling activities for commercial and research purposes. The known range is now closed to fishing activity. Given the rarity of the *Columbarium*, more work is needed to understand distributions within ranges. Along with others in the *Columbarium* complex, *C. ashleyfieldi* remains an enigma.

KEYWORDS *Columbarium*, *C. ashleyfieldi*, *C. spinicinctum*, *C. caragarang*, new species, Queensland, Trawling, Taxonomy

INTRODUCTION

The deeper waters off the Queensland coast have rapidly become a focus for molluscan research, with a growing awareness of the extent of the undescribed faunistic diversity within private citizen scientist collections (Maxwell *et al.* 2024). This is pertinent as the modern species synthesis is used to determine the rationale for describing an organism. The theoretical underpinning of description decision-making can have significant impacts on how we conceive the biodiversity that surrounds us (Maxwell *et al.* 2020a). Concerning specifically the description of a new species it is only the actual characteristics that are physically observed that are applicable in the description. The rush to utilize the information gained from molecular work to describe organism clusters has resulted in genetically cryptic species and the problem of no unique morphological identity. This is prohibiting the effective determination of description of the organisms and therefore, adds to a lack of applied taxonomic clarity on

species uniqueness for future research: a conundrum that was theoretically dealt with in Maxwell *et al.* (2021). Under the classical Linnean system, genetics have no role in the actual species description of taxa, the evidence merely assists in the subjective discrimination of morphological characteristics into recognizable sets or patterns.

The genus *Columbarium* Martens 1881 comprises deep water and continental shelf taxa, with Eastern Australia, New Zealand and South Africa accounting for most of the taxa (Garrard 1966; Darragh 1969) and in work by the American worker Harasewych (1983a, 1983b).

Abbreviations:

AFC	Ashley Field Collection, Smithfield, Queensland.
BSRF	BlueSky Research Foundation, Cairns, Queensland.
YZC	Yao Zheng Collection, Perth, Western Australia.
exUWC	ex Uwe Weinreich Collection.

METHODS

Material for this study was obtained from citizen scientist collections. Anecdotal evidence indicates that most of the material was obtained during the Pith Reef trial trawls late last century; these trawls have not been repeated and still provide a wide array material that gives rise to new species (Maxwell & Berschauer 2023; Maxwell *et al.* 2024). Genetic testing was possible, but due to a lack of funding was not achievable by the authors.

The *Columbarium* described herein was compared to the morphology of other members of the genus, in addition, its biogeographical location was used as a consideration in the rationale for description. The higher clades are Linnean and remain undefined in phylogenetic nomenclature.

SYSTEMATIC PART

Class	Gastropoda Cuvier, 1795
Order	Neogastropoda Wenz, 1938
Superfamily	Turbinelloidea Swainson, 1835
Family	Columbariidae Tomlin, 1821
Genus	<i>Columbarium</i> Martens 1881

Columbarium ashleyfieldi Zheng & Maxwell,
new species

(Plate 1 Figures A-F; Plate 2 Figure A;
Plate 3 Figure A)

Description. Shell medium-sized, elongated with an extended siphonal canal; the protoconch is bulbous, smooth with the first post-nuclear whorl without ornamentation; the second whorl becoming angulate at the shoulder topped by distinctive compressed triangulate spines; the mid-teleoconch is characterized by the development of short sharp spines above the suture; the body whorl has the continuation of the acute shoulder and

compressed spines, with the addition of two rows of sculpture on the otherwise smooth mid-body whorl; the first row below the shoulder and is a continuation of the line of subsutural ornamentation of the teleoconch, the second row is small formed by micronodules being chord like, raised and quite acute; there are up to six short needle-like spines on the smooth closed rostrum, which may be slightly recurved; the aperture is obovate with the columella being raised away from the body whorl and glossy.

Type Material. As shown on Plate 1, the type specimens are: A= Holotype - Hydrographers Passage, trawled 180-220 m, 80.0 mm (BSRF TC006); B= Paratype 1 - Hydrographers Passage, trawled 180-220 m, 50.0 mm (YZC); C= Paratype 2 - Trawled off Pith Reef, the northern part of the known range, 90.0 mm (YZC); D= Paratype 3 - the southern part of the known range, 71.0 mm (AFC); E=, Paratype 4 - 88.5 mm (AFC); F=, Paratype 5 - 62.0 mm (AFC); Paratype 6 - Hydrographers Passage, trawled 180-220 m, 92.0 mm (AFC); Paratype 7 - Hydrographers Passage, trawled 180-220 m, 100.0 mm (AFC); Paratype 8 - Hydrographers Passage, trawled 180-220 m, 86.5 m..

Type Location. Known from the area surrounding Pith Reef and Hydrographers Passage, Queensland.

Etymology. Named after Dr. Ashley Field, Smithfield, Cairns for bringing this new species to the authors' attention.

Comparative Remarks. The protoconch of those specimens from Pith Reef are somewhat larger than the Hydrographers Passage specimens at hand; the shells are robust in general. We recognise there are two similar species: the first, *Columbarium caragarang* Garrard, 1966 is found towards the coast in the Capricorn channel complex; and the second, the more southerly *C. spinicinatum* (Martens,

1881) from the region of Southeastern Queensland.

Columbarium ashleyfieldi with its needle-like rostrum spines differs from *C. caragarang* in the form possessing numerous raised sharp micronodules. The less developed and sparser spines on the rostrum of *C. spinicinctum* differentiate it from the *C. ashleyfieldi*, as does the number and form of the shoulder spines. Darragh (1969) synonymised *C. spinicinctum* and *C. caragarang*; however, our interpretation is that these are two distinct species, and not indicative of sexual dimorphism given the northern extent of the distribution of *C. caragarang* without *C. spinicinctum*.

DISCUSSION

The modern species synthesis frees the taxonomist from the bonds of one species conceptional approach, thus enabling the fullest exploration of information used to determine nature's diversity (Maxwell *et al.* 2020a). This information is then used to generate a rationale for an organism's distinctiveness within a framework of evolutionary change worthy of taxonomic recognition. A snapshot of evolution in time and place, this represents a singularity in nature. This has been demonstrated herein.

Furthermore, under the classical taxonomic system, there is a necessity for the declaration of the species type based on morphology, with a reference location that is amendable (Maxwell *et al.* 2020b); in contrast in the essentialist approach, the same space and time information is seen as a fixed point of reference along an evolutionary continuum, with defined characteristics from which taxonomic relationships at all levels are discerned (Maxwell *et al.* 2020a; 2020c). The species is defined only from its type location, and only that location, how we aggregate other

organisms with it is the criteria used by the taxonomist to describe the world more generally, with that species as the reference point for hypothesizing of the relationships between organisms.

Interestingly, both classical and phylogenetic nomenclature may contain congruent absolute ranks if consideration is given to type allocation in the classical methods and the allocation of that same taxa in the inclusivity of the clade theoretical construction; this has only recently been first successfully applied to molluscan taxonomy (Maxwell 2021a, 2021b; Maxwell & Rymer 2021). This descriptive congruence arguably defuses taxonomic wars on validity, particularly when dealing with code cultists and their disregard for the intellectual property value of nomenclature (Maxwell & Underdown 2022).

CONCLUSION

This paper presents *Columbarium ashleyfieldi* as a new species distinct in morphology and distribution from closely related sister taxa. This new species highlights the need for a new undertaking to investigate the benthic composition of these deep sea environments, much of which remains uncatalogued along the Australian coasts.

ACKNOWLEDGEMENTS

We thank Charlie Taylor of Mareeba, Australia, Dr. Ashley Field of Smithfield for the use of specimens illustrated in this paper. Trevor and Marguerite Young of Mt Barker, South Australia for kindly offering remarks.

LITERATURE CITED

Darragh, T. A. 1969. A revision of the family Columbariidae (Mollusca: Gastropoda). Proceedings of the Royal Society of Victoria

- 83(1):63-119, available online at <https://www.biodiversitylibrary.org/page/56624162> [details]
- Garrard, T. A. 1966.** New Mollusca from eastern Australia (part 2) with notes on some known species. *Journal of the Malacological Society of Australia* 1(10):3-12, 1 pl.
- Harasewych, M. G. 1983a.** A Review of the Columbariinae (Gastropoda: Turbinellidae) of the Western Atlantic With Notes on the Anatomy and Systematic Relationships of the Subfamily. *Nemouria* 27:1-42, (Occasional Papers of the Delaware Museum of Natural History).
- Harasewych, M.G. 1983b.** A New Species of *Columbarium* (Gastropoda: Muricacea) From Off Eastern Australia. *The Nautilus* 97(1):28-29.
- Martens, E. von. 1881.** [Description of marine Mollusca]. *Conchologische Mittheilungen als Fortsetzung der Novitates Conchologicae* 2(1):103–121, pls 21-24.
- Maxwell, S.J. 2021a.** Recognising and defining new crown clades in Stromboidea Rafinesque, 1815. *Bulletin of the Russian Far East Malacological Society* 25(1/2):9-16.
- Maxwell, S.J. 2021b.** Registration of Neostromboidae Clades in the RegNum of the PhyloCode and errata. *The Festivus* 53(3):192-209.
- Maxwell, S.J., & T.L. Rymer. 2021.** Are the ICZN and PhyloCode that incompatible? A summary of the shifts in Stromboidean taxonomy and the definition of two new subfamilies in Stromboidae (Mollusca, Neostromboidae). *The Festivus* 53(1):44-51.
- Maxwell, S.J., B.C. Congdon, & T.L. Rymer. 2020a.** Essentialistic Pluralism: The theory of Spatio-temporal positioning of species using integrated taxonomy. *Proceedings of the Royal Society of Queensland* 124:83-97.
- Maxwell, S.J., T.L. Rymer, B.C. Congdon, & A.M. Dekkers. 2020b.** Studies in *Canarium urceus* (Linné, 1758) Part 2: *Strombus anatellus* Duclou, 1844, *Strombus crassilabrum* Anton, 1839, *Strombus incisus* Wood, 1828 and *Strombus ustulatus* form *laevis* Dodge, 1946 (Neostromboidae: Strombidae). *The Festivus* 52(4):335-344.
- Maxwell, S.J., A.M. Dekkers, T.L. Rymer, & B.C. Congdon. 2020c.** Towards Resolving the American and West African Strombidae (Mollusca: Gastropoda: Neostromboidae) Using Integrated Taxonomy. *The Festivus* 52(1):3-38.
- Maxwell, S.J., & M.A. Underdown. 2022.** A potential intellectual property issue with the way in which some nomenclature code decisions are made, *The Journal of World Intellectual Property* 25(2):574-578.
- Maxwell, S.J., A.M. Dekkers, Y. Zheng & D.P. Berschauer. 2024.** New *Tudivasum* Rosenberg & Petit, 1987 (Mollusca: Vasiidae) from Queensland and the first report of sinistralism in that genus. *The Festivus* 56(2):101-122
- Maxwell, S.J. & D.P. Berschauer. 2023.** A Review of the *Relegamoria mollerii* complex (Gastropoda: Volutoidae: Volutidae) from the Solanderian Molluscan Province in Queensland, Australia. *The Festivus* 55(4):271-294
- Maxwell, S.J., T.L. Rymer, M.K. Rowell, L.-C. Hernandez Duran, D.P. Berschauer, M. Underdown, E.J. Petuch & A.M. Dekkers. 2021.** Defining and bringing relevance of meaning to species group-level taxa. *Proceedings of the Biological Society of Washington* 134:27-28.

Cite as:

Zheng, A. & S.J. Maxwell. 2025. A new *Columbarium* von Martens 1881 (Columbariidae) from Queensland with notes on modern taxonomic practice. *The Festivus* 57(3):150-156. <http://doi:10.54173/F573150>



Plate 1. Type material for *C. ashleyfieldi*: **A**= Holotype – Hydrographers Passage, trawled 180-220 m, 80 mm (BSRF TC006); **B**= Paratype 1 - Hydrographers Passage, trawled 180-220 m, 50 mm (YZC); **C**= Paratype 2 – Trawled off Pith Reef, the northern part of the known range, 90 mm (YZC); **D**= Paratype 3 – the southern part of the known range, 71.0 mm (AFC); **E**= Paratype 4 – 88.5 mm (AFC); **F**= Paratype 5 – 62.0 mm (AFC).

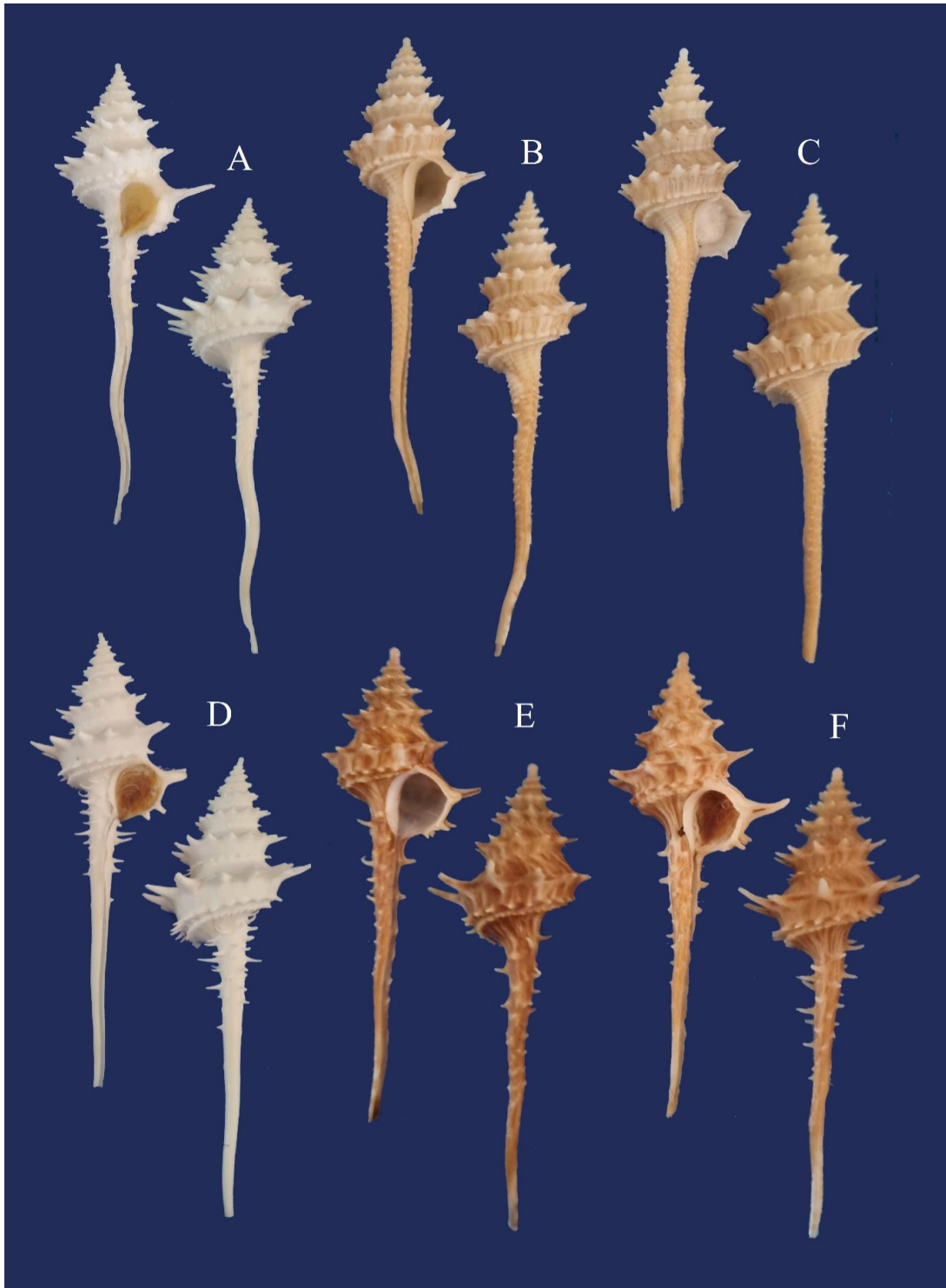


Plate 2. A comparison of *Columbarium ashleyfieldi*, *C. caragarang* and *C. spinicinctum* (von Martens, 1881): **A**= *C. ashleyfieldi* Hydrographers Passage, trawled 180-220 m, 92.0 mm, paratype 6 (AFC); **B**= *C. caragarang* Capricorn Cannel, Trawled, 70.5 mm (AFC); **C**= *C. caragarang* Capricorn Cannel, Trawled, 70.0 mm (AFC); **D**= *C. ashleyfieldi* Hydrographers Passage, Trawled 180-220 m 100.0 mm, paratype 7 (AFC); **E**= *C. spinicinctum* off Cape Moreton, Trawled 150 m, 63.5 mm (AFC); **F**= *C. spinicinctum* off Cape Moreton, Trawled 150 m, 60.0 mm (AFC).



Plate 3. A comparison of: **A=** *Columbarium ashleyfieldi*, Hydrographers Passage, trawled 180-220 m, 86.5 mm, paratype 7 (AFC); **B=** *Columbarium hystriculum* (Darragh, 1887), trawled off Townsville, 74 mm (exUWC); **C=** *oluzea distephanotis* (Melvill, 1891), trawled off the Swain Reefs, 84 mm (exUWC); **D=** *Columbarium harrisae* (Harasewych, 1983), trawled Lady Musgrave Island, 100 mm (exUWC); **E=** *Coluzea aapta* (Harasewych, 1986), Rowley Shoals, Western Australia, 62 mm (exUWC); **F=** *Columbarium pagodiodes* (Watson, 1882), trawled off Ulladulla, New South Wales 64 mm (exUWC).