

A New *Turricula* (Conoidea, Clavatulidae) from the Northwest Shelf of Western Australia

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ABSTRACT A new species of *Turricula* from the northwest continental shelf of Western Australia is described. *Turricula infida* Yao and Maxwell, nov. sp. can be differentiated from other *Turricula* by the sculpture of the upper whorls with its distinctive subsutural nodulations. This study indicates that further work is needed in *Turricula*.

KEYWORDS Continental shelf, Morphology, New Species, *Turricula*, *T. infida*, Western Australia

INTRODUCTION

Turricula Schumacher, 1817 is a relatively large genus with a long fossil record. Living species are typically deep-water taxa, and this makes them most difficult to obtain. Historically many species now incorporated into the *Turricula* were placed under the latter synonym *Surcula* Adams and Adams, 1853, and subgenera under *Clavatula* Lamarck, 1801. While there have been no new species described since the trio of Barnard (1958): *Turricula amplisulcus* (Barnard, 1958), *Turricula faurei* (Barnard, 1958), and *Turricula sulcicancellata* (Barnard, 1958), most work has centered on the higher taxonomic ordering (Shuto 1980; Bouchet *et al.* 2011). This study identifies a new species from the northwest continental shelf of Western Australia, a shell that had previously been combined with *Turricula tornatus* (Dillwyn 1817) complex by collectors. Further studies are needed into the *Turricula*, particularly considering the widely purported biogeographical distribution of some species, such as *Turricula tornatus* (Dillwyn 1817), and the length of time since the last major revision was undertaken.

METHODS

Specimens for this study were acquired from an old collection of deep water trawled material taken in the 1950's off the Northwest Coast of Western Australia. This species is recognized using morphology to distinguish it from other taxa. This study follows the higher taxonomic ordering within Conoidea Fleming, 1822 of Bouchet *et al.* (2011). The decision to use the rank of species or subspecies for taxa is based on Maxwell and Dekkers (2019) and Maxwell *et al.* (2021): the subspecies rank should be restricted to those taxa where there are no other forms of discrimination other than phenetic differences in genetic sequence.

SYSTEMATICS

Order	Prosobranchia Milne Edwards, 1848
Infraorder	Neogastropoda Wenz, 1938
Superfamily	Conoidea Fleming, 1822
Family	Clavatulidae Gray, 1853
Genus	<i>Turricula</i> Schumacher, 1817
Subgenus	<i>Nangilanica</i> Shuto, 1980

Turricula (Nangilanica) infida Zheng and Maxwell, nov. sp.
(Plates 1 and 2)

Description. Shell elongated, somewhat fusiform, fragile with strongly convex anterior, which forms long elongated rostrum; shell moderate in size, up to 70 mm; protoconch is smooth, bulboid, somewhat involute, translucent; spire 7-8 whorls, early whorls with distinctive nodulations on either side of suture, which becomes rounded; nodulations restricted to subsutural region with growth; later spiral whorls become smoothly shouldered, somewhat convexly rounded, with developing fine radial lines; pre-subsutural ramp is distinct with faint round nodules; sutures are distinct, somewhat incised; body whorls with finely incised radial lines over surface, becoming more distinct anteriorly, subsutural ramp with indistinct axial knobs; outer lip is thin, well rounded, with sinus at shoulder that form arch shape; outer lip joins below shoulder of body whorl; shell is coloured caramel, overlaid with fine tan axial lines, which follow growth form of aperture; aperture creamy white.

Type Material. Holotype - Deposited in the BlueSky Research Foundation Collection No. TC023, northwest Continental Shelf Western Australia (length 50.0 mm, width 16.3 mm). All paratypes are contained in the collection of Yao Zheng and are from the type location: Paratype 1 - 62.2 mm, width 21.0 mm; Paratype 2 - 55.5 mm, width 19.0 mm; Paratype 3 - 50.7 mm, width 19.0 mm; Paratype 4 - 59.3 mm, width 19 mm; Paratype 5 - 50.3 mm, width 12.8 mm.

Type Locality. Trawled from the northwest Continental Shelf of Western Australia.

Etymology. From the Latin *infidus*: “to write faithlessly”; and is dedicated to Metis, *Μῆτις*, the goddess of overthinking, the daughter of Oceanus and Tethys, and the mother of creative ingenuity.

COMPARISON AND DISCUSSION

Most similar species to the new taxa are those that come from the northern Indian Ocean. In particular, *Turricula tornata* (Dillwyn 1817) lacks the spiral sculpture being “smooth” in contrast to the distinctive sculpture of the new species (Plates 3 and 4). As further material becomes available there is a strong possibility that there will be more species found currently buried within such species as *T. tornata*. The spire of *Turricula infida* is not smooth as with *Turricula fulminata* (Kiener, 1839) and its squatty form *Turricula fulminata* var. *gloriosa* (Melvill, 1917) (Plate 3). The new species is not as fusiform as *T. catena* (Reeve, 1843) or *T. navarchus* (Melvill and Standen, 1903), both coming from the northern Indian Ocean (Plate 5).

Turricula infida differs from its sympatric sister taxa, *Turricula granobalteus* (Hedley, 1922) and *Turricula nelliae* (Smith, 1877), located in northwest Western Australia, in lacking the strong shoulder ornamentation and body whorl sculpture of rows of small nodules of those species (Plate 5). The strong radially raised ridges of *Turricula amplisulcus* (Barnard, 1958) from South Africa and *Turricula Havana* (Linné, 1758) from the Indonesia and South China Sea and associated areas (Plate 5).

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Plate 1. The holotype of *Turricula infida* nov. sp. trawled off the Northwest Coast of Western Australia showing the upper and middle sculpture of the spire highlighting the subsutural nodulations, trawled off the Northwest shelf of Western Australia, BlueSky Research Foundation Collection No. TC023, (length 50.0 mm, width 16.3 mm).

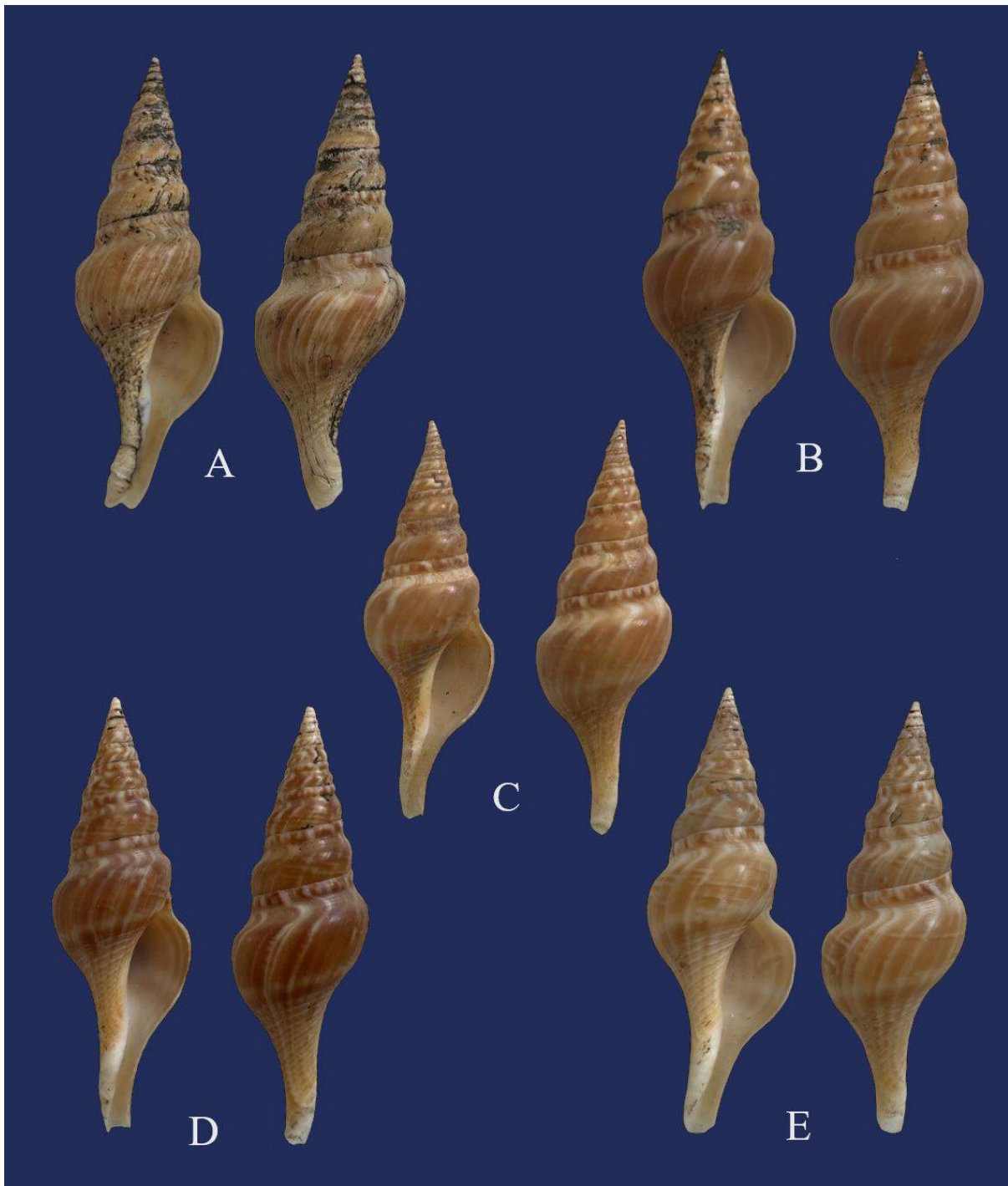


Plate 2. *Turricula infida* nov. sp. trawled off the Northwest shelf of Western Australia: **A**= Paratype 1 - 62.2 mm, width 21 mm, Yao Zheng Collection; **B**= Paratype 2 - 55.5 mm, width 19 mm, Yao Zheng Collection; **C**= Paratype 3 - 50.73mm, width 19 mm, Yao Zheng Collection; **D**= Paratype 4 - 59.3 mm, width 19 mm, Yao Zheng Collection; **E**= Paratype 5 - 50.25 mm, width 12.75 mm, Yao Zheng Collection.

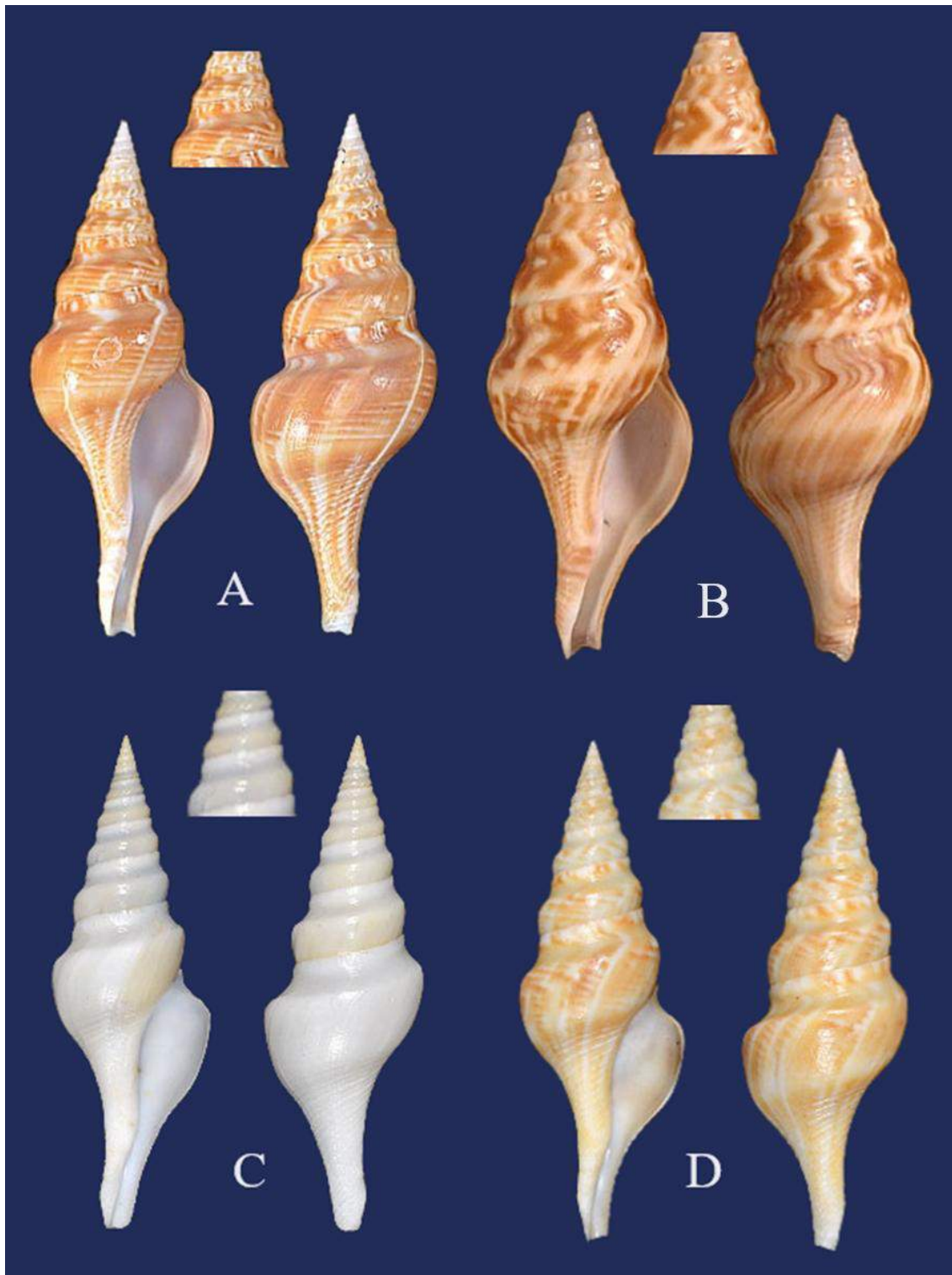


Plate 3. Comparative images of *Turricula* showing the sculpture: **A**= *T. fulminata* (Kiener, 1839), 63.0 mm, Ras Ha Run, Somalia (Femorale no. 97275); **B**= *T. fulminata* var. *gloriosa* (Melvill, 1917), 68.6 mm, Muscat, Oman (Femorale no. 148794); **C**= *T. tornata* var. *candida* (Menke, 1829), 68.0 mm, Konarak Iran (Femorale no. 289304); **D**= *T. tornata* (Dillwyn 1817), 61.0 mm, Konarak Iran (Femorale no. 289301).



Plate 4. Comparative images of *Turricula* showing the sculpture: **A**= *T. tornata* (Dillwyn 1817), 68.2 mm, Chennai, South India (Femorale no. 221717); **B**= *T. fulminata* var. *gloriosa* (Melvill, 1917), 46.6 mm, Chennai, South India (Femorale no. 144603); **C**= *cf. T. tornata* (Dillwyn 1817), 69.0 mm, Phuket Island, Thailand (Femorale no. 305335); **D**= *cf. T. tornata* (Dillwyn 1817), 82.0 mm, Phuket Island, Thailand (Femorale no. 49632).

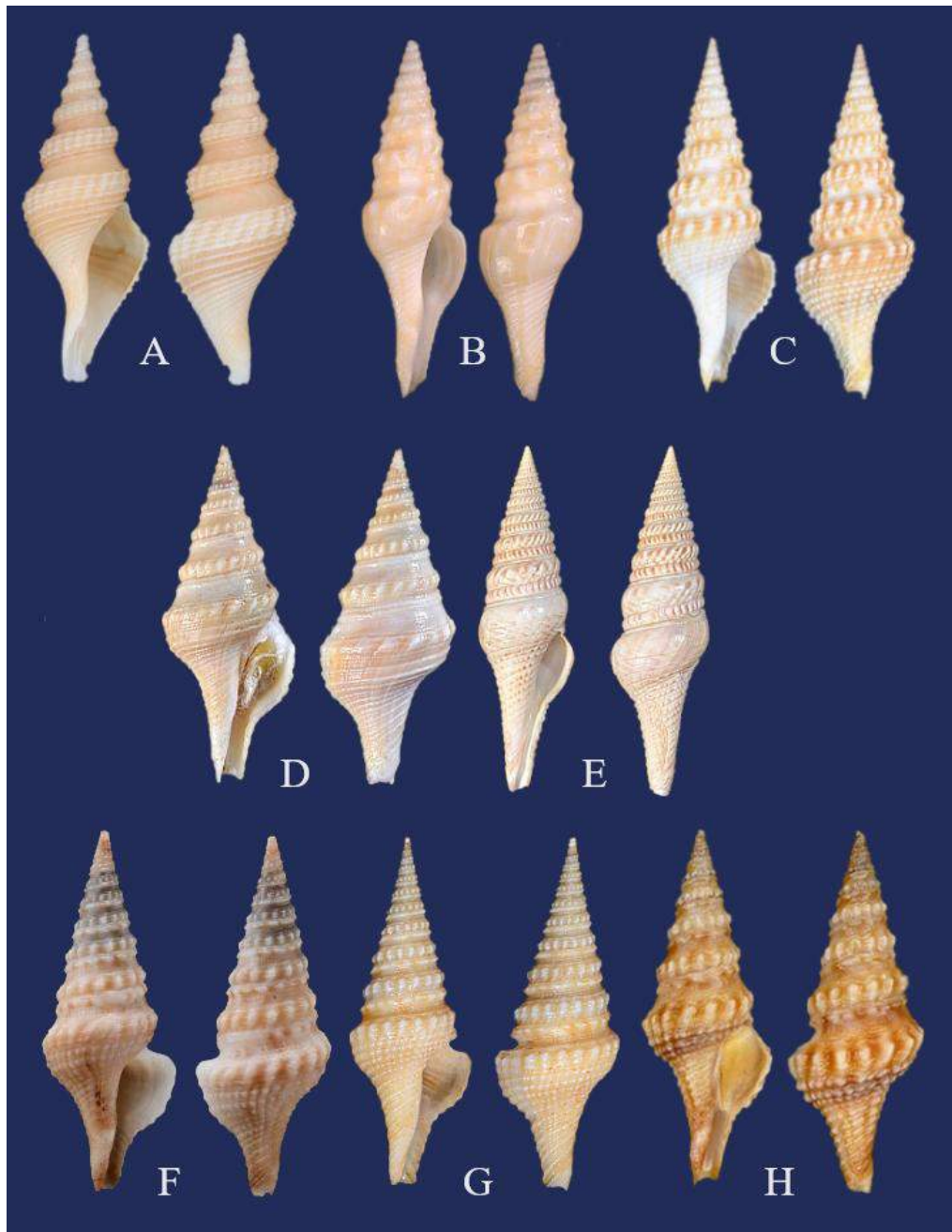


Plate 5. Comparative images of *Turricula*: **A**= *T. amplisulcus* (Barnard, 1958), 25.4 mm, Cape St Baize, South Africa (Femorale no. 210599); **B**= *T. catena* (Reeve, 1843), 45.9 mm, Al Masirah, Oman (Femorale no. 76072); **C**= *T. granobalteus* (Hedley, 1922), 33.4 mm, off Cape Moreton, Queensland (Femorale no. 310477); **D**= *T. javana* (Linnaeus, 1758), 36.3 mm, Jakarta Bay, Indonesia (Femorale no. 89688); **E**= *T. navarchus* (Melvill and Standen, 1903), 82.2 mm, off Fujairah, United Arab Emirates (Femorale no. 97286); **F**= *T. nelliae* (Smith, 1877), 23.8 mm, Cleaverville Beach, Karratha, Western Australia (Femorale no. 224143); **G**= *T. sethuramae* Vrendenberg, 1921, 25.0 mm, Langkawi, Malaysia (Femorale no. 264075); **H**= *T. spurius* (Hedley, 1922), 26.0 mm, Arafura Sea, Indonesia (Femorale no. 291284).