

Another Sundaland Relict *Cylinder* Species from Sumbawa Island, Indonesia

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ABSTRACT A new cone species, *Cylinder feliciae*, is described from the Saleh Gulf (Teluk Saleh) of Sumbawa, Nusa Tenggara Islands (Lesser Sunda Islands), Indonesia. The new species is morphologically similar to *Cylinder gloriamaris* (Chemnitz, 1777) from the southwestern Pacific and represents a geographically-isolated relict of a once widespread molluscan fauna that extended all along the coast of the Middle Pleistocene Sundaland Peninsula.

KEY WORDS Conidae, *Cylinder*, Indonesia, Lesser Sunda Islands, Sumbawa, Teluk Saleh

INTRODUCTION

The northern Lesser Sunda Islands of Indonesia, extending from Lombok Island to the Wetar Islands, constitute an “evolutionary hot spot” referred to as the Nusa Tenggara Infraprovince (Petuch and Berschauer, 2020: 190-191). This special area of increased speciation and evolution is one of the centers of biodiversity within the Indonesian Subprovince of the Indo-Malayan Molluscan Province and houses a large number of highly-restricted endemic species (Petuch and Berschauer, 2020: 203). Some of these Nusa Tenggara endemics include the cowrie *Erronea vredenburgi* Schilder, 1927, the volute *Cymbiola chrysostoma* (Swainson, 1824), and the cones *Cylinder johnabbasi* Petuch & Berschauer, 2018, *Cylinder sumbawaensis* Verbinnen, 2022, *Phasmoconus giorossii* (Bozzetti, 2006), *Graphiconus wittigi* (Walls, 1977), and several closely-knit sibling taxa in the *Eugeniconus victor* (Broderip, 1842) species complex (Parsons *et al.*, 2020). (See Plate 3)

Recently, increased collecting and exploration on Sumbawa Island, at the western end of the archipelago, has resulted in the discovery of two

unusual new conids: *Cylinder sumbawaensis* Verbinnen, 2022, and the species described herein. As pointed out by Veldsman *et al.* (2022) the enclosed and sheltered Teluk Saleh of Sumbawa Island has acted as a biogeographical refugium and contains a relict pocket of a Pleistocene Sundalandian marine environment, analogous to the relict pockets found in the Caribbean Sea (Petuch, 1982; Petuch, 2013). (See Figures 1 and 2) Here, a remnant of an ancestral Sundalandian molluscan fauna, including a *Cylinder* species complex has managed to survive.

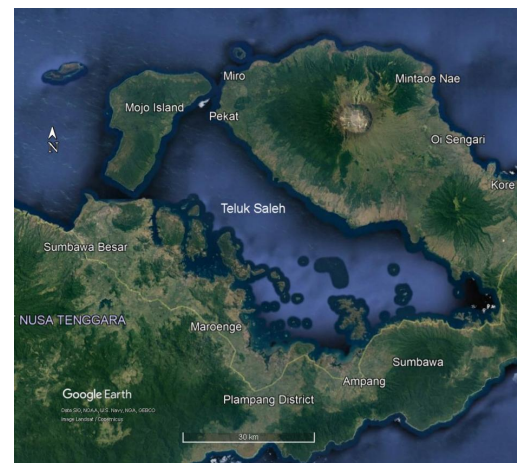


Figure 1. Satellite map of Teluk Saleh, Sumbawa Island. (Google Earth Image, 2019)

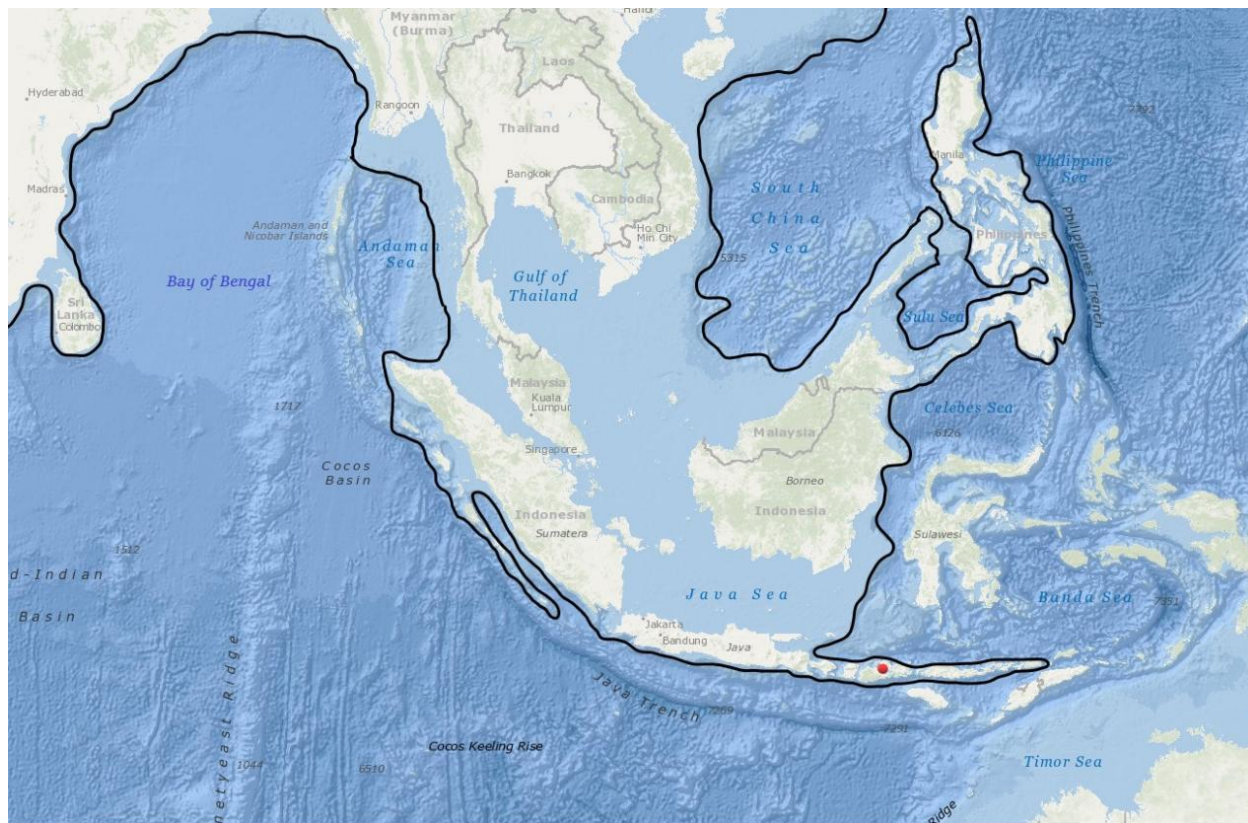


Figure 2. Middle Pleistocene coastlines of Sundaland compared to present day. (Adapted from Wisnu-Aji, 2016, and Zahirovic *et al.* 2014.) The red dot shows the modern day location of Teluk Saleh, Sumbawa Island, Indonesia.

SYSTEMATICS

Phylum Mollusca
 Class Gastropoda
 Subclass Sorbeoconcha
 Order Prosobranchia
 Infraorder Neogastropoda
 Superfamily Conoidea
 Family Conidae
 Subfamily Coninae
 Genus *Cylinder* Montfort, 1810

Cylinder feliciae Berschauer and Petuch,
 new species
 (Plate 1, Figures A-D)

Description. Shell of average size for genus, cylindrical, with straight very slightly convex sides; spire height moderate and stepped;

shoulder broad, angulate but slightly rounded; whorl tops slightly concave, shiny, bearing five fine radial line; protoconch and early whorls pink in color; aperture proportionally wide, pale whitish-blue within; body whorl smooth and shiny, with silky texture; body whorl cream-tan colored, completely overlaid with a dense dark brown fine netted pattern, composed of interconnected small triangles, ovals, and amorphous nettings that extend for entire length of shell; three wide bands of dark brown patches extend around body whorl, arranged with one at the mid-body line, one around the top third below the shoulder, and one around the basal third; underlying body color includes a gray-blue hue on the shoulder and whorl tops and gray-blue axial streaks; bearing one or two rows of long dark brown dashes located mid point between the wide bands of dark brown patches.

Type Material. Holotype LACM 3797 measuring 80.11 mm in height, 32.23 mm in width. Other material examined: two specimens in the Berschauer collection measuring 73.25 mm in height, 29.25 mm in width, and 59.07 mm in height, 22.60 mm in width; one specimen in the Petuch collection measuring 60.19 mm in height and 23.86 mm in width.

Type Locality. Teluk Saleh, Sumbawa Island, West Nusa Tenggara Province, Indonesia, in 10-15 meters depth. Collected by fishermen using hookah apparatus, diving for lobsters.

Distribution. Only known from Teluk Saleh, Sumbawa Island, Indonesia.

Etymology. Named for Felicia Berschauer, wife of the senior author.

DISCUSSION

Cylinder feliciae is another recently-discovered endemic species from the Nusa Tenggara Infraprovince, an area of increased speciation and evolution in the Indonesian Subprovince of the Indo-Malayan Molluscan Province. (Petuch and Berschauer, 2020: 190-191; Veldsman *et al.*, 2022). The new species is closest morphologically to its well-known sister taxon, *Cylinder gloriamaris* (Chemnitz, 1777), which has a widespread distribution throughout the Philippines Archipelago (the Philippinian Subprovince), with reports of specimens also being found in Papua New Guinea, the Solomon Islands, Fiji, and Samoa (the Melanesian Subprovince) (Rockel *et al.*, 1995; Monnier *et al.*, 2018) (holotype of *C. gloriamaris*, Plate 2, Figures E-F). The localities of the two populations are biogeographically far apart, with no direct gene flow. *Cylinder feliciae* is proportionately stockier than *C. gloriamaris* with a broader shoulder relative to length, an

angled shoulder, and a less dense and substantially darker color pattern of small triangles, ovals and netting on the body whorl, and long dark brown dashes.

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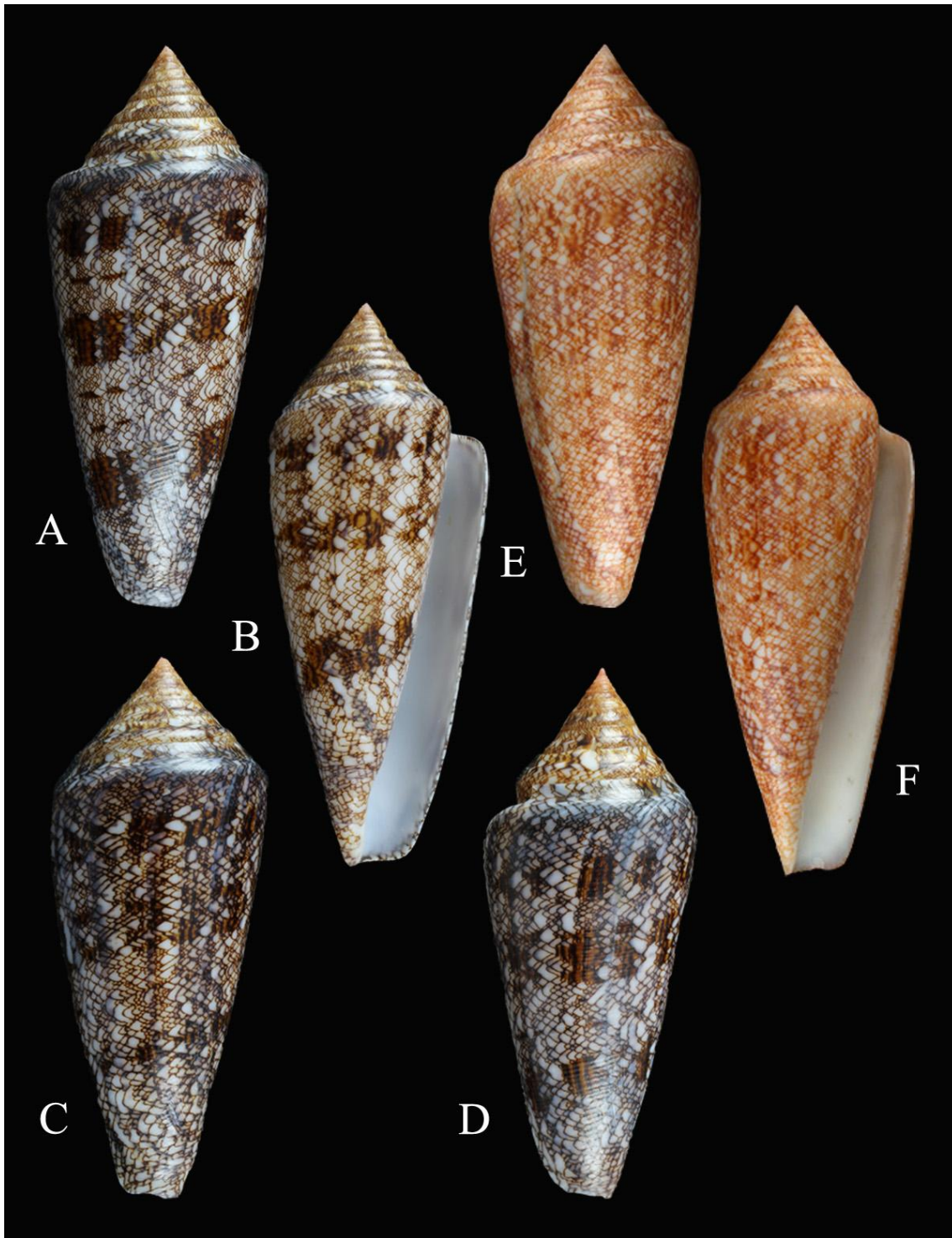


Plate 1. *Cylinder feliciae* compared with *C. gloriamaris*.

A, B= *Cylinder feliciae* holotype, LACM 3797, measuring 80.11 mm in height, 32.23 mm in width; **C=** *C. feliciae* specimen in the Berschauer collection measuring 73.25 mm in height, 29.25 mm in width; **D=** *C. feliciae* specimen in the Petuch collection measuring 60.19 mm in height and 23.86 mm in width; **E, F=** *C. gloriamaris* (Chemnitz, 1777) holotype, Universitetets Zoologiske Museum, Copenhagen (UZMC), measuring 92 mm in height, 35 mm in width.

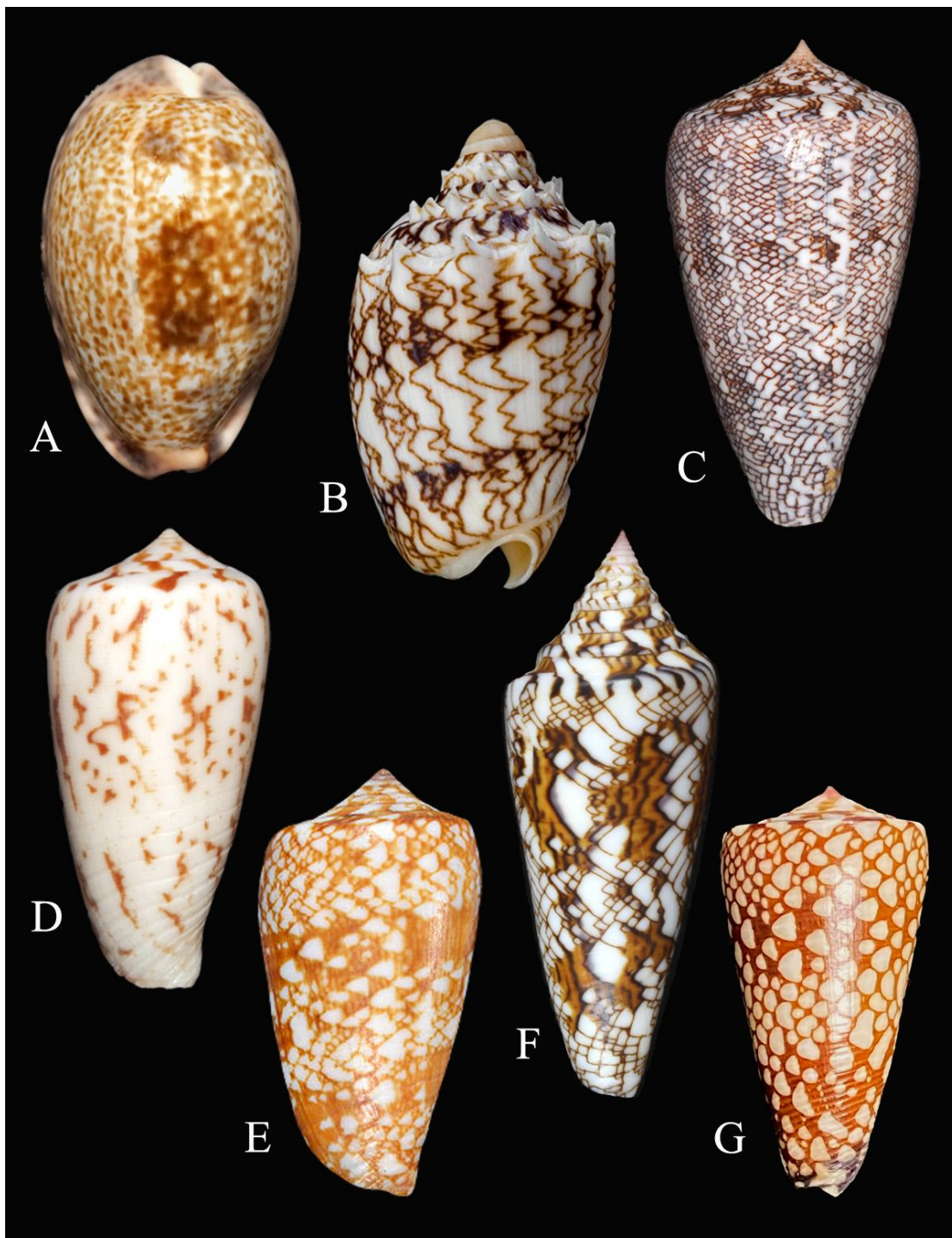


Plate 2. Some Nusa Tenggara Endemic Species.

A= *Erronea vredenburgi* Schilder, 1927, measuring 25 mm in length; **B**= *Cymbiola chrysostoma* (Swainson, 1824), measuring 47 mm in length; **C**= *Cylinder johnabbasi* Petuch & Berschauer, 2018, measuring 73 mm in length; **D**= *Phasmoconus giorossii* (Bozzetti, 2006), measuring 32 mm in length; **E**= *Graphiconus wittigi* (Walls, 1977), measuring 31 mm in length; **F**= *Cylinder sumbawaensis* Verbinnen, 2022, measuring 68.5 mm in length; **G**= *Eugeniconus gisellelieae* Parsons, Abbas & Lie, 2020, measuring 40.11 mm in length.