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TWELVE NEW INDO-PACIFIC GASTROPODS

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INTRODUCTION

This paper is a compilation of descriptions of new gastropod mollusks from several subregions of the Indo-Pacific Faunal Province. The new species were collected in a variety of manners in the various areas: drag-netting by commercial shell collectors in the Central Philippines, dredging by commercial shell collectors off the Solomon Islands, SCUBA diving by commercial shell collectors in the Red Sea, trawling by Taiwanese fishing boats off Southeast Africa, and trawling by exploratory fisheries boats in the China Strait off eastern New Guinea.

Most of the new species described in the paper are from the upper continental slope fauna of the Central Philippines; they give mute testament to the fact that we are still in the "Descriptive Age of Malacology" (Rosewater, 1976, p. 5). As more exploratory work is done on the lower shelf and upper slope communities around the world, doubtless many hundreds of new species of mollusks will be discovered. This is especially apparent when one considers that the slope and lower shelf areas were virtually unaffected by Plio-Pleistocene sea level fluctuations and temperature changes, and offered stable ecological conditions for diversification of post-Tethyan faunas. This long-lived stability allowed the faunas to become partitioned into many more ecological niches than were possible in the unstable shelf waters. A tiny part of this tremendous unstudied diversity is seen in the gastropod species described herein.

Ackowledgments

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This is a scientific contribution from the Rosenstiel School of Marine and Atmospheric Science, University of Miami.

NEW TAXA

Turbinidae
Guildfordia kurzi n.sp.
Trichotropidae
Zelippistes eccentricus n.sp.
Ovulidae
Pseudocypraea exquisita n.sp.
Cassidae
Morum (Oniscidia) kurzi n.sp.
Muricidae
Axymene philippinensis n.sp.
Olividae
Oliva baileyi n.sp.
Cancellariidae
Agatrix (Olssonella) nodosivaricosa n.sp.
Conidae
Conus aphrodite n.sp.
Conus boholensis n.sp.
Conus fragilissimus n.sp.
Conus nereis n.sp.
Conus zulu n.sp.

The type material is deposited in the type collection of the Department of Mollusks, Delaware Museum of Natural History, Greenville, Delaware.

FAMILY TURBINIDAE

SUBFAMILY ASTRAEINAE

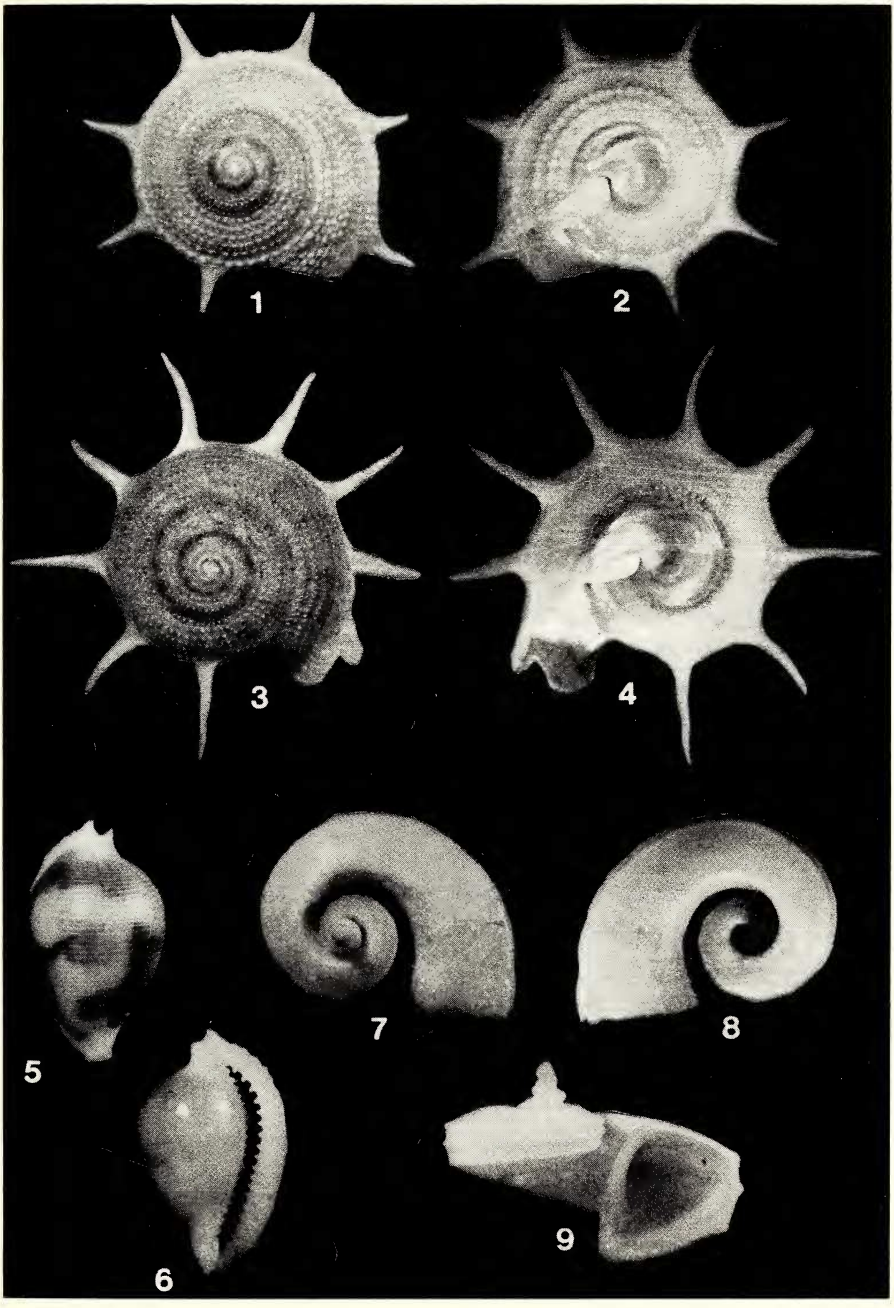
Genus *Guildfordia* Gray, 1850

***Guildfordia kurzi* new species**

(Figures 1 and 2)

MATERIAL EXAMINED: Holotype – Length 49 mm, width 47 mm, spire height 21 mm; 300 m depth off Balicasag, Bohol Is., Philippines; June 1978; DMNH No. 126389. Paratypes – Lengths 50 mm, 48 mm, 46 mm, 42 mm; same depth, locality, and date as holotype; DMNH No. 126390.

Figure 1: *Guildfordia kurzi* n.sp., dorsal aspect of holotype.
Figure 2: *Guildfordia kurzi* n.sp., ventral aspect of holotype.
Figure 3: *Guildfordia triumphans* (Philippi, 1841), Shikoku Is., Japan, dorsal aspect, width 55 mm.
Figure 4: *Guildfordia triumphans* (Philippi, 1841), ventral aspect of same specimen shown in Figure 3.
Figure 5: *Pseudocypraea exquisita* n.sp., dorsal aspect of holotype.
Figure 6: *Pseudocypraea exquisita* n.sp., ventral aspect of holotype.
Figure 7: *Zelippistes eccentricus* n.sp., dorsal aspect of holotype.
Figure 8: *Zelippistes eccentricus* n.sp., ventral aspect of holotype.
Figure 9: *Zelippistes eccentricus* n.sp., lateral aspect of holotype.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SHELL DESCRIPTION: Flattened, discoidal; body whorl with 7–9 short, solid spines; dorsal surface with 9–11 spiral rows of coarse granulations; basal surface with 5–6 spiral rows of coarse granulations arranged in 2 groups – 2 rows along periphery and 3–4 rows surrounding umbilical region; wide, deeply incised sulcus between 2 groups of granulations; umbilicus closed but with sunken area in center; dorsal color varying from greenish tan to lavender, basal color white; umbilicus with green or pink tint; operculum shiny, calcareous, flattened, elliptical in outline.

TYPE LOCALITY: 300 m depth off Balicasag, Bohol Is., Philippines.

DISTRIBUTION: At present known only from deep water in the Central Philippine Trenches.

ECOLOGY: Exploratory trawls have shown that *Guildfordia kurzi* prefers mud bottoms at a depth of approximately 200–500 m. The new species is a component of the upper slope ecosystem surrounding the steep-sided trenches in the Central Philippines. Gastropods collected with *G. kurzi* include: *Cypraea guttata* Gmelin, 1791; *Cypraea katsuae* Kuroda, 1950; *Oliva dubia* Schepman, 1911; *Agatrix (Olssonella) nodosivaricosa* new species; *Lyria planicostata* Sowerby, 1903; *Conus kintoki* Habe and Kosuge, 1952; *Conus kimioi* Habe, 1965; *C. kinoshitai* Kuroda, 1956; *C. praecellens* A. Adams, 1854; and *Comitas ensuyensis* (Shikama and Hyashi, 1977).

ETYMOLOGY: For Richard M. Kurz, Wauwatosa, Wisconsin, who first recognized the species as new and whose generosity in donation of material for study has been of great help to workers at many museums and scientific institutions.

REMARKS: Only four species of *Guildfordia* were previously known, these being divided into two groups: *Guildfordia* s.s. and the subgenus *Pseudoastralium* Schepman, 1908 (Wagner and Abbott, 1978, pp. 02–002). The new species belongs to the nominate group and is most closely related to *Guildfordia triumphans* (Philippi, 1841) (pl. 1, figs. C and D). *Guildfordia kurzi* differs from this species by having a higher spire, shorter and solid spines, more numerous and coarser granular sculpturing, and greener color. The most important character for separating the two species is seen in the basal sculpturing. *Guildfordia triumphans* has a smooth, unornamented base, with only a single row of granulations surrounding the umbilical region; *G. kurzi* is heavily sculptured, with coarse granulations and a deeply incised spiral sulcus.

FAMILY TRICHOTROPIDAE

Genus *Zelippistes* Finlay, 1926

***Zelippistes eccentricus* new species**

(Figures 7–9)

MATERIAL EXAMINED: Holotype – Length 18 mm, width 11 mm, spire height 11 mm; 250 m depth in China Strait, off Samarai Is., Eastern Papua, Papua-New Guinea; January 1970; DMNH No. 123691.

SHELL DESCRIPTION: Thin, fragile, smooth and glossy; body whorl flattened, discoidal; early whorls scalariform, producing sharply projecting spire; whorls rounded, strongly tricarinate; body whorl and early whorls completely uncoiled and separated from one another; aperture flaring, D-shaped; color uniform pale pinkish cream; aperture salmon-pink; periostracum thin, smooth, translucent yellow.

TYPE LOCALITY: 250 m depth in China Strait, off Samarai Is., Eastern Papua, Papua-New Guinea.

DISTRIBUTION: At present known only from type locality.

ECOLOGY: *Zelippistes eccentricus* is a component of the organic-rich mud bottom community found at approximately 200 m depth around the Milne Bay area of Eastern Papua. Exploratory trawling has shown that the bottom is rich in sponges and scattered beds of brissid-type irregular echinoids. Gastropods commonly taken with the new species include: *Cypraea bregeriana* Crosse, 1868; *Distorsio reticulata* (Röding, 1798); *Murex pecten* Lightfoot, 1786; *Murex ternispina* Lamarck, 1822; *Conus floridulus* Adams and Reeve, 1848; *C. filicinctus* Schepman, 1913; *C. lynceus* Sowerby, 1857; *C. poehlianus* Sowerby, 1887; and *C. schepmani* Fulton, 1936.

ETYMOLOGY: In reference to the rather unusual uncoiled whorls.

REMARKS: *Zelippistes eccentricus* is the first known tropical member of a basically antitropical species complex. In shell morphology, the new species is closest to the temperate-water, South Australian *Z. blainvilleanus* (Petit, 1851) (Macpherson and Gabriel, 1962, p. 129, fig. 153) and the Japonic *Z. helicoides* (Gmelin, 1791) (Kira, 1962, p. 29, pl. 14, fig. 11). *Zelippistes eccentricus* differs from both these species in being larger, having an exerted spire, and having uncoiled, planulate whorls.

FAMILY OVULIDAE

SUBFAMILY EOCYPRAEINAE

Genus *Pseudocypraea* Schilder, 1927

***Pseudocypraea exquisita* new species**

(Figures 5 and 6)

MATERIAL EXAMINED: Holotype – Length 9 mm, width 5 mm; app. 250 m depth off Panglao, Bohol Is., Philippines; June 1978; DMNH No. 126392.

SHELL DESCRIPTION: Thin, small, ovately pyriform; dorsum humped; body whorl with numerous fine, evenly spaced spiral threads; outer lip thickened, smooth, shiny; anterior and posterior terminals well produced, prominent; aperture narrow; columella and base smooth and polished; outer lip with 20 well developed teeth; columella with 24 fine teeth; posterior 5 labial teeth more developed than the others, projecting beyond lip margin; color pale tan with large, irregular patches of wine-red; base white with 2 pale red bands.

TYPE LOCALITY: 250 m depth off Panglao, Bohol Is., Philippines.

DISTRIBUTION: At present known only from deep water in the Central Philippines.

ECOLOGY: *Pseudocypraea exquisita* is a component of the lower shelf, mud bottom ecosystem that surrounds the Central Philippine Trenches. Some gastropods taken with this new species include: *Chicoreus nobilis* Shikama, 1977; *Murexiella martini* Shikama, 1977; *Conus boholensis* new species; *C. cancellatus* Hwass, 1792; *C. gloriamaris* Chemnitz, 1777; *C. grangeri* Sowerby, 1900; *C. neptunus* Reeve, 1843; *C. nereis* new species; *C. praecellens* A. Adams, 1854; *Latiaxis diadema* A. Adams, 1854; *Lyria planicostata* Sowerby, 1903; and occasionally such rare species as *Cypraea leucodon* Broderip, 1828; *C. porteri* Cate, 1966; *C. valentia* Perry, 1811.

REMARKS: The genus *Pseudocypraea* was previously considered to be monotypic (Cate, 1973, pp. 4–5; Cernohorsky, 1972, p. 91; Keen, 1971, pp. 497–498); the new species represents the second known member of this eocypraeid group. *Pseudocypraea exquisita* closely resembles *P. adamsonii* (Sowerby, 1832), the type of the genus, but differs in being more slender, in having the well developed posterior and anterior terminals, and in having well developed posterior labial teeth, which give the outer lip a serrated edge. *Pseudocypraea adamsonii* has a heavily sculptured columella and base, whereas the new species contrasts greatly in having a smooth and highly polished basal area. *Pseudocypraea exquisita* is also a much more brightly colored shell; the deep wine-red blotches of the new species contrast with the pale tan markings of *P. adamsonii*. The new species has a finer body sculpture and lacks the prominent longitudinal cross-hatching seen in *P. adamsonii*.

FAMILY CASSIDAE

Genus *Morum* Röding, 1798

Subgenus *Oniscidia* Mörch, 1852

***Morum (Oniscidia) kurzi* new species**

(Figures 10–13)

MATERIAL EXAMINED: Holotype – Length 23 mm, width 15 mm; 250 m depth off Panglao, Bohol Is., Philippines; June 1978; DMNH No. 126393.

SHELL DESCRIPTION: Thick, stocky, pyriform with wide shoulder; spire elevated, exerted; body whorl with 12 raised cords – 8 large, prominent on body whorl proper and 4 small on anterior canal; 8 varices per whorl; large hooked spines at juncture of spiral cords and varices; at shoulder, each varix has erect, sharply pointed spine; parietal shield large, covering whole columellar area, covered with numerous pustules; outer lip crenulate, with numerous large primary and secondary teeth; protoconch erect, papillate (see Figure 13); color pale cream with 3 tan bands, 1 on shoulder, 2 on either side of midbody line; base color pattern overlaid with numerous dark brown fleckings; protoconch and first three whorls bright pink-purple; parietal shield bright orange-pink with white pustules; outer lip orange with white teeth; interior of aperture white. In Figure 12, the holotype is coated with magnesium oxide to enhance the characteristic sculpture pattern.

TYPE LOCALITY: 250 m depth off Panglao, Bohol Is., Philippines.

DISTRIBUTION: At present known only from the Central Philippines.

ECOLOGY: Same as that of *Pseudocypraea exquisita.*

ETYMOLOGY: For Richard M. Kurz, Wauwatosa, Wisconsin, who first recognized the species as new.

REMARKS: The remarkable new species resembles no other known Indo-Pacific *Oniscidia*. The only species with which it appears to share any morphological characters is *Morum (Oniscidia) praeclarum* Melvill, 1919, from Southeast Africa and the Seychelles Islands (Emerson, 1977, p. 84; Kilburn, 1975, p. 50). *Morum kurzi* differs from *M. praeclarum* in being less pyriform, by having a less developed parietal shield, and by having a higher spire. Probably the most striking difference is seen in the colors of the parietal shields: *M. kurzi* has a bright orange shield, whereas that of *M. praeclarum* is pure white (Emerson, 1977, p. 83). In this last character, the new species somewhat resembles a miniature version of the Caribbean *M. dennisoni* (Reeve, 1842).

FAMILY MURICIDAE

SUBFAMILY TROPHONINAE COSSMANN, 1903

Genus *Axymene* Finlay, 1927

***Axymene philippinensis* new species**

(Figures 14 and 15)

MATERIAL EXAMINED: Holotype – Length 16 mm, width 8 mm; app. 250 m depth off Panglao, Bohol Is., Philippines; June 1978; DMNH No. 126394.

SHELL DESCRIPTION: Thin, fragile, elongate, fusiform; spire elevated, protracted; shoulder rounded, suture distinct; body whorl with 15 large, raised spiral cords, these crossed by axial growth lines, giving cancellate appearance; spire whorls with 4 spiral cords; apex small, papillate, $1\frac{1}{2}$ whorls; outer lip thin, crenulate, with small tooth at anterior end; columella well defined, glazed; color pure white; interior of aperture white; operculum unknown.

TYPE LOCALITY: 250 m depth off Panglao, Bohol Is., Philippines.

DISTRIBUTION: At present known only from deep water in Central Philippines.

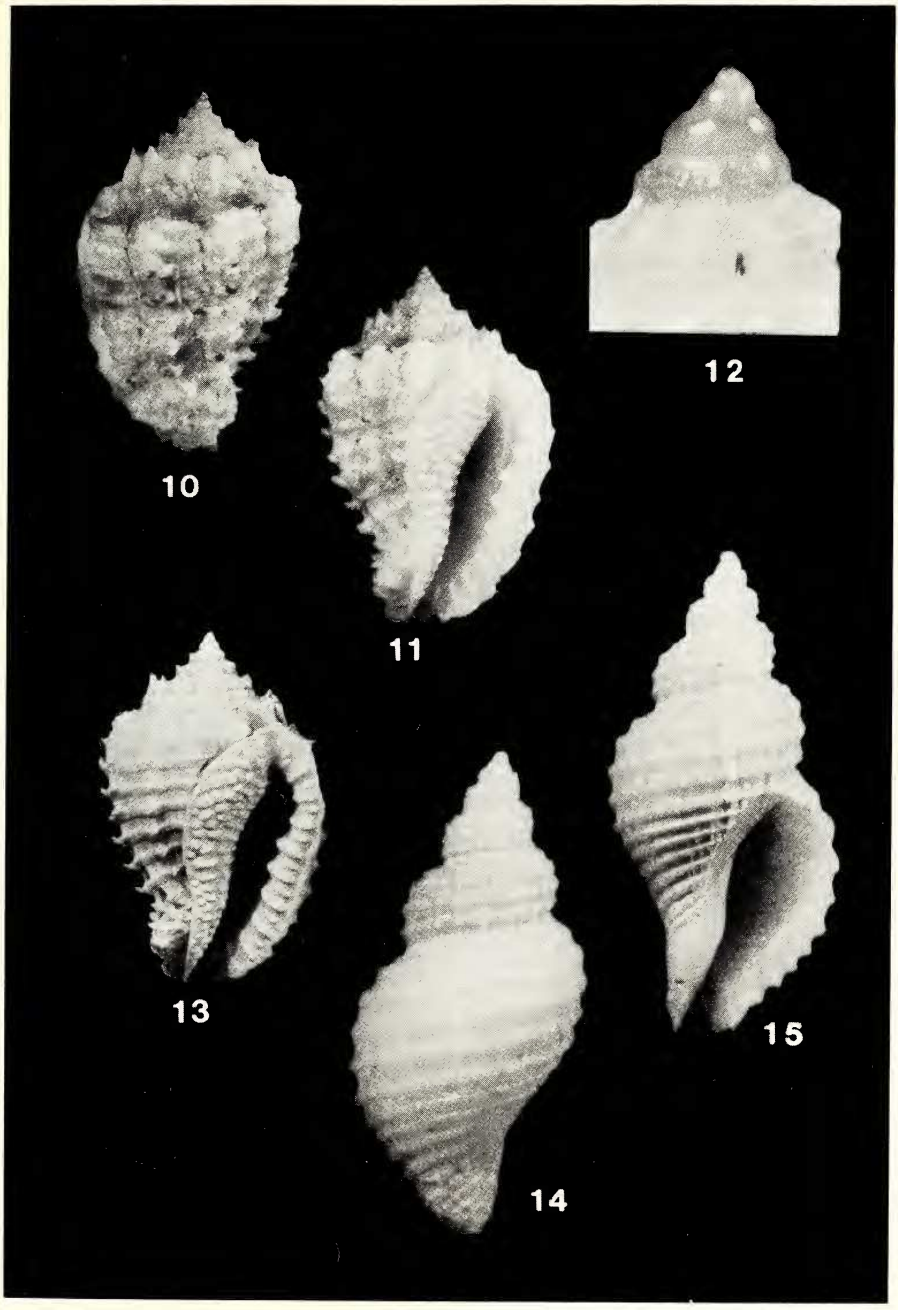
ECOLOGY: Same as the previous two species, *Pseudocypraea exquisita* and *Morum kurzi*.

ETYMOLOGY: For the type locality, the Philippine Islands.

REMARKS: The genus *Axymene* was previously thought to be monotypic (Radwin and D'Attilio, 1976, pp. 178–179). This new species represents the second known species.

Axymene philippinensis closely resembles the New Zealand *A. turbator* (Finlay, 1927), type of the genus. The new species differs from *A. turbator* by being larger, by having a rounded shoulder instead of an angled one, and by being pure white instead of chocolate-brown. The presence of an apertural tooth was not reported in *Axymene*. By having this character, *A. philippinensis* may prove to belong to a separate genus. Until more specimens are collected, however, it seems best to keep the new species in *Axymene*.

Figure 10: *Morum (Oniscidia) kurzi* n.sp., dorsal aspect of holotype.
Figure 11: *Morum (Oniscidia) kurzi* n.sp., ventral aspect of holotype.
Figure 12: *Morum (Oniscidia) kurzi* n.sp., detail of protoconch.
Figure 13: *Morum (Oniscidia) kurzi* n.sp., ventral aspect of holotype, coated with magnesium oxide to enhance sculpture.
Figure 14: *Axymene philippinensis* n.sp., dorsal aspect of holotype.
Figure 15: *Axymene philippinensis* n.sp., ventral aspect of holotype.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FAMILY OLIVIDAE

Genus *Oliva* Bruguière, 1789

Oliva baileyi **new species**

(Figures 16–19)

MATERIAL EXAMINED: Holotype – Length 30 mm, width 8 mm; trawled from 180 m depth off Russell Is., Solomon Islands; October 1978; DMNH No. 126395. Paratypes – Length 28 mm; same depth, locality, and date as holotype; DMNH No. 126396.

SHELL DESCRIPTION: Highly polished, thickened, oblong, cylindrical; spire short, flattened, calloused, with incised suture; callus of last whorl produced at posterior end of aperture; aperture narrow, straight; columella with 12–16 low teeth; posterior end of columella without teeth; color bright yellow-tan crossed diagonally by widely separated brown bands that extend from shoulder to anterior tip; diagonal brown bands never coalescing; spire callus bright purple, contrasting greatly with yellow shell; columella and teeth white; interior of aperture lavender.

TYPE LOCALITY: 180 m depth off Russell Is., Solomon Islands.

DISTRIBUTION: At present known only from deep water near the Solomon Islands.

ECOLOGY: *Oliva baileyi* is a component of the lower shelf, soft bottom ecosystem near the Solomon Islands. Other gastropods commonly taken with the new species include: *Murex heros* Fulton, 1936; *Pterynotus loebbeckii* (Kobelt, 1879); *Siratus propinquus* Kuroda and Azuma, 1961; *Lyria santoensis* Ladd, 1975; *Conus armadillo* Shikama, 1971; *C. excelsus* Sowerby, 1908; and *C. pretiosus* G. and H. Nevill, 1874.

ETYMOLOGY: For Mr. Brian Bailey, Solomon Islands, who trawled the type specimens and recognized the species as new.

REMARKS: *Oliva baileyi* most closely resembles *O. woolnoughi* Ladd, 1934, and *O. lauensis* Ladd, 1945, from the Pliocene of the Fiji Islands (Ladd, *in* Ladd and Hoffmeister, 1945, p. 368, pl. 53, figs. A and B). Of the two latter species, *O. baileyi* most closely resembles *O. lauensis*, which probably represents the direct ancestor.

Of the Recent Olividae, the new species appears closest to *O. rufula* Duclos, 1835, from shallow water in the Indo-Malay Archipelago and the Philippines. *Oliva baileyi* differs from *O. rufula* in being more slender and having a flatter spire and narrower aperture. The color patterns of the two species differ in an interesting way: the yellow and brown-banded body color of *O. baileyi* is the "photo negative" of the dark brown and white-banded body color of *O. rufula*. The strikingly bright purple spire callus and purple aperture of *O. baileyi* are unique characters, setting it aside from all other known Olividae.

FAMILY CANCELLARIIDAE

Genus *Agatrix* Petit, 1967

Subgenus *Olssonella* Petit, 1970

***Agatrix (Olssonella) nodosivaricosa* new species**

(Figures 26 and 27)

MATERIAL EXAMINED: Holotype – Length 11 mm, width 9 mm; 300 m depth off Balicasag, Bohol Is., Philippines; June 1978; DMNH No. 126397.

SHELL DESCRIPTION: Thin, fragile, inflated; suture indented, spire protracted, somewhat scalariform; body whorl with 12 rounded varices, crossed by numerous raised axial threads; varices ornamented with large, undulating, raised knobs, giving shell nodulose appearance; columella with 3 large plaits; umbilicus closed; outer lip with strong lirations; color pale cream with 3 tan bands, one at shoulder, one at midbody line, one at anterior end; aperture pale yellow with tan bands showing through in interior; periostracum thin, tufted at shoulder.

TYPE LOCALITY: 300 m depth off Balicasag, Bohol Is., Philippines.

DISTRIBUTION: At present known only from the Central Philippines.

ECOLOGY: The same as the previous new species, *Guildfordia kurzi*, with which the new cancellariid is sympatric.

ETYMOLOGY: In reference to the heavily nodulose varix characteristic of the new species.

REMARKS: *Agatrix nodosivaricosa* is closest to *A. deroyae* (Petit, 1970) from 150 m off the Galapagos Islands. The new species differs from *A. deroyae* by having a higher, scalariform spire; a deeply indented suture; 3 tan color bands; and larger and more pronounced nodules on the varices.

FAMILY CONIDAE

Genus *Conus* Linnaeus, 1758

***Conus aphrodite* new species**

(Figures 34 and 35)

MATERIAL EXAMINED: Holotype – Length 21 mm, width 11 mm; app. 250 m depth off Panglao, Bohol Is., Philippines; June 1978; DMNH No. 126398. Paratype – Length 13 mm; same locality, depth, and date as holotype; DMNH No. 126399.

SHELL DESCRIPTION: Thin, delicate, lightweight, glossy; outline straight sided, elongate, tapered toward the anterior end; shoulder smooth, sharp, slightly carinate; anterior one third with 6–8 faint spiral sulci; color lilac-purple with 3 bands of chestnut-brown flammules; base color pattern overlaid with 12 revolving rows of white and brown dots and dashes; one row of dashes just

anterior of midbody line always more prominent than others; spire purple with alternating brown flammules; edge of shoulder with alternating brown and white dashes; aperture purple; periostracum thin, smooth, translucent yellow.

TYPE LOCALITY: Approximately 250 m depth off Panglao, Bohol Is., Philippines.

DISTRIBUTION: Ranging from the Philippines to at least the Taiwan region (Walls, 1979, p. 516) at the preferred depth.

ECOLOGY: *Conus aphrodite* is a component of the lower shelf, mud bottom ecosystem that surrounds the Central Philippine Trenches and is sympatric with *Pseudocypraea exquisita* n.sp., *Morum kurzi* n.sp., *Axymene philippinensis* n.sp., *Agatrix nodosivaricosa* n.sp., *Conus boholensis* n.sp., *C. nereis* n.sp., and other associated gastropods.

ETYMOLOGY: For Aphrodite, Greek goddess of beauty and love, often associated with the sea.

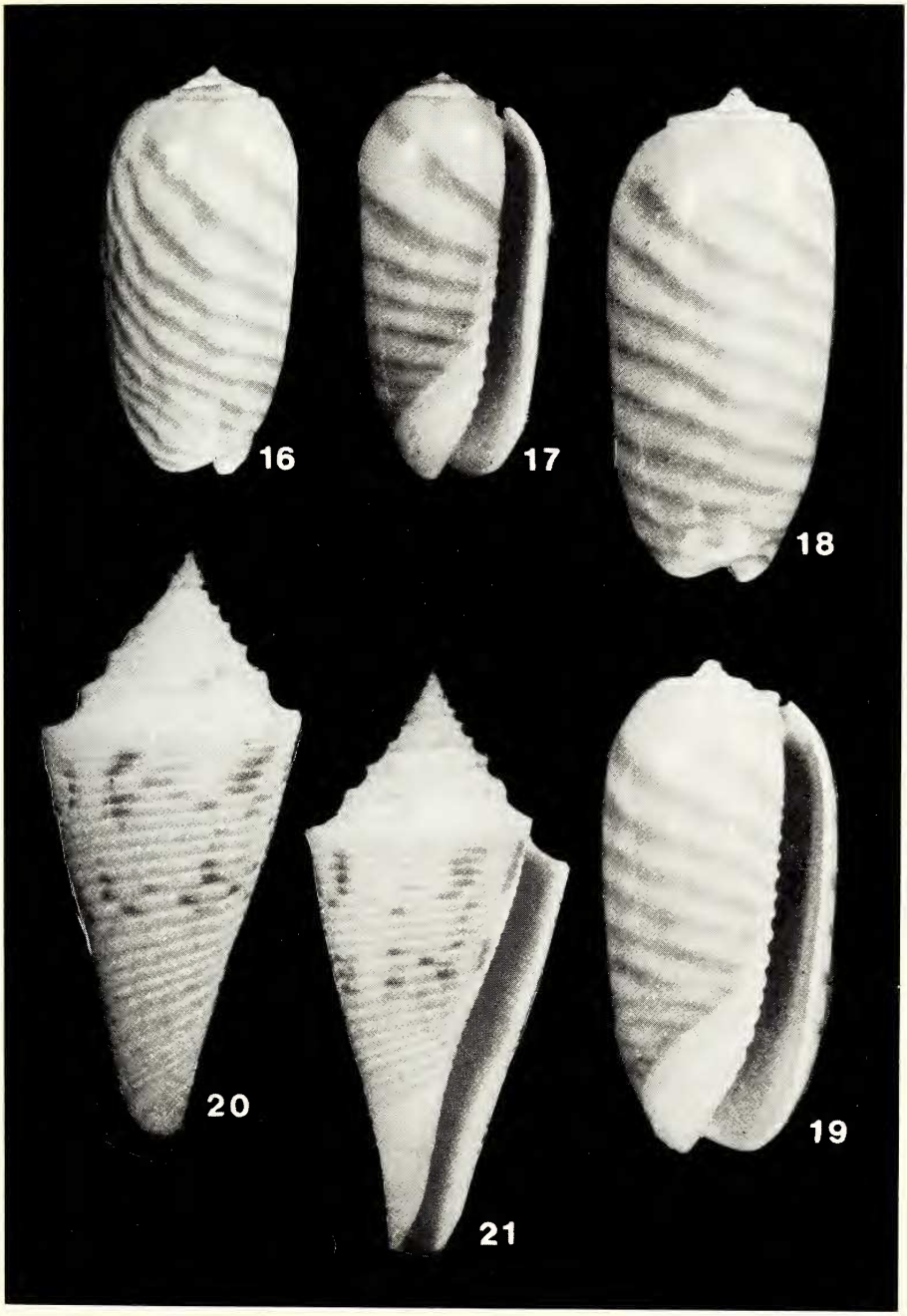
REMARKS: Walls (1979, p. 516, lower left figure) illustrates in color a specimen of *Conus aphrodite*. However, he misidentifies the new species as *C. otohimeae* Kuroda and Ito, 1961, a closely related species. *Conus aphrodite* is the newest member of an interesting species complex comprising *C. nadaensis* (Azuma and Toki, 1970) from Japan and the Ryukyu Islands and *C. memiae* (Habe and Kosuge, 1970) and *C. otohimeae* from deep water off Japan, the Philippines, and the Solomon Islands (Walls, 1979, p. 707). In general shell morphology, the new species is closest to *C. otohimeae*. *Conus aphrodite* differs from *C. otohimeae* in being smaller, having a higher spire, having a consistent purple shell color, and having a proportionately larger protoconch (a feature that shows up well on Walls' plate).

***Conus boholensis* new species**

(Figures 20 and 21)

MATERIAL EXAMINED: Holotype – Length 38 mm, width 18 mm; app. 250 m depth off Panglao, Bohol Is., Philippines; June 1978; DMNH 126400. Paratypes – Lengths 26 mm, 17 mm; same depth, locality, and date as holotype; DMNH No. 126401.

Figure 16: *Oliva baileyi* n.sp., dorsal aspect of paratype.
Figure 17: *Oliva baileyi* n.sp., ventral aspect of paratype.
Figure 18: *Oliva baileyi* n.sp., dorsal aspect of holotype.
Figure 19: *Oliva baileyi* n.sp., ventral aspect of holotype.
Figure 20: *Conus boholensis* n.sp., dorsal aspect of holotype.
Figure 21: *Conus boholensis* n.sp., ventral aspect of holotype.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SHELL DESCRIPTION: Thin, delicate, glossy; outline straight sided, very elongate, tapering to anterior end; shoulder sharp, extremely carinate, bladelike; slight constriction just anterior to shoulder carina; early whorls strongly coronate; spire whorls excavated because of well developed carina; spire scalariform with carinae of previous whorls projecting beyond suture; body whorl sculpture consisting of 25–35 deeply incised spiral sulci; spire smooth with only faint radiating growth lines extending from suture to carina; color pure white with scattered red-brown dashes; spire color white with only a few scattered, crescent-shaped, red-brown flammules; aperture white; periostracum unknown.

TYPE LOCALITY: Approximately 250 m depth off Panglao, Bohol Is., Philippines.

DISTRIBUTION: At present known only from around Bohol Island in the Central Philippines.

ECOLOGY: *Conus boholensis*, like *C. aphrodite*, is a component of the lower shelf, upper slope, mud bottom ecosystem surrounding the Philippine Trenches and is sympatric with the same gastropods.

ETYMOLOGY: For Bohol Is., the type locality.

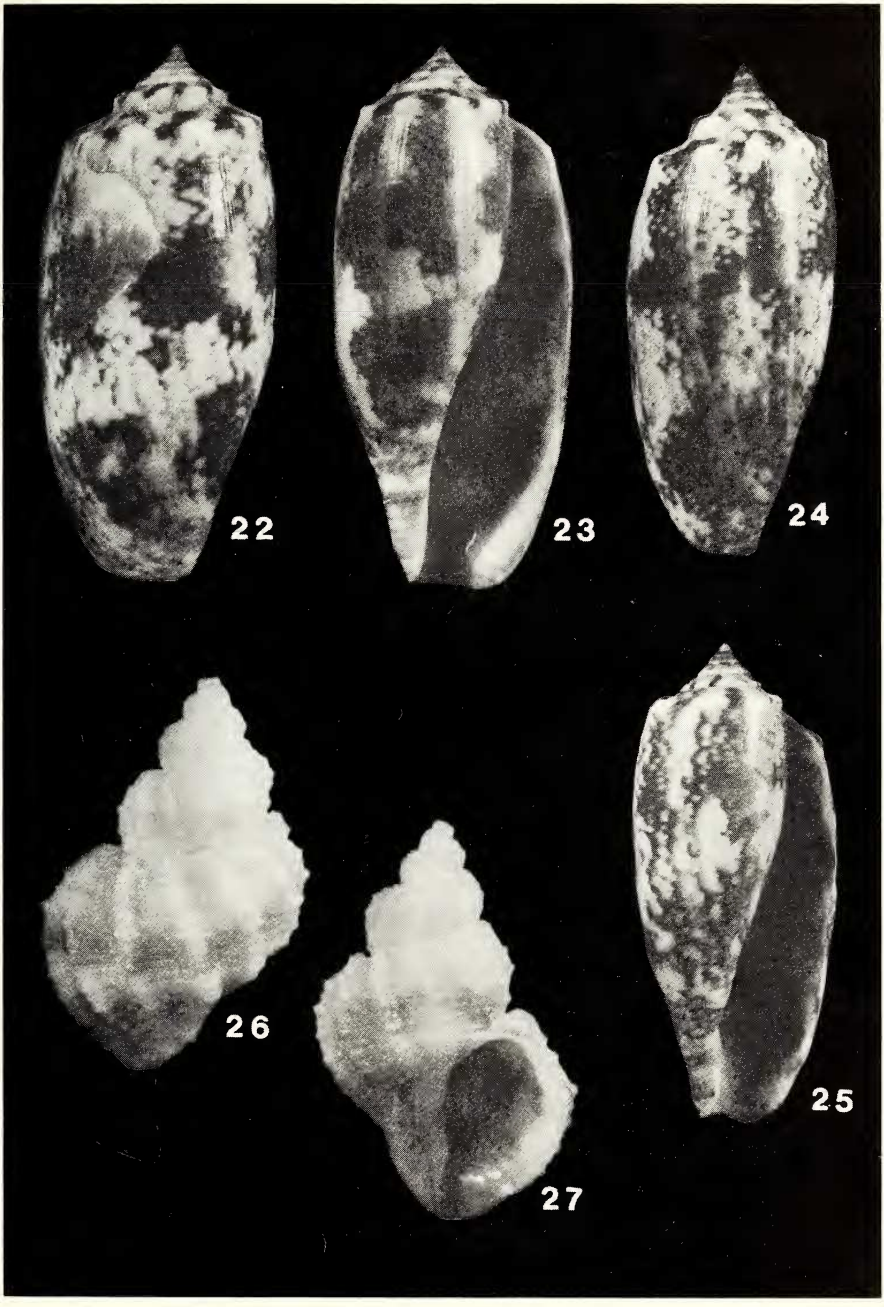
REMARKS: The new species most closely resembles *Conus cancellatus* Hwass, 1792, a widespread offshore Indo-Pacific species (Walls, 1979, pp. 267, 270). In the Philippines area the two species are sympatric. *Conus boholensis* differs from the pyriform *C. cancellatus* in being consistently straight sided, being more elongate, having a scalariform spire, and having an up-turned, extremely well developed carina and accompanying excavated spire – all features not found in *C. cancellatus*. The latter species has a spire sculpture composed of revolving spiral sulci, a character not seen in the smooth-spired *C. boholensis*.

Conus fragilissimus **new species**

(Figures 22–25)

MATERIAL EXAMINED: Holotype – Length 30 mm, width 12 mm; 3 m depth off south coast of Harmil Is., Dahlak Archipelago, Eritrea Province, Ethiopia, Red Sea; 1974; DMNH No. 126402. Paratypes – Lengths 34 mm, 31 mm, 26 mm; same depth, locality, and date as holotype; DMNH No. 126403.

Figure 22: *Conus fragilissimus* n.sp., dorsal aspect of holotype.
Figure 23: *Conus fragilissimus* n.sp., ventral aspect of holotype.
Figure 24: *Conus fragilissimus* n.sp., dorsal aspect of paratype.
Figure 25: *Conus fragilissimus* n.sp., ventral aspect of paratype.
Figure 26: *Agatrix (Olssonella) nodosivaricosa* n.sp., dorsal aspect of holotype.
Figure 27: *Agatrix (Olssonella) nodosivaricosa* n.sp., ventral aspect of holotype.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SHELL DESCRIPTION: Extremely thin, fragile, translucent, glossy; outline ovately cylindrical; sides convex, tapering to anterior end; shoulder wide, angled, with prominent coronations; spire high, stepped, somewhat scalariform; spire sculpture consisting of 4–6 fine revolving spiral threads; aperture wide, flaring; color pale tan with longitudinal brown flammules, flammules often coalescing into large brown patches; base color pattern overlaid with variable amounts of dots, dashes, and netlike pattern; spire color pale tan with regularly spaced dark brown flammules; protoconch and early whorls dark brown; shoulder coronations white; aperture white; periostracum smooth, translucent yellow; operculum unknown.

TYPE LOCALITY: 3 m depth off south coast of Harmil Is., Dahlak Archipelago, Eritrea Province, Ethiopia.

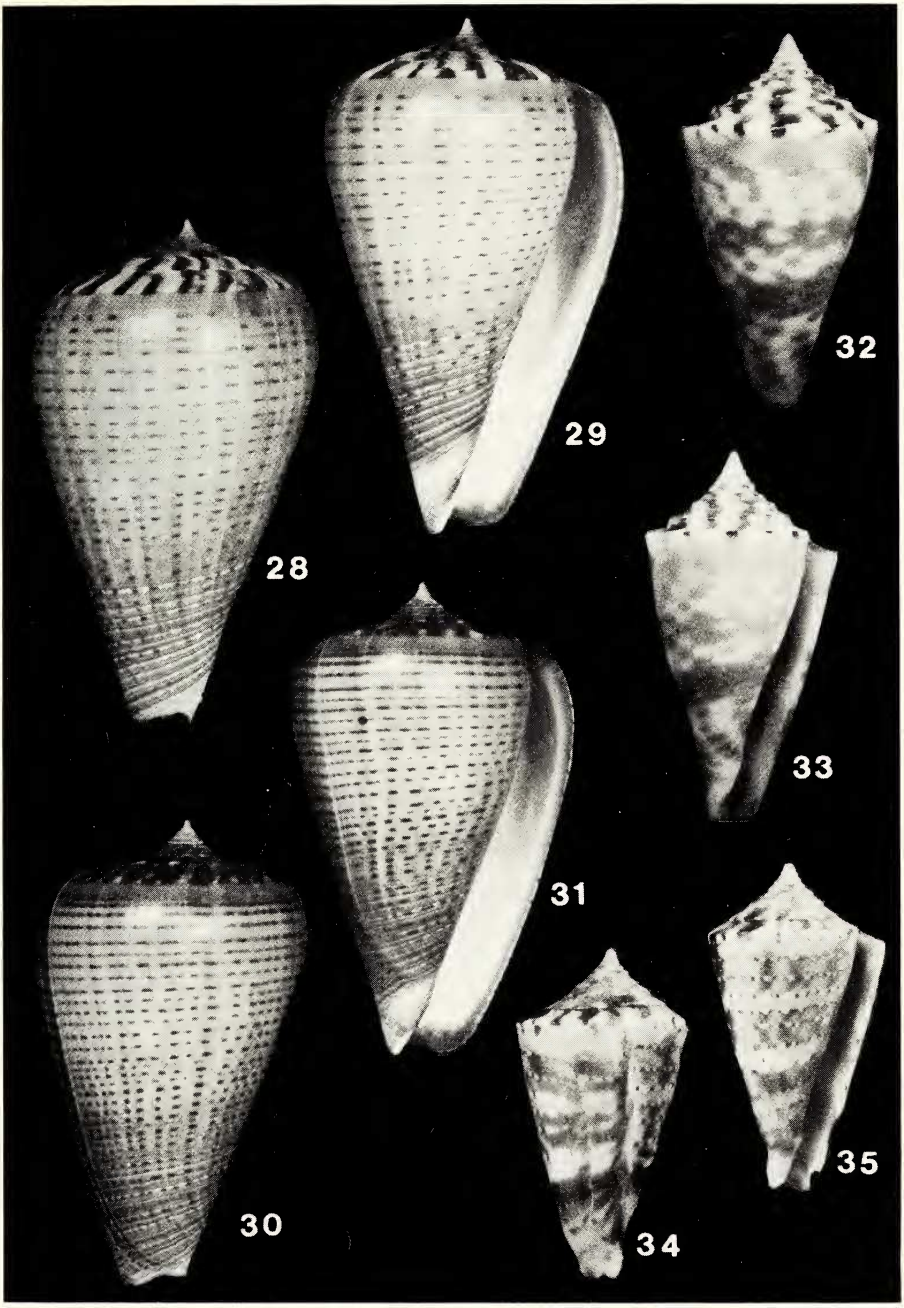
DISTRIBUTION: At present known only from the central Red Sea area.

ECOLOGY: According to the commercial divers and collectors, *Conus fragilissimus* is found in coral rubble in shallow reefs throughout the Dahlak Archipelago. Being a member of a piscivorous species group (Walls, 1979, p. 19), the new species most probably feeds on small benthic fishes, such as blennies and gobies. Gastropods commonly collected with *C. fragilissimus* in the Dahlak Archipelago include: *Cypraea erythraeensis* Sowerby, 1837; *C. nebrites* Melvill, 1888; *C. pantherina* Lightfoot, 1786; *C. turdus* Lamarck, 1810; *Strombus fasciatus* Born, 1778; *S. tricornis* Humphrey, 1786; *Homalocantha fauroti* (Jousseaume, 1888); *Naquetia jickelii* (Tapparone-Canefri, 1875); *Oliva bulbosa* Röding, 1798; *Conus cuvieri* Crosse, 1858; *C. erythraeensis* Reeve, 1843; *C. excavatus* Sowerby, 1866; *C. nigropunctatus* Sowerby, 1857; and *C. taeniatus* Hwass, 1792.

ETYMOLOGY: In reference to the almost paper thinness of the shell.

REMARKS: *Conus fragilissimus* is the newest member of an exclusively Indo-Pacific species complex comprising *C. eldredi* Morrison, 1955; *C. geographus* Linnaeus, 1758; *C. obscurus* Sowerby, 1833; and *C. tulipa* Linnaeus, 1758. This complex can be further divided into two subgroups: *C. eldredi, C. fragilissimus,* and *C. geographus*, all with strongly coronated shoulders, and *C. obscurus* and *C. tulipa*, both with smooth shoulders. Of the four related species, *C. fragilis-*

Figure 28: *Conus zulu* n.sp., dorsal aspect of holotype.
Figure 29: *Conus zulu* n.sp., ventral aspect of holotype.
Figure 30: *Conus zulu* n.sp., dorsal aspect of paratype.
Figure 31: *Conus zulu* n.sp., ventral aspect of paratype.
Figure 32: *Conus nereis* n.sp., dorsal aspect of holotype.
Figure 33: *Conus nereis* n.sp., ventral aspect of holotype.
Figure 34: *Conus aphrodite* n.sp., dorsal aspect of holotype.
Figure 35: *Conus aphrodite* n.sp., ventral aspect of holotype.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simus most closely resembles *C. geographus* – so much so that the new species was often called a "dwarf form of *C. geographus*" by commercial shell dealers and collectors. *Conus fragilissimus* differs from *C. geographus* by having a smaller adult size (average 30 mm as opposed to 100–150 mm for *C. geographus*), by lacking a pinkish red base color, by having distinct white shoulder coronations, and by having early whorls that are dark brown instead of pink or red (Walls, 1979, p. 507).

***Conus nereis* new species**

(Figures 32 and 33)

MATERIAL EXAMINED: Holotype – Length 23 mm, width 12 mm; app. 250 m depth off Panglao, Bohol Is., Philippines; June 1978; DMNH No. 126404. Paratype – Length 14 mm; same depth, locality, and date as holotype; DMNH No. 126405.

SHELL DESCRIPTION: Thin, delicate, smooth, glossy; outline straight sided, elongate; shoulder smooth, sharp, distinctly carinate; small groove just anterior to shoulder carina; anterior one third with 6–8 wide, deeply incised spiral sulci; color pale blue-white with 3 light brown bands, one just anterior to shoulder, one at midbody, and one anterior to midbody line; 3–4 rows of alternating brown and white dashes between 3 brown bands; dashes rectangular shaped, giving shell "checkerboard" effect; spire color white with alternating dark brown, crescent-shaped flammules; flammules extend from suture, across shoulder, and onto body whorl, producing pattern of alternating white and dark brown dashes along shoulder carina; aperture pale lilac, deeper in interior; periostracum thin, smooth, translucent yellow-brown.

TYPE LOCALITY: Approximately 250 m depth off Panglao, Bohol Is., Philippines.

DISTRIBUTION: At present known only from the Central Philippines near Bohol Island.

ECOLOGY: Like *Conus aphrodite* and *C. boholensis, C. nereis* is a member of the mud bottom community that borders the Philippine Trenches. It is sympatric with the same gastropods.

ETYMOLOGY: For any of the sea nymphs, daughters of Nereus, the constant attendants of Poseidon (Neptune); since the new species is sympatric with *Conus neptunus* Reeve, 1843, the taxon honors the courtiers of the submarine god.

REMARKS: The new species is closest to the widespread Indo-Pacific *Conus eugrammatus* Bartsch and Rehder, 1943 (Walls, 1979, pp. 292–293, 450–454) but differs from that species by having a lower spire; a broader shoulder; and revolving bands of broad, checker-shaped markings. The most important difference between these closely related species is seen in the body whorl sculp-

turing: *C. eugrammatus* is characteristically a heavily sculptured shell, being completely covered with deeply incised spiral sulci; *C. nereis* lacks this sculpture and has a smooth, polished body whorl surface. The two species are sympatric in the Philippines (Walls, 1979, p. 451).

***Conus zulu* new species**

(Figures 28–31)

MATERIAL EXAMINED: Holotype – Length 62 mm, width 35 mm; app. 40 m depth off the mouth of the Umfolozi River, Zululand Coast, Natal, South Africa; February 1973; DMNH No. 126406. Paratypes – Lengths 58 mm, 62 mm, 65 mm, 68 mm; same depth, locality, and date as holotype; DMNH No. 126407. Length 74 mm; 35 m depth off Inhaca Is., Mozambique; January 1975; DMNH No. 126408.

SHELL DESCRIPTION: Heavy, glossy, pyriform, tapering to anterior end; anterior third of body whorl heavily sculptured with deeply incised spiral sulci, posterior two thirds smooth; shoulder rounded, widest part of body whorl just anterior to shoulder; spire rounded, smooth, with early whorls exerted; color varying from yellow to gray-brown to deep gray, anterior half of shell darker than posterior half; shoulder with clear orange or red band; base color overlaid with numerous spiral rows of dark brown dots and dashes; anterior third with 6–10 prominent raised cords marked with white and brown dashes; spire color cream-gray with intermittent, regularly spaced, dark brown, crescent-shaped flammules; columella gray-white; aperture white, turning pale brown or violet in interior; periostracum thin, brown, with fine longitudinal striae.

TYPE LOCALITY: Approximately 40 m depth off the mouth of the Umfolozi River, Zululand Coast, Natal, South Africa.

DISTRIBUTION: From Natal northward to central Mozambique.

ECOLOGY: The new species apparently prefers sand and mud bottoms at depths ranging from 30 to 50 m depth along the Southeast African coast. Gastropods collected with *Conus zulu* include: *Cypraea lisetae* Kilburn, 1975; *Murex purdyae* Radwin and D'Attilio, 1976; *Turbinella laffertyi* Kilburn, 1975; *Festilyria duponti* Weaver, 1968; *Conus eumitis* Tomlin, 1931; *C. typhon* Kilburn, 1975; *C. visagenus* Kilburn, 1975; and *Turris tanyspira* Kilburn, 1975.

ETYMOLOGY: The taxon honors the renowned Zulu nation of the Republic of South Africa and southern Mozambique.

REMARKS: *Conus zulu* is the newest member of an exclusively Indo-Pacific complex comprising the wide-ranging *C. betulinus* Linnaeus, 1758; *C. figulinus* Linnaeus, 1758; and *C. loroisii* Kiener, 1845, from India and the Bay of Bengal region, as well as *C. glaucus* Linnaeus, 1758, and *C. suratensis* Hwass, 1792, from the Southwest Pacific. Of this species group, *C. zulu* is closest to *C. figuli-*

nus – so much so that Walls (1979, p. 474) considered the African species to be merely a color form. *Conus figulinus* is basically flat spired, often with sunken early spire whorls. *Conus zulu*, on the other hand, is characteristically high spired, with the early whorls exerted and well defined. The color patterns of the two species differ considerably: *C. figulinus* is dark gray-brown, with a lighter-colored midbody band, this color base in turn being overlaid with numerous, fine, uninterrupted bands of black or dark brown. *C. zulu* is light gray, darker on the anterior one third, this color base being overlaid with dots and dashes, much like *C. suratensis* or *C. glaucus*. The spire color patterns of the two species differ greatly, *C. figulinus* having a completely dark brown or black spire, almost always devoid of any pale markings, but *C. zulu* having a characteristic pale spire with regularly spaced dark crescents, producing a sun burst effect. *Conus zulu* has a thinner and more elongate shell than does *C. figulinus*.

Conus zulu is a member of the poorly known and highly endemic fauna found in the Mozambique Channel area. More extensive trawling in this region will no doubt bring to light many new discoveries.

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