

# Taxonomic Notes on the Western Atlantic Turridae (Gastropoda: Conoidea)

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## ABSTRACT

This paper presents results of research on the systematics of the western Atlantic Turridae. The following new species are described: *Drillia (Drillia) wolfei*, *Drillia (Clathrodrillia) petuchi*, *Fenimorea kathyae*, *F. petiti*, *Sediliopsis riosi*, and *Clathurella eversoni*. The new name *Drillia (Clathrodrillia) dautzenbergi* is proposed, as are the new generic combinations *Fenimorea pagodula* and *Pilsbryspira (Nymphispira) auberti*. Lectotypes are designated for *Drillia (Clathrodrillia) dautzenbergi* and *Fenimorea pagodula*. Radulae are figured for *Drillia (Drillia) wolfei*, *Lioglyphostoma hendersoni*, *Viridrillia williami*, *V. hendersoni*, *Inodrillia nucleata*, *Pilsbryspira albocincta*, *Pyrgocythara filosa*, *P. plicosa* and *P. danae* (U. S. west coast). Opercula are figured for: *Drillia (Drillia) wolfei*, *Fenimorea kathyae*, *F. sunderlandi* var., *F. petiti* and *Lioglyphostoma hendersoni*. The animal of *Pilsbryspira albocincta* is figured.

**Key Words:** Turridae, Taxonomy, Western Atlantic.

## INTRODUCTION

Although the family Turridae in the western Atlantic has been extensively studied and documented, there remain many gaps in our knowledge of its systematics and a major review is needed. New species are discovered not infrequently. In the absence of a definitive revision, such as provided for the tropical eastern Pacific by McLean (1971) and currently being carried out by Kilburn (1983, 1985, 1986, 1989, 1991, 1992, 1993, 1994) for the South African fauna, scattered information is at least of some value. This paper presents findings obtained during research on the family conducted over a number of years. Included are descriptions of new species, a new name, lectotype designations, animal and radular details, range data, and other information. It is hoped that these findings will provide clarification of some issues and represent a contribution to our knowledge of the family.

## MATERIAL AND METHODS

Specimens, both of empty shells and shells containing either preserved or dried animals, were obtained from various sources. Dried animal material was dissolved in KOH. Radulae were mounted on microscope slides and

stained with Prontosil + CMCP-10. Type specimens, slides, and voucher specimens were deposited at the USNM and other institutions. The conventional classification of the family Turridae is used rather than that proposed by Taylor *et al.*, 1993. This proposed classification is too recent to have gained general acceptance and does not consider the fossil record of the family as noted in a review of the classification by Kohn and McLean (1994).

### Abbreviations used:

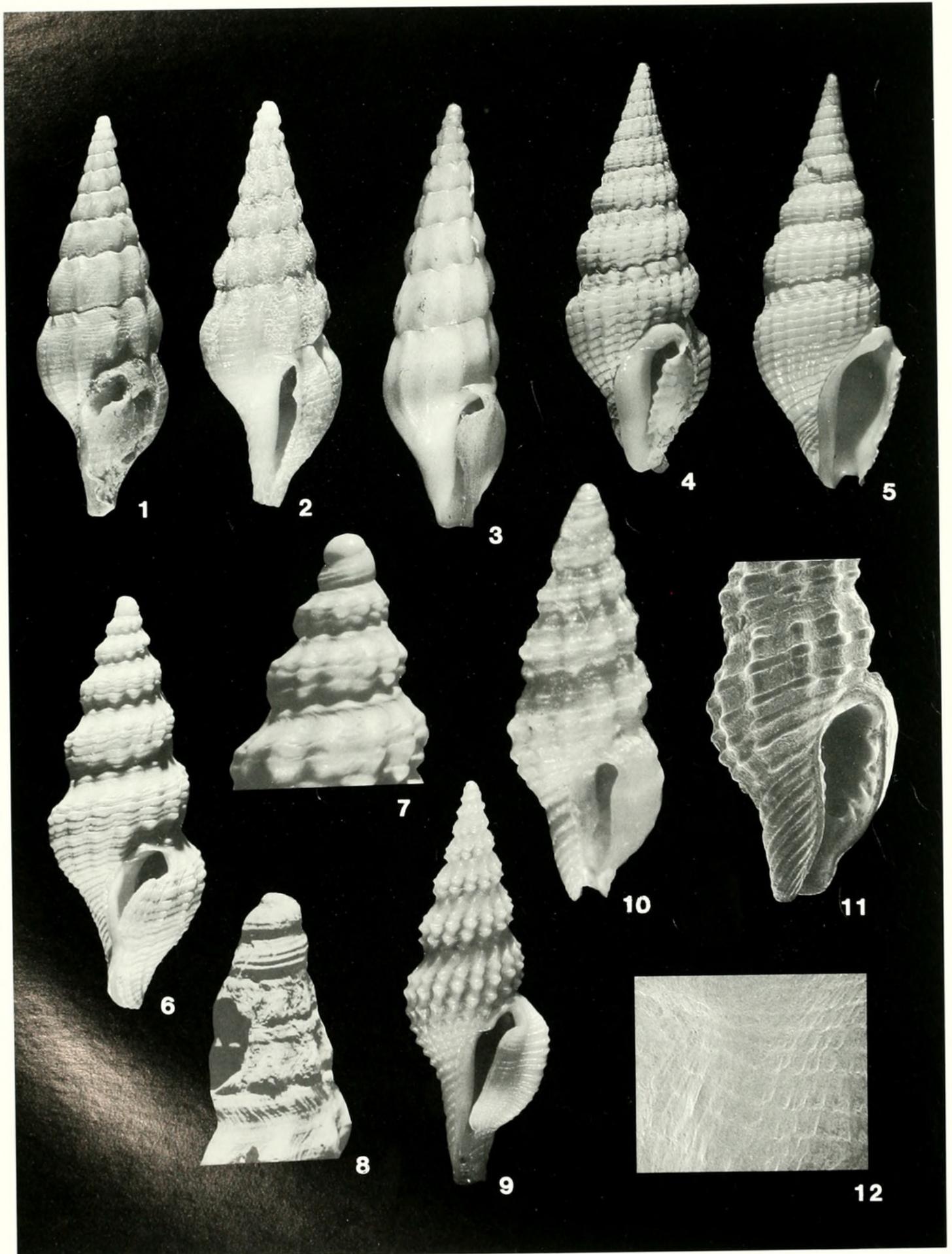
a = ratio of length of aperture plus canal to shell length;  
N = number, (of adult specimens);  
S.D. = standard deviation;  
w = ratio of maximum shell width to length;  
AMNH = American Museum of Natural History, New York;  
ANSP = Academy of Natural Sciences, Philadelphia;  
DMNH = Delaware Museum of Natural History, Wilmington;  
IRSNB = Institut Royal des Sciences Naturelles de Belgique, Brussels;  
LACM = Los Angeles County Museum of Natural History, Los Angeles;  
MCZ = Museum of Comparative Zoology, Harvard University, Cambridge;  
MNHN = Muséum National d'Histoire Naturelle, Paris;  
MORG = Museu Oceanografico "Prof. Eliézer de C. Rios", Rio Grande;  
NHM = The Natural History Museum, London;  
NM = Natal Museum, Pietermaritzburg;  
USNM = National Museum of Natural History, Smithsonian Institution, Washington, D.C.

## SYSTEMATICS

Subfamily **Drilliinae** Olsson, 1964  
Genus *Drillia* Gray, 1838

**Type species:** *Drillia umbilicata* Gray, 1838; by subsequent designation (Gray, 1847).

*Drillia (Drillia) wolfei* Tippett, new species  
(Figures 1, 28, 31)



? Sp. "L" Rice & Kornicker, 1965: 129, pl. 8, fig. 6.

**Description:** Shell small (14.1–19 mm, mean = 15.7, S.D.  $\pm$  1.4, N = 12), elongate-fusiform with tall spire, anterior canal of moderate length, emarginated parietally by strong callus but lacking umbilical chink ( $w = 0.33$ – $0.38$ ,  $a = 0.34$ – $0.38$ ). Protoconch of two smooth whorls, nuclear tip laterally placed. Teleoconch whorls initially flat-sided, with slightly concave shoulder slope on last whorl. Axial sculpture of widely spaced, rounded ribs, about 10 per whorl, extending from suture to suture on early whorls, sinuous, reduced in strength on shoulder slope of later whorls. Spiral sculpture of slightly wavy, evenly spaced striae. Sinus on shoulder slope, deep, U-shaped, rather narrow, bordered medially by a parietal tubercle that does not constrict opening. Outer lip thin, sharp, with small but distinct stromboid notch at lower extremity. Varix-like enlarged axial rib about 1/4 whorl behind outer lip. Color uniform light brown. Operculum (figure 31) leaf-shaped with terminal nucleus. Radula (figure 28) drilliine, with numerous rows of teeth, each consisting of small, unicuspid rachidian tooth, two comb-like lateral teeth, and two long, sharp-pointed marginal teeth. Dried animal, as viewed during treatment with KOH, with prominent eyes on short eye stalks, mantle with strong anterior siphonal extension and distinct, curved indentation on the right for anal sinus.

**Types:** Holotype, USNM 880070. Paratypes (donated by Dr. Wolfe), one each at AMNH, MCZ, DMNH, ANSP, LACM, NM, MORG, NHM, MNHN, IRSNB, author's collection, others in the Wolfe collection.

**Type locality:** 15 km east of Cape Lookout, North Carolina at 20 fm (36 m), from the Elmer Dewey Willis scallop plant, Williston, North Carolina. Leg. Dr. Douglas Wolfe, March–May 1971.

The North Carolina scallop fishery at the time of collection of the present material was concentrating on an area approximately 15 km east of Cape Lookout in about 20 fathoms according to Schwartz and Porter (1977). This is therefore selected as the type locality. Subsequently this scallop plant began to shuck scallops imported from off central to northern Florida. Despite numerous collecting excursions at various scallop shucking houses in Carteret County, North Carolina, both before and after the above dates, this species was not found again.

**Range:** Off North Carolina; ? Campeche Bank, Yucatan.

**Remarks:** *Drillia wolfei* superficially resembles *Fenimorea pagodula* Dall, 1889 (figure 3). It differs in having narrower, fewer, and more widely spaced ribs that do not run from suture to suture, stronger and more widely separated spiral threads that are not of the "butterfly wing" type (see below), a weaker varix, and in lacking a spiral color band on the whorl periphery. Despite the geographic separation, Rice and Kornicker's (1965) Sp. "L" (figure 2), from the Campeche Bank off Yucatan, appears to be this species. There is a high percentage (about 1/3) of shells with repaired damage, probably indicating attempts at predation by crabs. Named for Dr. Wolfe for his contribution of the material and assistance in developing important data on collection locality.

*Drillia* (*Clathrodrillia*) Dall, 1918

**Type species** (of subgenus): *Pleurotoma gibbosa* Reeve, 1843 (= *Murex gibbosus* Born, 1778).

**Remarks:** *Clathrodrillia* is conventionally regarded as a subgenus of *Drillia* (e.g., McLean, 1971, Abbott, 1974, Kilburn, 1988, Sysoev in Taylor *et al.*, 1993). Members of the subgenus have stronger spiral sculpture and a more pronounced terminal varix blotched with color than the nominal genus.

*Drillia* (*Clathrodrillia*) *dautzenbergi* Tippett, new name (Figures 4, 5)

*Drillia gibbosa* var. *minor* Dautzenberg, 1900:20, pl. 9, fig. 2 (anterior & posterior views), non *Drillia minor* Seguenza, 1880.

*Clathrodrillia minor* (Dautzenberg, 1900) Rios, 1975:130, #580, pl. 39; Altena, 1975:7, pl. 7, figs. 1,2.

**Description:** Shell medium sized (to 27 mm), elongate-ovate, with tall spire, moderately-sized body whorl terminating in barely differentiated, notched, recurved anterior canal ( $w = 0.38$ ,  $a = 0.33$ ). Protoconch of two smooth whorls, with laterally placed, immersed tip, bearing two or three brephic axial ribs at termination of protoconch. Teleoconch of about 9 moderately rounded whorls, with strong sulcus on upper third. Sculpture of numerous, regularly spaced, narrow, rounded axial ribs separated by equal interspaces and decussating, crowded spiral cords separated by deep grooves. Axial ribs reduced in strength, curved on sulcus, spirals cords finer, more on sulcus. Varix low, broad, about 1/4 whorl back from

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**Figure 1.** *Drillia* (*Drillia*) *wolfei* Tippett, new species. Holotype, USNM 880070, 16.6 × 6.1 mm. **Figure 2.** Sp. "L" Rice & Kornicker, 1965. USNM 667703, 12.1 × 4.2 mm. **Figure 3.** *Fenimorea pagodula* (Dall, 1889). Lectotype, USNM 87471, 17.7 × 5.8 mm. **Figure 4–5.** *Drillia* (*Clathrodrillia*) *dautzenbergi* Tippett, new name. **4.** Lectotype, IRSNB, 24.2 × 9.3 mm. **5.** USNM 880076, 27.1 × 10.2 mm. **Figures 6–7.** *Sediliopsis riosi* Tippett, new species. **6.** Holotype, MORG 31.775, 14.6 × 5.4 mm. **7.** Apex, 12 ×. Paratype, MORG 31.776. **Figure 8.** *Sediliopsis gracilis* (Conrad, 1830) Apex, after Gibson, 1962, pl. 41, fig. 11. **Figure 9.** *Lioglyphostoma hendersoni* (Bartsch, 1934). USNM 880078, 13.7 × 5.4 mm. **Figures 10–11.** *Clathurella eversoni* Tippett, new species. Holotype, USNM 880074, 4.5 × 1.7 mm. **10.** Anterior view. **11.** SEM of aperture showing teeth, 22 ×. **Figure 12.** *Fenimorea janetae* (Bartsch, 1934). Holotype, USNM 430249, SEM showing "butterfly wing" microsculpture, 22 ×.

outer lip. Lip fluted by spirals cords. Siphonal fasciole moderately developed. Sinus deep, U-shaped, occupying entire sulcus, with reflected rim terminating in parietal tubercle continuous with marginated columellar callus bearing weak false umbilicus below. Outer lip with broad, shallow stromboid notch just above anterior end. Color pure white.

**Type:** Institut Royal des Sciences Naturelles de Belgique, one specimen, no catalog number, here selected as lectotype.

**Type locality:** Isla Margarita, Venezuela.

**Range:** Widespread in the lower Caribbean and north Brazil.

**Remarks:** Both Rios (1975) and Altena (1975) recognized that this species is not a form of *D. (C.) gibbosa* as thought by Dautzenberg. It differs in being much smaller and in having more delicate sculpture, including finer spiral cords, and a weaker varix, siphonal fasciole and parietal tubercle. It is all white in color and lacks the color blotch on the varix that is present in *D. (C.) gibbosa*. *Drillia dautzenbergi* has spirals on the sulcus, which are lacking in *D. (C.) gibbosa*. Both Rios (1975) and Altena (1975) not only distinguished this species from *D. (C.) gibbosa*, but also raised *Clathrodrillia* to full generic rank, a step not taken in the classification herein. As a consequence of being retained in the genus *Drillia*, this species name is preoccupied by *Drillia minor* Seguenza, 1880 (Seguenza, 1880:103, pl. 11, fig. 8), a species from the Miocene of Italy. A new name thus becomes necessary and is supplied here. The species is named after the original author.

The specimen from IRSNB (figure 4) is housed in a circular box containing an old identification slip stating "*Drillia gibbosa* Born var. *minor* Dautz. Type. pl. A, f. 2.2, I. Margarita, 24 I 96." The same is written on the bottom of the container. A label of Glibert's states the specimen to be the holotype. Comparison of the shell with Dautzenberg's original figures shows that it was undoubtedly used for these illustrations. They are identical including repaired breakage preceding the lip and a somewhat short anterior canal. There is a second healed break about halfway through development of the body whorl that alters the continuity of the canal, making it shorter than normal. Altena's (1975) figures and the specimen shown here (figure 5) demonstrate the full development of the canal. The specimen illustrated in figure 5 has slightly finer axial and spiral sculpture and more and finer spirals on the sulcus than the IRSNB specimen,

but otherwise shows the same characters. Dautzenberg did not designate a holotype. The species was originally reported as being from various South Caribbean localities. Altena (1975) mentions having seen syntypes. As Glibert's assignment was not published, it cannot be considered a lectotype designation. As designation of a lectotype is appropriate, this specimen [IRSNB (figure 4)] is here designated as the lectotype.

*Drillia (Clathrodrillia) petuchi* Tippet, new species (Figure 18)

? *Crassispira* sp. Sully, 1986:96, photo.

*Splendrilla* sp. Petuch, 1988:160, pl. 38, figs. 3,4.

**Description:** Shell moderately large (to 53 mm), fusiform, turreted, with tall spire. Body whorl somewhat truncated, ending in short, open, slightly notched, recurved anterior canal ( $w = 0.39$ ,  $a = 0.43$ ). Whorls ca. 13 including 2 smooth nuclear whorls with immersed tip. Teleoconch whorls rounded, with deeply concave shoulder slope. Periphery angulated along upper ends of axial ribs, situated  $1/3$  whorl below suture. Sculpture of strong, rounded axial ribs (about 14 on penultimate whorl) with equal interspaces, with fine spiral striae that are absent on sulcus. Massive varix  $1/4$ – $1/3$  whorl behind flaring, fluted outer lip, bearing small but strong stromboid notch just above end of anterior canal. Axial ribbing reduced or absent following varix. Sinus deep, U-shaped, margined by recurved callus, bearing parietal tubercle, its entrance narrowed by upward extension of outer lip edge. Siphonal fasciole present. Large specimens with small umbilical chink. Color white, with 3 brownish spiral bands, adapical band spotted, on rear surface of ribs. Varix shows a blotch of same color.

**Type:** Holotype, USNM 880071.

**Type locality:** Off Barbados, 470 ft (142 m), crabbed, Dec. 1986, D. Hunt!

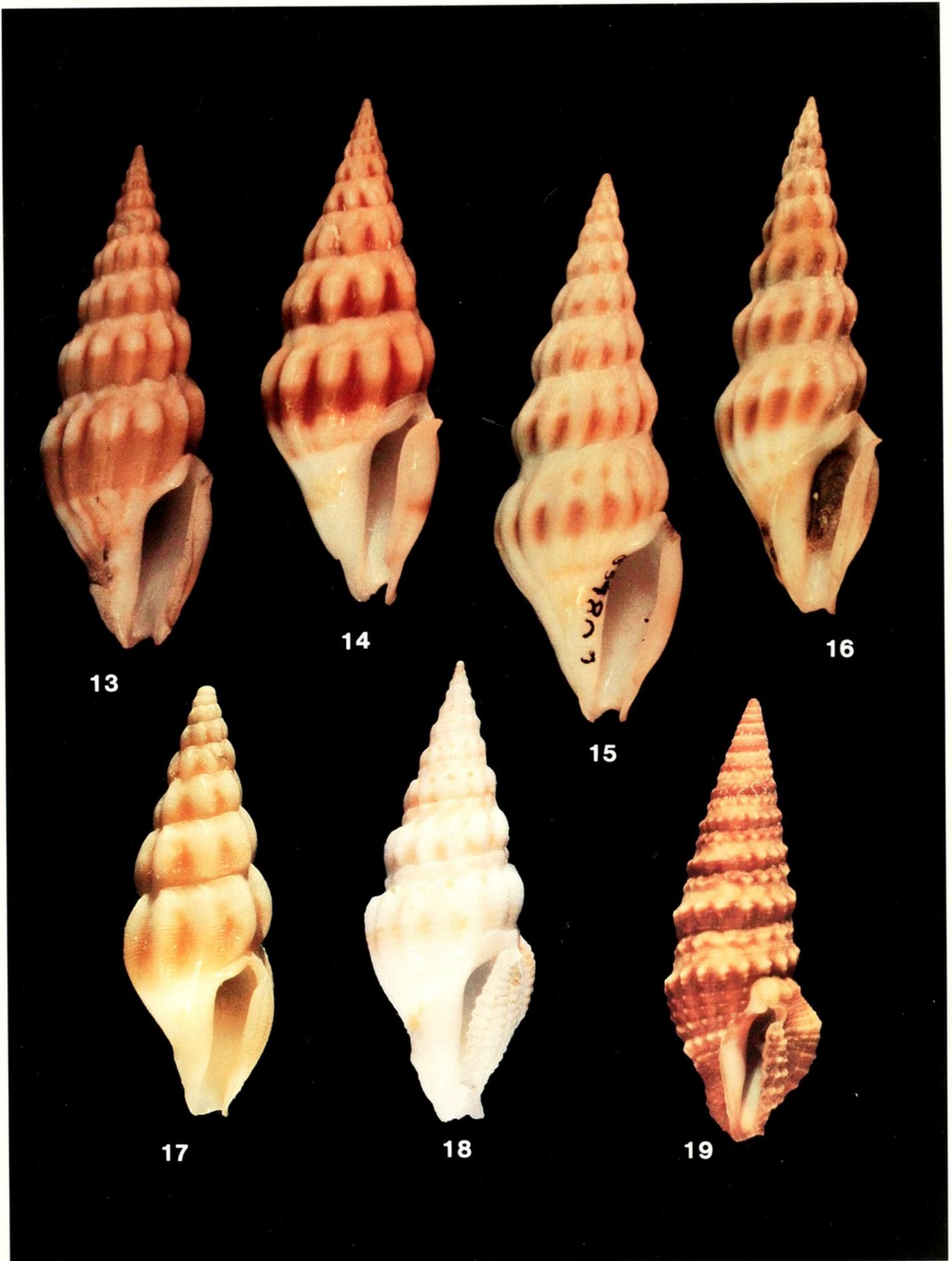
**Additional material examined:** AMNH 186435, 1 spec.; author's collection, 1 spec.

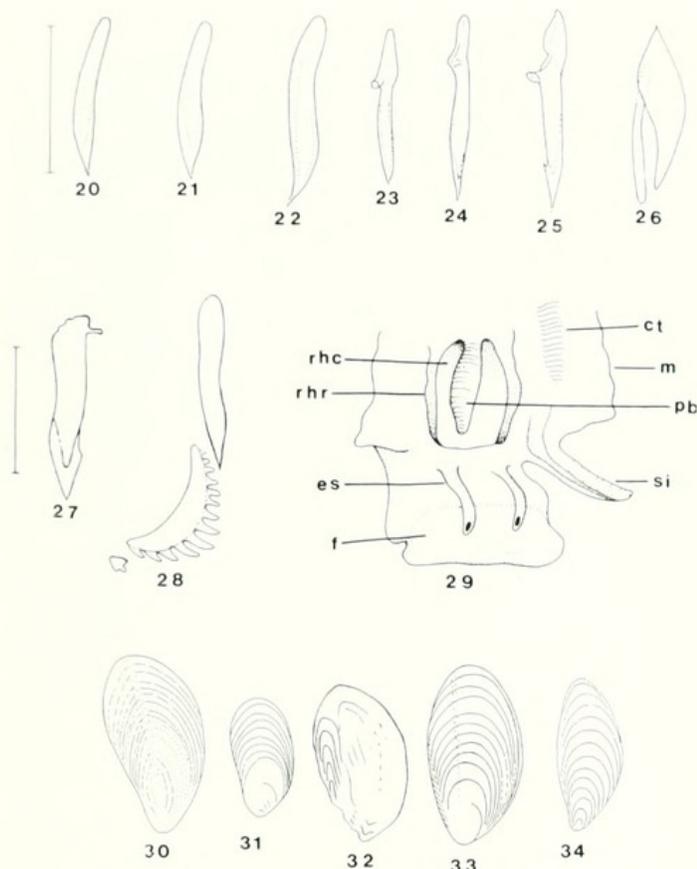
**Range:** Known only from Barbados.

**Remarks:** *Drillia petuchi* is similar to *Drillia (Clathrodrillia) gibbosa*, but differs in being more tumid and robust, having fewer and broader ribs, having a less recurved but more strongly notched anterior canal, and in having a base color that is white rather than pale brown. The varix is much more strongly colored in *D. (C.) gibbosa*, which lacks the spiral banding.

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**Figure 13.** *Fenimorea janetae* (Bartsch, 1934). Holotype, USNM 430249, 37.8 × 14.3 mm. **Figure 14.** *Fenimorea kathya* Tippet, new species. Holotype, USNM 880072, 36.1 × 14 mm. **Figure 15.** *Fenimorea sunderlandi* (Petuch, 1987). Holotype, USNM 859800, 40 × 14 mm. **Figure 16.** *Fenimorea sunderlandi* (Petuch, 1987) var. USNM 880077, 52 × 17.9 mm. **Figure 17.** *Fenimorea petiti* Tippet, new species. Holotype, USNM 880073, 13.2 × 5.2 mm. **Figure 18.** *Drillia (Clathrodrillia) petuchi* Tippet, new species. Holotype, USNM 880071, 39.4 × 15.4 mm. **Figure 19.** *Pilsbryspira (Nymphispira) auberti* (Lamy, 1934), new combination. USNM 880079, 34.7 × 12.8 mm.





**Figures 20–28.** Radular teeth. Scale bars = 100  $\mu$ m. **20.** *Inodrililla nucleata*. USNM 87454. **21.** *Viridrillia williamsi*. USNM 319167. **22.** *Viridrillia hendersoni*. USNM 354327. **23.** *Pyrgocythara plicosa*. USNM 880083 (specimen sacrificed). **24.** *Pyrgocythara danae*. USNM 266350. **25.** *Pyrgocythara filosa*. USNM 880082 (specimen sacrificed). **26.** *Lioglyphostoma hendersoni*. USNM 880080 (specimen sacrificed). **27.** *Pilsbryspira albocincta*. USNM 880081 (specimen sacrificed). **28.** *Drillia wolfei*. USNM 880084 (specimen sacrificed). **Figure 29.** *Pilsbryspira albocincta*. USNM 880081. Schematic drawing of animal, anterior area opened: **Figures 30–34.** Opercula. **30.** *Fenimorea sunderlandi* var. USNM 880077, 10.0  $\times$  5.5 mm. **31.** *Drillia wolfei*. USNM 880070, 3.4  $\times$  1.7 mm. **32.** *Fenimorea kathyae*. USNM 880072, 4.5  $\times$  2.6 mm. **33.** *Fenimorea petiti*. USNM 880073, 2.4  $\times$  1.3 mm. **34.** *Lioglyphostoma hendersoni*. USNM 880078, 3.0  $\times$  1.5 mm.

ct, ctenidium; es, eye stalk; f, foot; m, mantle edge; pb, proboscis; rhc, rhynchodeal cavity; rhr, rhynchodeal roof, reflected; si, siphon.

Petuch (1988:160) considered this species to be an example of his Barbadian Secondary Relict Pocket forms and a possible relative of the *Splendrillia scala* (= *Drillia scala* Pilsbry & Johnson, 1917:155) complex of his Gura-ban subprovince. However *Splendrillia scala* is not a *Clathrodrillia*, whereas the present form is a typical member of the group having the characteristic hump-backed form blotched with color, as well as distinct, relatively coarse, spiral threading. Barbados, the type locality of *D. (C.) petuchi*, is near the Venezuelan subprovince, where *D. (C.) gibbosa* occurs. A more similar form is Jung's (1965:567) *Clathrodrillia* ?n. sp. aff. *C. islalindae* (Maury, 1917) from the Miocene of the Parag-

uana Peninsula, Venezuela. That species is a typical clathrodrilline, has the same number of axial ribs as *D. (C.) petuchi*, but is narrower and the axials tend to extend sinusously over the sulcus to the suture above. It is possible that Maury's species is an ancestor of both *D. (C.) gibbosa* and *D. (C.) petuchi*. The present species is named for Dr. Edward J. Petuch, who first noted the species, and who has made significant contributions to the Caribbean molluscan fauna.

Genus *Fenimorea* Bartsch, 1934

**Type species:** *Fenimorea janetae* Bartsch, 1934.

**Remarks:** Bartsch created the genus *Fenimorea* for his new species *F. janetae* on the basis of its odd micro-sculpture of fine axial and spiral striae that produces a characteristic wavy pattern that "resembles the scales on some butterfly wings" (Bartsch, 1934:3. See figure 12). He was aware that there are other species with the same characteristic, including Dall's *F. moseri* (Dall, 1889) and *F. fucata* Reeve, 1845, but did not assign them to his new genus.

*Fenimorea kathyae* Tippett, new species  
(Figures 14, 32)

*Splendrillia* sp. Petuch, 1988: pl. 38, figs. 5,6.

**Description:** Shell medium sized (to 36 mm), fusiform-biconic with moderately tall spire. Body whorl gradually narrowing, terminating in scarcely differentiated, short, notched siphonal canal ( $w = 0.39$ ,  $a = 0.37$ ). Whorls ca. 11 including protoconch of two smooth whorls. Teleoconch whorls moderately rounded, with concave sulcus on upper 1/3, roundly angulated below by upper ends of axial ribs. Sculpture of strong, rounded axial ribs (about 10 on penultimate whorl) with narrower interspaces. Spiral striae fine, wavy, forming "butterfly wing" pattern in later whorls. Sinus deep, U-shaped, with parietal tubercle, entrance narrowed by an upward extension of outer lip. Constriction varies from slight to almost complete closure. Large varix 1/3 whorl behind lip. Stromboid notch shallow. Columellar callus variably emarginate. Color white, typically with three red spiral bands, the most prominent peripheral and visible on spire just above suture. Varix slightly blotched with red on forward surface. Operculum (figure 32) leaf-shaped with terminal nucleus.

**Type:** Holotype, USNM 880072.

**Type locality:** West coast Barbados, dredged, 500 ft (152 m), Oct. 1986, D. Hunt!

**Additional material examined:** 1 specimen, dredged at 300 ft (91 m), off Egmont Key, FL; 1 specimen, Hypoluxo, FL, 190 ft. (58 m), both in author's collection.

**Range:** Barbados; peninsular Florida.

**Remarks:** The present species is another example of the *F. janetae* complex of attractive shells. When fresh the shells are shiny and colorful, having bright spiral

banding in various shades of orange, red-brown or red. *Fenimorea kathyae* is most similar to *F. janetae* (figure 13), ( $w = 0.38$ ,  $a = 0.36$ ), having shouldered whorls and a sulcus but with a shorter spire, longer base, as well as fewer and broader ribs. The spiral banding in *F. janetae* is orange and broad but is bright red and narrow in *F. kathyae*. *F. sunderlandi* (Petuch, 1987) (figure 15), ( $w = 0.35$ ,  $a = 0.34$ ), another member of this group, lacks a sulcus, has non-angulate whorls, and narrower, more numerous ribs that are opisthocline, rather than orthocline, as in *F. janetae* and *F. kathyae*. As noted by Petuch (1987:19), *F. sunderlandi* has been misidentified as *F. janetae*. The shells so misidentified (figure 16, figure 30 for operculum), ( $w = 0.34$ ,  $a = 0.35$ ), coming principally from the well-known "bushels," dredgings, of Jim Moore and Riley Black in the 1960s and 1970s, are a variety of *F. sunderlandi* that is larger and narrower. This form has a facies suggestive of *F. janetae*, but shows the whorl-outline and rib characteristics of *F. sunderlandi*. All members of the group have the "butterfly wing" spiral sculpture although it differs in strength from specimen to specimen. The species is named for another beauty, and fine field collector, the author's wife.

*Fenimorea petiti* Tippett, new species  
(Figures 17, 33)

? *Drillia albicoma* Dall, 1889, Sunderland & Sunderland, 1993:  
14 (figured).

**Description:** Shell small (10–17.7 mm), fusiform, with tall spire and moderately elongate body whorl gradually tapering to short, unnotched anterior canal ( $w = 0.34$ – $0.45$ ,  $a = 0.31$ – $0.47$ ). Whorls rounded, lacking sulcal region. Sculpture of axial ribs, 10–12 on penultimate whorl, extending suture to suture, tending to be only slightly curved below the suture at area usually occupied by sulcus, and fine spiral striae of "butterfly wing" type overall. Sinus moderately deep, U-shaped, occupying most of shoulder slope, with parietal callus. Varix 1/4 whorl behind thin lip with shallow stromboid notch. Color white, with variable banding of orange shades. Operculum leaf-shaped, with terminal nucleus (figure 33).

**Type material:** Holotype, USNM 880073. Paratypes, one each at NMNH, AMNH, MCZ, DMNH, ANSP, LACM, NM, MORG, NHM, MNHN, IRSNB; others in author's collection.

**Type locality:** Gulf of Mexico west of Crystal River, Florida, 30 fm (59 m), dredged, Jim Moore!, May, 1963.

**Range:** Known only from the Gulf of Mexico from the Cedar Keys to the Florida Keys. The shell figured by the Sunderlands appears to be this species but would need verification as to identification and locality. A number of specimens have lost the precise locality data but are from the Gulf. All material is from the Jim Moore dredgings.

**Remarks:** The author initially considered *F. petiti* a possible dwarf form of *F. janetae* on the basis of general

appearance. However examination of additional material showed the resemblance to be superficial. The taxon is nearer a species that, on cursory scrutiny, does not even appear to be of the group, *Fenimorea pagodula*. (See below.) The major differences between the two species are that *F. petiti* is more tumescent, although quite variable, and has fewer, wider, and straighter axials. *Fenimorea petiti* shows variation of color pattern, the spiral band being pale and perhaps interrupted in some examples, but this is nearly always stronger and more colorful than the bland and unremarkable banding of *F. pagodula*. The species is named for Mr. Richard E. Petit for his kind donation of the material and in recognition of his many contributions to malacology.

*Fenimorea pagodula* (Dall, 1889) new combination  
(Figure 3)

*Drillia pagodula* Dall, 1889:90, pl. 13, fig. 6.

**Remarks:** Identification of *F. pagodula* has been on uncertain grounds because Dall did not designate a holotype and a number of syntype lots with shells of somewhat disparate nature, located both at the USNM and MCZ, exist. These have been examined and the shell illustrated in figure 3 (USNM 87471, off Havana, 119–175 fm (217–320 m)) is a good representation of Dall's description and figure despite being two mm shorter than the measurement given by Dall in the plate caption. The width of the specimen illustrated in figure 3 is 5.8 mm, as is stated in Dall's description. It is here designated lectotype of the species. Although not bright in general appearance, as typical of the *Fenimoreas*, this species has the microsculpture characteristic of *Fenimorea*. Paralectotypes: USNM 887466 (separated from USNM 87471); USNM 87472, 3 specimens, Dominica, 118 fm (216 m), sand, 65°F, Blake St. 177; MCZ 7068, off Barbados, 154 fm (282 m), Blake St. 282; MCZ 7069, 11 specimens (a mixed lot and only 5 specimens are true *F. pagodula*), off Barbados, 103 fm (188 m), Blake St. 273; MCZ 7070, off Barbados, 73 fm (133 m), Blake St. 290; MCZ 7071, W. of Fla., 50 fm.

Genus *Sediliopsis* Petuch, 1988

**Type species:** *Pleurotoma gracilis* Conrad, 1830.

*Sediliopsis riosi* Tippett, new species  
(Figures 6, 7)

**Description:** Shell small (12–15 mm), claviform, turreted, with moderately tall spire, short, unnotched siphonal canal ( $w = 0.37$ ,  $a = 0.41$ ). Whorls about 7 including protoconch of two whorls, the first smooth, the second bearing 3–4 spiral cords. Adult whorls rounded, somewhat tumid, with distinct suture followed by sub-sutural cord, deep shoulder sulcus, whorls angulated by upper ends of axial ribs. Sculpture of dominant axial ribs crossed by incised spiral striae producing wider, somewhat flattened cords most evident as laterally elongate

beading on ribs. Ribs broad, well rounded, about 16 on body whorl, with a tendency to bifurcate basally. Sinus moderately deep, U-shaped, occupying most of sulcus, apex at mid-point. No stromboid notch or varix. Color uniform milky white.

**Types:** Holotype, MORG 31.775. Paratypes, MORG 31.776 -one specimen, MORG 31.777 - five specimens; USNM 880075 - one specimen; one specimen in author's collection.

**Type Locality:** Off Sao Paulo, Brasil, 24°31'S, 44°28'W, in 250 m. This species and *Lioglyphostoma hendersoni*, below, were dredged using a beam trawl by the "W. Besnard" on Dec. 9, 1988. Bottom temp. 13.2°C. Ana Maria Vanin!

**Range:** Known by only the type material.

**Remarks:** This species represents the discovery of a living member of what has hitherto been known solely as a fossil genus. The distinguishing feature of the genus is the characteristic protoconch (figure 8), which bears three or four spiral cords on the second and, if present, third whorl(s), a state unique for the family in the western Atlantic. Gibson (1962:238), discussing Conrad's *Pleurotoma gracilis*, recognized this and identified several (fossil) species with the same type of protoconch, but only suggested that the group may deserve ranking as a separate genus or subgenus. Petuch (1988) erected the genus, feeling that the closest relative was *Sedilia* Fargo (1953:370), a Pliocene genus from southwestern Florida having a different type of protoconch. He stated, based on the available knowledge, that *Sediliopsis* became extinct after the time of the Saint Mary's formation (late Miocene of the Maryland coastal plain). The present species apparently represents an instance of relict-pocket occurrence, as discussed by Petuch. Further study of forms with this type of protoconch shows that others outside the restricted geotemporal range of *S. gracilis* (middle western Atlantic coastal plain Miocene) exist: *S. chowanensis* (Gardner, 1948), from the upper Pliocene of North Carolina and *S. aphanitoma* (Dall, 1892) and *S. ondulum* (Fargo, 1953), both from the Pliocene of Florida. This broader geographic and temporal range of members of the genus makes it reasonable that *Sediliopsis* could also occur in the Recent fauna of Brasil. This species is named in honor of Professor Eliézer de C. Rios for his contributions to Brazilian malacology and for providing the material for study.

Subfamily *Crassispirinae* Morrison, 1966, emended McLean, 1971

Genus *Lioglyphostoma* Woodring, 1928

**Type species:** *Lioglyphostoma adematum* Woodring, 1928.

*Lioglyphostoma hendersoni* (Bartsch, 1934)  
(Figures 9, 26, 34)

*Glyphostoma (Glyphostomops) hendersoni* Bartsch, 1934:17, pl. 5, figures 2,5,8.

Sp. "E" Rice & Kornicker, 1965:128, pl. 7, fig. 18.

**Material examined:** See with *Sediliopsis riosi* above; 34 specimens. Voucher specimen, USNM 880078; 2 specimens in author's collection; remainder at MORG.

**Remarks:** Described from Puerto Rico, this species has also been recorded from off North Carolina (Porter, 1975:35). The present report of *L. hendersoni* from off Brazil and a specimen from the Campeche Bank, Yucatan (Rice & Kornicker, 1965) indicate that it is widespread. The shells were compared with both the holotype and approximately 65 other lots in the USNM from the Miami and Florida Keys areas. Although the present material shows stronger beading at the intersections of the axial and spiral sculpture than does the holotype, there is complete intergrading of forms. Bartsch (1934) selected a specimen with weaker sculpture as the type. Unknown previously, the operculum (figure 34) is leaf shaped with a terminal nucleus, and the radula (figure 26) shows about 40 pairs of duplex teeth with a presumably detached accessory limb (detachment can not be determined conclusively using light microscopy).

Genus *Inodrillia* Bartsch, 1943

**Type species:** *Pleurotoma (Drillia) nucleata* Dall, 1881.

*Inodrillia nucleata* (Dall, 1881)  
(Figure 20)

*Pleurotoma (Drillia) nucleata* Dall, 1881:9.

*Drillia nucleata* Dall, 1889:92, pl. 11, fig. 1.

*Inodrillia (Inodrillia) nucleata* Bartsch, 1943:102, pl. 8, fig. 6; pl. 10, fig. 4; pl. 13, fig. 1.

Genus *Viridrillia* Bartsch, 1943

**Type species:** *Viridrillia williami* Bartsch, 1943.

*Viridrillia williami* Bartsch, 1943  
(Figure 21)

*Viridrillia (Viridrillia) williami* Bartsch, 1943:92, pl. 8, fig. 2; pl. 10, fig. 2.

*Viridrillia hendersoni* Bartsch, 1943  
(Figure 22)

*Viridrillia (Viridrillina) hendersoni* Bartsch, 1943:99, pl. 7, fig. 3; pl. 10, fig. 1; pl. 15, fig. 5.

**Remarks:** Bartsch's genera and the species from them are noted to ensure placement in the subfamily *Crassispirinae* and to illustrate the radulae of *Viridrillia williami* and *V. hendersoni*. Powell (1966, text figs. E 109-111) had figured J.P.E. Morrison's drawings of radulae, from the USNM, of *Inodrillia nucleata*, *I. miamia*, and *I. ino* Bartsch, but not those of *Viridrillia*, although they were

available to him. Powell commented about *Viridrillia* (1966:74, with the genus *Cerodrillia*): "... a very different radula, which consists only of a pair of elongate, foliated marginals." He placed the genera in his subfamily Clavinae, as he interpreted it at that time, principally on the basis of shell characters. Subsequently, McLean (1971:119) separated this grouping, largely on the basis of radular form, into the subfamilies Clavinae [subsequently Drilliinae, Clavinae being preoccupied (Cernohorsky, 1985:60)] and Crassispirinae. The teeth of *Inodrillia* and *Viridrillia*, although not typical, are most similar to those of Crassispirinae, certainly not to those of the Drilliinae. Sysoev, in Taylor *et al.* (1993:164), recognized this and listed *Inodrillia* as a crassispirine genus. Morrison's illustrations are somewhat unclear so I reviewed his slides and the figures presented here were made. The teeth of both genera are essentially the same, consisting of simple, elongate, solid, pointed marginals. They are not clearly duplex but show a lengthwise thickening suggestive of an accessory limb, perhaps a step in the evolution towards accessory limbs. Bartsch's subgenera *Viridrillina*, *Inodrillina*, *Inodrillara* now are synonymized with their respective parent genera *Viridrillia* and *Inodrillia*.

Subfamily **Clathurellinae** H. & A. Adams, 1858

Genus *Clathurella* Carpenter, 1857

**Type species:** *Clavatula rava* Hinds, 1843, by subsequent designation Cossmann, 1896.

*Clathurella eversoni* Tippett, new species.  
(Figures 10, 11)

**Description:** Shell very small (4.5 mm), biconic-fusi-form, with tall spire, short anterior canal ( $w = 0.38$ ,  $a = 0.33$ ). Protoconch of three smooth whorls. Adult whorls four, sculptured by 11–12 rounded axial ribs separated by equal interspaces, crossed by spiral cords forming laterally elongate beading at intersections. Spiral cords extend down over base and canal. Sinus moderately deep, U-shaped, on shoulder slope, with only modest parietal callus. Enlarged axial rib behind lip. Five spirally elongate denticles inside outer lip. Columella with two weak pustules. Color light brown with paler band on peripheral spiral.

**Type:** Holotype, USNM 880074.

**Type locality:** Off Dania Beach, Florida, between second and third reefs, 70 ft (21 m), in rubble, SCUBA at night, Gene Everson!

**Remarks:** Although known only from the holotype, this species is distinctive and warrants description. The holotype is still slightly juvenile and would undoubtedly show a deeper sinus at full maturity; also it is somewhat worn. There is a vestige of carination on the later protoconch whorls and traces of minute granulation on the shell surface, which are characteristic of the genus.

Until the description of *C. fuscobasis* Rehder (1980:87, pl. 11, figs. 3,4) from Easter Island, *Clathurella* in its modern concept was known only from the tropical eastern Pacific. The present species extends the range of the genus to the western Atlantic area. *Clathurella eversoni* is nearest *C. rava* (Hinds, 1843), differing in being smaller, having a broader shoulder slope, stronger spiral cord at the shoulder, and different color pattern. This species is named for its discoverer, Mr. Gene Everson.

Subfamily **Zonulispirinae** McLean, 1971

Genus *Pilsbryspira* Bartsch, 1950

**Type species:** *Pilsbryspira pilsbryi* Bartsch, 1950 (= *Pleurotoma jayana* C. B. Adams, 1850b).

*Pilsbryspira (Pilsbryspira) albocincta* (C. B. Adams, 1845)  
(Figures 27,29)

*Pleurotoma albocincta* C. B. Adams, 1845:3 (reprinted Clench & Turner, 1950:253, pl. 29, fig. 5).

**Material examined:** Two specimens, alcohol preserved, Cabbage Patch, Abaco Island, Bahamas, under rocks in 3 ft water, Colin Redfern!, July 8, 1972.

**Remarks:** Shells are an exact match to the lectotype (Clench & Turner, 1950, pl. 29, fig. 5). Animal is uniformly grayish pink. Prominent inhalant siphon leads to a large gill. Proboscis is of the intraembolic form. A much convoluted poison gland with a large muscular bulb is present. The oesophagus was empty. Radula (figure 27) consists of numerous pairs of broad marginal teeth, flaring at the distal end and bearing a small barb. The teeth are typical of the subfamily.

Subgenus *Pilsbryspira (Nymphispira)* McLean, 1971

**Type species:** *Crassispira nymphia* Pilsbry & Lowe, 1932.

*Pilsbryspira (Nymphispira) auberti* (Lamy, 1934), new combination  
(Figure 19)

*Drillia auberti* Lamy, 1934:435 (description and figure).

*Crassispira auberti* (Lamy, 1934) Radwin, 1969:232 (list).

*Pilsbryspira harfordiana* (Reeve, 1843) Vokes & Vokes, 1983:30, pl. 2, fig. 11a.

*Crassispira harfordiana* (Reeve, 1843) Sunderland & Sunderland, 1993:14 (figure).

**Material examined:** 3 specimens, dredged, 120 ft (36 m), Porto Bello Bay, Caribbean Panama, James Ernest! Voucher specimen, USNM 880079. Others in Everson and Ernest collections.

**Remarks:** As seen in the synonymy, there has been uncertainty as to the identification and placement of this species. Lamy's type material cannot be found (pers. comm., P. Bouchet) and thus identification must neces-

sarily be based on comparison with Lamy's description and figure. Fortunately, these are reasonably good, and the present material appears to be this species, agreeing in overall form, sculptural detail, and color. Also the current material is from the same geographic area. The material referred to in the cited publications appear to be the same species. It can be assumed that Radwin (1969) was accurate in his identification because his material came from the type locality. A broader geographic range than known previously is suggested. The Vokes' (1983) specimens came from Yucatan, not a surprising range extension, while Sunderland and Sunderland (1993) reported on material from Cuba. Identification of the Cuban specimens as *Crassispira (Glossispira) harfordiana* is in error, despite superficial similarity. This species is from the eastern Pacific and has a more tumescent outline, crassispirine sinus structure, blackish color, and other, finer, differences. Although soft parts of *P. auberti* are not available, the sinus structure, beaded base, and color pattern are consistent with the present assignment.

Subfamily **Mangeliinae** P. Fischer, 1887

Genus *Pyrgocythara* Woodring, 1928

**Type species:** *Pyrgocythara eminula* Woodring, 1928.

*Pyrgocythara filosa* Rehder, 1943  
(Figure 25)

*Pyrgocythara filosa* Rehder, 1943:203, pl. 20, fig. 2.

**Material examined:** Six specimens, alcohol preserved, Pine Island, east Florida, sieved from *Spartina* grass, 24 September 1993, John Wise!

**Remarks:** Shells of these specimens match the holotype except that the axials are slightly narrower and their shoulder angulation is slightly sharper. Animal white with black eyes located near the ends of short stalks. There is a prominent inhalant siphon. The mantle is speckled black and this coloring extends back over the visceral segment. There is a coiled poison gland and muscular bulb. The radula consists of paired marginal teeth enclosed in a radular sac. Radular tooth (figure 25) elongate, sharply pointed, bearing a small barb 1/3 the distance from the tip, and has a projection at the base from which a triangular extension of tissue protrudes posteriorly. The radular teeth are of the "hilted-dagger" type described by Powell (1966) and are very similar to those of *Pyrgocythara danae* (Dall, 1919) from the eastern Pacific except that the teeth of that species do not have barbs (figure 24).

*Pyrgocythara plicosa* (C. B. Adams, 1850)  
(Figure 23)

*Pleurotoma plicosa* C. B. Adams, 1850b:54 (new name for *Pleurotoma plicata* C. B. Adams, 1840, non Lamarck, 1804).

**Material examined:** 2 live specimens, Little Jim Island, Fort Pierce, Florida, grass and mud flats, intertidal, hand sieved, 24 & 25 January 1991, John Wise!

**Remarks:** The animal has a whitish, semitranslucent foot and head speckled with fine, bright, ivory-white spots, the eyes prominent toward the ends of rather long stalks. No operculum. The mantle is white speckled with sooty-black, and this coloration extends back over the visceral lobe. A long penis with a fingernail-shaped end is attached to the right side of the head and curls back inside the mantle cavity. Large gills, osphradium, and hypobranchial glands are present. The proboscis is intraembolic. The radular teeth (figure 23) are enclosed in a radular sac and number about 35 pairs. They are of the "hilted-dagger" form and resemble those of *P. danae* but lack an angulation toward the tip.

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