

Eight new molluscan species (Gastropoda: Turridae) from the western Atlantic, with the description of two new genera

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KEYWORDS. Gastropoda, Turridae, Mangeliinae, *Acmaturris*, *Suturocythara*, *Crassipirinae*, *Darrylia*, *Miraclathurella*, *Viridrillia*, Gulf of Mexico, Caribbean, Bahamas, Florida, new genera, new species, new combinations.

ABSTRACT. Two new turrid genera are described: *Suturocythara* n. gen., assigned to Mangeliinae, and *Darrylia* n. gen., assigned to Crassipirinae. Eight new turrid species are described: *Acmaturris annaclaireleeae* n. sp., *Acmaturris pelicanus* n. sp., *Agathotoma ethymata* n. sp., *Suturocythara apocrypha* n. sp., *Suturocythara redferni* n. sp., *Darrylia harryleei* n. sp., *Miraclathurella clendenini* n. sp., and *Viridrillia aureofasciata*, n. sp. *Drillia kleinrosa* Usticke, 1962 is assigned to the new genus *Darrylia*. *Agathotoma (Viridrillia) klasmidia* Shasky, 1971, and *A. (V.) secalis* Shaski, 1971, from the Panamic Province, are assigned to the new genus *Suturocythara*. All new genera and species are compared with similar taxa.

INTRODUCTION

When this study began, the goal was to describe three new turrid species from the Gulf of Mexico. However, in order to elucidate challenges encountered when trying to find generic placements, other undescribed conspecific material and congeneric taxa were uncovered and all has been incorporated in this report.

The eight turrid species described herein are small, inconspicuous species that were collected by the methodical search of sediment. Three of the species were collected during dredging expeditions in Bahía de Campeche, southwestern Gulf of Mexico in the summer of 2005, and in the northeastern Gulf of Mexico during the summer of 2006. Both expeditions were undertaken on board the R/V *Pelican*, a research vessel managed by LUMCON, the Louisiana Universities Marine Consortium. The Campeche cruise and its findings have been reported elsewhere (García, 2006, 2007b). The 2006 expedition covered the offshore waters from Louisiana to Tampa, Florida. It produced 272 species assigned to 44 families. Of these, the best represented are the turrids, with 39 species, of which some represent extensions of their known geographic distribution (García, 2007a). Others are yet to be identified. Also described here is an *Acmaturris* collected in a 2004 dredging campaign at Sackett Bank, one of Louisiana's many rich, deep-water banks. Sackett Bank has produced some 100 species of mollusks, 19 of which are turrids. This is the first *Acmaturris* species to be recorded from the Gulf of Mexico. The Gulf of Mexico material was extracted from several hundred kilos of sediment dredged between 60 and 94 m. A second species of *Acmaturris* inhabiting the Bahamas and the southern Caribbean is also described here.

One of the three original Gulf of Mexico turrid species which defied generic placement has been assigned to a new genus shared with a hitherto undescribed Bahamian species, a single specimen of which was collected by Colin Redfern, author of *Bahamian Seashells* (2001), in more than 30 years of collecting in the area. The genus *Suturocythara* n. gen. is proposed here for these two species, which share protoconchs fully ornamented with vermiform elements, a shoulder area where the whorls rise above the level of the suture, and a calloused, protruding anal sinus. Although assigned to Mangeliinae, their shape is not unlike some species of the genus *Kermia*, an Indo-Pacific genus belonging in the subfamily Raphitominae. The Gulf of Mexico species has also been found on the southeastern coast of Florida.

A second undescribed Gulf of Mexico species had been originally assigned to *Miraclathurella*; however, when it was compared with two other Recent western Caribbean species seemingly congeneric, an obvious discrepancy was detected. The Gulf species has been tentatively left in *Miraclathurella*, but the other two species have been assigned to *Darrylia* n. gen. Both genera share a broad protoconch with strong axial ribs but *Darrylia* lacks spiral ornamentation in the protoconch and a sutural cord.

A third undescribed Gulf of Mexico species was represented by a single specimen dredged in Campeche Bay; however, when images were sent to Harry G. Lee, of Jacksonville, Florida, and Colin Redfern, of Boca Raton, Florida, I was supplied by them with numerous samples of the species. While Redfern had obtained his specimens during many years of collecting in Abaco Is., Bahamas area, Dr. Lee had obtained his from a wider range, almost one at a time, through the generosity and unselfishness of

his many shell-collecting friends. Although the species has a paucispiral protoconch, suggesting limited larval distribution, it has been found from the Gulf of Mexico to the Bahamas and the British Virgin Islands, as well as south to off the coast of Nicaragua.

The *Viridrillia* species described here, dredged off the Alabama coast, is the largest and most colorful in the genus, and is the first species assigned to *Viridrillia* reported from the northern half and southwestern quadrant of the Gulf of Mexico; the only other species inhabits the southeastern corner, off the Florida Keys.

The taxonomic complexity exemplified by the turrid taxa treated in this study underscores the challenges that this family presents. It also indicates the underestimated diversity of the molluscan fauna of the western Atlantic and the possibilities of new discoveries that lay ahead.

Although Taylor et al., 1993 proposed a classification that moved some subfamilies of Turridae into Conidae and elevated others, such as Drilliinae, to familial status, subsequent workers (Kohn & McLean, 1994; Rosenberg, 1998) have questioned their conclusions. I have retained here the traditional classification of Turridae, as a consensus has not yet been reached.

All the specimens treated in this study were collected as empty shells unless otherwise stated.

Abbreviations

ANSP: Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.

BMSM: Bailey-Matthews Shell Museum, Sanibel, Florida, USA.

CR: Colin Redfern collection, Boca Raton, Florida, USA.

EFG: author's collection.

FSBC I: Florida Fish and Wildlife Conservation Commission - Florida Wildlife Research Institute (FWC-FWR1), St. Petersburg, Florida, USA.

HGL: Harry G. Lee collection, Jacksonville, Florida, USA.

FSBC: Florida Department of Natural Resources, St. Petersburg, Florida, USA.

LACM: Los Angeles County Museum, Los Angeles, California, USA.

SBMNH: Santa Barbara Museum of Natural History, California, USA.

UF: University of Florida, Florida Museum of Natural History, Gainesville, Florida, USA.

USNM: National Museum of Natural History, Smithsonian Institution, Washington, DC, USA.

SYSTEMATICS

Superfamily **CONOIDEA** Fleming, 1822

Family **TURRIDAE** Swainson, 1840

Subfamily **MANGELIINAE** Fischer, 1887

Genus *Acmaturris* Woodring, 1928

Type species: *Acmaturris comparata* Woodring, 1928 (by original designation).

Acmaturris annaclaireleeae n. sp.

Figs 1-4

Type material. Holotype UF 412553, length 3 mm, width 1.3 mm (Figs 1-4), Klein Bonaire, Netherlands Antilles, in 43 m. Paratypes: 1 BMSM 15496, Cape Eleuthera, Eleuthera Island, Bahama Islands, in 39 m.

Type locality. Klein Bonaire, Netherlands Antilles, in 43 m.

Distribution. Klein Bonaire, "ABC Islands," Netherlands Antilles, and Eleuthera Island, Bahamas, in 39-43 m.

Description. Holotype 3 mm in length, relatively strong, fusiform (width/length ratio 0.43). Protoconch (Fig. 4) white, broadly conical, of about 2.25 whorls; first whorl smooth, with irregularly placed pimple-like ornamentation; thin, obliquely arcuate axial riblets appearing at end of second whorl; termination of spiral ornamentation determined by appearance of spiral ornamentation. Teleoconch of about 2.75 whorls; whorls widely shouldered, sharply angular, slightly constricted anteriorly. Suture inconspicuous. Axial ornamentation of 11 or 12 round, narrow, arcuate ribs; ribs about 1/3 as wide as interspaces. Spiral ornamentation of well-defined, round cords; cords about 1/2 as wide as axial ribs; 3 such cords on early whorls, increasing to 10 on last whorl; cords forming strong reticulated pattern when crossing axial ribs, creating small nodes at intersections; secondary cords continuing on anterior canal. Shell surface covered with microscopic, scabrous axial and spiral ornamentation, creating a secondary reticulated pattern, giving surface a frosted appearance. Aperture narrow, long, approximately 1/2 length of shell, anterior canal slightly produced posteriorly; labrum moderately thin, incurved, then erect, slightly crenulated, re-enforced behind by a well-defined, rounded, narrow varix; shell ornamentation extending over surface of varix; stromboid notch lacking; anal sinus pronounced, wide, deep, somewhat rectangular in shape (Fig. 2); parietal wall smooth, weakly callused (Fig. 2). Shell crystalline-white.

Discussion. This and the following species have been placed in *Acmaturris* because of their similarity in shell form to the type species, strongly clathrate macrosculpture with a "frosted" microsculpture in the interspaces, strongly varicose lip with a crenulated thin edge, and a thickened sinus edge adjoining parietal shelf.

The paratype of *Acmaturris annaclaireleeae*, from Eleuthera Is., Bahamas, measures 2.9 mm, and has all of the characters of the holotype. The long distance between the two locations suggests that this species is

widely spread in the western Atlantic. The two type specimens were found by Dr. Lee from sediment collected by L. R. Zylman while SCUBA diving. The small size separates this species from all other *Acmaturris*. *Acmaturris brisis* Woodring, 1928, a fossil species described from the Bowden beds, Jamaica but reported from the Recent fauna of Amapá, Brazil (Rosenberg, 2008), grows to 8.3. *Acmaturris sagera* (Dall, 1927), a species inhabiting deep water off Georgia, grows to 5 mm, and has a smooth nucleus of 1.5 whorls. *Acmaturris pelicanus* n. sp. (Figs 5-9), grows to 4.4 mm, is relatively wider (width/ length ratio 0.45), and has a stronger reticulated pattern and a coarser microsculpture.

Etymology. Named for Anna Claire Lee, baby granddaughter of the well-known conchologist Harry G. Lee, of Jacksonville, Florida. Dr. Lee brought the new species to my attention and donated the type material to the repository institutions.

Acmaturris pelicanus n. sp.

Figs 5-9

Type material. Holotype ANSP 416413 (Figs 5-9), length 4.4 mm, width 2 mm.

Type locality. Louisiana. Sackett Bank, 28°38.16'N, 89°33.19'W, in 60-70 m.

Distribution. Known only from the type locality.

Description. Holotype 4.4 mm in length, strong, widely fusiform (width/ length ratio 0.45). Protoconch (Fig. 9) somewhat eroded, white, of approximately 2.25 whorls; first whorl presumably smooth; strong, wide, arcuate axial cords appearing on second whorl; cords as wide as interspaces; termination of protoconch determined by appearance of spiral ornamentation. Teleoconch of about 3.5 whorls; whorls convex, shouldered. Suture inconspicuous. Axial ornamentation of 10 or 11 strong, widely rounded ribs; ribs as wide as interspaces. Spiral ornamentation of narrow, well-defined cords; cords forming reticulated pattern as they cross axial elements, creating strong nodes at intersections: 3 such cords on early whorls, increasing to 8 on last whorl, cords continuing on anterior canal. Shell surface covered with numerous microscopic axial and spiral threads, creating a secondary reticulated, nodose pattern (Fig. 8). Aperture relatively narrow, occupying 1/2 length of shell; anterior canal wide; labrum thin, erect, slightly crenulated, re-enforced behind with strong, wide, rounded varix; shell ornamentation extending over surface of varix; stromboid notch lacking; anal sinus relatively deep, wide; parietal wall smooth, slightly callused. Shell white

Discussion. The small size and widely fusiform shape separate this species from most other *Acmaturris*

species. Only *Acmaturris annaclaireleeae* n. sp. (Figs 1-4) and *A. sagera* (Dall, 1927) are near the size of *A. pelicanus*; however, *A. annaclaireleeae* is smaller, narrower, and has a different sculpture; and *A. sagera* is slightly larger, narrower, has a protoconch of 1.5 whorls, and has a different microsculpture. The latter species has been collected off Georgia, reportedly in 538 to 805 m.

Etymology. Named for the R/V *Pelican*, the research vessel used in the cruise when the new species was obtained.

Genus *Agathotoua* Cossman, 1899

Type species: *Mangelia angusta* Jan in Bellardi, 1848 (by subsequent designation).

Agathotoua ecthyuata n. sp.

Figs 10-18

Type material. Holotype ANSP 416414, length 5 mm, width 2 mm (Figs 10-13). Paratypes: 3 CR 3320, 3368, 3334, Treasure Cay, Abaco Is., Bahamas; 1 BMSM 15497, Treasure Cay, Abaco Is., Bahamas, 26°40.00'N, 77°18.15'W, 0-1 m; 1 CR 3367, Treasure Cay, Abaco Is., Bahamas 26°39.45'N, 77°17.55'W, 1 m (Figs 14-15); 1 CR 12494, south of "Don't Rock", Abaco Is., Bahamas, 26°40.31'N, 77°15.16'W, 3.5 m; 1 USNM 1109964, Guana Cay, Abaco Is., Bahamas, 26°40.50'N, 77°08.05'W, 2 m, live; 1 HGL coll., Norman's Cay, Exuma, Bahamas; 1 HGL coll., east of St. Augustine, St. John Co. Florida, 40 m; 1 EFG 28091, Bahía de Campeche, Gulf of Mexico, 20°51.49'N, 92°21.44'W, 63-65 m (Figs 16-17); 1 CR 8072, Guana Cay, Abaco Is., Bahamas, 26°41.15'N, 77°10.10'W.

Type locality. Bahama Ids., Abaco Is., Treasure Cay, 26°40.00'N, 77°18.15'W, 0-1 m.

Other material examined. **Bahama Ids.** Abaco Is., Sandbank Creek, 26°39.35'N, 77°18.12'W, 2 m (EFG), 1; Airport Beach, Eleuthera (HGL), 1; South Ridge Rock, Cay Sal, 20 m (HGL), 1; west side of Cape Eleuthera, Eleuthera Is., Bahamas, 39 m (HGL), 1; "The G. Spot," French Cay, Turks and Caicos, 20 m (HGL), 1; Bloody Bay Wall, Little Cayman Is., Cayman Ids., 20 m (HGL), 1. **Belize.** Deadman's Reef, Turneffe Id, 20 m (HGL), 1. **British Virgin Islands.** Deadman Chest, 18 m (HGL, Fig. 18), 1. **Colombia.** Isla Providencia, western Santa Catalina Is., 13°27'N 81°21'W, 27 m (HGL), 1.

Distribution. Southwestern Gulf of Mexico to the British Virgin Islands, and south to Isla Providencia, Colombia, from 26°40'N to 13°27'N; from 64°44'W to 92°22'W, in 0-65 m.

Description. Holotype 5 mm in length, moderately strong, turreted (width/ length ratio 0.42) (Figs 10-13).

Protoconch white, of 1.5 whorls; apical tip spherical, irregularly sculptured with pimple-like projections (Fig. 12); projections subsequently increasing in number and strength, at times aligning spirally; whorl soon developing convex shoulder and nearly flat sides; 2 or 3 weak axial folds appearing at termination of protoconch. Beginning of teleoconch defined by appearance of scabrous spiral ornamentation and slight carina; remainder of teleoconch of 4.5 whorls; whorls strongly shouldered, angular, slightly narrowing anteriorly. Suture impressed, obscured by shell ornamentation. Axial sculpture of 9 or 10 wide, slightly slanted ribs; ribs as wide as interspaces on first whorl, becoming narrower, more defined on later whorls, stronger at shoulder. Surface of shell covered with numerous narrow, imbricated spiral threads (Fig. 13). Aperture elongated; outer lip thin, strengthened behind by strong, dorso-ventrally compressed varix which wraps around relatively wide, round anal sinus; sinus not constricted at aperture; anterior canal wide, short. Shell white, with three equidistant, indistinct, reddish bands: below periphery of shoulder, at mid-body, and at beginning of anterior canal; color strongest on labral varix, almost absent elsewhere.

Discussion. Some species tentatively assigned to *Pseudorhaphitoma* Boettger, 1895 (Kilburn, 1993: 319), an Indo-Pacific genus, have a protoconch ornamented with prickly granules not unlike the protoconch ornamentation of *Agathotoma ecthymata*, as well as a teleoconch of scabrous spiral threads (e.g., *P. obscurata* Kilburn, 1993: 343, figs 47-48); however, these species have teleoconch whorls that are not tapering anteriorly, have axial ribs that are continuous from whorl to whorl, similar to the genus *Ithycthyra*, and have a more claviform outline, with a wider, shorter, more anteriorly produced aperture. *Agathotoma angusta* (Jan in Bellardi, 1848) (Figs 20-22), the type species of *Agathotoma*, lacks the pimple-like projections of *Agathotoma ecthymata*, its whorls are convex, without anterior tapering, its spiral ornamentation is finer, less scabrous, and its anal sinus is deeper and more pronounced; therefore, I am only tentatively assigning the new species to *Agathotoma*. *Agathotoma ecthymata* grows to 6 mm. Some specimens are solid white, but this may be due to color fading. The intensity of coloration and width of the bands is also variable. A strongly colored specimen from Treasure Cay, Abaco, Bahama Ids.

(Fig. 14) has a yellow protoconch with white tip (Fig. 15); its first teleoconch whorl is orange and the second reddish; wide maroon bands appear on the shoulder and at mid-body of the last whorl, less conspicuously at the anterior canal. These highly colored specimens are similar to specimens identified as *Agathotoma candidissima* forma *badia* (Reeve, 1846) by Jong & Coomans (1988:114; pl. 44, Fig. 605), and as *A. badia* (Reeve, 1846) by Díaz & Puyana (1994: 227; pl. LXVII Fig. 899). I have not inspected those specimens; however, they do not conform with Reeve's description (1846: species 90) and illustration of *Mangelia badia* (Fig. 19; Reeve pl. 8).

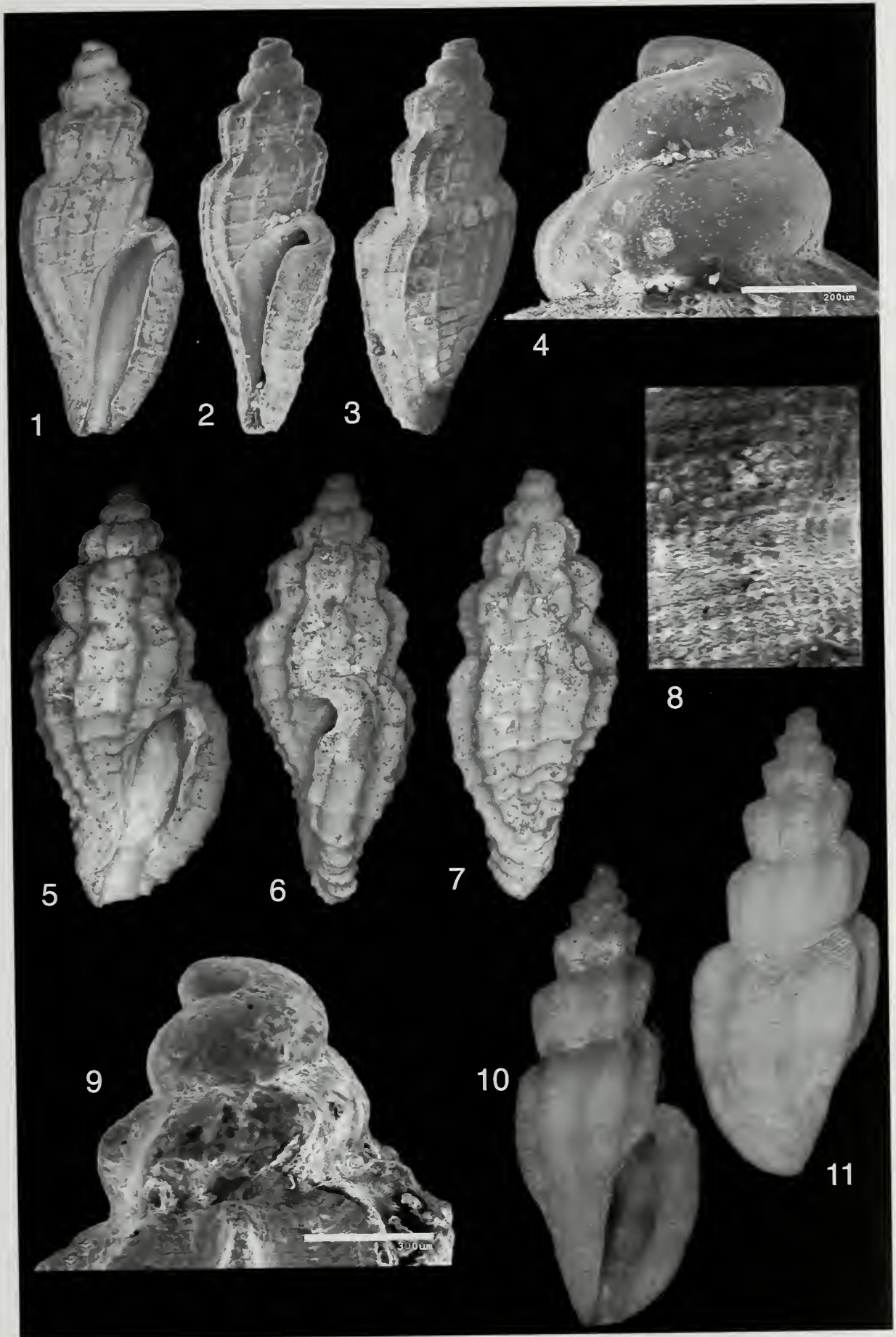
Although the squarish profile and pimple-like projections of the protoconch are constant, some protoconchs, such as that of the holotype, have most projections irregularly arranged, while others have most of them spirally aligned. Since both designs can be found in the same protoconch I have not considered this difference to be worthy of specific differentiation. The strength of the projections also varies considerably. This is presumed to be in part because of erosion. A protoconch extracted from sediment in the British Virgin Islands, and now in the collection of H. G. Lee, is an example of both the strength that the ornamentation can achieve as well as the combination of spirally aligned and irregularly arranged projections.

The paucispiral protoconch with its pimple-like ornamentation separates this species from similar species. *Agathotoma candidissima* (C. B. Adams, 1845) can easily be confused with this species; however, *A. candidissima* (Fig. 23) has a larger, widely conical protoconch of 2.5 whorls with thin, arcuate axial cords (Fig. 24), usually has a more elongated last whorl, and axial ribs that raise slightly above shoulder, creating a coronated pattern. *Agathotoma castellata* (E. A. Smith, 1888) is also similar; however, the syntype of this species shows less numerous, narrow, well-defined axial ribs and a more convex last whorl, not as constricted anteriorly as that of *A. ecthymata*. *Agathotoma ecthymata* has been collected alive in sediment taken from under rocks in 12 m, and from sand and grass in 1 to 3.5 m (Redfern, pers. comm.).

Etymology. From the Greek *ekthymatos* (noun, meaning pimple), used here as an adjective meaning "pimpled", referring to the ornamentation of the protoconch.

Figures 1-11

1-4. *Acmaturris annaclaireleeae* n. sp., Klein Bonaire, Netherlands Antilles, in 43 m. Holotype UF 412553; length 3 mm, width 1.3 mm. Protoconch scale bar: 200 μ m. 5-9. *Acmaturris pelicanus* n. sp., Sackett Bank, Louisiana, 28°38.16'N, 89°33.19'W, in 60-70 m. Holotype ANSP 416413; length 4.4 mm, width 2 mm. Protoconch scale bar: 300 μ m. 10-11. *Agathotoma ecthymata* n. sp., Abaco Id., Treasure Cay, Bahamas, 26°40.00'N, 77°18.15'W, 0-1 m. Holotype ANSP 416414; length 5 mm, width 2 mm.



Suturocythara n. gen.

Type species: *Suturocythara redferri* n. sp.

Description. Shell small, less than 5 mm in length, strong, elongate- cylindrical. Protoconch of 1.25 to 3 shouldered whorls, sculptured with irregular or spirally aligned vermiform threads, seen only under SEM and/or thin, arcuate axial riblets. Teleoconch of 3.5 to 4 whorls; whorls with strong, rounded shoulders that rise above sutural line, giving suture a "sunken" appearance; early whorls straight sided anteriorly. Axial sculpture of strong, somewhat sinuous ribs; ribs rising above suture, particularly on early whorls, creating an undulating pattern. Spiral sculpture of evenly spaced cords; cords narrower than axial elements, creating a strong to weak reticulated pattern when crossing axial ribs; secondary spiral threads showing in interspaces. Aperture elongate- ovate, less than half of total shell length; anterior canal short, wide; outer lip crenulated by terminals of spiral sculpture, re-enforced behind by a rounded varix, devoid of denticles inside aperture. Anal sinus spout-like, round, conspicuously protruding at shoulder, heavily calloused posteriorly. Shell usually white, rarely colored with irregular axial stripes.

Discussion. Two heretofore undescribed western Atlantic species are assigned to this genus: *Suturocythara redferri* and *S. apocrypha*. Two Panamic species, *Agathotoma (Vitricythara) secalis* Shasky, 1971 (Fig. 37), and *A. (V.) klasnuidia* Shasky, 1971 (Fig. 38) are also assigned to *Suturocythara*. Although *Suturocythara klasnuidia* n. comb. does not obviously show the more salient characters of the new genus, it has a protoconch similar to that of the type species (see Figs 31-32, 39-40), early teleoconch whorls with a "submerged" suture (Shasky, 1971:71), straight-sided anteriorly; and an ornamentation that, although not obviously reticulated, has a pattern of strong axial ribs crossed by "major and minor fimbriated spiral threads" (Shasky, 1971:71), every fifth thread larger. Were the differences in strength between major and minor threads more obvious, the shell ornamentation would be like that of the other

species assigned to *Suturocythara* (see Figs 30, 36), including that of *S. secalis* n. comb.

The genus *Agathotoma* is similar to *Suturocythara*; however, *Mangelia angusta* Jan in Bellardi, 1848 (Figs 20-22), the type species for *Agathotoma*, has a protoconch of smooth early whorls, with later whorls showing only arcuate axial elements (Fig. 22), its spiral ornamentation consisting of numerous, equal-sized, minute threads that do not create a clathrate pattern on the shell surface; its shoulders do not have the channeled appearance created by the elevated axial elements (which also gives the suture a "sunken" look); and its sinus is U-shaped, not constricted at aperture (Fig. 21).

The genus *Vitricythara* is also similar to the new genus; however, species assigned to *Vitricythara* have a "steeply conical" protoconch (Fig. 26), a differently structured shoulder, axial and spiral elements of almost equal value (Fig. 25), and an anal sinus that is broad, "subdued" (Fargo, 1953:395).

Suturocythara is superficially similar to the Indo-Pacific genus *Kermia* Oliver, 1915 in its elongated shape, general sculpture and strong anal sinus. However, species assigned to *Kermia* have a diagonally cancellated protoconch and an outer lip with denticles in the aperture.

Etymology. From the Latin *sutura* (noun, meaning seam), in reference to the structure of the shoulder, which emphasizes the sutural area; and *Cytherea*, Latin, a name for Aphrodite, commonly used for mangeliine turrid genera.

Suturocythara redferri n. sp.

Figs 27-32

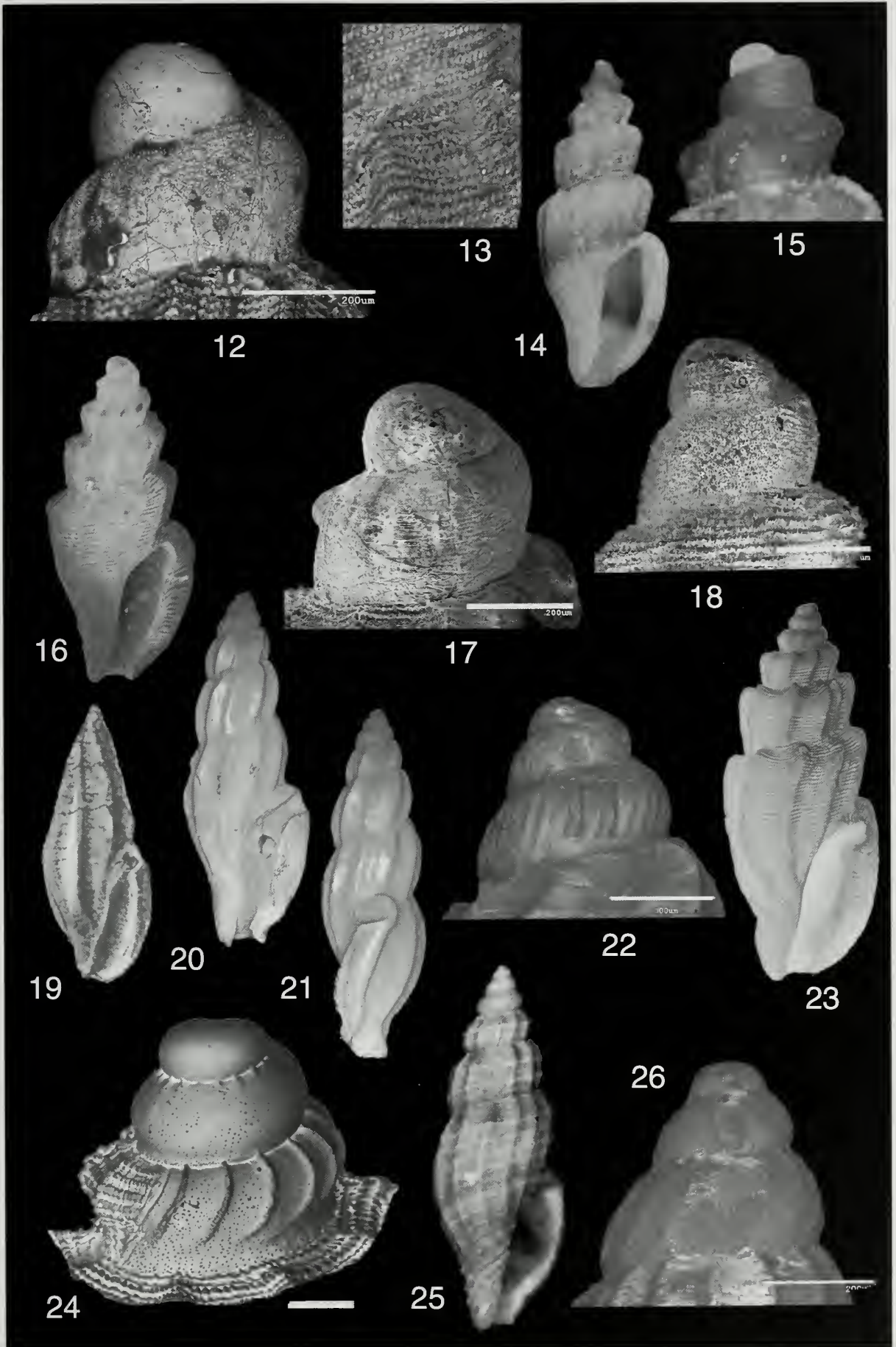
Type material. Holotype ANSP 416412 length 4 mm, width 1.5 mm (Figs 27-32).

Type locality. Bahama Islands, Abaco, off Guana Cay, in 53 m.

Distribution. Known only from the type locality

Figures 12-26

12-18. *Agathotoma ecthynata* n. sp., **12.** Protoconch of holotype. Scale bar: 200µm. **13.** Close-up of sculpture of holotype. **14-15.** Treasure Cay, Abaco Id., Bahamas, 26°39.45'N, 77°17.55'W, 1 m, 5.1 mm (CR 3367). **16-17.** Bahía de Campeche, Gulf of Mexico, Mexico, 20°51.49'N, 92°21.44'W, 63-65 m, 3.2 mm, EFG 28091. Protoconch scale bar: 200µm. **18.** Deadman Chest, British Virgin Islands. Sediment sample 18 m. (HGL, ex M. Loper). Protoconch only scale bar: 200µm. **19.** Original figure of *Mangelia badia* Reeve, 1846. **20-22.** *Agathotoma angusta* (Jan in Bellardi, 1848) Lower Pliocene: Zanclean; Campore: Parma. Italy, 5.7 mm. Protoconch scale bar: 300µm. **23-24.** *Agathotoma caudidissima* (C. B. Adams, 1845). After Leal (1991, pl. 24). Protoconch scale bar: 100µm. **25-26.** *Vitricythara auferiaua* (d'Orbigny, 1832), 28° 03.439'N, 92° 26.978'W 71-74 m, EFG 23382, 4.1 mm. Protoconch scale bar: 200µm.



Description. Holotype 4 mm in length, strong, elongate-ovate (width/length ratio 0.37) (Figs 27-29). Protoconch of about 2.25 whorls, turbinate, ornamented with thin, arcuate axial costae (Fig. 31); spaces between costae with irregular, slanted lines and crowded, irregular, vermiculate structures seen only under SEM (Fig. 32); beginning of nucleus white, remainder of protoconch yellowish-orange. Teleoconch of about 4 whorls; whorls straight at periphery, shouldered; shoulder rising slightly above suture. Suture submerged under shoulder structure. Axial sculpture on early whorls composed of numerous, rounded ribs; ribs as wide as interspaces, diminishing in number and strength on later whorls, becoming mere undulations on last two whorls, evident mainly at shoulder. Spiral ornamentation of narrow, well-defined cords starting on first teleoconch whorl; cords slightly nodulose, narrower than interspaces, increasing in number on following whorls; about 22 on last whorl, covering from suture to anterior end; cord interspaces ornamented with 3 or 4 scabrous spiral threads (Fig. 30). Aperture elongate-ovate; outer lip incurved, with shallow stromboid sinus near anterior end (Fig. 28), strengthened behind by a thick varix; varix wrapping around projecting, spout-like anal sinus; spiral ornamentation of last whorl continuing over surface of varix; sinus projecting about a 45° angle from axis of shell; parietal wall smooth, slightly calloused; anterior canal short but well-defined, wide, narrowing posteriorly. Shell white, with irregular, axially oriented yellowish-orange stripes; widest stripe appearing behind lip, occupying almost one fourth of last whorl.

Discussion. The characteristic structure of the sutural area, as well as the protruding, spout-like, heavily calloused sinus, separate this species from most mangeliine western Atlantic turrids. Only *Suturocythara apocrypha* n. sp. has these features; however, the protoconchs, the coloration, and the surface ornamentation of the two species differ. The Panamic species *Suturocythara secalis* n. comb. (Fig. 37) is similar to *S. redferni*; however, the former grows to 7 mm, has a protoconch of 3 whorls, has a stronger reticulated ornamentation, and is "whitish" in color.

This species has appeared as *Agathotoma* sp. C in Redfern (2001: 131, pl. 59, Fig. 541).

Etymology. Named for Colin Redfern, of Boca Raton, Florida, author of *Bahamian Shells*, for his contribution to malacology and discoverer of this species.

Suturocythara apocrypha n. sp.

Figs 33-36

Type material. Holotype ANSP 416415 length 4.5 mm, width 1.5 mm (Figs 33-36), 20°00.35'N, 92°26.10'W, 73-77 m. Paratypes: 1 ANSP 306436, W. of Campeche, Yucatán Peninsula, Mexico, in 32 m; 1 ANSP 416417, 1 EFG 26627, 20°51.16'N, 92°26.28'W, 93-94 m; 1 BMSM 15498, 1 SBMNH 83342, 20°52.40'N, 92°24.83'W, 77-81 m.

Type locality. Mexico, Bahía de Campeche, 20°00.35'N, 92°26.10'W, 73-77 m.

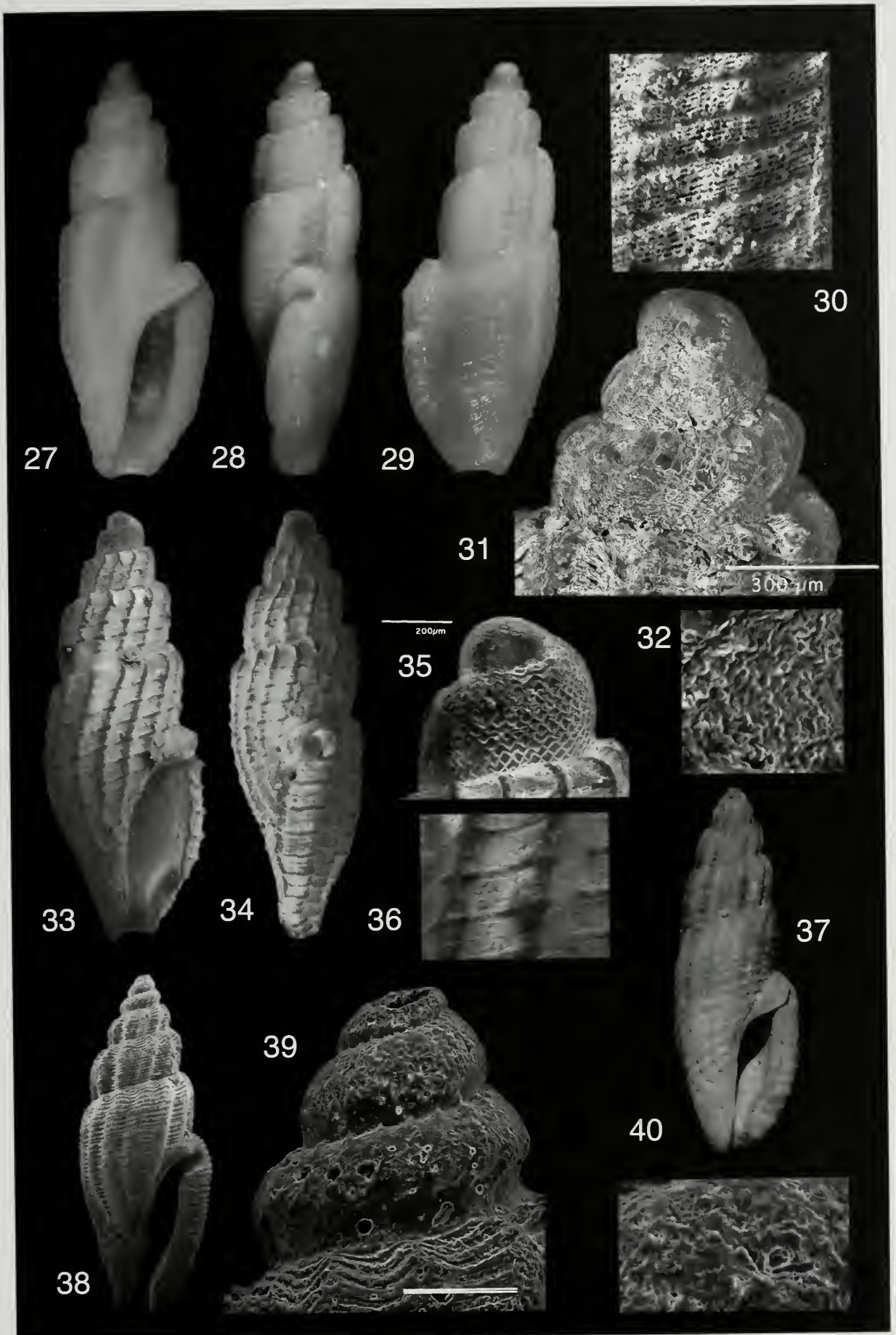
Other material. Belize. Turneffe Island (HGL). USA. Delray Beach, southeast Florida, 2 specimens (HGL); West Palm Beach, southeast Florida (Williams, 2006, sp. No.9033).

Distribution. Bahía de Campeche, southwestern Gulf of Mexico, 73-94 m to the southeast coast of Florida, and south to Belize.

Description. Holotype 4.5 mm in length, strong, elongate-ovate (width/length ratio 0.33) (Figs 33-36). Protoconch white, paucispiral, of 1.25 whorls, with somewhat square profile; nucleus bulbous, profusely sculptured with irregular vermiform threads; threads later becoming spirally oriented, giving appearance of a diagonally cancellated pattern as undulations of spiral threads coalesce (Fig. 35); demarcation between protoconch and teleoconch determined by abrupt change in sculpture. Teleoconch of approximately 3.25 whorls; whorls with strong, rounded shoulders and almost straight sides at periphery. Suture submerged by shoulder sculpture. Axial sculpture of strong, slightly sinuous ribs; ribs narrower than interspaces, extending posteriorly above suture

Figures 27-40

27-32. *Suturocythara redferni* n. sp., Abaco, off Guana Cay, Bahama Id., in 53 m. Holotype ANSP 416412; length 4 mm, width 1.5 mm. Protoconch scale bar: 300µm. **30.** Close-up of sculpture of teleoconch. **32.** Close-up of sculpture of protoconch. **33-36.** *Suturocythara apocrypha* n. sp., Bahía de Campeche, Mexico, 20°00.35'N, 92°26.10'W, 73-77 m. Holotype ANSP 416415; length 4.5 mm, width 1.5 mm. Protoconch scale bar: 200µm. **36.** Close-up of sculpture of teleoconch. **37.** *Suturocythara secalis* (Shasky, 1971) n. comb., Olas Altas Bay, Mazatlán, Sinaloa, Mexico. Holotype, 7 mm. After Shasky 1971, fig 9. **38-40.** *Suturocythara klasmidia* (Shasky, 1971), n. comb., San Carlos, Guaymas, Sonora, Mexico, SBMNH dr 17f, ex Poorman coll., 5mm. Protoconch scale bar: 200µm.



creating an undulated pattern; about 12 such ribs on penultimate whorl; ribs on last whorl extending to base of shell, where they curve right. Spiral sculpture of narrow, evenly spaced spiral cords; cords narrower than interspaces creating elongated nodes, as well as a reticulate pattern, when crossing over axial elements; interspaces ornamented with 3 or 4 spiral threads (Fig. 36). Aperture narrowly ovate, 2.1 mm in length; labrum re-enforce behind by thick varix; ornamentation of last whorl continuing over varix; spiral elements crenulating edge of labrum; stromboid notch shallow; anal sinus strong, circular, constricted at aperture (Fig. 34), strongly callused posteriorly; anal canal relatively short, wide. Shell white.

Discussion. The holotype was chosen because it has the best preserved protoconch; however, it has a slightly damaged lip and does not clearly show the weak stromboid sinus that appears in an adult specimen measuring 4.3 mm. Two other paratypes show the same protoconch structure of the holotype; the others have an eroded protoconch. Otherwise, all four paratypes conform to the characters of the holotype.

Differences between the new species and species of the genus *Kermia* have been discussed in the description of the genus. *Suturocythara apocrypha* n. sp. can only be confused with its western Atlantic congener *S. redferni* n. sp.; however, their protoconchs are different (compare Figs 31 and 35), their teleoconch sculpture is different (compare Figs 30 and 36), and they have different coloration.

Etymology. From the Greek *apocryphos* (adjective, meaning, unauthentic) in reference to the misleading ornamentation of the protoconch, which superficially resembles the diagonally cross-hatched ornamentation of species assigned to the subfamily Raphitominae.

Subfamily CRASSISPIRINAE Morrison, 1966

Genus *Darrylia* n. gen.

Type species: *Darrylia harryleei* n. sp.

Description. Shell small, claviform, whorls slightly shouldered; subsutural cord absent. Nuclear whorls broad, stout, of 1.5; beginning of nucleus smooth, followed by strong, wide, protracted axial ribs. Teleoconch of relatively wide axial ribs, crossed by narrower spiral cords; cords creating elongated nodes when crossing axial ornamentation. Aperture elongate-ovate, occupying about one third length of shell. Sinus deep, constricted at aperture, calloused posteriorly. Lip thickened behind by strong varix; stromboid notch shallow but conspicuous; strong denticle present at beginning of anterior canal, constricting opening.

Discussion. In addition to the type species the other member of the genus is *Darrylia kleinrosa* (Usticke, 1969). The radula of *Darrylia* is not known. The

genus has been placed tentatively in Crassispirinae because of the similarities of its members with other genera assigned to that subfamily.

The genera *Lioglyphostoma* Woodring, 1928 and *Miraclathurella* Woodring, 1928 are similar to *Darrylia*, as these two genera have a thickened varix behind the lip. *Lioglyphostoma* differs from the new genus in having a longer anterior canal, a relatively larger aperture with a wider last whorl, and a protoconch of about 3.5 smooth, rapidly enlarging whorls, the last whorl carinated. *Miraclathurella* has a strong sutural cord, a stronger stromboid notch, and a longer aperture. Although *Darrylia kleinrosa* has been placed in *Miraclathurella* by DeJong & Coomans (1988: 116), the species lacks a sutural cord and has a definite claviform shape, with a relatively small aperture and short anterior canal. Moreover, the obvious denticle at anterior end of aperture is uncharacteristic of *Miraclathurella*.

Darrylia is similar to the Panamic genus *Maesiella* McLean, 1971 in general shell shape, strong labral varix, and ribbed protoconch; however, *Maesiella* has a subsutural cord, a wider, more ovate shell, a proportionately longer aperture, and a protoconch with diagonal axial ribs on the third whorl.

Etymology. Named for my colleague, Darryl L. Felder, Head of the Biology Department at the University of Louisiana at Lafayette and an internationally known researcher in crustaceans. Dr. Felder's invitations to join him in numerous research cruises in the Gulf of Mexico have allowed me to obtain material for my studies for more than a decade.

***Darrylia harryleei* n. sp.**

Figs 41-45

Type material. Holotype ANSP 416409 length 5.9 mm, width 2.1 mm (Figs 41-45). Paratypes: 1 ANSP 416416, 1 SBMNH 83343, 1 LACM 3088, 2 EFG 12518, "The Key", Oakridge, south-central Roatán Is., Bay Ids., Honduras, 0 m; 1 USNM 1109963, 1 UF 412556, 1 BMSM 15495, 1 EFG 13865, 2 FSBC I 066901, 5 H. G. Lee coll., Caribe Bight, south-central Roatán Is., Bay Islands, Honduras, 0.2 m; 2 EFG 13848, Halfmoon Bay, south-central Roatán Is., Bay Ids., Honduras, 1-1.5 m.

Type locality. "The Key", Oakridge, south-central Roatán Island, Bay Islands, northern Honduras, 0.2 m.

Distribution. South-central coast of Roatán Island, Bay Islands, northern Honduras, in 0.2- 1 m.

Description. Holotype 5.9 mm in length, strong, elongate-fusiform (width/ length ratio 0.35) (Figs 41-43). Protoconch white, broad, stout, shouldered, paucispiral, of 1.5 whorls; tip of nucleus smooth; prosocline axial ribs soon developing, persisting for remainder of protoconch (Fig. 45); ribs wider than

interspaces, narrowing later; demarcation between protoconch and teleoconch inconspicuous, indicated by appearance of nodes on axial ribs. Teleoconch of approximately 4.25 convex whorls. Suture well impressed, slightly undulated by axial ribs. Axial sculpture of strong nodose ribs; ribs wider than interspaces; 10 such ribs on penultimate whorl. Spiral sculpture starting on first teleoconch whorl as aligned nodes on axial ribs, becoming recognizable, conspicuous cords by second whorl; cords undulating, creating strong, elongated beads as they cross over axial elements, stronger at periphery; 7 such cords on penultimate whorl, 17 on last whorl. Aperture elongate-ovate; outer lip thin, re-enforced behind by strong varix, showing tenuous stromboid notch towards anterior end; strong, spirally elongated denticle developing inside lip immediately anterior to stromboid notch, constricting beginning of anterior canal (Fig. 44); deep, rounded sinus showing at shoulder, sinus calloused posteriorly, constricted at aperture. Shell pale tan, with irregular brown blotches; blotches darker at interspaces, tending to form a band at shoulder.

Discussion. The paratypes follow the characters of the holotype. The largest paratype measures 7.7 mm. The new species is most similar in size and general shape to *Darrylia kleinrosa* (Usticke, 1969) n. comb. (Figs 46), which also develops a strong denticle at posterior edge of anterior canal (Fig. 48); however, *D. kleinrosa* has a different protoconch structure (Fig. 47), is pink in coloration, has less convex whorls, and a more subdued ornamentation. The protoconch of *Darrylia harryleei* is similar to that of *Miraclathurella clendenini* n. sp. (Fig. 51); however, the latter grows larger, has a more concave shoulder showing a subsutural cord, different axial and spiral ornamentation, and different coloration. All of the specimens were found under rubble, inhabited by hermit crabs.

Etymology. Named for Dr. Harry G. Lee, of Jacksonville Florida, for his numerous contributions to malacology and for his continuous support of my research.

Genus *Miraclathurella* Woodring, 1928

Type species: *Miraclathurella vittata* Woodring, 1928 (by original designation).

Miraclathurella clendenini n. sp.

Figs 49-51

Type material. Holotype ANSP 416411 length 8.2 mm, width 3.2 mm (Figs 49-51). Paratypes: 1 ANSP 416418, 2 FSBC I 066900, 1 LACM 3087, 2 USNM 1109965, 2 BSM 15494, 1 SBMNH 83341, 2 UF 412554, 2 HGL coll., 2 EFG 26628, Bahía de Campeche, 20°51.49'N, 92°21.44'W, 63-65 m.

Type locality. Bahía de Campeche, 20°51.49'N, 92°21.44'W, 63-65 m.

Other material. Mexico. Off Contoy Light, Yucatán Peninsula, 73-83 m, 1(HGL).

Distribution. Southern Gulf of Mexico, from Bahía de Campeche to Contoy Light, Yucatan Peninsula.

Description. Holotype 8.2 mm in length, strong, slightly turreted, elongate-fusiform (width/ length ratio 0.39) (Figs 49-50). Protoconch paucispiral, of approximately 1.5 whorls, stout, broad; tip smooth, tinged with pale-orange; remaining protoconch white, shouldered, ornamented with, smooth, prosocline axial ribs; ribs wider than interspaces (Fig. 51); approximately 19 ribs on last whorl; demarcation between protoconch and teleoconch indicated by sudden appearance of strong spiral ornamentation. Teleoconch of 5 whorls; whorls with narrowly concave shoulders, almost straight-sided at periphery. Suture shallow. Axial sculpture of strong, rounded ribs; ribs wider than interspaces; 12 such ribs on penultimate whorl; ribs evanescent anterior to periphery of last whorl; most adapertural rib creating a moderate, rounded varix; surface of shell covered with microscopic axial threads. Spiral sculpture of first teleoconch whorl of one sharp, undulating subsutural cord, followed by a narrow, concave sulcus and two strong, rounded, peripheral cords; cords forming strong, elongated nodes when crossing axial ornamentation, followed anteriorly by a narrow, sharp, undulating, presutural cord by the third whorl; peripheral cords increasing to 3 on following apical whorls; 13 spiral cords on last whorl. Aperture elongate-ovate, 2.9 mm in length; outer lip thin, with a strong stromboid notch at anterior half; sinus at shoulder deep, rounded, calloused posteriorly, constricted at aperture. Shell pale-orange, with lighter axial and spiral ornamentation.

Discussion. The holotype and all but one of the paratypes are slightly sub-adult. Only one paratype, a rather eroded specimen, seems to be a full adult. It measures 10.1 mm and has a stronger labral varix.

The new species has been tentatively placed in the genus *Miraclathurella* because of its stout, broad-tipped, axially ribbed protoconch, its teleoconch pattern of axial ribs and strong spiral cords, its well-developed subsutural cord, deep sinus, and strong stromboid notch. However, other members of *Miraclathurella* have a multispiral protoconch with a terminal keel, a proportionately longer aperture, and a longer anterior canal. Although the fossil genus *Sedilia* Woodring, 1928 is similar, its multispiral protoconch has spiral elements, and the shells are stouter, with a shorter anterior canal. *Miraclathurella clendenini* also shares a number of characters with the Panamic genus *Maesiella* McLean, 1971; however, species placed in *Maesiella* have a protoconch

ornamentation that also includes spiral elements, and their shells have a pupoid outline with a relatively longer aperture.

The axially ribbed protoconch and the shape and sculpture of the teleoconch of the new species are similar to the southwestern Caribbean species *Darrylia kleinrosa* (Usticke, 1969) n. comb. and *Darrylia harryleei* n. sp.. However, these species lack a concave shoulder with a subsutural cord, have a well-developed denticle at the beginning of the anterior canal, and are smaller in size. Although de Jong & Coomans (1988: 116) have placed Usticke's taxon in *Miraclathurella* Woodring, 1928, the protoconch structure and other teleoconch characters of *Darrylia kleinrosa* do not conform to Woodring's definition of the genus (1928: 189).

Etymology. Named for Mr. William Clendenin, of Sarasota, Florida, an enthusiastic shell collector, a good friend, and a companion on many shelling expeditions.

Genus *Viridrillia* Bartsch, 1943

Type species: *Viridrillia williami* Bartsch, 1943 (by original designation)

Viridrillia aureofasciata n. sp.

Figs 52-54

Type material. Holotype ANSP 416410 length 14.9 mm, width 5.2 mm (Figs 52-54). Paratypes: 1 UF 412555 length 14.9 mm, 1 HGL, length 14.6 mm, West Florida, W. Egmont Key, Hillsborough Co., in 216 m; 1 EFG 28096, length 11.6 mm, West Florida, SW Egmont Key, Hillsborough Co., in 72-90 m.

Type locality. Off Alabama, 29°26.25'N, 87°34.47'W, 66-73 m.

Other material examined. **Mexico.** Bahía de Campeche, 20°51.49'N, 92°21.44'W, in 60-65 m, 1 (HGL). **USA.** West Florida, SW Egmont Key, Hillsborough Co., in 72-90 m, 2 (HGL); W Egmont Key, Hillsborough Co., in 216 m, 1 (HGL).

Distribution. Alabama, west Florida and Bahía de Campeche, Mexico, in 60- 216 m; alive off Egmont

Key, Florida, dredged in 72- 90 m (EFG 28096).

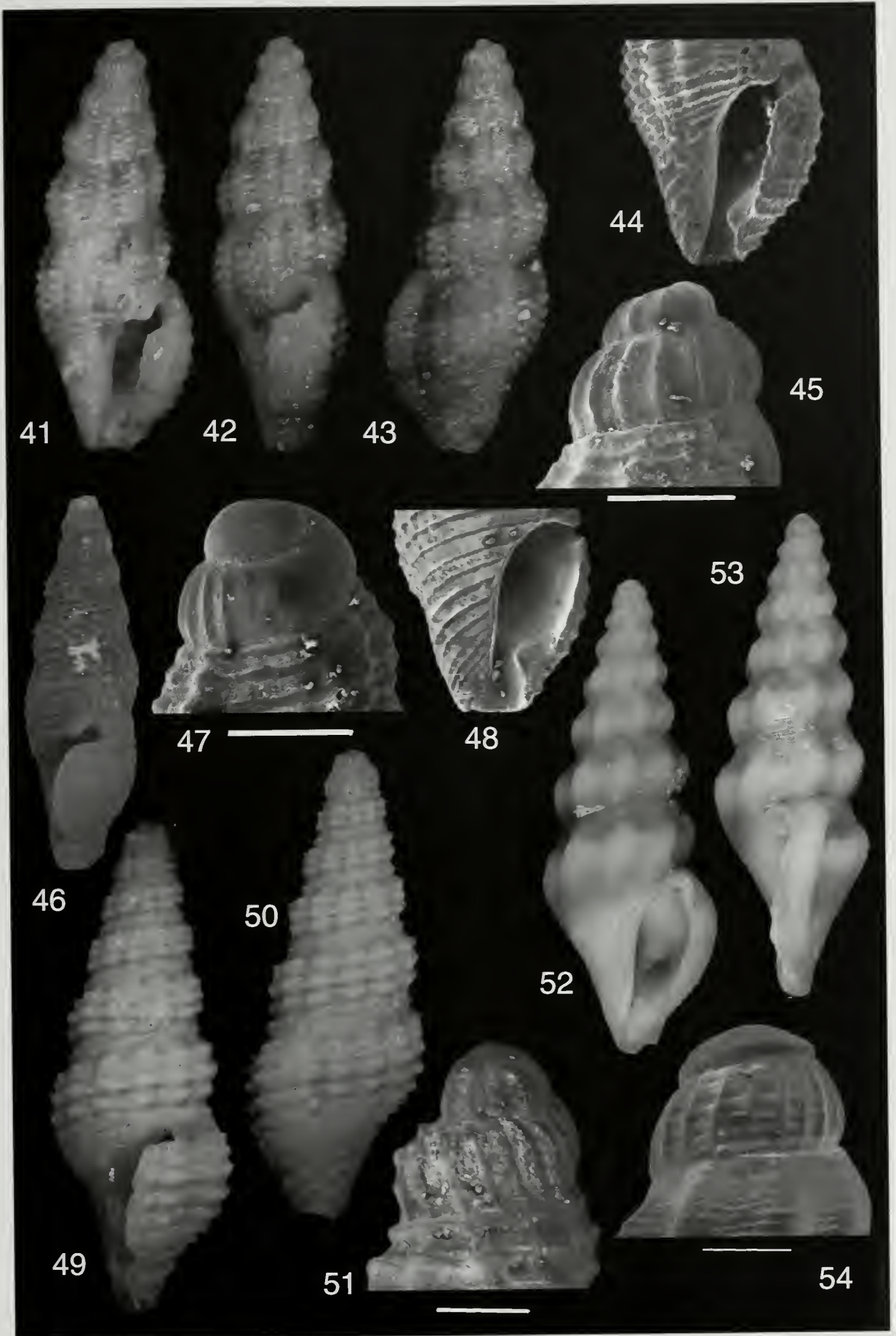
Description. Holotype 14.9 mm in length, strong, turreted (width/ length ratio 0.35) (Figs 52-53). Protoconch large, wide, paucispiral, of approximately 1.5 whorls; tip smooth, white; remainder of protoconch pale cream, ornamented at the start with strong axial cords and microscopic spiral scratches; spiral ornamentation rapidly increasing in strength, becoming as strong as axial elements on last 0.75 whorl, creating a reticulated pattern as they cross axial cords (Fig. 54); termination of protoconch indicated by last axial cord. Teleoconch of 6 convex, roundly angulated whorls. Suture incised. Axial sculpture of 8 strong, rounded, suture to suture ribs; ribs evanescent as they approach base of shell; surface of shell covered with numerous microscopic axial threads. Spiral sculpture of numerous narrow spiral cords and secondary spiral threads; cords and threads crossing over axial ribs, becoming corrugated, forming a microscopic reticulate pattern on crossing axial threads, giving a "frosted" look to surface of shell; approximately 24 spiral cords on penultimate whorl. Aperture elongate-ovate, 5.2 mm in length; anterior canal short, wide; outer lip thin, re-enforced behind by a rounded, well- defined, relatively narrow varix (Fig. 53). Sinus shallow (Fig. 53), slightly calloused posteriorly. Shell pale cream, a light-orange subsutural band starting on third whorl; a second, presutural band starting on fourth whorl, showing on last whorl below periphery of shell; color darker in axial interspaces; small, irregular blotches of same coloration showing at base of shell.

Discussion. Bartsch (1943) considered his new genus *Viridrillia* closely related to *Drillia*; however, radular studies made by Tippett (1995: 134-135; figs 20-22) have shown that, although not typical, *Viridrillia* radulae are most similar to those of Crassispirinae. I have followed Tippett in this study.

The holotype is the largest of all the specimens examined. Other than a faded, whitish coloration of most specimens, the inspected material conforms to the characters of the holotype. The operculum of the 11.6 mm specimen collected alive is dull brown, hook-shaped, with a terminal nucleus. It measures 2.8 mm in length and 1.5 mm in width.

Figures 41-54

41-45. *Darrylia harryleei* n. sp., "The Key", Oakridge, south-central Roatán Island, Bay Islands, northern Honduras, 0.2 m. Holotype ANSP 416409; length 5.9 mm, width 2.1 mm. Protoconch scale bar: 500µm. **46-48.** *Darrylia kleinrosa* (Usticke, 1969) n. comb., off Hotel Bonaire, Bonaire Id., Netherlands Antilles, 2.5-3 m, 6.5 mm. Protoconch scale bar: 500µm (EFG 13924). **49-51.** *Miraclathurella clendenini* n. sp., Bahía de Campeche, southwestern Gulf of Mexico, 20°51.49'N, 92°21.44'W, 63-65 m. Holotype ANSP 416411; length 8.2 mm, width 3.2 mm. **52-54.** *Viridrillia aureofasciata* n. sp., off Alabama, 29°26.25'N, 87°34.47'W, 66-73 m. Holotype ANSP 416410; length 14.9 mm, width 5.2 mm.



The new species has been assigned to *Viridrillia* based on the structure of its protoconch, which has the characters described by Bartsch (1943: 90). It is the first *Viridrillia* from the northern half of the Gulf of Mexico, and the largest in the genus. There are four western Atlantic species assigned to *Viridrillia*: *V. cervina* Bartsch, 1943, recorded from off North Carolina, has a protoconch of 2.25 whorls, grows to 10.4 mm, and is pale brown in color; *V. williamsi* Bartsch, 1943, recorded from off the Florida Keys but not from the Gulf of Mexico, has a protoconch of 2.3 whorls, is white with brown interspaces, and grows to only 9 mm; *Viridrillia bahamensis* Bartsch, 1943, from the Bahama Islands, has a protoconch of 2.1 whorls, is white, and grows to 10 mm; and *Viridrillia hendersoni* Bartsch, 1943, recorded from off the Florida Keys, is milky white, has a protoconch of 2.4 whorls, and grows to 10.9 mm. Moreover, there are differences in surface sculpture and profile.

Etymology. From the Latin *aureus* (adjective, meaning gold) and *fasciatus* (adjective, meaning banded), in reference to the color pattern of the species.

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