

The Southeastern Brazilian Muricidae Collected by RV *Marion-Dufresne* in 1987, with the Description of Three New Species

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ABSTRACT

Twenty-five species of Muricidae are recorded from southeastern Brazil, including eight species of Muricinae, nine of Muricopsinae, one of Ergalataxinae, one of Ocenebrinae, four of Trophoninae, and two of Typhinae. A short discussion is given for each species. Three new species are described: *Dermomurex leali* n.sp. differs from related taxa by the presence of 5 varices on its last teleoconch whorl and by its different intritacalx; *Favartia varimutabilis* n.sp. is compared with *F. alveata*, from which it differs by the erratic placement of the varices and by its multispiral protoconch; *Trophon mucrone* n.sp. differs from *T. lacunellus*, *T. dabneyi*, and *T. limicola* by its spiral sculpture, rounded teleoconch whorls, paucispiral protoconch, and number of axial lamellae. Two species remain unidentified and are listed as *Muricopsis* (?*Murexsul*) sp. and *Favartia* (*Favartia*) sp. *Drupa didyma* Schwengel, 1943 is synonymized with *Trachypollia turricula* (von Maltzan, 1884).

Key words: Muricidae; Brazil; *Dermomurex*; *Favartia*; *Trophon*; new species.

INTRODUCTION

The material examined was dredged or trawled off the southeastern coast of Brazil during the Expedition MD55 carried out by the R.V. *Marion-Dufresne* in May 1987, as a joint project of Muséum National d'Histoire Naturelle (MNHN), Paris, and Universidade Santa Ursula, Rio de Janeiro. Drs. A. Guille and F. Roumos were cruise leaders. Drs. P. Bouchet, J. Leal and B. Métiévier sorted the gastropod material on board. Muricidae were collected from 34 to 1,575 m, mostly along a series of sea-mounts running perpendicular to the Brazilian coast, between 18°50' and 23°47'S. Most of species collected are already known to occur off the Brazilian coast; *Chicoreus* (*Siratus*) *consuelae* (Verrill, 1950), *Poirieria* (*Pazinotus*) *stimpsonii* (Dall, 1889), *Pygmaepterys germainae* Vokes and D'Attilio, 1980, and *Trophon verrillii* Bush, 1893, however, represent new Brazilian records.

A report on the deep-water Volutidae collected during the same cruise has been already published (Leal & Bouchet, 1989).

For references to original descriptions not indicated here, the reader is referred to Radwin and D'Attilio (1976).

The number of dead collected specimens is followed by "dd"; the number of live collected specimens is identified by "lv".

The following institutional abbreviations are used: MCZ, Museum of Comparative Zoology, Cambridge; MNHN, Muséum d'Histoire Naturelle, Paris; MORG, Museu Oceanografico de Rio Grande; USNM, National Museum of Natural History, Smithsonian Institution. Prefixes for station data denote collecting equipment: CB, Blake trawl; CP, beam trawl; DC, dredge.

SYSTEMATICS

Family MURICIDAE Rafinesque, 1815
Subfamily MURICINAE Rafinesque, 1815
Chicoreus (*Siratus*) *coltrorum* Vokes, 1990

Type locality: Ilha de Itaparica, Bahia, Brazil.

Chicoreus (*Siratus*) *coltrorum* Vokes, 1990:127, figs. 7-13. (figure 3)

Material examined: Southeastern Brazil, stn. DC26, Victoria Bank, 20°21'S, 36°59'W, 97 m (2 dd); stn. DC27, Montague Bank, 20°26'S, 36°42'W, 81 m (1 dd); stn. DC40, Davis Bank, 20°40'S, 34°41'W, 60 m (5 dd); stn. DC43, Dogaressa Bank, 20°51'S, 33°45'W, 63 m (2 dd); stn. DC47, Columbia Bank, 20°42'S, 32°13'W, 94-105 m (5 dd); stn. DC48, Columbia Bank, 20°44'S, 32°08'W, 250-300 m (1 dd); stn. DC50, Columbia Bank, 20°44'S, 31°50'W, 95-120 m (3 dd); stn. DC82, 18°56'S, 37°52'W, 85-105 m (1 dd).

A recently described and often misidentified species, *C. coltrorum* is superficially similar to *C. consuelae* (Verrill, 1950) and may be distinguished mainly by the different protoconch (figures 3, 4). The protoconch of *C. coltrorum* has 1½ rounded whorls while *C. consuelae* has a conical protoconch consisting of 2¼ whorls; other differences are minimal. Only empty shells were collected. Rios (1985:82) reports this species from Brazil (as

Siratus consuelae), from Atol das Rocas, Fernando de Noronha; Rio Grande do Norte to Espírito Santo.

Chicoreus (Siratus) consuelae (Verril, 1950)
(figure 4)

Material examined: Southeastern Brazil, stn. DC52, Martin Vaz Island, 20°29'S, 28°51'W, 64–80 m (3 dd); stn. DC59, Trindade Island, 20°30'S, 29°19'W, 52–60 m (1 dd).

Similar to *C. coltrorum* (see above), the species is reported from off the coast of Texas to Curaçao and in the Lesser Antilles (Vokes, 1990:129).

Chicoreus (Siratus) tenuivaricosus
(Dautzenberg, 1927)
(figures 18, 19)

Material examined: Southeastern Brazil, stn. CB90, 19°34'S, 39°34'W, 34 m (33dd) (6 lv); stn. CB92, 19°34'S, 38°55'W, 340–360 m (1 dd) (1 lv).

Many specimens, mostly juveniles, were collected from station CB90 in dead and live condition. Two specimens, of which one was alive, were taken from station CB92, in 340–360 m; this record is probably based on specimens that had remained entangled in the net of a previous haul (stn. CB90), and this bathymetrical range requires confirmation.

The radula is muricine, with a lateral sickle-shaped tooth, and a central tooth with 3 major and 2 minor cusps (figures 18–19).

Aspella morchi Radwin and D'Attilio, 1976
(figures 9, 10, 29)

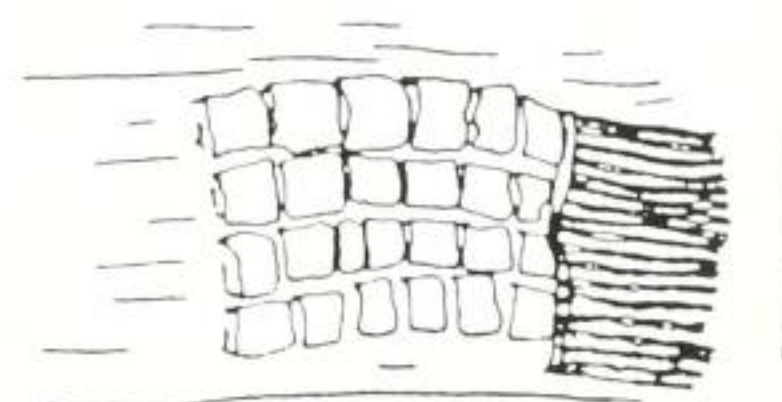
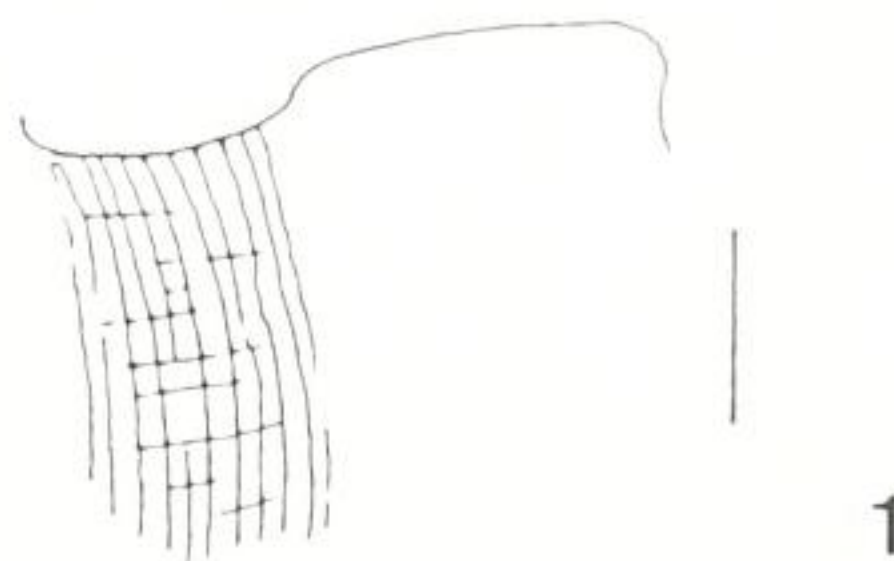
Material examined: Southeastern Brazil, stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (4 lv); stn. DC40, Davis Bank, 20°40'S, 34°41'W, 60 m (1 lv); stn. DC41, Davis Bank, 20°39'S, 34°43'W, 58–70 m (2 lv).

The paucispiral protoconch (figures 9, 10) had not previously been figured. The cancellate intritacalx is well illustrated by Radwin and D'Attilio (1976:223, fig. 167). A specimen with 6 teleoconch whorls, and broken protoconch, (MNHN, station DC40) (figure 29) is 10 mm long, while the maximum length given by Radwin and D'Attilio is of 6.6 mm. Previously known from Natal Bay (type locality), Fortaleza (Cerea) (Radwin & D'Attilio, 1976) and Kapmoan (Bahia) (coll. R. Houart).

Aspella senex Dall, 1903

Material examined: Southern Brazil, stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (1 dd).

The geographical range reported by Radwin and D'Attilio (1976:25) includes North Carolina and the Gulf of Mexico. Rios (1985:87) reported this species from the



Figures 1, 2. Intritacalx on last teleoconch whorl (scale bars: 0.5 mm). **1.** *Dermomurex (Trialatella) oxum* Petuch. **2.** *Dermomurex (Trialatella) leali* n.sp.

Abrolhos Islands. The present record extends the geographical range further southward.

Dermomurex (Trialatella) oxum Petuch, 1979
(figures 1, 26)

Dermomurex (Trialatella) oxum Petuch, 1979:517, fig. 1E, F.

Type locality: 2 km east of Santa Barbara Island, Abrolhos Archipelago, Bahia State, Brazil, 17°57'S, 38°41'W, in 25 m.

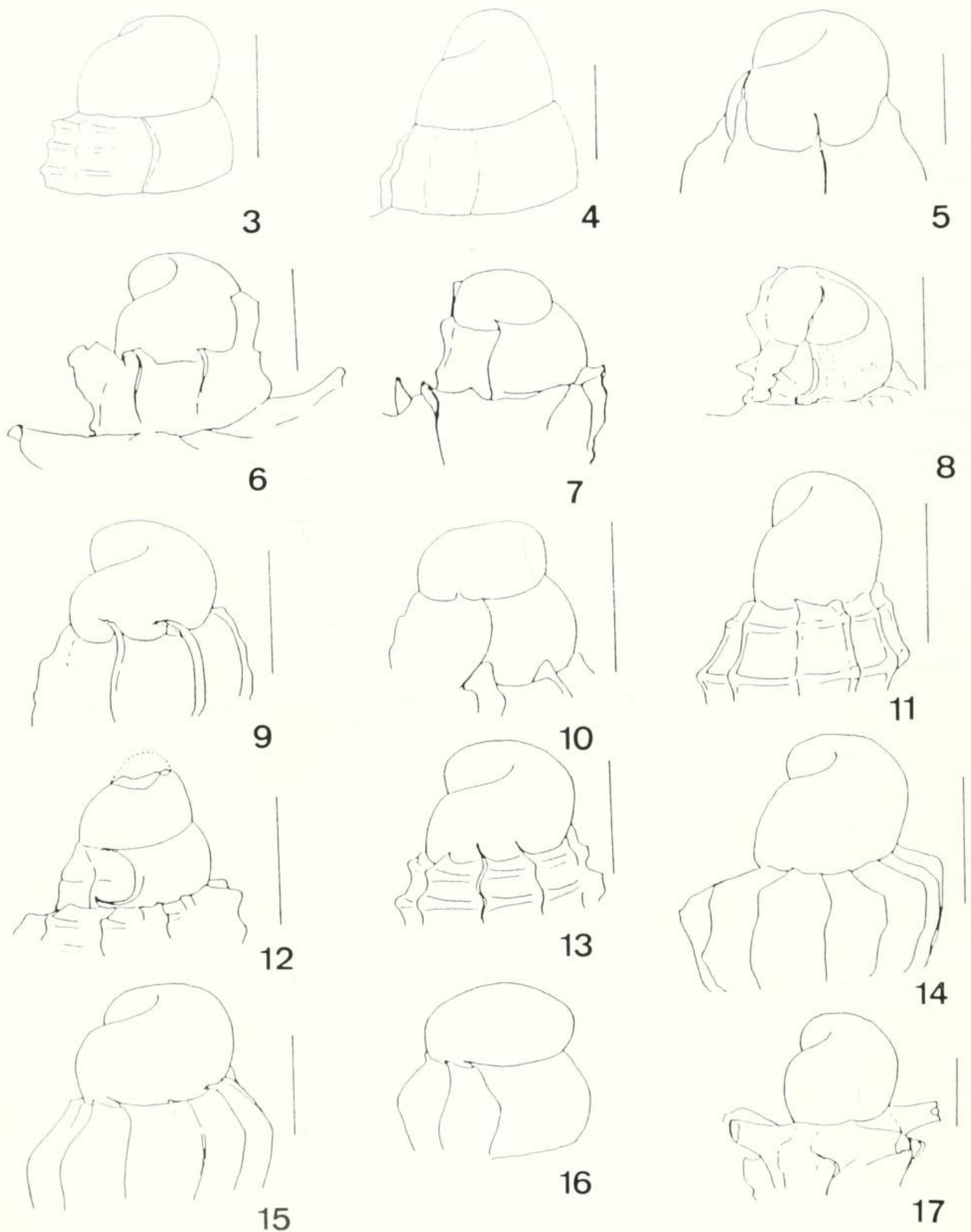
Material examined: Southeastern Brazil, stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (1 dd); stn. DC40, Davis Bank, 20°40'S, 34°41'W, 60 m (2 lv); stn. DC82, 18°56'S, 37°52'W, 85–105 m (1 lv).

The largest shell is 15.5 mm long (figure 26), while Petuch mentions 13 mm for his largest specimen (holotype).

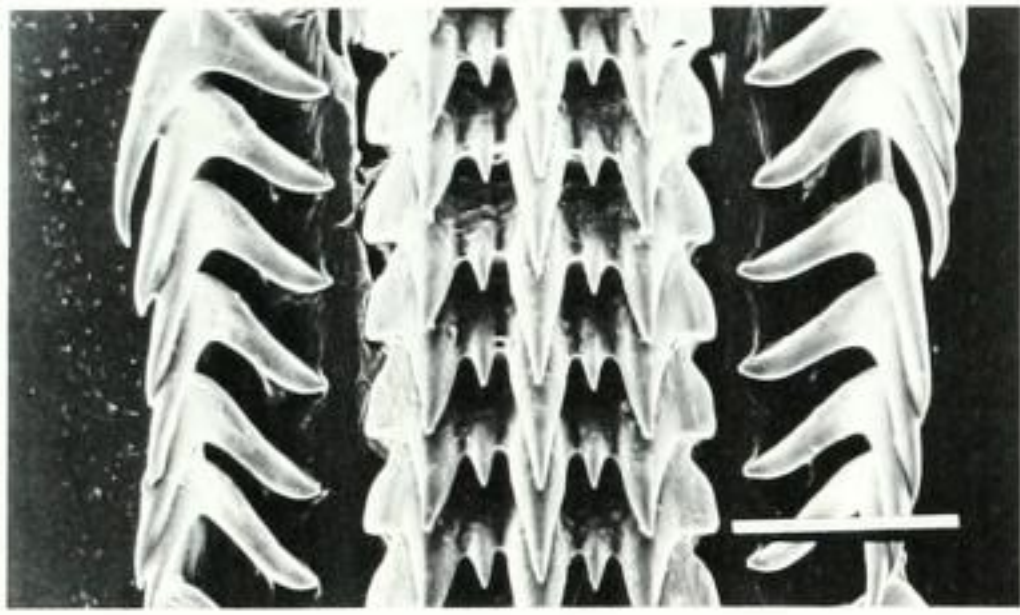
Dermomurex (Trialatella) leali n.sp.
(figures 2, 5, 27, 28)

Type material: Holotype MORG 26457, 9.5 × 5.6 mm, southeastern Brazil, stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (dd).

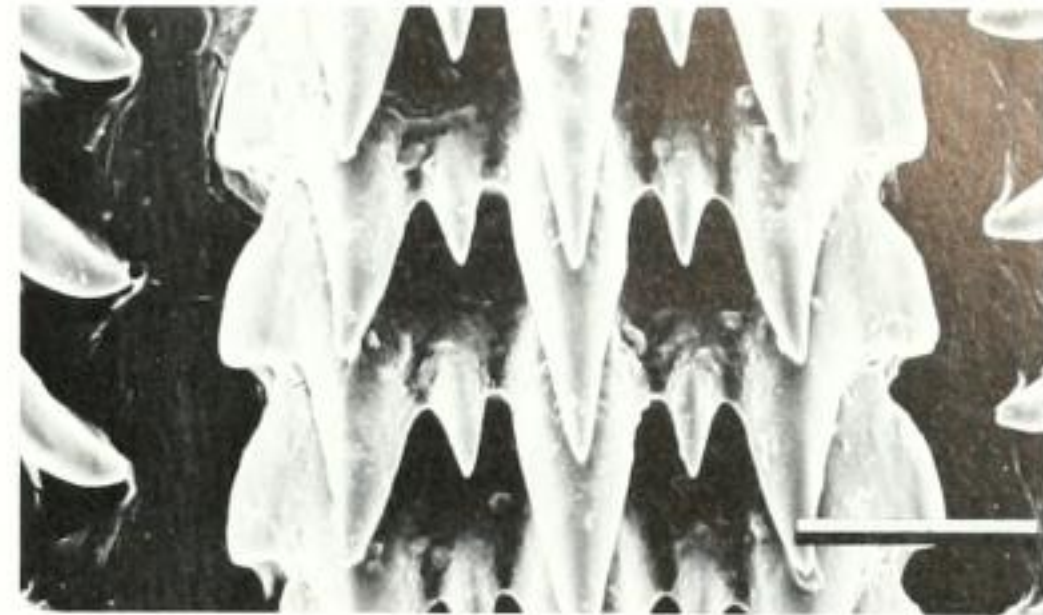
Description: Shell 9.5 mm in length, roundly-fusiform. Spire moderately high, with 1.5 protoconch whorls and 4 convex teleoconch whorls (subadult). Suture deeply impressed. Protoconch whorls rounded. Axial ornamentation of first teleoconch whorl consisting of 5 ribs, second whorl of 6 ribs, third whorl of 7 ribs. Last teleoconch whorl with 4 weak, lightly rounded varices. No other



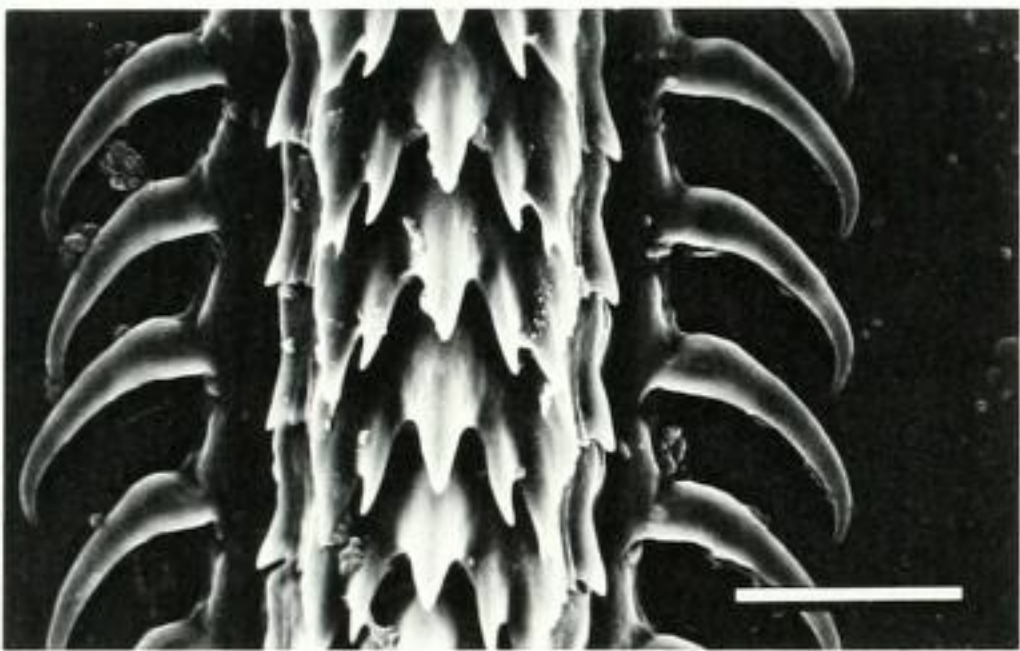
Figures 3–17. Protoconchs (scale bars: 0.5 mm). **3.** *Chicoreus (Siratus) coltrorum* Vokes, stn. DC26. **4.** *Chicoreus (Siratus) consuelae* (Verrill), stn. DC52. **5.** *Dermomurex (Trialatella) leali* n.sp., holotype MORG 26457, stn. DC22. **6, 7.** *Poirieria (Pazinotus) stimpsonii* (Dall), stn. DC82. **8.** *Muricopsis* (?*Murexsul*) sp., stn. DC35. **9, 10.** *Aspella morchi* Radwin & D'Attilio, stn. DC40. **11.** *Muricopsis (Risomurex) necocheana* (Pilsbry), stn. DC22. **12.** *Favartia (Caribiella) varimutabilis* n.sp., holotype MORG 26458, stn. DC15. **13.** *Favartia (Favartia)* sp., stn. DC35. **14.** *Trophon aculeatus* Watson, stn. CB104. **15, 16.** *Trophon mucrone* n.sp., paratype MORG 26459, stn. DC70. **17.** *Siphonochelus (Siphonochelus) riosi* (Bertsch & D'Attilio), stn. CB104.



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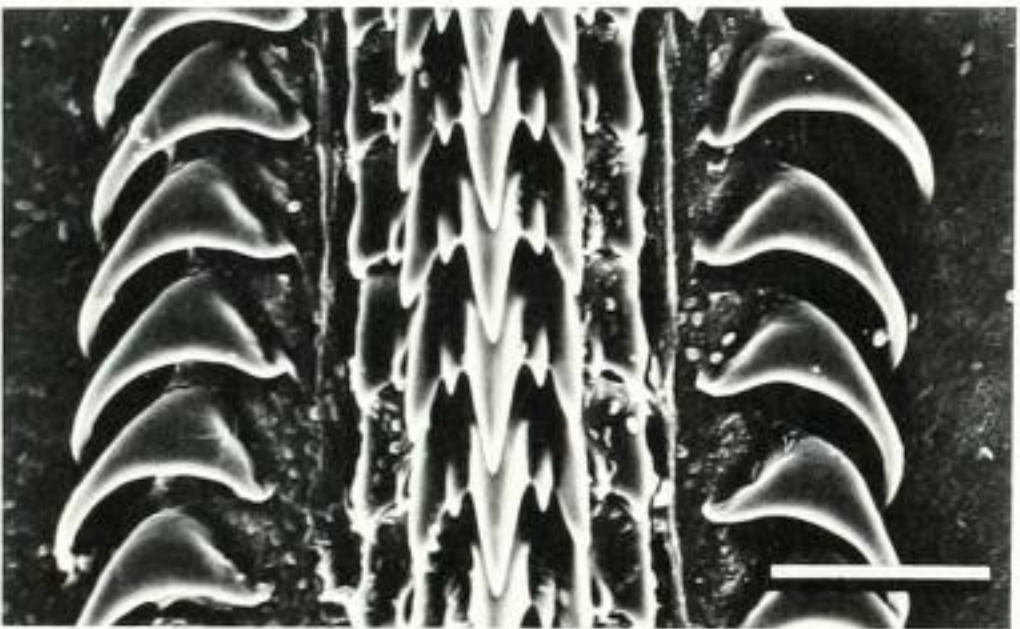
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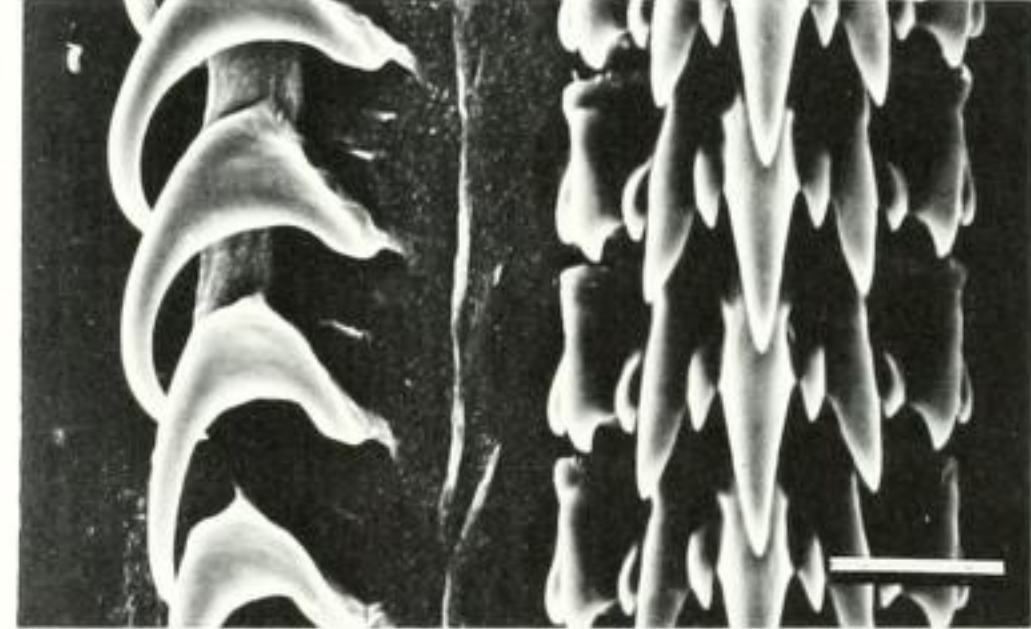
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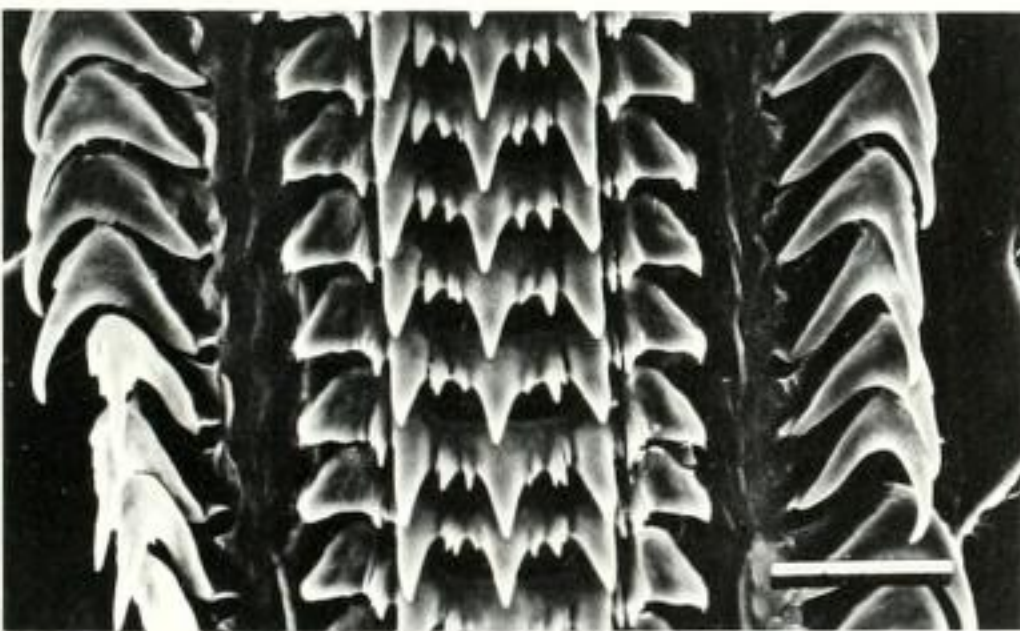
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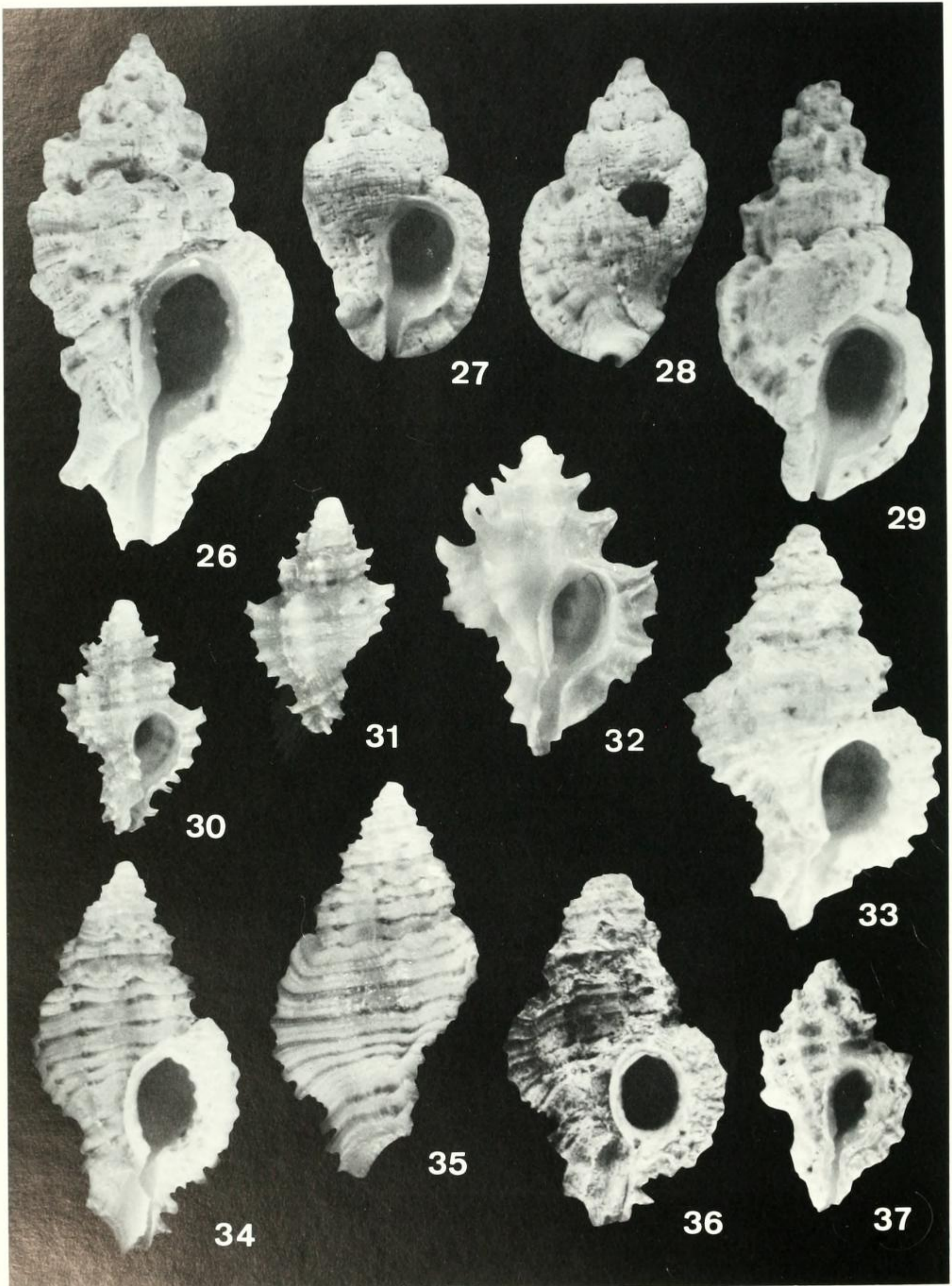


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Figures 18–25. Radulae (scale bars figures 20, 22, 24: 20 μm ; figures 21, 23, 25: 10 μm ; figure 18: 100 μm ; figure 19: 50 μm). 18, 19. *Chicoreus* (*Siratus*) *tenuivaricosus* (Dautzenberg), stn. CP90. 20, 21. *Favartia* (*Caribiella*) *varimutabilis* n.sp., paratype MNHN. 22, 23. *Trachypollia turricula* (von Matzan), stn. DC34. 24, 25. *Siphonochelus* (*Siphonochelus*) *riosi* (Bertsch & D'Attilio), stn. CB104.



axial sculpture. No apparent spiral sculpture except thick, whitish intritacalx, strongly reticulate when thin surface layer partially removed, otherwise minutely sculptured with sharp axial striae (figure 2).

Aperture broad, roundly-ovate. Columellar lip smooth, adherent. Anal notch broad, shallow. Outer lip weakly erect, with 4 low denticles within. Siphonal canal short, open, bent adaperturally at tip. Shell whitish.

Etymology: Named after J. H. Leal, School of Marine and Atmospheric Science, Miami, Florida, member of the scientific staff on board of the *Marion-Dufresne* during the MD55 cruise.

Discussion: The *Dermomurex* of the Western Atlantic region have been revised by Vokes (1975, 1976, and 1985) and include the following Recent species: *Dermomurex* (*Dermomurex*) *pauperculus* (C. B. Adams, 1850); *Dermomurex* (*Dermomurex*) *alabastrum* (A. Adams, 1864); *Dermomurex* (*Dermomurex*) *pacei* Petuch, 1988; *Dermomurex* (*Gracilimurex*) *elizabethae* (McGinty, 1940); *Dermomurex* (*Trialatella*) *abyssicola* (Crosse, 1865); *Dermomurex* (*Trialatella*) *oxum* Petuch, 1979; *Dermomurex* (*Trialatella*) *glicksteini* Petuch, 1987; *Dermomurex* (*Trialatella*) *kaicherae* Petuch, 1987; *Dermomurex* (*Trialatella*) *cuna* Petuch, 1990.

In addition there are several fossil species, discussed and illustrated in Vokes (1975).

The holotype of *D. abyssicola* has not been located (Vokes, 1975:148) but the original illustration shows a shell with 3 strong varices and intervaricial ridges, while *D. leali* has 5 varices on the last teleoconch whorl. *Dermomurex abyssicola* has a brown band at the base of its last whorl and a longer siphonal canal.

Dermomurex leali differs from *D. oxum* in having 5 varices on its last whorl instead of 3 strong varices and intervaricial ridge between pairs of varices as in *D. oxum*. *Dermomurex leali* has more rounded whorls, covered by a more finely sculptured intritacalx (figure 2), its aperture is relatively larger, the siphonal canal is shorter and the spire is lower.

Dermomurex leali differs from *D. glicksteini* and *D. kaicherae* by its more globose shell, its more numerous varices on last teleoconch whorl, its absence of intervaricial axial ridges, and shorter siphonal canal.

In addition, *D. oxum*, *D. glicksteini* and *D. kaicherae* have more or less obvious spiral sculpture when the intritacalx is removed, whereas it is absent in *D. leali*.

Dermomurex leali differs from *D. cuna* by its more rounded varices, shorter siphonal canal, comparatively larger aperture and by its different and more sharply striate intritacalx.

Poirieria (*Pazinotus*) *stimpsonii* (Dall, 1889)
(figures 6, 7, 32)

Material examined: Southeastern Brazil, stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (2 dd); stn. CB79, 19°02'S, 37°48'W, 1,500–1,575 (1 dd); stn. DC82, 18°56'S, 37°52'W, 85–105 m (1 lv).

Four juveniles, easily recognizable shells. The illustrated specimen (figure 32) is pinkish. The species is known from western Florida to Barbados (Radwin & D'Attilio, 1976:87), but has not previously been recorded south of Barbados.

Subfamily MURICOPSINAE Radwin & D'Attilio, 1971

Muricopsis (?*Murexsul*) sp.
(figures 8, 30, 31)

Material examined: Southeastern Brazil, stn. DC35, Jaseur Bank, 20°42'S, 35°22'W, 82–105 m, (1 lv) (juvenile); stn. DC43, Dogaressa Bank, 20°51'S, 33°45'W, 63 m (1 dd, 3 lv) (juveniles).

The largest of the Brazilian specimens is 5.2 mm long. All are pinkish. Examination of adult specimens is necessary for positive identification.

Muricopsis (*Risomurex*) *necocheanus* (Pilsbry, 1990)
(figure 11)

Material examined: Southeastern Brazil, stn. DC15, 21°37'S, 40°18'W, 37 m (1 dd) (damaged); stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (3 lv); stn. CP25, Vitoria Bank, 20°36'S, 37°27'W, 65 m (1 dd).

Recorded by Rios (1985:84) from Espirito Santo, Brazil, to Bahaa Blanca, Argentina. Vokes and Houart (1986:84) did not observe a complete protoconch, but, from the material then available, they presumed the protoconch to be rounded instead of keeled as in most *Muricopsis*. The protoconch here illustrated (figure 11) confirms their assumption.

Favartia (*Favartia*) *cellulosa* (Conrad, 1846)

Material examined: Southeastern Brazil, stn. DC29, Montague Bank, 20°27'S, 36°41'W, 310–350 m (1 dd).

Recorded by Rios (1985:85). The only specimen collected during the expedition is an empty, juvenile, damaged shell, obviously carried downslope from shallow water.

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Figures 26–33. 26. *Dermomurex* (*Trialatella*) *oxum* Petuch, stn. DC22, 15.5 × 8 mm. 27, 28. *Dermomurex* (*Trialatella*) *leali* n.sp., holotype MORG 26457, 9.5 × 5.6 mm. 29. *Aspella morchi* Radwin & D'Attilio, stn. DC40, 10 × 5 mm. 30, 31. *Muricopsis* (?*Murexsul*) sp., stn. DC35, 5.2 × 3.2 mm. 32. *Poirieria* (*Pazinotus*) *stimpsonii* (Dall), stn. DC82, 6.5 × 4.2 mm. 33. *Favartia* (*Favartia*) sp., stn. DC22, 8.2 × 5 mm. **Figures 34–36.** *Favartia* (*Caribiella*) *varimutabilis* n.sp. 34, 35. Holotype MORG 26458, 9 × 5 mm. 36. Paratype MNHN, stn. DC22, 9 × 5.1 mm. **Figure 37.** *Pygmaepterys germainae* Vokes & D'Attilio, stn. DC34, 5.5 × 3.4 mm.

Favartia (Favartia) nucea (Mörch, 1850)

Material examined: Southeastern Brazil, stn. DC15, 21°37'S, 40°18'W, 37 m (1 dd); stn. DC40, Davis Bank, 20°40'S, 34°41'W, 60 m (1 lv) (juvenile).

A species that has previously been recorded from Brazil by Rios (1985:85).

Favartia (Favartia) sp.
(figures 13, 33)

Material examined: Southeastern Brazil, stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (1 dd); stn. DC35, Jaseur Bank, 20°42'S, 35°22'W, 82–105 m (3 lv) (juveniles).

The shell is apparently different from any known western Atlantic *Favartia* species. The shell and the protoconch of a juvenile specimen are here illustrated. The colour is light pink to light brown.

The material collected during the expedition consists only of an adult but damaged shell (figure 33) and of 3 juveniles. There is presently insufficient material to compare in more detail with other *Favartia*.

Favartia (Favartia) varimutabilis n.sp.
(figures 12, 20, 21, 34, 35, 36)

Type material: Holotype MORG 26458, 9 × 5 mm, southeastern Brazil, stn. DC15, 21°37'S, 40°18'W, 37 m (dd); 3 paratypes MNHN: stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (1 dd); stn. DC27, Montague Bank, 20°26'S, 36°42'W, 81 m (1 lv); stn. DC40, Davis Bank, 20°40'S, 34°41'W, 60 m (1 dd).

Other material examined: Stn. DC24, Vitoria Bank, 20°42'S, 37°50'W, 48–52 m, coll. R. Houart (1 dd).

Description: Shell 8.5–9 mm in length, stout, fusiform. Spire high, with 2.5 protoconch whorls and 5 weakly convex, teleoconch whorls. Suture impressed. Protoconch whorls rounded, ending with a deeply indented varix. Last whorl with 3–5 irregular, rounded, erratically placed, squamous varices. Penultimate whorl bearing 8 or 9 varices. No intervaricial axial sculpture. Spiral sculpture of 7 cords, occasionally with 1 thread between each pair of cords, 2 or 3 adapical cords sometimes extending as small spinelets on varices.

Aperture roundly-ovate, outer lip erect and smooth, weakly lirate within. Columellar lip rim erect, with 2 or more small and narrow folds. Anal notch broad, shallow. Siphonal canal short, narrowly open, weakly bent aperturally, ornamented with 2 small open spines. Shell pale orange to pale brown, with darker spiral cords.

Radula typically muricopsine with a prominent central cusp (figures 20, 21).

Etymology: *Vari*: from varix; *mutabilis*: variable. Named for its variable shape of shell and varices.

Discussion: It seems doubtful that the shells illustrated in figures 34, 35 and 36 are conspecific. In fact, the last

teleoconch whorl of *F. varimutabilis* may be weakly convex or rounded, with erratical placement and variable form of the varices. Early teleoconch whorls are identical in all specimens examined.

Favartia (Caribiella) alveata (Kiener, 1842), known from Florida to Brazil has a shell with fewer, larger, scabrous cords, regularly placed varices and a paucispiral protoconch of 1.5 whorls, denoting nonplanktotrophic larval development. *Favartia varimutabilis* is also related to the Pacific species *F. jeanae* Emerson and D'Attilio, 1979, known from the Philippine Islands.

Favartia (Murexiella) hidalgoi (Crosse, 1868)

Material examined: Southeastern Brazil, stn. DC55, Martin Vaz Island, 20°32'S, 28°52'W, 780–795 m (1 dd) (fragment); stn. DC81, 19°00'S, 37°48'W, 120–135 m (1 dd).

Known from the Gulf of Mexico to Brazil. In Brazil recorded from Rio Grande do Sul by Rios (1985:85). Only 2 damaged and dead specimens were collected during this expedition.

Favartia (Murexiella) glypta (M. Smith, 1938)

Material examined: Southeastern Brazil, stn. DC15, 21°37'S, 40°18'W, 37 m (1 dd, 1 lv); stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (3 dd) (juveniles); stn. DC73, 19°00'S, 37°48'W, 607–620 m (1 dd) (juvenile).

Comparison of the photograph of the holotype of *Murex glypta* Smith, 1938 illustrated in Vokes (1968:117), of a very similar shell from Ilha do Pai, Brazil (coll. R. Houart), and of the type material of *Murexiella iemanja* Petuch, 1979 (holotype USNM 780652 and paratype USNM 780653) confirms the conclusion of Rios (1985:85) who synonymised *Murexiella iemanja* Petuch, 1979 with *Murex glypta* Smith, 1938.

The other shell illustrated as *Favartia glypta* in Vokes (1968: pl. 7, fig. 5) from the post-Caloosahatchee Formation, Florida (specimen USNM 645895) is *Favartia cellulosa* (Conrad, 1846).

Rios (1985:85) records *F. glypta* from Amapa to Rio de Janeiro and Abrolhos Islands.

Pygmaepteris germainae Vokes and D'Attilio, 1980
(figure 37)

?*Pygmaepteris germainae* Vokes and D'Attilio, 1980:50, pl. 1, figs. 1–4.

Type locality: Off Punta Higuero, northwestern Puerto Rico, 90 m.

Material examined: Southeastern Brazil, stn. DC24, Vitoria Bank, 20°42'S, 37°50'W, 48–52 m (1 dd); stn. DC27, Montague Bank, 20°26'S, 36°42'W, 81 m (1 dd); stn. DC34, Jaseur Bank, 20°28'S, 35°54'W, 54 m (1 dd).

Described from fossil specimens (Miocene and early Pleistocene) from the Dominican Republic and Costa

Rica and from Recent specimens from the Caribbean Sea (Puerto Rico to Panama, in 12–90 m). The presence of this species off southeastern Brazil extends considerably its geographical range.

Subfamily ERGALATAXINAE

Kuroda and Habe, 1971

Cytharomorula grayi (Dall, 1889)

Material examined: Southeastern Brazil, stn. DC28, Montague Bank, 20°27'S, 36°42'W, 525–600 m (1 dd); stn. DC48, Columbia Bank, 20°44'S, 32°08'W, 250–300 m (2 dd); stn. DC55, Martin Vaz Island, 20°32'S, 28°52'W, 780–795 m (14 dd); stn. DC73, 19°00'S, 37°48'W, 607–620 m (3 dd); stn. CB77, 19°41'S, 37°48'W, 790–940 m (2 dd); stn. DC81, 19°00'S, 37°48'W, 120–135 m (2 dd); stn. DC82, 18°56'S, 37°52'W, 85–105 m (3 dd); stn. CB92, 19°34'S, 38°55'W, 340–360 m (1 dd); stn. CB103, 23°36'S, 42°02'W, 200–217 m (1 lv).

Mentioned by Radwin and D'Attilio (1976:44) from Barbados and by Rios (1985:86) from Rio de Janeiro to Rio Grande do Sul in 80–175 m.

The species probably lives throughout the Caribbean to Brazil. Also known in the Eastern Atlantic in the Canary Islands, Madeira and St. Helena (Bouchet & Warén, 1985).

Subfamily OCENEBRINAE Cossmann, 1903

Trachypollia turricula (von Maltzan, 1884)
(figures 22, 23)

Cantharus (Pollia) turricula von Maltzan, 1884:67.

Type locality: Gorée, Sénégal, West Africa.

Material examined: Southeastern Brazil, stn. DC15, 21°37'S, 40°18'W, 37 m (1 dd); stn. DC22, Vitoria Bank, 20°32'S, 38°11'W, 52 m (4 dd, 1 lv); stn. DC27, Montague Bank, 20°26'S, 36°42'W, 81 m (1 dd, 2 lv); stn. DC28, Montague Bank, 20°27'S, 36°42'W, 525–600 m (1 dd); stn. DC30, Jaseur Bank, 20°27'S, 36°17'W, 60 m (1 lv); stn. DC34, Jaseur Bank, 20°28'S, 35°54'W, 54 m (2 lv); stn. DC35, Jaseur Bank, 20°42'S, 35°22'W, 82–105 m (9 dd); stn. DC40, Davis Bank, 20°40'S, 34°41'W, 60 m (1 dd); stn. DC42, Dogaressa Bank, 20°55'S, 34°01'W, 60 m (6 dd); stn. DC43, Dogaressa Bank, 20°51'S, 33°45'W, 63 m (1 dd, 3 lv); stn. DC47, Columbia Bank, 20°42'S, 32°13'W, 94–105 m (1 dd); stn. DC61, Trindade Island, 20°29'S, 29°18'W, 63 m (1 dd); stn. DC82, 18°56'S, 37°52'W, 85–105 m (3 dd); stn. DC83, 18°50'S, 37°57'W, 60 m (1 dd).

The shell dredged at station DC28 (525–600 m) was empty and damaged, and most likely carried downslope.

Drupa didyma Schwengel, 1943 described from off Palm Beach, Florida, is similar; comparison with the original diagnosis and with specimens from West Africa, Florida (coll. R. Houart), and Brazil (MNHN) confirms

this synonymy. The multispiral protoconch indicates planktotrophic development, which accounts for the broad distribution of this species in the western and eastern Atlantic.

Subfamily TROPHONINAE Crossmann, 1903

Trophon aculeatus Watson, 1883
(figures 14, 40)

Trophon aculeatus Watson, 1882:390.

Type locality: Off Pernambuco, 09°05'S, 34°50'W, 640 m.

Material examined: Southeastern Brazil, stn. CB77, 19°41'S, 37°48'W, 790–940 m; stn. CB104, 23°42'S, 42°07'W, 430–450 m; stn. CB105, 23°47'S, 42°10'W, 610 m (many live and dead collected specimens).

Rios (1985:88) reported this species to occur off Brazil (off Pernambuco) and Guadeloupe and included the type-locality of *T. lacunellus* (Dall, 1889), a different species that Rios synonymised with *T. aculeatus*. Live-taken specimens were collected by R.V. *Marion-Dufresne* in 430–450 m. All specimens collected in 610–940 m were empty shells.

Trophon pelseneeri E. A. Smith, 1915

Trophon pelseneeri E. A. Smith, 1915:92, pl. 2, figs. 6–7.

Type locality: West of Falkland Islands, 229 m.

Material examined: Southeastern Brazil, stn. CB101, 22°58'S, 42°06'W, 50 m (1 dd); stn. CB102, 23°07'S, 42°04'W, 100 m (1 dd) (damaged).

Recorded by Rios (1985:88), from the state of Rio de Janeiro, Brazil, to the Falkland Islands, Argentina. *Trophon orbigny* Carcelles, 1946 is a synonym (Rios, 1985:88). *Trophon pelecetus* Dall, 1902 is probably an earlier name, but study of more specimens is required to confirm this.

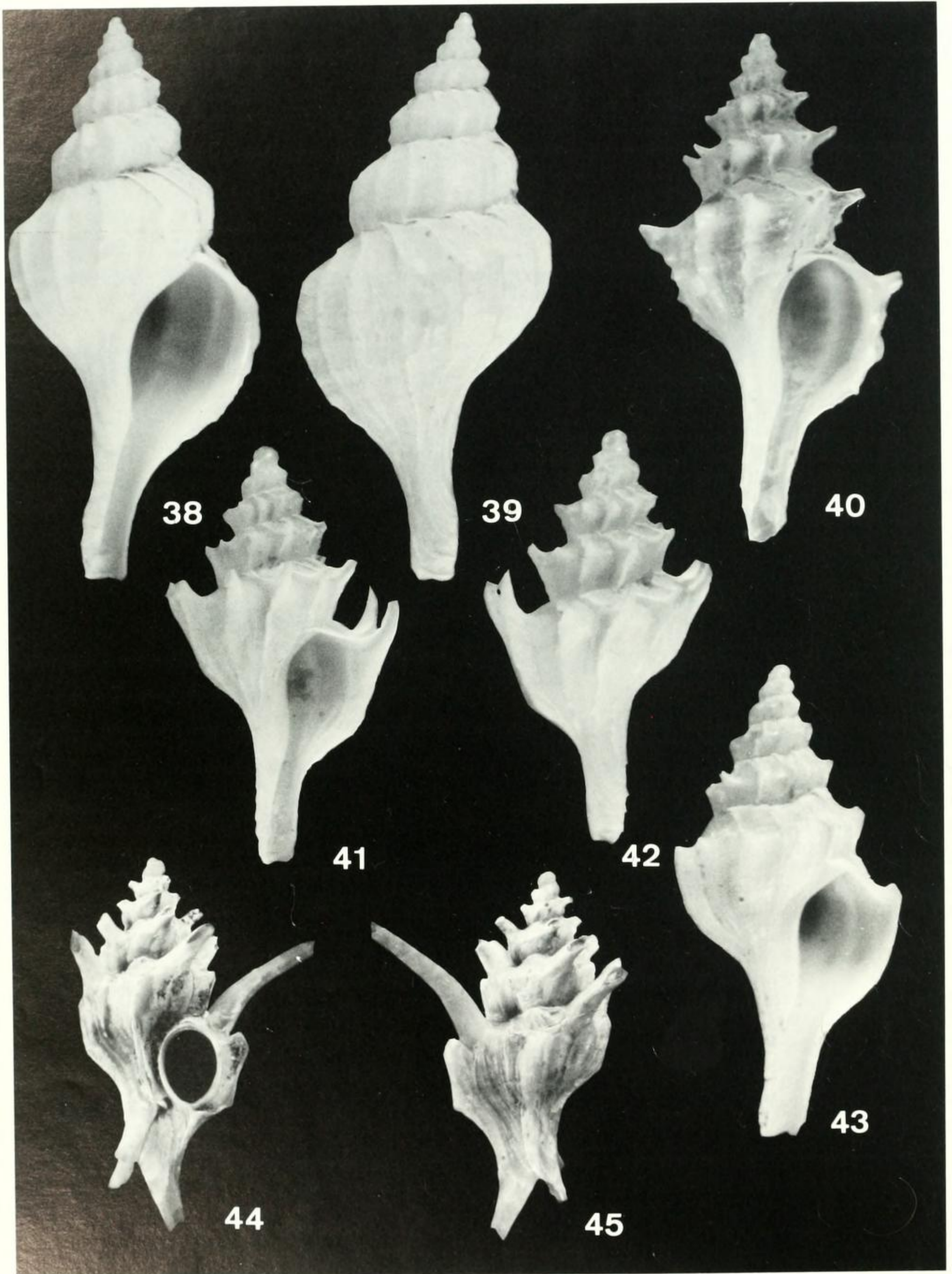
Trophon verrillii Bush, 1893
(figures 41–43)

Trophon verrillii Bush, 1893:214, pl. 1, fig. 16.

Type locality: Off Cape Fear, North Carolina, 1,183 m.

Material examined: Southeastern Brazil, stn. CB76, 18°59'S, 37°50'W, 637 m (3 dd, 4 lv).

Trophon verrillii differs from *T. aculeatus* in having a larger protoconch and totally lacking spiral ornamentation. The illustrated specimen (figures 41, 42) is very similar to the holotype (figure 43). To my knowledge *T. verrillii* was previously known only from the type locality.



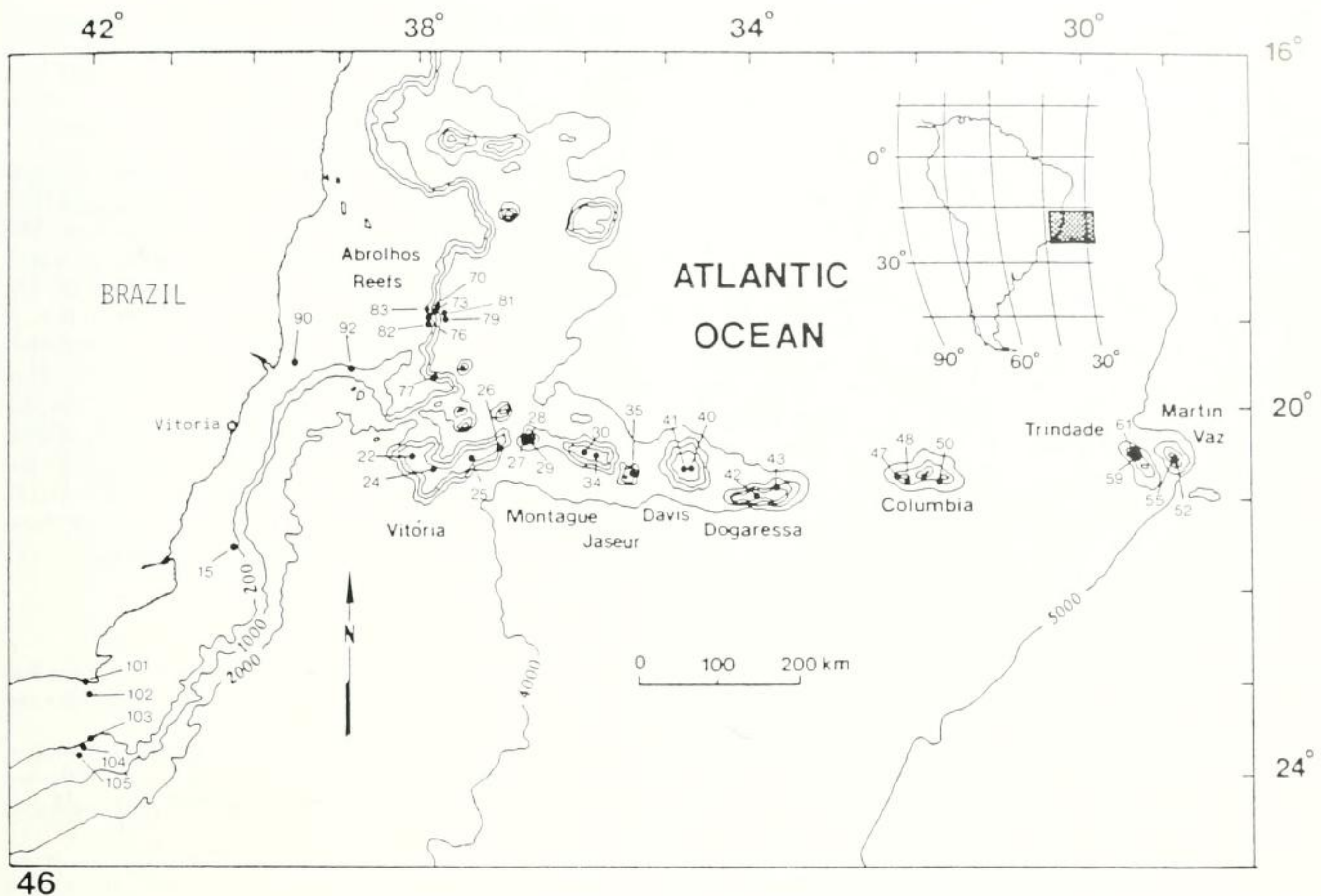


Figure 46. Map of investigated area with location of cited stations. Reproduced, with permission, from Leal and Bouchet (1991), with some additions.

Trophon mucrone n.sp.
(figures 15, 16, 38, 39)

Type material: Holotype MNHN, 26.5 × 11 mm, south-eastern Brazil, stn. CB79, 19°02'S, 37°48'W, 1,500–1,575 m (lv); 7 paratypes MORG 26459; stn. DC70, 18°59'S, 37°48'W, 1,540–1,550 m (4 dd) (juveniles); stn. CB77, 19°41'S, 37°48'W, 790–940 m (1 dd) (damaged); stn. CB79, (2 dd).

Other material examined: Stn. CB78, 18°59'S, 37°48'W, 1,200 m, coll. R. Houart (1) (damaged).

Distribution: Known only from the material examined.

Description: Shell 26.5–28.0 mm in length, roundly-elongate. Spire high with 1.5–1.75 protoconch whorls and 6 or 7 teleoconch whorls. Suture impressed. Protoconch whorls rounded. Axial ornamentation on last teleoconch whorl consisting of 12 sharp, low lamellae and numerous growth striae. Spiral sculpture of 4 or 5 low, weak cords; shoulder smooth, except for axial lamellae.

Aperture broadly ovate. Columellar lip smooth. Anal notch obsolete. Outer lip thin, smooth, glossy within. Siphonal canal moderately long, straight, broadly open. Shell whitish.

Etymology: *Mucrone*—from *mucro* (tip, sharp end). Named for its arrow or javelin tip shape.

Discussion: Three species, *Trophon lacunellus* (Dall, 1889), described from off Guadeloupe, in 1,406 m, *T. dabneyi* Dautzenberg, 1889, described from the Azores, in 1,287 m, and *T. limicola* Verrill, 1885, described from the New England Coast, in 1,542–3,718 m may be compared.

Trophon lacunellus differs from *T. mucrone* by its higher spired and smaller shell without spiral sculpture, narrower teleoconch whorls, and more rounded protoconch whorls.

Trophon dabneyi has more rounded teleoconch whorls than *T. mucrone*, spiral cords that are absent or very weak, and a multispiral protoconch of 2.5 whorls (prob-

Figures 38–40. 38, 39. *Trophon mucrone* n.sp., holotype MNHN, 26.5 × 11 mm. 40. *Trophon aculeatus* Watson, stn. CB104, 13.9 × 7 mm. **Figures 41–43.** *Trophon verrillii* Bush. 41, 42. Stn. CB76, 10 × 5.5 mm. 43. Holotype, MCZ119157, 13.9 × 6.8 mm. **Figures 44, 45.** *Siphonochelus (Siphonochelus) riosi* Bertsch & D'Attilio, stn. CB103, 11.5 × 5.2 mm.

able planktotrophic development) (Houart, 1981: pl. 3, fig. 14; Bouchet & Warén, 1985: fig. 305).

The holotype of *T. limicola* Verrill, 1885, a 10.5 mm high shell, was also compared with a 9.7 mm high juvenile specimen of *T. mucrone*. *Trophon limicola* has 20 axial lamellae on its last teleoconch whorl (only 9 in *T. mucrone*), a longer siphonal canal, more rounded protoconch whorls, and lacks spiral sculpture.

Additional notes on West Atlantic *Trophon* species: *Trophon aculeatus* Watson, 1883 and *T. verrillii* Bush, 1893 differ in many features such as spiral sculpture, number of axial lamellae, shape of whorls and protoconch. *Trophon abyssorum* Verrill, 1885, described from a juvenile specimen of 8 mm, is more closely related to *T. verrillii*, and has angulate and smooth teleoconch whorls, prominent spines at the shoulder and relatively longer siphonal canal.

Subfamily TYPHINAE Cossmann, 1903

Typhis (Typhina) belcheri Broderip, 1833

Material examined: Southeastern Brazil, stn. CB102, 23°07'S, 42°04'W, 100 m (1 dd).

The holotype of *Typhis belcheri* was illustrated by Kaicher (1980: card 2514). Comparison with the holotype of *Typhis cleryi* Petit, 1842 (MNHN), and with many specimens from Brazil (coll. R. Houart) and from West Africa (MNHN and coll. R. Houart) lead to the conclusion that these taxa are conspecific. The species is recorded by Rios (1985:89) as *Rugotyphis cleryi* (Petit, 1842), from Rio de Janeiro to Torres, Rio Grande do Sul. It lives usually in shallow water.

Typhis belcheri is also known from the Cape Verde Archipelago and Senegal (West Africa) (MNHN).

Siphonochelus (Siphonochelus) riosi

(Bertsch & D'Attilio, 1980)
(figures 17, 24, 25, 44, 45)

Typhis (Typhina) riosi Bertsch & D'Attilio, 1980:135, figs. 6, 7.

Type locality: Off Tramandai, southern Brazil, 30°04'S, 47°55'W, 280 m.

Material examined: Southeastern Brazil, stn. CB92, 19°34'S, 38°55'W, 340–360 m; stn. CB102, 23°07'S, 42°04'W, 100 m; stn. CB103, 23°36'S, 42°02'W, 200–217 m; stn. CB104, 23°42'S, 42°07'W, 430–450 m; stn. CB105, 23°47'S, 42°10'W, 610 m (many live and dead specimens).

The specimens collected in 100–217 m are larger than those dredged in 430–450 m, but no other differences are apparent between the two samples. As already mentioned by Vokes (1984:215), the specimen illustrated as *Typhis longicornis* Dall in Bayer (1971: fig. 31) is *S. riosi*.

The radula (figures 24, 25) consists of rachidian teeth

and a pair of curved lateral teeth. Rachidian teeth with 3 main cusps and asymmetrical lateral denticles.

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LITERATURE CITED

- Bertsch, H. and A. D'Attilio. 1980. New species of Muricidae (Gastropoda) from the Indian Ocean, the Philippines and Brasil. *Venus* 39(3):131–138.
- Bouchet, P. and A. Warén. 1985. Revision of the Northeast Atlantic bathyal and abyssal Neogastropoda excluding Turridae (Mollusca, Gastropoda). *Bolletino Malacologico* supplement 1:123–296.
- Bush, K. J. 1893. Reports on the results of dredgings, under the supervision of Alexander Agassiz, in the Gulf of Mexico (1877–78), and the Caribbean Sea (1879–80), and along the Atlantic coast of the United States (1880) by the United States coast survey steamer "Blake" . . . Report on the Mollusca dredged by the "Blake" in 1880, including descriptions of several new species. *Bulletin of the Museum of Comparative Zoology* 23:197–244.
- Clench, W. J. and I. Pérez Farfante. 1945. The genus *Murex* in the western Atlantic. *Johnsonia* 1(17):1–56.
- Houart, R. 1981. Révision des Trophoninae d'Europe. *Informations de la Société Belge de Malacologie* 9(1–2):3–70.
- Kaicher, S. D. 1980. Card catalogue of world-wide shells, Muricidae V. Privately published, St. Petersburg, Florida.
- Leal, J. H. and P. Bouchet. 1989. New deep-water Volutidae from off southeastern Brazil (Mollusca: Gastropoda). *The Nautilus* 103(1):1–12.
- Leal, J. H. & P. Bouchet. 1991. Distribution patterns and dispersal of prosobranch gastropods along a seamount chain in the Atlantic Ocean. *Journal of the Marine Biological Association of the United Kingdom* 71(1) (February 1991). In press.
- Maltzan, H. F. von. 1884. Diagnosen neuer Senegambischer gastropoden. *Nachrichtsblatt der deutschen Malakozologischen Gesellschaft* 16:65–73.
- Petuch, E. J. 1979. New gastropods from the Abrolhos Archipelago and reef complex, Brazil. *Proceedings of the Biological Society of Washington* 92(3):510–526.
- Petuch, E. J. 1987. New Caribbean molluscan faunas. CERF, Charlottesville, Virginia: 1–154, addendum A1–A4.
- Radwin, G. E. and A. D'Attilio. 1976. *Murex* shells of the world, an illustrated guide to the Muricidae. University Press, Stanford, 284 p.
- Rios, E. C. 1985. *Seashells of Brazil*. Rio Grande, 328 p.

- Smith, E. A. 1915. Mollusca. Pt. 1. Gastropoda prosobranchia, Scaphopoda and Pelecypoda.-British Antarctic ("Terra Nova") expedition, 1910. *Zoology* 2(4):61-112.
- Vokes, E. H. 1968. Cenozoic Muricidae of the western Atlantic region. Pt 4, *Hexaplex* and *Murexiella*. *Tulane Studies in Geology* 6(2-3):85-126.
- Vokes, E. H. 1975. Cenozoic Muricidae of the western Atlantic region, Pt 6, *Aspella* and *Dermomurex*. *Tulane Studies in Geology and Paleontology* 11:121-162.
- Vokes, E. H. 1976. Cenozoic Muricidae of the western Atlantic region. *Dermomurex*—addendum. *Tulane Studies in Geology and Paleontology* 12:45-46.
- Vokes, E. H. 1984. Comparison of the Muricidae of the eastern Pacific and western Atlantic, with cognate species. *Shells and Sea Life* 16(11):210-216.
- Vokes, E. H. 1985. Review of the west coast aspellids *Aspella* and *Dermomurex* (Gastropoda: Muricidae), with the descriptions of two new species. *The Veliger* 27(4):430-439.
- Vokes, E. H. 1990. Two new species of *Chicoreus* subgenus *Siratus* (Gastropoda: Muricidae) from Northeastern Brazil. *The Nautilus* 103(4):124-130.
- Vokes, E. H. and A. D'Attilio. 1980. *Pygmaeapterys*, a newly described taxon of Muricidae (Mollusca: Gastropoda), with the description of three new species from the Cenozoic of the western Atlantic. *Tulane Studies in Geology and Paleontology* 16:45-54.
- Vokes, E. H. and R. Houart. 1986. An evaluation of the taxa *Muricopsis* and *Risomurex* (Gastropoda: Muricidae), with one new species of *Risomurex*. *Tulane Studies in Geology and Paleontology* 19:63-88.
- Watson, R. B. 1882. Mollusca of H.M.S. *Challenger* expedition. *Journal of the Linnean Society London Part* 14:372-392.