AN EVALUATION OF THE TAXA *MURICOPSIS* AND *RISOMUREX* (GASTROPODA: MURICIDAE), WITH ONE NEW SPECIES OF *RISOMUREX*

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I. ABSTRACT

Risomurex is considered to be a subgenus of *Muricopsis*, being distinguished from the latter by lacking true varices, having instead only rounded axial ridges. All species are in the Atlantic Ocean with the majority found in the tropical western Atlantic; three are from West Africa; one is from temperate South America. One fossil species, presumed to be the ancestral form, occurs in the Burdigalian of France and Florida. The habitat of all is extremely shallow water, under rocks or coral boulders, the deepest known occurrence is no more than 30 m (for *roseus*) but most are intertidal. All are small; the largest (*necocheanus* and *gilbertharrisi*) are under 25 mm in height and most are about 15 mm. In all, there are 11 species recognized: two fossil forms; one Pliocene-Recent form; the remaining all Recent, of which one is a new species, *M. (R.) withrowi*, described from northern South America.

II. INTRODUCTION

Olsson and McGinty (1958, p. 40) originally described the muricid genus *Risomurex* without any comparison to the similar *Muricopsis* Bucquoy and Dautzenberg, 1882. As the authors noted, "Caribbean species of this group have been referred to *Ocenebra, Engina, Ricinula*, and most recently to *Ocinebrina*." They included in their new taxon four species: "*Engina*" *schrammi* Crosse, 1863 (the type); "*Fusus*" *muricoides* C. B. Adams, 1845; "*Ricinula*" *rosea* Reeve, 1846; and "*Murex*" *alveatus* Kiener, 1842. They added that the radula of *R. schrammi* is very close to that of "*M.*" *alveatus*, which is true, as both *Risomurex* and *Favartia*, to which *alveatus* is more correctly assigned (as subgenus *Caribiella*), are now placed in the subfamily Muricop-

sinae, characterized by having a three-dimensional rachidian tooth.

The only taxon with which Olsson and McGinty compared *Risomurex* was the Mediterranean *Ocinebrina*, no doubt due to Bartsch and Rehder's placement of their "*Tritonalia*" *caribbaea* in the subgenus *Ocinebrina*, and Abbott's (1954, p. 44) subsequent transfer of that species to synonymy with what he then termed "*Ocenebra (Ocinebrina) muricoides* (Adams)."

There is a superficial resemblance between *Ocinebrina* Jousseaume and *Risomurex*, in that both have non-varicate shells, with heavily denticulated apertures. However, this is due to convergence and *Ocinebrina*, as Abbott indicated, is a subgenus of *Ocenebra*, placed in the subfamily Ocenebrinae. The latter is distinguished by having calcitic (not aragonitic) shells, purpuroid opercula, thaid radulae, and (usually) a sealed siphonal canal.

In addition to *Ocinebrina*, the members of this group have been placed in a variety of muricid, thaid, and even buccinid genera. The latter usually has been *Engina* Gray, 1847 (type species: *E. zonata* Gray), superficially similar with its biconic, non-varicate shell and denticulated aperture. But, in addition to the buccinid radula, the two shell forms may be distinguished by the series of small denticles extending along the entire length of the columellar lip in *Engina*.

Initially most species were described as "*Ricinula*" or "*Sistrum*," both of which are synonyms of *Drupa* Röding, 1798 (type species: *D. morum* Röding), a thaid genus with numerous accessory denticles on the rachidian tooth and a purpuroid operculum. However, at the time of this usage, species now referred to *Morula* Schumacher, 1817 (type species: *Morula papillosa* Schumacher, 1817, = *Drupa uva* Röding, 1798) were also included in *Drupa* s.l., and there is a stronger resemblance between these forms and those here placed in *Risomurex*.

The genus *Morula*, which is Indo-Pacific in distribution, includes a group of species that have heavily denticulated apertures and non-varicate shells with nodulose axial sculpture. Although resembling members of *Drupa* in shell from, especially in the conspicuous purple aperture, the radula of the group is muricine, as is the operculum. *Morula* differs from *Risomurex* in the nature of the radula (muricine not muricopsine), in the arrangement of the labral denticles, and in having a strong plait in the center of the columellar wall, just opposite the largest of the labral denticles, greatly constricting the apertural opening.

In 1971 Vokes considered the genus *Risomurex* as being in the thaid family, somewhere near *Drupa*, and did not include the species in her "Catalogue of the genus *Murex*." But, in 1976, Radwin and D'Attilio observed that the radula, shell, and protoconch of the three species of *Risomurex* are muricid, nearly identical to the genus *Muricopsis*, and they synonymized the two taxa. Their illustration of the radula of "*M. schrammi*" (= *M. deformis*) (1976, fig. 112) shows the characteristic three-dimensional rachidian tooth of the subfamily. For the radula of "*Risomurex roseus*," unfortunately they illustrated some ocenebrine species, perhaps *Trachypollia nodulosa* (Adams, 1845) (compare Radwin and D'Attilio, 1976, fig. 110, with the same authors, 1972, fig. 11).

Although we are in complete agreement that *Risomurex* is closely allied with *Muricopsis*, the non-varicate shell of *Risomurex*, in contrast to the varicate shell of *Muricopsis*, seems sufficient justification for separating the two* at the subgeneric level (compare pl. 2, fig. 11 with others). This decision is further strengthened by the discovery of two additional *Risomurex* species, one of which is described below, that are in turn closely related to a fossil form described from the Miocene of France as "*Jania*" *crassicosta* Benoist.

*This same conclusion was reached independently by Kemperman and Coomans (1984), in a paper that appeared as ours was nearing completion. Their conclusions are essentially in agreement with ours (considerably blunting the impact of our paper), their most important contribution being the observation that the shell usually considered to be *M. (R.) schrammi* by all authors since Olsson and McGinty is not that form but another, which they named as a new species. In our opinion, the species in question is *M. (R.) deformis* (Reeve), which they state is similar to their new species but not the same.

1873, but which also occurs in the Early Miocene Chipola Formation of northwestern Florida (see pl. 3, figs. 6, 7). Although described in the buccinid genus *Jania*, the French species is unquestionably a *Risomurex*, the earliest member of the line yet discovered. Thus, the group has had a long geologic history of being distinct from *Muricopsis*, which first appears in the Middle Eocene of California (*Muricopsis vistaensis* Givens and Kennedy, 1976).

We agree with Olsson and McGinty (1958) and Kemperman and Coomans (1984) as to the species included in this subgenus [excluding "*M.*" *alveatus*, which as noted above is better referred to *Favartia (Caribiella)* and is perhaps better known to readers as *Murex intermedius* C. B. Adams, 1850, *non M. intermedius* Brocchi, 1814.] What there is not agreement on is the name by which these species are to be called. The nomenclature of the entire group is unusually complicated not only at the generic level but also at the species level.

Our studies show there are eleven species that may be assigned to the subgenus *Risomurex*. These are:

1. *deformis* (Reeve) (=*schrammi* of authors; =*mosquitensis* Kemperman and Coomans, 1984). Occurring only along the coast of Caribbean Central America, from the Chinchorro Banks, Mexico, to Panamá; a single dead specimen reported from the north coast of Cuba.
2. *roseus* (Reeve) (of which *schrammi* Crosse is probably a synonym). Found throughout the Antilles and the northeasternmost coast of Venezuela (Sucre State).
3. *caribbaeus* (Bartsch and Rehder) (=*Fusus muricoides* Adams, 1845, *non F. muricoides* Deshayes, 1835). The most widespread of the species, occurring from the Florida Keys to Barbados, and through the Caribbean from Yucatan to Panamá; however, not known from the northern coast of South America, except one island off Venezuela.
4. *gilbertharrisi* (Weisbord). Venezuela only; Late Pliocene near Caracas and living only in vicinity of Isla de Margarita.
5. *withrowi* Vokes and Houart, n. sp. From northern coast of South America (Colombia and Venezuela), Trinidad, Tobago, and Netherlands Antilles.
6. *rutilus* (Reeve). Ghana, West Africa.
7. *fusiformis* (Gmelin). Sénégal, West Africa.
8. *suga* (Fischer-Piette). Sénégal, West Africa.
9. *galbensis* (Jung). Early Pliocene of Trinidad.
10. *necocheanus* (Pilsbry). The only temperate species, found from central Brazil to northern Argentina.
11. *crassicosta* (Benoist). Early Miocene (Burdigalian) of France and Florida.

III. ACKNOWLEDGMENTS

The main framework of this paper is based upon work done at the British Museum (Natural History) and the Muséum National d'Histoire Naturelle, Paris, and to the members of the molluscan sections of these two institutions: John D. Taylor and Kathie Way, of the first; and Philippe Bouchet and J. E. Pointier, of the second, we extend our deepest gratitude for the multitude of favors rendered. In addition, this paper has required more than the usual amount of borrowing of specimens and seeking of information. For all of this help we wish to acknowledge our indebtedness to the following persons: the late Joseph Rosewater and Thomas R. Waller, U. S. National Museum; Ruth D. Turner and David H. Backus, Harvard Museum of Comparative Zoology; Peter Hoover, Paleontological Research Institution; Mary A. Garback, Academy of Natural Sciences, Philadephia; William K. Emerson, American Museum of Natural History; H. E. Coomans, Zoologisch Museum, Universiteit van Amsterdam; D. L. N. Vink, Wassenaar, Netherlands; R. von Cosel; Geissen, Germany; Emilio García, Lafayette, Louisiana; David G. Robinson, New Orleans, Louisiana; Robert Foster, Santa Barbara, Californa; Pierre Lozouet, Morigny, France; Emilio Rolán, Vigo (Pontevedra), Spain; and Peter Ryall, Takoradi, Ghana. In particular, for South American material, Mr. and Mrs. J. Gibson-Smith, Caracas, Venezuela, made available their extensive collection, permitting us to determine the distributional

extent of many of the species for the first time.

IV. SYSTEMATIC DESCRIPTIONS

Family MURICIDAE Rafinesque, 1815
Subfamily MURICOPSINAE Radwin and D'Attilio, 1972
Genus MURICOPSIS Bucquoy and Dautzenberg

Muricopsis BUCQUOY and DAUTZENBERG, *in* BUCQUOY, DAUTZENBERG, and DOLLFUS, 1882, Moll. Mar. Roussillon, v. 1, p. 19.

Type species: Murex blainvillei Payraudeau, 1826, by original designation.

Subgenus RISOMUREX Olsson and McGinty

Risomurex OLSSON and MCGINTY, 1958, Bulls. Amer. Paleontology, v. 39, no. 177, p. 40.

Type species: Engina schrammi Crosse, 1863, by original designation.

MURICOPSIS (RISOMUREX) DEFORMIS (Reeve)
Plate 2, figs. 1-5

Ricinula deformis REEVE, 1846 [plate dated "1856" in error], Conch. Icon., v. 3, *Ricinula*, pl. 6, fig. 44.

Engina deformis (Reeve). TRYON, 1883, Man. Conch., v. 5, p. 192, pl. 62, fig. 37.

Sistrum ferrugineum [sic] rubidum DALL, 1889, Harvard Mus. Comp. Zool., Bull., v. 18 ("Blake" Rept.), p. 217.

Sistrum ferrugineum [sic] rubidum Dall. M. SMITH, 1953, Illus. Cat. Recent Spec. Rock Shells, p. 30.

Risomurex schrammi (Crosse). OLSSON and MCGINTY, 1958, Bulls. Amer. Paleontology, v. 39, no. 177, p. 41, pl. 2, figs. 2, 2a (*not* of Crosse).

Risomurex roseus (Reeve). WARMKE and ABBOTT, 1961, Caribbean Seashells, p. 106, pl. 19b (*not* of Reeve).

Ocenebra (Risomurex) schrammi (Crosse). ABBOTT, 1974, American Seashells, p. 184 (*not* of Crosse).

Muricopsis schrammi (Crosse). RADWIN and D'ATTILIO, 1976, *Murex* Shells of the World, p. 171, pl. 2, fig. 1, text fig. 111 (protoconch-worn), 112 (radula) (*not* of Crosse).

Risomurex schrammi (Crosse). KAICHER, 1979, Card Cat. World Wide Shells, pack no. 20 (Muricidae IV), no. 2010 (*not* of Crosse).

Risomurex deformis (Reeve). KEMPERMAN and COOMANS, 1984, Zool. Mus. Univ. Amsterdam, Bull., v. 10, no. 1, p. 5, fig. 5 (holotype).

Risomurex mosquitensis KEMPERMAN and COOMANS, 1984, Zool. Mus. Univ. Amsterdam, Bull., v. 10, no. 1, p. 1, figs. 3, 4.

Risomurex schrammi (Crosse). SARASÚA and ESPINOSA, 1984, Poeyana, no. 273, p. 3, fig. 5A (*not* of Crosse).

Description: Shell of average size for the subgenus, height to 15 mm; roundly fusiform and solid. Aperture ovate and narrow; columellar lip adherent to shell on its whole surface, two elongate denticles on anterior part; anal notch fairly deep and strong; outer apertural lip weakly crenulate, inner side with five heavy, slightly elongate denticles, the second being stronger and more than twice as large as the others. Spire high; protoconch of one and one-half keeled whorls; five rounded postnuclear whorls. Suture slightly impressed. Body whorl with eight or nine rounded axial ridges; apertural varix bearing five short spines. Spiral sculpture consisting of eight or nine major cords; one or two on the shoulder, five on the body and two weaker on the siphonal canal; small nodes developed at the intersection of spiral cords and axial ribs, giving a nodulose appearance to the shell; other spiral sculpture consisting of two or three intermediate, somewhat squamose threads between each pair of cords. Siphonal canal short, straight and narrowly open. Color light to dark brown with white, cream, or light pink nodes where the spiral cords cross the axial sculpture; protoconch and first two spire whorls pink; aperture bluish-white, surrounded with light brown.

Holotype: BMNH 196872.

Dimensions of holotype: Height 8.8 mm, diameter 5.8 mm.

Type locality: TU R-366, Punta Cahuita, Costa Rica (here designated).

Figured specimens: Fig. 1, BMNH 196872 (holotype). Fig. 2, USNM 820637, height 12.0 mm, diameter 8.2 mm; locality TU R-366. Fig. 3, USNM 820638, height 14.7 mm, diameter 8.7 mm; locality TU R-109. Fig. 4, USNM 61199 (holotype-*Sistrum rubidum* Dall); height 8.6 mm, diameter 6.5 mm; locality, Utila, Bay Islands, Honduras. Fig. 5, ZMA 384001 (holotype-*Risomurex mosquitensis* Kemperman and Coomans); height 11.7 mm, diameter 6.9 mm; locality, Puerto Vargas, Costa Rica.

Discussion: Tryon (1883, p. 192) was the first author to consider the members of *Risomurex* as a group, assigning them to the genus "*Engina*." He placed *E. schrammi* Crosse in synonymy with *Ricinula rosea* Reeve and added that *Ricinula deformis* Reeve was probably also a synonym.

The species were only fleetingly men-

tioned by Dall in the *Blake* Report (1889, p. 217), where he noted that they should be referred to the genus *Sistrum* and added that the Caribbean species included "*S. roseum* Reeve, . . . *Sistrum nodulosum* C. B. Adams, [and] *S. ferrugineum [sic]* Reeve, a beautiful variety of which has the spiral nodules small, elongated, and scarlet, while the rest of the surface is a dark vernicose brown. The columella in this form is also a fine red color, and it seems worthy of separation as a variety *rubidum*."

The name "*Ricinula ferruginosa**" Reeve" has been used for years for a species from the eastern Pacific, but the type specimens prove to be the Atlantic *Trachypollia nodulosa* (Adams) (see Vokes, 1984, for further discussion). However, the scarlet "variety" to which Dall gave the name "*rubidum*" is a different form that already had the name *Ricinula deformis*.

When Olsson and McGinty (1958) did their study of the group and named the taxon *Risomurex* they overlooked both *deformis* and *rubidum*, naming what they considered to be "*schrammi* Crosse" type of their new genus. Although "*Ricinula*" *deformis* was described without locality data, the illustration is accurate and it is curious that this name has been completely overlooked in the past. The taxon was so obviously pertinent to the study of *Risomurex* that a special effort was made to examine the type of Reeve's species in the British Museum. One glance was sufficient to realize it is the form, common along the Caribbean coast of Panamá and Costa Rica, which Olsson and McGinty cited as "*R. schrammi*."

Thus, it was very surprising to see the recent paper by Kemperman and Coomans in which they described this form as a new species, *R. mosquitensis*. Had they not been aware of Reeve's name it would be understandable, but they figured Reeve's type and stated that it "resembles beachworn specimens of *Risomurex mosquitensis* . . . [but] the whorls are more globose than those of *R. mosquitensis*" (1984, p. 5). Having in our collections dozens of specimens of *M. (R.) deformis*, we cannot see the validity of their statement and the two are considered as synonymous. Furthermore, even if they did not believe *M. deformis* to be the correct name for the form, Dall's "*Sistrum ferrugineum rubidum*" is available. Although they consider the name to be a *nomen dubium*, "since no type material is known, no type locality is given and the poor description makes identification impossible" (*ibid.*, p. 5), we cannot accept any of these arguments. In the first place, the description is completely unequivocal and could not be referring to any other species; but what is even more important, there is a type specimen in the collections of the U. S. National Museum, labeled as coming from "Utilla Id. [Utila, one of the Bay Islands], Honduras." Although it is a poor specimen, covered at both the apex and the canal by encrusting foraminifera there is no doubt as to its identity, as may be seen in pl. 2, fig. 4.

The type specimen of "*R.*"*deformis* (figured here, pl. 2, fig. 1), as noted by Reeve (1846, expl. pl. 6), is "characterized by the depressed obesity of the spire," which is a result of the apex being broken in life and replugged by the animal. This is a fairly normal occurrence among the numerous examples in the Tulane collections from TU R-366, Punta Cahuita, Costa Rica, where the species is found in large numbers (see pl. 2, fig. 2). As Reeve gave no locality, Pta, Cahuita is here designated as type locality for "*Ricinula*" *deformis*.

Although the species bears some resemblance to the original illustration of "*Engina*" *schrammi*, as shown by Kemperman and Coomans, who figured the drawing and the type specimen (*ibid.*, figs. 6, 7), there is not a great deal of similarity beyond the generic level. The designation of "*E.*" *schrammi* as type species of *Risomurex* by Olsson and McGinty presents a problem that may be resolved in three different ways. According to the *Code of Zoological Nomenclature* (Art. 70a), if the type species of a genus is considered to have been misidentified, a petition should be made to the Commission to designate either: (1) the nominal species actually involved; *i.e.*, *R. deformis*; (2) a

*The misspelling "*ferruginea*," which appears repeatedly in the literature, seems to have originated with Tryon, 1880, p. 190 and expl. to pl. 59 (although correctly spelled on p. 233).

species chosen in conformity with the usage of the generic name at the time the misidentification is discovered; or (3) the species named by the designator, regardless of the misidentification, *i.e.*, *E. schrammi*.

Kemperman and Coomans have indicated that they intend to recommend solution no. 1 in their petition and ask to have *R. mosquitensis* declared type but this will simply introduce further problems, as *R. mosquitensis* is a subjective synonym of both *M. (R.) deformis* and *M. (R.) rubidus* (Dall). If the third alternative is selected, leaving *E. schrammi* as type, this also invites problems, with *E. schrammi* being a subjective synonym of *M. (R.) roseus* (Reeve). It seems the most desirable course to designate *M. deformis* itself and remove any possible confusion.

This small species is more widespread than indicated by Kemperman and Coomans (*ibid.*, fig. 1), and is moderately common, usually occurring on the undersides of coral slabs in shallow water. In the Tulane Collections there are numerous examples not only from Panamá and Costa Rica, but also from the Bay Islands, off Honduras, and to as far north as the Chinchorro Banks, Quintana Roo, Mexico (collected by Emilio García, subsequent to the publication of Vokes and Vokes, 1983). We know of no records from the Antilles except Sarasúa and Espinosa (1984, p. 3), who have reported a single dead specimen collected in sand dredged from the beach at La Habana, Cuba. Warmke and Abbott (1961, pl. 19b) figured it (as "*R. roseus*") from the "West Indies" but they gave no exact location. Likewise, there are no specimens known from the northern part of South America (Gibson-Smith, *in litt.*, 5 Jan. 1985). It would seem that *M. deformis* and *M. roseus* do not occur in the same area, with *M. deformis* being confined to the Central American coast and *M. roseus* to northern South America and the Antilles.

MURICOPSIS (RISOMUREX) ROSEUS (Reeve)
Plate 1, figs. 5-9

Ricinula rosea REEVE, 1846 [plate dated "1856" in error], Conch. Icon., v. 3, *Ricinula*, pl. 6, fig. 46.

Engina rosea (Reeve). TRYON, 1883, Man. Conch., v. 5, p. 192, pl. 62, fig. 34.

Sistrum roseum (Reeve). DALL, 1889, Harvard Mus. Comp. Zool., Bull., v. 18 ("Blake" Rept.), p. 217.

Sistrum roseum (Reeve). JUAME and SARASÚA, 1943, Soc. Malac. "Carlos de la

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PLATE 1

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1. *Muricopsis (Risomurex) schrammi* (Crosse) 76
(X5) Coll. J. de C., Mus. Natl. Hist. Nat., Paris (holotype); height 8.8 mm; diameter 5.5 mm.
Locality: Guadeloupe, French Antilles, (Fig. 1c whitened)

2-4. *Muricopsis (Risomurex) rutilus* (Reeve) 80

2. (X 4) BMNH 1968461 (lectotype); height 12.0 mm, diameter 5.5 mm.
Locality: Unknown.
3. (X4) Houart Coll.; height 13.0 mm, diameter 6.2 mm.
Locality: Busua Island, Ghana.
4. (X20) Vokes Coll.; height 7.8 mm, diameter 4.0 mm.
Locality: Takoradi, Ghana. (Whitened)

5-9. *Muricopsis (Risomurex) roseus* (Reeve) 68

5. (X4) BMNH 1968458 (lectotype); height 11.1 mm, diameter 6.4 mm.
Locality: "Island of Masbate."
6. (X3-1/2) BMNH 1984186 (paralectotype); height 14.8 mm, diameter 8.1 mm.
Locality: Unknown.
7. (X4) García Coll.; height 10.9 mm, diameter 6.2 mm.
8. (X4) García Coll.; height 9.5 mm, diameter 5.0 mm.
Locality of both: Shell Beach, Antigua, B.W.I.
9. (X4) Robinson Coll.; height 11.5 mm, diameter 6.4 mm.
Locality: Punta Rucia, Prov. Puerto Plata, Dom. Rep. (Whitened)

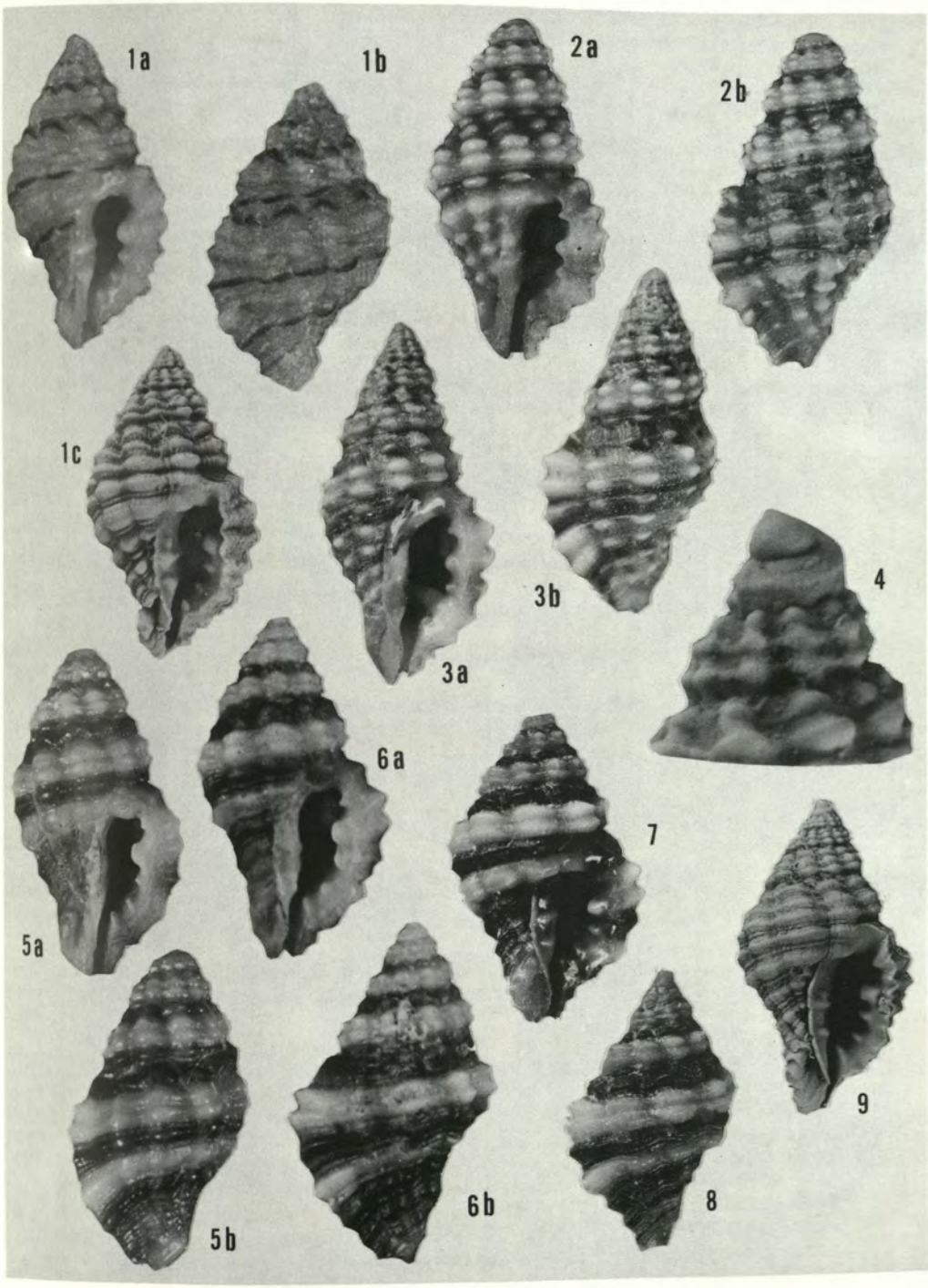

PLATE 1

Torre," Rev., v. 1, no. 2, p. 59.
Sistrum roseum (Reeve). M. SMITH, 1953, Illus. Cat. Recent Spec. Rock Shells, p. 31, pl. 20, figs. 1.
Risomurex roseus (Reeve). OLSSON and MCGINTY, 1958, Bulls. Amer. Paleontology, v. 39, no. 117, p. 41.
Not *Risomurex roseus* (Reeve). WARMKE and ABBOTT, 1961, Caribbean Seashells, p. 106, pl. 19b (= *M. deformis* Reeve).
Not *Risomurex roseus* (Reeve). GIBSON-SMITH and GIBSON-SMITH, 1972, VI Conf. Geol. Caribe, p. 474 (= *M. withrowi* n. sp.).
Ocenebra (Risomurex) rosea (Reeve). ABBOTT, 1974, American Seashells, p. 184.
Risomurex roseus (Reeve). HUMFREY, 1975, Sea Shells of the West Indies, p. 139, pl. 16, fig. 11.
Muricopsis roseus (Reeve). RADWIN and D'ATTILIO, 1976, *Murex* Shells of the World, p. 170, pl.2, fig. 5, text fig. 109 (protoconch), *not* text fig. 110 (radula of *Trachypollia nodulosa?*).
Morula rosea (Reeve). CERNOHORSKY, 1978, Rec. Auckland Inst. Mus., v. 15, p. 76, fig. 2 (syntype BMNH 1968458).
Risomurex roseus (Reeve). KAICHER, 1976, Card Cat. World Wide Shells, pack no. 2 (Muricidae IV), no. 1996.
Not *Morula rosea* (Reeve). KAICHER, 1980, Card Cat. World Wide Shells, pack no. 25 (Muricidae V), no. 2447 (= *?Ergalatax bicatenatus* Reeve).
Muricopsis roseus (Reeve). POINTIER, ERAVILLE, and DELPLANQUE, 1982, Xenophora, no. 9, p. 9.
Risomurex rutilus (Reeve). VOKES and VOKES, 1983, Mesoamer. Ecol. Inst., Mon. 1 (MARI Publ. 54), p. 24 (*not* of Reeve).
Risomurex roseus (Reeve). KEMPERMAN and

PLATE 2

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1-5. *Muricopsis (Risomurex) deformis* (Reeve) 66

1. (X5) BMNH 196872 (holotype); height 8.8 mm, diameter 5.8 mm.
Locality: Unknown.
2. (X4) USNM 820637; height 12.0 mm, diameter 8.2 mm.
Locality: TU R-366.
3. (X3-1/2) USNM 820638; height 14.7 mm, diameter 8.7 mm.
Locality: TU R-109.
4. (X5) USNM 61199 (holotype-*Sistrum rubidum* Dall); height 8.6 mm, diameter 6.5 mm.
Locality: Utila, Bay Islands, Honduras.
5. (X4) ZMA 384001 (holotype-*Risomurex mosquitensis* Kemperman and Coomans); height 11.7 mm, diameter 6.9 mm.
Locality: Puerto Vargas, Costa Rica. (Photograph courtesy of Zoology Museum Amsterdam)

6. *Muricopsis (Risomurex) galbensis* (Jung) 83
(X3-1/2) USNM 645367 (holotype); height 13.8 mm, diameter 7.7 mm.
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7-9. *Muricopsis (Risomurex) caribbaeus* (Bartsch and Rehder) 77

7. (X3) MCZ 186097 (holotype-*Fusus muricoides* C. B. Adams); height 15.3 mm, diameter 7.1 mm.
Locality: Jamaica.
8. (X3) USNM 820639; height 13.9 mm, diameter 7.0 mm.
Locality: TU-R-389, Monte Cristi, Dom. Rep. (Whitened)
9. (X6) USNM 472617 (holotype-*Tritonalia caribbaea* Bartsch and Rehder); height 8.3 mm, diameter 4.0 mm.
Locality: Isla de Providencia, Colombia.

10. *Muricopsis (?Risomurex) necocheanus* (Pilsbry) 84
(X3) Vokes Coll.; height 19.4 mm, diameter 9.8 mm.
Locality: Cabo Frio, Brazil. (Fig. 10a whitened)

11. *Muricopsis (Muricopsis) blainvillei* (Payraudeau) 64
(X2-1/2) Vokes Coll.; height 22.1 mm, diameter 10.8 mm.
Locality: Cartagena, Spain. (Whitened)

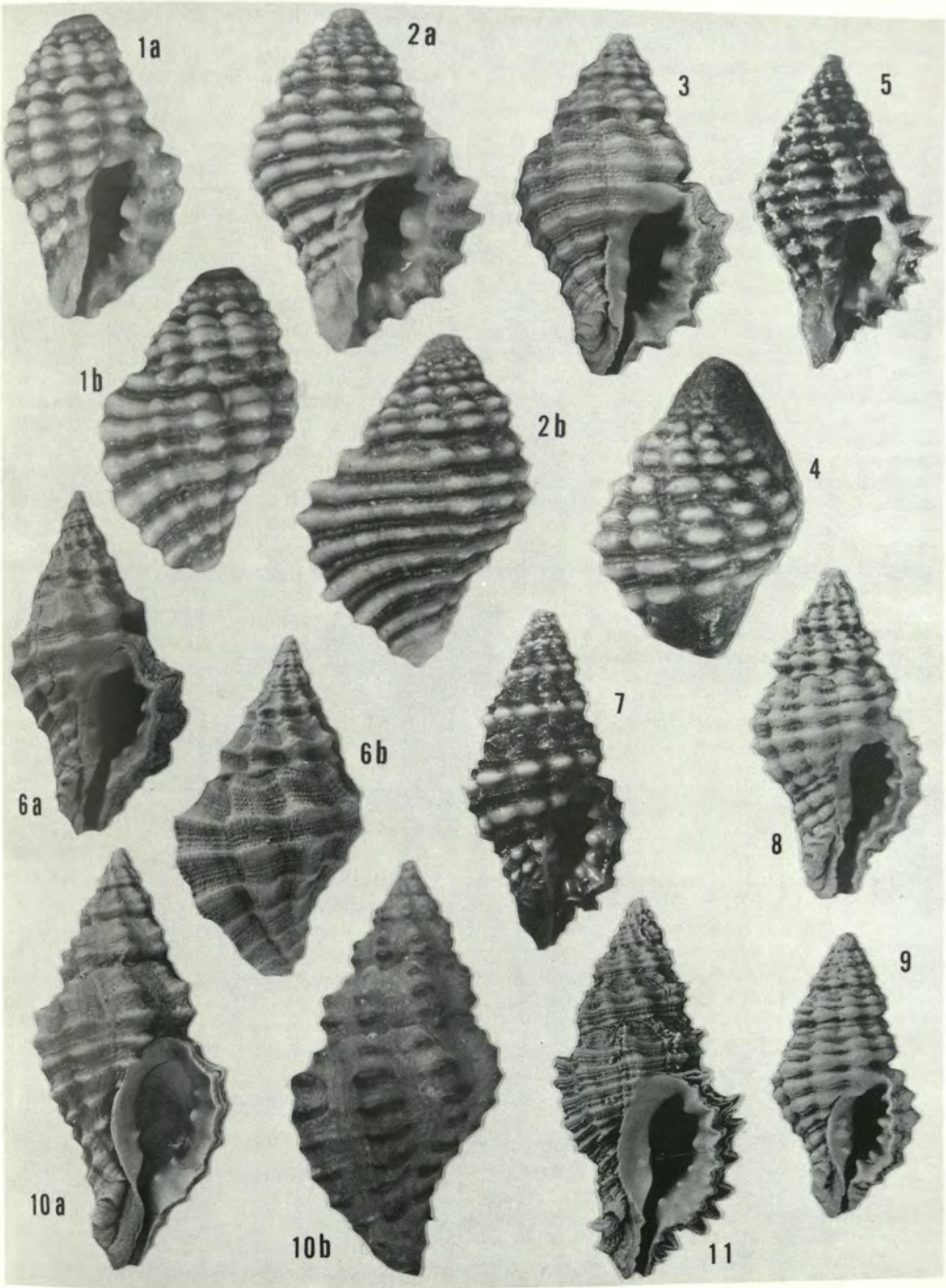

PLATE 2

COOMANS, 1984, Zool. Mus. Univ. Amsterdam, Bull., v. 10, no. 1, p. 5, fig. 8 (syntype).

Risomurex roseus (Reeve). SARASÚA and ESPINOSA, 1984, Poeyana, no. 273, p. 4, fig. 2A.

Description: Shell average in size for the subgenus, to 15 mm in height; fusiform and solid. Aperture ovate, narrow; columellar lip erect on four-fifths of anterior part, adherent above; one small node on anterior portion and two elongate, stronger nodes at the middle; anal notch fairly large and deep; outer apertural lip slightly crenulate, inner side with five elongate denticles, the second one the strongest. Spire high; protoconch of one and one-half keeled whorls; five rounded, slightly angular postnuclear whorls. Suture impressed. Body whorl with seven low, heavy, rounded axial ribs; apertural varix with five short spines. Spiral sculpture consisting of eight major cords: One on the shoulder, five on the body, the fifth of these shallowest, two smaller on the siphonal canal; other spiral sculpture of, usually, two intermediate threads between each pair of major cords; a small elongate node developed at intersection of spiral cords and axial ribs. Siphonal canal short, narrowly open and slightly bent dorsally. Shoulder cord, third and fifth cord on the body and the two cords on siphonal canal colored dark brown, almost black; protoconch and first spire whorl pink; other parts, including the aperture, light to dark pink.

Lectotype: BMNH 1968458 (here designated).

Dimensions of lectotype: Height 11.1 mm, diameter 6.4 mm.

Type locality: St. Thomas, Virgin Islands (designated by Kemperman and Coomans, 1984, p. 5).

Figured specimens: Fig. 5, BMNH 196845[illegible] (lectotype). Fig. 6, BMNH 1984186 (paralectotype); height 14.8 mm, diameter 8.1 mm; locality unknown. Fig. 7, García Collection; height 10.9 mm, diameter 6.2 mm. Fig. 8, García Collection; height 9.5 mm, diameter 5.0 mm; locality of both 7 and 8: 3 meters, under rubble, Shea Beach, Antigua, B.W.I. Fig. 9, Robinson Collection; height 11.5 mm, diameter 6.4 mm; locality Punta Rucia, Prov. Puerto Plata, Dom. Rep.

Discussion: Cernohorsky (1978, fig. 23) figured a syntype of *Ricinula rosea* Reeve, noting that the type locality was said by Reeve to be "Island of Masbate [Philippines]." This is an error, but only the first of many that have plagued this unfortunate species. As Cernohorsky stated, although subsequent authors have considered the form to be Caribbean, upon the reference of Tryon (1883, p. 192), the shell illustrated by Warmke and Abbott (1961, pl. 19b) is not conspecific with Reeve's syntypes, nor is the radula figured by Radwin and D'Attilio (1976, text fig. 110) of a muricine species. Cernohorsky is absolutely correct, the problem is that neither of the latter references is based upon the species here referred to *Muricopsis (Risomurex) roseus*. The shell illustrated by Warmke and Abbott is *M. (R.) deformis* (Reeve) and the

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PLATE 3

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1-3. *Muricopsis (Risomurex) gilbertharrisi* (Weisbord) 78

1. (X2-1/2) PRI 26205 (holotype); height 20.5 mm, diameter 9.9 mm.
   Locality: Quebrada Mare Abajo, Cabo Blanco, Venezuela; Mare Fm.
2. (X2-1/2) Rolán Coll.; height 21.3 mm, diameter 10.4 mm.
3. (X20) Houart Coll.; height 9.4 mm, diameter 4.6 mm.
   Locality of both: Isla de Margarita, Venezuela.

4, 5. *Muricopsis (Risomurex) withrowi* Vokes and Houart, n. sp. 79

4. (X3) USNM 779868 (holotype); height 16.3 mm, diameter 9.0 mm.
   Locality: Curaçao, Neth. Antilles.
5. (a, b X 3; c X 20) IRSNB I. G. 26,738/407 (paratype); height 19.5 mm, diameter 10.[illegible] mm.
   Locality: Off Riohacha, Colombia.

6, 7. *Muricopsis (Risomurex) crassicosta* (Benoist) 84

6. (X3) USNM 377394; height 17.3 mm, diameter 9.4 mm.
   Locality: Saucats, France; Burdigalian.
7. (X3) USNM 377395; height 16.0 mm, diameter 8.5 mm.
   Locality: TU 555, Chipola Fm., Florida; Burdigalian. (Fig. 7b, color pattern as revealed by ultraviolet light).

(All specimens whitened, except figs. 1c, 4, and 7b.)

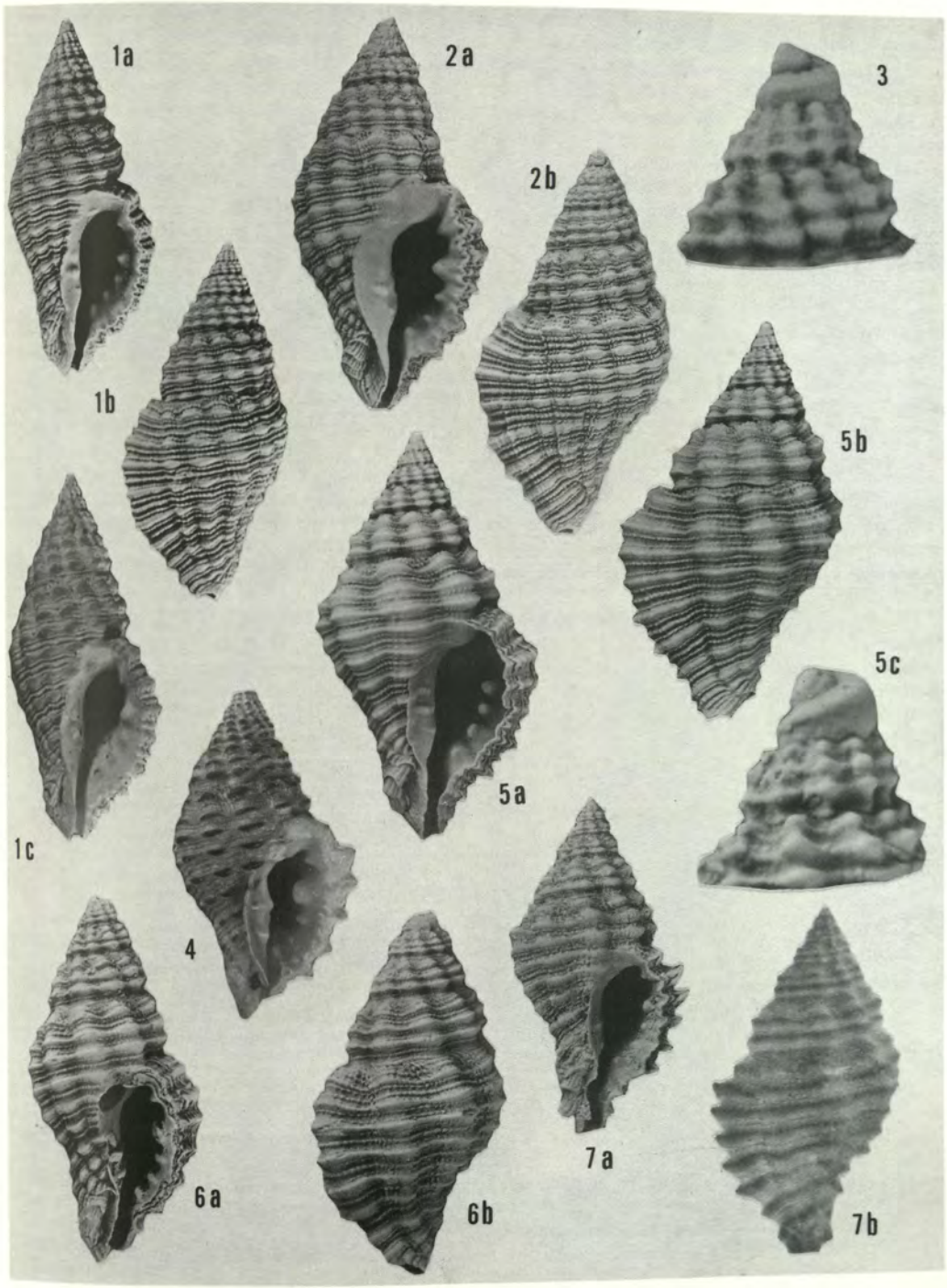

PLATE 3

radula given by Radwin and D'Attilio is an ocenebrine species, presumably *Trachypollia nodulosa* (C. B. Adams, 1845).

As Cernohorsky seemingly confirmed the Indo-Pacific locality of *M. (R.) roseus*, Vokes and Vokes (1983, p. 24) concluded that the correct name for the Carribbean species must be "*Ricinula*" *rutila* Reeve (see below), which has a similar color pattern but not exactly the same, as subsequent investigation proved. A visit to the British Museum (Natural History) turned up a number of examples of "*Ricinula*" *rosea*, all of which match the syntypes, and none of which has an Indo-Pacific locality. It seems obvious that, as was frequently the case in the Cuming Collection, the locality is in error and "*R.*" *rosea* is the Caribbean species Tryon first recognized.

In the type collection of the British Museum (Natural History) there are four specimens segregated as "syntypes." One of these (here figured, pl. 1, fig. 5) seems to match the Reeve illustration best and, at some point, an unknown person has marked an "x" in the aperture with pencil. This specimen is here designated as lectotype. In the collections there is a fifth specimen, also from the Cuming Collection but with no locality data, that is better than any of the syntypes. It is also figured (pl. 1, fig. 6) as a paralectotype.

This species is less common than *M. caribbaeus* and *M. deformis*, both of which occur in very shallow water. The records for *M. roseus* range to 30 m off the coast of Jamaica (Humfrey, 1975, p. 139), and as much as 25 m on the south coasts of the Dominican Republic (La Caleta - David G. Robinson, personal communication). But it also has been taken in very shallow water in Antigua, B.W.I. (3 m, García Collection and Houart Collection), on the north coast of the Dominican Republic (pl. 1, fig. 9, collected in 1 m by David G. Robinson) and in beach drift from Turks and Caicos (David G. Robinson). Sarasúa and Espinosa (1984, p. 4) state that 15 examples were taken alive at Playa Santa Lucia, Nuevitas, Camaguey, Cuba, in depths from 1.5 to 20 m on both rocks and coral reefs. Kemperman and Coomans (1984, p. 5) report it from St. Thomas, Virgin Islands (which they designate as type locality) and Pointier *et al.* (1982, p. 9) list it from Guadeloupe, French Antilles.

The species has not been reported from the northern coast of South America but Gibson-Smith (*in litt.*, 5 Jan. 1985) and D.L.N. Vink (*in litt.*, 3 Jan. 1985) both report taking the species along the coast of Sucre State, Venezuela. These Venezuela shells differ slightly from the typical *M. roseus* in that the color pattern is reversed between the dark and light cords on the upper part of the whorl. In typical *M. roseus* there are two light-colored cords on the shoulder and a single dark one at the periphery. In the South American shell there is one light-colored cord at the shoul-

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PLATE 4

Figures Page

1-3. *Muricopsis (Risomurex) fusiformis* (Gmelin) 81
1. (X4) Berlin Mus. 37204 (lectotype-*Cantharus multigranosus* Maltzan; height 14.4 mm, diameter 6.7 mm.
2. (X4) MNHN (lectotype); height 13.6 mm, diameter 6.4 mm.
3. (a,b X4; c X20) MNHN (paralectotype); height 11.9 mm, diameter 5.1 mm. Locality of all: Ile de Gorée, Senegal.

4, 5. *Muricopsis (Risomurex) suga* (Fischer-Piette) 82
4. (a-c X5; d X20) USNM 859067; height 9.9 mm, diameter 4.0 mm.
5. (X4) MNHN (paralectotype); height 10.8 mm; diameter 4.5 mm. Locality of both: Ile de Gorée, Senegal.

6-7. *Trachypollia turricula* (Maltzan) 81
6. (a X5; b X20) USNM 859068; height 11.0 mm, diameter 4.6 mm. Locality: Corimba, Luanda, Angola.
7. (X4) Berlin Mus. 37205 (lectotype); height 12.5 mm, diameter 5.4 mm. Locality: Ile de Gorée, Senegal.

(All specimens whitened except 2a, 3b, 4c, 5b, and 7)

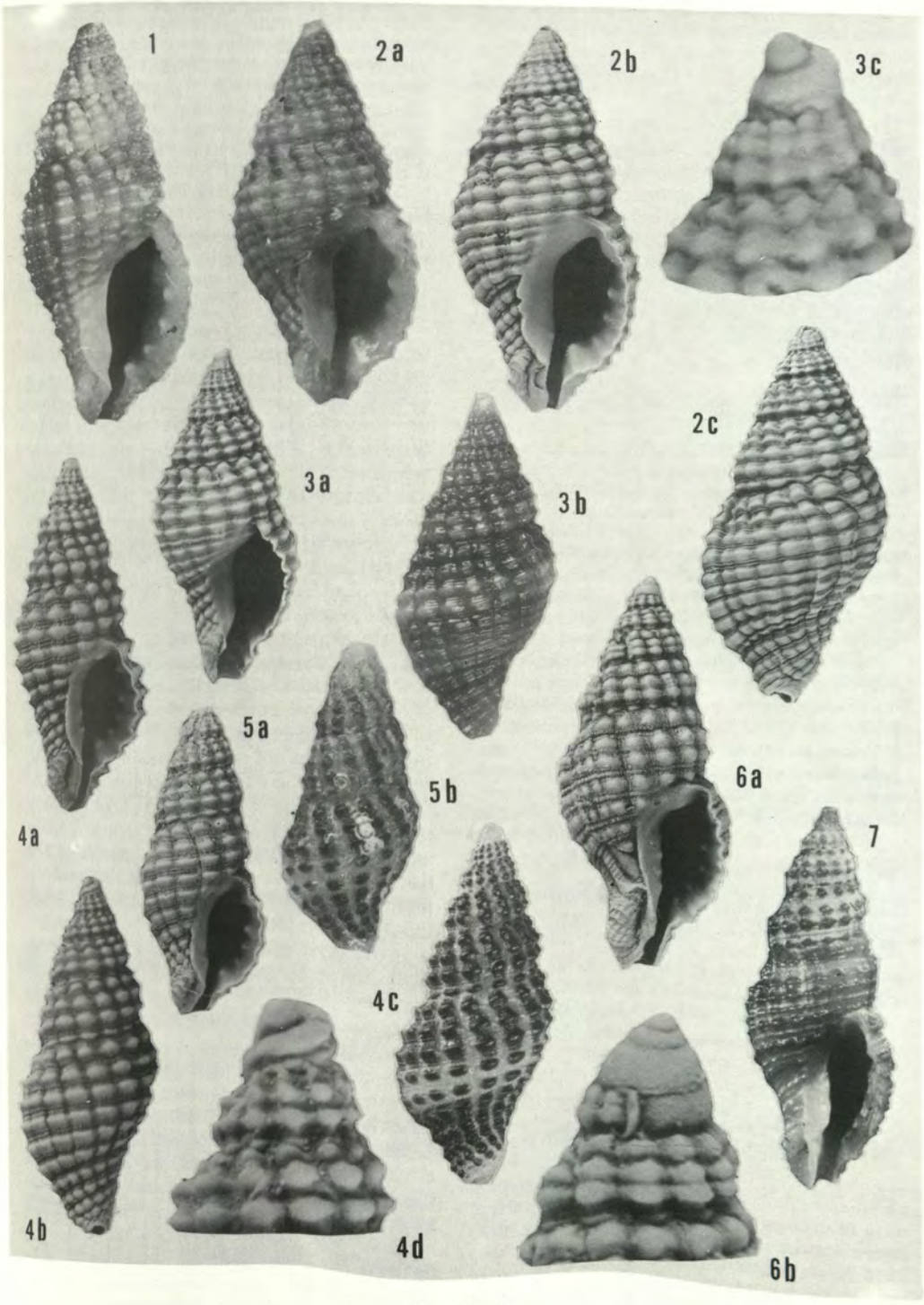

PLATE 4

der and two dark ones at the periphery. Otherwise, there is no morphological difference between these shells and the Antillian ones, and it is considered they are only a local color variant.

No examples are known from the coast of Central America or North America, with the exception of Maxwell Smith (1953, pl. 20, fig. 1), who correctly illustrated the species but stated that his specimen was from "Long Key, Florida." The only Long Key known to the writers is at the mouth of Tampa Bay, and this is a very suspect locality. It is assumed the species is found only in the Antilles, and the northern coast of South America.

MURICOPSIS (RISOMUREX) SCHRAMMI (Crosse)
Plate 1, fig. 1

Engina schrammi CROSSE, 1863, Jour. de Conchyl., v. 11, p. 82, pl. 1, fig. 7.

Engina rosea (Reeve). TRYON, 1883, Man. Conch., v. 5, p. 192, in part, pl. 62, fig. 35 only.

Not *Risomurex schrammi* (Crosse). OLSSON and MCGINTY, 1958, Bulls. Amer. Paleontology, v. 39, no. 177, p. 41, pl. 2, figs. 2, 2a (= *R. deformis* Reeve).

Not *Ocenebra (Risomurex) schrammi* (Crosse). ABBOTT, 1974, American Seashells, p. 184 (= *R. deformis* Reeve).

Not *Muricopsis schrammi* (Crosse). RADWIN and D'ATTILIO, 1976, *Murex* Shells of the World, p. 171, pl. 2, fig. 1, text fig. 111 (protoconch–worn), 112 (radula)(= *R. deformis* Reeve).

Not *Risomurex schrammi* (Crosse). KAICHER, 1979, Card Cat. World Wide Shells, pack no. 20 (Muricidae IV), no. 2010 (= *R. deformis* Reeve).

Risomurex schrammi (Crosse). KEMPERMAN and COOMANS, 1984, Zool. Mus. Univ. Amsterdam, Bull., v. 10, no. 1, p. 3, figs. 6 (holotype), 7 (J. de C., v. 11, pl. 1, fig. 7).

Not *Risomurex schrammi* (Crosse). SARASÚA and ESPINOSA, 1984, Poeyana, no. 273, p. 3, fig. 5A (= *R. deformis* Reeve).

Description: "Coquille imperforée, épaisse, subglobuleuse, atténuée aux deux extrémités et de couleur rose. Les tours de spire, au nombre de cinq, sont légèrement convexes, munis de côtes longitudinales obtuses, et ornés transversalement de nombreuses et élégantes lignes de nodulations: une seule de ces lignes, placée près de la suture, est d'un brun noirâtre très-intense: sur le dernier tour les lignes transverses, d'un brun noirâstre, sont au nombre de trois, l'une près de la suture, la seconde vers la partie médiane du tour, la troisième plus près de la base. La columelle est ridée et comme plissée, le bord droit épais et armé de quatre dents, dont l'une (la plus rapprochée du point d'insertion) est plus grosse que les autres. L'ouverture est, à peu près, droite, resserrée par les dents marginales, et par suite étroite: son intérieur est d'un rose violacé. La base de la coquille est canaliculée et sensiblement prolongée. - Longueur 9, plus grand diamètre 6 millimètres." (Crosse, 1863)

Holotype: Coll. Jour. de Conchyl., Mus. Nat. Hist. Nat. Paris.

Dimensions of holotype: Height 8.8 mm, diameter 5.5 mm.

Type locality: Guadeloupe, French Antilles.

Figured specimen: Holotype.

Discussion: In a recent paper Kemperman and Coomans (1984) have demonstrated that the Caribbean shell usually considered to be *Risomurex schrammi* (Crosse) is not that species but a different one, which they describe as *R. mosquitensis*. Although we are in complete agreement with their assessment of the two being different, we cannot accept the new species as being distinct from *Risomurex deformis* (Reeve) and it is so treated herein.

"Engina" schrammi was described from Guadeloupe, but to the writers' knowledge no subsequent specimens have ever been taken. In the extensive collections of mollusks from that island listed by Pointier *et al.* (1982) and housed in the Museum National d'Histoire Naturelle, Paris, there are no examples of *Risomurex* except *M. roseus* and *M. caribbaeus* (as *muricoides*).

The holotype is very faded and today is pale peach color with three narrow brown spiral cords. Except for the width of the dark bands the shell is indistinguishable from *M. roseus*. Since evidently no one has ever seen another example, we suspect that the type specimen is only an aberrent example of *M. roseus* and Tryon probably was correct when he placed *Engina schrammi* in the synonymy of *"E." rosea* (Reeve) (1883, p. 192).

As is discussed under *M. (R.) deformis* above, the name *"schrammi"* was used by Olsson and McGinty (1958, p. 41, pl. 2, figs. 2, 2a) for the form that occurs along the coast of Panamá and Costa Rica, which they cited as the type species of their new genus *Risomurex*. When one examines the original illustration of *E. schrammi* (refigured in Kemperman and Coomans 1984, fig. 7) this is an understandable error. The most significant difference between

M. deformis and "*E.*" *schrammi* is that in the first the dark color lines are *between* the spiral cords* and in the second it is the spiral cords themselves that are dark. However, the illustration gives the distinct impression of a dark shell with light spiral cords, of which only three are black. As can be seen from the photograph of the holotype (pl. 1, fig. 1; also figured in Kemperman and Coomans, 1984, fig. 6) this is not the case. The entire shell is pink, except for the three dark spiral cords, as noted in the description by Crosse.

MURICOPSIS (RISOMUREX) CARIBBAEUS
(Bartsch and Rehder)
Plate 2, figs. 7-9

Fusus muricoides C. B. Adams, 1845, Boston Soc. Nat. Hist., Proc., v. 2, p. 3; CLENCH and TURNER, 1950, Occ. Pap. Moll., Harvard Univ., v. 1, no. 15, p. 313, pl. 39, fig. 9 (holotype). (*Non Fusus muricoides* Deshayes, 1835).

Tritonalia (Ocinebrina) caribbaea BARTSCH and REHDER, 1939, Smithsonian Misc. Coll., v. 98, no. 10, p. 7, pl. 1, fig. 1.

Ocenebra (Ocinebrina) muricoides (Adams). ABBOTT, 1954, Nautilus, v. 68, p. 44, pl. 2, fig. 2 (holotype of *caribbaea*).

Risomurex muricoides (Adams). OLSSON and MCGINTY, 1958, Bulls. Amer. Paleontology, v. 39, no. 177, p. 41, pl. 2, figs. 1, 1a.

Ocenebra (Risomurex) muricoides (Adams). ABBOTT, 1974, American Seashells, p. 184, fig. 1922.

Risomurex muricoides (Adams). HUMFREY, 1975, Sea Shells of the West Indies, p. 140, pl. 16, fig. 9.

Risomurex muricoides (Adams). RADWIN and D'ATTILIO, 1976, *Murex* Shells of the World, p. 168, pl. 2, fig. 2.

Morula rutila (Reeve). CERNOHORSKY, 1978, Rec. Auckland Inst. Mus., v. 15, p. 78, in part, not fig. 27 (*not* of Reeve).

Muricopsis muricoides (Adams). POINTIER, ERAVILLE, and DELPLANQUE, 1982, Xenophora, no. 9, p. 9.

Risomurex caribbaeus (Bartsch and Rehder). VOKES and VOKES, 1983, Mesoamer. Ecol. Inst., Mon. 1 (MARI Publ. 54), p. 24, pl. 12, fig. 4 (holotype of *F. muricoides* Adams).

Risomurex muricoides (Adams). KEMPERMAN and COOMANS, 1984, Zool. Mus. Univ. Amsterdam, Bull., v. 10, no. 1, p. 3, fig. 9.

Risomurex muricoides (Adams). SARASÚA and ESPINOSA, 1984, Poeyana, no. 273, p. 4, fig. 2B.

Description: Shell of average size for the subgenus, height to 15 mm; fusiform and solid. Aperture narrow and ovate; columellar lip adherent its entire length, two small nodes on the anterior part; anal notch moderately deep; outer apertural lip weakly crenulate on inner side with five small, elongate denticles, the second of which is strongest, the fifth barely visible. Spire high and acute; protoconch of one and one-fourth slightly carinate whorls; five or six elongate and convex postnuclear whorls. Suture impressed. Body whorl with seven or eight large and moderately strong axial ribs. Spiral sculpture consisting of eight major cords: one on the shoulder, five on the body, and two on the siphonal canal; one or two weak intermediate spiral threads between each pair of major cords. Small elongate nodes appearing at intersection of axial ribs and spiral cords, giving the shell a nodulose appearance. Siphonal canal short, narrowly open, slightly recurved dorsally. Shell color from light to dark brown, with certain of the spiral cords white: the anteriormost on the spire whorls, the third and fifth on the body, and the two smaller on the siphonal canal; protoconch white or slightly stained with brown.

Holotype: USNM 472617.

Dimensions of holotype: Height 8.3 mm, diameter 4.0 mm.

Type locality: "Old Providence Island, Caribbean Sea" (= Isla de Providencia, Colombia).

Figured specimens: Fig. 7, MCZ 186098 (holotype - *Fusus muricoides* C. B. Adams); height 15.3 mm, diameter 7.1 mm; locality, Jamaica. Fig. 8, USNM 820639; height 13.9 mm, diameter 7.0 mm; locality TU R-389. Fig. 9, USNM 472617 (holotype).

Discussion: The name "*Tritonalia*" *caribbaea* Bartsch and Rehder has been universally accepted as a junior synonym of "*Fusus*" *muricoides* since Abbott's 1954 paper. Unfortunately, overlooked by all was the fact that *Fusus muricoides* Adams is preoccupied by *Fusus muricoides* Deshayes, 1835, a French Eocene fossil. Only recently did Cernohorsky (1978, p. 78) call this to our attention, suggesting that the name "*Ricinula*" *rutila* Reeve was the correct designation for the species. As is discussed below, this is incorrect and, therefore, the proper name is *M. (R.) caribbaeus*.

Of all the species of *Risomurex*, this is the most common and widespread. We have it from the Florida Keys, Yucatan, and the Bay Islands, to Costa Rica and

*The light-colored spiral cords, which are nodulated by the axial ridges, give the appearance of a shell covered by grains of rice. Presumably this is the origin of the name *Risomurex*, as *riso* is the Italian (but not the Latin!) word for rice.

Panamá. Adams (1845, p. 3) and Humfrey (1975, pl. 16, fig. 9) recorded it from Jamaica and we have taken it at several localities in the Dominican Republic. Sarasúa and Espinosa (1984, p. 4) note that the form is very abundant on Cuban coral reefs. Pointier *et al.* (1982, p. 9) list it from Guadeloupe and Radwin and D'Attilio (1976, pl. 2, fig. 3) illustrate an example from Barbados. The species is found in the same environment as *M. (R.) deformis*, occurring in even shallower water, under rocks and coral slabs that are exposed at low tide.

Gibson-Smith (*in litt.*, 5 Jan. 1985) has collected a number of juvenile specimens on Isla La Tortuga, off the coast of Venezuela, but otherwise there are no records from northern South America. Presumably, it is replaced by *M. withrowi* and *M. gilbertharrisi*, which occupy basically the same environmental niche.

MURICOPSIS (RISOMUREX) GILBERTHARRISI
(Weisbord)
Plate 3, figs. 1-3

Drupa (Morula) gilbertharrisi WEISBORD, 1962, Bulls. Amer. Paleontology, v. 42, no. 193, p. 295, pl. 26, figs. 12-14.

?*Risomurex gilbertharrisi* (Weisbord). GIBSON-SMITH and GIBSON-SMITH, 1972, VI Conf. Geol. Caribe, Mem., p. 474.

Description: Shell large for the subgenus, to 22 mm in height; elongate and solid. Aperture ovate, large; columellar lip with one or two small denticles on anterior part; adherent above and erect on four-fifths of anterior part; anal notch strong and deep; outer apertural lip slightly crenulated, with five low denticles on the inner side, the second slightly larger. Spire high; protoconch of one and one-half keeled whorls; six rounded and elongate postnuclear whorls. Suture indistinct. Body whorl with ten to twelve low, rounded axial ridges; no other axial sculpture. Spiral sculpture consisting of eight major cords; one on the shoulder, five on the body and two on the siphonal canal, accompanied by three squamose threads between each pair of major cords. Siphonal canal short, narrowly open, slightly recurved at tip. Color pink with darker spots where the spiral cords cross the varices; aperture white, margined with pink or yellow.

Holotype: PRI 26205.

Dimensions of holotype: Height 20.5 mm, diameter 9.9 mm.

Type locality: Lower Mare Formation, in stream 100 meters west of Quebrada Mare Abajo, Cabo Blanco, Venuzuela.

Figured specimens: Fig. 1, PRI 26205 (holotype). Fig. 2, Rolán Collection; height 21.3 mm, diameter 10.4 mm. Fig. 3, Houart Collection; height 9.4 mm, diameter 4.6 mm. Locality of specimens in figs. 2 and 3: Isla de Margarita, Venezuela; Recent.

Discussion: Originally described from the Early Pliocene lower Mare Formation of Venezuela, this form has been discovered living in 0.5 - 1 meter, on algae-covered rocks along the coast of Isla de Margarita, by Emilio Rolán, of Vigo (Pontevedra), Spain, who sent the figured material to Houart for identification. In the Gibson-Smith collection (*in litt.*, 5 Jan. 1985) there are a number of beach specimens from Juan Griego, Isla de Margarita, as well as a few from Playa Colorado, Santa Fe, Estado Sucre, but this seems to be the distributional extent of the species. Elsewhere it is replaced by *M. withrowi*.

The Mare Formation, based on the planktic foraminifera, is now considered to be Late Pliocene in age and many of the species described by Weisbord from the formation have subsequently been discovered in the Recent fauna (see Gibson-Smith and Gibson-Smith, 1979, pp. 24-30).

The environment of deposition of the lower Mare Formation must have been very near to that in which the modern specimens of *M. gilbertharrisi* were collected. The fauna comprises numerous examples of *Diodora*, *Fissurella*, *Tegula*, *Colliostoma*, and *Turbo*, plus the shallow-water muricid species that one would expect on a shallow, rocky, Caribbean coast.

MURICOPSIS (RISOMUREX) WITHROWI
Vokes and Houart, n. sp.
Plate 3, figs. 4, 5

Risomurex roseus (Reeve). GIBSON-SMITH and GIBSON-SMITH, 1972, VI Conf. Geol. Caribe, Mem., p. 474 (*not* of Reeve).

Description: Shell large for the subgenus, to 20 mm in height; solid and fusiform. Aperture ovate; columellar lip with two or three small denticles, reflecting the nodulose sculpture of the shell; adherent above and erect on about three-fourths of its anterior part; outer apertural lip crenulated, with five strong denticles on its inner side, the strongest being the second posterior one; anal notch deep and narrow. Spire

high and acute; protoconch of one and one-half keeled whorls; six convex, slightly angulate postnuclear whorls. Suture impressed and slightly undulating. Body whorl with seven to nine low, broad axial ridges; no other axial sculpture except growth lamellae. Spiral sculpture consisting of eight major cords, more apparent and darker colored on the axial ribs, giving a nodulose appearance to the shell, and distributed as follows: one on the shoulder; five on the body; and two on the siphonal canal; two or three somewhat squamose threads intercalated between each pair of major spiral cords. Siphonal canal short, open, very slightly recurved dorsally at the tip. Color mauve or orange to light brown, or almost black, with darker-colored spots where the spiral cords cross the ribs; aperture white, edged by pink.

Holotype: USNM 779868.

Dimensions of holotype: Height 16.3 mm, diameter 9.0 mm.

Paratype: IRSNB I. G. 26,738/407; height 19.5 mm, diameter 10.0 mm; locality, off Riohacha, Colombia, exact data unknown.

Type locality: Curaçao, Netherlands Antilles.

Figured specimens: Fig. 4, USNM 779868 (holotype). Fig. 5, IRSNB I. G. 26,738/407 (paratype).

Discussion: This new species is named for the late Carl Withrow, of St. Petersburg, Florida, who originally recognized the paratype specimen as new and sent it to the senior author for description. It may be compared with three more or less closely related species. From *M. (R.) deformis* it differs by its greater size, its color, and by its more elaborate spiral sculpture. The latter species has strong nodules at the intersection of the spiral cords and axial ridges, which are light pink on a dark-colored shell; *M. (R.) withrowi* has darker nodules on a light brown or orange shell. The spiral cords of *M. deformis* are larger and closer together. The columellar lip of *M. deformis* is very weakly erect or somewhat adherent on its anterior part, but that of *M. withrowi* is detached and erect on three-quarters of its anterior part. *Muricopsis roseus* is a much smaller shell with a different aperture, different spiral sculpture and a different, slightly appressed suture.

The most closely related species, *M. (R.) gilbertharrisi*, also occurs in northern South America, but so far as is known, the two do not occur together. It is possible that the two are only ecologic varients but, on the basis of our material, *M. gilbertharrisi* may be distinguished from *M. withrowi* by having a more narrow, elongated form, with lower and more numerous axial ribs; there being seven to nine ribs in *M. withrowi* and ten to twelve ribs in *M. gilbertharrisi*. The spiral cords are stronger in *M. withrowi* than in *M. gilbertharrisi*, and the labral denticles are larger.

Nevertheless, the distribution pattern of the two species is unusual, with *M. gilbertharrisi* being confined to the Isla de Margarita region and *M. withrowi* occurring all along the coast from Colombia and Venezuela, as far east as the islands of Trinidad and Tobago, as well as the offshore islands of the Netherlands Antilles. Originally described from the Caracas area, *M. gilbertharrisi* evidently is now found only farther to the east–and surrounded on three sides by the presumably younger form. Logic dictates that the two forms should be considered one species but the morphology of the two is sufficiently distinct that the authors believe the separation is valid.

Both of these South American species more closely resemble the Early Miocene *M. crassicosta* (Benoist) than they do the other living members of *Risomurex*. The three share the extremely ornate spiral sculpture, which consists of three squamose intermediate threads (one larger flanked by two smaller) between each pair of major spiral cords. Only *M. roseus* approaches this type of sculpture and in that form the major spirals greatly exceed in strength the intercalary threads.

The color pattern of the two South American species is more akin to that of *M. necocheanus* than to any of the other American forms of living *Risomurex*, in that the shell is lighter-colored with the nodules darker-colored. This is also the pattern in the ancestral *M. crassicosta* and in the living West African *M. suga*. In *M. deformis* the shell is dark and the nodules are lighter; in *M. roseus*, *M. rutilus*, *M. caribbaeus*, and *M. fusiformis* light-colored ribs alternate with dark ones.

According to Dr. Rudo von Cosel, of Giessen, Germany (*in litt.*, 1 June, 1984) the species is found "occurring sympatrically with *T. nodulosa*. It lives on rocky shores (mineral, not coral), under stones from 0-1 m," in the vicinity of Sta. Marta, Colombia. Several specimens, including

the holotype, have also been taken on the island of Curaçao, Netherlands Antilles, as well as on Aruba (D. L. N. Vink, *in litt*, 8 Nov. 1977). Gibson-Smith advises (*in litt.*, 5 Jan. 1985) that this is the species cited as "*Risomurex roseus*" (Gibson-Smith and Gibson-Smith, 1972, p. 474) from Borburata (approximately 120 km west of Caracas), where they have taken numerous specimens. The Gibson-Smith collection also contains examples from as far east as Carenero (approximately 80 km east of Caracas), Venezuela, and Islas Los Roques. Several embryonic specimens from Isla La Tortuga (about halfway between Los Roques and Margarita) cannot be assigned to either *M. gilbertharrisi* or *M. withrowi* with any degree of confidence. All of the Gibson-Smith material was taken in association with coral reefs or with cemented beach-rock (Playa Grande only), in very shallow water. In the collections of the American Museum of Natural History there are several lots of specimens (141494, 93352, 191664) from Tobago and one (93352) from Trinidad. All of these specimens are unmistakably identifiable as *M. withrowi*, with about nine axial ribs. They are all beach specimens with no ecologic data, unfortunately.

MURICOPSIS (RISOMUREX) RUTILUS (Reeve)
Plate 1, figs. 2-4

Ricinula rutila REEVE, 1846 [plate dated "1856" in error], Conch. Icon., v. 3, *Ricinula*, pl. 6, fig. 49.

Engina rutila (Reeve). TRYON, 1883, Man. Conch., v. 5, p. 192, pl. 62, fig. 36.

Muricopsis angolensis (Odhner). RADWIN and D'ATTILIO, 1976, *Murex* Shells of the World, p. 165, pl. 27, fig. 11 (*not* of Odhner).

Morula rutila (Reeve). CERNOHORSKY, 1978, Rec. Auckland Inst. Mus., v. 15, p. 78, fig. 27 (syntype BMNH 1968461).

Not *Risomurex rutilus* (Reeve). VOKES and VOKES, 1983, Mesoamer. Ecol. Inst., Mon. 1 (MARI Publ. 54), p. 24 (=*M. roseus* Reeve).

Description: Shell of average size for subgenus, to 13 mm in height; fusiform and elongate. Aperture ovate and narrow; columellar lip adherent above, detached below, with one small denticle and one small fold on the anterior end, the fold extending into the aperture; anal notch deep and large, in a reversed "U" form; outer apertural lip smooth, with five denticles on the inner side, the second one strongest, the remainder smaller. Spire high; protoconch of one and one-fourth keeled whorls; six slightly convex postnuclear whorls. Suture weakly impressed. Body whorl with seven rounded axial ridges; no other axial sculpture, except growth lines; apertural varix with five short spines. Spiral sculpture consisting of eight cords: one small one on the shoulder, five strong on the body and two small on the siphonal canal; other spiral sculpture consisting of two or three intermediate threads between each pair of major cords. At the intersection of axial ribs and spiral cords small elongate nodes developed, giving a nodulose appearance to the shell. Siphonal canal short, open and slightly recurved dorsally. Shell color gray, siphonal canal darker; shoulder of each whorl darker, with one small brown spot appearing below each node; first, second, fourth, and fifth spiral cord on the body white, the third dark gray; the aperture white with darker bands.

Lectotype: BMNH 1968461 (here designated).

Dimensions of lectotype: Height 12.0 mm, diameter 5.5 mm.

Type locality: Busua Island, Ghana, West Africa (here designated).

Figured specimens: Fig. 2, BMNH 1968461 (lectotype). Fig. 3, Houart Collection; height 13.0 mm, diameter 6.2 mm; locality, Busua Island, Ghana. Fig. 4, Vokes Collection; height 7.8 mm, diameter 4.0 mm; locality, Takoradi, Ghana.

Discussion: Cernohorsky (1978, fig. 27) figured a syntype of "*Ricinula*" *rutila* Reeve and suggested that this was the name to be used for the pre-occupied "*Fusus*" *muricoides* Adams, of the Caribbean. Vokes and Vokes (1983, p. 24) disagreed with this assessment suggesting, instead, that the name should be used for the Caribbean species that was being called "*Risomurex roseus*," as the latter was assumed to be an Indo-Pacific form. As noted above, subsequent investigation proved *M. roseus* is, in fact, the species that has been so considered and is from the Caribbean, not the Indo-Pacific, in spite of the "type locality" of "Island of Masbate."

Thus, the problem became, what is "*Ricinula*" *rutila*? It is colored very like the Caribbean *M. roseus*, but it seems to have a more narrow outline. Searching the British Museum and the Paris Musuem did not uncover any locality information. Then, in the collection of Houart we discovered, under the label "*Muricopsis angolensis*," a specimen (figured here, pl. 1, fig. 3) that is undoubtedly Reeve's species. The misidentification is a result of Radwin and D'Attilio's (1976, p. 165) treatment of

the species in question as "*Muricopsis angolensis* (Ohdner, 1922)." Their description and illustration are clearly of this form and not Odhner's species, which is a synonym of *Orania fusulus* (Brocchi, 1814).

Therefore, we can now say that *M. roseus* is the Caribbean form; *M. rutilus* is the West African form; and, although closely related, they are not the same. In veiw of geography, it is not surprising that this African species is similar in general form to the members of the group in the northern South American region, such as *M. withrowi* and *M. gilbertharrisi*, but it has the banded color pattern of the Caribbean *M. roseus* and *M. caribbaeus*.

The habitat of *M. rutilus* is similar to other members of the subgenus. Peter Ryall, of Takoradi, Ghana, who supplied the specimen with protoconch figured (pl. 1, fig. 4) advises (*in litt.*, 27 Oct. 1984) that "this shell is quite uncommon here, inhabiting rocky areas at a depth of 10 to 15 meters." The areal range of the form is not known at this time.

MURICOPSIS (RISOMUREX) FUSIFORMIS
(Gmelin)
Plate 4, figs. 1-3

"Le Loset" ADANSON, 1757, Hist. Nat. Senegal, Coquillages, p. 132, pl. 9, fig. 23.

Murex fusiformis GMELIN, 1791, Syst. Nat., ed. 13, p. 3549 (ref. to "Le Loset" Adanson).

Ocinebrina loset Adanson. JOUSSEAUME, 1882, Rev. Mag. Zool., (Ser. 3) v. 7, p. 332.

Cantharus (Pollia) multigranosus VON MALTZAN, 1884, Dtsch. Malak Gesell., Nachr., v. 16, no. 5, p. 68.

Tritonalia (Ocinebrina) fusiformis (Gmelin). FISCHER-PIETTE, 1942, Jour. de Conchyl., v. 85, p. 227, pl. 7, figs. 5-8 (syntypes); FISCHER-PIETTE and NICKLÈS, 1946, Jour. de Conchyl., v. 87, p. 60.

Tritonalia fusiformis (Gmelin). KNUDSEN, 1956, Atlantide-Rept., no. 4, p. 26 (in part), *not* pl. 2, fig. 20 (= *Trachypollia nodulosa*).

[?Ocinebrina] fusiformis (Gmelin). VOKES, 1971, Bulls. Amer. Paleontology, v. 61, no. 268, p. 52.

?Ocinebrina fusiformis (Gmelin). FAIR, 1976, *Murex* Book, p. 45.

Description: Shell average in size for the subgenus, to 15 mm in height; fusiform and solid. Aperture ovate, narrow; columellar lip erect on four-fifths of anterior part, adherent above; one weak denticle occasionally developed at anterior end; anal notch broad and ill-defined; outer apertural lip slightly crenulated, with five low denticles on the inner side, all of approximately the same size. Spire high; protoconch of one and one-half keeled whorls; six postnuclear whorls. Suture indistinct. Body whorl with 13 to 15 low flattened ridges; no other axial sculpture. Spiral sculpture of, on the spire whorls four, on the body whorl approximately 12 major cords: nine on the body portion and three on the canal; with three very fine threads between each pair of major cords. Siphonal canal short, narrowly open, slightly recurved at tip. Color reddish-brown, with a white band paralleling the two spiral cords that number third and fourth anterior to the suture, appearing adjacent to the suture on spire whorls; tops of the first two sprial cords anterior to suture tipped by golden blotches; aperture same color as shell.

Lectotype: MNHN (here designated), specimen figured by Fischer-Piette, 1942, pl. 7, fig. 6.

Dimensions of lectotype: Height 13.6 mm, diameter 6.4 mm.

Type locality: Ile de Gorée, Senegal, West Africa.

Figured specimens: Fig. 1, Berlin Mus. 37204 (lectotype-*Cantharus multigranosus* Maltzan, here designated); height 14.4 mm, diameter 6.7 mm. Fig. 2, MNHN (lectotype). Fig. 3, MNHN (paralectotype, here designated); height 11.9 mm, diameter 5.1 mm. Locality of all: Ile de Gorée, Senegal.

Discussion: This species has been known since the time of Adanson but does not seem to have been identified by any modern collectors. Fischer-Piette (1942, p. 227) noted that it had not been recognized since Adanson and the intervening years do not seem to have changed the situation. It was particularly misunderstood by Knudsen (1956, p. 26) who combined, under the name *Tritonalia fusiformis*, not only "*Tritonalia*" *suga*, which is another species of *Risomurex* (see below), but also "*Cantharus (Pollia)*" *turricula* Maltzan, 1884, which is a *Trachypollia*, and "*Cantharus (Pollia)*" *subsinuatus* Maltzan, 1884, which is a synonym of *C. turricula* Maltzan. The specimen illustrated, moreover, is none of these but is *Trachypollia nodulosa* (C. B. Adams, 1845). Only one of the names included by Knudsen is a true synonym, that named "*Cantharus (Pollia)*" *multigranosus* Maltzan 1884; a syntype is figured here (pl. 4, fig. 1) and designated as lectotype.

The above-mentioned species share a type locality and a small, nodulose, nonvaricate shell-shape but little more. In the two here referred to *Risomurex* the protoconch is of one and one-half keeled

whorls. The species of *Trachypollia* have a multi-whorled, conical protoconch. A syntype of "*C.*" *turricula* is figured (pl. 4, fig. 7) and designated as lectotype; another example is figured (pl. 4, fig. 6) showing the nature of the protoconch.

The color of each of these species is different, also. *Muricopsis fusiformis* is most like the Caribbean examples of *Risomurex*, having a shell of an overall reddish-brown color with a light-colored band at the periphery. The tops of the nodes on the two spiral cords immediately anterior to the suture are topped with a golden color, similar to *M. rutilus*. *Muricopsis suga*, on the other hand, is light-colored with dark reddish-brown tubercules, which are smaller and less darkly colored in a zone that gives a superficial resemblance to the light band of *M. fusiformis* but which is more anteriorly located, so that the spire of *M. suga* does not show a light band but that of *M. fusiformis* has a light band just posterior to the suture.

Inasmuch as Gmelin based his species "*Murex*" *fusiformis* on "Le Loset" of Adanson, the type lot of Le Loset is the type lot of *M. fusiformis*. In the Adanson collection, studied by Fischer-Piette (1942, p. 227, pl. 7, fig. 5) there are five examples, three large and two small. Fischer-Piette did not designate a lectotype but figured one of the specimens as "un exemplaire X 2." He indicated that it is the one at the upper right in his figure 5; this specimen is here designated as lectotype and refigured (pl. 4, fig. 2). One of the two smaller examples, that one at the lower left side of Fischer-Piette's illustration, is designated as a paralectotype and figured here (pl. 4, fig. 3). It has a well-preserved *Risomurex*-type keeled protoconch; however, the specimen on the right side is an example of *Trachypollia turricula*, also with a good protoconch but of the multi-whorled type, which is doubtless part of the reason for confusion between the two forms.

So far as is known, the species is found only at Ile de Gorée, Senegal. Knudsen (*ibid.*) cited the species as occurring from the Cape Verde Islands to Angola, but as noted above, due to confusion of several different species, this distribution is suspect. Certainly, the example that he figures from the Cape Verde locality is *Trachypollia nodulosa* and in collections of the Museum National d'Histoire Naturelle, Paris, all material collected from Luanda, Angola, is referable to *Trachypollia turricula*.

Muricopsis (Risomurex) suga (Fischer-Piette)
Plate 4, figs. 4, 5

"Le Suga" Adanson, 1757, Hist. Nat. Senegal, Coquillages, p. 132, pl. 9, fig. 24.

Tritonalia (Ocinebrina) suga FISCHER-PIETTE, 1942, Jour. de Conchyl., v. 85, p. 229, pl. 7, figs. 9, 10.

Tritonalia (Ocinebrina) fusiformis var. *suga* (Fischer-Piette). FISCHER-PIETTE and NICKLÈS, 1946, Jour. de Conchyl., v. 87, p. 61.

Tritonalia fusiformis (Gmelin). KNUDSEN, 1956, Atlantide-Rept., no. 4, p. 26 (in part).

[?Ocinebrina] suga (Fischer-Piette). VOKES, 1971, Bulls. Amer. Paleontology, v. 61, no. 268, p. 126.

Ocinebrina suga (Fischer-Piette). FAIR, 1976, *Murex* Book, p. 79, pl. 22, fig. 332 (not fig. 331, as stated) (lectotype-MNHN Paris).

Description: Shell small for the subgenus, to 11 mm in height; fusiform and elongate. Aperture narrowly ovate; columellar lip erect anteriorly, appressed posteriorly, with two small folds extending into the aperture at the anteriormost end; anal notch deep and narrow; outer lip slightly crenulated, with five denticles on inner side, all approximately of same size. Spire high; protoconch of one and one-half keeled whorls; six postnuclear whorls. Suture indistinct, body whorl with 12 or 13 flattened axial ribs; only other axial ornament fine growth laminae. Spiral ornamentation of, on spiral whorls four, and on body whorl usually nine major cords: six on body and three on siphonal canal; other spiral sculpture consisting of three beaded threads between each pair of major cords; at intersection of axial ribs and spiral cords, elongate, flattened nodes developed. Siphonal canal short, narrowly open. Shell color white, tops of each axial rib marked with dark reddish-brown, except along a zone paralleling the two spiral cords that number fourth and fifth anterior to the suture; here only the tops of the nodes colored, giving the illusion of a lighter colored band encircling the shell at the base of the body whorl. Aperture white.

Lectotype: MNHN (here designated), specimen figured by Fischer-Piette, 1942, pl. 7, fig. 10.

Dimensions of lectotype: Height 10.2 mm, diameter 4.2 mm.

Type of locality: Ile de Gorée, Senegal, West Africa.

Figured specimens: Fig. 4, USNM 859067; height 9.9 mm, diameter 4.0 mm. Fig. 5, MNHN (paralectotype); height 10.8 mm, diameter 4.5 mm. Locality of both: Ile de Gorée, Senegal.

Discussion: Adanson (1757, p. 132) recognized that there are two similar species occurring together in Senegal; accordingly, he denominated one "Le Loset" and the other "Le Suga." He noted that the two were frequently seen together but that they could be distinguished by the shell of "Le Suga" being smaller, with fewer rows of tubercules, which are smaller, more inflated, and more distinct from each other. The color is also different.

Initially, Fischer-Piette (1942, p. 229) in his study of the mollusks of Adanson, agreed with this assessment, giving the name "*Tritonalia*" *suga* to the Adanson species, which had never received a Linnean name. But subsequently Fischer-Piette and Nicklès (1946, p. 61) reduced the taxon to the rank of a variety of "*T.*" *fusiformis*, stating that Nicklès had collected a number of specimens, which permitted discovery of the transition between "Le Loset snd "Le Suga."

However, we are convinced that Adanson was correct in his evaluation of these two forms. The distinctions cited by Adanson are valid and "Le Suga" may indeed be distinguished by its smaller, narrower shape, fewer rows of tubercles and by the color, which is strikingly different from that of *M. fusiformis*. In coloration it is most nearly like the species from South America: *M. gilbertharrisi*, *M. withrowi*, and *M. necocheanus*, all of which have a light-colored shell with dark-brown tubercules. It differs from the American forms, however, in its smaller size (maximum height less than 11 mm) and narrower outline. Also, it lacks the one greatly enlarged denticle on the inner side of the outer lip; all of the denticles are approximately of the same size.

In the type lot there are 12 specimens. One of these was figured by Fischer-Piette (1942, pl. 7, fig. 10) and this same shell was later cited by Fair (1976, pl. 22, fig. 332) as "holotype." However, nowhere did Fischer-Piette mention that it was a type, but it was figured only as "un exemplaire X 2." Therefore, we here designate this specimen as lectotype. The shell shown herein (pl. 4, fig. 5) was selected for figuring because it has a better aperture and stronger color. Neither example has a well-preserved protoconch (in fact, none in the type lot does), so another specimen is illustrated, showing that the protoconch is typical of the *Risomurex* group.

All material seen has come from Ile de Gorée, most from the rocks, but the specimen with protoconch came from a lot dredged at 25 m (no doubt the reason it had a well-preserved protoconch). Knudsen (1956, p. 26) indicated that his specimens from "Station 38, Porto Grande, St. Vincent, Cape Verde Islands" should be referred to "variety *suga*." However, the example he figured from "Station 38" is *Trachypollia nodulosa*, as noted above, and there is no other evidence that *M. suga* occurs in the Cape Verde Islands.

MURICOPSIS (RISOMUREX) GALBENSIS (Jung)
Plate 2, fig. 6

Risomurex galbensis JUNG, 1969, Bulls. Amer. Paleontology, v. 55, no. 247, p. 495, pl. 50, fig. 10-13.

Description: "Small, stout. Protoconch consists of a little less than 1-1/2 smooth whorls. It is strongly keeled and flattened above forming a depression at the apex. Postnuclear whorls about five. Early sculpture consists of axials (about 10 on first scuptured whorl) and two spirals form beads at the intersections. On subsequent whorls the axials become much stronger, and the upper spiral forms a shoulder with acute nodes, where the axials cross. On the second or third sculptured whorl another spiral appears close to the lower suture which is noded as well. Spaces between spirals ornamented by several fine spirals. Body whorl with six to seven noded spirals and eight axials, the last ones being varix-like. Unworn specimens show undulating, somewhat lamellar growth lines. Outer lip thick, with five denticles on inner surface. Inner lip with two inconspicuous lirae on lower part. Anterior canal short. Siphonal fasciole inconspicuous." (Jung, 1969)

Holotype: USNM 645367.

Dimensions of holotype: Height 13.8 mm, diameter 7.7 mm.

Type locality: Courbaril Sand Member, Morne l'Enfer Formation, Pt. Courbaril, Trinidad.

Figured specimen: USNM 645367 (holotype).

Discussion: The Courbaril Sand fauna, according to Jung (1969, p. 306), represents a near-shore environment, with many examples of *Diodora*, *Cerithium*, *Bittium*, and some 50 examples of mostly worn

Muricopsis galbensis. It is thought to be Early Pliocene in age.

Although Jung compared his species with the other Caribbean members of *Risomurex*, it most nearly resembles the more southern (Brazil and Argentina) *M. necocheanus*, which has smaller labral denticles and weaker spiral ornamentation. As is noted below, *M. necocheanus* differs from the other species of *Risomurex* in lacking the keeled protoconch, which *M. galbensis* does have, suggesting that perhaps it is an intermediate form between the tropical, typical *Risomurex* group and the more southerly *M. necocheanus*.

MURICOPSIS (?RISOMUREX) NECOCHEANUS
(Pilsbry)
Plate 2, fig. 10

Sistrum nicocheanum [*sic*] PILSBRY, 1900, Nautilus, v. 14, p. 3.

Morula necocheana (Pilsbry). RIOS, 1970, Coastal Brazilian Seashells, p. 81, pl. 24; 1975, Brazilian Marine Mollusks Icon., p. 92, pl. 27, no. 381.

Muricopsis nicocheanus (Pilsbry). RADWIN and D'ATTILIO, 1976, *Murex* Shells of the World, p. 169, pl. 23, fig. 12.

Description: Shell large for the subgenus, to 25 mm in height; elongate fusiform. Aperture ovate; columellar lip erect anteriorly, adherent above, with two elongate plaits anteriorly, extending into the aperture; anal notch large and moderately deep; outer apertural lip shallowly crenulate, bearing five or six denticles on the inner side, second (or third when six denticles present) denticle slightly larger than the others. Spire high; six slightly convex postnuclear whorls and a protoconch of undetermined nature. Suture impressed. Body whorl with six or seven strong rounded axial ridges, no other axial sculpture. Spiral sculpture consisting of eight low cords, more apparent on the axial ridges; one cord on the shoulder, five on the body and two on the siphonal canal; three or four intermediate threads between each pair of spiral cords. Siphonal canal short, narrowly open and slightly recurved dorsally. Shell color light or dark brown, with darker markings on top of the spiral cords, at the intersection with the axial ridges; aperture white, sometimes surrounded with a light brown line.

Lectotype: ANSP 72640 (here designated).

Dimensions of lectotype: Height 21.5 mm, diameter 11.0 mm.

Type locality: "Nicochea" [Necochea], Argentina.

Figured specimen: Vokes Collection; height 19.4 mm, diameter 9.8 mm; locality, Cabo Frio, Brazil.

Discussion: According to Rios (1975, p. 92) this species occurs on rocky bottoms from Espirito Santo, in central Brazil, to Bahia Blanca, Argentina. The type locality is Necochea, which is between Bahia Blanca and Mar del Plata in northern Argentina. Although the original spelling was as "*nicocheanum*," this is an error and, according to ICZN Code, Article 32a(ii), is to be emended.

The decision to include this species as a *Risomurex* is something of a compromise. The characters that would place it in *Muricopsis* s.s. include no very large apertural tooth and a rounded rather than keeled protoconch, as best can be determined from the material at hand, all of which is eroded. However, if the lack of distinct varices is considered to be the most critical distinction between *Muricopsis* and *Risomurex*, then *necocheanus* should be placed in the latter. The principal reason, however, for placing it here is the strong resemblance to the fossil *M. crassicosta*, which also lacks the keeled protoconch, but has the large apertural tooth, and the similarity of the color pattern to that of the Recent *M. withrowi*, with dark spiral cords topping the axial ridges.

The type lot of "*Sistrum nicocheanum*" in the collections of the Academy of Natural Sciences of Philadelphia, consists of eight specimens, all extremely beachworn. Only one of these, the largest, matches the measurements cited by Pilsbry (height 21.5 mm, diameter 11 mm); accordingly, it is here designated as lectotype. The other seven paralectotypes now bear the museum number ANSP 359103.

MURICOPSIS (RISOMUREX) CRASSICOSTA
(Benoist)
Plate 3, figs. 6, 7

Jania crassicosta BENOIST, 1873, Cat. Saucats, p. 349.

Janiopsis crassicosta (Benoist). COSSMANN, 1901, Essais Paléoconch. Comp., v. 4, p. 178.

Muricopsis crassicosta (Benoist). COSSMANN and PEYROT, 1923, Linn. Soc. Bordeaux, Actes, v. 75, p. 142, pl. 15, fig. 5 (said to also be fig. 6, but not there).

Description: Shell large for the subgenus, to 21 mm in height; solid and heavy. Aperture ovate and narrow; columellar lip with two elongate nodes anteriorly; anal notch moderately deep; outer apertural lip crenulate, five strong denticles on the inner side, the second being the

strongest. Spire high; protoconch of one and one-half rounded whorls; eight or nine slightly angulate postnuclear whorls. Suture impressed, undulated by axial ridges. Body whorl with eight heavy, low axial ridges, crossed by eight or nine spiral cords: one on the shoulder, five or six on the body, and two on the siphonal canal; between each pair of major cords two fine squamose threads. At the intersection of the spiral cords and axial ridges low, elongate nodes developed; spiral cords forming five or six short spines on apertural varix. Siphonal canal open, short, wide and slightly recurved dorsally.

Neotype: Cossmann Collection, Dept. de Paléontologie, Université Paris (VI).

Dimensions of neotype: Height 21 mm, diameter 10 mm (*fide* Cossman and Peyrot, 1923, p. 143).

Type locality: Saucats (about 25 km south of Bordeaux), France.

Figured specimens: Fig. 6, USNM 377394, height 17.3 mm, diameter 9.4 mm; locality, Saucats, France. Fig. 7, USNM 377395; height 16.0 mm, diameter 8.5 mm; locality TU 555.

Discussion: In the Chipola Formation of northwestern Florida there are rare examples (seven in all, from TU 555, 547, and 1048) of a *Muricopsis* that proves to be identical to the species cited by Cossmann and Peyrot (1923, p. 142) as *Muricopsis crassicosta* (Benoist). Unfortunately, Benoist did not figure his species, but as the form is common in the Burdigalian Miocene of France, especially at Saucats, it is presumed that their identification is correct.

The confusion of this species with the members of *Janiopsis*, which is a buccinid, was caused by the presence of the labial denticles and the non-varicate shell. These same characteristics also apply to *Risomurex*; however, the species does not have a keeled protoconch. As noted under *M. necocheanus*, if the lack of distinct varices is considered as a more important taxonomic character than the keeled protoconch, then *M. crassicosta* may be placed with no difficulty in *Risomurex*. As there are species of *Muricopsis* that have a keeled protoconch, this character cannot be restricted to the subgenus. Therefore, it seems probable that the unkeeled protoconch of *M. crassicosta* and *M. necocheanus* is the primitive condition and *M. crassicosta* is the ancestor of the *Risomurex* line.

Because of the morphological similarity between *M. crassicosta* and the South American species of *Risomurex*, all of which have a color-pattern consisting of darker nodules on a light-colored shell, the examples of *M. crassicosta* were subjected to soaking in household bleach (sodium hypoclorite) and photographed under ultra-violet light. Happily, the color pattern proved to be almost identical to the living specimens (as may be seen in pl. 3, fig. 7b).

V. SUPPLEMENTARY LOCALITY DATA

The following are Tulane University fossil localities:

555. Chipola Fm., east bank of Chipola River, about 1000 ft. above Four Mile Creek (SW 1/4 Sec. 29, T1N, R9W), Calhoun Co., Florida.
547. Chipola Fm., west bank of Chipola River, about 2000 ft. above Four Mile Creek (SW 1/4 Sec. 29, T1N, R9W), Calhoun Co., Florida.
1048. Farley Creek, south bank, about 0.8 mi. east of bridge of Florida Highway 275 (NE 1/4 Sec. 21, T1N, R9W), Calhoun Co., Florida.

The following are Tulane University Recent localities:

R-109. Fill for refinery, Bahia las Minas, Isla Payardi, Panamá. (Radiocarbon dated at 7000 years B. P.)
R-366. Punta Cahuita, 42 km southeast of Puerto Limón, Costa Rica.
R-389. Monte Cristi, beach near foot of mountain, at north side of town, Prov. of Monte Cristi, Dom. Rep.

VI. APPENDIX – COMMENTS ON THE GENUS *MURICOPSIS* s.s.

The type species of *Muricopsis* is the Mediterranean *"Murex" blainvillei* Payraudeau, 1826. It is closely related to a form originally named from the Plio-Pleistocene of Italy as *"Murex" cristatus* Brocchi, 1814. There is considerable doubt if the two taxa actually represent two biologically distinct species. On the whole, the fossil shells are larger (attaining a usual height of 35-40 mm), more scabrous, with a proportionally longer siphonal canal. The Recent *M. blainvillei* is less scabrous, and has a smaller, broader shape (usual height no more than 25 mm). But both types occur in the Recent Mediterranean fauna. The living form referred by authors to *M. cristatus* has a larger light-colored shell in contrast to the smaller, darker shell usually referred to *M. blainvillei*. Fair (1976, pl. 17, figs. 232, 233) shows both types and a typical example of the living *M. cristatus* was

figured by Radwin and D'Attilio (1976, pl. 23, fig. 14). Although the latter was mistakenly identified in the plate explanation as "*Muricopsis blainvillei*," in the text (*ibid.*, p. 167) the shell is indicated as being thought to be the type of *Murex cataphractus* Sowerby, 1834, a synonym of *M. cristatus*.

Comparison of numerous examples of both forms does not reveal any consistent differences, other than size and color. The protoconchs of both are identical one and one-half rounded whorls, but on the basis of a very limited sample (most specimens are decollated) the protoconch of the *cristatus* form is slightly larger than that of the *blainvillei* form; this may be a reflection of the overall larger size.

It is presumed that the two extremes represent end members of a single cline, which is in the process of changing through time. As the name "*blainvillei*" is so entrenched in the literature, it would be unwise to suggest that the two names be synonymized without more solidly based biological evidence to back up the assumption.

It might seem that the strongly keeled protoconch seen in the species of *Risomurex* could be considered as diagnostic for the subgenus; however, *Muricopsis pauxillus* and *M. jaliscoensis* also have keeled protoconchs. So far as known, all other species of *Muricopsis* s.s. have rounded protoconchs.

A list of Recent species of *Muricopsis* s.s. recognized by us would include:

armatus (A. Adams, 1854) [*Murex*]; West Mexico.

blainvillei (Payraudeau, 1826) [*Murex*] (which may prove to be a synonym of *M. cristatus*); plus a number of named "varieties," probably all synonyms; Mediterranean.

cristatus (Brocchi, 1814) [*Murex*]. As noted above, there is some question as to whether *blainvillei* and *cristatus* should be separated at all, or perhaps treated as stratigraphic subspecies, with the name *cristatus* applied only to the Plio-Pleistocene members. if synonymized this is the older taxon.

cuspidatus (Sowerby, 1879) [*Murex*]; Indo-Pacific.

huberti Radwin and D'Attilio, 1976; Lesser Antilles.

jaliscocensis Radwin and D'Attilio, 1970; West Mexico.

oxytata (M. Smith, 1938) [*Murex*] Florida and Caribbean, including Gulf of Mexico.

pauxillus (A. Adams, 1854) [*Murex*]; West Mexico.

radula (Hedley, 1899) [*Murex*] (not *M. radula* Linné); Ellice Islands. The sole sample is an immature shell, with an incomplete outer lip, but it seems referable to *Muricopsis*. It has no valid name that we are aware of.

tulensis Radwin and D'Attilio, 1976, West Mexico.

zeteki Hertlein and Strong, 1951; West Mexico to Ecuador, including Galápagos Islands.

The following species have been referred, at one time or another (chiefly Vokes, 1971) to the genus *Muricopsis*, but are better placed elsewhere.

angolensis (Odhner, 1922) [*Ocenebra*]. Examination of the type material above shows this species is a synonym of *Orania fusulus* (Brocchi)*; however, the specimen figured by Radwin and D'Attilio (1976, pl. 27, fig. 11) is not *angolensis* but *M. (Risomurex) rutilus* (Reeve) (see above).

bombayanus (Melvill, 1893) [*Murex*]. The operculum with a sublateral nucleus, plus the overall shell color and ornamentation, indicate placement in *Lataxiena*.

brachys (Melvill and Standen, 1869) [*Murex*] Fair (1976, figs. 236, 236A) and Cernohorsky (1983, fig. 6) have both figured the holotype of *Murex brachys*. It is a synonym "*Ricinula*" *echinata* Reeve, 1846, as noted by Cernohorsky, but it is neither a *Muricopsis* nor a *Morula*, rather it is to be referred to the Ergalataxinae in an as yet undetermined genus.

brazieri (Angas, 1878) [*Murex*]. Is a *Murexsul*. The specimen figured by Radwin and D'Attilio (1976, pl. 24, fig. 13) as "*Muricopsis brazieri*" is *Murexsul purpurispina* (Ponder).

caledonica (Jousseaume, 1881) [*Muricidea*]. Is an *Attiliosa* (see Vokes and D'Attilio, 1982, p. 70).

infans (E. A. Smith, 1884) [*Murex*]. The holotype of this species (figured by Fair, 1976, pl. 17, fig. 228, and Kaicher, 1980, no. 2560) shows that it is an *Ergalatax*. The species described and figured by Radwin and D'Attilio (1976, p. 168, pl. 3, fig. 3) is not *M. infans* but *Muricopsis orri* Cernohorsky, 1976 (see below).

iostomus (A. Adams, 1853) [*Murex*] (not *M. ios-*

*The specific name "*fusulus*" is a noun - little spindle - and does not change to agree with the feminine *Orania*. The type of the genus *Orania* is *Murex spadae* Libasse, 1859, which has usually been considered to be a member of the Corallipphilidae; however, *Murex fusulus* Brocchi, 1814, is a synonym of *M. spadae* and has a radula that indicates placement in the muricid subfamily Ergalataxinae.

toma Sowerby, 1834); Philippine Islands. The type has been figured by Kaicher (1980, no. 2457), and it is to be referred to *Spinidrupa*. It has no valid name that we are aware of.

medicago (Watson, 1897) [*Murex*]. Is a synonym of *M. aradasii* Monterosato *in* Poirier, 1883, and is a *Murexsul*. Fair (1976, pl. 17, fig. 244) has illustrated the type of *medicago*.

nitens (A. Adams, 1854) [*Murex*]. Is an *Ergalatax*, Fair (1976, pl. 17, fig. 235) and Kaicher (1980, no. 2594) have illustrated the type.

noduliferus (Sowerby, 1841) [*Murex*]. Referred to *Attiliosa* by Vokes and D'Attilio (1982, p. 70).

oliverai (Kosuge,1984) [*Muricopsis*]. Should be referred to *Pazinotus* (see Vokes, 1985).

orri Cernohorsky, 1976 [*Muricopsis*]. A species only recently named (Cernohorsky, 1976, p. 116, figs 12-20) in the genus *Muricopsis*, and subsequently transferred to *Attiliosa* by Vokes and D'Attilio (1982, p. 71).

purpurispina Ponder, 1972 [*Muricopsis*]. Ponder considered the genera *Muricopsis* and *Murexsul* synonymous when he named this new species (1972, p. 242, pl. 23, fig. 6; text fig. 3:28 - radula). We do not accept this assignment and consider it better placed in *Murexsul*. As noted above, this species was figured by Radwin and D'Attilio as "*Muricopsis brazieri*."

VII. LITERATURE CITED

ABBOTT, R. T., 1954, New Gulf of Mexico gastropods (*Terebra* and *Ocenebra*): Nautilus, v. 68, p. 37-44, pl. 2.

ADAMS, C. B., 1845, Specierum novarum Conchyliorum, in Jamaica repertorum, synopsis: Boston Soc. Nat. Hist., Proc., v. 2, p. 1-17.

ADANSON, MICHEL, 1757, Histoire naturelle du Senegal, Coquillages. Paris. [Part 2] Histoire des Coquillages, xcvi + 275 p., 19 pls.

BUCQUOY, M. E. J., PHILIPPE DAUTZENBERG, and G. F. DOLLFUS, 1882-1886, Les Mollusques marins du Roussillon, v. I-Gasteropodes. Paris, 570 p. (p. 1-84 publ. 1882), 66 pls.

CERNOHORSKY, W. O., 1976, The taxonomy of some Indo-Pacific Mollusca, pt. 4: Auckland Inst. Mus., Rec., v. 13, p. 111-129, figs. 1-43.

CERNOHORSKY, W. O., 1978, The taxonomy of some Indo-Pacific Mollusca, pt. 6: Auckland Inst. Mus., Rec., v. 15, p. 67-86, figs. 1-40.

CERNOHORSKY, W. O., 1983, The taxonomy of some Indo-Pacific Mollusca, pt. 11: Auckland Inst. Mus., Rec., v. 20, p. 185-202, figs. 1-35.

COSSMANN, A. E. M., and A. PEYROT, 1923, Conchologie néogénique de l'Aquitaine: Soc. Linn. Bordeaux, Actes, v. 75, p. 73-144, pls. 12-18.

DALL, W. H., 1889, Report on the Mollusca (Blake Expedition): Part II, Gastropoda: Harvard Mus. Comp. Zool., Bull. 18, Report 29, 492 p., 31 pls.

FAIR, R. H., 1976, The *Murex* Book, an illustrated catalogue of Recent Muricidae (Muricinae, Muricopsinae, Ocenebrinae). Privately printed, Honolulu, Hawaii. 138 p., 23 pls., 67 text figs.

FISCHER-PIETTE, EDOUARD, 1942, Les Mollusques d'Adanson: Jour. de Conchyl., v. 85, p. 103-366, pls. 1-16.

FISCHER-PIETTE, EDOUARD, and MAURICE NICKLÉS, 1946, Mollusques noveaux ou peu connus des cotes de l'Afrique occidentale: Jour. de Conchyl., v. 87, p. 45-82, pl. 1, text figs. 1-26.

GIBSON-SMITH, J., 1971, Cabo Blanco and "Boeing, Boeing:" Asoc. Ven. Geol. Min. Petrol., Bol. Inf., v. 14, no. 10, p. 236-244, 2 pls.

GIBSON-SMITH, J., and W. GIBSON-SMITH, 1972, A collection of mollusks from Isla de Aves, Venezuela: VI Conf. Geol. Caribe, Mem., p. 470-478.

HUMFREY, MICHAEL, 1975, Sea shells of the West Indies. Taplinger Publ. Co., New York. 351 p., 32 pls., 20 text figs.

JUNG, PETER, 1969, Miocene and Pliocene mollusks from Trinidad: Bulls. Amer. Paleontology, v. 55, no. 247, p. 289-657, pls. 13-60, text figs. 1-4.

KAICHER, S. D., 1980, Card catalogue of world-wide shells, Pack no. 25, Muricidae (Part V), figs. 2498-2603. Publ. by the author, St. Petersburg, Fla.

KEMPERMAN, T. C. M., and H. E. COOMANS, 1984, Studies on West Indian Marine Molluscs, 1. *Risomurex mosquitensis*, a new Caribbean species, with remarks on the status of the genus *Risomurex* (Gastropoda: Muricidae): Bull. Zool. Mus. Univ. Amsterdam, v. 10, no. 1, p. 1-7, figs. 1-12.

KNUDSEN, JORGEN, 1956, Marine Prosobranchs of tropical West Africa: Atlantide-Rept. no. 4, p. 7-110, pls. 1-4.

MALTZAN, H. F., VON, 1884, Diagnosen neuer Senegambischer Gastropoden: Dtsch. Malak. Gesell., Nachr., v. 16, p. 65-73.

OLSSON, A. A., and T. L. MCGINTY, 1958, Recent marine mollusks from the Caribbean coast of Panama with the description of some new genera and species: Bulls. Amer. Paleontology, v. 39, no. 177, p. 1-58, pls. 1-5.

POINTIER, J. P., J. M. ERAVILLE, and A. DELPLANQUE, 1982, Les coquillages de Guadeloupe: Xenophora (Bull. Club Français Coll. Coquillages), no. 8, p. 9-12; no. 9, p. 9-10; no. 10, p. 12.

PONDER, W. F., 1972, Notes on some Austra-

lian genera and species of the family Muricidae (Neogastropoda): Malac. Soc. Australia, Jour., v. 2, no. 3, p. 215-248, pls. 20-23, 4 text figs.

RADWIN, G. E., and ANTHONY D'ATTILIO, 1972, The systematics of some New World muricid species (Mollusca: Gastropoda), with descriptions of two new genera and two new species: Biol. Soc. Washington, Proc., v. 85, no. 28, p. 323-352, figs. 1-26.

RADWIN, G. E., and ANTHONY D'ATTILIO, 1976, *Murex* shells of the world; an illustrated guide to the Muricidae. Stanford University Press, Stanford, California, 284 p., 32 pls. 192 text figs.

REEVE, L. A., 1846, Conchologia Iconica, v. 3 *Ricinula*, pls. 1-6.

RIOS, E. C., 1975, Brazilian Marine Mollusks Iconography. Museu Oceanográfico, Rio Grande, R.G.S., Brazil, 331 p., 91 pls.

SARASÚA, HORTENSIA, and JOSÉ ESPINOSA, 1984, Contribución al conocimiento del orden Neogastropoda (Mollusca: Prosobranchia) en Cuba: Poeyana, no. 273, p. 1-18, 6 text figs.

SMITH, MAXWELL, 1953, An illustrated catalog of the Recent species of the Rock Shells: Muricidae, Thaisidae, and Coraliophilidae. Tropical Laboratory, Windermere, Florida. 84 p., 23 pls., text figs. 1-z2.

TRYON, G. W., JR., 1880, Manual of Conchology, v. 2, Muricinae, Purpurinae. Philadelphia, 289 p., 70 pls.

TRYON, G. W., JR., 1883, Manual of Conchology, v. 5, Marginellidae, Olividae, Columbellidae. Philadelphia, 276 p., 63 pls.

VOKES, E. H., 1971, Catalogue of the genus *Murex* Linné (Mollusca: Gastropoda: Muricinae, Ocenebrinae: Bulls. Amer. Paleontology, v. 61, no. 268, p. 1-141.

VOKES, E. H., 1984, Comparison of the Muricidae of the eastern Pacific and western Atlantic, with cognate species: Shells and Sea Life, v. 16, no. 11, p. 210-215, 2 pls., 16 color figs.

VOKES, E. H., 1985, Observations on the generic placement of two recently described muricid species: Inst. Malac. Tokyo., Bull., v. 2, no. 2, p. 23-24.

VOKES, E. H., and ANTHONY D'ATTILIO, 1982, Review of the muricid genus *Attilioa*: Veliger, v. 25, no. 1, p. 67-71, 1 pl., 1 text fig.

VOKES, H. E., and E. H. VOKES, 1983, Distribution of shallow water marine Mollusca, Yucatan Peninsula, Mexico: Mesoamer. Ecol. Inst., Mon. 1 (Midd. Amer. Resh. Inst. Publ. 54), 183 p., 50 pls., 9 text figs., 3 tables, 1 map.

WARMKE, G. L., and R. T. ABBOTT, 1961, Caribbean Seashells. Narberth, Pennsylvania. x + 348 p., 44 pls., 34 text figs., 19 maps and end papers.

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A NEW SPECIES OF *MURICOPSIS (RISOMUREX)* FROM WEST AFRICA

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After the accompanying paper (Vokes and Houart, 1986) was completed, another new species of *Risomurex* was discovered on the coast of Senegal. Because of its relevance to the aforementioned work, it seems appropriate to describe it here.

MURICOPSIS (RISOMUREX) SEMINOLENSIS Vokes and Houart, n. sp.
Text figs. 1-3

Description: Shell small for the subgenus, from 9 to 11 mm, elongate and fusiform. Aperture narrow and ovate. Columellar lip erect anteriorly; smooth, except two small folds on its anterior part. Anal notch deep and wide. Outer lip undulate; inner part of outer lip bearing five or six strong denticles; third denticle (or second when only five denticles present) strongest, others much smaller. Spire high and acute, consisting of one and one-half to one and three-quarters strongly keeled nuclear whorls and five to six elongate postnuclear whorls. Suture impressed. Body whorl with seven or eight strong nodulose axial ridges. Spiral sculpture consisting of ten or eleven major cords: two or three small on the shoulder; five strong on the body with one shallow intermediate thread; three other strong cords on the siphonal canal. Intersection of axial ridges and spiral cords giving a nodulose appearance to the shell. Siphonal canal short, narrowly open, slightly backward bent. Color ochre to light brown, stained with