

A REVISION OF THE TEREBRID GASTROPODS
OF THE MARE FORMATION, CABO BLANCO, VENEZUELA

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ABSTRACT

Three taxa from the late Pliocene Mare Formation, Venezuela, are considered. *Strioterebrum trispiralis* (Weisbord, 1962) is made a synonym of *S. quadrispiralis* (Weisbord, 1962) and the form assigned by Weisbord (1962) to *Terebra (Strioterebrum) gatunensis kugleri* Rutsch, 1934, from the early Pliocene Punta Gavilan Formation, Venezuela, later reassigned by Woodring (1964) to *S. dislocatum* (Say), is described as a new species: *S. weisbordi*. Both *S. quadrispiralis* and *S. weisbordi* survive in Venezuelan waters. Finally, a new species is described from the Venezuelan Recent: *S. angelli*.

INTRODUCTION

Weisbord (1962) cited three taxa in the subgenus *Terebra (Strioterebrum)* from the late Pliocene Mare Formation, Cabo Blanco, Venezuela. One was assigned to *T. (S.) gatunensis kugleri* Rutsch, 1934, from the early Pliocene Punta Gavilan Formation, Falcón State, Venezuela. The Punta Gavilan form, however, was later made a junior synonym of *S. spiriferum* (Dall, 1895) from the Gatun Formation, Panamá, by Woodring (1970, p. 409) who, at the same time, recognized that the Mare form was distinct, reassigning it to *S. dislocatum* (Say, 1822). This last is known from the early Miocene to Recent in Florida and today ranges from Maryland to Texas, the West Indies and Brazil, but also on the west coast from California to Panamá (Abbott 1974, p. 259; Keen 1971, p. 674). However, the Mare form, which still survives in Venezuela, differs from *S. dislocatum* and is described here as a new species: *Strioterebrum weisbordi* n. sp.

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The other two taxa cited by Weisbord (1962) were: *T. (S.) trispiralis* n. sp. and *T. (S.) quadrispiralis* n. sp. However, with better material available, it is clear that they represent a single taxon and, although the former has page preference, it is referred here to *S. quadrispiralis* as being more correctly descriptive. It also occurs in the Venezuelan Recent.

Lastly, a new species from the Venezuelan Recent, formerly referred to *S. trispiralis* and *S. quadrispiralis* by Petuch (1981, p. 337) is described here as *Strioterebrum angelli* n. sp.

It might be added that the Mare fauna was reviewed briefly by Gibson-Smith and Gibson-Smith (1979, p. 24), the number of taxa still surviving in Venezuela being greatly increased. Two more can now be added.

FAMILY TEREBRIDAE

Genus STRIOTEREBRUM Sacco

Strioterebrum SACCO, 1891, I Molluschi dei terreni terziari di Piemonte e della Liguria, pt. 10, p. 33.

Type species (by original designation): *Terebra basteroti* Nyst.

STRIOTEREBRUM WEISBORDI

Gibson-Smith and Gibson-Smith, n. sp.

Plate I, Figures 1, 2

Terebra (Strioterebrum) gatunensis kugleri Rutsch, 1934. WEISBORD, 1962, *Bulls. Amer. Paleontology*, v. 42, no. 193, p. 428, pl. 40, figs. 12, 13; pl. 45, figs. 24, 25. PETUCH, 1981, *Malacologia*, v. 20, no. 2, p. 336, figs. 99, 100 (both non Rutsch).

Strioterebrum dislocatum (Say, 1822). WOODRING, 1970, U.S. Geol. Surv., Prof. Paper 306-D, p. 413 (under *S. indocayapum* Olsson) (non Say.)

Description: "The Cabo Blanco shell referred to *T. kugleri* is of medium size, slender, the spire acuminate, the apex often slightly bent, the angle of spire below the apex about 15 degrees. Fully grown, the species has nearly 18 whorls in

all, the nucleus consisting of $1\frac{1}{2}$ or 2 of them. Nucleus smooth, subhyaline, the tip fused and indistinct, the initial turn full, a little offset from the last which is bulbous and larger than the first post-nuclear whorl, and is defined from the conch by the appearance of axial riblets. First post-nuclear whorl flat-sided, sculptured by 14 to 18 curved axial ribs extending from suture to suture with four or five spiral grooves in the interspaces. Subsequent whorls are provided with a collar immediately below the suture the collar marked with subequal longitudinal riblets. Below the collar the sculpture consists of rather narrow, subequal axial cords and lower spiral ridges, the intercepts beaded, the general pattern subreticulate. Mature shells have an average of 33 axial cords on the penultimate whorl, but there may be as many as 38 and as few as 30, one specimen having only 25. Generally there are four spiral ridges below the collar, but here again the number may vary; one specimen has but three and several have five or six. The spacing of the spiral ridges is also variable. On some of the specimens the ridges are more or less equal, on others the interspace is wider below the first or second spiral ridge. On a number of specimens the posterior spiral ridges are stronger than the anterior, but this is not constant. The subsutural collar is prominent and broad, occupying a little over a third of the whorl; it is crenulated by broad axial riblets or folds about equal in number to the axial cords below but larger than those. The collar is thicker posteriorly and projects slightly beyond the preceding whorl. On later whorls, the fur-

row below the collar is fairly deep and wide, but on the earliest whorls, the space below the collar is represented by a fine groove. Surface covered with numerous axial growth striae. Sutures narrowly impressed, hardly distinguishable. Aperture sinuously lenticular. Outer lip broken back on all specimens. Columella with two strong folds of about the same size; the lower one forms the margin of the canal. Parietal wall with a thin covering of enamel, rather deeply excavated above the posterior of the columellar folds. Siphonal fasciole flattish to undulatory, built up of arched incrementals, bordered by a strongly keeled ridge which continues around to form an emargination on the side of the terminal notch. Above the keel, the base is severely contracted into a deep broad furrow. Last whorl with an average of 13 coarse nodulous spiral ribs of unequal size, and nearly obsolescent axial cords, the ribs usually present in the furrow at the base. Anterior canal short, broad, and deep, recurved backward at the extremity, the siphonal notch large and broadly U-shaped." (Weisbord, 1962)

Addendum to description: Recent specimens are banded in brown with darker flammules and a narrow white band below mid-whorl; nodes of subsutural collar alternating white and brown; aperture dark brown.

Holotype: PRI 26324, as illustrated by Weisbord (1962, pl. 40, figs. 12, 13); height 38.3 mm, diameter 9.5 mm.

Type locality: Lower Mare Formation, Cabo Blanco Venezuela; late Pliocene.

Paratypes: USNM 236013, NHMB H 17098; BM(NH) 21461-5; Universidad Central de Venezuela, UCVG 7064.

PLATE 1

Figures

- 1, 2. *Strioterebrum weisbordi* Gibson-Smith and Gibson-Smith, n.sp.
 1. Paratype, USNM 256013; height 48.3 mm, diameter 11.0 mm. Locality: Mare Formation, Cabo Blanco, Venezuela.
 2. NHMB H17098; height 38.6 mm, diameter 9.2 mm. Locality: Punta Mangle, Isla Margarita, Venezuela. Recent.
3. *Strioterebrum spiriferum* (Dall, 1895).
 3. NHMB H17100; height 49.0 mm, diameter 11.6 mm. Locality: Punta Gavilan Formation, Falcón State, Venezuela.
- 4, 5. *Strioterebrum quadrispiralis* (Weisbord).
 4. PRI 8228; height 24.8 mm, diameter 5.5 mm. Locality: Mare Formation, Cabo Blanco, Venezuela.
 5. NHMB H17101; height 16.2 mm, diameter 3.7 mm. Locality: Recent, Punta Moron, Carabobo State, Venezuela.
- 6, 7. *Strioterebrum angelli* Gibson-Smith and Gibson-Smith, n.sp.
 6. Holotype, USNM 784720; height 15.4 mm, diameter 4.1 mm.
 7. Same, whitened.

(All illustrations magnified $\times 7$)

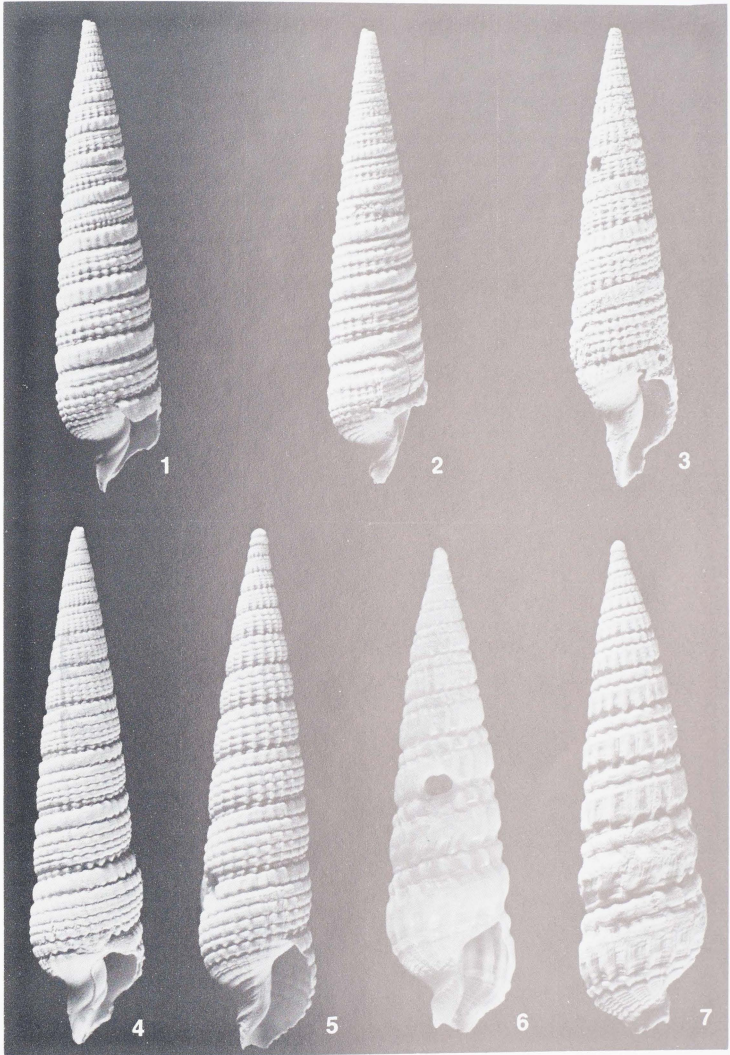


PLATE 1

Range: Also Recent along the north coast of Venezuela from the Golfo de Venezuela to Isla Margarita.

Remarks: There are 435 specimens available in the collections of the authors. A single, worn specimen was recorded by Weisbord (*loc. cit.*) from the Maiquetia Member, Playa Grande Formation, at Punta Gorda (locality W-23 = GS-7-CB). However, as stated by Gibson-Smith and Gibson-Smith (1979, p. 24) this locality also pertains to the Mare Formation. The Recent suite consists of 26 specimens found mainly in beach drift, but also at depths down to 15 meters. For comparison there are 54 topotypes of *S. spiriferum* from Punta Gavilan and 37 specimens of *S. dislocatum* from Florida.

Comparisons: *Strioterebrum weisbordi* n. sp. differs from *S. spiriferum* (Fig. 3) in being more tightly coiled in the adult, with lower whorls; the spiral groove below the subsutural cord is wider and across it the axial ribs are obsolescent. The columellar fold in *S. weisbordi* is strongly bipartite; whereas, in *S. spiriferum* it is broad and low, possibly representing two completely fused folds. The base of the whorl in *S. weisbordi* is more abruptly constricted, resulting in a shorter more sharply recurved, anterior canal. Finally, *S. weisbordi* is smaller than *S. spiriferum*, reaching a height of 65 versus 95 mm. Weisbord (*loc. cit.*) noted a similarity between *S. weisbordi* and *S. dislocatum*, but found that "the Cabo Blanco shells have a greater number of axial cords, the groove below the subsutural collar is more pronounced and the two columellar folds are not fused as they are on *T. dislocata*." It can be added that in *S. dislocatum* the subsutural collar is wider, occupying more of the whorl height, and the attendant, narrower groove is crossed by the reduced axial ribs.

STRIOTEREBRUM QUADRISPIRALIS Weisbord
Plate 1, Figures 4, 5

Terebra (*Strioterebrum*) *quadrspiralis* WEISBORD, 1962, *Bulls. Amer. Paleontology* v. 42, no. 193, p. 431, pl. 41, figs. 1-4.

Terebra (*Strioterebrum*) *trispiralis* WEISBORD, 1962, *Bulls. Amer. Paleontology*, v. 42, no. 193, p. 430, pl. 40, figs. 14, 15.

Strioterebrum bowdenensis Woodring, 1928. PETUCH, 1981, *Malacologia*, v. 20, no. 2, p. 36, fig. 98 (*non* Woodring).

NOT *Strioterebrum quadrspiralis* Weisbord. PETUCH, 1981, *Malacologia*, v. 20, no. 2, p. 337, figs. 103, 104 (= *S. angelli* n.sp.).

NOT *Strioterebrum trispiralis* Weisbord. PETUCH, 1981, *Malacologia*, v. 20, no. 2, p. 337, figs. 105, 106 (= *S. angelli* n.sp.).

Addendum to description: Shell reaching a height of 26.4 mm with a diameter of 6.6 mm. Protoconch of one and one-fourth whorls, teleoconch of 11 to 12 whorls. Number of spiral cords varying between three and eight. In Recent specimens the shell is orange-brown in colour with a lighter band at the middle of the whorl, many specimens having faded (?) to white.

Remarks: With a suite of 61 Mare specimens available it is clear that *S. trispiralis* and *S. quadrspiralis* are the same. Of 41 adult specimens, three have three spiral cords, 17 have four and 21 have five to eight spiral cords. They are referred to *S. quadrspiralis* as being more representative of this taxon, rather than to *S. trispiralis* which has page preference. A Recent suite of 118 specimens comes from ten localities along the north coast of Venezuela between Adicora, Paraguaná Peninsula, and Punta Mangle, Isla Margarita; most came from beach drift, but some are from a depth of 55 meters in a seafloor sample from a Maraven S.A. drilling location in the Ensenada de Barcelona (Well EBC-1-X; coordinates: N.10° 18' 28", W.65° 32' 00"). The Recent form is somewhat smaller than the fossil, maximum heights being 22.3 and 26.4 mm with maximum diameters of 4.8 and 6.6 mm, respectively; in both there is a variation in the degree of stoutness. Two Recent specimens from the Golfo Triste, Venezuela, were assigned by Petuch (1981, p. 336, fig. 98) to *S. bowdenensis* (Woodring, 1928) from the early Pleistocene Bowden Formation, Jamaica; they are specimens of *S. quadrspiralis*. The protoconch of *S. bowdenensis* is of two to two and one-half whorls and the diameter of a large shell quoted by Woodring (1928, p. 138) is 12.2 mm at a broken height of 28.1 mm, indicating a very much larger shell than is *S. quadrspiralis*. The homologue of *S. quadrspiralis* in Florida seems to be *S. pro-*

texta (Conrad, 1845); we have found no description of its protoconch, but the spire whorls are said to be slightly concave (Abbott, 1974, p. 260) and its purplish-black, or ash to dark purple, colour is also distinct. The ancestor of *S. quadrispiralis* is believed to be *S. meesmanni* (Rutsch, 1934) from the early Pliocene Punta Gavilan Formation, Falcón State, but that is more coarsely sculptured, with heavily beaded axial ribs, as seen in 15 topotypes.

STRIOTEREBRUM ANGELLI

Gibson-Smith and Gibson-Smith, n. sp.

Plate 1, Figures 6, 7.

Strioterebrum quadrispiralis (Weisbord, 1962).
PETUCH, 1981, *Malacologia*, v. 20, no. 2, p. 337, figs. 103, 104 (*non* Weisbord).

Strioterebrum trispiralis (Weisbord, 1962).
PETUCH, 1981, *Malacologia*, v. 20, no. 2, p. 337, figs. 105, 106 (*non* Weisbord).

?*Strioterebrum ischna* (Woodring, 1928),
PETUCH, 1981, *Malacologia*, v. 20, no. 2, p. 336, figs. 101, 102.

Description: Shell small, somewhat stubby for the genus, reaching a height of 15 mm. Protoconch of one and one-half smooth, brown whorls; ten sculptured whorls. Whorls bulging about the middle, the periphery close to anterior suture. A strongly noded subsutural cord delimited by a narrow, deep sulcus crossed by the reduced axial ribs. Axial ribs strong, sharp, opisthocyrt, numbering 13 to 15 with wider interspaces. Two to five flat spiral cords, with more on the base, often weak to obsolescent over the middle of the whorl and failing to node the axial ribs. Shell surface covered in microscopic, crowded spiral striae. No columellar fold. Colour a dark purplish brown with a lighter ashy band about the whorl middle; the nodes of the subsutural collar and the crests of the axial ribs also sometimes ashy. Columella brown and inside of aperture a translucent brown.

Holotype: USNM 784720; height 15.4 mm, diameter 4.2 mm.

Type locality: Recent, Punta Mangle, Isla Margarita, Venezuela.

Paratypes: AMNH 202289; BM(NH); NHMB H 17099; Universidad Central de Venezuela, UCVG 7065.

Remarks: There are some 900 paratypes of *Strioterebrum angelli* n.sp. from a number of north coast localities. Of these, 700 came from suction-dredge spoil at Punta Mangle, Isla Margarita; they occur also on a mud flat with *Thalassia* at adja-

cent Punta de Piedras. None were recovered in the carbonate province of the offshore islands; they prefer, seemingly, a muddier environment. The name records our appreciation of much help, including donation of material, given by marine biologist Charles Angell, at one time in charge of oyster and shrimp culture at the Estación de Investigaciones Marinas, Punta de Piedras, Isla Margarita.

Comparisons: Although assigned by Petuch (1981, p. 337), using our material, to *S. trispiralis* Weisbord and *S. quadrispiralis* Weisbord (redefined earlier as one species under *S. quadrispiralis*), *S. angelli* is not closely related and is little over half the size. Nor do there seem to be any other closely related Recent taxa. Its ancestor may be *Strioterebrum brechincastrensis* (Rutsch, 1942) from the early Pliocene Springvale Formation, Trinidad; it has similar bulging whorls and strong, opisthocyrt axial ribs, but it is twice the size of *S. angelli*, reaching a height of almost 30 mm. An undescribed form related to *S. brechincastrensis* is present in the early Pliocene Punta Gavilan Formation. The status of the form assigned by Petuch (1981, pp. 336, 337) to *Strioterebrum ischna* (Woodring, 1928) from the early Pleistocene Bowden Formation, Jamaica, is problematical; it occurs together with *S. angelli* at Adicora, Paraguán Peninsula; with its bulging whorls and strong opisthocyrt axial ribs, it has much the appearance of that species. *S. ischna* on the other hand is smaller and slimmer, its whorls less convex and it virtually lacks a subsutural cord, giving to some specimens a *Hastula*-like appearance (Woodring, 1928, p. 136). This form from Adicora may be no more than juvenile *S. angelli*.

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REVIEW

DISTRIBUTION OF SHALLOW-WATER MARINE MOLLUSCA, YUCATAN PENINSULA, MEXICO, by Harold E. Vokes, and Emily H. Vokes. Published by Middle American Research Institute and Mesoamerican Ecology Institute of Tulane University, New Orleans, 1983, viii + 183 pp., illus., atlas of 50 pls., paper \$21.50 (including postage and handling)

This monograph presents the data compiled during the past twenty-five years by the late E. Wylls Andrews IV and by Harold and Emily Vokes, who joined him in this project in 1964. When Dr. Andrews became ill and it became apparent that he would not survive, the doctors Vokes promised him that they would see their combined efforts through to completion. This handsomely illustrated volume recording 769 identified species from 99 localities and their distribution within seven ecological provinces along the coasts of Yucatan amply fulfills their promise. The book is dedicated to Bill Andrews.

Yucatan, a quadrangular limestone platform, occupies an unique position geographically and ecologically. Its eastern margin fronts on the Caribbean Sea and drops steeply into deep waters; its northern and western margins are on the Gulf of Mexico and have broader and shallower shelf areas known as the Yucatan Bank.

Further, the eastern margin is bordered by a nearly continuous series of coral barrier reefs, but coral growth is confined to the outer reaches of the Yucatan Bank and consists of relatively small patch reefs. The waters off the east coast are deep blue and mud-free, those off the northern and western coasts are milky green reflecting the rather high content of suspended "lime-mud" sediments. These physical differences contribute to the striking differences in the faunas and ecological environments of the eastern coast compared with the northern and western coasts. These, and other geological, geographical, and ecological features are described and explained in the text. This monograph is an extremely important contribution to the knowledge of Recent molluscan distributions and ecology and is highly recommended to all readers interested in this field of study.

The volume is number 54 of the prestigious *Publications* series of the Middle American Research Institute. It also comprises Monograph 1 of Mesoamerican Ecology Institute, a new series. Both institutes were among those institutions who supported the research recorded therein. Publication 54 may be ordered from the Middle American Research Institute, Tulane University, New Orleans, Louisiana 70118 USA.

--H.C.S.