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EPITONIIDAE

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## THE GENUS EPITONIUM IN THE WESTERN ATLANTIC

### Part I

BY

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This present number deals with three subgenera in the genus *Epitonium*. In these particular subgenera the axial costae completely dominate the sculpture of the shell. The spiral sculpture, other than the basal ridge which is present in a few species, is almost entirely absent. On purely taxonomic grounds, the present grouping of these species under these subgenera is artificial and they are to be considered as a convenience rather than an expression of understood or believed relationships. They are used tentatively, not only because of their lack of true value in a taxonomic sense but also on nomenclatorial grounds. As stated in our previous number, E. de Boury created a very large number of subgenera<sup>1</sup> which were never diagnosed but defined only by citing a type species.



Plate 108. *Epitonium scalare* Linné  
China (natural size). This species is the genotype  
of the genus *Epitonium*.

<sup>1</sup> E. de Boury 1909, Journal de Conchyliologie 57, pp. 255-258.

When more of these type species are better known and evaluated, many more names may be added to the synonymy.

There appears to be considerable parallel development in the shell characters that are used to separate species or indicate their close relationship. That is, the presence of a basal ridge may indicate a close relationship between two or more species, yet its absence may separate species which in all other characters approximate one another. An open umbilicus as opposed to one more or less closed by the parietal expansion of the inner lip may separate two species subgenerically. On purely mechanical grounds, a more widely coiled species will evolve the character of an open umbilicus, a more narrowly coiled species will not show it, the difference thus being far more apparent than real. Nevertheless these differences have their value in grouping the species in this genus, even if this grouping is considered to be somewhat artificial.

The axial costae are blade-like or cord-like and may be angled, pointed or hooked at the whorl shoulder. In the case of *E. echinaticostum*, from three to five such angles are produced on each costa giving it a fluted appearance. The costae of each whorl may be produced just below those of the whorl above so that in alignment they form a nearly straight and continuous ridge from the nuclear whorls to the base of the shell. Individual specimens, however, may produce these costae independent of those of the whorl above, though this character appears to be more constant in certain species than in others. In many species the whorls proper are produced as a free coil and are attached only by the opposing costae on the preceding whorl for structural strength. In a few species, the costae may be reflected backward as in *E. venosum* Sowerby or they may exhibit this character only in the early post-nuclear whorls. In general, however, the costae are usually developed at right angles to the axis of the shell.

The basal ridge may be well developed as is usually the case with most specimens of *E. lamellosum* Lamarek or poorly developed as in many specimens of *E. rupicolum* Kurtz. Between the costae the shell is generally highly polished and smooth, but occasional specimens may show a very faint trace of spiral sculpture when viewed under a magnification of 14x or more.

A peculiar character exhibited by many specimens is the changing of the direction of the axis of the shell after the production of the nuclear whorls. It is most frequently observed in specimens of *E. echinaticostum* d'Orbigny and *E. krebsii* Mörch or other species that produce a wide coil and are openly umbilicate. This is probably brought about by the change from a tightly coiled young stage to the wide and freely coiled shell of the adult.

The nuclear whorls are usually smooth, glass-like and devoid of sculpture. The post-nuclear whorls show sculpture as fine blade-like costae, usually a little more numerous on these early whorls than on the later whorls.

The operculum is generally thin, corneous, paucispiral and light brownish-yellow in color.

So far as known the eggs are laid on a string of chitinized material and covered by agglutinized sand grains. The egg mass appears as a minute string of beads. (Plate 120, fig. 1)

Pigmentation in the shell proper is rather rare in this family. In *E. rupicolum* Kurtz there is a diffused brownish pigment with darker areas indicating spiral bands of color. In a few other species the pigment may be limited to a single spiral band as in *E. uni-*

*fasciatum* Sowerby and rarely to spots as in the European *E. mirificum* Linné. A brilliant red species, *E. mirificum* Locard, has been figured by Filhol (La Vie au Fond des Mers, Paris 1885, plate 5). This species was obtained by both the *Travailleur* and the *Talisman* off the coast of Morocco as deep as 2075 meters (1134 fathoms). Vivid coloration of this sort is all the more remarkable as in general, mollusks living in waters of this depth are usually devoid of brilliant coloration. A complete description and excellent figures of this species are given by Locard 1897 (Expéditions Scientifiques du Travailleur et du Talisman, Mollusques 1, p. 399, pl. 18, figs. 27-30).

Wentle-trap shells have always been admired for their beauty of sculpture. A perfect specimen of *Epitonium lamellosum* is an exceedingly beautiful shell. Simple in design and perfect in its execution, it represents a form of beauty seldom exceeded by the far more elaborate sculpture in other genera and species.

### Genus *Epitonium* Röding

*Scala* Bruguière 1792, Encyclopédie Méthodique 1, pt. 2, p. 532. [This is only a copy of J. T. Klein's work, a pre-Linnean author.]

*Epitonium* Röding 1798, Museum Boltenianum p. 91.

*Cyclostoma* Lamarek 1799, Mem. Soc. d'Hist. Nat. Paris, p. 74 (genotype, *Turbo scalaris* Linné, monotypic); non *Cyclostoma* Lamarek 1801.

*Scalaria* Lamarek 1801, Système des Animaux Sans Vertèbres, Paris, p. 88 (*Scalaria conica* Lamarek = *Turbo scalaris* Linné).

*Scalatarius* Duméril 1806, Zoologie Analytique, Paris, France, p. 164.

*Aciona* Leach 1815, Zoological Miscellany 2, p. 79, plate 87 (genotype, *Aciona scalaris* Linné, monotypic.)

Genotype, *Turbo scalaris* Linné, subsequent designation, Suter 1913.

The species composing the genus *Epitonium* are characterized by having the whorls either attached, or freely coiled with attachment by the costae only. Generally they possess rather strong axial costae or cords and between the costae they may be smooth or have spiral cords either strongly or weakly developed. The species may vary from widely umbilicate to imperforate. Most species are white; a limited few are colored with bands, spots or diffused pigmentation. Most species are attenuate, but a few are rather short and broad. The aperture is generally holostomatous; a few species have the lip appressed to the parietal wall. A basal ridge is developed in a few species.

*Epitonium* differs from *Sthenorytis* by being proportionately more attenuate and less massive in structure and in having the face of the aperture nearly parallel to the axis.

The synonymy involving this genus is exceedingly long and complicated. We give above the more important synonyms. For a more detailed account of the many names ascribed to this genus reference should be made to Dall.<sup>1</sup>

The name *Scala* was first used by J. T. Klein, a pre-Linnean author, in 1753. In 1792 Bruguière copied the system of Klein in his Encyclopédie Méthodique 1, p. 532. However he made no additions or gave no indication as to what these various genera were (no species were given) so according to opinion 5 of the International Rules, Bruguière's use of the name *Scala* remains invalid. As a validly introduced name, though still a synonym, it can date from Herrmannsen 1848 (Indicis Generum Malacozoorum 2, p. 418) or from Mörch 1852 (Catalogus Conchyliorum Comes de Yoldi, p. 48) as these authors, by indication, associated this name with *Scalaria* Lamarek and *Epitonium* Röding.

<sup>1</sup> Dall, W. H. 1889, Bulletin Museum of Comparative Zoölogy 18, pp. 299-307.

The first available name is that proposed by Röding in the Museum Boltenianum where he established *Epitonium* for this group in 1798. This was a composite group containing many generic elements that are not even remotely related to *Epitonium* in its restricted use. However, the fixation of a genotype by Suter<sup>1</sup> limits the use of the name to the wentle-trap shells.

We include a description of *Epitonium scalare* Linné as it is the genotype of the genus *Epitonium*. In fact, it is the cornerstone of the entire family and the departure point for similarities and differences that exist between the many genera and species that compose this remarkable family of mollusks.

### **Epitonium (Epitonium) scalare Linné**

#### Plate 108

*Turbo scalaris* Linné 1758, Systema Naturae, edition 10, p. 764.

*Epitonium breve* Röding 1798, Museum Boltenianum, p. 91.

*Epitonium lineatum* Röding 1798, Museum Boltenianum, p. 91; non *S. lineata* Say 1822.

*Epitonium medium* Röding 1798, Museum Boltenianum, p. 91.

*Epitonium principale* Röding 1798, Museum Boltenianum, p. 91.

*Scalaria pretiosa* Lamarck 1816, Encyclopédie Méthodique Vers 3, pl. 451, figs. 1a-b.

Under all of the above species by Röding reference is made to *Turbo scalaris* Linné.

*Description.* Shell reaching about 70 mm. ( $2\frac{3}{4}$  inches) in length, openly umbilicate, axially costate and rather solid. Color white to pale ivory. Whorls 8 to 9, strongly convex and unattached other than by the costae. Spire extended. Aperture subcircular and holostomatous. Lip reflected, the lip being the last costa produced. Columella not defined. Umbilicus widely open, the early whorls being visible from within. Suture profound. Sculpture consisting of numerous axial costae which may be blade-like, occasionally thickened and usually somewhat recurved, at least on the last 2 whorls. There are 12 to 14 costae on the body whorl. Microscopic sculpture faint, consisting of very fine spiral threads. Nuclear whorls smooth, glass-like and opaque. Operculum not seen.

length	width	whorls	
67	42.5 mm.	7*	China
65.5	42	7*	Hongkong, China
58	32.3	7*	

\* Broken, possibly a loss of two early whorls.

*Types.* Among the references of Linné is that of Gaultieri 1742, plate 10, fig. 22 which we here select to be the type figure. According to Hanley (1855, Ipsa Linnaei Conchylia, p. 339) Linné did not possess a specimen of this species at the time his description was written, but depended upon the figures of other authors.

*Remarks.* This is one of the largest species in the family Epitoniidae and certainly one of the best known. In the latter part of the eighteenth century perfect specimens were sold for as high as £40, a value which would be equal to \$500.00 today. It is still a very rare species and large examples are not easy to obtain.

*Range.* In distribution, it extends from southern Japan, China, the Philippine Islands, and south and east to Queensland, Australia. Specific localities such as Manila, Hong-

<sup>1</sup> Suter, H. 1913, Manual of the New Zealand Mollusca, Wellington, p. 319.

kong and Singapore really mean but little as these localities were markets and specimens sold at these places may have come from areas hundreds of miles away.

### Subgenus *Cycloscala* Dall

*Cycloscala* Dall 1889, Bull. Museum Comparative Zoölogy **18**, p. 316 (no type designation); de Boury 1909, Journal de Conchyliologie **57**, p. 258.

Subgenotype, *Scala dunkeriana* Dall (= *E. echinaticostum* d'Orbigny), subsequent designation, de Boury 1909.

Shell with the body of the whorls free or unattached though connected to one another by the costae. Openly umbilicate, at least in mature examples, with the costae completely encircling the whorls. Costae scalloped or fluted, at least along the palatal side.

The single character, that of the fluted costae, alone differentiates this subgenus from all others in the genus *Epitonium*, and it is the only character other than size which separates it from *Epitonium* s. s.

### *Epitonium* (*Cycloscala*) *echinaticostum* d'Orbigny

Plate 109, figs. 1-3

*Scalaria echinaticosta* d'Orbigny 1842 [in] Ramon de la Sagra, Histoire de l'Isle de Cuba, Mollusques **2**, p. 18, pl. 11, figs. 4-6 (St. Thomas [Virgin Islands]).

*Scala soluta* 'Dunker' Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn,<sup>1</sup> no. 17, p. 255 (St. Thomas and Smith Bay [Virgin Islands]); Mörch 1875, Malakozologische Blätter **22**, p. 145; Mörch 1876, Jour. Acad. Nat. Sciences Philadelphia (2) **8**, p. 195, pl. 29, fig. 5.

*Scala volubilis* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn, no. 17, p. 256; Mörch 1875, Malakozologische Blätter **22**, p. 146; Mörch 1876, Jour. Acad. Nat. Sciences Philadelphia (2) **8**, p. 195 (St. Thomas [Virgin Islands]).

*Scala blandii* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn, no. 17, p. 256 (St. Thomas [Virgin Islands]); Mörch 1875, Malakozologische Blätter **22**, p. 145; Mörch 1876, Jour. Acad. Nat. Sciences Philadelphia (2) **8**, p. 195, pl. 29, fig. 8.

*Scala* (*Cycloscala*) *dunkeriana* Dall 1889, Bull. Museum Comparative Zoölogy **18**, p. 315, new name for *Scala soluta* Mörch; non A. Adams 1862; Tiberi 1863.

*Scalaria inconstans* de Boury 1913, Jour. de Conchyliologie **61**, p. 87, new name for *S. dunkeriana* Dall 1889; non *S. dunkeri* Nyst 1882. [This name was not necessary at all as *dunkeri* and *dunkeriaua* are not homonyms.]

*Description.* Adult shell reaching about 9 mm. (about  $\frac{3}{8}$  inch) in length, attenuated, widely umbilicate, with the whorls free and possessing numerous blade-like axial costae. Color white. Whorls 8, very strongly convex and solute. First three whorls generally narrowly coiled and attached, later whorls free and much more widely coiled; in addition, the axis of these early whorls may be set at a different angle from those that develop later. Spire extended, acute, and produced at an angle of about 30°. Aperture circular and holostomatous. Lip expanded to form a ring around the aperture, each succeeding lip becoming one of the costae. Suture and columella not defined. Sculpture consisting of axial costae which completely encircle the shell. The outer or palatal portion with from 3 to 5 small angulated lobes. Inner or parietal area smooth. Costae from 7 to 13 on the body whorl. These costae are generally very thin, lobed and may be slightly recurved

<sup>1</sup>The present accepted spelling of this city is Köbenhavn. We adhere to the older spelling only in the references as originally cited.

backwards. Nuclear whorls two and one-half, opaque, glass-like and smooth. Operculum thin, corneous, sub-multispiral with an eccentric nucleus, light straw-yellow in color.

length	width	whorls	
9.5	4.9 mm.	8	Bermuda
7.1	4.5	6	Garden Key, Tortugas, Florida
6.7	3.3	8	Lake Worth, Florida
6.4	3.8	7	“ “ “

*Types.* The type specimen of *E. echinaticostum* d'Orbigny is probably in the British Museum. The holotype of *E. solutum* Dunker is in the Universitetets Zoologiske Museum, København, Denmark. Both of these specimens are from St. Thomas, Virgin Islands, the type locality. We do not know the present location of the type specimens of *volubile* Mörch and *blandii* Mörch. Both were described as coming from St. Thomas.

*Remarks.* This species is exceedingly variable in most of its characters. The several synonyms given above are based almost entirely on the many variants or upon immature stages in its growth. The earliest name available is that of d'Orbigny, *echinaticostum*, which was based upon a very young specimen. In his description d'Orbigny states that it was "imperforate." This is true only in part, as the first 2 or 3 whorls are usually narrowly spiral and the apertural costa, the last produced in his example, had covered the narrow umbilicus. He was dealing only with juvenile specimens. Beyond these, the whorls become free or unattached and proceed in this manner until the animal becomes adult. The coil expands and as a consequence, produces a widely open umbilicus in the adult stage. At the start of the free or solute stage of development the axis alignment

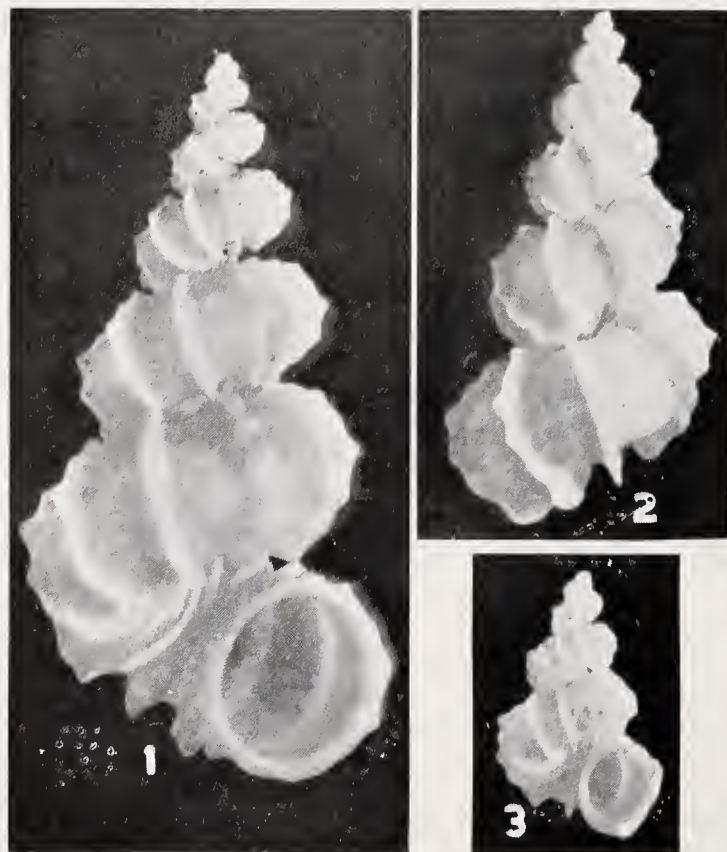


Plate 109. *Epitonium echinaticostum* d'Orbigny

Fig. 1. Boot Key Harbor, Key Vaca, Florida. Fig. 2. Caesars Creek, Biscayne Bay, Florida. Fig. 3. Holotype specimen of *Scalaria soluta* Dunker (= *Epitonium echinaticostum* d'Orbigny), St. Thomas, Virgin Islands (all about 7x).

may change, sometimes as much as  $45^\circ$  between the nuclear whorls and the post nuclear whorls. The degree of separation between the whorls is very variable, even in examples found in a single locality. Thus, two examples with the same number of whorls may differ as much as a millimeter in their total length, the only difference being the extent to which the whorls are separated. The costae also vary in number, possibly dependent upon the rate of growth. Specimens from deeper water usually possess fewer costae and are somewhat thinner in structure than those occurring in the low tidal areas or just below the low water line. The small wavy or fluted costae make possible a ready determination of this species, even in very young examples. It has been dredged as deep as 200 fathoms off Anguilla in the Lesser Antilles.

*Range.* Bermuda; Florida from Lake Worth south along the Lower Keys and north to Gulfport on the west coast; the West Indies and south to Barbados in the Lesser Antilles.

*Records.* FLORIDA: Lake Worth (T. McGinty); off Hollywood in 45 fathoms (L. A. Burry); *Eolis*, station 117 off Miami in 35–38 fathoms; Caesars Creek Bank in 2 fathoms (both USNM); Featherbed Bank off Ragged Key (H. Moore); Key Vaea; Duck Key; Bahía Honda Key; Bone Fish Key; Soldiers Key; Virginia Key (all J. Weber); Conch Key (T. McGinty); Tea Table Key (J. Schwengel); Boca Chica Key (E. Bates); No Name Key; *Eolis*, station 66 off Key West in 3–4 fathoms; Garden Key, Tortugas (all USNM); Fort Myers Beach (J. Weber); Boca Grande (USNM). GULFPORT (MCZ). BERMUDA: (Bermuda Government Museum); Fairyland (ANSP). BAHAMA ISLANDS: *Eolis*, station 50 off North Bimini Island in 20 fathoms; South Bight, Andros Island (both USNM); New Providence (J. Weber); Savannah Sound, Eleuthera Island (MCZ); Grand Caicos Island; East Caicos Island (both USNM). CUBA: *Tomas Barrera*, off Punta Colorado in 2–3 fathoms and off Cardenas in 1–3 fathoms (both USNM); Habana (M. Jaume); Guarda la Vaca, Banes (MCZ). HISPANIOLA: Saltrou, Dept. de l'Ouest, Haiti; Bahía de Samaná, Santo Domingo (both USNM). JAMAICA: Robins Bay, St. Mary (USNM). VIRGIN ISLANDS: St. Thomas (ANSP and Univ. Zool. Mus. København). LESSER ANTILLES: off Anguilla in 200 fathoms (B. Hubendiek); Barbados (USNM).

### Subgenus *Epitonium* Röding

*Epitonium* Röding 1798, Museum Boltenianum, p. 91.

*Turbona* 'Brown' Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 259; non *Turbona* Leach 1847.

*Nitidiscala* de Boury 1909, Jour. de Conchyliologie 57, p. 257 (subgenotype, *Scala uifasciata* Sowerby).

*Eburniscala* de Boury 1909, Jour. de Conchyliologie 57, p. 257 (subgenotype, *Scala venosa* Sowerby).

*Aculiscala* de Boury 1909, Journal de Conchyliologie 57, p. 257 (subgenotype, *S. philippinarum* Sowerby).

*Anguliscala* de Boury 1909, Jour. de Conchyliologie 57, p. 258 (subgenotype, *Scala angulata* Say).

*Viciniscala* de Boury 1909, Jour. de Conchyliologie 57, p. 258 (subgenotype, *Scala pallasii* Kiener).

*Lamelliscala* de Boury 1909, Journal de Conchyliologie 57, p. 258 (subgenotype, *S. fasciata* Sowerby).

*Solvaclathrus* Iredale 1936, Records of the Australian Museum 14, p. 299 (genotype, *Solvaclathrus jacobiscala* Iredale).

Subgenotype, *Turbo scalaris* Linné, subsequent designation, Suter 1913.

Species included in this subgenus possess blade-like or cord-like, axial costae with the interspaces smooth or with only a trace of spiral sculpture when seen under a 14x mag-

nification. The whorls may be appressed or unattached and the shell may be umbilicate or imperforate. There is no basal ridge. The aperture is usually holostomatous with the last costa forming the lip. The costae may possess angles or hooks at the whorl shoulder.

### Epitonium (Epitonium) krebsii Mörch

Plates 110: 111

*Scala krebsii* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 252 (St. Thomas in 60 ft.; St. Martin); Mörch 1875, Malakozologische Blätter **22**, p. 142; Mörch 1876, Journal Academy Natural Sciences Philadelphia (2) **8**, p. 192, pl. 29, figs. 1, 2.

*Scala swiftii* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 253 (St. Thomas [Virgin Islands]); Mörch 1875, Malakozologische Blätter **22**, p. 123; Mörch 1876, Journal Academy Natural Sciences Philadelphia (2) **8**, p. 193, pl. 29, fig. 3.

*Scalaria bulbulus* 'Sowerby' Mörch 1876, Journal Academy Natural Sciences Philadelphia (2) **8**, p. 193 [a nude name included as a synonym of *S. swiftii* Mörch].

*Scala contorquata* Dall 1889, Bull. Museum Comparative Zoölogy **18**, p. 318, pl. 18, fig. 9 (Blake, station 248, off Grenada [Lesser Antilles] in 161 fathoms).

*Scala electa* Verrill and Bush 1900, Transactions Connecticut Academy of Science **10**, p. 536, pl. 64, fig. 11 (Bermuda Islands).

*Description.* Adult shell rather small, reaching about 18 mm. (about  $\frac{3}{4}$  inch) in length, globose turbinate, thin but strong, narrowly to rather widely umbilicate and possessing numerous blade-like costae. Color generally a china-white; occasionally specimens occur in which there is a trace of brown to pinkish-brown more or less diffused on the body whorl. Whorls 7 to 8, strongly convex and attached by the costae only. Spire moderately extended and forming an angle of about  $45^\circ$ . Aperture subcircular and holostomatous. Lip reflected and slightly turned backward. Parietal area of the lip attached to the costae on the whorl above. Columella not definable. Umbilicus rather narrow to wide, exceedingly deep and but slightly covered by the reflection of the lip. Suture profound. Sculpture consisting of numerous blade-like costae which are slightly recurved

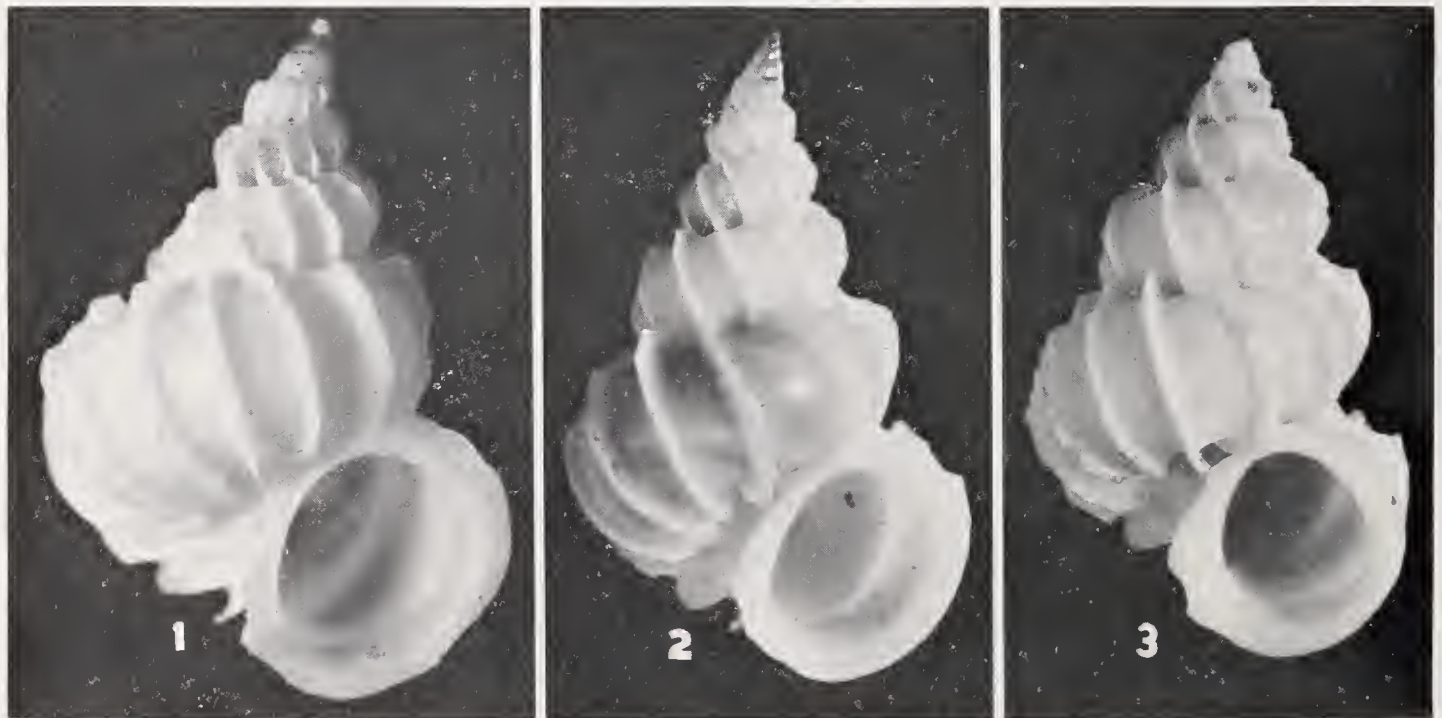


Plate 110. *Epitonium krebsii* Mörch

Fig. 1. Holotype specimen of *Scala contorquata* Dall (= *krebsii* Mörch) from off Grenada (11x).  
Fig. 2. From off Key West, Florida (10x). Fig. 3. From off Destin, Florida ( $3\frac{1}{2}x$ ).

backward and with a rather strong angulation at the shoulder of the whorl. There are 10 to 12 costae on the body whorl. The costae of one whorl are attached to the costae of the whorl above. There is no microscopic sculpture present. Nuclear whorls two, glass-like and smooth. Operculum dark mahogany-brown, paucispiral and corneous.

length	width	whorls	
18	11.5 mm.	7	off Destin, Florida
17	9	8	off Key Largo, Florida
16	9.5	7	off Tortugas, Florida

*Types.* The holotype of *Scala swiftii* Mörch is in the Academy of Natural Sciences Philadelphia no. 19715, from St. Thomas, Virgin Islands. We do not know the present location of the types of *Scala krebsii* Mörch from St. Thomas and St. Martin or those of *Scala electa* Verrill and Bush from Bermuda. We here limit the type locality to St. Thomas, Virgin Islands. The holotype of *Scala contorquata* Dall is in the United States National Museum no. 106913 from off Grenada, Lesser Antilles, *Blake*, station 248, in 161 fathoms.

*Remarks.* *Epitonium swiftii* Mörch is but a somewhat worn and narrowly umbilicate specimen of *E. krebsii* Mörch. Mörch based this name upon a unique example contained originally in the collection of Robert Swift which is now in the Academy of Natural Sciences, Philadelphia. *Epitonium contorquata* Dall is only a young specimen of *krebsii* Mörch. This species is easily recognized by its rather stout form and its open and deep umbilicus. The whorls are well separated though attached by the costae. The surface of

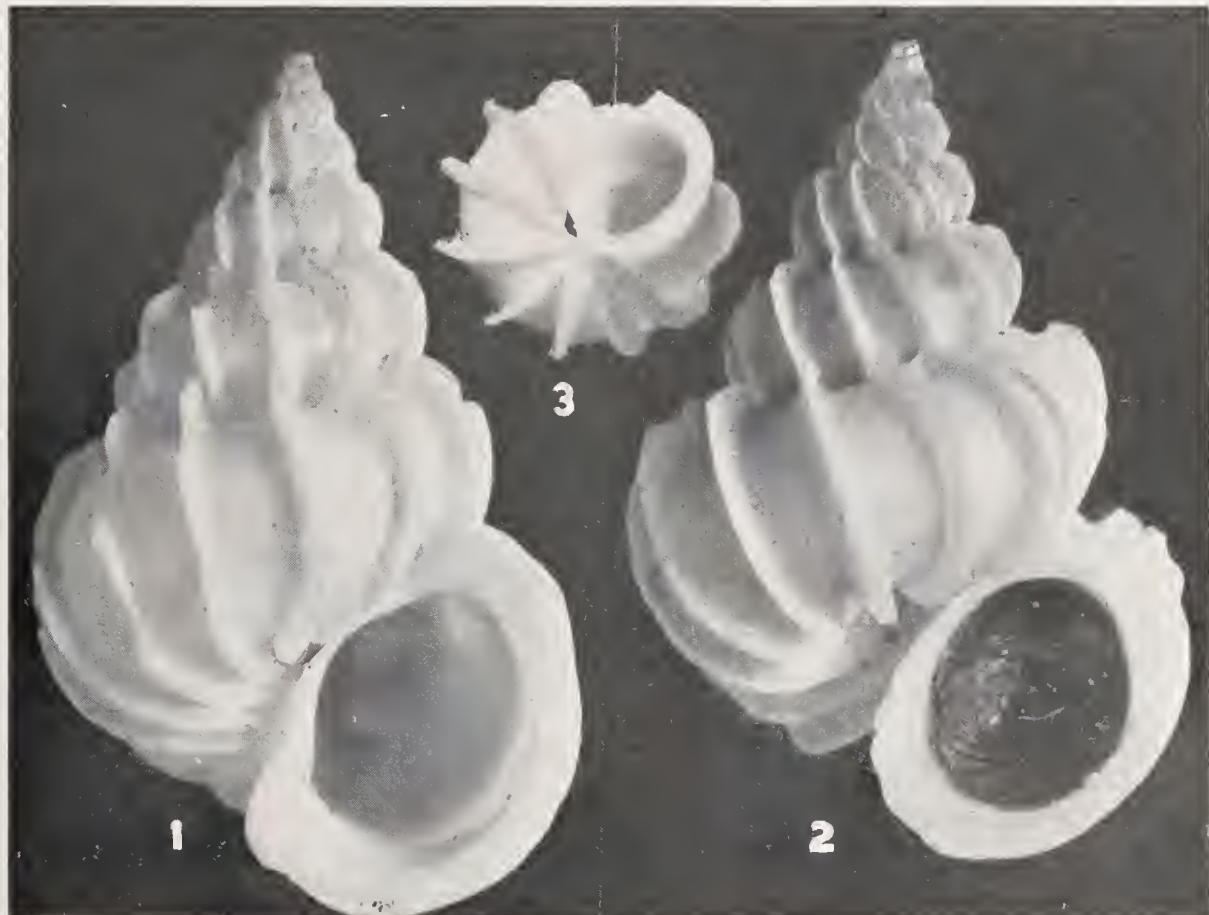


Plate 111. *Epitonium krebsii* Mörch

Fig. 1. Holotype specimens of *Scala swiftii* (= *krebsii* Mörch), St. Thomas, Virgin Islands (7x). Fig. 2. From off Sand Key, Florida (8x). Fig. 3. Basal view of specimen from Marathorn, Florida ( $3\frac{1}{2}$ x).

the shell between the costae is highly polished. The angulations on the costae are small, though well developed, but these may be broken off on worn specimens.

Geographically the species though rare appears to be rather widely distributed, appearing as it does in the northern Gulf of Mexico and south to at least as far as the Barbados. The numerous records which we have given from the Lower Florida Keys are due mainly to the extensive dredging in this region by Leo A. Burry and J. B. Henderson. *Epitonium krebsii* lives from a little below the low water line to depths of 160 fathoms in rather fine coral sand.

*Range.* South Florida, the Gulf of Mexico, Bermuda and south through the West Indies to the Lesser Antilles.

*Records.* FLORIDA: off Palm Beach in 50–70 fathoms; off Lake Worth in 70–80 fathoms; Boynton Beach (all T. McGinty); off Hillsboro Light in 100 fathoms; off Pompano Beach in 60–70 fathoms; off Fort Lauderdale in 60 fathoms; off Hollywood in 45 fathoms (all L. A. Burry); *Eolis*, station 131, off Fowey Light in 25–60 fathoms; *Eolis*, station 77, off Miami in 8 fathoms; *Eolis*, station 69, off Miami in 38 fathoms (all USNM); off Molasses Reef, Key Largo in 75 fathoms; off The Elbow, Key Largo in 66–75 fathoms; off American Shoals in 40–100 fathoms; off Sombrero Light in 90–150 fathoms; off Looe Key in 100 fathoms (all L. A. Burry); *Eolis*, station 160, off Sand Key in 62 fathoms; *Eolis*, station 30, off Key West in 7 fathoms; *Eolis*, station 43, off Key West in 63 fathoms; off Tortugas in 16–35 fathoms; off Cape San Blas in 20 fathoms (all USNM); off Destin in 14 fathoms (T. McGinty). BERMUDA: (USNM). BAHAMA ISLANDS: *Eolis*, station 50, North Bimini Island, Bimini Islands in 20 fathoms; Rum Cay (both USNM). CUBA: off Habana (C. G. Aguayo). VIRGIN ISLANDS: St. Thomas (ANSP). JAMAICA: (MCZ). LESSER ANTILLES: Anguilla (B. Hubendick); off Falmouth, Antigua; *Blake*, station 248, off Grenada in 161 fathoms; off Pelican Island, Barbados in 100 fathoms (all USNM).

### **Epitonium (Epitonium) occidentale Nyst**

#### Plate 112

*Scalaria tenuis* Sowerby 1844, Thesaurus Conchyliorum **1**, pt. 4, p. 87, pl. 32, figs. 6–7 (West Indies); non *S. tenuis* Gray.

*Scalaria occidentalis* Nyst 1871, Annales Société Malacologique de Belgique **6**, p. 124; new name for *S. tenuis* Sowerby, non *S. tenuis* Gray.

*Scala micromphala* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 258 (Vieques Island [Puerto Rico]), Riise collector; Mörch 1875, Malakozologische Blätter **22**, p. 147; Mörch 1876, Journal Academy Natural Sciences Philadelphia (2) **8**, p. 197.

*Scola occidentalis* var. *aurita* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 257; Mörch 1875, Malakozologische Blätter **22**, p. 146; Mörch 1876, Journal Academy Natural Sciences Philadelphia (2) **8**, p. 196 (St. Thomas, Virgin Islands, A. H. Riise collector); non *S. aurita* Sowerby 1844.

*Description.* Adult shell reaching about 25 mm. (1 inch) in length, rather light in structure, imperforate or very nearly so and possessing numerous rather low, blade-like costae. Color white with the surface somewhat shining. Whorls up to 10, strongly convex, slightly separated and attached by the costae. Spire extended and forming an angle of 35°. Aperture subcircular and holostomatous. Outer lip reflected and thin. Parietal area appressed and attached to the costae. Columella not definable. Suture profound

owing to the unattached whorls. Sculpture consisting of numerous thin and occasionally slightly reflected costae which are generally acutely angled on the whorl shoulder. Sometimes, especially on young specimens, the shoulder angles of the costae are pointed enough to be called spines. Here the shoulder of the whorl is flattened so that each whorl above is decidedly inset. On the early whorls the costae are far more numerous, becoming less so as the shell advances toward maturity. There are 12 to 15 costae on the body whorl. There is no indication of spiral sculpture. Nuclear whorls smooth, glass-like and white. Operculum paucispiral, thin and corneous.

length	width	whorls	
24.3	10.2 mm.	10	Tortugas, Florida
15	6.4	10	St. Thomas, Virgin Islands
13	5.8	10	Bear Cut, Biscayne Bay, Florida

*Types.* The type of this species is probably in the British Museum under the name of *Scalaria tenuis* Sowerby. The holotype of *S. micromphala* Mörch is in the Universitetets Zoologiske Museum, København, Denmark. It is a young specimen from Vieques Island, Puerto Rico and was collected by Riise. We here limit the type locality to St. Thomas, Virgin Islands from which we have seen many fine examples of this species.

*Remarks.* Perhaps the most distinctive features of this species are the flattened whorl shoulder and the usually fine pointed shoulder angles on the costae. From *E. krebsii* with which this species may be confused it differs in being proportionately narrower and in being imperforate, or nearly so, and in having the whorls less solute. From *E. foliaceicostum* it differs by being proportionately wider, having far more globose whorls and much lower and more numerous costae.

This species is generally found below low water line though occasional specimens are

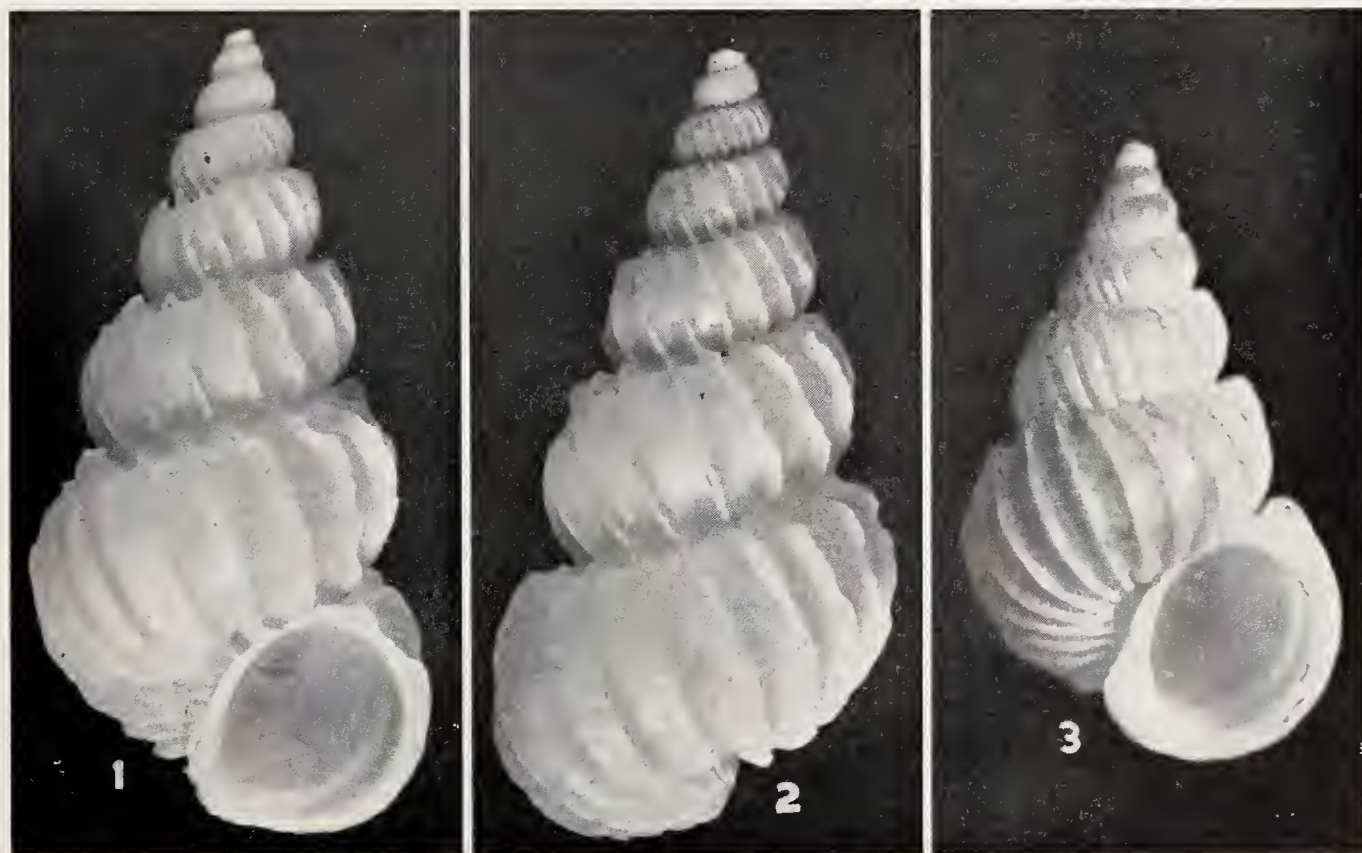


Plate 112. *Epitonium occidentale* Nyst

Figs. 1-2. St. Thomas, Virgin Islands (about 7x). Fig. 3. Holotype of *Scala micromphala* Mörch (= *E. occidentale* Nyst) Vieques Island (10x).

washed up on the shore after storms. Mr. L. A. Burry has dredged it off Sombrero Light in the Lower Florida Keys in about 150 fathoms.

The largest example which we have seen measured a little over 24 mm., though such large specimens are apparently exceedingly rare. Most of the adult specimens that we have studied measured about 12 to 15 mm. in length.

*Range.* Southern Florida from Miami to Tortugas, Bermuda and south through the West Indies to Barbados, Lesser Antilles.

*Records.* FLORIDA: Bear Cut, Biscayne Bay (H. Moore); off Sombrero Light in 150 fathoms (L. A. Burry); *Eolis*, station 32, off Sand Key in 61 fathoms (USNM); Key West; Tortugas (both Charleston Mus.). BERMUDA: (USNM). BAHAMAS: Great Abaco (USNM). CUBA: La Chorrera, Habana (M. Jaume); Cape Cajon, Pinar del Rio (USNM). HISPANIOLA: Bahía de Samaná, Santo Domingo (USNM); Saltrou, Dept. de l'Ouest; Port Salut, Dept. du Sud; Biziton, Dept. de l'Ouest; Baie Anglaise, near Aquin, Dept. du Sud; Les Cayes, Dept. du Sud, all Haiti (all USNM); Miragoane, Haiti (MCZ). PUERTO RICO: Vieques Island (Univ. Zool. Mus. Köbenhavn, Denmark). JAMAICA: Port Royal; Kingston (both USNM). VIRGIN ISLANDS: St. Thomas (MCZ; USNM; ANSP); Little Camanoe Island, Tortola (M. Dewey). BARBADOS: (MCZ; USNM).

### Epitonium (Epitonium) albidum d'Orbigny

Plates 113; 114

*Scalaria albida* d'Orbigny 1842 [in] Sagra, Histoire Physique, Politique et Naturelle de l'Île de Cuba 2, Mollusques, p. 17, pl. 10, figs. 24, 25 (Cuba, Auber collector).

*Scalaria fragilis* 'Hanley' Sowerby 1844, Thesaurus Conchyliorum 1, pt. 4, p. 88, pl. 33, figs. 64-66 (St. Vincent [Lesser Antilles] Cuming Collection); non *S. fragilis* Hanley 1840.

*Scalaria ligata* C. B. Adams 1850, Contributions to Conchology no. 4, p. 67 (Jamaica); Clench and Turner 1950, Occasional Papers on Mollusks 1, p. 304.

*Scala quindecimcostata* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 258 (St. Thomas [Virgin Islands]); Mörch 1875, Malakozoologische Blätter 22, p. 147; Mörch 1876, Journal Academy Natural Sciences Philadelphia (2) 8, p. 197.

*Scala gradatella* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 259 (St. Thomas [Virgin Islands] H. Krebs collector); Mörch 1875, Malakozoologische Blätter 22, p. 148; Mörch 1876, Journal Academy Natural Sciences Philadelphia (2) 8, p. 198, pl. 29, fig. 11.

*Description.* Adult shell reaching about 21.5 mm. (about  $\frac{3}{4}$  inch) in length, rather light in structure, imperforate and possessing numerous blade-like costae. Color generally a shiny white with occasional specimens having a faint subsutural band of yellowish-brown. Whorls 9 to 11, moderately convex and attached by the costae only, particularly on the later whorls. Spire extended and forming an angle of 27°. Aperture sub-circular. Outer lip expanded and reflected, parietal area narrow, somewhat thickened and held away from the body whorl by the costae. In older specimens the costae fuse, forming a much thickened area at this point. Columella not readily definable as the aperture is nearly holostomatous. Suture very deep on the early whorls, profound on the later whorls. Sculpture consisting of numerous blade-like to narrow ridge-like costae which are rather low and generally fused with the costae on the whorl above. There are 12 to 14 costae on the body whorl which are not angled at the whorl shoulder. Micro-

scopic sculpture when present consisting of exceedingly fine spiral threads. There is no basal ridge. Operculum thin, corneous and paucispiral. Nuclear whorls smooth and glass-like and light amber in color.

length	width	whorls	
21.5	9 mm.	11	St. Thomas, Virgin Islands
16.8	7.5	10	Jamaica
17.2	7.6	10	Bathsheba, Barbados

*Types.* The type of *Scalaria albida* d'Orbigny is in the British Museum according to Gray 1854, p. 18, as is also the type of *S. fragilis* 'Hanley' Sowerby. The type of *S. ligata* C.B. Adams has been lost. The holotype of *S. quindecimcostata* Mörch is in the Universitetets Zoologiske Museum, København, Denmark. The whereabouts of the type of *S. gradatella* Mörch is unknown. We here limit the type locality to Habana, Cuba.

*Remarks.* This species appears to be widely distributed though not at all common. It has an extended range in the Western Atlantic occurring as it does from Bermuda and southern Florida south to northern Argentina. In addition, it is found in the Eastern Atlantic and the Atlantic Islands of St. Helena and the Cape Verde Islands.

This species may very well be the "*Scala eburnea*" Potiez and Michaud but this latter species is poorly described and figured so that no certainty can ever be given to it.

We have not seen the type of *E. gradatella*. This species was based upon a unique specimen collected by Henry Krebs on the island of St. Thomas in the Virgin Islands. In our opinion it is a rather narrow form of the variable *E. albidum*.

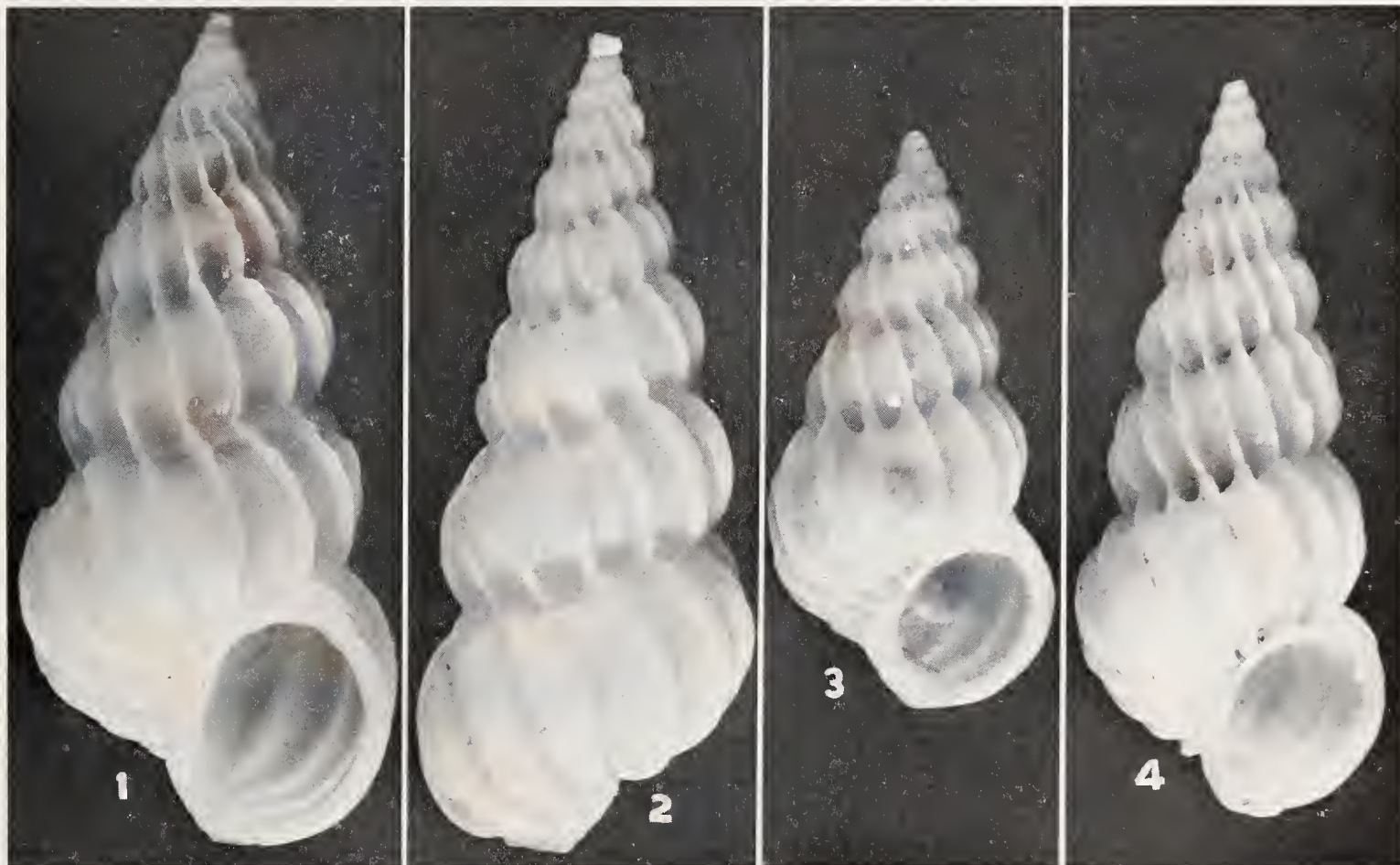


Plate 113. *Epitoniium albidum* d'Orbigny

Figs. 1-3. Boynton Beach, Florida. Fig. 1. Form with brownish-yellow subsutural band ( $10\frac{1}{2}x$ ). Fig. 2. ( $8x$ ). Fig. 3. Young to show nuclear whorls ( $15x$ ). Fig. 4. Holotype of *Scalaria quindecimcostata* Mörch (= *E. albidum* d'Orbigny), St. Thomas, Virgin Islands ( $10\frac{1}{2}x$ ).

*Epitonium albidum* d'Orbigny may be considered the basic pattern in the subgenus *Epitonium* s.s. It is less elaborately developed than the other members of this group and as a consequence worn specimens of other closely related forms often resemble this species.

This species appears to be fairly close in its relationship to *venosum* Sowerby and *georgettina* Kiener. From *venosum* it differs by having the costae usually thin and erect and by its somewhat larger size. From *georgettina* it differs in being smaller and having the costae usually blade-like and not thickened as they are in this latter species.

This species is rather difficult to define though it appears to us to be distinct. The shell is rather thin, the costae are blade-like, low and show no tendency to develop angles on the whorl shoulder. Occasional specimens develop a yellowish-brown sub-sutural band. These specimens look superficially like *E. unifasciatum* Sowerby. They differ by having more numerous and thin costae whereas in *unifasciatum* the costae are not only fewer but they are somewhat thickened. In addition, the whorls of *unifasciatum* are attached while in *albidum* the later whorls are solute, being attached by the costae only, and are more globose. Worn specimens of *E. occidentale* may be confused with *E. albidum*.

**Range.** WESTERN ATLANTIC: Southern Florida, Bermuda, the West Indies and south to northern Argentina. EASTERN ATLANTIC: The west coast of Africa, probably in the latitude of the Cape Verde Islands and south to the Gold Coast.

**Records.** FLORIDA: Hillsboro Light in 65 fathoms (L. A. Burry); Boynton Beach; Lake Worth; Virginia Key (all T. McGinty); Tortugas (USNM). BERMUDA: (Bermuda Government Museum; MCZ). BAHAMA ISLANDS: West End, Grand Bahama

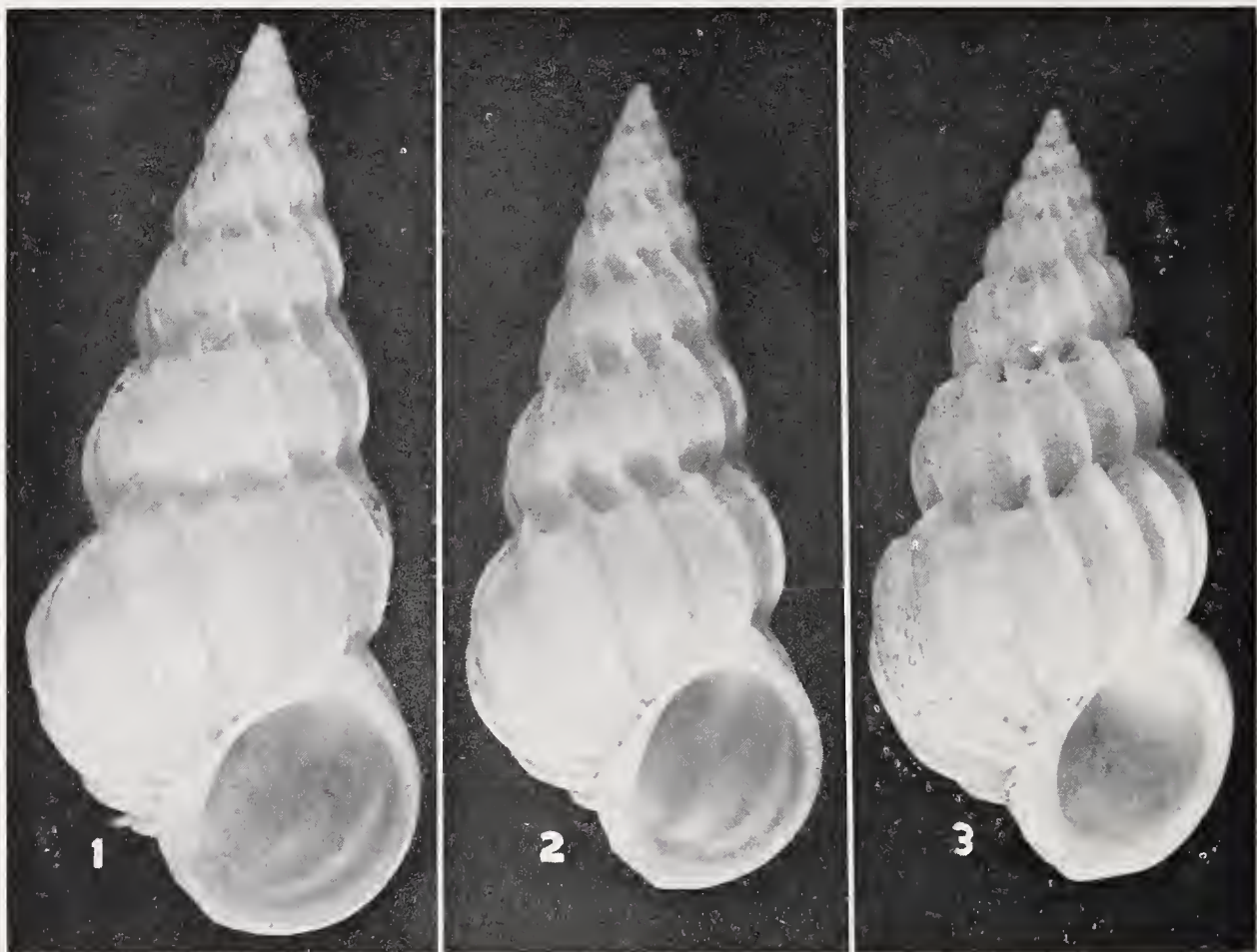


Plate 114. *Epitonium albidum* d'Orbigny

Fig. 1. From off Bathsheba, Barbados (6x). Fig. 2. La Chorrera, Habana, Cuba ( $8\frac{1}{2}x$ ).  
Fig. 3. Bahía San Blas, Buenos Aires, Argentina ( $6\frac{1}{2}x$ ).

(MCZ); Great Abaco (USNM); New Providence (J. Weber); Arthurstown, Cat Island; Matthewtown, Great Inagua (both MCZ). CUBA: Cabo San Antonio (USNM); La Chorrera, Habana (C. G. Aguayo); Vedado, Habana; Boca Rio Quibu, Habana (both M. Jaume); Caibarién (P. J. Bermúdez). HISPANIOLA: Aquin, Dept. du Sud; Bariadele, Dept. du Sud; Les Cayes, Dept. du Sud; Saltrou, Dept. de l'Ouest; Les Trois Pavillons, Dept. du Nord-Ouest, all Haiti (all USNM). JAMAICA: Montego Bay (Charleston Museum); Port Royal; Runaway Bay; Port Morant; Robins Bay, St. Mary (all USNM). VIRGIN ISLANDS: Virgin Gorda (USNM); St. Thomas (USNM; ANSP). LESSER ANTILLES: Guadeloupe (MCZ); Barbados (MCZ; USNM). MEXICO: Vera Cruz (USNM; ANSP). BRASIL: São Sebastião, São Paulo (USNM). URUGUAY: Punta Coronilla (USNM). ARGENTINA: Bahía San Blas, Buenos Aires (A. Carcelles).

EASTERN ATLANTIC: St. Helena (M. Jaume); São Vicente, Cape Verde Islands (Univ. of Michigan). GOLD COAST: Accra (MCZ). LIBERIA: Monrovia (MCZ).

### ***Epitonium (Epitonium) venosum* Sowerby**

Plate 115: Plate 116, figs. 3-5

*Scalaria venosa* Sowerby April 1844, Thesaurus Conchyliorum **1**, p. 89, pl. 33, figs. 72, 73 (the West Indies); Sowerby July 1844, Proc. Zoological Society London, p. 13 (Nevis [Lesser Antilles]).

*Scalaria modesta* C. B. Adams 1845, Proc. Boston Society Natural History **2**, p. 7 (Jamaica); Jay 1850, A Catalogue of the Shells Contained in the Collection of J. C. Jay, Fourth edition, New York, p. 301; Clench and Turner 1950, Occasional Papers on Mollusks **1**, no. 15, p. 309, pl. 49, fig. 6.

*Scala erectispina* Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 258 (St. Thomas, A. H. Riise, collector); Mörch 1875, Malakozoologische Blätter **22**, p. 146; Mörch 1876, Proceedings Academy Natural Sciences Philadelphia (2) **8**, p. 196.

*Description.* Adult shell reaching about 15 mm. ( $\frac{5}{8}$  of an inch) in length, rather strong in structure, imperforate and possessing numerous blade-like costae. Color grayish-white with the costae china-white. Whorls 9 to 10, moderately convex and attached by the cos-



Plate 115. *Epitonium venosum* Sowerby

Holotype of *Scalaria erectispina* Mörch (= *E. venosum* Sowerby)  
St. Thomas, Virgin Islands. A very young specimen (16x).

tae only. Spire extended and forming an angle of about  $22^\circ$ . Aperture subcircular. Outer lip expanded and reflected. Parietal area somewhat thickened and held away from the body whorl by the costae. Columella not readily definable as the aperture is nearly holostomatous. Suture profound. Sculpture consisting of numerous blade-like costae which are recurved backward, particularly on the earlier whorls. There are 11–13 costae on the body whorl. There is a slight to moderate angulation of the costae at the whorl shoulder and the costae of one whorl impinge on those of the whorl above. Microscopic sculpture, when present, consisting of exceedingly fine axial and spiral threads. These are generally very faint and can only be seen under a magnification of 10x or more. There is no basal ridge. Operculum unknown.

length	width	whorls	
13.7	4.8 mm.	$8\frac{1}{2}$	Puerto Cabello, Venezuela
12	4.5	8	"
10	4.2	$7\frac{1}{2}$	Jamaica

*Types.* The holotype of *Epitonium venosum* Sowerby is probably in the British Museum. The lectotype of *E. modestum* C. B. Adams from Jamaica is in the Museum of Comparative Zoölogy no. 186168. The type locality is the island of Nevis in the Lesser Antilles. The type of *Scala erectispina* Mörch is in the Universitetets Zoologiske Museum, Köbenhavn, Denmark from St. Thomas, Virgin Islands.

*Remarks.* This species is mainly characterized by having the axial costae reflected backward and in many cases the edge is bent downward giving the impression of thickness to the costae; occasionally succeeding costae nearly touch one another particularly on the earlier whorls. At the whorl shoulder the costae are built forward to a greater extent forming a definite angle at that point.

Dall was completely confused regarding this species as it appeared in the *Blake Report* (1889, *Bulletin Museum Comparative Zoölogy* 18, p. 311). He believed that he

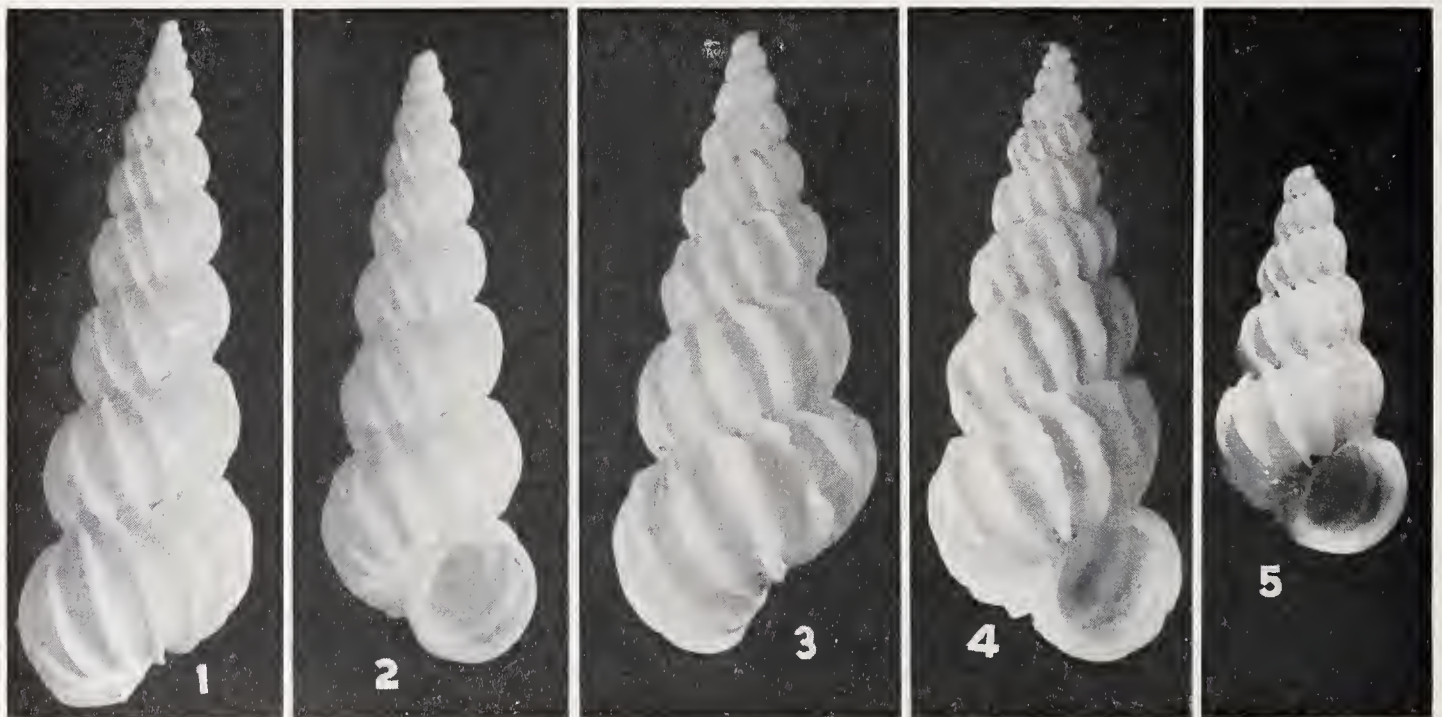


Plate 116

*Epitonium georgettina* Kiener. Fig. 1. Mar de Ojo, Buenos Aires, Argentina. Fig. 2. Puerto San Antonio, Rio Negro, Argentina (both  $2\frac{1}{2}x$ ). *Epitonium venosum* Sowerby. Figs. 3–4. Puerto Cabello, Venezuela (both  $5x$ ). Fig. 5. Holotype specimen of *Scala modesta* C. B. Adams (= *Epitonium venosum* Sowerby) Jamaica (about  $8x$ ).

had specimens from the Adams type series, but the specimens which Dall had and which we have also examined are totally different from the types of Adams and from Adams' original description. Dall's specimens are *E. undecimcostatum* Mörch and the original type specimens of *E. modestum* C. B. Adams are typical *E. venosum* Sowerby.

In relationship *E. venosum* appears to be nearest to *E. albidum*, differing by being on the average a little smaller in size and by possessing large and recurved costae.

*Range.* Isle of Pines, Jamaica and the Virgin Islands south to Venezuela.

*Records.* ISLE OF PINES: (C. G. Aguayo). JAMAICA: (MCZ). VIRGIN ISLANDS: St. Thomas (Univ. Zool. Mus. København, Denmark); St. Croix (ANSP). LESSER ANTILLES: Nevis (type locality); Barbados (MCZ; USNM). PANAMA: Colón (ANSP). VENEZUELA: Puerto Cabello (MCZ).

### *Epitonium (Epitonium) georgettina* Kiener

Plate 116, figs. 1, 2; Plate 117, fig. 1

*Scalaria georgettina* Kiener 1839, Iconographie des Coquilles Vivantes **10**, p. 14, pl. 5, fig. 15 (Océan Atlantique).

*Scalaria elegans* d'Orbigny 1840, Voyage dans l'Amérique Meridionale **5**, Mollusca, pt. 3, p. 389, pl. 54, figs. 1-3 (Patagonia, Baie de San Blas; Baie de Blanche and l'Embouchure de Rio Negro).

*Scalaria d'orbigny* Nyst 1871, Annales de la Société Malacologique de Belgique **6**, p. 124 (new name for *S. elegans* d'Orbigny; non Risso 1826; non Lea 1841).

*Description.* Adult shell reaching about 33 mm. (about 1¼ inches) in length, rather light in structure, imperforate or very slightly rimate and possessing numerous and rather low cord-like costae. Color white with the surface usually somewhat shining. Whorls up to 10½, strongly convex and slightly separated, being attached by the costae only. Spire extended forming an angle of 20°. Aperture subcircular and holostomatous. Outer lip

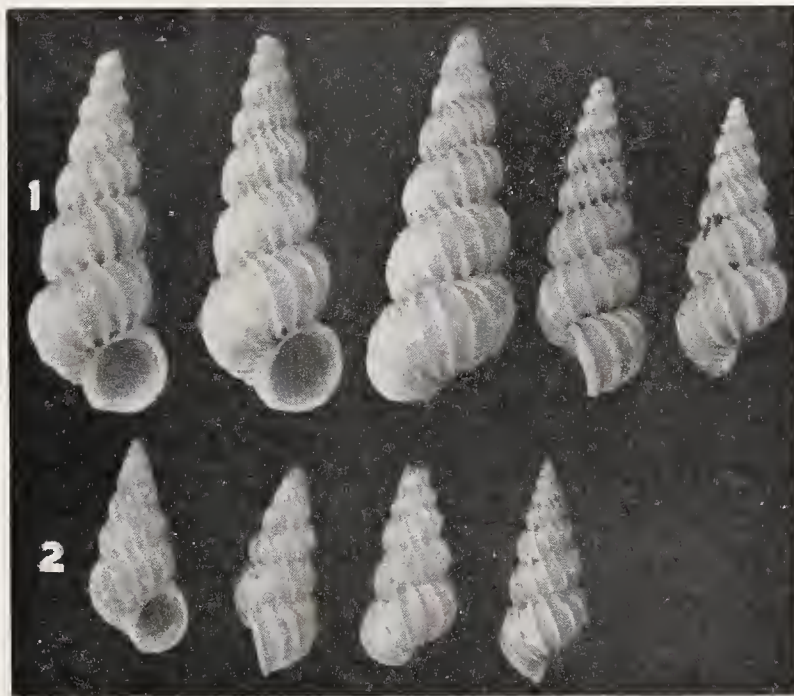


Plate 117

Fig. 1. (Upper row) *Epitonium georgettina* Kiener.

Fig. 2. (Lower row) *Epitonium humphreysii* Kiener.

These are the probable types of Kiener for these two species. Photographs by G. Mermod, Natural History Museum, Geneva, Switzerland.

slightly reflected, parietal area usually in the form of a slight shield which overlays the costae. Columella not definable as the aperture is holostomatous. Suture profound owing to the unattached whorls. Sculpture consisting of numerous, rather low, narrow, slightly reflected costae. This reflection adds to their apparent thickness. There are from 12 to 15 costae on the body whorl. There is no indication of spiral sculpture. Nuclear whorls  $2\frac{1}{2}$ , exceedingly small, glass-like and smooth. Operculum unknown.

length	width	whorls	
33	10.4 mm.	$10\frac{1}{2}$	Mar del Plata, Argentina
32	10.8	10	Puerto Madryn, Chubut, Argentina
31	10	$10\frac{1}{2}$	Rio Grande do Sul, Brasil

*Types.* The original specimens of *E. georgettina* Kiener were in the collection of Prince Massena, which was later acquired by Delessert, and are now in the Museum of Natural History at Geneva, Switzerland<sup>1</sup>. According to Gray the types of *E. elegans* d'Orbigny are in the British Museum. We here limit the type locality to Bahía San Blas, Buenos Aires, Argentina which is one of the several localities listed by d'Orbigny.

*Remarks.* This species has been known mainly as *Epitonium d'orbigny* Nyst. Kiener's name, *E. georgettina*, for this species has been unrecognized mainly owing to the indefinite locality given (Océan Atlantique) in the original description. However, the excellent figure in Kiener leaves no doubt in our minds as to its identity.

This is one of the largest species of *Epitonium* in the Western Atlantic. It exists from low water to depths at least as deep as 55 fathoms. In relationship it appears to be nearest to *E. tollini* Bartsch. As in other members in this subgenus, there is a fair amount of variation in the proportion of length to width of the shell and in the number of costae.

*Range.* From southern Brasil south to the province of Chubut, Argentina.

*Records.* BRASIL: Rio Grande do Sul (USNM). URUGUAY: La Coronilla; off Cabo Polonio (S. Lat.  $34^{\circ}40'$ ; W. Long.  $52^{\circ}56'$  in 55 fathoms); Cabo Santa Maria (all Museo Argentino de Ciencias Naturales); Punta del Este, Maldonado (Univ. Michigan; ANSP; USNM). ARGENTINA: Mar del Ajo, Buenos Aires (M. Birabén); Monte Hermosa, Buenos Aires (USNM); Ostende; Mar del Plata; 20 miles south of Mar del Plata in 33 fathoms; Miramar; Bahía San Blas; Puerto San Antonio, Gulf of San Matias, all Buenos Aires (all Museo Argentino de Ciencias Naturales); off Punta Bermeja (S. Lat.  $41^{\circ}17'$ ; W. Long.  $63^{\circ}00'$ ) in 17 fathoms; off Promontorio Balen (S. Lat.  $41^{\circ}15'$ ; W. Long.  $63^{\circ}50'$ ) in 25 fathoms; off mouth of Río Negro (S. Lat.  $41^{\circ}40'$ ; W. Long.  $63^{\circ}13'$ ) in 30 fathoms (all Hassler voyage MCZ); Puerto Madryn, Golfo Nuevo, Chubut; Bahía Vera, Chubut (S. Lat.  $44^{\circ}16'$ ; W. Long.  $65^{\circ}12'$ ) in 27 fathoms (both Museo Argentino de Ciencias Naturales).

### **Epitonium (Epitonium) tollini Bartsch**

Plate 118, figs. 1-4

*Epitonium tollini* 'Dall' Bartsch 1938, Nautilus **52**, p. 34, pl. 1, fig. 7 (Sanibel Island, Florida, W. N. Souther, collector); Perry 1940, Marine Shells of the Southwest Coast of Florida, p. 107, pl. 22, fig. 148.

<sup>1</sup> Through the kindness of Dr. G. Mermod of the Geneva Museum we have received photographs of the supposed types of *georgettina* (Plate 117, fig. 1).

*Epitonium tolleni* [sic] Dall, M. Smith 1941, East Coast Marine Shells, Ann Arbor, Michigan, p. 85 [error for *tollini* Bartsch].

**Description.** Adult shell reaching about 14 mm. (about  $\frac{1}{2}$  inch) in length, rather light in structure, imperforate and possessing numerous blade-like costae. Color a china-white with the apical whorls on live specimens a very faint amber-brown. Whorls 9 to 10, strongly convex and appressed or slightly separated, being attached by the costae only. Spire extended and produced at an angle of  $21^{\circ}$  to  $23^{\circ}$ . Aperture subcircular. Outer lip generally thickened and reflected. Palatal lip fairly narrow and appressed tightly to the parietal wall. Columella short and arched. Suture profound. Sculpture consisting of numerous and generally blade-like costae which range in number from 11 to 16 on the body whorl. These costae are irregular in spacing and are not always produced so as to line up with the costae on the whorl above. These costae are not angled at the whorl shoulder, they are even in height throughout their length, generally thin and blade-like with an occasional thickened costa, especially on the body whorl of adult specimens. There appears to be no microscopic sculpture other than exceedingly fine growth lines. Operculum paucispiral, corneous and yellowish-brown in color.

length	width	whorls	
13.9	4.9 mm.	9	Sanibel Island, Florida
11.5	3.8	10	“ “ “
8.3	3	9	Holotype

**Types.** Holotype, United States National Museum no. 188931 and paratypes, Museum of Comparative Zoölogy nos. 16892, 132757 and 137356 from Sanibel Island, Florida, collected by W. N. Souther and W. F. Clapp.

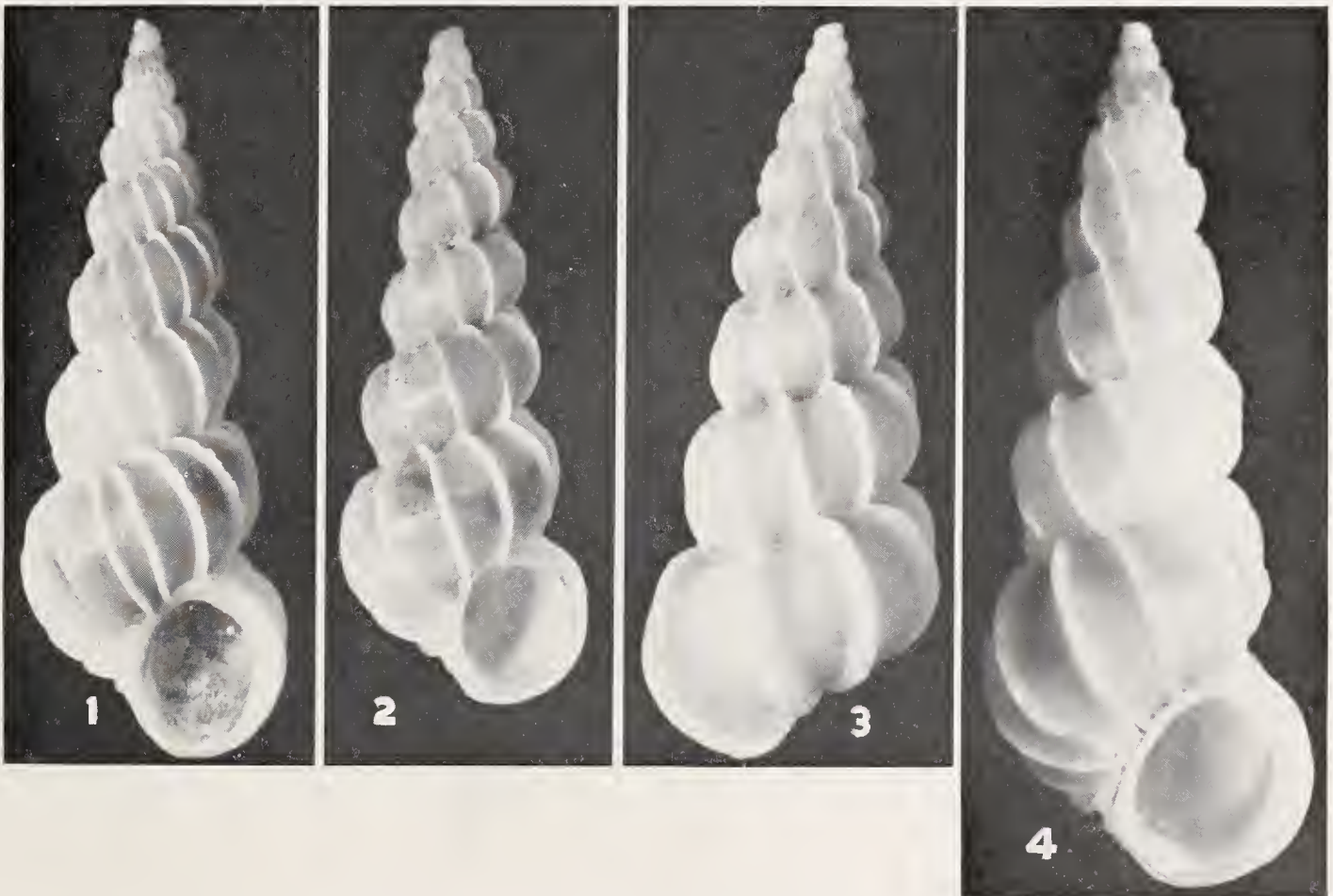


Plate 118. *Epitonium tolleni* Bartsch

Figs. 1-3. From Sanibel Island, Florida (about  $7\frac{1}{2}x$ ). Fig. 4. Holotype from Sanibel Island, Florida ( $11\frac{1}{2}x$ ).

*Remarks.* *Epitonium tollini* is nearest in its relationships to *E. georgettina* Kiener of Uruguay and Argentina, differing, however, by being much smaller. The largest specimens of *tollini* reach only 14 mm. in length while specimens of *georgettina* reach 33 mm. in length. In addition, the costae on the later whorls of *georgettina* are more widely spaced and somewhat recurved. From *E. humphreysii*, with which *tollini* is often confused, it differs in being a little narrower in proportion to its length, having the whorls globose, and most important by lacking any trace of angulation on the costae. In addition, the costae of *tollini* are usually blade-like and lower and do not always line up with the costae on the whorl above.

This species is only known from the west coast of Florida and there it is limited in its range, so far as is now known, from Marco Island north to Gasparilla Island, though it very probably will be found beyond those limits. So far as we can determine, this species lives off the outer beaches below the low water line.

*Range.* West Florida from Marco Island north to Gasparilla Island.

*Records.* FLORIDA: Sanibel Island (ANSP; USNM; MCZ); Boca Grande, Gasparilla Island (ANSP); Hickory Island, Hickory Pass (MCZ); Marco (USNM).

### **Epitonium (Epitonium) humphreysii** Kiener

Plate 117, fig. 2; Plate 119; Plate 120

*Scalaria humphreysii* Kiener 1838, *Iconographie des Coquilles Vivantes* 10, p. 15, pl. 5, fig. 16 (Atlantic Ocean to the south of Carolina).

*Scalaria humphreysiana* 'Kiener' Sowerby 1873, *Conchologia Iconica* 19, species no. 14, synonymy only [error for *humphreysii* Kiener].

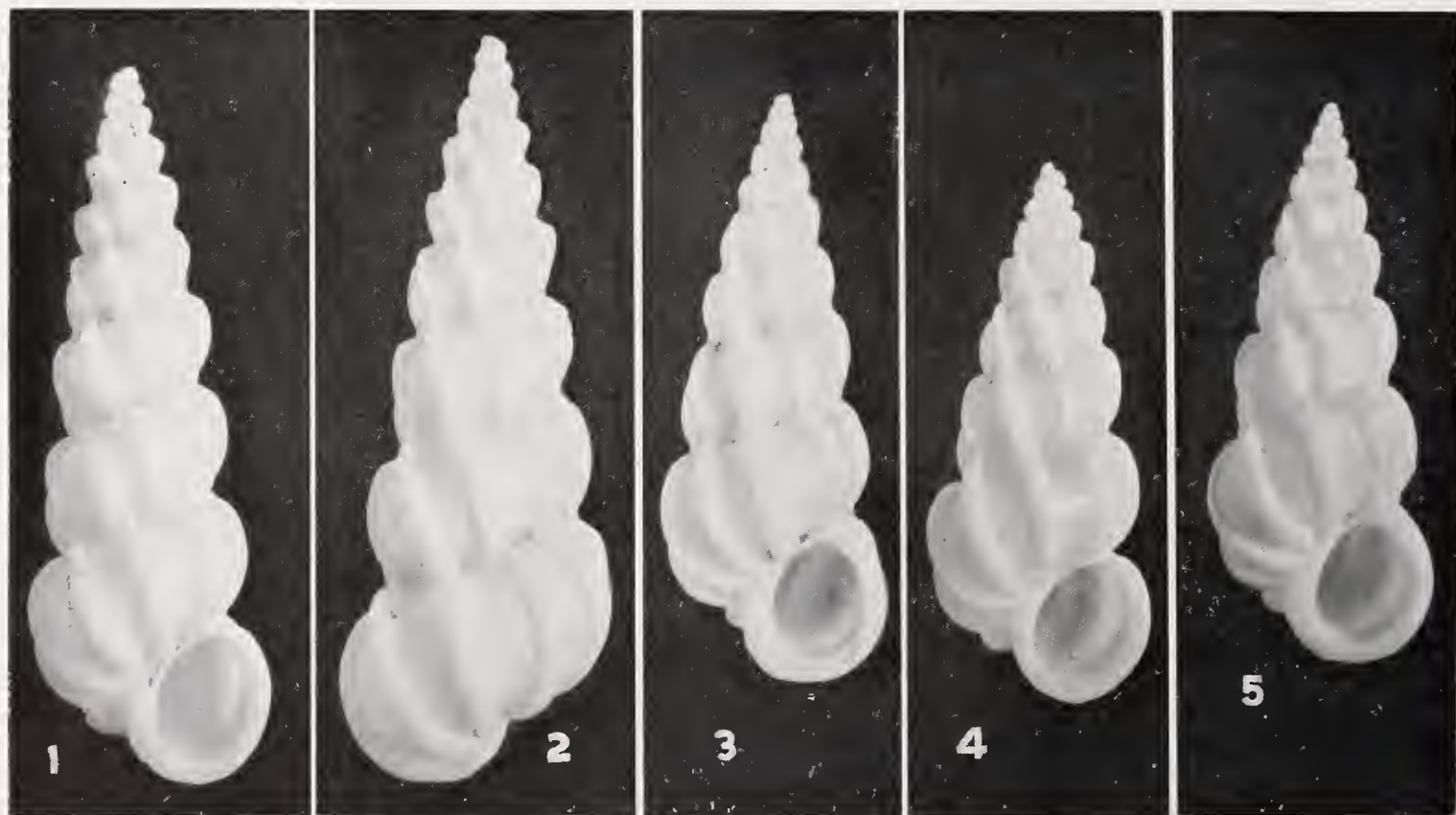


Plate 119. *Epitonium humphreysii* Kiener

Fig. 1. Isle of Palms, South Carolina. Fig. 2. Shackleford Island, North Carolina. Fig. 3. Sullivan's Island, Charleston, South Carolina. Figs. 4-5. Port St. Joseph, Florida [also called Port St. Joe] (all 4.4x).

*Scala sayana* Dall 1889, Bulletin Museum Comparative Zoölogy **18**, p. 309 (Virginia to Key West and Corpus Christi, Texas).

*Scala humphreysii* Kiener, Pilsbry 1890, Nautilus **3**, p. 106.

*Description.* Adult shell reaching about 18 mm. ( $\frac{3}{4}$  inch) in length, rather strong in structure, imperforate and possessing numerous blade-like to rounded costae. Color a flat white. Whorls 9 to 10, rather strongly convex and attached to one another by the costae. Spire extended and produced at an angle of  $25^{\circ}$  to  $27^{\circ}$ . Aperture subcircular, outer lip expanded and usually thickened. Parietal lip thin and tightly appressed to the body whorl. Columella short and arched. Suture profound. Sculpture consisting of numerous costae which may be thin and blade-like or rounded and thickened. On the early whorls the costae are generally more blade-like and on the later whorls they become more rounded and thickened. Occasionally the costae may be slightly reflected backward. These costae may be somewhat angled at the whorl shoulder, especially on the early whorls. There are 8 to 9 costae on the body whorl. Microscopic sculpture absent. Operculum thin, paucispiral, corneous and dark mahogany-brown in color. Nuclear whorls two and one-half, opaque and smooth.

length	width	whorls	
18.2	7.5 mm.	10	St. Augustine, Florida
17.5	6.4	10	Shackleford Island, North Carolina
15.1	5.5	10	Charleston, South Carolina
14.1	6.0	10	Bradenton Beach, Florida
13.1	5.3	9	Port St. Joseph, Florida

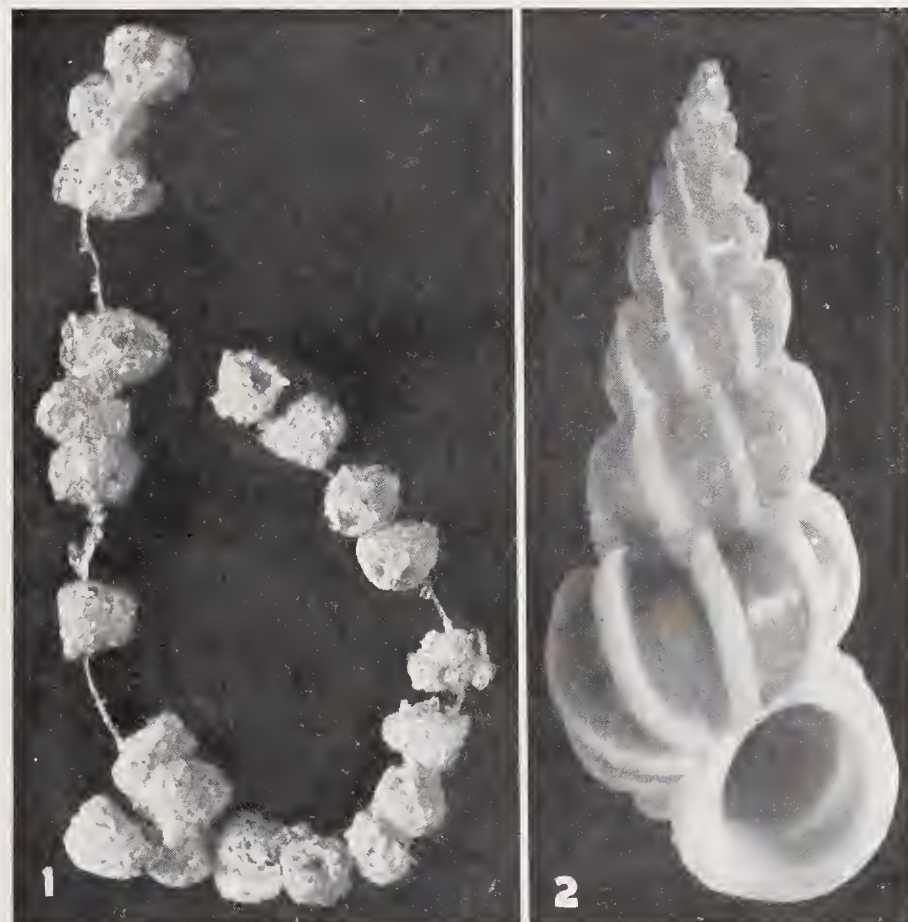


Plate 120. *Epitonium humphreysii* Kiener

Fig. 1. Egg cases showing their arrangement and construction (7x). Fig. 2. Specimen which produced the egg cases ( $6\frac{1}{2}$ x). From Pine Island Sound, Captiva Island, Florida, received from Dr. Schwengel. This specimen produced the egg cases in an aquarium.

*Types.* The original specimens of *E. humphreysii* Kiener<sup>1</sup> were in the collection of Prince Massena, which later was acquired by Delessert. These specimens are now in the collection of the Museum d'Histoire Naturelle de Genève, Switzerland<sup>2</sup>.

We here limit the type locality to Sullivan's Island, Charleston, South Carolina.

*Remarks.* This is a difficult species to understand. Typical specimens are very different from *E. angulatum* but there are many examples, especially young specimens, that approach *angulatum* very closely. In many localities both species are known to occur and in others only one or the other species may exist.

*Epitonium humphreysii* Kiener is most closely related to *E. angulatum* Say. From typical examples of *angulatum* it differs by being proportionately narrower, having the costae generally more rounded rather than blade-like, and in having the angle at the whorl shoulder of the costae much less developed. For additional data on relationships see remarks under *angulatum* and *tollini*.

This species has a typical Carolinian Zone distribution, extending as it does from Cape Cod, Massachusetts south to near Lake Worth, Florida and in the Gulf of Mexico from the west coast of Florida at Cape Romano to Texas.

*Range.* From Cape Cod, Massachusetts south to Florida (excluding the Lower Florida Keys) and west to Texas.

*Records.* MASSACHUSETTS: Cotuit (J. Miller). RHODE ISLAND: Tiverton; off Point Judith (both J. Miller). CONNECTICUT: Branford (MCZ). NEW YORK: Three Mile Harbor, East Hampton, Long Island (R. Latham). NEW JERSEY: Atlantic City (USNM); Anglesea (USNM; ANSP); Reeds Beach, Wildwood (MCZ); off New England Creek, Delaware Bay (USNM). DELAWARE: Lewes, Delaware Bay (USNM). VIRGINIA: Hog Island (MCZ); Chincoteague Island; Smith's Island; Lynnhaven Bay, Chesapeake Bay; Magothy Bay, Chesapeake Bay; Virginia Beach (all USNM). NORTH CAROLINA: *Albatross*, station 2297, off Cape Hatteras (N. Lat. 35°38'; W. Long. 74°53') in 49 fathoms; *Albatross*, station 2290, off Cape Hatteras (N. Lat. 35°23'; W. Long. 75°24') in 10 fathoms; off Cape Lookout in 52 fathoms (all USNM); between Fort Macon and Beaufort; Shackleford Island (both MCZ). SOUTH CAROLINA: Pawley's Island; Cape Romain; Sullivan's Island, Charleston; Folly Island; Isle of Palms; Edisto Island (all Charleston Museum); Myrtle Beach (USNM); Fort Johnson (MCZ). FLORIDA: Mayport (USNM; T. McGinty); St. Augustine (USNM); Daytona (E. Bates); Cape Canaveral (Charleston Museum); Lake Worth (T. McGinty); off Hollywood in 45 fathoms (L. A. Burry); Port St. Joseph (A. Merrill); off Fort Walton in 16 fathoms (L. A. Burry); Dunedin; Point Pinellas, Tampa Bay; Shell Key, St. Petersburg; Egmont Key (all USNM); Cortez; Bradenton Beach; Siesta Key, Sarasota (all N. E. Schmidt); Englewood (ANSP; T. McGinty); Punta Gorda (A. Koto);

<sup>1</sup> Kiener states that the original material came from "M. Humphreys, de l'Academie des Sciences de Boston." In all probability this was D. Humphreys Storer who at that time was an officer in the Boston Society of Natural History, and an admirer of Kiener. He was, in fact, translating Kiener's work into English and in 1837 published privately one volume of these translations which including the genera *Tornatella*, *Pyramidella*, *Thracia*, *Hurpa*, *Buccinum* and *Dolium*. No other translations were ever published.

<sup>2</sup> The photographs of the supposed types (Plate 117, fig. 2) were supplied through the kindness of Dr. G. Mermod of the Geneva Museum.

Captiva Island (J. Schwengel); Sanibel Island (ANSP; MCZ); Fort Myers Beach (ANSP; N. E. Schmidt); Bonita Springs (N. E. Schmidt); Marco (E. Bates; N. E. Schmidt); Cape Romano (USNM). LOUISIANA: Cameron (USNM). TEXAS: Galveston (USNM; T. Pulley); Corpus Christi (USNM).

**Epitonium (Epitonium) angulatum Say**

Plate 121, figs. 1-3; Plate 122, figs. 1-4

*Scalaria clathrus angulata* Say 1830, American Conchology no. 3, pl. 27, two upper figures (South coast of the United States).

*Scalaria turbinata* Conrad 1837, Journal Academy Natural Sciences Philadelphia 7, p. 263, pl. 20, fig. 26 (near Beaufort, North Carolina).

*Scala angulata* Say, Pilsbry 1890, Nautilus 3, p. 106.

**Description.** Adult shell reaching about 18.5 mm. (about  $\frac{3}{4}$  inch) in length, rather strong in structure, imperforate and possessing numerous blade-like, axial costae. Color a china-white. Whorls eight, rather convex and attached to one another by the costae. Spire extended and produced at an angle of  $28^{\circ}$  to  $30^{\circ}$ . Aperture subcircular, outer lip expanded, thickened and reflected. Parietal area somewhat thickened and held away from the body whorl by the costae. Columella not defined. Suture profound. Sculpture consisting of numerous blade-like costae which are very slightly reflected backward. At the whorl shoulder these costae are generally expanded and form an angle. The angles are usually strong on all the early whorls, a little less so to almost absent on the later and body whorls. The costae of each whorl are usually formed in line with those on the

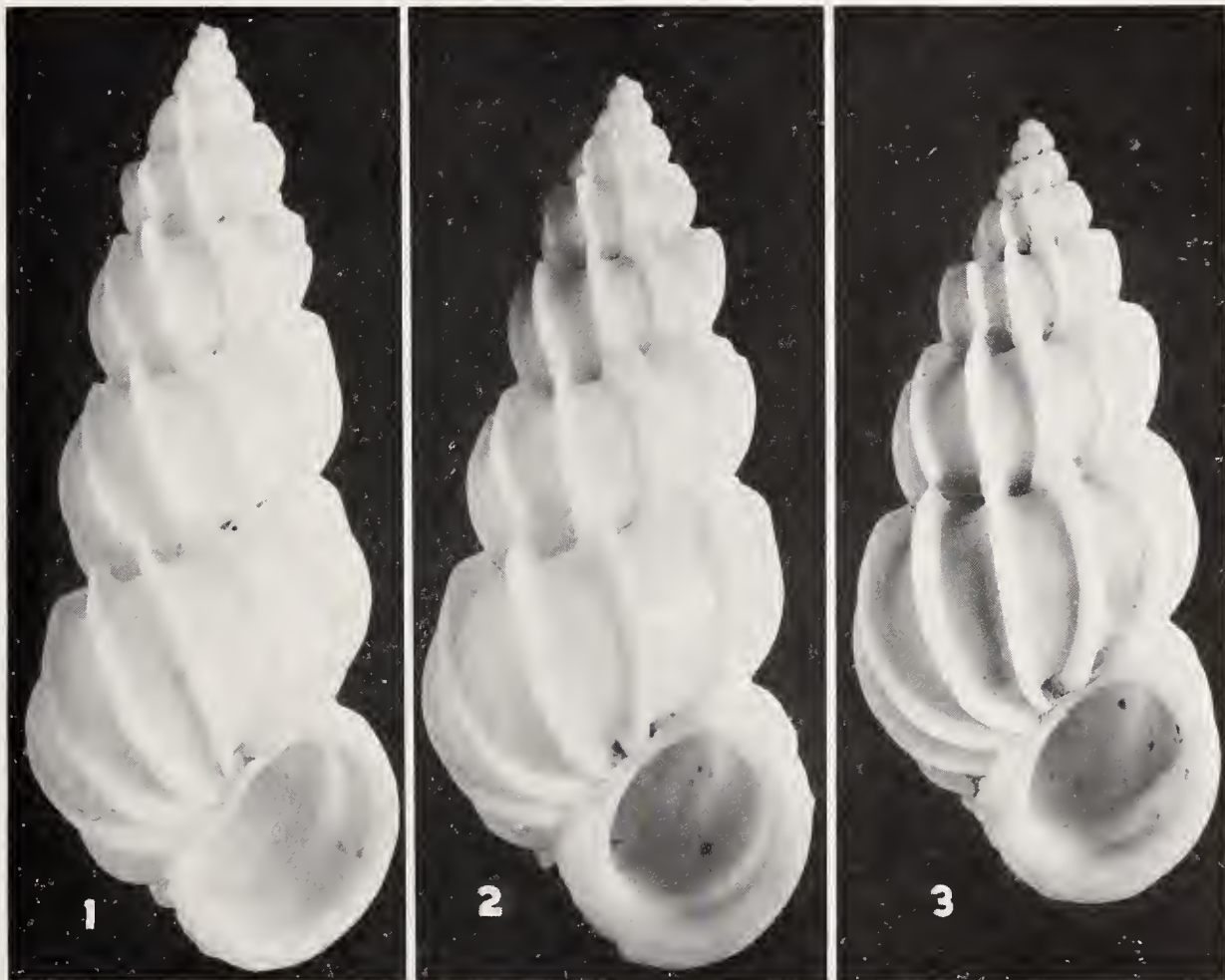


Plate 121. *Epitonium angulatum* Say

Figs. 1-3. Isle of Palms, South Carolina (all about  $4\frac{1}{2}x$ ).

whorl above and are fused at their points of contact. Microscopic sculpture, when present, consisting of numerous and exceedingly fine spiral threads which are visible only under strong magnification. Operculum corneous, paucispiral and yellowish to dark-brown in color. Nuclear whorls are smooth, glass-like and opaque.

length	width	whorls	
24.5	9.0 mm.	9	Isle of Palms, South Carolina
18.5	8.2	9	Daytona Beach, Florida
17	6.9	7	Easthampton, Long Island, New York
16	6.5	8	Galveston, Texas
13	6.5	7½	Marco, Florida

*Types.* The present location of Say's type specimen is unknown. It is not in the Academy of Natural Sciences, Philadelphia where many of Say's types are preserved.<sup>1</sup> We restrict the type locality to Charleston, South Carolina, an area from which Say had received much material.

*Remarks.* This species extends throughout the Carolinian Zone and appears to be fairly abundant throughout its range.

Say derived the name of this species from the angle which is developed on the costae at the whorl shoulder. This is usually a well developed character in this species, though many specimens are found in which there is but a slight indication of angulation. These angles are best developed during the early stages of growth and as the animal approaches

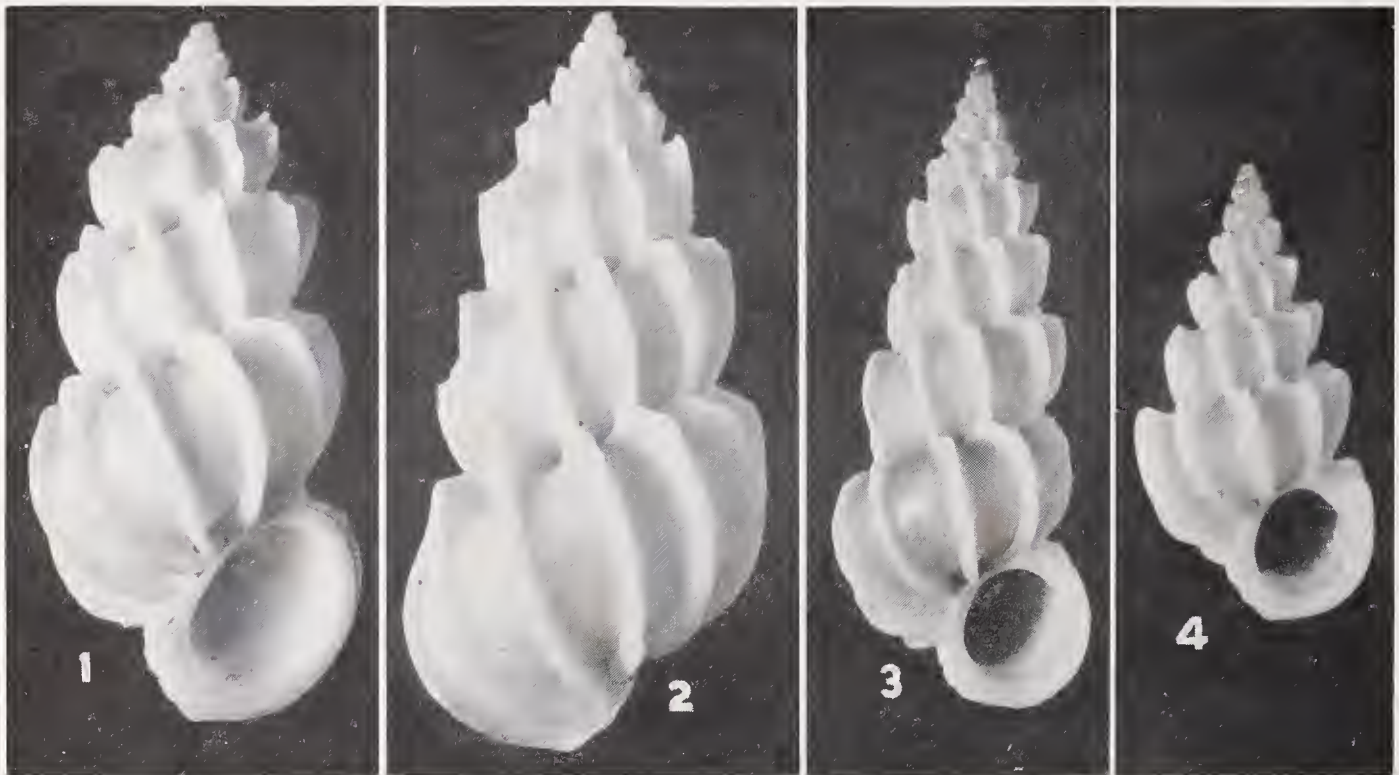


Plate 122. *Epitonium angulatum* Say

Figs. 1-2. Cape Lookout, North Carolina (about  $4\frac{1}{2}x$ ). Fig. 3. Bradenton Beach, Florida ( $4\frac{1}{2}x$ ).  
Fig. 4. Bradenton Beach, Florida ( $7\frac{1}{2}x$ ).

<sup>1</sup> Thomas Say sent much of his original material to others who had become interested in his species. Thus many of his early types were distributed and their present location is unknown. We know that Mr. J. G. Anthony, after the death of Say, received many type lots of his freshwater species from Mrs. Say. These formed a part of Mr. Anthony's private collection which was later deposited in the Museum of Comparative Zoölogy.

maturity, the costae generally show a tendency to become more rounded and thickened.

There is considerable variation in size and proportion, many specimens, even from the same locality, being quite slender as compared with the wider and more typical forms. This variation has occasioned considerable difficulty in separating many of these narrow forms of *E. augnlatnm* from *E. humphreysii*. See also under remarks for *E. humphreysii* Kiener.

*Range.* From eastern end of Long Island, south to Florida (excluding the Lower Keys) and west to Texas.

*Records.* NEW YORK: East Hampton; Orient; Peconick Bay; Noyack Bay, all Long Island (all R. Latham). VIRGINIA: Lynnhaven Bay, off Cherrystone Light in 25 fathoms; off Horseshoe Light in 7½ fathoms; off Smith's Island, all Chesapeake Bay; off Cape Charles in 10 fathoms (all *Fish Hack*, all USNM). NORTH CAROLINA: *Albatross*, station 2276, off Cape Hatteras (N. Lat. 35°21'; W. Long. 75°19') in 16 fathoms (USNM); Shackleford Island (Univ. of Michigan; MCZ); Beaufort (ANSP; USNM; Univ. of Michigan); Cape Lookout (MCZ). SOUTH CAROLINA: Cape Romain (Charleston Mus.); Sullivan's Island (MCZ; Charleston Mus.); Pawley's Island; Isle of Palms; Folly Island; Edisto Island; St. Helena's Sound in 3-6 fathoms (all Charleston Mus.). FLORIDA: Fernandina (USNM); Mayport (USNM; Charleston Mus.; Univ. of Michigan); Jacksonville Beach (ANSP); Titusville (USNM); Cape Canaveral (Charleston Mus.); Daytona (E. Bates); New Smyrna (A. Koto); Palm Beach Inlet (T. McGinty); off Fort Walton (L. A. Burry); Port St. Joseph (A. Merrill); Little Clearwater Pass (ANSP); Egmont Key (MCZ; Yale Univ.); Cortez; Bradenton Beach; Sarasota (all N. E. Schmidt); Punta Gorda (A. Koto); Sanibel Island (MCZ); Fort Myers Beach (ANSP; N. E. Schmidt); Naples (MCZ); Marco (USNM; N. E. Schmidt); Pavilion Key (ANSP). TEXAS: 25 miles south of Port Arthur (MCZ); Galveston Beach (USNM; MCZ; T. Pulley); Matagorda Bay (USNM).

### **Epitonium (Epitonium) foliaceicostum** *d'Orbigny*

Plate 123, figs. 1-3; Plate 124, figs. 1-2

*Scalaria foliaceicosta* d'Orbigny 1842 [in] Ramon de la Sagra, *Histoire de L'Ile de Cuba* 2, p. 17, pl. 10, figs. 26-28 (Martinique; Guadeloupe and St. Thomas). [Spelled *faliaceicosta* on plate.]

*Scalaria muricata* 'Kiener' Sowerby 1844, *Thesaurus Conchyliorum* 1, pt. 4, p. 86, pl. 32, figs. 29, 31-32 (a common West Indian species); non *S. muricata* Risso 1826.

*Scalaria foliaceicostata* 'd'Orbigny' Krebs 1864, *The West Indian Marine Shells*, Denmark, p. 64 [error for *foliaceicosta*].

*Scala spuria* Mörch 1874, *Vidensk. Medd. Naturhist. Forening i Kjöbenhavn* no. 17, p. 254; Mörch 1875, *Malakozologische Blätter* 22, p. 144; Mörch 1876, *Journal Academy Natural Sciences Philadelphia* (2) 8, p. 194 (St. Thomas, Anguilla).

*Scala spina-rosae* Mörch 1874, *Vidensk. Medd. Naturhist. Forening i Kjöbenhavn* no. 17, p. 255 (St. Thomas).

*Scala spinae-rosae* Mörch 1875, *Malakozologische Blätter* 22, p. 145 (St. Thomas [Virgin Islands]); Mörch 1876, *Journal Academy Natural Sciences Philadelphia* (2) 8, p. 194.

*Scala novemcostata* Mörch 1874, *Vidensk. Medd. Naturhist. Forening i Kjöbenhavn* no. 17, p. 254; Mörch 1875, *Malakozologische Blätter* 22, p. 144; Mörch 1876, *Journal Academy Natural Sciences Philadelphia* (2) 8, p. 193 (St. Thomas [Virgin Islands]).

*Scala pretiosula* Mörch 1874, *Vidensk. Medd. Naturhist. Forening i Kjöbenhavn* no. 17, p. 252; Mörch 1875, *Malakozologische Blätter* 22, p. 143; Mörch 1876, *Journal Academy Natural Sciences Philadelphia* (2) 8, p. 192 (St. Martin [Lesser Antilles] H. Krebs, collector).

*Description.* Shell reaching about 18 mm. (about  $\frac{3}{4}$  inch) in length, rather light in structure, imperforate and possessing numerous blade-like costae. Color a flat white to pale ivory. Whorls 10–11, strongly convex and separated, being attached by the costae only. Spire extended and produced at an angle of  $25^\circ$ . Aperture subcircular and nearly holostomatous. Outer lip expanded, inner lip reflected and rolled over on top of the costae. Columella not definable. Suture profound. Sculpture consisting of numerous blade-like costae which are strongly angled at the whorl shoulder. There are 7 to 8 costae on the body whorl. The tips of these angles are high and acute and slope concavely toward the suture in profile view. Microscopic sculpture consisting of a few exceedingly fine spiral lines which are visible only under strong magnification. Nuclear whorls  $1\frac{1}{2}$ , opaque, white and devoid of sculpture. Operculum corneous, paucispiral, thin and a light brownish-yellow in color.

length	width	whorls	
17.2	6.5 mm.	11	Lake Worth, Florida
13	7	8	Hunt's Bay, St. Andrews, Jamaica
13	5.5	9	off Tortugas, Florida

*Types.* The type specimen of *E. foliaceicostum* is probably in the British Museum. We here restrict the type locality to St. Thomas, Virgin Islands. The lectotype, here chosen, of *S. spuria* Mörch from St. Thomas, Virgin Islands, and the holotype of *S. novemcostata* Mörch from St. Thomas, Virgin Islands, both A. H. Riise, collector, are in the Universitetets Zoologiske Museum, København, Denmark. The present whereabouts of the type specimens of *Scala spina-rosae* Mörch and *S. pretiosula* Mörch is unknown though they are probably in Denmark. Both were contained originally in the Krebs collection.

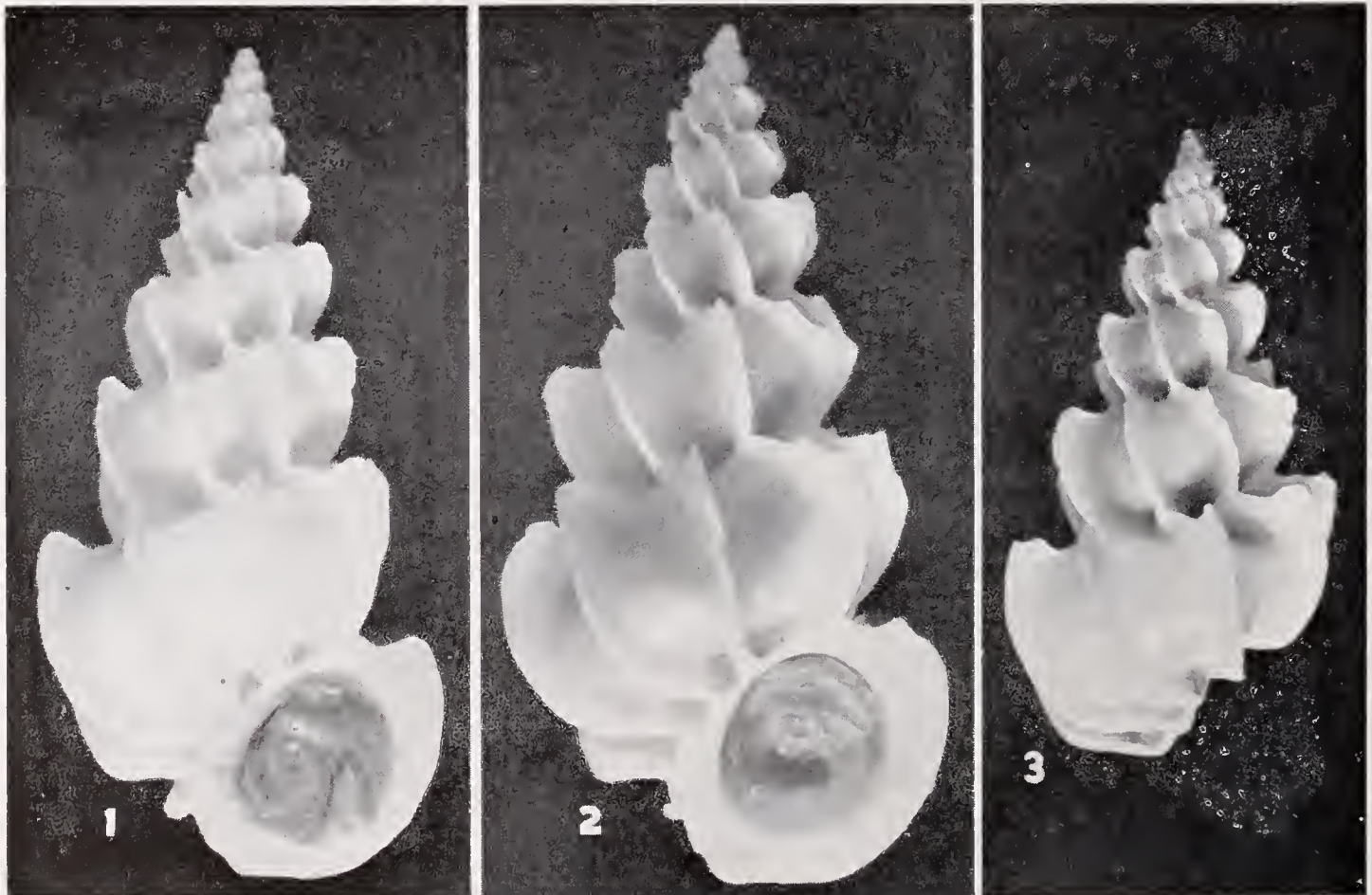


Plate 123. *Epitonium foliaceicostum* d'Orbigny

Fig. 1. Peanut Island, North Inlet, Lake Worth, Florida (7x). Figs. 2–3. *Eolis*, station 33, off Tortugas, Florida in 16 fathoms (7x).

*Remarks.* This species is the West Indian analogue of *E. angulatum* Say. It differs from *angulatum* by being somewhat smaller, lighter in structure and having the angle on the whorl shoulder greatly developed. The blade-like costae are thin and fairly high, the angles pointed and occasionally extending as high as the mid-portion of the whorl above. From *E. krebsii* Mörch, with which it may be confused, it differs by being narrower, imperforate and in having much more highly developed shoulder angles on the costae. Very young and worn specimens of this species may be confused with *E. echinaticostum* d'Orbigny. In the case of the latter species, however, the whorls are far more disjoined and the costae have a fluted appearance. Worn specimens of *E. foliaceicostum* have given rise to many of the synonyms named above. We have figured a few of the type specimens that were available.

This species occurs from low water to depths of at least 120 fathoms. It is rather widely distributed in the West Indian region though apparently it is never common at any one locality.

*Range.* Florida east coast from Lake Worth, south to Tortugas and north in the Gulf of Mexico to off Destin. In the West Indies from the Bahamas south and east to the Lesser Antilles.

*Records.* FLORIDA: Lake Worth, Boynton (T. McGinty); Hillsboro Light in 80 fathoms; Fort Lauderdale in 60 fathoms; off Hollywood in 45 fathoms (all L. A. Burry); off Lower Matecumbe Key; *Eolis*, station 62, off Miami in 20 fathoms (both USNM); off The Elbow, Key Largo in 90–100 fathoms; off Looe Key; off American Shoals, Lower Florida Keys in 55–70 fathoms (all L. A. Burry); off Key West (L. A.

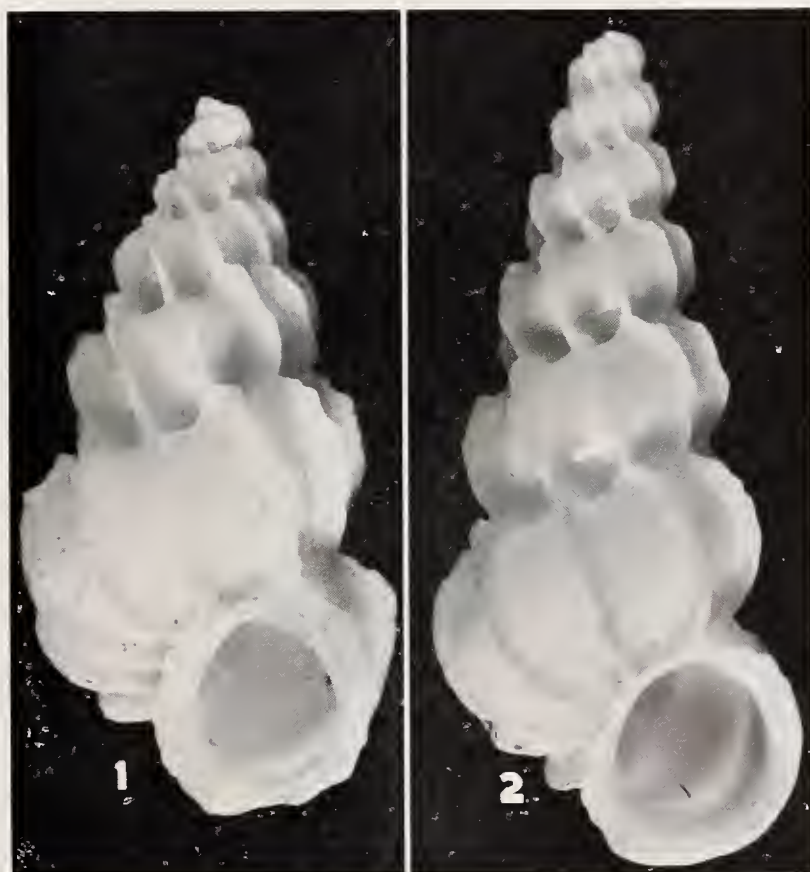


Plate 124. *Epitonium foliaceicostum* d'Orbigny

Fig. 1. Holotype of *Scalaria novemcostatum* Mörch (= *E. foliaceicostum* d'Orbigny) St. Thomas, Virgin Islands (10x). Fig. 2. Lectotype of *Scalaria spuria* Mörch (= *E. foliaceicostum* d'Orbigny) St. Thomas, Virgin Islands (6.8x).

Burry; USNM); Loggerhead Key, Tortugas; *Eolis*, station 330, off Sambo Reef in 120 fathoms; *Eolis*, station 33, off Tortugas in 16 fathoms; *Eolis*, station 4, off Cape Sable in 1½ fathoms (all USNM); off Destin in 18–20 fathoms (T. McGinty). BAHAMA ISLANDS: South Bight, Andros Island (USNM); New Providence (D. H. Brown; T. McGinty); Mangrove Cay, Andros Island; Arthurstown, Cat Island (both MCZ). CUBA: Vedado, Habana (M. Jaume); Arenas de la Chorrera, Habana (C. G. Aguayo); Cayo Levisa; Bahía Cochinos (both USNM). HISPANIOLA: Bahía de Samaná; Santo Domingo in 17 fathoms; Aquin, Dept. du Sud, Haiti (both USNM). JAMAICA: Hunt's Bay, St. Andrew; Kingston (both USNM). VIRGIN ISLANDS: St. Croix (ANSP); St. Thomas (MCZ; Univ. Zool. Mus. København, Denmark). LESSER ANTILLES: English Harbour, Antigua (USNM); Guadeloupe; Barbados (both MCZ).

### *Epitonium (Epitonium) fractum* Dall

Plate 125

*Epitonium fractum* Dall 1927, Proceedings United States National Museum 70, Art. 18, p. 60 (off Fernandina [Florida] *Albatross*, station 2668 in 294 fathoms (N. Lat. 30°58'; W. Long. 79°38').

*Description.* Adult shell reaching 22 mm. (about  $\frac{7}{8}$  inch) in length, rather light in structure, attenuated, minutely perforate and possessing numerous blade-like, axial costae. Color white with the nuclear whorls a light amber-brown. Whorls 16, strongly convex, free and attached by the costae only. Spire extended, forming an angle of 20°. Aperture subcircular and holostomatous. Outer lip reflected, formed by the last costa. Inner or parietal lip a little narrower and slightly appressed against the costae. Suture profound. Columella not definable. Umbilicus very small and partially hidden by the parietal lip. Sculpture consisting of numerous thin, blade-like costae which number 17 to 19 on the body whorl. At the whorl shoulder the costae have a very well developed angle; in the case of the present species, these angles form a series of sharply pointed hooks. There appears to be no trace of spiral sculpture. There is no basal ridge. However, there is a small rib which is formed by the costae as they coalesce on the outer edge of the umbilicus. Nuclear whorls 3½, glass-like and smooth. Operculum paucispiral, corneous and a light brownish-yellow.

length	width	whorls	
22.2	6.4 mm.	16	off Delray, Florida
15.8	5	10*	off Fowey Light, Florida
8.5	4.2	4½*	Holotype

\* Early whorls lost.

*Types.* The holotype of *E. fractum* Dall is in the United States National Museum no. 108015 from *Albatross*, station 2668, off Fernandina, Florida in 294 fathoms (N. Lat. 30°58'; W. Long. 79°38').

*Remarks.* This species was based upon a unique and badly broken specimen. However, the species is so characteristic that even the broken fragment readily characterized it.

This species occurs in depths from 30 to 325 fathoms and it is rare throughout its range.

See *Remarks* under *E. dallianum* Verrill and Smith.

*Range.* East coast of Florida from off Fernandina south to Key West.

*Records.* FLORIDA: *Albatross*, station 2668, off Fernandina (N. Lat.  $30^{\circ}58'$ ; W. Long.  $79^{\circ}38'$ ) in 294 fathoms; *Eolis*, station 139, off Miami in 30 fathoms; *Eolis*, station 358, off Fowey Light in 125 fathoms; *Eolis*, station 332, off Sambo Reef in 115 fathoms; *Eolis*, station 334, off Key West in 90 fathoms (all USNM); 16 miles off Boynton in 275–285 fathoms; 18 miles E. of Delray in 300 to 325 fathoms; off Sombrero Light in 35 fathoms (all L. A. Burry).

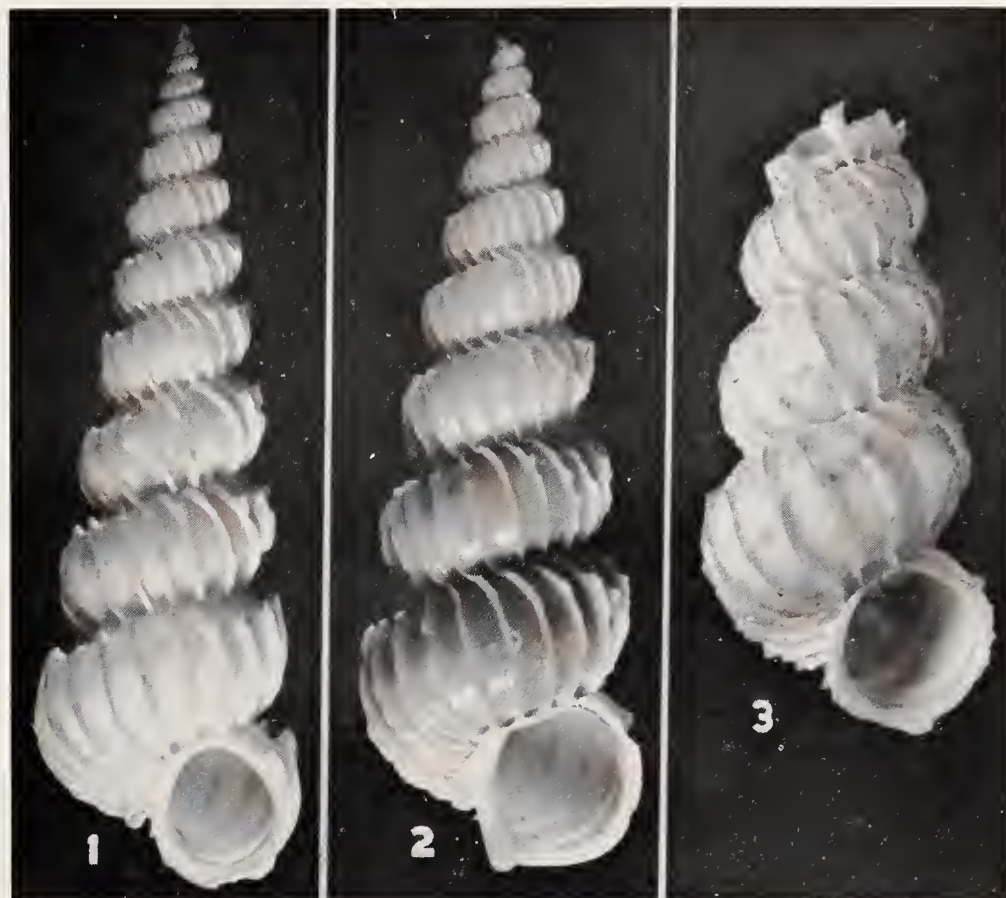


Plate 125. *Epitonium fractum* Dall

Fig. 1. Eighteen miles east of Delray, Florida in 300 to 325 fathoms (about 4x). Fig. 2. *Eolis*, station 358, off Fowey Light, Florida in 125 fathoms ( $5\frac{1}{2}x$ ). Fig. 3. Holotype. *Albatross*, station 2668, off Fernandina, Florida in 294 fathoms (about  $7\frac{1}{2}x$ ).

### ***Epitonium (Epitonium) dallianum* Verrill and Smith**

#### Plate 126

*Scalaria dalliana* Verrill and Smith 1880, American Journal of Science **20**, p. 395 (*Fish Hawk*, station 869 [about 175 miles off Asbury Park, New Jersey] about 85 miles S. of Martha's Vineyard (N. Lat.  $40^{\circ}02'18''$ ; W. Long.  $70^{\circ}23'06''$  in 192 fathoms)); Verrill and Smith 1882, Transactions Connecticut Academy **5**, p. 527, pl. 57, fig. 33; Verrill 1885, Annual Report of the Commissioner of Fish and Fisheries for 1883, p. 568, pl. 25, fig. 91.

*Epitonium dallianum* Verrill and Smith, Johnson 1915, Occasional Papers Boston Society of Natural History **7**, no. 13, p. 103.

*Description.* Adult shell reaching 12.5 mm. ( $\frac{1}{2}$  inch) in length, rather light in structure, attenuate, nearly imperforate and possessing numerous, blade-like axial costae. Color a grayish-white with the nuclear whorls very pale amber. Whorls 10 and strongly convex. Early whorls attached, later whorls very slightly separated by the costae. Spire extended forming an angle of  $17^{\circ}$ . Aperture subcircular and holostomatous. Outer lip reflected, formed by the last costa. Inner or parietal lip a little narrow and appressed

against the costae on the whorl above. Columella not definable. Suture deep to profound. Umbilicus very minute and more or less covered by the reflection of the parietal lip. Sculpture consisting of numerous, thin, blade-like costae. There are 20 to 30 costae on the body whorl. At the whorl shoulder the costae have a small but well developed angle which is slightly hooked. When seen in profile the regularity of the position of these hooks gives a shouldered appearance to the whorls. There is no basal ridge. Nuclear whorls two, glass-like and smooth. Operculum paucispiral, corneous and light brownish-yellow in color.

length	width	whorls	
12.5	4.0 mm.	10	<i>Fish Hawk</i> , station 871, off Asbury Park, New Jersey
10.1	3.4	10	<i>Fish Hawk</i> , station 869, off Asbury Park, New Jersey, lectotype
15	4.8	10*	<i>Fish Hawk</i> , station 870, off Asbury Park, New Jersey

\* Broken.

*Types.* The lectotype, here chosen, is in the United States National Museum no. 44795, *Fish Hawk*, station 869. Additional paratypes in the United States National Museum and the Academy of Natural Sciences, Philadelphia and the Peabody Museum, Yale University. The type locality is *Fish Hawk*, station 869, off Asbury Park, New Jersey (N. Lat.  $40^{\circ}02'18''$ ; W. Long.  $70^{\circ}23'06''$ ) in 192 fathoms.

*Remarks.* This is not a common species and there are comparatively few specimens available for study. In relationship it appears nearest to *Epitonium fractum* Dall. It differs from this species by being smaller, having lower costae and having the angles or hooks on the whorl shoulder much less developed.

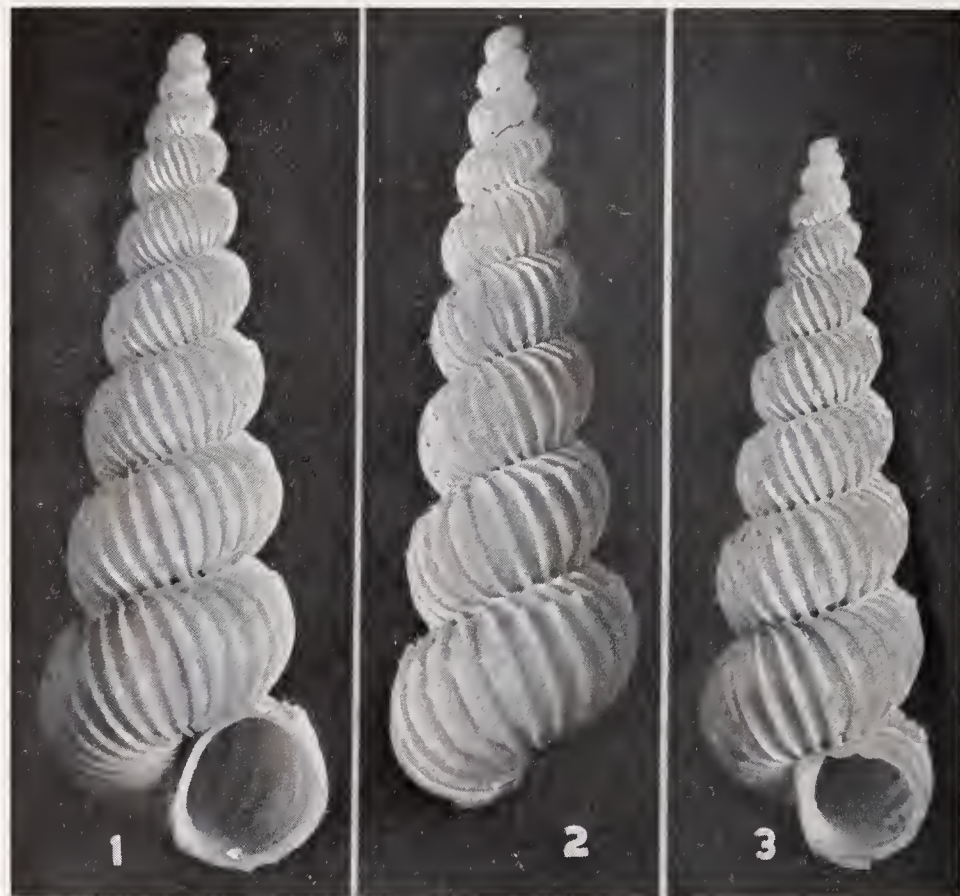


Plate 126. *Epitonium dallianum* Verrill and Smith

Fig. 1. *Fish Hawk*, station 871 in 115 fathoms. Fig. 2. *Fish Hawk*, station 874 in 85 fathoms. Fig. 3. Lectotype. *Fish Hawk*, station 869 in 192 fathoms. All off Asbury Park, New Jersey (all about 7x.)

*Range.* From the latitude of northern New Jersey south to North Carolina in depths ranging from 63 to 192 fathoms.

*Records.* NEW JERSEY: *Fish Hawk*, station 869 (N. Lat.  $40^{\circ}02'18''$ ; W. Long.  $70^{\circ}23'06''$ ) in 192 fathoms (USNM; Yale University); *Fish Hawk*, station 870 (N. Lat.  $40^{\circ}02'36''$ ; W. Long.  $70^{\circ}22'58''$ ) in 155 fathoms (USNM); *Fish Hawk*, station 871 (N. Lat.  $40^{\circ}02'54''$ ; W. Long.  $70^{\circ}23'40''$ ) in 115 fathoms (ANSP; Yale University); *Fish Hawk*, station 874 (N. Lat.  $40^{\circ}00'$ ; W. Long.  $70^{\circ}57'$ ) in 85 fathoms (USNM). (All of the above stations are about 150 to 175 miles east of Asbury Park, New Jersey and about 85 miles south of Martha's Vineyard.) *Atlantis*, station D6 (1935) about 130 miles east of Asbury Park in 67 fathoms (MCZ); *Fish Hawk*, station 1097, about 200 miles off Barnegat Bay (N. Lat.  $39^{\circ}54'$ ; W. Long.  $69^{\circ}44'$ ) in 158 fathoms (USNM). VIRGINIA: *Albatross*, station 2265, about 60 miles off Cape Charles (N. Lat.  $37^{\circ}07'$ ; W. Long.  $74^{\circ}35'$ ) in 70 fathoms (Yale University). NORTH CAROLINA: *Albatross*, station 5109, about 25 miles off Cape Hatteras (N. Lat.  $35^{\circ}14'$ ; W. Long.  $74^{\circ}59'$ ) in 142 fathoms (Yale Univ.); *Albatross*, station 2595, about 22 miles off Cape Hatteras (N. Lat.  $35^{\circ}08'$ ; W. Long.  $75^{\circ}05'$ ) in 63 fathoms; *Albatross*, station 2602, about 36 miles off Cape Hatteras (N. Lat.  $34^{\circ}38'$ ; W. Long.  $75^{\circ}33'$ ) in 124 fathoms; *Albatross*, station 2614, about 36 miles off Cape Lookout (N. Lat.  $34^{\circ}09'$ ; W. Long.  $76^{\circ}02'$ ) in 168 fathoms (all USNM).

### **Epitonium (Epitonium) unifasciatum Sowerby**

Plate 127

*Scalaria unifasciata* Sowerby 1844, Thesaurus Conchyliorum 1, p. 98, pl. 33, fig. 68 (West Indies).

*Description.* Adult shell reaching 13 mm. (about  $\frac{1}{2}$  inch) in length, rather light in structure, imperforate and possessing numerous low rounded axial costae. Color white with an irregular spiral band of brown on the upper portion of the whorl near the suture. Occasional specimens with the coloration slightly diffused. Costae white. Whorls eleven, moderately convex and attached. Spire extended and forming an angle of  $20^{\circ}$ . Aperture subcircular. Outer lip generally slightly reflected and usually moderately to greatly thickened. Varices usually limited to the final one, the lip of the adult. Occasionally, however, more are produced and these are usually limited to a position on the last whorl. The parietal wall and columella are not definable as the aperture is holostomatous. Suture well defined and moderately deep. Sculpture consisting of many low, narrow and somewhat rounded axial costae. In general, the costae on one whorl are in line with those on the whorl above. There are from 7 to 9 costae on the body whorl. No basal ridge is developed. Nuclear whorls about two and devoid of sculpture. Operculum unknown.

length	width	whorls	
13	5.5 mm.	$9\frac{1}{2}$	Jamaica
12	5.5	10	St. Thomas, Virgin Islands
9.7	4.5	$9\frac{1}{2}$	Boynton Beach, Florida

*Types.* The type of this species is probably in the British Museum. The type locality given by Sowerby was only "the West Indies." We here restrict the type locality to Port Royal, Jamaica.

*Remarks.* This is a very distinct species. It is rare throughout its range and as a consequence not often seen. It can, however, be confused with a few other forms in the Western Atlantic. It superficially resembles worn specimens of *E. lamellosum* Lamarek, but can be easily distinguished from this species by the lack of a basal ridge. From *E. albidum* d'Orbigny it differs by being more attenuate, having the whorls attached and having fewer, more cord-like costae rather than blade-like costae. Usually the subsutural band of brown is present.

See remarks under *E. lamellosum* and *E. albidum*.

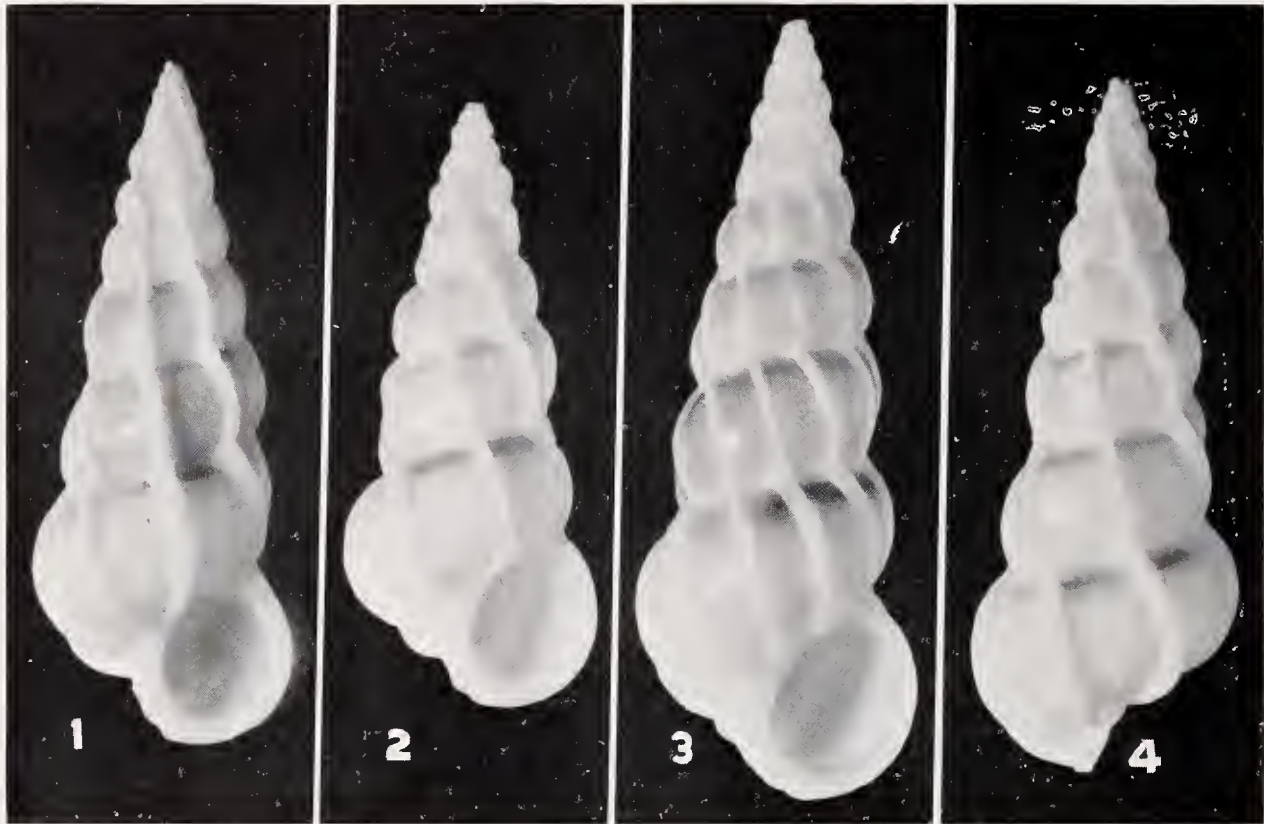


Plate 127. *Epitonium unifasciatum* Sowerby  
Figs. 1-4. Jamaica (about 6x).

*Range.* South Florida, the Bahama Islands and south through the West Indies to the Lesser Antilles.

*Records.* FLORIDA: Lake Worth; Boynton Beach (both T. McGinty). BAHAMA ISLANDS: South Bimini Island, Bimini Islands; Great Abaco (both USNM). CUBA: Habana (M. Jaume). HISPANIOLA: Anse à Drick, Dept. du Sud, Haiti (USNM). PUERTO RICO: East of Boca de Congrejos (Univ. of Michigan). JAMAICA: Montego Bay (Charleston Mus.); Port Royal; Jacob's Bay, St. Mary (both USNM). VIRGIN ISLANDS: Prosperity Beach, St. Croix (H. A. Beatty); St. Thomas (USNM). LESSER ANTILLES: St. Vincent (ANSP); Barbados (MCZ).

### Subgenus *Gyroscala* de Boury

*Gyroscala* de Boury 1887, Etude sur les sous genres de Scalidae du Bassins de Paris, p. 15, Thémécourt, Seine-et-Oise, France (subgenotype, *G. (Scalaria) commutata* Monterosato [= *Epitonium lamellosum* Lamarek]).

*Turbona* 'Brown' Mörch 1874, Vidensk. Medd. Naturhist. Forening i Kjöbenhavn no. 17, p. 259 [sectional type, *Scala lamellosa* Lamarek, here selected]; non *Turbona* Leach 1847.

*Pictoscala* Dall 1917, Bull. United States National Museum **53**, no. 2217, p. 477 [subgenotype, *S. lineata* Say, subsequent designation, de Boury 1919].

*Depressiscula* de Boury 1909, Journal de Conchyliologie **57**, p. 258 (subgenotype, *S. aurita* Sowerby, original designation).

Subgenotype, *Scalaria commutata* Monterosato [= *Epitonium lamellosum* Lamarck].

Species in this subgenus are imperforate, moderately to strongly axially costate, have convex whorls and possess a well developed basal ridge. Color may be present as spiral bands or somewhat diffused. The whorls are generally attached.

## **Epitonium (Gyroscale) lamellosum Lamarck**

Plates 128–129

*Turbo clathrus* Linné 1758, Systema Naturae, edition 10, p. 765 [in part, reference to Gualtieri only].

*Scalaria lamellosa* Lamarck<sup>1</sup> 1822, Animaux Sans Vertèbres **6**, pt. 2, p. 227 (locality unknown); Kiener 1839, Iconographie Coquilles Vivantes **10**, Scalaria, p. 10, pl. 3, figs. 7, 7a, 7b (Corsica; Sicily; Teneriffe, Canary Islands and Martinique); Delessert 1841, Recueil de Coquilles Décrites par Lamarck, Paris, pl. 33, figs. 10a-b.

<sup>1</sup> *Turbo lamellosa* Brocchi 1814, Conchiologia Fossile Subapennina **2**, p. 379, pl. 7, fig. 2, is not a homonym of *Scalaria lamellosa* Lamarck. Both were described in different genera and both are in different genera at this time. E. de Boury places *Turbo lamellosa* Brocchi in the genus *Cirsotrema*.

*Scalaria pseudoscalaris* 'Risso' Philippi 1836, Enumeratio Molluscorum Siciliae **1**, p. 167, pl. 10, fig. 2 (Panormi, Messina, Sicily); non *pseudoscalaris* Brocchi 1814.

*Scalaria monocycla* 'Lamarck' Kiener 1839, Iconographie des Coquilles Vivantes **10**, Scalaria, p. 19, pl. 3, fig. 9; non Lamarck (locality unknown).

*Scalaria commutata* Monterosato 1877, Ann. Museo Civico di Storia Naturale di Genova **9**, p. 240 (Civitavecchia, Italy).

*Description.* Adult shell reaching 32 mm. (about 1¼ inch) in length, rather light in structure; imperforate and possessing numerous blade-like axial costae. Color whitish with irregular brownish markings which are generally stronger at the suture. Occasionally the color becomes diffused over all portions of the whorl and is usually darker on the later whorls. The costae are always white. Whorls eleven, strongly convex and attached. Spire extended, forming an angle of 40° to 50°. Aperture subcircular. Outer lip generally slightly reflected and usually moderately to greatly thickened. Varices usually limited to the final one, the lip of the adult; occasionally, however, more are produced and these are usually limited to a position on the last whorl. The parietal wall and columella are not definable as the aperture is nearly holostomatous. Suture well defined and moderately deep. Sculpture consisting of numerous thin, high, blade-like axial costae. The costae of each succeeding whorl are nearly in line with one another so that in general they appear continuous from the apex to the base of the shell. Rarely they may be offset or double. Basal ridge consisting of a well developed thread-like line. Nuclear whorls two and devoid of sculpture. Operculum dark mahogany-brown, thin, corneous and paucispiral.

length	width	whorls	
34	15 mm.	11*	Arthurstown, Cat Island, Bahama Islands
30.8	14	8*	Monte Cristi, Santo Domingo
28.8	12.5	11	Grassy Key, Florida
28.5	14.5	11	St. Thomas, Virgin Islands

\* Broken — early whorls lost.

*Types.* Delessert in 1841 figured Lamarck's type specimen of this species. It is now probably in the museum at Geneva, Switzerland where Delessert's collection was deposited. The original locality was unknown to Lamarck. We here select Corsica to be the type locality. This is one of the several localities cited by Kiener in 1839, based upon the material contained in the Paris Museum.

*Remarks.* This species is one of the most beautiful in the entire family. Perfect specimens are not common as the thin blade-like costae are very quickly broken after the animal dies. It is not a rare species as it is found throughout the entire Caribbean area as well as portions of the Eastern Atlantic, though it is perhaps never abundant at any one locality.

So far as we can detect there appears to be no characters upon which the West Indian specimens of this species can be separated from those occurring along the shores of southern Europe and the west coast of Africa.

The name *lamellosum* appears to be the earliest that is available. According to Hanley (1855, *Ipsa Linnaei Conchyliæ*, London, p. 339) Linné had two species in the group

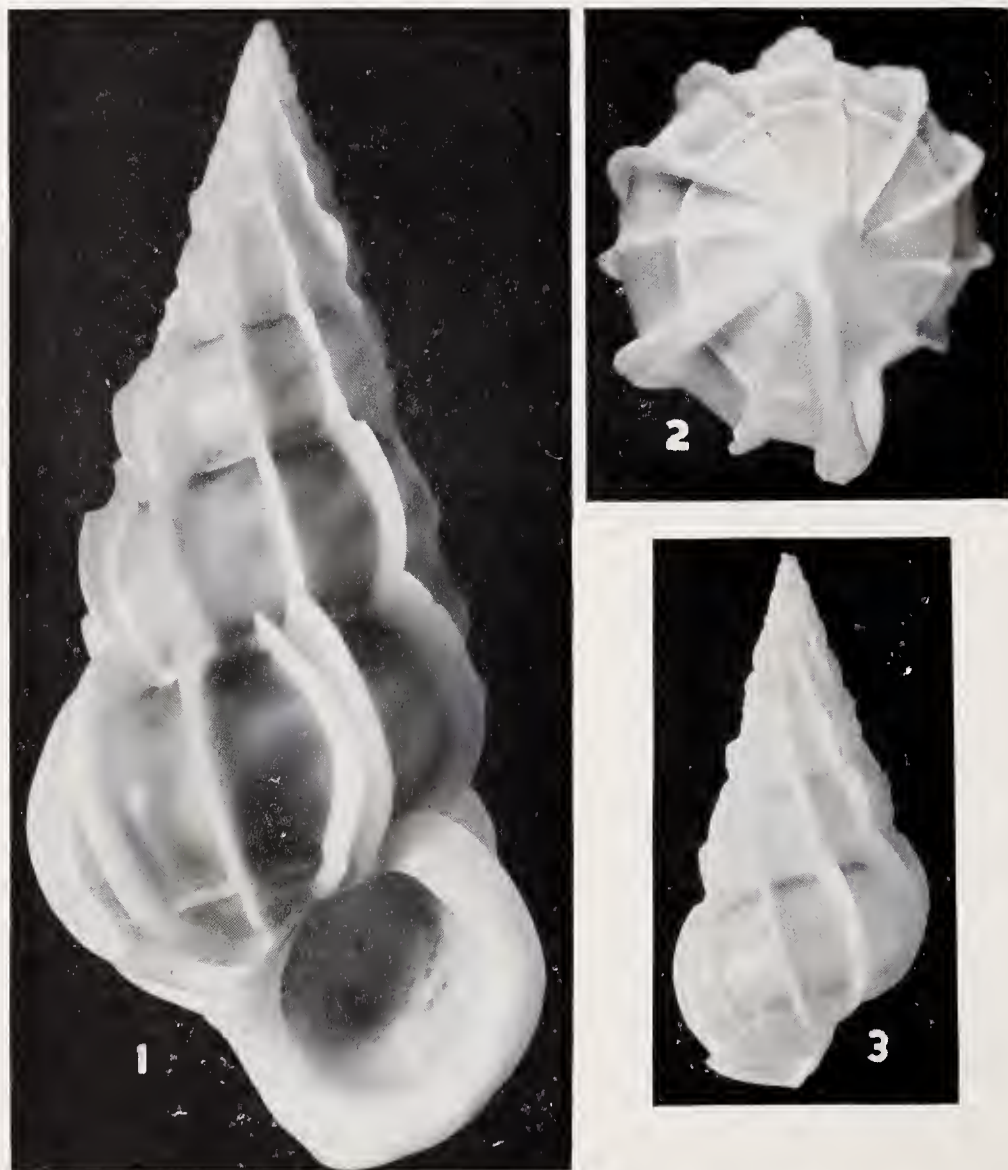


Plate 128. *Epitonium lamellosum* Lamarck

Fig. 1. Grassy Key, Lower Florida Keys, Florida (4x). Note double costae. Fig. 2. Bathsheba, Barbados (4x). Showing the well developed basal ridge. Fig. 3. Barbados (4.3x). A nearly pure white form with a faint brownish, subsutural line.

which he called *clathrus*. All references but one (Gaultieri) cited by Linné refer to a species without a basal ridge, or what is now understood to be *Epitonium clathrus* Linné. The figure cited by Gaultieri (1742, Index Testorum Conchyliorum, pl. 58, figure H) is that which was later named *lamellosum* by Lamarek.

This species is readily differentiated from *E. unifasciatum* by the presence of a well defined basal ridge, its much larger size and by its blade-like costae. In *unifasciatum* the costae are low and rounded and there is no basal ridge. In coloration there are generally two definable brown bands on each whorl of *lamellosum*, even when the color has become somewhat diffused, while in *unifasciatum* the color is limited to a single narrow and occasionally interrupted subsutural band.

From *E. rupicolum* this species differs in being larger, having the costae blade-like and uniform in height. In *E. rupicolum* the costae are occasionally very much thickened to form varices and those in-between are much reduced in height and thickness.

This species is found from low water to depths of about 33 fathoms.

*Range.* WESTERN ATLANTIC: From Lake Worth, Florida, Bermuda and the Gulf of Mexico, south through the West Indies to Tobago in the Lesser Antilles. EASTERN ATLANTIC: On the Atlantic coast of France from Finistere south; the western Mediterranean and the coast of Africa south to Liberia and the Gold Coast.

*Records.* EASTERN ATLANTIC: CORSICA: (AMNH; MCZ). SICILY: Palermo; Messina (both MCZ). ITALY: Porto Mourizio (MCZ). ALGERIA: Gulf of Oran (MCZ); Algiers (Bergens Museum). CANARY ISLANDS: Teneriffe (AMNH); Grand Canary Island (MCZ). GOLD COAST: Accra (MCZ). LIBERIA: Monrovia (MCZ).

WESTERN ATLANTIC: FLORIDA: Lake Worth; Boynton Beach (both T. McGinty); Biscayne Bay (J. Weber); Virginia Key (T. McGinty; J. Weber); Key Largo; Tea Table Key (both Univ. of Miami); Tavenier Key (USNM); Lower Matecumbe Key; Washerwoman Key (both J. Schwengel); Grassy Key; Boca Chica Key (both N. E. Schmidt); Bahía Honda Key (A. Soper); Missouri Key; Pelican Shoals; Middle Sambo Shoals (all T. McGinty); 5 mi. S.E. of Sombrero Light in 33 fathoms (L. A. Burry); Key West (ANSP); Garden Key and Loggerhead Key, Tortugas (USNM); Marco (J. Weber); Sanibel Island (MCZ); off Fort Walton in 13-19 fathoms (L. A. Burry). BERMUDA: (AMNH; USNM). BAHAMA ISLANDS: West End and Eight Mile Rock, Grand Bahama Island; North Bimini (all MCZ); Nassau, New Providence; South Bimini and Gun Cay, Bimini Islands (all T. McGinty); Arthurstown, Cat Island (MCZ); Cay Sal, Cay Sal Bank (R. Humes); Matthewtown, Great Inagua (MCZ); Rocky Point, Acklin Island (USNM). CUBA: Cape San Antonio (Univ. of Michigan); Cape Cajon, *Tomas Barrera*, station 211; Cardenas (both USNM); Vedado, Habana (C. G. Aguayo); Habana (ANSP; Univ. of Michigan); Cayo Francés, Caibarién (MCZ); Cayo Santa Maria, Camagüey (R. Humes); Guantánamo (MCZ); Aquadores, near Santiago, Oriente (M. Jaume); Punta de los Colorados, Cienfuegos (MCZ). HISPANIOLA: Les Cayes; Aquin, both Dept. du Sud, Haiti; Saltrou, Dept. de l'Ouest, Haiti (all USNM); Jérémie, Haiti (MCZ); Les Trois Pavillons, Dept. du Nord-Ouest, Haiti; Gonave Island, Haiti (both USNM); Monte Cristi; Puerto Plata; Puerto Sosua, all Santo Domingo (all MCZ); Bahía de Samaná, Santo Domingo (USNM). PUERTO RICO:

Arroyo (USNM); Mona Island (MCZ); Parguera (N. T. Mattox); San Juan (N. Athearn); E. of Boca de Congrejos (Univ. of Michigan); Cajo de Muertos, off Ponce (AMNH; N.T. Mattox). JAMAICA: Montego Bay (MCZ; Charleston Mus.); Robins Bay and Jacobs Bay, St. Mary; Port Royal (all USNM). VIRGIN ISLANDS: St. Croix (MCZ; ANSP); St. Thomas (MCZ; USNM); St. John (MCZ); Guana Island, Tortola (M. W. Dewey). LESSER ANTILLES: Antigua (MCZ; USNM); St. Bartholomew

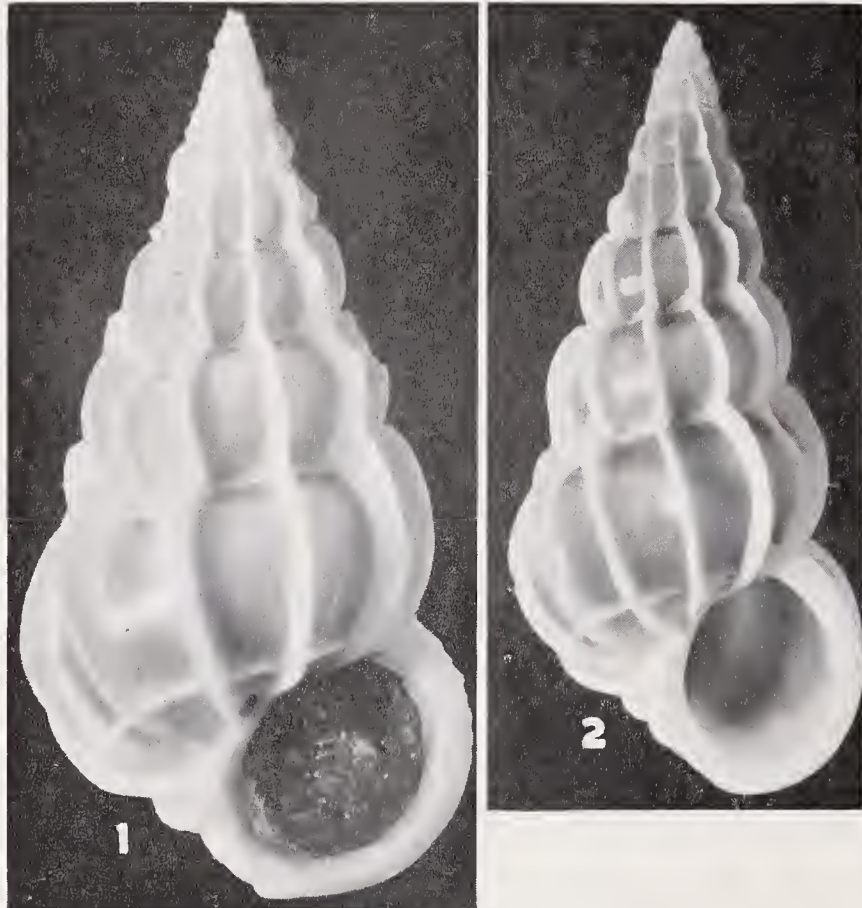


Plate 129. *Epitonium lamellosum* Lamarck

Fig. 1. Biscayne Bay, Florida (4.1x). Port Salut, Dept. du Sud, Haiti (4 $\frac{1}{4}$ x).

(B. Hubendick); St. Martin (MCZ; B. Hubendick); Martinique; Guadeloupe (both ANSP); Dominica (USNM); Barbados (MCZ; F. G. Kellett; USNM); Bucco Reef and Anse Fourmi, Tobago Island (both MCZ). CARIBBEAN ISLANDS: Swan Island (MCZ); St. Andrews Island (ANSP); Curaçao (AMNH); Ruatan Island, Bay Islands (USNM). MEXICO: Cabo Catoche, Yucatan (A. del Valle); Isla Mujeres, Yucatan (USNM). COLOMBIA: Santa Marta; near Cartagena (both USNM).

### *Epitonium* (*Gyroscaia*) *rupicolum* Kurtz

#### Plate 130

*Scalaria lineata* Say 1822, Journal Academy Natural Sciences, Philadelphia 2, p. 242 (inhabits the southern coast [of the United States]); Say 1831, American Conchology No. 3, *Scalaria*, pl. 27, two lower left figures; Gould 1870, Invertebrata of Massachusetts, Boston, p. 312 [description only, not the figure]; non *Scalaria lineata* Kiener<sup>1</sup>; non *E. lineatum* Röding 1798.

<sup>1</sup> Kiener (1839, Iconographie des Coquilles Vivantes 10, p. 6, pl. 2, fig. 5; pl. 6, fig. 20) is completely wrong regarding this species of Say. Sowerby in 1844 referred Kiener's species to the Philippines and in addition he complicated the problem by calling the species *lineolata*. This was followed by de Boury who had

*Scalaria rupicola* Kurtz 1860, Catalogue of the Recent Marine Shells found on the Coast of North and South Carolina, Portland [Maine], p. 7 (Fort Johnson, South Carolina); Clench 1946, Nautilus **60**, p. 71.

*Scalaria unicastata* Sowerby 1873, Conchologia Iconica **19**, Scalaria, pl. 8, fig. 55 (America).

*Scalaria fischeriana* Tapparone-Canefri 1876, Journal de Conchyliologie **24**, p. 152 (new name for *unicostata* Sowerby non *uncinaticosta* d'Orbigny.) [The name *uncinaticosta* d'Orbigny is not, however, a homonym of *unicostata* Sowerby as considered by Tapparone-Canefri.]

*Epitonium reynoldsi* Sowerby 1916, Proc. Malacological Society London **12**, p. 74, pl. 3, fig. 4 (Florida).

*Scalaria sublineata* de Boury<sup>2</sup> 1918, Journal de Conchyliologie **64**, p. 38 [nomen nudum].

**Description.** Adult shell reaching about 20 mm. (about  $\frac{3}{4}$  inch) in length, imperforate and possessing numerous blade-like or rounded, axial costae. Color whitish or light yellowish with two brownish, spiral bands at the suture. The brownish color may become somewhat diffused, though generally the spiral bands show up much darker. In very young specimens there may be but a single band and that at the lower margin of each whorl. Very rarely specimens occur which are very dark brown all over, the darker bands being barely visible. The costae are always white or slightly tinged with brown in the banded area. Whorls eleven, globose, strongly convex and attached. Spire extended forming an angle of 35° to 40°. Aperture subcircular. Outer lip generally slightly reflected and usually moderately thickened. The number of varices varies greatly, adult specimens possessing from one to as many as six. The parietal wall and columella are not definable as the aperture is nearly holostomatous. Suture well defined and very deep. Sculpture consisting of numerous and rather low, blade-like costae. The rounded costae are usually varices produced during the earlier stages in the animal's growth. The costae are variable both in number and height on the various specimens and occasionally they are hardly produced above the shell surface. The costae of one whorl are not necessarily lined up with those of the whorl above. There are from 12 to 18 costae on the body whorl. Basal ridge well developed but usually existing as a very thin, thread-like line. Nuclear whorls two and devoid of sculpture. Operculum thin, corneous, yellowish in color and paucispiral.

length	width	whorls	
25	11.5 mm.	$9\frac{3}{4}$	Tampa, Florida
20.5	8.5	$8\frac{1}{2}$	Smith's Island, Virginia
19.4	10	$9\frac{1}{2}$	Peconic Bay, Southold, New York
18.5	8	$10\frac{1}{2}$	Gulfport, Florida
15.5	6.8	$9\frac{1}{2}$	Marco Island, Florida

**Types.** Say's type of *S. lineata* is probably not in existence, at least it is not in the Academy of Natural Sciences, Philadelphia where many of his types are to be found. Say did not delimit his type locality other than "inhabits the southern coast." The

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created a new subgenus (*Lineoscala*) with the type *S. lineolata* Kiener. All this resulted from the fact that Kiener never described the species but only gave figures for a species and variety, both of which were very different but were given under the name of *lineata*.

<sup>2</sup> It is utterly impossible to understand de Boury's reasoning in proposing this name along with others in this particular paper. There is no description and his reference to Dall (1890, Transactions Wagner Free Institution of Science, Philadelphia **3**, p. 158) is only to a series of localities and Dall's subsequent reference to a description of the living *E. lineatum* Say. In this particular paper de Boury created new names for several late tertiary specimens of this and other species without making any attempt whatsoever to examine the original material.

whereabouts of the type of *S. rupicola* Kurtz is unknown. The type locality is Fort Johnson, South Carolina.

*Remarks.* Except for lower Florida this species is well distributed from Cape Cod, Massachusetts to Texas and is fairly common throughout its range. This species occurs from just below low water to depths of about 20 fathoms.

It is exceedingly unfortunate that the well known name of *lineatum* Say must be relegated to the synonymy as a homonym because Röding used the same name many years before. The first available name is that of J. D. Kurtz who described a dark form of *Scalaria lineata* under the name of *S. rupicola*. His description is exceedingly brief, but the single character of brown coloration on the shell proper and the white ribs defines only this species among all known to us from this area of the Western Atlantic. The following is the entire original description as given by Kurtz.

"*Scalaria rupicola* Kurtz, n.s. length .5 in., divergence  $48^\circ$  whorls brown, ribs white; in the crevices of stones. Ft. Johnson, S.C."

There is considerable color variation within this species, certain specimens becoming quite dark where the brownish color has become diffused throughout most of the shell. In general, the color is limited to the two spiral bands which margin the suture.

*Range.* Provincetown, Massachusetts south to Florida and west to Texas.

*Records.* MASSACHUSETTS: Provincetown (J. Weber); South Harwich Beach; Dennisport; Hyannis; Woods Hole (all MCZ); Wareham (J. Miller); Marion; New Bedford (both MCZ); off Gay Head, Martha's Vineyard in 10 fathoms (J. Miller); West Jetty, Nantucket (D. Taylor). RHODE ISLAND: Sakonnet in 2 fathoms (J. Miller). NEW YORK: Sag Harbor; Southold; Orient, all Long Island (all R. Latham); Bayville, Long Island (MCZ); Staten Island (USNM). NEW JERSEY: off New England Creek, Dela-

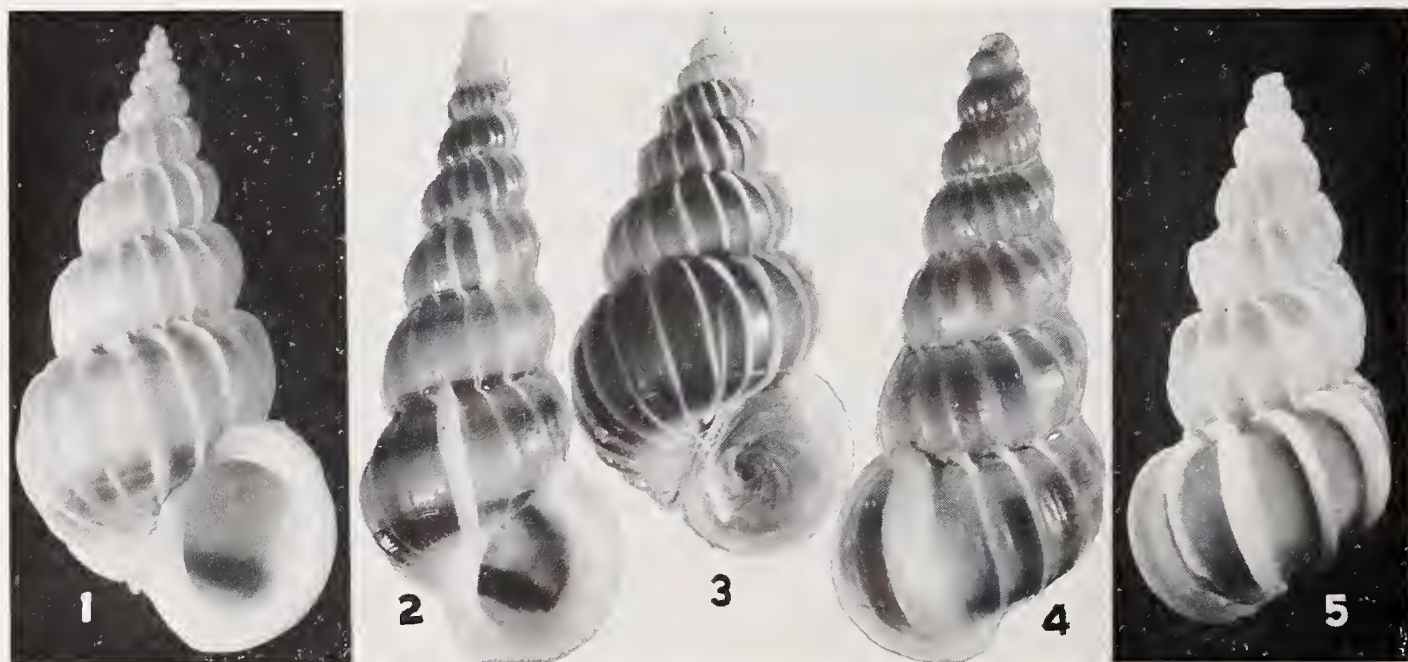


Plate 130. *Epitonium rupiculum* Kurtz

Fig. 1. Lake Worth, Boynton, Florida (4x). Fig. 2. Marco Island, Florida (about  $4\frac{1}{2}x$ ). Fig. 3. Lake Worth, Boynton, Florida (4.2x). Fig. 4. Smith's Island, Virginia ( $4\frac{1}{4}x$ ). Fig. 5. Sanibel Island, Florida ( $4\frac{1}{2}x$ ).

ware Bay (USNM). DELAWARE: off Bowers (USNM). MARYLAND: Town Point, Little Choptank River (R. Jackson); Parkers Creek, Calvert Co., Chesapeake Bay; Benedict; Plum Point Wharf; off Gibson Island, *Fish Hawk*, station 8533 (N. Lat.  $39^{\circ}02'$ ; W. Long.  $76^{\circ}22'$ ) in 7 fathoms; off Cove Point, *Fish Hawk*, station 8524 (N. Lat.  $38^{\circ}21'$ ; W. Long.  $76^{\circ}22'$ ) in 4 fathoms (all USNM). VIRGINIA: Chincoteague Island; Magothy Bay, Chesapeake Bay; Smith's Island; off Smith's Point Light, Chesapeake Bay, *Fish Hawk*, station 8383, (N. Lat.  $37^{\circ}53'$ ; W. Long.  $76^{\circ}05'$ ) in 6 fathoms; off Cape Henry, *Fish Hawk*, station 8595 (N. Lat.  $36^{\circ}57'$ ; W. Long.  $76^{\circ}00'$ ) in 12 fathoms (all USNM). NORTH CAROLINA: off Cape Hatteras in 16 fathoms; off Cape Lookout Bight, *Eolis*, station 20 (both USNM); Beaufort (Univ. of Michigan; USNM); Shackleford Island (MCZ). SOUTH CAROLINA: Cape Romain; Pawley's Island; Mt. Pleasant; Isle of Palms; Sullivan's Island; Charleston Harbor; Folly Island; Edisto Island; off Edisto River in 3-7 fathoms; Eddingsville Beach (all Charleston Museum); May River (USNM). FLORIDA: St. Augustine (USNM); near Daytona (E. Bates); Cape Canaveral (Charleston Museum); Cocoa Beach (MCZ); Palm Beach Inlet (T. McGinty); South Lake Worth; Yamata, Palm Beach Co. (both Univ. Miami); Fort Lauderdale (L. A. Burry); Bird Key, Biscayne Bay, *Eolis*, station 13 (USNM); off Fort Walton (L. A. Burry); Clearwater (ANSP); Gulfport in 2 fathoms (MCZ); St. Petersburg (T. McGinty; J. Weber); Crescent Beach, Sarasota (N. E. Schmidt); Egmont Key, Tampa Bay (L. A. Burry); Useppa Island (MCZ); Punta Gorda (J. Weber); Sanibel Island (MCZ); Fort Myers Beach (N. E. Schmidt); Marco Island (E. Bates; N. E. Schmidt); Cape Romano (USNM). MISSISSIPPI: Gulfport (J. Weber). LOUISIANA: Cameron; Grand Lake; Cameron Co. (both USNM); Baratavia Bay, Grand Isle (A. Walsh). TEXAS: Galveston (T. Pulley); Matagorda Bay and Keller Bay, Calhoun Co. (both USNM); Port Aransas (T. Pulley; J. Hedgpeth); Corpus Christi (USNM).

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### Notes

In our previous number (*Johnsonia* no. 29, p. 243) we used *Ferminoscala* as a subgenus of *Amaca*. We unfortunately overlooked a paper by K. van Winkle Palmer in which it was shown that *Ferminoscala* Dall is a synonym of *Scalina* Conrad.

The following is the synonymy as we now understand it.

#### Genus *Amaca* H. and A. Adams

##### Subgenus *Scalina* Conrad

*Scalina* Conrad 1865, American Journal of Conchology **1**, p. 27.

*Ferminoscala* Dall 1908, Bull. Museum Comparative Zoölogy **43**, p. 315 (subgenotype, *Epitonium* (*Ferminoscala*) *ferminianum* Dall [not *ferminoscala* as we had it in error]).

*Elegantiscala* de Boury 1911, Journal de Conchyliologie **58**, p. 216 (subgenotype, *S. elegantissima* Deshayes).

*Scalina* Conrad, Palmer 1937, Bulletins American Paleontology **7**, no. 32, p. 102 (subgenotype, *Scalina staminea* Conrad, subsequent designation, Palmer 1937).

### *Epitonium eburneum* Potiez and Michaud

*Scalaria eburnea* Potiez and Michaud 1838, *Galerie des Mollusques* 1, p. 344, pl. 31, figs. 1-2 (locality unknown).

It is impossible to tell just what this species may be as the poor figures could represent any of several forms. The few casual remarks given regarding the differences between this and *Epitonium lamellosum* Lamarck and *Opalia australis* Lamarck are far too superficial to be of any significant value. We suggest it should be dropped from the list of Western Atlantic species.

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### Book Review

Dezallier D'Argenville 1742: *L'Historie Naturelle Eclaircie dans deux de ses parties principales: La Lithologie et La Conchyliologie*, Paris, 4to., pp. viii+492, 33 pls. The brilliant French Court of Louis XV lavishly and ostentatiously supported the arts and sciences, and it is not surprising that D'Argenville's work appeared in the midst of the War of the Austrian Succession. Plates 6-33 illustrate mollusks. They are well done and for the most part easily recognizable. It is because of the figures that the work still commands our attention, for many of these cuts were referred to by Linné and subsequent authors, and many are the type figures of our Western Atlantic mollusks. The work also contains a history of conchology and a report on the principal shell cabinets then to be found in Europe.

In 1757, a second edition of the conchological section was printed with 41 plates, 1-29, 1-3, 1-9. Two of these plates portray the soft parts of the mollusks. Both of these editions appeared anonymously, but it is evident from the dedication that very little concealment of identity was intended.

D'Argenville had a high opinion of his ability as a conchologist, bumptiously asserting that his works were "un monument eternal." Johnston (1850, *Introduction to Conchology*, London, p. 503) says however, "He was a mere amateur, and had no idea of a naturalist beyond his capacity for ticketing a cabinet."

The second edition was translated into German and appeared in Vienna in 1772 under the title, *Dezallier von Argenville's Conchyliologie oder Ubhandlung von den Schnecken Museheln*, &c. It contains the same plates as the second edition but in a somewhat different order, plates 1-28, 1-9 (1-3 being numbered 10-12).

D'Argenville died in 1763, but in 1780 a third edition of the work appeared under the title, *La Conchyliologie ou Historie Naturelle des Coquilles* edited by De Favanne de Moncervelle, father and son. This greatly enlarged edition consists of two quarto volumes and an atlas of 80 plates, three engraved frontispieces, and a portrait of D'Argenville. The plates are not easily collated with the other editions. This edition was to have consisted of 5 volumes with an atlas of plates. Only two were published. Seventy-two pages of volume three were printed but were never distributed.

All of these various editions of D'Argenville have as a frontispiece an engraving done by the celebrated French artist of the period, Francois Boucher.—RICHARD I. JOHNSON