

Two new species of *Epitonium* (Gastropoda: Epitoniidae) from the western Atlantic

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ABSTRACT. Two new *Epitonium* species from eastern Florida, the Gulf of Mexico and Puerto Rico are described and compared with similar congeners. Special attention is given to *E. championi* Clench & Turner, 1952, the most similar to the two proposed new taxa.

INTRODUCTION

In June, 2005, faculty members and graduate student in the Biology Department at the University of Louisiana, Lafayette went on a research expedition to Bahía de Campeche, southern Gulf of Mexico, on board the R/V Pelican, a research vessel operated by the Louisiana Universities Marine Consortium (LUMCON). Results of this expedition have been reported elsewhere (García, 2006, 2007, 2008a, 2008b, 2008c). This area of the Gulf, located in the southwest quadrant, has been poorly sampled. The single campaign in 2005 increased the known diversity of the area from 575 to 674, that is by 17% (Rosenberg et al., 2009: 584).

Among the interesting material dredged in 120 hauls in Bahía de Campeche, there was an epitoniid species, collected at only two consecutive stations. Although there have been 56 species of Epitoniidae recorded from the Gulf of Mexico (Rosenberg et al, 2009: 583), the Campeche specimens defied identification. The species looked similar to *Epitonium championi* Clench & Turner, 1952, a taxon that had been erroneously reported from the Gulf of Mexico (García & Lee, 2002:11; Rosenberg et al., 2010: 641); however, upon close inspection of the holotype of *E. championi* and other type material, important differences came to light. Moreover, after studying other epitoniids from the Gulf and elsewhere, mostly from the Harry G. Lee collection, a second undescribed species was revealed that had been hitherto identified as *E. championi* and *E. turritellula*. This was a very surprising find, as the species inhabits a large area, at least from Texas and Louisiana to Sanibel Island, northeast Florida and Puerto Rico.

This study proposes two new *Epitonium* taxa and scrutinizes them against their most similar congener, *E. championi*, as well as other less- likely congeneric taxa.

Abbreviations

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

EFG: author's collection.

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

HMNS: Houston Museum of Natural Science, Houston, Texas, USA.

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

MCZ: Museum of Comparative Zoology, Cambridge, Massachusetts, USA.

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

UNAM: Universidad Nacional Autónoma de México, Ciudad México, México.

USNM: United States National Museum, Washington, D.C., USA.

spec: specimen(s).

SYSTEMATICS

Family **EPITONIIDAE** S. S. Berry, 1910

Genus *Epitonium* Röding, 1798

Type species: *Turbo scalaris* Linnaeus, 1758 by subsequent designation by Suter (1913).

Epitonium championi Clench & Turner, 1952

Figs 1-12, Table I

Material examined. Holotype MCZ 182900 length 11.5 mm, width 4.6 mm, Massachusetts, Cape Cod, Hyannis, Lewis Bay (Figs 1-5); 3 paratypes, MCZ 162585 Massachusetts, Martha's Vineyard, Gay Head (see Figs 6 and 7) ; 6 spec.; Emerald I., North Carolina, 34°40'1"N 77°0'49"W (HMNS 47485); Stone Harbor, New Jersey, 39°02'8"N 74°46'03"W (HMNS 47484) (Fig. 9), 1 spec.; Florida, Duval County, off Big Talbot I., 10-20 m (see Figs 10 to 12) (HGL); 2 spec., Florida, Duval County, S.Jacksonville Beach (see Fig. 8) (HGL); 1 spec., Florida, Duval County, Fort George(HGL).

Distribution. South coast of Cape Cod, Massachusetts to Duval County, NE Florida.

Original description. " Shell reaching about 14 m (1/2 inch in length, attenuate, imperforate, rather solid

and strongly sculptured. Whorls 10 to 11, convex and attached. Color a flat white to a light cream. Aperture subcircular, with both the palatal and parietal margins thickened. The palatal or outer lip being greatly thickened in older specimens. Columella short and arched. Spire extended and produced at an angle of 20°. Suture moderately impressed. Axial sculpture consisting of 8 or 9 flattened cord-like, slightly impressed costae which are rather variable as to width. Spiral sculpture consisting of 19 to 20 flattened ridges, those nearest the umbilical area being a little narrower. Basal ridge absent. Operculum thin, paucispiral and brown in color. Nuclear whorls 2 1/2 to 3, smooth and opaque" (Clench and Turner, 1952:318).

Discussion. In their original description Clench and Turner (1952:318) described *E. championi* as having flattened, cord-like axial costae and flattened spiral ridges. Later on, in their "Remarks," they elaborate on this distinctive sculpture, stating that it "appears much like a basket weave in which the upright and outer struts (the axial costae) are woven tightly, causing the horizontal weave (the spiral ridges) to bulge outwardly between the struts" (p. 319). This peculiar character of the species is clearly seen on Fig. 4, a close-up of the holotype, and Fig. 12, a specimen dredged off Duval County, Florida.

The authors subsequently state that *E. championi* "is perhaps a divergent element of *E. candeanum*, in which both axial and spiral sculpture have had an excess of development" (p. 319); however, *E. candeanum* has blade-like axial costae and a microsculpture of axial and spiral threads. Clench & Turner did not observe the presence of a microsculpture in the type material of *E. championi*, nor did I on examining them. This character was also lacking from all the specimens examined, including those from northeast Florida (see Figs 4 & 12). The juxtaposition of *E. candeanum* and *E. championi*, i.e., blade-like vs. cord-like axial costae, has led to the misidentification of the species described herein as *E. leali*, which does show the cord-like (although not very flattened) costae of *E. championi* but also a microsculpture between the axial elements lacking in the latter. Other differences will be shown in the discussion of the former.

The maximum reported size of *E. championi* is 13.7 mm (Rosenberg, 2009); however, I have examined a specimen from the Houston Museum of

Natural Science (No. 47484) that measures 17mm (Fig. 9).

Although Dr. Lee's collection shows that *E. championi* is well-represented in NE Florida, the specimens of *Epitonium "championi"* from the Gulf of Mexico that I have examined, as well as the specimen shown in the *Encyclopedia of Texas Seashells* (Tunnell et al, 2010:190) are misidentifications.

***Epitonium leali* n. sp.**

Figs 13- 26, Table II

Epitonium championi Clench & Turner, 1952- García & Lee, 2002:11.

Epitonium championi Clench & Turner, 1952- Lee, 2009: 95, fig. 454.

Epitonium championi Clench & Turner, 1952- Rosenberg et al., 2010:641.

Epitonium turritellula (Mörch, 1875)- Tunnell et al., 2010: 193.

Type material. Florida, Gulf County, St. Joe Bay, Palm Point, 29°48'29"N 85°17'52"W. Holotype USNM 1150471 length 9.7 mm, width 3.6 mm (Figs 13-17) ;1 paratype SBMNH 149690 (Fig. 18); 1 paratype BMSM 17956 1 paratype EFG 29966; 7 paratypes HGL all from the type locality.

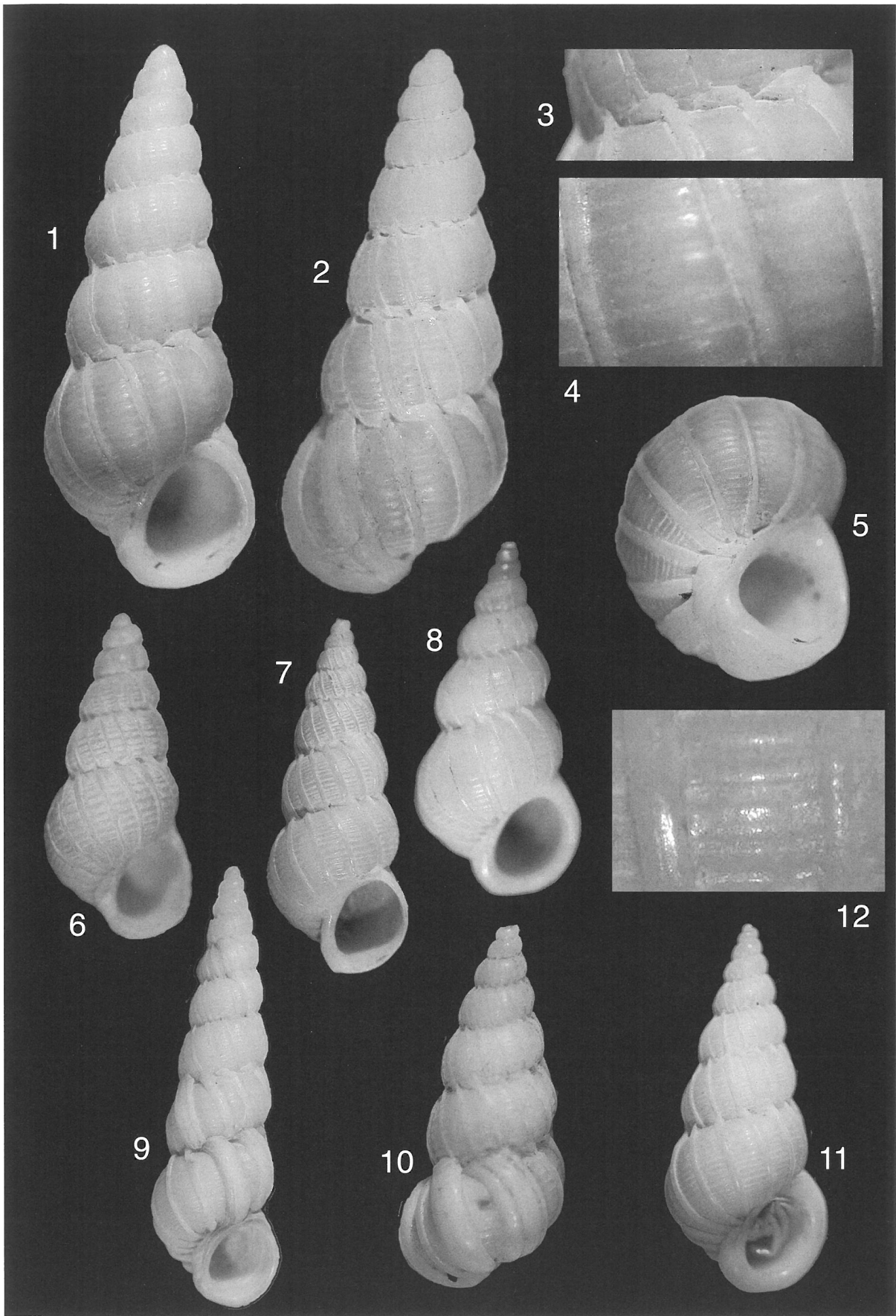
Type locality. Florida, Gulf County, St. Joe Bay, Palm Point, 29°48'29"N 85°17'52"W.

Other material examined. Puerto Rico: San Juan, Isla Verde, 18° 25' 39" N, 66° 0' 36" W (Figs 24-26)(1 spec., HGL). **Florida:** Duval County, off Big Talbot I., 10-20 m (7 spec. HGL)(see Figs 19 and 20) ; Lee County, Sanibel Island ,26°27'N 82°01' W (3 spec.; BMSM 5687, BMSM 25698, BMSM 25708)(see Fig. 21); west end of St. Vincent I., 29.66° N 85.13° W (HMNS 47413). **Louisiana:** Terrebonne Parish, Isles Derniers, 29°3'41.44"N, 90°57'1.51"W (1 spec., HGL; 2 spec. EFG 10350)(see Fig. 23). **Texas:** Heald Bank 29°12.5'N, 92°10.8'W, 10-13 m (1 spec., EFG 12861); Nueces Co, Port Aransas, 27° 50' 1" N, 97° 3' 39" W (2 spec., HGL)(see Fig. 22); San Luis Pass, Galveston, 29°5'2"N 95°7'12"W (HMNS 39743);

Distribution. Puerto Rico, east Florida, west Florida, Louisiana, Texas.

Figures 1-12. *Epitonium) championi* Clench & Turner

1-5. Massachusetts, Cape Cod, Hayannis, Lewis Bay. Holotype MSZ 182900 length 11.5 mm,width 4.6 mm. **6.** Massachusetts, Martha'sVineyard, off Gay head. Paratype, 5.9 mm, **7.** Massachusetts, Martha'sVineyard, off Gay head. Paratype, 9.2 mm **8.** Florida, Duval County, S.Jacksonville Beach, 4.6 mm (HGL). **9.** New Jersey, Stone Harbor, 39°02'8"N 74°46'03"W, 17 mm (HMNS 47484), **10.** Florida, Duval Co., off Big Talbot Island, 10-20 m, 8.4 mm (HGL). **11-12.** Florida, Duval Co., off Big Talbot Island, 10-20 m, 7.7mm (HGL).



Description. Holotype (Figs 13-17) 11.5 mm in length, attenuate (width/ length ratio 0.37). Protoconch damaged, remaining whorl smooth, white. Teleoconch of 8 moderately convex, joined whorls. Suture relatively deep. Axial ornamentation on early whorls of 16 or 17 narrow, well- defined, rounded costae, some becoming varicoid starting on fourth whorl; at least one varix per whorl after fourth; costae diminishing in number on later whorls, 10 on last whorl; posterior terminal embedding into suture, joining earlier whorl (Fig. 15); axial interspaces approximately 3 to 4 times as wide as costae, except where varical formations occur; 4 strong varices on last whorl. Spiral sculpture of 14 or 15 cords between sutures; cords uneven in strength, narrower than interspaces (Fig. 16); interspaces ornamented with numerous microscopic axial threads, which wrinkle top of spiral cords as they cross over (Fig. 16); base of last whorl convex, developing a shallow chink at umbilical area (Fig. 17). Aperture elongate-ovate, complete, with strong, wide labral varix, narrower on parietal side. Operculum unknown. Shell pale pinkish-tan with white axial costae.

Discussion. There is very little variation in all the material studied, other than number and position of varices and slight variation in number of axial costae. Compare holotype Figs 13, 15 and 16 with Figs 24, 25 and 26, the specimen from Puerto Rico; also, see Table II. Some specimens from deeper water have a tendency to develop a more capacious last whorl, which also causes them to have a stronger umbilical depression (Figs 19 and 20). Fresh specimens, such as those from the type locality and the specimen from Puerto Rico (Figs 24 to 26), have a pale pinkish-tan shell with white axial costae; all other specimens are white.

This new species has been confused with *Epitonium championi*, from which it differs by having more rounded axial costae which embed into a deeper suture (Compare Fig. 3 with Figs 15 and 26), in having narrower spiral cords that do not “bulge”, in having a secondary microsculpture in the axial interspaces (Compare Figs 4 and 12 with Figs 16 and 25), and in generally having a narrower shell (width/ length ratios 0.36 vs 0.40). Although some specimens of *E. leali* do approach the same ratio as *E. championi*, this is due to the strong development of the last whorl.

Epitonium leali may also be confused with *Epitonium pigrum* n. sp. The differences between the two taxa will be treated in the discussion of the latter.

Epitonium tiburonense Clench & Turner, 1952 is superficially similar to *E. leali*, but the former is smaller; the holotype having 9 whorls at only 6.8 mm in length. Moreover, *E. tiburonense* has evenly distributed non- varicoid axial costae which “form a thickened pad” (Clench & Turner, 1952: 305) in the umbilical area, and lacks the secondary microsculpture of *E. leali*.

Although *Epitonium turritellula* Mörch, 1874 has been confused with the new species (Tunnell et al., 2010: 93), the former only grows to 6.5 mm (Rosenberg, 2009), producing 10 whorls at only 6.4 mm in length (Clench & Turner, 1952: 298). Also, *E. turritellula* has blade- like, more numerous costae (about 20 on last whorl) that tend to “peak” at the suture, giving the appearance of narrowly coronated whorls.

Although all of the specimens of *Epitonium leali* in this study were collected empty, it seems that the species inhabits very shallow water in the Gulf of Mexico, as most specimens have been collected at beaches from southwestern Florida to Texas.

Etymology. Named for Dr. José H. Leal, Director of the Bailey- Matthews Shell Museum, Sanibel, Florida and Editor of the prestigious malacological journal *The Nautilus*. This taxon honors him for his accomplishments in the field and for his willingness to help both personally and in his capacity as the Director of the Bailey-Matthews Shell Museum.

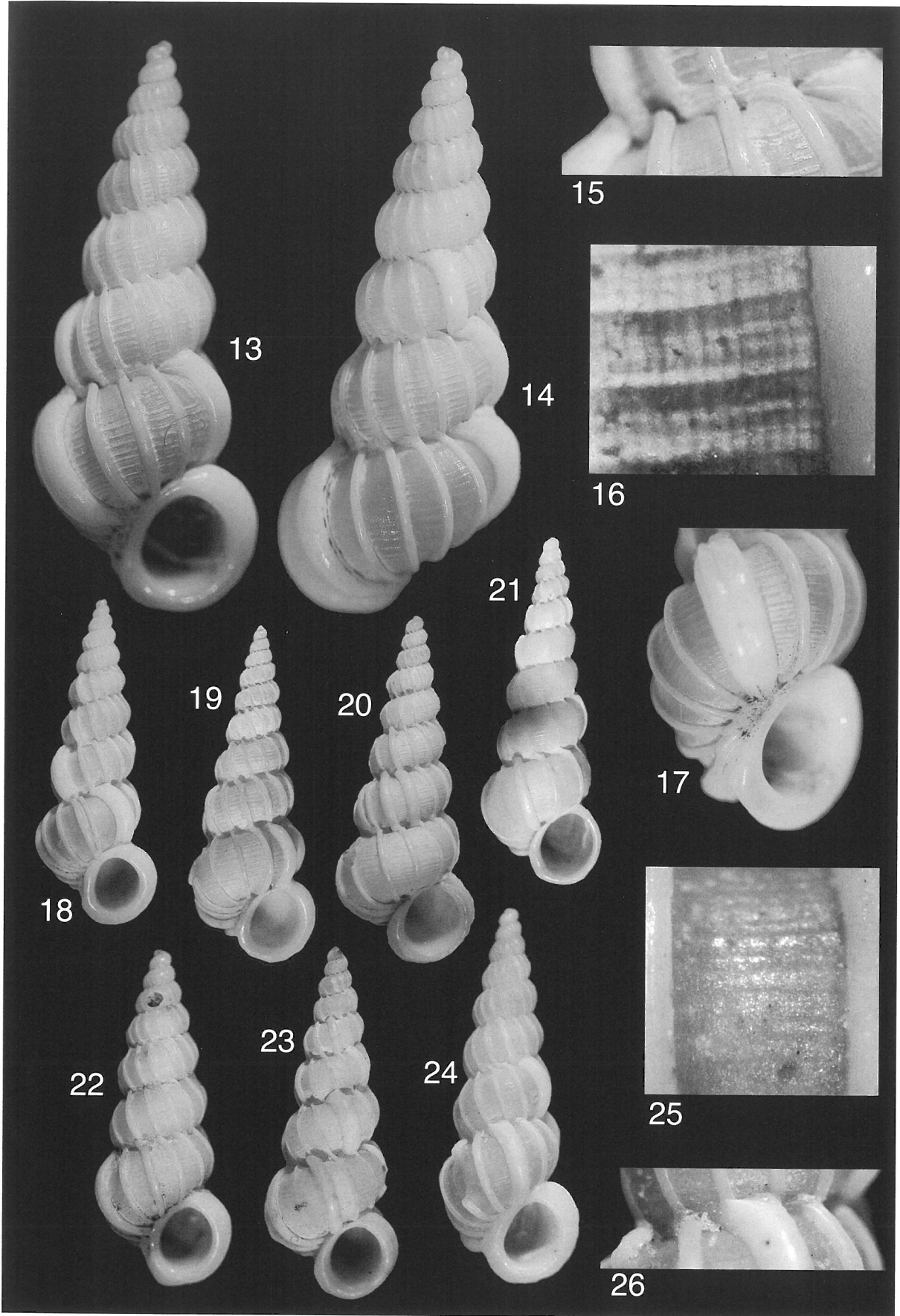
***Epitonium pigrum* n. sp.**

Figs 27- 40, Table III

Type material. Mexico: Bahía de Campeche, 20°51.49'N, 92°21.44'W, in 63-65 m. Holotype USNM1150470 length 11.5 mm, width 4.3 mm; 1 paratype MCZ 373765 (Fig. 32); 1 paratype UNAM; 1 paratype EFG 26207 (Figs 33-34) 1 paratype BMSM 17957 (Fig. 35); 1 paratype SBMNH 149689 (Fig 36); 1 paratype HGL (Fig. 37). Bahía de Campeche, 20°52.40'N, 92°24.83'W, in 77-81 m; 1 paratype LACM 3189 (Fig. 38), 1 paratypes EFG 26273 (Figs 39-40).

Figures 13-26. *Epitonium leali* n. sp.

13-17. Florida, Gulf County, St. Joe Bay, Palm Point, 29°48'29" N 85°17'52" W. Holotype USNM 1150471 length 9.7 mm, width 3.6 mm. **18.** Florida, Gulf County, St. Joe Bay, Palm Point, 29°48'29" N 85°17'52" W. Paratype SBMNH 149690 11mm. **19.** Florida, Duval County, off Big Talbot I., 10-20 m, 14 mm (HGL). **20.** Florida, Duval County, off Big Talbot I., 10-20 m, 13.5 mm (HGL). **21.** Florida, Lee County, Sanibel Island, 26°27'N 82°01' W, 18.5 mm (BMSM 25708). **22.** Texas, Nueces Co, Port Aransas, 27°50'1" N, 97°3'9" W, 8.5 mm (HGL) **23.** Louisiana, Terrebonne Parish, Isles Derniers, 29°3'41.44"N, 90°57'1.51"W, 11.5 mm (EFG 10350). **24- 26.** Puerto Rico, San Juan, Isla Verde, 18°25'39" N, 66° 0' 36" W, 9 mm (HGL).



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

Other material examined. **Louisiana:** 28°05'N, 90°59'W, in 114 m (HMNS 39750); 28° 37.920'N, 90° 36.550'W, in 22 m (EFG 23531). **Texas:** SSE of Freeport, 28°15'N, 95°0'W (HMNS 39734); Heald Bank, SSE of Galveston, 29°08'N, 94°01'W (HMNS 39735); S. of Galveston, 29°55'N, 94°41'W, in 20 m (HMNS 39736); SE of Freeport, 28°19'N, 94°29'W, in 50 m (HMNS 39737); off Galveston, 28°52'N, 94°42'W, in 22 m (HMNS 39738); off Galveston, 29°16'N, 94°29'W, in 16 m (HMNS 39740); off Galveston, 28°21'N, 94°53'W (HMNS 39744); 30 mi. off Port Isabel, in 22-28 m (HMNS 39745); off Galveston, 28°18'N, 94°28'W, in 50 m (HMNS 39746); off Matagorda peninsula, 28°35'41"N, 95°58'59'W, in 15 m (HMNS 39747); Padre I., in 4 m (HMNS 39748); off Padre I., in 22 m (HMNS 39749)

Distribution. Western Gulf of Mexico: Bahía de Campeche, Mexico; Texas and Louisiana, USA

Description. Holotype (Figs 27-31) 11.5 mm in length, imperforate, attenuate (width/ length ration 0.37). Protoconch conical, smooth, glassy, with a brownish band on shoulder of whorls, of approximately 4 whorls; transition to teleoconch delineated by growth scar and change in opacity. Teleoconch of 9.5 convex whorls; whorls rapidly increasing in width. Suture relatively shallow, crossed by axial ornamentation. Axial sculpture of approximately 22 thin, erect costae on early whorls; costae curving adaperturally, slightly flattening, as they cross over suture, pasting on to the earlier whorl, some forming inconspicuous "peaks" (Fig. 29), decreasing in number, becoming more cord- like on later whorls; 17 costae on last whorl; varices forming randomly starting at the end of fifth whorl; 3 varices on last whorl; microscopic axial wrinkles showing on interspaces between axial costae. Spiral sculpture of primary cords of uneven strength; microscopic spiral wrinkles appearing between them, creating pustulose surface as they cross axial elements (Fig. 30); spiral ornamentation not crossing over axial elements; approximately 12 primary cords on early whorls,

increasing in number on later whorls. Base of shell solid; umbilical area covered by parietal thickness (Fig. 31). Aperture oval; parietal and labral margins thickened; labral margin becoming patulose anteriorly, parietal margin narrowing at posterior end. Shell milky-white with slight satin luster.

Discussion. The main characters of the paratypes are consistent with those of the holotype; there is some expected variation in the number of axial costae (see Table III), and in the number and placement of varices.

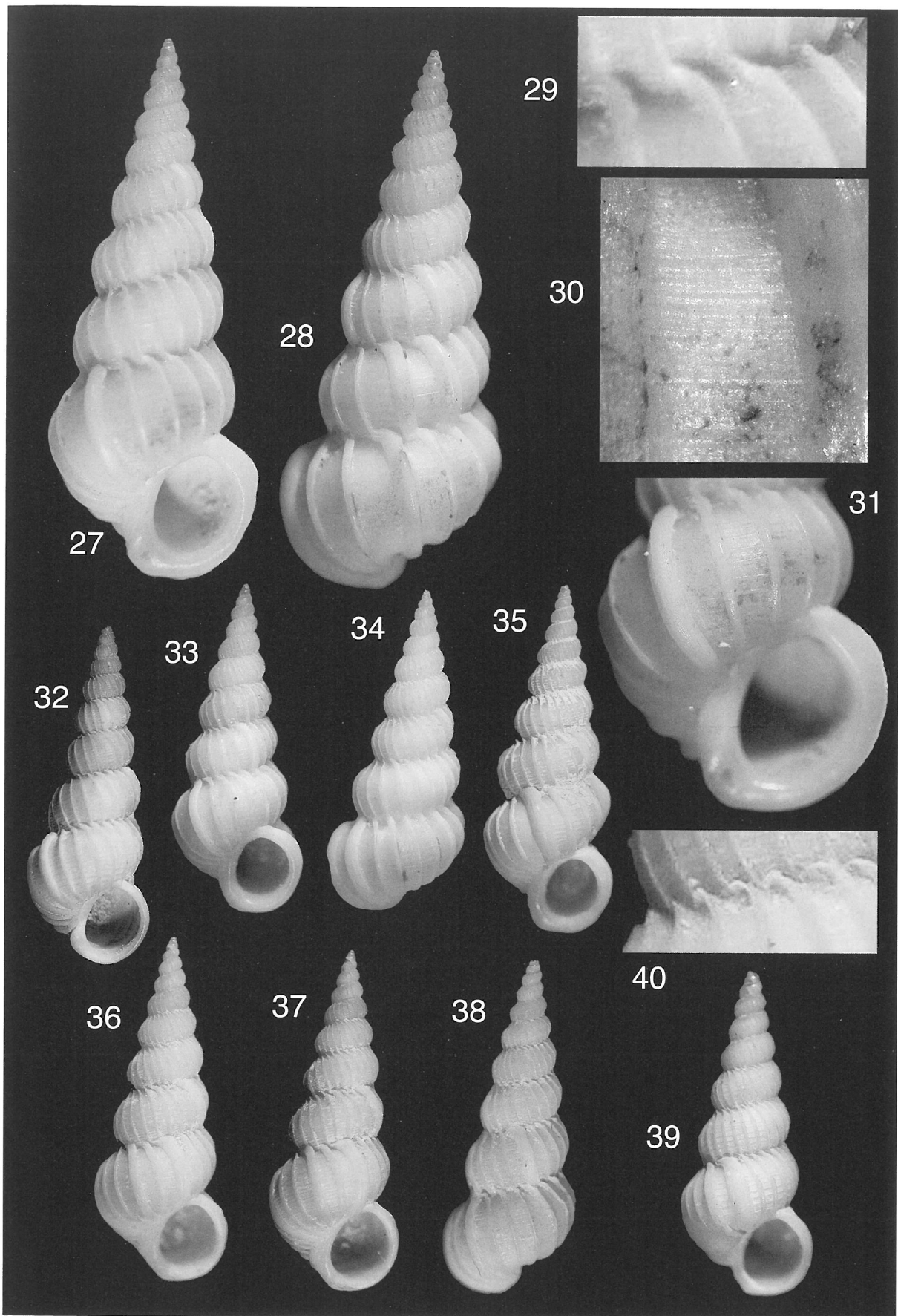
Epitonium pigrum is most similar to *E. leali* n.sp. They both have the same general proportions, a number of varicoid axial costae and similar microsculpture on interspaces. However, *E. pigrum* has more numerous axial costae on early whorls (22 vs. 15) and on the last whorl (15 vs. 10), a shallower suture, and a solid umbilical area without a chink (compare Figs 7 and 35). More importantly, the production of the terminals of the axial costae of the two species as they cross the suture are quite different: *E. pigrum* produces flattened costae which curve adaperturally and adhere to the previous whorl; *E. leali* maintains the rounded costae which embed into the deeper suture and do not turn adaperturally (compare Figs 15 and 26 with Figs 29 and 40). Although both species inhabit the coastal areas of Louisiana and Texas, fresh specimens of *Epitonium leali* can be found on beaches while *E. pigrum* inhabits offshore banks.

Epitonium championi is also similar to *E. pigrum* in general shape, and the production of the terminals of the axial varices is similar, particularly when the specimens are not fresh (compare Fig. 3 with Figs 29 and 40); however, *E. championi* has fewer axial costae on early whorls (16 vs. 22) and on the last whorl (10 vs. 15), has more flattened axial costae, wider spiral cords that "bulge" out, and lacks a microsculpture (compare Figs 4 and 12 with Fig. 30).

Etymology. From the Latin *pigrum* (adjective meaning lazy), referring to the relatively large number of prominent varices, presumably periods of rest.

Figures 27-40. *Epitonium pigrum* n. sp.

27-37. Mexico, Bahía de Campeche, 20°51.49'N, 92°21.44'W, 63-65 m. 27-31. Holotype USNM 1150470 length 11.5 mm, width 4.3 mm. 32. Paratype MCZ 373765 33-34. Paratype BMSM 17957 35. Paratype SBMNH 149689 36. Paratype LACM 3189 37 Paratype EFG 26207 38-40. Mexico, Bahía de Campeche, 20°52.40'N, 92°24.83'W, 77-81 m 38. Paratype HGL col. 39-40. Paratype EFG 26273.



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TABLES

Abbreviations: **H:** Holotype; **P:** Paratype; **BT:** Big Talbot I., NE Florida; **Ft.G.:** Fort Geroge, NE Florida; **HB:** Healds Bank, Texas; **ID:** Isles Derniers, Louisiana; **JX:** Jacksonville Beach, NE Florida; **NJ:** Stone Harbor, New Jersey; **PA:** Port Aransas, Texas; **PR:** Isla Verde, N. Puerto Rico; **SI:** Sanibel Island, W Florida; **SJB:** St. Joe Bay, NW Florida; **SL Pass:** San Luis Pass, Galveston, Texas.
- Juvenile specimens were not included in the tables below.

TABLE I. *Epitonium championi* Clench & Turner, 1952

Specimen	Number of whorls	Length in mm	Width in mm	W/L ratio	Number of early axial costae	Number of axial costae last whorl
H Figs 1-5	7	11.5	4.6	0.40	14	9
P Fig. 7	7	9.2	3.6	0.39	16	11
BT	7.5	10	3.8	0.38	16	10
BT Fig. 11	7	7.7	3.2	0.42	16	10
BT	6	7.5	3.5	0.47	16	9
BT	6	7.1	3.1	0.44	18	9
BT Fig.10	6	8.4	3.5	0.42	17	10
BT	7.5	8.8	3.8	0.43	16	10
Ft.G.	6	5.7	2.2	0.39	18	11
N.J. Fig. 9	8	17	5	0.29	16	9
Average				0.40	16	10

TABLE II. *Epitonium leali* n. sp

Specimen	Number of whorls	Length in mm	Width in mm	W/L ratio	Number of early axial costae	Number of axial costae last whorl
H Figs 13-17	8	9.7	3.6	0.37	16	9
P SJB	9	9.9	3.5	0.35	16	8
P SJB Fig. 18	9	11	3.8	0.35	16	10
P SJB	7	10.7	4.2	0.39	14	10
P SJB	8.5	10.7	4.0	0.37	14	10
P SJB	8	9.4	3.6	0.38	16	10
P SJB	6.5	9.8	3.6	0.37	14	9
P SJB	8	8.5	3.2	0.38	16	11
P SJB	9	10	3.8	0.38	12	9
P SJB	8	9.0	3.3	0.37	16	10
PSJB	6.5	7.7	2.8	0.36	14	10
BT Fig. 19	8.5	14.0	5.3	0.38	15	10
BT Fig. 20	8.5	15.8	6.3	0.40	15	10
BT	8.5	13.5	5.0	0.37	16	11
BT	8	12.1	4.9	0.40	16	10
BT	8	8.0	3.0	0.38	18	9
BT	9	10.2	3.6	0.35	13	10
BT	8	7.2	2.7	0.38	17	9
HB	6.5	4.0	1.7	0.42	12	12
PA Fig. 22	7.5	8.5	3.5	0.41	16	10
PA	7.5	7.4	2.7	0.37	18	11
ID Fig. 23	8	11.5	4.3	0.37	13	10
ID	7.5	9.8	3.8	0.39	13	9
ID	7.5	10.7	4.5	0.42	14	9
PR Figs 24-26	8	9	3.2	0.36	15	9
SI	7.5	16.2	5.8	0.36	11	11
SI	8.5	18.6	6.3	0.34	9	10
SI Fig. 21	8.5	18.5	6.3	0.34	12	10
SL Pass	7	9.2	3.6	0.39	16	9
Average				0.36	15	10

TABLE III. *Epitonium pigrum* n. sp.

Specimen	Number of whorls	Length in mm	Width in mm	W/L ratio	Number of early axial costae	Number of axial costae last whorl
H Figs 27-31	9.5	11.5	4.3	0.37	22	16
P Fig. 32	10	11	4	0.36	23	16
P	9.5	12.6	4.3	0.34	19	15
P Figs 33-34	8.5	10.9	4.1	0.38	23	15
P Fig. 35	8	11	4	0.36	24	15
P Fig. 36	7.5	9.6	3.7	0.39	22	15
P Fig. 37	8.5	11.6	4.3	0.37	20	13
Average				0.36	22	15