The family Cerithiopsidae (Mollusca: Gastropoda) in Cuba

4. The genus *Cerithiopsis* s. l., the banded and the variably coloured species

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Abstract: Seventeen species of the genus *Cerithiopsis* s. l. from Cuba, all of them with a banded teleoconch in brown and white or with a variable colour, are studied. Nine species were previously known, but a positive identification remained impossible for one of them. Six species are described as new to science, and two more are not named due to the limited amount of material available. Lectotypes for *C. ara* and *C. io* are designated. The morphology of the shell and the protoconch of all of them are discussed and an identification key for all the species is given. The morphological differences are shown in a table. A list of all the taxa included in *Cerithiopsis* in some works and originating from the Caribbean and nearby areas is given, likewise showing their actual taxonomic value and synonyms.
An addendum to the study on brown shells is presented at the end, with new information on other species previously mentioned in other works and a further new species is described.

Resumen: Se estudian 17 especies de *Cerithiopsis* s. l. encontradas en Cuba y que tienen la teloconcha con bandas de color castaño y blanco, o tienen coloración variable. Nueve especies eran previamente conocidas, aunque una de ellas ha sido identificada con dudas. Se describen seis especies como nuevas para la ciencia, y dos más no reciben nombre debido a la escasez del material disponible. Se designan lectotipos para *Cerithiopsis ara* y *C. io*. Se discuten y comparan todas las especies según la morfología de la concha y protoconcha de cada una de ellas, y se presenta una clave de identificación para las especies estudiadas. Finalmente, se hace una lista de todos los taxones del Caribe y de zonas próximas que en alguna ocasión se han encontrado incluidas en *Cerithiopsis,* indicado su consideración taxonómica actual, validez y sinónimos.
Al final del trabajo se hace un addendum a las especies con concha castaña aportando nueva información sobre especies ya mencionadas en otros trabajos y describiendo una nueva especie.

Palabras clave: GASTROPODA, CERITHIOPSIDAE, *Cerithiopsis,* Cuba, especies nuevas, Caribe, lista de taxones.

Introduction:

This work is a sequel to previous studies on CERITHIOPSIDAE from Cuba (Rolán & Espinosa, 1992a, 1992b, 1996). In the latter, the shells with a brown colour were studied. In the present work species with brown and white bands, or shells with a variable colouration are studied and described.

Some species with such colour patterns were already described by C.B. Adams (1850a, 1850b); Dall & Bartsch (1911); Bartsch (1911); Nowell-Usticke (1959, 1969); De Jong & Coomans (1988).

Other general works have shown species of this family from the Caribbean or nearby areas, like Warmke & Abbott (1961), Abbott (1974), Vokes & Vokes (1983), Rios (1985), Ode (1989) and Díaz Merlano & Puyana Hegedos (1994).

Material and methods:

The material studied was collected by the authors in many places in Cuba, most in individual samples, most by diving. Other material was separated from sediments collected during these diving sessions or after dredgings. Some samples were obtained during the expeditions organized by the 'Universidad Autónoma de Madrid and the Universidad of La Habana'.

Abbreviations:

AMNH American Museum of Natural History, New York
BMNH The Natural History Museum, London
DBUA Departamento de Biologia Universidad Autonoma, Madrid
IES Instituto de Ecología y Sistemática
MCZ Museo of Comparative Zoology, Cambridge
MNCN Museo Nacional de Ciencias Naturales, Madrid
MNHN Museum national d'Histoire naturelle, Paris
USNM United States Natural History, Smithsonian Institution, Washington
ZMA Zoologisch Museum, Amsterdam
ZSM Zoologische Staatssammlung, München

CCR collection of C. Redfern
CER collection of E. Rolán
CFG collection of R. Fernández-Garcés

sp shells with soft parts
s empty shells
f fragments
j juveniles

The species included in the present work have white and brown colour bands, and sometimes brown bands with a variable colour intensity. The species with a variable colour, yet banded in some varieties have also been included.

Species key:

- species with rounded nodules in the crossing points of ribs and cords 1
- the nodules in the crossing points are sharp pointed 16

1 - species with a shell with constant colour spiral bands 2
- species variable in colour, sometimes with bands less evident 14

2 - the upper spiral cord on the last whorl is white ..... *Cerithiopsis ara*
- the upper spiral cord on the last whorl is brown or yellow 3

3 - the upper spiral cord is brown 4
- the upper spiral cord is pale yellow or not regular 12

4 - the first upper spiral cord is brown, the colour is a little extended to the suture, and the second spiral cord is cream or light brown ..... *Cerithiopsis lata*
- the brown band is very narrow and the second spiral cord is white 5

5 - the third spiral cord is brown ..... *Cerithiopsis* cf. *pesa*
- the third spiral cord is white 6

6 - shell short, teleoconch with about 5 whorls or fewer 7
- shell large, teleoconch with more than 5 whorls when adult 9

7 - protoconch with 2 whorls ..... *Cerithiopsis vicola*
- protoconch with 4 whorls 8

8 - shell solid, brown cord well marked ..... *Cerithiopsis io*
- shell fragile, only exceptionally 5-6 whorls, very light brown colour ..... *Cerithiopsis beneitoi* spec. nov.

9 - shell relatively wide, with concave base and numerous axial ribs ..... *Cerithiopsis cruzana*
- shell with base not concave, axial ribs less numerous 10

10 - protoconch yellow or light brown ..... *Cerithiopsis familiarum* spec. nov.
- protoconch white 11

11 - spirals cords 1-2 at same distance as 2-3 ..... *Cerithiopsis dilata* spec. nov.
- spirals cords 1-2 closer than 2-3 ..... *Cerithiopsis iuxtafuniculata* spec. nov.

12 - three spiral cords 13
- shell with only two spiral cords ..... *Cerithiopsis* sp. 1

13 - the colour of the upper spiral cord is interrupted by light nodules; few axial ribs, a small cord on the suture ..... *Cerithiopsis infrequens* spec. nov.
- the colour of the upper spiral cord is continuous but very pale; numerous axial ribs, no sutural cord ..... *Cerithiopsis* sp. 2

14 - shells with variable colour: from white to brown, sometimes with bands, protoconch not very wide ..... *Cerithiopsis albovittata*
- shells variable in colour but usually yellow or light brown, sometimes with bands, protoconch wide at its base 15

15 - protoconch not sharply pointed, rounded at apex ..... *Cerithiopsis parvada* spec. nov.
- protoconch sharply pointed and brown at the apex ..... *Cerithiopsis flava*

16 - spiral cord 1 depressed and nodules of spiral cords 2 and 3 sharply pointed ..... *Cerithiopsis warmkae*

Results:

Family CERITHIOPSIDAE H. Adams & A. Adams, 1853

Genus *Cerithiopsis* s. l. H. Adams & A. Adams, 1853

Remarks: CERITHIOPSIDAE is a family with many species and a worldwide distribution, ranging from arctic to tropical seas and from the intertidal zone down to 3000 m deep (Marshall, 1978).
It is close to the family TRIPHORIDAE Gray, 1847 and both belong to the superfamily TRIPHOROIDEA Gray, 1847 (Bouchet & Rocroi, 2005).
Marshall (1978) mentioned numerous genera in his revision but, as in Triphoridae (see Marshall, 1983; Bouchet, 1984; Rolán & Fernández-Garcés, 1993a, 1993b, 1994, 1995), the separation into genera must be based on a better knowledge of the soft parts, radulae or DNA. In the meantime, we only distinguish a few genera and most of the species are included in *Cerithiopsis* s. l.

Cerithiopsis ara Dall & Bartsch, 1911
Figs 1, 2, 56 & 91.

Cerithiopsis ara Dall & Bartsch, 1911. *Proc. U. S. Nat. Mus*., 40 (1820): 282, pl. 35, fig. 1. [Type locality: Bermuda].
Cerithiopsis contrapupa Nowell-Usticke, 1969. *A supplementary list of new shells of St. Croix*, p. 8. [Type locality: Virgin Islands].

Type material: Bermuda: Lectotype (Fig. 91), designated herein, and 13 paralectotypes in USNM nº 221612.

Other material studied: Cuba: 9 s, 1 f with protoconch, 40 m, Rancho Luna (CER); 1 s and 2 f with protoconch, 56 m, Faro de los Colorados, Cienfuegos (CER); 1 s, Cienfuegos (IES); 1 s, Cienfuegos (CFG). Trinidad: 1 s, 1 j, 1 f, Chaguaramas Bay (MCZ 356072).

Description: See Dall & Bartsch (1911), Nowell-Usticke (1969), Ode (1989) and Redfern (2001).
The protoconch is not described in the original description, being mentioned as decollated. It was described in De Jong & Coomans (1988) and we hereby figure one protoconch from the material collected in Cuba (Fig. 56); the protoconch has 4 1/4 whorls, the first one with spiral cords and the subsequent one with axial ribs crossed by small spiral threads.
The upper cord of the teleoconch is white; on the body whorl this subsutural cord is divided into two of which only the uppermost one is white.

Distribution: This species has been recorded from Bermuda (type locality), Bahamas (Redfern, 2001), Dutch Caribbean Islands (De Jong & Coomans, 1988), Virgin Islands (Nowell-Usticke, 1969), northwest of the Gulf of Mexico (Ode, 1989) and Cuba.

Remarks: This is the only species of this group with a white subsutural cord. All other species show a brown subsutural cord.
C. cynthia Bartsch, 1911 has also got a white first subsutural spiral cord, but the shell is larger, with 7 whorls or more, and the three spiral cords are well developed from the first whorls onwards.

Cerithiopsis lata (C.B. Adams, 1850)
Figs 3-6, 57, 58, 92 & 93.

Cerithium latum C.B. Adams, 1850. *Contribution to Conchology,* 7: 122. [Type locality: Jamaica].
Cerithiopsis buijsei De Jong & Coomans, 1988. *Marine gastropods from Curaçao, Aruba and Bonaire*, p. 47, pl. 3, sp. 228. [Type locality: Curaçao and Aruba].

Type material: Holotype (Fig. 92) MCZ (186134). Holotype of *Cerithiopsis buijsei* (Fig. 93), ZMA (3.87.069).

Other material studied: Cuba: 1 sp, Punta Varadero, 10-12 m (IES); 1 s, 20 m, Cayo de los Indios (CER); 8 sp and 5 s, Rancho Luna (CER); 1 s, Rancho Luna (IES); 2 s, Los Canarreos Archipelago (CER); 5 s, 2 j Cienfuegos, 20 m (CFG); 3 s, Cienfuegos, 30 m (CFG); 3 s, Cienfuegos, 30 m (IES); 30 s, Cienfuegos 10-30 m (CER); 2 s, Cayo Cantiles (CER). Nicaragua: 3 s, Cayo Witties, 8 m (CER). Mexico: 4 s, Puerto Morelos, Yucatan, 6 m (CER).

Description: See Adams (1850b) and Clench & Turner (1950).
Protoconch is not present, neither in the holotype of *C. lata* nor in *C. buijsei*. Several protoconchs were studied in the material from Cuba (Figs 57, 58). It has about 4 whorls or a little less, is milk white and smooth.
Teleoconch with a band of light brown which includes the suture and the subsutural cord (nodules lighter); spiral cord 2 is sometimes white and sometimes slightly brown, but lighter than the upper one, or only with brown in the internodular spaces. One further spiral cord at the base: brown with lighter nodules.

Below this fourth spiral cord the base may totally be brown or white, only leaving the lower end of the siphonal canal brown. Animal whitish with very small spots behind the eyes and in the dorsal part of the foot.

Distribution: This species has been recorded from Jamaica (type locality), Dutch Islands (De Jong & Coomans, 1988), Bahamas (Redfern, 2001), Puerto Rico (Warmke & Abbott, 1961), the northwest of the Gulf of Mexico (Ode, 1989), and Cuba, Nicaragua and Yucatan in the present work.

Remarks: We have compared the holotypes of *C. lata* and *C. buijsei* and the only differences found were that the brown band reaches the second spiral cord and that the nodules are a little smaller in the latter. These differences are not important and we consider both conspecific. Variation in the morphological characteristics of the shell are numerous in the studied material. The differences with other species will be exposed below in the remarks for the following species.

Cerithiopsis cf***. pesa*** Dall & Bartsch, 1911
Figs 7 & 94.

Cerithiopsis pesa Dall & Bartsch, 1911. *Proc. U. S. Nat. Mus*., 40: 283, pl. 35, fig. 10. [Type locality: Bermuda].

Type material: Holotype (Fig. 94) and 2 paratypes, (USNM 221616).

Other material studied: Cuba: 1 s, 4 m, Jibacoa Beach, north of Cuba (CER).

Description: See Dall & Bartsch (1911).
Protoconch: the holotype has a brown protoconch which consists of 2 whorls. The shell collected in Cuba has a white protoconch, with only little less than 2 smooth whorls.
Teleoconch with three spiral cords from the beginning onwards. The colour is a typical characteristic: the suture and spiral 1 are dark brown; spiral 2 is white and spiral 3 is light brown.

Distribution: The species has been recorded from Bermuda (type locality), and now also from Cuba.

Remarks: The differences in the colour of the protoconch of the type specimen and our material and the form of the shell could be enough to consider both different. Yet, we have not got enough material to know the specific variability, and so, we provisionally keep this shell in this taxon and await future finds.

Cerithiopsis vicola Dall & Bartsch, 1911
Figs 8, 59 & 112.

Cerithiopsis vicola Dall & Bartsch, 1911. *Proc. U. S. Nat. Mus.*, 40(1820): 284, pl. 35, fig. 12. [Type locality: Bermuda].

Type material: Not examined (in Bermuda Museum). Original representation (Fig. 112).

Other material studied: Cuba: 2 s, 20 m, Cayo Los Indios (IES); 2 s, 4 m, Punta Francés, Isla de la Juventud (DBUA).

Description: See Dall & Bartsch (1911) and Redfern (2001).
Protoconch (Fig. 59) white, smooth, consisting of 2 1/2 whorls.
Teleoconch with brown upper nodular cord, rest cream or yellowish (almost white in eroded specimens). Three cords at the beginning of the first whorl.
Redfern (2001, fig. 302C) described and figured the soft parts.

Distribution: The species has been recorded from Bermuda (type locality), Bahamas (Redfern, 2001) and Cuba.

Remarks: This species can be distinguished from other similar species (like *C. lata*) by its short protoconch. Other species with short protoconch, like *C. pesa*, have two colour bands and one white band.

Cerithiopsis io Dall & Bartsch, 1911
Figs 9-12, 60 & 95.

Cerithiopsis io Dall & Bartsch, 1911. *Proc. U. S. Nat. Mus*., 40(1820): 285, pl. 35, fig. 3. [Type locality: Bermuda].

Type material: Cotype (hereby designed as lectotype) (Fig. 95) (USNM 221615).

Other material studied: Cuba: 3 s, Los Canarreos Archipelago (CER); 5 s, 4 m, Jibacoa (CER); 1 s, Comodoro Hotel, La Habana (CER); 3 s, Rancho Luna, Cienfuegos (CER); 7 s, 45 m, Cienfuegos Bay (CER); 1 s, Cienfuegos Bay (IES); 1 s, Cayo Los Indios (IES); 1 s, Rancho Luna (IES); 6 s, 3 j, Cienfuegos (CFG); 1 s, La Herradura, La Habana (CER). México: 2 s, Puerto Morelos, Yucatan, 6 m (CER).

Description: See Dall & Bartsch (1911).
Protoconch (Fig. 60) examined in juveniles of this species is white and with about 4 or a little fewer smooth whorls without any sculpture.
Teleoconch with the subsutural cord totally dark brown, as well as the nodules and the interspaces, without differences between them. The nodules are a little larger than in the other ribs, especially on the last whorl. The colour of the spiral band is clearly delimited, not reaching the suture or the other cords. Spiral cords 2 and 3 are totally white. In the last whorl, a new spiral cord appears below and it is brown, narrow, and also with nodules in the same colour. The base may have a brown blotch.

Distribution: The present species has been recorded from Bermuda (type locality), Bahamas (Redfern, 2001), Dutch Islands (De Jong & Coomans, 1988), Cuba and Mexico.

Remarks: Most of the shells studied were decollated; only few adults and some juveniles kept the protoconch.

- *C. io* has a uniformly brown colour, which is narrow and very limited at spiral cord 1, thus it can be distinguished from *C. lata* because the latter has a lighter brown subsutural cord and the nodules on this cord are lighter. The dark colour in *C. lata* is extended up to the suture and also often reaches the interspace with spiral cord 2 (mainly at the end of the last whorl), which never occurs in *C. io*. The nodules in the first whorls of the teleoconch are smaller in *C. lata*, and larger in *C. io*. The fourth cord at the periphery of the last whorl is wider in *C. lata* and the nodules too are wider and lighter in colour. These differences seem to be rather constant without intergradations.
- *C. vicola* has a paucispiral protoconch. *C. pesa* also has a paucispiral protoconch and spiral cord 3 is brownish.

Cerithiopsis beneitoi spec. nov.
Figs 13-16, 61 & 62.

Type material: Holotype (Fig. 14) 2.9 mm, in MNCN (15.05/47008). Paratypes in the following collections: AMNH (1), MNHN (1), USNM (1), IES (6), ZSM (1), BMNH (1), CER (12), CFG (4) all from the type locality; IES (1) from Cayo Los Indios, DBUA (1) from La Herradura, La Habana, DBUA (1) Punta Francés, 4 m.

Other material studied: 1 s, Cayo Witties, Nicaragua (CER).

Type locality: Rancho Luna, Cienfuegos Bay, at 45 m.

Etymology: After Ramón Beneito, malacologist from Tarragona, Spain.

Description: Shell (Figs 13-16) small, ovoid-elongate, fragile. Protoconch (Fig. 61) white, consisting of 4 whorls, apparently smooth, with a small spiral cord on the lower part of the whorls close to the suture. Under magnification, small riblets may be seen (Fig. 62) in the suture. Teleoconch of about 4-7 whorls, slightly convex, with three nodulous spiral cords, which appear from the beginning. These spiral cords are of similar size and regularly separated. The upper one is less prominent, and has a slightly brown colour in a narrow band. The other two are white, as well as the suture. At the periphery, one other narrow brown nodulous cord appears, and below, another, scarcely prominent cord is present in a concave area. The base is white. The aperture is rounded, the siphonal canal is short and open.

Distribution: Known from northern and southern Cuba and from Nicaragua.

Remarks: The present species could be the one represented in Ode (1989) as *Joculator brassica* Olsson and Harbison, 1953.

Cerithiopsis beneitoi spec. nov. must be compared with the following species:

- *C. lata* has a wider and more solid shell, the brown colour is darker and includes the suture and sometimes spiral cord 2; the number of axial ribs is smaller, and its protoconch has neither a spiral cord nor riblets at the suture.

- *C. io* also has a wider and more solid shell, the brown colour is well-marked on the whole of spiral cord 1, the nodules are larger; there is not a concave area below the periphery and the base is brown. The protoconch has not got any sutural riblets.

Cerithiopsis cruzana Nowell-Usticke, 1959
Figs 17, 63 & 64.

Cerithiopsis cruzana Nowell-Usticke, 1959*. A check list of the marine shells of St. Croix U. S. Virgin Islands with random annotations,* p. 43, pl. 2, fig. 17. [Type locality: Long Reef, Christian-sted, St. Croix].

Type material: Not examined.

Other material studied: Cuba: 2 s, 4 m, Jibacoa (CER); 1 s, Cayo los Indios (CER); 3 s, Cienfuegos (CFG); 1 s, Cienfuegos (IES); 4 s, 1 j, 50 m, Faro de los Colorados (CER); 1 j, Canarreos (CER); 1 s, Rancho Luna (CER). Mexico: 3 s, 1 f, Puerto Morelos, Yucatan, 6 m (CER).

Description: See Nowell-Usticke (1959). The description is very short, but the holotype is representative.
Protoconch (Fig. 63) with almost 5 smooth and white whorls (in spite of the three ones mentioned in the original description, because the protoconch was broken at the apex); the lower whorls are scarcely wider than the first ones (as shown in the figure of the holotype). Under magnification, it is possible to see an elevation like a step near the lower suture (Fig. 64).
Teleoconch with at least 6 whorls, even reaching up to 8 whorls; the subsutural cord is dark brown, except in the first two whorls where it is almost invisible. The colour is limited to the first spiral cord and does not reach the suture; this cord is always narrower than the other two, the nodules smaller, and the colour band very limited. At the beginning of the teleoconch there are three cords; spiral cords 1-2 may be a little closer in first whorls. Base totally white.
At the base, a new brown cord appears, but very fine and narrow. From the periphery, the profile of the base is concave and white, and this base is more extended than the aperture, which is slightly oval.

Distribution: The present species has been recorded from the Virgin Islands (type locality), Dutch Caribbean Islands (De Jong & Coomans, 1988), northwest of the Gulf of Mexico (Ode, 1989), and Cuba and Mexico in the present work.

Remarks: This species has been synonymized with *C. albovittata* C.B. Adams, 1850, but the colour and the protoconch are different (see below).
The differentiation with other species with brown and white bands is as follows:

- *C. lata* is smaller, usually with less than 6 teleoconch whorls, the profile is ovoid, the subsutural cord is wider, the brown band is also wider, the colour partially extended to spiral cord 2, and the nodules are lighter; the base is short, not concave, and usually with a brown colour; the protoconch has not got any cords.

- *C. vicola* has a smaller, paucispiral protoconch and spiral cord 1 is wider.

- *C. io* has a smaller shell, with a brown base. Spiral cord 1 of the teleoconch is wider and darker, brownish from the first whorl onwards; the protoconch has not got any spiral cords.

- *C. beneitoi* spec. nov. is smaller, more fragile, the brown band is very narrow and with a very light colour, the protoconch has sutural riblets.

See **Remarks** in the following species.

Cerithiopsis familiarum spec. nov.
Figs 18-20, 65 & 66.

Type material: Holotype (Fig. 18), 4.3 mm, in MNCN (15.05/47009). Paratypes in the following collections: AMNH (1), MNHN (1), USNM (1), MCZ (1), IES (2), CFG (1), CER (8) all from the type locality; BMNH (1) from Jibacoa, ZSM (1) from Rancho Luna, 45 m.

Type locality: Faro de los Colorados, 50 m, Cienfuegos.

Etymology: The specific name honours the authors' families, who helped us in many aspects with the present and other works.

Description: Shell (Figs 18-20) nearly cylindrical, solid, not transparent.
Protoconch (Figs 65, 66) wide, light brown or yellowish coloured, 4.4-4.5 whorls, with a prominent cord on the lower part, close to the suture, and some large riblets placed on this suture.
Teleoconch with about 6-8 whorls. Subsutural spiral cord 1 narrow, less prominent and smaller than spiral cords 2 and 3, which are of equal size. The brown colour of spiral cord 1 begins on the first whorl of the teleoconch, it is not so limited but extended to the suture; the base is uniformly light brown. Aperture rounded, siphonal canal short.
Animal milkish white with small green spots behind the eyes.

Distribution: This species is only known from Cuba.

Remarks: This species can easily be distinguished from *C. lata* and *C. io* by its teleoconch of 6-8 whorls. Furthermore, these two species have a protoconch without sculpture.

- *C. cruzana* has a very narrow spiral cord 1, and sometimes the brown colour of this spiral cord begins after 1-2 whorls; the protoconch is white and lacks riblets.

- *C. beneitoi* spec. nov. is smaller, more fragile, the brown colour almost invisible, not present in the suture, and the protoconch has smaller riblets just above the suture.

Cerithiopsis dilata spec. nov.
Figs 21-22 & 67.

Type material: Holotype (Fig. 21) 3.7 mm, in MNCN (15.05/47.010). Paratypes: AMNH (1), IES (1), USNM (1), CER (1), CFG (1) all from the type locality.

Other material studied: Cuba: 2 f, Cienfuegos 25-40 m (CER). Nicaragua: 1 s, Cayo Witties, 8 m (CER).

Type locality: Cienfuegos, Cuba.

Etymology: The specific name is derived from the Latin word *dilatus* which means "be different" as an allusion to the similarity and differences with the previous species.

Description: Protoconch (Fig. 67) wide, whitish about 4.2 whorls, with a prominent cord just on the suture. Teleoconch with about 7-8 whorls. The subsutural spiral cord is narrow, less prominent and smaller than spiral cords 2 and 3 in the first 3-4 whorls; the three are equal in later whorls. The brown colour of spiral cord 1 begins on the second or third whorl of the teleoconch, it is limited to this spiral cord and not extended to the suture; the base is uniformly white. Aperture rounded, siphonal canal short.

Distribution: The present species is known from Cuba and Nicaragua.

Remarks: This species can easily be distinguished from *C. lata* and *C. io* by its teleoconch of 7-8 whorls and its larger shell. Furthermore, these two species have a protoconch without sculpture.

- *C. cruzana* has a wider shell; the base is concave; the protoconch is white and narrow.

- *C. beneitoi* spec. nov. has a smaller and more fragile shell, the suture is more evident, the upper spiral cord is narrow and light brown; the protoconch is narrower and with a spiral cord more distant from the suture, in which there are small riblets.

- *C. familiarum* spec. nov. has a wider shell with a darker upper cord, the colour almost reaches the suture and the base is white; protoconch light brown or yellowish, wider, with very evident riblets in the suture.

Cerithiopsis iuxtafuniculata spec. nov.
Figs 23-26, 68-70.

Type material: Holotype (Fig. 23) 3.7 mm in MNCN (15.05/47.011). Paratypes in the following collections: AMNH (1), USNM (1), MNHN (2), BMNH (2), CFG (8), CER (22), all from the type locality; IES (1) from Cayo Los Indios; DBUA (1) from Cayo Avalos; ZSM (2) from Los Canarreos Archipelago.

Type locality: Rancho Luna, Cienfuegos.

Etymology: The specific name is derived from the Latin words *iuxta* "close to" and *funiculata* "cords" alluding to the proximity of the upper two cords.

Description: Shell (Figs 23-26) ovoid elongate, solid.
Protoconch (Figs 68, 70) with about 4 whorls, apparently smooth, but a spiral cord can be seen near the suture under high magnification; small riblets just on it, and small tubercles (Fig. 69) above the suture.
Teleoconch of about 7 whorls each with three spiral cords; spiral cord 1 is slightly smaller and closer to spiral cord 2 in most of the spire. The brown colour of the band is visible from the second whorl of the teleoconch onwards and increases in the following one; it is well marked, but does not reach the suture. At the periphery of the last whorl, a new brown spiral cord appears, but it is very narrow and smaller in size than spiral cord 1. Another white cord appears further down. The base is white, the aperture rounded, the siphonal canal short and open.

Distribution: Only known from the type locality.

Remarks: *C. iuxtafuniculata* spec. nov. can be distinguished from *C. lata* and *C. io*: these two species have a shorter spire and a smooth protoconch.

- *C. beneitoi* spec. nov. is a smaller and narrower, more fragile shell with more convex whorls, and the three spiral cords situated at regular distance.

- *C. cruzana* has a protoconch with a suprasutural step, the brown colour appears in the third teleoconch whorl, and spiral cords 1 and 2 are at the same distance as 2 and 3.

- *C. familiarum* spec. nov. has a yellowish and wider protoconch, with evident sutural riblets, spiral cords 1-2 are not closer and the base is light brown.

- *C. dilata* spec. nov. has a narrower shell with smaller nodules, the brown spiral cord of the periphery of the last whorl is well marked, the cords of the teleoconch are at regular distance and the protoconch has only got a sutural cord.

Cerithiopsis sp. 1
Figs 52, 84, 85 & 86.

Material studied: Only one shell. Cienfuegos (CER).

Description: The protoconch (Fig. 86) of the only shell available was broken during the study but kept. It is white and has about 4 whorls, with a spiral cord near the suture.
Teleoconch with 6 whorls with only two spiral cords in most of the spire, separate, of similar size and spiral cord 1 being less prominent. Another small cord is present in the suture from the 3rd–4th whorl onwards. It forms the peripheral cord in the last whorl. There is a small cord below the peripheral cord. The colour is brown on the upper cord, well marked. Aperture ovoid, siphonal canal very short and open.

Remarks: The difference with the species described above is the existence of only two spiral cords in all teleoconch whorls.
We have not named it and are waiting for more material.

Cerithiopsis infrequens spec. nov.
Figs 51 & 80-83.

Type material: Holotype (Figs 80, 81) 3.2 mm (MNCN 15-05/47012). Paratypes: 2 f with protoconch (MNCN); CER (2) (Fig. 51); IES (1), all from the type locality.

Other material examined: Nicaragua: 1 s, Cayo Witties, 8 m (CER).

Type locality: Cienfuegos Bay, 20-40 m, Cuba.

Etymology: The specific name refers to the scarce collecting of shells of this species.

Description: Shell (Figs 51, 80 & 81) conically elongate, rather fragile. Protoconch (Fig. 82) broken in the four shells studied, only showing 1-2 smooth whorls, with a small cord in the suture. The protoconch, photographed (Fig. 83) from a juvenile, has 4 ½ smooth whorls, which slowly increase.
Teleoconch with about 5 whorls with three spiral cords besides other smaller ones in the suture, well developed; spiral cord 1 smaller and less prominent. The axial ribs are small, separated, depressed and form very small nodules in the crossing points. There are only 9-12 axial ribs on a whorl.
The colour is similar to that in *C. lata*, the brown colour reaching the suture and spiral cord 2, but very pale and diffuse. The nodules of spiral cords 1 and 2 are white.
The base is concave and no cord is present below the subperipheral area.

Distribution: Only known from Cuba and Nicaragua.

Remarks: We did not include the shells of this species in the group of *C. lata* because they are more elongate in form, showing a higher number of whorls (up to almost 6), the presence of a fourth cord in the suture, the more extended base, the light and more diffuse brown colour, the lighter nodules on the dark cord, the brown base with a concave part above the periphery without any spiral cord in this area, and the lower brown cord below spiral cord 3.

- *C. io* is more ovoid, the crossing nodules are larger, the dark brown band is more limited and the nodules are not lighter.

- *C. cruzana* has a larger shell, more axial ribs which are more prominent, the wide colour band is narrow, this dark band is not visible in the first whorls, and there are lighter nodules on the dark band.

- *C. beneitoi* spec. nov. is lighter, with the dark spiral band very narrow and scarcely visible, has more numerous and more prominent axial ribs and a wider protoconch.

- *C. familiarum* spec. nov. and *C. dilata* spec. nov. are larger, elongate, with more axial ribs, a wider protoconch, a limited colour band and a spiral cord near the base below the peripheral one.

Cerithiopsis sp. 2
Figs 88-90.

Material examined: 20 s and j, Cienfuegos (IES, CER, CFG).

Remarks: These shells (Fig. 88) were separated from a lot of *Cerithiopsis* with white shells, because the colour seemed white, but the spiral cord 1 had a light yellowish tonality. Most of them had a very narrow spiral cord 1.

The three spirals cords were at equal distance. In general aspect they seemed very similar to *C. cruzana* but showing some differences: most of the shells were larger, wider, and with slightly wider protoconchs (Fig. 89). But some protoconchs had a different form (Fig. 90): smaller, without any spiral cord or sutural riblets. So, we think that more than one species could be mixed in the lot, and even decolorate shells from other known species could be present. Lacking enough information, we prefer to mention this lot but keep it for a future study after the collection of more material.

Cerithiopsis albovittata (C.B. Adams, 1850)
Figs 27-33, 71-73, 106.

Cerithium albovittatum C.B. Adams, 1850. *Contributions to Conchology,* 7: 122-123. [Type locality: Jamaica].

Type material: Holotype in MCZ (156412), represented in Clench & Turner (1950).

Other material studied: Cuba: more than 100 s, j and f, Cienfuegos, 10-20 m (CER); 2 sp, canal Cayo Luca, Yaguajarí (IES); 1 s, Playa calle 14, 18 m (IES); 2 sp, Playa Vista del Mar (IES); 2 sp, Varadero (IES); 1 sp, playa de Marianao, La Habana (IES); 6 sp, cueva de Alamar, La Habana, 18 m (IES); 6 s, Hotel Comodoro, 4 m (CER); 2 sp, Sante Fe, Playa, 25 m (IES); 1 sp, Punta Norte, La Habana, 18 m (IES); 6 s, playa de Jibacoa, La Habana, 8 m (CER); 8 s, 6 j, 10 f, Cienfuegos, 40 m (CER); 10 s, Cienfuegos, 40 m (IES); 40 s, Cienfuegos, 25-40 m (CFG); 34 s, 12 j, Rancho Luna, 50 m (CER); 7 s, Faro de los Colorados, Cienfuegos (CER); 15 s, Cayo Cantiles (CER); 8 s, Cayo Matías, Canarreos (DBUA); 16 s, Canarreos, 20 m (CER); 17 s, Cayo Avalos 20 m (DBUA); 3 s, Punta Pedernales, 50 m (DBUA). Nicaragua: 2 s, Cayo Witties, 8 m (CER). Mexico: 7 s, Puerto Morelos, Yucatan, 6 m (CER).

Description: See Adams (1850b), Clench & Turner (1950) and Redfern (2001).
Shell (Figs 27-33) conically elongate, pointed, rather fragile; colour variable.
Protoconch (Figs 71-73) with variable colour from cream to light brown, sometimes with a lighter apex; a cord in the lower part of the whorls is visible under high magnification and here are small axial riblets below it. These have sometimes disappeared because of erosion.
Teleoconch with 7-9 whorls. The most remarkable feature is the darker subsutural spiral cord, whereas the second one is white and the lower ones brown, sometimes even lighter. This colour pattern is rather constant but variable from creamish or almost white to dark brown. Some shells have only got a light brown colour on the subsutural cord and not on the others; some specimens have a uniform light brown colour or they are even totally cream or almost white.
Operculum (Fig. 106) transparent, triangular in form, with the nucleus at one side.

Distribution: It seems to be one of the most common species in the Caribbean, recorded from Jamaica (type locality), Dutch Islands (De Jong & Coomans, 1988), Bahamas (Redfern, 2001), Cuba, Nicaragua and México.

Remarks: The holotype (figured in Clench & Turner, 1950, pl. 38, fig. 6) examined by us, is a beached shell, decolorate (but the spiral cord 2 is lighter), without protoconch and a broken last whorl. This fragment does not correspond with the original description in which one can read *"... three spiral ridges, of which the middle one is most prominent ..."* because this characteristic is not present in the holotype. Anyway, the species is very variable and in spite of the description possibly not being very complete, we decided that this is the species referred to, and we agree with Redfern (2001, species 293) on the interpretation of the shells corresponding to this taxon.
There is no relation between this species and all the previously mentioned species, in which the presence of a brown spiral cord 1 contrasts with the white colour of the other two, although this pattern can also be present in shells of this species. So, the protoconch then serves as the differential characteristic.

Cerithiopsis parvada spec. nov.
Figs 34-41, 74, 75, 100.

Type material: Holotype (Fig. 34) 2.7 mm, in MNCN (15.05/47013). Paratypes in the following collections: AMNH (2), BMNH (2), MCZ (2), IES (10) MNHN (2), CFG (14), USNM (2), ZSM (2), CER (150) all from type locality; CFG (3) from Faro de los Colorados; DBUA (2) from Cayo Diego Pérez;

Type locality: Cienfuegos Bay, between 10 and 40 m.

Etymology: The specific name is derived from the fusion of the Latin words *parva* "small" and *parda* "brown" referring to the small size and the usually light brown colour.

Description: Shell (Figs 34-41) small, oval, elongate, solid.

Protoconch (Fig. 75) usually with 4-4.5 whorls, cream in colour, with a spiral cord in the lower part of the whorls and riblets on the suture. The spiral cord has disappeared in the protoconch (Fig. 74) of some shells.
Teleoconch with about 4-5 whorls, and in few shells there are 6 in number. Three spiral cords at the beginning of the teleoconch, spiral cord 1 slightly smaller than the other ones; spiral cords 1 and 2 are slightly closer in the first whorls. Aperture ovoid, siphonal canal short and open. Colour may be uniform light brown or with some bands of different tonality within the brown shades. The shell is sometimes almost brown or cream.
Dimensions: some shells can reach 3.5 mm, but are usually smaller than 3.0 mm.
Operculum (Fig. 100) corneous, translucent and with marginal nucleus.

Distribution: Apparently very common in Cuba. As it was probably confused with other species it may be present in other Caribbean areas, but without proper records.

Remarks: *C. parvada* spec. nov. has a protoconch similar to that of *C. albovittata*, but it is slightly wider. They can be distinghuished because *C. albovittata* has a larger shell and its protoconch may be white, cream or brown, whereas it is always creamish in *C. parvada*. In *C. albovittata,* the three cords are regularly spaced at the beginning of the teleoconch, although spiral cord 1 is a little smaller, whereas spiral cords 1 and 2 are a little closer in C. *parvada*. The colour is very variable in both species, but in *C. albovittata* spiral cords 1 and 3 can be brown or dark brown, unusual in *C. parvada,* which always has spiral cords in light colours.

Cerithiopsis flava (C.B. Adams, 1850)
Figs 42-50, 76-79, 99, 100, 105, 108, 110 & 111.

Cerithium flavum C.B. Adams, 1850. *Contribution to Conchology,* 7: 122. [Type locality: Jamaica].
Cerithium iota C.B. Adams, 1845. *Proc. Boston Soc. Nat. Hist*., 2: 5. [Type locality: Jamaica].
Cerithiopsis hero Bartsch, 1911. *Proc. U. S. Nat. Mus*., 41(1861): 303, pl. 28, fig. 1. [Type locality: Bermuda].

Type material: Holotype of *Cerithium flavum* (Fig. 108), MCZ (186114); also represented in Clench & Turner (1950); cotype of *Cerithiopsis hero* (Fig. 110), USNM (226750). Lectotype of *Cerithium iota* (Fig. 111) in MCZ (186115).
Other material studied: Cuba: 5 sp, playa de Marianao, La Habana (IES); 28 s, playa de Jibacoa, La Habana, 10 m (CER); 19 s, Los Luntris, 20 (IES); 2 sp, canal Cayo Luca, Yaguajarí (IES); 1 s, Varadero (IES); 2 s, Instituto de Oceanografía, La Habana, 20-30 m (IES); 13 s, La Herradura, 8 m (CER); 3 s, La Herradura, 8 m (DBUA); 16 s, Cayo Matías, Canarreos (DBUA); 15 s, Cayo Cantiles, 15 m (DBUA); 43 s, Cayo Matías, Canarreos, 20 m (CER); 35 s, Los Canarreos, 10 m (CER); 7 s, Punta Pedernales, 15 m (DBUA); 1 s, Punta Pedernales, 50 m (DBUA); 6 s, Punta Francés, Isla de la Juventud, 10 m (DBUA); 14 s, Playa Baracoa, La Habana, 10 m (CER); 31 s, Hotel Comodoro, 8 m (CER); more than 250 s, j and f, Cienfuegos Bay, 10-20 m (CER); 27 s, Faro de los Colorados, Cienfuegos, 30 m (CER); 37 s, Faro de los Colorados, Cienfuegos, 45 m (CER); 45 s, 6 j, 10 f, Cienfuegos, 40 m (CER); 21 s, Cienfuegos, 40 m (CFG); 10 sp, Playa Rancho Luna, 10 m (IES); 12 s, 2 j, Rancho Luna, 30 m (CER); 45 s, Rancho Luna, 45 m (CER). Bahamas: 2 j, Abaco (CCR). Nicaragua: 25 s, Cayo Witties (CER). Mexico: 45 s, 10 f, Puerto Morelos, Yucatan, 6 m (CER).

Description: See C.B. Adams (1850b), Clench & Turner (1950), Bartsch (1911) and Redfern (2001).
Shell (Figs 42-50) conically elongate, solid, sharply pointed, very variable in size and colour, frequently light brown, but it can be totally white, dark brown or with bands of different brown or light brown.
The types did not have a protoconch, but this was represented in Thiriot-Quiévreux (1980, figs 34, 35 & 37) and in Redfern (2001, fig. 295B). We hereby present it from Cuban shells (Figs 77-79) and describe it now as very sharply pointed, with about 5 whorls which quickly increase from a relatively wide base. The whorls are smooth with one spiral cord close to the lower suture and riblets on this suture. The colour is usually brown at the apex, and white in the rest. The suture is sometimes brown. Numerous tubercles (Fig. 79) on the apex, which are smaller and less numerous in other whorls, yet only visible in fresh shells can be seen under sufficient magnification.
The teleoconch has up to 10 whorls and it is also very variable. The spiral cords are sometimes fine and form small nodules in the crossing points; these nodules are sometimes larger. The profile of the shell has frequent changes, hardly protruding in the last whorls, or changing its profile after a uniform development of several whorls.
The three spiral cords may be different: in most of the shells the three are equal.

In other shells, spiral cord 1 may be very small and less prominent. The aperture is rounded and the edge is very fine; the base is pointed; the siphonal canal is wide.
Animal (examined in several specimens from Cuba) whitish with small milky white spots in the foot and the head. Tentacles elongate and narrow. Also figured by Redfern (2001, fig. 295D).
Operculum (Fig. 105) triangular, with the nucleus at one end.
It is similar to other opercula observed in other species such as *C. gemmulosum* (Figs 103, 104) or *C. academicorum* (Fig. 107).
Radula (Figs 99, 100) as in other *Cerithiopsis* (see figs 96-98 and 101, 102) very small, with numerous and very elongate marginal teeth, curved at its free extremities, with several cusps; the lateral ones with 4-6 curved cusps.

Distribution: The present species has been recorded from Jamaica (type locality), Bermuda (Bartsch, 1911), Bahamas (Redfern, 2001), Dutch Islands (De Jong & Coomans, 1988), Barbados and Carolina (Thiriot-Quiévreux, 1980), and Cuba, Nicaragua and Mexico, in the present work.

Remarks: The examination of numerous shells could make one think that we are faced with several different species due to the high variability of the teleoconch. Yet, the protoconch is very characteristic and it cannot be confused with other Caribbean species. When the protoconch is broken, the differentiation with other species must be based on the usually small nodules in the crossing points; the elongate shell with a more or less uniformly light brown colour, and sometimes the change in the profile. Anyway, it could be difficult.

The holotype (Fig. 108) of *C. flavum*, also shown by Clench & Turner (1950, pl. 37, fig. 11), is an eroded shell without protoconch and probably with the first teleoconch whorls lost. However, it shows three spiral cords, a straight profile and small nodules in the crossing points. It closely resembles badly eroded shells of the species *C. flava* (see fig. 76). The same can be said for the lectotype of *C. iota* (Clench & Turner, 1950, pl. 37, fig. 16), also examined by us (Fig. 111), but this shell is not so typical and it could represent several species. Furthermore, the description is shorter and does not give enough details to be sure as to which species it is referred to. So, we have chosen the name *C. flava* to designate the species to and the name *C. iota* must be considered a *nomen dubium*.

Ode (1989) considers *C. flava* different from *C. hero*, and shows drawings of the protoconchs. In our opinion, the figure “b”, which is assigned to *C. flava,* is the species we consider *C. albovittata* in the present survey.

Cerithiopsis warmkae De Jong & Coomans, 1988
Fig. 53.

Cerithiopsis warmkae De Jong & Coomans, 1988. *Mar. gast. from Curaç., Aruba and Bonaire,* p. 48, pl. 3. figs. 229. [Type locality: Aruba, harbour].

Type material: Holotype (Fig. 53) and one paratype (ZMA 3.87.070).

Other material examined: 1 s, Cienfuegos (CFG).

Description: De Jong & Coomans (1988).
The holotype has not got a protoconch, but the paratype has a perfect protoconch with 3.5 smooth whorls. The upper spiral cord is yellowish, depressed and smaller than the other two. The rest of the shell is white.

Distribution: The present species is only known from the type material and the shell recorded here.

Remarks: This species may be related to *Cerithiopsis guitarti* Espinosa & Ortea, 2001 (Fig. 54), which has a similar profile, but which appears to be milky white and with spiral cords 2 and 3 more prominent and sharply pointed. The limited amount of material we have examined (5 shells from Cienfuegos, the holotype and two shells shown in Redfern, 2001) constantly showed these differences and so we provisionally keep this species as being different from *C. warmkae*.

Addendum:

Some information on the brown shells is reported here:

Cerithiopsis academicorum Rolán & Espinosa, 1996

Remarks: Many shells of this species were collected so we can have a better idea of the animal (which is black with only a white area around the eyes). The shell variability was very small, always with a dark brown colour in the shell as well as in the protoconch.
The operculum (Fig. 107) is represented, together with other photographed opercula.

Cerithiopsis gemmulosa (C.B. Adams, 1847)

Remarks: New information on the development of this species has been reported by Collin (2004). Operculum (Figs 103 & 104) and radula (Figs 101 & 102) are shown.

Cerithiopsis aimen Rolán & Espinosa, 1996

Remarks: The radula is shown (Figs. 96-98). All the radulae are similar to the one shown in Rolán & Espinosa (1996) for *C. prieguei*.

Cerithiopsis apexcostata spec. nov.
Figs 55, 87.

Joculator aralia Ode, 1989 non Olsson & Harbison, 1953. *Texas Conchologist*, 26: 17, fig. 8.

Type material: Holotype (Fig. 55) 2.6 mm in MNCN (15.05/47014). Paratypes in IES (1) and in CER (1, Fig. 87)

Type locality: Cienfuegos, Cuba.

Etymology: The specific name refers to the presence of axial ribs on the protoconch.

Description: Shell small (Fig. 55), solid, with prominent protoconch. Protoconch (Fig. 87) white, narrow, with 4 convex whorls, presenting an evident suture. About 15 axial ribs, which do not reach the upper suture, appear in the last two whorls.
Teleoconch of about 5 whorls, flat, with the suture similar to the separation between cords, with three spiral cords on each whorl, the upper two closer in all the whorls. There are about 18 axial ribs on the last whorls. They form rounded nodules in the crossing points with the spiral cords. Aperture ovoid, the external lip broken in the holotype. Siphonal canal short and open. Colour of the teleoconch uniformly brown.

Distribution: The species mentioned from the northwest of the Gulf of Mexico by Ode (1989) is not this species. As a consequence, it is only known from Cuba.

Remarks: The typical axial ribs of the protoconch distinguishes the present species from most of the species known in this area.

- *Cerithiopsis prieguei* Rolán & Espinosa, 1996 has small axial ribs in the protoconch and strong spiral cords. The spiral cords 1-2 are closer to each other.

- *Cerithiopsis ara* has axial ribs in all the protoconch whorls, but they are crossed by spiral cords and the colour of the teleoconch is different.

- *Cerithiopsis aralia* Olsson & Harbison, 1953 is a fossil species which was represented in Ode (1989) for a recent shell, but his drawings of the protoconch show that the axial ribs are extended to most of the protoconch, which does not occur in *C. apexcostata*.

Conclusions:

The present work is the continuation of that by Rolán & Espinosa (1996) in which the brown shells were studied. In this respect, 13 species with brown shell were studied, 5 known, 7 new species and 1 without name for the time being. In the present work the shells with bands and those with variable colouration have been studied, a total of 17 species, 9 known, 6 described as new and two more kept without a name for different reasons. Adding the 5 species studied in previous works (Rolán & Espinosa, 1992a, 1992b), we have at present studied 35 species of CERITHIOPSIDAE from the Caribbean. Moreover, we must remember that the present work adds one more species to the species with brown shells and the senior author has the description of another species collected in Florida, USA in press (Rolán & Fernández-Garcés, in press).
To all these species in the Caribbean fauna we will have to add those with white shells (which will be the subject of a future work), those described by other authors and not found in Cuba, those from deep water (very numerous and partially unknown), and some more mentioned in other works as 'spec.'.
Besides, we are only working within a limited area and we must keep in mind that there is a lot of endemicity compared to other areas in this group.
We think that the number of species within this group (CERITHIOPSIDAE) may be very large in the Caribbean and so, we assume the total of CERITHIOPSIDAE for the area may be more than 100 species.

In **Table 1** we present a list of the taxa which have been placed in *Cerithiopsis* in any occasion.

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Table 1

Index-List of taxa in *Cerithiopsis* (or similar used as *Cerithiopsis* in some occasion)

Conventional information on the taxa:
(1) it was studied by Rolán & Espinosa (1992a)
(2) id Rolán & Espinosa (1992b)
(3) id Rolán & Espinosa (1996)
(4) in the actual work (Rolán, Espinosa, Fernández-Garcés)
(5) to be studied in the future
(= synonym)
(><) means that it was erroneously mentioned for the Caribbean
fossil NR (without relation to actual species)
fossil NR? (the shell lacks the protoconch to compare with actual species)
bold letter: species considered valid
dubious genus (probably it must be placed in another genus; different from *Cerithiopsis*)
..... page in the present work

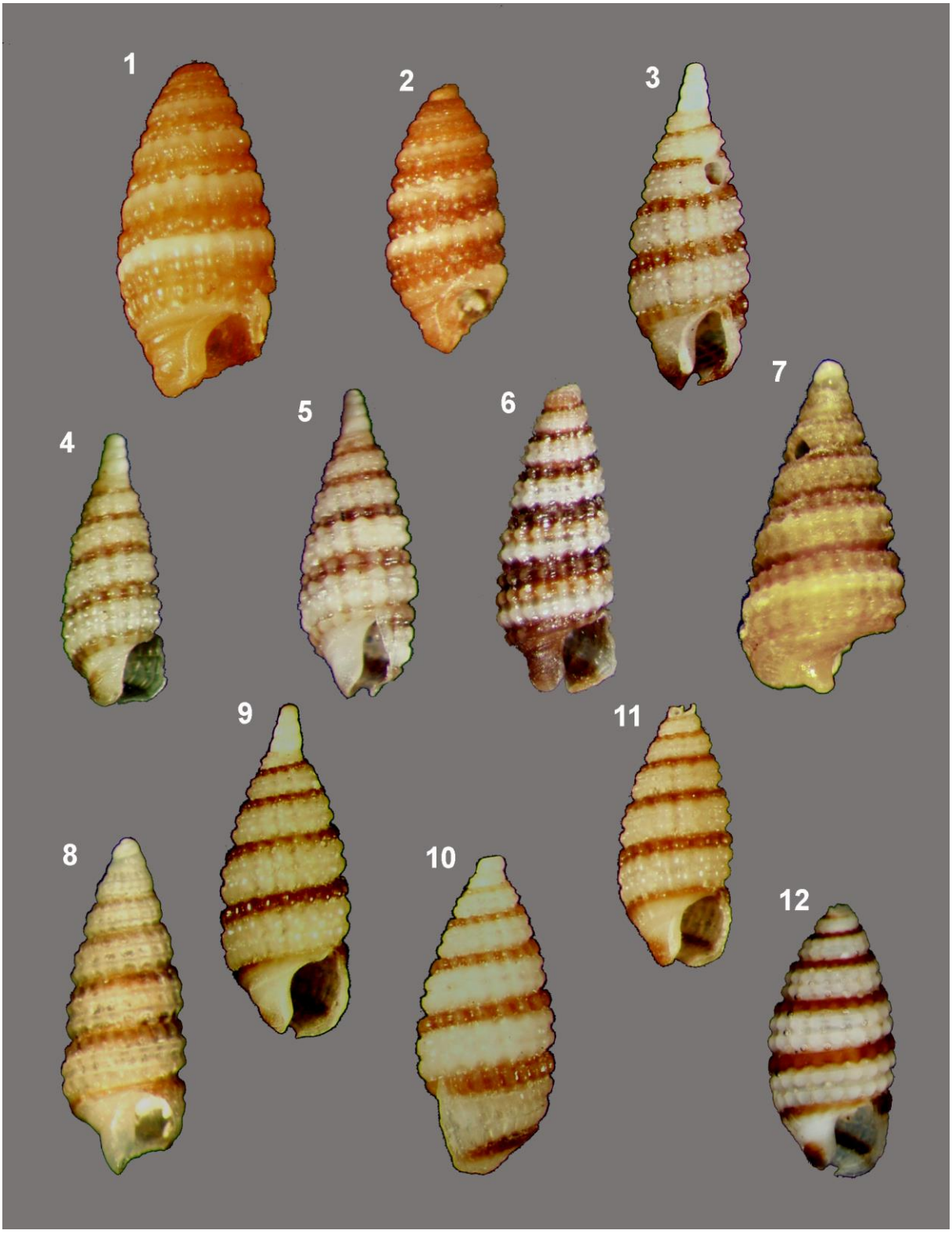

Plate I
Figs 1-2. *Cerithiopsis ara*, 2.8, 2.3 mm, Rancho Luna (CER). Figs 3-6. *Cerithiopsis lata*, 2.8, 2.3, 2.6, 2.2 mm, Cienfuegos (CER). Fig. 7. *Cerithiopsis pesa*, 2.6 mm, Jibacoa Beach, north of Cuba (CER). Fig. 8. *Cerithiopsis vicola*, 2.4 mm, Cayo Los Indios (IES). Figs 9-12. *Cerithiopsis io,* 3.1, 2.9, 2.4, 2.6 mm, Cienfuegos (CER).

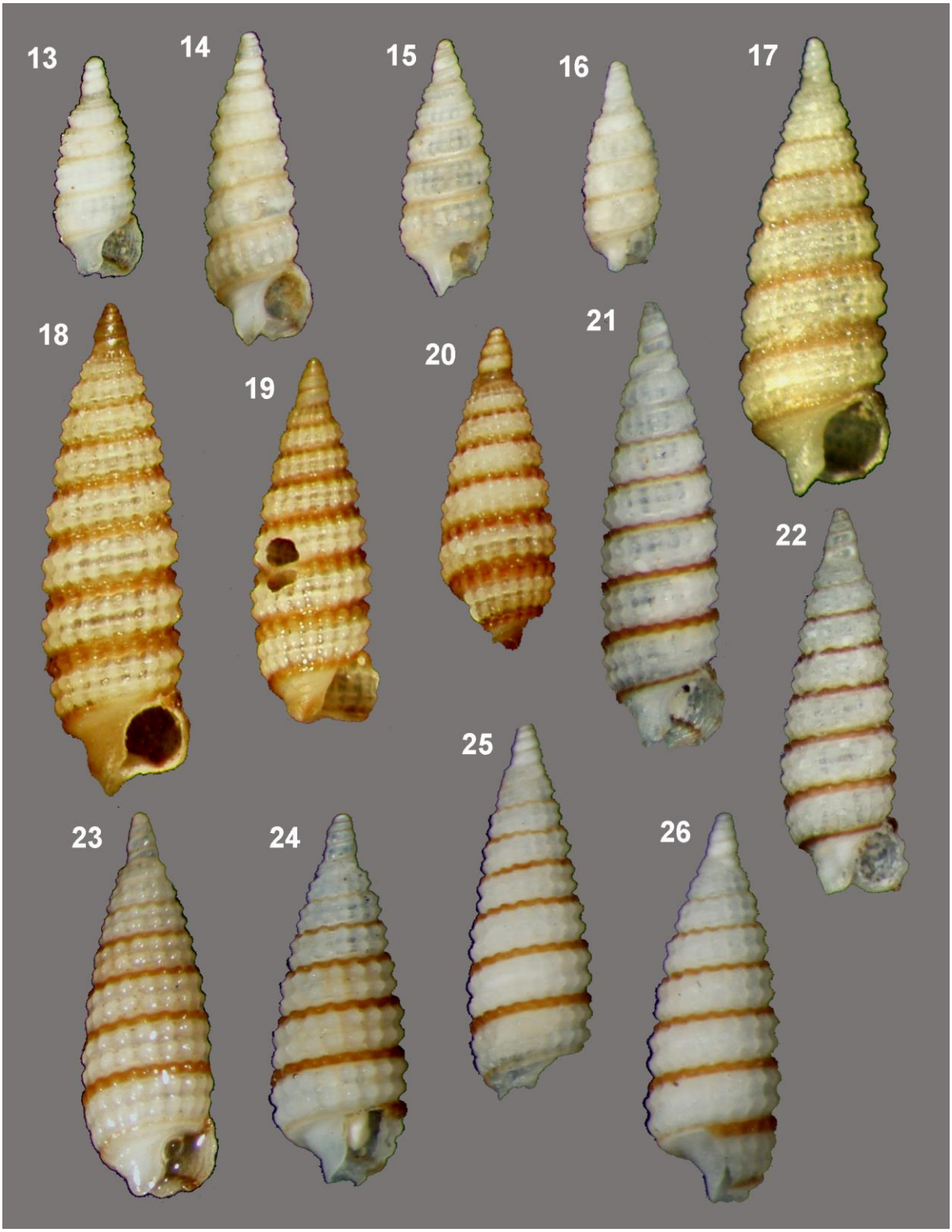

Plate II

Figs 13-16. *Cerithiopsis beneitoi* spec. nov., 1.9 (paratype CER), 2.9 (holotype MNCN), 2.4, 1.7 mm (paratypes, CER), Rancho Luna, Cienfuegos. Fig. 17. *Cerithiopsis cruzana*, 3.8 mm, Jibacoa (CER). Figs 18-20. *Cerithiopsis familiarum* spec. nov. 2, 4.3 (holotype MNCN), 3.1 (paratype CER), 2.7 mm, (paratype, IES) Faro de los Colorados, Cienfuegos. Figs 21-22. *Cerithiopsis dilata* spec. nov., 3.7 (holotype MNCN), 3.1 mm (paratype CER), Cienfuegos, Cuba. Figs 23-26. *Cerithiopsis iuxtafuniculata* spec. nov., 3.4 (holotype MNCN), 3.0, 3.1, 3.3 mm (paratypes CER), Rancho Luna, Cienfuegos.

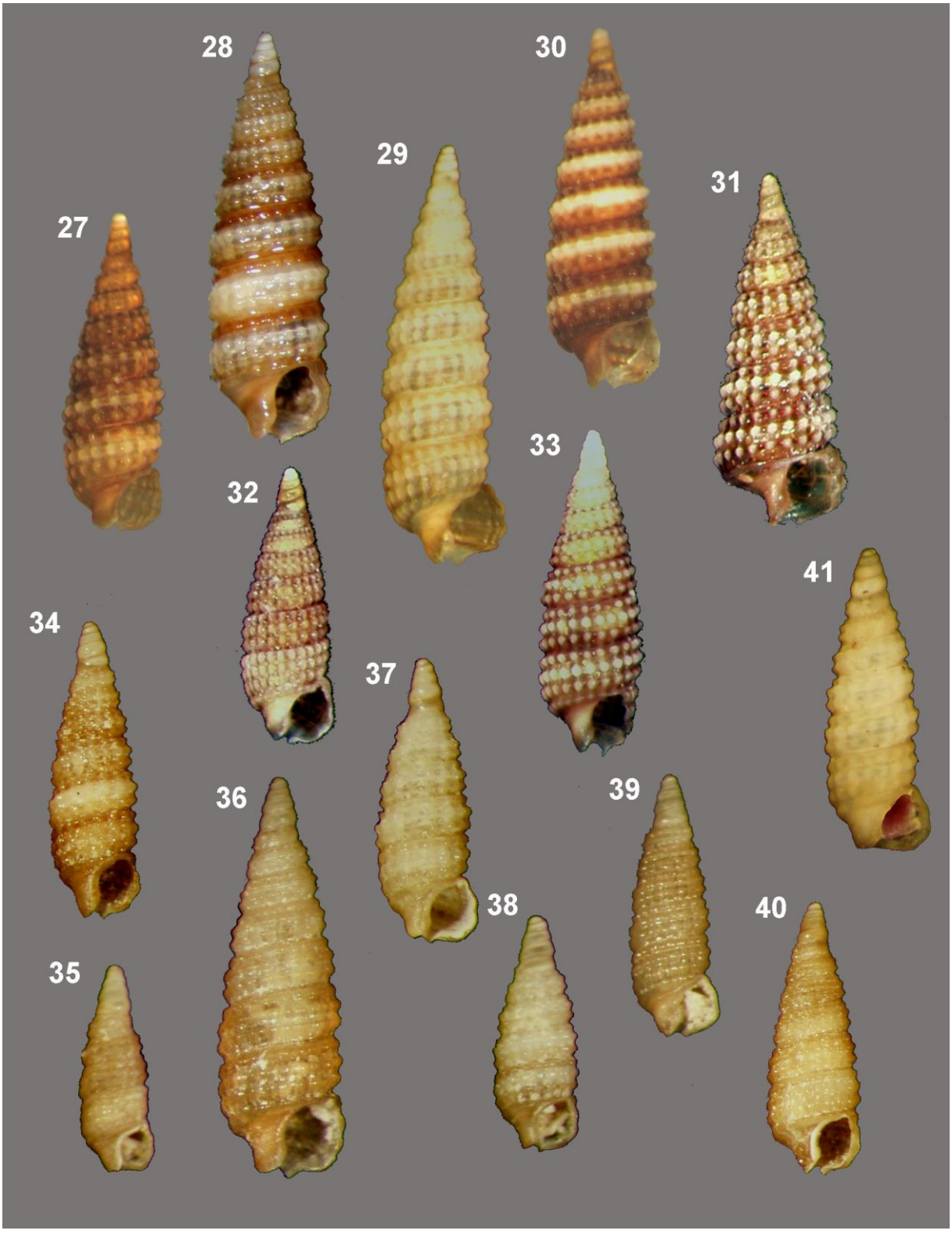

Plate III

Figs 27-33. *Cerithiopsis albovittata*, 3.0, 3.9, 4.1, 3.4, 4.8, 2.7, 3.7 mm, Cienfuegos. Figs 34-41. *Cerithiopsis parvada* spec. nov.: 2.7 mm (holotype, MNCN) 1.7, 3.3, 2.3, 2.2, 2.0, 2.8 mm (paratypes CER), Cienfuegos Bay.

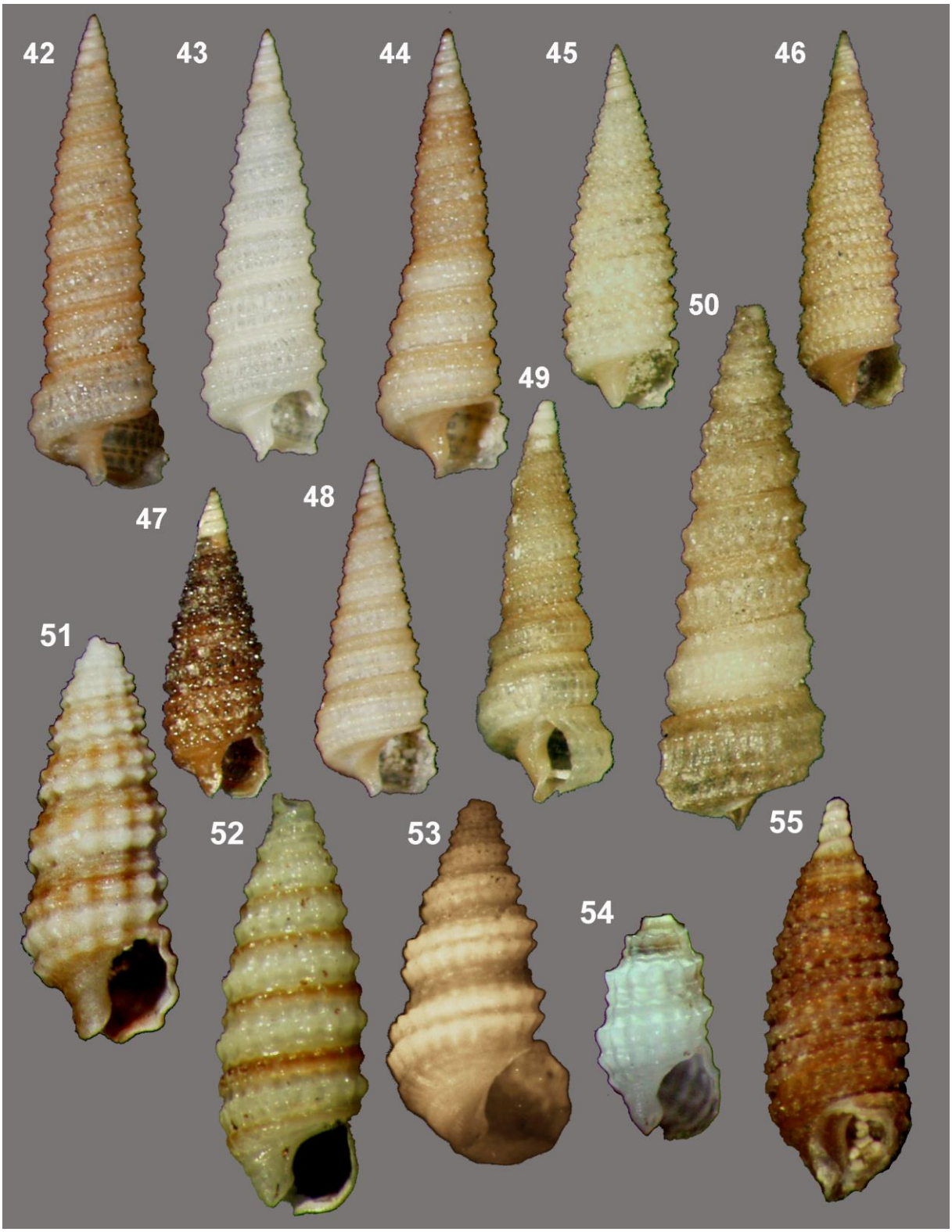

Plate IV

Figs 42–50. *Cerithiopsis flava*, 5.1, 4.7, 4.8, 3.4, 4.2, 4.0, 3.5, 4.1, 6.7 mm, Cienfuegos (CER). Fig. 51. *Cerithiopsis infrequens* spec. nov., paratype, 2.5 mm (CER). Fig 52. *Cerithiopsis* sp., shell. Fig. 53. *Cerithiopsis warmkae,* 4 mm, holotype, Aruba (ZMA). Fig. 54. *Cerithiopsis guitarti*, 2.5 mm, Cienfuegos (CER). Fig. 55. *Cerithiopsis apexcostata*, holotype, 2.6 mm, Cienfuegos (MNCN).

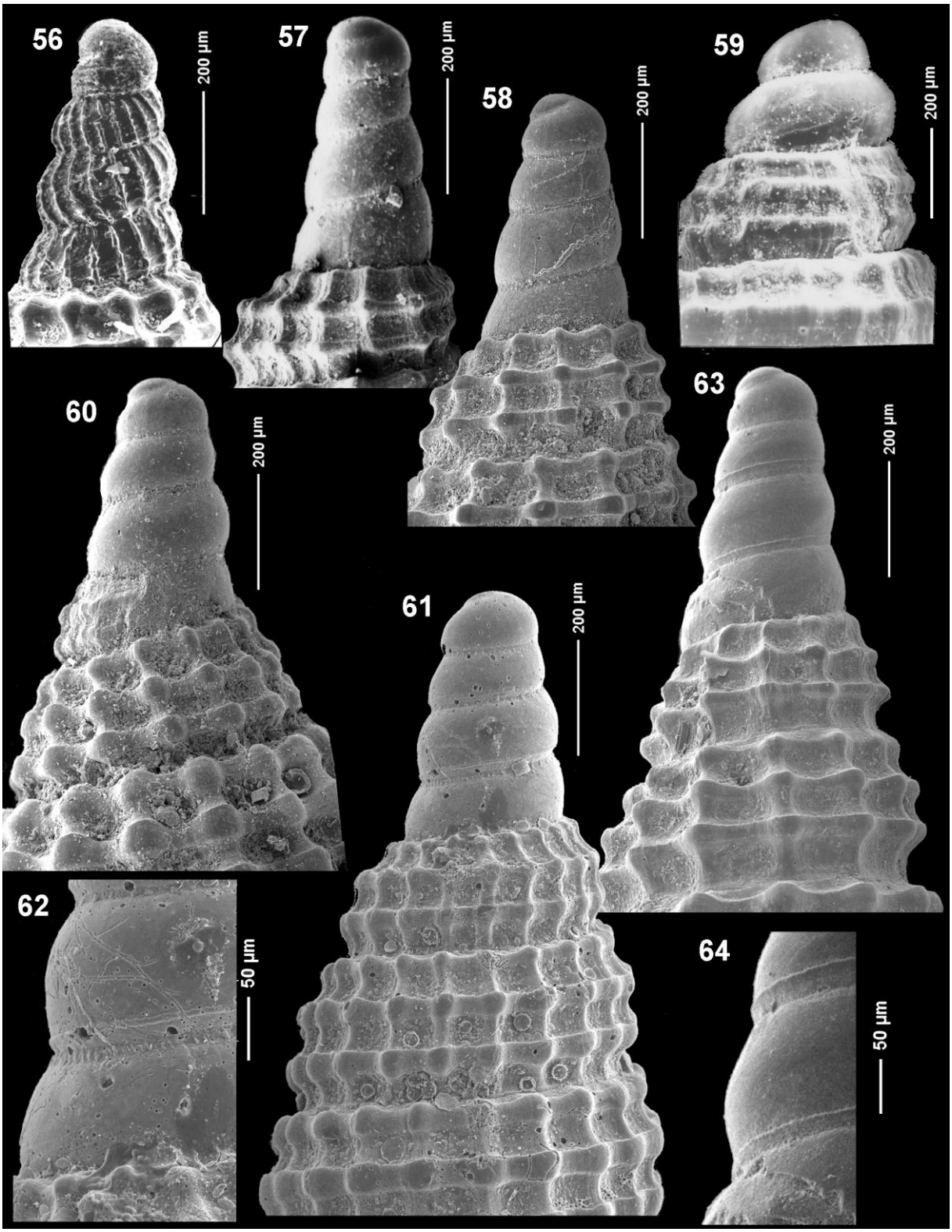

Plate V

Figs 56-64. Protoconchs and first whorls of teleoconch. Fig. 56. *Cerithiopsis ara*, Rancho Luna, Cienfuegos (CER). Figs 57, 58. *Cerithiopsis lata*, Cienfuegos (CER). Fig. 59. *Cerithiopsis vicola,* Cayo los Indios (DBUA). Fig. 60. *Cerithiopsis io*, Cienfuegos (CER). Figs 61, 62. *Cerithiopsis beneitoi* paratype, Cienfuegos (CER). Figs 63, 64. *Cerithiopsis cruzana*, Cienfuegos (CER).

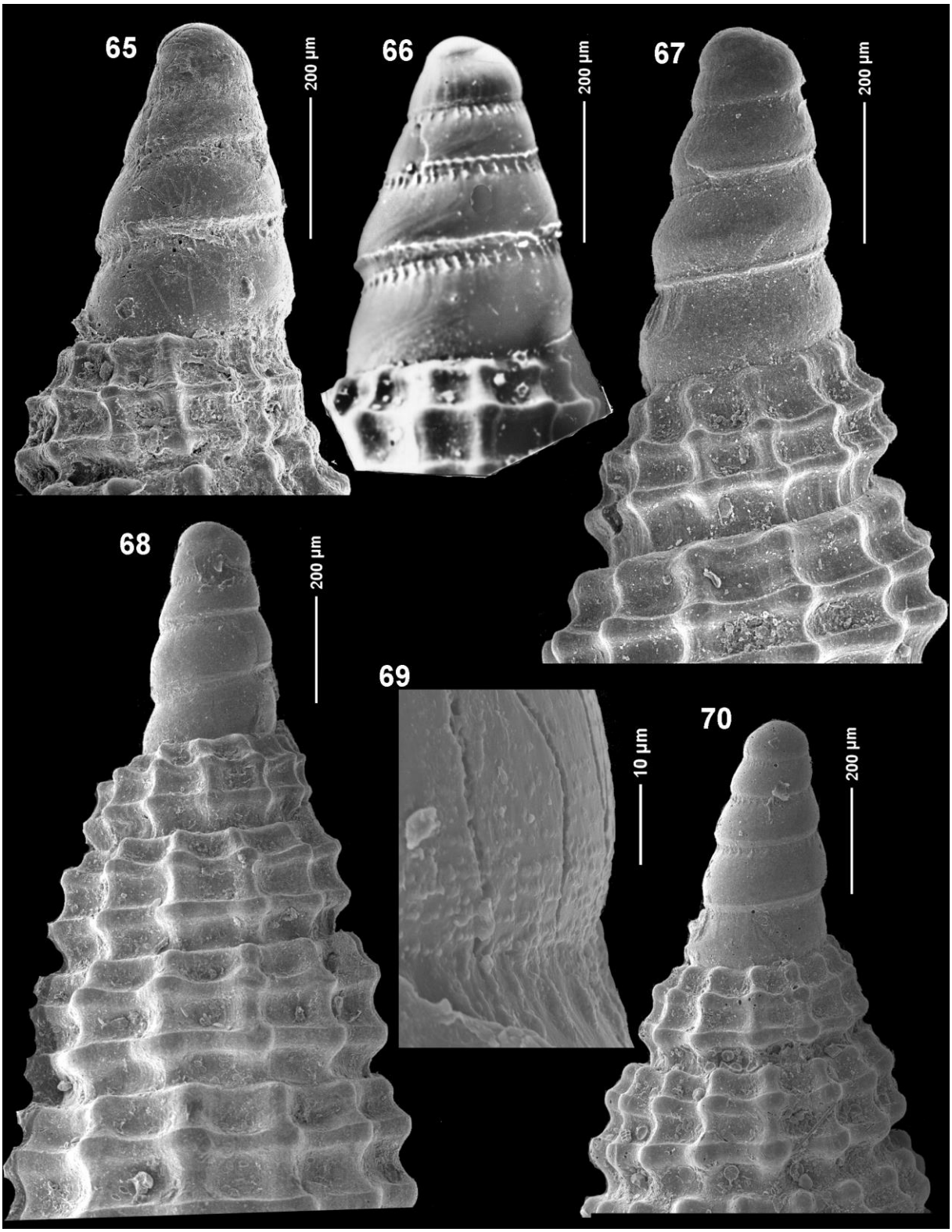

Plate VI

Figs 65-70. Protoconchs and first whorls of teleoconch. Figs 65, 66. *Cerithiopsis familiarum* spec. nov., paratypes, Faro de los Colorados, Cienfuegos (CER). Fig. 67. *Cerithiopsis dilata*, paratype, Cienfuegos (CER). Figs 68-70, *Cerithiopsis iuxtafuniculata* spec. nov., paratypes, Rancho Luna, Cienfuegos (CER).

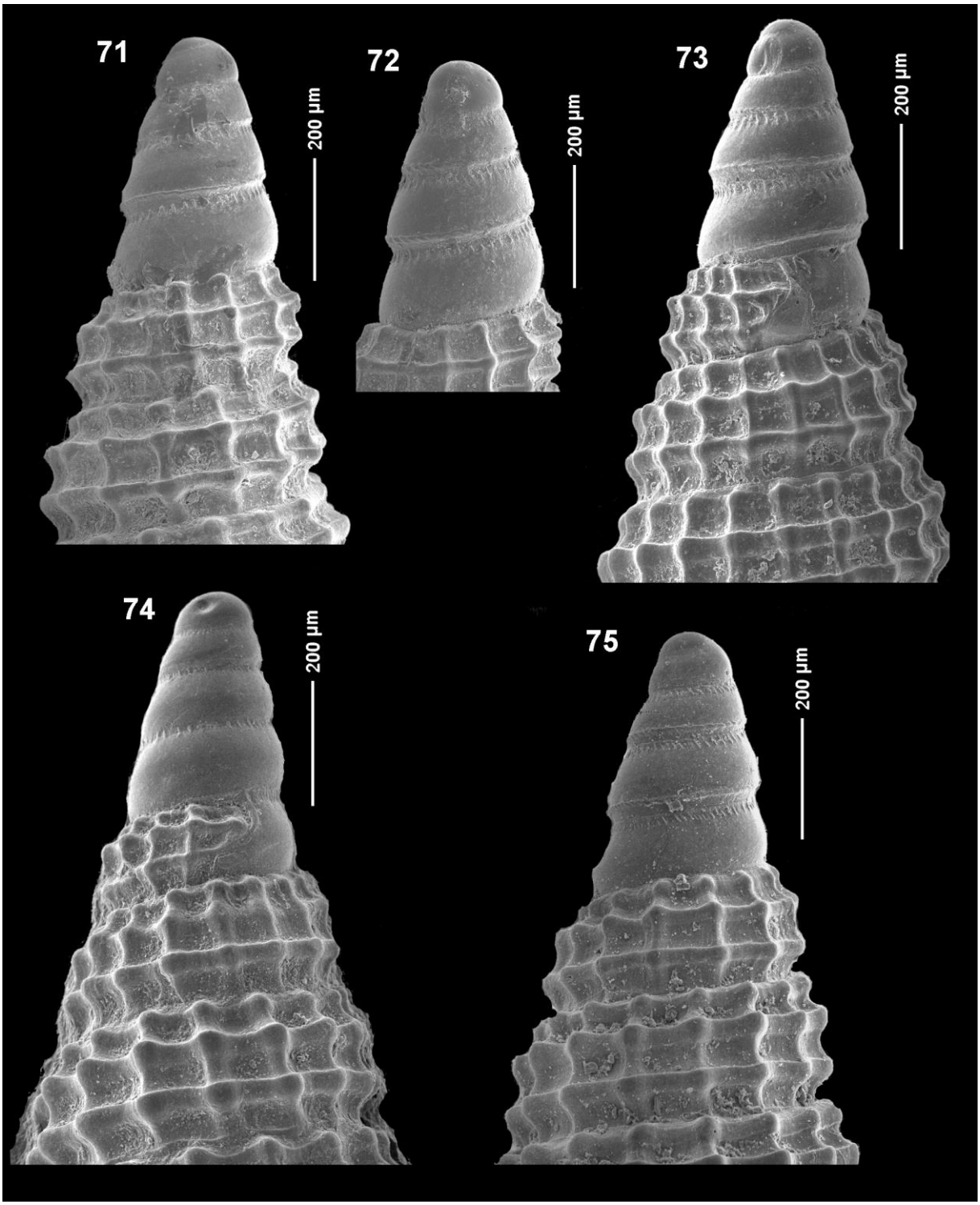

Plate VII
Figs 71-75. Protoconchs and first whorls of teleoconch. Figs 71-73. *Cerithiopsis albovittata*, Cienfuegos (CER). Figs 74-75. *Cerithiopsis parvada* spec. nov., paratypes, Cienfuegos (CER).

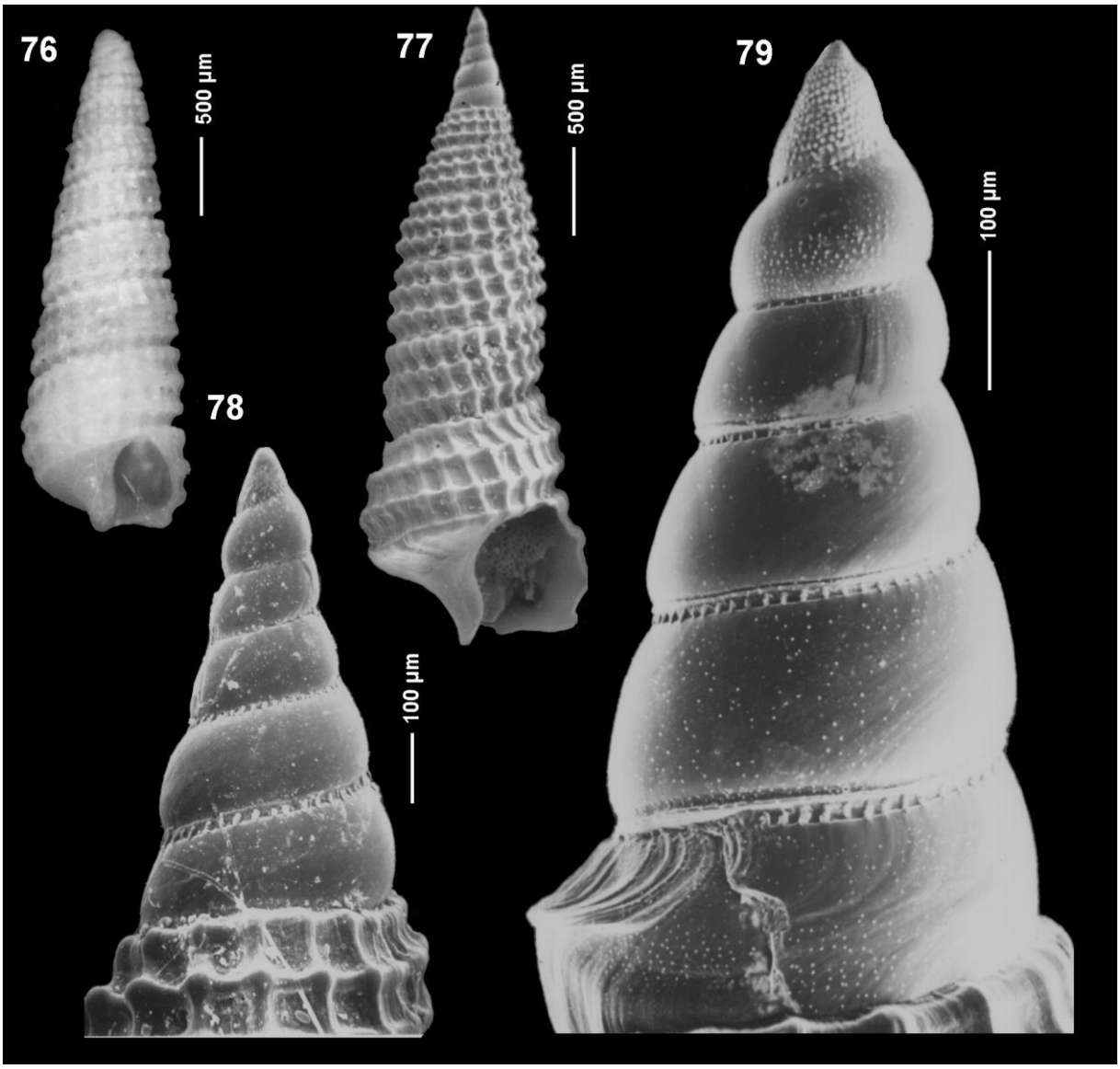

Plate VIII
Figs 76-79. *Cerithiopsis flava*. Fig. 76. Fragment of shell from Cuba similar to the holotype (CER). Fig. 77. Shell at SEM, Cuba. Figs 78-79. Protoconch.

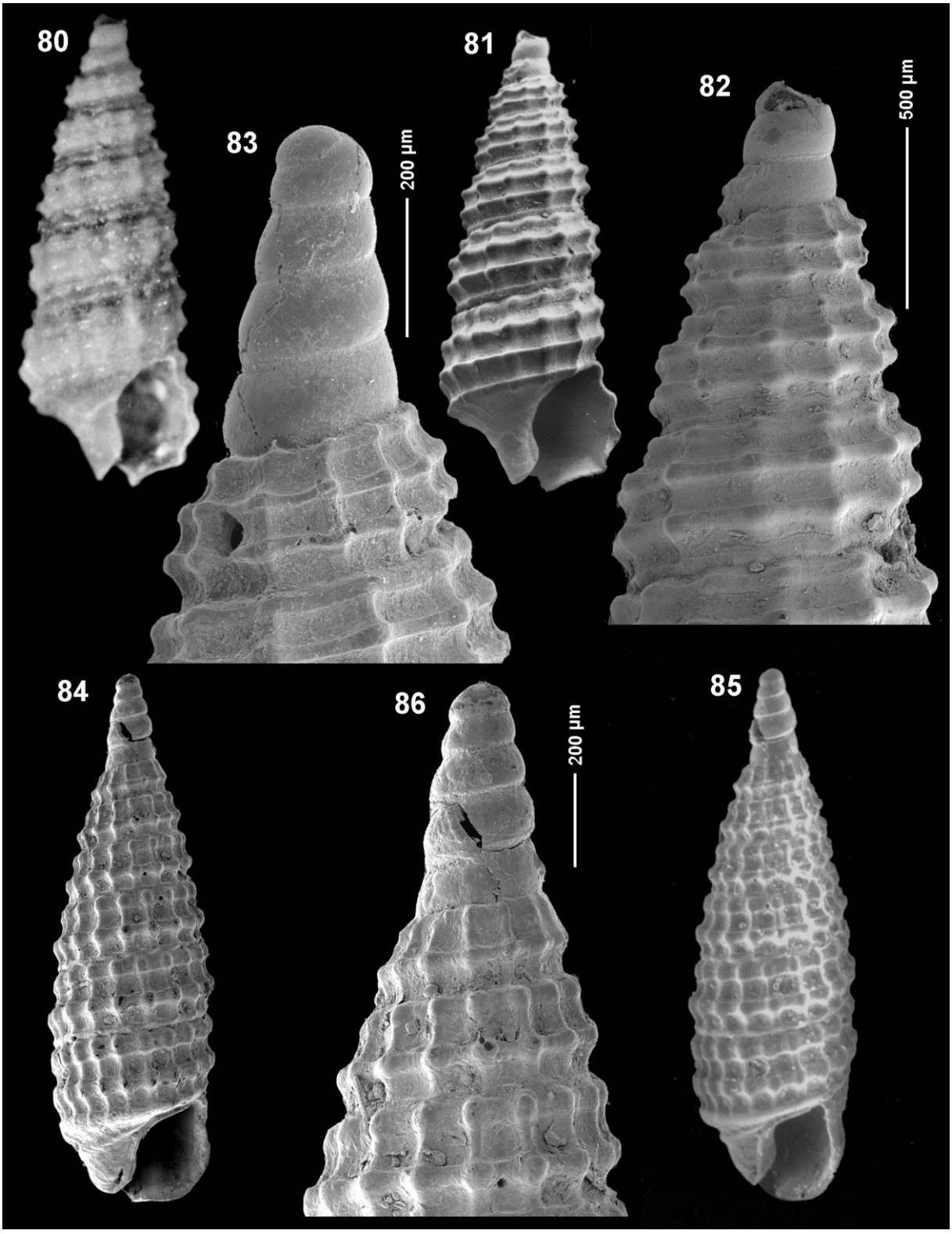

Plate IX
Figs 80-83. *Cerithiopsis infrequens* spec. nov. 80, 81: holotype, 3.2 mm (MNCN). Fig. 82. Apex of the holotype. Fig. 82. Protoconch, paratype (MNCN). Figs 84-86. *Cerithiopsis* sp. 84, 85: the same shell in two positions (CER). Fig. 86. Protoconch and first teleoconch whorls.

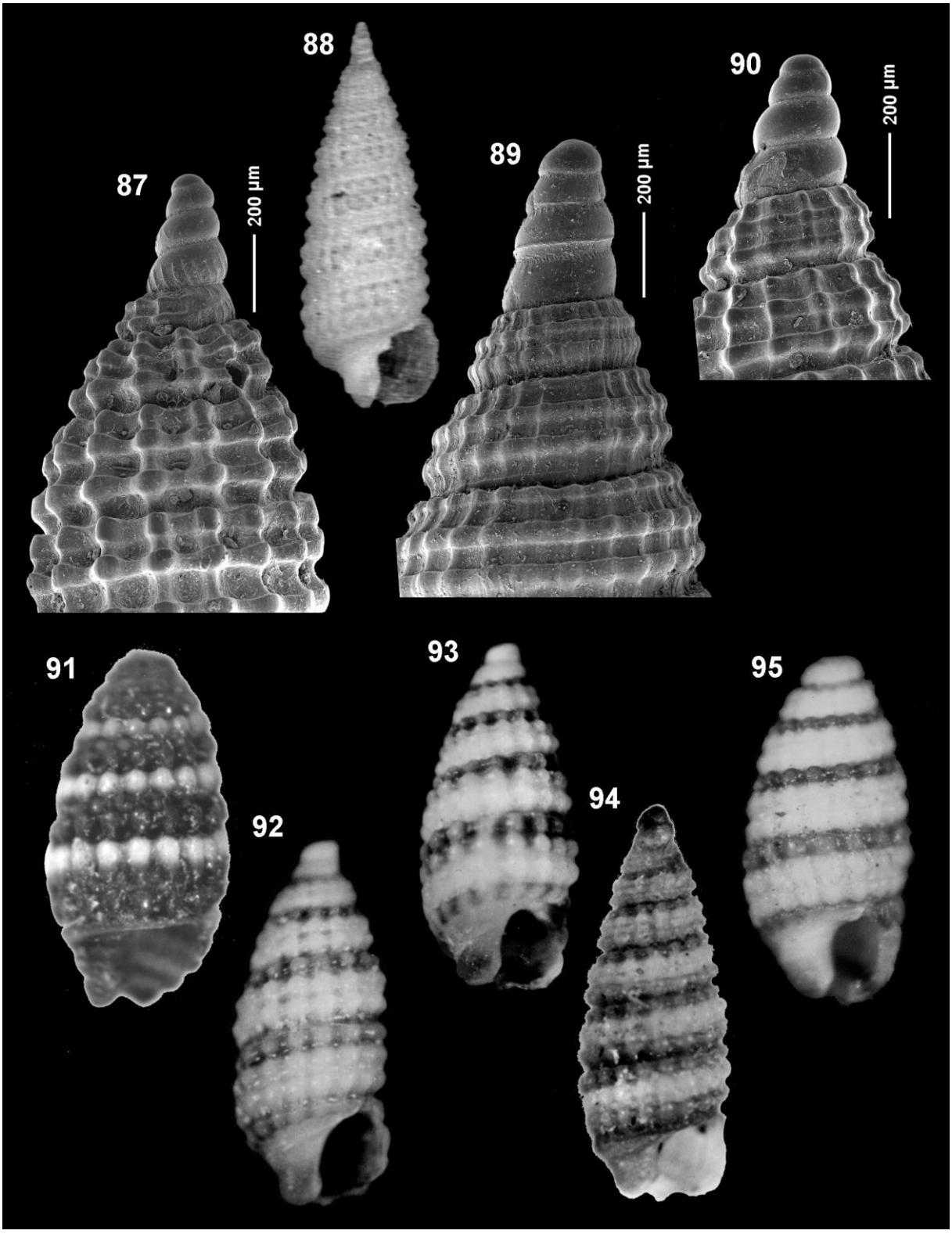

Plate X

Fig 87. *Cerithiopsis apexcostata*, protoconch, paratype (CER). Figs 88-90. *Cerithiopsis* sp. 2. Fig. 88. Shell, Cienfuegos (CER). Fig. 89. Protoconch type 1. Fig. 90. Protoconch type 2. Figs 91-95. Types. Fig. 91. *Cerithiopsis ara*, 2.3 mm, lectotype (USNM). Fig. 92. *Cerithiopsis lata*, 2.16 mm, holotype (MCZ). Fig. 93. *Cerithiopsis buijsei*, 2.2 mm, holotype (ZMA). Fig. 94. *Cerithiopsis pesa*, 2.5 mm, holotype (USNM). Fig. 95. *Cerithiopsis io*, 2.3 mm, lectotype (USNM).

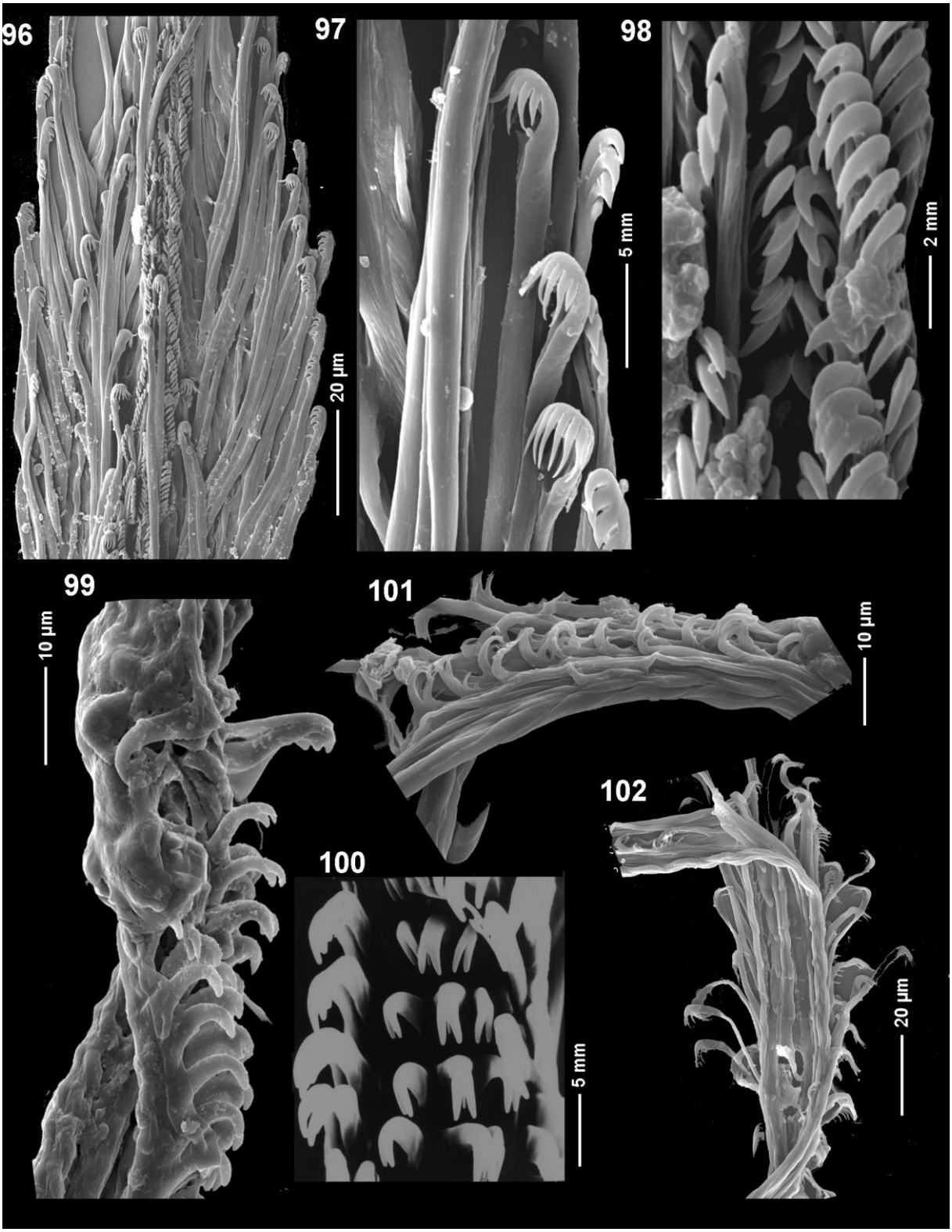

Plate XI
Figs 96-102. Radulae of *Cerithiopsis* species. Figs 96-98. *Cerithiopsis aimeni*. Figs 99, 100. *Cerithiopsis flava*. Figs 101, 102. *C. gemmulosum*.

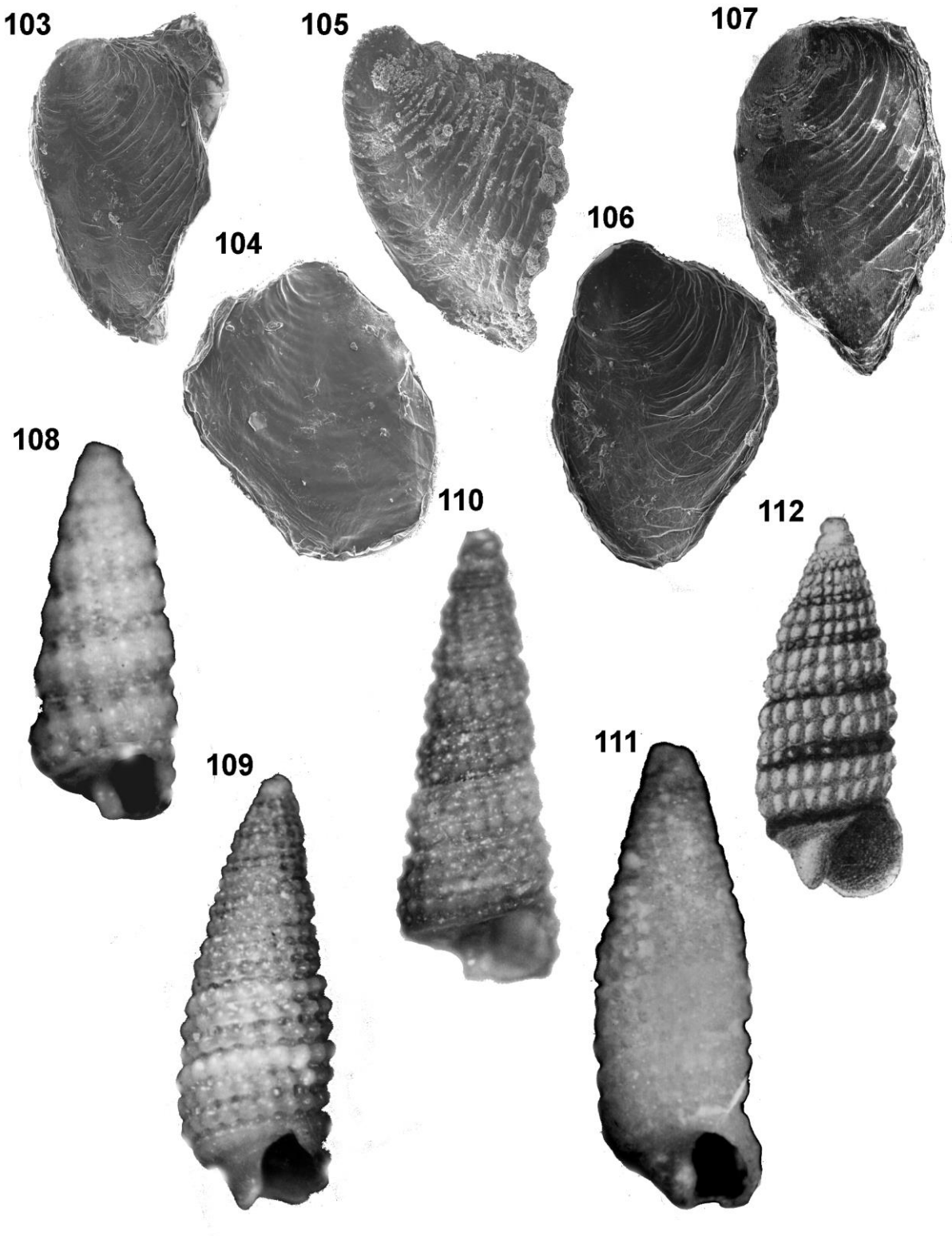

Plate XII

Figs 103-107. Opercula. Figs 103, 104. *Cerithiopsis gemmulosum*. Fig. 105. *Cerithiopsis. flava*. Fig. 106. *Cerithiopsis albovittata*. Fig. 107. *Cerithiopsis academicorum*. Figs 108-112. Types of *Cerithiopsis*. Fig. 108. *Cerithium flavum*, holotype, 3.8 mm (MCZ). Fig. 109. *Cerithiopsis cynthia*, syntype, 3.9 mm (USNM). Fig. 110. C*erithiopsis hero*, cotype (USNM). Fig. 111. *Cerithiopsis iota*, lectotype, 3.4 mm (MCZ). Fig. 112. *Cerithiopsis vicola*, 2.9 mm, original representation of holotype (Bermuda Museum).