

## A revision of the genus *Eratoidea* Weinkauff, 1879 (Gastropoda: Marginellidae)

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**ABSTRACT.** The genus *Eratoidea* Weinkauff, 1879 is revised and its phylogenetic relationship to other genera of the Marginellini Fleming, 1828, a tribe in the Marginellidae, is discussed. The genus currently comprises thirteen described species: *Marginella margarita* Kiener, 1834, type species of the genus *Eratoidea*; *M. hematita* Kiener, 1834; *M. sulcata* d'Orbigny, 1842 (= *M. striata* Sowerby II, 1846, non Laseron, 1957); *M. scalaris* Jousseume, 1875 (= *Marginella janeiroensis* E. A. Smith, 1915); *M. watsoni* Dall, 1881; *M. costulata* Thiele, 1925; *M. fernandinae* Dall, 1927; *M. microgonia* Dall, 1927; *M. lasallei* Talavera & Princz, 1985; *Dentimargo costata* Bozzetti, 1997; *D. sinuosa* Bozzetti, 1997.

Thirty one new species and three new phena, one considered to be a form of *Eratoidea sulcata* and two considered to be forms of *E. margarita*, are described for the first time. In an attempt to deal with the morphological disparity of the genus, all species and forms are arranged into nine morphological species groups as follows:

***Eratoidea levisa*** group: *E. levisa* n. sp., *E. glareana* n. sp., *E. diatrete* n. sp., *E. phillipsi* n. sp., *E. ponsia* n. sp., *E. infera* n. sp., *E. stiatola* n. sp., *E. tayronata* n. sp.

***Eratoidea sulcata*** group: *E. sulcata* (d'Orbigny, 1842), *E. sotaventensis* n. sp., *E. fuiensis* n. sp., *E. gorda* n. sp., *E. viequesa* n. sp., *E. cf. E. sulcata*, *E. unionensis* n. sp., *E. rugata* n. sp.

***Eratoidea lasallei*** group: *E. lasallei* (Talavera & Princz, 1984), *E. copiosa* n. sp., *E. ampla* n. sp., *E. estensis* n. sp., *E. perspicua* n. sp., *E. brevis* n. sp., *E. rugosa* n. sp., *E. rosarioensis* n. sp., *E. recta* n. sp., *E. acuta* n. sp.

***Eratoidea acutulla*** group: *E. acutulla* n. sp., *E. aciesa* n. sp.

***Eratoidea margarita*** group: *E. margarita* (Kiener, 1834), *E. lozii* n. sp., *E. cf. E. margarita* form A, *E. cf. E. margarita* form B.

***Eratoidea hematita*** group: *E. hematita* (Kiener, 1834), *E. cochensis* n. sp., *E. ranguanaensis* n. sp., *E. pustulata* n. sp., *E. robusta* n. sp., *E. grandis* n. sp.

***Eratoidea watsoni*** group: *E. watsoni* (Dall, 1881), *E. fernandinae* (Dall, 1927).

***Eratoidea scalaris*** group: *E. scalaris* (Jousseume, 1875), *E. janeiroensis* (Smith 1915).

***Eratoidea costulata*** group: *E. costulata* (Thiele, 1925), *E. costata* (Bozzetti, 1997), *E. sinuosa* (Bozzetti, 1997), *E. boyeri* (Bozzetti, 1994).

### GENERAL INTRODUCTION

Historically all taxa which are currently assigned to the genera *Eratoidea* and *Dentimargo* were classified as *Marginella*. On morphological grounds many *Eratoidea*, particularly the smaller species are very close to *Dentimargo* and the bigger species are close to *Marginella*. It is understandable how confusion can arise, therefore, before describing any new species in the genus *Eratoidea* it is necessary to define the salient morphological features in both genera in order to separate them from each other and to distinguish them from *Marginella sensu stricto*.

Although the genus *Eratoidea* was proposed by Weinkauff (1879:140), he continued to use the all-encompassing generic name *Marginella* (in his monograph). Weinkauff used the terms "Section" and "Gruppe" in his proposals. The latter – "Gruppe" – equates with genus in modern taxonomic terms

(Coover and Coover, 1995:96), but it was not until twenty years later that the genus was formalised by Cossmann (1899:87) when *Marginella margarita* Kiener, 1834, was subsequently designated type species of the new genus *Eratoidea* Weinkauff, 1879.

In his proposal, under "1. Section", Weinkauff listed three Groupes (sub-divisions):

Gruppe a. (*Marginella* s. str. H. et A. Adams) z. B. *Marg. glabella* Linné sp.

Gruppe b. (*Glabella* H. et A. Adams) z. B. *Marg. faba* Linné. *Muscaria* Lam.

Gruppe c. (*Eratoidea* Wk. = *Marginella et Egouena* Jous. Partim).

α mit bewaffnetem Mundrand z. B. *Marg. margarita* Kiener.

β - glatter - *australis* Hinds.

γ (= *serrata* Jous. ex parte) - *serrata* Gask.

Weinkauff saw a somewhat similar phylogeny to that which, over a hundred years later was supported

by Covert and Covert (1995:104) who grouped together four genera in their "Intuitively Derived Phylogeny of the Marginellini", and supported this with observations of shell morphologies and a summary of research into the internal anatomy of the animals. All appear to lack a radula, their principal unifying character. These genera are: *Dentimargo* Cossmann, 1899; *Eratoidea* Weinkauff, 1879; *Marginella* Lamarck, 1799; and *Glabella* Swainson, 1840.

Weinkauff only proposed an outline classification that included the new "Gruppe" *Eratoidea*, and it was left to Covert and Covert (1995:96) to establish the first diagnosis of the genus. Covert and Covert only studied two species in the genus which resulted in their diagnosis being incomplete but it appears to have been seen as wide enough to accommodate several additional taxa which were subsequently included in the genus. These taxa, which could represent other phyletic divisions, are generally represented by only a small number of poorly studied samples. I propose that they are given 'species group' status until more material becomes available for study and more knowledge is gained about them.

**Separation of genera.** In the separation of *Eratoidea* species from *Dentimargo*, bifurcation of the plications is the most important feature to be considered. While it is almost universal in the genus *Eratoidea*, bifurcation of the plications is not diagnostic for the genus as it stands at present: bifurcation is absent in the *E. watsoni* group from the northern Caribbean, the *E. scalaris* group from Brazil and *E. grandis* n. sp. in the *E. hematita* group from the Caribbean, all of which have simple, thin plications.

The fossil genus *Stazzania* Sacco, 1890a, from the Eocene, is represented by a wide range of species, all of which exhibit strongly bifurcated plications (Fig. 24). Covert and Covert (1995:94) discuss the bifurcation of plications in the context of the possible ancestry of the genus *Stazzania* Sacco, 1890a, to the genus *Dentimargo*, and they make a statement which is very significant when separating the two genera *Dentimargo* and *Eratoidea*: they state that they consider *Stazzania* to be an extinct separate lineage from the contemporaneous *Dentimargo* and that most recent species of *Dentimargo* have simple unmodified plications. This statement is significant because, after the re-assignment of a number of previously described species from the genus *Dentimargo* to *Eratoidea* and clarification of the morphology of *Dentimargo reductus* Bavay, 1922, thus allowing all the *E. levisa* group species to be confidently placed in the genus *Eratoidea*, there are no taxa with bifurcated plications, known to me, remaining in the genus *Dentimargo*. It was noted that the second plication of some *Dentimargo* species examined have somewhat flattened, widened distal ends, but these cannot be regarded as bifurcated. My research has been based largely on photographic images of the *Dentimargo*

taxa, and in a number of cases no image has been available. However, because of the above statement by Covert and Covert and my own findings it seems probable that any taxon with bifurcated plications remaining in the genus *Dentimargo* will turn out to be an *Eratoidea*.

Other shell characters which can help to separate *Dentimargo* from *Eratoidea* are: in general *Dentimargo* have taller spires; often have a single prominent posterior labial denticle, as in *D. dentifera* (Lamarck, 1803), the type species of the genus; have labial denticles that are more numerous and weaker; and surface costae are absent. *Eratoidea*, in general, have bifurcated plications; less numerous but stronger labial denticles; shorter spires; are more inflated and have weak or strong axial costae. Chromatism of the animals is significantly different between the two genera: *Eratoidea* are without colour or are white except for an occasional very slight yellow tint; generally have yellow or orange colour on or around the eyes; some species have black areas on the mantle roof; one species, *E. brevis* n. sp., has very pale yellow spots and some iridescence on the foot. The *E. Hematita* group which is closest to the genus *Marginella*, with all observed species having strongly coloured shells and polychromatic animals, can't be confused with *Dentimargo* because of the difference in shell and animal morphology as well as in animal chromatism. In *Dentimargo* strong yellow or orange colour on or around the eyes is normal; other external parts of the animal often have coloured marks or can be polychromatic; the majority of species have polychromatic mantle roofs. The separation of *Eratoidea* from *Dentimargo* is considerably simplified because those species of *Eratoidea* which are closest to *Dentimargo* are endemic to the south and east of the Caribbean, therefore, there are very few species which are likely to be confused. *Dentimargo reductus* Bavay, 1922, is the closest to the genus *Eratoidea* and separation, in particular from the *E. levisa* group, will be conclusively demonstrated later in this article.

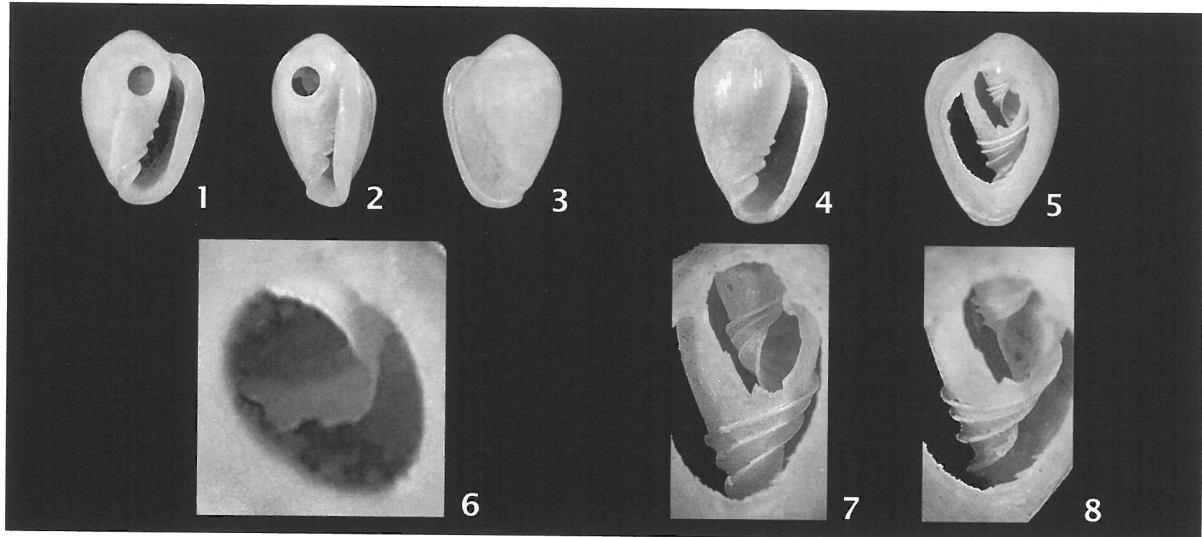
Taxa in the genus *Marginella* are somewhat similar to the larger species in the genus *Eratoidea* and in the case of the *E. hematita* group which is closest, can be separated by their normally strongly coloured, patterned shell and smooth mantle. In all the other *Eratoidea* groups where an element of shell pattern may be detected, in particular the *E. levisa* group, separation can be achieved by comparison of basic shell morphology. Although widely costate, *Glabella* appear to be less closely related to *Eratoidea* and can be separated by their patterned shell and siphonal notch.

The phylogenetic relationship is such that the genus *Eratoidea*, with its wide range of intermediate morphologies lies comfortably between *Dentimargo* on the one hand and *Marginella* on the other.

*Marginella microgonia* Dall, 1927; type locality: USA, Albatross sta. 2415, off Georgia, 30°44'N

79°26'W, 805 m; sta. 2668, off Fernandina, Florida (actually off Georgia), 30°58'N 79°38'W, 538 m. has been widely accepted, until now, as an *Eratoidea*. Coover (1986d) provisionally assigned it to the genus *Cystiscus* but subsequently re-assigned it to the genus *Eratoidea*. This species exhibits axial striations which appear to be the only feature which could possibly link it to *Eratoidea*. Two shells were examined internally, one through a predator hole and the other by grinding a large hole in the dorsum. It was found that the internal whorls and plications in one shell

were largely resorbed and in the other, were partially resorbed (Figs 1-8). The degree of resorption was similar to that found in the genus *Granulina* (McCleery, 2010:39). Resorption or absence of resorption of internal whorls and plications is the feature which separates the families Cystiscidae and Marginellidae (Coover and Coover 1995:43, 48-49), therefore, it is clear that *M. microgonia* belongs in the Cystiscidae and is here re-assigned to the Cystiscid genus *Granulina* Jousseume, 1888, with which it has most affinity.



Figures 1-8

1-8. *Granulina microgonia* (Dall, 1927), off Bahamas, 996 m.

1-4. Predated shell, 2.37 x 1.67 mm, W:L 71%, incompletely resorbed early teleoconch whorl viewed through predator hole; 5-8. Cut shell, 2.68 x 1.86 mm, W:L 69%, partially resorbed plications viewed through cut away dorsum.

**Geographical distribution.** Caribbean Sea is used herein to include the south eastern U.S.A. south of Georgia and the Bahamas in the north, and Trinidad and Tobago in the south east. The genus *Eratoidea* is known to range from the southern U.S.A. to Brazil and from South Africa to Somalia, with a large separation between the two areas. It is unknown in the Pacific and the Eastern Indian Ocean. The Caribbean is a stronghold for the genus, particularly the southern Caribbean and West Indies where some species groups appear to be endemic. The genus is thinly spread between the Caribbean and Brazil with only one undescribed species in the *E. lasallei* group and two described species in the *E. scalaris* group being known. The genus is also thinly spread between South Africa and Somalia with only four described species in the *E. costulata* group being known in this area. Considerably more sampling has been carried out, both historically and recently, in the Caribbean which probably accounts for the difference in species counts recorded between these geographical areas.

**Described species.** The list of described species includes all described species which remain assigned to the genus *Eratoidea* after the re-assignment of *Marginella microgonia* to the Cystiscid genus *Granulina* and the addition of *Dentimargo boyeri* Bozzetti, 1994, which is included in *Eratoidea* for the first time:

*Marginella margarita* Kiener, 1834, type species;  
*Marginella hematita* Kiener, 1834;  
*Marginella sulcata* d'Orbigny, 1842;  
*Syn. Marginella striata* Sowerby II, 1846, non Laseron, 1957;  
*Marginella scalaris* Jousseume, 1875;  
*Syn. Marginella janeiroensis* E. A. Smith, 1915;  
*Marginella watsoni* Dall, 1881;  
*Marginella costulata* Thiele, 1925;  
*Marginella fernandinae* Dall, 1927;  
*Marginella lasallei* Talavera & Princz, 1985;  
*Dentimargo boyeri* Bozzetti, 1994;  
*Dentimargo costata* Bozzetti, 1997;  
*Dentimargo sinuosa* Bozzetti, 1997.



Map 1. Caribbean Sea, type localities and other localities referred to in text

1. USA, Albatross sta. 2668, off Fernandina, Florida (actually off Georgia), 30°58'N 79°38'W (Off map to north).
2. Bahamas, Abaco Island.
3. Bahamas, Exuma Islands.
4. Cuba, off Havana.
5. Puerto Rico, islets to north east, 18°05.9'N 65°34.5'W.
6. British Virgin Islands, Virgin Gorda, 18°30.85'N 64°21.93'W.
7. West Indies, Barbuda, Spanish point, 17°32.7'N 61°44.3'W.
8. West Indies, Martinique.
9. West Indies, St Vincent and the Grenadines, Isle Quatre, 12°57.7'N 61°15.1'W.
10. West Indies, St Vincent and the Grenadines, Union Island, Chatham Bay, 12°36.3'N 61°27.1'W.
11. West Indies, St Vincent and the Grenadines, off Union Island, 12°35'N 61°28'W.
12. West Indies, Trinidad and Tobago, Tobago, Man-o-War Bay, 11°20.2'N 60°33.7'W.
13. Venezuela, off Islas Los Testigos, approximately 11°22'N 65°05'W.
14. Venezuela, east of Isla Coche, 10°47.3'N 63°52.7'W.
15. Venezuela, north west of Isla Margarita, 11°17'N 64°29'W.
16. Venezuela, Isla Cubagua, the anchorage, 10°49.9'N 64°09.8'W.
17. Venezuela, east of Isla Tortuga, 10°53'N 65°27'W.
18. Venezuela, Cabo Codera, 10°36.3'N 66°04.4'W.
19. Venezuela, Islas Las Aves de Barlovento, 11°59'N 67°27'W.
20. Venezuela, Islas Las Aves de Sotavento; 12°01'N 67°39'W.
21. Venezuela, Caracas del Este, 10°21'N 64°27'W.
22. Venezuela, off Ocumare, 10°30'N 67°47'W.
23. Venezuela, Puerto Cabello, Isla Largo, 10°29.3'N 67°56.9'W.
24. Curaçao, Fuik Bay, 12°02.9'N 68°50.0'W and off Spaanse Water, 12°04'N 68°51'W.
25. Aruba, Barcadera river estuary, 12°28.3'N 69°58.5'W.
26. Venezuela, Monjes del Sur, harbour, 12°21.5'N 70°54.1'W.
27. Colombia, Cabo de Vela, 11°56'N 72°42'W.

28. Colombia, Santa Martha, 11°19.8'N 74°08.7'W.
29. Colombia, off Cartagena, 10°22.4'N 75°35.8'W and east of Islas Rosarios, 10°15.0'N 75°42.6'W.
30. Columbia, Golfo de Morrosquillo, 9°34'N 75°46'W.
31. Honduras, Bay Islands, Guanaja, north eastern lagoon, 16°28.4'N 85°49.6'W.
32. Honduras, Bay Islands, Roatan, Fantasy Island, 16°21.3'N 86°26.3'W.
33. Belize, Ranguana Cay, 16°21.3'N 86°26.3'W.

**Proposed species groups.** The shell morphologies of described species currently included in the genus *Eratoidea* (listed above) are demonstrably very disparate (Figs 9-25). The following proposed species groups are intended to rationalise this unsatisfactory situation and at the same time to accommodate the thirty one new *Eratoidea* species into a workable taxonomic framework. A representative species will be assigned to each proposed group.

The nine proposed *Eratoidea* species groups and their representative species are:

*Eratoidea levisa* group, represented by *E. levisa* n. sp.;

*Eratoidea sulcata* group, represented by *E. sulcata* (d'Orbigny, 1842);

*Eratoidea lasallei* group, represented by *E. Lasallei* (Talavera & Princez, 1985);

*Eratoidea acutulla* group represented by *E. acutulla* n. sp.;

*Eratoidea margarita* group, represented by the genus type species *E. margarita* (Kiener, 1834);

*Eratoidea hematita* group, represented by *E. hematita* (Kiener, 1834);

*Eratoidea watsoni* group represented by *E. watsoni* (Dall, 1881);

*Eratoidea scalaris* group represented by *E. scalaris* (Jousseume, 1875);

*Eratoidea costulata* group, represented by *E. costulata* (Thiele, 1925).

On grounds of shell morphology alone, the first six groups listed, which range from the Bahamas to Brazil, are arranged in an intuitive order between the genera *Dentimargo* and *Marginella*. The *Eratoidea levisa* group is closest to *Dentimargo* followed closely by the *E. sulcata*, *E. lasallei* and *E. acutulla* groups. These four groups which are minute to small species with weak to very strongly costate surfaces, are followed by the *E. margarita* group, and *E. hematita* group (closely approaches the genus *Marginella*) which have medium to moderately large shells with only traces of surface costae showing in some species. All six groups present bifurcated plications and weak to strong surface costae, features which are considered to be the most important and distinctive features of the genus *Eratoidea*. The remaining three groups: the *E. watsoni*, *E. scalaris* and *E. costulata* groups do not fit comfortably in the genus *Eratoidea*. They each have at least one feature which has probably brought about their assignment to the genus but all three also have features which are not essentially those of the

genus *Eratoidea* or indeed, *Dentimargo*. This subject will be discussed fully in the systematic section.

There is a huge difference in shell morphology between the groups (Figs 9-25), and there seems to be a case for the erection of new genera, but I consider this to be a subject best tackled separately from this article.

## MATERIALS and METHODS

In the period between 1999 and 2009 I collected, by a combination of dredging, diving and snorkelling, approximately 1,200 live specimens and dead shells in over 200 lots in the genus *Eratoidea*. The area of the Caribbean Sea covered stretched from Belize and the Cayman Islands, south through The Bay Islands of Honduras, a number of off-shore islands and reefs, to Panama, throughout the southern Caribbean to the West Indies including Trinidad and Tobago, and north to the Bahamas. Only a very small and random part of the area was actually sampled which gives some indication of the large number of species which probably remain to be collected and described. Much of the material was collected by dredging and was dead, but approximately one specimen in every fifty was found to be live providing an opportunity for anatomical studies and live animal photography.

Hand dredging in sand or muddy substrates and the use of a hand operated suction pump on rocks and rubble substrates were the most productive methods of collecting *Eratoidea* in shallow waters down to approximately 30 metres. Night diving yielded some positive results as specimens could be picked up from sand and rubble or off rocks. Many species, including those in the *E. lasallei* and *E. acutulla* groups which are deep water species, were collected by dredging. The resultant grit from all methods of collection was screened into four grades. Finer screenings were placed in bowls of sea water and covered. Live animals then crawled up the sides where they could be picked up. Finer grades of grit from deep dredging were also sorted visually for dead shells, which comprised an average of approximately 95 percent of all shells collected by dredging. As dredging techniques improved so did the percentage of samples containing live animals. Before collecting ceased, approximately half of all samples collected by dredging contained some live material. This was probably due to the dredge skimming the surface of substrates rather than by biting too deeply and becoming blocked - much dead material appears to lie in the solid, settled mud, but live animals inhabit the

surface layer and loose algal material on top of the solid mud.

From amongst these samples thirty one new species have been identified and are described herein. Generally these new species are represented by six or more examples, but a few are represented by smaller lots where the quality of the data is regarded as sufficient to justify the description of a new species.

Samples from live material were photographed in a small aquarium below a microscope with a digital camera mounted on top. The same equipment was used for detailed imaging of dried shells and was calibrated so that shell dimensions could be obtained from data displayed by software. Dimensions of shells are accurate to plus or minus 2 %, and those of live animals to plus or minus 4%. All relevant data, including a chosen shell image were entered in a database. A special feature of the database is a comparator which enables a simple and very effective means for comparing shell images. This proved to be very useful in highlighting small yet consistent morphological differences. Wide use has been made of SEM images but optical photography remains essential for presenting sub-surface features where shells are semi-transparent or translucent. SEM images as presented in this article show only surface features (Figs 95-96).

It has not been possible to use a single magnification for all images due to the large size variation between species groups; the magnifications used, which range from approximately X5 to X25, are stated under each group. In order to give a visual impression of the wide range of shell sizes found in the genus one plate is presented in which all species groups are represented. In this plate all images are produced at X10 magnification (Figs 9-25). Within each species group both the optical and SEM shell

images, in ventral and side view, are made at a constant magnification in order to give a true indication of the relative sizes of each species in that group. The cleanest shell available was chosen for SEM images in each new species and, if it was found to be significantly above or below the average size the images were reduced to the average size of that species.

Shell surface texture (micro-sculpture) can take the form of small pustule-like protuberances, visible to the naked eye, through to very minute texture only visible in SEM images with a magnification of approximately X240. Surface texture has been described in a number of recent *Granulina* species by several authors: Boyer and Rolán (1999:1-10), Espinosa & Ortea (2005:36), McCleery (2010:37-71), but its presence in other genera in the Families Cystiscidae and Marginellidae is only now becoming recognised. Surface texture takes many forms and is widely found in the genus *Eratoidea*, and in some cases has been helpful in distinguishing between the new species described herein. However, it was not found to be universally helpful in separating species as the texture is remarkably variable in some species.

Shells in the *Eratoidea sulcata* and *E. lasallei* species groups are strongly costate. The total number of costae and costae per whorl are variable between species and this feature is helpful in species identification. In order to establish both of these numbers it was essential to accurately count the number of whorls. The most satisfactory way to do this is to count the whorls from the body whorl inwards, designating the body whorl as the 'first' whorl. In most species there is an incomplete whorl between the third whorl and the transition point from protoconch to teleoconch. This extra segment of teleoconch whorl, usually the fourth whorl, is

## Figures 9-25

**9-25.** The genus *Eratoidea*, all proposed species groups represented, magnification approximately X10.

**9.** *Eratoidea acutulla* group, *E. aciesa* n. sp., paratype 1, 6.22 mm, Venezuela, East of Isla La Tortuga, MNHN 23756; **10.** *Eratoidea acutulla* group, *E. acutulla* n. sp., holotype, 4.51 mm, Trinidad and Tobago, north west coast of Tobago, MNHN 23753; **11.** *Eratoidea watsoni* group, *E. watsoni* (Dall, 1881), 10.4 mm, off Jamaica, TMC; **12.** *Eratoidea margarita* group, *E. lozii* n. sp., holotype, 4.70 mm, Honduras, Bay Islands, Guanaja, MNHN 23757; **13.** *Eratoidea sulcata* group, undescribed sp., biggest shell recorded, 3.64 m, Venezuela, Las Aves de Barlovento, TMC; **14.** *Eratoidea sulcata* group, *E. rugosa* n. sp., holotype, 2.24 mm, St Vincent and the Grenadines, off Union Island, MNHN 23745; **15.** *Eratoidea scalaris* group, *E. scalaris* (Jousseume, 1875), 2.85, Brazil, AWC; **16.** *Eratoidea margarita* group, *E. cf. E. margarita* (Kiener, 1834) form B, 7.49 mm, West Indies, Barbuda, MNHN; **17.** *Eratoidea levisa* group, *E. statiola* n. sp., ad. lv., 2.83 mm, Venezuela, Monjes del Sur, harbour, TMC; **18.** *Eratoidea levisa* group, *E. phillipsi* n. sp., paratype 1, 2.07 mm, Curaçao, off Spaanse Water, MNHN 23714; **19.** *Eratoidea lasallei* group, *E. recta* n. sp., paratype 1, 3.50 mm, Colombia, west of Cabo de Vela, MNHN 23750; **20.** *Eratoidea lasallei* group, *E. brevis* n. sp., holotype, 1.90 mm, Venezuela, Cabo Codera, MNHN 23743; **21.** *Eratoidea hematita* group, *E. cochensis* n. sp., paratype 4, 5.90 mm, Venezuela, Isla, off Coche, MNHN 23760, TMC; **22.** *Eratoidea hematita* group, *E. grandis* n. sp., paratype 2, 13 mm, Aruba, off south west coast, MNHN 23769, TMC; **23.** *Eratoidea costulata* group, *E. boyeri* (Bozzetti, 1994), holotype, Somalia, Cape Ras Hafun, MNHN 0666; **24.** *Stazzania bifidoplicata* (Charlesworth), 3.5 mm, fossil, Eocene, Lower Barton Bed, A3, Barton, Highcliffe, England. Courtesy of Dr Alan Morton; **25.** *Eratoidea costulata* group, *E. sinuosa* (Bozzetti, 1997), holotype, 2.3 mm, Zanzibar, Kiwengwa, MNHN 1268.



measured in tenths of a whorl. For example, where there are three complete teleoconch whorls and an extra 0.1 part of a whorl, the total teleoconch whorls are described as 3.1 whorls. This system has been used throughout this article.

Descriptions are of the holotypes, and additional information is given in the 'Remarks'. Where possible coloured images of the holotypes (shell and animal) are presented, but occasionally it was necessary to feature a paratype. In some cases the SEM protoconch images are not of the type material because the shells were of poor quality. In such cases this is stated.

## ABBREVIATIONS AND TERMINOLOGY

ANSP: The Academy of Natural Sciences.  
 BM(NH): British Museum (Natural History).  
 MHNG: Muséum d'Histoire Naturelle, Geneva, Switzerland.  
 MHNP: Muséum d'Histoire Naturelle, Parigi, Italy.  
 MICN: Museo Insular de Ciencias Naturales. Santa Cruz de Tenerife, Islas Canarias, Spain.  
 MNHN: Muséum national d'Histoire naturelle, Paris, France.  
 AWC: Andrew Wakefield Collection.  
 TMC: Tony McCleery Collection.  
 ad.: adult specimen.  
 juv.: juvenile specimen.  
 dd.: dead collected.  
 lv.: live collected.  
 TS: type species.  
 SD: subsequent designation as type.  
 RS: representative species.

**Terminology.** In general I have followed terminology and conventions established by Coovert and Coovert (1995):

Shell size: minute, up to 2.4 mm; small, over 2.4 mm up to 6.0 mm; medium, over 6.0 mm up to 13 mm; moderately large, over 13 mm up to 25 mm.

Spire: low; less than 25% of shell length; medium, 26-33% of shell length, tall, more than 33% of shell length (Coovert and Coovert, 1995:50).

The terms 'siphonal notch' and 'posterior notch' have precise meanings and are clearly described (Coovert and Coovert, 1995:50). 'Siphonal canal' (Coovert and Coovert, 1995:47) and posterior canal are used herein, but do not indicate the presence or absence of a notch which is a separate and distinct feature. All *Eratoidea* species have a 'type 2 Head' (Coovert and Coovert 1995:52), therefore, this is not repeated in the description of animals.

The term 'semi-transparent' is used to describe the shell or animal where features and their colour can be readily distinguished through the shell; 'translucent-white' is used where features and their colour are barely discernable. 'Chromatism' is the term used to cover both colour and pattern. The terms 'columellar plications' and 'external varix' are shortened to

'plications' and 'varix' to avoid repetition as there cannot be any confusion in the genus *Eratoidea* by the omission of 'columellar' and 'external'. The term 'scales' is used to describe one distinct form of minute surface texture found in a number of taxa (Fig. 259). The term 'bifurcation' is used to describe both the split distal end of plications (Fig. 97) and the widened distal ends, even where the widening edges, referred to as 'limbs' are little more than very slight ridges around the widened area (Figs 188-195). The limbs are occasionally slightly raised, particularly the upper limb of the first plication (Fig. 306).

## SYSTEMATICS

Family **MARGINELLIDAE** Fleming, 1828:328  
 Subfamily **MARGINELLINAE** Fleming, 1828:328  
 Tribe **MARGINELLINI** Fleming, 1828:328  
 Genus *Eratoidea* Weinkauff, 1879  
 Type species *Marginella margarita* Kiener, 1834; SD, Cossmann, 1899: 87  
 Gender Feminine

**Type material.** Lectotype, 7.7 x 5.1 mm, W:L 66%, (designation Boyer), registered MHNG 993.202. The original type material is lost (part of the Delessert collection).

**Type locality.** "Les mers des Indes", which is presumed to translate as Caribbean Sea.

**Original description.** Shell small, oval, columbelliform, translucent white; spire low and conical; lip colour matt white; very pronounced denticles filling the inside edge of the lip; varix strongly pronounced; four plications. Length 10.2, width 5.1 mm.

**Remarks.** The type locality of the lectotype is unknown. The shell is somewhat different to all those which I collected, being almost perfectly symmetrical with an unusually low spire, high rounded shoulder, very strong plications and very evenly graded labial denticles, reducing in size anteriorly. Only photographs of the lectotype have been examined.

**Morphological features of the genus.** *Eratoidea margarita* (Kiener, 1834), the type species of the genus *Eratoidea*, exhibits most of the features found in the genus, and in morphological terms lies between the *E. acutulla* and *E. hematita* species groups which, themselves, lie towards the genus *Marginella*. The majority of species in the genus are minute and lie closer to the genus *Dentimargo*.

When Coovert and Coovert (1995:96) made the first detailed diagnosis of the genus *Eratoidea*, they omitted several features which have recently come to light and are important in distinguishing between the proposed species groups. Their paper also contained

the following confusing statements: a). The Type 2 animal has a papillose mantle extending over the shell, and b). The shells of *Eratoidea* species have four strong plications.

Regarding the papillose mantle, Covert and Covert based their conclusion on the mantle of only one live animal which happened to be *Eratoidea hematita*, a papillose species. I photographed many live animals in the genus which included five *Eratoidea* species groups and determined that the mantles in all except those species in the *E. hematita* group are completely smooth. All mantles observed, except those in the *E. hematita* group were found to be transparent. This was well illustrated by the discovery of a damaged animal of *E. ponsia* n. sp. which was found to have its transparent mantle partially extended, with particles of sand and other debris embedded in it (Figs 50-51). Subsequently it was noticed that mantles first emerge in a thickened state and can occasionally be detected close to the varix (Figs 139, 150). Mantles of *Eratoidea* are generally unmarked or occasionally sparsely covered with minute white or off-white spots (Fig. 218). No animals were observed in the *E. acutulla*, *E. watsoni*, *E. scalaris* and *E. costulata* groups.

Three of the six species in the *E. hematita* group were collected live and all mantles were found to be papillose. When the papillae were fully extended they were observed to be long and not noticeably tapered. Of note was the manner in which these long, individual papilla, when in the fully extended state, project from the mantle without any noticeable basal thickening (Fig. 355) making it difficult to understand how such an appendage can materialise out of the very thin mantle. It was also noted that live animals in the *E. hematita* group always presented their mantles, at least, partially extended.

Regarding the number of plications: *Eratoidea watsoni* (Dall, 1881) is unusual and could be termed 'multiplicate' as some shells have up to seven plications and lirae combined. Dall (1881:71), in his sketch of the holotype of *E. watsoni* clearly depicts a shell with only four plications; a shell in the Andrew Wakefield collection has a total of seven plications and lirae combined; Cossignani (2006:215) illustrates an example which has five distinct plications plus a weak sixth and a shell in my own collection (Figs 11, 401-404) has four plications and one strong lira. It was also noted that the plications of *E. watsoni* show no sign of bifurcation. *E. watsoni* does not fit comfortably in the genus because of its unusual plications and overall shell morphology. However, without a more suitable genus to which it could be assigned, it was decided that it should remain in the genus *Eratoidea* as the representative species for the proposed *E. watsoni* species group, together with *E. fernandinae*, a shell with somewhat similar morphology.

Bifurcation of the plications is a feature present in most *Eratoidea* species but it is not diagnostic of the

genus because it is absent in the *E. watsoni* and *E. scalaris* groups, and in *E. grandis* n. sp. in the *E. hematita* group. Two forms of bifurcation are found and both are equally common: one form is a simple splitting of the distal end of the plications which results in two short, well formed limbs which extend a short distance on the ventral surface before merging with it (Figs 24, 97). This form is generally found on the third and fourth plications. The other form is more complex and is essentially confined to the first and second plications: the distal end of a plication widens and thickens, the edges are slightly to noticeably raised and are referred to as limbs even when only very slightly raised (Figs 188-195); frequently the limbs extend only a short distance over the ventral surface before merging with it; occasionally the limbs rejoin distally to form the shape of a pointed leaf (Fig. 189); on other occasions the lower limb will quickly fade while the upper limb will extend significantly before merging with the ventral surface (Figs 185, 193); other minor variations are also found. Limbs of the bifurcated first plication seldom widen significantly; the upper limb is generally stronger and often somewhat raised (Fig. 306). The limbs of the first plication, particularly the lower limb merge with the extended lip, or lip and varix combined, which sweep around the base forming the siphonal canal (Fig. 253).

Covert and Covert (1995:96) gave the size range for the genus as 'adult length 1.9-11.0 mm'. This is now extended to 1.74 - 15.0 mm, W:L 47 to 66%.

Shell colour ranges from semi-transparent with or without tints of pink, yellow, or brown, through translucent to opaque white, yellow, brown, greenish-grey, pink, rose and deep wine-red. The stronger, more opaque colours are confined to the *Eratoidea hematita* group. Bands of yellow-brown to reddish-brown are common in some groups and can also develop into large solid coloured areas on the dorsum (Figs 145, 150). Costae, aperture and callus areas are strongly translucent or opaque off-white, even when present on otherwise semi-transparent shells, occasionally these areas are tinted. Costae are not diagnostic for the genus *Eratoidea* as they are absent in some species, particularly those in the *E. hematita* group, and are generally present in the Marginellid genus *Glabella* which is also a member of the tribe Marginellini. Various forms of surface texture (micro-sculpture) are present in the genus and on occasions have been helpful in species identification. These vary from a pustulose embellishment of the surface, just visible to the naked eye (Fig. 327), to a variety of forms of extremely fine protuberances only visible at magnifications of around X240 or more (Figs 257-259). One particularly distinct form can be likened to scales and is often found on the lip and emergent parietal wall; these scales have fused outlines with raised, serrated distal edges (Fig. 259). Surface texture has the effect of dulling the shell surfaces and it is interesting to note that Kiener (1834) in his original

description of *E. margarita* stated that the colour of the lip was matt white. This was almost certainly caused by the strong texture found on the lip, a feature of *E. margarita*.

Labial denticles are variable in the genus but fairly constant in each species, not only in their number but in their form and position on the lip. An unusual feature is the secondary row of labial denticles present in all species of the *E. lasallei* group, and is a diagnostic feature of that group (Fig. 254).

Covert and Covert (1995:104) believed that all four extant genera in the tribe Marginellini were non-radulate, but Boyer (2005) has shown that there are exceptions to this by the discovery of a minute radula in *Dentimargo aureocinctus* (Stearns, 1872). This radula has the same general form as radulae, type 6, of *Volvarina* Hinds, 1844, and Boyer draws attention to the probable very close relationship between the genera *Dentimargo* and *Volvarina*. This is not inconsistent with Covert and Covert's conclusion, as they show in their 'Intuitively Derived Phylogeny of Marginellidae' a close relationship between the tribes Marginellini and Prunini which includes the genus *Volvarina*. I attempted extractions on approximately ten specimens in the genus *Eratoidea* and no radulae were found, but this is inconclusive as the radula discovered in *D. aureocinctus* by Boyer was minute, and any radula which might exist in *Eratoidea* can also be expected to be minute and very difficult to find.

**Animals.** The foot ranges from 1 ½ to 2 times the shell length and from slightly narrower to significantly wider; tentacles and siphon are moderately long, to long. Close examination of the available coloured images reveals that the marks on various membranes, including the foot and the tentacles, are comprised of numerous very fine grains of pigment which are located within the membrane and, in the tentacles, are often arranged in loosely formed rings. This structure is similar to that found in animals of the Cystiscid genus *Granulina* (McCleery, 2010:40). In simple terms the eyes are comprised of a broadly round, black centre encased in a membrane which is transparent, white, yellow or orange in colour. The black centres were clearly seen in a number of specimens while being dissolved in a solution of KOH when searching for a radula: they were amongst the last parts of the animals to dissolve and appeared as solid black spheres. The eyes in the genus were found to vary significantly, for example, all those observed in the *E. lasallei* group appeared to be looking upwards (Figs 214-223), whilst those in the *E. levisa* group appear to be looking sideways (Figs 56, 58-67) except for one animal which appears to be looking upwards (Fig. 57). In the *E. margarita* group the colour of the encasing membrane of *E. lozii* n. sp. is pale orange accompanied by two diametrically opposed, adjacent, orange marks, and the eyes are looking sideways (Fig. 289); in *E. cf. E.*

*margarita* form A the encasing membrane is translucent white accompanied by two small, diametrically opposed, adjacent, orange marks and the eyes are looking partially upwards (Fig. 287); in *E. cf. E. margarita* form B the encasing membrane is almost transparent, with semi-circular, orange marks partially encircling the eyes which are looking upwards (Fig. 291). If movement is a feature of the eyes it was not observed but could easily have been overlooked. White is the predominant colour of the animals in the genus but in the *E. lasallei* group they are tinted in shades of brownish yellow (Figs 214-223) and in the *E. hematita* group the animals are colourful, particularly the mantles which are variegated in shades which match the colour of the shells (Figs 333, 356).

### ERATOIDEA LEVISA SPECIES GROUP

Figs 17, 29, 30, 32-128

#### INTRODUCTION

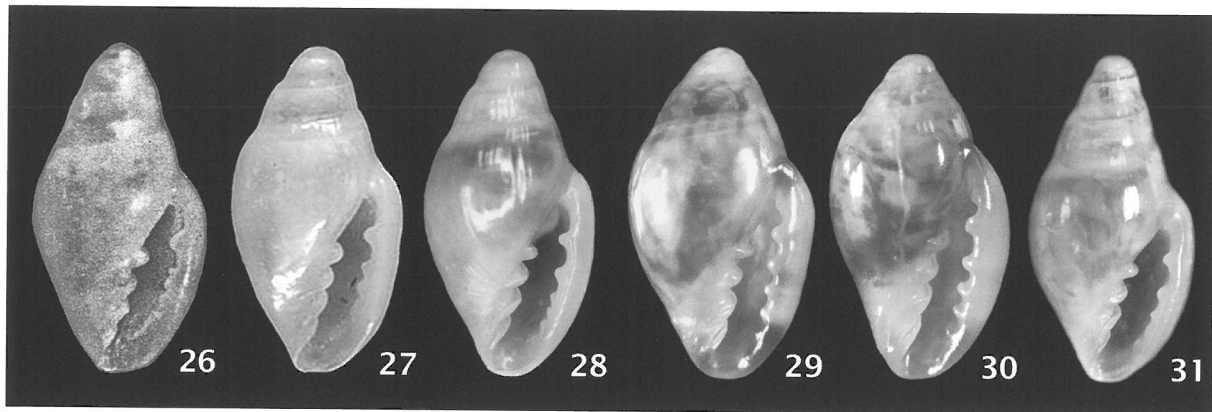
The proposed *Eratoidea levisa* species group exhibits shell morphology closest to the genus *Dentimargo* Cossmann, 1899. It is common in the southern Caribbean between Tobago in the east and the Rosario Islands of Colombia in the west. I did not collect any samples belonging to the group outside this area although much sampling was carried out in Panama and north to Honduras, Belize and the Cayman islands and in the Windward and Leeward islands of the West Indies and as far north as the Bahamas. Espinosa and Ortea (Avicennia, 1993-2009) carried out extensive sampling in Cuba and Costa Rica, and it is noted that they made no reference to any material which could belong to the *E. levisa* group. Therefore, it is concluded that the *E. levisa* group is endemic to the southern Caribbean. This group is generally found in shallow water but dead shells were dredged at various depths down to 80 m.

Until now, species belonging to the *E. levisa* group have generally been referred to as *Dentimargo reductus* Bavay, 1922 (gender correction from *D. reducta*, Covert 1999: 30). This is understandable as there is much similarity between them. However, they belong to two different genera, and there are sufficient morphological differences to enable positive separation, for example, in *D. reductus* the plications are not bifurcated, the labial denticles are weaker anteriorly, and there is a distinct difference in the chromatism. In this matter three groups/species need to be considered.

1). *Dentimargo reductus* (Bavay, 1922) *sensu stricto* which is represented herein by three images: a specimen of *D. reductus*, 2.67 x 1.42 mm, W:L 53%, Exuma islands, Bahamas, grass flats, 6 m, (Fig. 28), which compares well with the *D. reductus* syntype, MNHN 1176, (Fig. 27) and *D. reductus*, Bahamas, (Kaicher, 1981:2707), (Fig.26).

2). The *Eratoidea levisa* group, represented by *E. ponsia* n. sp., holotype, 2.87 x 1.61 mm, W:L 56%, Aruba, Barcadera river estuary, 1m, (Fig. 29) and *E. glarea* n. sp., holotype, 2.76 x 1.53 mm, W:L 5%, Tobago, Man-o-War Bay, 8 m, (Fig. 30).

3). An undescribed species, up to 4.5 mm, Bahamas, Abaco Island, 2.5 m. (= *D. reductus* in Redfern 2001, p. 104, figs 438a-438c), which I also collected in the Bahamas, Exuma islands, Pudding Cay, 3.30 x 1.72 mm, W:L 52% (Fig. 31).



**Figures 26-31** (constant size with varying magnifications)

**26-28.** *Dentimargo reductus* (Bavay, 1922), Bahamas.

**26.** Kaicher (1981, card 2707), approx. 3 mm; **27.** Syntype, 2.2 mm, Bahamas, MNHN 1176; **28.** Ad. lv., 2.67 x 1.42 mm, Bahamas, Exuma Islands, grass bank, 6 m, TMC.

**29.** *Eratoidea levisa* group, *E. ponsia* n. sp., holotype, 2.87 x 1.61 mm, Aruba, Barcadera river estuary, 1m, MNHN 23715; **30.** *Eratoidea levisa* group, *E. glarea* n. sp., holotype, 2.76 x 1.53 mm, Tobago, Man-o-War Bay, 8 m, MNHN 23709; **31.** *Dentimargo*, undescribed species, ad. lv., 3.30 x 1.72 mm, W:L 52%, Bahamas, Exuma Islands, Pudding Cay, TMC.

The undescribed species, up to 4.5 mm, Abaco Island, Bahamas, is common in the Exuma islands, and when compared to *D. reductus* (Bavay, 1922) *sensu stricto*, is separated by its size and by its spire which is always distinctly more pointed. In comparing *D. reductus* to new species in the *E. levisa* group, the plications in *D. reductus* are thin and well formed whereas, in *E. ponsia*, *E. glarea* and all other *E. levisa* group species the plications are distinctly wider and somewhat bifurcated (Figs 29-30, 75, 84); in *D. reductus* the eyes are black with a bright orange encasing membrane (Fig. 70) and orange spots are present on the foot, siphon and mantle roof (Figs 44, 70), whereas, in all *E. levisa* group species the eyes show only pale shades of yellow and all external parts of the animals, including the mantle, consistently exhibit only white spots or marks (Figs 56, 67); the only colours present, apart from the eyes, are very pale tints of the white parts of the animal in some *E. levisa* group species (Figs 33, 37). In contrast to this, the shells of all species in the *E. levisa* group exhibit yellow-brown or reddish-brown marks whilst the shells of *D. reductus* are colourless. The above data clearly confirms *D. reductus* as a *Dentimargo* and the *E. levisa* species group as belonging to the genus *Eratoidea*.

Eight new species in the proposed *Eratoidea levisa* species group are described. They are:

*Eratoidea levisa* n. sp., Venezuela, Isla Cubagua, the anchorage, 6 m; representative species.

*E. glarea* n. sp., Trinidad & Tobago, Tobago, Man-o-War Bay, 30-60 m.

*Eratoidea diatretra* n. sp., Venezuela, Puerto Cabello, Isla Largo, 2-3 m.

*Eratoidea phillipsi* n. sp., Curaçao, off Spaanse Water, 18-30 m.

*Eratoidea ponsia* n. sp., Aruba, Barcadera river estuary, 1 m.

*Eratoidea infera* n. sp., Aruba, Oranjestad, off the harbour, 6-26 m.

*Eratoidea statiola* n. sp., Venezuela, Monjes del Sur, the harbour, 3-12 m.

*Eratoidea tayronata* n. sp., Colombia, Santa Martha, Concha Bay, 2-10 m.

**Morphological features.** Shells of the *Eratoidea levisa* species group are broadly biconic and generally smooth in appearance, but all have very weak costae (Figs 71-72). Costae are most conspicuous sub-suturally and on the dorsal surface where they tend to strengthen slightly anteriorly, forming distinct ridges which curl around the base towards the second

plication where they merge with the ventral callus (Fig. 73). High magnification, X240, reveals that fine surface texture is always present on the lip and plications, is normally present on the ventral side of the spire and on parts of the protoconch, and rarely the entire shell is covered (Figs 113-120, 125-128). Surface texture occurs in many forms and is always invisible unless magnified; there is considerable intra-specific variation which reduces the importance of surface texture for distinguishing between species. It was noted that there can also be a variation in the form of the surface texture on individual shells. Callus deposits are generally weak apart from the ventral callus (Fig. 69) and callus at the labial insertion point (Fig. 72). The ventral callus is located between the anterior end of the shell and the fourth plication and reaches its widest point at the level of the third plication; there is a tendency for an axial ridge to form distally to the first and second plication (Figs 86, 92); in some species the edge of the callus is clearly defined and occasionally it can extend above the fourth plication as a parietal callus ridge (Fig. 69). Shell colour ranges from semi-transparent to translucent or almost opaque white, with or without tints of yellow-brown to reddish-brown. All bear some degree of random pattern comprised of marks or lines in deeper shades of yellow-brown to reddish-brown; spiral bands of small marks, and axial lines are common; occasionally the axial lines are sinuous or broken (Fig. 46). Shell size in the group is minute to small, and ranges from 2.07 x 1.21 to 3.42 x 1.65 mm, W:L 49 - 61%. Spire length is medium, with a range of approximately 26 - 35% of shell length. The suture is normally shallow, occasionally with a weak ridge or ridges (Figs 122, 124, 126, 128). It was often found that the transition point between protoconch and teleoconch was almost impossible to detect, therefore data relating to protoconch and teleoconch is somewhat subjective and must be treated with caution. The protoconch was more easily examined in optical images than in SEM images but being minute

and indistinct it was occasionally impossible to ascertain the precise position of the nucleus. The data recorded is as follows: protoconch comprised between 1.5 and 2.2 whorls, average 1.8 whorls; teleoconch comprised between 2.1 and 2.7 whorls, average 2.3 whorls; the total ranged between 3.8 and 4.5 whorls, average 4.1 whorls. The lip is wide to moderately narrow, slightly curved, slightly curled inwards and filled by six to eight denticles. In ventral view labial denticles appear as true denticles, but in axial view (siphonal view) it can be seen that most denticles are moderately long and extend from the edge of the lip to deep inside, and that they vary considerably, from raised and rounded (Figs 85, 101) to flattened (Figs 88, 102). A very weak, small extra denticle is generally present between the first denticle and the labial insertion point (Figs 74, 98). Occasionally, other extra, small denticles are present at various locations on the lip (Fig. 100). Denticles are generally located close to or on the edge of the lip (Figs 85, 101), but occasionally the anterior denticles are located moderately deep inside (Figs 88, 102). The number and arrangement of labial denticles was found to be fairly constant and was useful in differentiating between species. The varix is generally wide and strong, weakens basally and together with the lip, sweeps around the base and merges with the limbs of the first plication. In some species the lip remains separate from the dorsal edge of the varix as they sweep around the base, the former merging with the first plication and the latter merging with the ventral callus (Fig. 85). Four plications are always present and fill approximately 68% of the aperture. Bifurcation is generally strongest in the first and second plication: the limbs of the second plication at first widen and then narrow to rejoin forming a pointed, leaf-like pattern before merging with the ventral callus; bifurcation varies from weak to occasionally absent in the third and fourth plications. The aperture is moderately wide, widest medially or anterior medially.

### Figures 32-43

**32-35.** *Eratoidea levisa* n. sp., Venezuela, Cubagua, the anchorage, 6 m

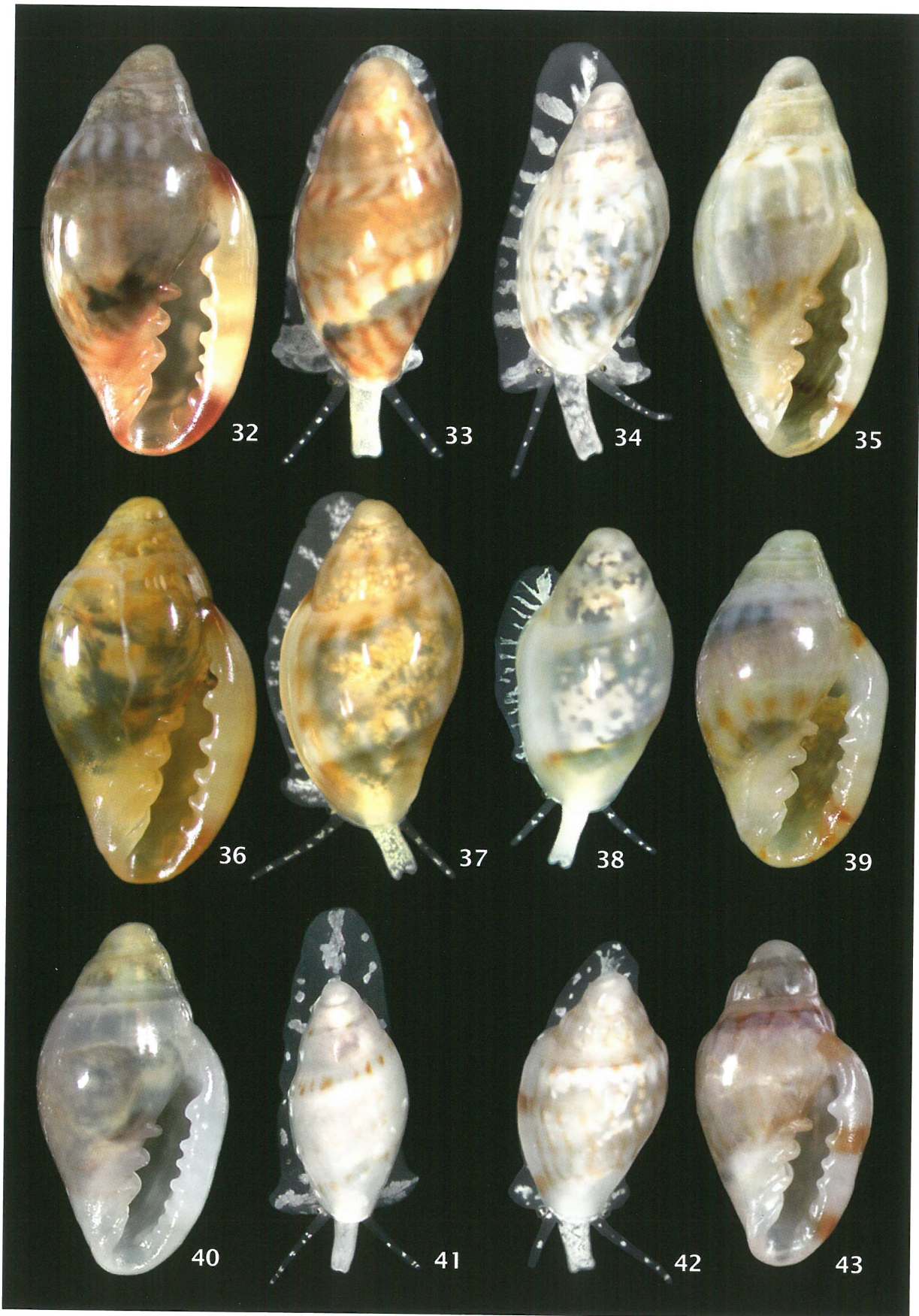
**32-33.** Dark coloured specimen, ad. lv., 3.05 x 1.61 mm, W:L 53%, TMC; **34-35.** Holotype, 2.88 x 1.42 mm, W:L 49%, MNHN 23707.

**36-37.** *Eratoidea glareia* n. sp., paratype 5, 2.76 x 1.55 mm, W:L 56%, Trinidad and Tobago, Tobago, Man-o-War Bay, 8-60 m, MNHN 23710, TMC.

**38-39.** *Eratoidea diatreta* n. sp., holotype, 2.53 x 1.45 mm, W:L 57%, Venezuela, Puerto Cabello, Isla Largo, 2-3 m, MNHN 23711.

**40-41.** *Eratoidea infera* n. sp., holotype, 2.57 x 1.41 mm, W:L 55%, Aruba, Oranjestad harbour, reef drop off, 6-26 m, MNHN 23717.

**42-43.** *Eratoidea phillipsi* n. sp., holotype, 2.39 x 1.32 mm, W:L 55%, Curaçao, off Spaanse Water, 18-30 m, MNHN 23713.



**Animal.** The foot was seldom observed fully extended but was measured in two species and found to be approximately 25% longer than the shell length and the width is approximately the same as shell width. It is semi-transparent or occasionally transparent, bearing small white or off-white spots or larger marks; occasionally a medial, elongated mark is present on the metapodium. The moderately long tentacles always bear between three and ten white spots or marks; occasionally the posterior white marks on the tentacles are very close to the eyes (Fig. 65). The moderately long siphon is covered in fine, white spots which coalesce to form a solid white siphon in some species. Occasionally the white on the tentacles and siphon is tinted very pale beige (Fig. 62). The black eyes have pale yellow or white encasing membranes, and occasionally, weak white annular rings are present (Fig. 66). The transparent mantle, sparsely covered by small white spots, covering the varix, can be identified in some animal images (Figs 34, 41, 46); a partially extended mantle with debris embedded in it shows the transparent nature of the mantles in this species group (Figs 50-51). The mantle roofs were only observed through the translucent or almost opaque shells. They are always white, generally with large irregular areas of black pigmentation (Fig. 38). The black pigmentation suggests melanism, but in this case no black, or dark colours were observed on the external parts of the animals, therefore, they are not considered to be melanistic species. No attempts were made to extract radulae, but it is assumed that the animals in the *E. levisa* group are non-radulate.

**Habitat.** *Eratoidea levisa* group species inhabit substrates of gravel, very coarse to fine sand, or mud to 105 m. In shallow water to 30 m, the substrate would normally include coral rubble or broken shell debris, and specimens were also collected on rocks which were covered with sand and algae. In depths deeper than 30 m the substrates were found to be sand or mud, almost always devoid of rubble.

## MATERIALS and METHODS

Approximately 35 lots of the *Eratoidea levisa* group material were collected by all methods including dredging to depths of 105 m. Approximately twenty lots were used as 'type material' or 'other material' for the eight new species described. The majority of the remaining lots consisted of only a few shells or eroded material which was unsuitable for use as type material.

Most images have been produced at a magnification of X25. Exceptions are: protoconch, and apical and ventral images of surface texture which are presented with a width of approximately 7 cm; images of live animals and those depicting special features have been produced at various suitable sizes and magnifications.

***Eratoidea levisa* species group** (RS, *Eratoidea levisa* n. sp.)

***Eratoidea levisa* n. sp.**

Figs 32-35, 56-57, 71-73, 97, 105, 113

**Type material.** Venezuela, Isla Cubagua, the anchorage, 10°49.9'N 64°09.8'W, 6 m; holotype, 2.88 x 1.42 mm, W:L 49%, MNHN 23707; paratype 1, 3.07 x 1.55 mm, W:L 51%, MNHN 23708; paratype 2, 2.77 x 1.44 mm, W:L 52%, MNHN 23708, TMC; paratype 3, 3.12 x 1.69 mm, W:L 54%, MNHN 23708, TMC; paratype 4, 3.13 x 1.59 mm, W:L 51%, MNHN 23708, AWC; paratype 5, 2.95 x 1.59 mm, W:L 54%, MNHN 23708, AWC.

**Other material.** 3 ad. lv., Venezuela, Isla Cubagua, 10°49.9'N 64°09.8'W, 6 m, TMC; 65 ad. lv., Venezuela, Isla Cubagua, 10°50.1'N 64°09.9'W, 10 m, TMC; 4 ad. lv., 4 ad. dd., Venezuela, east of Isla Cubagua, 18-8 m, TMC.

**Type locality.** Venezuela, Isla Cubagua, 10°49.9'N 64°09.8'W, 6 m, (Map ref. 16).

## Figures 44-55

**44.** *Dentimargo reductus* Bavay, 1922, ad. lv., 2.67 x 1.42 mm, Bahamas, Exuma Islands, grass bank, 6 m, TMC. Illustrates orange spot on metapodium and siphon, and tentacles without marks.

**45-47.** *Eratoidea tayronata* n. sp., Colombia, Santa Martha, Concha Bay, 2-10 m

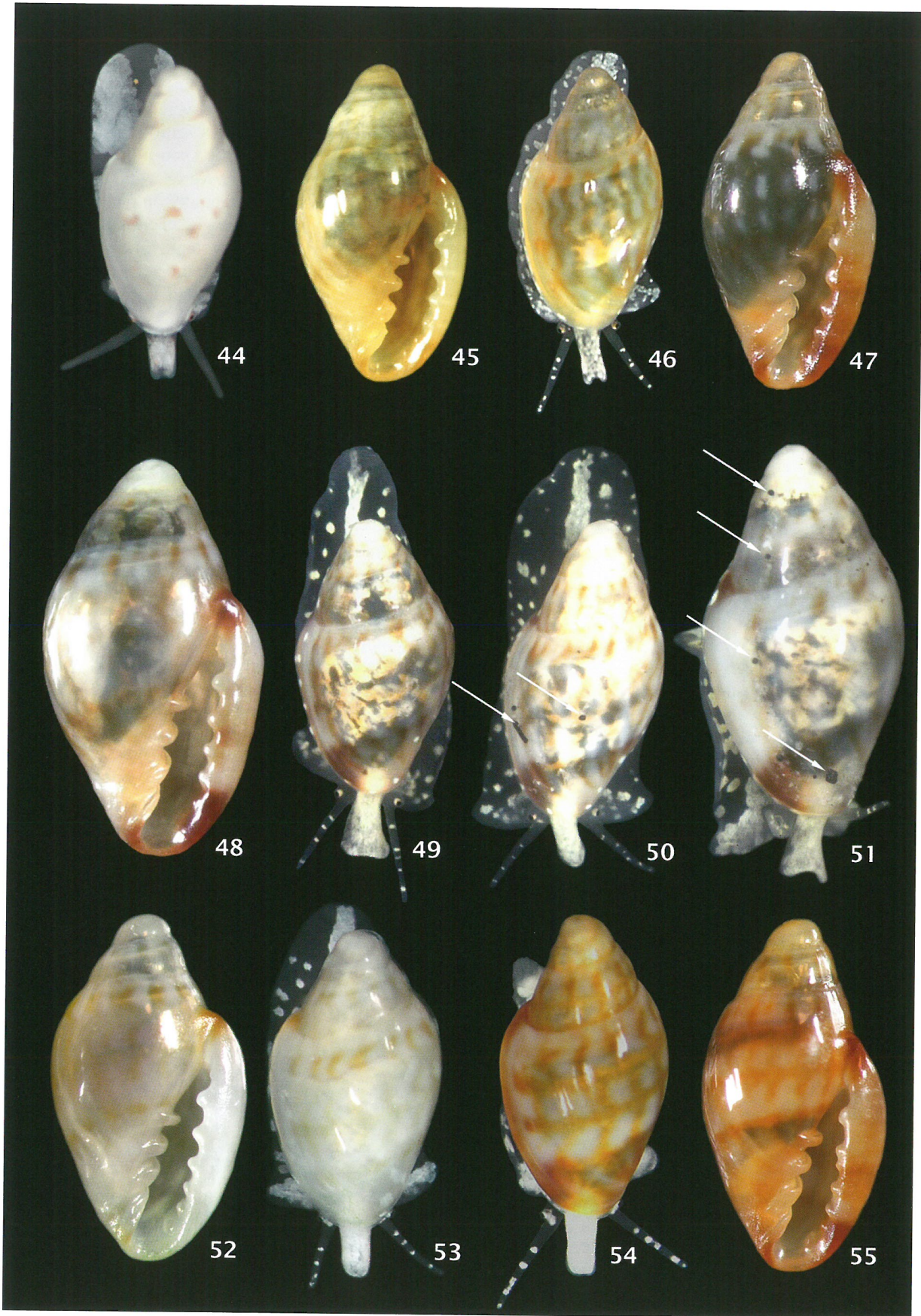
**45-46.** Holotype, 2.37 x 1.29 mm, W:L 55%, MNHN 23721; **47.** Dark coloured specimen, ad. lv., 2.64 x 1.37 mm, W:L 52%, TMC.

**48-51.** *Eratoidea ponsia* n. sp. Aruba, Barcadera river estuary, 1 m

**48-49.** Holotype, 2.87 x 1.61 mm, W:L 56%, MNHN 23715; **50-51.** Unmeasured, ad. lv., arrows point to particles of debris embedded in transparent mantle.

**52-55.** *Eratoidea statiola* n. sp., Venezuela, Monjes del Sur, harbour, 3-12 m

**52-53.** Paratype 2, 2.46 x 1.41 mm, W:L 75%, MNHN 23720, TMC; **54-55.** Dark coloured, ad. lv., 2.83 x 1.48 mm, W:L 53%, TMC.



**Habitat.** Sandy rubble containing broken dead coral and shells, with weed and algae.

**Description.** Shell: shape broadly biconic; shiny; costae very weak, short, located sub-suturally, forming distinct ridges anteriorly on dorsum which curl around base and merge with ventral callus. Ventral callus deposit strongest at distal end of plications. Colour and pattern: four spiral bands on semi-transparent shell; posterior band sub-sutural with small, distinct, yellowish-brown, rectangular marks; posterior medial band with very pale, indistinct, yellowish-brown marks; anterior medial band with irregularly shaped, yellowish-brown marks; anterior axial band with elongate, yellowish-brown marks becoming stronger towards lip; sinuous, translucent white axial marks cover dorsum and much of anterior surface, strongest posteriorly; lip darker translucent off-white; deep reddish-brown mark anteriorly; faint reddish-brown mark at labial insertion point; plications and ventral callus darker translucent off-white, tinted slightly reddish-brown. Size small, 2.88 x 1.42 mm, W:L 49%. Spire medium, approximately 29 - 35% of shell length. Suture shallow, distinct. Whorls slightly convex; total of 4.2 whorls comprised of 1.5 protoconch whorls, 2.7 teleoconch whorls. Shoulder weakly curved to labial insertion point. Lip moderately thin, slightly wider posteriorly; gently curved; slightly curled inwards; filled by six denticles, first very strong, gradually weakening to fifth, sixth stronger than fifth; very weak extra denticle between first denticle and insertion point. In side view lip straight; all denticles project from lip, particularly first. Varix moderately strong, wide, widest medially, narrows evenly to base; lip and dorsal edge of varix form strong basal edge of siphonal canal, merge with first plication. Four plications fill approximately 70% of aperture, all moderately bifurcated, merge with ventral callus distally; first plication, upper limb strongest; second, limbs widen slightly, slope towards first plication more than usual, rejoin distally; third

and fourth, limbs short. Aperture moderately wide, more so anterior medially.

Animal. Length of foot unknown, width approximately same as shell, almost transparent with approximately nine lateral white marks, weakest medially. Propodium largely covered with somewhat diffuse white marks. Tentacles semi-transparent, five to seven white spots; posterior spots adjacent to eyes. Siphon almost completely covered with fine diffuse white marks. Eyes located laterally on pods at base of tentacles, black with pale yellow encasing membrane and translucent white annular rings. Emergent mantle, semi-transparent, bears approximately eight white spots. Mantle roof: several irregular black areas on white background.

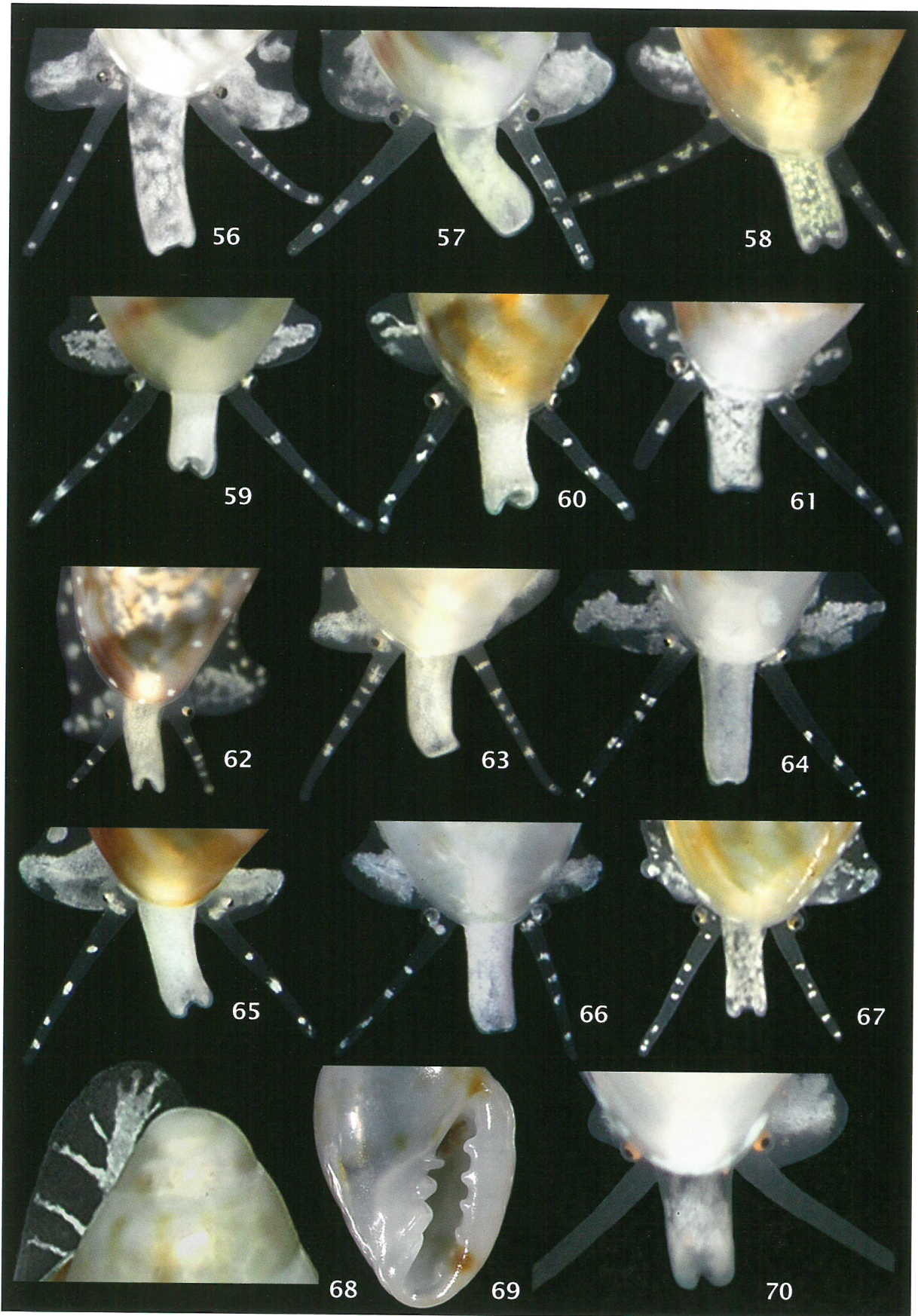
**Remarks.** *Eratoidea levisa* n. sp. has been chosen as representative species for the group because of the broad range of data available from the large number of specimens collected and more live animal images being available than for any other species. The size range is 2.97 to 3.13 mm, W:L 49 - 54%. The most significant feature is the average W:L ratio of 51.8% which is lower than for any other species in the group; the closest to it is *Eratoidea infera* n. sp. with an average W:L of 53.9%; the first denticle is unusually strong (Fig. 89, 97). Like the majority of species in the group there are significant black areas on the mantle roof of most specimens, covering from almost none to approximately 80% of the visible area. No black marks were observed on the external parts of the animals, therefore, the irregularly black internal chromatism is not regarded as sufficient to regard this species as melanistic. The seven other new species in the group will be compared with *Eratoidea levisa* n. sp. and with other new species closely related to them.

**Etymology.** The name refers to smooth appearance of the shell and is taken from the Latin word *levis* meaning smooth.

## Figures 56-70

56-67. *Eratoidea levisa* species group, enlarged heads of animals.

56. *Eratoidea levisa* n. sp., holotype, 2.88 x 1.42 mm; 57. *Eratoidea levisa* n. sp., tinted specimen, ad., 3.01 mm; 58. *Eratoidea glareana* n. sp., paratype 5, 2.76 x 1.55 mm; 59. *Eratoidea diatrete* n. sp., holotype, 2.53 x 1.45 mm; 60. *Eratoidea diatrete* n. sp., dark coloured, ad., estimated 2.7 mm; 61. *Eratoidea phillipsi* n. sp., holotype, 2.39 x 1.32 mm; 62. *Eratoidea ponsia* n. sp., holotype, 2.87 x 1.61 mm; 63. *Eratoidea ponsia* n. sp., ad., unmeasured; 64. *Eratoidea infera* n. sp., holotype, 2.57 x 1.41 mm; 65. *Eratoidea statiola* n. sp., dark coloured, ad., 2.83 x 1.48 mm; 66. *Eratoidea statiola* n. sp., paratype 2, 2.46 x 1.41 mm; 67. *Eratoidea tayronata* n. sp., holotype, 2.37 x 1.29 mm; 68. *Eratoidea diatrete* n. sp., holotype, 2.53 x 1.45 mm. Illustrates details of pattern on the foot of the animal; 69. *Eratoidea levisa* group, ad., 3.08 x 1.64 mm, W:L 53%, Aruba, Oranjestad harbour flats, 1 m. Illustrates a typical form of anterior callus; 70. *Dentimargo reductus* (Bavay, 1922), ad., 2.67 x 1.42 mm, Bahamas, Exuma Islands, grass bank, 6 m. Illustrates the orange encasing membrane of the eyes and orange spot on the siphon.



*Eratoidea glarea* n. sp.

Figs 30, 36, 37, 58, 74-76, 98, 106, 114

**Type material.** Trinidad and Tobago, Tobago, Man-o-War Bay, 11°20.2'N 60°33.7'W, 8-60 m; holotype, 2.75 x 1.53 mm, W:L 56%, MNHN 23709; paratype 1, 2.89 x 1.69 mm, W:L 58%, MNHN 23710; paratype 2, 2.71 x 1.51 mm, W:L 56%, MNHN 23710, AWC; paratype 3, 3.03 x 1.85 mm, W:L 61%, MNHN 23710, AWC; paratype 4, 2.70 x 1.43 mm, W:L 53%, MNHN 23710, TMC; paratype 5, 2.76 x 1.55 mm, W:L 56%, MNHN 23710, TMC.

**Other material.** 12 ad. dd., Trinidad and Tobago, Tobago, Man-o-War Bay, 11°20.2'N 60°33.7'W, 30-60 m, TMC; 10 ad. dd., off Tobago, 11°N 60°W, 83-98 m, TMC.

**Type locality.** Trinidad and Tobago, Tobago, Man-o-War Bay, 11°20.2'N 60°33.7'W, 30-60 m, (Map ref. 12).

**Habitat.** Coarse gravelly sand with some coral rubble and large rocks, and mud in depths below 30 m; very clean water from the Equatorial current, 8-60 m.

**Description.** Shell: shape broadly biconic; shiny; very weakly costate; dense fine surface texture of slightly elongate lumps on ventral surfaces. Colour and pattern: four yellowish-brown spiral bands on semi-transparent amber shell; posterior band sub-sutural with distinct marks; two indistinct medial bands, marks strongest close to varix; anterior band axially elongate, marks becoming stronger towards varix; lip, plications and ventral callus translucent amber; lip with reddish-brown mark at posterior and anterior ends. Size small, 2.75 x 1.53 mm, W:L 56%. Spire medium, 27 - 32% of shell length. Suture shallow, indistinct. Whorls very slightly convex, total of 3.9 whorls comprised of 1.7 protoconch whorls, 2.2 teleoconch whorls. Shoulder rounded; weak lump close to labial insertion point. Strong ventral callus deposit at the distal ends of plications. Lip evenly, moderately wide; slightly curved; curled inwards; filled by six denticles; first very strong, second and subsequent denticles weakening anteriorly; one small, weak denticle between first strong denticle and labial insertion point. In side view lip almost straight, angled slightly anti-clockwise; denticles, particularly first,

project from lip. Varix strong, wide, widest anteriorly, weakens sharply to base, curves around siphonal canal, merges with first plication. Weak costae develop three or four weak ridges, sweep around base, merge with ventral callus aligned with first and second plications. Ventral callus strong close to distal ends of first and second plication. Four plications fill approximately 70% of aperture, all slightly bifurcated, merge with ventral callus; first with upper limb strongest; second, limbs widen, rejoin; third and fourth, limbs short. Aperture evenly, moderately wide.

Animal (paratype 5). Length of foot undetermined, width approximately same as shell, almost transparent; approximately ten lateral, irregularly shaped, small white marks comprised of small spots; metapodium with wide medial line comprised of small white spots; propodium largely covered with diffuse white marks. Tentacles semi-transparent, four to seven irregularly shaped yellowish-white spots. Siphon covered with fine, very pale yellowish-white spots. Eyes located laterally on pods at base of tentacles, black with yellow encasing membrane. Mantle roof with patches of black on background of dense, off-white spots.

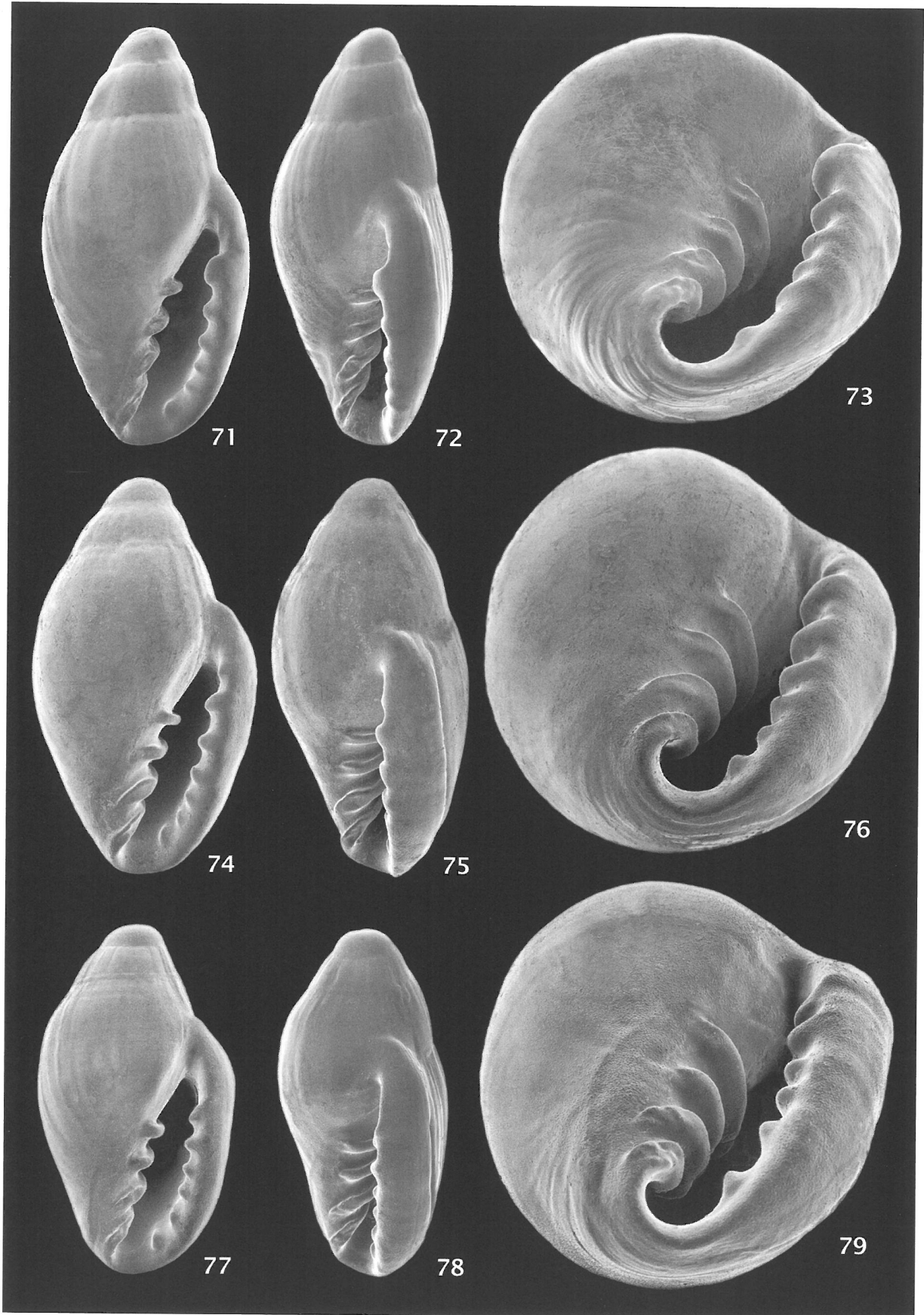
**Remarks.** The size range of *Eratoidea glarea* n. sp. is 2.70 x 1.43 to 3.03 x 1.85 mm, W:L 53 - 61%. It lacks the very strong first denticle of *Eratoidea levisa* n. sp. and has a distinctly more inflated shell at W:L 53 - 61%, compared to *E. levisa* n. sp. at W:L 49 - 54%. The closest species to *Eratoidea glarea* n. sp., apart from *E. levisa* n. sp., appears to be *E. statiola* n. sp. from Venezuela, Monjes del Sur. Both have shells of similar appearance, but differences are: in *E. glarea* n. sp. the varix is wide, more so anteriorly (Fig. 75); in *E. statiola* n. sp. the varix is widest posteriorly, but less wide than *E. glarea* n. sp., and narrows gently to the anterior end (Fig. 90). Most significant is the surface texture which is dense, fine, slightly elongate in *E. glarea* n. sp. (Fig. 114) but very strong on both ventral surfaces and the protoconch in *E. statiola* n. sp. (Figs 119, 127, 128). Only one live animal of *E. glarea* n. sp. was collected. The colour is unremarkable and the pattern is indistinct. The white marks on the metapodium are rather diffuse and comprised of identifiable small white spots, different to all other species in the group.

**Figures 71-79**

**71-73.** *Eratoidea levisa* n. sp., holotype, 2.88 x 1.42 mm, W:L 49%, Venezuela, Cubagua, the anchorage, 6 m, MNHN 23707.

**74-76.** *Eratoidea glarea* n. sp., holotype, 2.75 x 1.53 mm, W:L 56%, Trinidad and Tobago, Tobago, Man-o-War Bay, 8-60 m, MNHN 23709.

**77-79.** *Eratoidea diatreta* n. sp., holotype, 2.53 x 1.45 mm, W:L 57%, Venezuela, Puerto Cabello, Isla Largo, 2-3 m, MNHN 23711.



**Etymology.** The name refers to the substrate in which this species was collected and is taken from the Latin word *glarea* meaning gravel.

*Eratoidea diatreta* n. sp.

Figs 38, 39, 59, 60, 77-79, 95, 96, 99, 107, 115, 121, 122

**Type material.** Venezuela, Puerto Cabello, Isla Largo, 10°29.3'N 67°56.9'W, 2-3 m; holotype, 2.53 x 1.45 mm, W:L 57%, MNHN 23711; paratype 1, 2.56 x 1.38 mm, W:L 54%, MNHN 23712; paratype 2, 2.29 x 1.31 mm, W:L 57%, MNHN 23712, TMC; paratype 3, 2.60 x 1.43 mm, W:L 55%, MNHN 23712, TMC; paratype 4, 2.38 x 1.27 mm, W:L 53%, MNHN 23712, AWC; paratype 5, 2.26 mm, juvenile, MNHN 23712, TMC.

**Other material.** None.

**Type locality.** Venezuela, Puerto Cabello, Isla Largo, 10°29.3'N 67°56.9'W, 2-3 m, (Map ref. 23).

**Habitat.** Muddy sand and rubble close to live coral heads, 2-3 m.

**Description.** Shell: shape broadly biconic; shiny; very weakly costate; dense, very fine surface texture of somewhat rounded lumps on ventral surfaces. Colour and pattern: two yellowish-brown spiral bands on semi-transparent off-white shell; posterior band sub-sutural with pale, indistinct, yellowish-brown marks; anterior band of axially elongate yellowish-brown marks on ventral surface becoming weaker on dorsum with almost solid colour posterior edge; lip translucent white posteriorly, small reddish-brown mark at labial insertion point, translucent yellowish-brown anteriorly; split reddish-brown mark anteriorly; plications and ventral callus translucent pale yellowish-brown. Size small, 2.53 x 1.45 mm, W:L 57%. Spire medium, 26 - 30% of shell length. Suture shallow, indistinct. Whorls very slightly convex; total of 4.0 whorls comprised of 1.7 protoconch whorls, 2.3 teleoconch whorls. Shoulder curved, with weak lump close to labial insertion point. Strong ventral callus deposit at distal end of plications. Lip evenly wide; straight medially, curved anteriorly; curled inwards; filled by six denticles, first and second strong, concave medially, extend weakly over varix; third and subsequent weakening anteriorly; one small, weak

denticle between first strong denticle and labial insertion point. In side view all denticles project almost equally from straight lip; lip curves around siphonal canal, merges with lower limb of first plication. Varix evenly very wide; weakens rapidly to base; dorsal groove loses identity, mingles with ridges from extended weak costae, all merge into ventral callus. Ventral callus strong, widely curved to fourth plication; edge distinct. Four plications fill approximately 70% of aperture; all bifurcated and merge with ventral callus; first, upper limb strongest, both limbs lumpy at labial junction; second weak, lumpy limbs widen, rejoin distally; third and fourth, bifurcation weak, limbs short. Aperture moderately wide, slightly more so medially.

**Animal.** Length of foot undetermined, width approximately same as shell, almost transparent with approximately fifteen fine, lateral, solid white marks. Propodium largely covered with white marks comprised of dense, minute white spots. Tentacles semi-transparent with four to five small white marks. Siphon solid white. Eyes located laterally on small pods at base of tentacles, black with pale off-white encasing membrane. Mantle roof with patches of black on white background.

**Remarks.** *Eratoidea diatreta* n. sp. differs from all other species in the group in several ways: the shell is the most robust; the lip is straight medially and curves strongly towards the base anteriorly; external parts of the animal exhibit a delicate pattern of fine white marks from which this species derives its name. None of these features are present in any other species in the group. The size range is 2.29 to 2.60 mm, W:L 53 - 57%.

**Etymology.** The name refers to the markings on the foot of the animal and is taken from the Latin *diatreta* word meaning filigree.

*Eratoidea phillipsi* n. sp.

Figs 42, 43, 61, 80-82, 100, 108, 116, 123, 124

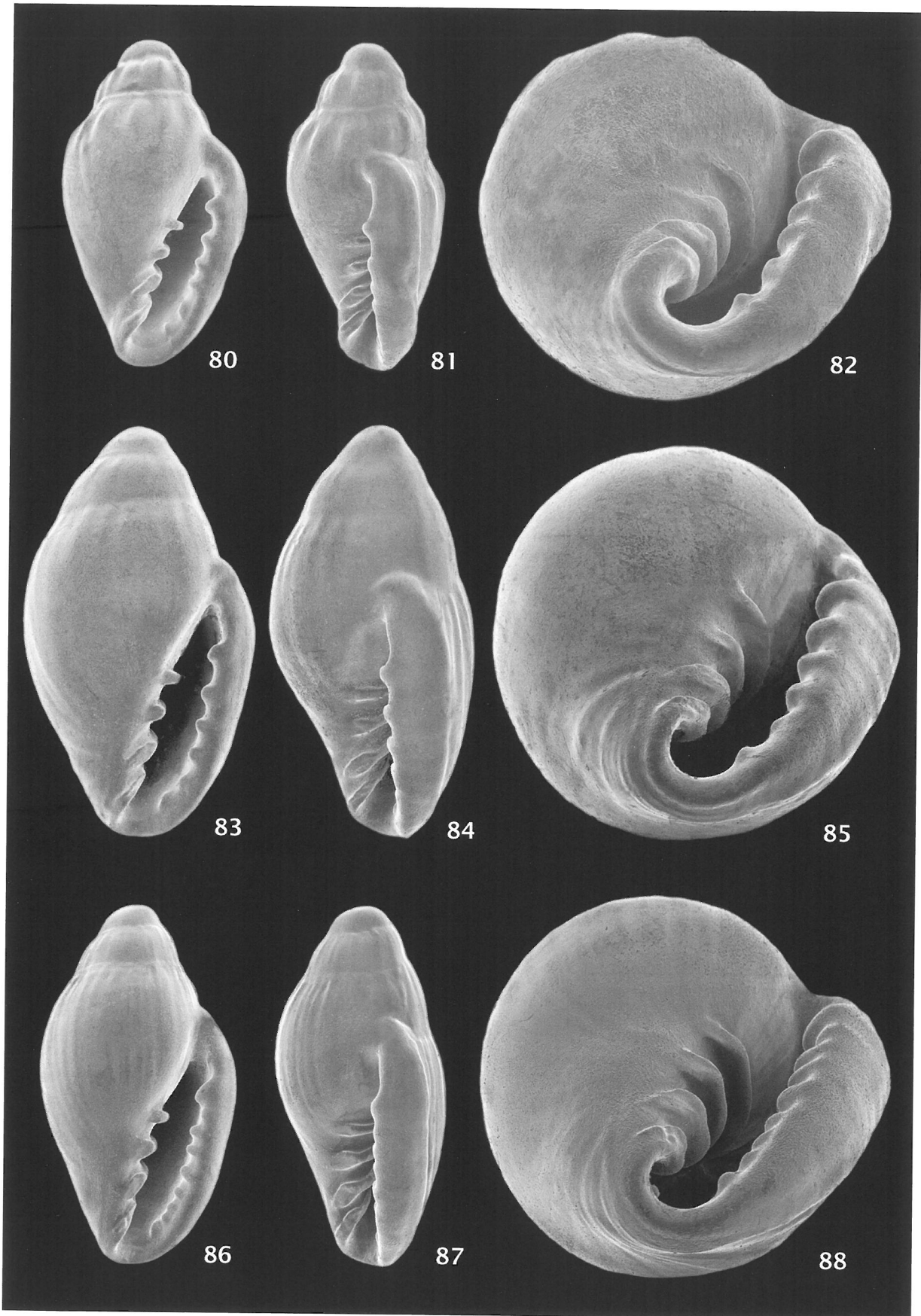
**Type material.** Curaçao, off Spaanse Water, 12°04'N 68°51'W, 18-30 m; holotype, 2.39 x 1.32 mm, W:L 55%, MNHN 23713; paratype 1, 2.07 x 1.21 mm, W:L 58%, MNHN 23714; paratype 2, juvenile, MNHN 23714, TMC.

**Figures 80-88**

**80-82.** *Eratoidea phillipsi* n. sp., holotype, 2.39 x 1.32 mm, W:L 55%, Curaçao, off Spaanse Water, 18-30 m, MNHN 23713.

**83-85.** *Eratoidea ponsia* n. sp., holotype, 2.87 x 1.61 mm, W:L 56%, Aruba, Barcadera river estuary, 1 m, MNHN 23715.

**86-88.** *Eratoidea infera* n. sp., holotype, 2.57 x 1.41 mm, W:L 55%, Aruba, Oranjestad harbour, reef drop off, 6-26 m, MNHN 23717.



**Other material.** 1 juv. lv., Curaçao, off Spaanse Water, 12°04'N 68°51'W, 18-30 m, TMC.

**Type locality.** Curaçao, off Spaanse Water, 18-30 m, (Map ref. 24).

**Habitat.** Weedy sand on and around rubble and rocks, 18-30 m.

**Description.** Shell: shape broadly biconic; shiny; costae sub-sutural, moderately weak, short. Surface texture dense, fine, very small irregularly shaped lumps on ventral surfaces; sparse, very fine on protoconch. Pattern and colour: three spiral bands on semi-transparent, pale brownish tinted shell; posterior band sub-sutural, pale yellow-brown marks becoming axially elongated towards lip, lower edge terminates before varix, upper edge sweeps up to labial insertion point; medial band moderately wide, faint, pale yellow-brown marks, stronger at lip; anterior band wide, axially elongated yellow-brown marks becoming stronger and more axially elongated towards lip, upper edge terminates before varix, lower edge extends to lip; lip, plications and ventral callus almost opaque, tinted very pale yellow-brown; lip with three yellow-brown marks corresponding with spiral bands; posterior small, located on labial insertion callus; medial and anterior stronger; protoconch solid opaque white. Size small, 2.39 x 1.32 mm, W:L 55%. Spire medium 28 - 31% of shell length. Suture moderately deep, wide between significantly convex whorls; total of 3.9 whorls comprised of 1.7 protoconch whorls, 2.2 teleoconch whorls. Shoulder gently curved to labial insertion point. Ventral callus with moderately strong deposit at distal ends of plications, widest at level between second and third plication, edge curves to meet distal end of fourth plication, very weak parietal ridge extends to posterior end of aperture. Lip evenly moderately wide; slightly curved; curled inwards; filled by six denticles; first strong, rounded; second to fifth rounded, weakening anteriorly, becoming located deeper inside lip; sixth true denticle accompanied by small, weak, extra denticle on edge of lip. In side view lip almost straight; angled slightly anti-clockwise; all denticles, particularly first, project from straight lip, less so anteriorly; lip curves around base, merges with both limbs of first plication. Varix strong, wide, slightly wider posteriorly, significant dorsal edge weakens abruptly at base; dorsal edge remains

separate from lip, curves around siphonal canal, merges with second plication. Four plications fill approximately 70% of aperture; first bifurcated, upper limb strongest; second weakly bifurcated, limbs rejoin distally; third and fourth, slightly bifurcated, flattened distally, merge with ventral callus. Aperture evenly, moderately wide.

Animal. Length of foot undetermined, width approximately same as shell, almost totally transparent, approximately twelve small lateral white spots and marks, metapodium with weak, poorly defined, medial white line; propodium partly covered with white marks. Tentacles semi-transparent, approximately two to five white spots. Siphon densely covered with fine white spots. Eyes located laterally on small pods at base of tentacles, black with pale yellow-white encasing membrane; translucent white annular rings. Mantle roof with irregular black patches on white background.

**Remarks.** Only two adult and one juvenile specimen were collected. The smallest and most distinct species in the *Eratoidea levisa* group, *E. phillipsi* n. sp. also differs from all other species in several ways: the costae are stronger and shorter, the whorls on the spire are strongly convex, the basal edge of the siphonal canal is wider and it is the only species to have an extra small denticle adjacent to the sixth denticle on the edge of the lip. The size ranges from 2.07 x 1.21 to 2.39 x 1.32 mm, W:L 55 - 58%.

**Etymology.** The name acknowledges the help received from Jen Phillips, an enthusiastic collector and close friend who provided the author with much useful material.

*Eratoidea ponsia* n. sp.

Figs 29, 48-51, 62, 63, 83 - 85, 101, 109, 117, 125, 126

**Type material.** Aruba, Barcadera river estuary, 12°28.3'N 69°58.5'W, 1 m; holotype, 2.87 x 1.61 mm, W:L 56%, MNHN 23715; paratype 1, 3.13 x 1.68 mm, W:L 54%, MNHN 23716; paratype 2, 3.04 x 1.66 mm, W:L 55%, MNHN 23716, TMC; paratype 3, 2.77 x 1.55 mm, W:L 56%, MNHN 23716, TMC; paratype 4, 2.73 x 1.56 mm, W:L 57%, MNHN 23716, AWC; paratype 5, 3.10 x 1.70 mm, W:L 55%, MNHN 23716, AWC.

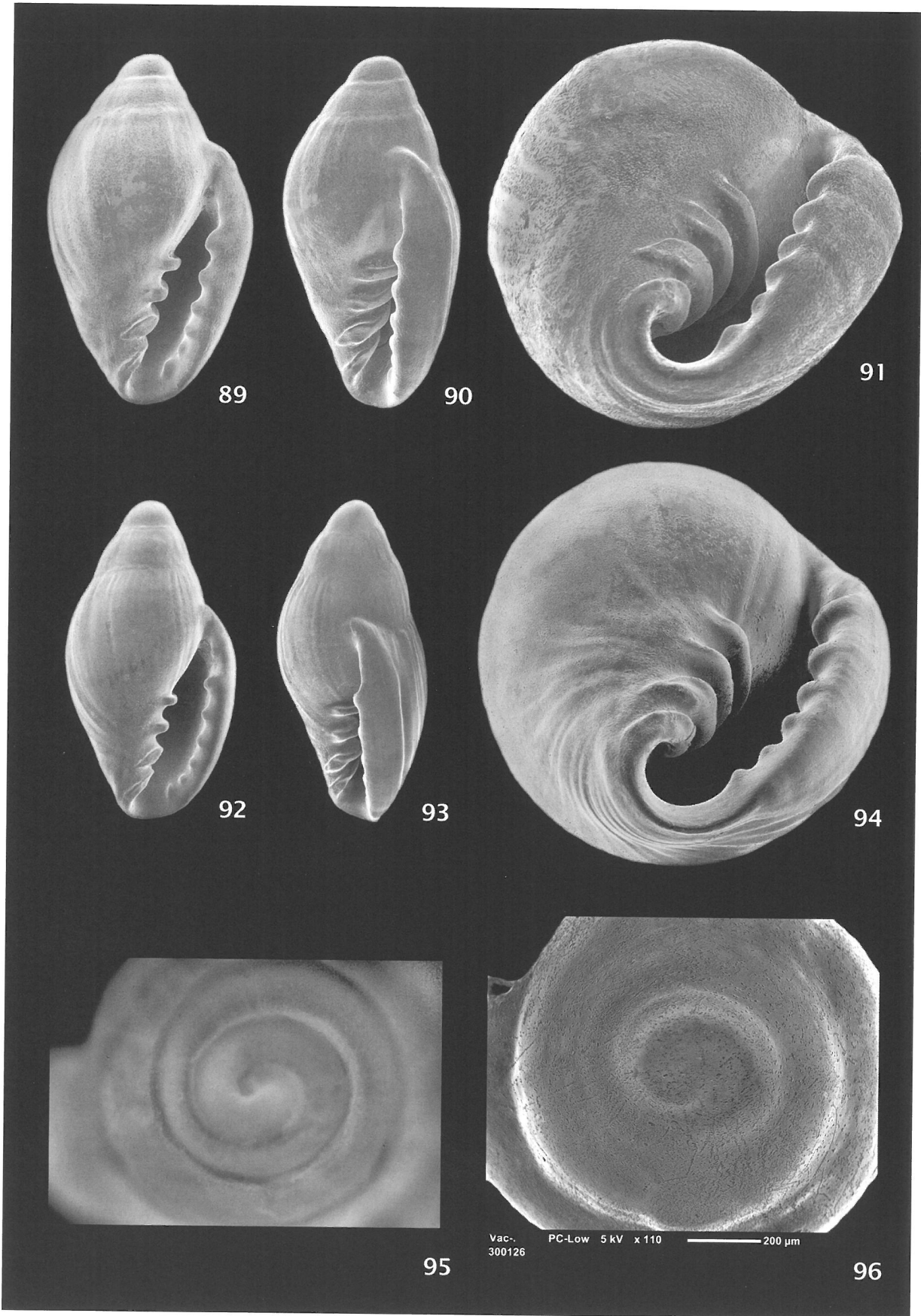
**Figures 89-96**

**89-91.** *Eratoidea statiola* n. sp., holotype, 2.48 x 1.44 mm, W:L 58%, Venezuela, Monjes del Sur, harbour, 3-12 m, MNHN 23719.

**92-94.** *Eratoidea tayronata* n. sp., holotype, 2.37 x 1.29 mm, W:L 55%, Colombia, Santa Martha, Concha Bay, 2-10 m, MNHN 23721.

**95-96.** *Eratoidea diatreta* n. sp., paratype 1, 2.56 x 1.38 mm, W:L 54%, Venezuela, Puerto Cabello, Isla Largo, 2-3 m, MNHN 23712.

**95.** Optical image; **96.** SEM image.



**Other material.** 9 ad. lv., 8 juv. lv., Aruba, Barcadera river estuary, 12°28.3'N 69°58.5'W, 1 m, TMC.

**Type locality.** Aruba, Barcadera river estuary, 12°28.3'N 69°58.5'W, 1 m, (Map ref. 25).

**Habitat.** Sandy mud and dense weed, 1 m.

**Description.** Shell: shape broadly biconic; shiny; costae very weak; surface texture: ventral surfaces sparse, fine; protoconch dense, moderately fine. Colour and pattern: three faint spiral bands on semi-transparent, very pale reddish-brown tinted shell; posterior band sub-sutural, sparse, yellow-brown marks alternating with translucent off-white marks; medial band wide, indistinct reddish-brown marks; anterior band stronger, small reddish-brown marks, becoming wider and more elongate towards lip; lip, plications and ventral callus translucent, very pale reddish-brown; lip with two deep reddish-brown marks; posterior small, located on labial insertion callus; anterior wide, extends around basal edge of siphonal canal; protoconch opaque white. Size small, 2.87 x 1.61 mm, W:L 56%. Spire medium 32 - 34% of shell length. Suture shallow, indistinct. Whorls with almost straight sides; total of 4.3 whorls comprised of 2.0 protoconch whorls, 2.3 teleoconch whorls. Shoulder gently curved with noticeable callus lump at labial insertion point. Ventral callus moderately strong to fourth plication. Lip evenly, moderately wide; slightly curved; slightly curled inwards; filled by six rounded denticles; first strongest, weakening slightly anteriorly; one very weak denticle can be detected between first denticle and insertion point. In side view lip straight; angled slightly anti-clockwise; all denticles, particularly first, project from lip. Varix strong, wide, widest posteriorly medially, weakens gradually over length to base; lip and dorsal edge of varix retain separate identities, curl around base; lip merges with first plication at lumpy junction; dorsal edge blends into ventral callus. Axial costae form distinct ridges anteriorly on dorsum, curl around base, merge with ventral callus. Four plications fill approximately 65% of aperture; all plications slightly bifurcated; first with upper limb strongest, slightly lumpy; second, limbs widen, rejoin distally; third and fourth, bifurcation

weak, limbs short. Aperture moderately wide, slightly more so anterior medially.

Animal. Length of foot 25 % longer than shell, width approximately same as shell; almost transparent; approximately fifteen small, lateral, beige spots and marks; medial, elongated beige mark on metapodium. Propodium sparsely covered with diffuse beige marks. Tentacles semi-transparent; approximately four and six off-white spots. Siphon densely covered with fine off-white spots. Eyes located laterally on pods at base of tentacles, small, black with pale yellow encasing membrane. Mantle transparent, sparsely covered with small white spots. Mantle roof with irregular black patches on white background.

**Remarks.** *Eratoidea ponsia* n. sp. differs from *E. levisa* n. sp. and all other species in the group. The dorsal edge of the varix remains separate from the lip, curls around the base and merges with the second plication; the foot of the animal bears approximately fifteen small round pale beige coloured spots and a clearly defined, moderately wide, pale beige medial line on metapodium. *Eratoidea ponsia* n. sp. has a more pronounced reddish hue than any other species in the group (Figs 48 - 51). Size range is 2.13 x 1.68 to 3.13 x 1.68 mm, W:L 54 - 57%. The mantle of one specimen was revealed by fine grains of sand and other debris embedded in it (Figs 50-51).

**Etymology.** The name relates to the bridge at the type locality, and is taken from the Latin word *pons* meaning bridge.

*Eratoidea infera* n. sp.

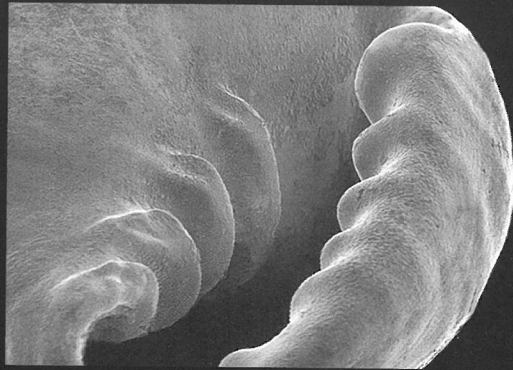
Figs 40, 41, 64, 86-88, 102, 110, 118

**Type material.** Aruba, Oranjestad, reef drop off, 12°30.1'N 70°01.9'W, 6-26 m; holotype, 2.57 x 1.41 mm, W:L 55%, MNHN 23717; paratype 1, 2.84 x 1.45 mm, W:L 51%, MNHN 23718; paratype 2, 2.33 x 1.35 mm, W:L 58%, MNHN 23718, TMC; paratype 3, 2.61 x 1.43 mm, W:L 55%, MNHN 23718, TMC; paratype 4, juvenile, MNHN 23718, TMC.

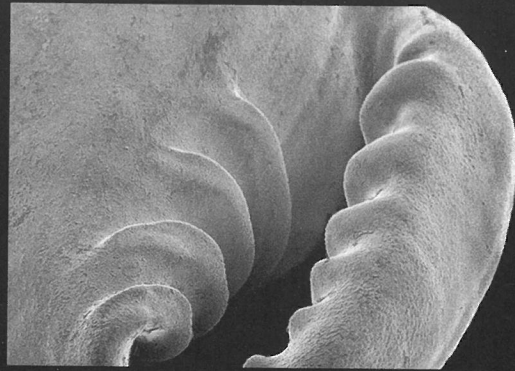
**Other material.** 2 juv. lv., Aruba, Oranjestad, reef drop off, 12°30.1'N 70°01.9'W, 6-26 m, TMC.

**Figures 97-104**

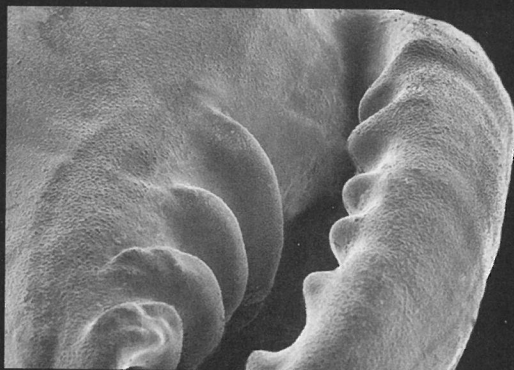
**97.** *Eratoidea levisa* n. sp., holotype, 2.88 x 1.42 mm, W:L 49%, MNHN 23707; **98.** *Eratoidea glareia* n. sp., holotype, 2.75 x 1.53 mm, W:L 56%, MNHN 23709; **99.** *Eratoidea diatrete* n. sp., holotype, 2.53 x 1.45 mm, W:L 57%, MNHN 23711; **100.** *Eratoidea phillipsi* n. sp., holotype, 2.39 x 1.32 mm, W:L 55%, MNHN 23713; **101.** *Eratoidea ponsia* n. sp., holotype, 2.87 x 1.61 mm, W:L 56%, MNHN 23715; **102.** *Eratoidea infera* n. sp., holotype, 2.57 x 1.41 mm, W:L 55%, MNHN 23717; **103.** *Eratoidea statiola* n. sp., holotype, 2.48 x 1.44 mm, W:L 58%, MNHN 23719; **104.** *Eratoidea tayronata* n. sp., holotype, 2.37 x 1.29 mm, W:L 55%, MNHN 23721.



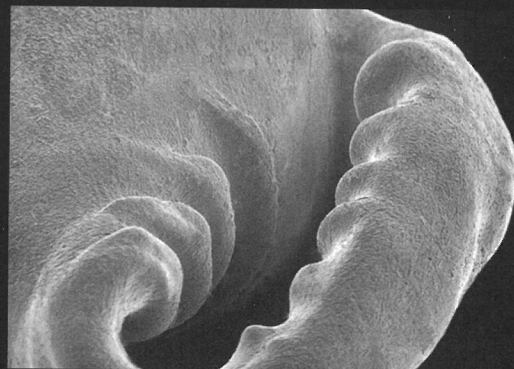
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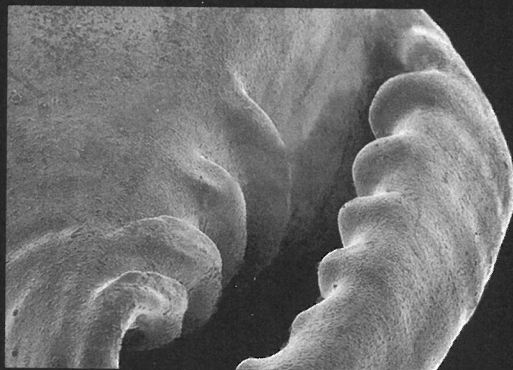
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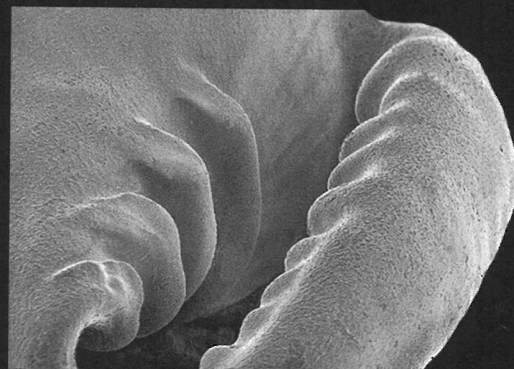
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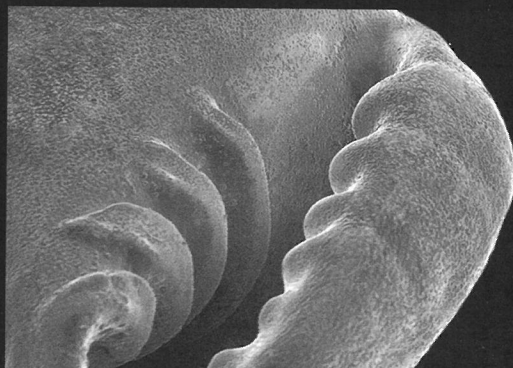
100



101



102



103



104

**Type locality.** Aruba, Oranjestad, reef drop off, 12°30.1'N 70°01.9'W, 6-26 m, (Map ref. 25).

**Habitat.** Weedy sand on and around rubble and rocks.

**Description.** Shell: shape broadly biconic; shiny; costae moderately weak, sub-sutural, short; surface texture dense, very fine, somewhat rounded lumps on ventral surfaces, protoconch (dorsal side only) moderately dense, very fine. Pattern and colour: three spiral bands on translucent white shell; posterior band sub-sutural, small irregularly shaped yellow-brown marks; medial band of very faint yellow-brown marks; anterior band of faint yellow-brown marks; lip, plications and ventral callus translucent white without marks. Size small, 2.57 x 1.41 mm, W:L 55%. Spire medium, 28 - 31% of shell length. Suture shallow, indistinct. Whorls very slightly convex; total of 4.3 whorls, comprised of 2.2 protoconch whorls, 2.1 teleoconch whorls. Shoulder gently curved to labial insertion point. Strong ventral callus deposit at distal end of plications, to fourth plication. Lip evenly moderately narrow; curved; slightly curled inwards; filled by eight denticles; first strongest, rounded; second to fourth weakening, located below edge of lip with flat extension of each denticle to edge; fifth to eighth weaker, located below edge of lip; two very weak denticles can be detected: one between first denticle and insertion point, other on edge of lip between first and second denticle. In side view lip straight; denticles approximately level with lip except for first which projects. Varix evenly wide, moderately strong, weakens strongly anteriorly; lip and dorsal edge of varix remain separated, curl around base; lip merges with lower limb of first plication; dorsal edge blends with ventral callus. Four plications fill approximately 67% of aperture; all plications moderately bifurcated; first, upper limb strongest, lumpy, remains distinctly separated from lower limb, merges with ventral callus; second, limbs widen, upper strongest, rejoin distally, merge into callus; third and fourth, limbs remain separated, merge with callus. Axial costae form weak ridges anteriorly, curl around base, merge with ventral callus. Aperture moderately wide, slightly more so medially.

Animal. Length of foot 25 % longer than shell, width approximately same as shell, almost semi-transparent, approximately eight small lateral white marks; metapodium with medial, elongated, irregular white mark; propodium partly covered with single, irregularly shaped white mark on each side. Tentacles almost transparent; approximately five or six split, white marks; basal mark adjacent to eye. Siphon solid translucent white. Eyes located laterally on pods at base of tentacles, black with pale yellow encasing membrane. Mantle transparent with some white spots. Mantle roof not observed.

**Remarks.** The main features which separate *Eratoidea infera* n. sp. from all other species in the group are the labial denticles: seven or eight are always present; all other species in the group have six, except for an occasional specimen in some species. In addition the denticles, particularly the anterior ones, are located slightly deeper inside the lip (Figs 88, 102), and the surface texture on the ventral surface, close to the plications, is sparse, minute elongated lumps (Fig. 118). Size range is 2.33 x 1.35 to 2.84 x 1.45 mm, W:L 51 - 58%.

**Etymology.** This species was collected on a steep reef drop-off. The name is taken from the Latin word *inferus*, meaning below.

*Eratoidea statiola* n. sp.

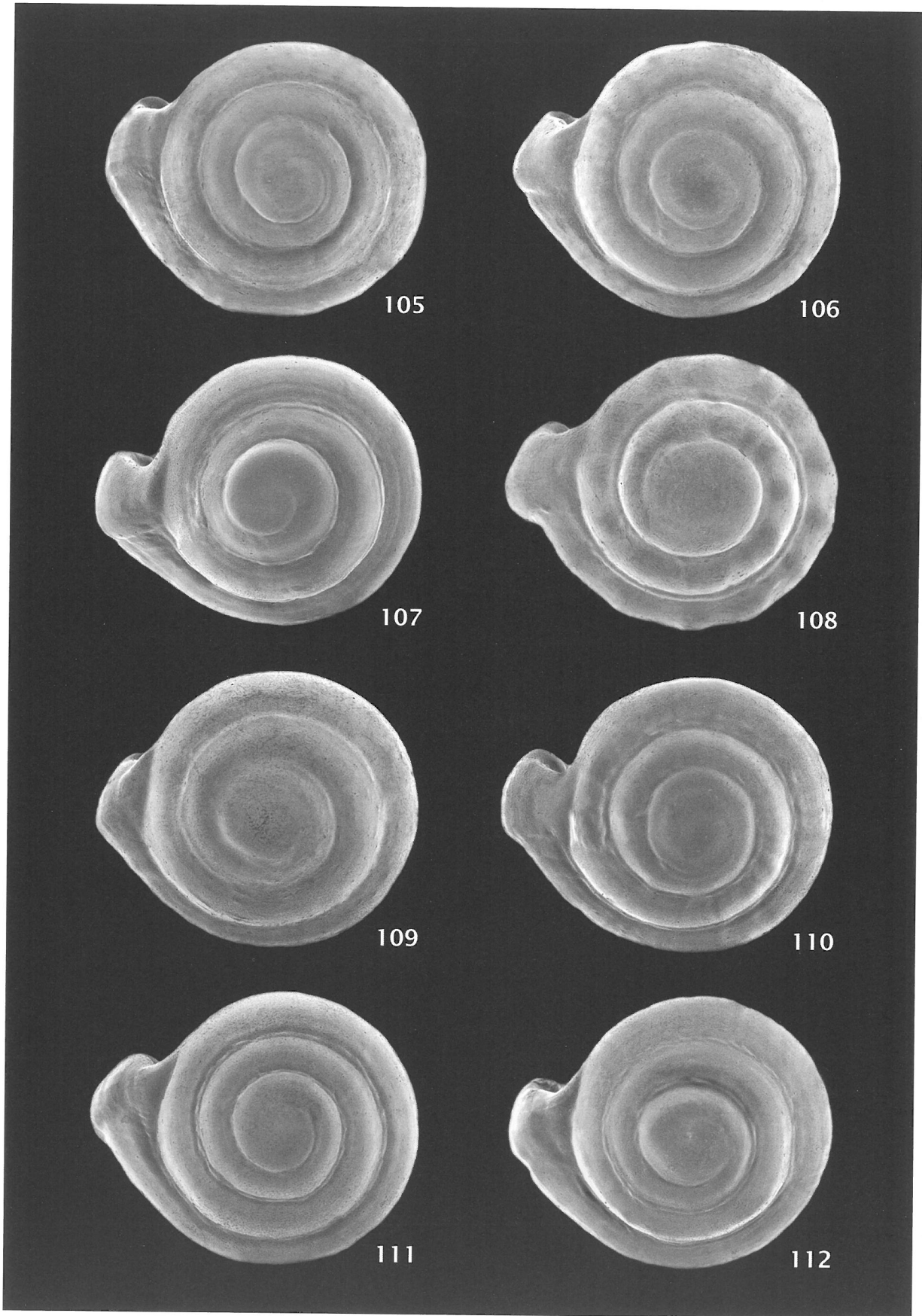
Figs 52-55, 65, 66, 89-91, 103, 111, 119, 127-128

**Type material.** Venezuela, Monjes del Sur, harbour, 12°21.5'N 70°54.1'W, 3-12 m; holotype, 2.48 x 1.44 mm, W:L 58%, MNHN 23719; paratype 1, 2.69 x 1.44 mm, W:L 54%, MNHN 23720; paratype 2, 2.46 x 1.41 mm, W:L 57%, MNHN 23720, TMC; paratype 3, 2.91 x 1.54 mm, W:L 53%, MNHN 23720, TMC; paratype 4, 2.73 x 1.56 mm, W:L 57%, MNHN 23720, AWC; Paratype 5, 2.68 x 1.56 mm, W:L 58%, MNHN 23720, AWC.

**Other material.** 9 ad. lv., 8 juv. lv., Venezuela, Monjes del Sur, harbour, 12°21.5'N 70°54.1'W, 3-12 m, TMC.

**Figures 105-112**

**105.** *Eratoidea levisa* n. sp., holotype, 2.88 x 1.42 mm, W:L 49%, MNHN 23707; **106.** *Eratoidea glarea* n. sp., holotype, 2.75 x 1.53 mm, W:L 56%, MNHN 23709; **107.** *Eratoidea diatreta* n. sp., holotype, 2.53 x 1.45 mm, W:L 57%, MNHN 23711; **108.** *Eratoidea phillipsi* n. sp., holotype, 2.39 x 1.32 mm, W:L 55%, MNHN 23713; **109.** *Eratoidea ponsia* n. sp., holotype, 2.87 x 1.61 mm, W:L 56%, MNHN 23715; **110.** *Eratoidea infera* n. sp., holotype, 2.57 x 1.41 mm, W:L 55%, MNHN 23717; **111.** *Eratoidea statiola* n. sp., holotype, 2.48 x 1.44 mm, W:L 58%, MNHN 23719; **112.** *Eratoidea tayronata* n. sp., holotype, 2.37 x 1.29 mm, W:L 55%, MNHN 23721.



**Type locality.** Venezuela, Monjes del Sur, harbour, 12°21.5'N 70°54.1'W, 3-12 m, (Map ref. 26).

**Habitat.** Muddy sand on and around large rounded boulders.

**Description.** Shell: shape broadly biconic; shiny; very weakly axially costate; surface texture dense, coarse, irregular shaped lumps on ventral surfaces and protoconch. Colour and pattern: four spiral bands on almost opaque white shell; posterior band on suture, indistinct, pale yellowish-brown, strengthening at labial insertion; posterior medial band distinct, yellowish-brown chevron marks; anterior medial and anterior bands very pale, indistinct, yellowish-brown marks; ventral surfaces with five, indistinct, sinuous, axial, translucent white lines; lip, plications and ventral callus opaque white; labial insertion point with yellow-brown mark. Size small, 2.48 x 1.44 mm, W:L 58%. Spire medium 26 - 31% of shell length. Suture shallow, distinct. Whorls very slightly convex; total of 3.9 whorls comprised of 1.7 protoconch whorls, 2.2 teleoconch whorls. Shoulder gently curved; significant lump close to labial insertion point. Lip moderately wide, slightly wider posteriorly; gently curved; slightly curled inwards; filled by six denticles, first strongest, gradually weakening to fifth, sixth stronger than fifth; very weak extra denticle between first denticle and insertion point. In side view lip straight; all denticles project from lip; varix weak, wide, widest posteriorly medially, narrows gradually to base; lip forms strong basal edge of siphonal canal, merges with lower limb of first plication; less distinct dorsal edge merges with ventral callus. Axial costae form distinct ridges anteriorly on dorsum, curl around base, merge with ventral callus. Ventral callus strongest at distal end of plications. Four plications fill approximately 67% of aperture, all plications moderately bifurcated, merge with callus; first, upper limb strongest; remains separated from lower limb; second, limbs widen, rejoin distally; third, limbs remain wide; fourth weak, limbs straight. Aperture moderately wide, slightly more so medially.

Animal. Length of foot 25 % longer than shell, width approximately same as shell, almost semi-transparent with approximately eight small lateral white marks; medial, elongated irregular white mark present on metapodium; propodium partly covered with single

white mark on each side. Tentacles semi-transparent with four white marks. Siphon solid translucent white. Eyes small, located laterally on small pods at base of tentacles, black with yellowish-white encasing membrane; weak white annular rings. Mantle and mantle roof not observed.

**Remarks.** Twenty live specimens of *Eratoidea statiola* n. sp. were collected, with a wide range of shades being present on the shells. It is apparent that the arrangement of the colour bands differs between pale and dark shades: the four pale bands present in the pale holotype are replaced in darker specimens by darker bands with corresponding dark marks on the lip, the addition of an extra band in the solid white area below the posterior medial band, and the shell becomes covered by a reticulated pattern (Figs 52-55). In *E. statiola* n. sp. the first white marks on the tentacles are very close to the eyes with which they can easily be confused. *E. statiola* n. sp. is separated from all other species by its reticulated pattern and very strong surface texture covering most of the shell (Figs 103, 119, 127). Size range 2.46 x 1.41 to 2.91 x 1.59 mm, W:L 53 - 58%.

**Etymology.** The name refers to the type locality, the most westerly maritime outpost of Venezuela, and is taken from the Latin word *statio* meaning outpost.

*Eratoidea tayronata* n. sp.

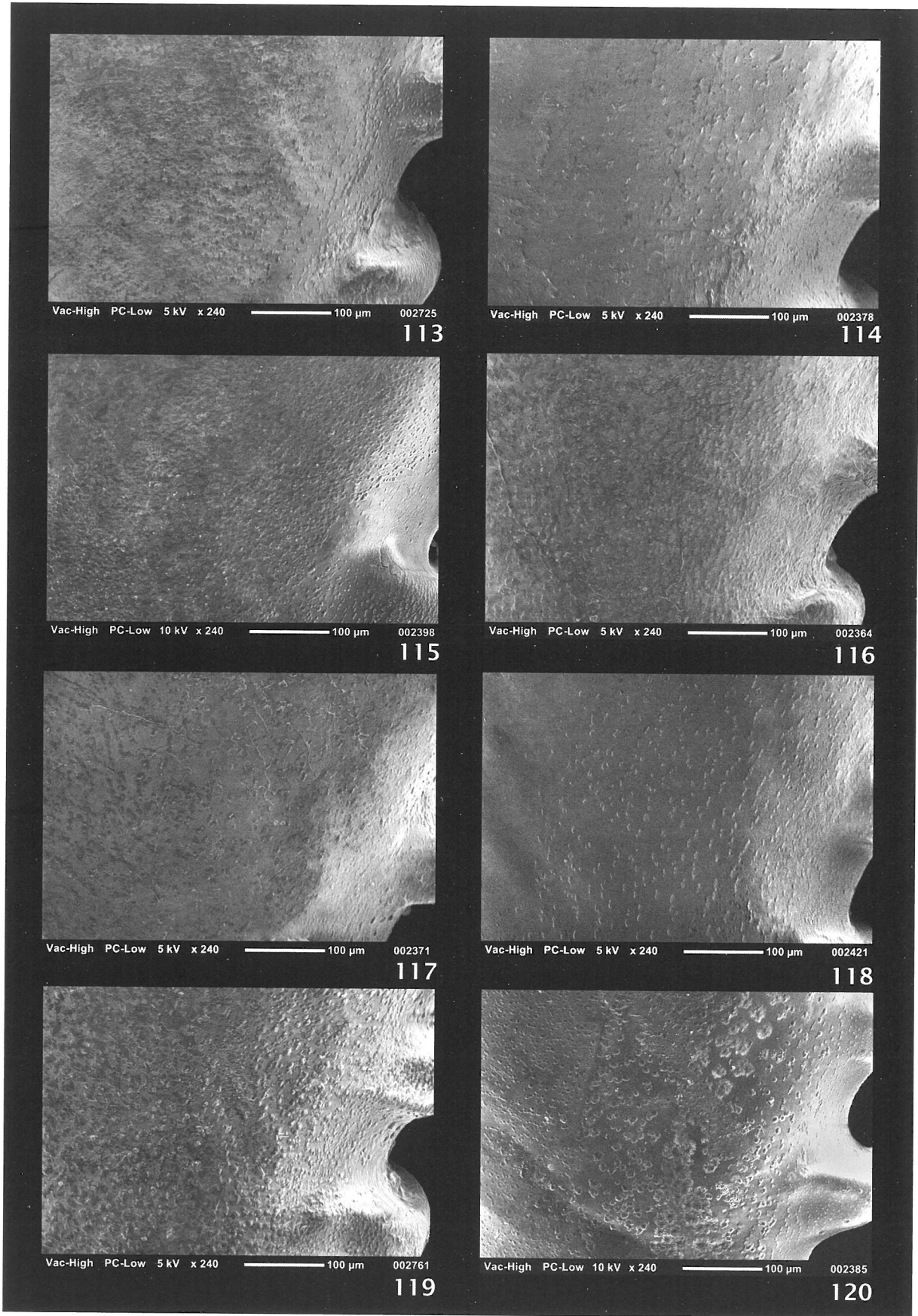
Figs 45-47, 67, 92-94, 104, 112, 120

**Type material.** Colombia, Santa Martha, Concha Bay, 11°19.8'N 74°08.7'W, 2-10 m; holotype, 2.37 x 1.29 mm, W:L 54%, MNHN 23721; paratype 1, 2.41 x 1.32 mm, W:L 55%, MNHN 23722; paratype 2, 2.17 x 1.12 mm, W:L 52%, MNHN 23722, TMC; paratype 3, 2.14 x 1.20 mm, W:L 56%, MNHN 23722, TMC; paratype 4, 2.40 x 1.35 mm, W:L 56%, MNHN 23722, AWC; paratype 5, 2.19 x 1.23 mm, W:L 56%, MNHN 23722, AWC.

**Other material.** 15 ad. lv., 5 juv. lv., Colombia, Santa Martha, Concha Bay, 11°19.8'N 74°08.7'W, 2-10 m, TMC; 6 ad. lv., 3 juv. lv., 5 ad. dd., Colombia, Santa Martha, bay to south west, 11°18.9'N 74°09.8'W, 3-6 m, TMC; 14 ad. lv., 4 juv. lv., 4 ad. dd., Colombia, Santa Martha, Gayraca Bay, 11°19.8'N 74°06.7'W, 3-6 m, TMC.

**Figures 113-120**

**113.** *Eratoidea levisa* n. sp., holotype, 2.88 x 1.42 mm, W:L 49%, MNHN 23707; **114.** *Eratoidea glarea* n. sp., holotype, 2.75 x 1.53 mm, W:L 56%, MNHN 23709; **115.** *Eratoidea diatreta* n. sp., holotype, 2.53 x 1.45 mm, W:L 57%, MNHN 23711; **116.** *Eratoidea phillipsi* n. sp., holotype, 2.39 x 1.32 mm, W:L 55%, MNHN 23713; **117.** *Eratoidea ponsia* n. sp., holotype, 2.87 x 1.61 mm, W:L 56%, MNHN 23715; **118.** *Eratoidea infera* n. sp., holotype, 2.57 x 1.41 mm, W:L 55%, MNHN 23717; **119.** *Eratoidea statiola* n. sp., holotype, 2.48 x 1.44 mm, W:L 58%, MNHN 23719; **120.** *Eratoidea tayronata* n. sp., holotype, 2.37 x 1.29 mm, W:L 55%, MNHN 23721.



**Type locality.** Colombia, Santa Martha, 11°19.8'N 74°08.7'W, 2-10 m, (Map ref. 28).

**Habitat.** Muddy sand amongst weedy rubble and off rocks.

**Description.** Shell: shape broadly biconic; shiny; very weakly, axially costate; ventral surface texture minute to larger almost round lumps; protoconch, minute almost round lumps and patches without texture. Colour and pattern: four indistinct spiral bands; numerous sinuous axial, yellowish-brown lines alternating with equal width translucent off-white lines; lip, plications and ventral callus translucent amber; labial insertion callus with reddish-brown mark. Size minute, 2.37 x 1.29 mm, W:L 54%. Spire medium 29 - 32% of shell length. Suture shallow, distinct. Whorls convex; total of 3.8 whorls comprised of 1.6 protoconch whorls, 2.2 teleoconch whorls. Shoulder gently curved to labial insertion point. Lip narrow; curved, more so anteriorly; slightly curled inwards; filled by six denticles, first strongest, gradually weakening anteriorly; very weak extra denticle between first denticle and insertion point. In side view lip straight; slightly angled anti-clockwise; denticles approximately level with lip except for first which projects. Varix moderately, evenly wide; narrows abruptly to base; lip and dorsal edge remain separated; lip sweeps around siphonal canal, merges with weak lower limb of first plication; dorsal edge less distinct, merges with ventral callus. Axial costae form weak but distinct ridges anteriorly on dorsum, curl around base, merge with ventral callus. Ventral callus deposit strongest at distal end of plications; widest at level between second and third plication, curves towards distal end of fourth, continues very

weakly above fourth, fades out on parietal wall. Four plications fill approximately 67% of aperture, all plications moderately bifurcated; first with upper limb strongest, remains separated from lower limb, merges with ventral callus; second, limbs widen, rejoin distally, merge with callus; third and fourth, limbs remain straight, merge with callus. Aperture moderately wide, slightly more so medially.

**Animal.** Length of foot undetermined, width approximately same as shell, almost semi-transparent; numerous small, distinct, white spots; metapodium with wide medial white mark; propodium partly covered with numerous white spots. Tentacles semi-transparent with five or six white marks. Siphon densely covered with diffuse white spots. Eyes small, located laterally on small pods at base of tentacles, black with pale yellow encasing membrane. Mantle transparent with some white spots.

**Remarks.** *Eratoidea tayronata* n. sp. is distinguished from all other species in the group by its narrow lip; heavy surface texture on ventral surface close to the plications and dense fine texture on part only of the protoconch. This species is unusual in having two or three weak lirae on the edge of the lip between the weak denticles (Fig. 104). Size range 2.14 x 1.20 to 2.41 x 1.32 mm, W:L 51 - 56%.

**Etymology.** The name refers to the Tayrona National Natural Park which in turn takes its name from the ancient Tayrona Indian tribe which inhabited the region. The park includes five shallow bays, two of them being Concha Bay - the type locality, and Gayraca Bay where 'other material' was collected.

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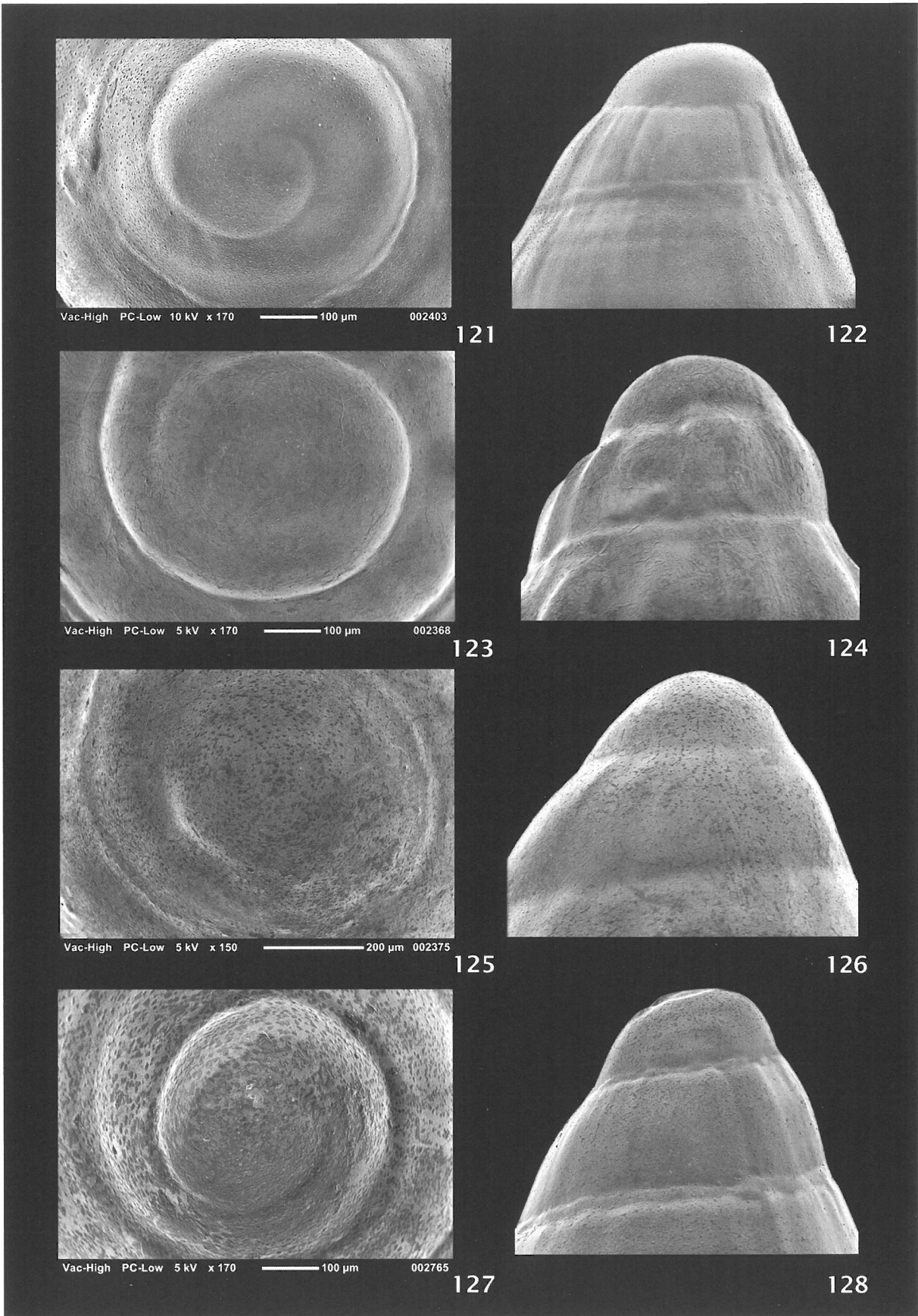
### Figures 121-128

121-122. *Eratoidea diatrete* n. sp., holotype, 2.53 x 1.45 mm, W:L 57%, MNHN 23711.

123-124. *Eratoidea phillipsi* n. sp., holotype, 2.39 x 1.32 mm, W:L 55%, MNHN 23713.

125-126. *Eratoidea ponsia* n. sp., holotype, 2.87 x 1.61 mm, W:L 56%, MNHN 23715.

127-128. *Eratoidea statiola* n. sp., holotype, 2.48 x 1.44 mm, W:L 58%, MNHN 23719.



**ERATOIDEA SULCATA SPECIES GROUP**

Figs 13-14; 129-203

**INTRODUCTION**

Only one previously described species in the genus *Eratoidea* Weinkauff, 1879, can be assigned to the proposed *Eratoidea sulcata* species group. This species is *E. sulcata* (d'Orbigny, 1842) which has been chosen as the representative species for the group (Figs 143, 152, 154-158, 180, 188, 196). *Eratoidea striata* (Sowerby, 1846) was considered by Tomlin (1917) to be a synonym of *E. sulcata* and as this appears to be justified will continue to be regarded as such (Fig. 153). Six new species and one unconfirmed new species are described herein, and the group is summarised as follows:

*Eratoidea sulcata* (d'Orbigny, 1842), Martinique, group representative species.

Synonym: *E. striata* (Sowerby II, 1846), West Indies.

*Eratoidea sotaventensis*, n. sp., Venezuela, Las Aves de Sotavento, 1-27 m.

*Eratoidea fuikensis*, n. sp., Curaçao, Fuik Bay, 1-10 m.

*Eratoidea gorda*, n. sp., British Virgin Islands, Gorda Sound, 1-3 m.

*Eratoidea viequesa*, n. sp., Puerto Rico, islets to north east, 1-2 m.

*Eratoidea* cf. *E. sulcata* (d'Orbigny, 1842), St Vincent and the Grenadines, Isle Quatre, 4 m.

*Eratoidea unionensis*, n. sp., St Vincent and the Grenadines, Union Island, Chatham Bay, 9-23 m.

*Eratoidea rugata*, n. sp., St Vincent and the Grenadines, off Union Island, to SW, 37 m.

Many samples belonging to the *Eratoidea sulcata* group were collected in the southern Caribbean between Grenada in the east and Aruba in the south west, and throughout the West Indies as far north west as Puerto Rico. Although much sampling was carried out, no samples were collected in Trinidad and Tobago, along the Venezuelan mainland coast, except for one minute live juvenile specimen, or in any locality to the West of Aruba. Lipe (1991) did not list *E. sulcata*, nor did Redfern (2001) find this species in Abaco, Bahamas. Espinosa and Ortea (1993-2009) carried out extensive sampling in Cuba and Costa Rica, and they made no reference to any material which could be compared with *E. sulcata*. Cossignani (2006) illustrates *Marginella striata* Sowerby and gives the data as 'Bihimi Is. Bahamas, 4.5 mm; holotype, BM(NH), 80. 9. 18. 13-5 = *D. sulcata*'. This is an error as the shell illustrated by Cossignani is the same shell as illustrated herein which is one of three syntypes held in the BM(NH) type collection bearing the registration number BM(NH), 80. 9. 18. 13-15, (Fig. 153). The location and sizes of the three shells are not stated on the attached label, but this shell was measured at the time the photograph was taken and the size is given as 2.5mm. Tomlin (1917)

gives the type locality of this lot as the West Indies and confirms the type locality of *E. sulcata* as Martinique. There can be no doubt that *E. sulcata* and its synonym *E. striata* are from the West Indies and not the Bahamas. Therefore, it is concluded that Puerto Rico in the north, Grenada in the south east, and Aruba in the south west are the known limits of the geographic range of the *E. sulcata* species group.

The *Eratoidea sulcata* group embraces species which have much in common with the *E. levisa* group but there are distinct differences which separate them. In the *E. sulcata* group the surface axial costae are much more distinct, more numerous and cover most of the shell; the suture is deeper, the teleoconch whorls considerably more convex and the spire is lower. The chromatism of the animal also differs: the white marks on the foot are comprised of fewer, larger marks and the encasing membrane of the eyes is always more orange. There is an overlap in shell colour between the two groups although the majority species can be separated on shell colour alone, for example, some *E. sulcata* species present a wide dorsal band of orange-brown (Fig. 145) which is not found in the *E. levisa* group.

**Habitat.** Species in the *Eratoidea sulcata* group inhabit sand and mud substrates, often mixed with coral rubble and it was found that the finer grades of sand and muddy sand were preferred. In the case of *Eratoidea fuikensis* n. sp., many specimens were collected at night on fine green weed which was growing on muddy sand. They generally inhabit shallow water but a few were collected at various depths down to 105 m. It is noticeable that some of the shells collected in depths between 26 m and 105 m are shorter, more inflated and have fewer costae than those from shallow water down to 34 m, (Fig. 149).

**Morphological features.** Shells of the *Eratoidea sulcata* species group are broadly biconic, somewhat dull and are completely covered with well formed costae, except for the protoconch where they are always absent and the ventral surface of the body whorl where they are weak, or absent in some species. They are usually very weak in the early stages of teleoconch development, which causes the number of costae to be more variable on the partial third teleoconch whorl (third whorl as counted from body whorl inwards), than on the first or second whorl. It was found that the total number of costae on the first and second teleoconch whorls was more constant than the grand total of all costae, therefore, it is regarded as being the more useful guide in species separation. The costae count for the group is as follows: number of costae on the first whorl 18 - 40, average 26; on second whorl 13 - 26; average 19; on partial third teleoconch whorl 0 - 20; average 7. The average total costae on the first and second whorls is 45 and the average total costae on all whorls is 54. The anterior ends of all costae tend to curve towards the aperture

and merge with the ventral callus, more or less aligned with the plications. In particular, the dorsal costae tend to come together tightly as narrow ridges, curl around the base and merge with the ventral callus, generally aligned with the first and second plications (Fig. 161).

High magnification revealed that surface texture which occurs in many forms is always present on the lip and plications, is normally present on the ventral side of the spire and on parts of the protoconch, and occasionally the entire shell is covered (Figs 180, 188, 196). There is considerable intra-specific variation which reduces the usefulness of surface texture for distinguishing between species. Callus deposits are generally weak apart from the ventral callus and deposit at the labial insertion point. The ventral callus is located on the ventral surface between the base and the fourth plication, and is generally widest level with the third plication. There is a tendency for a short axial ridge to form, remote from the distal ends of the first and second plications (Fig. 168); the ventral callus occasionally extends above the fourth plication as a barely perceptible parietal callus ridge (Fig. 159-164).

Shell colour is very variable in the *E. sulcata* group and ranges from semi-transparent to translucent or almost opaque white; nearly all shells bear some degree of pattern comprised of marks or lines in deeper shades of yellow-brown; spiral bands of small marks and axial lines are common features (Figs 139, 146), and wide solid yellow-brown bands occur in some species (Figs 133, 145, 150). Shell size in the group is minute to small and ranges from 1.91 to 3.64 mm in length, with W:L ratio of 53 - 68%. Spire length is low to medium and the average for the group was found to range between 24 and 30% of shell length. The suture is wide and often deep. A ridge - the sutural ridge - is located around the anterior edge, largely formed by lumps on the posterior end of the costae (Fig. 155). The teleoconch whorls are always convex. The nucleus and transition from protoconch to teleoconch were almost impossible to detect, and data relating to whorls must be treated with caution. Estimated data are as follows: protoconch comprised of 1.5 whorls; teleoconch comprised of 2.3 - 2.7 whorls. The total of protoconch and teleoconch whorls for the group ranges between 3.8 - 4.2 whorls, with an average total of 4.0 whorls. The shoulder is always rounded with little variation between species, and the labial insertion point is always significantly below the suture (Fig. 154). The lip is narrow to wide, straight to curved, slightly curled inwards, and filled by six or seven denticles located on the inside edge. In ventral view the labial denticles appear as true denticles, but in axial view (siphonal view) denticles vary considerably; some are raised and rounded (Fig. 182), while others are flattened (Fig. 181). The first denticle is always strongest, with subsequent denticles generally weakening anteriorly. A very weak, small denticle is often present between the first denticle and

the labial insertion point, and another, occasionally, between the first and second denticle (Fig. 182). Denticles generally remain close to or on the edge of the lip (Fig. 183), but occasionally the medial and anterior denticles are located slightly inside the lip (Fig. 180). The number and arrangement of labial denticles was found to be constant within each new species and was useful in differentiating between species. In side view the labial denticles are seen to project from the lip, particularly the first; the varix is generally wide and strong, weakens anteriorly and, together with the lip, sweeps around the base and merges with the limbs of the first plication. In some species the lip remains separate from the dorsal edge of the varix as they sweep around the base, the former merging with the first plication and the latter merging with the ventral callus (Fig. 170). Four plications are always present and fill approximately 65 - 70% of the aperture. The emerging section of the plications varies considerably between species: bifurcation is strongest in the first and second plication, and varies from strong to weak in the third and fourth plications. In the second plication the limbs widen, then rejoin distally before merging with the ventral callus. The aperture is moderately, evenly wide.

Animal. The foot is up to 40% longer than shell length, the width slightly less than shell width. It is semi-transparent to translucent white, generally bearing three to five substantial white marks laterally but in one species the foot was observed to be sparsely covered with small white spots (Fig. 138). A medial, elongated white line, occasionally narrow or somewhat diffuse, generally widened distally, is always present on the metapodium. The moderately long tentacles are without marks, or occasionally with up to five or six white marks. The colour of the moderately long siphon is most often solid white but variations, such as being partially without colour basally, occur (Fig. 133). The encasing membrane of the otherwise black eyes is pale yellow to deep orange, and occasionally adjacent, separate marks in the same colour are present (Figs 141-142). Emergent mantles were occasionally observed around the periphery of the shell in a thickened state prior to extending over the shell. Mantles appeared to be transparent, and most were sparsely covered with white spots (Fig. 139) except in a specimen of an undescribed species, the largest recorded, with a mantle which appears to be translucent white (Fig. 150). The mantle roof was only observed in translucent white shells and was observed to be sparsely covered with white spots (Figs 136, 138). Apart from the eyes, no colour was observed in any of the animals examined.

## MATERIALS and METHODS

Approximately forty five lots of *Eratoidea sulcata* group material were collected by all methods

including dredging to depths of 105 m. Approximately fifteen lots were used as 'type' or 'other material' for the seven new species described herein. The majority of the remaining lots consisted largely of only a few shells or contained eroded material which was unsuitable for type material.

Most images have been produced at a magnification of X25. Exceptions are: protoconch, apical and ventral images of surface texture which are presented with a width of approximately 7 cm; images of live animals and those depicting special features have been produced at various suitable sizes and magnifications.

***Eratoidea sulcata* species group** (RS. *Eratoidea sulcata* (d'Orbigny, 1842))

*Eratoidea sulcata* (d'Orbigny, 1842)  
Figs 143, 152, 154-158, 180, 188, 196

**Type material.** Kaicher (1981:2630) illustrated a shell from the type collection in the BM(NH), registration number: 1854.10.4.314, locality Martinique, size to 3 mm x 1.5 mm (Fig. 152), (Not examined). *Eratoidea sulcata* was listed by Tomlin (1917): 'SULCATA, Orbigny (Marginella), 1842. R. de la Sagra's Hist. Nat. de Cuba, Moll. ii, 102, pl. xxi, f.14-16. Loc.-Martinique. Types.- Coll. Orbigny in Brit. Mus., five labelled "Martinique" '. Tomlin (1917) listed *Marginella striata* Sowerby, 1846 as a synonym of *Eratoidea sulcata*.

**Type locality.** West Indies, Martinique, (Map ref. 8).

**Original description.** 'This species is like a small *Marginella bifasciata*, Lamarck; posterior part conical, inside denticulate; it is distinguished, not only by being ten times smaller, but also by the taller spire, the costae extending the full length, and by the strong denticles on the lip. We found it in sand in Martinique, collected by M de Candé; it is fairly common there.'

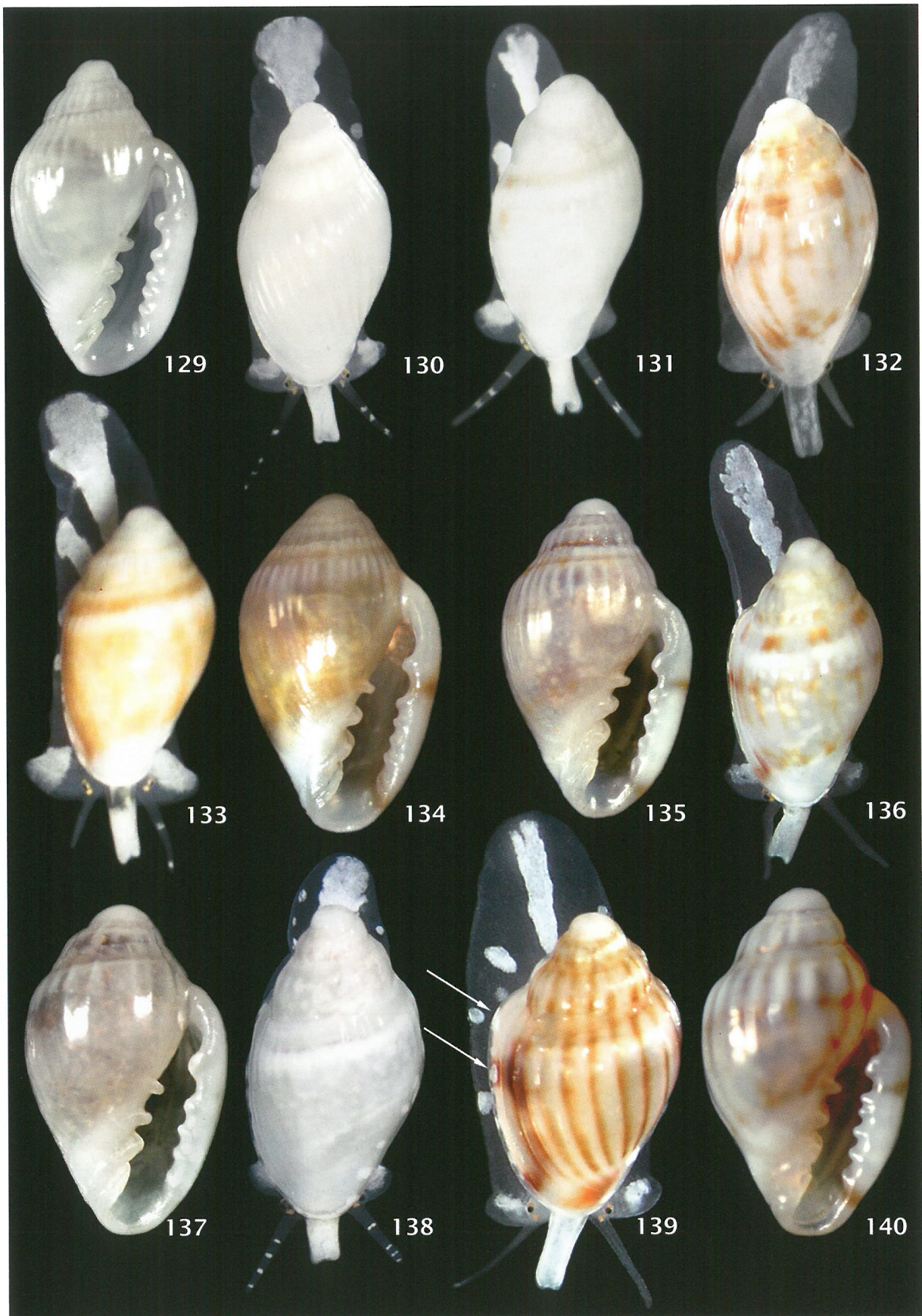
**New material examined.** 5 live collected specimens: 2.26 x 1.31 to 2.64 x 1.60 mm, W:L: 57-61%, West Indies, Martinique, TMC.

**Remarks.** The type material of *Eratoidea sulcata* (d'Orbigny, 1842) which was illustrated by Kaicher (1981:2630) is in poor condition (Fig. 152). This is somewhat surprising as d'Orbigny stated in his original description that *E. sulcata* was fairly common in the type locality. The five shells (New material examined), all of which were collected in Martinique, appear to have very similar morphology to the type species, therefore, they been used to provide data for these complementary notes (Fig. 154).

The axial costae are clearly defined and their number count falls in the middle of the range for the group: costae on first whorl 25 - 28, average 26; on second whorl 20 - 22, average 21; on partial third teleoconch whorl 5 - 7; average 6; the average total costae on the first and second whorls is 48, and the average total costae on all whorls is 54. Surface texture is coarse and covers most of the shell, including the protoconch (Figs 180, 188, 196). Callus at the labial insertion is unusually strong and wide, and extends significantly onto the ventral surface. The ventral callus is also unusually strong and covers more of the ventral surface than in other species in the group (Fig. 154). Two of the five shells examined are without any marks, the other three exhibit traces of two spiral bands ventrally as a series of faint yellow-brown marks located in the spaces between the costae, but only one of these shells showed a single, very faint mark on the lip. Shell size is small with an average size of 2.47 x 1.45 mm, W:L 59%. The spire is medium at approximately 30% of shell length, which is slightly taller than most of the group. The suture is moderately wide with a strong sutural ridge formed by lumps on the posterior end of the costae (Fig. 155). Total whorls range from 4.0 to 4.5 whorls in the five shells examined. The lip is wide, straight and is strongly curled inwards, particularly in the posterior half. Six denticles fill the lip; the first is

## Figures 129-140

- 129-130.** *Eratoidea sotaventensis* n. sp., Venezuela, Las Aves de Sotavento, off Lighthouse Island, 18-27 m. **129.** Holotype, 2.45 x 1.47 mm, W:L 60%, MNHN 23723; **130.** Ad., size unknown, from the type locality.  
**131, 133-134.** *Eratoidea viequesa* n. sp., Puerto Rico, north eastern islands, 1-2 m. **131.** Ad. lv., 2.22 mm, 1-2 m; **133-134.** Holotype, 2.46 x 1.49 mm, W:L 61%, MNHN 23729.  
**132, 135-136.** *Eratoidea fuikensis* n. sp., Curaçao, Fuik Bay, 1-10 m **132.** Dark specimen, ad. lv., unmeasured, TMC; **135-136.** Holotype, 2.24 x 1.35 mm, W:L 60%, MNHN 23725.  
**137-138.** *Eratoidea gorda* n. sp., British Virgin Islands, Virgin Gorda, 1-2 m **137.** Holotype, 2.38 x 1.47 mm, W:L 62%, MNHN 23727; **138.** Ad. lv., unmeasured, from the type locality.  
**139-140.** *Eratoidea unionensis* n. sp., holotype, 2.11 x 1.28 mm, W:L 61%, St Vincent and the Grenadines, Union Island, Chatham Bay, 9-23 m, MNHN 23731.



rounded and stronger than the remainder which are more like true denticles, and become gradually weaker anteriorly. All are positioned inside the lip except for the first which extends outwards over the edge (Fig. 180). A very small, weak, extra denticle can be seen between first denticle and labial insertion point. In side view the lip is almost straight, and the denticles, particularly the first, project from lip. The lip sweeps around the siphonal canal which has a moderately thick basal edge, and merges with the first plication. The varix is wide and strong, widest anterior medially and weakens sharply to the base; it curves around the siphonal canal independently of the lip, and merges with the ventral callus. Four plications fill approximately 70% of the aperture; all are bifurcated. The first has a particularly deep cavity internally, with the emergent edge becoming a raised upper limb extending distally to meet the basal edge of the lip (Figs 156-158, 180, 188.); the lower limb is almost absent. In the second plication, which has a somewhat similar configuration but is considerably stronger, the upper limb is strongest and slightly raised, widens from a short, very weak lower limb, and merges with the ventral callus. The third and fourth plications have short limbs which merge with the ventral callus. The aperture is moderately and evenly narrow.

**Remarks.** No live animals were observed. A combination of a number of features set *Eratoidea sulcata* apart from all other species in the *E. sulcata* group except possibly *E. cf. E. sulcata*: the wide, straight, and strongly inwardly curled lip; the labial denticles which are located inside the lip; the configuration of the plications with the deep cavity on the internal edge of the first and second plications; the strong callus deposits at the labial insertion point, the ventral callus which can be particularly strong; and the strong sutural ridge.

*Eratoidea sotaventensis* n. sp.

Figs 129-130, 142, 159-161, 181, 189, 197

**Type material.** Venezuela, Las Aves de Sotavento, off Lighthouse Island, 12°01'N 67°39'W, 18-27 m;

holotype, 2.45 x 1.47 mm, W:L 60%, MNHN 23723; paratype 1, 2.34 x 1.43 mm, W:L 61%, MNHN 23724; paratype 2, 2.06 x 1.25 mm, W:L 61%, MNHN 23724, TMC; paratype 3, 2.36 x 1.36 mm, W:L 58%, MNHN 23724, TMC; paratype 4, 2.13 x 1.30 mm, W:L 61%, MNHN 23724, AWC; paratype 5, 2.29 x 1.33 mm, W:L 58%, MNHN 23724, AWC.

**Other material.** Approximately 40 ad. lv., 10 ad. dd., Venezuela, Las Aves de Sotavento, various location around the type locality, 1-27 m, TMC.

**Type locality.** Venezuela, Las Aves de Sotavento, off Lighthouse Island, 12°01'N 67°39'W, (Map ref. 20).

**Habitat.** Patches of sand and coral rubble with weed and algae, between coral heads.

**Description.** Shell: shape broadly biconic; matt white appearance with clearly defined axial costae. Number of costae on first whorl 18 - 40, average 26; second whorl 13 - 26, average 19; partial third teleoconch whorl 0 - 20; average: 7; average total costae on first and second whorls 45; average total costae on all whorls 54. Anterior ends of costae sweep towards plications; in particular, dorsal costae form numerous ridges which bunch together and sweep around base, merge with ventral callus aligned with first and second plications. Surface texture moderately coarse, roundish lumps on most surfaces. Callus at labial insertion strong, wide. Ventral callus moderately strong close to distal ends of first and second plication. Colour and pattern: translucent white; lip, ventral callus, suture and protoconch opaque white. Size small, 2.45 x 1.47 mm, W:L 60%. Spire medium, 25% of shell length. Suture moderately wide, deep; sutural ridge distinct, formed by lumps on posterior end of costae. Total of 4.0 whorls comprised of protoconch 1.6 whorls, teleoconch 2.4 whorls. Shoulder rounded. Labial insertion significantly below suture. Lip evenly moderately wide; slightly curved; curled inwards; filled by seven denticles, first strongest, rounded; second and subsequent denticles somewhat flattened medially, weakening anteriorly;

### Figures 141-151

**141.** *Eratoidea unionensis* n. sp., holotype, 2.11 x 1.28 mm, W:L 61%, St Vincent and the Grenadines, Union Island, Chatham Bay, 9-23 m, MNHN 23731, (Same as image, fig.139).

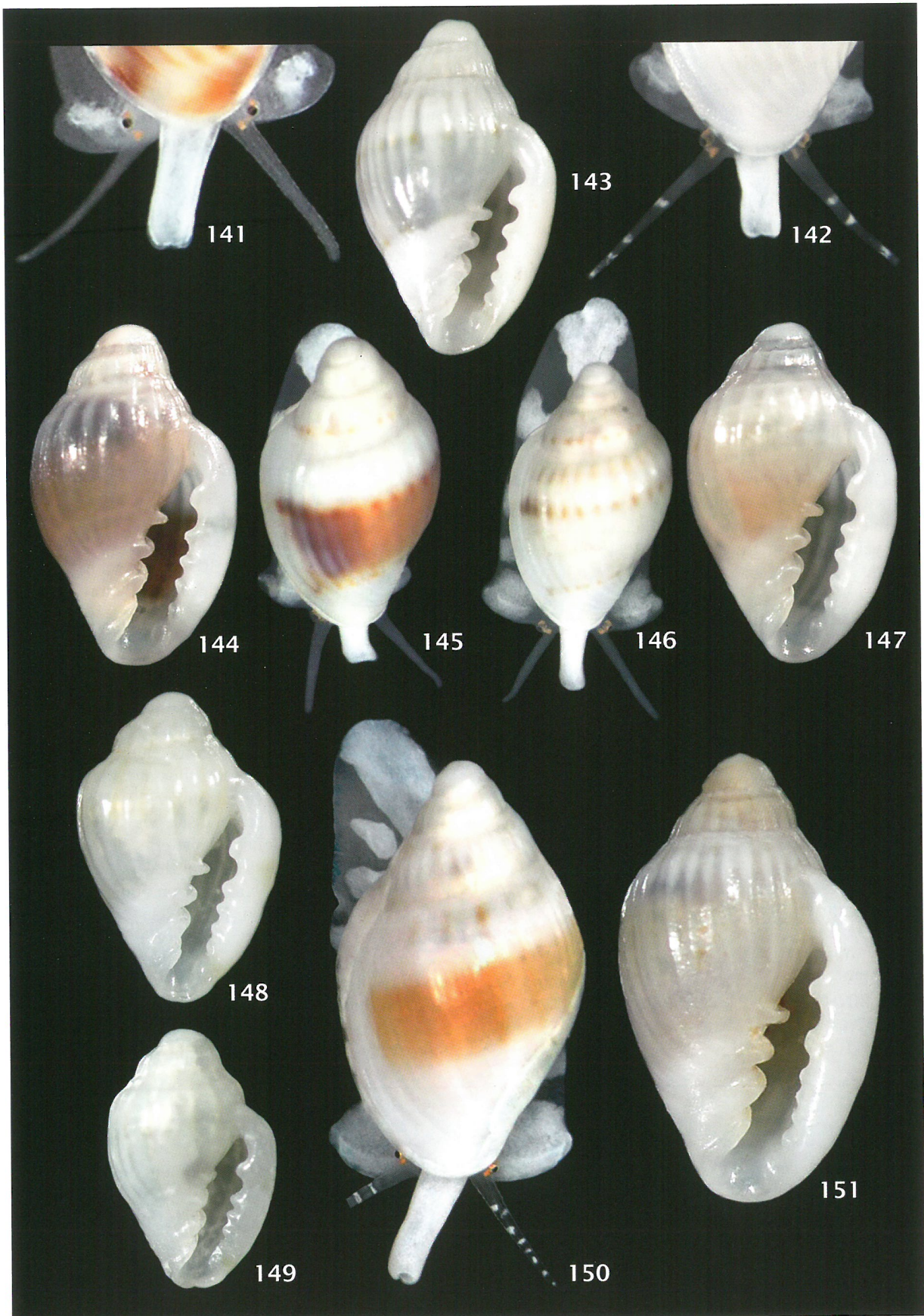
**142.** *Eratoidea sotaventensis* n. sp., ad., unmeasured, Venezuela, Las Aves de Sotavento, off Lighthouse Island, 18-27 m, (Same as image, fig.130).

**143.** *Eratoidea sulcata* (d'Orbigny, 1842), ad. dd., 2.34 x 1.40 mm, W:L 60%, West Indies, Martinique, TMC.

**144-147.** *Eratoidea cf. E. sulcata*, St Vincent and the Grenadines, Isle Quatre, 4 m; **144-145.** Ad. lv., 2.41 x 1.47 mm, W:L 61%, MNHN; **146-147.** Ad. lv., 2.58 x 1.60 mm, W:L 62%, MNHN.

**148-149.** *Eratoidea rugata* n. sp., St Vincent and the Grenadines, off Union Island, 37 m; **148.** Holotype, 2.24 x 1.47 mm, W:L 66%, MNHN 23733; **149.** Paratype 1, 1.97 x 1.34 mm, W:L 68%, MNHN 23734.

**150-151.** *Eratoidea sulcata* group, ad. lv., 3.64 x 2.12 mm, W:L 58%, Venezuela, Las Aves de Barlovento, largest recorded species in the group, TMC.



small, weak, extra denticle between first denticle and labial insertion point, another very weak denticle located on edge of lip between fifth and sixth denticles. In side view lip almost straight, angled slightly anti-clockwise; denticles, particularly first, project from lip; lip sweeps around base and merges with lower limb of first plication. Varix strong, wide, widest anteriorly, weakens sharply to base, curves around siphonal canal, merges with ventral callus. Four plications fill approximately 70% of aperture; all strongly bifurcated; first plication, upper limb strongest, merges with ventral callus; second, upper limb strongest, limbs widen, rejoin, merge with ventral callus; third and fourth, limbs short, merge with ventral callus. Aperture evenly, moderately wide.

Animal. Length of foot approximately 30% more than shell length, width narrower than shell, almost transparent; one lateral, irregularly shaped white mark; metapodium, wide medial line, widens posteriorly, extends to distal end. Propodium largely covered with one diffuse white mark on each side. Tentacles semi-transparent, three and four irregularly shaped white spots. Siphon solid white. Eyes located laterally on small pods at base of tentacles, black with dull yellow encasing membrane. Mantle not observed. Mantle roof white, without marks.

**Remarks.** *Eratoidea sotaventensis* n. sp. is the only species with shells which are always without coloured marks or bands; it has the second largest number of costae per whorl in the group after *E. viequesa* n. sp. The lip is unusually straight and evenly wide throughout most of its length. and the plications are wide and strong. The average size is 2.57 x 1.52 mm, W:L 59%.

**Etymology.** The name is derived from the type locality.

*Eratoidea fuikensis* n. sp.

Figs 132, 135-136, 162-164, 182, 190, 198

**Type material.** Curaçao, Fuik Bay, 12°02.9'N 68°50.0'W, 1-10 m; holotype, 2.24 x 1.35 mm, W:L 60%, MNHN 23725; paratype 1, 2.25 x 1.28 mm, W:L 57%, MNHN 23726; paratype 2, 2.29 x 1.37 mm, W:L 60%, MNHN 23726, AWC; paratype 3,

2.48 x 1.43 mm, W:L 58%, MNHN 23726, TMC; paratype 4, 2.06 x 1.25 mm, W:L 61%, MNHN 23726, TMC; paratype 5, 2.43 x 1.40 mm, W:L 58%, MNHN 23726, AWC.

**Other material.** Approximately 50 ad. lv., Curaçao, Fuik Bay, 12°02.9'N 68°50.0'W, 1-10 m, TMC; 5 ad. lv., 1 juv. lv., Curaçao, Spaanse Water channel, 12°02.9'N 68°50.0'W, TMC; 2 ad. lv., 1 juv. lv., Curaçao, Spaanse Water, 12°06.4'N 68°55.9'W, 1-2 m, TMC; 2 ad. lv., 1 juv. lv., Curaçao, off Piscadera bay, 12°07.3'N 68°58.3'W, 1-2 m, TMC; 12 ad. lv., Curaçao, St Michaels bay, 12°08.7'N 69°00.0'W, 6 m, TMC; 1 ad. lv., Curaçao, St Kruz bay, 12°18.1'N 69°09.1'W, 7m, TMC.

**Type locality.** Curaçao, Fuik Bay, 12°02.9'N 68°50.0'W, 1-10 m, (Map ref. 24).

**Habitat.** Collected at night on weed and on surrounding muddy sand, 1-10 m.

**Description.** Shell: shape broadly biconic; matt appearance; largely covered with clearly defined axial costae, weakening anteriorly; number of costae on first whorl 26 - 32, average 30; second whorl 19 - 20, average 20; partial third teleoconch whorl 6 - 12; average 8; average total costae on first and second whorls 49; average total costae on all whorls 58. Anterior ends of costae, weak; several weak ridges sweep around base, merge with ventral callus aligned with first and second plications. Surface texture on ventral surfaces strongly textured with coarse irregularly shaped lumps; protoconch with several small lumps close to suture. Callus at labial insertion moderately strong, wide, lumpy. Ventral callus moderately strong close to distal ends of first and second plication. Colour and pattern: almost opaque white, sub-sutural band on translucent white shell; two broken, yellow-brown bands on body whorl, with corresponding marks on lip; costae opaque white, strongest close to suture; some yellow-brown axial marks in space between costae, extending somewhat anteriorly, but not meeting anterior band; lip, ventral callus and protoconch: opaque white. Size minute, 2.24 x 1.35 mm, W:L 60%. Spire medium, approximately 29% of shell length. Suture moderately

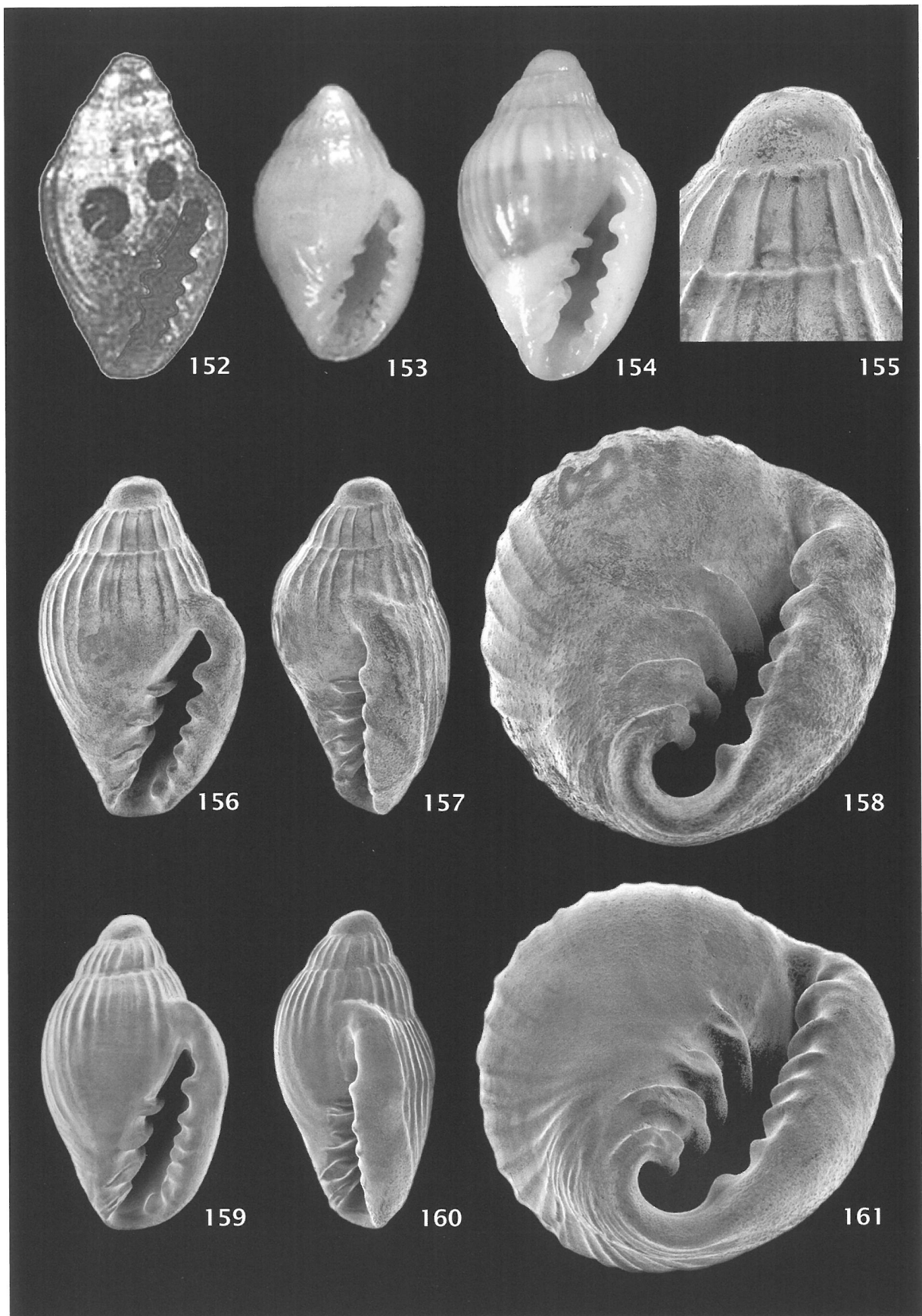
**Figures 152-161**

**152.** *Eratoidea sulcata* (d'Orbigny, 1842), Kaicher (1981, card 2630), from the type collection in the BM(NH), registration number: 1854.10.4.314, locality Martinique, size to 3 mm x 1.5 mm.

**153.** *Eratoidea striata* (Sowerby, 1846), one of three syntypes held in the BM(NH) type collection, registration number BM(NH), 80. 9. 18. 13-15. (Photo, Andrew Wakefield).

**154-158.** *Eratoidea sulcata* (d'Orbigny, 1842), ad. dd., 2.34 x 1.40 mm, W:L 60%, West Indies, Martinique, TMC (Same as colour image, fig. 143).

**159, 161.** *Eratoidea sotaventensis* n. sp., holotype, 2.45 x 1.47 mm, W:L 60%, Venezuela, Las Aves de Sotavento, off Lighthouse Island, 18-27 m, MNHN 23723.



wide, deep; sutural ridge very weak. Total of 4.0 whorls comprised of protoconch 1.6 whorls, teleoconch 2.4 whorls. Shoulder rounded. Labial insertion point significantly below suture. Lip evenly moderately wide; almost straight; curled inwards; filled by seven denticles, first strongest, rounded; second and subsequent rounded, weakening anteriorly; small, weak extra denticle between first denticle and labial insertion point, another very weak denticle on edge of lip between first and second denticles. In side view lip almost straight, angled slightly anti-clockwise; denticles, particularly first, project from lip; lip sweeps around base, merges with lower limb of first plication. Varix strong, wide, widest medially, dorsal edges straight, weakens sharply to base, curves around siphonal canal, merges with ventral callus in slight ridge aligned with second plication. Four plications fill approximately 70% of aperture; all strongly bifurcated, and strongly angled downwards; first, upper limb strongest, somewhat lumpy, merges with ventral callus; second, upper limb strong, lower limb weak, limbs widen, rejoin, merge with ventral callus very close to first plication; third and fourth, limbs short, merge with ventral callus. Aperture evenly, moderately wide.

Animal. Length of foot approximately 40% more than shell length, width narrower than shell, almost transparent; one lateral, very small white mark; metapodium, wide medial line with irregularly lumpy edges, widens posteriorly, terminates short of distal end. Propodium, diffuse white mark on each side. Tentacles semi-transparent, unmarked. Siphon solid white, slightly translucent anteriorly. Eyes located laterally on small pods at base of tentacles, black with orange encasing membrane; orange mark on tentacles close to eyes. Mantle transparent with sparse white spots. Mantle roof white spots on darker background.

**Remarks.** The features which separate *Eratoidea fuikensis* n. sp. from all other species are the plications which are strongly bifurcated and more acutely angled than in any other species in the group; the widely spaced limbs of the bifurcated plications, particularly on the first plication (Figs 162-163, 191) and the broken axial marks and strong sub-sutural, yellow-brown marks on the shell, compared to *E. unionensis* n. sp., which is closest, on which the marks are more regular and continuous. The average size is 2.29 x 1.35 mm, W:L 58.8%.

**Etymology.** The name is derived from the type locality.

*Eratoidea gorda* n. sp.

Figs 137-138, 165-167, 183, 191, 199

**Type material.** British Virgin Islands, Virgin Gorda, 18°30.85'N 64°21.93'W, 1-2 m; holotype, 2.38 x 1.47 mm, W:L 62%, MNHN 23727; paratype 1, 2.32 x 1.35 mm, W:L 58%, MNHN 23728; paratype 2, 2.13 x 1.35 mm, W:L 63%, MNHN 23728, TMC; paratype 3, 2.14 x 1.34 mm, W:L 63%, MNHN 23728, TMC; paratype 4, 2.56 x 1.47 mm, W:L 57%, MNHN 23728, AWC; paratype 5, 2.58 x 1.54 mm, W:L 60%, MNHN 23728, AWC.

**Other material.** 1 ad. lv., 2 juv. lv., British Virgin Islands, Virgin Gorda, 18°30.85'N 64°21.93'W, 1-2 m, TMC.

**Type locality.** British Virgin Islands, Virgin Gorda, 18°30.85'N 64°21.93'W, 1-2 m, (Map ref. 6).

**Habitat.** Weedy sand and rubble between rocks, 1-2 m, subjected to much wash from passing boats.

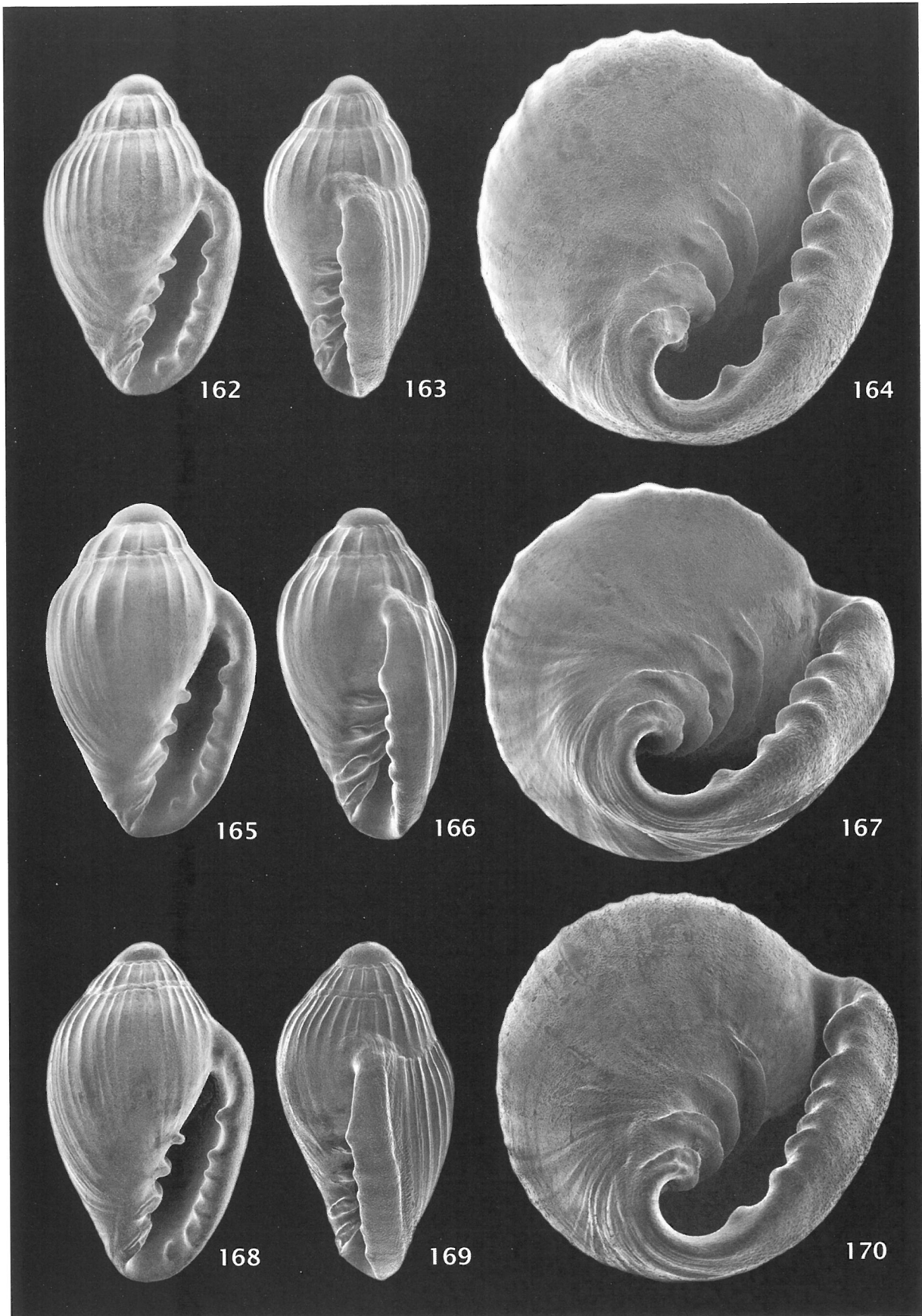
**Description.** Shell: shape broadly biconic; matt appearance; covered with clearly defined axial costae; number of costae on first whorl 24 - 25, average 25; second whorl 16 - 18, average 17; partial third teleoconch whorl 5 - 11; average 8; average total costae on first and second whorls 42; average total costae on all whorls 50. Anterior ends of costae sweep towards plications; in particular, dorsal costae form numerous ridges which sweep around base, merge with ventral callus aligned with first and second plications. Surface texture sparse, small lumps ventrally; lip with dense, coarse roundish lumps; protoconch partially covered with weak lumps. Callus at labial insertion moderately strong, lumpy. Ventral callus moderately strong close to distal ends of first and second plication. Colour and pattern translucent white, spiral band of more opaque white somewhat below suture, costae opaque white posteriorly, coloured marks absent; lip, ventral callus and protoconch opaque white. Size minute, 2.39 x 1.43 mm, W:L 60%. Spire low, approximately 23% of shell length. Suture moderately wide, shallow; sutural

**Figures 162-170**

**162-164.** *Eratoidea fuikensis* n. sp., holotype, 2.24 x 1.35 mm, W:L 60%, Curaçao, Fuik Bay, 1-10 m, MNHN 23725.

**165-167.** *Eratoidea gorda* n. sp., holotype, 2.38 x 1.47 mm, W:L 62%, British Virgin Islands, Virgin Gorda, 1-2 m, MNHN 23727.

**168-170.** *Eratoidea viequesa* n. sp., holotype, 2.46 x 1.49 mm, W:L 61%, Puerto Rico, islets to north east, 1-2 m, MNHN 23729.



ridge with weak lumps, callus with woven pattern ventrally. Total of 4.0 whorls comprised of protoconch 1.6 whorls, teleoconch 2.4 whorls. Shoulder rounded. Labial insertion significantly below suture. Lip evenly narrow, almost straight, filled by six rounded denticles, first strongest; second to fourth equally weaker; fifth weaker; sixth weakest. In side view lip straight, angled slightly anticlockwise; first to fourth denticles project from lip; lip sweeps around base developing approximately four narrow ridges, merges with lower limb of first plication. Varix moderately narrow, widest medially, dorsal edges convex, weakens to base, curves around siphonal canal, merges with ventral callus in slight ridge aligned with second plication. Four plications fill approximately 70% of the aperture, all moderately strongly bifurcated; first plication, upper limb strongest, merges with ventral callus; second, upper limb strongest, lower limb weak, limbs widen, rejoin, merge with ventral callus; third and fourth, limbs moderately long, merge with ventral callus. Aperture evenly, moderately wide.

Animal. Length of foot approximately 25% more than shell length, width narrower than shell, almost transparent; approximately eight, lateral, small, white spots; metapodium with wide medial line, terminates short of distal end. Propodium with diffuse white mark on each side. Tentacles semi-transparent, four white marks. Siphon solid white. Eyes located laterally on small pods at base of tentacles, black with orange encasing membrane. Mantle transparent with sparse white spots. Mantle roof evenly covered by small white spots on slightly darker background.

**Remarks.** *Eratoidea gorda* n. sp. is distinguished from all other species in the group by its narrow lip; more or less equally sized second to fourth labial denticles which project from the lip more than in any other species in the group (Figs 166, 183) and by the foot of the animal which exhibits small white spots. The average size is 2.39 x 1.43 mm, W:L 60%.

**Etymology.** The name is derived from the type locality.

*Eratoidea viequesa* n. sp.

Figs 131, 133-134, 168-170, 184, 192, 200

**Type material.** Puerto Rico, islets to north east, 18°05.9'N 65°34.5'W, 1-2 m; holotype, 2.46 x 1.49

mm, W:L 61%, MNHN 23729; paratype 1, 2.52 x 1.45 mm, W:L 58%, MNHN 23730; paratype 2, 2.42 x 1.37 mm, W:L 57%, MNHN 23730, TMC; paratype 3, 2.70 x 1.52 mm, W:L 56%, MNHN 23730, TMC; paratype 4, 2.17 x 1.29 mm, W:L 59%, MNHN 23730, AWC; paratype 5, 2.34 x 1.36 mm, W:L 58%, MNHN 23730, AWC.

**Other material.** 1 ad. lv., 3 juv. lv., Puerto Rico, islets to north east, 18°05.9'N 65°34.5'W, 1-2 m. TMC.

**Type locality.** Puerto Rico, islets to north east, 18°05.9'N 65°34.5'W, 1-2 m, (Map ref. 5).

**Habitat.** Sandy rubble around rocks, and on slab heavily covered with short weed and embedded sand, 1-2 m, moderately exposed to wave action.

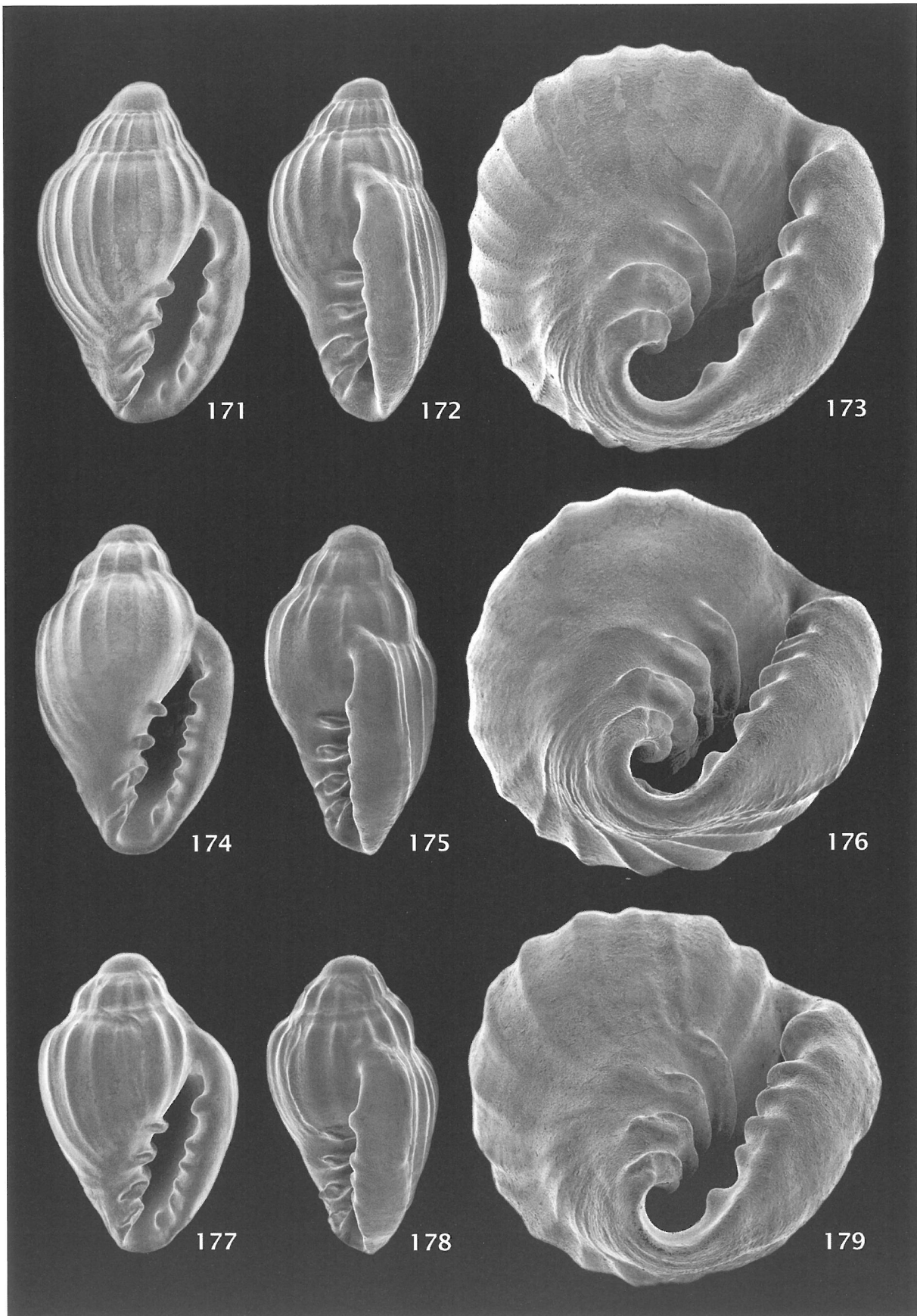
**Description.** Shell: shape broadly biconic; matt appearance; covered with unusually numerous, fine, distinct, axial costae; number of costae on first whorl 34 - 40, average 37; second whorl 22 - 26, average 24; partial third teleoconch whorl 8 - 11; average 10; average total costae on first and second whorls 61; average total costae on all whorls 71. Anterior ends of costae sweep towards plications; in particular, dorsal costae form numerous ridges which sweep around base, merge with ventral callus aligned with first and second plications. Surface texture: ventral surfaces strongly textured with coarse irregularly shaped lumps; protoconch evenly covered with small lumps. Callus at labial insertion moderate, smooth, radiates outwards from insertion point. Ventral callus moderately strong; slight axial ridge remote to distal end of first and second plications. Colour and pattern translucent white with sub-sutural, opaque white spiral band and three broken yellow-brown bands; posterior band terminates before varix; two medial bands formed at edges of single wide, yellow-brown band; posterior ends of costae opaque white; lip, ventral callus, protoconch opaque white. Size small, 2.46 x 1.49 mm, W:L 61%. Spire low, approximately 22% of shell length. Suture moderately wide, shallow; sutural ridge with small lumps on posterior ends of costae. Total of 4.2 whorls comprised of protoconch 1.5 whorls, teleoconch 2.7 whorls. Shoulder rounded. Labial insertion significantly below suture. Lip evenly moderately narrow; slightly curved; filled by seven

## Figures 171-179

**171-173.** *Eratoidea* cf. *E. sulcata*, ad. lv., 2.58 x 1.60 mm, W:L 62%, St Vincent and the Grenadines, Isle Quatre 12°57.7'N, 61°15.1'W, 4 m, MNHN.

**174-176.** *Eratoidea unionensis* n. sp., holotype, 2.11 x 1.28 mm, W:L 61%, St Vincent and the Grenadines, Union Island, Chatham Bay, 9 - 23 m, MNHN 23731.

**177-179.** *Eratoidea rugata* n. sp., holotype, 2.24 x 1.47 mm, W:L 66%, St Vincent and the Grenadines, off Union Island, 37 m, MNHN 23733.



weakly rounded denticles, first strongest, subsequent denticles weakening. In side view lip straight, angled slightly anti-clockwise; denticles project from lip, particularly first; lip sweeps around base, merges with lower limb of first plication. Varix generally moderately narrow, section above first denticle narrows to labial insertion point; dorsal edge straight, curves around siphonal canal, weakening, merges with ventral callus. Four plications fill approximately 63% of aperture, all moderately strongly bifurcated; first plication, upper limb strongest, merges with ventral callus; second, upper limb strong, lower limb weak; limbs widen, rejoin, merge with ventral callus; third and fourth, bifurcation weaker, narrow, limbs merge with ventral callus. Aperture evenly, moderately wide.

Animal. Length of foot approximately 35% more than shell length, width narrower than shell, almost transparent; three white marks laterally; metapodium with wide medial line, widening posteriorly, extends to distal end. Propodium with large white mark distally on each side. Tentacles semi-transparent, two white marks. Siphon with short unmarked section, solid white distally. Eyes located laterally on small pods at base of tentacles, black with orange encasing membrane. Mantle transparent with sparse white spots. Mantle roof not observed.

**Remarks.** *Eratoidea viequesa* n. sp. is separated from all other species in the group by its unusually numerous, fine costae. The average total number of costae on the first and second whorls is 61; the closest to *E. viequesa* n. sp. is *E. sotaventensis* n. sp. with 54 costae, both well above the average 45 for the group. The shells of *E. sotaventensis* n. sp. are always totally without any marks, whereas the shells of *E. viequesa* n. sp. frequently have a yellow-brown dorsal band which is wider than on any other species in the group and a solid sub-sutural band of the same shade, which is also unique (Fig. 133). The average size of *E. viequesa* n. sp. is 2.44 x 1.41 mm, W:L 58%.

**Etymology.** The name is derived from Vieques, the name of one of the islands in the type locality.

***Eratoidea* cf. *E. sulcata*** (d'Orbigny, 1842)

Figs 144-147, 171-173, 185, 193, 201

**Voucher material.** St Vincent and the Grenadines, Isle Quatre, 12°57.7'N 61°15.1'W, 4 m; ad. lv., 2.58 x 1.60 mm, W:L 62%, MNHN; ad. lv., 2.28 x 1.40 mm, W:L 61%, MNHN; ad. lv., 2.25 x 1.44 mm, W:L 64%, TMC; ad. lv., 2.73 x 1.65 mm, W:L 60%, TMC; ad. lv., 2.41 x 1.47 mm, W:L 61%, TMC; ad. lv., 2.75 x 1.59 mm, W:L 58%, TMC.

**Other material.** Approximately 40 ad. lv., St Vincent and the Grenadines, Isle Quatre, 12°57.8'N 61°15.1'W, 4 m, TMC; 2 ad. lv., 4 juv. lv., Isle Quatre, 12°57.7'N 61°15.1'W, 20 m, TMC; 10 ad., lv., Isle Quatre, 12°57.7'N 61°15.1'W, 6 m, TMC.

**Type locality.** St Vincent and the Grenadines, Isle Quatre, 12°57.7'N 61°15.1'W, 4 m, (Map ref. 9).

**Habitat.** Sand and algae on huge rocks, 4 m; sandy rubble 6 m; weedy sand, 20 m.

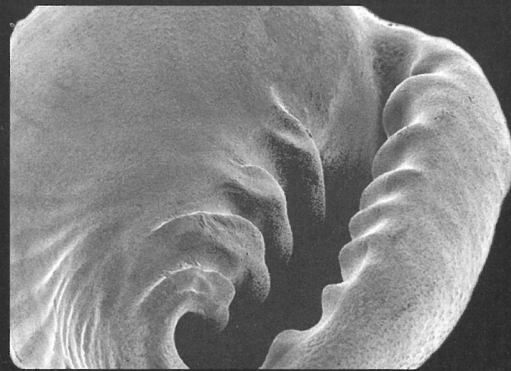
**Description.** Shell: shape broadly biconic; matt appearance; covered with fine, distinct, axial costae; number of costae on first whorl 21 - 26, average 24; second whorl 16 - 23, average 21; partial third teleoconch whorl 0 - 20; average 8; average total costae on first and second whorls 44; average total costae on all whorls 52. Anterior ends of costae sweep towards plications; in particular, dorsal costae form numerous ridges which sweep around base and merge with ventral callus aligned with first and second plications. Surface texture: all surfaces extensively covered with texture of small irregularly shaped lumps; protoconch evenly covered with fine lumps. Callus at labial insertion slight, smooth. Ventral callus moderately strong; slight axial ridge remote to distal end of first and second plications. Colour and pattern translucent white with three weak, broken yellow-brown bands: posterior band sub-sutural, terminates before varix; two widely separated, medial, yellow-brown bands terminate before varix; lip, ventral

**Figures 180-187**

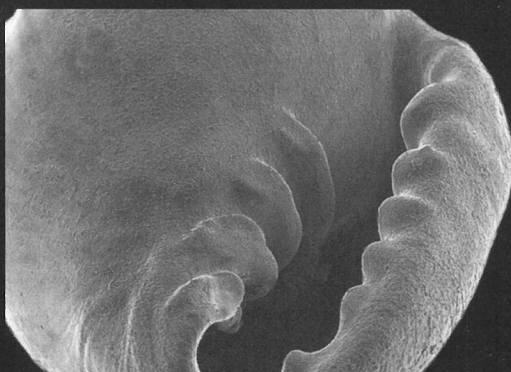
180. *Eratoidea sulcata* (d'Orbigny, 1842), ad. dd., 2.34 x 1.40 mm, W:L 60, TMC.  
 181. *Eratoidea sotaventensis* n. sp., holotype, 2.45 x 1.47 mm, W:L 60%, MNHN 23723.  
 182. *Eratoidea fuiikensis* n. sp., holotype, 2.24 x 1.35 mm, W:L 60%, MNHN 23725.  
 183. *Eratoidea gorda* n. sp., holotype, 2.38 x 1.47 mm, W:L 62%, MNHN 23727.  
 184. *Eratoidea viequesa* n. sp., holotype, 2.46 x 1.49 mm, W:L 61%, MNHN 23729.  
 185. *Eratoidea* cf. *E. sulcata*, 2.58 x 1.60 mm, W:L 62%, MNHN.  
 186. *Eratoidea unionensis* n. sp., holotype, 2.11 x 1.28 mm, W:L 61%, MNHN 23731.  
 187. *Eratoidea rugata* n. sp., holotype, 2.24 x 1.47 mm, W:L 66%, MNHN 23733.



180



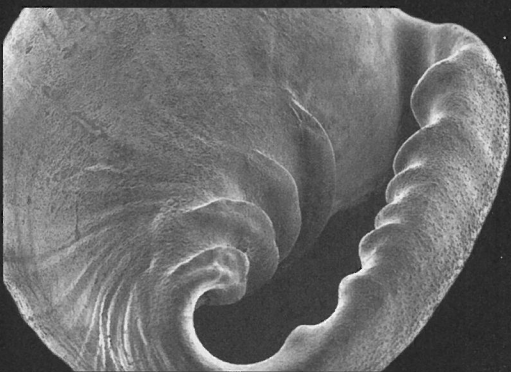
181



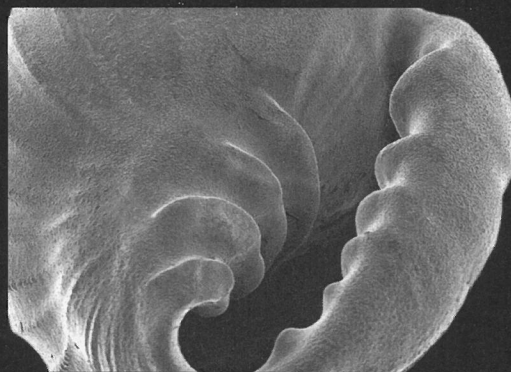
182



183



184



185



186



187

callus, protoconch and posterior ends of costae opaque white. Size small, 2.58 x 1.60 mm, W:L 62%. Spire medium, approximately 26% of shell length. Suture moderately wide, shallow; sutural ridge of small lumps on posterior ends of costae. Total of 4.2 whorls comprised of protoconch 1.5 whorls, teleoconch 2.7 whorls. Shoulder rounded. Labial insertion significantly below suture. Lip evenly moderately wide, slightly curved, slightly curled inwards; filled by six somewhat rounded denticles, first strongest, subsequent denticles weakening. In side view lip straight, angled slightly anti-clockwise; denticles project from lip, particularly first; lip sweeps around base, merges with lower limb of first plication. Varix evenly moderately wide; dorsal edges straight; curves around siphonal canal, weakening, merges with ventral callus. Four plications fill approximately 70% of aperture; all moderately strongly bifurcated; first plication upper limb strongest, merges with ventral callus; second lower limb weak, upper limb long, raised, curves anteriorly, merges with ventral callus; third and fourth, bifurcation weaker, limbs merge with ventral callus. Aperture evenly, moderately wide.

Animal. Length of foot approximately 20% more than shell length, same width as shell, almost transparent; three large white marks laterally; metapodium with wide medial line, widening posteriorly, extends to distal end. Propodium with large white mark distally on each side. Tentacles semi-transparent, without marks. Siphon solid white. Eyes located laterally on small pods at base of tentacles, black with orange encasing membrane. Mantle and mantle roof not observed.

**Remarks.** *Eratoidea* cf. *E. sulcata* has shell morphology which is very close to that of *E. sulcata*. A faint, broken, brown posterior medial band is present in four of the five shells of *E. sulcata* which were examined, and one shell is unmarked. A similar band is present on a number of the many specimens of *E. cf. E. sulcata* which were examined, however, in other specimens a strong, wide, orange-brown medial band is present (Fig. 145), suggestive of a second species being present. The labial denticles are more rounded in *E. cf. E. sulcata*. Whether or not there are two distinct species will only be resolved by

examination of many more shells of *E. sulcata*, or better, by examination of live animals. The average size of *E. cf. E. sulcata* is 2.45 x 1.49 mm, W:L 61%.

*Eratoidea unionensis* n. sp.

Figs 139-141, 174-176, 186, 194, 202

**Type material.** St Vincent and the Grenadines, Union Island, Chatham Bay, 12°36.3'N 61°27.1'W 9-23 m; holotype, 2.11 x 1.28 mm, W:L 61%, MNHN 23731; paratype 1, 2.57 x 1.59 mm, W:L 62%, MNHN 23732; paratype 2, 2.16 x 1.25 mm, W:L 58%, MNHN 23732, AWC; paratype 3, 2.61 x 1.53 mm, W:L 59%, MNHN 23732, TMC; paratype 4, 2.43 x 1.39 mm, W:L 57%, MNHN 23732, TMC; paratype 5, 2.25 x 1.34 mm, W:L 60%, MNHN 23732, AWC.

**Other material.** 11 ad. lv., 2 juv. lv., St Vincent and the Grenadines, Union Island, Chatham Bay, 12°36.3'N 61°27.1'W, 9-23, TMC.

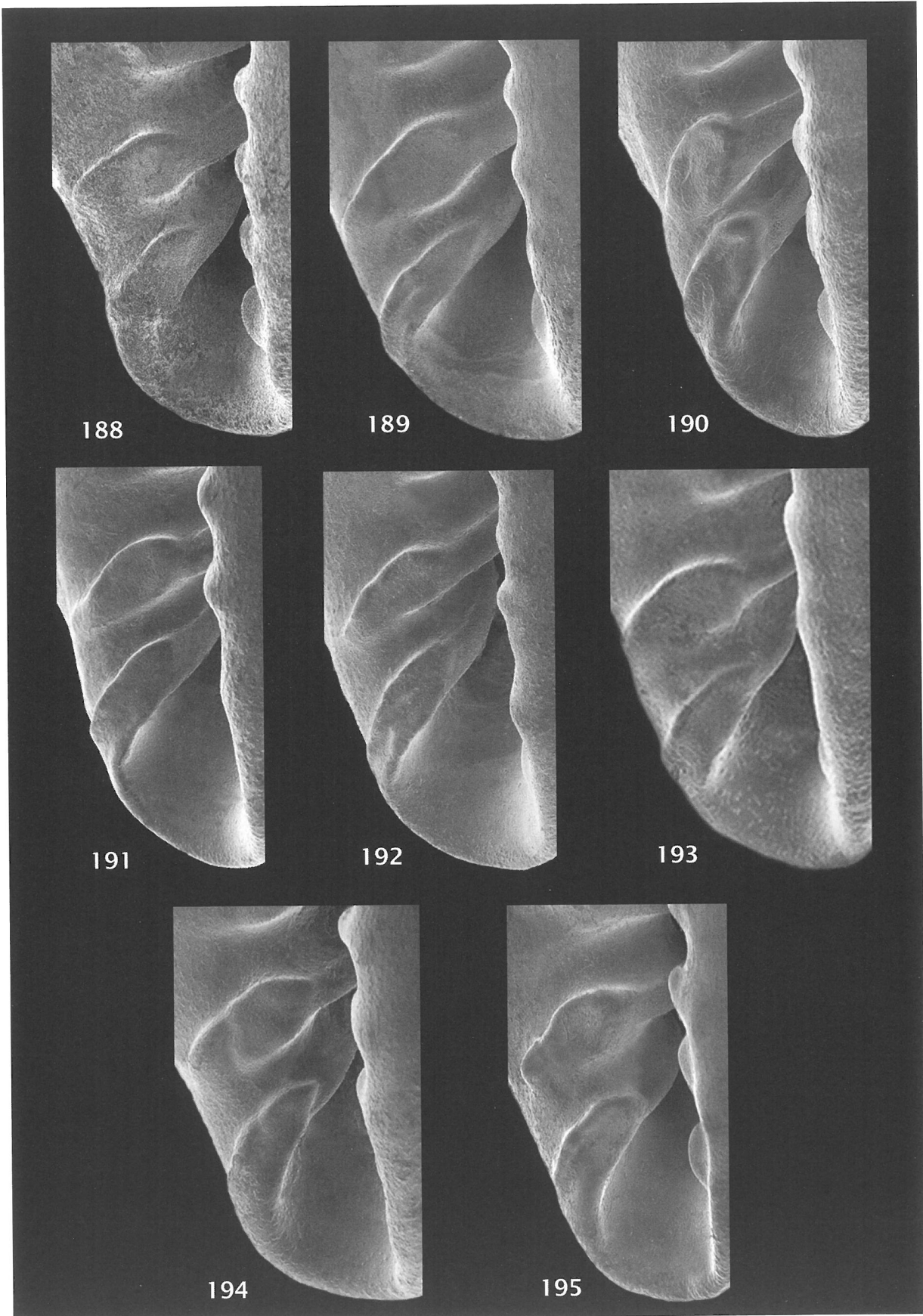
**Type locality.** St Vincent and the Grenadines, Union Island, Chatham Bay, 12°36.3'N 61°27.1'W, 9-23 m, (Map ref. 10).

**Habitat.** Sandy rubble between coral heads, 9-23 m.

**Description.** Shell: shape broadly biconic; matt appearance; covered with somewhat rounded axial costae; number of costae on first whorl 18 - 19, average 18; second whorl 13 - 18, average 16; partial third teleoconch whorl 2 - 12; average 7; average total costae on first and second whorls 34; average total costae on all whorls 41. Anterior ends of costae weak ventrally; dorsal costae form numerous ridges which sweep around base, merge with ventral callus aligned with first and second plications. Surface texture: ventral surfaces, including edge of lip, largely covered with fine lumps; anterior dorsal area of varix covered with very weak, large lumps; protoconch very sparsely covered with fine lumps. Callus at labial insertion weak, smooth. Ventral callus weak. Colour and pattern translucent white with opaque costae; yellow-brown axial stripes between costae; two widely spaced weak bands medially on dorsum with deep brown marks close to varix; lip, ventral callus, suture and protoconch opaque white; lip with two moderately weak marks associated with dorsal bands.

### Figures 188-195

188. *Eratoidea sulcata* (d'Orbigny, 1842), ad. dd., 2.34 x 1.40 mm, W:L 60, TMC.  
 189. *Eratoidea sotaventensis* n. sp., holotype, 2.45 x 1.47 mm, W:L 60%, MNHN 23723.  
 190. *Eratoidea fuikensis* n. sp., holotype, 2.24 x 1.35 mm, W:L 60%, MNHN 23725.  
 191. *Eratoidea gorda* n. sp., holotype, 2.38 x 1.47 mm, W:L 62%, MNHN 23727.  
 192. *Eratoidea viequesa* n. sp., holotype, 2.46 x 1.49 mm, W:L 61%, MNHN 23729.  
 193. *Eratoidea* cf. *E. sulcata*, 2.58 x 1.60 mm, W:L 62%, MNHN.  
 194. *Eratoidea unionensis* n. sp., holotype, 2.11 x 1.28 mm, W:L 61%, MNHN 23731.  
 195. *Eratoidea rugata* n. sp., holotype, 2.24 x 1.47 mm, W:L 66%, MNHN 23733.



Size minute, 2.11 x 1.28 mm, W:L 61%. Spire medium, approximately 28% of shell length. Suture moderately wide, deep; sutural ridge absent. Total of 4.0 whorls comprised of protoconch 1.6 whorls, teleoconch 2.4 whorls. Shoulder rounded. Labial insertion significantly below suture. Lip moderately wide and straight medially, narrows and curves anteriorly; slightly curled inwards; filled by six flattened denticles, first strongest and more rounded, second and third, joined to form one widely bifurcated denticle; remainder weakening somewhat. In side view lip slightly convex; denticles project weakly; sweeps around base, merges with both limbs of first plication. Varix strong, wide, widest anteriorly, dorsal edge straight, curves around siphonal canal, merges with ventral callus. Four plications fill approximately 72% of the aperture, all strongly bifurcated; first plication concave on parietal wall, somewhat lumpy, upper limb strongest; second concave on parietal wall, somewhat lumpy, limbs widen, rejoin, merge abruptly with ventral callus; third, limbs widen slightly, rejoin, merge with ventral callus; fourth straight on parietal wall, limbs short, merge with ventral callus. Aperture evenly moderately wide.

Animal. Length of foot approximately 40% more than shell length, width same as shell, slightly translucent; four lateral, white marks; metapodium with moderately wide medial line, widens slightly posteriorly, terminates before distal end. Propodium partly covered with diffuse white mark on each side. Tentacles semi-transparent, unmarked. Siphon solid white. Eyes located laterally on small pods at base of tentacles, black with orange encasing membrane. Two small orange marks close to eyes. Mantle transparent with sparse white spots. Mantle roof not observed.

**Remarks.** The closest species to *Eratoidea unionensis* n. sp. is *E. fuikensis* n. sp. When dark coloured shells are compared it can be seen that the yellow-brown axial lines in *E. unionensis* n. sp. (Fig. 139) are regular and unbroken, whereas, in *E. fuikensis* n. sp. (Fig. 132) the axial lines are irregular and broken and have substantial marks of the same colour at both posterior and anterior ends. In *E. unionensis* n. sp. the animal chromatism consists of

sharply defined white, lateral marks and medial line on the metapodium (Fig. 139), whereas, in *E. fuikensis* n. sp. the lateral white marks are absent and the medial line on the metapodium is indistinct and diffuse dull white. The most striking difference in shell morphology is in the labial denticles: in *E. fuikensis* n. sp. the denticles are largely located on the edge of the lip and rounded (Fig. 182), whereas, in *E. unionensis* n. sp. they are located significantly below the edge of the lip and have somewhat straight edges (Fig. 185). Shell morphology of *E. rugata* n. sp. is also close to *E. unionensis* n. sp. but is separated by its considerably smaller size and W:L ratio: 2.16 x 1.41 mm, W:L 65.3%, compared to *E. unionensis* n. sp. with 2.36 x 1.40 mm, W:L 59.3%. The shape of the labial denticles of *E. rugata* n. sp. lies between that of *E. fuikensis* n. sp. and *E. unionensis* n. sp. The average size of *E. unionensis* n. sp. is 2.36 x 1.40 mm, W:L 59.3%.

**Etymology.** The name is derived from the type locality.

*Eratoidea rugata* n. sp.

Figs 148-149, 177-179, 187, 195, 203

**Type material.** St Vincent and the Grenadines, off Union Island, 12°05'N 61°45'W, 37 m; holotype, 2.24 x 1.47 mm, W:L 66%, MNHN 23733; paratype 1, 1.97 x 1.34 mm, W:L 66%, MNHN 23734; paratype 2, 2.45 x 1.52 mm, W:L 62%, MNHN 23734, TMC; paratype 3, 2.02 x 1.31 mm, W:L 65%, MNHN 23734, TMC; paratype 4, 2.15 x 1.43 mm, W:L 67%, MNHN 23734, AWC; paratype 5, 2.13 x 1.38 mm, W:L 65%, MNHN 23734, AWC.

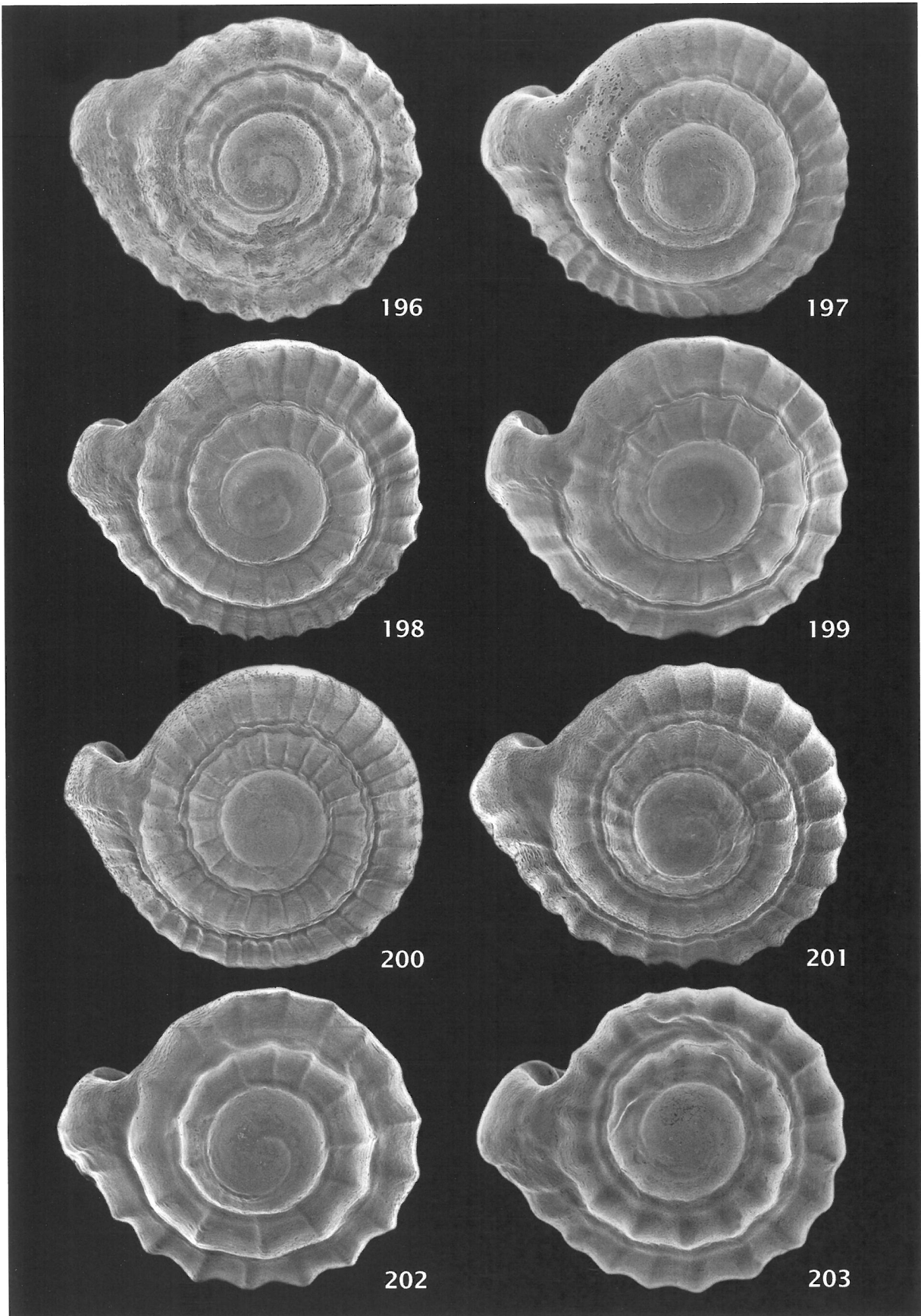
**Other material.** 14 ad. dd., St Vincent and the Grenadines, off Union Island, 12°05'N 61°45'W, 37 m, TMC.

**Type locality.** St Vincent and the Grenadines, off Union Island, 12°05'N 61°45'W, 37 m, (Map ref. 11).

**Habitat.** Pale beige coloured, slightly muddy sand, 37 m.

## Figures 196-203

196. *Eratoidea sulcata* (d'Orbigny, 1842), ad. dd., 2.34 x 1.40 mm, W:L 60%, TMC.
197. *Eratoidea sotaventensis* n. sp., holotype, 2.45 x 1.47 mm, W:L 60%, MNHN 23723.
198. *Eratoidea fuikensis* n. sp., holotype, 2.24 x 1.35 mm, W:L 60%, MNHN 23725.
199. *Eratoidea gorda* n. sp., holotype, 2.38 x 1.47 mm, W:L 62%, MNHN 23727.
200. *Eratoidea viequesa* n. sp., holotype, 2.46 x 1.49 mm, W:L 61%, MNHN 23729.
201. *Eratoidea* cf. *E. sulcata*, 2.58 x 1.60 mm, W:L 62%, MNHN.
202. *Eratoidea unionensis* n. sp., holotype, 2.11 x 1.28 mm, W:L 61%, MNHN 23731.
203. *Eratoidea rugata* n. sp., holotype, 2.24 x 1.47 mm, W:L 66%, MNHN 23733.



**Description.** Shell: (dead collected) shape broadly biconic; matt appearance; covered with somewhat rounded axial costae; number of costae on first whorl 18 - 20, average 19; second whorl 13 - 14, average 14; partial third teleoconch whorl 1 - 10; average 4; average total of first and second whorls 33; average total of costae on all whorls 37. Anterior ends of dorsal costae sweep towards plications ventrally; dorsal costae form numerous weak ridges which sweep around base, merge with ventral callus, aligned with first and second plications. Surface texture: ventral surface partly covered with fine lumps; protoconch sparsely covered with fine lumps. Callus at labial insertion moderately strong, slightly lumpy, coincides with a costa. Ventral callus moderately weak. Colour and pattern translucent white; lip, ventral callus, suture and protoconch opaque white; yellow-brown, axial stripes between costae; lip with two moderately weak marks. Size minute; 2.24 x 1.47 mm, W:L 66%. Spire medium; approximately 28% of shell length. Suture moderately wide, very deep; somewhat lumpy around centre. Whorls very convex; total of 4.0 whorls, comprised of protoconch 1.6 whorls, teleoconch 2.4 whorls. Shoulder rounded. Labial insertion significantly below suture. Lip moderately wide, narrows gradually anteriorly, slightly curved, slightly curled inwards; filled by six slightly flattened denticles, first strongest and rounded, remainder weakening. In side view lip slightly convex; first to fourth denticles project from lip; basal edge moderately sharp, sweeps around base, merges with upper limb of first plication. Varix strong, evenly very wide, slightly concave medially, curves around siphonal canal, merges with ventral callus. Four plications fill approximately 66% of aperture, all strongly bifurcated; first plication somewhat lumpy; limbs widen, upper limb strongest, raised, merges with ventral callus; second slightly concave on parietal wall, limbs widen, rejoin, merge abruptly with ventral callus; third and fourth, limbs moderately long, merge with ventral callus. Aperture evenly, moderately wide.

**Remarks.** *Eratoidea rugata* n. sp. represents a number of samples from different stations which were dredged in depths between 26 and 105 m. No live animals were collected, and generally the samples contained only one or two shells which were in poor condition. *E. rugata* n. sp. can be separated from all other new species in the *E. sulcata* group by its small size and more inflated shell, the average being 2.16 x 1.41 mm, W:L 65.3%. The costae are more widely spaced and the varix is wider. *E. rugata* n. sp. can easily be separated from all other species in the group by its different appearance alone.

**Etymology.** The name is derived from the Latin word *rugosus* meaning wrinkled, and refers to the costate surface of the shell.

## ERATOIDEA LASALLEI SPECIES GROUP

Figs 19-20, 204-271

### INTRODUCTION

*Eratoidea lasallei* (Talavera & Princz, 1985) is a minute to small deep water species which is common in the southern Caribbean and is the only previously described species which can be assigned to the proposed *E. lasallei* species group, therefore, it has been selected to represent the group. Nine new species in the group are described, and the group is summarised as follows:

*Eratoidea lasallei* (Talavera & Princz, 1985), Venezuela, north of Isla Margarita, 29-71 m.

*Eratoidea copiosa* n. sp., Trinidad and Tobago, north west Tobago, 68 m.

*Eratoidea ampla* n. sp., Venezuela, north west of Isla Cubagua, 85 m.

*Eratoidea estensis* n. sp., Venezuela, Caracas del Este, 39 m.

*Eratoidea perspicua* n. sp., Venezuela, off Isla La Tortuga, to east, 152 m.

*Eratoidea brevis* n. sp., Venezuela, Cabo Codera, 46 m.

*Eratoidea rugosa* n. sp., Venezuela, off Cabo Codera, 80 m.

*Eratoidea rosarioensis* n. sp., Colombia, east of Islas Rosarios, 97 m.

*Eratoidea recta* n. sp., Colombia, west of Cabo de Vela, 69m.

*Eratoidea acuta* n. sp., Colombia, north east of Cabo de Vela, 63 m.

Many samples belonging to the *E. lasallei* group were collected in the southern Caribbean between Tobago in the east and the gulf of Morrosquillo, Colombia, in the west. No shells belonging to the group were collected outside this area although much dredging was carried out in the surrounding areas. Shells of the *E. lasallei* group were found to be very common off the coast of Venezuela, but the geographic range of the group is known to extend along the north eastern coast of South America, with one known record of an undescribed species from Amapá, northern Brazil.

It has not been possible to examine the type material of *Eratoidea lasallei* but a number of shells (New material examined) collected at the southern fringes of the type locality are, without reasonable doubt, *E. lasallei*, *sensu stricto*.

**Morphological features.** The *Eratoidea lasallei* group is remarkable for several morphological features which are unique to it. These are: the very strong, often sharp, shell surface costae; the second row of labial denticles; the very thin basal lip; and a tendency for the anterior end to be rostrate.

Shells in the group are biconic and are completely covered with very strong costae, except for the

protoconch on which costae are absent. The number of costae was recorded as follows: first whorl 11 - 20; second whorl 9 - 15; third whorl 6 - 18; partial fourth whorl 0 - 6; total costae on all whorls 30 - 60. The protoconch of all species examined was found to be constant at approximately one complete whorl. Various forms of fine surface texture are found and these vary from sparse or dense very fine lumps to coarse lumps, and in some species the lumps take the form of scales with a serrated edge which is located distally to the aperture (Fig. 257-259). Callus is minimal but is present at the labial insertion and as ventral callus around the distal ends of the plications. Shell colour ranges from semi-transparent very pale yellow-brown to pale reddish-brown; two spiral bands are generally present and can be yellow-brown to reddish-brown. The lip, ventral callus, suture and protoconch are translucent or opaque in similar shades to the rest of the shell. Two dark marks associated with the spiral bands are usually present on the lip, and a distinct, dark spot is present on the protoconch of some species. This spot is present in all species found in the eastern part of the geographic range but is only known in one species found in the western part (Figs 214-218). Size range is 1.74 x 1.04 to 3.80 x 2.07 mm, W:L 50 - 65%. The spire is medium to tall, 31 to 47% of shell length. The suture is wide and generally deep; a ridge - the sutural ridge - is located around the posterior edge and varies in strength between species. Lumps, which coincide with the sutural ridge are often present on the anterior ends of the costae (Figs 239, 248). Whorls range from slightly to very convex, and the labial insertion point is always significantly below the suture. The shoulder varies widely between species, sometimes being very strong, sometimes very gently curved. A short section of costa is often present on the shoulder. The lip ranges from narrow to wide, curved to almost straight, is generally curled inwards and is filled by six to nine primary denticles. The lip is of special interest in the *E. lasallei* group because of its unique double row of denticles which is diagnostic of the group (Fig. 226, 254). These secondary denticles are always smaller than the primary denticles and their number, exact location and shape is very variable between species. They are strongly associated with the siphonal canal and form a basal lip which is frequently very thin and sharp, even in mature adult shells (Figs 209, 217); occasionally it can exhibit a scalloped or crudely serrated edge (Fig. 254). The secondary denticles can gradually transform, anteriorly, into the basal lip (Figs 226, 247), or abruptly at a distinct step located at approximately the level of the most anterior primary denticle (Figs 232, 241). The step is occasionally somewhat remote from the last secondary denticle. The basal lip (basal edge of siphonal canal) sweeps around the siphonal canal and normally merges with the lower limb of the bifurcated first plication. The varix also sweeps around the siphonal canal but is

located slightly posteriorly to the basal lip and normally retains its identity, and merges with the upper limb of the bifurcated first plication (Figs 226, 229). Bifurcation of the plications is very variable. The posterior of the two limbs is generally strongest; the limbs can widen, remain apart or rejoin; one or both of the limbs can be raised. Often the bifurcation is very shallow with only slightly raised edges (limbs). In most species the plications, internally, have concave sides which leaves the supporting centre section of the plication very thin and translucent below the generally rounded top. There is a tendency towards basal rostration in the *E. lasallei* group (Fig. 212), a feature not recorded in other Marginellidae. The aperture is generally wide. In all species in the group the parietal wall is more or less straight except for the section posterior to the fourth plication which turns abruptly towards the labial insertion point.

Animal. Live animals of only four species were collected. Size of the foot is approximately 30 - 40% of shell length, and width is slightly less than the shell width. All parts are semi-transparent; chromatism varies from small, white or yellow round spots to larger marks of yellow, or pink which has iridescent properties. Tentacles are long, thin, tapered, with or without small spots, and the moderately short, robust siphon bears similar marks. The eyes are located at the base of the tentacles on small pods and the encasing membrane of the otherwise black eyes is colourless (Figs 214, 215) to pale yellow (Fig. 218) and a faint pale-yellow annular ring is present in one species (Fig. 223). The mantle is thin and transparent, with yellow spots (Fig. 223) or white spots (Fig. 218). The mantle roof is similarly coloured.

## MATERIALS and METHODS

In excess of fifty lots of *Eratoidea lasallei* group material were collected by dredging only, at depths between 30 and 198 m. Approximately twenty lots were used as 'type' or 'other material' for the nine new species described herein. The majority of the remaining lots consisted of only a few shells or eroded material which was unsuitable for type material. Several specimens were examined for radulae but none were found.

The majority of images have been produced at a magnification of X25. Exceptions are: apical and protoconch images with an image width of approximately 7.0 cm; images depicting special features, produced at various magnifications, generally with scale bar or stated in the captions; live animal images are produced at various convenient sizes.

*Eratoidea lasallei* species group (RS. *Eratoidea lasallei* (Talavera & Princz, 1985))

***Eratoidea lasallei*** (Talavera & Princz, 1985)

Figs 204-206, 214, 224-226, 254-255, 259, 260, 266

**Type material.** Holotype, Talavera & Princz, 1985, ad. dd., size 3.50 mm x 2.00 mm, W:L 57%; eight paratypes, size range 3.0 mm to 3.5 mm. MICN, No. TFMC-M16. (Not examined).

**Type locality.** Venezuela, north of Isla Margarita in the area bounded by the co-ordinates 11° 30'N 64° 10'W, 11° 30'N 63° 15'W and 11° 00'N 63° 42'W, 29-71 m, (Map ref. 15).

**Original description.** Small shell with medium high spire formed with three turns. Surface with 14-16 axial costae per turn. Colour light beige. Aperture with very visible hollow anal canal. External lip thick with 7-8 denticles, reducing in size from the anal canal, last two or three projecting externally. Space between denticles irregular. Four plications, thick except for last. Last two parallel.

**New material presented.** *Eratoidea lasallei* (Talavera & Princz, 1985), 1 ad. dd., 2.98 x 1.76 mm, W:L 59%, Venezuela, north west of Isla Margarita, 11°17'N 64°29'W, 85 m, TMC; 1 ad. dd., 2.74 x 1.59 mm, W:L 58%, Venezuela, east of Islas La Tortuga, 10°53'N 65°27'W, 152-183 m, MNHN; 1 ad. dd., 2.79 x 1.58 mm, W:L 57%, Venezuela, north of Islas Los Testigos, 11°33'N 63°06'W, 73 m, TMC.

**Other material.** 9 ad. dd., 5 broken, Venezuela, north west of Isla Margarita, 11°17'N 64°29'W, 80-100 m, TMC; 1 ad. dd., Venezuela, east of Islas La Tortuga, Venezuela, 10°53'N 65°27'W, 152-183 m, TMC; 1 ad. lv., 2 ad. dd., (1 broken), Venezuela, north of Islas Los Testigos, 11°33'N 63°06'W, 73 m, TMC.

**Remarks.** The original description is very brief and these complimentary notes are necessary to help with the separation of new species. *Eratoidea lasallei*

(Talavera & Princz, 1985) is the most robust member of the *E. lasallei* group. The shell is biconic, strongly costate and the costae are generally somewhat rounded. Recorded data on the costae is as follows: number of costae on first whorl 16 - 17; second whorl 13 - 15; third whorl 14 - 16; partial fourth whorl 2 - 4; total costae on all whorls 47 - 50. Surface texture consists of sparse, moderately coarse, irregularly shaped round lumps ventrally and on the spire; the protoconch is partially covered with fine texture. An arc of weak ventral callus extends from the anterior end of the shell to the fourth plication. The colour is largely semi-transparent, pale reddish-brown; two pale reddish-brown bands are present on the body whorl and two marks on the lip; basal edge of siphonal canal, distal portion of first plication, and callus at the labial insertion point are all darker reddish-brown; plications and labial denticles are largely opaque off-white; costae are translucent off-white. A small dark reddish-brown spot is present on the protoconch. The image of the holotype supporting the original description is of a partially eroded shell and it is probable that Talavera & Princz (1985) only collected dead shells as no reference is made to any live specimens. This would account for their describing the shell colour as light beige - most dead material which I have seen was pale dull yellow or pale beige. The shell size is small, range 2.63 x 1.54 mm to 3.5 x 2.0 mm, W:L 55 - 60%. The medium spire, 31 - 33% of the shell length, is the lowest of any species in the *lasallei* group. The suture is moderately deep; the sutural ridge and lumps on the anterior ends of the costae are weak. The shoulder is very widely rounded and generally bears a weak, short costa close to the labial insertion point. The labial insertion point is always significantly below the suture. A total of 4.4 whorls is comprised of protoconch approximately 1.0 whorl and teleoconch 3.4 whorls, which is the second highest number of teleoconch whorls in the

**Figures 204-213**

**204-206.** *Eratoidea lasallei* (Talavera & Princz, 1985), Venezuela.

**204.** Ad. dd., 2.98 x 1.76 mm, W:L 59%, north west of Isla Margarita, TMC; **205.** Ad. dd., 2.74 x 1.59 mm, W:L 58%, east of Islas La Tortuga, 152 m, TMC; **206.** Ad. dd., 2.79 x 1.58 mm, W:L 57%, north of Islas Los Testigos, 73 m, TMC.

**207.** *Eratoidea copiosa* n. sp., holotype, 2.76 x 1.52 mm, W:L 55%, Trinidad and Tobago, Tobago, off Man-o-War bay, 68 m, MNHN 23735.

**208.** *Eratoidea recta* n. sp., paratype 1, 3.50 x 1.75 mm, W:L 50%, Colombia, west of Cabo de Vela, 69m, MNHN 23750.

**209.** *Eratoidea acuta* n. sp., paratype 1, 2.68 x 1.35 mm, W:L 50%, Colombia, north east of Cabo de Vela, 63 m, MNHN 23752.

**210.** *Eratoidea rosarioensis* n. sp., holotype, 2.12 x 1.25 mm, W:L 59%, Colombia, east of Islas Rosarios, 97 m, MNHN 23747.

**211.** *Eratoidea rugosa* n. sp., holotype, 2.18 x 1.23 mm, W:L 56%, Venezuela, off Cabo Codera, 80 m, MNHN 23745.

**212-213.** *Eratoidea perspicua* n. sp., Venezuela, east of Isla La Tortuga, 152 m

**212.** Paratype 2, 2.41 x 1.32 mm, W:L 55%, MNHN 23742, TMC; **213.** Holotype, 2.29 x 1.26 mm, W:L 55%, MNHN 23741.



group in which the number varies from 3.0 - 4.0 whorls. The lip is very wide medially, less so at the shoulder and anteriorly; generally straight, and slightly flared anteriorly. It is filled by six to eight primary denticles; the wide posterior canal is almost semi-circular internally and strongly concave to the first (posterior) primary denticle; the space between the first and second denticle is approximately equal to space between first and labial insertion point; the first and second denticles are strongest; following denticles weaken, become closer and progressively deeper inside aperture; the anterior primary denticle is slightly remote, stronger, somewhat rounded and is located significantly inside the flare of the lip. Up to ten small, irregular secondary denticles are arranged in a straight line, and widening from the primary denticles, merge with the basal lip at a significant step below the level of the anterior primary denticle. In side view the lip is strongly and evenly curved, and the posterior primary denticles and all secondary denticles project slightly from edge. The varix is strong and very wide medially; the dorsal edge is largely straight but curves sharply to the insertion point; it weakens anteriorly, and retaining its identity, sweeps around the siphonal canal and merges with the upper limb of the first plication. The well defined basal lip has a slightly irregular, sharp edge medially; it sweeps around the siphonal canal and merges with the lower limb of first plication. The siphonal canal is strongly flared to the basal edge. Four strong, bifurcated plications fill approximately 75% of the aperture; the first is widely bifurcated, both limbs are lumpy and the upper limb is slightly raised; the second is widely bifurcated, its lower limb is short and both limbs fade out on the ventral callus; the third and fourth plications are slightly bifurcated, they emerge horizontally and quickly fade on the ventral callus; the first, second and fourth plications are slightly concave on the parietal wall. Internally, all plications are strong with concave sides and rounded tops. The parietal wall is straight medially and turns abruptly towards the labial insertion point above fourth plication. The aperture is evenly narrow and straight.

Animal. The foot was only observed in a partially extended state, therefore, its length is unknown; the width was approximately the same as the shell; external parts of the animal are almost transparent and sparsely covered with small yellowish spots. The eyes are located at the base of the tentacles on small pods; the encasing membrane of the otherwise black eyes is colourless (Fig. 214) but a slight variation in the opacity of the encasing membrane and the surrounding pod allow the eye to be seen clearly at magnifications of X40 or more. The mantle is almost transparent and unmarked, but the chromatism of the mantle roof is undetermined.

*Eratoidea copiosa* n. sp.

Figs 207, 215-217, 227-229, 251, 267

**Type material.** Trinidad and Tobago, off Man-o-War bay, Tobago, approximately 11°20'N 60°34'W, 68 m; holotype, 2.76 x 1.52 mm, W:L 55%, MNHN 23737; paratype 1, 2.86 x 1.55 mm, W:L 54%, MNHN 23736; paratype 2, 2.87 x 1.61 mm, W:L 56%, MNHN 23736, AWC; paratype 3, 2.86 x 1.61 mm, W:L 56%, MNHN 23736, AWC; paratype 4, 2.82 x 1.58 mm, W:L 56%, MNHN 23736, TMC; paratype 5, 2.66 x 1.51 mm, W:L 57%, MNHN 23736, TMC.

**Other material.** 1 ad. lv., 1 juv. lv., approximately 100 ad. dd., Trinidad and Tobago, off north west to south west Tobago, 65-109 m, TMC; 6 ad. dd., off north west Tobago, 198 m, TMC; 1 juv. lv., 14 ad. dd., Venezuela, off Islas Los Testigos, to west, 11°21.8'N 63°09.8'W, 35 m, TMC.

**Type locality.** Trinidad and Tobago, off Man-o-War bay, Tobago, approximately 11°20'N 60°36'W, (Map ref. 12).

**Description.** Shell: shape biconic, very strongly costate; costae rounded, shallow; first whorl 15 costae; second whorl 12; third whorl 16; partial fourth whorl 6; total costae on all whorls 49. Surface texture consists of sparse, fine, irregularly round lumps ventrally and on spire, protoconch smooth. Arc of

**Figures 214-223**

**214.** *Eratoidea lasallei* (Talavera & Princz, 1985), juv. lv., 2.79 x 1.58 mm, W:L 57%, Venezuela, north of Islas Los Testigos, 73 m, TMC.

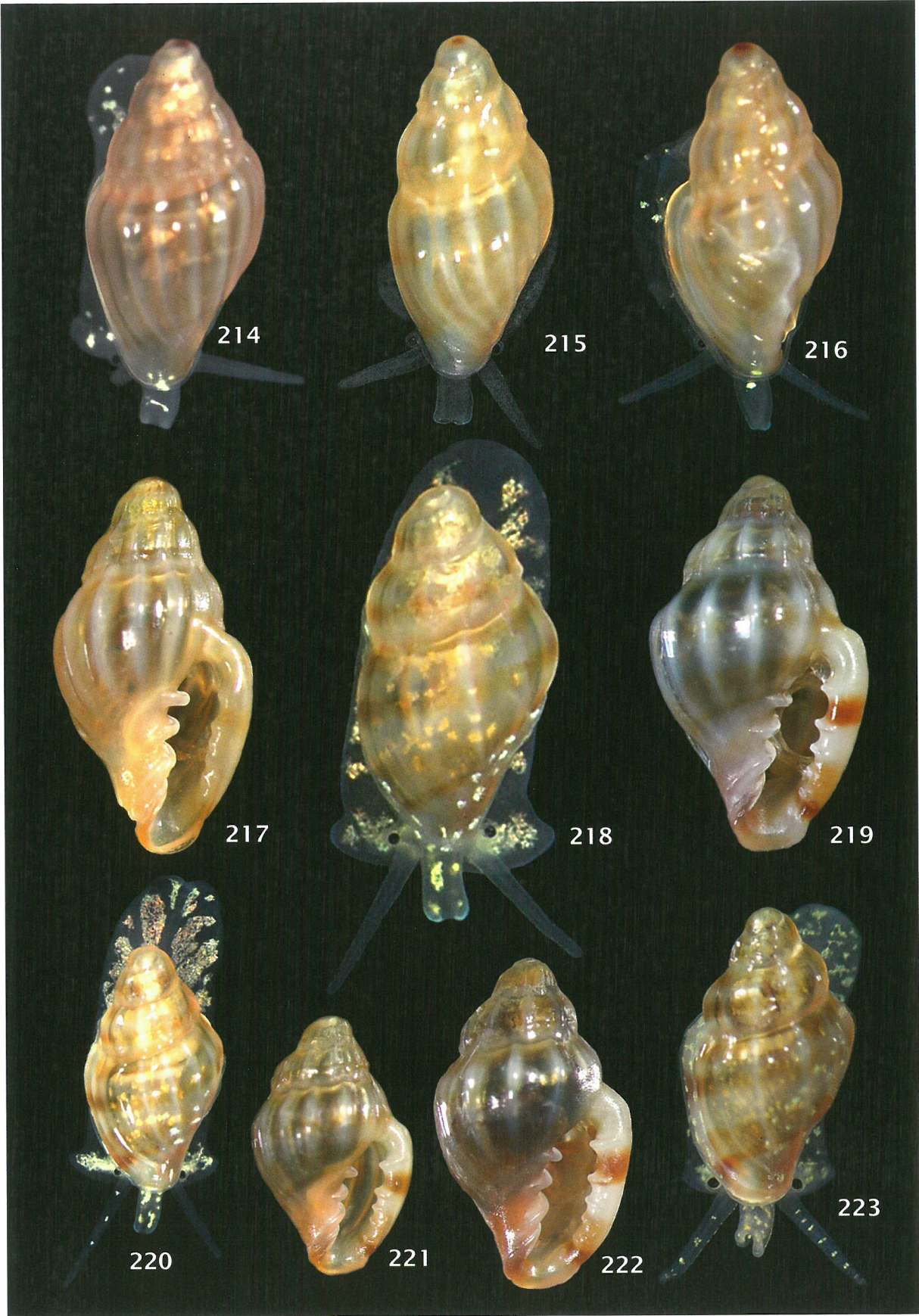
**215-217.** *Eratoidea copiosa* n. sp., Trinidad and Tobago, Tobago, off Man-o-War bay, 35-68 m.

**215.** Juv. lv., 2.46 mm, TMC; **216-217.** Damaged specimen, ad. lv., 2.73 x 1.45 mm, W:L 53%, TMC.

**218, 220-221.** *Eratoidea brevis* n. sp., holotype, 1.90 x 1.18 mm, W:L 62%, Venezuela, Cabo Codera, 46 m, MNHN 23743.

**219.** *Eratoidea ampla* n. sp., holotype, 2.76 x 1.61 mm, W:L 58%, Venezuela, north west of Isla Cubagua, 85 m, MNHN 23737.

**222-223.** *Eratoidea estensis* n. sp., holotype, 2.40 x 1.45 mm, W:L 61%, Venezuela, Caracas del Este, 39 m, MNHN 23739.



weak ventral callus extends to fourth plication. Colour and pattern largely semi-transparent, tinted very pale yellowish-brown; two very pale reddish-brown bands on body whorl, two slightly darker reddish-brown marks on lip and basal edge of siphonal canal; plications and callus deposits opaque pale beige, costae translucent off-white; dark reddish-brown spot on protoconch. Size small, 2.76 x 1.52 mm, W:L 55%. Spire tall, approximately 39% of shell length; Total of 4.3 whorls comprised of protoconch 1.0 whorl, teleoconch 3.3 whorls. Suture deep, moderately strong; sutural ridge weak; lumps at base of costae moderately strong. Shoulder moderately rounded. Lip generally wide, tapering anteriorly to narrow, slightly curved anteriorly; filled by eight primary denticles; posterior canal almost semi-circular internally, strongly, smoothly concave to first primary denticle; space between first and second denticle slightly narrower than space between first denticle and labial insertion point; first denticle strongest, curls around rounded lip, encroaches slightly onto varix; following four denticles weakening and becoming closer; fifth to eighth strengthening; denticles located progressively deeper inside aperture; eighth moderately strong, located significantly inside lip. Five irregular secondary denticles commence between fourth and fifth primary denticle, join basal lip smoothly, slightly below level of eighth primary. In side view lip evenly curved; posterior three primary denticles and all secondary denticles project slightly from edge. Varix wide, strong, straight, curves sharply to insertion point; weakening, sweeps around siphonal canal, merges with upper limb of first plication. Basal lip well defined, sweeps around siphonal canal, edge slightly irregular, very thin, sharp basally, merges with lower limb of first plication. Siphonal canal strongly flared to basal edge. Four plications fill approximately 75% of aperture; first weakly bifurcated, lumpy area at junction of limbs with basal lip and extended varix; second bifurcated, limbs widen, rejoin in elongated raised lump, angled downwards, fade on ventral callus; third and fourth: short, emerge horizontally, quickly fade on ventral callus; second, third and fourth plications slightly concave on parietal wall; all plications moderately thick; sides concave, translucent in thinnest part, tops rounded. Aperture wide, widest medially.

Animal. Size of foot undetermined; all visible parts almost transparent; foot and siphon sparsely covered with small to minute, round, very pale yellowish-white spots. Tentacles long, thin, tapered, unmarked. Siphon long, thick, unmarked. Eyes on small pods located at base of tentacles; encasing membrane of the otherwise black eyes, colourless. Mantle transparent, smooth, unmarked. Mantle roof unmarked.

**Distribution.** Known from the type locality, the entire west coast of Tobago and a location to the west of Islas Los Testigos, Venezuela.

**Remarks.** Over one hundred dead shells belonging of *Eratoidea copiosa* n. sp. were collected along the western coast of Tobago in 65 - 109 m and six shells were collected at 198 m. All were *E. copiosa* n. sp., apart from three shells measuring over 3 mm, bearing 10 primary labial denticles, and one other odd shell. Most shells were in poor condition. One damaged live young adult (Figs 216 - 217) and one live juvenile specimen (Fig. 215) were collected at the type locality. The damaged young adult specimen was used to describe the chromatism of this species, but it was not chosen as a type specimen because of its damaged and slightly immature state. Another lot of 14 ad. dd., and 1 juv. lv., were collected west of Islas Los Testigos in 35 m; this lot was at first believed to be a different species, but the differences in shell morphology are very small and the live animal images reveal no significant differences, therefore, this lot has been included in *E. copiosa* n. sp. *E. copiosa* n. sp. is close to *E. lasallei*, with which it is compared: *E. copiosa* n. sp. is slightly smaller and slightly less inflated; the spire is considerably taller; the plications are weaker and shorter; the lip is slightly curved internally; the varix is weaker and narrower, and the general appearance is less robust than that of *E. lasallei*. Data recorded: average size 2.80 x 1.56 mm, W:L 55.7%; average number of teleoconch whorls 3.3; average number of costae on first whorl 15.0; second whorl 12.7; third whorl 15.3; partial fourth whorl 3.3; average total costae on all whorls 46.3.

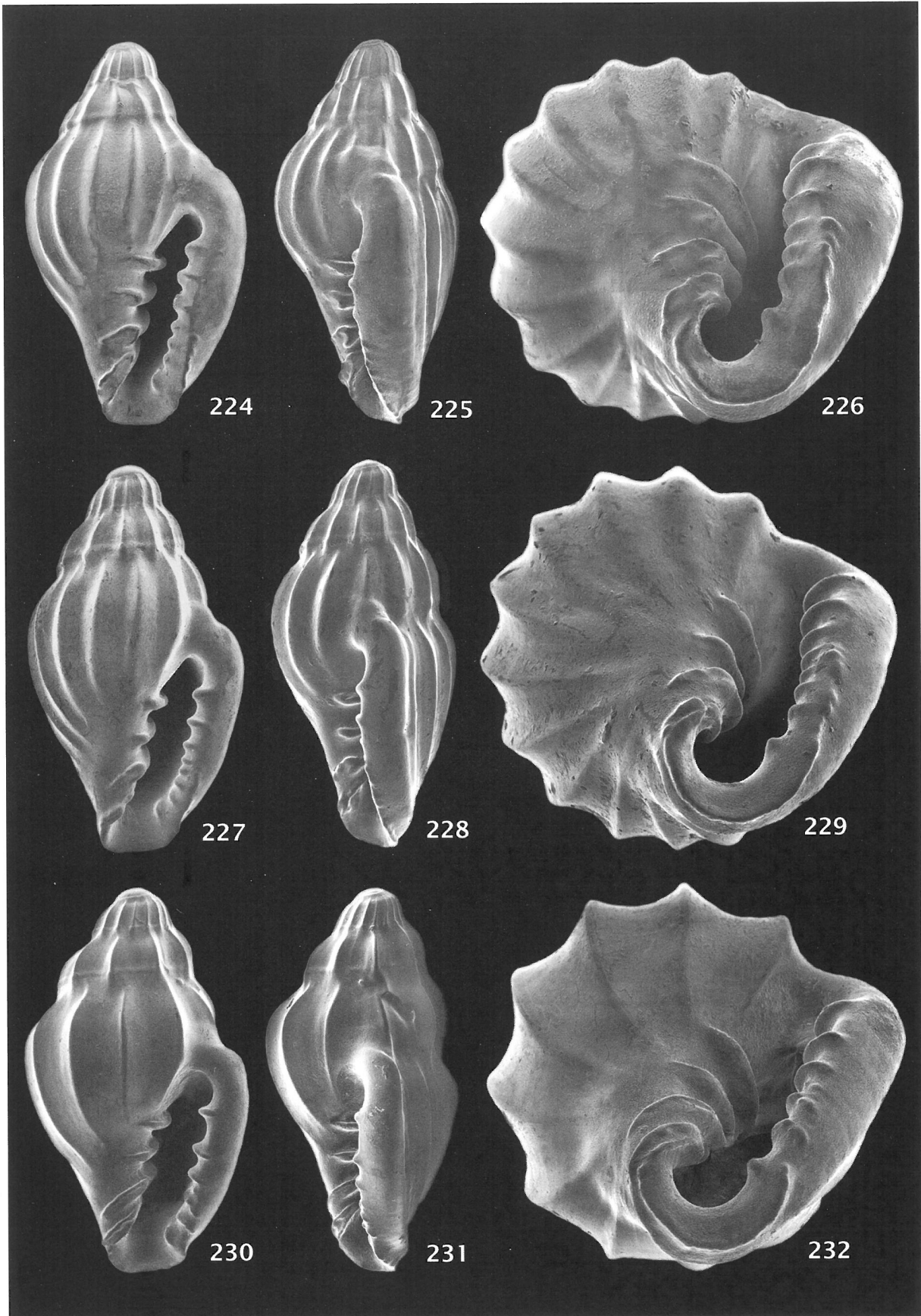
**Etymology.** From the Latin *copiosus*, plentiful. Refers to the large number of specimens of this species collected in the type locality.

#### Figures 224-232

**224-226.** *Eratoidea lasallei* (Talavera & Princz, 1985), ad. dd., 2.74 x 1.59 mm, W:L 58%, Venezuela, east of Islas La Tortuga, 157 m, TMC.

**227-229.** *Eratoidea copiosa* n. sp., holotype, 2.76 x 1.52 mm, W:L 55%, Trinidad and Tobago, Tobago, off Man-o-War bay, 68 m, MNHN 23735.

**230-232.** *Eratoidea ampla* n. sp., holotype, 2.76 x 1.61 mm, W:L 58%, Venezuela, north west of Isla Cubagua, 85 m, MNHN 23737.



*Eratoidea ampla* n. sp.

Figs 219, 230-232, 256, 262, 268

**Type material.** North west of Isla Cubagua, Venezuela, 10°52'N 64°17'W, 85 m; Holotype, 2.76 x 1.61 mm, W:L 58%, MNHN 23737; paratype 1, 2.66 x 1.60 mm, W:L 60%, MNHN 23738; paratype 2, 2.74 x 1.55 mm, W:L 57%, 23738, TMC; paratype 3, 2.66 x 1.51 mm, W:L 57%, 23738, TMC; paratype 4, 2.43 x 1.47 mm, W:L 60%, 23738, AWC; paratype 5, 2.48 x 1.43 mm, W:L 58%, 23738, AWC.

**Other material.** 14 ad. dd., Venezuela, north west of Isla Cubagua, 10°52'N 64°17'W, 85m, TMC; 30 ad. dd., Venezuela, north of Isla Cubagua, 10°52'N 64°09'W, 38m, TMC; 80 ad. dd., Venezuela, west of anchorage, Isla Cubagua, 10°50.3'N 64°10.2'W, 38-40 m, TMC.

**Type locality.** Venezuela, north west of Isla Cubagua, 10°52'N 64°17'W, (Map ref. 16).

**Description.** Shell: shape biconic; very strongly, widely costate; costae sharp, shallow; first whorl 12 costae; second 9; third 12; partial fourth whorl 3; total costae 36. Surface texture dense small, irregular lumps ventrally, weakening on spire; protoconch densely covered. Arc of ventral callus extends from anterior end of shell to fourth plication. Colour largely transparent, tinted very pale brownish-yellow; lip, plications and callus deposits opaque pale beige; costae translucent white; two reddish-brown marks on lip, one between first and second labial denticles, other narrow, between anterior and penultimate primary denticle; wider, pale orange-brown band immediately above; distal part of lower limb of first plication deep reddish-brown; ventral callus wash almost opaque, partially obscures reddish-brown colour of shell. Size small, 2.76 x 1.61 mm, W:L 58%. Spire tall, approximately 40% of shell length. Total of 4.2 whorls comprised of protoconch approximately 1.0 whorl; teleoconch 3.2 whorls. Suture wide, deep; sutural ridge weak. Shoulder strong, bearing short costa. Lip narrow, slightly tapered, slightly narrower anteriorly, curved, more so anteriorly, filled by six somewhat weak primary denticles; posterior canal very strongly concave to first primary denticle; space between first and second denticle wider than space between first and labial insertion point; first to third primary denticles equally strong, following two denticles weakening and

becoming progressively deeper in aperture, sixth rounded, located deep inside anterior edge of lip. Three secondary denticles, first weak, located between third and fourth primary on edge of lip close to primaries, join basal lip at distinct step level with sixth primary denticle. In side view lip curved, very strongly basally; first to third primary and all secondary denticles project slightly from edge. Varix wide, strong; dorsal edge largely straight, curves very sharply to labial insertion point; weakening, sweeps widely around siphonal canal, merges at lumpy junction with upper limb of first plication. Basal lip slightly lumpy, sweeps around siphonal canal, merges at lumpy junction with lower limb of first plication. Siphonal canal strongly flared to basal edge. Four plications fill approximately 75% of aperture; first strongly, widely bifurcated; second bifurcated, lower limb short, upper limb strong, long, slightly raised, fades on ventral callus; third and fourth emerge almost horizontally, fade on ventral callus; all plications moderately thin internally, sides slightly concave, tops wider, slightly rounded. Aperture wide, slightly wider medially.

**Distribution.** Known from the type locality and two locations approximately eight miles to the east.

**Remarks.** Approximately 130 ad. dd., shells in 3 lots were collected; a number were in good condition, including one unfaded fresh dead shell and about five with varying degrees of fading. No live specimens were found. *Eratoidea ampla* n. sp. is strikingly different to *E. lasallei*. It most closely resembles *E. estensis* n. sp. to which it is probably closely related and with which it is compared: *E. ampla* n. sp. has the widest spaced costae of any species in the *E. lasallei* group. It also differs by the varix being more strongly turned in at the labial insertion point; secondary denticles located closer to the primaries; stronger lower limb to the first plication; the ventral callus is heavier and tends to cover the deep reddish-brown area which is significant in *E. estensis* n. sp. Data recorded: average size 2.62 x 1.53 mm, W:L 58.4%; average number of teleoconch whorls 3.15; average number of costae on first whorl 11.5; second whorl 9.5; third whorl 12.5; partial fourth whorl 1.5; average total costae on all whorls 35.0.

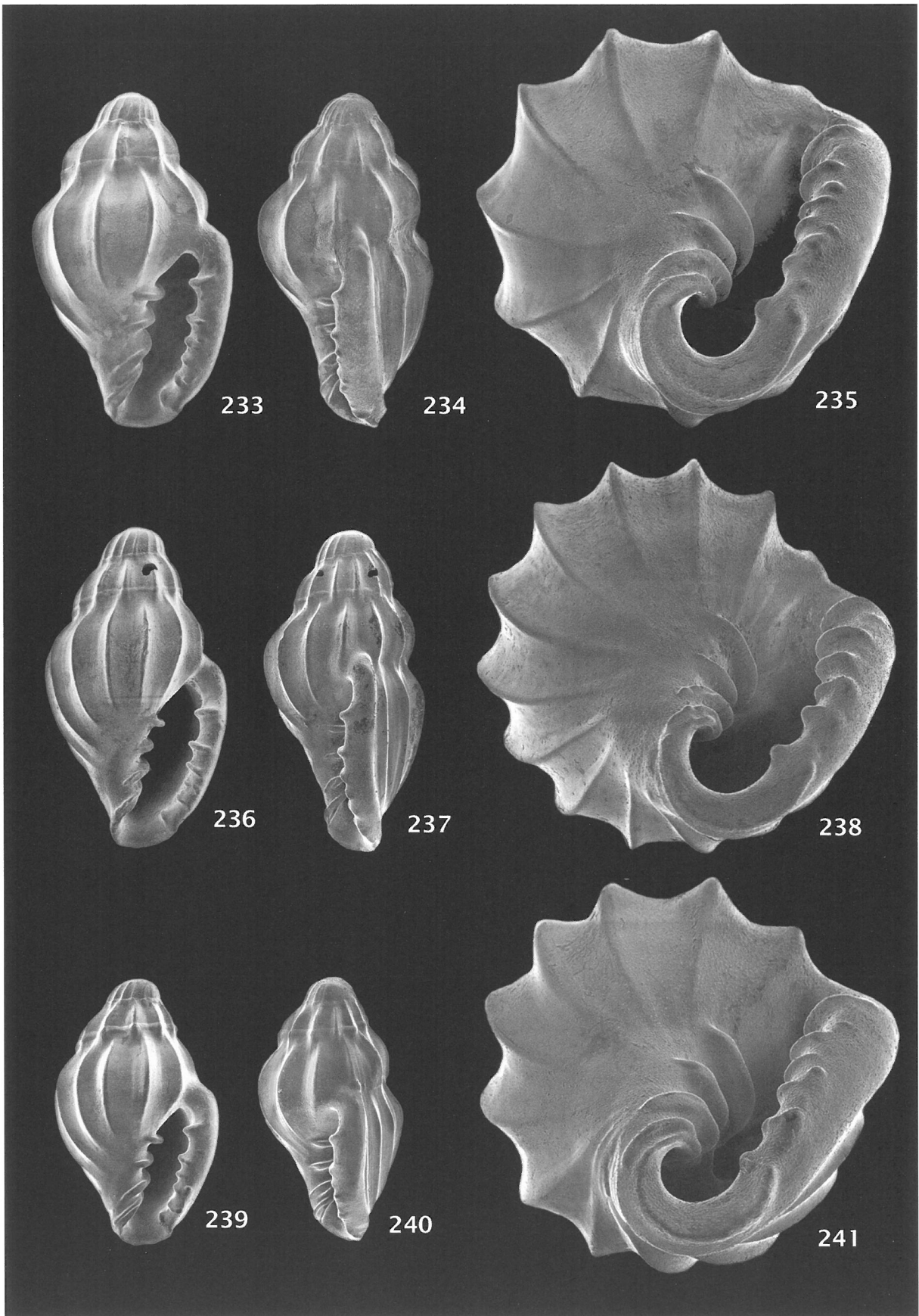
**Etymology.** From the Latin *amplus*, wide. Reflects the widely spaced costae of this species.

**Figures 233-241**

**233-235.** *Eratoidea estensis* n. sp., holotype, 2.40 x 1.45 mm, W:L 61%, Venezuela, Caracas del Este, 39 m, MNHN 23739.

**236-238.** *Eratoidea perspicua* n. sp., holotype, 2.29 x 1.26 mm, W:L 55, Venezuela, east of Isla La Tortuga, 152 m, MNHN 23741.

**239-241.** *Eratoidea brevis* n. sp., holotype, 1.90 x 1.18 mm, W:L 62%, Venezuela, Cabo Codera, 46 m, MNHN 23743.



*Eratoidea estensis* n. sp.

Figs 222-223, 233-235

**Type material.** Venezuela, Caracas del Este, 10°21'N 64°27'W, 39 m; holotype, 2.40 x 1.45 mm, W:L 60%, MNHN 23739; paratype 1, 2.51 x 1.43 mm, W:L 57%, MNHN 23740; paratype 2, 2.59 x 1.48 mm, W:L 57%, MNHN 23740, AWC; paratype 3, 2.69 x 1.52 mm, W:L 57%, MNHN 23740, AWC; paratype 4, 2.59 x 1.52 mm, W:L 59%, MNHN 23740, TMC; paratype 5, 2.70 x 1.51 mm, W:L 56%, MNHN 23740, TMC.

**Other material.** 45 ad. dd., Venezuela, Caracas del Este, 10°21'N 64°27'W, 39 m, TMC.

**Type locality.** Venezuela, Caracas del Este, 10°21'N 64°27'W, (Map ref. 21).

**Description.** Shell: shape biconic, very strongly, widely costate; costae sharp, shallow; first whorl 11 costae; second 10; third 16; total costae 37. Colour largely transparent, tinted very pale brownish-yellow; two orange yellow bands on dorsum; portions of lip and plications opaque pale beige; costae weakly translucent white; two deep reddish-brown marks on lip, one between first and second labial denticles, other narrower, between anterior and penultimate denticles, pale orange-brown section immediately above; distal part of first plication deep reddish-brown; ventral callus orange-brown. Size small 2.40 x 1.45 mm, W:L 60%. Spire tall, approximately 39% of shell length. Total of 4.0 whorls comprised of protoconch approximately 1.0 whorl, teleoconch 3.0 whorls. Surface texture, dense covering of small lumps ventrally, absent on spire; protoconch sparsely covered with minute lumps. Suture deep; sutural ridge weak; teleoconch whorls very strongly convex. Lip narrow, slightly tapered, slightly narrower anteriorly, curved, more so anteriorly, filled by six primary denticles; posterior canal very strongly concave to first primary denticle; first denticle strongest, angled slightly downwards; space between first and second denticle greater than space between first and labial insertion point; second to fourth denticles weakening; fifth and sixth strengthening; all becoming progressively deeper in aperture; sixth moderately

strong, rounded, located deep inside anterior edge of lip; outer end of first, second and fourth primary denticles with lump more or less aligned with secondary denticles. Six irregular, secondary denticles commence between first and second primary denticles, located on edge of lip close to primaries, strengthening anteriorly. Basal lip commences at sixth secondary denticle, below level of sixth primary denticle. In side view lip largely straight, curves strongly anteriorly, very strongly basally; first to third primary and all secondary denticles project strongly from edge. Varix very wide, less so posteriorly; strong dorsal edge largely straight, angled slightly anti-clockwise; sharp dorsal edge basally, weakening, sweeps widely around siphonal canal, merges with strong upper limb of first plication. Basal lip sweeps around siphonal canal, gently curved, thin, moderately sharp basally, merges at lump on lower limb of first plication. Siphonal canal very strongly flared to basal edge. Four plications fill approximately 75% of aperture; first strongly, widely bifurcated, upper limb strong, slightly raised, junction with extended varix smooth; second long, widens without bifurcating, fades on ventral callus; third angled downwards, widens, fades; fourth slightly angled upwards, widens from third, fades; all plications moderately thin internally, sides concave, translucent immediately below wider, rounded tops; fourth plication noticeably thinner than first to third. Arc of ventral callus extends to fourth plication. Aperture very wide, narrows slightly anteriorly.

**Animal.** Foot same width as shell, length undetermined, animal almost transparent externally; foot with many small irregularly shaped yellow marks. Propodium with similar yellow marks. Tentacles moderately long, thick basally, tapered, approximately six small, evenly spaced, yellow marks. Siphon moderately long, thick, numerous yellowish spots. Eyes on small pods located at base of tentacles; encasing membrane of the otherwise black eyes pale yellow. Mantle smooth, almost transparent, thinly covered with yellowish-white spots. Mantle roof with numerous yellow spots.

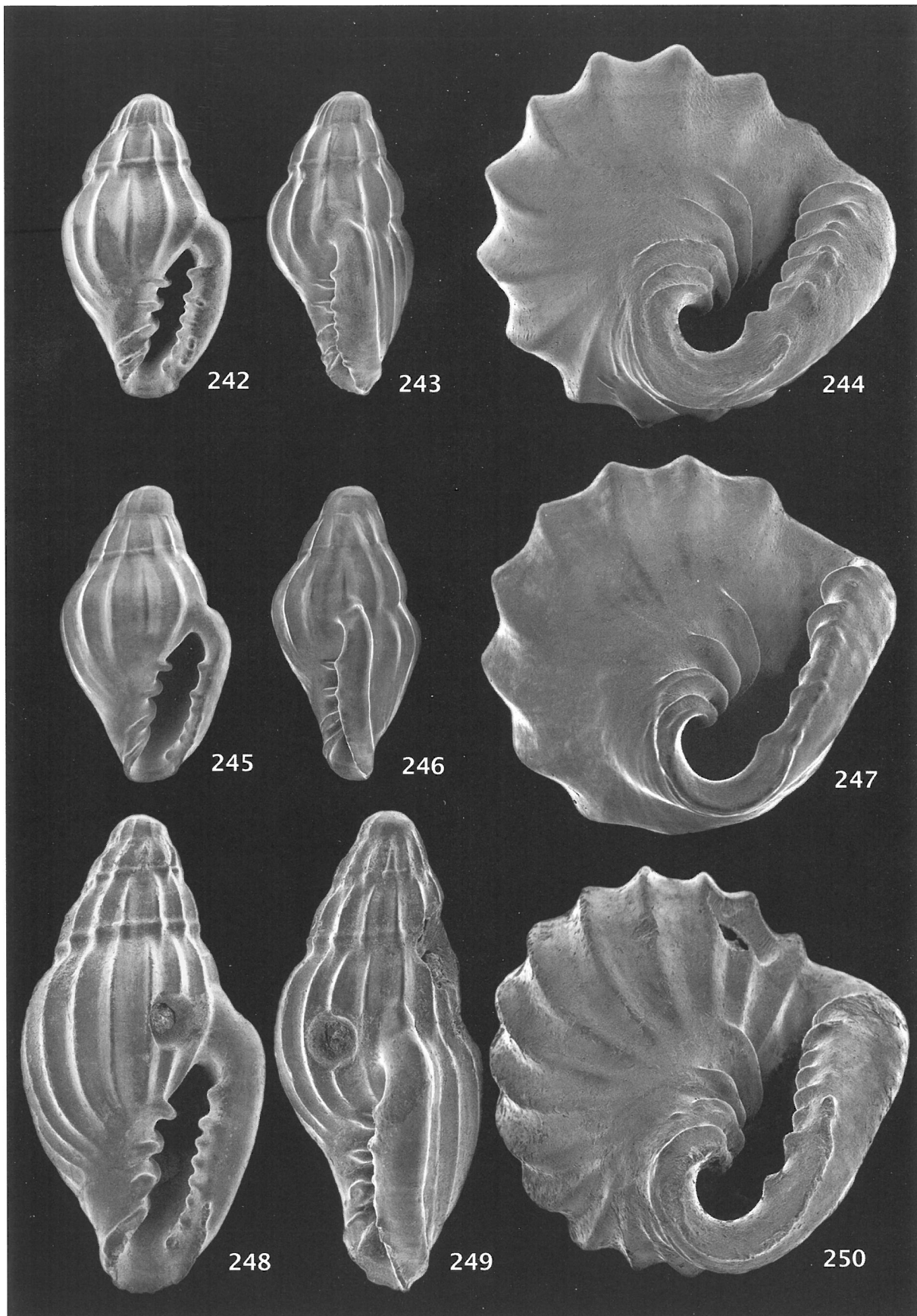
**Distribution.** Known only from type locality.

**Figures 242-250**

**242-244.** *Eratoidea rugosa* n. sp., holotype, 2.18 x 1.23 mm, W:L 56%, Venezuela, off Cabo Codera, 80 m, MNHN 23745.

**245-247.** *Eratoidea rosarioensis* n. sp., holotype, 2.12 x 1.25 mm, W:L 59%, Colombia, east of Islas Rosarios, 97 m, MNHN 23747.

**248-250.** *Eratoidea recta* n. sp., holotype, 3.42 x 1.73 mm, W:L 50%, Colombia, west of Cabo de Vela, 69m, MNHN 23749.



**Remarks.** One lot of fifty dead shells included one live specimen. *Eratoidea estensis* n. sp. most closely resembles *E. ampla* n. sp. but differs in its curved lip and very wide, straight, strong varix; labial denticles in slightly curved line, more externally located on lip; weak lower limb of first plication; tendency to slightly rostrate base; brightly coloured ventral callus. Data recorded: average size 2.58 x 1.50 mm, W:L 58.1%; average number of teleoconch whorls 3.0; average number of costae on first whorl 11, second whorl 10, third whorl 16, partial fourth whorl 0, average total costae on all whorls 37.

**Etymology.** Named after the type locality.

*Eratoidea perspicua* n. sp.

Figs 212-213, 236-238, 258, 269

**Type material.** Venezuela, east of Isla La Tortuga, 10°53'N 65°27'W, 152 m; holotype, 2.29 x 1.26 mm, W:L 55%, MNHN 23741; paratype 1, 2.35 x 1.31 mm, W:L 56%, MNHN 23742; paratype 2, 2.41 x 1.32 mm, W:L 55%, MNHN 23742, TMC; paratype 3, 2.37 x 1.36 mm, W:L 57%, MNHN 23742, AWC; paratype 4, 2.30 x 1.31 mm, W:L 57%, MNHN 23742, TMC.

**Other material.** 1 ad. dd., broken, Venezuela, east of Isla La Tortuga, 10°53'N 65°27'W, 152 m, TMC.

**Type locality.** Venezuela, east of Isla La Tortuga, 10°53'N 65°27'W, (Map ref. 17).

**Description.** Shell: shape biconic, very thin, slightly rostrate basally, very strongly costate; costae sharp, deep; first whorl 15 costae; second 12; third 16; partial fourth whorl 1; total costae on all whorls 44. Surface texture: dense covering of very fine irregularly shaped minute lumps ventrally; protoconch densely covered with minute lumps. Arc of very light ventral callus extends to fourth plication. Colour in various depths of translucent white, coloured marks

absent. Size minute, 2.29 x 1.26 mm, W:L 55%. Spire tall, approximately 39% of shell length. Total of 4.1 whorls comprised of protoconch approximately 1.0 whorl, teleoconch 3.1 whorls. Suture wide, deep; sutural ridge weak; lumps at base of costae weak. Shoulder narrowly rounded; short weak costa present. Lip evenly thin, strongly curved, somewhat flared anteriorly; filled by six primary denticles; posterior canal strongly concave to first primary denticle; space between first and second denticle slightly wider than space between first and labial insertion point; first denticle strongest, second to fourth weakening, fifth and sixth strengthening; first to third encroach onto varix and quickly fade; sixth primary denticle somewhat rounded, located inside edge of lip; three irregular secondary denticles commence between first and second primary denticles; second and third secondary denticles joined to fourth and fifth primary denticles respectively; basal lip remote from third secondary denticle, commences below level of sixth primary denticle. In side view lip strongly curved, more so basally; all denticles except sixth primary project from edge. Varix narrow, slightly concave; dorsal edge weak, curves slightly to labial insertion point; weakening, sweeps around siphonal canal, merges with upper limb of first plication, very close to lower limb. Basal lip slightly lumpy, sweeps around siphonal canal, sharp, merges with lower limb of first plication. Siphonal canal strongly flared to basal edge. Four plications fill approximately 75% of aperture; first narrowly bifurcated, both limbs lumpy, tend to join distally; second narrowly bifurcated, lumpy limbs rejoin, become strong distally, end abruptly on ventral callus; third short, angled downwards slightly; fourth emerges horizontally, widens from third, short; all plications thick internally; sides strongly concave, significantly translucent; tops perfectly rounded. Aperture very wide, narrows slightly anteriorly and posteriorly.

**Distribution.** Known only from the type locality.

**Figures 251-259**

**251-253.** *Eratoidea acuta* n. sp., holotype, 2.72 x 1.44 mm, W:L 53%, Colombia, north east of Cabo de Vela, 63 m, MNHN 23751.

**254.** *Eratoidea lasallei* (Talavera & Princz, 1985), ad. dd., 2.74 x 1.59 mm, W:L 58%, Venezuela, east of Islas La Tortuga, 157 m, scale bar 200µm.

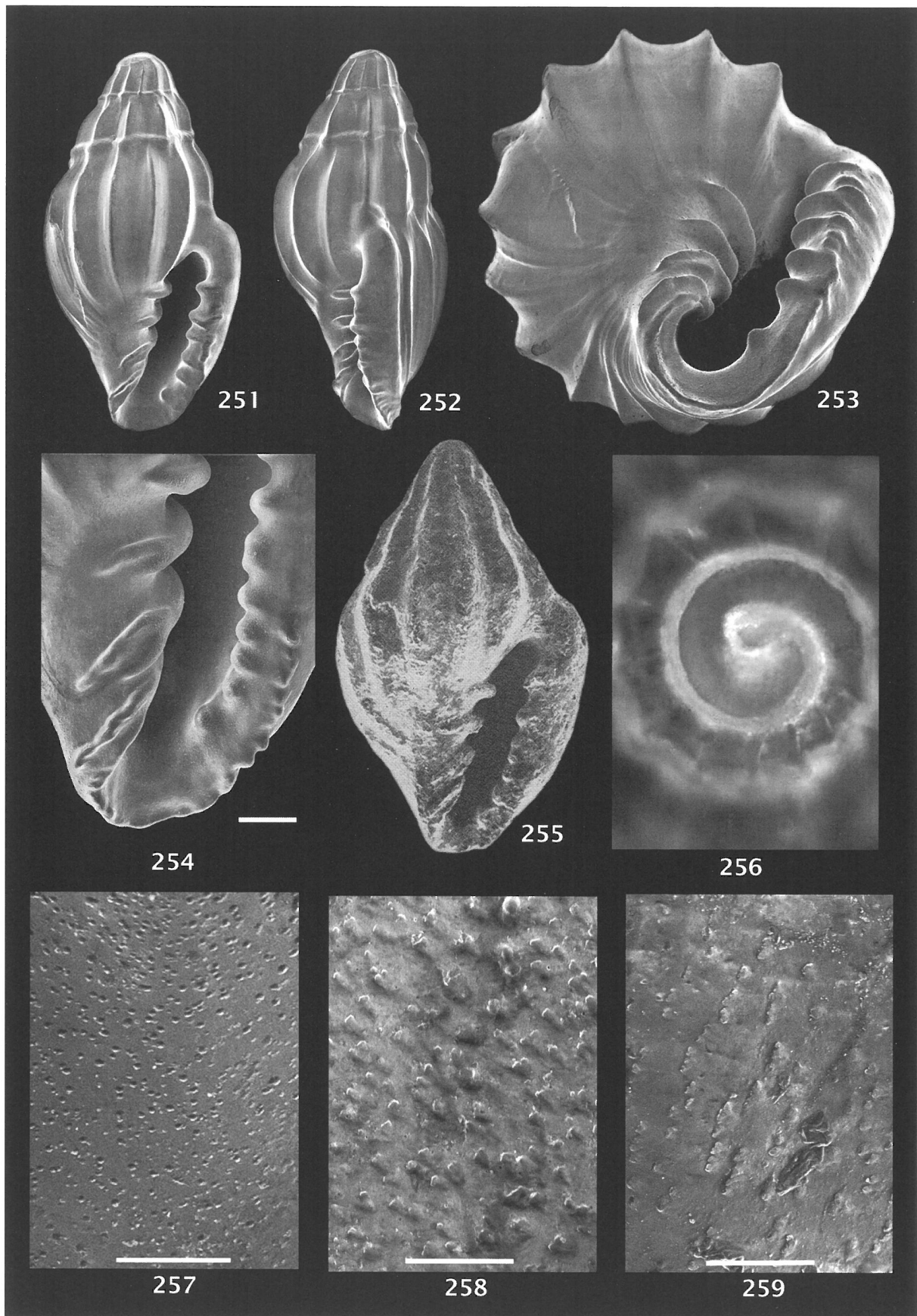
**255.** *Eratoidea lasallei* (Talavera & Princz, 1985), holotype, 3.50 x 2.0 mm, original drawing.

**256.** *Eratoidea ampla* n. sp., ad. dd., 2.64 x 1.54 mm, W:L 58%, Venezuela, north west of Isla Cubagua, 85 m, TMC.

**257.** *Eratoidea lasallei* group, ad. dd., 2.15 x 1.21 mm, W:L 56%, Venezuela, off Carabadella, 63 m, scale bar 50 µm, TMC.

**258.** *Eratoidea perspicua* n. sp., holotype, 2.29 x 1.26 mm, W:L 55, Venezuela, east of Isla La Tortuga, 152 m, MNHN 23741, scale bar 50 µm.

**259.** *Eratoidea lasallei* (Talavera & Princz, 1985), ad. dd., 2.98 x 1.76 mm, W:L 59%, Venezuela, north west of Isla Margarita, 85 m, scale bar 50 µm.



**Remarks.** One small lot of five ad. dd., shells were collected. *Eratoidea perspicua* n. sp. differs from all other species in the *E. lasallei* group in its extremely thin shell, extremely curved varix; and its slightly rostrate base. Data recorded: average size 2.36 x 1.31 mm, W:L 55.5%, average number of teleoconch whorls 3.15; average number of costae on first whorl 14.5; second whorl 11.5; third whorl 15.5; partial fourth whorl 2.5; average total costae on all whorls 44.0.

**Etymology.** From the Latin *perspicuus*, transparent. Refers to the thin, translucent shell of this species

*Eratoidea brevisa* n. sp.

Figs 20, 218, 220-221, 239-241, 263

**Type material.** Cabo Codera, Venezuela, 10°36.3'N, 66°04.4'W, 46 m; holotype, 1.90 x 1.18 mm, W:L 62%, MNHN 23743; paratype 1, 2.02 x 1.19 mm, W:L 59%, MNHN 23744; paratype 2, 1.89 x 1.18 mm, W:L 62%, MNHN 23744, AWC; paratype 3, 2.01 x 1.20 mm, W:L 60%, MNHN 23744, AWC; paratype 4, 2.04 x 1.18 mm, W:L 58%, MNHN 23744, TMC; paratype 5, 1.91 x 1.18 mm, W:L 62%, MNHN 23744, TMC.

**Other material.** 4 ad. lv., Venezuela, Cabo Codera, 10°36.3'N, 66°04.4'W, 46 m, TMC; 8 ad. dd., Venezuela, off Cabo Codera, approximately 10°20'N 65°30'W 50-80 m, TMC.

**Type locality.** Venezuela, Cabo Codera, 10°36.3'N, 66°04.4'W, (Map ref. 18).

**Description.** Shell: shape biconic, very strongly costate; costae sharp, deep; first whorl 14 costae; second 10; third 15; total costae 39. Surface texture: all ventral surfaces densely covered with very small scales, sparse on spire; protoconch lightly covered with minute lumps. Arc of weak ventral callus extends to fourth plication. Colour largely semi-transparent, tinted very pale brownish-yellow; lip and plications opaque pale beige; costae weakly translucent white; three deep reddish-brown marks on lip: one between first and second labial denticles, one between anterior and penultimate denticles, one on emergent limbs of first plication; several pale orange-brown marks: one at labial insertion point, one immediately above lower labial deep reddish-brown mark, one on basal lip, one covering most of ventral callus. Size minute, 1.90 x 1.18 mm, W:L 62%. Spire tall, approximately 40% of shell length. Total of 4.0 whorls comprised of protoconch approximately 1.0 whorl, teleoconch 3.0 whorls. Suture deep, strong; sutural ridge strong; lumps at base of costae very strong. Shoulder weakly rounded. Lip narrow, narrower anteriorly, moderately strongly and evenly curved, filled by six weak primary denticles; posterior portion very strongly concave to first primary

denticle; first denticle strongest, angled downwards; space between first and second denticle slightly wider than space between first and labial insertion point; following denticles weakening, become progressively deeper in aperture; sixth denticle rounded, located deep inside anterior labial edge. Four secondary denticles commence between first and second primary denticles, located on labial edge close to primaries, strengthening anteriorly. Basal lip commences at small, distinct step anteriorly remote from fourth secondary denticle, slightly angled outwards. In side view lip curved, very strongly curved basally; first to third primary and anterior secondary denticles project slightly from edge. Varix wide, strong; dorsal edge concave, curves outwards basally, weakening, sweeps widely around siphonal canal, merges smoothly with strong upper limb of first plication. Basal lip sweeps around siphonal canal, gently curved, moderately thin basally, merges with weak lower limb of first plication. Siphonal canal strongly flared to basal edge. Four plications fill approximately 75% of aperture; first widely bifurcated; second bifurcated, upper limb strong, fades on ventral callus, lower limb shorter; third and fourth emerge almost horizontally, fade on callus; all plications moderately thin internally with wider, rounded tops. Aperture wide, widest posterior medially.

Animal. Foot same width as shell, approximately 40% longer; external parts of animal pale translucent white; small marks laterally on foot, large and small elongate marks on metapodium, all comprised largely of minute spots in yellowish shades; significant areas of iridescent pale pinkish-orange and a few minute black spots also present. Propodium with wide lateral mark comprised of minute greenish-yellow spots. Tentacles long, tapered, three minute yellowish spots. Siphon moderately long, thick, several yellowish spots and bigger marks. Eyes on small pods located at base of tentacles; encasing membrane of the otherwise black eyes, pale yellow. Mantle smooth, almost transparent, sparsely covered with white spots. Mantle roof with numerous spots which appear orange-yellow through brownish-yellow tinted dorsum.

**Distribution.** Known from the type locality and one other location approximately 35 miles to the west.

**Remarks.** Twenty shells in two lots were collected and included several live specimens. A number of the dead shells were also in good condition. *Eratoidea brevisa* n. sp. is the smallest recorded member of the *E. lasallei* group and of the genus *Eratoidea* with a size of 1.74 x 1.06 mm, W:L 60%. It most closely resembles *E. rugosa* n. sp. and *E. estensis* n. sp. Compared with *E. estensis* n. sp., *E. brevisa* n. sp. is a very much smaller species and more inflated. The most significant difference is in the animal chromatism: in *E. brevisa* n. sp. marks on the metapodium are large, elongate and somewhat

iridescent and marks on the tentacles are simple small spots, whereas, in *E. estensis* n. sp. marks on the metapodium are small and irregularly shaped and marks on the tentacles are noticeably wide. Compared with *E. rugosa* n. sp. some significant differences in shell morphology are apparent: *E. brevis* has considerably fewer costae, is more inflated, the spire is lower and the aperture is wider, more so medially. Data recorded: average size 1.96 x 1.19 mm, W:L 60.7%; average number of teleoconch whorls 3.0; average number of costae on first whorl 14, second whorl 10, third whorl 13.5, average total costae on all whorls 37.5.

**Etymology.** From the Latin word *brevis*, squat. Reflects the morphology of this species.

*Eratoidea rugosa* n. sp.  
Figs 211, 242-244, 270

**Type material.** Venezuela, off Cabo Codera, 10°39.7'N 66°16.2'W, 80 m; holotype, 2.18 x 1.23 mm, W:L 56%, MNHN 23745; paratype 1, 2.15 x 1.24 mm, W:L 58%, MNHN 23746; paratype 2, 2.39 x 1.28 mm, W:L 54%, MNHN 23746, AWC; paratype 3, 2.12 x 1.23 mm, W:L 58%, MNHN 23746, TMC; paratype 4, 2.51 x 1.40 mm, W:L 56%, MNHN 23746, AWC; paratype 5, 2.38 x 1.30 mm, W:L 55%, MNHN 23746, TMC.

**Other material.** 14 ad. dd., type location, Venezuela, off Cabo Codera, 10°39.7'N 66°16.2'W, 80 m, TMC; 8 ad. dd., Venezuela, off Cabo Codera, 10°39.4'N 66°31.9'W, 80 m, TMC; 9 ad. dd., 3 juv. dd., Venezuela, off Ocumare, 10° 30'N 67°47'W, 69-100 m, TMC.

**Type locality.** Venezuela, off Cabo Codera, 10°39.7'N 66°16.2'W, (Map ref. 18).

**Description.** Shell: shape biconic, very strongly costate; costae deep, slightly rounded, first whorl 16 costae, second 11, third 15, partial fourth whorl 1, total costae 43. Surface texture: ventral surfaces densely covered with small lumps, weakening on spire; protoconch densely covered with minute lumps. Arc of weak ventral callus extends to fourth plication. Colour undetermined. Size minute, 2.18 x 1.23 mm, W:L 56%. Spire tall, approximately 41% of shell length. Total of 4.2 whorls comprised of protoconch approximately 1.0 whorl, teleoconch 3.2 whorls. Suture moderately wide, deep, ridge formed by lumps at base of costae. Shoulder narrowly rounded, bearing short costa. Lip wide posteriorly and medially, tapers anteriorly, slightly curved, filled by six primary denticles; posterior canal very strongly and smoothly concave to first primary denticle; space between first and second denticle equal to space between first and labial insertion point; first denticle strongest, following denticles weakening, becoming

progressively deeper in aperture; second wide and slightly bifurcated, sixth rounded, located low somewhat inside anterior edge of lip. Row of approximately eight strong, secondary denticles commences between first and second primary denticle, located on edge of lip, three or four joined to corresponding primary denticles, others somewhat intermingled with primaries. Basal lip commences at small distinct step remote from secondary denticles and below level of sixth primary denticle. In side view lip convex; denticles project strongly from edge. Varix very wide, more so medially; dorsal edge straight, curves strongly to labial insertion point; weakening, sweeps widely around siphonal canal, merges with upper limb of first plication. Basal lip sweeps around siphonal canal, moderately thin, somewhat lumpy basally, merges with lower limb of first plication. Siphonal canal moderately flared to basal edge. Four plications fill approximately 75% of aperture; first very widely bifurcated, both limbs equally strong, slightly lumpy; second weakly bifurcated, lower limb very short, upper limb long, fades on ventral callus; third and fourth only slightly bifurcated, emerge horizontally, fade on callus. Aperture evenly, moderately wide.

**Distribution.** Known from the type locality, a locality approximately 15 miles west and another approximately 40 miles to the south west.

**Remarks.** Only dead shells were collected; all shells were faded and nearly all had signs of predation. However, some were in reasonable condition and were designated as type material. *Eratoidea rugosa* n. sp. has a more variable shell morphology than other species in the *E. lasallei* group: the number of costae varies from 42 - 52 which can largely be attributed to very weak, gradual formation of the early costae; the strength and number of labial denticles; the curvature of the lip and the degree of surface texture are all unusually variable. *Eratoidea rugosa* n. sp. most closely resembles *E. brevis* n. sp. from the same type locality, with which it is compared: *E. rugosa* n. sp. is a bigger species, has considerably more costae, a lower W:L ratio and narrower aperture. Data recorded: average size 2.29 x 1.26 mm, W:L 58.1%; average number of teleoconch whorls 3.2; average number of costae on first whorl 16.3; second whorl 13.0; third whorl 15.5; partial fourth whorl 3.0; average total costae on all whorls 47.8.

**Etymology.** From the Latin word *rugosus*, corrugated. Refers to the surface costae.

*Eratoidea rosarioensis* n. sp.  
Figs 210, 245-247, 264, 271

**Type material.** Colombia, east of Islas Rosarios, 10°15.0'N 75°42.6'W, 97 m; holotype, 2.12 x 1.25 mm, W:L 59%, MNHN 23747; paratype 1, 2.10 x

1.20 mm, W:L 57%, MNHN 23748; paratype 2, 2.32 x 1.38 mm, W:L 59%, MNHN 23748, AWC; paratype 3, 1.98 x 1.19 mm, W:L 60%, MNHN 23748, AWC; paratype 4, 2.00 x 1.18 mm, W:L 59%, MNHN 23748, TMC; paratype 5, 2.43 x 1.27 mm, W:L 52%, MNHN 23748, TMC.

**Other material.** Approximately 100 ad. dd., Colombia, east of Islas Rosarios, 10°15.0'N 75°42.6'W, 97 m, TMC; 1 ad. dd., Colombia, off Cartagena, 10°22.2'N 75°40.3'W, 59-63 m, TMC.

**Type locality.** Colombia, east of Islas Rosarios, 10°15.0'N 75°42.6'W, (Map ref. 29).

**Description.** Shell: shape biconic, costate; costae moderately weak; first whorl 14 costae; second 13; incomplete third whorl 10; total costae 37. Surface texture: entire ventral surfaces and protoconch covered with irregularly shaped minute round lumps. Colour undetermined. Size minute 2.12 x 1.25 mm, W:L 59%. Spire tall, approximately 41% of shell length. Total of 3.9 whorls comprised of protoconch 1.0 whorls, teleoconch 2.9 whorls. Suture shallow; sutural ridge weak. Shoulder widely, evenly rounded. Lip thin, slightly wider posteriorly, largely straight, curves slightly anteriorly; filled by six primary denticles; posterior canal strongly and smoothly concave to first primary denticle; space between first and second denticle wide, slightly less than space between first and labial insertion point, following three denticles very weak; sixth, large, weak, rounded, located low inside anterior edge of lip. Approximately eight small, very weak, very irregular secondary denticles commence above first primary denticle, located on edge of lip, intermingled with and occasionally joined to primary denticles, strengthening anteriorly. Basal lip commences at eighth secondary denticle, slightly below level of sixth primary. In side view lip strongly, evenly curved; first and second primary and all secondary denticles project slightly from edge. Varix moderately

wide, slightly sinuous; dorsal edge concave, curves gently to insertion point; weakens anteriorly, sweeps around siphonal canal close to basal lip, fades before reaching limbs of first plication. Basal lip solid, well defined, sweeps around siphonal canal, smooth, thin, sharp medially, merges with limbs of first plication. Siphonal canal flared to basal edge. Four plications fill approximately 75% of aperture; first widely bifurcated, upper limb strongest, drops down to rejoin lower limb; second weakly bifurcated, upper limb quickly fades, lower limb drops down to merge weakly with first plication; third emerges slightly angled downwards, widens only slightly from second, quickly fades on ventral callus; fourth angled very slightly upwards, widens from third, fades quickly on ventral callus; all plications moderately thin internally, sides concave, tops wider, rounded. Aperture very wide, slightly less so anteriorly.

**Distribution.** Known from type locality and a location off Cartagena where one shell was collected

**Remarks.** A large lot approximately 100 dead shells were collected in the type locality, a number were in good condition, but all were faded. This species is noticeable for its consistently very weak morphological features which alone distinguish it from all other species in the *E. lasallei* group. Also of note is that one specimen of *E. rosarioensis* with a total of 30 costae, has the lowest recorded total number of costae in the group; this is four less than the minimum number recorded in *E. ampla* and is due to the reduced number on the incomplete third whorl. Also of note is the somewhat sinuous lip and varix in side view. Data recorded: average size 2.16 x 1.25 mm, W:L 57.9%; average number of teleoconch whorls 2.9; average number of costae on first whorl 13.5; second whorl 12.0; third whorl 8.0; average total costae on all whorls 33.5.

**Etymology.** Named after the type locality.

## Figures 260-265

**260.** *Eratoidea lasallei* (Talavera & Princz, 1985), ad. dd., 2.74 x 1.59 mm, W:L 58%, Venezuela, east of Islas La Tortuga, 157 m, scale bar 200µm.

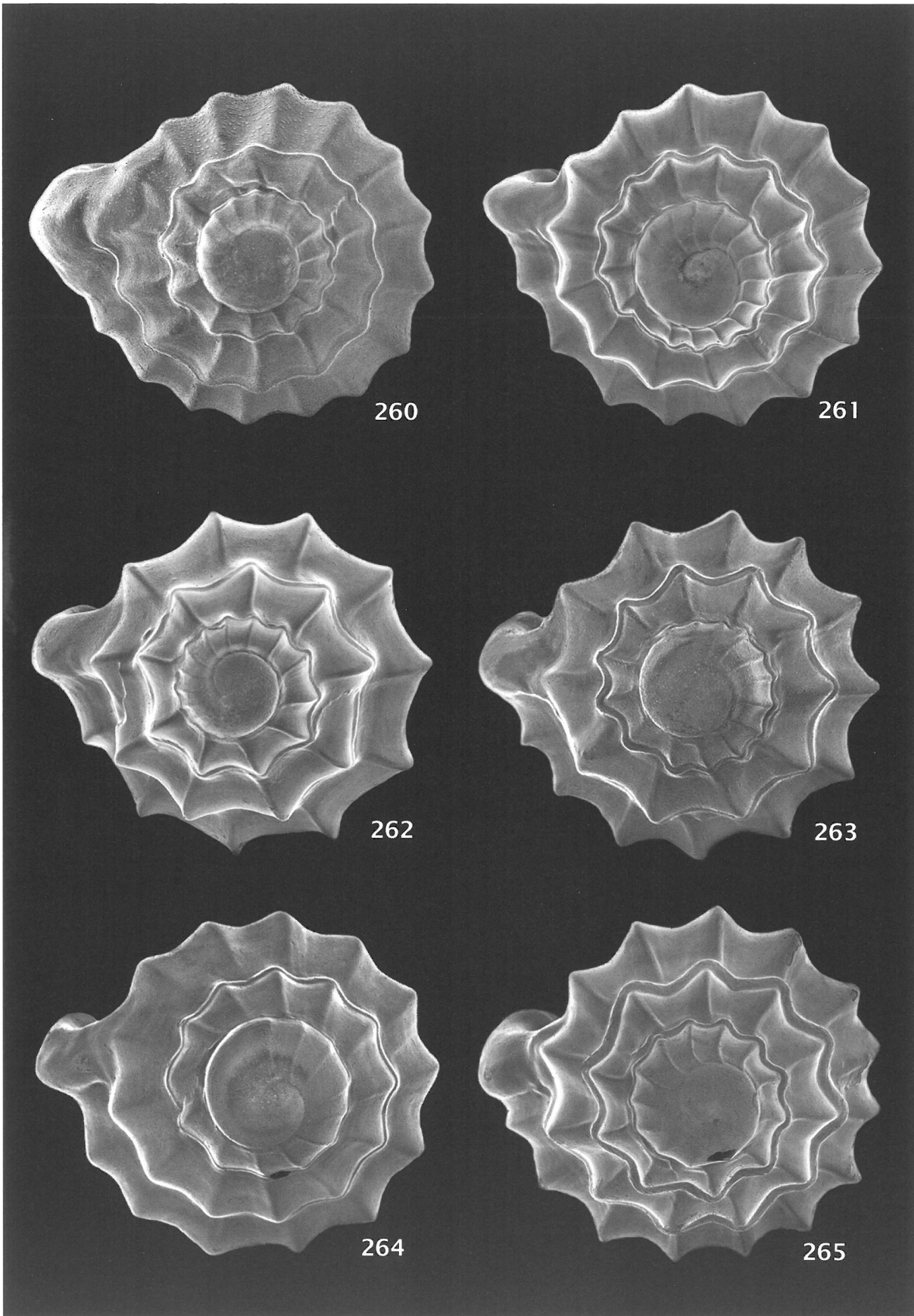
**261.** *Eratoidea copiosa* n. sp., paratype 5, 2.66 x 1.51 mm, W:L 57%, Trinidad and Tobago, Tobago, off Man-o-War bay, 68 m, MNHN 23736, TMC.

**262.** *Eratoidea ampla* n. sp., holotype, 2.76 x 1.61 mm, W:L 58%, Venezuela, north west of Isla Cubagua, 85 m, MNHN 23737.

**263.** *Eratoidea brevis* n. sp., holotype, 1.90 x 1.18 mm, W:L 62%, Venezuela, Cabo Codera, 46 m, MNHN 23743.

**264.** *Eratoidea rosarioensis* n. sp., holotype, 2.12 x 1.25 mm, W:L 59%, Colombia, east of Islas Rosarios, 97 m, MNHN 23747.

**265.** *Eratoidea acuta* n. sp., holotype, 2.72 x 1.44 mm, W:L 53%, Colombia, north east of Cabo de Vela, 63 m, MNHN 23751.



*Eratoidea recta* n. sp.

Figs 15, 208, 248-250

**Type material.** Colombia, west of Cabo de Vela, 11°56'N 72°42'W, 69m; holotype, 3.42 x 1.73 mm, W:L 51%, MNHN 23749; paratype 1, 3.50 x 1.75 mm, W:L 50%, MNHN 23750; paratype 2, 2.94 x 1.60 mm, W:L 54%, MNHN 23750, TMC; paratype 3, 2.95 x 1.59 mm, W:L 54%, MNHN 23750, TMC.

**Other material.** 1 ad. dd. broken shell, Colombia, west of Cabo de Vela, 11°56'N 72°42'W, 69m, TMC; 1 ad. dd., 3 broken pieces, Colombia, west of Cabo de Vela, 11°56.0'N 72°42.0'W, 59m, TMC.

**Type locality.** Colombia, west of Cabo de Vela, 11°56'N 72°42'W, (Map ref. 27).

**Description.** Shell: shape biconic, very strongly costate; first whorl 18 costae; second 15; third 13; fourth 13; total costae 59. Costae unusually strong on parietal wall and merge with fourth plication. Surface texture: entire ventral surfaces and protoconch covered with irregularly round minute lumps. Arc of weak ventral callus extends to fourth plication. Colour undetermined. Surface texture undetermined. Size medium, 3.42 x 1.73 mm, W:L 51%. Spire tall, approximately 42% of shell length. Total of 5.0 whorls comprised of protoconch approximately 1.0 whorls, teleoconch 4.0 whorls. Suture deep; sutural ridge strong, lumps at base of costae strong; teleoconch whorls slightly convex. Lip wide, tapered anteriorly; generally straight, slightly curved and slightly flared anteriorly; filled by eight weak primary denticles; posterior canal strongly and smoothly concave to first primary denticle; space between first and second significantly less than space between first and labial insertion point; first to sixth denticles weakening; eighth moderately strong, rounded, pointed, located low inside anterior edge of lip. Five irregular secondary denticles, first three very weak commence at second primary denticle, located on edge of lip; fourth and fifth small, pointed, located outside edge of lip. Basal lip commences at fifth secondary denticle at level of sixth primary. In side

view lip evenly curved; first and second primary and all secondary denticles project slightly from edge. Varix wide, strong, dorsal edge slightly sinuous, curves sharply to labial insertion point; sweeps widely around siphonal canal, weakening, merges with strong upper limb of first plication. Basal lip sweeps around siphonal canal, basal edge slightly serrated, becomes lumpy, merges with weak lower limb of first plication. Four plications fill approximately 75% of aperture; first wide, lightly bifurcated, lower limb very weak, upper limb stronger; second long, widely bifurcated, limbs rejoin, fade on ventral callus; third slightly angled downwards, fades; fourth almost horizontal, widens slightly from third, fades; all plications moderately thick internally, sides slightly concave, tops slightly rounded. Aperture evenly moderately wide.

**Distribution.** Known only from the type locality.

**Remarks.** Only 4 ad. dd. shells of *Eratoidea recta* n. sp. were collected. All were faded and to some extent eroded. *E. recta* n. sp. is unique in the *E. lasallei* group because of the very unusual complete fourth teleoconch whorl. Data recorded: average size 3.20. x 1.67 mm, W:L 52.2%, average number of teleoconch whorls 4.0, average number of costae on first whorl 17.7; second whorl 13.7; third whorl 12.3; complete fourth whorl 11.7; average total costae on all whorls 55.4.

**Etymology.** From the Latin word *rectus*, upright. Reflects the length and low W:L ratio of this species.

*Eratoidea acuta* n. sp.

Figs 209, 251-253, 265

**Type material.** Colombia, north east of Cabo de Vela, 12°20.1'N 72°01.3'W, 63 m; holotype, 2.72 x 1.44 mm, W:L 53%, MNHN 23751; paratype 1, 2.68 x 1.35 mm, W:L 50%, MNHN 23752; paratype 2, 3.19 x 1.63 mm, W:L 51%, MNHN 23752, TMC; paratype 3, 2.60 x 1.44 mm, W:L 55%, MNHN 23752, TMC.

**Figures 266-271**

**266.** *Eratoidea lasallei* (Talavera & Princz, 1985), ad. dd., 2.76 x 1.58 mm, W:L 57%, north of Islas Los Testigos, 73 m, TMC.

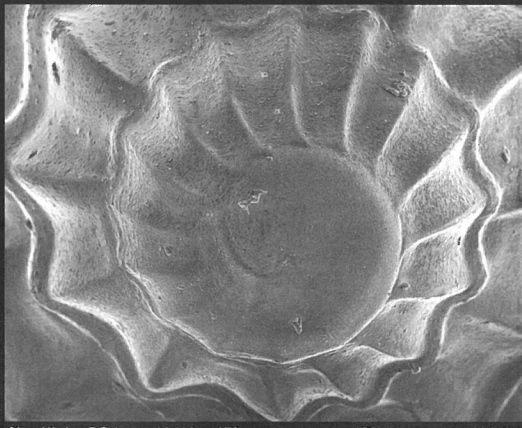
**267.** *Eratoidea copiosa* n. sp., paratype 5, 2.66 x 1.51 mm, W:L 57%, Trinidad and Tobago, Tobago, off Man-o-War bay, 68 m, MNHN 23736, TMC.

**268.** *Eratoidea ampla* n. sp., holotype, 2.76 x 1.61 mm, W:L 58%, Venezuela, north west of Isla Cubagua, 85 m, MNHN 23737.

**268.** *Eratoidea perspicua* n. sp., holotype, 2.29 x 1.26 mm, W:L 55, Venezuela, east of Isla La Tortuga, 152 m, MNHN 23741.

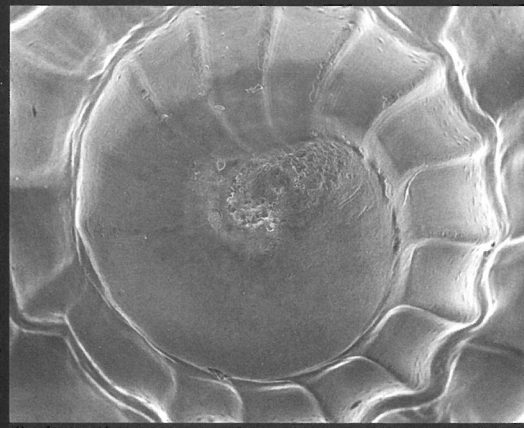
**270.** *Eratoidea rugosa* n. sp., ad. dd., 2.49 x 1.43 mm, W:L 53%, Venezuela, off Cabo Codera, 80 m, TMC.

**271.** *Eratoidea rosarioensis* n. sp., holotype, 2.12 x 1.25 mm, W:L 59%, Colombia, east of Islas Rosarios, 97 m, MNHN 23747.



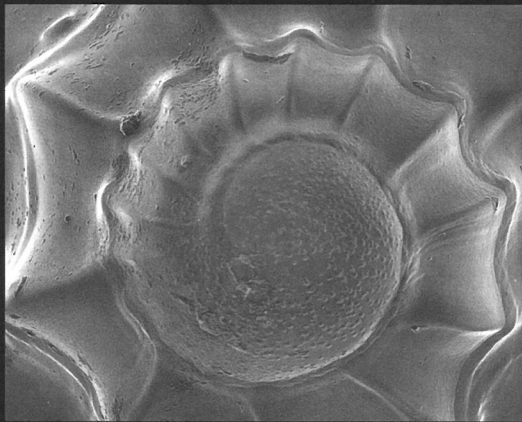
Vac-High PC-Low 10 kV x 170 100 µm 001501  
300126

266



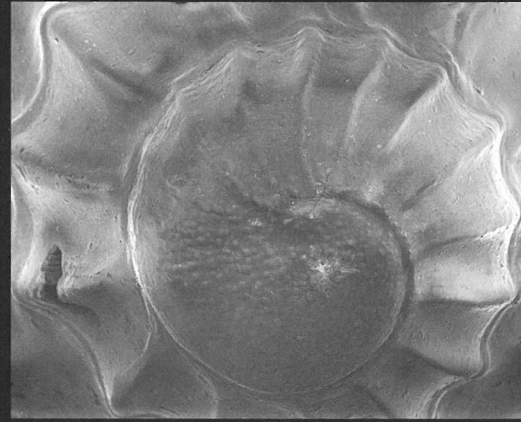
Vac-High PC-Low 10 kV x 200 100 µm 001699  
300126

267



Vac-High PC-Low 10 kV x 170 100 µm 001864  
300126

268



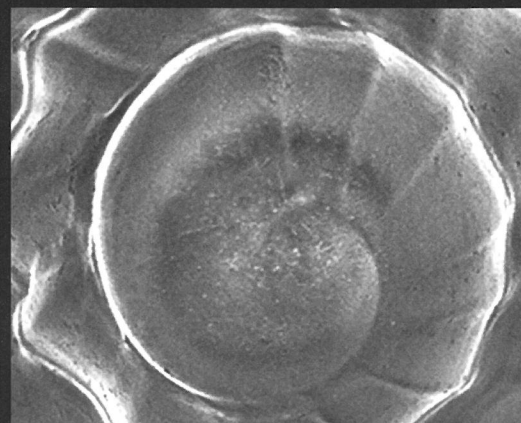
Vac-High PC-Low 10 kV x 200 100 µm 001988  
300126

269



Vac-High PC-Low 5 kV x 200 100 µm 001921  
300126

270



271

**Other material.** 1 juv. dd., 3 broken pieces, Colombia, north east of Cabo de Vela, 12°20.1'N 72°01.3'W, 63 m, TMC.

**Type locality.** Colombia, north east of Cabo de Vela, 12°20.1'N 72°01.3'W, (Map ref. 27).

**Description.** Shell: shape biconic, very strongly costate; costae very sharp; first whorl 15 costae; second 12; third 12; partial fourth whorl 3; total costae 42. Surface texture very sparse fine lumps. Arc of weak ventral callus extends to fourth plication. Colour undetermined; brown spot on protoconch. Size medium, 2.72 x 1.44 mm, W:L 53%. Spire tall, approximately 42% of shell length. Total whorls 4.2 comprised of protoconch approximately 1.0 whorl, teleoconch 3.2 whorls. Suture shallow, very strong, slightly sinuous sutural ridge; lumps at base of costae. Shoulder moderately strong, short weak costa present. Lip narrow, slightly wider posteriorly, slightly curved; filled by six strong primary denticles; posterior canal almost semi-circular internally, strongly and smoothly concave to posterior primary denticle, space between first and second denticle approximately same as space between first and labial insertion point; all primary denticles deep, strong, curl weakly outwards onto varix, fade; first to fifth denticles weakening slightly anteriorly; sixth remote from fifth, small, round, located deep inside edge of lip. Approximately nine very irregular secondary denticles, some joined to primary denticles, form distinct line on edge of lip. Basal lip commences at level of fifth primary denticle. In side view lip strongly, evenly curved; all denticles project slightly from edge. Lirae extend onto varix from all primary and secondary denticles. Varix strong, wide medially; dorsal edge generally straight, curves sharply to labial insertion point; weakening, sweeps around siphonal canal, merges in lumpy area with upper limb of first plication. Basal lip well defined, sweeps around siphonal canal, basal edge thin, sharp, slightly scalloped, merges with lower limb of first plication, junction somewhat thickened. Siphonal canal strongly flared to basal edge. Four plications fill approximately 75% of aperture; first strongly, moderately widely bifurcated, upper limb strongest, slightly raised; second widely bifurcated, limbs almost rejoin distally, fade on ventral callus; third short, slightly bifurcated, angled downwards, widens slightly from second, quickly fades on ventral

callus; fourth emerges horizontally, quickly fades on ventral callus. All plications moderately thick internally, sides slightly concave, tops slightly rounded. Aperture moderately wide, slightly wider posteriorly.

**Distribution.** Known only from the type locality,

**Remarks.** Only five dead shells were collected at the type locality and most were in moderate condition. *Eratoidea acuta* n. sp. has a fairly average shell morphology for the *E. lasallei* group. It resembles *E. recta* n. sp. in some respects, but differs in the smaller number of teleoconch whorls. *E. acuta* n. sp. is a moderately large species; has very sharp costae which are, otherwise, only found in the very small species, *E. brevisa* n. sp., *E. estensis* n. sp. and *E. perspicua* n. sp. A brown spot is present on the protoconch, which is unusual in the western part of the range of the group. The two features which most clearly distinguishes *E. acuta* n. sp. from all other species are its very strong, slightly sinuous, sutural ridge and the distinctive anterior part of the lip (Figs 251-253). Data recorded: average size 2.80 x 1.47 mm, W:L 52.5%, average number of teleoconch whorls 3.2, average number of costae on first whorl 16.0; second whorl 12.5; third whorl 12.5; partial fourth whorl 3.0; average total costae on all whorls 44.0.

**Etymology.** The Latin word *acuta*, sharp. Reflects the unusually sharp costae of this species.

#### ERATOIDEA ACUTULLA SPECIES GROUP

Figs 9-10, 272-286

#### INTRODUCTION

The proposed *Eratoidea acutulla* group is one of the least well represented of the Caribbean *Eratoidea* species groups. A total of approximately thirty shells were collected by dredging in depths from 42 - 198 m and the majority of shells were in poor condition. No live animals or fresh dead shells were collected. However, a few shells were in reasonably good condition and it has been possible to separate two distinct new species which clearly do not fit into any other *Eratoidea* species group. *E. acutulla* n. sp., has been chosen as the group representative species, and the group is summarised as follows:

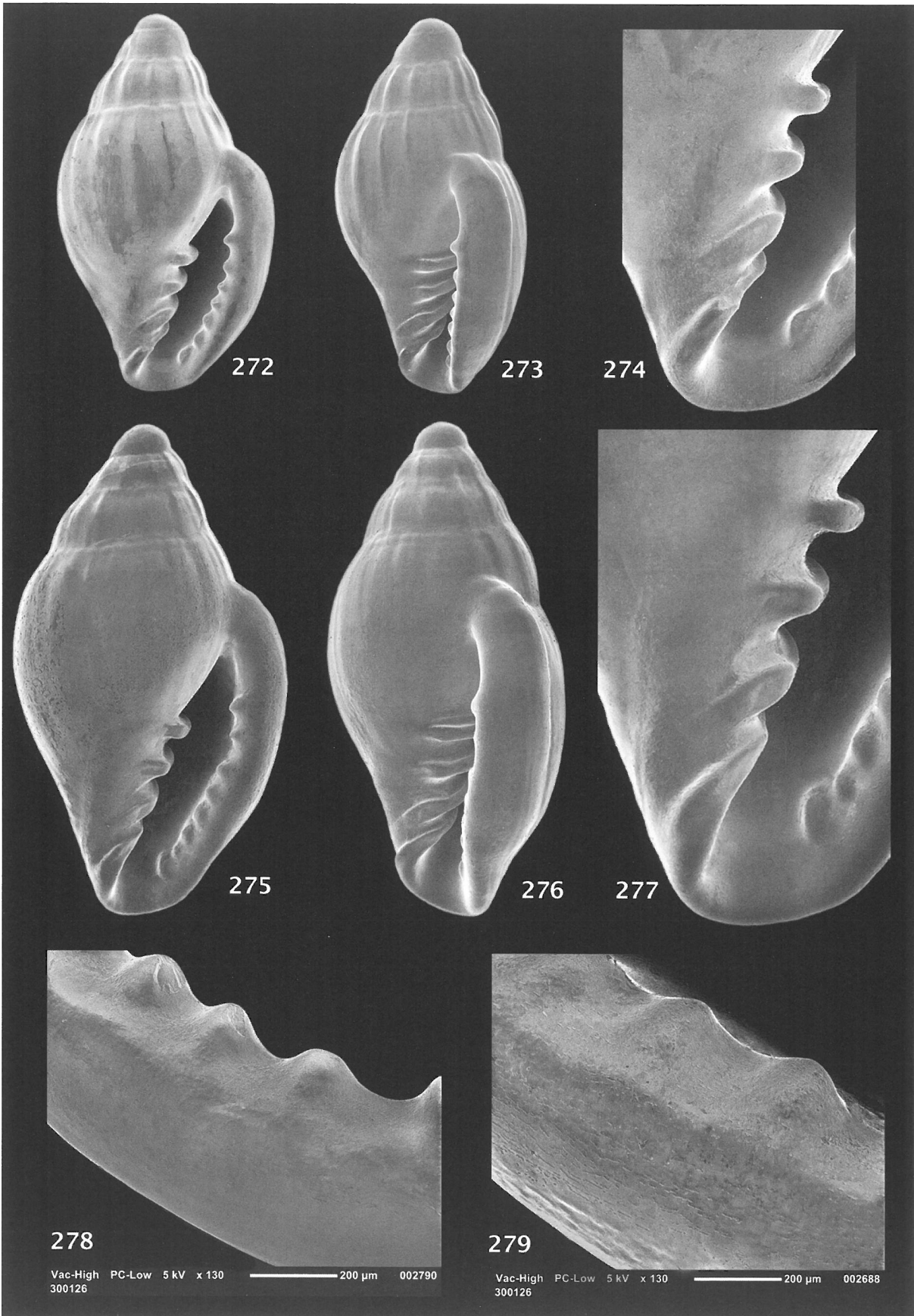
#### Figures 272-279

272-274. *Eratoidea acutulla* n. sp., holotype, 4.51 x 2.97 mm, W:L 58%, Trinidad and Tobago, north west coast of Tobago, 65-198 m, MNHN 23753.

275-277. *Eratoidea aciesa* n. sp., holotype, 5.85 x 3.25 mm, W:L 56%, Venezuela, north west of Isla Margarita, 80-100 m, MNHN 23755.

278. *Eratoidea acutulla* n. sp., holotype, 4.51 x 2.97 mm, W:L 58%, Trinidad and Tobago, north west coast of Tobago, 65-198 m, MNHN 23753.

279. *Eratoidea aciesa* n. sp., holotype, 5.85 x 3.25 mm, W:L 56%, Venezuela, north west of Isla Margarita, 80-100 m, MNHN 23755.



*Eratoidea acutulla* n. sp., Trinidad and Tobago, off the north west coast of Tobago, 60-90 m, group representative species;

*Eratoidea aciesa* n. sp., Venezuela, off the north west coast of Isla Margarita, 80-183 m.

All shells were collected in the area bounded by Tobago in the east; Cabo Codera, off the mainland coast of Venezuela in the south, and Aruba in the west. In spite of much sampling in many other areas of the Caribbean no evidence of this group was found outside this area, to which the *E. acutulla* group is considered to be endemic. Although only two new species are described in the group, examination of single shells indicates that there are three or more species present (Fig. 282).

Most images have been produced at a magnification of X15. Exceptions are the siphonal and apical images and those depicting labial surface texture which are presented with image widths of approximately 6.9 - 7.5 cm. A constant magnification of X15 has been used for both optical photograph and SEM shell images in ventral and side view in order to give a true indication of the relative sizes of each species in the group.

***Eratoidea acutulla* species group** (RS, *Eratoidea acutulla* n. sp.)

***Eratoidea acutulla* n. sp.**

Figs 10, 272-274, 278, 280, 283, 285

**Type material.** Trinidad and Tobago, north west coast of Tobago, 11°20'N 60°34'W, 65-198 m; holotype, 4.51 x 2.97 mm, W:L 58%, MNHN 23753; paratype 1, 5.08 x 2.97 mm, W:L 58%, MNHN 23754; paratype 2, 5.13 x 2.91 mm, W:L 57%, MNHN 23754, TMC; paratype 3, 5.40 x 3.02 mm, W:L 56%, MNHN 23754, TMC; paratype 4, 4.15 x

2.38 mm, W:L 56%, MNHN 23754, AWC; paratype 5, 4.96 x 2.81 mm, W:L 57%, MNHN 23754, AWC.

**Other material.** 5 ad, dd., 6 juv., dd., various broken shells, Trinidad and Tobago, north west coast of Tobago, 11°20.5'N 60°34.5'W, 90 m, TMC.

**Type locality.** Trinidad and Tobago, north west coast of Tobago, 11°20.5'N 60°34.5'W, (Map ref. 12).

**Description.** Shell: broadly biconic, shiny; weakly costate, approximately twenty very weak costae per whorl, almost absent on ventral surface. Surface texture in form of weak scales on lip. Callus moderately strong. Colour bright brownish-orange between opaque off-white costae. Size small, 4.51 x 2.97 mm, W:L 58%. Spire medium, pointed. Total of 4.8 slightly convex whorls comprised of protoconch 2.3 whorls, teleoconch 2.5 whorls. Suture moderately strong, ridge around anterior edge, lumps on posterior end of very weak costae, weak secondary ridge around posterior edge. Labial insertion point significantly below suture. Shoulder weakly rounded. Lip moderately wide, moderately strongly curved, anterior half tapered to base, curled inwards; posterior canal narrow, curved to first denticle; almost filled by seven small denticles; first and second extend weakly over edge of lip, more widely spaced than equally spaced second to seventh; denticles located on inside of lip, slightly below edge, anterior denticles more so. Lip sweeps around siphonal canal, merges with first plication. In side view lip straight. Varix very wide, weak; dorsal groove very weak; basally narrowing varix slightly convex, blends perfectly with curve of dorsum, sweeps around base, merges with ventral callus. Anterior ends of dorsal costae group together tightly as narrow ridges, curl around base, merge with ventral callus. Four plications fill approximately 68% of aperture; first weakly bifurcated, upper limb

**Figures 280-286**

**280.** *Eratoidea acutulla* n. sp., holotype, 4.51 x 2.97 mm, W:L 58%, Trinidad and Tobago, north west coast of Tobago, 65-198 m, MNHN 23753.

**281.** *Eratoidea aciesa* n. sp., holotype, 5.85 x 3.25 mm, W:L 56%, Venezuela, north west of Isla Margarita, 80-100 m, MNHN 23755.

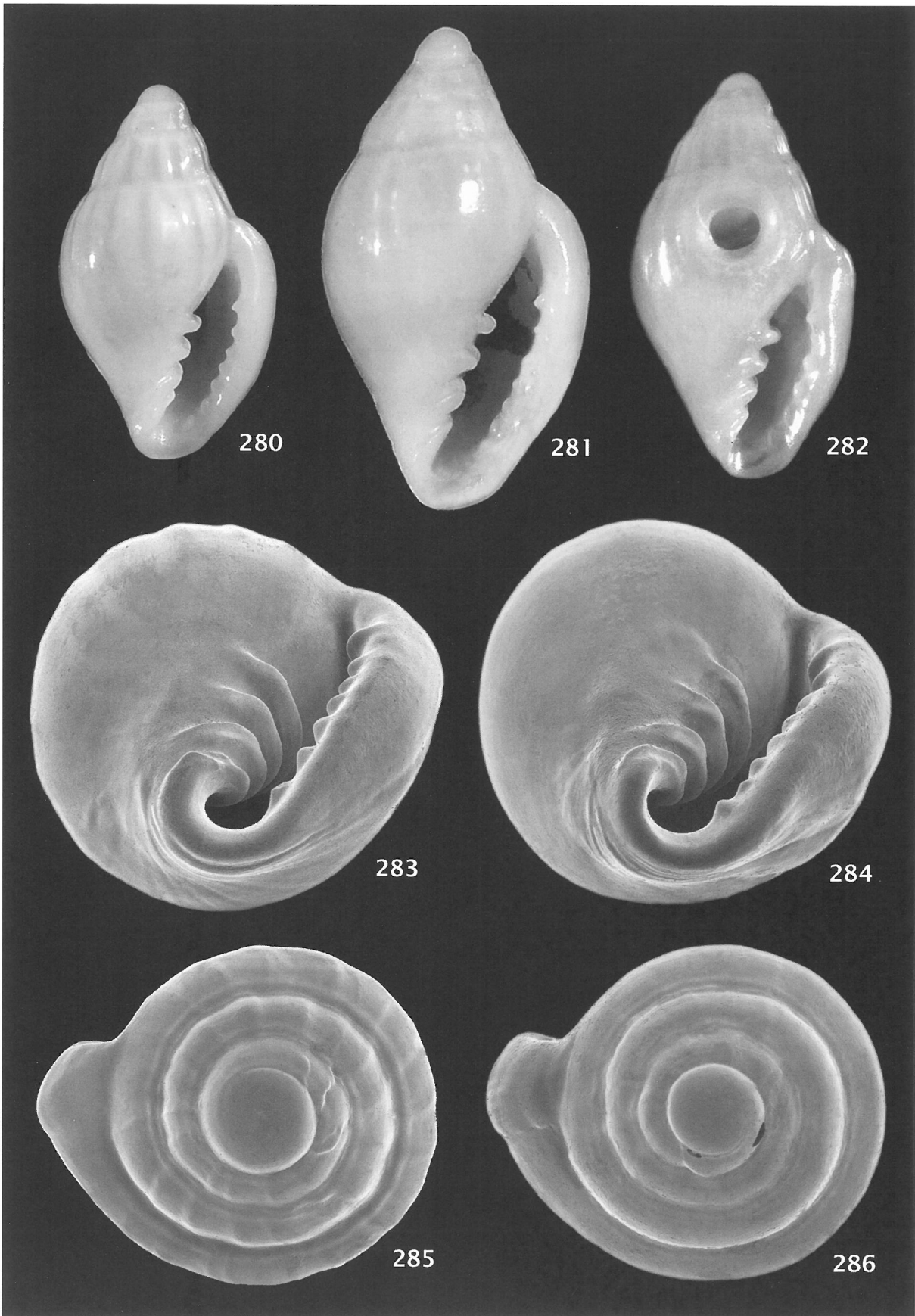
**282.** *Eratoidea acutulla* group, ad. dd., 4.95 x 2.75 mm, W:L 56%, Aruba, off south coast, 105 m, TMC.

**283.** *Eratoidea acutulla* n. sp., holotype, 4.51 x 2.97 mm, W:L 58%, Trinidad and Tobago, north west coast of Tobago, 65-198 m, MNHN 23753.

**284.** *Eratoidea aciesa* n. sp., holotype, 5.85 x 3.25 mm, W:L 56%, Venezuela, north west of Isla Margarita, 80-100 m, MNHN 23755.

**285.** *Eratoidea acutulla* n. sp., holotype, 4.51 x 2.97 mm, W:L 58%, Trinidad and Tobago, north west coast of Tobago, 65-198 m, MNHN 23753.

**286.** *Eratoidea aciesa* n. sp., holotype, 5.85 x 3.25 mm, W:L 56%, Venezuela, north west of Isla Margarita, 80-100 m, MNHN 23755.



strongest, slightly raised; second widens, becomes flat and weakly bifurcated, weak limbs tend to rejoin and fade on ventral callus; third widens, becomes flat and weakly bifurcated, limbs fade on ventral callus; fourth weakly bifurcated, limbs fade on ventral callus. Ventral callus weakens above second plication, more so above third, extends weakly to posterior canal above fourth. The aperture is moderately wide, more so posteriorly.

**Remarks.** *Eratoidea acutulla* n. sp. was only collected off the north west coast of Tobago. *E. acutulla* n. sp. and *E. aciesa* n. sp. have much in common and appear to be closely related, but they can be positively separated. *E. acutulla* n. sp. is significantly smaller and slightly less inflated and has an average size of 4.87 x 2.84 mm, W:L 58.3% compared with 5.93 x 3.32 mm, W:L 60%; it has seven labial denticles compared with eight or nine; in side view the denticles consistently project more from the lip, the costae are stronger and the weakening varix has a convex profile anteriorly compared to a concave profile in *E. aciesa* n. sp. The most significant difference is in the whorls: *E. acutulla* n. sp. has a total of 4.70 whorls comprised of protoconch with 2.30 and teleoconch with 2.40, whereas *E. aciesa* n. sp. has a total of 5.33 whorls comprised of protoconch with 2.00 and teleoconch with 3.33. The holotype has a chipped first plication and slightly damaged third and fourth labial denticles.

**Etymology.** The name alludes to the pointed spire of this species and is taken from the Latin word *acutus* meaning pointed.

*Eratoidea aciesa* n. sp.

Figs 9, 275-277, 279, 281, 284, 286

**Type material.** Holotype, 5.85 x 3.25 mm, W:L 56%, Venezuela, north west of Isla Margarita, 11°17'N 64°29'W, 80-100 m, MNHN 23755; paratype 1, 6.22 x 3.49 mm, W:L 56%, Venezuela, east of Tortuga, 10°53'N 65°27'W, 183 m, MNHN 23756; paratype 2, 5.72 x 3.21 mm, W:L 56%, Venezuela, north west of Cabo Codera, 10°42.8'N 66°10.8'W, 124 m, MNHN 23756, TMC.

**Other material.** 1 ad, dd., 3 juv. dd.; Venezuela, north west of Margarita, 11°17'N 64°29'W, 80-100 m, TMC; 1 ad., broken, Venezuela, east of Tortuga, 10°53'N 65°27'W, 183 m, TMC; 2 juv. broken pieces, Venezuela, north west Cabo Codera, 10°42.8'N 66°10.8'W, 124 m, TMC.

**Type locality.** Venezuela, north west of Isla Margarita, 11°17'N 64°29'W, 80-100 m, (Map ref. 15).

**Description.** Shell broadly biconic, shiny, very weakly costate; approximately twenty very weak costae per whorl, absent on ventral surface. Surface texture weak and variable. Callus moderately strong. Colour undetermined. Size small, 5.85 x 3.25 mm, W:L 56%. Spire medium, pointed. Whorls slightly convex; total of 5.2 whorls comprised of protoconch 2.0 whorls, teleoconch 3.2 whorls. Suture moderately strong, ridge around anterior edge, weak lumps on posterior end of weak costae, weak secondary ridge around posterior edge of suture. Labial insertion point significantly below suture. Shoulder weakly rounded. Lip moderately wide, slightly kinked between second and third denticles, straight above and below kink; slightly curled inwards, slightly flared anteriorly; posterior canal narrow, almost straight to first denticle; almost filled by eight more or less evenly sized denticles; first extends weakly over edge of lip, denticles located on inside of lip, slightly below edge. Lip sweeps around siphonal canal, merges with first plication. In side view lip slightly sinuous. Varix very wide, moderately weak; dorsal groove weak; basally narrowing varix concave, sweeps around base, merges with ventral callus. Anterior ends of very weak dorsal costae group together tightly as narrow ridges, curl around base, merge with ventral callus. Four plications fill approximately 69% of aperture; first weakly bifurcated, upper limb strongest, slightly raised; second widens, becomes flat and weakly bifurcated, weak limbs tend to rejoin, fade on ventral callus; third and fourth weakly bifurcated, limbs fade on ventral callus. Ventral callus weakens above second plication, more so above third, extends weakly to posterior canal above fourth. The aperture is moderately wide, widest posteriorly medially.

**Figures 287-295**

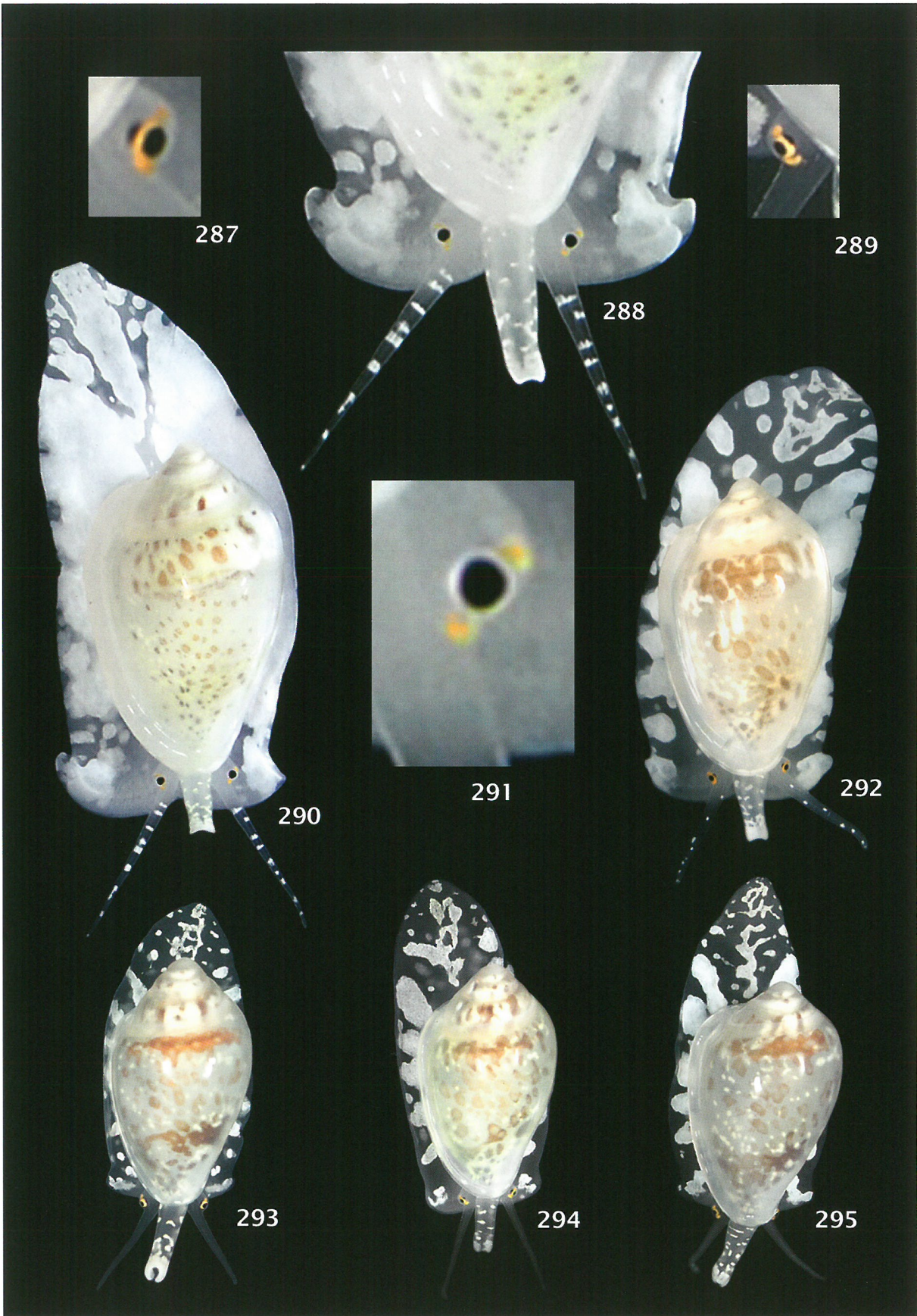
**287, 292.** *Eratoidea* cf. *E. margarita* form A, ad. lv., 6.06 x 3.69 mm, W:L 61%, Venezuela, Las Aves de Sotavento; 1-28 m, MNHN.

**288, 290-291.** *Eratoidea* cf. *E. margarita* form B, ad. lv., 7.24 x 4.68 mm, W:L 65%, West Indies, Barbuda, Spanish point, 1 m, MNHN.

**289, 295.** *Eratoidea lozii* n. sp., holotype 4.70 x 2.95 mm, W:L 63%, Honduras, Bay Islands, Guanaja, north eastern lagoon, 10 m, MNHN 23757.

**293.** *Eratoidea lozii* n. sp., ad. lv., 4.60 x 2.82 mm, W:L 61%, Belize, off Ranguana Cay, 28 m, TMC.

**294.** *Eratoidea lozii* n. sp., ad. lv., approximately 5.5 mm, Honduras, Bay Islands, Roatan, Fantasy Island, 12 m, TMC.



**Remarks.** *Eratoidea aciesa* n. sp. and *E. acutulla* n. sp. have much in common and appear to be closely related, but they can be positively separated. *E. aciesa* n. sp. is significantly bigger and slightly more inflated with an average size of 5.93 x 3.32 mm, W:L 60%, compared with 4.72 x 2.72 mm, W:L 58%; it has eight to nine labial denticles compared with seven; in side view the denticles consistently project less from the lip and the costae are weaker; the weakening varix has a concave profile anteriorly compared to a convex profile in *E. acutulla* n. sp. The most significant difference is in the whorls: *E. aciesa* n. sp. has a total of 5.33 whorls comprised of protoconch with 2.00 and teleoconch with 3.33, whereas *E. acutulla* n. sp. has a total of 4.74 whorls comprised of protoconch with 2.32 and teleoconch 2.42. An image of a juvenile shell is included to give an indication of the colour pattern of on the shells of *E. aciesa* n. sp. (Fig. 293).

**Etymology.** The name alludes to the pointed spire of this species and is taken from the Latin word *acies* meaning point.

#### **ERATOIDEA MARGARITA SPECIES GROUP**

Figs 12, 16, 287-319

#### **INTRODUCTION**

The type species of the genus *Eratoidea* is *E. margarita* (Kiener, 1834) and it has been chosen as representative species for the proposed *E. margarita* species group. The original type material has been lost and the species is now represented by a lectotype, size 7.7 x 5.1 mm, W:L 66%, designated by Boyer (1993), registration MHNG 993.202, and is held in the general systematic collection (originally Delessert collection) of the Muséum d'Histoire Naturelle, Geneva, Switzerland (Fig. 297). The location of this shell is unknown, however, in his original description of *E. margarita* Kiener (1834) gave the type locality as 'Les mers des Indes' which equates with Caribbean, but no further details about the type locality are known. Four shells of *E. margarita* are held in the type collection of the BM(NH) but there is

no indication that they have any type material status. They are from the Cuming collection and are mounted on a board and labelled 'margarita Kien.' and a part word 'incent's' which at least confirms that *E. margarita* was known from St Vincent in the West Indies at that time (Fig. 301). The location of the shell photographed by Kaicher (1981:2609) (Fig. 299), is given as the lower Caribbean and the morphology of this shell compares well with *E. margarita* from St Vincent (Fig. 300) but the provenance of the shell photographed by Kaicher (1981) is unknown. Kiener's original drawing (Fig. 298) and another by Weinkauff (Fig. 296) being artists' impressions are of little help in species identification.

During my years in the Caribbean I was able to collect many samples of *E. margarita* in the West Indies from Barbuda, the most northerly of the Windward Islands, to Grenada in the south; in most of the southern Caribbean islands as far west as Aruba; and throughout the whole western Caribbean coast and islands from Panama to Belize. On the other hand, Espinosa and Ortea (Avicennia 1993-2009) carried out extensive sampling in Cuba and Costa Rica, and it is noted that they made no reference to *E. margarita* or any other material in the genus *Eratoidea*. I am not aware of any records from Florida: Lipe (1991) illustrated shells from Grenada and Bonaire, which seems to confirm that *E. margarita* is not present in Florida. One dead shell was collected in Abaco, Bahamas, by Redfern (2001), but being an isolated shell, considerably separated from the known range, raises the possibility of it having been transported, for example, as ships ballast. During several months of extensive collecting in the central Bahamas I did not find any examples of *E. margarita*. From this data it appears that *E. margarita* is either very scarce or absent from Trinidad and Tobago in the south east, along the mainland coasts of Venezuela and Colombia, and all the islands in the northern Caribbean and Florida. This geographic range must be treated with caution as *E. margarita* is an elusive species, thinly spread over its range, and there maybe other records which are unknown to me which would extend this range.

#### **Figures 296-304**

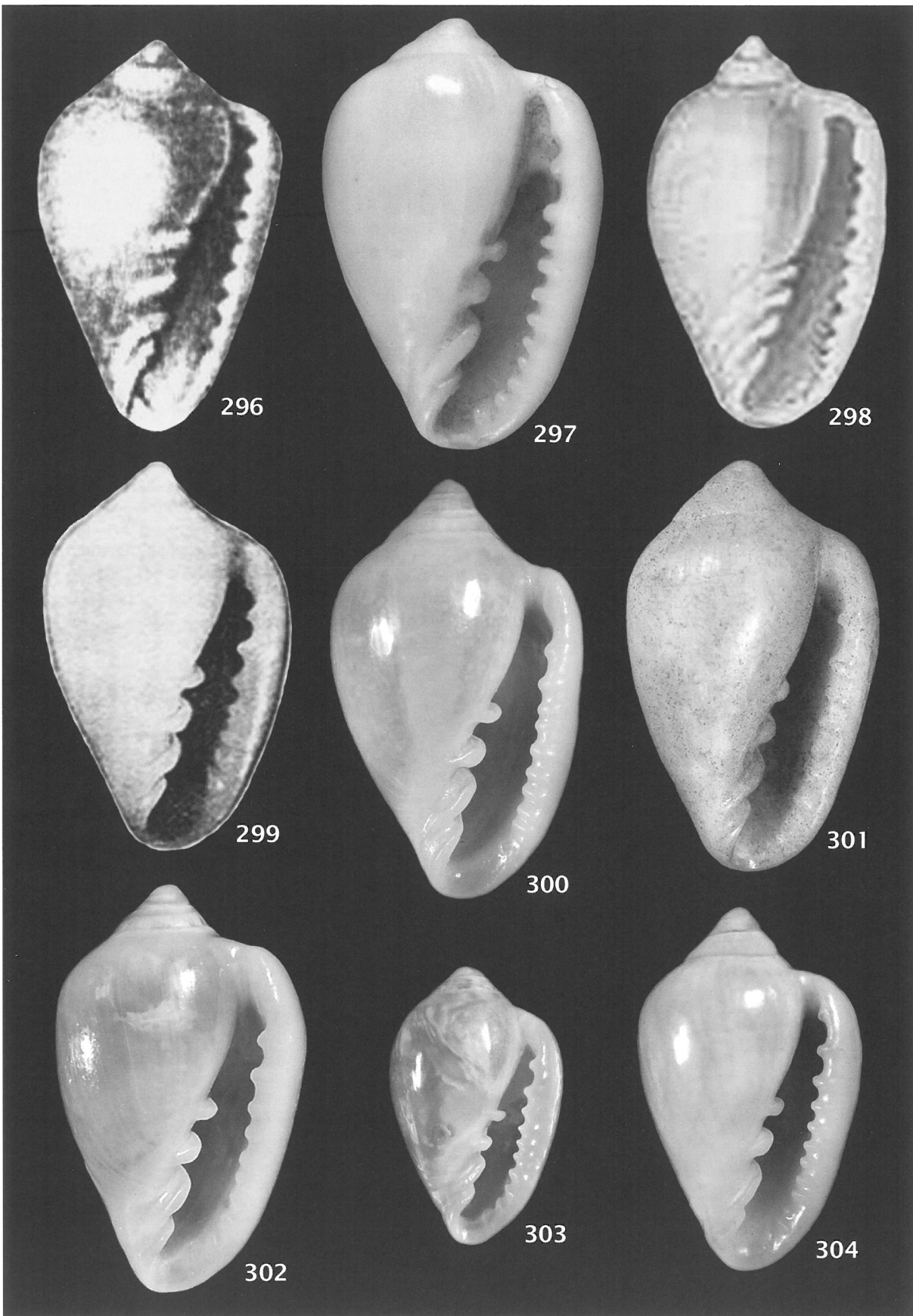
**296-301.** *Eratoidea margarita* (Kiener, 1834).

**296.** Weinkauff (1879), pl. 15, fig.13; **297.** Lectotype, 7.7 x 5.1 mm, W:L 66%, MHNG 993.202; **298.** Kiener (1834), original drawing; **299.** Kaicher (1881, card 2609), lower Caribbean; **300.** Ad. lv., 8.00 x 4.85 mm, W:L 61%, St Vincent, Young Island, TMC; **301.** 1 of 4 shells, 8 mm, St Vincent, Cuming Col., BM(NH).

**302.** *Eratoidea* cf. *E. margarita* form B, ad. lv., 7.49 x 4.64 mm, W:L 62%, West Indies, Barbuda, Spanish point, 1 m, MNHN.

**303.** *Eratoidea lozii* n. sp., holotype, 4.70 x 2.95 mm, W:L 63%, Honduras, Bay Islands, Guanaja, north eastern lagoon, 10 m, MNHN 23757.

**304.** *Eratoidea* cf. *E. margarita* form A, ad. lv., 6.06 x 3.69 mm, W:L 61%, Venezuela, Las Aves de Sotavento, 1-28 m, MNHN.



Although shells of *Eratoidea margarita* show minimal variations in morphology it is apparent from close examination of the samples available that a number of distinct species exist over the distribution range. In the absence of animals to examine it was not possible to relate the majority of these to the type species and as only five samples are represented by animal images it has only been possible to positively identify one new species. Two other probable new species are given cf. status. A summary of the proposed *Eratoidea margarita* species group is as follows:

*Eratoidea margarita* (Kiener, 1834), Caribbean, group representative species.

*Eratoidea lozii* n. sp. Honduras, Bay Islands, Guanaja, 10 m;

*Eratoidea* cf. *E. margarita* form A, Venezuela, Las Aves de Sotavento, 1-28 m;

*Eratoidea* cf. *E. margarita* form B, West Indies, Barbuda, Spanish point, 1 m.

A constant magnification of X10 has been used for both optical photographs and SEM shell images in ventral and side view in order to give a true indication of the relative sizes of each species in the group. Animal images and other detail images are presented at various suitable magnifications.

**Shell and animal morphology.** Shell: the shape is broadly biconic and the surface is shiny. Faint traces of costae can be seen in the SEM images of most shells (Figs 305-313). Surface texture is also present and can be seen easily in SEM images of the lip (Figs 315, 317, 319). Shells are not heavily callused, but moderately strong deposits are present as ventral callus and around the labial insertion point. Shells are generally translucent white without marks, but some, particularly those from St Vincent, are tinted in a range of very pale shades including yellow, pink, green and brown, and traces of very pale brown bands are sometime present. Shell size is small to medium and ranges from 4.45 x 2.72 to 8.03 x 4.56 mm, W:L 57 - 65%; an exceptionally large shell measuring 9 mm is illustrated by Cossignani (2006). The spire is low with convex or concave sides, and the total number of whorls ranges between 3.9 and 5.0; the transition for protoconch to teleoconch is almost undetectable. The labial insertion point is always below the suture and the shoulder ranges from sharp

to widely rounded. The lip is moderately wide with little variation and is always curved, sometimes strongly curved anteriorly (Fig. 308) and is curled inwards. It is filled by ten to twelve, occasionally nine or thirteen moderately strong denticles. Denticles are generally elongated and curl around the edge of the lip with faint ridges continuing onto the varix. The anterior two or three denticles are more like true denticles being round and distinctly raised, and are generally located inside the lip, slightly below the edge (Figs 308-310). A very small, partially formed denticle is always present between the first denticle and the labial insertion point. A weak posterior notch is present in some species (Figs 305-307). In side view the lip is straight or slightly sinuous and the varix is always wide and strong with a strong dorsal groove. The lip combined with varix sweeps around the siphonal canal to merge with the first plication which can in some species be slightly raised (Fig. 306). Four strong plications fill approximately 57% of the aperture. The first is weakest; the second strongest and is generally widely bifurcated, extends well onto the ventral callus and the limbs rejoin distally; the third and fourth are short, bifurcated and terminate abruptly on the ventral callus. The aperture is generally narrower posteriorly, widening anteriorly.

Animal. The foot is approximately twice the shell length, almost transparent and is heavily covered with irregularly shaped white marks. Tentacles are moderately long and finely tapered distally, they are unmarked or marked with minute white spots. The siphon is moderately long with minute white spots, dense distally. The black eyes have white, pale yellow or orange encasing membranes and are frequently accompanied by adjacent orange marks (Figs 291, 295); they are located on pods at the base of the tentacles. The chromatism of the eyes appears to be specific and is most useful in separating species. Mantles are very thin, and pale translucent white with minute white spots (Fig. 291). Mantle roofs are covered with minute white spots and larger pale brown spots; the brown spots are generally concentrated anteriorly and posteriorly (Fig. 295).

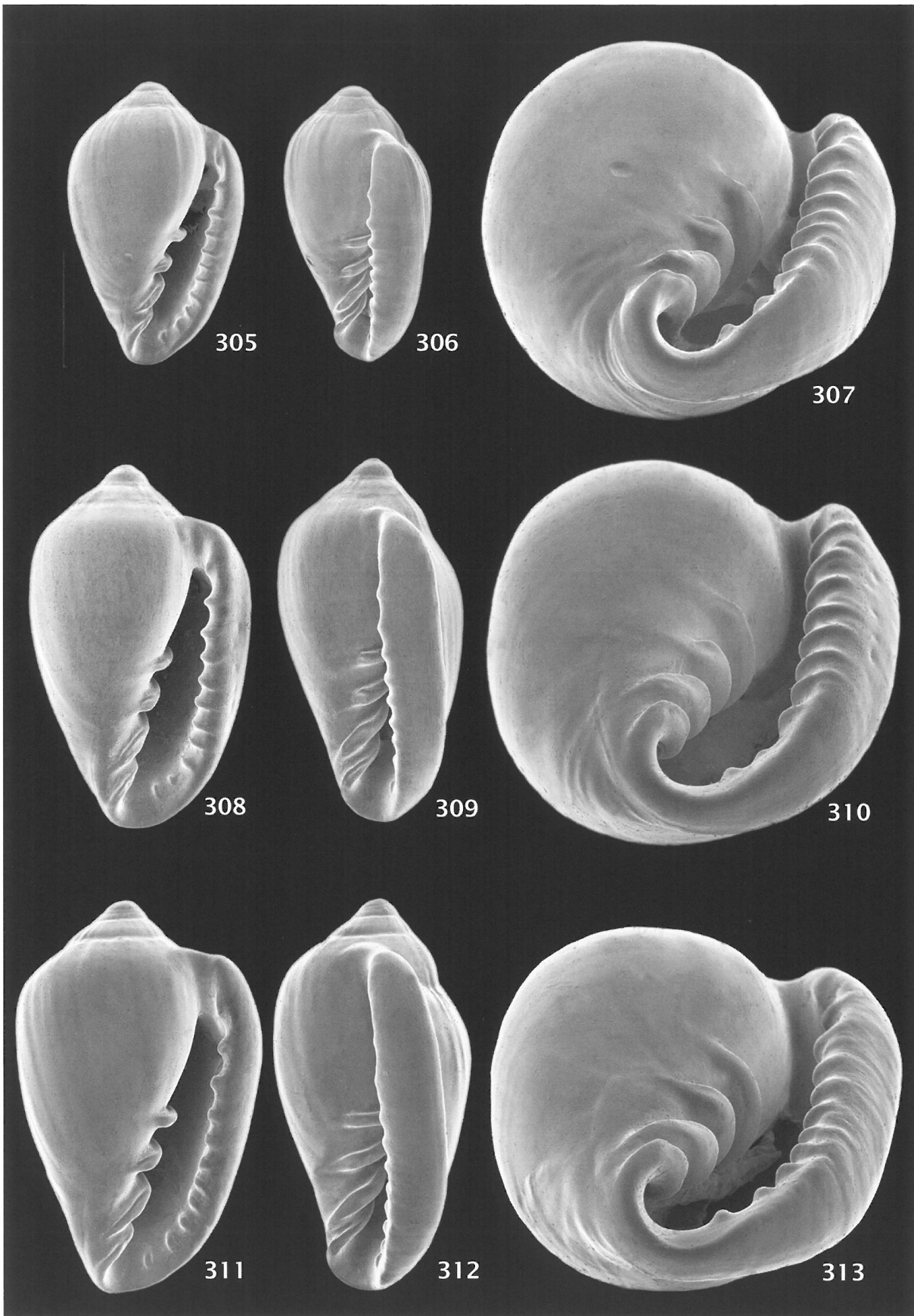
When seen at night in their natural habitat which is generally sand or sandy mud, the shells were often noted to be unusually reflective and could be spotted as very bright pin-points of light.

### Figures 305-313

**305-307.** *Eratoidea lozii* n. sp., holotype 4.70 x 2.95 mm, W:L 63%, Honduras, Bay Islands, Guanaja, north eastern lagoon, 10 m, MNHN 23757.

**308-310.** *Eratoidea* cf. *E. margarita* form A, ad. lv., 6.06 x 3.69 mm, W:L 61%, Venezuela, Las Aves de Sotavento, 1-28 m, MNHN.

**311-313.** *Eratoidea* cf. *E. margarita* form B, ad. lv., 7.49 x 4.64 mm, W:L 62%, West Indies, Barbuda, Spanish point, 1 m, MNHN.



***Eratoidea margarita* species group** (RS, *Eratoidea margarita* (Kiener, 1834))***Eratoidea margarita*** (Kiener, 1834)  
Figs 296-301

**Type material.** Lectotype, 7.7 x 5.1 mm, W:L 66%, (designation Boyer), registered MHNG 993.202. The original type material is lost (part of the Delessert collection). (Photos only examined).

**Type locality.** "Les mers des Indes", which is presumed to translate as Caribbean Sea.

**Original description.** Shell small, oval, columbelliform, translucent white; spire low and conical; lip colour matt white; very pronounced denticles filling the inside edge of the lip; varix strongly pronounced; four plications. Length 10.2, width 5.1 mm.

**Lectotype - morphological features.** Shell shape is broadly biconic, surface smooth and shiny. Size medium, 7.7 x 5.1 mm, W:L 66%. Spire low, sides slightly convex. Suture shallow. Labial insertion point below suture; shoulder moderately strong, rounded. Lip moderately, evenly wide; slightly curved, more so anteriorly; curled inwards; filled by eleven strong denticles and one small, partly formed extra denticle between first denticle and labial insertion point; first and second denticles strongest, remainder gradually weakening anteriorly. Four plications fill approximately 57% of aperture; first weak; second strongest, wide, extends well onto ventral callus, distally close to first plication; third and fourth plications short, tops widened. Aperture narrow posteriorly, evenly widening to wide anteriorly.

**Remarks.** The lectotype of *Eratoidea margarita* is different to the one new species and two cf. taxa described herein. In particular, the labial denticles are stronger and very evenly graded from posterior to base and the plications are considerably stronger. Bifurcation of the plications is not apparent, probably due to shell erosion. Approximately 250 ad. lv. and dd. shells in forty lots of *E. margarita* group were collected from many locations in the Caribbean, in particular, in the San Blas Islands of Panama, but no animal images were secured there.

***Eratoidea lozii* n. sp.**

Figs 12, 289, 293-295, 303, 305-307, 314-315

**Type material.** Honduras, Bay Islands, Guanaja, north eastern lagoon, 16°28.4'N 85°49.6'W, 10 m; holotype, 4.70 x 2.95 mm, W:L 63%, MNHN 23757; paratype 1, 5.64 x 3.46 mm, W:L 61%, MNHN 23758; paratype 2, 5.20 x 3.08 mm, W:L 59%, MNHN 23758, TMC; paratype 3, 4.77 x 3.01 mm, W:L 63%, MNHN 23758, TMC; paratype 4, 4.96 x 3.06 mm, W:L 62%, MNHN 23758, AWC.

**Other material.** 2 juv. lv., Honduras, Bay Islands, Guanaja, north eastern lagoon, 16°28.4'N 85°49.6'W, 10 m. TMC; 4 ad. lv., 1 ad. dd., 1 broken shell, Honduras, Bay Islands, Roatan, Fantasy Island, 16°21.3'N 86°26.3'W, 12 m, TMC; 2 ad. lv., Belize, off Ranguana Cay, 16°17'N 88°14'W, 6 m, TMC.

**Type locality.** Honduras, Bay Islands, Guanaja, north eastern lagoon, 16°28.4'N 85°49.6'W, 10 m, (Map ref. 31).

**Habitat.** Open and weed covered sand and mud substrates.

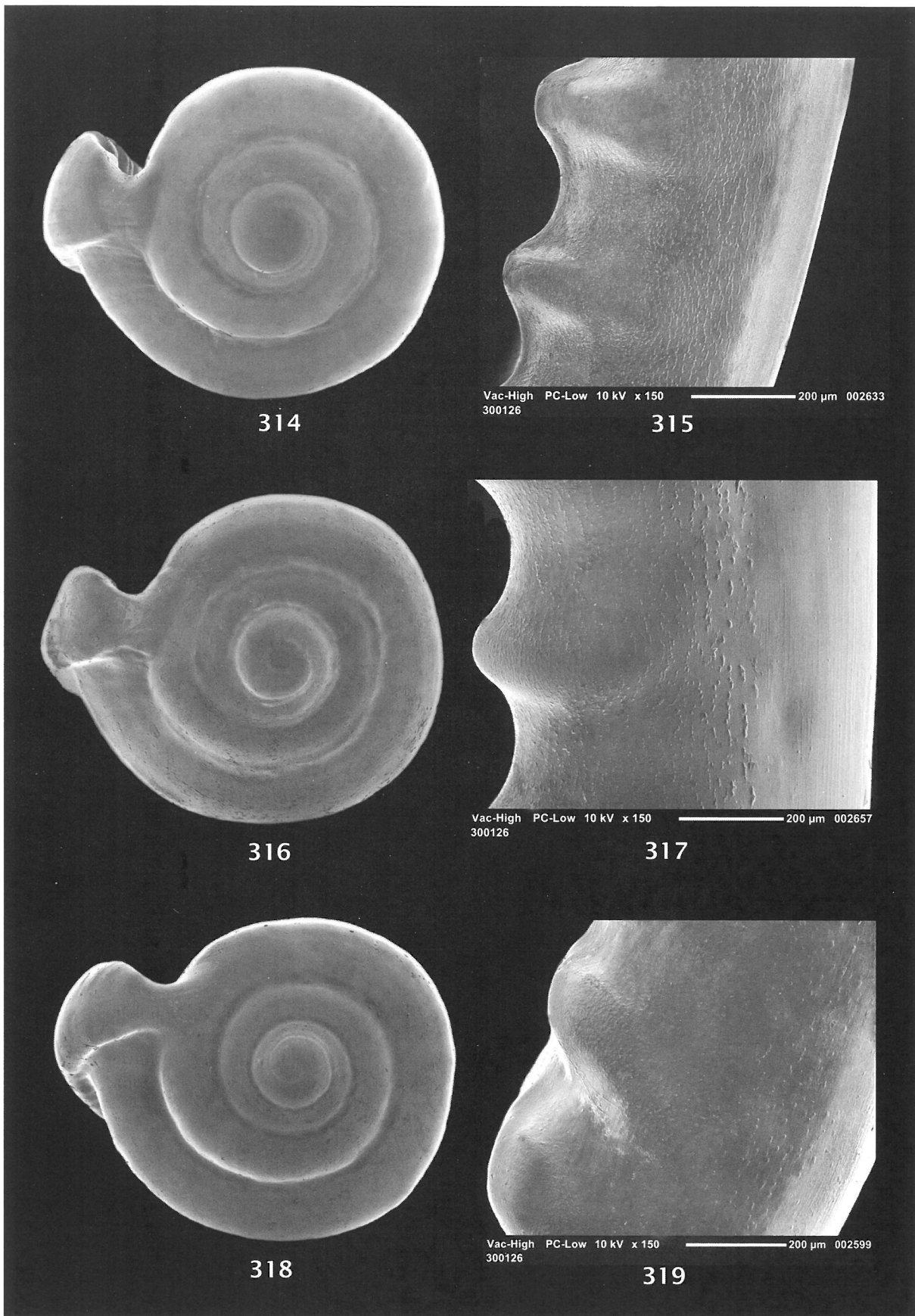
**Description.** Shell: shape broadly biconic, shiny. Faint traces of costae, particularly below suture. Surface texture in form of weak scales with serrated distal edges. Callus very weak except at labial insertion point and ventral callus. Colour absent except for traces of brownish bands, largely semi-transparent; lip, plications, protoconch and ventral callus opaque white. Size small, 4.70 x 2.95 mm, W:L 63%. Spire low, sides very slightly convex; total of approximately 4.5 whorls. Labial insertion point significantly below suture. Shoulder rounded. Lip moderately narrow; slightly curved, more so anteriorly; curled inwards; filled by ten strong denticles and one very small, partially formed denticle between first denticle and posterior canal; denticles elongated, curl around lip, faint ridges continuing onto varix; anterior two denticles located inside lip, slightly below edge. Weak posterior notch present. In side view lip straight; denticles, except anterior two, project from lip. Varix very wide, slightly more so medially, strong; dorsal groove strong. Lip combined with varix sweep around siphonal canal, dorsal groove

**Figures 314-319**

**314-315.** *Eratoidea lozii* n. sp., holotype, 4.70 x 2.95 mm, W:L 63%, Honduras, Bay Islands, Guanaja, north eastern lagoon, 10 m, MNHN 23757.

**316-317.** *Eratoidea* cf. *E. margarita* form A, ad. lv., 6.06 x 3.69 mm, W:L 61%, Venezuela, Las Aves de Sotavento; 1-28 m, MNHN.

**318-319.** *Eratoidea* cf. *E. margarita* form B, ad. lv., 7.49 x 4.64 mm, W:L 62%, West Indies, Barbuda, Spanish point, 1 m, MNHN.



strengthening until past base then rapidly reducing to merge with first plication. Four strong, weakly bifurcated plications fill approximately 57% of aperture; first weakest, widens, becomes slightly raised, merges with weakening lip and varix; second strongest, emerges wide, bifurcates weakly, extends well onto ventral callus, becomes pointed distally, merges with ventral callus; third and fourth short, strong, terminate abruptly. Aperture narrow posteriorly, moderately wide anteriorly.

Animal. Foot approximately 40% longer than shell and 20% wider; almost transparent; approximately six large white marks laterally; metapodium with smaller, randomly curled marks and spots. Tentacles long, tapered, very thin distally, semi-transparent, unmarked. Siphon long, semi-transparent with minute white spots, dense distally. Eyes located on pods at base of tentacles, black centre in orange encasing membrane with transparent posterior, accompanied by two opposing, adjacent orange marks. Mantle very thin, pale translucent white with minute white spots. Mantle roof with minute white spots and larger pale brown spots; brown spots concentrated anteriorly and posteriorly.

**Remarks.** The type locality of *Eratoidea lozii* n. sp. is Guanaja but it was also collected in Roatan and Belize (Figs 293-294). *E. lozii* n. sp. can be separated from all other species in the group by its small size; labial insertion point which is significantly below the suture; slightly different arrangement of lip and varix basally and unmarked tentacles; the almost transparent shell and different chromatism of the animal including the eyes (Fig. 289). The size ranges from 4.60 x 2.82 to 5.64 x 3.46 mm, W:L 59 - 63%. Average size: 5.05 x 3.11 mm, W:L 61.6%.

**Etymology.** Named after Loz Shamler, a friend and enthusiastic free diver who crewed with me on my boat during 2006, in recognition of his valued help.

*Eratoidea* cf. *E. margarita* form A  
Figs 287, 292, 304, 308-310, 316-317

**Material presented.** Venezuela, Las Aves de Sotavento; 12°01'N 67°39'W, 1-28 m; ad. lv., 6.06 x 3.69 mm, W:L 61%, MNHN; ad. lv., 5.65 x 3.41 mm, W:L 60%, MNHN; ad. lv., 6.35 x 3.96 mm, W:L 62%, TMC; ad. lv., 7.04 x 4.21 mm, W:L 60%, TMC; ad. lv., 7.45 x 4.54 mm, W:L 61%, AWC; ad. lv., 6.51 x 4.13 mm, W:L 63%, AWC.

**Other material.** 16 ad. lv., 2 juv. lv., 19 ad. dd., Venezuela, Las Aves de Sotavento; 12°01'N 67°39'W, 12 m, TMC.

**Locality.** Venezuela, Las Aves de Sotavento; 12°01'N 67°39'W, 1-28 m, (Map ref. 20).

**Habitat.** Open areas of clean or muddy sand, occasionally with light weed.

**Description.** Shell: shape broadly biconic, shiny. Very faint traces of costae. Surface texture sparse, in form of weak scales with serrated edges distally. Callus very weak except at labial insertion point and ventrally. Colour translucent white; lip, plications, ventral callus and protoconch opaque white. Size medium, 6.06 x 3.69 mm, W:L 61%. Spire low, sides straight, apex pointed; total of approximately 4.2 whorls. Labial insertion point slightly below suture. Shoulder narrowly rounded. Lip moderately narrow; essentially straight, strongly curved basally; curled inwards; filled by ten strong denticles and one very small, partially formed denticle between first denticle and posterior canal; denticles elongated, curled around lip, faint ridges continuing onto varix; the two anterior denticles located inside lip, slightly below edge. Weak posterior notch present. In side view spire set towards dorsal side, body whorl more inflated ventrally than laterally; lip straight; all denticles except anterior two project from lip. Varix very wide, straight, strong; dorsal groove strong. Varix widest at point where lip combined with varix sweep around the siphonal canal, varix first thins then narrows; lip and most of varix merge with first plication; remainder of varix and dorsal edge fade on ventral callus. Four strong weakly bifurcated plications fill approximately 57% of aperture; first weakest, widens, merges with weakening lip and varix; second strongest, emerges wide, widens strongly, weakly bifurcated, extends well onto ventral callus, narrows, becomes pointed distally, merges with ventral callus; third and fourth short, strong, merge quickly with ventral callus. Aperture narrow posteriorly, moderately wide anteriorly.

Animal. Foot approximately 40% longer than shell and 20% wider; translucent white; seven large white marks laterally; metapodium widely rounded, approximately six smaller white marks separated by one larger broken, white mark extending distally. Tentacles long, tapered, thin distally, semi-transparent, six or seven minute white spots. Siphon moderately long, translucent white, minute white spots, dense distally. Eyes located on pods at base of tentacles, black centre in encasing membrane with orange semi-circle on top, posterior transparent, accompanied by two opposing, barely perceptible, adjacent orange marks. Mantle very thin, pale translucent white without marks. Mantle roof with minute white spots and larger pale brown spots; concentration of brown spots posteriorly.

**Remarks.** *Eratoidea* cf. *E. margarita* form A ranges widely in Las Aves de Sotavento, about twenty five specimens in total being collected. It can be separated from the lectotype by its different morphology of the plications, from *E. lozii* n. sp. by its size, the higher

labial insertion point, translucent shell and by animal chromatism including the eyes and from *Eratoidea* cf. *E. margarita* form B by its differently shaped lip; different animal chromatism, in particular the foot and the eyes. However, I consider that, in the absence of animal images for examination, the morphological differences between the lectotype and *E. cf. E. margarita* form A are insufficiently clear to positively separate them as two distinct species. The size ranges from 6.06 x 2.82 mm to 7.45 x 4.54 mm, W:L 60 - 64%. Average size is approximately 6.51 x 3.99 mm, W:L 61.3%

***Eratoidea* cf. *E. margarita* form B**

Figs 16, 288, 290-291, 302, 311-313, 318-319

**Material presented.** West Indies, Barbuda, Spanish point, 17°32.7'N 61°44.3'W, 1 m; ad. lv., 7.49 x 4.64 mm, W:L 62%, MNHN; ad. lv., 7.24 x 4.68 mm, W:L 65%, MNHN; ad. lv., broken shell, MNHN.

**Other material.** None

**Locality.** West Indies, Barbuda, Spanish point, 17°32.7'N, 61°44.3'W, (Map ref. 7).

**Habitat.** Open, clean sand.

**Description.** Shell: broadly biconic, shiny. Clear traces of costae over most of surface. Surface texture sparse minute lumps. Callus very weak except at labial insertion point and ventrally. Colour translucent white; lip, plications, ventral callus and protoconch opaque white. Size medium, 7.49 x 4.64 mm, W:L 62%. Spire low, sides straight; total of approximately 4.7 whorls. Labial insertion point slightly below suture. Shoulder sharply rounded. Lip moderately narrow; posterior half straight, anterior half curved; curled inwards; filled by ten strong denticles and one very small, partially formed denticle between first denticle and posterior canal; second strongest; denticles elongated, curled around lip, faint ridges continuing onto varix; space between denticles somewhat lumpy; the three anterior denticles located inside lip, slightly below edge. Very weak posterior notch present. In side view spire set significantly towards dorsal side, body whorl more inflated ventrally; lip slightly concave and curved to left anteriorly; all denticles project from lip. Varix strong, very wide, slightly more so anteriorly; dorsal groove strong; varix widest slightly before combining with lip and sweeping around siphonal canal, varix first narrows at base with dorsal groove remaining strong, varix then rapidly thins and largely merges with first plication; thinned varix splits and part merges with ventral callus. Siphonal canal slightly flared and twisted to columellar side. Aperture more or less evenly, moderately wide. Four strong plications fill approximately 57% of aperture, bifurcation weak; first weakest, widens, merges with weakening lip and varix; second strongest, emerges wide, widens

strongly extends well onto ventral callus, narrows, becomes pointed distally, merges with ventral callus close to first plication; third, very slightly bifurcated shorter, strong, merges with ventral callus; fourth strong, merges with ventral callus. Aperture moderately wide.

Animal. Foot approximately 40% longer than shell and 20% wider; translucent white; extensively covered with large and small white marks; metapodium shows medial white mark on posterior half demarcated by some unmarked areas and small white marks, slightly truncated distally. Tentacles long, tapered thinly distally, semi-transparent, nine minute white spots. Siphon moderately long, translucent white with sparse minute white spots. Eyes located on pods at base of tentacles, black centre in translucent white encasing membrane, accompanied by two opposing, adjacent orange marks. Mantle very thin, pale translucent white with sparse white spots. Mantle roof with minute dark brown and pale brown spots, large pale brown spots posteriorly.

**Remarks.** *Eratoidea* cf. *E. margarita* form B can be separated from the lectotype by the different morphology of its plications and lip. It is closest to *E. cf. E. margarita* form A from which it can be separated by its lip and varix; the manner in which the lip is twisted basally towards the plications; the differing surface texture and animal chromatism, in particular the eyes. However, I consider that, in the absence of animal images for examination, the morphological differences between the lectotype and *E. cf. E. margarita* form B are insufficiently clear to positively separate them as two distinct species. The size range is 7.24 x 4.68 to 7.49 x 4.64 mm, W:L 62 - 65%. Average size is 7.37 x 4.66 mm, W:L 63%.

**ERATOIDEA HEMATITA SPECIES GROUP**

Figs 21-22, 320-399

**INTRODUCTION**

*Eratoidea hematita*, which was originally described as *Marginella hematita* Kiener, 1834 (Fig. 331) is the only previously described species in the genus *Eratoidea* Weinkauff, 1879 which can be assigned to the proposed *Eratoidea hematita* species group, and it has been chosen as the representative species for the group. Five new species are described herein, and the group is summarized as follows:

*Eratoidea hematita* Puerto Rico, beach drift; group representative species.

*Eratoidea cochensis* n. sp., Venezuela, off Isla Coche, 6 m.

*Eratoidea ranguanaensis* n. sp., Belize, off Ranguana Cay, 25 m.

*Eratoidea pustulata*, n. sp., Venezuela, Islas Los Testigos, Conejo channel, 17-46 m.

*Eratoidea robusta* n. sp., Venezuela, Islas Los Testigos, 41-43 m.

*Eratoidea grandis* n. sp., Aruba, off south west coast, 90-105 m.

Enquiries to locate the type material were unsuccessful and it appears that it has been lost. Three shells from the Cuming collection are held in the type collection of the BM(NH) (Fig. 330). They are mounted on a board and labelled 'hematita, Kiener'; 'Porto Rico'. On the reverse there are several notes: 'marg. hematita Kiener = Erato hematina, Menke Porto Rico'; 'Reeve Con. Ic.'; 'Sow Thes.'; 'Figd. in C. I. Erato, pl. ii, f. 8 a, b'; and the initials 'M. C.' of Museum Cuming. These three shells have no type material status at present but could be considered for assignment as lectotypes if the type material is definitely lost. They are a dull rose-red colour, with a bright red protoconch which is a common feature in the group, even, for example, in otherwise grey coloured shells (Figs 349-351). The dull rose-red colour of these three shells could possibly be faded original red.

Kiener gave the type locality *Eratoidea hematita* as 'Mediterranean Sea, coasts of Sicily' which is an error as the *E. hematita* group is only known from the Caribbean. A significant point about the three shells from the Cuming Collection is that their location is given as Puerto Rico. The reference to 'Erato hematina, Menke Porto Rico' indicates the understandable confusion of early authors with the genus *Erato*: some species of *Erato* have strongly pustulate surface texture which can be compared with that found in the *E. hematita* group, for example, *Erato (Hespererato) panamensis* Carpenter, 1856, which is a strongly pustulate species of a similar size and with a denticulate lip.

Lipe (1991) illustrates *E. hematita* with the caption '9 - 12 mm. Dredged in Gulf of Mexico off Florida. Colour red. Common off Puerto Rico beaches after storms'. There is also a large coloured image of *E. hematita* on the back cover (Fig. 329). The morphology of the latter shell, from Florida, is different to those in the BM(NH) from Puerto Rico (Fig. 330) and also to those from the southern

Caribbean except for *E. grandis* n. sp. (Figs 22, 391) with which it shares the thin straight lip. Lipe's note about the prevalence of *E. Hematita* in Puerto Rico supports the probability that the type locality of the species is Puerto Rico and that the shell colour is red. The original description of *Eratoidea hematita* was supported by a drawing (Fig. 331) which depicts a red coloured shell. A drawing by Sowerby (1846) illustrates the significant features of *E. hematita* including the pustules on the ventral surface which are shown as brownish spots on a pale but essentially red coloured shell (Fig. 328). The illustration by Weinkauff (1879) is more artistic than accurate (Fig. 332), but it is interesting as it clearly shows the ventral surface pustules found in the group, and it is coloured red. All the above observations indicate the probability of the type locality being Puerto Rico and that the shell colour was red.

However, this position is weakened by the following: Tryon (1883), states "*Marginella hematita* Kiener, location, Porto Rico, West Indies", is "smooth, or very slightly pitted, light lilac-red". 'Pitted' obviously refers to the pustules of the *E. hematita* group. While supporting Puerto Rico as being the type locality and the shell being pustulose, it casts doubt on the red colour of the shells which could be 'lilac-red, somewhat similar to the present colour of the three shells from the Cuming collection. Most recently, Cossignani (2006) presented five images showing colour variations of *E. hematita* from St. Vincent with sizes ranging from 7.5 to 9 mm. Two of these images illustrate shells which are pale dull pink with a red protoconch, and it is noted that their morphology compares favourably with Sowerby's drawing (Fig. 328). In only one of the five images is the shell apparently pustulose.

All the material belonging to the *E. hematita* group which I collected was from the West Indies and southern Caribbean and was in colours other than red, except for one lot from Venezuela, off Isla Coche, which is described herein as *E. cochensis* n. sp. It is deep red with a bright red protoconch and slightly pustulose (a few strong pustules).

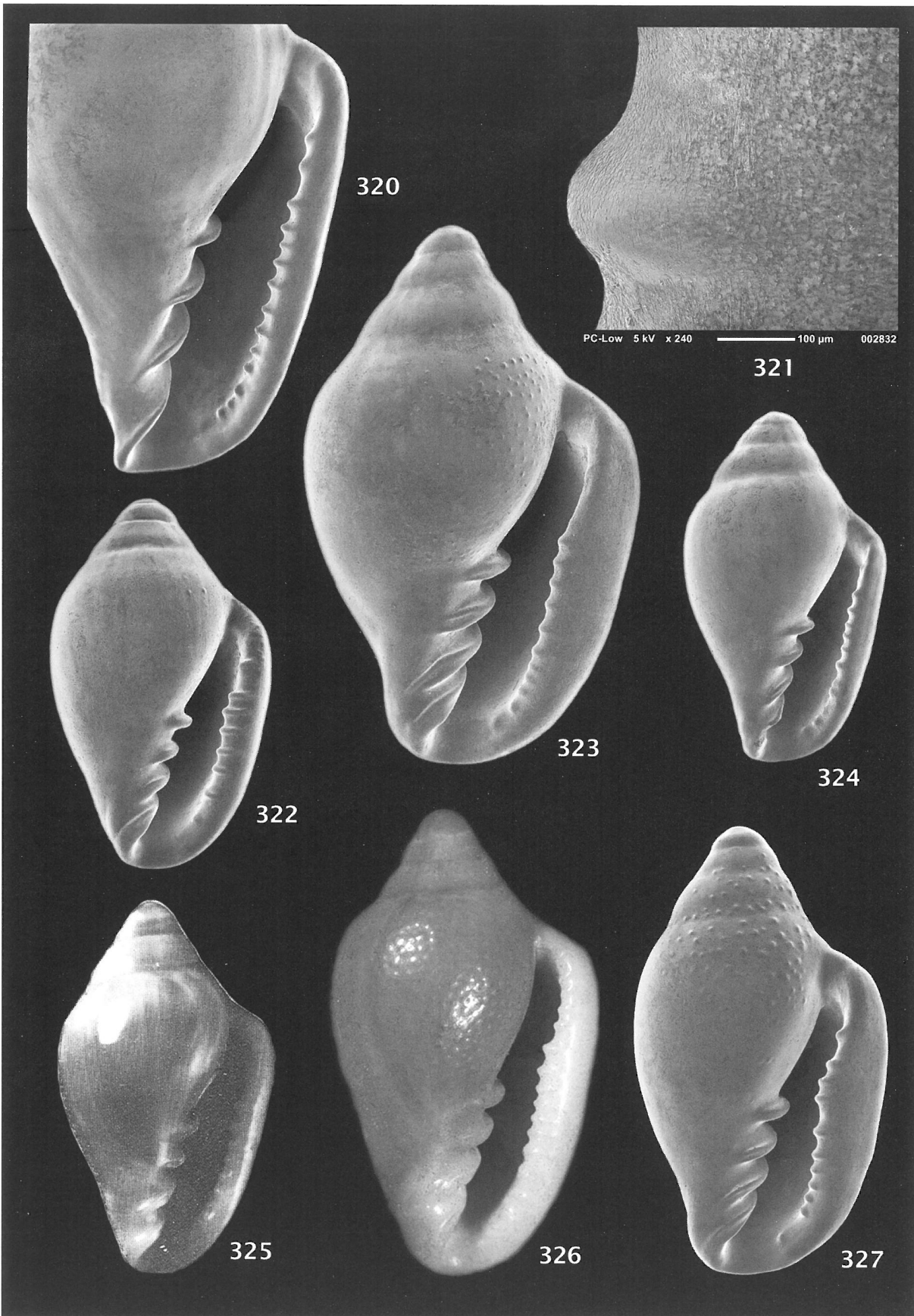
### Figures 320-327

**320.** *Eratoidea grandis* n. sp., paratype 2, 13.0 x 7.00 mm, W:L 54%, Aruba, off south west coast, 90-105 m, MNHN 23769, TMC; **321.** *Eratoidea pustulata* n. sp., holotype, 8.25 x 4.66 mm, W:L 56%, Venezuela, off Islas Los Testigos, 17-46 m, MNHN 23764; **322.** *Eratoidea cochensis* n. sp., holotype, 6.59 x 3.89 mm, W:L 59%, Venezuela, east of Isla Coche, 6 m, MNHN 23759; **323.** *Eratoidea robusta* n. sp., holotype, 9.94 x 6.10 mm, W:L 61%, Venezuela, south west of Islas Los Testigos, 41-43 m, MNHN 23766; **324.** *Eratoidea ranguanaensis* n. sp., holotype, 6.53 x 3.82 mm, W:L 58%, Belize, Ranguana Cay, 25 m MNHN 23761.

**325-326.** *Eratoidea hematita* (Kiener, 1834).

**325.** Florida-Caribbean, Kaicher (1973, card 14), 7 mm; **326.** One of three shells in BM(NH), 9.6 mm, Cuming col., Puerto Rico, beach drift.

**327.** *Eratoidea pustulata* n. sp., holotype, 8.25 x 4.66 mm, W:L 56%, Venezuela, off Islas Los Testigos, 17-46 m, MNHN 23764.



If, as seems likely, the original type material is confirmed as having been lost and the three shells in the BM(NH) from the Cuming collection are selected as lectotypes, the type locality will be confirmed as Puerto Rico. Such a decision would not effect the status of the five new species described in this article because none of them can be confused with the material from Puerto Rico because of differences in shell morphology.

Rios (1994) gave the range of *E. hematita* as being North Carolina, Florida, the West Indies and Brazil but the shell from Brazil which he illustrated belongs to the genus *Marginella* and not *Eratoidea*. When this error was corrected there remained no known records of the *E. hematita* group from south of the Caribbean.

During my years of shelling in the Caribbean I collected many samples belonging to the *Eratoidea hematita* group. Clearly the group is well represented in Puerto Rico although I did not collect any north of Antigua. From Antigua, south to Trinidad and Tobago and west throughout the islands off the Venezuelan coast as far west as Aruba the group is well represented in localised areas, for example, around Isla Margarita and off the south west coast of Aruba. Only one sample was collected along the coast of Venezuela, at Cabo Codera. The group is widely but thinly distributed along the Colombian and Panamanian coasts. North of this area it is known from the Bay Islands of Honduras and from Belize, Florida (Lipe, 1991, and Kaicher 1973:14) and Puerto Rico. Espinosa and Ortea (1993-2009), who carried out extensive sampling in Cuba and Costa Rica, made no reference to any *Eratoidea* species, Redfern (2001) did not find this group in Abaco, Bahamas and I am not aware of any records from Mexico, Jamaica, Haiti or the Dominican Republic. Therefore, it seems probable that the *E. hematita* group is absent from this large area.

Six metres is the shallowest depth known to me for the *E. hematita* group. Samples were collected at this depth on weed covered lumps of dead coral off Isla Coche, Venezuela; and off Isle Quatre, St Vincent and the Grenadines, where they can be found dwelling on weed on a sandy bottom. Generally, samples were dredged on sand and mud substrates, down to 120 m.

## MATERIALS and METHODS

Only five new species in the *E. hematita* group are described herein, but many shells, with a variety of morphologies remain undescribed because of insufficient material, particularly live animals. A number of these are illustrated (Figs 349-354, 381-399). Shells in the *Eratoidea hematita* group are very variable; possibly the most variable of the *Eratoidea* species groups.

A constant magnification of X5 has been used for both optical photographs and SEM shell images in ventral and side view in order to give a true indication of the relative sizes of each species in the group.

Exceptions to this are, one plate with SEM images at X10 magnification which shows the shell morphology, ventral view, in greater detail (Figs, 320, 322-327); animal and images of other features, such as the apical images, all of which are produced at various suitable magnifications.

**Morphological features.** Shells in the *Eratoidea hematita* group are biconic and generally shiny; pustules are frequently present on the ventral surfaces (Figs 326-327), and fine texture is also present (Fig. 321). Callus is often very strong anterior ventrally, particularly aligned with the first and second plication where the varix, after curving around the siphonal canal, finally fades out; and weak at the labial insertion point. Shells are always coloured and always without any sign of pattern (the feature which most decisively separates the *E. hematita* group from the genus *Marginella*). Deep shades of red, dull yellow to orange, grey or brown are the most common; the protoconch is often bright red, even in shells which are of a different colour (Figs 349-351). Shell size is small to moderately large; size range 5.80 x 3.18 to 15.0 x 8.37 mm, W:L ratio 51 - 63%. Spires vary from medium to tall with convex or concave sides; the apex can be sharply to broadly rounded. Whorls range from approximately 4.7 - 5.7 in total, comprised of approximately 2.2 - 2.6 protoconch whorls and 2.3 - 3.5 teleoconch whorls. The suture is always weak but distinct, and occasionally deeply grooved between convex whorls (Figs 382, 384). The shoulder varies from very strong to rounded and the labial insertion point is always significantly below the suture. The lip varies from narrow to moderately wide, straight or curved, curled inwards, weakly to strongly denticulate, and the varix is always strong. Siphonal and posterior notches are absent. Four strong plications fill more than half of aperture, bifurcation and widening of the distal ends are common features (Fig.323). The aperture is evenly narrow to moderately wide.

Animal. The foot is approximately twice as long as the shell and often significantly wider; the chromatism is semi-transparent, densely covered with minute off-white spots giving a translucent white appearance, to densely coloured with diffuse off white marks. Tentacles and siphon are moderately long and chromatism is generally similar to the foot. Eyes are unusually small and are located on a pod at the base of the tentacles. All have black centres encased in a white or off-white membrane (Figs 334, 371). Mantles in the *E. hematita* group are always papillose with thirty or more long papillae; two sections of mantle tend to meet in a sinuous seam medially. No mantle roofs were observed due to the opaque nature of the shells.

*Eratoidea hematita* species group (RS. *Eratoidea hematita* (Kiener, 1834))

Synonyms *Marginella jaspidea* Schwengel, 1940, and *Marginella philtata* Abbott, 1954).

***Eratoidea hematita*** (Kiener, 1834)

Figs 21, 326, 328-332

**Type material.** The type material appears to have been lost.

**Material presented.** Three shells from the 'Cuming' collection, in the type collection of the BM(NH). Sizes 8.4; 8.6; and 9.6 mm, Puerto Rico, beach drift.

**Type locality.** Mediterranean Sea, coasts of Sicily. This was an error made at the time of the original description. There is evidence to indicate that Puerto Rico in the Caribbean is the probable type locality.

**Original description.** Shell very small, shiny, oblong, colour uniform deep red "sanguine"; Spire steep, obtuse; the lip a paler colour than the rest of the shell. Denticulate for the whole length of the interior; Varix very pronounced; four plications. Length 0.4 inch x width 0.2 inch, = 10 mm x 5 mm.

**Complimentary notes.** The three shells in the BM(NH) are 8.4, 8.6, and 9.6 mm in length, with approximate W:L 55 - 57%. The 9.6 mm shell is strongly pustulate; the 8.6 mm shell is eroded but traces of pustules can be seen; the 8.4 mm shell is mounted on its ventral side and only the dorsum is visible. The colour of all three shells is faded rose-red with a deeper, bright red protoconch: the contrasting colour of the protoconch is a feature frequently found in the *E. hematita* group. The teleoconch has approximately 2.8 whorls and the spire varies from straight to slightly concave. First and second plications are white; third and fourth are rose-red; all plications are somewhat flattened and show signs of bifurcation, particularly the second which is wide medially. The lip is moderately wide, slightly more so medially and slightly sinuous; filled by sixteen denticles; the seventh denticle is the most prominent with five weaker ones above and ten, becoming progressively weaker, below. Of particular note are the lirae which extend from the medial denticles, over the edge of lip and onto the varix. The plications occupy approximately 57% of the aperture. The aperture is long and more or less evenly narrow. The profile, in ventral view, shows a straight abapertural side.

***Eratoidea cochensis*** n. sp.

Figs 21, 322, 333-341

**Type material.** Venezuela, east of Isla Coche, 10°47.3'N 63°52.7'W, 6 m; holotype, 6.59 x 3.89 mm, W:L 59%, MNHN 23759; paratype 1, 8.31 x 4.57 mm, W:L 55%, MNHN 23760; paratype 2, 8.34 x 4.94 mm, W:L 59%, MNHN 23760, TMC; paratype 3, 6.98 x 3.93 mm, W:L 56%, MNHN 23760, TMC;

paratype 4, 5.90 x 3.58 mm, W:L 61%, MNHN 23760, TMC.

**Other material.** 2 juv. lv., Venezuela, east of Isla Coche, 10°47.3'N 63°52.7'W, 6 m, TMC.

**Type locality.** Venezuela, east of Isla Coche, 10°47.3'N 63°52.7'W, 6 m, (Map ref. 14).

**Habitat.** Coral rubble covered with algae and short weed.

**Description.** Shell: shape broadly biconic; shiny; very weakly pustulate, pustules located medially on ventral surface. Callus generally weak, moderately strong ventral callus close to distal end of first and second plications. Colour largely deep red; lip, plications, ventral callus opaque pinkish-white; protoconch deeper shiny red. Size medium, 6.59 x 3.89 mm, W:L 59%. Spire medium, approximately 27% of shell length. Whorls straight sided between sutures, 4.5 whorls comprised of protoconch 2.2 whorls, teleoconch 2.3 whorls. Suture weak, marked by thin off-white callus edge. Labial insertion point significantly below suture. Shoulder broadly rounded. Lip moderately, evenly wide, very slightly convex, slightly narrower posteriorly, slightly curled inwards; posterior canal wide, curved to first denticle; filled by eight almost evenly sized denticles; first and second widely spaced, remainder equally spaced, eighth located slightly deeper inside lip. In side view lip slightly convex, more so posteriorly; all denticles project except eighth. Varix wide, widest posterior medially, dorsal edge very slightly concave, dorsal groove strong. Lip sweeps around siphonal canal, merges smoothly with wide limbs of first plication; varix sweeps around siphonal canal widening and weakening; fading dorsal edge sweeps upwards to form weak axial ridge of ventral callus. Four plications fill 63% of aperture; first weakly, widely bifurcated, limbs remain separated; second very weakly bifurcated, merges with ventral callus close to first; third and fourth barely emerge and end quite abruptly. Aperture moderately wide, slightly wider anteriorly.

Animal. Foot at least 50% longer than shell length and slightly wider; translucent white, covered by areas of fine white spots alternating with areas of black. Tentacles moderately long, semi-transparent, dark grey area basally, off-white annular rings medially, random marks distally. Siphon long, fine white spots and a few white marks on black background. Eyes very small, located on small pods at base of tentacles; black centre in off-white encasing membrane. Mantle papillose with approximately thirty moderately long papillae; sinuous join over dorsum; chromatism similar to foot, reddish hue apparent through translucent mantle; papillae with off-white spots when fully extended.

**Remarks.** The Kaicher (1973:14), image of *Eratoidea hematita* (Fig. 332), has a visual appearance which compares well with *Eratoidea cochensis* but the locality is omitted from the data, therefore it is of no help in the identification of species. *E. cochensis* n. sp. differs from all the shells presented in the *E. hematita* group and not confirmed as *E. hematita sensu stricto* in a number of subtle ways: the spire is always straight sided with 2.3 teleoconch whorls compared to *E. hematita* with concave sides and 2.8 teleoconch whorls; labial denticles are less numerous and stronger and lirae do not extend over the lip as they do in *E. hematita*. The most significant difference is in the portion of the aperture filled by the plications: in *E. hematita* they fill 57% of the aperture and in *E. cochensis* n. sp., they fill 63%. The two species have a significantly different visual appearance, and finally, they are widely separated geographically, and by the strong equatorial current which flows westwards through the Caribbean.

Amongst the specimens which were collected at the type locality was one very mature adult shell (Fig. 336). Due to its age this shell has a stronger varix and much stronger ventral callus which somewhat changes the profile, but this shell can still be identified as *E. cochensis* n. sp. by its lip and denticles. These specimens from Isla Coche were the only red coloured *E. hematita* group shells which I collected; all the others, from about 25 different locations, ranged from shades of yellow or orange to grey or brown. All those recorded from Puerto Rico and Florida are coloured red or rose-red (lilac red), which is further evidence pointing to Puerto Rico as being the type locality.

**Etymology.** The name is taken from the type locality.

*Eratoidea ranguanaensis* n. sp.  
Figs 324, 342-348, 389

**Type material.** Belize, Ranguana Cay, 16°21.3'N 86°26.3'W, 25 m; holotype, 6.53 x 3.82 mm, W:L

58%, MNHN 23761; paratype 1, broken shell, MNHN 23762; paratype 2, 5.90 x 3.46 mm, W:L 59%, western Caribbean, MNHN 23763; paratype 3, Juv. lv., (minute), MNHN 23762.

**Other material.** None.

**Type locality.** Belize, Ranguana Cay, off to west, 16°17'N 88°14'W, (Map ref. 33).

**Habitat.** Algae covered coral rocks and rubble.

**Description.** Shell: shape biconic; smooth, shiny; surface texture insignificant. Callus weak. Colour pinkish-beige; lip and plications pale beige; protoconch, varix and ventral callus pink. Size medium, 6.53 x 3.82 mm, W:L 58%. Spire medium, 32% of shell length. Whorls convex between sutures; approximately 5.0 whorls comprised of protoconch 2.6 whorls, teleoconch 2.4 whorls. Suture weak, highlighted by thin, off-white callus edge. Labial insertion point slightly below suture. Lip evenly narrow, slightly curved, more so anteriorly, very slightly curled inwards; posterior canal wide, sharply curved to first denticle; filled by thirteen irregularly sized denticles, first two very weak, followed by six small denticles, remainder weak, located internally below edge of lip. In side view lip strongly convex, more so posteriorly; approximately eight medial denticles project from lip. Varix moderately, evenly wide; slightly concave dorsal edge; dorsal groove strong. Lip and weakening varix sweep around siphonal canal, merge with first plication. Four weakly bifurcated plications fill approximately 60% of aperture; first thickened, weakly bifurcated; second very weakly bifurcated, merges with ventral callus; third and fourth barely emerge, terminate quite abruptly. Ventral callus weak; line of callus wash extends from second plication, close to distal end of third and fourth plication to posterior canal. Aperture moderately wide, wider anteriorly.

## Figures 328-354

**328-332.** *Eratoidea hematita* (Kiener, 1834).

**328.** Drawing by Sowerby (1846, pl. LXXV, figs 60, 61); **329.** 9-12 mm, USA, Florida, Lipe (1991, back cover); **330.** 9.6 mm, one of three shells in BM(NH), Cuming col., Puerto Rico, beach drift; **331.** Original drawing by Kiener (1834), p11, pl vii, fig. 31; **332.** Drawing by Weinkauff (1879, pl. 9, fig 12).

**333-341.** *Eratoidea cochensis* n. sp., Venezuela, east of Isla Coche, 6 m.

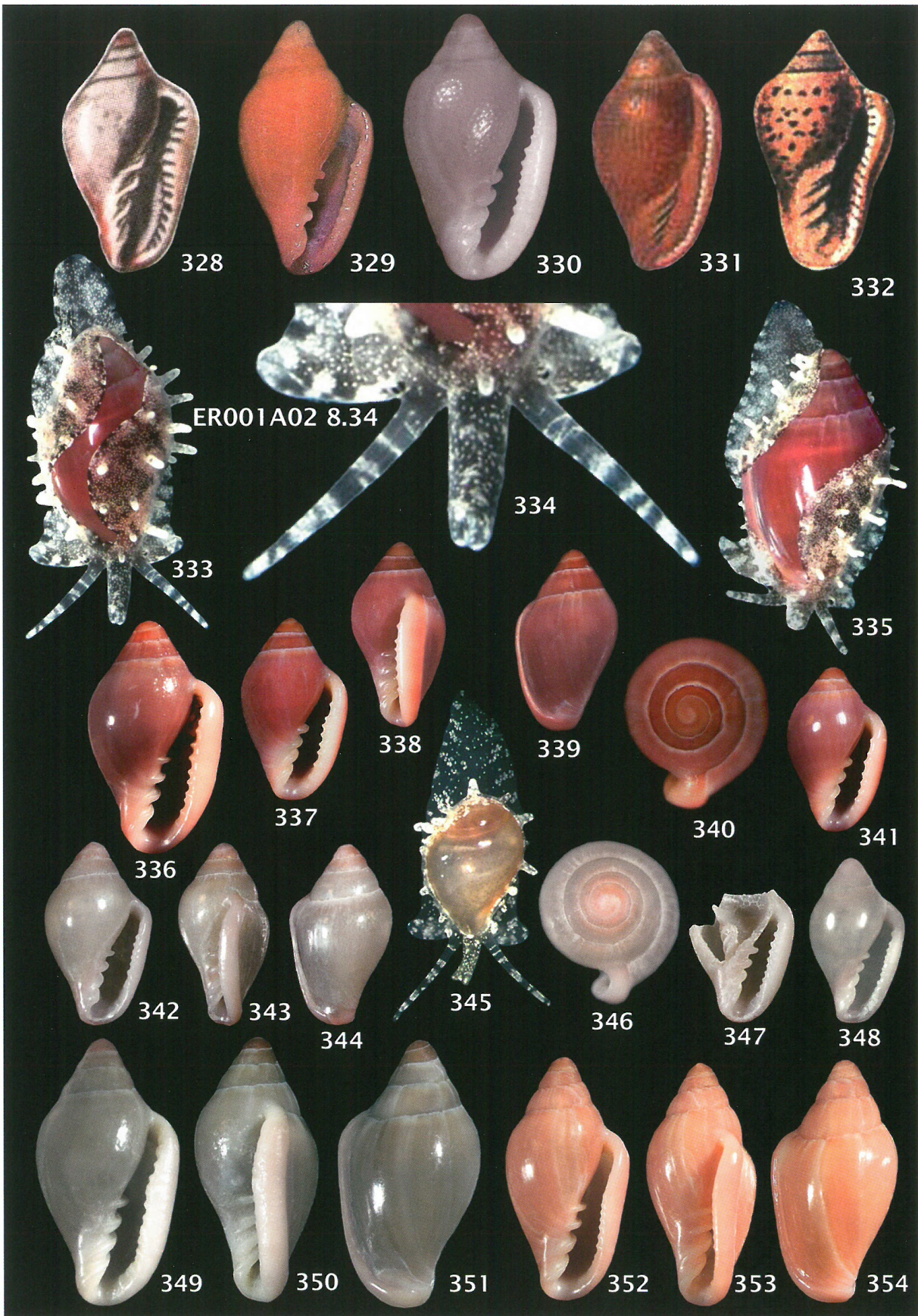
**333-334.** Paratype 1, 8.31 x 4.57 mm, W:L 55%, MNHN 23760; **335, 337-336.** Paratype 2, 8.34 x 4.94 mm, W:L 60%, MNHN 23760, TMC; **340.** Holotype, 6.59 x 3.89 mm, W:L 59%, MNHN 23759; **341.** Paratype 4, 5.90 x 3.58 mm, W:L 61%, MNHN 23760, TMC.

**342-348.** *Eratoidea ranguanaensis* n. sp., Belize, Ranguana Cay, 25 m.

**342, 344, 346.** Holotype, 6.53 x 3.82 mm, W:L 58%, MNHN 23761; **345.** Paratype 3, juv. lv., MNHN 23762; **347.** Paratype 1, broken shell, MNHN; 23762; **348.** Paratype 2, 5.90 x 3.46 mm, W:L 59%, western Caribbean, location unknown, MNHN 23763.

**349-351.** *Eratoidea* sp., ad. dd., 9.51 x 5.14 mm, W:L 54%, St Vincent, TMC.

**352-354.** *Eratoidea* sp., ad. dd., 8.68 x 4.48 mm, W:L 52%, St Vincent and the Grenadines, Isle Quatre, 15 m, TMC.



Animal. Based on a minute juvenile specimen: foot twice shell length, slightly wider, semi-transparent, sparsely covered with yellow-white spots, intermingled with fewer dark brown spots; propodium similarly marked. Tentacles, yellow-white marks interspersed with dark brown spots. Siphon densely covered with small yellow-white spots, intermingled with medium brown spots. Eyes small, located on small pods at base of tentacles; black centre in off-white encasing membrane. Mantle papillose; papillae pale yellow-white.

**Distribution.** Only known from the type locality.

**Remarks.** In addition to material collected at the type locality, one shell was acquired without data except 'believed to be from the western Caribbean'. The morphology of this shell appears to be identical to the holotype therefore, it has been assigned as paratype 2. The live animal collected at the type locality is a very small juvenile. *E. ranguanaensis* n. sp. differs from all other species in the group by its smaller size, thin shell, lip which is straight in ventral view and strongly convex in side view, shell colour, and animal chromatism.

**Etymology.** The name is taken from the type locality.

*Eratoidea pustulata* n. sp.

Figs 321, 327, 356-372

**Type material.** Venezuela, off Islas Los Testigos, approximately 11°22'N 65°05'W, 17-46 m; holotype, 8.25 x 4.66 mm, W:L 56%, MNHN 23764; paratype 1, 8.68 x 4.88 mm, W:L 56%, MNHN 23765; paratype 2, 7.45 x 4.02 mm, W:L 54%, MNHN 23765, AWC; paratype 3, 8.57 x 5.15 mm, W:L 60%, MNHN 23765, TMC; paratype 4, 7.83 x 4.47 mm, W:L 57%, MNHN 23765, AWC; paratype 5, 8.90 x 4.69 mm, W:L 53%, MNHN 23765, TMC.

**Other material.** 4 ad. lv., 1 ad. dd., 2 juv. dd., 3 ad,

broken pieces, Venezuela, off Islas Los Testigos, approximately 11°22'N 65°05'W, TMC.

**Type locality.** Venezuela, off Islas Los Testigos, approximately 11°22'N 65°05'W, 17-46 m, (Map ref. 13).

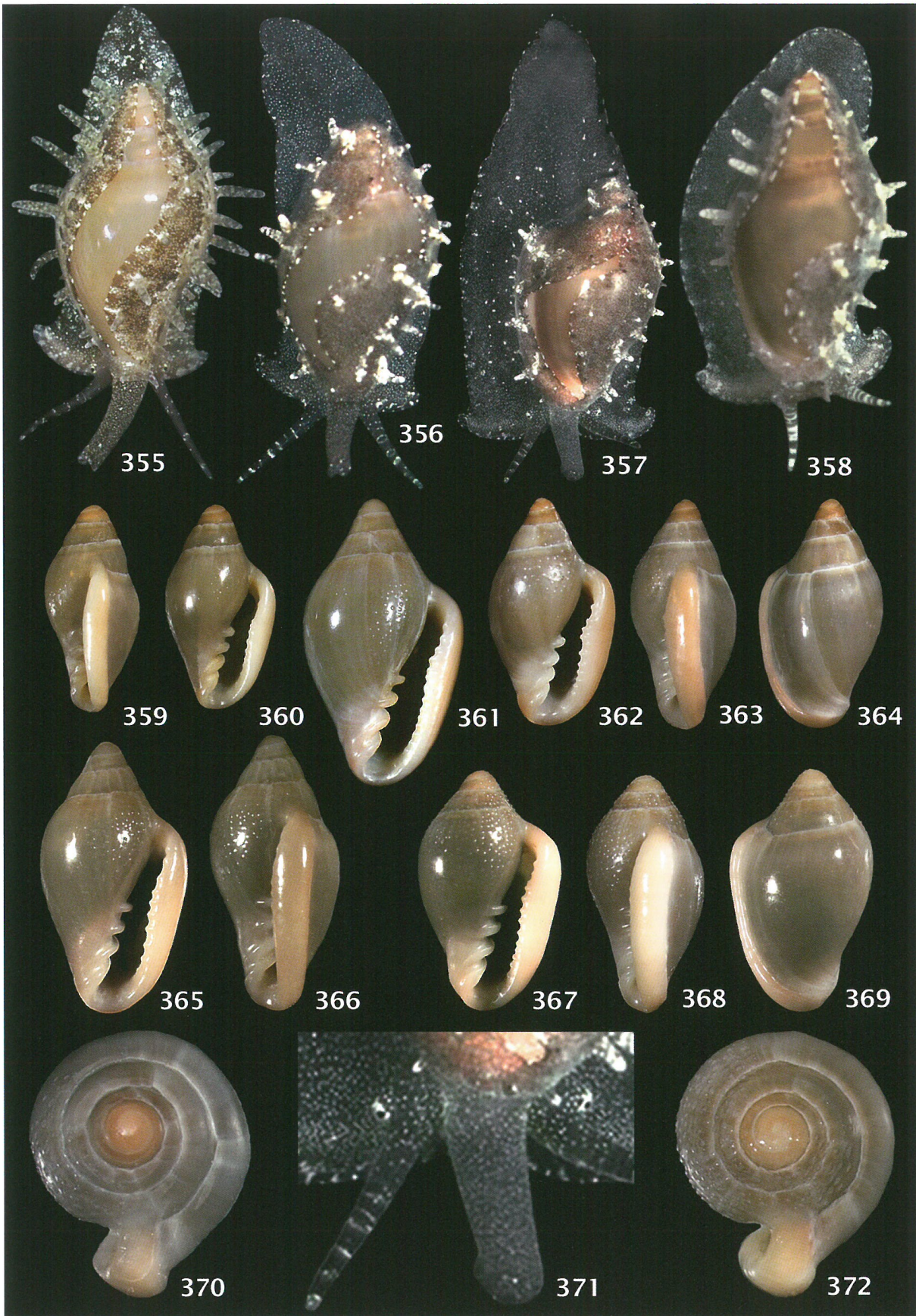
**Description.** Shell: shape broadly biconic, glossy; surface weakly to strongly pustulate, pustules large; some very fine texture also present on lip and around aperture. Ventral callus very strong at distal end of plications, weak to level between third and fourth plication; axial ridge extending to level of second plication. Colour generally dull grey-brown; protoconch moderately bright reddish-brown; lip very pale reddish-brown; varix, base and anterior part of ventral callus pale reddish-brown; plications opaque white; suture marked by narrow off-white line. Size medium, 8.25 x 4.66 mm, W:L 56%. Spire medium, approximately 29% of shell length, sides very slightly convex. Average of 5.3 whorls comprised of protoconch 2.6 whorls, teleoconch 2.7 whorls. Suture distinct. Labial insertion point significantly below suture. Shoulder rounded. Lip wide, widest medially; somewhat sinuous being concave posteriorly, convex medially, concave anteriorly; curled inwards; almost filled by eleven small, moderately evenly sized denticles, first slightly stronger; eleventh denticle remote from tenth, located slightly below inside edge of lip; posterior canal moderately wide; sharply curved around to first denticle. In side view lip curved, more so posteriorly; posterior and medial denticles project from edge; sweeps around base and merges smoothly with first plication. Varix very strong, wide, slightly more so medially; dorsal edge slightly concave; dorsal groove strong. Varix, weakening, sweeps around siphonal canal, merges with ventral callus. Four bifurcated plications fill approximately 61% percent of aperture; first weakly bifurcated, upper limb stronger, both limbs merge with strong ventral callus formed by fading varix; second only slightly widened, extended distally, merges with ventral callus; third and fourth: short, barely emerge, not significantly widened.

**Figures 355-372**

**355.** *Eratoidea* sp., juv. lv., 8.48 mm, Venezuela, north west of Isla Margarita, 90 m, TMC.

**356-372.** *Eratoidea pustulata* n. sp., Venezuela, off Islas Los Testigos, 17-46 m.

**356.** Juv. lv., 5.81 mm, TMC; **357, 367-369, 371-372.** Paratype 3, 8.57 x 5.15 mm, W:L 60%, MNHN 23765, TMC; **358.** Ad. lv., 7.16 x 3.93 mm, W:L 55%, TMC; **359-360.** Paratype 2, 7.45 x 4.02 mm, W:L 54%, MNHN 23765, AWC; **361.** Ad., 10.3 x 5.76 mm, W:L 56%, TMC; **362-364, 370.** Holotype, 8.25 x 4.66 mm, W:L 56%, MNHN 23764; **365-366.** Ad. lv., 9.77 x 5.40 mm, W:L 55%, TMC.



Animal. Foot approximately twice shell length, significantly wider; semi-transparent; densely covered with minute off-white spots giving translucent white appearance, intermingled with some similarly sized brown or black spots and occasional slightly larger off-white spots; edge outlined with small off-white spots; propodium somewhat highlighted by greater number of minute off-white spots. Tentacles moderately long, semi-transparent; basal half similar chromatism to foot, distal half with off-white annular rings and other marks. Siphon long; similar chromatism to foot. Eyes very small, black in off-white encasing membrane. Mantle papillose; completely covers shell, joins dorsally in sinuous seam; chromatism similar to foot; edge highlighted with alternating off-white and brown marks; papillae with off-white spots when fully extended. Mantle roof unknown.

**Distribution.** Only known from the type locality,

**Remarks.** *Eratoidea pustulata* n. sp. is separated from *E. cochensis* n. sp. by its very pustulate shell with unusually large pustules (Fig. 327); by the differing chromatism, particularly the lack of pattern on the foot, very different shell colour and by the medially widened lip. Shell size ranges from medium sized 7.16 x 3.93 to 11.3 x 6.3 mm, W:L 53 - 60%. *E. robusta* n. sp. which has shell morphology closest to *E. pustulata* n. sp. is separated by its more inflated shell giving it a very robust appearance, shorter, sharper spire and the finer labial denticles.

**Etymology.** The name alludes to the very pustulate ventral surface of this new species and is taken from the Latin word *pustula* meaning pimple.

***Eratoidea robusta* n. sp.**  
Figs 323, 373-380

**Type material.** Venezuela, south west of Islas Los Testigos, 11°20.1'N 63°01.5'W, 41-43 m; holotype, 9.94 x 6.10 mm, W:L 61%, MNHN 23766; paratype 1, 9.04 x 5.66 mm, W:L 63%, MNHN 23767.

**Other material.** 2 ad. broken pieces, Venezuela, south west of Islas Los Testigos, 11°20.1'N 63°01.5'W, 41-43 m, TMC.

**Type locality.** Venezuela, south west of Islas Los Testigos, 11°20.1'N 63°01.5'W, 41-43 m, (Map ref. 13).

**Description.** Shell: shape broadly biconic, glossy; ventral surface moderately pustulose, otherwise surface texture insignificant. Callus weak. Colour yellow brown. Size medium, 9.94 x 6.10 mm, W:L 61%. Spire medium, 27% of shell length, straight sided somewhat pointed. Approximately 5.5 whorls comprised of protoconch 2.6 whorls, teleoconch 2.9 whorls. Suture weak, highlighted by thin off-white callus edge. Labial insertion point significantly below suture. Shoulder rounded. Lip wide, slightly more so medially; slightly convex; curled inwards; posterior canal moderately wide; posterior 30% with indistinct signs of denticles, anterior 70% with twelve small even denticles. In side view lip evenly convex; all denticles project weakly. Varix wide, strong; dorsal edge straight; dorsal groove deep. Lip and varix remaining strong sweep around siphonal canal, largely merge with first plication; dorsal edge of varix kinked upwards merges with ventral callus ridge (Fig. 376). Four plications fill approximately 60% of aperture; first weakly bifurcated, widens, limbs remain wide; second bifurcated, limbs widen, almost rejoin before merging with ventral callus; third bifurcated, moderately long limbs merge with ventral callus; fourth barely emerges, weakly bifurcated, limbs terminate quite abruptly. Aperture moderately, evenly wide.

**Distribution.** Only known from the type locality

**Remarks.** *Eratoidea robusta* n. sp. is a very solid shell with a size range of 9.04 x 5.66 to 9.94 x 6.10 x 3.82 mm, and W:L 61 - 63%. It is compared with *E. pustulata* n. sp. with which it has much in common and is probably closely related: it differs in its more

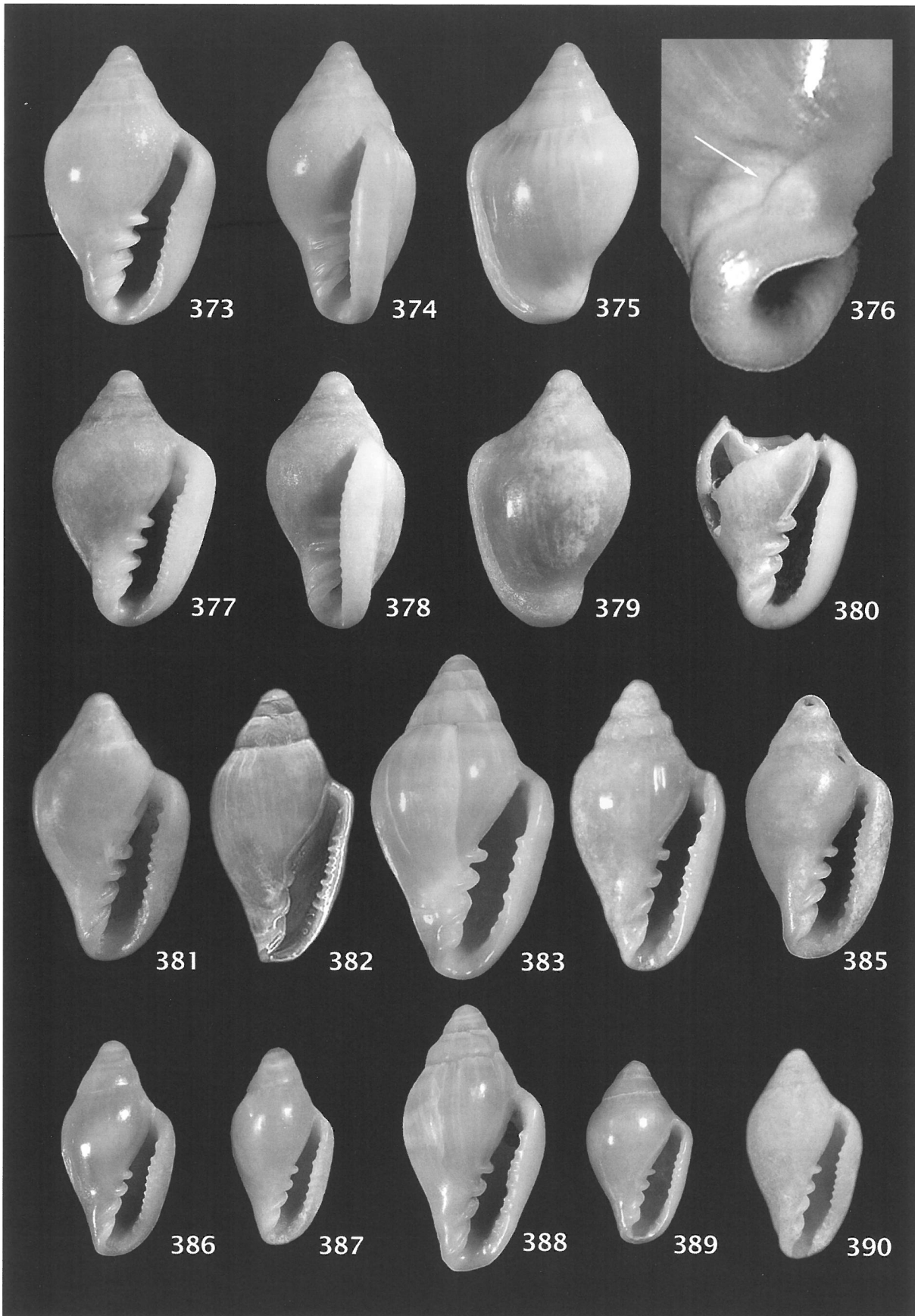
**Figures 373-390**

**373-380.** *Eratoidea robusta* n. sp., Venezuela, south west of Islas Los Testigos, 41-43 m.

**373-376.** Holotype, 9.94 x 6.10 mm, W:L 61%, MNHN 23766; **377-379.** Paratype 1, 9.04 x 5.66 mm, W:L 63%, MNHN 23767; **380.** Ad. dd., broken piece, MNHN.

**381-390.** *Eratoidea* species group, adult shells, variations in shell morphology of, as yet, undescribed material.

**381.** 9.65 x 5.65 mm, W:L 59%, Columbia, Golfo de Morrosquillo, 120 m, TMC; **382.** 10.0 mm, Columbia, Cartagena, Femorale Col.; **383.** 11.6 x 6.67 mm, W:L 57%, Venezuela, Isla Margarita, TMC; **384.** 10.5 x 5.70 mm, W:L 54%, Venezuela, north west of Cabo Codera, 59 m, TMC; **385.** 9.46 x 5.42 mm, W:L 52%, Colombia, Cabo De Vela, 58 m, TMC; **386.** 7.88 x 4.14 mm, W:L 53%, Colombia, Santa Martha, TMC; **387.** 7.02 x 3.71 mm, W:L 53%, Granada, south coast, 6 m, TMC; **388.** 9.75 x 5.26 mm, W:L 54%, Columbia, Cartagena, TMC; **389.** *Eratoidea ranguanaensis* n. sp., holotype, 6.53 x 3.82 mm, W:L 58%, MNHN 23761; **390.** 7.59 x 4.26 mm, W:L 56%, Panama, San Blas, off Chichime Cays, 75 m, TMC.



robust shell and greater W:L ratio of 61 - 63% compared with 54 - 60% (no overlap); the spire is slightly concave and more pointed; its surface pustules are finer and less numerous than the very coarse and generally more numerous pustules of *E. pustulata* n. sp., and the bifurcation of the plications is stronger. An unusual feature is the kink at the junction between the varix and ventral callus which has not been observed in any other *E. hematita* group species. Although the type locations are close, the conditions are quite different: *Eratoidea robusta* n. sp. inhabits deeper water in the main, very strong, current stream, whereas, *E. pustulata* n. sp. inhabits shallower water in a channel between two islands where the current is much less.

**Etymology.** The name alludes to the robust appearance of the shell and is taken from the Latin word *robustus* meaning robust.

*Eratoidea grandis* n. sp.  
Figs 22, 320, 391-399

**Type material.** Aruba, off south west coast, between 12° 26.1'N 70° 02.8'W and 31.4'N 70°07.4'W, 90-105 m; holotype, 14.0 x 7.39 mm, W:L 53%, MNHN 23768; paratype 1, 13.4 x 7.01 mm, W:L 52%, MNHN 23769; paratype 2, 13.0 x 7.00 mm, W:L 54%, MNHN 23769, TMC; paratype 3, 15.0 x 8.37 mm, W:L 56%, MNHN 23769, TMC; paratype 4, 13.7 x 7.49 mm, W:L 55%, MNHN 23769, TMC; paratype 5, 11.8 x 6.71 mm, W:L 57%, MNHN 23769, AWC.

**Other material.** 1 ad, dd., 9 juveniles and broken shells, all in very poor condition, Aruba, off south west coast, between 12° 26.1'N 70° 02.8'W and 31.4'N 70°07.4'W, 90-105 m, TMC.

**Type locality.** Off Aruba, 12° 26.1'N 70° 02.8'W to 12°31.4'N 70°07.4'W, (Map ref. 25).

**Description.** Shell; shape biconic, base very slightly produced; smooth and glossy; pustules absent; callus

strong at labial insertion point; ventral callus very weak at distal end of plications. Colour grey-brown. Size moderately large, 13.0 x 7.00 mm, W:L 53%. Spire medium, somewhat pointed. Total of 5.0 whorls comprised of protoconch 2.4 whorls, teleoconch 2.6 whorls. Suture moderately strong. Labial insertion point significantly below suture. Shoulder narrowly rounded. Lip narrow, essentially straight, slightly tapered to base, slightly curled inwards; filled by twelve small denticles located inside edge, top two rounded, gap to weaker third, remainder slightly variable; posterior canal moderately wide. In side view lip slightly convex anteriorly, denticles do not project from lip. Varix strong, rounded, slightly tapered, narrower at base; dorsal groove strong. Varix sweeps around base of rounded siphonal canal, merges smoothly with first plication. Four plications fill approximately 65% of aperture; bifurcation absent; first moderately strong, smooth; second, third and fourth barely emerge, moderately strong, smooth, fade somewhat abruptly. Aperture moderately, evenly wide.

**Remarks.** All shells were dead collected and in rather poor condition, but this species is so different from any others in the group that the poor quality of the material does not prevent positive separation from all other taxa. Size ranges from 11.1 - 15.0 mm, W:L 52 - 57%. *Eratoidea grandis* n. sp. is the biggest species in the genus *Eratoidea*. The features which distinguish *E. grandis* n. sp. from all others species in the group are the unusually straight lip and aperture, total absence of bifurcation of plications, large number of fine denticles, light appearance of the shells and tendency to be slightly rostrate (Fig. 398). It is noted that the undescribed, red coloured shell illustrated by Lipe (1991), from USA., Florida, has a similar shape and appearance to *E. grandis* n. sp.

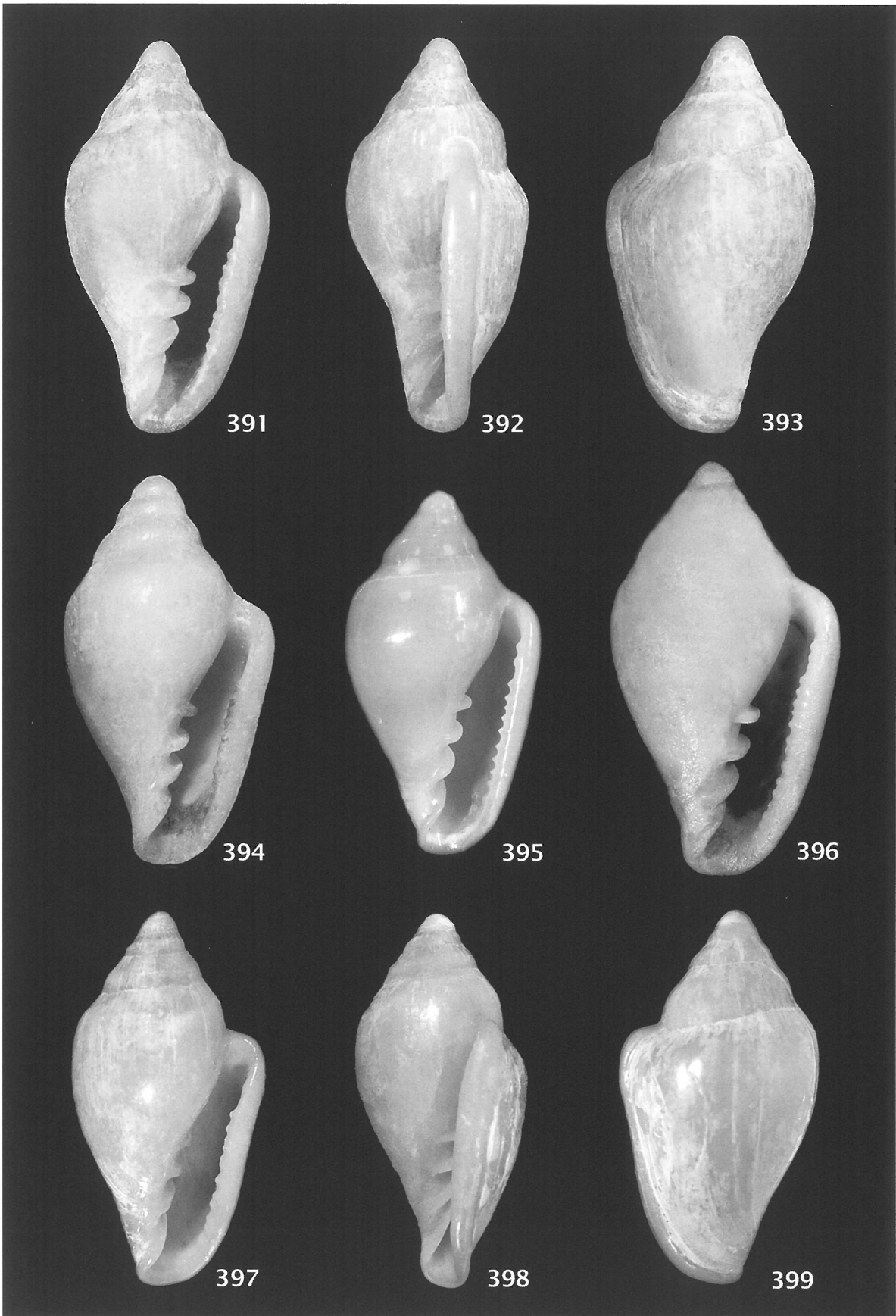
**Distribution.** Only known from the type locality.

**Etymology.** The name alludes to the large size of this new species and is taken from the Latin word *grandis* meaning large.

## Figures 391-399

**391-399.** *Eratoidea grandis* n. sp., Aruba, off south west coast, 90-105 m.

**391-393.** Holotype, 14.0 x 7.39 mm, W:L 52%, MNHN 23768; **394.** Paratype 4, 13.7 x 7.49 mm, W:L 55%, MNHN 23769, TMC; **395.** Paratype 2, 13.0 x 7.00 mm, W:L 54%, MNHN 23769, TMC; **396.** Paratype 3, 15.0 x 8.37 mm, W:L 56%, MNHN 23769, TMC; **397-399.** Paratype 1, 13.4 x 7.01 mm, W:L 52%, MNHN 23769.



**ERATOIDEA WATSONI SPECIES GROUP**

Figs 11, 400-405

**INTRODUCTION**

*Eratoidea watsoni* (Dall, 1881) and *Eratoidea fernandinae* (Dall, 1927) are two deep water species which do not comfortably fit into the genus *Eratoidea*. There is no other genus to which they could reasonably be assigned, therefore, it is proposed to form a new group within the genus *Eratoidea* - the *E. watsoni* species group, to which these two species are assigned. *E. watsoni* is chosen to be the representative species for the group and the group is summarised as follows:

*Eratoidea watsoni* (Dall, 1881), Cuba, off Havana, 878 m., group representative species;

*Eratoidea fernandinae* (Dall, 1927), USA, Georgia, off Fernandina, 538 m.

Two shells of *Eratoidea watsoni* have been examined but only photographs of the type species of *E. fernandinae* have been available: USNM 107973, south eastern USA, offshore, deep water (Kaicher, 1973:77). The main difference between these two species lies in the somewhat crenulated suture of *E. watsoni*, otherwise they appear to have similar morphology.

Based on examination of *Eratoidea watsoni* the morphological features of the group which differ from those otherwise found in the genus *Eratoidea* are, most significantly, the variable number of plications. All other taxa in the genus have four very distinct plications but in *E. watsoni*, which could be described as multiplicate, the number varies from 4 to 6, or even up to seven when the number of plications and lirae are combined. Dall (1881:71) in his sketch of the holotype of *E. watsoni* clearly depicts a shell with only four plications; a shell in the Andrew Wakefield collection has a total of seven plications and lirae combined; Cossignani (2006:215) illustrates an example which has five distinct plications plus a weak sixth and a shell in my own collection (Figs 11, 401-405) has four plications and one strong lira. The crenulated spire is not present in any other taxa in the genus *Eratoidea*, and it was also noted that the plications of *E. watsoni* show no sign of bifurcation, an abnormal feature for the genus (bifurcation is also absent in the *E. scalaris* group and in *E. grandis* n. sp. in the *E. hematita* group). The figure caption for the images of *E. watsoni*, Cossignani (2006:215) gives the location as 'Jamaica, -30 m.'. This seems to be an

error as it is well authenticated that *E. watsoni* is a very deep water species and has been collected at depths of 825 to 1470 m (ANSP, Ver. 4.1.1), therefore, it seems unlikely that *E. watsoni* would also inhabit depths of around 30 m.

A magnification of X10 has been used for shell images in ventral view (Figs 400-401).

***Eratoidea watsoni* species group** (RS. *Eratoidea watsoni* (Dall, 1881))

*Eratoidea watsoni* (Dall, 1881)

Figs 11, 401-405

**Type material.** (not examined)

**Type locality.** Off Havana, 878 m; Blake sta. 2, 1473; bed of Gulf Stream, 825 m; Yucatan Strait, 1170 m. Range 23.23°N to 22°N; 85°W to 82.42°W.

**Material presented.** Ad. dd., 10.4 x 7.18 mm, W:L 69%, off Cuba, 595 m, TMC.

*Eratoidea fernandinae* (Dall, 1927)

Fig. 400

**Type material.** USNM 107973, south eastern USA, (not examined).

**Type locality.** Albatross sta. 2668, off Fernandina, Florida (actually off Georgia), 30°58'N 79°38'W, 538 m.

**Remarks.** The two shells which comprise this group are very different to all other taxa in the genus and probably qualify for separate generic treatment.

**ERATOIDEA SCALARIS SPECIES GROUP**

Figs 15, 406-438

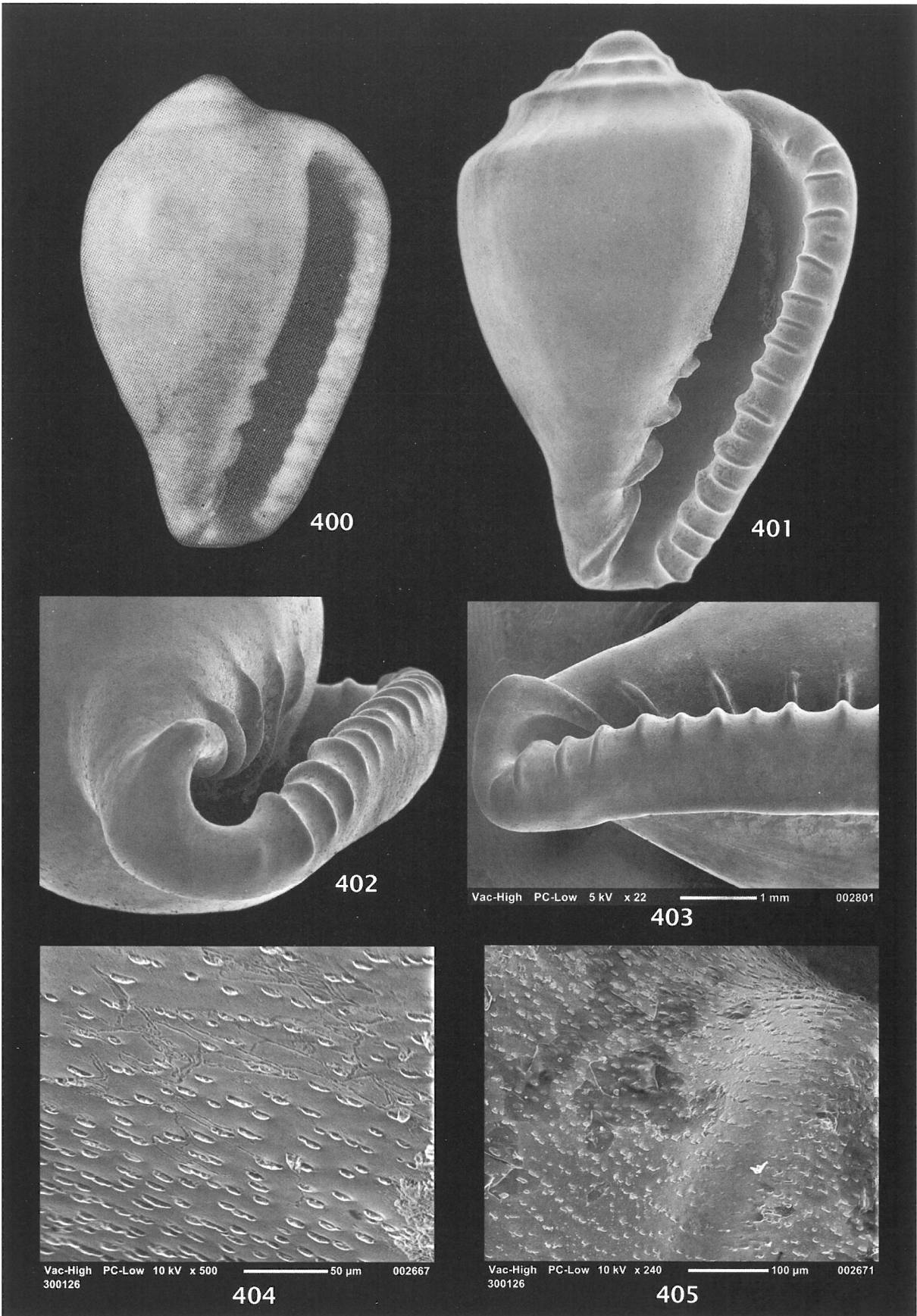
**INTRODUCTION**

*Eratoidea scalaris* (Jousseaume, 1875) and *E. janeiroensis* (E. A. Smith 1915) are two previously described taxa which are endemic to Brazil. They are off-shore species and have been collected in depths between 35 and 250 m. *E. scalaris* is represented by two syntypes which reside in the MNHN, MNHN 1419; Kaicher (1992:6178) photographed one

**Figures 400-405**

**400.** *Eratoidea fernandinae* (Dall, 1927), USA, Georgia, off Fernandina, 538 m, Kaicher (1973, card 77).

**401-405.** *Eratoidea watsoni* (Dall, 1881), 10.4 x 7.18 mm. W:L 69%, Cuba, off Havana, 878 m.



of these shells and gave the size as up to 6 mm. *Eratoidea janeiroensis* is represented by the holotype which resides in the type collection of the BH(NH), reg. no. 1915.4.18.319, 4 mm, Brazil, off Rio de Janeiro, 73 m, and was also photographed by Kaicher (1981:2626). The precise type locality of *E. scalaris* is unknown. Shells of *E. janeiroensis*, *sensu stricto*, from off Rio de Janeiro, 35 - 250 m, are offered by dealers from time to time but due to the customary synonymy are always labelled *Eratoidea scalaris*. Both taxa have somewhat similar shell morphology and *E. janeiroensis* has generally been regarded as a synonym of *E. scalaris*. However, examination of the syntypes has revealed sufficient evidence to suggest that they are probably two distinct species and I propose that the synonymy is disregarded unless proven by further research. These two taxa have shell morphologies significantly different to all other species in the genus *Eratoidea*, therefore, the *Eratoidea scalaris* species group is proposed in order to accommodate them and is summarised as follows: *Eratoidea scalaris* (Jousseaume, 1875), Brazil, group representative species. *Eratoidea janeiroensis* (E. A. Smith 1915), Brazil, off Rio de Janeiro, 73 m.

Although the *Eratoidea scalaris* group is closest in general appearance to the *E. acutulla* group, it does not fit comfortably into the genus *Eratoidea* because: the lip is unusually narrow with a widely varying number and arrangement of denticles which is not found in any other species in the genus; the varix is weak with a very thin edge at the junction with the dorsum on many shells and, most significantly, the plications are thin and show no sign of bifurcation.

All the shells examined or which have been offered to me have come from the type locality of *Eratoidea janeiroensis* and are a good match to the holotype of *E. janeiroensis* as figured by Kaicher (1981:2626). Eight small shells of *E. scalaris*, *sensu lato*, more probably *E. janeiroensis*, with a size range of 3.68 x 2.66 to 3.88 x 2.19 mm, W:L 56 - 61%, have been examined. In addition, one image of an adult shell from the Rios museum, with scale bar which gives a shell size of 5.42 x 3.24 mm, W:L 60% (Fig. 432), has also been examined. It is the biggest shell known to me in the *E. scalaris* group. This shell has unusual plications which turn downwards distally and merge with the adjacent plication which is another feature not previously observed in the genus

*Eratoidea*, and is suggestive of a third species being present in the *E. scalaris* group.

A sectioned shell revealed perfect internal plications which show no sign of resorption, thus confirming that the *E. scalaris* group belongs in the Marginellidae (Fig. 435). As far as I am aware no live material has ever been collected.

A constant magnification of X15 has been used for both optical photograph and SEM shell images in ventral and side view in order to give a true indication of the relative sizes of each species in the group.

***Eratoidea scalaris* species group** (RS. *Eratoidea scalaris* (Jousseaume, 1875))

***Eratoidea scalaris*** (Jousseaume, 1875).

Figs 406-411, 418-419, 422-423, 426-427, 430-431

**Type material.** Two syntypes, 4.71 x 2.67 mm, W:L 57% and 4.07 x 2.43 mm, W:L 60%, Brazil, MNHN 1419.

**Type locality.** Brazil, no further details are known.

**Original description.** Rev. et Mag. Zool., 1875, 3(3), p.189.

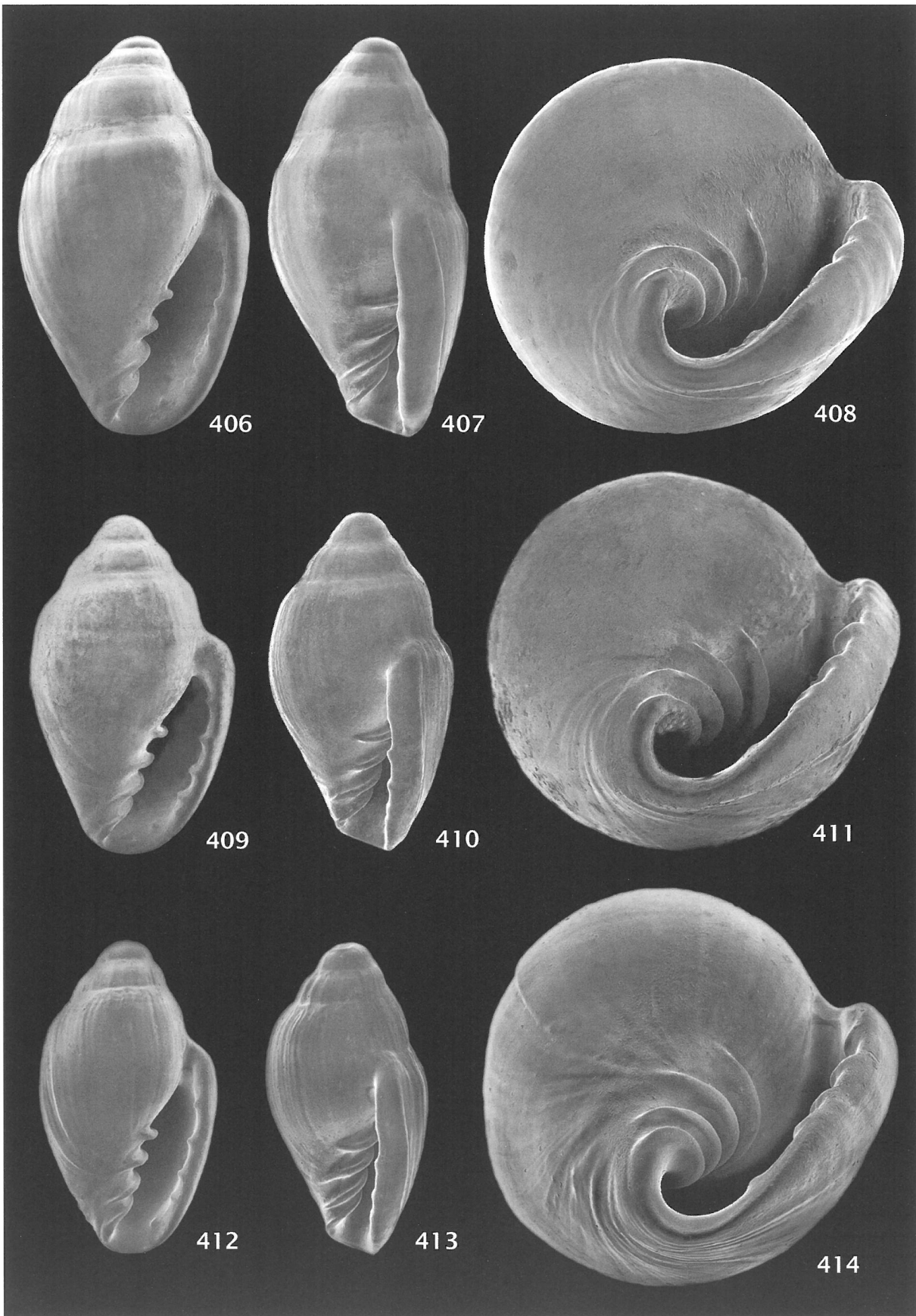
**Shell morphology.** Shell: shape broadly biconic; very weakly costate; shiny; surface texture weak on lip and plications, absent on ventral surface; callus weak. Colour translucent white, with faint traces of darker bands (Kaicher, 1992:6178). No other references to colour are known in this species. Size range 4.07 x 2.43 to 4.71 x 2.67 mm, W:L 57 - 60%; up to 6 mm (Kaicher 1992:6178). Spire tall. Suture moderately deep, smooth with strong, rounded, sub-sutural shoulder. Total of 5.0 whorls. Suture moderately deep, smooth. Labial insertion point significantly below suture and rounded sub-sutural shoulder. Shoulder (labial) rounded. Lip narrow; evenly curved; filled by five or six weak denticles; in the larger syntype the top denticle of five widely spaced denticles is absent resulting in only 65% of the lip being filled. In side view lip essentially straight, denticles project weakly. Varix moderately narrow; dorsal groove weak. Four moderately weak plications fill approximately 60% of aperture; bifurcation absent; fourth weakest, somewhat remote from third. Aperture wide.

#### Figures 406-414

**406-411.** *Eratoidea scalaris* (Jousseaume, 1875), Brazil.

**406-408.** Syntype, 4.71 x 2.67 mm, W:L 57%, Brazil, MNHN 1419; **409-411.** Syntype, 4.07 x 2.43 mm, W:L 60%, Brazil, MNHN 1419.

**412-414.** *Eratoidea janeiroensis* (E. A. Smith 1915), ad., 3.73 x 2.19 mm, W:L 56%, Brazil, off Rio de Janeiro, dredged by research boat, 200-250 m, TMC.



*Eratoidea janeiroensis* (E. A. Smith 1915).

Figs 15, 410-417, 420-421, 424-425, 428-429, 433-438

**Type material.** Ad, dd., 4.0 mm, British Antarctic Expedition, 1910, BM(NH) 1915.4.18.319; (Kaicher, 1981:2626).

**Type locality.** off Rio de Janeiro, Brazil, 73 m.

**Material presented.** 8 ad, dd., Brazil, off Rio de Janeiro, 35-250 m, TMC).

**Original description.** Zool. ii, no. 4, p. 95, pl. ii, f. 14 (Tomlin 1917).

**Shell morphology.** Shell: shape broadly biconic; very weakly costate; shiny; surface texture of scaly protuberances on ventral surface close to plications (Fig. 428-429), edge of lip irregularly rough, scale like texture deeper inside lip. Callus generally weak; ventral callus can be strong. Colour translucent white, without marks. Size 3.68 x 2.66 to 3.88 x 2.19 mm, W:L 56 - 61%. Spire tall. Suture moderately deep, slightly rough, with strong, rounded, sub-sutural shoulder. Total of 4.2 - 4.4 whorls, average 4.35 whorls. Labial insertion point significantly below suture and rounded sub-sutural shoulder. Shoulder (labial) rounded. Lip narrow; evenly curved; filled with five widely spaced denticles, occasionally up to nine more closely spaced. In side view lip essentially straight, denticles project weakly. Varix moderately narrow, wider medially; dorsal edge very thin, chipped, not bonded to dorsum. Lip and weakening varix sweep around siphonal canal, very slightly flared basally, merge with first plication. Weak costae form bunched ridges anteriorly which curve around the siphonal canal to merge with moderately heavy, somewhat lumpy ventral callus. Four moderately weak plications fill approximately 60 - 65% of aperture; bifurcation absent. Fourth tends slightly remote from third. Aperture moderately wide.

**Remarks.** In comparing *Eratoidea scalaris* with *E. janeiroensis* four differences are significant: 1). The shell size is consistently different. This is based on only a very small sample which includes the type material, and indicates that *E. scalaris* is 15% bigger than *E. janeiroensis*. 2). Surface texture is very weak

in *E. scalaris* (Figs 426-427) whereas it is moderately strong in *E. janeiroensis* (Figs 428-429). 3). It can be seen in the siphonal images (Figs 408, 411, 414, 417) that *E. scalaris* is less inflated ventrally than *E. janeiroensis*. The averages of the two pairs of images presented are: *E. janeiroensis* 96.5%, and *E. scalaris* 90.5% which is a substantial difference. 4). The most significant difference is in the number of whorls: *E. scalaris* has a total of 5.0 whorls and *E. janeiroensis* has a total of only 4.35 whorls. The above data supports the case for there being two species present and the proposal that they be regarded as different species until proved otherwise.

Little is known about these two species which were first discovered in 1875, probably because they are off-shore species, only found in deep water.

**ERATOIDEA COSTULATA SPECIES GROUP**

Figs 23, 25, 439-458

**INTRODUCTION**

Four species from South Africa and the eastern coast of Africa which have, until now, been regarded as *Dentimargo* are here included in the genus *Eratoidea* for the first time. These taxa have costate shell surfaces and four strong plications which in some species are bifurcated, thus indicating that they belong in the genus *Eratoidea* and not *Dentimargo*. They differ significantly from the Caribbean *Eratoidea* in several respects, the most noticeable being the lip which is wide, straight and without labial denticles, and the wide conspicuous ventral callus seen in some species. These taxa do not fit into any other species group because of these distinctive features, therefore, the *Eratoidea costulata* species group is proposed in order to accommodate them. Of these taxa the first species to be described was *Eratoidea costulata* (Thiele, 1925) and it is chosen to be the representative species for the group which is summarised as follows:

*Eratoidea costulata* (Thiele, 1925), South Africa. Kwa-Zulu, Natal, 35-45 m. Representative species;  
*Eratoidea costata* (Bozzetti, 1997), Zanzibar, Kiwengwa, 2-3 m;  
*Eratoidea sinuosa* (Bozzetti, 1997), Zanzibar, Kiwengwa, 2-3 m;  
*Eratoidea boyeri* (Bozzetti, 1994), north east Somalia, Cape Ras Hafun, 120-200m.

**Figures 415-421**

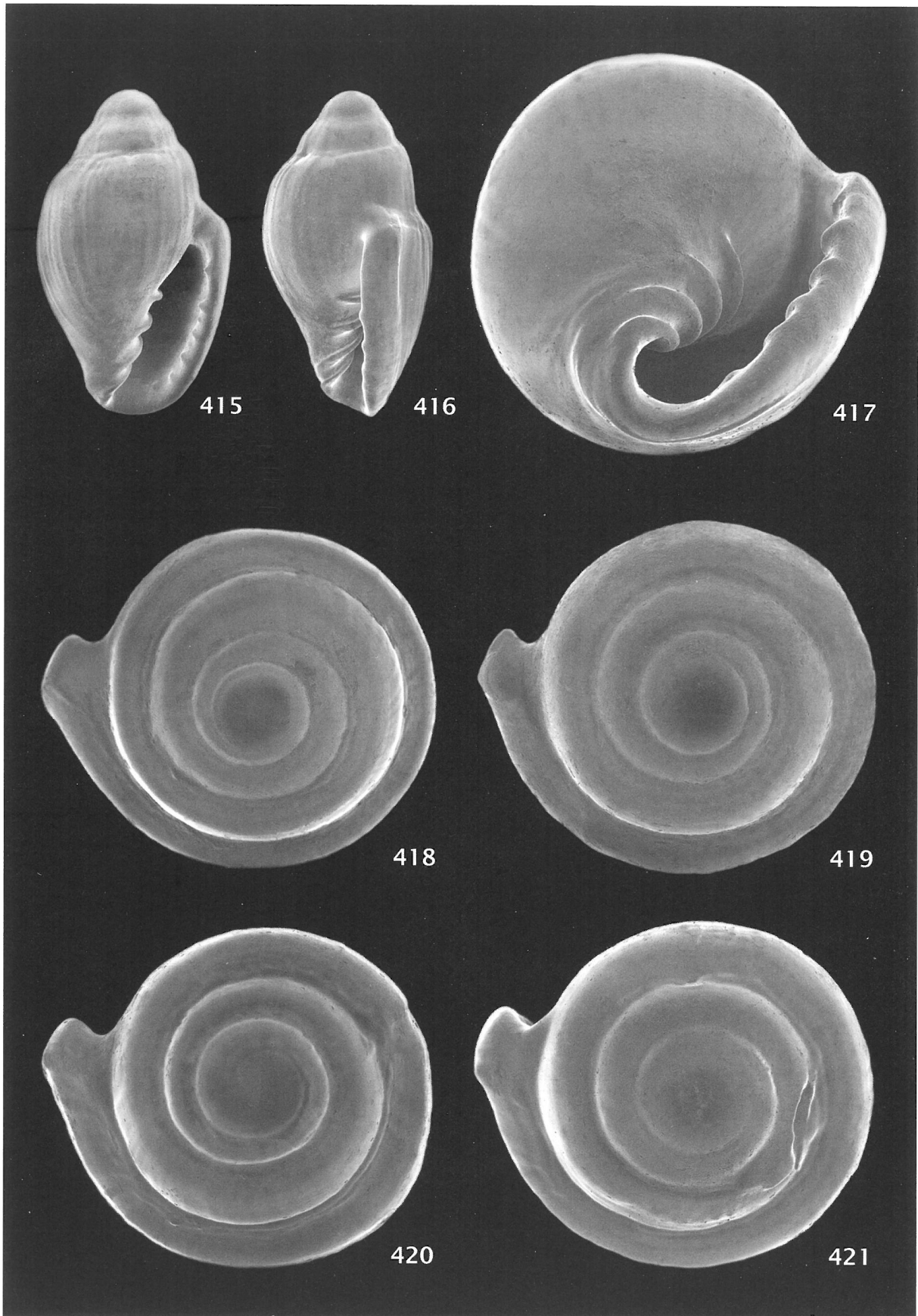
**415-417.** *Eratoidea janeiroensis* (E. A. Smith 1915), ad., 3.88 x 2.19 mm, W:L 56%, Brazil, off Rio de Janeiro, 35-40 m, TMC.

**418-419.** *Eratoidea scalaris* (Jousseume, 1875), Brazil.

**418.** Syntype, 4.71 x 2.67 mm, W:L 57%, Brazil, MNHN 1419; **419.** Syntype, 4.07 x 2.43 mm, W:L 60%, Brazil, MNHN 1419.

**420-421.** *Eratoidea janeiroensis* (E. A. Smith 1915), Brazil, off Rio de Janeiro, 35-250 m.

**420.** Ad., 3.73 x 2.19 mm, W:L 56%, dredged by research boat, 200-250 m, TMC; **421.** Ad., 3.88 x 2.19 mm, W:L 56%, 35-40 m, TMC.



The type material of *E. costulata* resides in the Berlin Museum, but is undated (Pers. com. Gerald Smith) and it was for this reason that Lussi and Smith (1999) regarded *E. costulata* as a synonym of *E. costata*. The two taxa are at first similar, but closer examination shows that there is a significant difference in shell size, in the morphology of the lip and also some difference in the plications, therefore, they will be regarded as two distinct species within the group. *E. sinuosa* with its sinuous, costate surface is a straight forward candidate for the group. *E. boyeri* from the northern limit of the known geographic range of the group is a much bigger species and much less inflated, but it meets the criteria for the group with its bifurcated plications and costate surfaces. There are no published records of any animal images or any data relating to the animals in this group.

A constant magnification of X25 has been used for both optical photograph and SEM shell images in ventral and side view in order to give a true indication of the relative sizes of each species in the group.

**Shell morphology.** Four ad. dd., shells of *Eratoidea costulata* and the holotype of *E. boyeri* were examined. Shell shape is broadly biconic, surface strongly to very strongly costate. Surface texture was found to be strong around the aperture (Figs 444-445, 456) and was found to be remarkably similar in both *E. costulata* and *E. boyeri*. A distinctive feature of the *E. costulata* group is the area of callus which extends in an arc from the first plication to the labial insertion point, strongest anteriorly, weakening posteriorly. It can be very strong in some species, for example *E. costata* (Fig. 449). Apart from *E. boyeri* which has one brown band medially and a pale second band (Fig. 23), shells in the group are translucent white, without noticeable colour or markings. Size ranges from 2.00 x 0.85 to 5.42 x 2.55 mm, W:L 47 - 53%, and the spire is medium to tall with slightly to very strongly convex whorls. The number of whorls varies from approximately 3.75 whorls in *E. sinuosa* to 6.1 whorls in *E. boyeri*. The labial insertion point is significantly below the suture and the shoulder ranges from narrowly rounded to very weak. The most

significant features of the group are the lip and varix: the lip is generally straight and non-denticulate; an axial ridge or ridges are present on the edge of the lip and on the varix (Figs 441, 449, 455). Although denticles are absent a large weak protrusion is generally present at the junction of posterior canal and lip which can be likened to a very weak single denticle (Figs 447, 455). The posterior canal is strong with a weak notch. The varix is moderately wide and is slightly striate. Four plications fill approximately 60 - 62% of the aperture; apart from *E. boyeri* in which the plications are wide and bifurcated, bifurcation is moderately to very weak. The aperture ranges from narrow to wide.

**Remarks.** It was noticed from the image of the fossil *Stazzania bifidoplicata* that this species presents a straight non-denticulate lip very similar in appearance to the *Eratoidea costulata* group, however, in all other respects, particularly the very strong true bifurcation of the plications in *S. bifidoplicata*, the morphology of the groups is dissimilar.

The east coast of Africa, together with the off-shore islands, including Madagascar, is a vast, relatively unexplored area and it is very probable that many more species belonging to the *Eratoidea costulata* group will be discovered in the future.

***Eratoidea costulata* species group** (RS. *Eratoidea E. costulata* (Thiele, 1925))

*Eratoidea costulata* (Thiele, 1925).  
Figs 439-440, 444-445, 446-453

**Type material.** Berlin Museum, undated. (Not examined).

**Material presented.** Two ad. dd., 3.14 x 1.63 and 3.08 x 1.63 mm W:L 52-53%, South Africa, Natal, off Park Rynie, 35-45 m, TMC.

**Type locality.** Natal, South Africa.

**Other material.** 2 ad. dd., South Africa, Natal, off Park Rynie, 35-45 m, TMC.

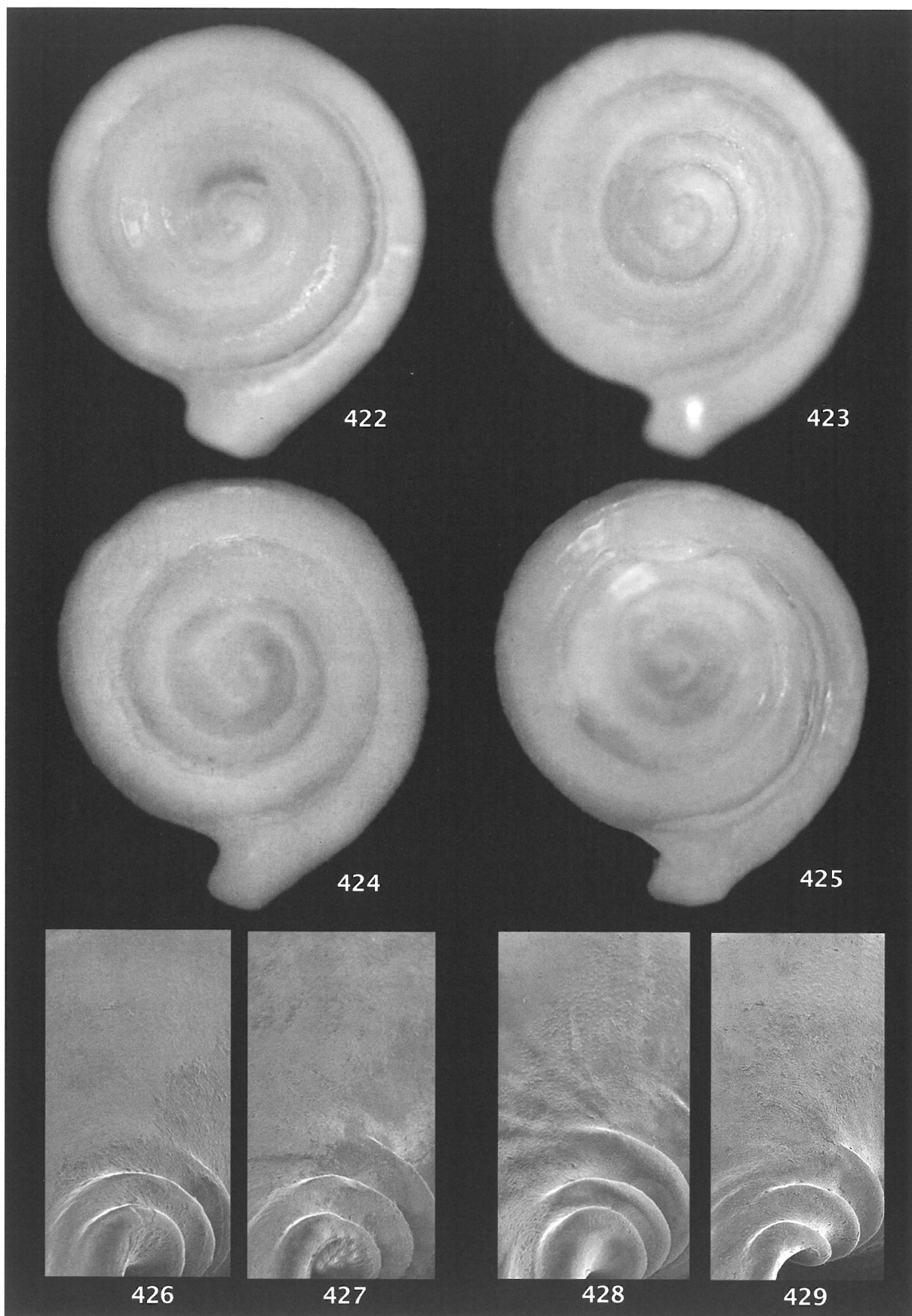
## Figures 422-429

422-423, 426-427. *Eratoidea scalaris* (Jousseaume, 1875), Brazil.

422, 426. Syntype, 4.71 x 2.67 mm, W:L 57%, Brazil, MNHN 1419; 423-427. Syntype, 4.07 x 2.43 mm, W:L 60%, Brazil, MNHN 1419.

424-425, 428-429. *Eratoidea janeiroensis* (E. A. Smith 1915), Brazil, off Rio de Janeiro, 35-250 m.

424, 428. Ad., 3.73 x 2.19 mm, W:L 56%, dredged by research boat, 200-250 m, TMC; 425, 429. Ad., 3.88 x 2.19 mm, W:L 56%, 35-40 m, TMC.



**Shell morphology.** Shape broadly biconic; surface strongly costate; surface texture of minute irregular lumps on ventral callus and on dorsum close to varix. Callus generally weak. Size small, 2.84 x 1.50 to 3.14 x 1.63 mm, W:L 52 - 56%. Spire medium to tall, approximately 4.5 slightly convex whorls, comprised of protoconch 1.8 whorls, teleoconch 2.7 whorls. Suture moderately deep, narrow; labial insertion point significantly below suture. Lip moderately narrow, very slightly concave, slightly curled inwards posteriorly, non-denticulate, smooth with slight rounded protrusion posteriorly suggestive of one very weak denticle; posterior canal deep, wide, rounded, sweeps around siphonal canal and merges with first plication. In side view lip largely straight, turns 30 degrees to right posteriorly to form posterior canal, curves to right anteriorly at slightly flared siphonal canal. Varix is moderately narrow, narrows substantially at posterior canal, slightly convex anteriorly; surface bears weak axial ridges; the costa immediately above labial insertion point curves around posterior canal onto varix, continues to base where it merges with edge of lip; dorsal edge of varix thin, somewhat chipped, not bonded to dorsum, narrows substantially and loses identity at siphonal canal. Four weak plications fill approximately 62% of aperture; bifurcation absent; first widens smoothly; second to fourth emerge narrow, widen, fade on ventral callus. Arc of ventral callus with strong distal edge bearing strong surface texture (Figs 444-445). Aperture moderately, evenly wide.

**Remarks.** *Eratoidea costulata* must be compared with *E. costata* with which it was synonymised by Lussi and Smith (1999). *E. costulata* is a significantly bigger shell with a size range of 3.14 x 1.63 to 2.84 x 1.50 mm, W:L 52 - 56%, compared with 2.20 x 1.05 to 2.60 x 1.25 mm, W:L 47 - 49% of *E. costata*; its lip is slightly curved compared with very straight and it has 4.5 whorls compared with 3.75 - 4.0 in *E. costata*. There seems to be little doubt that it is a different species, a view which is strengthened when it is noted that the type localities of the two species are significantly separated geographically.

*Eratoidea costata* (Bozzetti, 1997).

Fig. 441

**Type material.** Holotype, 2.35 x 1.10 mm, W:L 47%, Zanzibar, Kiwengwa, 2-3 m, MNHN 0583. (Not examined).

**Type locality.** Zanzibar, Kiwengwa, 2-3 m.

**Shell morphology.** Shape broadly biconic, surface strongly costate. Colour white, without marks. Size range 2.20 x 1.05 to 2.60 x 1.25 mm, W:L 47 - 49%. Spire tall; a total of 3.75 - 4.0 whorls is comprised of protoconch 1.5 - 1.75 whorls, teleoconch 2.25 whorls. The lip is straight, moderately narrow, turns 30 degrees to right posteriorly to form posterior canal, slightly curled inwards, smooth, without denticles; the posterior canal is deep and strong. Ventral callus forms a wide arc which extends posteriorly to labial insertion.

**Remarks.** *Eratoidea costata* must be compared with *E. costulata* with which it was synonymised by Lussi and Smith (1999). *E. costulata* is a significantly bigger shell with a size range of 3.14 x 1.63 to 2.84 x 1.50 mm, W:L 52 - 56%, compared with 2.20 x 1.05 to 2.60 x 1.25 mm, W:L 47 - 49% of *E. costata*; its lip is slightly curved compared with very straight and it has 4.5 whorls compared with 3.75 - 4.0 in *E. costata*. There is little doubt that it is a different species, a view which is strengthened when it is noted that the type localities of the two species are widely separated geographically.

*Eratoidea sinuosa* (Bozzetti, 1997).

Figs 25, 443

**Type material.** Holotype 2.35 x 1.15 mm, W:L 49%, Zanzibar, Kiwengwa, 2-3 m, MNHN 1268. (Not examined).

**Type locality.** Zanzibar, Kiwengwa, 2-3 m.

**Figures 430-438**

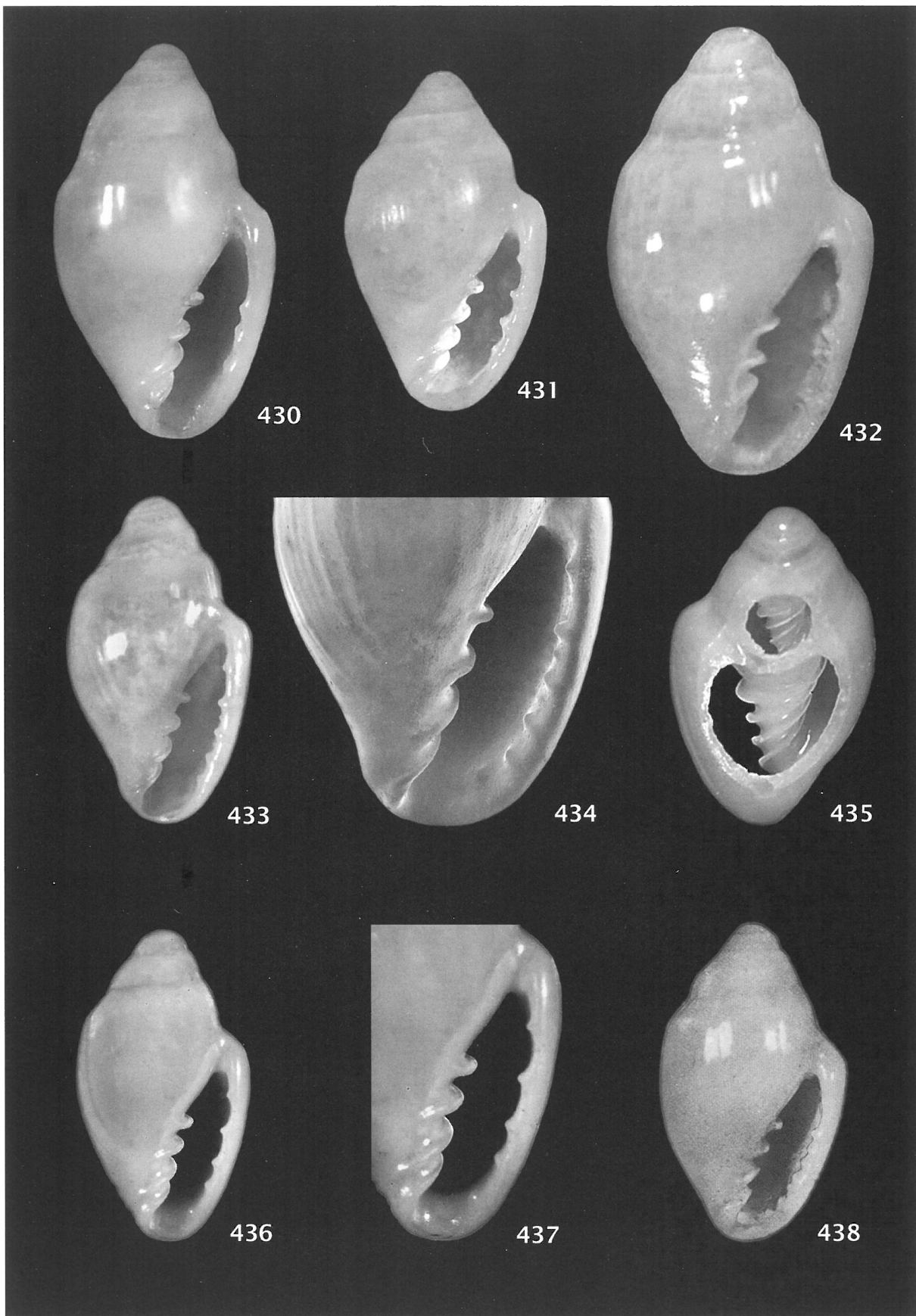
**430-431.** *Eratoidea scalaris* (Jousseume, 1875), Brazil.

**430.** Syntype, 4.71 x 2.67 mm, W:L 57%, Brazil, MNHN 1419; **431.** Syntype, 4.07 x 2.43 mm, W:L 60%, Brazil, MNHN 1419.

**432.** Ad. dd., 4.52 x 3.24 mm, W:L 60%, Brazil, Rios museum.

**433-438.** *Eratoidea janeiroensis* (E. A. Smith 1915), Brazil, off Rio de Janeiro, 35-250 m.

**433-435.** Ad., 3.88 x 2.19 mm, W:L 56%, Brazil, off Rio de Janeiro, 35-40 m, TMC; **436-437.** Ad., 3.73 x 2.19 mm, W:L 56%, Brazil, off Rio de Janeiro, dredged by research boat, 200-250 m, TMC; **438.** Holotype, up to 4 mm, Brazil, off Rio de Janeiro, 73 m, BM(NH) 1915.4.18.319, Kaicher (1981, card 2626).



**Shell morphology.** Shape broadly biconic, surface strongly costate. Colour white. Size range 2.00 x 0.85 to 2.35 x 1.15 mm, W:L 47 - 50%. Spire tall; whorls very convex and suture very deep giving a sinuous appearance to the shell. Approximately 4 whorls are comprised of protoconch 1.25 - 1.5 whorls and teleoconch 2.6 - 2.8 whorls. The lip is straight, generally wide, narrows anteriorly, slightly curled inwards, smooth, without denticles and the posterior canal is moderately weak. Ventral callus forms a wide arc which extends posteriorly to the labial insertion point

**Remarks.** *Eratoidea sinuosa* is a species with unique shell morphology which cannot be confused with any other taxa in the genus.

*Eratoidea boyeri* (Bozzetti, 1994).

Figs 23, 442, 454-458

**Type material.** Holotype, 5.42 x 2.55 mm, W:L 47%. north east Somalia, Cape Ras Hafun, 120-200 m, MNHN 0666.

**Type locality.** North east Somalia, Cape Ras Hafun, 120-200 m.

**Shell morphology.** Shape elongated biconic, surface strongly costate; colour white to pale beige with a moderately narrow, brown band with indistinct edges. This band almost covers the first teleoconch whorl; is located on the suture of the second teleoconch whorl; is above the suture on the penultimate whorl and is located on the widest part of the body whorl. A second very pale band is located anteriorly on the body whorl. Size of the holotype is 5.42 x 2.55 mm, W:L 47%. The spire is tall with very slightly convex whorls. The total number of whorls is approximately 6.1 comprised of 1.6 protoconch whorls and 4.5 teleoconch whorls. The suture is shallow but distinct. The lip is moderately wide and very straight, slightly curled inwards; non-denticulate; the posterior canal is moderately narrow and weakly notched. In side view a narrow, weak protrusion is noticeable and can be likened to a very weak denticle. The varix is wide,

straight, bears a distinct ridge which bends towards the denticle-like protrusion, then widens away from the edge of the lip anterior medially and finally merges with the lip as it sweeps around the siphonal canal. The dorsal edge of the varix is indistinct. The four plications are wide, bifurcated, and fill approximately 60% of the aperture. The first plication is unusual in the way it widens and thickens as it emerges, then narrows abruptly at the junction with the lip. The ventral callus is gently curved to the distal end of the third plication where it becomes a moderately strong ridge which extends to level with the labial insertion point. This ridge is located externally to the parietal wall and its outer edge is distinct and covered by strong surface texture of irregularly sized round lumps (Fig. 456). The aperture is moderately narrow and straight.

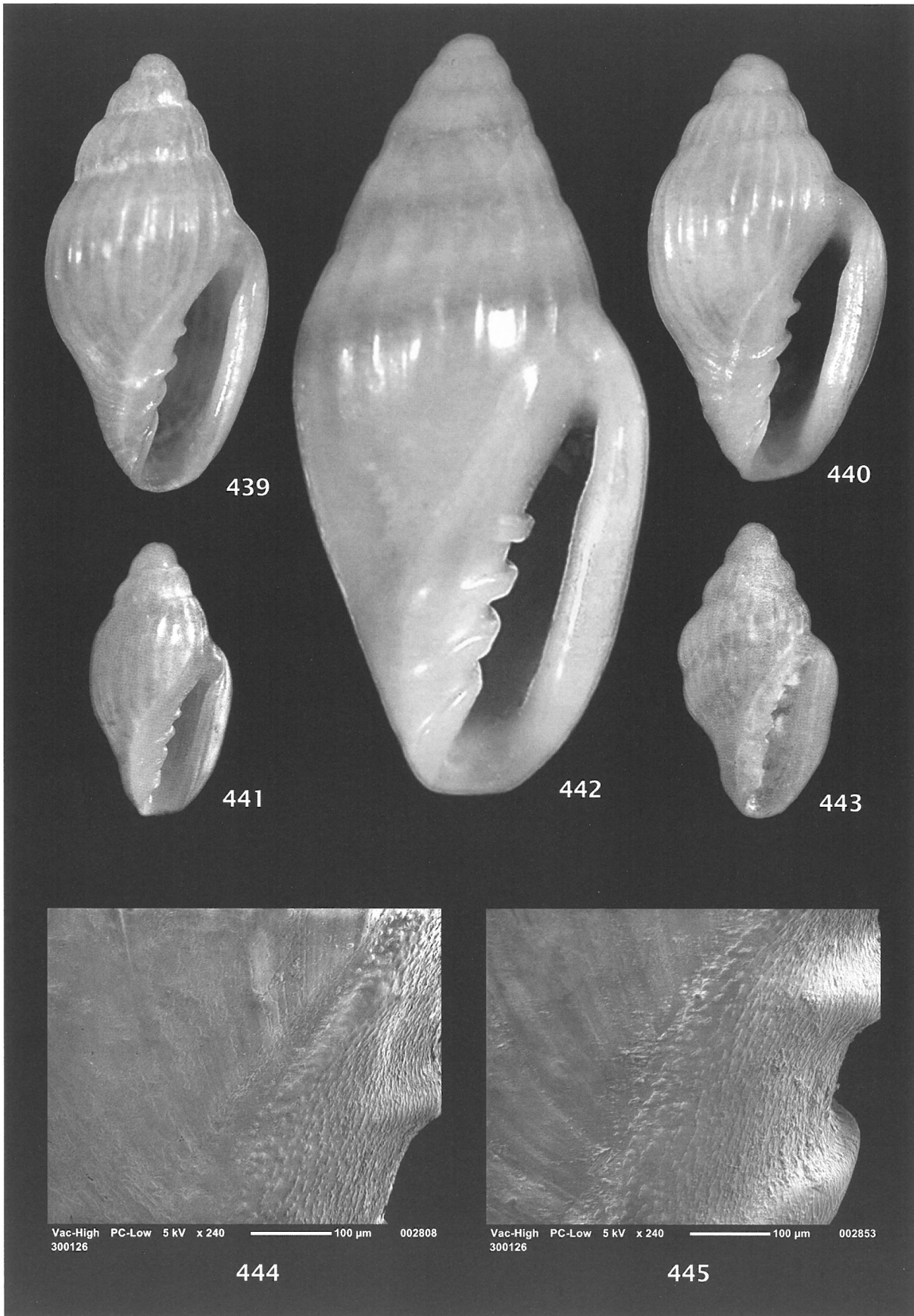
**Remarks.** *Eratoidea boyeri* is a species which cannot be confused with any other taxa in the genus because of its elongated shape, distinctive medial brown band and distinctive strong, bifurcated plications.

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**Figures 439-445**

- 439-440, 444-445.** *Eratoidea costulata* (Thiele, 1925), South Africa. Kwa-Zulu, Natal, 35-45 m.  
**439, 444.** Ad. dd., 3.14 x 1.63 mm, W:L 52%, TMC; **440, 445.** Ad. dd., 3.08 x 1.63 mm, W:L 53%, TMC.  
**441.** *Eratoidea costata* (Bozzetti, 1997), holotype, 2.35 x 1.10 mm, W:L 47%, Zanzibar, Kiwengwa, 2-3 m, MNHN 0583.  
**442.** *Eratoidea boyeri* (Bozzetti, 1994), holotype 5.4 x 2.42 mm, W:L 45%, Somalia, Cape Ras Hafun, 200 m, MNHN 0666.  
**443.** *Eratoidea sinuosa* (Bozzetti, 1997), holotype 2.35 x 1.15 mm, W:L 49%, Zanzibar, Kiwengwa, 2-3 m, MNHN 1268. (Not examined).



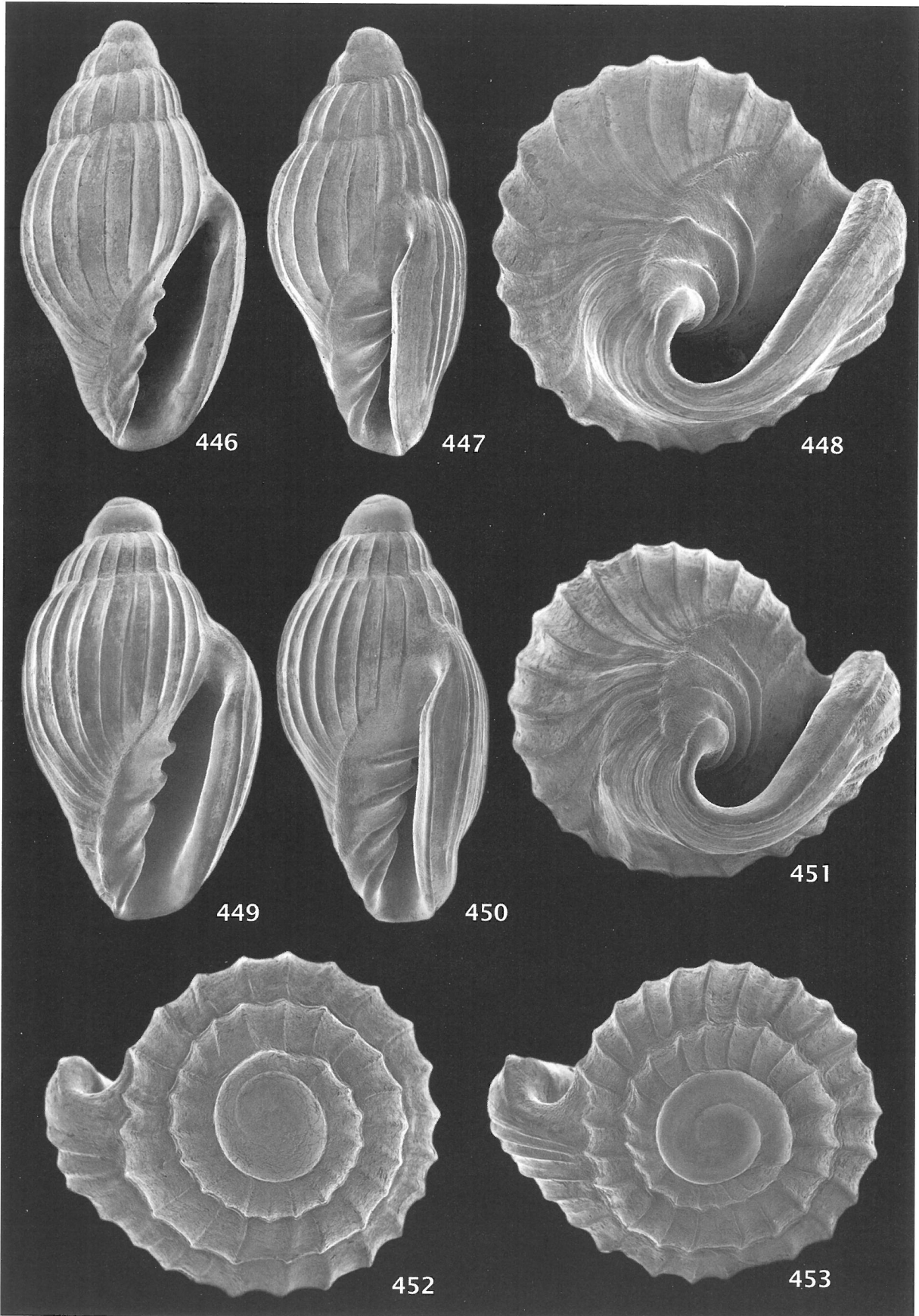
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## Figures 446-453

446-453. *Eratoidea costulata* (Thiele, 1925), South Africa. Kwa-Zulu, Natal, 35-45 m.

446-448, 452. Ad. dd., 3.14 x 1.63 mm, W:L 52%, TMC; 449-451, 453. Ad. dd., 3.08 x 1.63 mm, W:L 53%, TMC.



**Figures 454-458**

**454-458.** *Eratoidea boyeri* (Bozzetti, 1994), holotype, 5.42 x 2.55 mm, W:L 47%. north east Somalia, Cape Ras Hafun 150-200 m, MNHN 0666.

