New information on the malacological fauna (Mollusca, Gastropoda) of the Cape Verde Archipelago, with the description of five new species

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KEYWORDS. *Parviturbo*, *Eatonina*, *Obtusella*, *Megalomphalus*, *Vitrinella*, *Mareleptopoma*, *Tomura*, Cape Verde archipelago, new species.

ABSTRACT. New information on the Cape Verde molluscan fauna is reported in the present work. Additional information for some previously known species is presented, and the radulae of *Parviturbo insularis* and *Eatonina martae* are illustrated. Five species new for science are described, which are included in the following genera: *Obtusella lata*, *Megalomphalus serus, Vitrinella politurae, Mareleptopoma verdensis* and *Tomura abscondita*.

RÉSUMÉ. De nouvelles données sur la faune malacologique de l'Archipel du Cap Vert sont signalées. Des informations complémentaires pour des espèces connues sont présentées et les radulas de *Parviturbo insularis* et *Eatonina martae* sont illustrées. Cinq nouvelles espèces sont décrites:*Obtusella lata*, *Megalomphalus serus, Vitrinella politurae, Mareleptopoma verdensis* et *Tomura abscondita*.

RESUMEN. En el presente trabajo se aporta nueva información a la fauna de moluscos del archipiélago de Cabo Verde. Por un lado, se mencionan datos adicionales para algunas especies ya conocidas, como las rádulas de *Parviturbo insularis* y *Eatonina martae*. Por otra parte, se describen cinco especies nuevas para la ciencia, que están incluidas en los géneros que se mencionan a continuación: *Obtusella lata*, *Megalomphalus serus, Vitrinella politurae, Mareleptopoma verdensis* y *Tomura abscondita*.

INTRODUCTION

The Cape Verde archipelago is inhabited by a very peculiar mollusc fauna with a high number of endemic species which even today remain poorly known (ROLÁN, 1992a). In previous molluscan inventaries written by BURNAY & MONTEIRO (1977), SAUNDERS (1978), and VON COSEL (1982a, 1982b, 1982c) there is little information on the small gastropods.

Recently, small species have been published from Cape Verde Islands, most of them endemic to this archipelago (FERNANDES & ROLÁN, 1988, ROLÁN, 1988, 1991, 1992b, MOOLENBEEK & ROLÁN, 1988, ROLÁN & FERNANDES, 1989, BURNAY & ROLÁN, 1990, ROLÁN & RUBIO, 1992, ROLÁN & TEMPLADO, 1993, TEMPLADO & ROLÁN, 1994, PEÑAS & ROLÁN, 1997a, 1997b, 1998 and HOENSELAAR & GOUD, 1998). Further researchs are actually in progress (PEÑAS & ROLÁN, in preparation, and ROLÁN & LUQUE, in press) but curiously no species in the genera *Obtusella*, *Megalomphalus*, *Vitrinella*, *Mareleptopoma* or *Tomura* have been mentioned from these islands.

Nevertheless, in the study of sediment material collected from several trips between 1978 and 1988, as well as in the expedition Macaronesia 2 in 1997, some small shells new for science were found and are described in this present work.

At the same time live material of other species has been collected which allows us to add new information concerning living animal and anatomy.

Abbreviations

AMNH: American Museum of Natural History, New York.
MNCN: Museo Nacional de Ciencias Naturales, Madrid.
MNHN: Muséum National d'Histoire Naturelle, Paris.
NNM: Nationaal Natuurhistorisch Museum, Leiden.
USNM: The National History Museum, Washington.
CFR: collection Federico Rubio, Valencia
CER: collection Emilio Rolán, Vigo.

RESULTS

Subclass **ARCHAEOGASTROPODA**
Superfamily **TROCHOIDEA**
Family **SKENEIDAE** Clark, 1851
Genus ***Parviturbo*** Pilsbry & McGinty, 1945

Type species, by original designation: *Parviturbo rehderi* Pilsbry & McGinty, 1945. Florida.

Parviturbo insularis Rolán, 1988
Figs. 1-4

Material examined. See ROLÁN (1988). More recent material: 4 specimens, in Rabo de Junco, Sal, intertidal; many empty shells from other places (Boa Vista: Morro de Areia, Porto da Cruz; Santiago: Prainha, Ponta Geneanes, Tarrafal; Brava: Porto do Ancião, Furna, etc.).

Description. See ROLÁN (1988). New information on the species can now be reported. The operculum (Figs. 1-2) is corneus, yellowish, rounded; the edge is very thin. It is multispiral, but its spire is not easily visible and only then in its inner part, being uniform on the outer part.

The animal was observed and it is cream-white with elongate ciliated cephalic tentacles; small black eyes, not pedunculated, and a big parapodial tentacle in the right side, between the eye and the epipodium; mouth bilobulated; epipodium with three pairs of tentacles, not very long, being two of them on the opercular lobule. The observation of the rest of the body characters was impossible because the animal was very shy and it was almost all the time withdrawn into the shell.

The radula (Figs. 3-4) has a formula of n.5.1.5.n. The rachidian tooth is very broad with quadrangular shape and the lateral edges strongly expanded and with a smooth cusp. The lateral teeth are of similar size, overlapping on the inner part, with the characteristic bend in the middle shaft and with long denticulated cusps overhanging the outer part. A well-developed lateromarginal plate is visible. This plate extends behind and in front of the inner marginals. The marginal teeth are long and narrow with denticulated cusps which are strongly overhanging.

Habitat. The live specimens of *Parviturbo insularis* from Rabo de Junco, north of the Mordeira Bay, in Sal Island, were collected under stones in the upper high tide level.

Remarks. ROLÁN (1988) described *Parviturbo insularis* studying some shells collected in sediment samples from the Cape Verde Islands. These samples were collected from depths of between 4 and 30 m. No live animals were known. So the placement of this species in the genus *Parviturbo* was made only tentatively on the basis of the shell characteristics. Having been collected only in the Cape Verde archipelago, it was assumed that *P. insularis* was an species endemic to these islands.

The radula of *Parviturbo insularis* is very similar to that of *Parviturbo acuticostatus* (Carpenter, 1864) which is figured by HICKMAN & MCLEAN (1990, fig. 97A) in their description of *Parviturbo-Haplocochlias* group and by WARÉN (1992, fig. 2A). After comparing these characters, we conclude that this species was correctly placed in the genus *Parviturbo*.

Superfamily **CINGULOPSOIDEA**
Family **CINGULOPSIDAE** Fretter & Patil, 1958
Genus ***Eatonina*** Thiele, 1912

Type species, by monotypy: *Eatonina pusilla* Thiele, 1912.

Subgenus ***Coriandria*** Tomlin, 1917

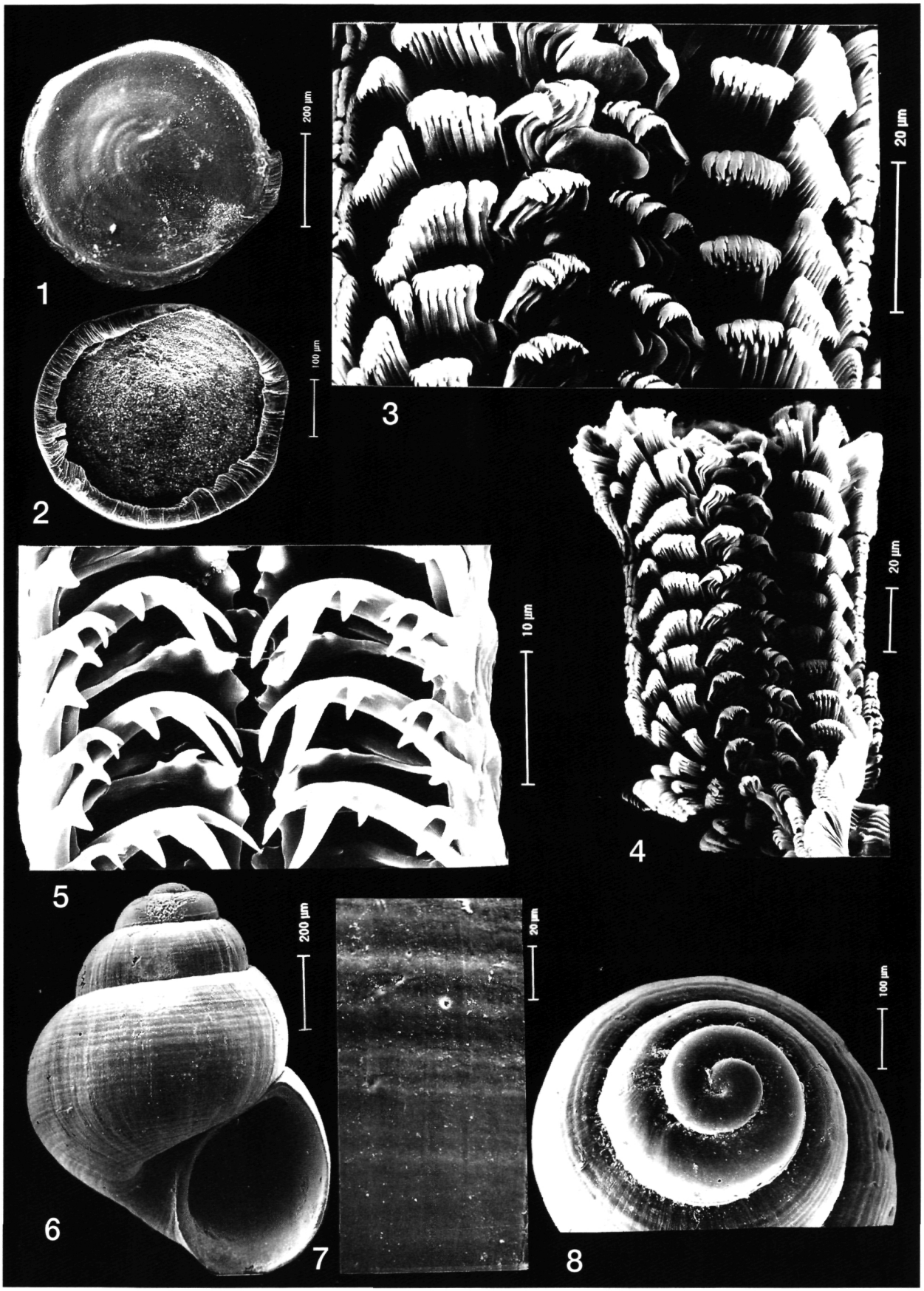
Eatonina (Coriandria) martae
Rolán & Templado, 1993
Fig. 5

Material examined. See ROLÁN & TEMPLADO (1993). Additionally from our last trips: 25 specimens, from Furna, Brava, and 10 more from Punta Geneanes, Santiago; several hundred empty shells from sediment collected at Brava, Ilheus Rombos, Santiago, Fogo, etc.

Description. See ROLÁN & TEMPLADO (1993). Further to this description it can be added the following: the radula (Fig. 5) is typical of the subgenus; it is very small in size being only 35 μm in width. It has a central tooth with two small denticles on its border, lateral folds which completely lacks any denticle in its inner face. The lateral tooth is quadrangular, with its upper bord uniformly convex and the external margin with four denticles, the outside one smaller. The inner marginal tooth has three elongate denticles at its apex, of which the central one is the most prominent. The marginal external tooth has a wide base and three sharp slightly curved denticles at its extremity.

Remarks. *E. martae* was described without any subgeneric assignment due to the fact that only empty shells were studied. The collection of several live specimens allowed us the complete radular study and therefore we can now confirm its location in the family Cingulopsidae and in the subgenus *Coriandria*.

Figs. 1-4. *Parviturbo insularis*. Figs. 1-2. Operculum. Figs. 3-4. Radula. **Fig. 5**. *Eatonina (Coriandria) martae*. Radula. **Figs. 6-8**. *Obtusella lata* n. sp. Fig. 6. Holotype (MNCN). Fig. 7. Microsculpture. Fig. 8. Protoconch.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Superfamily **RISSOIDEA**

Family **RISSOIDAE** Tomlin, 1917

Genus ***Obtusella*** Cossmann, 1921

Type species, by monotypy: *Obtusella intersecta* (S. W. Wood, 1857) (= *Rissoa obtusa* Cantraine). Europe.

Obtusella lata n. sp.

Figs. 6-8

Type material. Holotype (Fig. 6) of 1.11 x 0.84 mm, and 7 paratypes in MNCN (nº 15.05/32185), all from type locality. Other paratypes: 2 in MNHN, AMNH, USNM, NNM and CFR; 14 in CER (Fig. 8); all from type locality, collected between 15-30 m.

Other material studied. 9 shells, Porto Mindelo, 25 m, São Vicente.

Type locality. Off Pau Seco, Maio.

Etymology. The specific name is derived of the latin word *latus,* which means wide, alluding to be the wider dimension consistantly above the known size relevant to the European species *Obtusella intersecta* (Wood, 1857), at least in the Spain populations.

Description. Shell (Fig. 6) of very small size, milk-white in colour, globose, thin, a little higher than wide, spire formed by 3 ½ convex whorls, separating by a fine suture. Protoconch (Fig. 8) probably planktotrophic type, with 1 3/4 whorls and a maximum diameter of 310 µm. The embryonic protoconch (protoconch I) has a ½ spiral whorl scaring 3-4 spiral threads, which disappear at the beginning of the larvl phase (protoconch II); this is totally smooth with the exception of a spiral thread above the suture. Teleoconch consists of up to 2 spiral whorls, covered completelly by fine, very depressed spiral threads (Fig. 7), inequal in size and crossed by very fine scarcely prosocline growth lines. Aperture ovoid, ortocline, inner lip and external border sharp, columela curved, reflected towards the umbilicus, which is relatively wide and deep.

Dimensions. Usually, 1.0 mm in height and 0.8 mm in width. Some shells from Porto Mindelo can reach 1.2 mm.

Distribution. It has been collected in muddy substrata in Maio and São Vicente islands, but it is probably present in the rest of the archipelago.

Remarks. *Obtusella lata* spec. nov. has some similarity with the species of the European waters *Obtusella intersecta*. Both have a similar protoconch, but the shell is different because the Cape Verde ones are milk-white in colour, more globose, with a wider last whorl, the spiral threads are of unequal size, and the umbilicus is wider. *O. intersecta* is whitish-cream in colour, narrower profile, the spiral threads are uniform, and the umbilicus is always narrower. Also, the protoconch of *O. lata* has 1 3/4 whorls, while most the spp of *O. intersecta* studied from Vigo Bay have 2 whorls, although some are a little shorter.

O. intersecta has been cited with its southern distribution being the Maroccan coast (VERDUIN, 1984, Cancap 1 stn. 132 and 147) but, probably it must be considered as a species with a wide distribution along the entire West African. Recently the authors have found this species in sediment samples from Angola. In spite *O. lata* being in the middle of the distribution area of *O. intersecta*, the oceanic islands often present this kind of isolation for species ancestrally related.

Family **VANIKORIDAE** Gray, 1840

Genus ***Megalomphalus*** Brusina, 1871

Type species, by monotypy: *Stomatia azonea* Brusina, 1864.

Megalomphalus serus n. sp.

Figs. 9-13

Type material. Holotype (Figs. 9-10) of 1.92 x 1.45 mm, deposited in MNCN (nº 15.05/32186). One paratype in MNHN collected in the same locality, in sediment dredgings at 30 m.

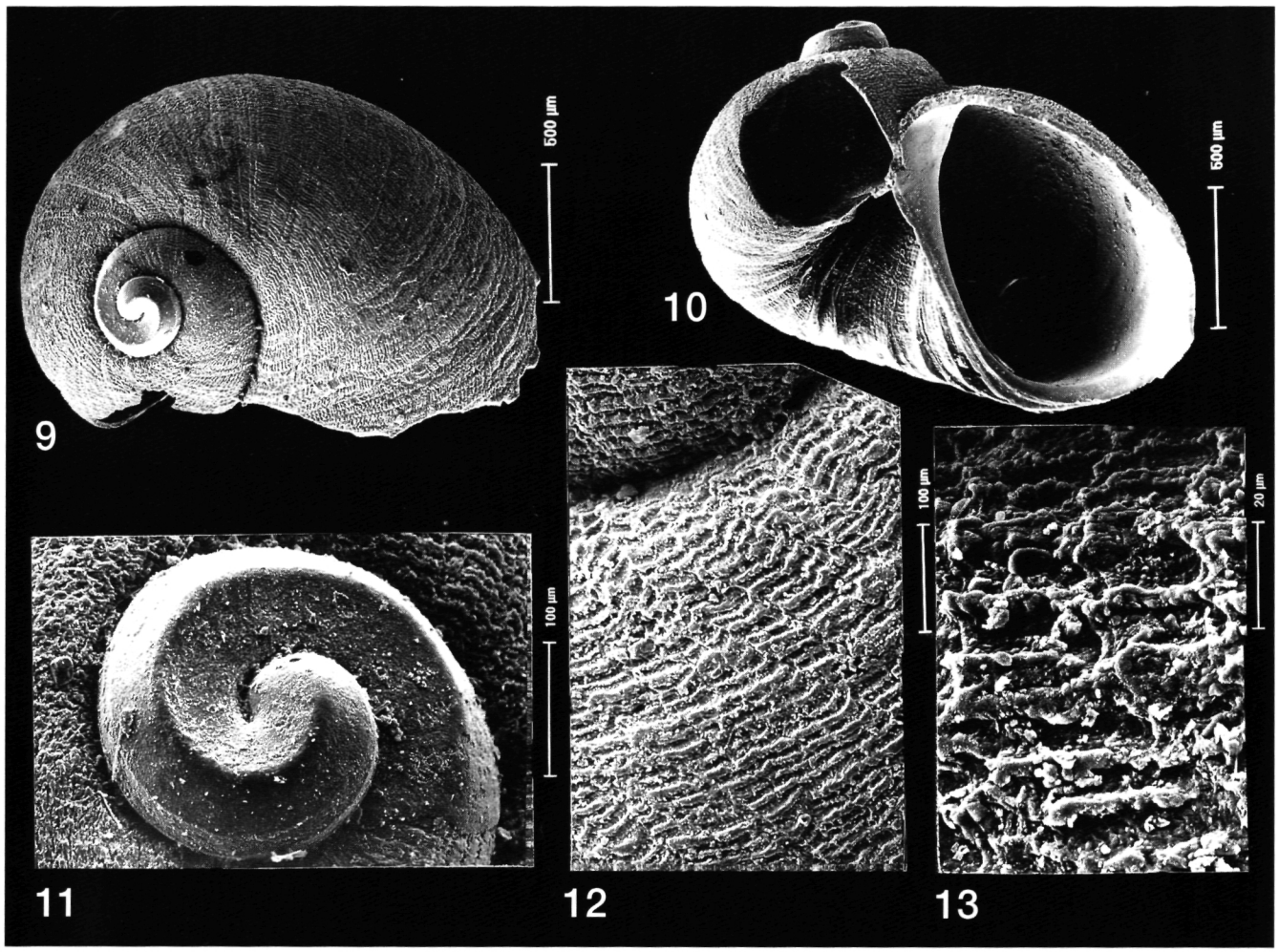
Type locality. Off Pau Seco, Maio Island.

Etymology. The specific name is derived of the latin name *serus* which means late, in allusion to it being found for the first time after many years of examining sediment samples.

Description. Shell (Figs. 9-10) of small size (maximum diameter 2.5 mm), depressed, fragile, spire formed by 2 ½ whorls of quick development, with a evident suture. The protoconch (Fig. 11) of the holotype has a maximum diameter of 315 µm, with a little more than one whorl, whose surface is aparently covered by very fine granules, and with a strong spiral cord which begins in the nucleus and continue as a keel until the end of the protoconch.

The teleoconch has 1 1/2 spiral whorls which enlarge in size quickly and has a surface totally covered by very small and irregular undulating spiral threads crossed by growth lines (Figs. 12-13). Aperture quadrangular, slightly prosocline. Base with a wide umbilicus bordered by a few prominent part where there are well marked axial ribs.

Animal, radula and operculum are unknown.



Figs. 9-13. *Megalomphalus serus* n. sp. Figs. 9-10. Holotype (MNCN). Fig. 11. Protoconch. Figs. 12-13. Microsculpture.

Distribution. Only know from the type locality.

Remarks. The generic assignation has been made because of its similarity with the type species of the genus, *M. azonea*.

M. serus n. sp. can be differentiated *from M. disciformis* and *M. mercatoris* by its keeled protoconch, the lack of axial sculpture and the very fine undulating spiral threads.

Anyway, WARÉN & BOUCHET (1988) indicate having seen the holotype of *Megalomphalus mercatoris* Adams & Knudsen, 1969 and they did not find any differences with the specimen of *Megalomphalus disciformis* identified by Monterosato as *M. depressus* Seguenza.

Some species of the genus *Macromphalina* Cossman, 1888 from West Africa can have similar morphological features (*M. boury* Dautzenberg, 1910 and *M. gofasi* Rubio & Rolán, 1994), but both have multispiral protoconch.

A recent revision (ROLÁN & RUBIO, 1998) of the Caribbean species of *Megalomphalus* and *Macromphalina* shows that all species differ in shell shape and protoconch from *M. serus* n. sp.

Family **VITRINELLIDAE**

Genus ***Vitrinella*** C. B. Adams, 1850

Type species, by original designation: *V. helicoidea* C. B. Adams, 1850.

Vitrinella politurae n. sp.
Figs. 14-19

Type material. Holotype (Fig. 18) of 0.88 x 0.44 mm, and 4 paratypes deposited in MNCN (nº 15.05/32188), all from the type locality. Paratypes: 1 (Fig. 17) in MNHN, 1 in CFR, 1 in AMNH and 1 in USNM, all from type locality, collected at 4 m; 5 paratypes (Fig. 15) in CER, 1 from Baia Teodora, 4 m, Boa Vista, and 4 from Regona, 3 m, Sal; 2 more from Sal Rei Bay, in CFR.

Other material studied. 2 shells, Porto Mindelo, 15 m, São Vicente; 1 shell, 1 juvenile and 1 fragment, Baia Teodora, 4 m, Boa Vista; 3 shells, Baia da Pedrinha, 8 m, Brava; 2 shells, Furna, 15 m, Brava.

Type locality. Baia da Mordeira, Sal Island.

Etymology. The specific name is derived from the latin word *politura*, which means polish, in allusion to the surface of the shell.

Description. Shell (Figs. 14-18) very small in size, whitish, apically planispiral, with 2 spiral whorls of relatively quick development, and a few impressed sutures. Protoconch (Fig. 19) of one spiral whorl, smooth. Teleoconch totaly smooth, except for growth lines which are more evident in the umbilical zone. Aperture rounded, prosocline, with thicked columela expanded on the previous whorl forming a small callous in front of the aperture. Periostracum fine, cream in colour.

Dimensions. The shells can reach maximum dimension of 1.3 mm.

Distribution. So far only know from the Cape Verde archipelago, the islands of Sal, Boavista, São Vicente and Brava, but probably present in all islands of this group.

Remarks. *Vitrinella politurae* n. sp. can be differentiated from its congeneric species of the West African coast because by its smaller size and the fact that it is totally smooth: *V. bushi* Dautzenberg, 1913 is almost smooth but has evident growth lines, and the umbilicus is narrowed by a thick columelar callous. *V. annulifera* Dautzenberg, 1910 has spiral cords and striae.

Most of the Caribbean species has some kind of spiral sculpture; only three species are smooth: *V. helicoidea* C. B. Adams, 1850 has the umbilicus rounded by a smooth spiral cord; *V. floridana* Pilsbry & McGinty, 1946, can seem similar but it is not dorsally planispiral, and its size is bigger (the holotype, in ANSP, figured by VOKES & VOKES, 1983 has 1.95 mm).

Family **PICKWORTHIIDAE** Iredale, 1917

Genus ***Mareleptopoma***
Moolenbeek & Faber, 1984

Type species, by monotypy: *Mareleptopoma karpatensis* Moolenbeek & Faber, 1984. Caribbean.

Mareleptopoma verdensis n. sp.
Figs. 20-22

Type material. Holotype (Fig. 20) of 1.2 x 0.8 mm, deposited in MNCN (nº 15.05/32189). One paratype in each of the following. MNHN (Fig. 21), AMNH, USNM and 5 in CER, all from type locality; 2 in CFR, one from Baixos de João Valente and other from Prainha, Santiago.

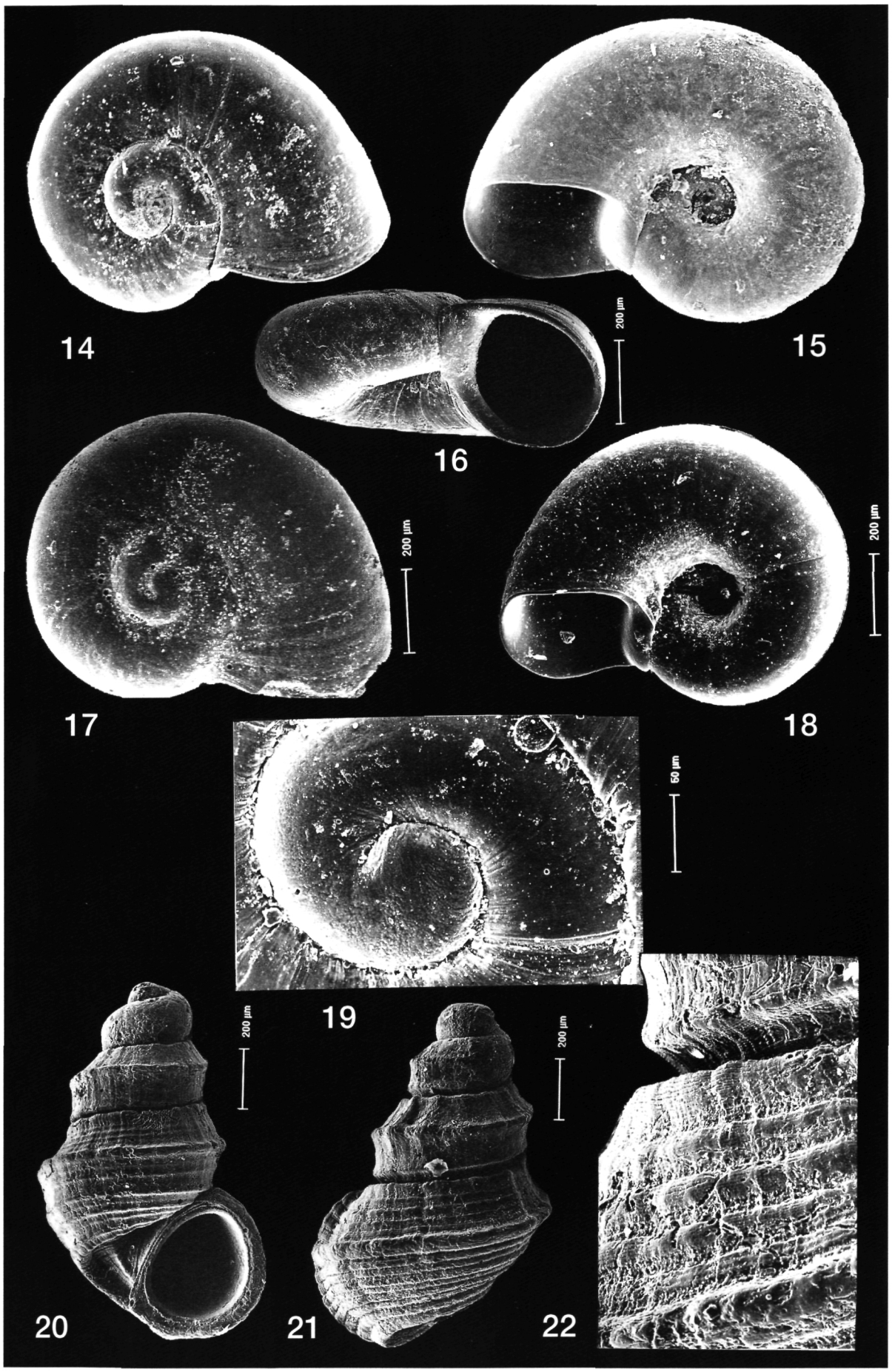
Type locality. Praia da Cruz, north of Sal Rei, Boa Vista Island.

Etymology. The specific name refers to the archipelago where it was collected.

Description. Shell (Figs. 20-21) of small size, thick, conoid-elongate, with 3 1/2 spiral whorls, separated by a deep and canaliculated suture. The last whorl represents 65% of its height. Protoconch paucispiral, with only one whorl, apparently smooth. The teleoconch has 2 spiral whorls which have a strong spiral cord like a keel, forming an angle at the periphery. Other smaller flattened spiral cords are present on the last whorl, 5 above and 8-9 below the first one. These smaller cords as well as the interspaces have very punctiform fine sulcii (Fig. 22). There are also growth lines. The cord at the base is the strongest and it borders the umbilical infundibulum. This umbilicus has other strong cord into. The contact of the aperture with the previous whorl is only in a short area. Aperture oval, almost rounded, scarcely prosocline, with a thick external varix. Peristome continuous, wide, flat, with the border of the inner lip everted. The external border is undulating due the spiral cords on the base caused by the umbilical cords.

Animal, radula and operculum are unknown.

Figs. 14-19. *Vitrinella politurae* n. sp. Fig. 14. Bahía Teodora, Boa Vista. Fig. 15. Paratype (CER), Furna, Brava. Fig. 16. Furna, Brava. Fig. 17. Paratype (MNHN). Fig. 18. Holotype (MNCN). Fig. 19. Protoconch. **Figs. 20-22.** *Mareleptopoma verdensis* n. sp. Fig. 20. Holotype (MNCN). Fig. 21. Paratype (MNHN). Fig. 22. Detail of the sculpture.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15
200 µm
16
17
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18
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22

Distribution. Only know from Boa Vista and Santiago Islands, and the Baixos de João Valente.

Remarks. There is no species of the genus *Mareleptopoma* known from the West Atlantic coast. Most of the Caribbean species have very wide shells which for this reason are very much different from *M. verdensis* n. sp. The only elongate species is *M. katyae* Rolán, Espinosa & Fernández-Garcés, 1990, but it is different because the less numerous spiral cords on the last whorl and the three sculptured whorls of the protoconch.

Subclass **HETEROBRANCHIA**
Superfamily **VALVATOIDEA**
Family **CORNIROSTRIDAE** Ponder, 1990
Genus ***Tomura*** Pilsbry & McGinty, 1946

Type species, by monotypy: *Vitrinella (Tomura) bicaudata* Pilsbry & McGinty, 1946. Florida.

Tomura abscondita n. sp.
Figs. 23-30

Type material. Holotype (Fig. 23) of 0.75 x 0.66 mm, deposited in MNCN (nº 15.05/32190). One paratype in each of the following: MNHN (Fig. 24), USNM (Fig. 29), AMNH (Fig. 26), all from type locality, collected in sediments of 30 m; 3 more in CER and 1 in CFR, from Porto Mindelo, São Vicente.

Type locality. Tarrafal, Santiago Island.

Etymology. The specific name is derived from the latin word *absconditus*, which means hidden, and alludes to the long time in which it was not found during our previous studies of sediment samples from this area.

Description. Shell (Figs. 23-26) very small, whitish, translucent, almost spherical, fragile, with a naticiform aspect. Protoconch (Figs. 27-28) hiperstrophic, with less that one spiral whorl visible and a maximum diameter of 157 μm, smooth, except for the nucleus which seems to have small granulations. The teleoconch has 2 spiral whorls, and a microsculpture formed by very small and numerous spiral threads of variable size, which extend also into the umbilicus (Figs. 25-26). There are numerous very small growth lines. The spiral microsculpture is more attenuated in most shells in the upper part (Fig. 29) whilst being more evident in the lower part of the shell where more prominent threads alternate with 1-3 smaller (Fig. 30).

Aperture rounded, prosocline with a right columela; the last whorl contacts only in a short part with the previous whorl. The external lip is fine, sharp; the internal lip is reflected towards the umbilicus forming a small callous.

Animal, radula and operculum are unknown.

Distribution. Only known from the Cape Verde archipelago, where it has been collected in Santiago and São Vicente islands.

Remarks. Generic assignation is made tentatively because no live animal has been collected. This placement is based on its similarity with *T. depressa* from Europa.

Tomura abscondita n. sp. can be differentiated from *T. depressa* (Granata, 1877) because its shell is a little more globose, is totally covered by spiral threads and the callous formed by the enlargement of the internal lip does not cover the umbilicus. From the Caribbean, RUBIO & ROLÁN (1998) described *T. xenoskeneoides*, which is differentiated because this species has a valvatoid shell lacking any spiral sculpture and enlargement of the internal lip. From *T. bicaudata* it can be separated because this species has a convex base, becoming a little concave near the strong angle or cord which overhangs the umbilicus, also being smooth.

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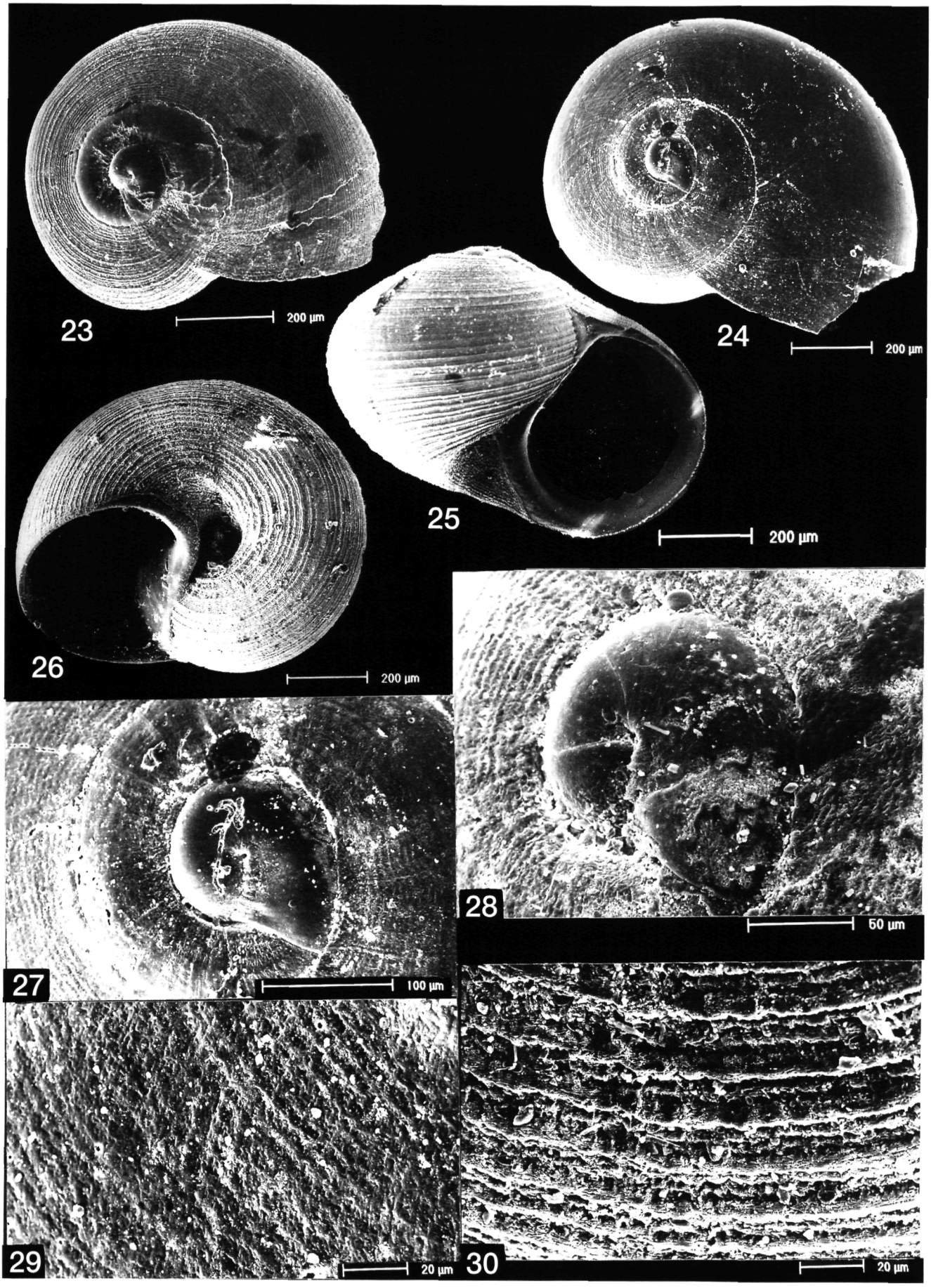
Figs. 23-30. *Tomura abscondita* n. sp. Fig. 23. Holotype (MNCN). Fig. 24. Paratype (MNHN). Fig. 25. Paratype (USNM). Fig. 26. Paratype (AMNH). Figs. 27-28. Protoconch. Figs. 29-30. Microsculpture.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