

New small deep-sea species of Gastropoda from the Campos Basin off Brazil

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Abstract: During environmental characterization of the Campos Basin, Rio de Janeiro State (22°S), about 120 samples from depths between 400 and 2000 m were dredged with a 0.25-m² box-core, and a high biodiversity of micro-molluscs was found. Although only dead animals were collected, the shells were often in a good state of preservation. Six new species, belonging to gastropods families Aclididae (*Aclis kanela* n. sp.), Trochidae (*Mirachelus urueuauau* n. sp. and *Calliotropis pataxo* n. sp.), Skeneidae (*Palazzia pankakare* n. sp. and *Adeuomphalus xerente* n. sp.), and Tornidae (*Ponderinella xacriaba* n. sp.) are described.

Key words: biodiversity, deep-water, continental slope, new species

This paper consists of observations on several groups of southern Atlantic gastropods, accumulated during the past 10 years. It is based on material from the continental slope of Brazil obtained during environmental characterization of the Campos Basin, the main Brazilian oil-production area, sponsored by the Brazilian petroleum company Petrobras. Finds of very small and well-preserved shells are still rare worldwide, and there are no published records from the Brazilian coast. This is the most extensive collection of deep-water molluscs from South America.

Of the 1575 species of marine molluscs reported for Brazil by Rios (1994), 1112 belong to the Gastropoda. Only 126 (11.33%) of these are reported to occur on the continental slope (below 200 m depth); many also occur on the continental shelf. These numbers are not indicative of an impoverished malacological fauna but rather reflect quite limited collecting effort at such depths.

The first gastropod species from Brazilian deep water was reported by Watson (1879), who described *Margarites dnopherus* (Watson, 1879). Many of the 126 above-mentioned deep-water species were also described or reported by him. After the great 19th century exploratory expeditions (the "Challenger," "Albatross," and others), no additional reports on Brazilian deep-water molluscs appeared. This situation began to change after 1980, when Leal and co-workers described some new macro-mollusc species (Leal and Bouchet 1989, 1991, Leal and Rios 1990, Leal and Simone 1998, 2000). Other reports appeared by Harasewych (1983) and more recently by Absalão *et al.* (2001), Absalão and Pimenta (2003, 2005), Absalão and Santos (2004), Zelaya *et al.* (2006), Simone (1999, 2002, 2003, 2005), Simone and Birman (2006), Simone and Cunha (2006), Barros *et al.* (2007), Lima and Barros (2007), and Lima *et al.* (2007). Despite the efforts of these

investigators, our knowledge about molluscs and especially about deep-water micro-molluscs is incomplete.

Our limited knowledge about biodiversity of these deep waters is even worse when we consider our lack of knowledge about the anatomy of the soft parts and the radulae of most deep-water species, making it difficult to determine their generic and/or sub-generic placement. Therefore, despite taxonomic difficulties, the goal of this study was to describe several newly discovered deep-water micro-gastropod species.

MATERIALS AND METHODS

About 120 samples were dredged with a 0.25-m² box-core from the continental slope off Rio de Janeiro state, at depths ranging from 700 to 1950 m. Dredging was performed by the R/V *Astro-Garoupa* between 2001 and 2003 as part of the program "Environmental Characterization of Campos Basin, RJ, Brazil" under the auspices of PETROBRAS S.A.

Each sample was washed through a 0.5-mm mesh and preserved in 70% ethanol. In the laboratory, these residual materials were sorted under magnification and the molluscs picked out. Although no live specimens were collected, the shells were often in a good state of preservation.

Shells were mounted on specimen stubs and photographed under a Scanning Electron Microscope (ZEISS EVO 40) at "Gerência de Bioestatigrafia e Paleoecologia Aplicada (BPA)" belonging to the Centro de Pesquisas da Petrobrás (CENPES).

Most of the material is deposited in the mollusc collection of Departamento de Zoologia, Instituto de Biologia da Universidade Federal do Rio de Janeiro (IBUFRJ) unless otherwise stated. Other abbreviations and terms used in this paper are: MNRJ (Museu Nacional do Rio de Janeiro), MNHN

(Muséum national d'Histoire naturelle Paris), BC (Bacia de Campos = Campos Basin), PETROBRAS (Brazilian Petroleum Company), n. sp. (new species), Norte (north), and Sul (south).

RESULTS

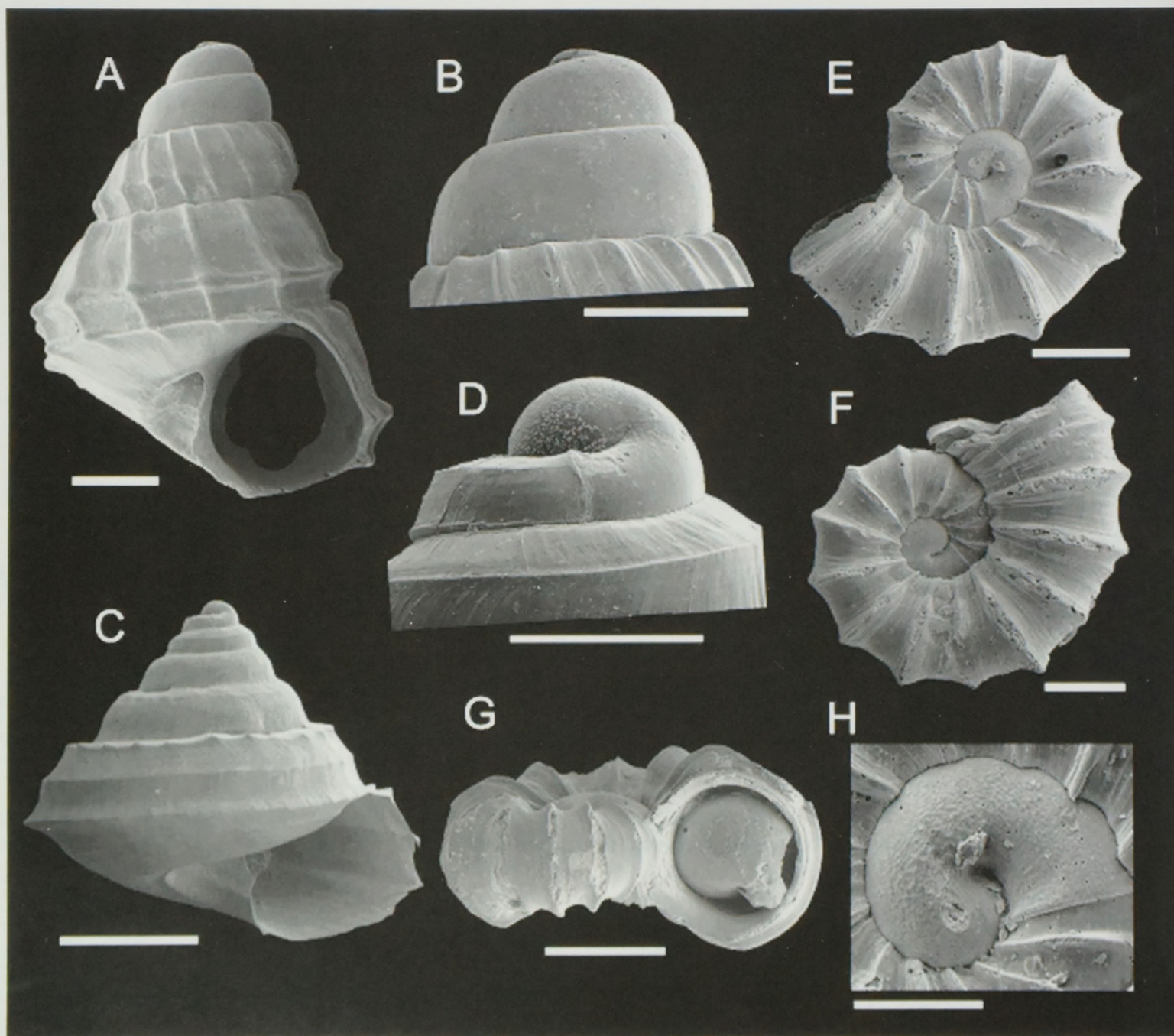
Family Trochidae Rafinesque, 1915

Genus *Mirachelus* Woodring, 1928

Mirachelus urueuauau new species (Figs. 1A-B)

Description

Shell small, conical, and solid, of about 4 whorls. Protoconch relatively large and smooth, with about 2½ whorls. Teleoconch with 12 well-separated, thin axial cordlets. There is a spiral cord on the lower ⅓ of the whorl, forming nodules where it crosses the axial cordlets. No microsculpture. Shell profile pagoda-like, with a deep suture. Base almost straight, with a smooth cord bordering the umbilicus. Aperture subcircular-polyhedric because the outer lip is



Figures 1. A-B, *Mirachelus urueuauau* n. sp. Holotype IBUFRJ 18031. A, whole shell, frontal view; B, protoconch. C-D, *Calliotropis pataxo* n. sp. Holotype IBUFRJ 18035. C, whole shell, frontal view; D, protoconch. E-H, *Palazzia pankakare* n. sp. Holotype IBUFRJ 18041. E, dorsal view; F, ventral view; G, frontal view; H, protoconch. Scale bar for A-C: 500 µm; D: 250 µm; E-G: 400 µm; H: 200 µm.

marked to both the spiral cord and basal cord. Columella short, slightly arched. Radula and operculum unknown.

Etymology

This species is named in honor of the Uru-eu-au-au Indians, one of the indigenous peoples of Brazil. The name is employed as a noun in apposition.

Holotype

IBUFRJ 18031; 2.65 mm length, 2.26 mm width, Campos Basin, BC Sul I #75 (22°31'28"S, 40°03'50"W), 19.XI.2002, 1050 m.

Paratypes

MNRJ 12847, BC Sul II #80 (22°24'30"S, 39°57'28"W), 20.VI.2003, 1044 m; IBUFRJ 18032, BC Sul II #86 (22°31'37"S, 39°55'14"W), 16.VI.2003, 1630 m; MNHN, BC Sul II #81 (22°26'28"S, 39°54'08"W), 21.VI.2003, 1345 m; IBUFRJ 18033 BC Norte I #61 (21°52'51"S, 39°48'11"W), 12.XII.2002, 1350 m.

Additional material

IBUFRJ 18034 BC Norte II #61 (21°52'51"S, 39°48'12"W), 26.VI.2003, 1372 m.

Remarks

The only species of *Mirachelus* previously reported for Brazil is *Mirachelus clinocnemus* Quinn, 1979 (Quinn 1979: 18-19, figs. 33-34). Rios (1994, fig. 83) illustrated the species with an SEM photograph. *Mirachelus urueuauau* n. sp. can be distinguished from *M. clinocnemus* by its more delicate axial riblets, compared to the thicker axial ribs in *M. clinocnemus*. The spaces between the axial riblets in *M. urueuauau* n. sp. is about 4 times the riblet width whereas the spaces are almost equal to the width of the ribs in *M. clinocnemus*. Finally, the base is almost straight and smooth in *M. urueuauau* n. sp., while in *M. clinocnemus* it is convex and has three strong spiral cords. The umbilicus is wider in *M. urueuauau* n. sp. than in *M. clinocnemus*. Although the holotype of *Mirachelus urueuauau* n. sp. is only a fourth whorl shell, these differences cannot be attributed to size differences. *Mirachelus corbis* (Dall, 1889) (Quinn 1979: 18, figs. 35-36) is a very distinctive species, with a more turreted shell profile, stronger and numerous axial ribs, an additional spiral cord on the whorls, an excavated suture, and an ornamented base rib. Despite its small size, *Mirachelus urueuauau* n. sp. cannot be confused with any other species of the genus.

Description

Shell small, broadly conical, of about 6 whorls, iridescent, carinate, and with broad umbilicus. Shell profile straight or slightly concave, strongly stepped. Protoconch small, smooth, with slightly more than one whorl, ornamented with very small irregular stellar nodules connected by protuberances concentrated on the initial part. Proto-teleoconch boundary well marked. First and second whorls of teleoconch with a narrow keel on the shoulder, then becoming obsolete and arising again on the body whorl as a more nodulose keel. Body whorl with three keels: one nodulose near the suture; the second in the middle of the whorl, less evident than the others; and the third with very light nodules, delimiting the body whorl from the base. Opisthocline axial growth scars present on the entire shell, but more visible on the first two teleoconch whorls. There are about 22 low but somewhat pointed nodules on the spiral keel on the body whorl, suggesting the presence of very retractive axial ribs. Base convex, smooth or with hardly discernible axial cords. Umbilicus broad and deep, bordered by somewhat evanescent cord; two additional umbilical cords may also be present inside. Aperture subquadrate, narrow; inner lip slightly reflected. Columella slightly oblique and arched.

Etymology

This species is named in honor of the Pataxó Indians, one of the indigenous peoples of Brazil. The name is employed as a noun in apposition.

Holotype

IBUFRJ 18035, 1.22 mm length, 1.40 mm width, Campos Basin, BC Sul I #73 (22°41'35"S, 40°00'45"W), 22.XI.2002, 1950 m.

Paratypes

MNRJ 12848, BC Sul II #77 (22°36'12"S, 39°58'22"W), 13.VI.2003, 1670 m; IBUFRJ 18036, BC Sul II #83 (22°30'34"S, 39°51'44"W), 16.VI.2003, 1970 m; MNHN, BC Norte I #46 (22°10'55"S, 39°49'00"W), 10.XII.2002, 1350 m; IBUFRJ 18037, BC Norte I #62 (21°52'41"S, 39°46'17"W), 11.XII.2002, 1650 m.

Additional material

IBUFRJ 18038, BC Norte I #63 (21°52'44"S, 39°40'45"W), 11.XII.2002, 1950 m; IBUFRJ 18039, BC Norte II #57 (21°57'15"S, 39°47'41"W), 28.VI.2003, 1587 m.

Remarks

There are only three species previously reported for Brazil: *Calliotropis actinophora* (Dall, 1890), *Calliotropis aeglees* (Watson, 1879), and *Calliotropis calatha* (Dall, 1927) (Rios 1994). The first two are deep-water species reported from off

Genus *Calliotropis* Seguenza, 1903

Calliotropis pataxo new species (Figs. 1C-D)

northern and northeastern Brazil; the third is reported from the edge of the continental shelf off southern Brazil. *Calliotropis pataxo* n. sp. can be distinguished from *C. actinophora* (type illustrated by Quinn 1979, figs. 21-22) by its smaller spire angle, less-rounded profile of the body whorl, absence of thin radial riblets, absence of nodulous middle spiral keel, and absence of two strong spiral cords on the base. It can be distinguished from *C. aeglees* (type illustrated by Quinn 1979, figs. 11-12) by its stepped shell; the less-nodulose spiral cords, especially the supra-sutural cord; absence of axial riblets on the first whorl; absence of a third keel forming the whorl periphery; and absence of three spiral cords on the base. It can be distinguished from *C. calatha* (type illustrated by Quinn 1979, figs. 15-16) by the less-expanded body whorl, absence of axial riblets, sutures not being channeled, less-prominent middle keel, and absence of four spiral cords on the base. *Calliotropis rhina* (Watson, 1886) (type illustrated by Quinn 1979, figs. 27-28) shows a much higher spire than *Calliotropis pataxo* n. sp., in addition to more nodulous spiral cords and spiral cords on the base. *Calliotropis lissocona* (Dall, 1881) (type illustrated by Quinn, 1979, figs. 13-14) has a smaller spire angle than *C. pataxo* n. sp., shows no trace of a middle keel, has two very strong spiral cords on the base, and a nodulose spiral cord bordering the umbilicus; none of these cords is present in *C. pataxo* n. sp. In summary, the stepped shell, the slight nodulose ornamentation, and smooth base preclude any chance of confusing *Calliotropis pataxo* n. sp. with other species of the Atlantic basin.

Family Skeneidae Thiele, 1929

Genus *Palazzia* Warén, 1991

Palazzia pankakare new species (Figs. 1E-H)

Description

Shell small, diameter about 1.5 mm, white, solid, planispiral; spire not projecting beyond the last whorl profile. Protoconch with about 1.5 whorls, with clear cut between proto-teleoconch boundary. It is entirely covered by irregular corrugations. Teleoconch with 15 annular ribs (triangular in section) and broad smooth interspaces between them, these spaces about 3-4 times the width of the annular ribs. No spiral sculpture nor pits present. Lips strong but not thickened. Aperture holostomate, circular. Operculum unknown.

Etymology

This species is named in honor of the Pankakaré Indians, one of the indigenous peoples of Brazil. The name is employed as a noun in apposition.

Holotype

IBUFRJ 18041, shell diameter 1.40 mm, height 0.68 mm, Campos Basin, BC Sul I #77 (22°36'03"S, 39°57'54"W), 16.XI.2002, 1650 m.

Paratypes

MNRJ 12849, BC Sul I #85 (22°29'33"S, 39°56'17"W), 19.XI.2002, 1350 m; IBUFRJ 18042, BC Sul II #85 (22°30'21"S, 39°56'53"W), 21.VI.2003, 1353 m; MNHN, BC Sul II #86 (22°31'37"S, 39°55'14"W), 16.VI.2003, 1630 m; IBUFRJ 18043, BC Norte I #61 (21°52'51"S, 39°48'11"W), 12.XII.2002, 1350 m.

Additional material

IBUFRJ 18044, BC Norte II #61 (21°52'51"S, 39°48'12"W), 26.VI.2003, 1372 m.

Remarks

There is no record of this genus in the South Atlantic, and *Palazzia planorbis* (Dall, 1927) and *Palazzia ausonia* (Palazzi, 1988) are the only known species reported for the North Atlantic (Warén 1991a: 77, figs. 16A-D; 78-79, figs. 17A-G, 18A-C). *Palazzia pankakare* n. sp. can be distinguished from the other congeners by its incomplete and much more numerous axial rings. The micro-ornamentation of the protoconch of *P. pankakare* n. sp. is identical those showed by *P. planorbis* and *P. ausonia* (see Warén 1991a: 79, figs. 18A-C). The genus *Ammonicera* Vayssière, 1893 has conchological similarities with *Palazzia pankakare* n. sp. but is distinguished from *Palazzia* by its spirally ornamented protoconch (Rolán 1992). Despite the good fit of *P. pankakare* n. sp. to genus *Palazzia*, Warén (1991a: 75) states that "the teleoconch surface is finely and irregularly pitted" and we were unable to find any sign of pits on the teleoconch. So, attribution to the generic level should be viewed with caution.

Genus *Adeuomphalus* Seguenza, 1876

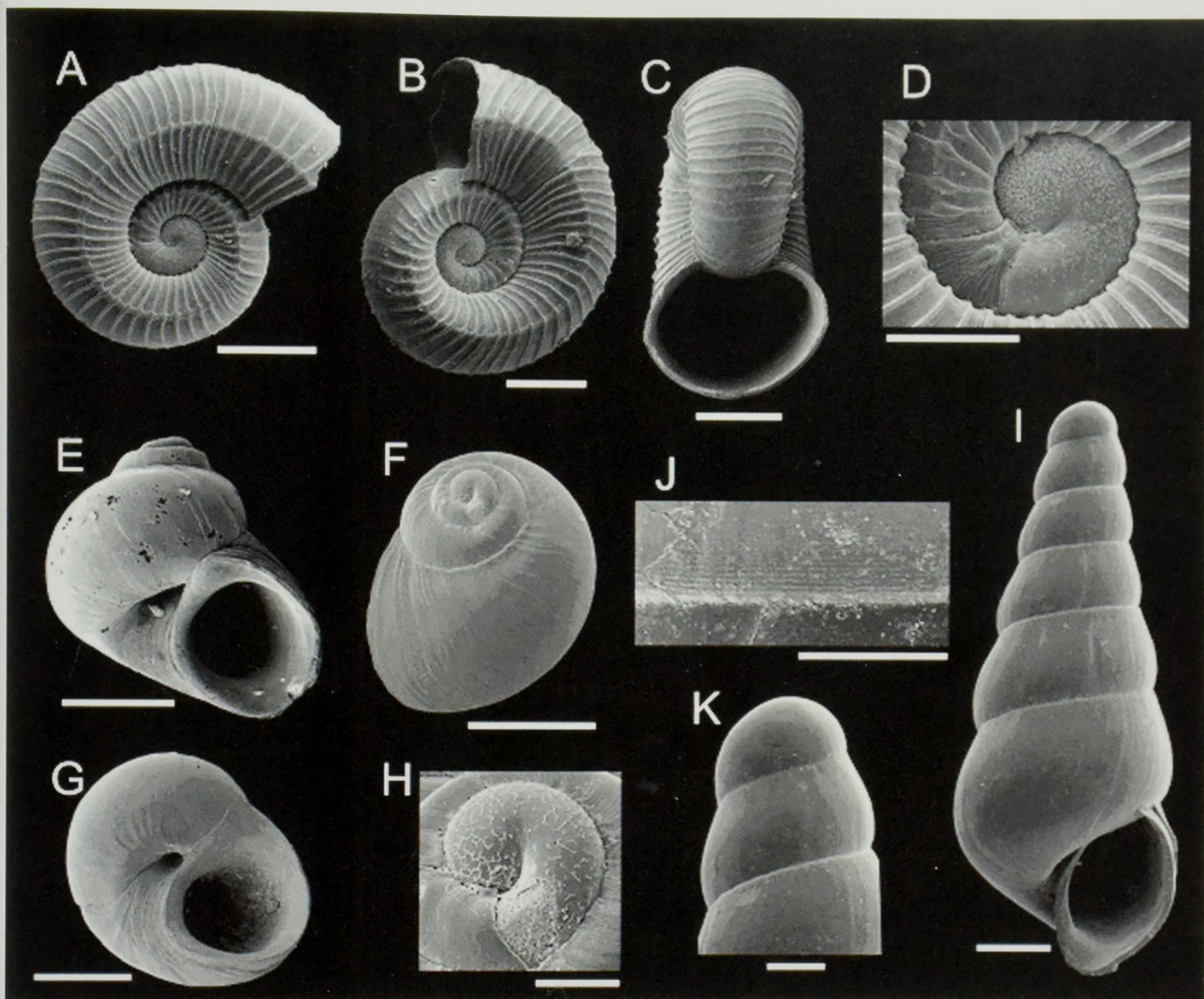
Adeuomphalus xerente new species (Figs. 2A-D)

Description

Shell planospiral, small, white, with axial rings and spiral cords. Protoconch size about 1.75 whorls, with well-marked boundary with teleoconch. Protoconch with irregular stellar nodules connected by protuberances that spread over $\frac{3}{4}$ of the protoconch length. Teleoconch with about 60 narrow, equally spaced rings. Width of interspaces about 2-4 times the width of ring. Peripherally there is a spiral cord on both the dorsal and ventral side of the shell, and sometimes it is crossed by rings forming low and rounded nodules. Lips not thickened, aperture irregularly ovoid with anterior whorl projecting slightly over it. Operculum and radula unknown.

Etymology

This species is named in honor of the Xerente Indians, one of the indigenous peoples of Brazil. The name is employed as a noun in apposition.



Figures 2. A-D, *Adeuomphalus xerente* n. sp. Holotype IBUFRJ 18045. A, dorsal view; B, ventral view; C, frontal view; D, protoconch. E-H, *Poderinella xacriaba* n. sp. Holotype IBUFRJ 18048. E, whole shell, frontal view; F, dorsal view; G, base; H, protoconch. I-K, *Aclis kanela* n. sp. Holotype IBUFRJ 18056. I, whole shell, frontal view; J, protoconch and K, detail of suture. Scale bar for A-C, I: 250 μ m; D, H, J-K: 100 μ m; E, G: 500 μ m

Holotype

IBUFRJ 18045, shell diameter 0.74 mm, height 0.55 mm, Campos Basin, BC Sul II #85 (22°30'21"S, 39°56'53"W), 21.VI.2003, 1353 m.

Paratypes

MNRJ 12850, BC Sul II #86 (22°31'37"S, 39°55'14"W), 16.VI.2003, 1630 m; IBUFRJ18046, BC Norte I #46 (22°10'55"S, 39°49'00"W), 10.XII.2002, 1350 m; MNHN, BC Norte I #61 (21°52'51"S, 39°48'11"W), 12.XII.2002, 1350 m;

IBUFRJ 18047, BC Norte II #45 (22°10'53"S, 39°52'18"W), 01.VII.2003, 1039 m.

Remarks

There is no record of this genus in the South Atlantic, and *Adeuomphalus ammoniformis* Seguenza, 1876 is the only known species reported for the North Atlantic (Warén 1991a: 74-76, figs. 14F, 15A-B). It can be distinguished from *Adeuomphalus xerente* n. sp. by its much more numerous axial rings (about 85); *A. xerente* n. sp. has only about 60. These rings in *A. ammoniformis*

also disappear abruptly towards the periphery of the shell, and frequently have a tubercle $\frac{2}{5}$ from the periphery; in *Adeuomphalus xerente* n. sp. the axial rings are constant over all the shell, not disappearing in any part. The tubercles are more discrete than those in *A. ammoniformis*. The protoconch ornamentation of *Adeuomphalus xerente* n. sp. is identical to that described for *A. ammoniformis*. But despite that, the two species can be clearly distinguished.

Family Tornidae Sacco, 1896

Genus *Ponderinella* Marshall, 1988

Ponderinella xacriaba new species (Figs. 2E-H)

Description

Shell ovoid-conical, almost globular, small, smooth, solid, and white. Resembling a small naticid. Protoconch with about 1.5 whorls, ornamented with delicate irregular lines that ramify and anastomose (very small irregular stellar nodules connected by protuberances), and a well-marked boundary with the teleoconch. Teleoconch with convex whorls, smooth except for irregular growth scars. Suture well marked, bordered at body whorl by a slight depression. Base smooth, umbilicus moderately narrow. Lips strong, aperture rounded, prosocline, slightly pointed posteriorly. Operculum and radula unknown.

Etymology

This species is named in honor of the Xacriaba Indians, one of the indigenous peoples of Brazil. The name is employed as a noun in apposition.

Holotype

IBUFRJ 18048, 1.23 mm length, 1.23 mm width, Campos Basin, BC Sul I, #73 (22°41'35"S, 40°00'45"W), 22.XI.2002, 1950 m.

Paratypes

MNRJ 12851, BC Sul I #77 (22°36'03"S, 39°57'54"W), 16.XI.2002, 1650 m; IBUFRJ 18049, BC Sul I #82 (22°28'49"S, 39°53'24"W), 17.XI.2002, 1650 m; MNHN, BC Sul I #85 (22°29'33"S, 39°56'17"W), 19.XI.2002, 1350 m; IBUFRJ 18050, BC Sul II #81 (22°26'28"S, 39°54'08"W), 21.VI.2003, 1345 m.

Additional material

IBUFRJ 18051, BC Sul II #85 (22°30'21"S, 39°56'53"W), 21.VI.2003, 1353 m; IBUFRJ 18052, BC Norte I #46 (22°10'55"S, 39°49'00"W), 10.XII.2002, 1350 m; IBUFRJ 18053, BC Norte I #61 (21°52'51"S, 39°48'11"W), 12.XII.2002, 1350 m; IBUFRJ 18054, BC Norte II #50 (22°04'33"S, 39°52'05"W), 30.VI.2003, 1030 m; IBUFRJ 18055, BC Norte II #61 (21°52'51"S, 39°48'12"W), 26.VI.2003, 1372 m.

Remarks

At first glance, *Ponderinella xacriaba* n. sp. resembles *Cirsonella* in the general shell shape, but the protoconch ornamentation and aperture are very distinctive. While *Cirsonella* has a protoconch with very fine irregular spiral lines (Warén, 1991b: 210, fig. E), *Ponderinella xacriaba* n. sp. has tiny irregular stellar nodules connected by protuberances (Fig. 2H). The aperture of *Cirsonella* is regularly rounded (Warén, 1991b: 212, figs. 11A-D), whereas in *P. xacriaba* n. sp. it is posteriorly constricted (Fig. 2E). These differences preclude assignment of this new taxon to the genus *Cirsonella*. The genus *Ponderinella*, on other hand, was originally created to accommodate a characteristic group from the southeastern Pacific. Recently, Rolán and Rubio (2002) assigned some eastern Atlantic species to this genus, and it seems to be an appropriate systematic placement for *Ponderinella xacriaba* n. sp. as well.

The genus *Ponderinella* was, until now, restricted to the eastern Atlantic. The record of *Ponderinella xacriaba* n. sp. expands the genus distribution to the southwestern Atlantic. Among Atlantic *Ponderinella*, *P. xacriaba* n. sp. is distinguished from *Ponderinella tornatica* (Moolenbeek and Hoenselaar, 1995) (Rolán and Rubio 2002: 39, figs. 101-106) which has a strong peripheral keel on the body whorl and another keel bordering the umbilicus, whereas *P. xacriaba* n. sp. is devoid of such characters. *Ponderinella minutissima* Rolán and Rubio, 2002 (pp. 42-43, figs. 118-126) has a thickened umbilical cord, which is absent in *P. xacriaba* n. sp. *Ponderinella skeneoides* Rolán and Rubio, 2002 (pp. 40-41, figs. 107-117) is the most similar species to *P. xacriaba* n. sp. Although *P. skeneoides* has a very variable shell profile, some of them (Rolán and Rubio 2002: 41, fig. 115) resemble those present in *P. xacriaba* n. sp., and in addition both species share the same kind of protoconch ornamentation (Rolán and Rubio 2002: 41, fig. 116, and Figs. 2E-F herein). Despite these similarities, the two species can be distinguished because *P. skeneoides* usually has a much broader umbilicus (Rolán and Rubio 2002: 41, figs. 107-110), an umbilical cord (sometimes nodulose) (Rolán and Rubio 2002: 41, figs. 108, 113-114), and a less-rounded aperture with the ventral part somewhat retracted (same illustrations mentioned above); *P. xacriaba* n. sp. has a narrower umbilicus, no umbilical cord, and a more-rounded aperture with no retraction on the ventral side (Figs. 2E, 2G).

Family Aclididae Sars, 1878

Genus *Aclis* Lovén, 1846

Aclis kanela new species (Figs. 2I-K)

Description

Shell small, white, thin, conical-elongated. Protoconch globose, smooth, with about 1½ whorls. Proto-teleoconch

transition not discernible. Teleoconch with convex profile; in the third and fourth whorls, the main whorl diameter is in the anterior part of the whorl. Whorls increasing moderately in diameter. Smooth, except for irregular axial growing scars. Suture well impressed, with posterior border clearly extending over the anterior one, forming a projecting border (Fig. 2K). Supra-sutural microscopic spiral striation, visible only under very strong magnification, disappears towards the middle of the whorl. Base conical, convex. Aperture ovoid, peristome reflected on anterior side, with no thickening. Umbilicus narrow, partially covered by parietal wall (fig. 2I).

Etymology

This species is named in honor of the Kanela Indians, one of the indigenous peoples of Brazil. The name is employed as a noun in apposition.

Holotype

IBUFRJ 18056, 1.90 mm length, 0.75 mm width, Campos Basin, BC Sul I #75 (22°31'28"S, 40°03'50"W), 19.XI.2002, 1050 m.

Paratypes

MNRJ 12852, BC Sul I #80 (22°24'31"S, 39°57'28"W), 20.XI.2002, 1050 m; IBUFRJ 18057, BC Sul II #75 (22°31'28"S, 40°03'49"W), 18.VI.2003, 1043 m; MNHN, BC Sul II #84 (22°26'28"S, 39°58'53.3"W), 20.VI.2003, 1046 m; IBUFRJ 18058, BC Norte I #45 (22°10'54"S, 39°52'19"W), 10.XII.2002, 1050 m.

Additional material

IBUFRJ 18059, BC Norte I #60 (21°52'50"S, 39°51'04"W), 12.XII.2002, 1050 m; IBUFRJ 18060, BC Norte II #63 (21°52'43"S, 39°40'41"W), 26.VI.2003, 1941 m.

Remarks

Five species of *Aclis* have been previously reported for Brazil (Rios 1994). Two of them are shallow-water species (*Aclis bermudensis* Dall and Bartsch, 1911 and *Aclis underwoodae* (Bartsch, 1947)) and show distinctive shell profiles. *Aclis hyalina* Watson, 1881 was reallocated to the genus *Costaclis* Bartsch, 1947 by Bouchet and Warén (1986). The other two, *Aclis sarissa* Watson, 1881 and *Aclis macrostoma* Barros, Lima, and Francisco, 2007 are deep-water species from northern Brazil and will be discussed below. *Aclis sarissa* shows the typical elongated-turreted *Aclis* shell profile, with the first whorls markedly smaller than the last ones; whereas in *Aclis kanela* n. sp. the increase in shell width is more regular. The apex is also blunter than in the two former species. Finally, *A. sarissa* shows very fine axial lines, which are lacking in *A. kanela* n. sp. *Aclis macrostoma* and *A. kanela* n. sp. share

the same type of supra-sutural microscopic spiral striae. *Aclis macrostoma* has a more pointed protoconch than *A. kanela* n. sp., a much more obtuse spire angle, and an opisthocline aperture with reflected lips posteriorly and anteriorly; *A. kanela* n. sp. has the aperture almost orthocline and reflected lips restricted on the anterior side. A similar protoconch is present in *Aclis attenuans* Jeffreys, 1883 (Bouchet and Warén 1986: 305, fig. 730), but the whorls are regularly convex, whereas in *Aclis kanela* n. sp. the greatest whorl diameter is on the anterior part of the whorl; moreover, the lip in *A. attenuans* is more extensively reflected, whereas this reflection is more restricted in *A. kanela* n. sp. Finally, *A. attenuans* is a Mediterranean species, while *A. kanela* n. sp. is a South American one.

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