

New species of the genus *Ammonicera* Vayssière, 1893 (family Omalogyridae)

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Key Words: *Ammonicera pascuensis* sp. nov., *Ammonicera tahitiensis* sp. nov., *Ammonicera albanyensis* sp. nov., *Ammonicera tomensis* sp. nov., *Ammonicera tomalba* sp. nov., *Ammonicera croata* sp. nov., *Ammonicera caledonica* sp. nov.

Abstract: Some new species of the genus *Ammonicera* are described and comparisons with previously known ones are presented.

Introduction: The species of the genus *Ammonicera* have been known for many years since Vayssière described the genus in 1893.

There are numerous publications describing species of this genus, which is present worldwide, although, due to their small size (between 0.3-1 mm), they were often poorly known and badly represented. Since the introduction of the electron microscope, the number of descriptions and publications started growing, as it was then possible to make the morphological comparisons necessary to demonstrate that specimens collected in sediments were the same or different from others previously known. There were even publications describing more than one species, such as those of Sleurs (1985a, 1985b), Rolán (1991, 1992), Chernyshev (2003), Sartorio & Bieler (2014), Oliver & Rolán (2015), amongst others.

The most notable differences between the species of this genus are found in the sculpture of the teleoconch and that of the protoconch, almost always very variable and different in dimensions and microsculpture.

Material and methods: The material studied was collected through diving or dredging and the subsequent separation of fine sediments under binocular view. These sediments come from the authors' private collections or,

more frequently, from the material that was collected by the Muséum national d'Histoire naturelle in Paris, during the many campaigns organised by prof. P. Bouchet, in collaboration with the IRD.

Abbreviations:

IRD: Institute de Recherche pour le Development, France

MNHN: Muséum national d'Histoire naturelle, Paris

MNCN: Museo Nacional de Ciencias Naturales, Madrid

MHNS: Museo de Historia Natural, Santiago de Compostela

WAM: Western Australian Museum, Perth

s: shell

spm: specimen - collected alive

Systematics:

Family: Omalogyriidae G. O. Sars, 1878

Genus: *Ammonicera* Vayssière, 1893

Ammonicera Vayssière, 1893: 19 [Type species by original designation: *Homalogyra fischeriana* Monterosato, 1869].

Ammonicera pascuensis sp. nov.

Fig. 1A-D

Type material: Holotype (Fig. 1A) MNHN-IM-2000-35742.

Type locality: Anakena, Easter Island, Chile, dived at 8 m (collected by Jorge Otero Schmitt, a Galician malacologist).

Description: Shell minute (size <math><0.5\text{ mm}</math>), depressed, fragile, not shiny, whitish. Protoconch with $\frac{3}{4}$ whorl after the nucleus, measuring $143\ \mu\text{m}$ in diameter; the nucleus measures $44\ \mu\text{m}$. The sculpture is formed by a spiral groove in the middle and one other, almost invisible on, near the suture. The surface is covered with an irregular sculpture, with depressions of circular or short linear shape. Teleoconch with $1\frac{1}{4}$ whorls, rounded and smooth, except for many grooves that begin near the suture and

extend until the middle of the whorl, where they present a small prominence, slightly more noticeable before they continue to the external part; there are about 30 on the first whorl.

Dimensions: The holotype measures 0.436 mm in maximum diameter.

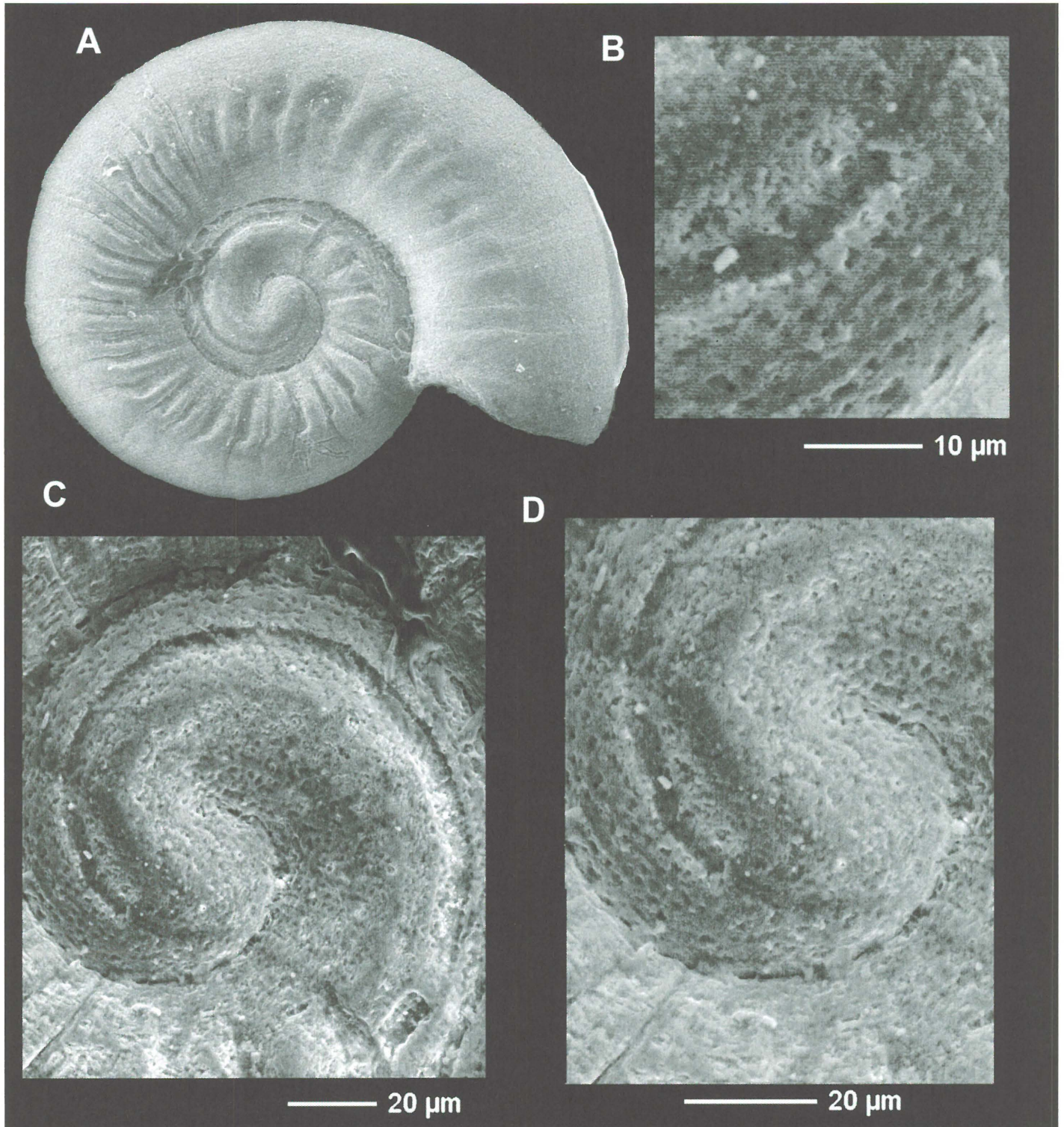


Fig. 1: *Ammonicera pascuensis* sp. nov.

A: holotype, 0.436 mm , Pascua I., Anakena, 8 m (MNHN); **B-D:** protoconch detail and microsculpture.

Habitat: Unknown. Infralittoral species collected in sediments from sand bottom at a depth of 8 m.

Distribution: Supposedly endemic to Easter Island.

Remarks: The characteristics of this species are very peculiar and different from any other known species.

Etymology: The species' name refers to the island where the species was collected.

Ammonicera tahitiensis sp. nov.
Rubio, Rolán & Letourneux
Fig. 2A-C

Type material: Holotype (Fig. 2A) MNHN-IM-2000-35743.

Type locality: French Polynesia, Mahina, Tahiti, 10 m.

Description: Minute shell (<0.4 mm), depressed, fragile, whitish, not shiny. Protoconch with $\frac{3}{4}$ whorl after the nucleus, measuring 105 μm in diameter; the nucleus measures 47 μm . The sculpture is formed by a thick and raised spiral cord near the suture, while the rest of the surface is at a lower level and is rough, formed by an irregular sculpture with depressions of circular or short linear shape. The teleoconch has one whorl and about 9 adapical axial oblique elevations, rather separated, and a spiral angulation; the external border is rounded.

Dimensions: The holotype measures 0.38 mm in maximum diameter.

Habitat: Infralittoral species collected in sand bottom at a depth of 10 m.

Distribution: Supposedly endemic to Tahiti.

Remarks: The characteristics of the present species are very different from any other known species. For this reason, we have described it despite having only one still slightly juvenile shell.

Etymology: The species' name refers to the country in which the species was found.

Ammonicera albanensis sp. nov.
Fig. 3A-D

Type material: Holotype (Fig. 3A) in WAM.

Material examined: 1 s; WESTERN AUSTRALIA 2011: 1 s, Western Australia, Albany, Mistaken Island, King George Sound, Stn. WA13, 35°04'S-117°56.5'E, 10 m.

Type locality: Western Australia, Albany, Mistaken Island, King George Sound, 35°04'S-117°56.5'E, 10 m [WESTERN AUSTRALIA 2011: WA13].

Description: Minute shell (<1 mm), depressed, fragile, whitish, not shiny. Protoconch with $\frac{3}{4}$ whorl after the nucleus, measuring 105 μm in diameter; the nucleus measures 47 μm . The sculpture is formed by a narrow spiral groove in the middle of the protoconch, the surface of the rest of the protoconch is finely rough. This surface has an irregular sculpture formed by small elevations of variable shape. The teleoconch has almost two whorls, whose surface is smooth, with only some prominences in the middle of the whorls, along a depressed line which follows that of the protoconch; on the first whorl, these elevations are slightly prolonged towards the sutures, but in the following whorl these prolongations almost disappear. The number of the elevations is 14 on the first whorl and 22 on the last one. The external border is rounded and smooth.

Dimensions: The holotype measures 0.785 mm in maximum diameter.

Habitat: Unknown. Collected in sandy bottom, at a depth of 10 m.

Distribution: Supposedly endemic to Australia.

Remarks: The shell has some peculiar characteristics, namely the groove that goes along the teleoconch and the elevations that only appears on this groove. The protoconch has a narrow groove and a rough surface. *A. pascuensis* sp. nov. has a similar protoconch, but with a wider groove and stronger microsculpture.

Etymology: The species' name refers to the Australian area in which the species was collected.

Ammonicera tomensis sp. nov.

Fig. 4A-E, Fig. 5A-D

Type material: Holotype (Fig. 4A) MNHN-IM-2000-35745 and 12 paratypes MNHN-IM-2000-35746 (Figs. 4B-E).

Material examined: 16 s: São Tomé: 13 s, Lagoa Azul, dived in sediments on rocky bottom at 10-12 m (type

material); Príncipe: 2 s, Príncipe Island, 5 m; Ghana: 1 s, Takoradi, 5 m (MHNS).

Type locality: São Tomé, Lagoa Azul, dived in sediments on rocky bottom at 10-12 m.

Description: Shell minute (<0.5 mm), depressed, fragile, translucent, shiny, light brown or yellowish colour in fresh specimens, mainly in the protoconch; eroded shells may be white. Protoconch with nearly one whorl after the

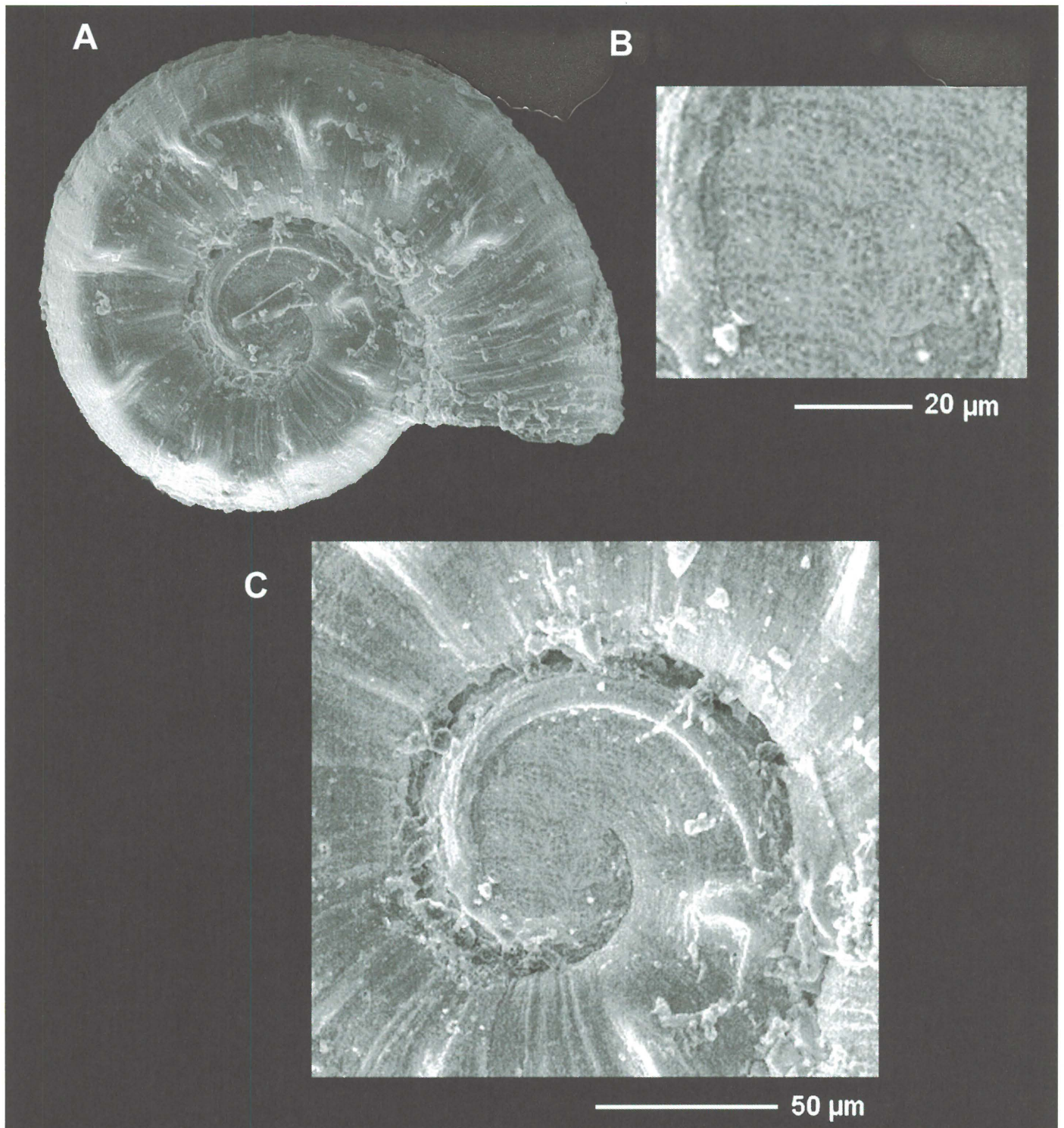


Fig. 2: . *Ammonicera tahitiensis* sp. nov.

A: holotype, 0.38 mm, French Polynesia, Mahina, Tahiti, 10 m (MNHN); **B-C:** protoconch and microsculpture.

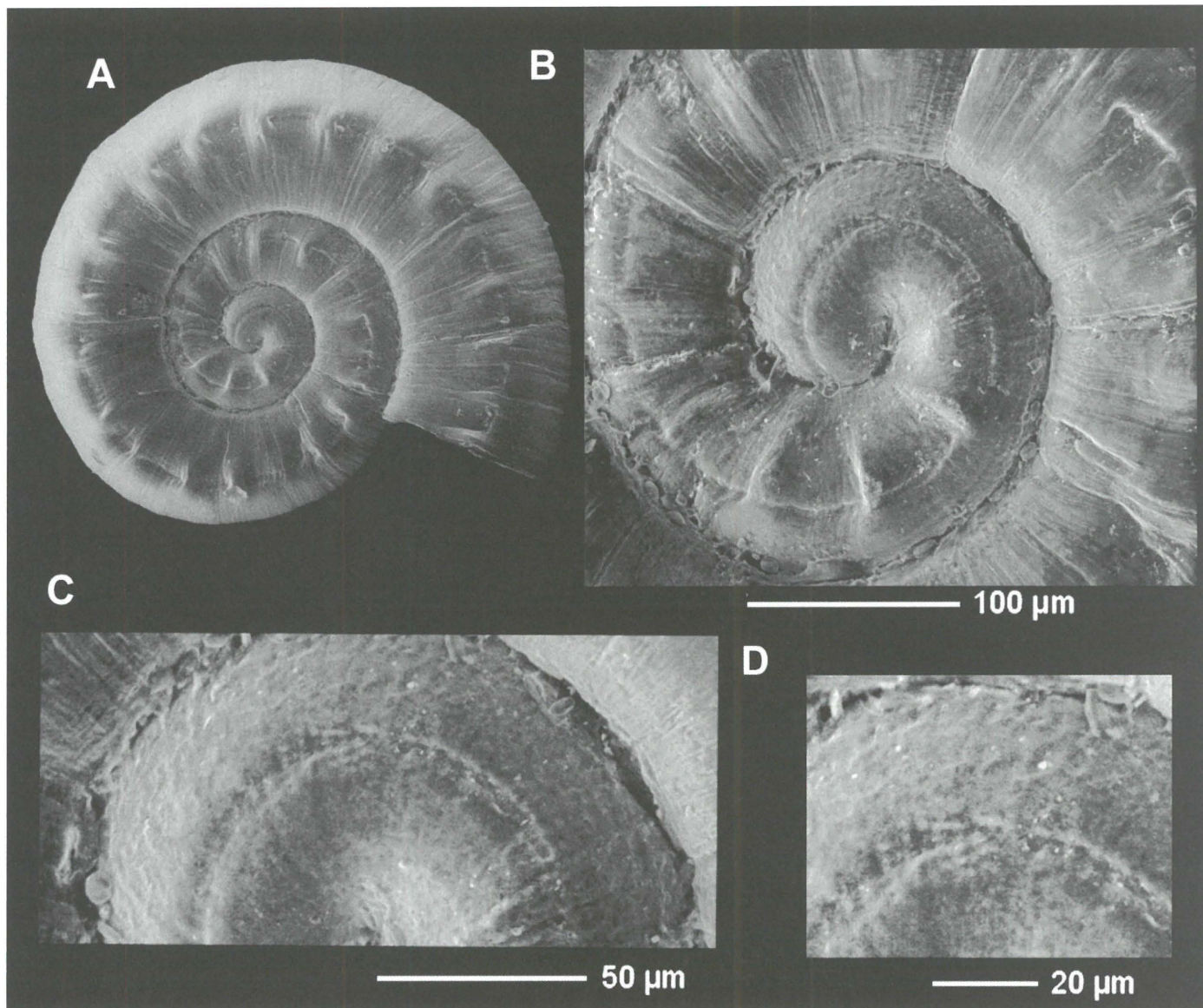


Fig. 3: *Ammonicera albanyensis* sp. nov.

A: holotype, 0.785 mm in diameter, Australia, Albany, Mistake I. 10 m (Western Australian Museum)

B-D: Protoconch and details of the sculpture.

nucleus, measuring 130 µm in diameter; the nucleus is about 34 µm in diameter. The sculpture is formed by a well-marked spiral cord near the suture, while the rest of the surface is rough and presents an irregular sculpture, with depressions of circular or short linear shape. The teleoconch has about 1¼ whorls and one elevated band, which is the continuation of the elevated part of the protoconch; on it there are nodules along the shell, both ad- and abapically; the microsculpture is formed by small ribs that are very irregular, most of them are the continuation of the nodules; between them, axially placed, there are many microscopic lines; spirally, there is a microsculpture, only visible in the SEM micrographs; the external border is convex and on it there are two grooves, which separate three areas of almost similar size.

Dimensions: The holotype measures 0.43 mm in maximum diameter.

Habitat: Infralittoral species collected in sediments from rocky bottom at 5-12 m.

Distribution: Supposedly endemic to West Africa.

Remarks: This species presents a raised band in the protoconch, which goes close to the suture. This band does not exist in any other Atlantic species and has only been observed in the Polynesian species *A. tahitiensis* sp. nov., but in the latter this band is narrower and the sculpture of the teleoconch is also very different.

Etymology: The name of the present species refers to the island where it was collected.

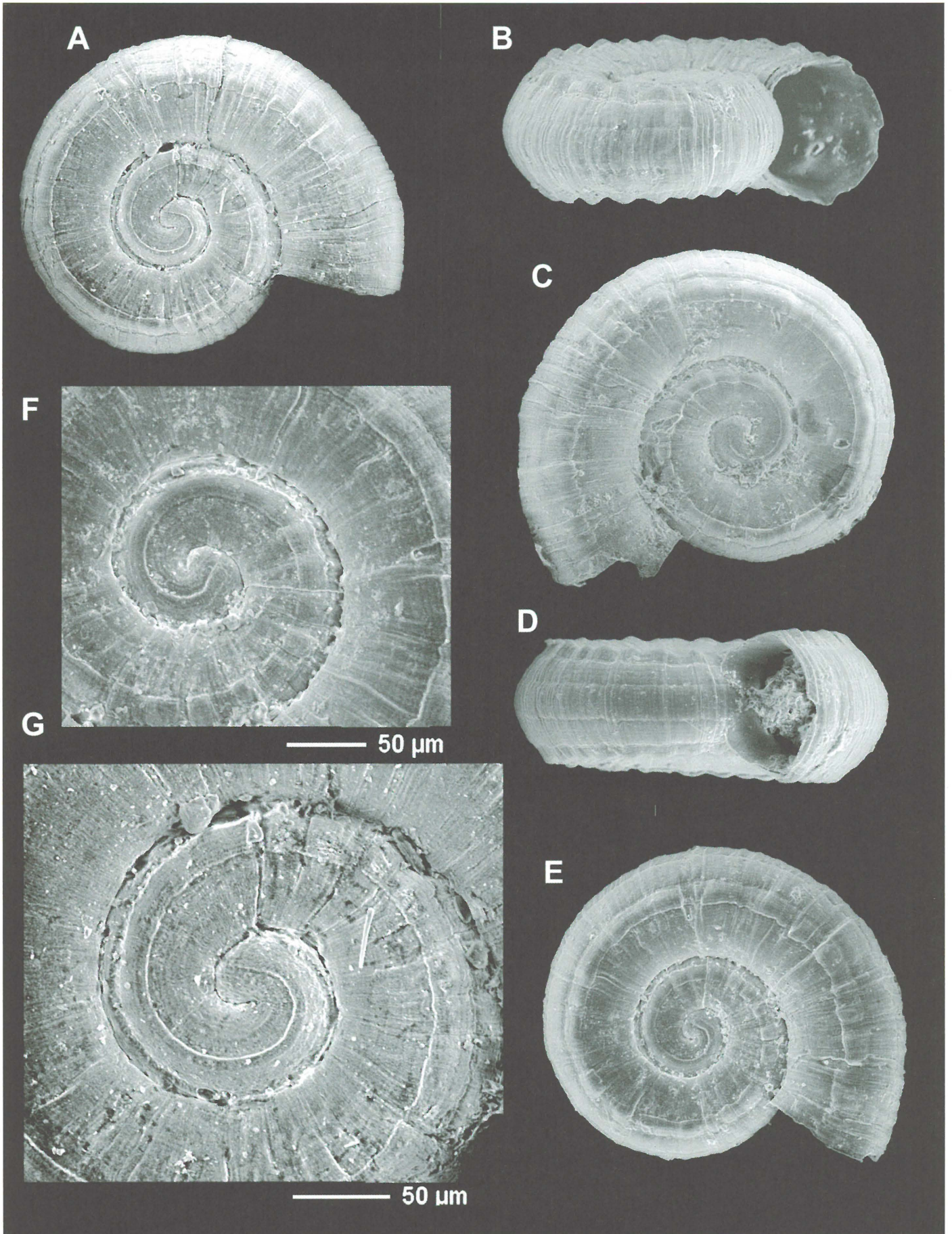


Fig. 4: *Ammonicera tomensis* sp. nov.

A: holotype, 0.43 mm in diameter, São Tomé, Lagoa Azul, 10 m (MNHN);
B-E: paratypes, 0.4, 0.42, 0.46, 0.4 mm in diameter, same locality (MNHN);

F-G: protoconchs of a paratype and the holotype.

Ammonicera tomalba sp. nov.

Fig. 5E-F

Type material: Holotype (Fig. 5E-F) MNHN-IM-2000-35747 and four paratypes MNHN-IM-2000-35748.

Material examined: São Tomé: 4 s, Minerio, 10-15 m (type material); 1 s, Sete Brazas, 5 m (MHNS).

Type locality: Minerio, São Tomé, 10-15 m.

Description: Shell minute (<0.5 mm), depressed, fragile, white, shiny. Protoconch with one whorl after the nucleus, measuring 150 µm in diameter; the nucleus is 57 µm in diameter. The protoconch sculpture is formed by a narrow depressed groove, which begins in the middle; it continues but gets narrower, continuing in the teleoconch with another groove; the rest of the protoconch is covered with fine parallel striae, forming a rough surface. The teleoconch has about 1¼ whorls, with a narrow spiral band which reaches the end of the spire; under magnification numerous axial striae can be seen, as well as very irregular and very fine spiral lines.

Dimensions: The holotype measures 0.404 mm in maximum diameter.

Habitat: Infralittoral species collected in sand bottom at a depth of 5-10 m.

Distribution: Supposedly endemic to São Tomé Island.

Remarks: The present species may be separated from the other species also found in São Tomé island by the different colour, the protoconch with a central elevation, which has a groove in the middle, and also a different sculpture of the teleoconch.

Etymology: The name of the present species is formed by the union of the name of the island (Tomé) and also the color (*albus*), which is the most common in the species.

Ammonicera croata sp. nov.

Fig. 6A-B

Type material: Holotype (Fig. 6A) MNHN-IM-2000-35749.

Type locality: Peninsula of Istria, Croatia, 30 m.

Description: Shell depressed, very small (<0.6 mm), fragile, white, shiny and with yellowish colour. Protoconch with ¾ of a whorl after the nucleus, measuring 190 µm in diameter; the nucleus is 60 µm in diameter. The sculpture is formed by one spiral cord that begins in the nucleus and is close to the well-marked internal suture, while in the external part there is another spiral, but in this case with a groove in the centre; the rest of the protoconch is rough, but without other visible detail in the sculpture. The teleoconch has 1¼ whorls without any apparent sculptural details. There are many irregularly distributed growth lines and it is possible to observe very light spiral lines on the convexity of the external border.

Dimensions: The holotype measures 0.45 mm in maximum diameter.

Habitat: Infralittoral species collected in sand bottom at 30 m.

Distribution: Supposedly endemic to the Adriatic Sea, probably to the Istria Peninsula.

Remarks: The present species is almost without sculpture, but the protoconch is very characteristic and different from any other with two elevations near the external suture.

Etymology: The name refers to the country where it was collected.

Ammonicera caledonica n. sp.

Fig. 7A-D

Type material: Holotype (Fig. 7A) MNHN-IM-2000-35750 and 5 paratypes MNHN-IM-2000-35751.

Material examined: New Caledonia. LAGON: 6 s, off Nouméa, reef flat îlot Maître, Stn. 1351, 22°20'S-166°26 E, detritic mounts, tidal.

Type locality: New Caledonia, off Nouméa, reef flat îlot Maître, Stn. 1351, 22°20'S-166°26 E, detritic mounts, tidal [LAGON: 1351].

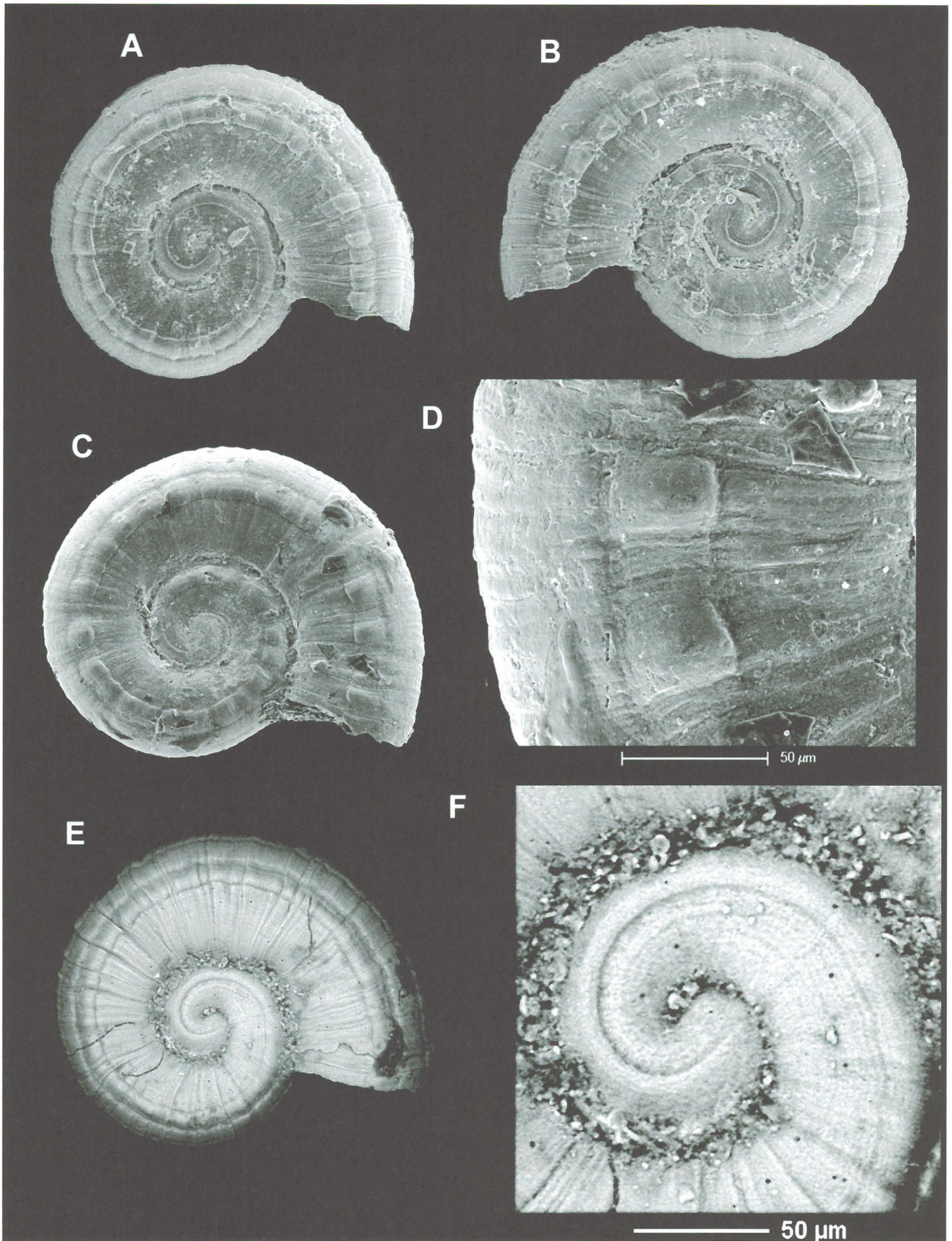


Fig. 5

A-C: *Ammonicera tomensis* sp. nov. A-B: shells, 0.4, 0.46 mm in diameter, Sete Brazas, Principe (MHNS).

C: 0.45 mm, shell from Takoradi, Ghana, 15 m (MHNS). D: detail of the sculpture.

E-F: *Ammonicera tomalba* sp. nov. holotype. 0.404 mm, Minerio, São Tomé, 10 m (MNHN). B: protoconch of the holotype.

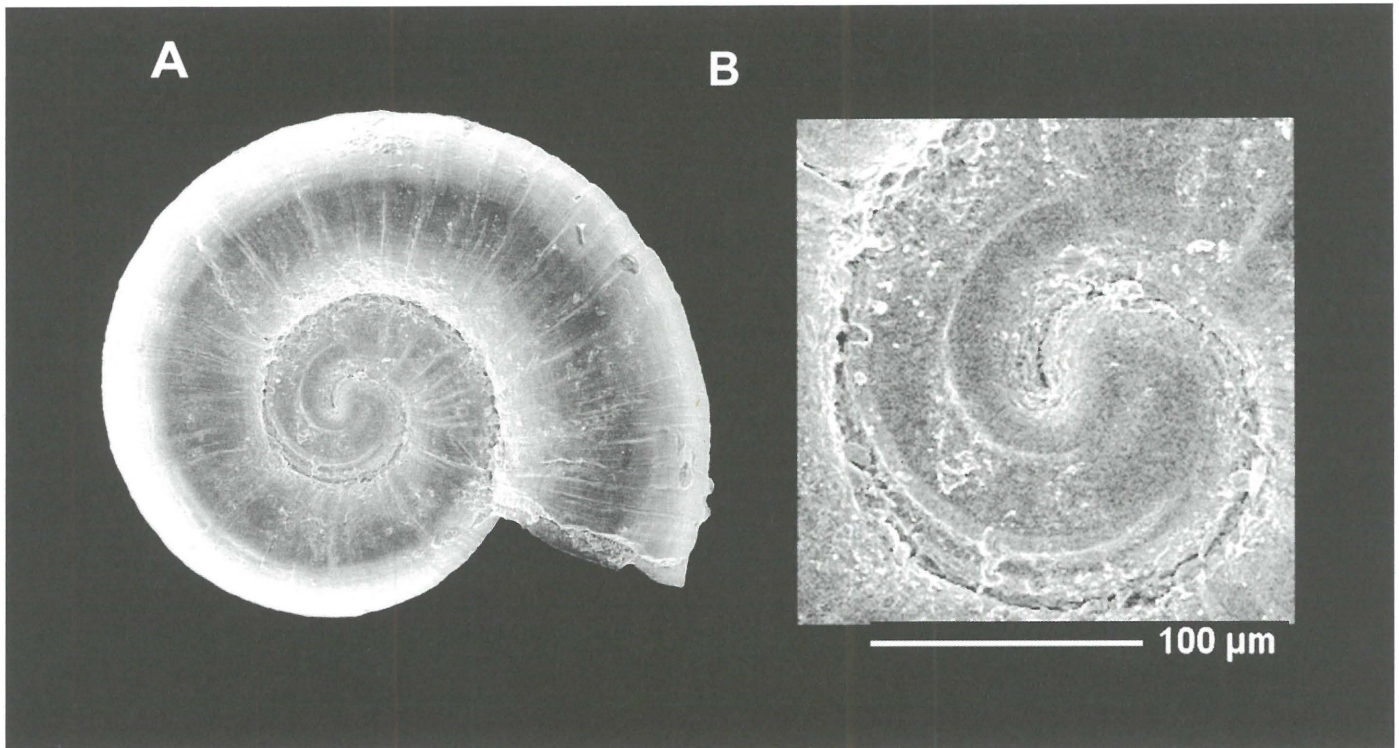


Fig. 6: *Ammonicera croata* sp. nov.

A: holotype, 0.45 mm in diameter, Croacia, Peninsula of Istria, 10 m (MNHN). **B:** protoconch and details.

Description: Minute shell (<0.6 mm), depressed, brown, fragile, shiny. Protoconch with $\frac{3}{4}$ of whorl after the nucleus, measuring about 130 μm in diameter; the nucleus measures 40 μm . The sculpture is very complex, formed by a wide spiral depressed groove, rounded by an elevated cordlet; from this cordlet until the external suture there are about 4-5 depressed grooves, with numerous small axial lines. Teleoconch of $1\frac{1}{4}$ whorl, uniformly rounded, with many axial fissures that in many places change into axial riblets, which are almost at the same level, except in a line in the middle of the teleoconch spaces, both ad- and abapically, where they form small very irregular elevations, about 26-33 on the last whorl. There is no spiral sculpture. Aperture rounded, a little flat in the contact area with the previous whorl.

Dimensions: The holotype measures 0.5 mm in maximum diameter.

Habitat: Unknown. Collected in sandy bottom.

Distribution: Supposedly endemic to New Caledonia.

Remarks: At first sight, the shell of *A. caledonica* sp. nov. bears some slight similarity with that of *Ammonicera japonica* Habe, 1972, but there are many differences: in some papers, such as in Okutani (2000), *A. japonica* is represented with strong axial ribs and about 13 ribs on the last whorl, whereas in others, like in

Waki et al. (2016), the same species is shown almost without axial ribs, which are few and irregular and number about 11 on the last whorl. Anyway, *A. caledonica* sp. nov., which we have just described, has very fine axial ribs, of which there are about 28 on the last whorl. The protoconch is mentioned by Waki et al. (2016) with a diameter of 185 μm , but our shells of *A. caledonica* measure 130 μm ; in the shell of *A. japonica* shown in Waki et al. (2016), the protoconch has one very wide groove and no more clearly visible others, while *A. caledonica* has several spiral grooves in the protoconch, close to that main one.

Another somewhat similar species from Cuba was described by Rolán (1992) as *Ammonicera minortalis*: it also has about 12 strong ribs ad- and abapically; and the protoconch also has a similar structure. Nevertheless, the wider groove has a different sculpture, with clear spiral cords instead of the small axial ones in *A. caledonica*.

Remarks and comments: In spite of their small size, WoRMS (World Register of Marine Species) lists 41 species of *Ammonicera* in its web page in the present year. There are probably many more, but their small size makes collecting them difficult and for their study a scanning electron microscope is necessary for diagnosis and for comparison of samples with similar species.

Probably more new species will be described in the nearby future since optical microscopes and scanning electron microscopes are currently of common use in universities and research laboratories.

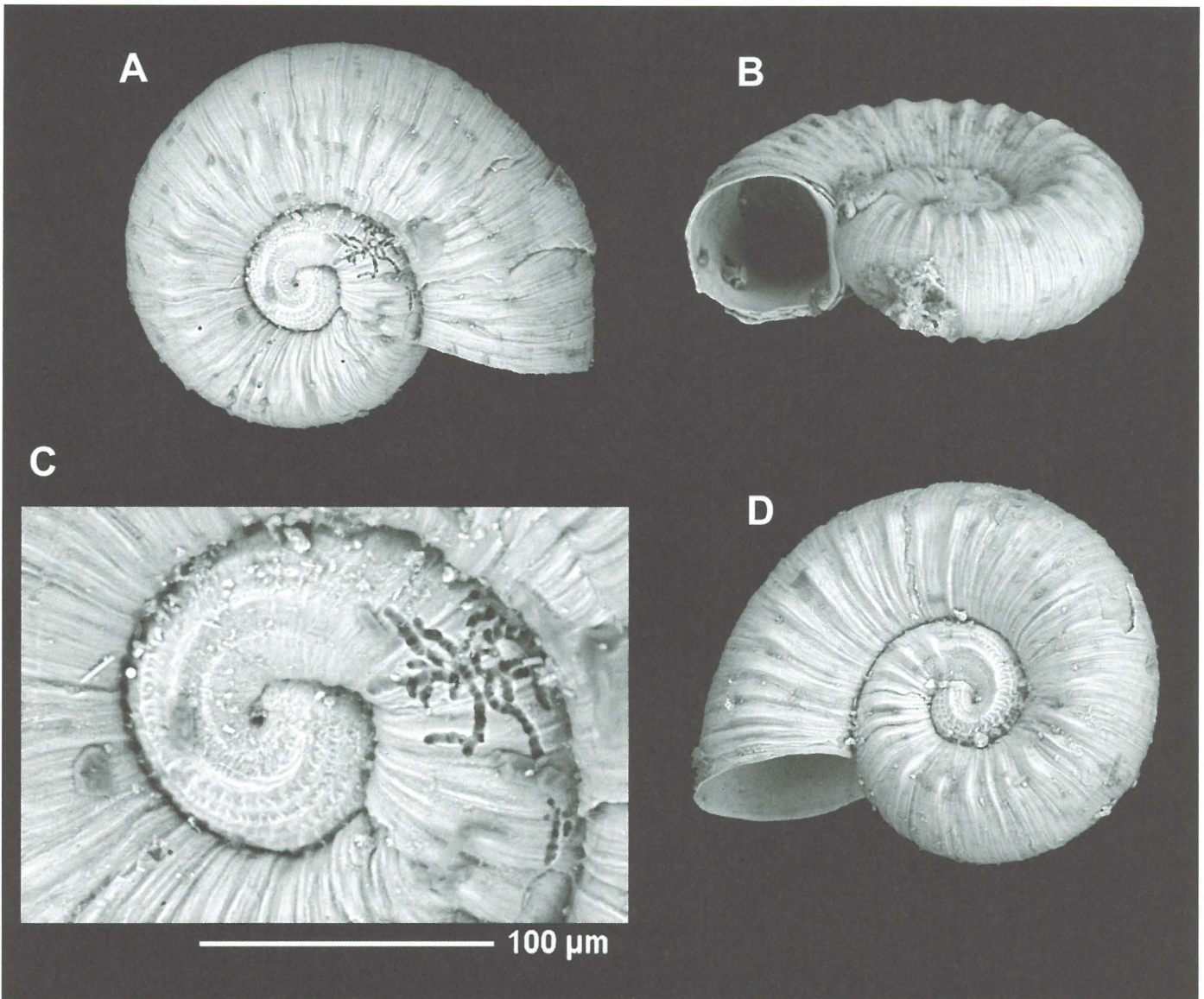


Fig. 7: *Ammonicera caledonica* sp. nov.

A: holotype, 0.5 mm in diameter, New Caledonia, off Noumea, reef flat îlot Maître, Stn 1351 (MNHN).
 B, D: paratypes, 0.46, 0.49 mm in diameter, same locality (MNHN). C: protoconch of the holotype

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