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Shallow-water Rissoidae of the genera *Alvania* Risso, 1826, *Haurakia* Iredale, 1915, *Parashiela* Laseron, 1956, *Simulamerelina* Ponder, 1985 and *Subestea* Cotton, 1944 (Gastropoda, Caenogastropoda, Rissooidea) from French Polynesia, with the description of a new deep-water genus

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Shells of Rissoidae from French Polynesia: *Alvania letouneuxi* n. sp., *Alvania herosae* n. sp., *Alvania herosae* n. sp., *Alvania parvimaculata* n. sp., *Alvania prosocostata* n. sp., *Alvania uapou* n. sp., *Ellenstrongia tarasoc* n. gen., n. sp., *Haurakia marmorata* (Hedley, 1907), *Parashiela ambulata* Laseron, 1956, *Parashiela expansilabrum* n. sp., *Parashiela obesula* n. sp.

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ABSTRACT
The extant species of the genera *Alvania* Risso, 1826, *Haurakia* Iredale, 1915, *Parashiela* Laseron, 1956, *Simulamerelina* Ponder, 1985 and *Subestea* Cotton, 1944 (Rissoidae Gray, 1847) collected in the shallow waters of French Polynesia are herein revised, for a total of 19 species. Additionally, a new genus for a new deep-water species is here introduced. Two species with wide range in the Pacific are reported: *Haurakia marmorata* (Hedley, 1907) and *Parashiela ambulata* Laseron, 1956. Five species of *Alvania*, one of *Ellenstrongia* n. gen., five of *Parashiela*, six of *Simulamerelina* and one *Subestea* are described as new: *Alvania letourneuxi* n. sp., *Alvania herosae* n. sp., *Alvania parvimaculata* n. sp., *Alvania prosocostata* n. sp., *Alvania uapou* n. sp., *Ellenstrongia tarasoc* n. gen., n. sp., *Parashiela expansilabrum* n. sp., *Parashiela obesula* n. sp., *Parashiela rimatara* n. sp., *Parashiela rotundata* n. sp., *Parashiela soniae* n. sp., *Simulamerelina australes* n. sp., *Simulamerelina densestriata* n. sp., *Simulamerelina gracilis* n. sp., *Simulamerelina lepteseiras* n. sp., *Simulamerelina micrometrica* n. sp., *Simulamerelina tuamotu* n. sp., *Subestea moruroa* n. sp. Three taxa are transferred to *Alvania*: *Rissoa denseclathrata* Thiele, 1925, *Rissoa lusoria* Yokoyama, 1926, *Rissoa proditoris* Thiele, 1925. Twelve species have a non-planktotrophic development; five of them are endemic to a single archipelago: *Alvania letourneuxi* n. sp., *Simulamerelina gracilis* n. sp., *Simulamerelina tuamotu* n. sp. to Tuamotu, *Simulamerelina densestriata* n. sp. to Australes, *Parashiela soniae* n. sp. to Marquesas. Of the eight species with planktotrophic development, two are apparently endemic to a single archipelago: *Parashiela obesula* n. sp. and *Parashiela rimatara* n. sp. to Australes.

KEY WORDS
Gastropoda,
Rissoidae,
French Polynesia,
new combinations,
new species,
new genus.

RÉSUMÉ
Rissoidae des genres Alvania *Risso, 1826,* Haurakia *Iredale, 1915,* Parashiela *Laseron, 1956,* Simulamerelina *Ponder, 1985 et* Subestea *Cotton, 1944 (Gastropoda, Caenogastropoda, Rissooidea) des eaux côtières de Polynésie française et description d'un nouveau genre bathyal.*
Les espèces actuelles des genres *Alvania* Risso, 1826, *Haurakia* Iredale, 1915, *Parashiela* Laseron, 1956, *Simulamerelina* Ponder, 1985 et *Subestea* Cotton, 1944 (Rissoidae Gray, 1847) des eaux côtières de Polynésie française sont révisées, avec un total de 19 espèces ; de plus, un nouveau genre est introduit pour une nouvelle espèce bathyale. Deux espèces à large distribution géographique dans le Pacifique sont signalées : *Haurakia marmorata* (Hedley, 1907) et *Parashiela ambulata* Laseron, 1956. Cinq espèces d'*Alvania*, une de *Ellenstrongia* n. gen., cinq de *Parashiela*, six de *Simulamerelina* et une *Subestea* sont décrites comme nouvelles : *Alvania letourneuxi* n. sp., *Alvania herosae* n. sp., *Alvania parvimaculata* n. sp., *Alvania prosocostata* n. sp., *Alvania uapou* n. sp., *Ellenstrongia tarasoc* n. gen., n. sp., *Parashiela expansilabrum* n. sp., *Parashiela obesula* n. sp., *Parashiela rimatara* n. sp., *Parashiela rotundata* n. sp., *Parashiela soniae* n. sp., *Simulamerelina australes* n. sp., *Simulamerelina densestriata* n. sp., *Simulamerelina gracilis* n. sp., *Simulamerelina lepteseiras* n. sp., *Simulamerelina micrometrica* n. sp., *Simulamerelina tuamotu* n. sp., *Subestea moruroa* n. sp. Trois taxons sont transférés vers *Alvania* : *Rissoa denseclathrata* Thiele, 1925, *Rissoa lusoria* Yokoyama, 1926, *Rissoa proditoris* Thiele, 1925. Douze espèces ont un développement non planctotrophe ; cinq d'entre elles sont endémiques d'un seul archipel : *Alvania letourneuxi* n. sp., *Simulamerelina gracilis* n. sp., *Simulamerelina tuamotu* n. sp. des Tuamotu, *Simulamerelina densestriata* n. sp. des Australes et *Parashiela soniae* n. sp. des Marquises. Sur les huit espèces à développement planctotrophe, deux sont apparemment endémiques d'un seul archipel : *Parashiela obesula* n. sp. et *Parashiela rimatara* n. sp. des Australes.

MOTS CLÉS
Gastropoda,
Rissoidae,
Polynésie française,
combinaisons nouvelles,
genre nouveau,
espèces nouvelles.

INTRODUCTION

The Rissoidae Gray, 1847 are a family of caenogastropods classified into 36 extant and 13 fossil-only genera (MolluscaBase 2023a), having diversified mostly in shallow waters throughout the world, from tropical to polar waters (with a few lineages having colonised deeper waters, on the continental shelves but also on bathyal and abyssal bottoms).

Rissoidae have an extensive fossil record reaching back to at least the Lower Jurassic (e.g. Conti *et al.* 1993: 67; Kaim 2004: 79; Hikuroa & Kaim 2007: 120).

We have recently revised the deep-water species of the genera *Benthonella* Dall, 1889 and *Benthonellania* Lozouet, 1990 from French Polynesia (Amati *et al.* 2022). In the present work, we revise part of the rissoid material from shallower waters in the collection of the Muséum national d'Histoire naturelle (MNHN), collected during expeditions to French Polynesia (Fig. 1) by MNHN and the Institut de Recherche pour le Développement (IRD), and in the private collections of Michel Boutet and Jean Letourneux (Tahiti). The shallow-water species herein studied are referable to the genera *Alvania* Risso, 1826, *Haurakia* Iredale, 1915, *Parashiela* Laseron, 1956, *Simulamerelina* Ponder, 1985 and *Subestea* Cotton, 1944, as currently conceived. Literature records of these genera in French Polynesia are traced with difficulty, especially when not accompanied by a good iconography, and a partial screening of those records (based on the original samples or discussion with the relevant authors) suggests frequent misidentifications at the species and genus levels (Tröndlé & von Cosel 2005; Tröndlé & Boutet 2009; Salvat & Tröndlé 2017; Boutet *et al.* 2020; see below, Systematics section, and Discussion). Additionally, we have studied *c.* 350 specimens (empty shells and live collected specimens) all from samplings deeper than 400 m, of an undescribed species that was impossible to classify in one of the known genera. Its belonging in the Rissoidae has been confirmed to us by Ellen E. Strong (Smithsonian Institution, Washington, pers. comm.) based on unpublished molecular data. We have therefore introduced hereby a new genus for this species, *Ellenstrongia* n. gen. (see below).

MATERIAL AND METHODS

We have studied a total of over 12 800 specimens (*c.* 5250 of *Alvania*, *c.* 350 of *Ellenstrongia* n. gen., *c.* 800 of *Haurakia*, *c.* 2350 of *Parashiela*, *c.* 4000 of *Simulamerelina*, and 66 of *Subestea*) collected at 123 stations by amateur collectors (Fig. 1A) or during the following expeditions organised by the MNHN and IRD to the Marquesas Islands, Austral Islands, Society Islands and Tuamotu: Atelier MARQUISES (1999: four stations, PIs Claire Bryce & Kirstie Kaiser), Atelier RAPA (2002: 51 stations, PI Pierre Lozouet, https://expeditions.mnhn.fr/campaign/rapa2002), TARASOC (2009: 20 stations, PI Philippe Bouchet, RV *Alis*, https://doi.org/10.17600/9100040), PAKAIHI I TE MOANA (2011-2012: 10 stations, PIs Claude Payri and Thierry Pérez), MUSORSTOM 9 (1997: five stations, PI Bertrand Richer de Forges, RV *Alis*, https://doi.org/10.17600/97100020), BENTHAUS (2002: 29 stations, PI Bertrand Richer de Forges, RV *Alis*, https://doi.org/10.17600/2100100). Further information on the cruises, full lists of stations, participants and published results can be found on the "Basexp" site (https://expeditions.mnhn.fr/). The stations from expeditions to French Polynesia that yielded material examined in the revision are mapped in Fig. 1B, C.

The vast majority of the examined specimens (85%) were collected during institutional expeditions, but still 15% of the material originated from private amateur collections. The samples studied herein are stored at MNHN (Paris) and in the private collections of J. Letourneux and M. Boutet (Tahiti), unless stated otherwise.

We have also studied for comparison, the type material of some taxa described by Thiele (1925) (ZMB) from the Indian Ocean; we have included in the Systematic part the redescriptions of these taxa.

The shells were measured with a micrometric eyepiece with magnification (X90) with ± 10% deviation, using the method of Verduin (1982). Photographs have been taken with a Sony Cyber-shot DSC-W110 digital camera mounted on a Kyowa KBS and a Kyowa SDZ-P stereomicroscopes; image stacking was performed with the software Combine-Z (Hadley 2006). SEM photographs were taken with a FE-SEM ZEISS Sigma Gemini 300 at the interdepartmental laboratory of electron Microscopy (LIME: University "Roma Tre", Roma).

We have used a standardised format for the citation of specimen data in the "Type material" and the "Other material examined" sections, as described by Chester *et al.* (2019), with the following data-fields: **Country** (or major geographic area) • number of specimens (lv and/or dd); locality data (from largest to smallest); geographic coordinates (in decimal degrees); depth; date (format "16.I.1998"); other collecting data (e.g. habitat); collection and catalogue code.

Maps were created using SimplMappr (Shorthouse 2010). Sympatry was detected at the island scale (two species were considered as sympatric when they were collected in the same island) whereas endemicity was estimated at the archipelago scale. The adopted rissoid taxonomy is based on that accepted by MolluscaBase (accessed through the World Register of Marine Species, WoRMS, at https://www.marinespecies.org).

We have estimated patterns of similarity among the studied areas (the distinct archipelagos plus the Tarava Seamounts) by calculating Jaccard similarity indices, and representing them in a tree graph after an UPGMA cluster analysis; all analyses were performed by the package NTSYSpc v. 2.02i (Rohlf 1997).

ABBREVIATIONS AND ACRONYMS

AMS	The Australian Museum, Sydney;
ANSP	Academy of Natural Sciences of Philadelphia;
MNHN	Muséum national d'Histoire naturelle, Paris;
USNM	National Museum of Natural History, Washington D.C.;
ZMB	Museum für Naturkunde – Leibniz-Institut für Evolutions-und Biodiversitätsforschung an der Humboldt-Universität zu Berlin, Berlin;
coll. MB	Private collection of Michel Boutet (Tahiti);
coll. JL	Private collection of Jean Letourneux (Tahiti).

Others

dd	empty shell(s);
lv	live collected specimen(s);
NA	not available;
SEM	scanning electron microscope;
Stn	station.

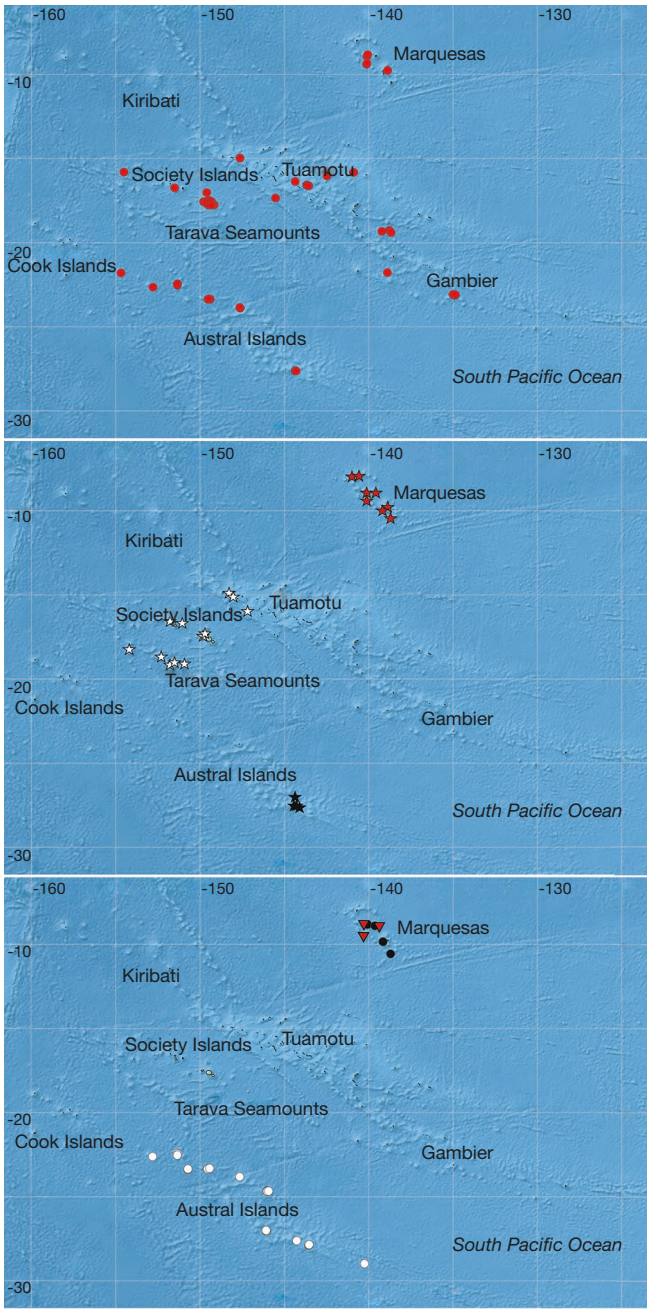

FIG. 1. — Maps of French Polynesia with the sampling sites yielding specimens studied in this revision (multiple stations at several sites); **A**, collecting sites of specimens from private collections; **B**, sampling sites of the PAKAIHI I TE MOANA (★), TARASOC (☆), and Atelier RAPA (★) stations. PAKAIHI I TE MOANA: MQ1-GR, MQ2-GR, MQ3-GR, MQ15-GR, MQ21-GR, MQ27-GR, MQ32-GR, MQ19-B, MQ12-M, MQ31-ACH1. Atelier RAPA: 2, 4, 5, 6, 8, 9, 10, 11, 13, 14, 15, 16, 17, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 41, 43, 44, 47, 48, 54, 61, 64, 67, 69, 70, 72, 77, 78, 79, 81, 82, 83, 87, 89, 94. TARASOC: CP3329, DW3302, DW3313, DW3314, DW3317, DW3324, DW3327, DW3328, DW3330, DW3331, DW3332, DW3333, DW3340, DW3349, DW3351, DW3359, DW3387, DW3389, DW3416, DW3426, DW3461; **C**, sampling sites of the MUSORSTOM 9 (●), Atelier MARQUISES (▲), and BENTHAUS (○) stations. MUSORSTOM 9: DR1200, DR1247, DW1184, DW1206, DW1288. Atelier MARQUISES: 01, 12, 19, 20. BENTHAUS: DW1875, DW1877, DW1884, DW1885, DW1886, DW1887, DW1889, DW1914, DW1924, DW1925, DW1926, DW1927, DW1932, DW1933, DW1937, DW1943, DW1955, DW1961, DW1962, DW1974, DW1975, DW1978, DW1981, DW1998, DW2003, DW2004, DW2010, DW2020, DW2021.

SYSTEMATICS

Class GASTROPODA Cuvier, 1795
Subclass CAENOGASTROPODA Cox, 1960
Order LITTORINIMORPHA
Golikov & Starobogatov, 1975
Superfamily RISSOOIDEA Gray, 1847
Family RISSOIDAE Gray, 1847

Genus *Alvania* Risso, 1826

Alvania Risso, 1826: 140.

TYPE SPECIES. — *Alvania europea* Risso, 1826: 142, pl. IX, fig. 116. Synonym of *Alvania cimex* (Linnaeus, 1758) by subsequent designation (Nevill 1885: 105).

DIAGNOSIS. — Shell from scarcely to very robust, from small to large for the family (1-7 mm hight), ovate-conical, generally with axial and spiral elements forming a clathrate sculpture. Aperture piriform, peristome continuous and simple; outer lip with moderate to very robust varix, inner side smooth or with teeth. Umbilical fissure generally absent. Protoconch multispiral or paucispiral, smooth to heavily sculptured.
Head-foot: cephalic tentacles long, ciliated, with parallel sides; anterior and posterior pallial tentacles present in most species; metapodial tentacles, in most species, 3-7; anterior pedal gland present, posterior pedal gland usually inconspicuous and possibly absent in a few species. Operculum: thin, nucleus eccentric, paucispiral (after Ponder 1985: 36).

REMARKS
The genus *Alvania* Risso, 1826 as currently conceived includes a speciose group of small to large sized rissoid species living from the lower intertidal to bathyal depths, mostly on the continental shelf, where they are prevalently associated with algal facies (e.g. Ponder 1985: 2; Gofas 2007: 779; Ávila *et al.* 2012), with few representatives in deeper waters down to 4700 m depth (Bouchet & Warén 1993). They feed on diatoms, dinoflagellates, and detritus, with the deep-sea species presumably selective deposit feeders (Ponder 1985). The genus is based on the Mediterranean *Alvania europea* Risso, 1826, and includes a remarkable radiation in the northeastern Atlantic and the Mediterranean Sea; the inclusion of species from other biogeographic provinces may (or may not) make it polyphyletic (see e.g. Criscione *et al.* 2016) and its actual taxonomic extension needs to be tested by integrated molecular and anatomical studies. As currently conceived (for the long list of synonyms, not reported here, see MolluscaBase 2023b), *Alvania* comprises species from a wide geographic range, spanning the northeastern Atlantic and Mediterranean, the northwestern Atlantic and the Caribbean, the eastern Pacific, the Indo-West Pacific, temperate Australia, and South Africa (Ponder 1985), and includes 265 known Recent species and 177 fossil ones (MolluscaBase 2023b). The genus dates back to the European Oligocene (Cossmann & Pissarro 1913; Lozouet 1998; Garilli & Parrinello 2010), with the extant fauna being the result of the large diversification from the Miocene to the Pleistocene (e.g. Sacco 1895; L. Seguenza 1903).

Several taxa originally introduced under other genera, actually belong to *Alvania* as currently conceived. For instance, the examination of the type material of *Rissoa denseclathrata* Thiele, 1925 (10 syntypes ZMB/Ma.64984: Fig. 2A-G), from Cape Agulhas, South Africa, in 80 m (Thiele 1925: 81, pl. 6, fig. 11) and of *Rissoa proditoris* Thiele, 1925 (10 syntypes, ZMB/Moll.64965: Fig. 3A-G) from Angola and Agulhas Bank, South Africa (Thiele 1925: 46, pl. 6, fig. 9) are very similar to e.g. *Alvania herosae* n. sp., and we accordingly propose *Alvania denseclathrata* (Thiele, 1925) n. comb. as a new combination for *Rissoa denseclathrata* Thiele, 1925 and *Alvania proditoris* (Thiele, 1925) n. comb. as a new combination for *Rissoa proditoris* Thiele, 1925 (for details see below).

Rissoa (*Alvania*) *lusoria* Yokoyama, 1926, from the Pliocene of Sado Island (Japan: Yokoyama 1926: 273, pl. 33, fig. 18; Makiyama 1958, pl. 45, fig. 18; Hasegawa 2014: 123, fig. 34) is also very similar to *Alvania herosae* n. sp., and we accordingly propose *Alvania lusoria* (Yokoyama, 1926) as a new combination for *Rissoa* (*Alvania*) *lusoria* Yokoyama, 1926 (see below for details).

The examination of *c.* 5250 specimens from French Polynesia, allowed us to identify five shallow water species, all undescribed: *Alvania letourneuxi* n. sp., *Alvania herosae* n. sp., *Alvania parvimaculata* n. sp., *Alvania prosocostata* n. sp. and *Alvania uapou* n. sp.

Alvania denseclathrata (Thiele, 1925) n. comb.
(Figs 2; 48)

Rissoa denseclathrata Thiele, 1925: 81, pl. 6, fig. 11.

TYPE MATERIAL. — **Lectotype. South Africa** • dd; Valdivia Stn 95; 34°51'0"S, 19°37'47"E; 80 m; ZMB/Ma.64984 (here designated). **Paralectotypes**. **South Africa** • 4 dd; Valdivia Stn 95; 34°51'0"S, 19°37'47"E; 80 m; ZMB/Ma.64984 • 3 dd; Valdivia Stn 104; 35°15'57"S, 22°26'42"E; 155 m; ZMB/Ma.64984.
Angola • 2 dd; Valdivia Stn 81; 16°26'27"S, 11°41'27"E; ZMB/Ma.64984.

TYPE LOCALITY. — South Africa, Valdivia Stn 95; 34°51'0"S, 19°37'47"E; 80 m.

DISTRIBUTION. — Only known from southern Africa (Valdivia Stns 95 and 104) and from a station in southern Angola (Valdivia Stn 81) (Fig. 48).

DIAGNOSIS. — *Alvania* with small (height *c.* 2 mm), robust shell, ovate-conical; convex whorls with weakly impressed suture; axial and spiral double sculpture dense, of equal thickness; aperture piriform, peristome continuous and simple, outer lip with robust varix; umbilical fissure absent. Protoconch paucispiral, dome-shaped, with spiral sculpture. Colouration uniform whitish.

REMARKS
The lot from southern Angola (Valdivia Stn 81) comes form a completely distinct biogeographic area, and we are not sure it is not a case of mislabelling. In any case, to stabilize the type locality we have designated as lectotype a specimen from the Cape area (Valdivia St. 95). *Rissoa denseclathrata* is currently

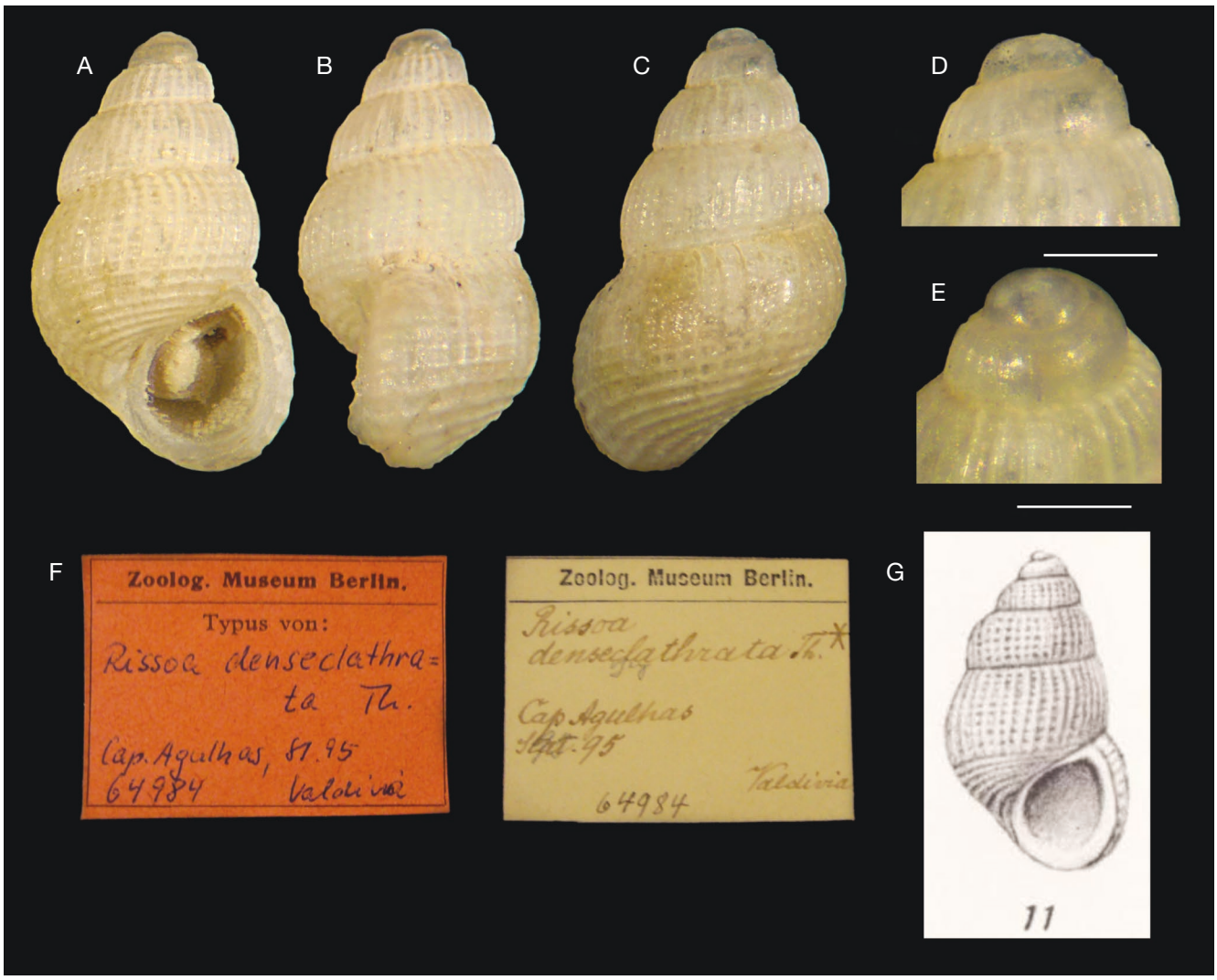

FIG. 2. — *Alvania denseclathrata* (Thiele, 1925) n. comb.: **A**-**E**, Lectotype, height 2.2 mm, width 1.35 mm, South Africa, Valdivia Stn 95, 80 m, ZMB/Moll. N ° 64984: shell (**A**-**C**); detail of the first whorls (**D**, **E**); **F**, original labels; **G**, original drawing. Scale bars: D, E, 20 µm.

included (Ponder 1985) in *Haurakia* Iredale, 1915. However, this is clearly a member of *Alvania*, with its shell devoid of umbilical fissure, with double sculpture (axial and spiral), piriform aperture, continuous and simple peristome, outer lip with robust varix, dome-shaped paucispiral protoconch with spiral sculpture. *Alvania valeriae* Absãlao, 1993 from off southeastern Espirito Santo State (southeastern Brazil) 38 m depth (Absãlao 1993: 104, 105, figs 1-3; Oliveira *et al.* 2018: 95, fig. 4 I-K), differs from *Alvania denseclathrata* n. comb. in its protoconch (quite evidently paucispiral and not multispiral as originally described) without sculpture vs sculptured with spiral cordlets in *A. denseclathrata* n. comb.; in the narrow umbilical fissure, absent in *A. denseclathrata* n. comb.; in the absence of a labial varix vs a robust labial varix in *A. denseclathrata* n. comb.

Alvania flexilis Gofas, 1999 from off Ilha de Luanda (Angola) 40-60 m (Gofas, 1999: 85, figs 27-32), differs from *A. denseclathrata* (Thiele, 1925) n. comb., in its multispiral protoconch sculptured with granules vs paucispiral with spiral sculpture in *A. denseclathrata* n. comb.; in the axial and spiral sulpture on the teleoconch more spaced than in *A. denseclathrata* n. comb.

We accordingly propose *Alvania denseclathrata* (Thiele, 1925) n. comb. as a new combination for *Rissoa denseclathrata* Thiele, 1925.

Alvania proditoris (Thiele, 1925) n. comb.
(Figs 3; 48)

Rissoa proditoris Thiele, 1925: 80, pl. 6, fig. 9.

TYPE MATERIAL. — **Lectotype. South Africa** • dd; Valdivia Stn 101; 33°50'27"S, 25°48'46"E; ZMB/Ma.64965 (here designated). **Paralectotypes**. **South Africa** • 5 dd; Valdivia Stn 95; 34°51'0"S, 19°37'47"E; 80 m; ZMB/Ma.64965 • 3 dd; Valdivia Stn 101; 33°50'27"S, 25°48'46"E; ZMB/Ma.64965.
Angola • 1 dd; Valdivia Stn 81; 16°26'27"S, 11°41'27"E; ZMB/Ma.64965.

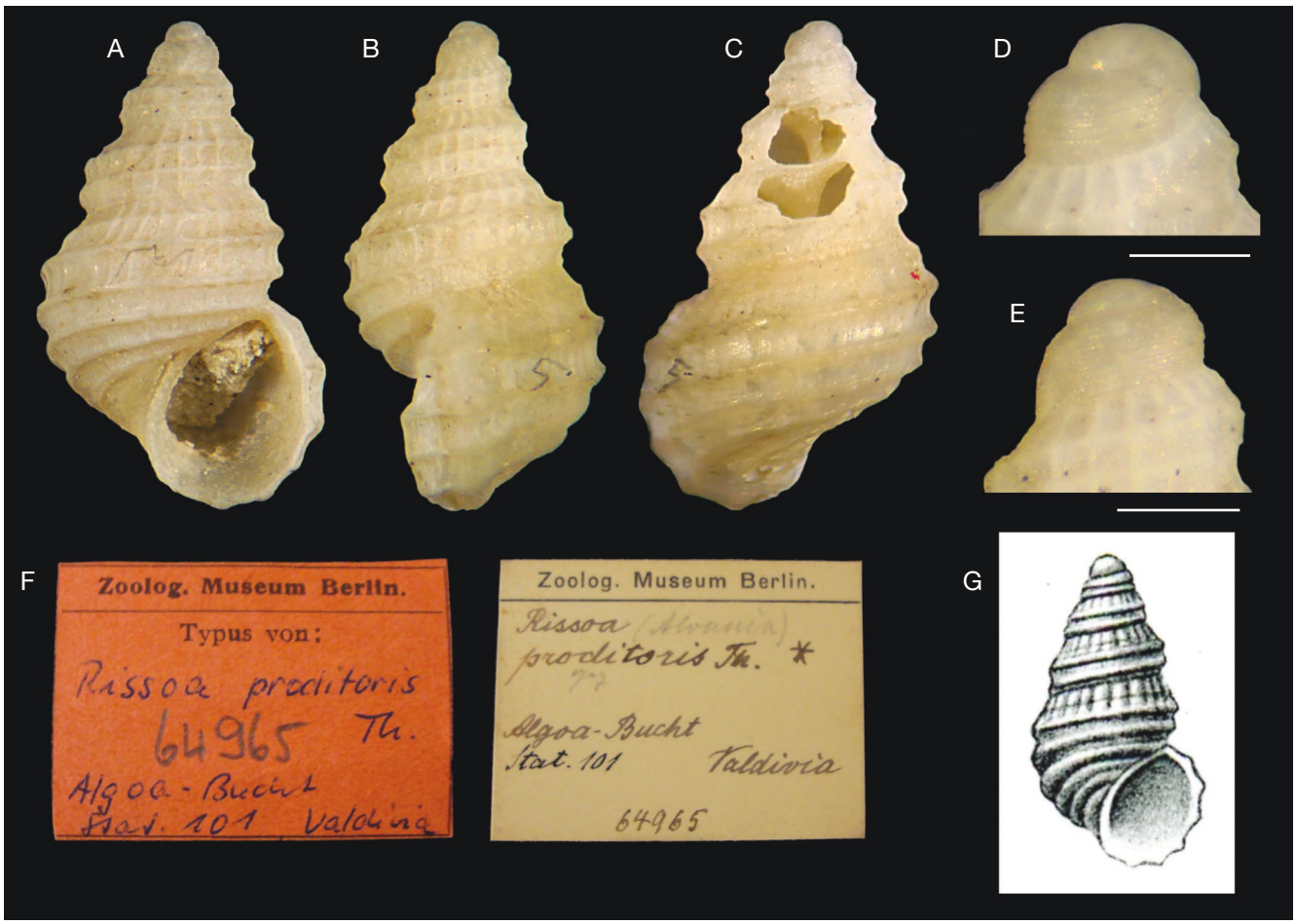

FIG. 3. — *Alvania proditoris* (Thiele, 1925) n. comb.: **A**-**E**, lectotype, height 2.75 mm, width 1.65 mm, South Africa, Valdivia Stn 101, depth unknown, ZMB/Moll. N° 64965: shell (**A**-**C**); detail of the first whorls (**D**, **E**); **F**, original labels; **G**, original drawing. Scale bars: D, E, 20 µm.

TYPE LOCALITY. — South Africa, Valdivia Stn 101; 33°50'27"S, 25°48'46"E.

DISTRIBUTION. — Only known from southern Africa (Valdivia Stns 95 and 101) and from a station in southern Angola (Valdivia Stn 81) (Fig. 48).

DIAGNOSIS. — *Alvania* with small (height <3 mm), robust shell, ovate-conical; spiral sculpture stronger than axial; aperture piriform, peristome continuous and simple, outer lip with robust; umbilical fissure absent. Protoconch paucispiral, dome-shaped, with spiral sculpture. Colouration uniform whitish.

REMARKS

The lot from southern Angola (Valdivia Stn 81) comes form a completely distinct biogeographic area, and we are not sure it is not a case of mislabelling. In any case, to stabilize the type locality we have designated as lectotype a specimen from the Cape area (Valdivia Stn 95). *Rissoa proditoris* Thiele, 1925 is clearly a member of *Alvania*, with its shell devoid of umbilical fissure, with double sculpture (axial and spiral), piriform aperture, continuous and simple peristome, outer lip with robust varix, dome-shaped paucispiral protoconch with spiral sculpture. We accordingly propose *Alvania proditoris* (Thiele, 1925) n. comb. as a new combination for *Rissoa proditoris* Thiele, 1925.

Alvania isolata (Laseron, 1956)
(Figs 4; 48)

Haurakia isolata Laseron, 1956: 439, fig. 144.

Alvania isolata – Ponder 1985: 142, figs 93A, B.

TYPE MATERIAL. — **Holotype. Australia** • dd (height 1.5 mm, Fig. 4A, B); Christmas Island; AMS C.102476.
Paratypes. Australia • dd (height 1.6 mm, Fig. 4D-F); Christmas Island; AMS C.102476 • 7 dd (one of these height 1.6 mm, Fig. 4G, H); Christmas Island; AMS C.304689.

TYPE LOCALITY. — Christmas Island (Australia).

DISTRIBUTION. — Only known from the type locality, in the eastern Indian Ocean (Fig. 48).

DIAGNOSIS. — *Alvania* with small (height <2 mm) and robust shell, ovate-conical shape; with double sculpture (axial and spiral) of equal thickness, aperture piriform, continuous and simple peristome, outer lip with mediocre varix and devoid of umbilical fissure. Protoconch paucispiral, dome-shaped sculptured of 4-5 smooth spiral cordlets. Colouration whitish, with series of pairs of short brown lines.

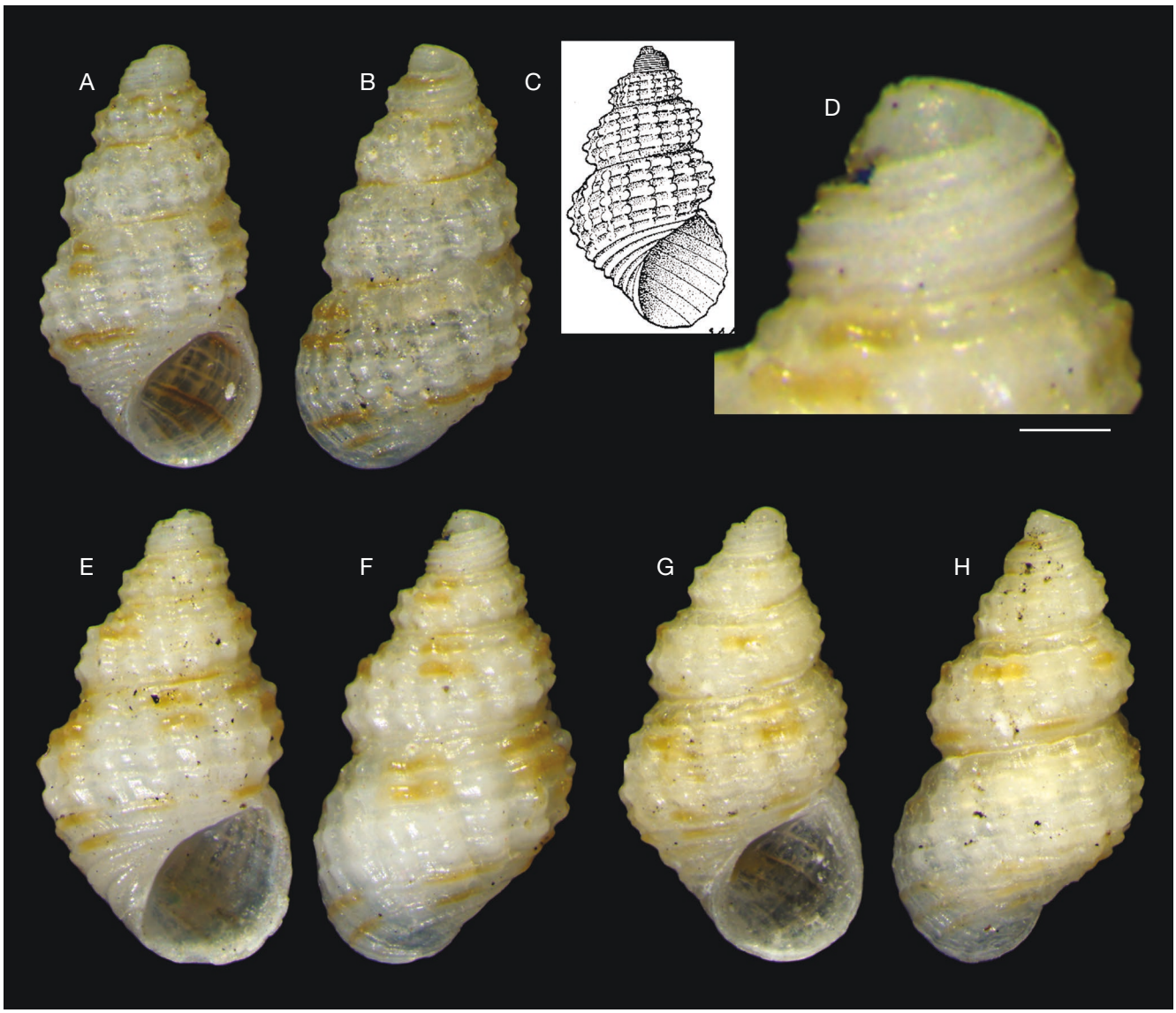

FIG. 4. — *Alvania isolata* (Laseron, 1956): **A**, **B**, holotype, height 1.5 mm, Christmas Island, AMS C.102476; **C**, original drawing; **D**-**F**, paratype, height 1.6 mm, Christmas Island, AMS C.102476; **G**, **H**, paratype, height 1.6 mm, Christmas Island, AMS C.304689. Images: A. C. Miller; copyright: Australian Museum. Scale bar: 100 mm.

REMARKS

Besides Laseron (1956) and Ponder (1985), some authors have used the name *Alvania isolata* (Laseron, 1956) for three similar, yet distinct and probably all undescribed species. One from Hawaii (Kay 1979: 78, fig. 27C; Severns 2011: 114, pl. 41, fig. 1) with finely striated protoconch, teleoconch with angled whorls, and three sets of red-orange subsutural lines; another from Taiwan (Chang & Wu 2004: 10, 11, 71, fig. 5) and the Philippines (Hasegawa 2006b: 107, fig. 2), also with finely striated protoconch with more convex whorls, and teleoconch with broader base. Finally, *Alvania isolata* has also been reported from French Polynesia (Tröndlé & Boutet 2009; Salvat & Tröndlé 2017). The latter records actually refer to a further undescribed species (see below *Alvania uapou* n. sp.).

Alvania letourneuxi n. sp.

(Figs 5; 6; 49A; 53A; Tables 1; 2)

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TYPE MATERIAL. — **Holotype. Tuamotu** • dd (height 1.60 mm, width 0.95 mm, Figs 5; 6; 49A); Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 1-20 m; J. Letourneux leg.; MNHN-IM-2000-38703.

TYPE LOCALITY. — Tuamotu: Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 1-20 m.

DISTRIBUTION AND SYMPATRY. — *Alvania letourneuxi* n. sp. is known from the South Pacific Ocean, in the Tuamotu Archipelago (Makemo) (Fig. 49A).
Alvania letourneuxi n. sp. is sympatric with *Alvania parvimaculata* n. sp. in the Tuamotu (Makemo).

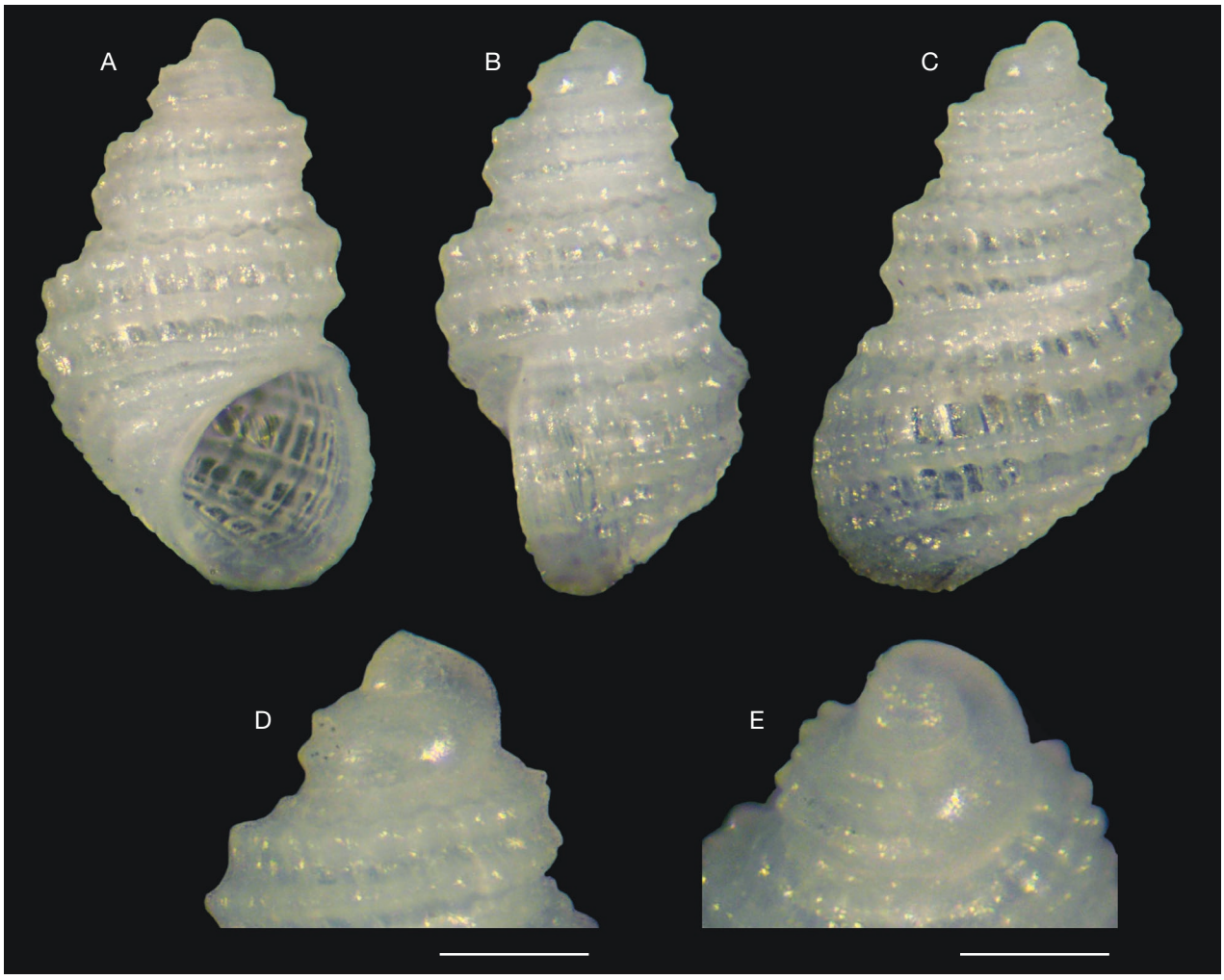

FIG. 5. — *Alvania letourneuxi* n. sp.: holotype, Tuamotu, Makemo, Passe Arikitamiro 1-20 m, MNHN-IM-2000-38703, height 1.60 mm: **A**-**C**, shell; **D**, **E**, details of the protoconch. Scale bars: D, E, 20 µm.

ETYMOLOGY. — Named after Jean Letourneux (Mahina, Tahiti), who collected the type material in the Tuamotu, for his continuous study of the Polynesian molluscs, and for having made materials from his collection available for this revision.

DIAGNOSIS. — *Alvania* with small shell (<2 mm height); protoconch paucispiral; spiral sculpture a little stronger than axial; two spiral cordlets starting after protoconch-teleoconch boundary; colouration uniform white.

DESCRIPTION OF HOLOTYPE

Shell (Figs 5A-C; 6A; 53A)

Small for the genus, height 1.60 mm, width 0.95 mm, height/width ratio 1.69, robust, ovate-conical.

Protoconch (Figs 5D, E; 6B-D)

Paucispiral with nucleus intorted, of 1 convex whorl, height 0.250 mm, nucleus diameter 0.075 mm, first half whorl diameter 0.150 mm, maximum diameter 0.200 mm; with 5 small keels, interspaced by axial riblets, replaced by scattered on the last quarter of whorl. Protoconch-teleoconch boundary well marked, prosocline.

Teleoconch

Of 2.90 convex whorls, with suture impressed. Axial sculpture on the last whorl of 21 slightly prosocline ribs thinner than interspaces, gradually vanishing at the base. Spiral sculpture of equidistant cordlets slightly broader than axials, 7 on the last whorl, 3 above the aperture, one on suture line and 3 on the base. Cordlets II and III starting immediately after the protoconch-teleoconch boundary; cordlet I (subsutural) thinner, starting subsequently. Medium size, rounded tubercles at the intersections; interspaces quadrangular. Microsculpture of weak, minute spiral threads crossing the growth lines (Fig. 6B). Umbilical fissure absent. Aperture piriform, height 0.92 mm, height/aperture height ratio 1.74, peristome continuous and simple, external varix moderately thickened, outer lip sharp, smooth internally, prosocline.

Colour

Colouration uniform white.

Operculum and soft parts

Unknown.

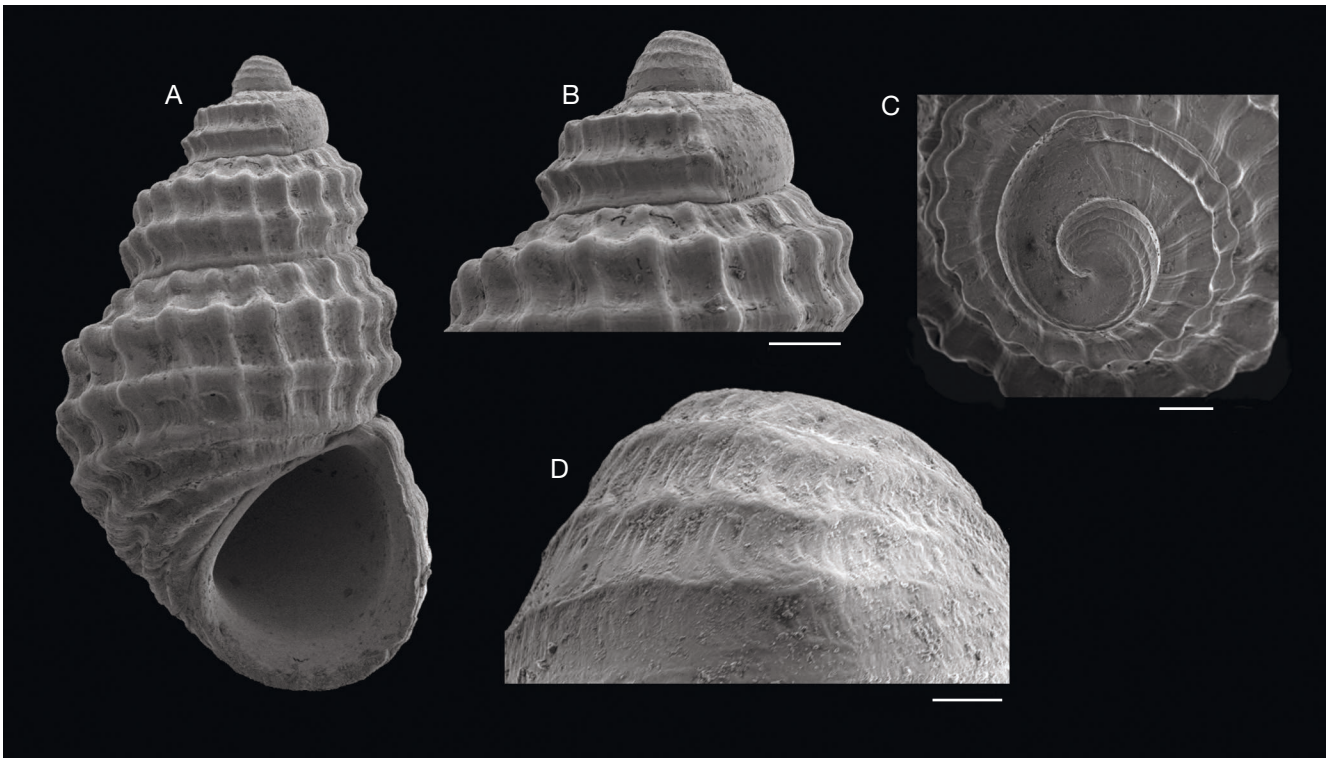

FIG. 6. — *Alvania letourneuxi* n. sp.: holotype, Tuamotu, Makemo, Passe Arikitamiro 1-20 m, MNHN-IM-2000-38703, height 1.60 mm: **A**, shell; **B**-**D**, detail of the protoconch sculpture. Scale bars: B, C, 100 µm; D, 20 µm.

VARIABILITY

A single specimen known. (See Table 1 and Appendix 1).

REMARK

See under *A. parvimaculata* n. sp. for detailed comparison.

Alvania herosae n. sp.

(Figs 7; 8; 9; 10; 11; 12; 13; 49A; 53B, C; Tables 1; 2)

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Alvania sp. 2 – Boutet *et al.* 2020: 239.

TYPE MATERIAL. — **Holotype. Australes** • dd (height 2.02 mm, width 1.10 mm, Figs 7; 9B; 53B); Rapa, East of Tupuaki Bay, Atelier RAPA Stn 21; 27°34'12"S, 144°20'34"W; 5 m; 12.XI.2002; blocks of dead coral on a sandy bottom; MNHN-IM-2000-38704. **Paratypes**. **Australes** • 116 dd (morph A), 17 lv (morph A); same locality data as holotype; MNHN-IM-2000-38705.

TYPE LOCALITY. — Australes. Rapa, East of Tupuaki Bay, Stn 21; 27°34'12"S, 144°20'34"W; 5 m; blocks of dead coral on a sandy bottom, Atelier RAPA 12.XI.2002.

OTHER MATERIAL EXAMINED. — **Australes** • 129 dd (morph A); Marotiri, BENTHAUS Stn DW1885; 27°52'1"S, 143°33'0"W; 700-800 m; 6.XI.2002; MNHN • 7 dd (morph A); Marotiri, BENTHAUS Stn DW1886; 27°51'0"S, 143°31'58"W; 620-1000 m; 6.XI.2002; MNHN • 40 dd (morph A), 13 dd (morph B); E of Rapa, BENTHAUS Stn DW1889; 27°37'1"S, 144°16'1"W; 600-620 m; 7.XI.2002; MNHN • 1 dd (morph B); Rapa; 27°36'57"S, 144°19'48"W; coll. MB • 41 dd (morph A); Rapa, Ahurei Bay; 27°36'57"S, 144°19'48"W; 1 m; coll. JL • 4 dd (morph A), 2 dd (morph B); Rapa, Ahurei Bay; 27°36'57"S, 144°19'48"W; 1 m; coll. MB • 15 dd (morph A); Rapa, Ahurei Bay, Atelier RAPA Stn 77; 27°37'12"S, 144°19'48"W; intertidal; 5.XI.2002; near wharf; MNHN • 8 dd (morph A), 22 dd (morph B); Rapa, Akatamiro Bay, Atelier RAPA Stn 94; 27°34'37"S, 144°21'25"W; intertidal; 5.XII.2002; MNHN • 31 dd (morph A), 1 lv (morph A), 7 dd (morph B); Rapa, Akatanui Bay, Atelier RAPA Stn 13; 27°36'7"S, 144°18'53"W; 2 m; 8.XI.2002; sandy pockets; MNHN • 1 dd (morph B); Rapa, Akatanui Bay, Atelier RAPA Stn 81; 27°35'52"S, 144°18'28"W; intertidal; 9.XI.2002; rocks; MNHN • 71 dd (morph A), 8 dd (morph B); Rapa, Anarua Bay, Atelier RAPA Stn 41; 27°36'18"S, 144°22'40"W; 5 m; 25.XI.2002; corals on sandy bottom; MNHN • 4 dd (morph A), 4 dd (morph B); Rapa, Anarua Bay, Atelier RAPA Stn 87; 27°36'25"S, 144°22'37"W; intertidal; 25.XI.2002; entry of cave; MNHN • 2 dd (morph A), 10 dd (morph B); Rapa, Anatakuri Bay, Atelier RAPA Stn 69; 27°37'47"S, 144°18'43"W; 3-4 m; 19.XI.2002; coarse sand and algae; MNHN • 1 dd (morph A), 14 dd (morph B); Rapa, Anatakuri Nako Bay, Atelier RAPA Stn 25; 27°38'24"S, 144°18'53"W; 3 m; 13.XI.2002; blocks of dead coral on sand; MNHN • 2 dd (morph A), 1 dd (morph B), 1 dd (intermediate form); Rapa, Anatakuri Nako Bay, Atelier RAPA Stn 64; 27°38'24"S, 144°18'53"W; 1.5-2 m; 16.XI.2002; fine muddy sand; MNHN • 5 dd (morph A); Rapa, E of Area, Atelier RAPA Stn 54; 27°36'35"S, 144°19'19"W; 12-20 m; 5.XI.2002; yellow mud, corals on the slopes; MNHN • 9 dd (morph A); Rapa, Haurei Bay, Atelier RAPA Stn 43; 27°36'46"S, 144°18'18"W; 45 m; 26.XI.2002; muddy bottom at the foot base of a drop-off; MNHN • 23 dd (morph A); Rapa, Haurei Bay, Atelier RAPA Stn 47; 27°36'43"S, 144°19'4"W; 33 m; 29.XI.2002; corals on muddy bottom; MNHN • 232 dd (morph A); Rapa, Hiri Bay; 27°37'19"S, 144°22'4"W; 3-5 m; coll. JL • 2 dd (morph A); Rapa, Hiri Bay; 27°37'19"S, 144°22'4"W; 3-5 m; coll. MB • 60 dd (morph A), 1 lv (morph A), 10 dd (morph B); Rapa, Hiri Bay, Atelier RAPA Stn 9; 27°37'19"S, 144°22'12"W; 3-24 m; 6.XI.2002; amidst corals;

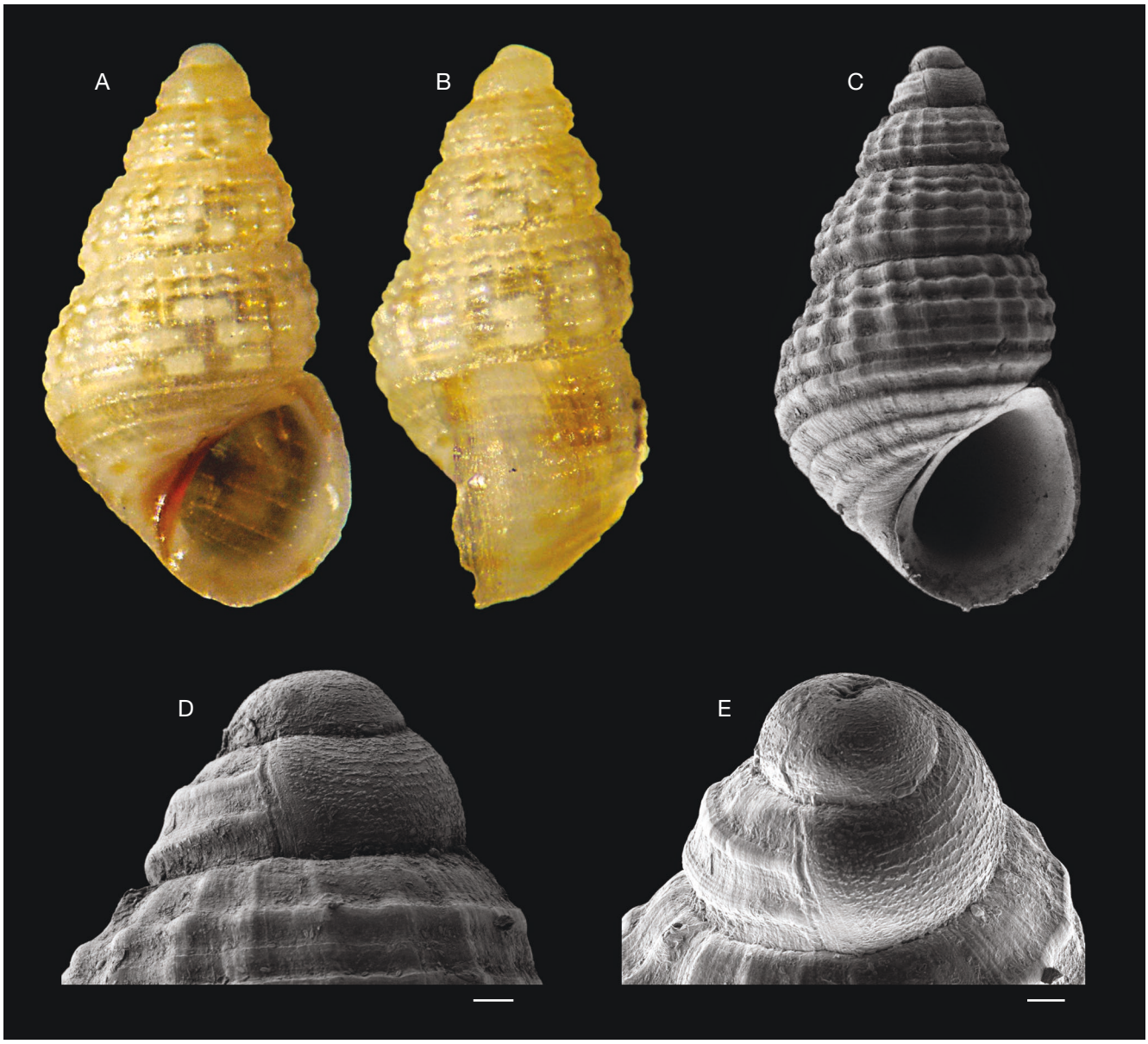

FIG. 7. — *Alvania herosae* n. sp.: **A**-**E**, holotype, representative of morph 'A', Australes, Rapa, Tupuaki Bay, Stn 21, 5 m, height 2.02 mm, width 1.10 mm, MNHN-IM-2000-38704, shell (**A**-**C**), details protoconch microsculpture (**D**, **E**). Scale bars: D, E, 40 µm.

MNHN • 31 dd (morph A), 27 lv (morph A), 57 dd (morph B), 14 lv (morph B); Rapa, N of Anatakuri Bay, Atelier RAPA Stn 38; 27°37'22"S, 144°18'25"W; 2 m; 22.XI.2002; sediment under a large rock; MNHN • 104 dd (morph A), 105 lv (morph A), 37 dd (morph B); Rapa, N of Aturapa I., Atelier RAPA Stn 29; 27°34'19"S, 144°20'59"W; 2-4 m; 15.XI.2002; dead coral; MNHN • 102 dd (morph A); Rapa, N of Rapa Iti I., Atelier RAPA Stn 11; 27°37'12"S, 144°18'10"W; 2 m; 7.XI.2002; sandy pockets amidst slabs of dead coral; MNHN • 39 dd (morph A), 22 dd (morph B); Rapa, Nord of Pukitarava, Atelier RAPA Stn 14; 27°35'49"S, 144°13'37"W; 2 m; 8.XI.2002; dead coral blocks on sand; MNHN • 14 dd (morph A); Rapa, NW of Tauna I., Atelier RAPA Stn 44; 27°36'18"S, 144°18'10"W; 30 m; 27.XI.2002; drop-off with muddy bottoms; MNHN • 146 dd (morph A); Rapa, off Ahurei Bay, Atelier RAPA Stn 6; 27°36'46"S, 144°16'40"W; 42 m; 5.XI.2002; live and dead corals; MNHN • 102 dd (morph A), 5 dd (morph B); Rapa, off Cape Rukuaga, Atelier RAPA Stn 22; 27°33'54"S, 144°21'43"W; 18-22 m; 13.XI.2002; corals on rocky bottom; MNHN • 133 dd (morph A), 2 dd (morph B); Rapa, off Pointe Rukuaga, Atelier RAPA Stn 48; 27°34'4"S, 144°22'4"W; 36 m; 30.XI.2002; plateau with silty sand; MNHN • 85 dd (morph A), 5 dd (morph B); Rapa, Pake Bay, Atelier RAPA Stn 61; 27°37'1"S, 144°18'36"W; 10-15 m; 11-14.XI.2002; sandy mud and coral; MNHN • 7 dd (morph A), 20 dd (morph B); Rapa, Pariati Bay, Atelier Rapa Stn 67; 27°34'40"S, 144°21'43"W; 3-4 m; 18.XI.2002; muddy sand and seaweed; MNHN • 167 dd (morph A), 15 lv (morph A); Rapa, Pointe Kauira, Atelier RAPA Stn 36; 27°33'28"S, 144°20'49"W; 27 m; 21.XI.2002; corals, mostly alive; MNHN • 4 dd (morph A), 1 dd (morph B); Rapa, Pointe Komiré, Atelier RAPA Stn 10; 27°34'47"S, 144°22'47"W; 16-18 m; 7.XI.2002; rocks covered with brown algae; MNHN • 291 dd (morph A), 53 lv (morph A); Rapa, Pointe Mei, Atelier RAPA Stn 30; 27°38'13"S, 144°18'10"W; 16-20 m; 16-18.XI.2002; drop-off with dead corals; MNHN • 565 dd (morph A), 3 lv (morph A), 4 dd (morph B); Rapa, Pointe Mei, Atelier RAPA Stn 31; 27°38'13"S, 144°18'10"W; 6 m; 16.XI.2002; rocks; MNHN (1 coated for SEM) • 56 dd (morph A), 11 dd (morph B); Rapa,

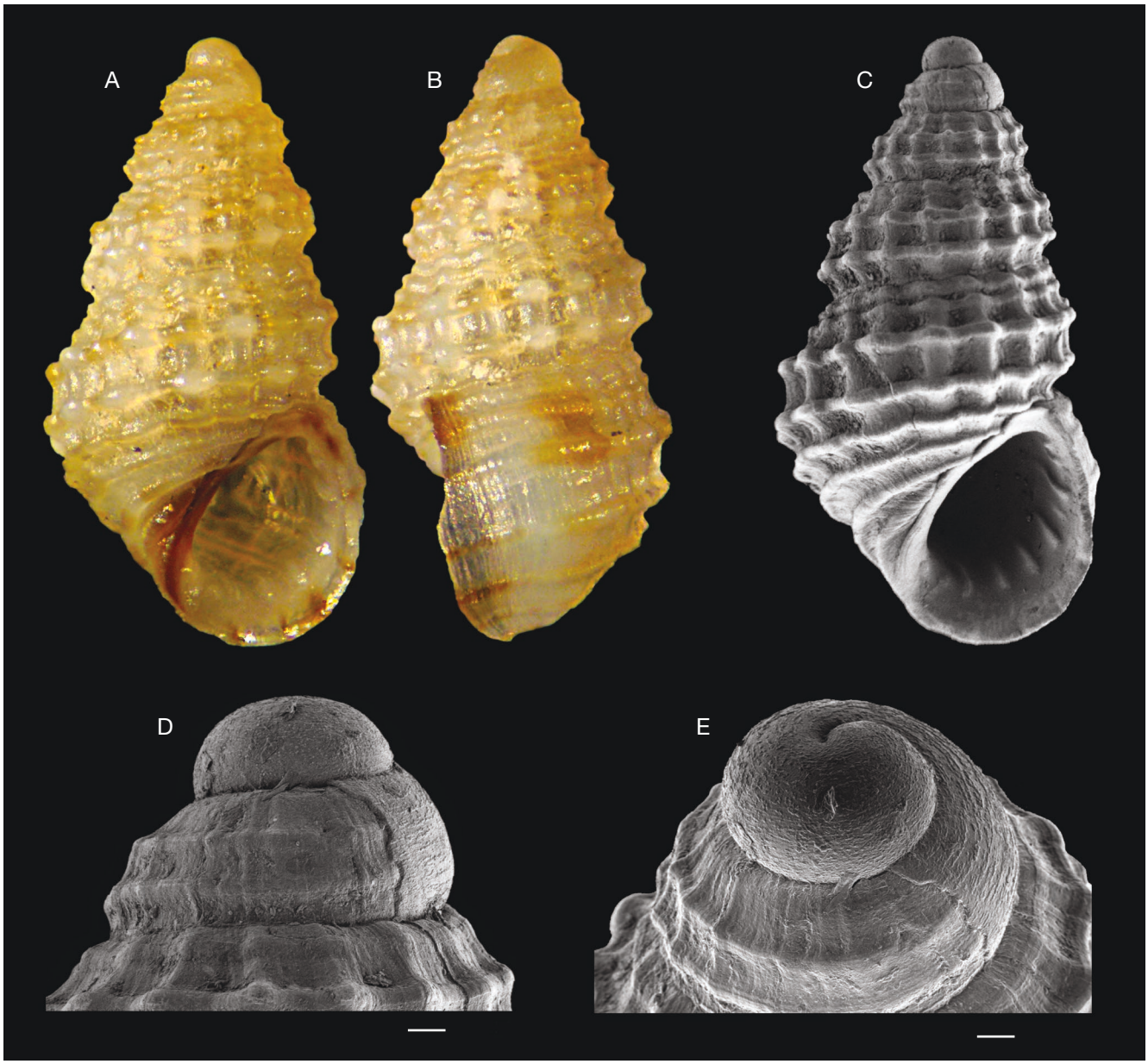

FIG. 8. — *Alvania herosae* n. sp.: Morph 'B', Australes, Rapa, Aturapa I., 2-4 m, height 2.16 mm: **A**-**C** shell; **D**, **E**, details of protoconch microsculpture, MNHN. Scale bars: D, E, 40 µm.

Pointe Taekateke, Atelier RAPA Stn 28; 27°38'24"S, 144°20'34"W; 30 m; 15.XI.2002; rocky blocks with algal cover; MNHN • 36 dd (morph A); Rapa, Pointe Teruametitoi, Atelier RAPA Stn 33; 27°34'47"S, 144°18'36"W; 30 m; 19.XI.2002; dead corals; MNHN • 3 dd (morph B); Rapa, Rapa Iti, Atelier RAPA Stn 83; 27°37'19"S, 144°18'7"W; intertidal; 12-13.XI.2002; MNHN • 23 dd (morph A); Rapa, Rarapai I., Atelier RAPA Stn 4; 27°34'19"S, 144°21'36"W8; 18 m; 4.XI.2002; rocky blocks covered with brown algae; MNHN • 72 dd (morph A), 13 dd (morph B); Rapa, S of Anatakuri Bay, Atelier RAPA Stn 19; 27°37'40"S, 144°18'43"W; 3 m; 11.XI.2002; coral blocks on sandy bottom; MNHN • 88 dd (morph A), 12 dd (morph B); Rapa, S of Tarakoi I., Atelier RAPA Stn 5; 27°5'34"S, 144°18'28"W; 8 m; 4.XI.2002; dead corals with algae, muddy-sandy pockets; MNHN • 2 dd (morph A); Rapa, SE of Pointe Tematapu, Atelier RAPA Stn 34; 27°34'47"S, 144°19'1"W; 2-8 m; 19.XI.2002; slope in a large cave, muddy bottom; MNHN • 60 dd (morph A), 7 lv (morph A), 5 dd (morph B), 2 lv (morph B); Rapa, SE of Pointe Tematapu, Atelier RAPA Stn 35; 27°34'47"S, 144°19'1"W; 2 m; 20.XI.2002; pebbles at cave exit; MNHN • 7 dd (morph A); Rapa, SE of Tauna I., Atelier RAPA Stn 8; 27°36'28"S, 144°17'41"W; 52-57 m; 06-22.XI.2002; rocky bottoms with sandy pockets; MNHN • 1 dd (morph A), 4 dd (morph B); Rapa, SW of Pointe Goten-aonao, Atelier RAPA Stn 27; 27°38'41"S, 144°19'11"W; 6 m; 14.XI.2002; rocks with algae cover; MNHN • 3 dd (morph A), 3 dd (morph B); Rapa, SW of Rarapai I., Atelier RAPA Stn 17; 27°34'37"S, 144°22'40"W; 9 m; 10.XI.2002; rocky boulders on sandy bottom; MNHN • 51 dd (morph B); Rapa, Vavai, Atelier RAPA Stn 20; 27°35'23"S, 144°23'16"W; 5 m; 12.XI.2002; coral blocks on sand bottom; MNHN • 470 dd (morph A), 3 lv (morph A), 22 dd (morph B); Rapa, Vavai, Atelier RAPA Stn 32; 27°34'58"S, 144°22'40"W; 15-20 m; 18.XI.2002; coral; MNHN • 1 dd (morph B); Rapa, W of Pointe Aukura, Atelier RAPA Stn 15; 27°38'6"S, 144°21'7"W; 20 m; 9.XI.2002; sandy pockets amidst large rocky blocks; MNHN • 85 dd (morph A), 90 dd (morph B); Rapa, W of

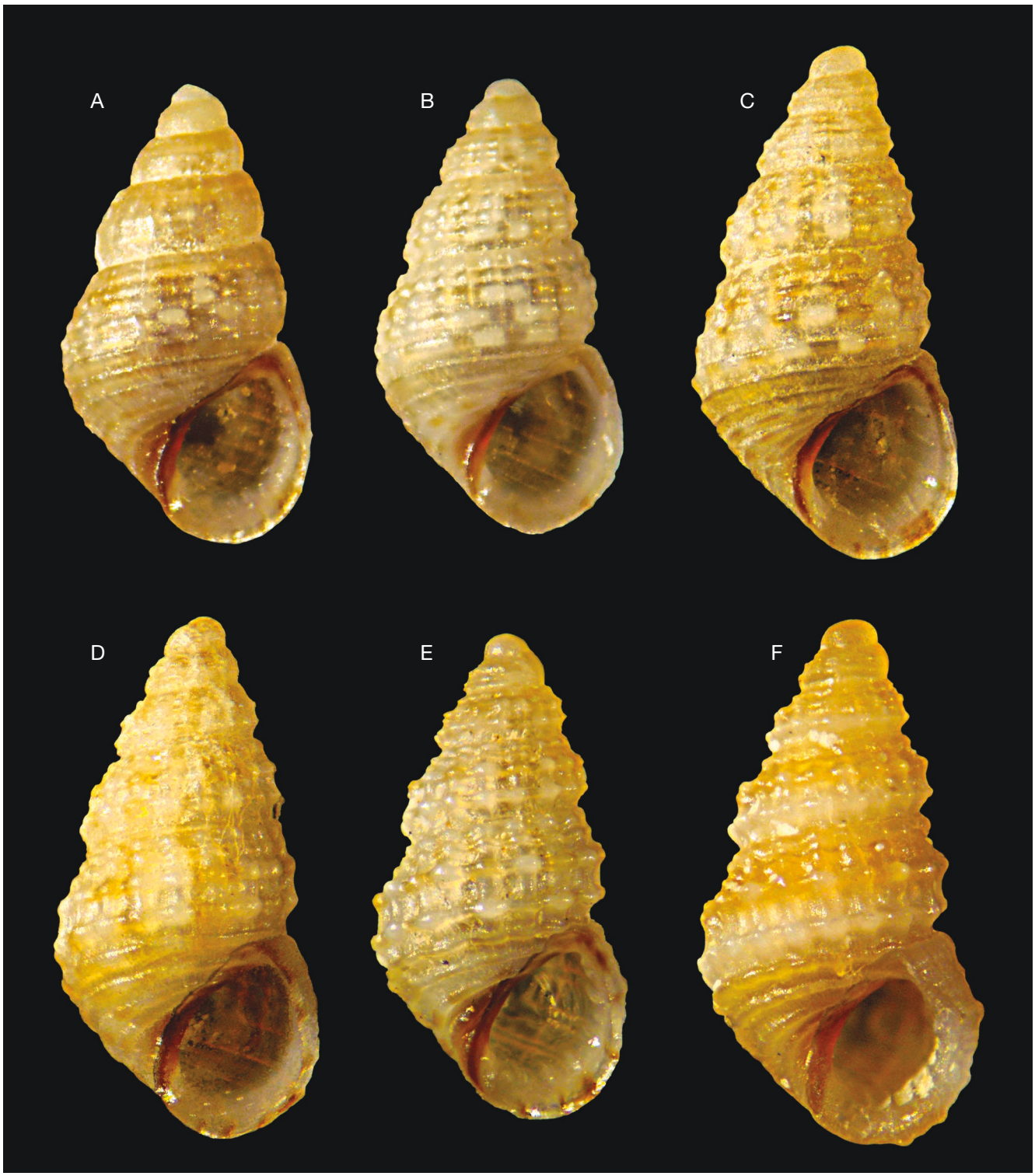

FIG. 9. — *Alvania herosae* n. sp.: series of specimens with transition from morph 'A' to morph 'B': **A**, Australes, Rapa, Tapuaki Bay, 5 m, height 2.03 mm, MNHN; **B**, holotype, Australes, Rapa, Tapuaki Bay, 5 m, height 2.0 mm, MNHN-IM-2000-38704; **C**, Australes, Rapa, 'Aturapa I., 2-4 m, height 2.3 mm, MNHN; **D**, Australes, Rapa, 'Aturapa I., 2-4 m, height 2.3 mm, MNHN; **E**, Australes, Rapa, 'Aturapa I., 2-4 m, height 2.16 mm, MNHN; **F**, Australes, Rapa, Tapuaki Bay, 5 m, height 2.33 mm, MNHN.

Rapa Iti I.; 27°37'15"S, 144°18'3"W; 24 m; coll. JL • 61 dd (morph A), 1 dd (morph B); Rapa, W of Tauna I., Atelier RAPA Stn 16; 27°36'18"S, 144°18'25"W; 5 m; 9.XI.2002; corals, mostly dead; MNHN • 2 dd (morph A); Rapa, wharf of Area, Atelier RAPA Stn 70; 27°36'35"S, 144°19'11"W5; 15-20 m; 20.XI.2002; muddy pockets and corals; MNHN • 4 dd (morph A); Récif Neilson, BENTHAUS Stn DW1914; 27°4'1"S, 146°4'1"W; 150 m; 11.XI.2002; MNHN • 1 dd (morph A); Récif Neilson, BENTHAUS Stn DW1924; 27°1'1"S, 146°4'58"W; 340-800 m; 12.XI.2002; MNHN • 1 dd (morph A); Banc Président Thiers, BENTHAUS

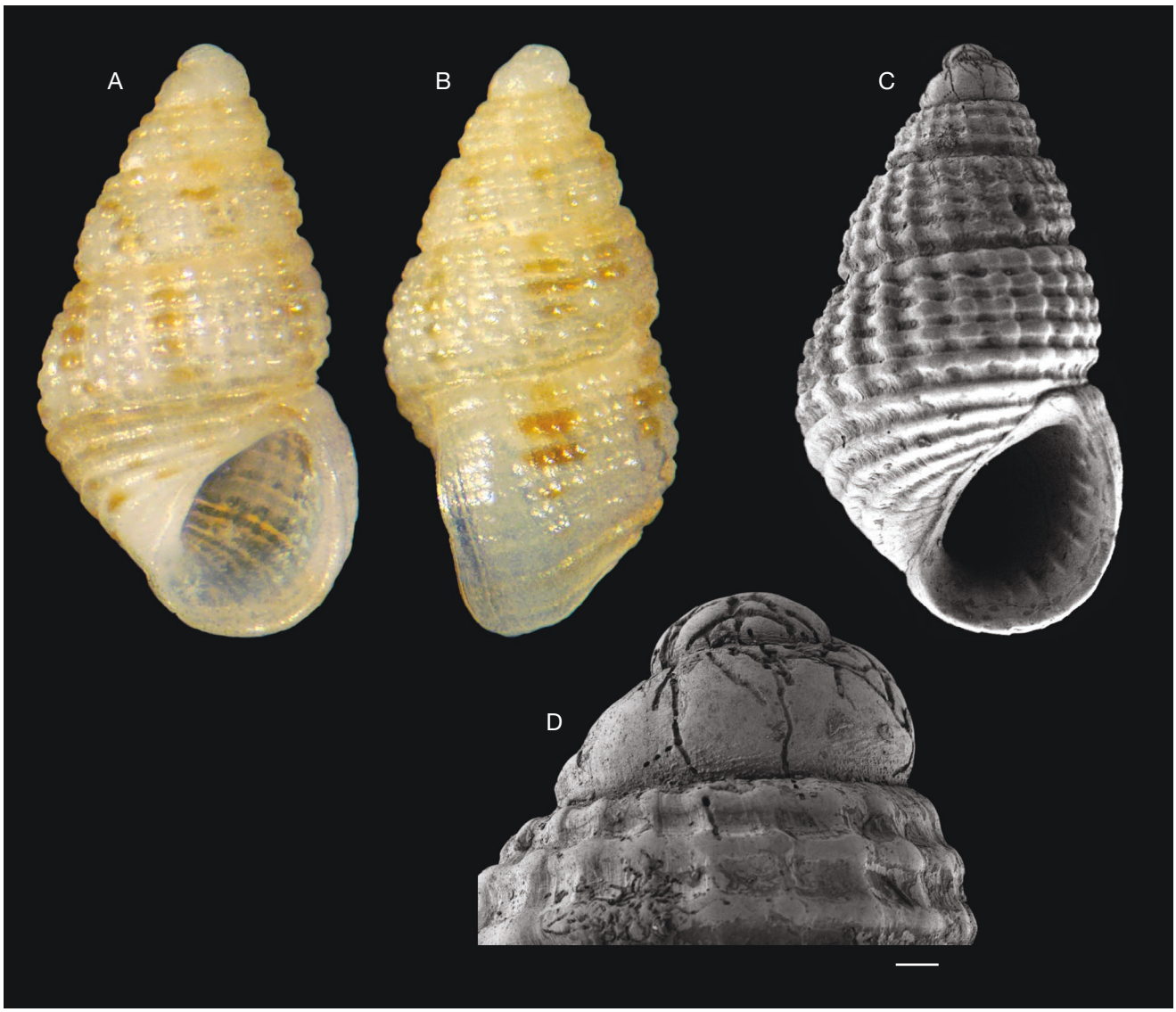

FIG. 10. — *Alvania herosae* n. sp.: Australes, Rapa, N of Aturapa I., 2-4 m, height 2.05 mm: **A-C**, shell; **D**, details of the protoconch microsculpture, MNHN. Scale bar: D, 40 µm.

Stn DW1927; 24°38'59"S, 146°1'37"W; 105-95 m; 13.XI.2002; MNHN • 13 dd (morph A); Banc Président Thiers, BENTHAUS Stn DW1932; 24°40'58"S, 146°1'58"W; 500-800 m; 14.XI.2002; MNHN • 10 dd (morph A); Banc Président Thiers, BENTHAUS Stn DW1933; 24°40'58"S, 146°1'1"W; 500-850 m; 14.XI.2002; MNHN • 3 dd (morph A); Banc Président Thiers, BENTHAUS Stn DW1937; 24°40'1"S, 145°55'58"W; 469-500 m; 14.XI.2002; MNHN • 5 dd (morph A); Raivavae; 23°51'0"S, 147°38'34"W; from reef flat (1 m) to 20 m; coll. JL • 11 dd (morph A); Tubuai; 23°20'38"S, 149°28'33"W; beached; coll. MB • 9 dd (morph A); Tubuai, BENTHAUS Stn DW1962; 23°21'0"S, 149°33'0"W; 470-800 m; 19.XI.2002; MNHN • 36 dd (morph A); Tubuai, Mataura; 23°22'4"S, 149°32'2"W; 1 m; coll. JL • 11 dd (morph A); Tubuai, Mataura; 23°22'1"S, 149°31'40"W; beached; coll. MB • 2 dd (morph A); Banc Arago, BENTHAUS Stn DW1975; 23°23'59"S, 150°43'58"W; 600-691 m; 20.XI.2002; MNHN • 3 dd (morph A), 1 dd (morph B); E coast of Rurutu, BENTHAUS Stn DW2003; 22°28'1"S, 151°18'36"W7; 250-330 m; 24.XI.2002; MNHN • 20 dd (morph A); Rurutu, Vitaria; 22°28'44"S, 151°21'14"W; 1 m; fringing reef platform of Vitaria; coll. JL • 18 dd (morph A); Rurutu, Morerai; 22°26'56"S, 151°20'9"W; 51 m; coll. JL • 19 dd (morph A); S of Rurutu BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN • 15 dd (morph A); Rimatara; 22°38'45"S, 152°47'23"W; 1 m; reef flat; coll. JL • 115 dd (morph A); Rimatara, BENTHAUS Stn DW 2020; 22°37'1"S, 152°49'1"W; 920-930 m; 25.XI.2002; MNHN • 39 dd (A, 7 of which large size); Rimatara, BENTHAUS Stn DW2021; 22°37'1"S, 152°49'1"W; 1200-1226 m; 25.XI.2002; MNHN.

Gambier • 6 dd (morph A); Mangareva, Rikitea; 23°6'39"S, 134°58'1"W; beached; coll. JL.

DISTRIBUTION AND SYMPATRY. — *Alvania herosae* n. sp. is known from the South Pacific Ocean, in the Australes chain (Marotiri, Rapa, Récif Neilson, Banc Président Thiers, Raivavae, Tubuai, Banc Arago, Rurutu, Rimatara) and Gambier with 203 live specimens collected in 2-24 m depth (Fig. 49A).

Empty but fresh shells are usually collected from 0 to 57 m depth; shells from deeper samples (95-1226 m depth), usually in bad conditions, are probably drifted down from upper bottoms.

Alvania herosae n. sp. is sympatric in the Australes (Rapa) with *Alvania prosocostata* n. sp. and *Alvania uapou* n. sp.; in the Gambier with *Alvania prosocostata* n. sp. (Table 2).

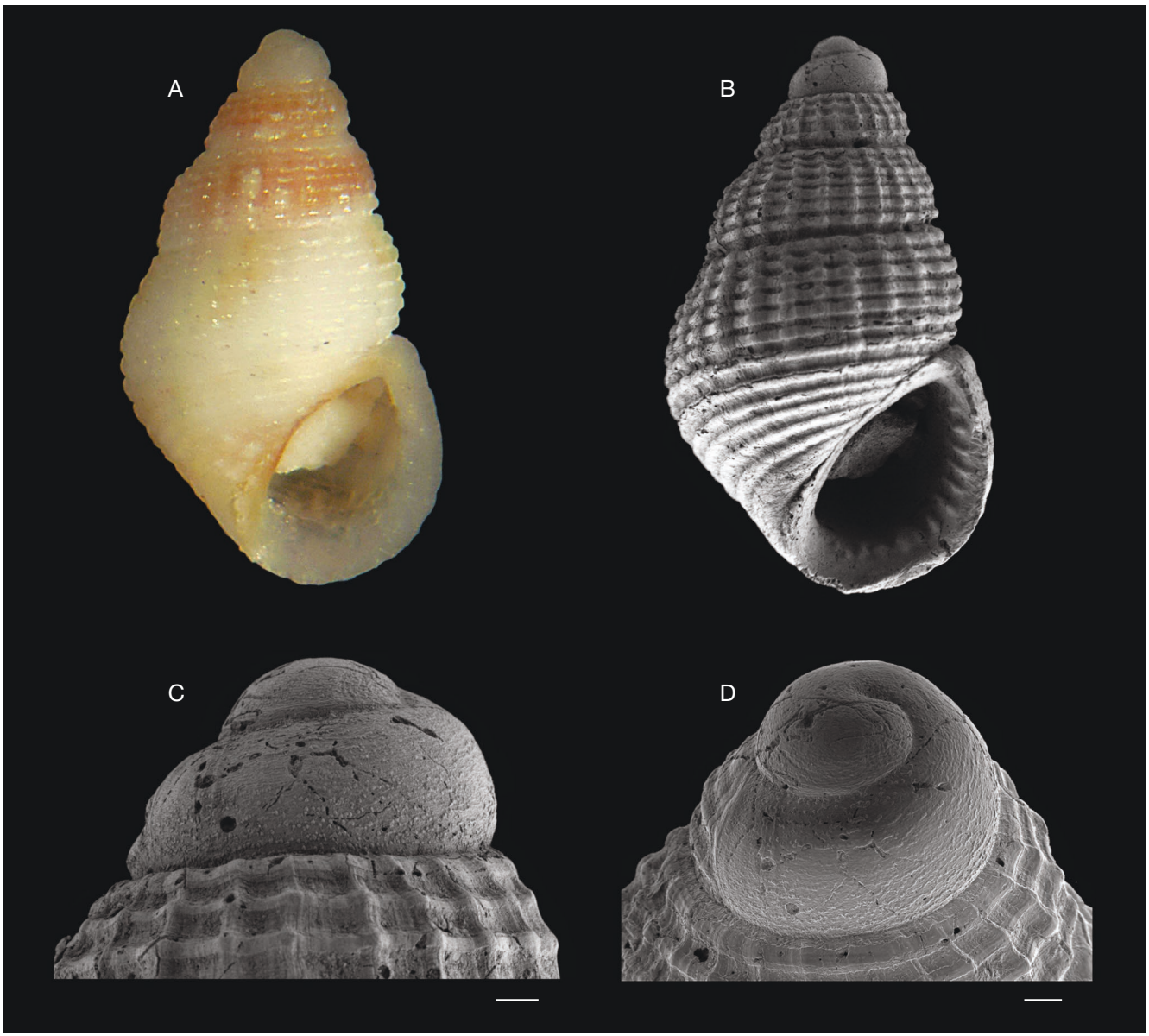

FIG. 11. — *Alvania herosae* n. sp.: Australes, Rimatara, 1200-1226 m, height 1.92 mm: **A**, **B**, shell; **C**, **D**, details of the protoconch microsculpture, MNHN. Scale bars: C, D, 40 µm.

ETYMOLOGY. — Named after Virginie Héros (MNHN, Paris), who participated in the Atelier RAPA expedition, for her indefatigable, long lasting, and always graciously helpful work on the MNHN collections.

DIAGNOSIS. — *Alvania* small for the genus (height *c.* 2 mm), with rather robust shell; protoconch paucispiral; teleoconch morphologically very variable; at least two extreme morphotypes observed (morph A and morph B), with rare intermediate forms. Colouration very variable: uniform, banded or with coloured blotches.

DESCRIPTION OF HOLOTYPE

Shell (Figs 7; 9B; 53B)

Small for the genus, height 2.02 mm, width 1.10 mm, height/width ratio 1.84, ovate-conical.

Protoconch (Fig. 7D, E)

Paucispiral, of 1.25 whorls, height 0.225 mm, nucleus diameter 0.112 mm, first half whorl diameter 0.200 mm, maximum diameter 0.300 mm; sculptured by microtubercles, many fused and spirally arranged, well separated on the nucleus and just before the protoconch/teleoconch boundary (Fig. 7D, E). Protoconch-teleoconch boundary well marked (Fig. 7D, E).

Teleoconch

Of 3.75 convex whorls, with suture impressed, little canaliculated. Axial sculpture on the last whorl of 18 orthocline ribs in the upper whorls, slightly prosocline on the last, thinner than interspaces, gradually vanishing at the base. Spiral sculpture finer than axial, of equidistant cordlets, 9 on last whorl, 5 above the aperture and 4 on the base.

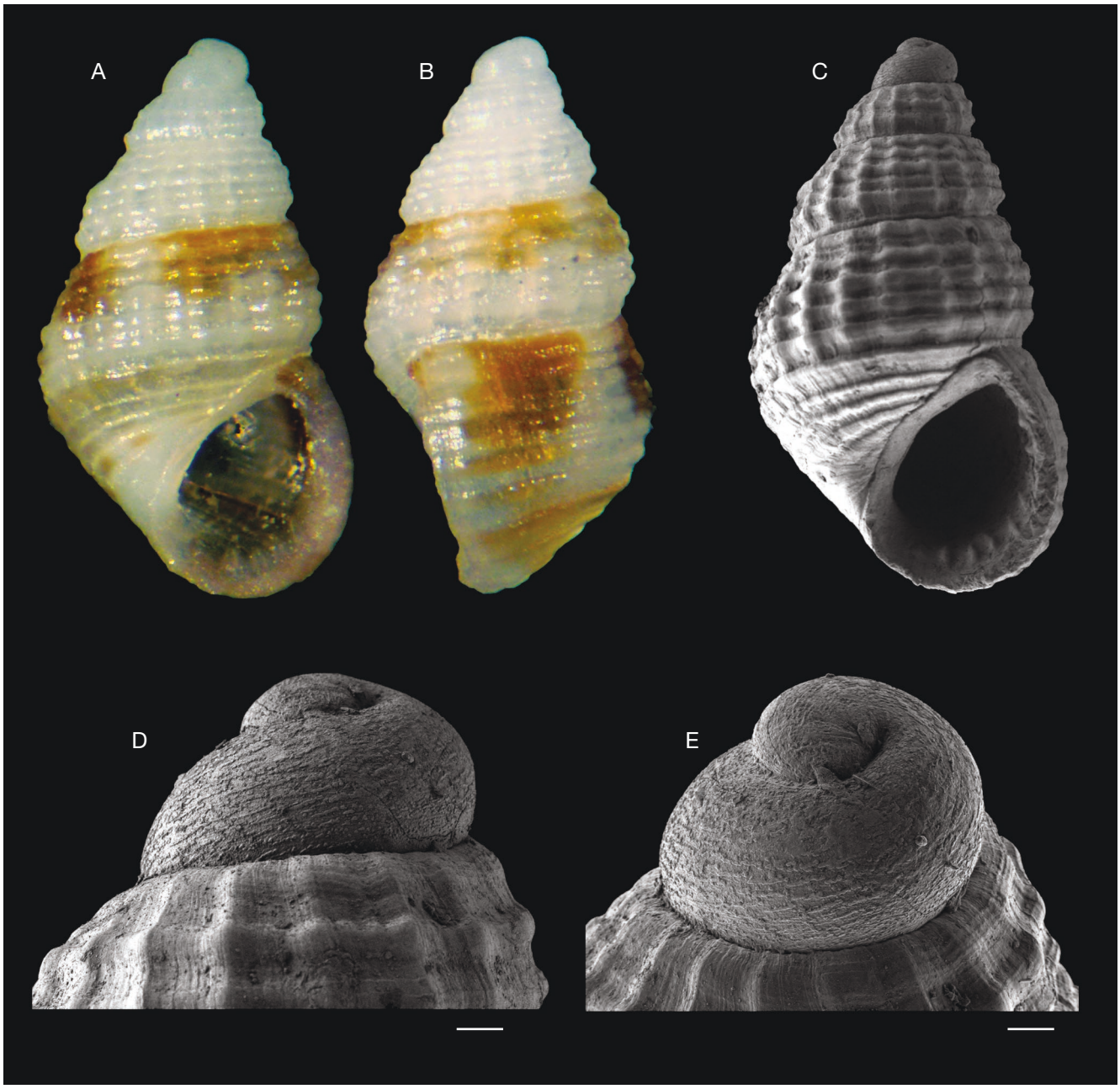

Fig. 12. — *Alvania herosae* n. sp.: Australes, Rapa, W of Rapa Iti I, 24 m, height 1.82 mm: **A**-**C**, shell; **D**, **E**, details of the protoconch microsculpture, coll. JL. Scale bars: D, E, 40 µm.

Cord III and V starting immediately after the protoconch-teleoconch boundary; immediately afterwards cords I and II developing almost simultaneously, cord II formed subsequently. On the last lap 5 equidistant cords of same size.

Small, rounded tubercles at the intersections of the sculptures. Microsculpture of spiral microstriae on the entire surface, crossing the growth lines (Fig. 7D, E). Umbilical fissure absent. Aperture piriform, height 0.8 mm, height/aperture height ratio 2.53, peristome continuous, outer varix large, sharp lip, internally smooth, slightly prosocline.

Colour

Colouration of teleoconch yellowish-white with quadrangular spots arranged on the spiral cordlets; some light brown spots scattered on the teleoconch, inner lip with some lighter spots. Columellar area brownish; a darker subsutural spot on the outer lip.

Operculum and soft parts

Operculum typical for the genus, width 0.425 mm, length 0.625 mm in a specimen 1.75 mm high.

Soft parts unknown.

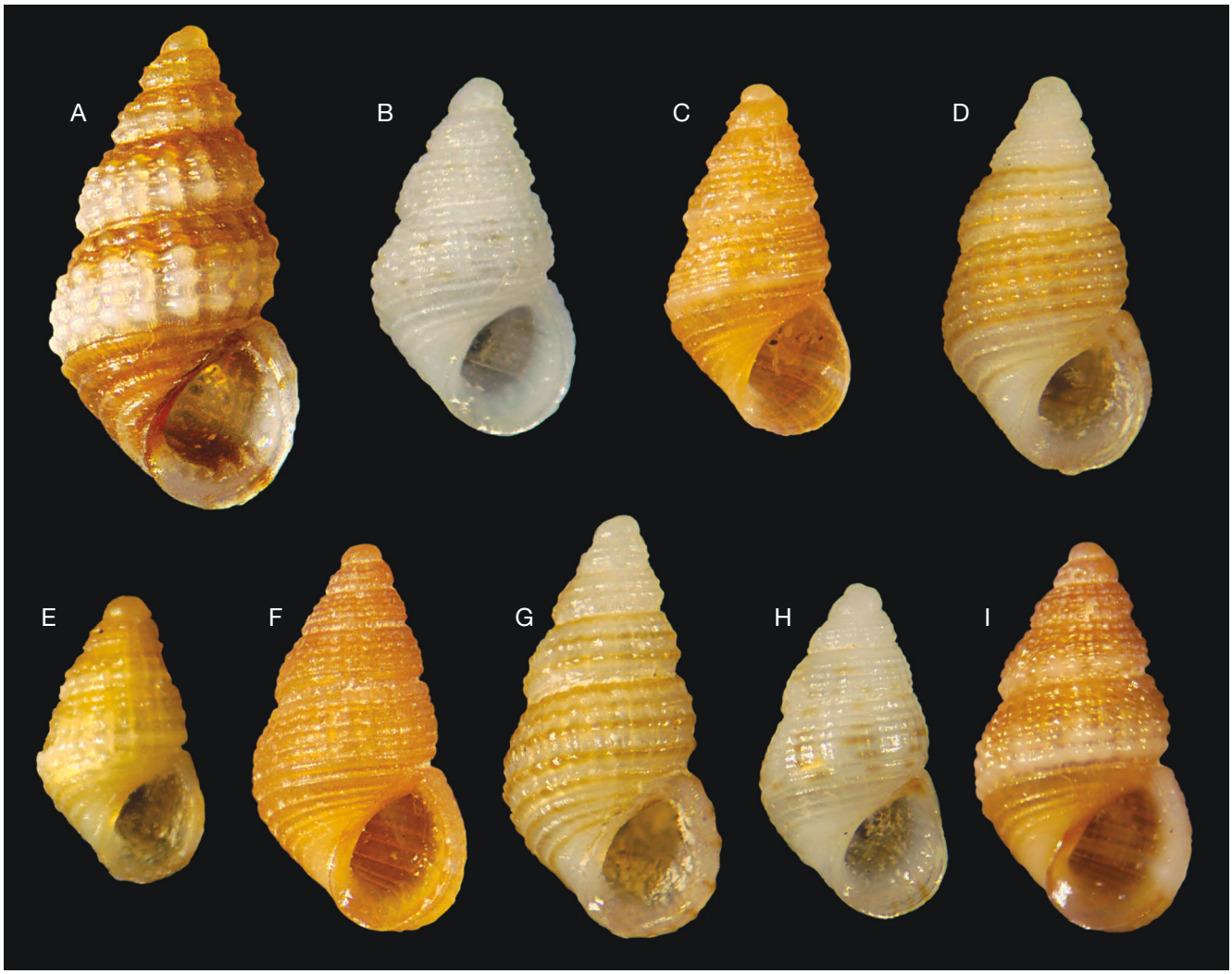

FIG. 13. — *Alvania herosae* n. sp.: variability of the species: **A**, Australes, Rapa, Anatakura Bay, Stn 38, 2 m, height 2.63 mm, MNHN; **B**, Australes, Rapa, Tarakoi I., Stn 5, 8 m, height 1.95 mm, MNHN; **C**, Australes, Rapa, Anatakuri Bay, Stn 38, 2 m, height 1.90 mm, MNHN; **D**, Australes, Rapa, Rapa Iti islet, Stn 11, 2 m, height 2.16 mm, MNHN; **E**, Australes, Rapa, Pointe Kamira, Stn 36, 27 m, height 1.56 mm, MNHN; **F**, Australes, Rapa, Tarakoi I., Stn 5, 8 m, height 2.10 mm, MNHN; **G**, Australes, Rapa, Hiri Bay, Stn 9, 3-24 m, height 2.3 mm, MNHN; **H**, Australes, Rapa, Pointe Mei, Stn 30, 16-20 m, height 1.83 mm, MNHN; **I**, Australes, Rapa, Tarakoi I., Stn 5, 8 m, height 2.1 mm, MNHN.

VARIABILITY

Two morphotypes are present named here 'A' and 'B', which we provisionally and conservatively regard as representing a single very variable species, because intermediates have been observed (Fig. 9), although very rarely. We have selected as holotype a specimen of morph 'A' (as well as all paratypes). The extreme specimens of the two morphs differ rather consistently in the strength and different genesis of the spiral cordlets.

In morph 'A' (corresponding to the holotype), all cordlets are of the same strength; cordlets III and V appear immediately after the protoconch-teleoconch boundary; then, the remaining cordlets (I, II, IV).

In morph 'B', cordlets III and IV appear immediately after the protoconch-teleoconch boundary and are stronger than the rest; subsequently and gradually, the smaller cordlets I and II are formed. Less frequently cordlets III and V appear immediately after the protoconch-teleoconch boundary; subsequently cordlets I, II and IV appear.

Variation in morph 'A' includes:

Rare specimens from Rimatara (see Figs 10; 12; Table 1), have 3 cordlets starting after the protoconch-teleoconch boundary (I, III, V), subsequently followed by cordlets II and IV. A single specimen from Rimatara (Fig. 11) has 4 cordlets (I, III, V, VII) starting after the protoconch-teleoconch boundary, subsequently followed by cordlets II, IV and VI. Not infrequently the suprasutural cordlet is more protruding than the others (Fig. 13C, E). The axial ribs can be more obsolete, making the spiral sculpture more evident (Fig. 13H). Number and strength of the teeth inside the outer lip vary in proportion to the number of spiral cordlets on the last whorl. Maximum adult height 3.05 mm, minimum 1.05 mm. The protoconch is also variable in the aggregation of the tubercles (Figs 7D, E; 8D, E; 10D; 11C, D; 12D, E). Colouration very variable: uniform white, brown, orange or with a whitish, yellowish or light brown background and a series of more or less large whitish spots or blotches; whitish-yellowish background

with two darker bands, subsutural and basal, always with a brownish columellar area; pale yellow background with reddish spiral cordlets; white with short spiral lines on the reddish cordlets; brown with the first whorls white; white with subsutural quadrangular blotches.

Variation in morph 'B' includes:
Maximum height 2.5 mm; minimum height 1.6 mm. The colouration is also variable: uniform white or brown, or uniform yellowish with brownish columellar zone, whitish-yellowish background with two darker bands, subsutural and basal, always with brownish columellar zone; light brownish with white tubercles (See Table 1 and Appendices 2; 3).

REMARKS
The species is characterized by an extreme variability in the sculptures (number and strength of the elements) and in the colouration (see Variability; Figs 9; 13and Table 1).

The morph 'A' of *A. herosae* n. sp. recalls the drawing and, in part, the original description of *Alvania denseclathrata* (Thiele, 1925) n. comb. from southern Africa in 80 m (Thiele 1925: 81, pl. 6, fig. 11) (here Fig. 11A, B and Fig. 2G). Specimens of the type series of *Rissoa denseclathrata* Thiele, 1925 (lectotype and nine paralectotypes ZMB/Ma.64984) (Fig. 2A-G) have a similar paucispiral protoconch, sculptured by microtubercles, and are of the same size (height *c.* 2 mm) with a dense axial and spiral sculpture. However, *A. denseclathrata* n. comb. differs from *A. herosae* n. sp. in its thinner and more flexuose axial ribs; more numerous spiral cordlets on the last whorl (16 vs 8-12 in *Alvania herosae* n. sp.); whitish vs highly variable colour in *Alvania herosae* n. sp.; hint of umbilical fissure, absent in *Alvania herosae* n. sp.; absence of tubercles at the intersection of the sculpture.

Alvania albachiarae Perugia, 2021, from Masirah Island (Oman) (Perugia 2021: 1, 6, pl. 1, fig. D-F), differs from *Alvania herosae* n. sp. in its axial ribs reaching the base and forming evident tubercles at the intersection with all the spirals vs axial ribs interrupted before the base leaving smooth spiral on the base in *Alvania herosae* n. sp.

The morph 'B' of *A. herosae* n. sp. recalls the drawing and, in part, the original description of *Alvania proditoris* (Thiele, 1925) n. comb. from Agulhas Bank, South Africa (Thiele 1925: 46, pl. 6, fig. 9) (here Fig. 8A-C and Fig. 3G). Specimens of the type series of *Rissoa proditoris* Thiele, 1925 (lectotype and nine paralectotypes, ZMB/Moll. n. 64965) (Fig. 3A-G) have a protoconch with 9 spiral cordlets vs scattered tubercles in *Alvania herosae* n. sp.; orthocline vs prosocline outer lip; two major spiral cordlets, and one much thinner subsutural cordlet on the last whorl vs two main cordlets and two additional thinner subsutural cordlets In *A. herosae* n. sp.

Alvania lusoria (Yokoyama, 1926), from the Pliocene of Sado Island, Japan (Yokoyama 1926: 273, pl. 33, fig. 18), differs from *A. herosae* n. sp. in its less protruding first protoconch whorl; in the smaller and strongly prosocline aperture, only slightly prosocline in *A. herosae* n. sp.; in the fewer spiral cordlets on the last whorl (6 vs 7-10 in *A. herosae* n. sp. morph 'B'); in the non-varicose vs varicose outer lip.

Alvania parvimaculata n. sp.
(Figs 14; 15; 49B; 53D; Tables 1; 2)

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?*Simulamerelina* sp. 1 – Boutet *et al.* 2020: 240.

TYPE MATERIAL. — **Holotype. Tuamotu** • dd (height 1.65 mm, width 0.95 mm, Figs 14A, B; 15; 53D); Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 1-20 m; Jean Letourneux leg.; MNHN-IM-2000-38706.
Paratypes. Tuamotu • 5 dd. (Fig. 14C-F); same locality data as holotype; MNHN-IM-2000-38707.

TYPE LOCALITY. — Tuamotu: Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 1-20 m.

OTHER MATERIAL EXAMINED. — **Tuamotu** • 15 dd; Pinaki; 19°23'56"S, 138°40'1"W; 1 m; reef edge; coll. JL • 2 dd; Ana'a; 17°20'31"S, 145°30'32"W; coll. MB • 10 dd; Katiu; 16°21'43"S, 144°21'32"W; 1 m; reef edge; coll. JL • 25 dd; Makemo, Passe Arikitamiro, Nake; 16°37'1"S, 143°33'43"W; <1m; reef flat; coll. JL • 30 dd; Makemo; 16°34'26"S, 143°40'19"W; 1 m; reef edge after air-strip; coll. JL • 25 dd; Makemo; 16°36'21"S, 143°37'55"W; 1 m; reef edge between village and air-strip; coll. JL • 20 dd; Fangatao; 15°49'40"S, 140°54'10"W; 1 m; reef edge; coll. JL.
Society Islands • 1 dd; Tahiti, Arue; 17°31'15"S, 149°31'33"W; <1m; reef flat behind tomb of King Pomare V; coll. JL • 1 dd; Tahiti, E coast; 17°30'32"S, 149°25'58"W; 1 m; fringing reef flat of Papenoo; coll. JL • 1 dd; Tetiaroa; 17°1'19"S, 149°36'3"W; 1 m; reef edge; coll. JL • 1 dd; Motu One; 15°48'21"S, 154°30'39"W; 1 m; reef edge; coll. JL.

DISTRIBUTION AND SYMPATRY. — The species is at present known in the South Pacific Ocean from the Tuamotu (Pinaki, Ana'a, Katiu, Makemo, Fangatao) and Society Islands (Tahiti, Tetiaroa, Motu One) (Fig. 49B).
Alvania parvimaculata n. sp. is sympatric with *Alvania letourneuxi* n. sp. at the Tuamotu (Makemo) (Table 2).

ETYMOLOGY. — For the particular colouration with small spots, from the Latin *parvus* – small, *maculatus* – spotted.

DIAGNOSIS. — *Alvania* with small shell (<2 mm height); protoconch paucispiral; teleoconch spiral sculpture stronger than axial one; start of 2 spiral cordlets after protoconch-teleoconch boundary; colouration yellowish-white with small brown spots.

DESCRIPTION OF HOLOTYPE
Shell (Figs 14A, B; 15; 53D)
Small for the genus, height 1.65 mm, width 0.95 mm, height/width ratio 1.74, robust, ovate-conical.

Protoconch (Fig. 15B, C)
Paucispiral, of 1.20 convex whorls, height 0.250 mm, nucleus diameter 0.100 mm, first half whorl diameter 0.170 mm, maximum diameter 0.262 mm; devoid of sculpture. Protoconch-teleoconch boundary well marked.

Teleoconch
Of 3.10 convex whorls, suture impressed. Axial sculpture on last whorl of 16 slightly prosocline ribs, thinner than interspaces, gradually vanishing toward the base. Spiral sculpture of equidistant cordlets thinner than axials, 7 on the last whorl,

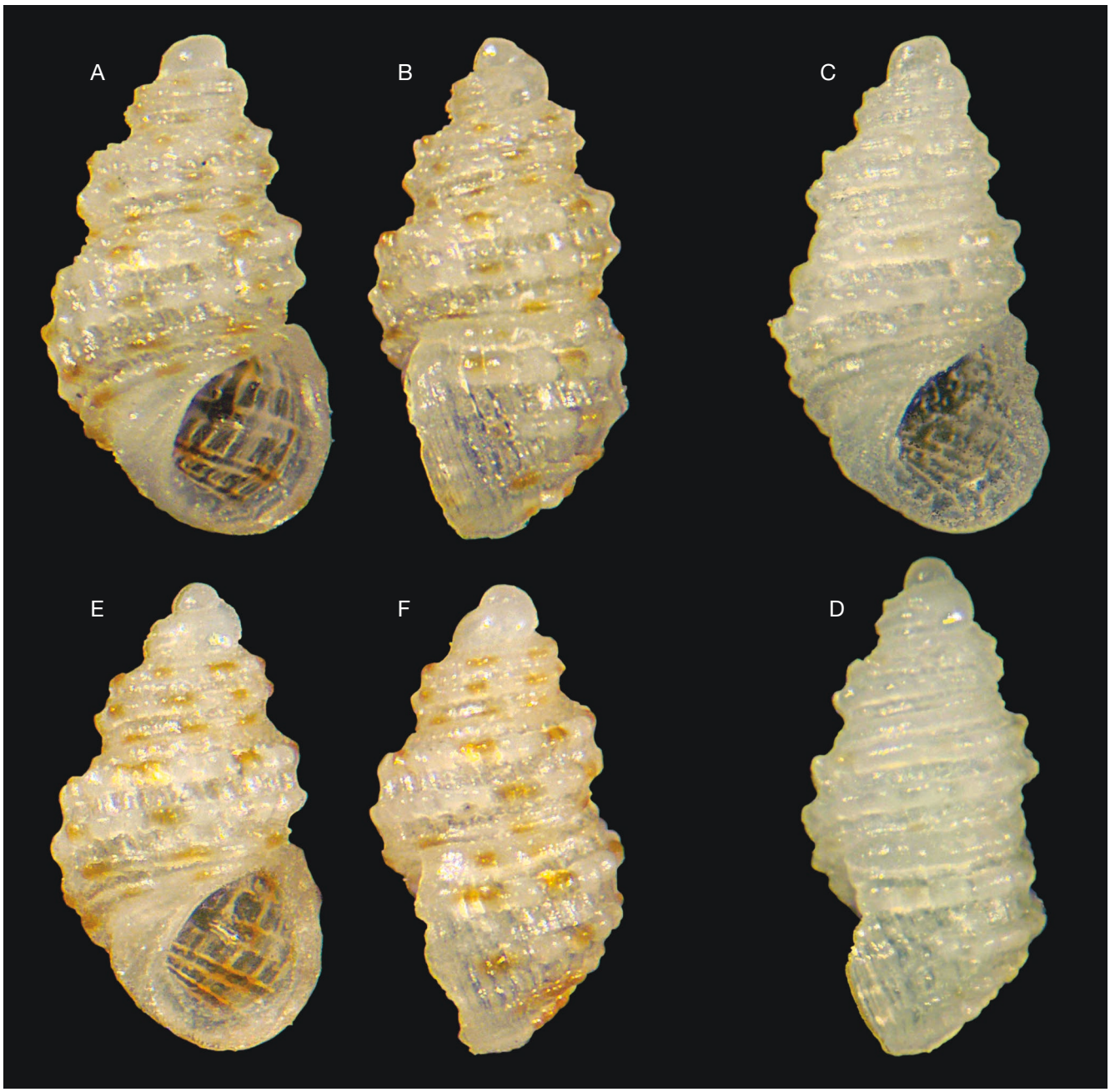

FIG. 14. — *Alvania parvimaculata* n. sp.: **A**, **B**, holotype, Tuamotu, height 1.65 mm, 1-20 m, MNHN-IM-2000-38706; **C**, **D**, paratype, height 1.65 mm; **E**, **F**, paratype, height 1.55 mm, MNHN-IM-2000-38707.

3 above the aperture, one on the suture line and 3 on the base. Cordlets II and III starting immediately after protoconch-teleoconch boundary, followed by subsutural cord I, thinner and less prominent. Medium sized rounded tubercles at the intersections; quadrangular interspaces. Microsculpture of weak spiral threads and growth lines (Fig. 15B). Umbilical fissure absent. Aperture piriform, height 0.70 mm, height/aperture height ratio 2.36, peristome continuous and simple, outer varix moderately thickened; outer lip sharp, smooth internally, prosocline.

Colour

Colouration yellowish-white with sparse small brown spots on tubercles.

Operculum and soft parts

Unknown.

VARIABILITY

Maximum height 1.70 mm and minimum 1.25 mm. (See Table 1 and Appendix 4).

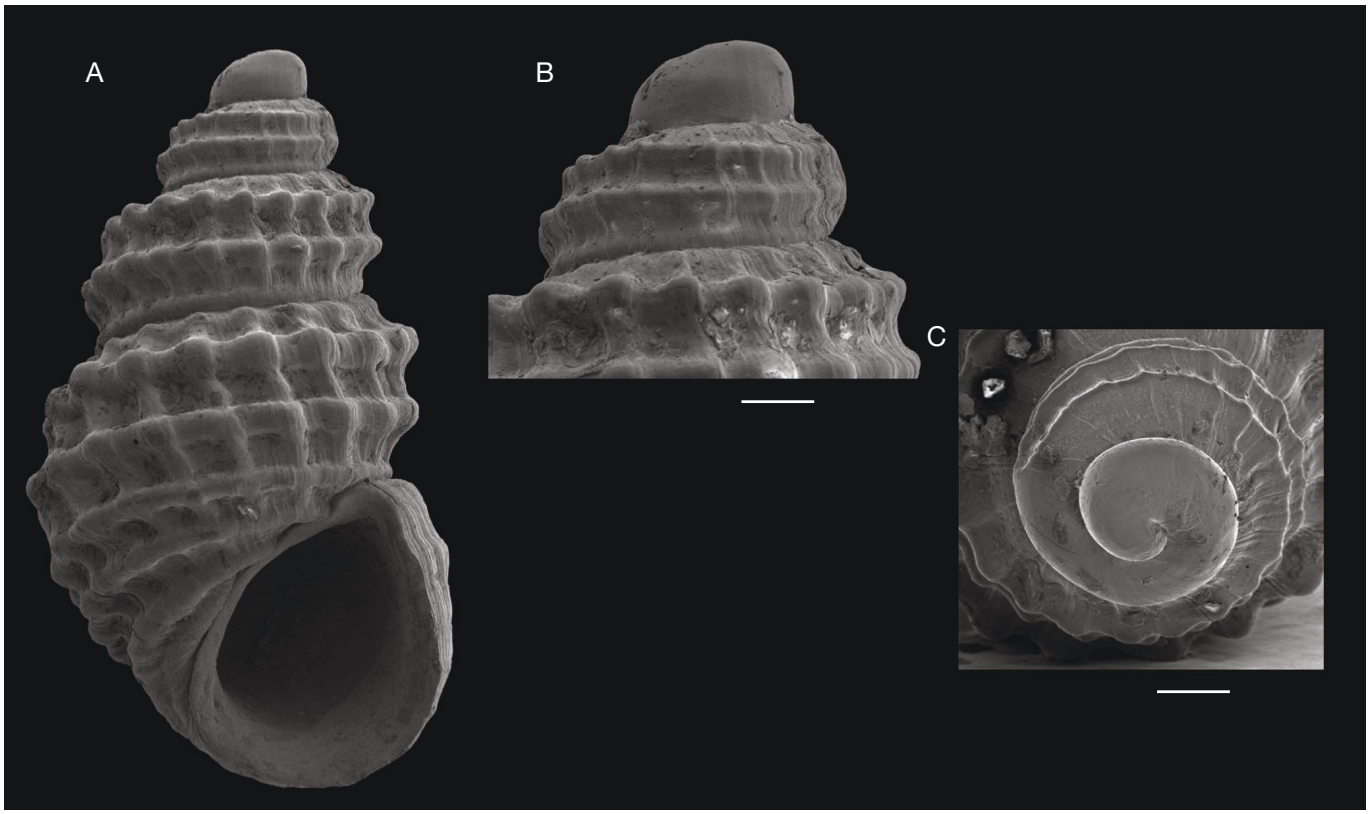

Fig. 15. — *Alvania parvimaculata* n. sp.: holotype, Tuamotu, height 1.65 mm, 1-20 m, MNHN-IM-2000-38706: **A**, shell; **B**, **C**, detail of the protoconch microsculpture. Scale bars: B, C, 100 µm.

Remarks

Alvania parvimaculata n. sp. is very similar to some species of the genus *Simulamerelina* Ponder, 1985, like, e.g. *Simulamerelina bermudensis* (Faber & Moolenbeek, 1987), from which it differs mainly by the less slender outline, the simple and not duplicated peristome and the almost smooth protoconch, not sculptured by spiral keels.

Alvania hueti Bozzetti, 2017, from Boucan-Canot, west coast of Réunion (Bozzetti 2017: 6, 7, five unnumbered figures), is the most similar species. It differs from *A. parvimaculata* n. sp. in its more slender outline (holotype height/width ratio 1.86 vs 1.58-1.79 in *A. parvimaculata* n. sp.); in having three spiral cordlets on all whorls vs two cordlets on the first whorls and a smaller third one (subsutural) only on the last half of the last whorl; in the fewer axial ribs (12-13 vs 16-19 in *A. parvimaculata* n. sp.); in the protoconch sculptured with spirals vs smooth protoconch in *A. parvimaculata* n. sp.; in the dark subsutural spot on the last whorl before the aperture and the darker initial part of the protoconch (nucleus and part of the first whorl) vs absent spot and colourless apex in *A. parvimaculata* n. sp.

Alvania letourneuxi n. sp. has more axial ribs on the last whorl (21 vs 16-19 in *A. parvimaculata* n. sp.); more prominent rounded tubercles at the intersections; protoconch with fewer whorls (1 vs 1.15-1.20 in *A. parvimaculata* n. sp.), with smaller diameters (nucleus diameter 0.075 mm vs 0.100-0.125 mm; first half whorl diameter 0.150 mm vs 0.170-0.212 mm; maximum diameter 0.200 mm vs 0.250-0.300 mm), with nucleus intorted vs non intorted in *A. parvimaculata* n. sp., sculptured by five small keels with an axial sculpture in the interspaces, replaced by scattered microtubercles towards the last quarter of a whorl vs a protoconch devoid of sculpture in *A. parvimaculata* n. sp.

Alvania prosocostata n. sp.
(Figs 16; 17; 49B; 53E; Tables 1; 2)

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Type material. — **Holotype.** Gambier • dd (height 2.05 mm, width 1.2 mm, Figs 16A-D; 17A-C; 53E); Taraururoa; 23°6'25"S, 134°51'43"W; 1-3 m; J. Letourneux leg.; MNHN-IM-2000-38708. **Paratypes. Gambier** • 5 dd (Fig. 16E-J); same data as holotype; MNHN-IM-2000-38709.

Type locality. — Gambier, Taraururoa; 23°6'25"S, 134°51'43"W; 1-3 m.

Other material examined. — **Gambier** • 6 dd; Mangareva, Rikitea; 23°6'39"S, 134°58'1"W; beached; coll. JL • 8 dd; Mangareva, Rikitea; 23°6'39"S, 134°58'1"W; beached; coll. MB • 2 dd; Mangareva, Taku; 23°4'58"S, 134°56'56"W; 1-3 m; coll. JL • 8 dd; Tenoko; 23°4'26"S, 135°0'35"W; 1-3 m; coll. JL • 10 dd; Tenoko; 23°4'26"S, 135°0'35"W; 1-3 m; coll. JL • 5 dd; Totegegi; 23°5'2"S, 134°52'58"W; 1-3 m; coll. JL.
Australes • 2 dd; Rapa, Pararaki; 27°36'46"S, 144°19'1"W; beached; coll. MB.

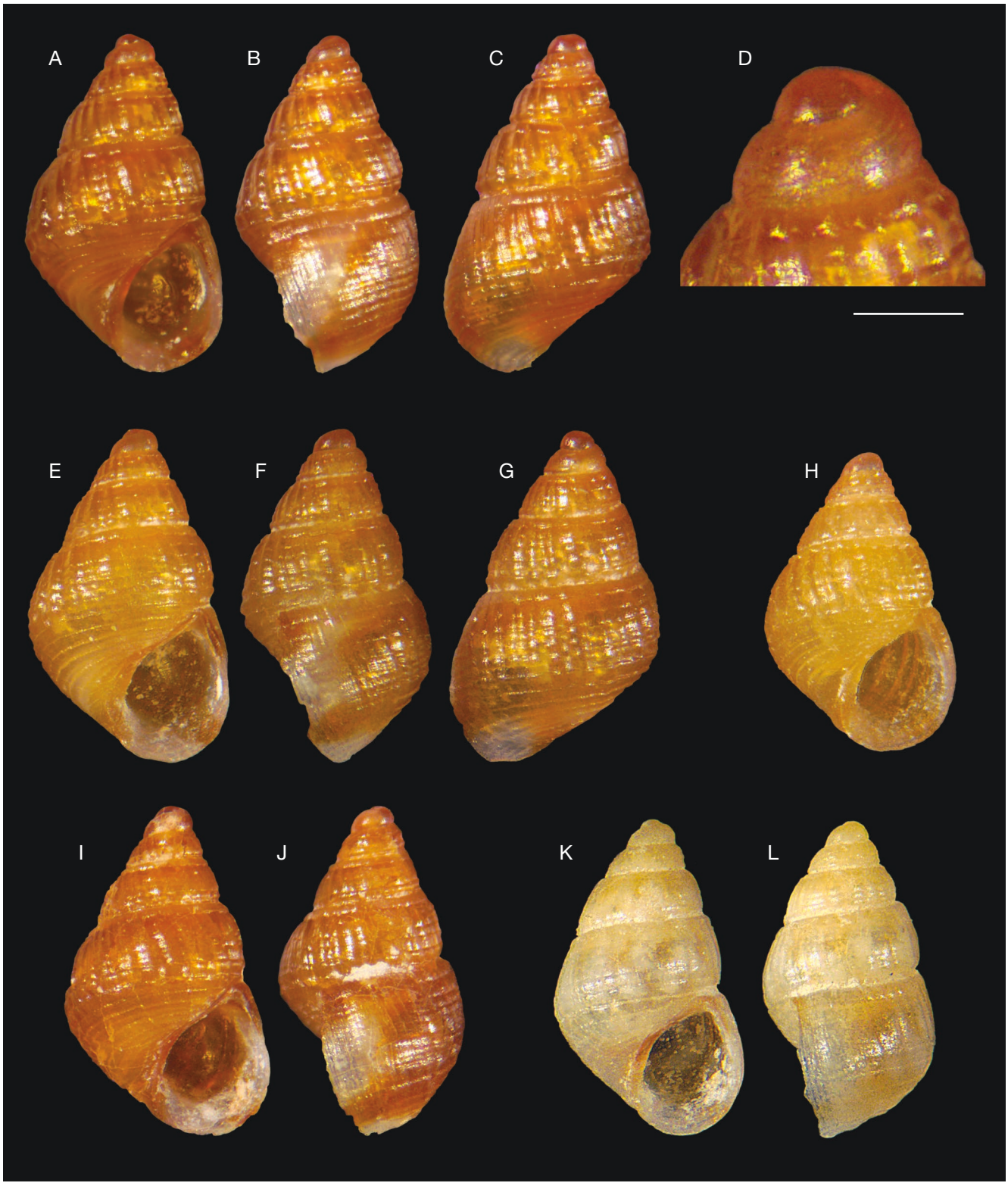

FIG. 16. — *Alvania prosocostata* n. sp.: **A**-**D**, holotype, height 2.05 mm, Gambier, Taraururoa, 1-3 m, MNHN-IM-2000-38708; shell (**A**), detail of the protoconch microsculpture (**B**); **E**-**G**, paratype, height 2.02 mm, Gambier, Taraururoa, 1-3 m, MNHN-IM-2000-38709; **H**, paratype, height 1.82 mm, Gambier, Taraururoa, 1-3 m, MNHN-IM-2000-38709; **I**, **J**, paratype, height 2 mm, Gambier, Taraururoa, 1-3 m, MNHN-IM-2000-38709; **K**, **L**, Australes, Rapa I., Pararaki Bay, height 1.92 mm, coll. MB. Scale bar: D, 20 µm.

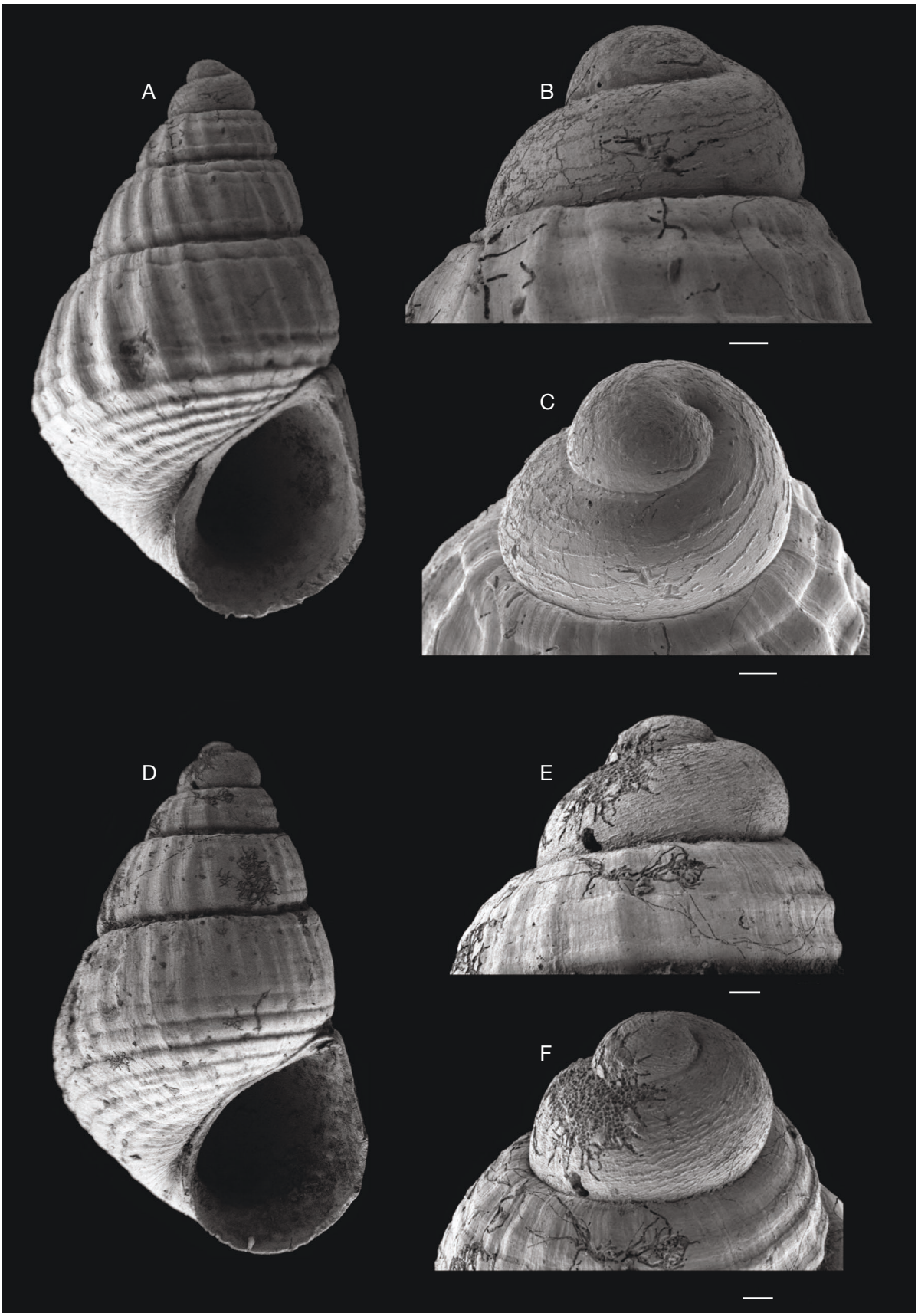

Fig. 17. — *Alvania prosocostata* n. sp.: **A**-**C**, holotype, height 2.05 mm, Gambier, Taraururoa, 1-3 m, MNHN-IM-2000-38708: shell (**A**), details of the protoconch microsculpture (**B**, **C**); **D**-**F**, height 1.95 mm. Australes, Rapa I., Pararaki Bay: shell (**A**), details of the protoconch microsculpture (**E**, **F**). Scale bars: B, C, E, F, 40 µm.

DISTRIBUTION AND SYMPATRY. — The species is known in the South Pacific Ocean from the Gambier and Australes (Pararaki Bay, Rapa), with only empty shells collected in 1-3 m depth (Fig. 49B). *Alvania prosocostata* n. sp. is sympatric with *Alvania herosae* n. sp. and *Alvania uapou* n. sp. in the Australes (Rapa); with *Alvania herosae* n. sp. in the Gambier (Table 2).

ETYMOLOGY. — From the Greek πρόσω, forward, and the Latin *costatus*, ribbed; for the prosocline inclination of the axial ribs.

DIAGNOSIS. — *Alvania* with medium sized and robust shell; protoconch paucispiral; teleoconch with faint spiral sculpture on the body-whorl, well marked on the base; 3 spiral cordlets starting after protoconch-teleoconch boundary; prosocline axial ribs; colouration uniform dark brown with two whitish spots on the aperture (specimens from Gambier) or yellowish with small whitish spots scattered on the teleoconch, dark spot on the last whorl before the varix, columellar lip brown (specimens from Australes).

DESCRIPTION OF HOLOTYPE

Shell (Figs 16A-C; 17A; 53E)

Small for the genus, height 2.05 mm, width 1.2 mm, height/width ratio 1.71, robust, ovate-conical.

Protoconch (Figs 16D; 17B, C)

Paucispiral, with nucleus moderately intorted, of 1.25 rather convex whorls, height 0.237 mm, nucleus diameter 0.112 mm, first half whorl diameter 0.225 mm, maximum diameter 0.325 mm, nucleus with weak discontinuous sculpture, the remainder with five or six thin, irregular, very fragmented and widely spaced spiral threads. Protoconch-teleoconch boundary scarcely marked, prosocline.

Teleoconch

Of 3.5 slightly convex whorls, suture impressed, canaliculated. Axial sculpture on the last whorl of 24 prosocline ribs slightly narrower than interspaces, abruptly interrupting on the first basal spiral cordlet. Spiral sculpture of 13 flat cordlets on the last whorl, 6 above the aperture very faint, one on the suture line and 6 on the base more marked. Cordlets I and VI separated from other cordlets with a more marked groove. Cordlets I, II and VI starting immediately after the protoconch-teleoconch boundary. Microsculpture of growth lines and very faint, minute spiral threads (Fig. 17B, C). Umbilical fissure absent. Aperture piriform, height 0.90 mm, height/aperture height ratio 2.28, peristome continuous, outer varix broad and rather thick; outer lip sharp, internally smooth, prosocline.

Colour

Colouration of teleoconch uniform dark brown with two whitish spots on the aperture: one median, the other basal.

Operculum and soft parts

Unknown.

VARIABILITY

Height 1.77-2.05, width 1.10-1.25; height/width ratio 1.56-1.71. Axial ribs on the last whorl 22-29. Colouration varies in the intensity of the background from dark brown to white.

Two specimens from the Australes (numbers 8 and 9 in Appendix 5) have the inclination of the axial ribs less accentuated, the protoconch more densely sculptured (Fig. 17D) (see Table 1 and Appendix 5) and cordlets I, II and VII starting immediately after the protoconch-teleoconch boundary; colouration yellowish background with small whitish spots, dark blotch on last whorl before the varix. Columellar lip brown. (See Table 1 and Appendix 5).

REMARKS

Alvania prosocostata n. sp. is very similar to the European species of the group of *Alvania lineata* Risso, 1826 (Amati *et al.* 2019), and in particular to the Mediterranean *Alvania schwartziana* Brusina, 1866 for the similar outline, robustness of the shell and in particular for the uniform brown colour (Brusina 1866: 25, pl. III, fig. 9; Amati *et al.* 2019: fig. 57). The most evident differences are in the larger size (height *c*. 4 mm vs *c*. 2 mm in *A. prosocostata* n. sp.); in the sculpture of the paucispiral protoconch (1.3 whorls, maximum diameter 0.511 mm, sculptured by *c.* 12 undulated spiral cordlets, also on the nucleus vs 1.25 rather convex whorls, maximum diameter 0.325 mm, with nucleus moderately intorted and smooth, the remainder with five or six thin, irregular, very fragmented and widely separated spiral threads in *A. prosocostata* n. sp.); and for the inclination of the axial ribs (orthocline vs prosocline in *A. prosocostata* n. sp.).

Alvania uapou n. sp.
(Figs 18A, B; 19; 49C; 53F; Tables 1; 2)

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Alvania isolata – Tröndlé & Boutet 2009: 17. — Salvat & Tröndlé 2017: 238.

Alvania sp. 1 – Boutet *et al.* 2020: 239.

TYPE MATERIAL. — **Holotype. Marquesas** • lv (height 1.70 mm, width 0.90 mm); Ua Pou, Motu Mokohe, Atelier MARQUISES Stn 20; 9°20'49"S, 140°5'45"W; 10-15 m; 26.X.1999; Bryce & Kaiser leg.; MNHN-IM-2000-38710.
Paratypes. Marquesas • 17 dd, 24 lv (Fig. 18C-F); same locality data as holotype; MNHN-IM-2000-38711.

TYPE LOCALITY. — Marquesas: Ua Pou, Motu Mokohe, Atelier MARQUISES Stn 20; 9°20'49"S, 140°5'45"W; 10-15 m.

OTHER MATERIAL EXAMINED. — **Marquesas** • 5 dd, 4 lv; Fatu Hiva, Matautu cave, PAKAIHI I TE MOANA Stn MQ15-GR; 10°28'19"S, 138°40'40"W; 0-28 m; 17-18.I.2012; MNHN • 4 dd; Fatu Hiva, MUSORSTOM 9 Stn DR1247; 10°34'1"S, 138°41'59"W; 1150-1250 m; 1.IX.1997; MNHN • 5 dd; Tahuata; 9°54'0"S, 139°7'1"W; 48 m; 31.VIII.1990; MNHN • 2 lv; Tahuata, PAKAIHI I TE MOANA Stn MQ12-M (intertidal); 9°58'12"S, 139°7'33"W; 0-1 m; 15.I.2012; MNHN • 3 dd; Hiva Oa, MUSORSTOM 9 Stn DR1200; 9°49'55"S, 139°8'52"W; 96-100 m; 28.VIII.1997; MNHN • 21 dd; Hiva Oa; 9°45'46"S, 138°52'33"W; <1 m; in coarse sand near the shore; coll. MB • 14 dd; Hiva Oa, MUSORSTOM 9 Stn DW1206; 9°50'59"S, 139°9'0"W; 352-358 m; 28.VIII.1997;

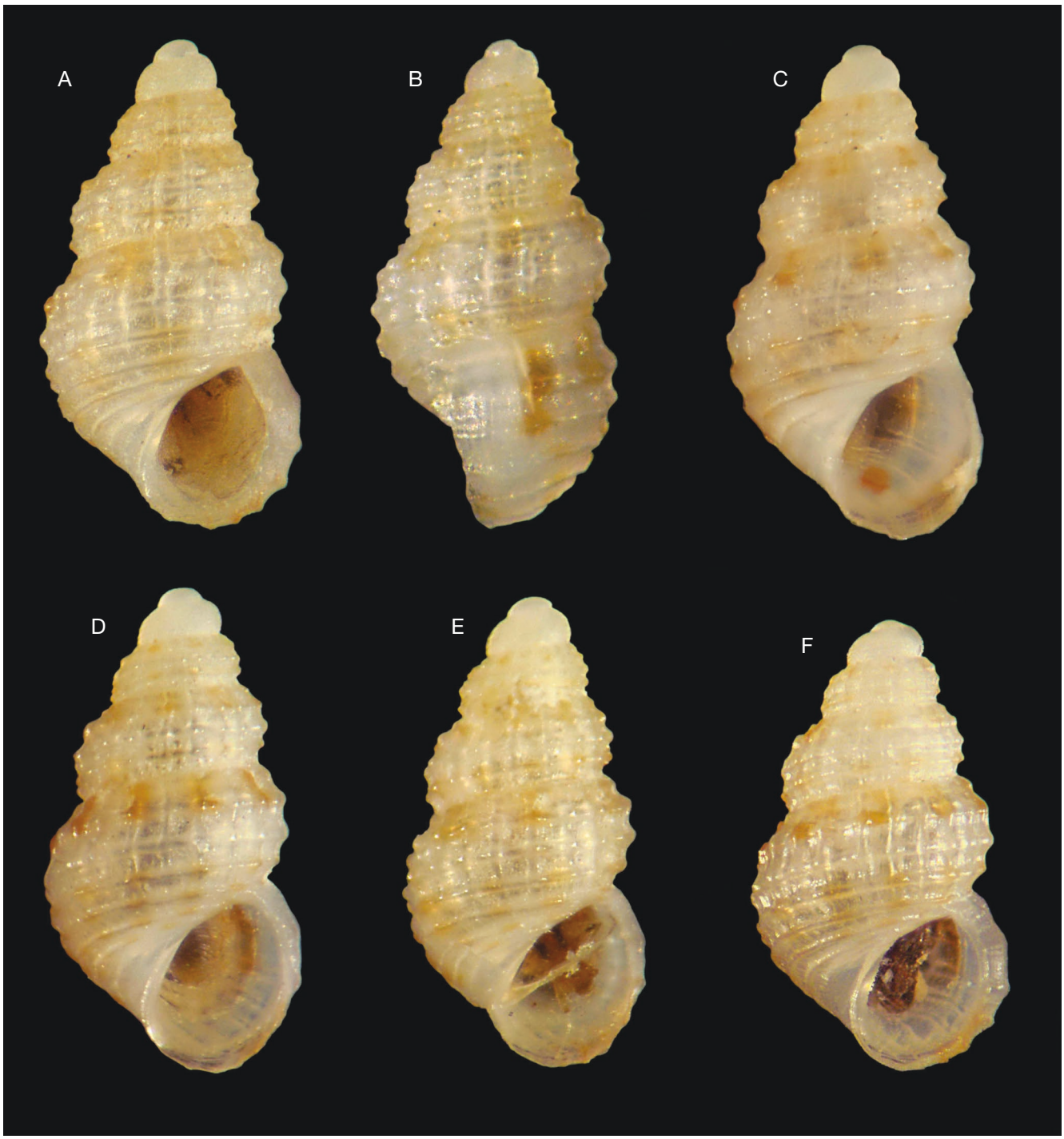

FIG. 18. — *Alvania uapou* n. sp.: **A**, **B**, holotype, height 1.70 mm, Marquesas, Ua Pou, Motu Mokohe, Atelier MARQUISES Stn 20, 10-15 m, MNHN-IM-2000-38710; **C**-**F**, paratypes, height 1.70 mm (**C**), 1.66 mm (**D**), 1.63 mm (**E**), 1.57 mm (**F**), Marquesas, Ua Pou, Motu Mokohe, Atelier MARQUISES Stn 20, 10-15 m, MNHN-IM-2000-38711.

MNHN • 1 dd, 7 lv; NE Hiva Oa, PAKAIHI I TE MOANA Stn MQ19-B; 9°45'39"S, 138°50'41"W; 10-25 m; 21.I.2012; cave exit; MNHN • 99 lv; NE Hiva Oa, PAKAIHI I TE MOANA Stn MQ19-B; 9°45'39"S, 138°50'41"W; 10-25 m; 21.I.2012; cave exit; MNHN • 82 dd, 9 lv; Ua Pou, Hatu Iti, cave, PAKAIHI I TE MOANA Stn MQ27-GR; 9°23'41"S, 140°7'44"W; 5-22 m; 25.I.2012; MNHN • 4 dd; Ua Pou, Haakuti, Vaietu Bay (Cape Punatu); 9°23'9"S, 140°7'47"W; 68 m; coll. JL • 4 dd; Ua Pou, Hakahetau Bay; 9°21'28"S, 140°6'14"W; 1-3 m; coll. JL • 9 dd; Ua Pou, Hakaheteau cave, PAKAIHI I TE MOANA Stn MQ21-GR; 9°22'8"S, 140°6'50"W; 6-10 m; 23.I.2012; MNHN • 2 dd; Ua Pou, Hakaomaka, Atelier MARQUISES Stn 19; 9°20'49"S, 140°5'49"W; 10-20 m; 25.X.1999; Bryce & Kaiser leg.; MNHN • 2 dd; Ua Huka, Hiniaehi Bay-Hinitaihava Bay, Atelier MAR-

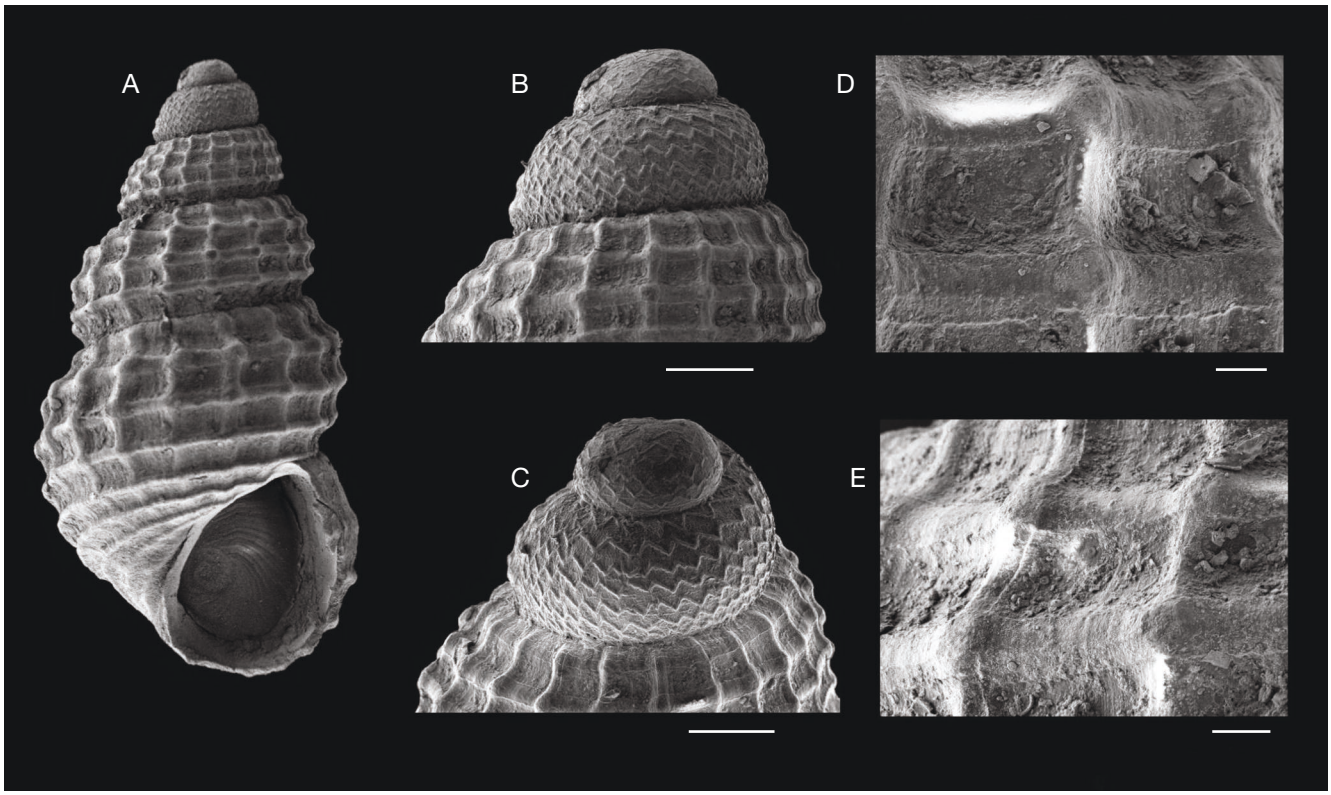

FIG. 19. — *Alvania uapou* n. sp.: holotype, height 1.70 mm, Marquesas, Ua Pou, Motu Mokohe Atelier MARQUISES Stn 20, 10-15 m: **A**, shell; **B**, **C**, details of the protoconch microsculpture; **D**, **E**, details of the teleoconch microsculpture (MNHN-IM-2000-38710). Scale bars: B, C, 100 µm; D, E 20 µm.

QUISES Stn 12; 8°55'58"S, 139°32'49"W; intertidal; IX.1997; 'trottoir' with sandy pockets, Bryce & Kaiser leg.; MNHN • 2 dd; Ua Huka, MUSORSTOM 9 Stn DW1288; 8°54'0"S, 139°37'58"W; 200-220 m; 8.IX.1997; MNHN • 4 dd, 1 lv; Nuku Hiva Talohae Bay, W Moto Nui; 8°56'9"S, 140°6'39"W; 10-20 m; 18.X.1999; Scuba dead coral, loose rocks on slope; MNHN • 3 dd; Nuku Hiva, Anao Bay; 8°49'40"S, 140°3'32"W; beached; coll. MB • 58 lv; Nuku Hiva, Ekamako cave, PAKAIHI I TE MOANA Stn MQ1-GR; 8°56'13"S, 140°5'27"W; 8-10 m; 07, 28.I.2012; MNHN • 11 dd, 5 lv; Nuku Hiva, Les 4 grottes, PAKAIHI I TE MOANA Stn MQ2-GR; 8°56'13"S, 140°7'15"W; 20-23 m; 07, 11-13, 29.I.2012; MNHN • 53 dd, 2 lv; Nuku Hiva, Matateteiko, PAKAIHI I TE MOANA Stn MQ3-GR; 8°55'58"S, 140°13'33"W; 20-25 m; 8.I.2012; MNHN • 34 dd; Nuku Hiva, MUSORSTOM 9 Stn DW1184; 8°49'19"S, 140°3'36"W; 23-30 m; 26.VIII.1997; MNHN • 19 dd; Nuku Hiva, Taiohae Bay, W Matauapuna, Atelier MARQUISES Stn 02; 8°56'13"S, 140°5'41"W; 10-20 m; 18.X.1999; Bryce & Kaiser leg.; MNHN • 5 lv; Hatutu, Cave, PAKAIHI I TE MOANA Stn MQ32-GR; 7°54'25"S, 140°33'57"W; 17-22 m; 27.I.2012; MNHN.

Australes • 1 dd; Rapa, Hiri Bay; 27°37'19"S, 144°22'4"W; 3-5 m; coll. JL.

Society Islands • 22 dd; Tahiti, Arue, Matavai Bay; 17°31'15"S, 149°31'33"W; 1-16 m; behind the King's tomb; coll. JL • 1 dd; Tahiti, Faille d'Arue; 17°31'1"S, 149°31'30"W; 18 m; in sediment of the outer slope; coll. MB • 15 dd; Tahiti, Faille d'Arue; 17°31'1"S, 149°31'30"W; 15-48 m; coll. JL • 15 dd; Tahiti, Motu Uta; 17°31'51"S, 149°34'51"W; 20 m; wreck, behind breakwater; coll. JL • 4 dd; Tahiti, Port Phaeton, Taravao isthmus; 17°43'19"S, 149°18'10"W; beached; in the sand of the beach; coll. MB • 25 dd; Tahiti, Punaauia, La Source; 17°36'7"S, 149°37'15"W; 30 m; coll. JL • 5 dd; Tahiti, Tiarei; 17°32'34"S, 149°20'27"W; <1 m; fringing reef flat; coll. JL.

DISTRIBUTION AND SYMPATRY. — *Alvania uapou* n. sp. is at present known in the South Pacific Ocean from the Marquesas (Fatu Hiva, Tahuata, Hiva Oa, Ne Hiva, Ua Pou, Ua Huka, Nuku Hiva, Hatutu), and from the Australes (Rapa) and the Society (Tahiti) (Fig. 49C), with 216 specimens live collected in 0-28 m depth, and 383 empty shells collected in 0-1250 m depth.

Alvania uapou n. sp. is sympatric with *Alvania herosae* n. sp. in the Australes (Rapa, Tubuai, Rurutu, Rimatara); with *Alvania prosocostata* n. sp. in the Australes (Rapa); with *Alvania parvimaculata* n. sp. in the Society (Tahiti) (Table 2).

ETYMOLOGY. — The species is named after the type locality, Ua Pou (Marquesas), used as a noun in apposition.

DIAGNOSIS. — *Alvania* with small (height <2 mm), slender and rather robust shell; paucispiral protoconch; teleoconch with orthocline axial ribs and spiral cordlets; 3 spiral cordlet starting immediately after the protoconch-teleoconch boundary; colouration translucent whitish-yellowish, with quadrangular subsutural brown blotches.

DESCRIPTION OF HOLOTYPE

Shell (Figs 18A, B; 19A; 53F)

Small for the genus, height 1.70 mm, width 0.90 mm, height/width ratio 1.89, rather robust, ovate-conical.

Protoconch (Fig. 19B, C)

Paucispiral, dome-shaped, of 1.4 whorls, height 0.25 mm, nucleus diameter 0.100 mm, first half whorl diameter 0.175 mm, maximum diameter 0.287 mm; sculptured with seven zig-zag

spiral threads (Fig. 19B, C). Protoconch-teleoconch boundary scarcely marked.

Teleoconch

Of 3.5 convex whorls, with suture impressed. Axial sculpture on last whorl of 14 orthocline ribs (plus the labial varix), narrower than a third of the interspaces, gradually vanishing at the base. Spiral sculpture of 9 not equidistant cordlets on last whorl of same size as axial ribs: 4 above the aperture, 1 on the suture line and 4 smooth on the base; 4 on the penultimate whorl. Cordlets II, III and IV starting immediately after the protoconch-teleoconch boundary; cordlet I, starting slightly later, thinner. Small, rounded tubercles at the intersections of the sculptures; interspaces quadrangular. Microsculpture of only fine growth striae (Fig. 19D, E). Umbilical fissure absent. Aperture piriform, height 0.60 mm, height/aperture height ratio 2.83, peristome continuous, outer lip with moderately thickened varix, internally smooth, sligthly prosocline.

Colour

Colouration translucent whitish-yellowish, with quadrangular subsutural brown blotches and other smaller basal ones; varix white, with a brown blotch just behind the varix.

Operculum and soft parts

Operculum typical for the genus: 0.300 mm width, 0.500 mm height in a specimen 1.5 mm high from NE Hiva Oa (PAKAIHI I TE MOANA Stn MQ19-B, MNHN). Soft parts unknown.

VARIABILITY

The examined materials (599 shell) showed negligible morphological variation. Height ranged in the examined material 1.2-2.0 mm (largest and smallest specimens, both from Marquesas). The presence of a fifth basal cord is quite rare and when present, it is always the thinnest. The interspace between spiral cordlets I and II is broader than the others. In some fresh specimens, a sharp labial regrowth is observed after the varix. The specimens from the Marquesas compared to those from the Society have smaller protoconchs and fewer axial ribs on the last teleoconch whorl (see Appendix 6). One specimen (coll. MB) from Tahiti (Society) is darker in colour, orange-brown with darker subsutural spots and has a fifth thin spiral cordlet above the aperture. The specimens of the Society Islands have spiral cordlets thinner than axial ribs. (See Table 1 and Appendix 6).

REMARKS

Alvania uapou n. sp. is similar to *Alvania isolata* (Laseron, 1956) described from Christmas Island (Indian Ocean) (Laseron 1956: 439, 479, fig. 144) (Fig. 4A-H), with which it has been confused (e.g. Tröndlé & Boutet 2009; Salvat & Tröndlé 2017). *Alvania isolata* differs from *Alvania uapou* n. sp. by the order of appearance of the teleoconch spiral cordlets (II and IV first, then I and III vs II, III and IV first, then I at 0.20-1 whorl in *Alvania uapou* n. sp.); by the protoconch sculptured of 4-5 spiral cordlets vs thinner zig-zag cordlets In *A. uapou* n. sp.; by the colouration, whitish with small subsutural and basal speckles vs translucent whitish-yellowish, with quadrangular subsutural brown blotches and other smaller basal ones in *Alvania uapou* n. sp.

Alvania lavaleyei Hoenselaar & Goud, 1998 from Cape Verde Islands (Atlantic Ocean) (Hoenselaar & Goud 1998: 89, figs 41-43), broadly recalls *A. uapou* n. sp. It differs in the 6 zig-zag cordlets on the protoconch vs 7 fine zig-zag cordlets in *A. uapou* n. sp.; the colouration dirty-white to cream vs translucent whitish-yellowish, with quadrangular subsutural brown blotches and other smaller basal ones in *A. uapou* n. sp.; the spiral sculpture starting with 2 spiral cordlets vs 3 in *A. uapou* n. sp., and the 5 spiral cordlets on the last whorl above the aperture vs 4 in *A. uapou* n. sp.

Alvania awa Chinzei, 1959 [not Mimoto & Nakao 2013: 52, figs 2, 4] from the Japanese Pliocene (Chinzei 1959: 109: pl. 10, figs 1-4; holotype figured also in Hasegawa 2014: 138, figs 48 A-C), is probably a fossil-only species. Rare Recent specimens with similar features have been compared with the type material (Hasegawa 2014), but given the scarcity of specimens their conspecificity is still to be confirmed. However, both fossil and extant specimens referred to *A. awa* differ from *A. uapou* n. sp. in having only 3 spiral cordlets above the aperture vs 4 cordlets in *A. uapou* n. sp. in the lower and less convex protoconch; and in the more markedly prosocline inclination of the aperture. Moreover, in the two extant specimens (Hasegawa 2014: 138, figs 48D, E) from off Sado Island, 200-300 m, the H/W ratio is markedly lower 1.45-1.46 respectively vs 1.65-1.98 in *A. uapou* n. sp.

Alvania uapou n. sp. closely resembles the drawing and, in part, also the original description of *Rissoa* (*Alvania*) *sombrerensis* Thiele, 1925 (currently *Alvania sombrerensis*) from the Sombrero-Kanal (Indian Ocean, 7°48.8'N, 93°7.6'E, 805 m: Thiele 1925: 86, pl. 6, fig. 37). *Alvania sombrerensis* differs in the linear spiral sculpture of the protoconch vs zigzag sculpture in *A. uapou* n. sp., and in the fewer spiral cords on the last whorl (7 vs 8-9 in *A. uapou* n. sp.).

Alvania uapou n. sp. shares the peculiar zigzag pattern on the protoconch with several rissoid species, like e.g., the northeastern Atlantic *Alvania vermaasi* van Aartsen, 1975 and *Alvania zylensis* Gofas & Warén, 1982 (Hasegawa 2014: 132, 2022: 87; Oliver & Rolán 2017: 52), and particularly with *Alvania jeffreysi* (Waller, 1864), described from off Unst, Scotland, in 146-155 m (Waller 1864: 136), which differs in its larger size (height >2 mm vs 1.2-2.0 mm *A. uapou* n. sp.); in the predominant spiral sculpture vs equally strong axials and spirals in *A. uapou* n. sp.; in the non-zigzag cordlets in the protoconch nucleus, changing to zigzag only in the last protoconch whorl vs zigzag cordlets in the whole protoconch starting from the nucleus in *A. uapou* n. sp.; in the uniform whitish-yellowish colouration vs translucent whitish-yellowish, with quadrangular subsutural brown blotches and white varix in *A. uapou* n. sp.

Genus *Ellenstrongia* n. gen.

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TYPE SPECIES. — *Ellenstrongia tarasoc* n. gen., n. sp.

DIAGNOSIS. — Shell of medium (height >4 mm) size for the family, robust, slender and acute, with very convex whorls and deep sutures; protoconch multispiral, coloured, strongly sculptured; teleoconch with weak spiral sculpture and narrow, acute, orthocline and flexuose axial ribs; microsculpture of minute pits; umbilical fissure absent; aperture piriform, peristome continuos, wide with rather thick outer varix, sharp outer lip, internally smooth; colouration uniform white with light orange protoconch.
Operculum and soft parts not examined.

ETYMOLOGY. — The name of the new genus is after Ellen E. Strong (USNM), for her contribution to the knowledge of gastropod systematics and evolution. She has shared her unpublished molecular data, supporting the classification of the new genus in the Rissoidae.

REMARKS

The new genus is proposed for a species with a unique combination of characters, not shared with any known genus of Rissoidae. Initially, we considered also the hypothesis that it was not a rissoid, but then Ellen E. Strong (pers. comm.) communicated that her still unpublished molecular data confirmed it was nested inside Rissoidae.

Shell morphology, i.e., the elongated shell with acute spire, convex whorls, double sculpture on the teleoconch (the axial one stronger), may recall some European species of *Alvania*, such as *A. rudis* (Philippi, 1844), *A. micalii* Chirli, 2006, and *A. merlei* Van Dingenen, Ceulemans & Landau, 2016. However, the sculpture of the multispiral protoconch is completely different, as is also diagnostic the peculiar pitted microsculpture.

A similar teleoconch microsculpture is observed in the genus *Porosalvania* Gofas, 2007 known from northeast Atlantic Seamounts (Gofas 2007: 848). Known species of *Porosalvania* all have a nearly smooth, paucispiral, dome-shaped protoconch: the corresponding part of the multispiral protoconch of *Ellenstrongia* n. gen. (the protoconch I) is more protruding and densely and strongly sculptured by microgranules; additionally, the outline of *Porosalvania* is neatly more scalariform. Relationships among the rissoid genera with pitted teleoconch microsculpture (e.g. *Gofasia* Bouchet & Warén, 1994, *Manzonia* Brusina, 1870, *Onoba* H. Adams & A. Adams, 1852, *Porosalvania* Gofas, 2007) should be tested by integrating molecular data. This feature is also present in genera of other rissooidean families (e.g. *Barleeia* W. Clark, 1843, *Rissoina* d'Orbigny, 1841).

The markedly sculptured and coloured multispiral protoconch of *Ellenstrongia* n. gen. is very similar to that of some species of *Benthonellania* Lozouet, 1990 (e.g. *B. alvanioides* Oliver & Rolán, 2017, *B. bouteti* Amati, Di Giulio & Oliverio, 2022 and *B. tuamotu* Amati, Di Giulio & Oliverio, 2022) (Amati *et al.* 2022). The new genus, however, differs in the more slender teleoconch profile with more convex whorls, and the peculiar pitted microsculpture.

Ellenstrongia tarasoc n. sp.
(Figs 20; 49D; 53G; Tables 1; 2)

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TYPE MATERIAL. — **Holotype. Tarava Seamounts** • dd (height 4.50 mm, width 2.12 mm, Figs 20A-C, F-I; 53G); Mont Honu, TARASOC Stn DW3340; 18°23'59"S, 154°9'0"W; 787-792 m; MNHN-IM-2000-39448.
Paratypes. Tarava Seamounts • 22 dd (Fig. 20D, E); same locality data as holotype; MNHN-IM-2000-39449 • 4 dd; same locality data as holotype; 27.IX.2009; coll. MB.

TYPE LOCALITY. — Tarava Seamounts: Mont Honu, TARASOC Stn DW3340; 18°23'59"S, 154°9'0"W; 787-792 m.

OTHER MATERIAL EXAMINED. — **Society Islands** • 2 dd; Bora Bora, TARASOC Stn DW3416; 16°34'58"S, 151°43'58"W; 914 m; MNHN • 1 dd; Moorea, TARASOC Stn DW3461; 17°26'59"S, 149°49'1"W; 844-877 m; MNHN.
Tuamotu • 1 dd juv.; SW of Kaukura, TARASOC Stn DW3359; 15°56'59"S, 147°7'58"W; 492-980 m; coll. MB • 1 dd; SW of Kaukura, TARASOC Stn DW3359; 15°56'59"S, 147°7'58"W; 492-980 m; MNHN • 54 dd; between Tikehau and Rangiroa, TARASOC Stn DW3349; 15°4'58"S, 148°3'0"W; 976-997 m; MNHN • 4 dd; between Tikehau and Rangiroa, TARASOC Stn DW3351; 15°4'1"S, 148°1'1"W; 976-983 m; MNHN • 1 dd; Tikehau, TARASOC Stn DW3387; 14°56'59"S, 148°16'1"W; 550-600 m; MNHN-IM-2009-17712 • 1 dd; Tikehau, TARASOC Stn DW3389; 14°55'1"S, 148°15'0"W; 889 m; MNHN.
Australes • 1 dd juv.; Récif Neilson, BENTHAUS Stn DW1925; 27°0'0"S, 146°4'58"W; 560-790 m; MNHN • 1 dd juv.; Marotiri, BENTHAUS Stn DW1886; 27°51'0"S, 143°31'58"W; 620-1000 m; 6.XI.2002; MNHN • 5 dd; Banc Président Thiers, BENTHAUS Stn DW1932; 24°40'58"S, 146°1'58"W; 500-800 m; 14.XI.2002; MNHN • 3 dd; Marotiri, BENTHAUS Stn DW1886; 27°51'0"S, 143°31'58"W; 620-1000 m; 6.XI.2002; MNHN • 4 dd; Marotiri, BENTHAUS Stn DW1885; 27°52'1"S, 143°33'0"W; 700-800 m; 6.XI.2002; MNHN • 5 dd; Marotiri BENTHAUS Stn DW1884; 27°53'59"S, 143°33'0"W; 570-620 m; MNHN • 1 dd; Banc Arago, BENTHAUS Stn DW1981; 23°21'0"S, 150°43'1"W; 650-1150 m; MNHN • 1 juv.; Banc Arago, BENTHAUS Stn DW1975; 23°23'59"S, 150°43'58"W; 600-691 m; 20.XI.2002; MNHN • 26 dd. (9 juv.); S of Rurutu, BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN • 99 dd, 6 lv; E of Rapa, BENTHAUS Stn DW1889; 27°37'1"S, 144°16'1"W; 600-620 m; 7.XI.2002; MNHN • 1 dd; Tubuai, BENTHAUS Stn DW1955; 23°19'1"S, 149°25'58"W; 750-850 m; MNHN • 1 lv; Tubuai, BENTHAUS Stn DW1962; 23°21'0"S, 149°33'0"W; 470-800 m; 19.XI.2002; MNHN • 3 dd; Rimatara, BENTHAUS Stn DW2020; 22°37'1"S, 152°49'1"W; 920-930 m; 25.XI.2002; MNHN • 8 dd; Rimatara, BENTHAUS Stn DW2021; 22°37'1"S, 152°49'1"W; 1200-1226 m; 25.XI.2002; MNHN • 6 dd; Récif Neilson, BENTHAUS Stn DW1925; 27°0'0"S, 146°4'58"W; 560-790 m; 12.XI.2002; MNHN • 3 dd; E coast of Rurutu, BENTHAUS Stn DW2004; 22°27'43"S, 151°18'43"W; 430-850 n; 24.XI.2002; MNHN • 1 dd; N of Raivavae, BENTHAUS Stn DW1943; 23°49'1"S, 147°39'0"W; 950 m; 5.XI.2002; MNHN. TARAVA SEAMOUNTS • 1 dd; Mont Ari'i Moana, TARASOC Stn DW3313; 19°13'58"S, 151°37'1"W; 670-770 m; 24.IX.2009; MNHN • 1 dd; Mont Ari'i Moana, TARASOC Stn DW3314; 19°13'58"S, 151°39'0"W; 803-815 m; 24.IX.2009; MNHN • 1 dd; Mont Ari'i Moana, TARASOC Stn DW3317; 19°13'1"S, 151°28'58"W; 593-668 m; 25.IX.2009; MNHN • 1 dd; Mont Ari'i Moana, TARASOC Stn DW3324; 19°15'0"S, 151°34'1"W; 554-630 m; 26.IX.2009; MNHN • 10 dd; Mont

FIG. 20. — *Ellenstrongia tarasoc* n. gen., n. sp.: **A**-**C**, **F**-**I**, holotype, height 4.50 mm, width 2.12 mm, Tarava Seamount, Mont Honu, 787-792 m depth stn TARASOC DW3340, shell (**A**-**C**, **F**), detail of the protoconch microsculpture (**E**) (MNHN-IM-2000-39448); **D**, **E**, paratype, same data and locality of the holotype, height 4.22 mm width 1.97 mm (coll. MB), shell (**D**), detail of the first whorls (**E**), (SEM) shell (**F**), details of the teleoconch microsculpture (**G**, **H**), detail of the protoconch microsculpture (**I**). Scale bars: E, 20 µm, G-I, 100 µm.

TABLE 1. — Measurements of teleoconch and protoconch of Polynesian species of *Alvania* and *Ellenstrongia* n. gen., in mm, with minimum-maximum range and mean [standard deviation in square parentheses]; sample size in parentheses with the species name; **M**, protoconch multispiral; **P**, protoconch paucispiral.

	***Alvania letourneuxi* n. sp. (1)**	***Alvania herosae* n. sp. Morph A+B (17+20)**	***Alvania herosae* n. sp. Morph A (17)**	***Alvania herosae* n. sp. Morph B (20)**	***Alvania parvimaculata* n. sp. (5)**	***Alvania prosocostata* n. sp. (9)**	***Alvania uapou* n. sp. (10)**	***Ellenstrongia tarasoc* n. gen., n. sp. (7)**
Teleoconch								
Height	1.60	1.55-2.47 2.06 [0.254]	1.55-2.25 1.92 [0.228]	1.67-2.47 2.18 [0.209]	1.42-1.70 1.54 [0.124]	1.77-2.05 1.94 [0.098]	1.57-1.82 1.69 [0.076]	3.82-4.50 4.11 [0.215]
Width	0.95	0.90-1.32 1.13 [0.109]	0.90-1.25 1.08 [0.114]	0.97-1.32 1.17 [0.092]	0.85-0.95 0.92 [0.045]	1.10-1.25 1.18 [0.047]	0.85-0.97 0.91 [0.035]	1.82-2.12 1.95 [0.090]
Height/Width ratio	1.69	1.67-2.02 1.81 [0.0932]	1.67-1.88 1.75 [0.0622]	1.72-2.02 1.87 [0.0800]	1.55-1.79 1.68 [0.1068]	1.56-1.71 1.64 [0.0519]	1.65-1.98 1.86 [0.1076]	2.03-2.17 2.11 [0.049]
Aperture height	0.68	0.7-1.05 0.85 [0.0856]	0.70-1.00 0.81 [0.087]	0.70-1.05 0.87 [0.079]	0.62-0.72 0.68 [0.041]	0.75-0.92 0.86 [0.048]	0.60-0.65 0.62 [0.024]	1.25-1.47 1.36 [0.075]
Height/aperture height ratio	1.74	2.15-2.65 2.43 [0.1300]	2.15-2.53 2.34 [0.1105]	2.34-2.65 2.51 [0.0908]	2.10-2.37 2.27 [0.1245]	2.14-2.36 2.24 [0.0689]	2.49-2.92 2.71 [0.1302]	2.89-3.20 3.02 [0.098]
No. whorls	2.90	3-4.2 3.7 [0.36]	3.00-4.10 3.47 [0.357]	3.20-4.20 3.9 [0.27]	2.35-3.20 2.78 [0.378]	3.15-3.50 3.31 [0.110]	3.20-3.50 3.34 [0.129]	5.20-5.75 5.36 [0.264]
No. axial ribs on last whorls	21	13-21 16.5 [1.98]	15-21 17.6 [2.13]	13-21 16.05 [1.820]	16-19 16.8 [1.30]	22-29 24.5 [2.56]	14-25 19.4 [3.36]	11-13 12.1 [0.69]
No. spiral cords on last whorls (above aperture)	7(3)	7-13 (3-7) 9.6 (4.7) [1.69 (0.96)]	8-13 (4-7) 11 (5.52) [1.3 (0.799)]	7-10 (3-5) 8.3 (4.05) [0.75 (0.394)]	7 (3) 7 (3) [0 (0)]	11-14 (5-7) 12.37 (6.37) [1.302 (0.744)]	8-9 (4) 8.5 (4) [0.53 (0)]	14-17(9-10) 15.3(9.3) [1.11 (2.16)]
Protoconch								
Height	0.250	0.205-0.275 0.241 [0.0154]	0.205-0.275 0.240 [0.0166]	0.212-0.275 0.241 [0.0147]	0.250-0.262 0.252 [0.0054]	0.220-0.275 0.246 [0.0161]	0.237-0.287 0.262 [0.0199]	0.437-0.525 0.448 [0.029]
Diameter of nucleus	0.075	0.100-0.125 0.115 [0.0070]	0.100-0.125 0.116 [0.0075]	0.100-0.125 0.114 [0.0072]	0.100-0.125 0.110 [0.0104]	0.112-0.125 0.117 [0.0068]	0.100-0.125 0.110 [0.0113]	0.057-0.127 0.085 [0.024]
Diameter of first half whorl	0.150	0.20-0.25 0.22 [0.015]	0.200-0.237 0.215 [0.0149]	0.200-0.250 0.220 [0.0149]	0.170-0.212 0.193 [0.0182]	0.212-0.237 0.228 [0.0092]	0.175-0.220 0.197 [0.0145]	0.125-0.200 0.166 [0.028]
Maximum diameter	0.200	0.275-0.337 0.308 [0.0142]	0.287-0.337 0.312 [0.0117]	0.275-0.325 0.303 [0.0152]	0.250-0.300 0.272 [0.0186]	0.275-0.325 0.304 [0.0191]	0.287-0.337 0.307 [0.0146]	0.387-0.433 0.407 [0.015]
No. of whorls	1.00	1-1.3 1.2 [0.05]	1.00-1.30 1.22 [0.064]	1.15-1.30 1.22 [0.033]	1.15-1.25 1.2 [0.03]	1.10-1.25 1.21 [0.046]	1.25-1.40 1.33 [0.042]	2.75-3.20 2.95 [0.204]
Protoconch type	P	P	P	P	P	P	P	M

'Otaha, TARASOC Stn DW3327; 18°45'0"S, 152°16'1"W; 747-836 m; 26.IX.2009; MNHN • 31 dd; Mont 'Otaha, TARASOC Stn DW3328; 18°46'1"S, 152°15'0"W; 788-836 m; 26.IX.2009; MNHN • 3 dd; Mont 'Otaha, TARASOC Stn DW3328; 18°46'1"S, 152°15'0"W; 788-836 m; 26.IX.2009; coll. MB • 7 dd; Mont 'Otaha, TARASOC Stn CP3329; 18°45'0"S, 152°16'1"W; 755-840 m; 26.IX.2009; MNHN • 2 dd; Mont 'Otaha, TARASOC Stn DW3330; 18°45'0"S, 152°15'35"W7; 717-794 m; 26.IX.2009; MNHN • 3 dd; Mont 'Otaha, TARASOC Stn DW3331; 18°45'0"S, 152°16'58"W; 766 m; 26.IX.2009; MNHN • 4 dd; Mont 'Otaha, TARASOC Stn DW3332; 18°45'0"S, 152°18'0"W0; 790-880 m; 26.IX.2009; MNHN • 3 dd; Mont 'Otaha, TARASOC Stn DW3333; 18°45'0"S, 152°18'0"W; 795-975 m; 26.IX.2009; MNHN • 13 dd; Mont Punu Taipu, TARASOC Stn DW3302; 19°15'0"S, 150°56'59"W; 600-660 m; 23.IX.2009; MNHN.

DISTRIBUTION AND SYMPATRY. — The species is known from the South Pacific Ocean in the Tarava Seamounts (Mont Honu, Mont 'Otaha, Mont Ari'i Moana, Mont Punu Taipu), Society Islands (Moorea, Bora Bora), Tuamotu (Kaukura, between Tikehau and Rangiroa, Tikehau), Australes (Marotiri, Rapa, Recif Neilson, Banc Président Thiers, Raivavae, Tubuai, Banc Arago, Rurutu, Rimatara), with empty shells collected in 430-1226 m, and 7 live specimens collected in 470-800 m in various stations (Fig. 49D).

ETYMOLOGY. — From the name of the tarasoc oceanographic expedition to the Tarava Seamounts [itself derived from TARAva Seamounts and SOCiety Islands], during which the type material has been sampled. Used as a noun in apposition.

DIAGNOSIS. — As for the genus *Ellenstrongia* n. gen.

DESCRIPTION OF HOLOTYPE

Shell (Figs 20A-C, F; 53G)

Medium size for the family, height 4.50 mm, width 2.12 mm, height/width ratio 2.12, robust, ovate-conical, slender and pointed.

Protoconch (Fig. 20E, I)

Slender, acute, multispiral, of 2.75 little convex whorls, height 0.467 mm, nucleus diameter 0.062 mm, first half whorl diameter 0.137, maximum diameter 0.387; protoconch I sculptured by dense microgranules; protoconch I-protoconch II boundary well visible and sinuous; protoconch II with 2 zig-zag spiral cordlets, interspaces with microtubercles and a series of axial rodlets. Protoconch-teleoconch boundary well marked, opisthocline and sinuous, with sinusigera notch (Fig. 20I).

Teleoconch

Of 5.75 very convex whorls with deep sutures. Axial sculpture on the last whorl of 11 ortocline ribs, plus the labial varix, slightly sinuous and rather acute, very narrower than the interspaces, interrupting gradually on the base. Spiral sculpture weak and flattened, subtler than interspaces (Fig. 20G), 18 cordlets on the last whorl, of which 11 above the aperture and 7 on the base. The 2-3 subsutural spiral cordlets are weaker. Microsculpture of growth striae and minute pits randomly distributed, over the entire surface (Fig. 20H). Umbilical fissure absent. Aperture piriform, height 1.47 mm, height/height aperture ratio 3.06, peristome continuos, wide and rather thick outer varix; sharp lip, internally smooth, ortocline.

Colour

Teleoconch uniform white; protoconch light orange.

Operculum and soft parts

Not examined.

VARIABILITY

We examined 247 specimens, some of which are immature. Size ranges for adult specimens from 3.82 to 4.50 mm. *Ellenstrongia tarasoc* n. gen., n. sp., despite having a wide distribution in French Polynesia, shows a negligible morphological variation (see Table 1 and Appendix 7).

REMARKS

Ellenstrongia tarasoc n. gen., n. sp. is not directly comparable to almost any known rissoid species, due to the unique combination of shell outline, peculiar microsculpture of the teleoconch and sculpture of the coloured protoconch. *Porosalvania profundior* Gofas, 2007, from the Hyères Seamount, 31°09.5'N, 28°43.5'W, 845 m (Gofas 2007: 861, figs 53, 54), is similar in its slender shell and pitted microsculpture on the teleoconch. It differs in the smaller size (<3.5 mm height vs >3.8 mm height in *E. tarasoc* n. gen., n. sp.); fewer whorls with less incised sutures; larger but narrower aperture; sparser spiral sculpture; teleoconch microsculpture of minute pits more orderly arranged in spiral series vs randomly distributed, over the entire surface in *E. tarasoc* n. gen., n. sp.; smooth paucispiral protoconch vs multispiral and markedly sculptured in *E. tarasoc* n. gen., n. sp. We also found some similarity with the fossil *Alvania merlei* Van Dingenen, Ceulemans & Landau, 2016, described from the Zanclean (lower Pliocene) of NW France (Van Dingenen *et al.* 2016: 137, pl. 8, figs 4, 5; pl. 9, fig. 3) in the slender outline, the very convex whorls with incised suture, the strong axial sculpture; *Alvania merlei* differs in the aperture (more acute posteriorly), the more numerous and opisthocline axial ribs (orthocline in *E. tarasoc* n. gen., n. sp.), and the paucispiral protoconch (multispiral in *E. tarasoc* n. gen., n. sp.).

TABLE 2. — List of Recent *Alvania* from French Polynesia, with their occurrence in the explored areas (**grey shaded cells**) and the sympatric co-occurrence in the same island with other species (**black shaded cells**).

Species	Areas	*Alvania letourneuxi* n. sp.	*Alvania herosae* n. sp.	*Alvania parvimaculata* n. sp.	*Alvania prosocostata* n. sp.	*Alvania uapou* n. sp.
Alvania letourneuxi n. sp.	Marquesas					
	Tuamotu					
	Gambier					
	Society					
	Australes					
Alvania herosae n. sp.	Marquesas					
	Tuamotu					
	Gambier					
	Society					
	Australes					
Alvania parvimaculata n. sp.	Marquesas					
	Tuamotu					
	Gambier					
	Society					
	Australes					
Alvania prosocostata n. sp.	Marquesas					
	Tuamotu					
	Gambier					
	Society					
	Australes					
Alvania uapou n. sp.	Marquesas					
	Tuamotu					
	Gambier					
	Society					
	Australes					

TABLE 3. — List of the known species of the genus *Haurakia* Iredale, 1915 with geographic area and iconographic references.

Species	Geographic area	Iconographic references
Haurakia amica (Thiele, 1925)	Indian O., South Africa	Thiele 1925: 79, pl. 18, fig. 3
Haurakia angulata (Hedley, 1907)	Indian O., SW Australia, Tasmania	Hedley 1907: 291, pl. Iv., fig. 16
Haurakia aupouria (Powell, 1937)	Pacific O., New Zealand	Powell 1937: 191, pl. 52, fig. 4
Haurakia averni (Ponder & Worsfold, 1994)	Pacific O., South America	Ponder & Worsfold 1994: 24, 25, pl. 16, figs A, B; Güller & Zelaya 2017: 1933, figs j-l
Haurakia buccella Marwick, 1931 †	New Zealand, Tertiary of the Gisborne District	Marwick 1931: 88, pl. 7, fig. 127
Haurakia chemnitzia Laws, 1948 †	New Zealand, Tertiary of the Hokianga District	Laws 1948: 147, pl. 12, fig. 14
Haurakia crassicosta Powell, 1955	Pacific O., New Zealand	holotype at https://www.mollusca.co.nz/speciesdetail.php?taxa=2976
Haurakia discrepans (Tate & May, 1900)	Pacific O., Tasmania	Tate & May 1900: 99
Haurakia finlayi Powell, 1937	Pacific O., New Zealand	Powell 1937: 190, pl. 52, fig. 1
Haurakia gilva (W. H. Turton, 1932)	SW Indian O., South Africa, Port Alfred	Turton 1932: 145, pl. 32, fig. 1037
Haurakia hamiltoni (Suter, 1898)	Pacific O., New Zealand	Suter 1898: 2, 5, fig. 4
Haurakia huttoni (Suter, 1898)	Pacific O., New Zealand	Suter 1898: 2 without figure (*nomen novum* for *R. nana* Hutton, 1873: 28 without figure); Suter 1913: 200, pl. 12, fig. 2
Haurakia imitator (Thiele, 1930)	Indian O., South west Australia	Thiele 1930: 571, fig. 11
Haurakia infecta (Suter, 1908)	Pacific O., New Zealand	Suter 1908: 31, pl. 3, fig. 31
Haurakia latiambita (Ponder, 1967)	Pacific O., New Zealand	Ponder 1967: 199, pl. 2, fig. 2; holotype at https://www.mollusca.co.nz/speciesdetail.php?taxa=2981
Haurakia marmorata (Hedley, 1907)	Indo-W Pacific	Hedley 1907: 498, pl. 18, figs 27, 28; Figs 21A-L; 53H
Haurakia marshalli (Grant-Mackie & Chapman-Smith, 1971) †	New Zealand, Middle Pleistocene (Castlecliffian)	Grant-Mackie & Chapman-Smith 1971: 660, 695, fig. 5, no. 10
Haurakia mediolaevis Cotton, 1944	Indian O., W Australia (Cottesloe), S Australia; Pacific O., Tasmania (Thouin Bay)	Cotton 1944: 294, pl. 16, fig. 4
Haurakia minuscula Powell, 1955	Pacific O., New Zealand	holotype at https://www.mollusca.co.nz/speciesdetail.php?taxa=2982
Haurakia mobilicosta (Ponder, 1967)	Pacific O., New Zealand	Ponder 1967: 200, pl. 1, figs 8, 9, a; holotype at https://www.mollusca.co.nz/speciesdetail.php?taxa=2983
Haurakia oamarutica Finlay, 1924 †	New Zealand, Tertiary, Miocene of Target Gulli	Finlay 1924: 483, 492, fig. 2
Haurakia occulta (Thiele, 1925)	Indian O., South Africa	Thiele 1925: 79, pl. 18, fig. 4
Haurakia onerata Laws, 1939 †	New Zealand, Tertiary, Pakaurangi Point, Kaipara Harbour	Laws 1939: 484, fig. 54
Haurakia otagoensis Dell, 1956	Pacific, New Zealand	holotype at https://www.mollusca.co.nz/speciesdetail.php?taxa=2984
Haurakia pellucida (Powell, 1937)	Pacific New Zealand	Powell 1937: 192, pl. 52, fig. 5
Haurakia praeda (Hedley, 1908)	Pacific, SW Australia, Middle Harbour	Hedley 1908: 468, pl. 10, fig. 35
Haurakia relativa (Laseron, 1956)	Australia, Solanderian (Pacific) and Dampierian Michaelmas Cay (Indian)	Laseron 1956: 452, fig. 179
Haurakia semireticulata (Murdoch & Suter, 1906)	Pacific, New Zealand	Murdoch & Suter 1906: 294, pl 24, figs 33, 34 holotype at https://www.mollusca.co.nz/speciesdetail.php?taxa=2986
Haurakia sinuastoma (Ponder, 1967)	Pacific, New Zealand	Ponder 1967: 199, pl. 2, fig. 1; https://www.mollusca.co.nz/speciesdetail.php?taxa=2987 (holotype image)
Haurakia sodalis Laws, 1939 †	New Zealand, Tertiary, Pakaurangi Point, Kaipara Harbour	Laws 1939: 485, fig. 63
Haurakia subsuturalis Dell, 1956	Pacific, New Zealand	Dell 1956: 61 holotype on MolluscaBase; https://www.mollusca.co.nz/speciesdetail.php?taxa=2988
Haurakia sufflava (Cecalupo & Perugia, 2009)	Indian O., S Madagascar	Cecalupo & Perugia 2009: 20, unnumbered fig. Paratype (MNHN-IM-2010-16423) at https://science.mnhn.fr/institution/mnhn/collection/im/item/2010-16423
Haurakia tenuisculpta Laws, 1950 †	New Zealand, Lower Pliocene of Otahuhu	Laws 1950: 20, pl. 3, fig. 2
Haurakia wallacei (W. R. B. Oliver, 1915)	Pacific O, Kermadec Islands	W. R. B. Oliver 1915: 533, pl. 11, fig. 29
Haurakia sp.	Indian O., Red Sea	Blatterer & Blatterer 2019: 246, pl. 120, figs 6a-6e

Genus *Haurakia* Iredale, 1915

Haurakia Iredale, 1915: 449.

Haurakiopsis Powell, 1937: 192.

Vitricithna Laseron, 1956: 452.

TYPE SPECIES. — *Rissoia hamiltoni* Suter, 1898: 2, 3, 5; fig. IV (by original designation) accepted as *Haurakia hamiltoni* (Suter, 1898).
Haurakiopsis: *Haurakiopsis pellucida* Powell, 1937 (by original designation) accepted as *Haurakia pellucida* (Powell, 1937).
Vitricithna: *Cithna marmorata* Hedley, 1907 (by original designation) accepted as *Haurakia marmorata* (Hedley, 1907).

DIAGNOSIS. — Shell ovate-conical, with weak or moderately strong axial or smooth ribs; in some species the ribs are interrupted at the periphery due to the presence of a spiral cordlets. Anterior edge of the aperture with shallow, wide excavation, posterior sinus wide, distinct. Protoconch apparently smooth or with one or more spiral threads or rows of minute granules; about 1.5 whorls with large nucleus (when paucispiral) or small nucleus and about 2.5 whorls (when multispiral). Colouration of teleoconch variable with several patterns. Head-foot: long ciliated cephalic tentacles; foot constricted in middle, with posterior mucous gland; anterior and posterior pallial tentacles; a single, slender metapodial tentacle (see Ponder 1985: 29; Kay 1979). Operculum simple, thin, nucleus eccentric, last whorl large (Ponder 1985: 131, fig. 82C).

REMARKS

Previously considered as a subgenus of *Pusillina* Monterosato, 1884 (Ponder 1985: 29), it is now ranked as a full genus (Criscione *et al.* 2016). *Rissoia hamiltoni* (type species of *Haurakia*) and *Cithna marmorata* (type species of *Vitricithna*) share some general teleoconch, head-foot, radular and anatomical features (including male and female genital ones), and their closer affinity with respect to a distinct clade of *Pusillina* species is supported by molecular data (Criscione *et al.* 2016). However, Criscione *et al.* (2016: 14) also treated *Haurakia* and *Vitricithna* as distinct genera, scoring a large genetic divergence between the two type species (larger than that scored between widely recognised genera); the issue should be assessed by a denser sampling in a molecular phylogenetic framework. We keep here *Cithna marmorata* in the genus *Haurakia* following current treatment [Ponder 1985: 29-30, fig. 82A-E; Hasegawa 2000: 149, pl. 74, fig. Rissoidae-1; both as *Pusillina* (*Haurakia*)]. *Haurakia*, as currently conceived, includes *c.* 35 species, of which seven fossil, and dates back to the Miocene-Pleistocene of New Zealand and the Oligocene-Miocene of Tasmania (Ponder 1985: 30).

Haurakia marmorata (Hedley, 1907)
(Figs 21; 51A; 53H; Tables 3; 5)

Cithna marmorata Hedley, 1907: 498, pl. 18, figs 27, 28.

TYPE MATERIAL. — **Syntypes**. **Australia** • 3 dd; Queensland, Capricorn Group, Mast Head Island; 21-36.5 m (17-20 fathoms); 23-31.X.1904; C. Hedley leg.; ANSP/MC.94839. Other syntypes in ASM (Ponder 1985), where much of the original *H. marmorata* material is disintegrated in the tubes (Laseron 1956).

TYPE LOCALITY. — Described from Queensland, Capricorn Group, Mast Head Reef, 17-20 fathoms and from Hope Islands (south of Cooktown), 5-10 fathoms.

OTHER MATERIAL EXAMINED. — **Marquesas** • 1 dd; Hiva Oa; 9°45'46"S, 138°52'33"W; <1 m; in coarse sand near the shore; coll. MB.
Tuamotu • 2 dd; Ana'a; 17°20'31"S, 145°30'32"W; coll. MB • 130 dd; Ana'a, Tukuhora; 17°20'41"S, 145°31'26"W; 1-2 m; lagoon; coll. JL • 103 dd; Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 1-47 m; coll. JL • 20 dd; Makemo, Passe Arikitamiro, Nake; 16°37'1"S, 143°33'43"W; <1 m; coll. JL • 84 dd; Makemo, Pouheva; 16°37'22"S, 143°35'34"W; 1 m; reef edge; coll. JL • 58 dd; Makemo, Pouheva; 16°37'22"S, 143°35'34"W; <1 m; reef edge; coll. JL • 25 dd; Raroia; 16°2'9"S, 142°28'37"W; <1 m; reef edge; coll. JL • 210 dd; Tikehau; 15°7'8"S, 148°14'45"W; reef flat; coll. JL.
Society Islands • 7 dd; Tahiti, Arue; 17°31'15"S, 149°31'33"W; <1 m; reef flat ('platier') behind tomb of King [Pomare V]; coll. JL • 10 dd; Tahiti, Arue, Banc du Dolphin; 17°29'49"S, 149°30'3"W; 18-20 m; coll. JL • 2 dd; Tahiti, Arue, Chenal lagon; 17°31'8"S, 149°31'51"W; 12 m; coll. JL • 2 dd; Tahiti, Arue, Matavai Bay; 17°31'15"S, 149°31'33"W; 16-27 m; coll. JL • 1 dd; Tahiti, Arue, Vaipoopo; 17°35'41"S, 149°36'50"W; <1 m; reef flat; coll. JL • 2 dd; Tahiti, Faille d'Arue; 17°31'1"S, 149°31'30"W; 18 m; coll. JL • 15 dd; Tahiti, Faille d'Arue; 17°31'1"S, 149°31'30"W; 18 m; in sediment of the outer slope; coll. MB • 5 dd; Tahiti, Hitia'a; 17°32'20"S, 149°21'36"W0; <1 m; reef edge; coll. JL • 2 dd; Tahiti, Mahae17°34'4"S, 149°19'11"W; <1 m; reef flat (platier frangeant); coll. JL • 10 dd; Tahiti, Mahina, Pointe Vénus; 17°29'42"S, 149°29'24"W; 1 m; coll. JL • 5 dd; Tahiti, Motu Uta; 17°31'51"S, 149°34'51"W; 20 m; wreck, behind breakwater; coll. JL • 2 dd; Tahiti, Paea; 17°41'16"S, 149°35'34"W; 20 m; coll. JL • 1 dd; Tahiti, Paea Lagoon; 17°41'16"S, 149°35'13"W; beached; beached sediment; coll. MB • 2 dd; Tahiti, Papara lagoon; 17°45'28"S, 149°31'22"W; <1 m; coastal reef flat, in coarse sand; coll. MB • 3 dd; Tahiti, Papenoo; 17°30'32"S, 149°25'58"W; 1 m; reef flat ('platier frangeant') of Papenoo; coll. JL • 1 dd; Tahiti, Port Phaeton, Taravao isthmus; 17°43'19"S, 149°18'10"W; beached; in the sand of the beach; coll. MB • 1 dd; Tahiti, Punaauia, La Source; 17°36'7"S, 149°37'15"W; 8-20 m; coll. JL • 2 dd; Tahiti, Tautira; 17°44'27"S, 149°9'46"W; 1-5 m; reef crest; coll. JL • 1 dd; Tahiti, Tiarei; 17°32'34"S, 149°20'27"W; <1 m; reef flat; coll. JL • 7 dd; Tahiti, Toahotu lagoon; 17°45'32"S, 149°19'4"W; beached; beached sediment; coll. MB • 1 dd; Moorea; 17°34'1"S, 149°46'58"W; 20 m; coll. JL • 8 dd; Tetiaroa; 17°1'19"S, 149°36'3"W; <1-15 m; reef edge; coll. JL.
Gambier • 27 dd; Mangareva, Rikitea; 23°7'8"S, 134°57'50"W; 1 m; coll. JL • 5 dd; Mangareva, Taku; 23°5'13"S, 134°58'11"W; 1 m; coll. JL • 6 dd; Gatavake; 23°6'50"S, 134°58'55"W-23°6'50"S, 134°58'55"W; 1 m; coll. JL • 6 dd; Taraururoa; 23°6'25"S, 134°51'43"W; 1-3 m; coll. JL • 25 dd; Tenoko; 23°4'26"S, 135°0'35"W; 1-3 m; coll. JL • 15 dd; Totegegi; 23°5'2"S, 134°52'58"W; 1-3 m; coll. JL.

DISTRIBUTION. — *Haurakia marmorata* is widely distributed in the Pacific (Queensland, Australia, Hawaii, Japan, Philippines and Indonesia; Hedley 1907: 498; Kay 1979: 79; Ponder 1985: 30; Hasegawa 2000: 149; 2006: 106); Kay (1979: 79) observed that the species is common in Hawaii at depth of 3-40 m. Over 800 specimens of this species have been isolated in the material examined from Marquesas (Hiva Oa), Tuamotu (Makemo, Ana'a, Tikehau, Raroia), Society Islands (Tahiti, Moorea, Tetiaroa), and Gambier, with empty shells collected in <1-61 m depth (Fig. 51A).

DIAGNOSIS. — *Haurakia* of medium size for the genus, height >2.0 mm, ovate-conic. Protoconch multispiral. Teleoconch with dense and thin growth lines, and a more or less evident suprasu-

tural cordlet. Non-umbilicate. Peristome subquadrangular; outer lip flexuose, anteriorly excavated, opisthocline, with a moderate varix followed by a thin extension of the lip; inner lip angled, with anterior callous fold. Colouration variable: uniform white to brown, or with different patterns. Soft parts and operculum not observed, as for the genus (see Kay 1979 and Ponder 1985).

Description (based on Polynesian specimens)

Shell (Fig. 21A-L)

Medium for the genus, height 1.2-2.25 mm, width 0.75-1.25 mm, height aperture 0.57-0.95, height/width ratio 1.55-1.81, rather solid, ovate-conical.

Protoconch (Fig. 21N, P, Q)

Multispiral, of 1.80-2.10 whorls, height 0.212-0.255 mm, nucleus diameter 0.050-0.070 mm, first half whorl diameter 0.100-0.150 mm, maximum diameter 0.275-0300 mm; protoconch I smooth, slightly more than half a whorl (Fig. 20P, Q); protoconch II with sinuous growth streaks and a thin suprasutural spiral cordlet (Fig. 21N, P). Protoconch-teleoconch boundary distinct and sinuous, with sinusigera notch (Fig. 21N, Q).

Teleoconch

Of 3.15-3.8 convex whorls, suture impressed, frequently slightly angled at periphery of with a weak sutural spiral cordlets (Fig. 21O). Sculpture of only growth lines, orthocline and flexuose (Fig. 21O). Umbilical fissure absent (Fig. 21O). Aperture height 0.57-0.95 mm, height/aperture height ratio 2.00-2.71; aperture simple, sub-quadrangular, posteriorly acute, anteriorly broad; inner lip thin, angled medially, with anterior callous fold (Fig. 21D); outer lip anteriorly excavated, slightly prosocline, with weak varix, followed by a thin extension of the lip.

Colour

Colourless or yellowish transparent background, with very variable pattern: uniform white to brown, or with zigzagging vertical lines, or with one or more series of white quadrangular sutural blotches, or with subsutural series of narrow vertical reddish lines, etc.

Operculum and soft parts

Not observed.

Variability

As in the rest of the range, *H. marmorata* shows an extreme variability in the chromatic pattern. Variation is less marked in the shell morphology, essentially in the height/width and height/aperture height ratios, and in minimum and maximum size, with the following observed ranges in adults: height 1.2-2.25 mm, width 0.75-1.25 mm, aperture height 0.57-0.95 mm, height/width ratio 1.55-1.81, height/aperture height ratio 2.00-2.71. Specimens from the Society Islands are more vividly coloured, with variable chromatic patterns (Fig. 21A-I). Specimens from Gambier have a colourless transparent shell (with rare exceptions of uniform white specimens) with one or more series of white quadrangular sutural blotches (Fig. 21J, K). Specimens from the Tuamotu can be divided into two distinct chromatic groups: one, very similar to specimens from the Gambier, the other with a yellowish shell, a whitish columellar area and subsutural series of narrow vertical reddish lines, often interrupted, occasionally with suprasutural quadrangular white spots (Fig. 21L) (see Table 2 and Appendix 8).

Remarks

This species, although common and widely distributed, has been poorly represented in the recent literature (e.g. Laseron 1956: 481, figs 177, 178; Kay 1979: 78, fig. 27E, F; Ponder 1985: 131, fig. 82A-E; Hasegawa 2000: 148, pl. 74, fig. 1). Blatterer & Blatterer (2019: 246, 247) illustrated (as *Pusillina* sp.) a species from the Red Sea with a chromatic pattern very similar to that of some specimens of *H. marmorata* (cf. Fig. 21F). The Red Sea species differs from *H. marmorata* in the presence, albeit narrow, of an umbilical fissure, in the paucispiral protoconch (vs multispiral in *H. marmorata*) and in the simple aperture (without the typical abapical embayment of the outer lip).

Genus *Parashiela* Laseron, 1956

Parashiela Laseron, 1956: 439.

Type species. — *Parashiela ambulata* Laseron, 1956: 439, 479, fig. 145 (type by original designation).

Diagnosis. — Shell of small to minute size for the family, less than 2 mm in length, ovate-conic, nonumbilicate or with narrow umbilical fissure, with axial ribs extending to the base. Fine spiral microsculpture densely and minutely granulated. One to four strong, spiral cords on body whorl, one or two cords on first whorls or total absence of spiral cords on body whorl. Aperture with double peristome, almost circular, lacking anterior or posterior angulations or slightly angled or channels, outer lip orthocline o prosocline, with varix. Protoconch (if multispiral) smooth except for one or two weak spiral thread or (if paucispiral) with irregular spiral ridges.

Head-foot: cephalic tentacles rather short, ciliated, with parallel sides; a short posterior pallial tentacle and a short, narrow metapodial tentacle; long, distinct anterior pedal gland, no posterior pedal gland. Operculum: oval, thin, nucleus eccentric (after Ponder 1985: 59).

Remarks

The genus *Parashiela* Laseron, 1956 includes a group of small species from the Indo-Pacific and the Western Atlantic (Carlo Smriglio, pers. comm.). *Parashiela* is currently represented by three recognised species (MolluscaBase 2023c), all extant (no fossil specimens recorded so far): *P. ambulata* Laseron, 1956, *Parashiela invisibilis* (Hedley, 1899) and *Parashiela liddelliana* (Hedley, 1907). A fourth nominal species, *Parashiela beetsi* Ladd, 1966, is regarded as a synonym of *P. ambulata* (Ekawa 1993; Higo *et al.* 1999; Hasegawa 2006b). As already suggested by van Gemert (2016: 8) the number of *Parashiela* species is actually larger. Ponder (1985: 51) reported "an undescribed species" from Madagascar with a paucispiral protoconch with

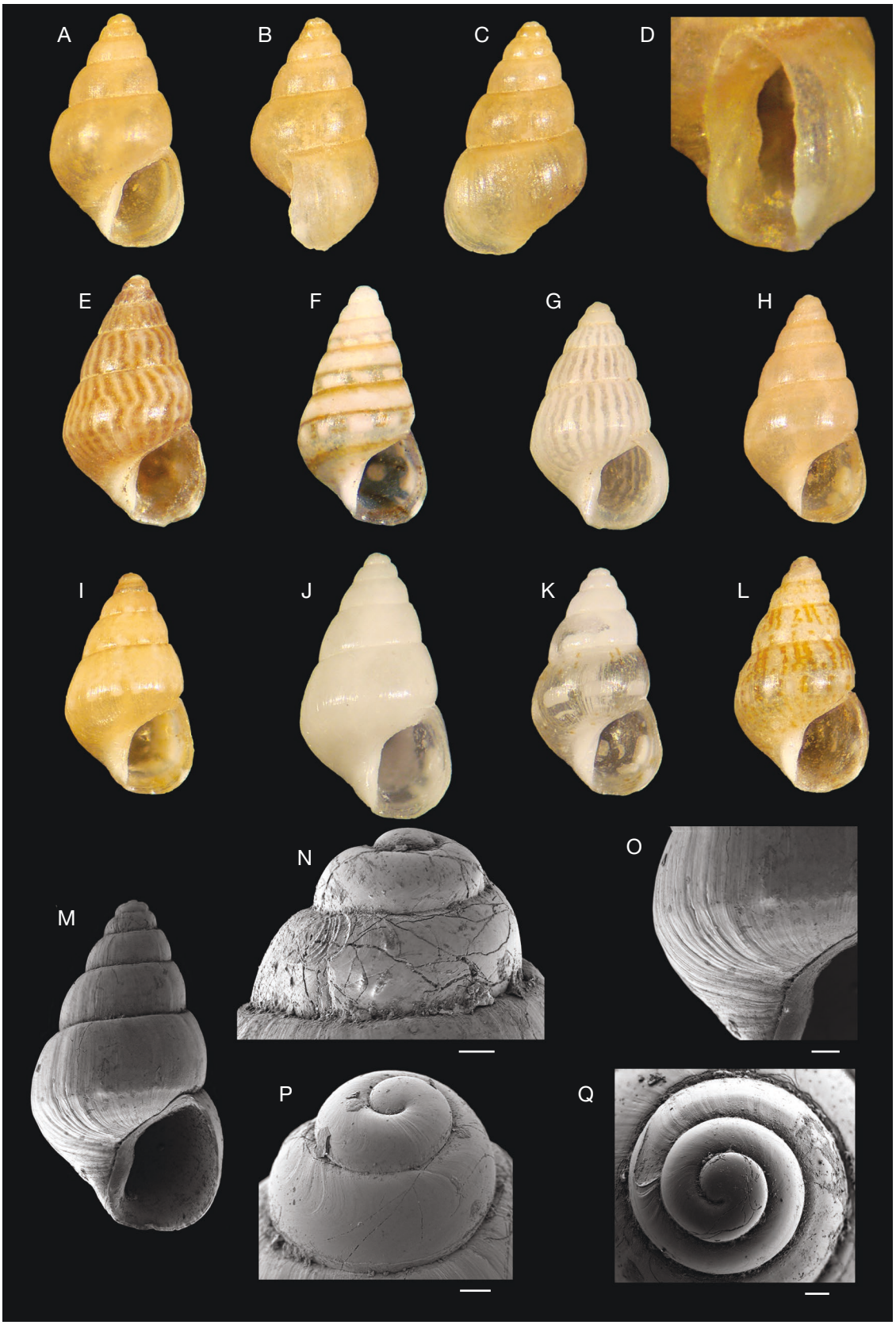

FIG. 21. — *Haurakia marmorata* (Hedley, 1907): **A**-**D**, **M**-**Q**, Society Islands, Tahiti, Arue, <1 m, shell (**A**-**C**, **M**), height 1.9 mm, detail of aperture (**D**), detail of the protoconch (**N**), detail sculpture on the last whorl (**O**), height 18.5 mm, detail of the protoconch (**P**), height 1.4 mm, detail of the protoconch (coll. JL) (**Q**); **E**-**I**, Society Islands, shell, height 2.05 mm, height 1.95 mm, height 1.85 mm rispettivamente; **J**, **K**, Gambier, Mangareva, Rikitea, 1 m, shell, height 1.92 mm (coll. JL); **L**, Tuamotu, Makemo, Pouheva, 1 m, shell, height 1.92 mm (coll. JL). Scale bars D, 0.25 µm; N, P, Q, 40 µm; O, 100 µm.

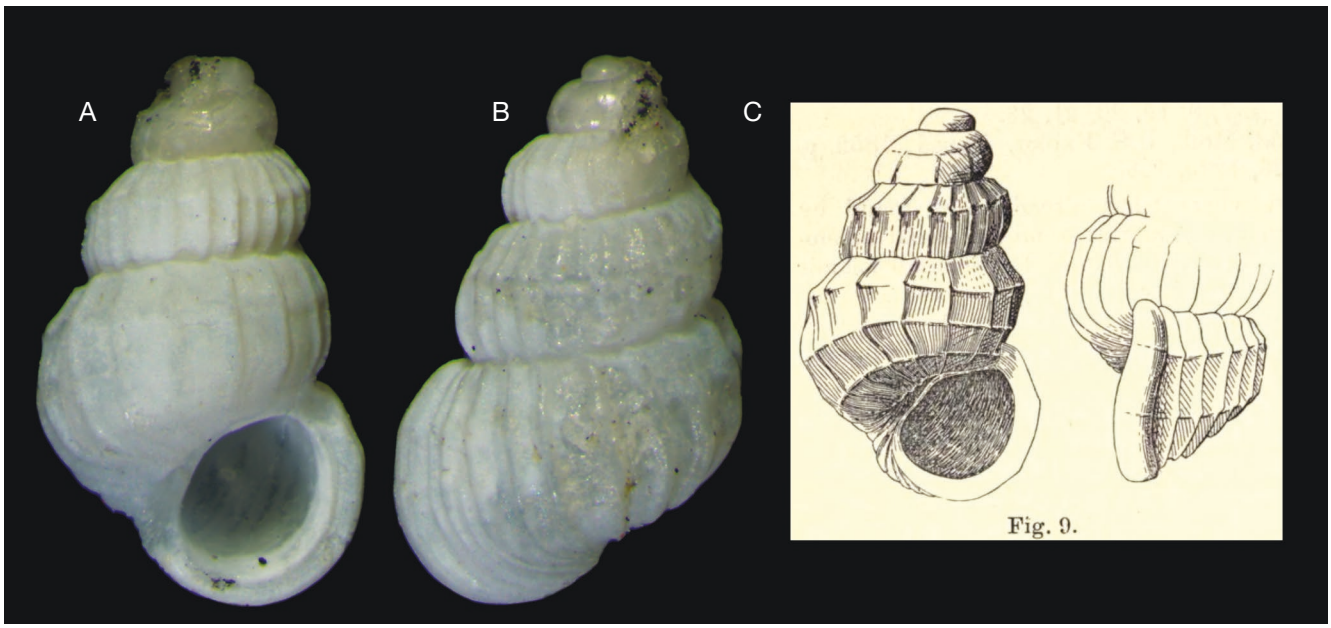

FIG. 22. — *Parashiela invisibilis* (Hedley, 1899): **A**, **B**, holotype, height 1.2 mm, width 0.72 mm, Tuvalu Islands, Funafuti Atoll, AMS-C.5892 (Images: A. C. Miller, Copyright: Australian Museum); **C**, original drawing.

spiral sculpture (MNHN). Criscione *et al.* (2016: 9, fig. 5) reported a *Parashiela* sp. from the Society Islands, morphologically similar to, but genetically divergent from a typical *P. ambulata* from Fiji.

Janssen *et al.* (2011: 415, pl. 15, fig. 3) and Blatterer & Blatterer (2019: 245, 247, pl. 119, fig. 4a-d) figured a *Parashiela* sp. from the northern Red Sea. We note that the specimen figured as *Parashiela* sp. from the northern Red Sea by Blatterer & Blatterer (2019: 245, 247, pl. 119, fig. 5a, b) probably belongs to another genus based on its simple peristome.

Four distinct species of *Parashiela* from Indonesia, Papua New Guinea and Micronesia are figured in webpages (at https://ingokurtz.jimdofree.com/mollusca-weichtiere/rissoidae/): two have a multispiral protoconch, one with a thin suprasutural spiral cordlet on the teleoconch, the other with a slender teleoconch with narrow base; two have a paucispiral protoconch, one with the apex strongly sculptured by 5 spiral cordlets, the other with the apex sculptured by thin spiral threads and microgranules.

Geiger *et al.* (2007) figured a specimen morphologically somehow intermediate between *P. ambulata* and *P. invisibilis,* with 2 spiral cordlets on the teleoconch.

Middelfart *et al.* (2020) figured a specimen as *Parashiela* cf. *invisibilis*, very similar to *P. ambulata* (slender shell, chromatic pattern, etc.), but with 3 evident spiral cordlets on the last whorl, as in some forms of *P. invisibilis*.

Finally, we have examined 2 shells from Cape Verde, Eastern Atlantic (coll. Carlo Smriglio, Roma), very similar to *P. ambulata*.

The examination of *c*. 2350 specimens allowed us to identify 6 species of *Parashiela* in French Polynesia, of which 5 undescribed: *Parashiela ambulata* Laseron, 1956, *Parashiela expansilabrum* n. sp., *Parashiela obesula* n. sp., *Parashiela rimatara* n. sp., *Parashiela rotundata* n. sp., *Parashiela soniae* n. sp. We provide some comparative remarks on two additional species, *P. invisibilis* and *P. liddelliana*.

Parashiela invisibilis (Hedley, 1899)
(Figs 22; 50)

Rissoa invisibilis Hedley, 1899: 418, fig. 9.

TYPE MATERIAL. — **Holotype. Tuvalu Islands** • dd; Funafuti Atoll; 8°31'1"S, 179°13'1"E; 1896; C. Hedley leg., Royal Society Coral Boring Expedition; AMS-C.5892.

TYPE LOCALITY. — Tuvalu Islands: Funafuti Atoll.

DISTRIBUTION. — Tropical Pacific ranging from the Philippines to southern Japan and to Hawaii (van Gemert 2016: 7) (Fig. 50).

DIAGNOSIS. — *Parashiela* small for the genus, height 1.20 mm (holotype), ovate-conic. Protoconch paucispiral. Teleoconch with thin orthocline axial ribs, reaching the base and entering the narrow umbilical fissure; four thin spiral cordlets on the last whorl, 2 above the aperture and on upper whorls. Peristome duplicated, with thick and broad varix crossed by evident growth striae. Colouration uniform white.

REMARKS

We note that the holotype has two (not one as originally described: Hedley 1899: 418; van Gemert 2016: 7) very thin spiral cordlets above the aperture and on upper whorls.

We suspect that several of the specimens reported in the literature as *P. invisibilis* (e.g. Ekawa 1993: 80, pl. 2, fig. 14; Hasegawa 2000:150, pl. 75, fig. 12 [two images]; Hasegawa 2006b: 108, fig. 6; Poppe & Tagaro 2011: pl. 1306, fig. 3; Middelfart *et al.* 2020: 26, fig. 4A, as *Parashiela* cf. *invisibilis*;

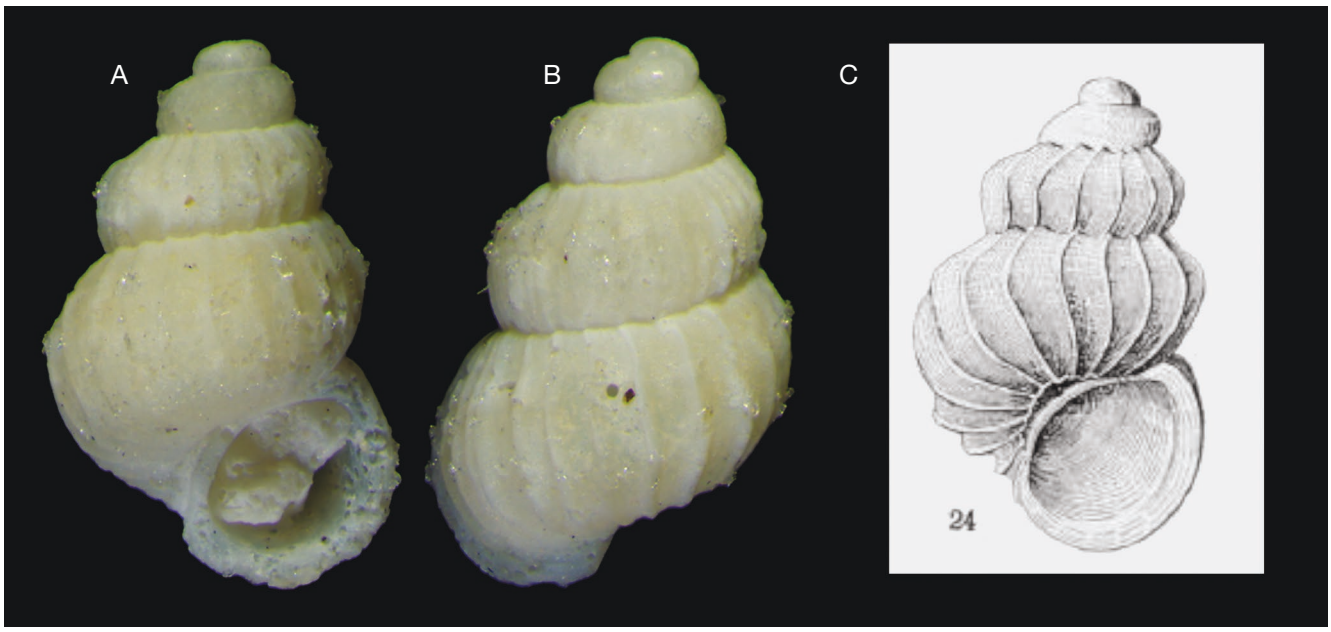

FIG. 23. — *Parashiela liddelliana* (Hedley, 1907): **A**, **B**, holotype, height 1.2 mm, width 0.76 mm, Queensland, Capricorn Group, Mast Head Reef, depth unknown, AMS-C.19544 (Images: A. C. Miller, Copyright: Australian Museum); **C**, original drawing.

but also by Severns 2011: 116, pl. 42, figs 1, 2, as *Parashiela* sp. and *Parashiela beetsi*), which are larger and with more marked spiral and axial sculptures, may actually belong to one or more distinct and probably undescribed species.

See under *P. rimatara* n. sp. and *P. expansilabrum* n. sp. for detailed comparisons.

Parashiela liddelliana (Hedley, 1907)
(Figs 23; 50)

Rissoa liddelliana Hedley, 1907: 494, pl. xvii, fig. 24.

TYPE MATERIAL. — **Holotype. Australia** • dd; Queensland, Capricorn Group, Mast Head Reef; AMS-C.19544.
Paratypes. Australia • 14 dd; Queensland, Capricorn Group, Mast Head Reef; AMS-C.170431.

TYPE LOCALITY. — Australia: Queensland, Capricorn Group, Mast Head Reef.

DISTRIBUTION. — Pacific from the northern part of Australia to Japan and Hawaii (van Gemert 2016: 8) (Fig. 50).

DIAGNOSIS. — *Parashiela* small for the genus, height 1.20 mm. Whorls convex with weak double anglulation on the last whorl. Protoconch multispiral. Teleoconch devoid of spiral macro-sculpture; 20 narrow and slightly flexuose axial ribs on the last whorl, reaching the base and entering the narrow umbilical fissure. Peristome duplicated, with thick and wide varix crossed by evident growth striae. Colouration whitish.

REMARKS
The holotype (AMS-C.19544) (Fig. 23A, B) is rather damaged, especially on the aperture (it has also suffered partial corrosion from the Byne's disease). This species has rarely been reported in the literature (e.g. Middelfart *et al.* 2020: 171, fig. 8C) and more often under other names (e.g. Kay 1979: 78, pl. 27, fig. D, as *Parashiela beetsi*, *fide* Hasegawa 2006b:109; Fukuda 1993: 40, pl. 13, fig. 188, as *Parashiela ambulata*; Ekawa, 1993, as *Parashiela* sp., *fide* Hasegawa 2006b: 109).

See under *P. expansilabrum* n. sp., *P. rimatara* n. sp. and *P. soniae* n. sp. for detailed comparisons.

Parashiela ambulata Laseron, 1956
(Figs 24A-C; 25; 26; 50; 51B; 53I; Tables 4; 5; 6)

Parashiela ambulata Laseron, 1956: 439, fig. 145.

Parashiela beetsi Ladd, 1966: 64, pl. 12, figs 8, 9.

?*Parashiela beetsi* – Tröndlé & Boutet 2009: 17.

?*Parashiela beetsi* – Salvat & Tröndlé 2017: 238.

Parashiela sp. 1 – Boutet *et al.* 2020: 240.

TYPE MATERIAL. — *Parashiela ambulata* Laseron, 1956. **Holotype. Australia** • dd (Fig. 24A, B); Great Barrier Reef, Michaelmas Cay; 16°36'0"S, 145°58'58"E; V.1926; T. Iredale & G. P. Whitley leg., Great Barrier Reef Boring Expedition; AMS-C.102467.
Paratypes. Australia • 10 dd (Fig. 24D, E); Great Barrier Reef, Michaelmas Cay; same data as holotype; AMS-C.109001.
Parashiela beetsi Ladd, 1966. **Holotype**. **Marshall Islands** • dd; Eniwetok Atoll, Atomic Energy Commission drill-hole F-8-C; 1952; drill-hole on the atoll, 5.8-6.7 m (19-22 feet); USNM 648368.
Paratype. **Marshall Islands** • dd; Eniwetok Atoll; same data as holotype; USNM 648369.

TYPE LOCALITY. — *Parashiela ambulata*. Australia: Queensland, Michaelmas Cay. *Parashiela beetsi*. Marshall Islands: Eniwetok Atoll.

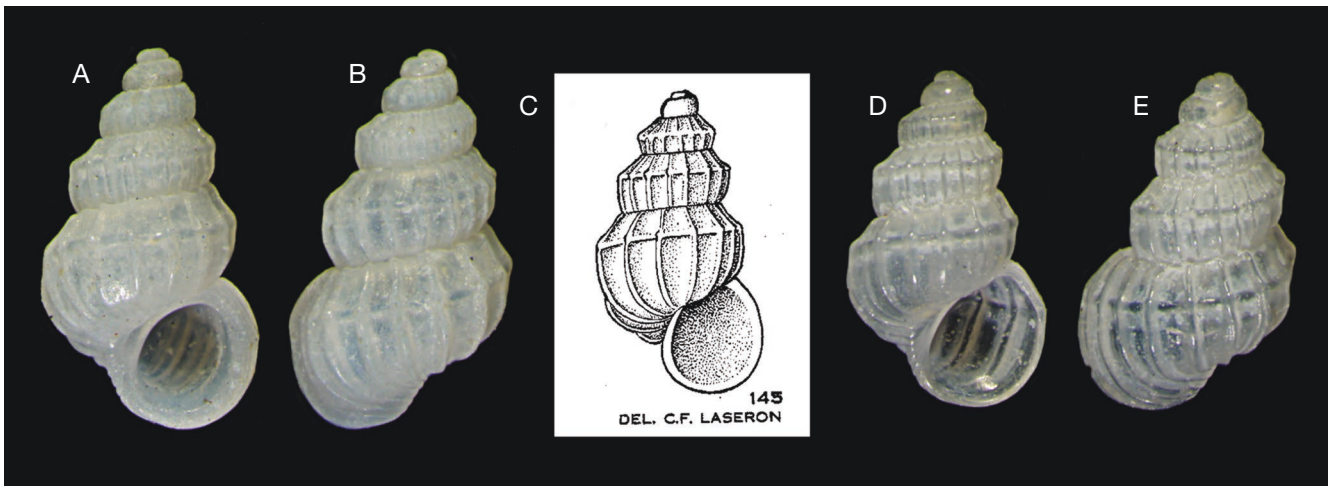

FIG. 24. — *Parashiela ambulata* Laseron, 1956: **A**, **B**, holotype, height 1.8 mm, width 1.02 mm, Australia, Michaelmas Cay, depth unknown, AMS - C.102467; **C**, original drawing; **D**, **E**, paratype, height 1.6 mm, width 0.94 mm, AMS - C.109001 (Images: A. C. Miller, Copyright: Australian Museum).

TABLE 4. — List of the known species of the genus *Parashiela* Laseron, 1956 with geographic area, iconographic references and protoconch type.

Species	Geographic area	Iconographic references	Protoconch type
Parashiela ambulata Laseron, 1956	Indo-W Pacific	Laseron 1956: 439, fig. 145; Figs 24; 25; 26; 53H	multispiral
Parashiela expansilabrum n. sp.	Pacific O.	Figs 28; 53I	multispiral
Parashiela invisibilis (Hedley, 1899)	Pacific O.	Hedley 1899: 418, fig. 9; Fig. 22	multispiral
Parashiela liddelliana (Hedley, 1907)	Pacific O.	Hedley 1907: 494, pl. xvii, fig. 24; Fig. 23	multispiral
Parashiela obesula n. sp.	Pacific O.	Figs 29; 53J	multispiral
Parashiela rimatara n. sp.	Pacific O.	Figs 30; 53K	multispiral
Parashiela rotundata n. sp.	Pacific O.	Figs 31; 53L	multispiral
Parashiela soniae n. sp.	Pacific O.	Figs 32; 33; 53M	paucispiral
Parashiela sp.	Pacific O.	Criscione *et al.* 2016: 9, fig. 5J.	multispiral
Parashiela sp.	E Atlantic O.	Fig. 26A, B	multispiral
Parashiela sp.	Indian O., Red Sea	Janssen *et al.* 2011: 483, pl. 15, fig. 3; Blatterer & Blatterer 2019: 245, 247, pl. 119, figs 4a, b and 4c, d (error in the text 4a, b)	multispiral
Parashiela sp.	W Indian O.	Ponder 1985: 51 (without figure)	paucispiral
Parashiela sp.	E Indian O.	https://ingokurtz.jimdofree.com/mollusca-weichtiere/rissoidae/	multispiral
Parashiela sp.	S Pacific O.	https://ingokurtz.jimdofree.com/mollusca-weichtiere/rissoidae/	multispiral
Parashiela sp.	S Pacific O.	https://ingokurtz.jimdofree.com/mollusca-weichtiere/rissoidae/	paucispiral?
Parashiela sp.	S Pacific O.	https://ingokurtz.jimdofree.com/mollusca-weichtiere/rissoidae/	paucispiral
Parashiela cf. *invisibiilis*	E Indian O.	Middelfart *et al.* 2020: 126, fig. 4A	paucispiral
Parashiela sp.	E Indian O.	Middelfart *et al.* 2020: 149, 177	?
Parashiela sp.	E Indian O.	Middelfart *et al.* 2020: 149, 177	?
Parashiela sp.	E Indian O.	Middelfart *et al.* 2020: 149, 177	?

OTHER MATERIAL EXAMINED. — **Australes** • 1 dd; Banc Mac Donald, BENTHAUS Stn DW1875; 28°58'58"S, 140°15'0"W; 110-150 m; 4.XI.2002; MNHN • 1 dd; Banc Mac Donald, BENTHAUS Stn DW1877; 28°58'58"S, 140°15'0"W; 59-150 m; 4.XI.2002; MNHN • 1 dd; Marotiri, BENTHAUS Stn DW1886; 27°51'0"S, 143°31'58"W; 620-1000 m; 6.XI.2002; MNHN • 30 dd; Rapa, Ahurei Bay; 27°36'57"S, 144°19'48"W; 1 m; coll. JL • 1 dd, 1 lv; Rapa, Akatanui Bay, Atelier RAPA Stn 13; 27°36'7"S, 144°18'53"W; 2 m; 8.XI.2002; sandy pockets; MNHN • 1 lv; Rapa, Anarua Ba, Atelier RAPA Stn 72; 27°36'35"S, 144°22'12"W8; 5-10 m; 25.XI.2002; fine compact sand with algae; MNHN • 15 dd, 38 lv; Rapa, Anarua Bay, Atelier RAPA Stn 41; 27°36'18"S, 144°22'40"W; 5 m; 25.XI.2002; corals on sandy bottom; MNHN • 11 lv; Rapa, Anatakuri Nako Bay, Atelier RAPA Stn 25; 27°38'24"S, 144°18'53"W; 3 m; 13.XI.2002; blocks of dead coral on sand; MNHN • 2 lv; Rapa, E of Tupuaki Bay, Atelier RAPA Stn 21; 27°34'12"S, 144°20'34"W; 5 m; 12.XI.2002; slabs of dead corals on sandy bottom; MNHN • 32 dd, 4 lv; Rapa, Haurei Bay, Atelier RAPA Stn 43; 27°36'46"S, 144°18'18"W; 45 m; 26.XI.2002; muddy bottom at the foot base of a drop-off; MNHN • 4 dd; Rapa, Haurei Bay, Atelier RAPA Stn 47; 27°36'43"S, 144°19'4"W; 33 m; 29.XI.2002; corals on muddy bottom; MNHN • 34 dd; Rapa, Hiri Bay; 27°37'19"S, 144°22'4"W; 3-5 m; coll. JL • 3 dd, 161 lv; Rapa, Hiri Bay, Atelier RAPA Stn 9; 27°37'19"S, 144°22'12"W; 3-24 m; 6.XI.2002; amidst corals; MNHN • 12 dd, 5 lv; Rapa, N of Anatakuri Bay, Atelier RAPA Stn 38; 27°37'22"S, 144°18'0"W7; 2 m; 22.XI.2002; sediment under a large rock; MNHN • 5 dd, 24 lv; Rapa, N of Aturapa I., Atelier RAPA Stn 29; 27°34'19"S, 144°20'59"W; 4-2 m; 15.XI.2002; dead coral; MNHN • 5 lv; Rapa, N of Rapa Iti I., Atelier RAPA Stn 11; 27°37'12"S, 144°18'0"W; 2 m; 7.XI.2002; sandy pockets amidst slabs of dead

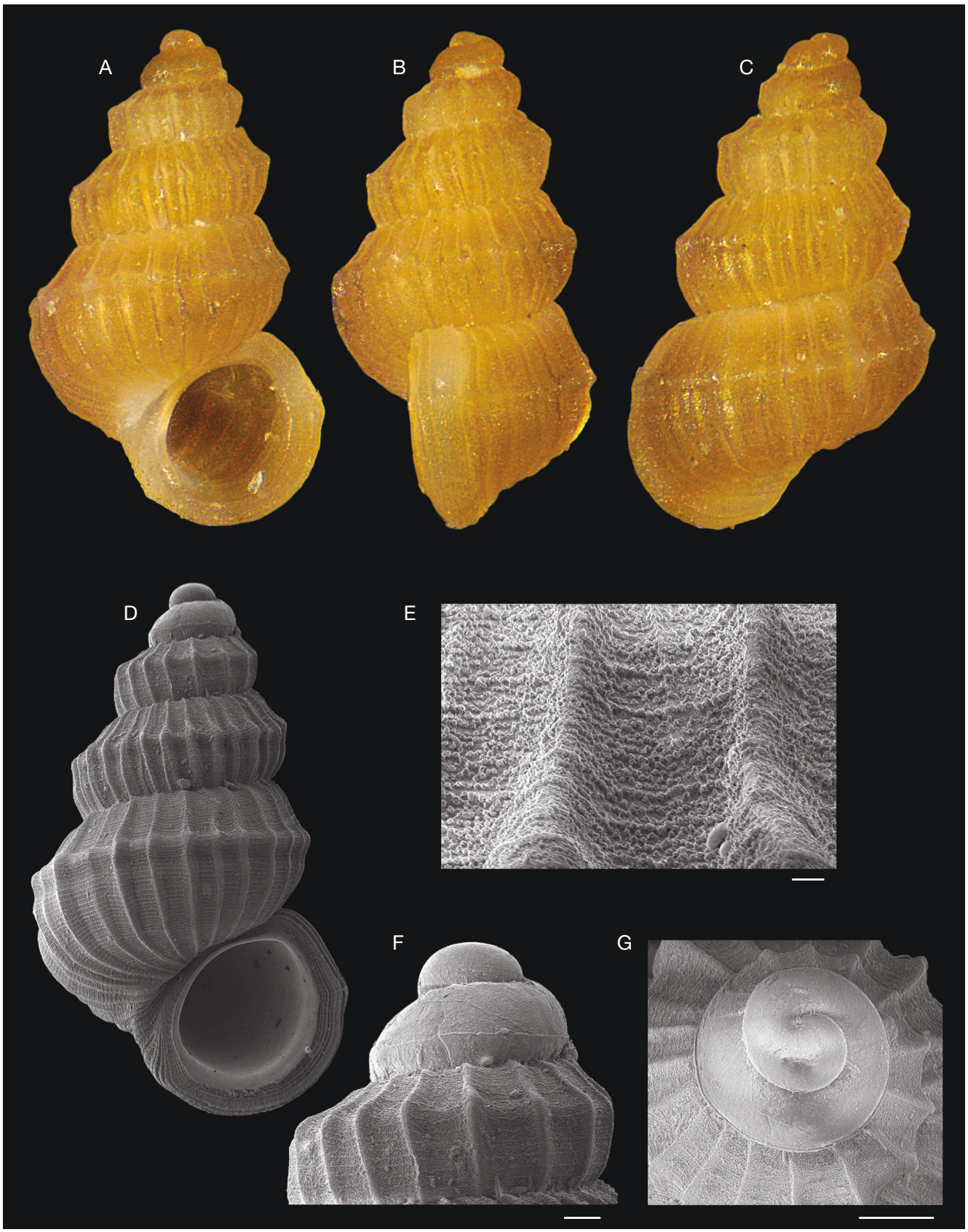

FIG. 25. — *Parashiela ambulata* Laseron, 1956: **A**-**C**, Australes, Rapa, Pointe Kauira, Stn 36, 27 m, height 1.60 mm, width 0.98 mm, MNHN. shell; **D**-**G**, same specimen: shell (**D**), detail of the penultimate whorl microsculpture, subsutural median portion (**E**); **F**, **G**, details of the first whorls. Scale bars: E, 10 µm, F, 50 µm, G, 100 µm.

coral; MNHN • 1 lv; Rapa, Nord of Pukitarava, Atelier RAPA Stn 14; 27°35'49"S, 144°13'37"W; 2 m; 8.XI.2002; dead coral blocks on sand; MNHN • 92 dd; Rapa, NW of Tauna I., Atelier RAPA Stn 44; 27°36'18"S, 144°18'10"W; 30 m; 27.XI.2002; drop-off with muddy bottoms; MNHN • 5 dd; Rapa, NW of Tauna I., Atelier RAPA Stn 44; 27°36'18"S, 144°18'10"W; 30 m; 27.XI.2002; drop-off with muddy bottoms; MNHN • 55 lv; Rapa, off Ahurei Bay, Atelier RAPA Stn 6; 27°36'46"S, 144°16'12"W; 42 m; 5.XI.2002; live and dead corals; MNHN • 76 lv; Rapa, off Cape Rukuaga, Atelier RAPA Stn 22; 27°33'54"S, 144°21'43"W; 18-22 m; 13.XI.2002; corals on rocky bottom; MNHN • 250 dd; Rapa, off Pointe Rukuaga, Atelier RAPA Stn 48; 27°34'4"S, 144°22'4"W; 36 m; 30.XI.2002; plateau with silty sand; MNHN • 1 dd; Rapa, Pake Bay, Atelier RAPA Stn 61; 27°37'1"S, 144°18'36"W; 10-15 m; 11-14.XI.2002; sandy mud and coral; MNHN • 175 lv; Rapa, Pointe Kauira, Atelier RAPA Stn 36; 27°33'28"S, 144°20'49"W; 27 m; 21.XI.2002; corals, mostly alive; MNHN • 2 dd, 1 lv; Rapa, Pointe Komiré, Atelier RAPA Stn 10; 27°34'47"S, 144°22'47"W; 16-18 m; 7.XI.2002; rocks covered with brown algae; MNHN • 77 dd, 44 lv; Rapa, Pointe Mei, Atelier RAPA Stn 30; 27°38'13"S, 144°18'10"W; 16-20 m; 16-18.XI.2002; drop-off with dead corals; MNHN • 44 lv; Rapa, Pointe Mei, Atelier RAPA Stn 31; 27°38'13"S, 144°18'10"W; 6 m; 16.XI.2002; rocks; MNHN • 54 lv; Rapa, Pointe Taekateke, Atelier RAPA Stn 28; 27°38'24"S, 144°20'34"W; 30 m; 15.XI.2002; rocky blocks with algal cover; MNHN • 2 dd, 5 lv; Rapa, Pointe Tematapu, Atelier RAPA Stn 2; 27°34.4'S, 144°19.0'W; 29 m; 1.XI.2002; corals, mostly dead; MNHN • 58 lv; Rapa, Pointe Teruametitoi, Atelier RAPA Stn 33; 27°34'47"S, 144°18'36"W; 30 m; 19.XI.2002; dead corals; MNHN • 48 dd; Rapa, Rarapai I., Atelier RAPA Stn 4; 27°34'19"S, 144°22'4"W; 18 m; 4.XI.2002; rocky blocks covered with brown algae; MNHN • 4 dd; Rapa, S of Anatakuri Bay, Atelier RAPA Stn 19; 27°37'40"S, 144°18'43"W; 3 m; 11.XI.2002; coral blocks on sandy bottom; MNHN • 66 lv; Rapa, S of Tarakoi I., Atelier RAPA Stn 5; 27°5'34"S, 144°18'28"W; 8 m; 4.XI.2002; dead corals with algae, muddy-sandy pockets; MNHN • 12 dd, 1 lv; Rapa, SE of Tauna I., Atelier RAPA Stn 8; 27°36'28"S, 144°17'41"W; 52-57 m; 06-22.XI.2002; rocky bottoms with sandy pockets; MNHN • 12 dd; Rapa, SE of Tauna I., Atelier RAPA Stn 8; 27°36'28"S, 144°17'41"W; 52-57 m; 06-22.XI.2002; rocky bottoms with sandy pockets; MNHN • 3 lv; Rapa, SW of Pointe Gotenaonao, Atelier RAPA Stn 27; 27°38'41"S, 144°19'11"W; 6 m; 14.XI.2002; pebble blocks with algae cover; MNHN • 8 dd; Rapa, SW of Rarapai I., Atelier RAPA Stn 17; 27°34'37"S, 144°22'40"W; 9 m; 10.XI.2002; rocky boulders on sandy bottom; MNHN • 5 dd, 286 lv; Rapa, Vavai, Atelier RAPA Stn 32; 27°34'58"S, 144°22'40"W; 15-20 m; 18.XI.2002; coral; MNHN • 2 lv; Rapa, W of Pointe Aukura, Atelier RAPA Stn 15; 27°38'6"S, 144°21'7"W; 20 m; 9.XI.2002; sandy pockets amidst large rocky blocks; MNHN • 30 dd; Rapa, W of Rapa Iti I.; 27°37'15"S, 144°18'3"W; coll. JL • 3 dd; Rapa, W of Rapa Iti I.; 27°37'15"S, 144°18'3"W; 24 m; coll. MB • 44 lv; Rapa, W of Tauna I., Atelier RAPA Stn 16; 27°36'18"S, 144°18'25"W; 5 m; 9.XI.2002; corals, mostly dead; MNHN • 1 dd; Récif Neilson, BENTHAUS Stn DW1914; 27°4'1"S, 146°4'1"W; 150 m; 11.XI.2002; MNHN • 3 dd; Banc Président Thiers, BENTHAUS Stn DW1932; 24°40'58"S, 146°1'58"W; 500-800 m; 14.XI.2002; MNHN • 1 dd; Banc Président Thiers, BENTHAUS Stn DW1933; 24°40'58"S, 146°1'1"W; 500-850 m; 14.XI.2002; MNHN • 94 dd; Raivavae, Motu; 23°53'20"S, 147°37'1"W; 1 m; reef edge; coll. JL • 1 dd; Tubuai, BENTHAUS Stn DW1961; 23°21'0"S, 149°34'1"W; 470-800 m; 19.XI.2002; MNHN • 4 dd; Tubuai, BENTHAUS Stn DW1962; 23°21'0"S, 149°33'0"W; 470-800 m; 19.XI.2002; MNHN • 18 dd; S of Rurutu, BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN • 1 dd; North coast of Rurutu BENTHAUS Stn DW1998; 22°25'1"S, 151°22'1"W; 250-302 m; 23.XI.2002; MNHN • 2 dd; Rimatara, BENTHAUS Stn DW 2020; 22°37'1"S, 152°49'1"W; 920-930 m; 25.XI.2002; MNHN • 1 dd; Rimatara, BENTHAUS Stn DW2021; 22°37'1"S, 152°49'1"W; 1200-1226 m; 25.XI.2002; MNHN.
Tuamotu • 1 dd; Moruroa; 21°46'37"S, 138°53'31"W; beached; on the sea-line; coll. MB • 10 dd; Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 20 m, 45 m, 47 m, 54 m; coll. JL • 10 dd; Makemo, Passe Arikitamiro, Nake; 16°37'1"S, 143°33'43"W; <1 m; reef edge; coll. JL • 10 dd; Makemo, Pouheva; 16°37'22"S, 143°35'34"W; reef edge; coll. JL • 10 dd; Katiu; 16°21'50"S, 144°21'21"W; <1 m; reef edge; coll. JL • 10 dd; Raroia; 16°2'9"S, 142°28'37"W; <1 m; reef edge; coll. JL.
Gambier • 5 dd; Mangareva, Rikitea; 23°7'8"S, 134°57'36"W4; 1 m; coll. JL • 5 dd; Mangareva Taku; 23°5'13"S, 134°58'11"W; 1 m; coll. JL • 4 dd; Gatavake; 23°6'50"S, 134°58'55"W; 1-3 m; coll. JL • 4 dd; Totegegi; 23°5'2"S, 134°52'58"W; 1-3 m; coll. JL • 4 dd; Tenoko; 23°4'26"S, 135°0'35"W; 1-3 m; coll. JL • 4 dd; Taraururoa; 23°6'25"S, 134°51'43"W; 1-3 m; coll. JL.
Society Islands • 18 dd; Tahiti, Arue, Banc du Dolphin; 17°29'49"S, 149°30'3"W; 18-20 m; coll. JL • 18 dd; Tahiti, Arue; 17°31'15"S, 149°31'33"W; 1 m; reef flat behind tomb of King Pomare V; coll. JL • 20 dd; Tahiti, Arue, platier de Vaipoopo; 17°35'41"S, 149°36'50"W; <1 m; coll. JL • 18 dd; Tahiti, Faille d'Arue; 17°31'1"S, 149°31'30"W; 17-48 m; coll. JL • 18 dd; Tahiti, Papeete, Motu Uta; 17°31'51"S, 149°34'51"W; 20 m; wreck, behind breakwater; coll. JL • 18 dd; Tahiti, Tautira; 17°44'27"S, 149°9'46"W; 1-50 m; reef crest; coll. JL • 18 dd; Tahiti, Matavai Bay; 17°31'1"S, 149°30'35"W; 16-25 m, 27 m; coll. JL • 18 dd; Tahiti, Punaauia, La Source; 17°36'7"S, 149°37'15"W; 16 m, 20 m, 30 m; coll. JL • 18 dd; Tahiti, Tiarei; 17°32'34"S, 149°20'27"W; <1 m; reef flat; coll. JL • 18 dd; Tahiti, Paea; 17°41'16"S, 149°35'34"W; 20 m; coll. JL • 18 dd; Tahiti, Mahae17°33'57"S, 149°19'22"W; <1 m; reef flat; coll. JL • 20 dd; Tahiti, Hitia'a; 17°32'20"S, 149°21'36"W; <1 m; reef edge; coll. JL • 20 dd; Tahiti, Papenoo; 17°30'32"S, 149°25'58"W; <1 m; fringing reef flat; coll. JL • 20 dd; Tahiti, Mahina, Pointe Vénus; 17°29'42"S, 149°29'24"W; 1 m; coll. JL • 4 dd; Tahiti; coll. JL • 1 dd; Tahiti, Papara lagoon; 17°45'28"S, 149°31'22"W; <1 m; coastal reef flat, in coarse sand; coll. MB • 1 dd; Tahiti, Papara lagoon; 17°45'28"S, 149°31'22"W; <1 m; coastal reef flat, in coarse sand; coll. MB • 20 dd; Tetiaroa; 17°1'19"S, 149°36'3"W; 15 m; reef edge; coll. JL • 20 dd; Motu One; 15°48'21"S, 154°30'39"W; 1 m; reef edge; coll. JL.

DISTRIBUTION. — *Parashiela ambulata* is reported in the Indo-West Pacific from the northern part of Australia to Japan, through the Indian Ocean to the Red Sea (van Gemert 2016: 7). Nearly 2 000 specimens of this species have been isolated in the material examined, from the Australes (Banc Mac Donald, Marotiri, Rapa, Récif Neilson, Banc Président Thiers, Tubuai, Rurutu, Rimatara), Tuamotu (Moruroa, Makemo, Katiu, Raroia), Gambier, Society Islands (Tahiti, Tetiaroa, Motu One), with 881 live specimen collected at 2-57 m depth (Fig. 51A).
Parashiela ambulata Laseron, 1956 is sympatric with *P. obesula* n. sp. in the Australes (Rurutu); with *P. expansilabrum* n. sp. in the Australes (Rurutu), Tuamotu (Makemo), Society (Tahiti); with *P. rimatara* n. sp. in the Australes (Rimatara); with *P. rotundata* n. sp. in the Society (Tahiti) and Tuamotu (Makemo) (Table 5).

DIAGNOSIS. — *Parashiela* large for the genus, height <2.0 mm, ovate-conic. Protoconch multispiral. Teleoconch with one strong, spiral cordlet, and strong axial ribs extending to the base. Microsculpture of spirally arranged microgranules. Peristome duplicated, almost circular, outer lip orthocline or slightly prosocline, with varix. Non-umbilicate or with narrow fissure. Colouration variable: uniform from white to brown or with spots or bands. For the soft parts see Ponder (1985).

FIG. 26. — *Parashiela ambulata* Laseron, 1956: **A**, Australes, Rapa, N of Aturapa I., 2-4 m, height 1.80 mm, MNHN; **B**, Australes, Rimatara, 920-930 m, height 1.67 mm, MNHN; **C**, Australes, Rapa, Vavai, 15-20 m, height 1.60 mm, MNHN; **D**, Australes, Rapa, N of Aturapa I., 2-4 m, height 1.60 mm, MNHN; **E**, Australes, Rapa, N of Aturapa I., 2-4 m, height 1.63 mm, MNHN; **F**, Australes, Banc Président Thiers, 500-850 m, height 1.50 mm, MNHN; **G**, Australes, Rapa, Rarapai I., 18 m, height 1.53 mm, MNHN; **H**, Australes, Rapa, Pointe Mei, 16-20 m, height 1.33 mm, MNHN; **I**, Australes, Rapa, Vavai, 15-20 m, height 1.37 mm, MNHN; **J**, Australes, Rapa, Rarapai I., 18 m, height 1.47 mm, MNHN; **K**, Australes, Rapa, Vavai, 15-20 m, height 1.42 mm, MNHN; **L**, Australes, Rapa, Pointe Mei, 16-20 m, height 1.50 mm, MNHN.

DESCRIPTION (BASED ON POLYNESIAN SPECIMENS)

Shell (Figs 25; 26)

Large for the genus, height 0.85-1.90 mm, height/width ratio 1.53-1.91, rather solid, ovate-conical.

Protoconch (Fig. 25F, G)

Multispiral of 1.30-1.80 whorls, height 0.212-0.260 mm, nucleus diameter 0.067-0.087mm, first half whorl diameter 0.100-0.160 mm, maximum diameter 0.237-

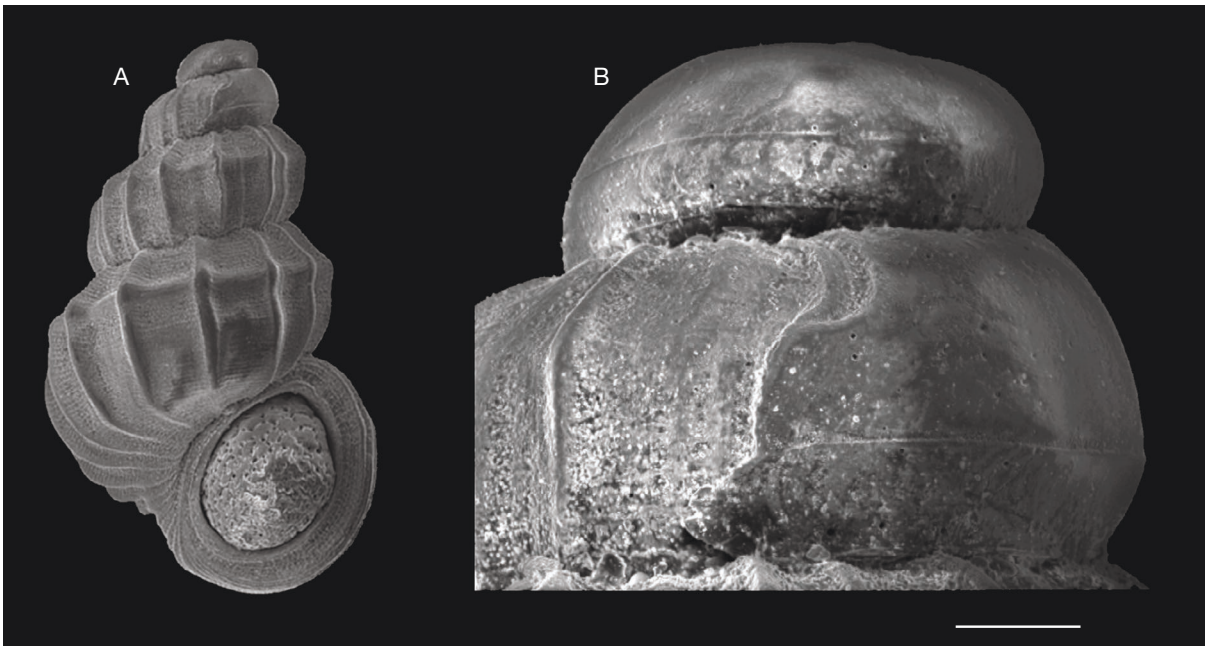

Fig. 27. — *Parashiela* sp.: Cape Verde, height 1.32 mm, coll. Carlo Smriglio, Roma: **A**, shell; **B**, detail of the protoconch microsculpture. Scale bars: B, 50 µm.

0.280 mm; protoconch I with 5 very thin spiral chains of microgranules, protoconch II with a thin spiral cordlet on the lower third. Protoconch I and II boundary very weak. Protoconch-teleoconch boundary marked, with a sinusigera notch (Fig. 25F).

Teleoconch

Teleoconch of 3.15-3.90 convex whorls with a keel, adapical on the first whorl, then central on the remaining whorls. Axial sculpture on the last whorl of 10-39 thin ribs prosocline, reaching the base and entering the umbilical fissure. Interspaces about twice as wide as the axial ribs. Small rounded tubercles at the intersections. Microsculpture of dense threads, made of fused microgranules (Fig. 25E). Umbilical fissure absent or very narrow. Aperture ovate-piriform height 0.52-0.63 mm, height/aperture height ratio 2.38-2.93, peristome duplicate; outer lip prosocline, slightly sinuous, internally smooth, expanded and strongly thickened, by numerous and appressed growth striae, columellar lip bent medially.

Colour

Uniform white to brown, with or without spiral bands, or spots, or blotches.

Operculum and soft parts

Operculum as for the genus. For the morphology of soft parts see Ponder (1985).

Variability

Specimens from Polynesia are rather variable, in the colouration (see Fig. 26A-L), in the number and strength of the axial sculpture (10-39 ribs) (see also Hasegawa 2006b: 109) and in size: minimum adult height 0.85 mm (from Society, Tahiti), maximum 1.90 mm (from Australes, Rapa). Frequently the number and strength of axial ribs vary in different whorls of the same specimen (see Table 4 and Appendix 9).

Remarks

The type series of 11 specimens (holotype AMS-C.102467 and 10 paratypes AMS-C.109001), includes some not completely adult specimens with faint lip thickening. Laseron (1956: 439), while describing the species, merged features of the holotype with variation in the type series; among the characters of a single specimen (likely the holotype) he gave a height of 1.6 mm, lack of a thick labial varix, and 14 ribs on the body whorl and about 16 on the penultimate whorl, and the original drawing shows a very faint lip thickening; the paratype in Fig. 24D, E has 14 ribs on the body whorl and 16 on the penultimate whorl. We suspect that there might have been an unfortunate swap of specimens and that the specimen currently marked as 'holotype' (Fig. 24A, B) 1.8 mm high, with a well thickened lip, is not the one selected by Laseron. This seems to be confirmed by Ladd (1966: 64, pl. 12, figs 8, 9) who diagnosed his *Parashiela beetsi* from *P. ambulata* basically due to the different conformation of the lip: double peristome thickened to form a low varix in *P. beetsi*, simple peristome not thickened in *P. ambulata*.

It is possible that a complex of species is hidden under the name *P. ambulata*. This species is reported from a remarkably wide geographic range (from Red Sea to Polynesia: see e.g. Ponder 1985: 51, 153, fig. 29, 104A-G; Ekawa 1991: 42, pl. 1, figs 1, 7; 1993: 79, pl. 2, figs 16-17; Hasegawa 2000: 151, pl. 75, fig. 11, two figures; 2006: 109, fig 5A, B; Blatterer & Blatterer 2019: 119, fig. 3a, b). Additionally, we have examined two specimens of *Parashiela* from Cape Verde (Eastern Atlantic Ocean; coll. Carlo Smriglio, Roma) (Fig. 27A, B) very

similar to the types of *P. ambulata* (Fig. 23A-E). Criscione *et al.* (2016) sequenced two specimens morphologically ascribable to *P. ambulata*, from the Society Islands and Fiji, respectively, with a resulting not negligible genetic divergence. The numerous specimens examined by us from the Australes, Tuamotu, Gambier and Society, are not morphologically separable from *P. ambulata* Laseron, 1956, but also showed a remarkable variability. We therefore use *Parashiela ambulata* for the Polynesian material, conservatively, pending additional comparative studies, ideally including genetic data.

See under *P. expansilabrum* n. sp. and *P. rimatara* n. sp. for detailed comparisons.

Parashiela expansilabrum n. sp.
(Figs 28; 51B; 53J; Tables 4; 5; 6)

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Parashiela sp. 2 – Boutet *et al.* 2020: 240.

TYPE MATERIAL. — **Holotype. Australes** • dd (height 1.47 mm, width 1.00 mm, Figs 28A-C, F-J; 53J); Rimatara, BENTHAUS Stn DW 2020; 22°37'1"S, 152°49'1"W; 920-930 m; 25.XI.2002; MNHN-IM-2000-38712.
Paratype. Australes • 1 dd; same locality data as holotype; MNHN-IM-2000-38713.

TYPE LOCALITY. — Australes: Rimatara, BENTHAUS Stn DW 2020; 22°37'1"S, 152°49'1"W; 920-930 m.

OTHER MATERIAL EXAMINED. — **Society Islands** • 3 dd; Tahiti, Tiarei; 17°32'34"S, 149°20'27"W; <1 m depth; fringing reef flat; coll. JL • 6 dd; Tahiti, Arue, Matavai Bay; 17°31'1"S, 149°30'35"W; 16 m depth; coll. JL • 4 dd; Tahiti, Faille d'Arue; 17°31'1"S, 149°31'30"W; 15-61 m depth; coll. JL • 5 dd; Tahiti, Motu Uta; 17°31'51"S, 149°34'51"W; 20 m; wreck, behind breakwater; coll. JL • 1 dd; Moorea; 17°34'1"S, 149°46'58"W; 85 m; coll. JL • 1 dd; Huahine, TARASOC Stn DW3426; 16°40'58"S, 151°3'0"W; 801-874 m; MNHN • 1 dd; Raiatea; 16°44'27"S, 151°30'21"W; 85 m; outer slope; coll. MB.
Tuamotu • 2 dd; Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 47-54 m; coll. JL • 1 dd; Rangiroa, Passe Tiputa; 14°58'1"S, 147°37'33"W; 100 m; coll. JL.
Australes • 1 dd; Rurutu, Vitaria; 22°28'44"S, 151°21'14"W; 51 m; coll. JL.

DISTRIBUTION AND SYMPATRY. — The species is known from the South Pacific Ocean in the Australes (Rurutu, Rimatara), Society Islands (Tahiti, Moorea, Huahine), Tuamotu (Makemo, Rangiroa), with only empty shells collected at 1-100 m depth, but also at 801-930 m depth; we consider that the deeper samples were carried downslope from upper habitats, all known *Parashiela* being rather shallow water species. (Fig. 51B).
Parashiela expansilabrum n. sp. is sympatric with *P. rimatara* n. sp. in the Australes (Rimatara); with *P. ambulata* Laseron, 1956 in the Australes (Rimatara), Tuamotu (Makemo), Society (Tahiti); with *P. obesula* n. sp. in the Australes (Rurutu) (Table 5).

ETYMOLOGY. — For the particular conformation of the aperture, from the Latin *expansus* – expanded, *labrum* – lip. Used as a noun in apposition.

DIAGNOSIS. — *Parashiela* of medium size for the genus, height <1.55 mm. Protoconch multispiral. Teleoconch with flexuose axial ribs, rather robust for the genus, reaching the base and entering the narrow umbilical fissure; whorls with a weak triple anglulation on the last whorl. Spiral sculpture of only a thin suprasutural cordlet on the first whorl, changing into a weak angulation in subsequent whorls. Dense microsculpture of spirally arranged microgranules. Peristome duplicated, with thick and broad varix crossed by evident growth striae.

DESCRIPTION OF HOLOTYPE
Shell (Figs 28A-C, F-J; 53J)
Medium size for the genus, height 1.47 mm, width 1.00 mm, height/width ratio 1.47, rather robust, ovate-conical.

Protoconch (Fig. 28G, H)
Multispiral, low, of 1.30 whorls, height 0.200 mm, nucleus diameter 0.100 mm, first half whorl diameter 0.162 mm, maximum diameter 0.237 mm; protoconch I and protoconch II almost smooth, with a thin spiral thread on the lower third. Protoconch I-II boundary weak, sinuous (Fig. 28G, H).

Protoconch-teleoconch boundary marked, with a sinusigera notch.

Teleoconch
Of 3.25 convex whorls with slight shoulder on upper whorls and a triple slight angle on last whorl. Axial sculpture on last whorl of 18 thin ribs, robust for the genus, flexuose, slightly prosocline, reaching the base and entering the narrow umbilical fissure. Interspaces twice to three times as wide as the axial ribs. Macro spiral sculpture of only a weak and thin suprasutural cordlet on the first whorl, changing into a weak angulation in subsequent whorls. Microsculpture of spirally arranged microgranules. (Fig. 28I, J). Umbilical fissure evident, narrow. Aperture ovate-piriform, height 0.67 mm, height/aperture height ratio 2.19, with continuous duplicated peristome; outer lip orthocline, sinuous, smooth internally, very expanded and thickened, with numerous growth striae; columellar lip slightly angled.

Colour
Colouration whitish.

Operculum and soft parts
Unknown.

VARIABILITY
Size: minimum adult height: 1.12 mm (from Tahiti), maximum: 1.55 mm (from Tuamotu) (see Table 4 and Appendix 10).

REMARKS
Parashiela invisibilis differs from *P. expansilabrum* n. sp. in the presence of spiral cordlets on the whorls, absent in *P. expansilabrum* n. sp., and in a higher height/width ratio (1.67 vs 1.33-1.47 in *P. expansilabrum* n. sp.).

Parashiela liddelliana differs from *P. expansilabrum* n. sp. in its more slender shell with a broader shoulder; in its smaller aperture without any expansion of the outer lip; in the narrower last whorl, base, and umbilical fissure.

Parashiela ambulata differs from *P. expansilabrum* n. sp. in the presence of spiral cordlets on the whorls, absent in *P. expansilabrum* n. sp.

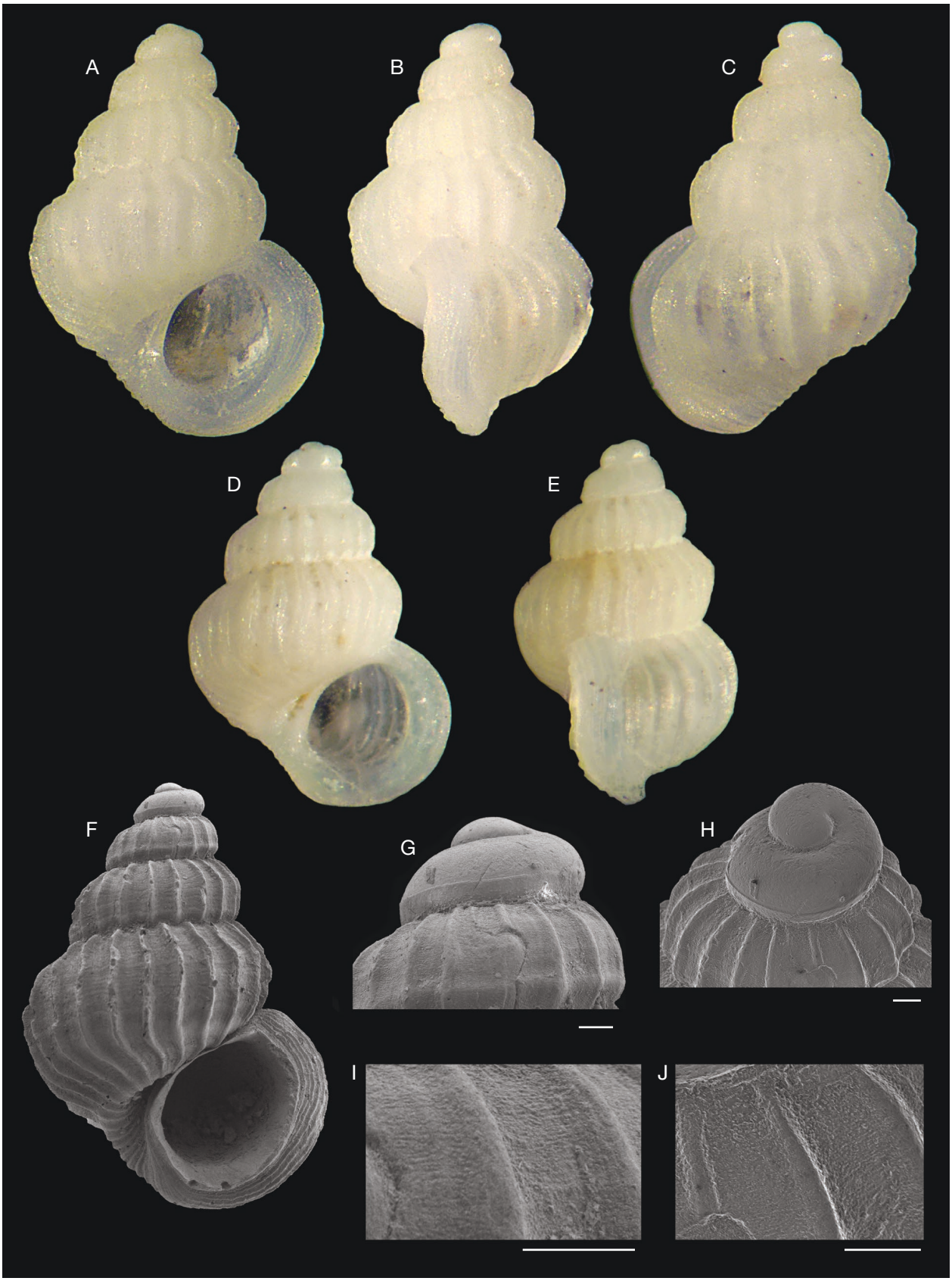


FIG. 28. — *Parashiela expansilabrum* n. sp.: **A**-**C**, **F**-**J**, holotype. Australes, Rimatara, BENTHAUS Stn DW 2020, 920-930 m, 920-930 m, height 1.47 mm, MNHN-IM-2000-38712 shell (**A**-**C**, **F**), details of the first whorls (**G**, **H**), details of the teleoconch microsculpture (**I**, **J**); **D**, **E**, Society, Huahine, TARASOC DW3426, 801-874 m, height 1.38 mm, MNHN. Scale bars: G-J, 40 µm.

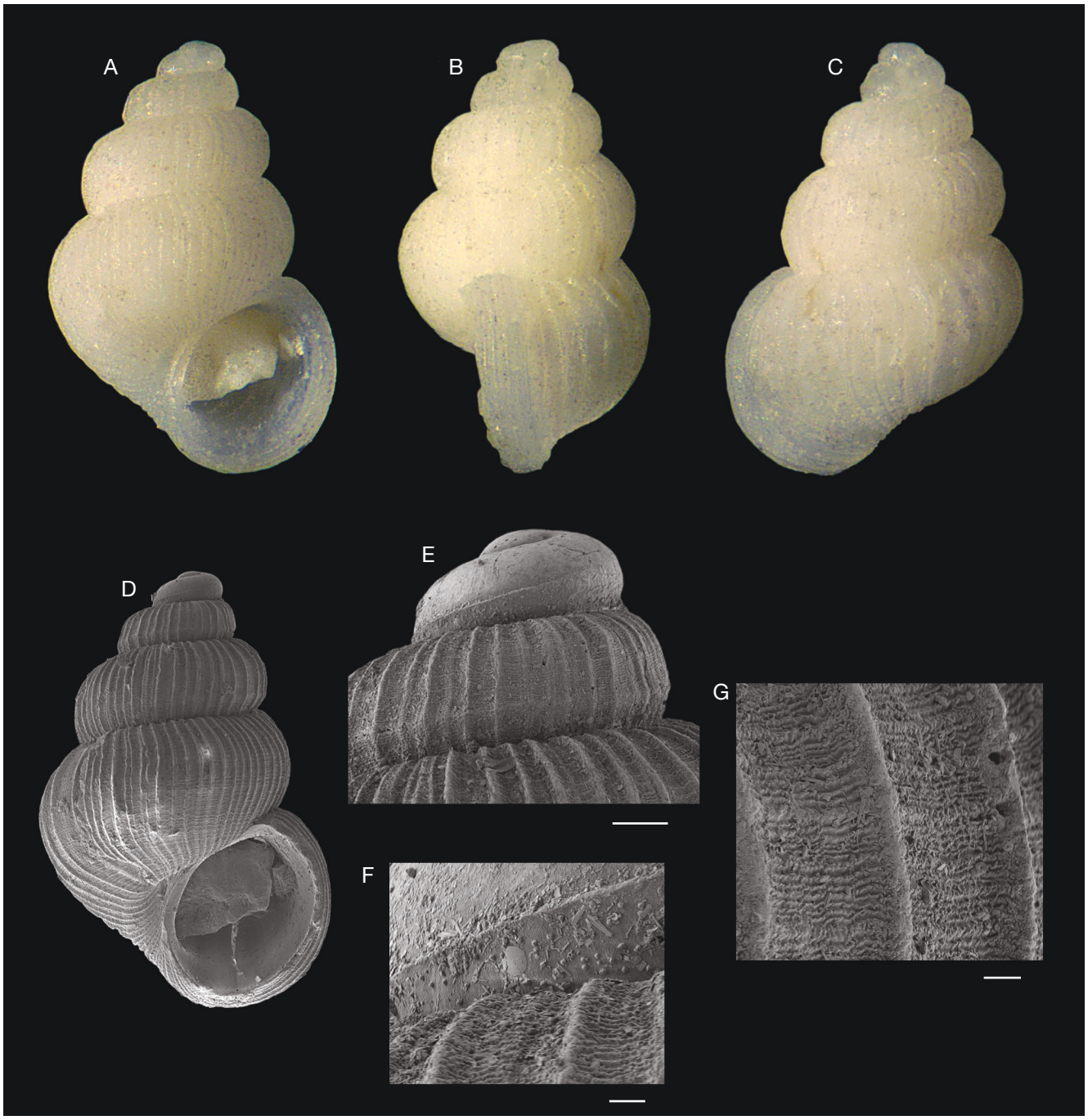


Fig. 29. — *Parashiela obesula* n. sp.: holotype. Australes, Rurutu, Stn BENTHAUS DW2010, 520-950 m, height 1.32 mm, width 0.88 mm, MNHN-IM-2000-38714: **A**-**D**, shell; **E**, **F**, detail of the first whorls; **G**, detail of the microsculpture of the teleoconch. Scale bars: E, 40 µm, F, G 10 µm.

Parashiela rimatara n. sp. differs from *P. expansilabrum* n. sp. in its more slender and delicate shell; in the axial ribs thinner and more numerous (26-54 vs 18-24 in *P. expansilabrum* n. sp.); in the higher height/width ratio (1.53 vs 1.33-1.47 in *P. expansilabrum* n. sp.), narrower interspaces, narrower labial varix without any expansion of the lip; in the lack of angles at the body-whorls vs three weak angles on the last whorl in *P. expansilabrum* n. sp.

See under *P. soniae* n. sp. for detailed comparisons.

Parashiela obesula n. sp.
(Figs 29; 51C; 53K; Tables 4; 5; 6)

urn:lsid:zoobank.org:act:8E9BA374-355A-4140-AA62-97657B1A62F5

Type material. — **Holotype. Australes** • dd (height 1.32 mm, width 0.88 mm, Figs 29; 53K); S of Rurutu, BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN-IM-2000-38714.

Paratypes. Australes • 2 dd; same locality data as holotype; MNHN-IM-2000-38715.

TYPE LOCALITY. — Australes: S of Rurutu; BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m.

DISTRIBUTION AND SYMPATRY. — The species is at present known in the South Pacific Ocean from the Australes (Rurutu) (Fig. 51C), where it is sympatric with *P. ambulata* Laseron, 1956 and *P. expansilabrum* n. sp. (Table 5).

ETYMOLOGY. — From the Latin *obesus, -a, -um* meaning plump or fat, referring to the plump outline (*-ula* is a diminutive suffix).

DIAGNOSIS. — *Parashiela* small for the genus, height 1.07-1.32 mm. Protoconch multispiral. Teleoconch with numerous, thin axial ribs, entering the umbilical fissure; convex whorls with no angles, macro spiral sculpture of only a thin suprasutural cordlets on the first whorl, vanishing on the second whorl. Microsculpture of dense spiral threads, some more marked. Peristome duplicated, with moderately thickened varix crossed by evident growth striae.

DESCRIPTION OF HOLOTYPE

Shell (Figs 29A-D; 53K)

Small for the genus, height 1.32 mm, width 0.88 mm, height/width ratio 1.50, rather robust, ovate-conical.

Protoconch (Fig. 29E, F)

Multispiral, dome-shaped, of 1.35 whorls, height 0.200 mm, nucleus diameter 0.063 mm, first half whorl diameter 0.137 mm, maximum diameter 0.250 mm; protoconch I devoid of sculpture, protoconch II with only a thin spiral cordlet on lower third and microtubercles on the abapical area (Fig. 29F). Protoconch I-II boundary weak, sinuous. Protoconch-teleoconch boundary marked, with a sinusigera notch.

Teleoconch

Of 3.15 convex whorls, with a weak cordlet on the first whorl, fading and eventually disappearing on the second whorl. Axial sculpture on the last whorl of 37 thin, flexuose, slightly prosocline ribs, reaching the base and entering the umbilical fissure. Interspaces twice as wide as axial ribs, sculptured by numerous spiral threads, some thicker and more marked (Fig. 29G). Very narrow umbilical fissure. Aperture ovate-piriform height 0.58 mm, height/aperture height ratio 2.28; peristome continuous, duplicated; outer lip prosocline, slightly sinuous, smooth internally, externally expanded and very thickened, with numerous growth striae; columellar lip slightly angled medially.

Colour

Whitish colouration.

Operculum and soft parts

Unknown.

VARIABILITY

Only three specimens examined, all adults: no significant variation detected (see Table 5 and Appendix 11).

REMARKS

See under *P. rimatara* n. sp. and *P. rotundata* n. sp. for detailed comparisons.

Parashiela rimatara n. sp.
(Figs 30; 51C; 53L; Tables 4; 5; 6)

urn:lsid:zoobank.org:act:F4FD4FFA-0A9C-4905-B91D-53CA21E1CCC4

TYPE MATERIAL. — **Holotype. Australes** • dd (height 1.53 mm, width 1.00 mm, Figs 30A-C, E-I, 53L); Rimatara, BENTHAUS Stn DW2021; 22°37'1"S, 152°48'36"W; 1200-1226 m; 25.XI.2002; MNHN-IM-2000-38716.
Paratype. Australes • 1 dd (height 1.33 mm, Fig. 30D); Rimatara, BENTHAUS Stn DW2020; 22°37'1"S, 152°49'1"W; 920-930 m; 25.XI.2002; MNHN-IM-2000-38717.

TYPE LOCALITY. — Australes: Rimatara, BENTHAUS Stn DW2021; 22°37'1"S, 152°49'1"W; 1200-1226 m.

OTHER MATERIAL EXAMINED. — **Australes** • 1 dd; S of Rurutu; BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN.

DISTRIBUTION AND SYMPATRY. — The species is at present known in the South Pacific Ocean from the Australes Islands (Rimatara, Rurutu) (Fig. 51C), where it is sympatric with *P. ambulata* Laseron, 1956 (Rimatara, Rurutu) and with *P. expansilabrum* n. sp. (Rimatara) (Table 5).

ETYMOLOGY. — The name is based on the type locality, Rimatara Island, used as a noun in apposition.

DIAGNOSIS. — *Parashiela* of medium size for the genus, height *c.* 1.50 mm. Protoconch multispiral. Teleoconch with numerous thin axial ribs, entering the umbilical fissure; convex, non angular whorls, macro spiral sculpture of only a thin suprasutural cordlets on the first whorl, vanishing on the last whorl. Microsculpture of dense spiral threads, some thicker and more marked. Peristome duplicated, with moderately thickened varix crossed by evident growth striae.

DESCRIPTION OF HOLOTYPE

Shell (Figs 30A-C, E; 53L)

Medium size for the genus, height 1.53 mm, width 1.00 mm, height/width ratio 1.53, not very robust, ovate-conical.

Protoconch (Fig. 30F, G)

Multispiral, rather acute, of 1.4 whorls, height 0.185 mm, nucleus diameter 0.625 mm, first half whorl diameter 0.125 mm, maximum diameter 0.250 mm; protoconch I devoid of sculpture, protoconch II with only a thin spiral cordlet on the lower third. Protoconch I-II boundary very weak, sinuous (Fig. 30F, G). Protoconch-teleoconch boundary marked, with a sinusigera notch.

Teleoconch

Of 3.6 convex whorls, with barely evident double angle on the last whorl. Axial sculpture on the last whorl of 26 thin, flexuose, orthocline ribs, reaching the base and entering the umbilical fissure. Interspaces twice or three times as wide as the axial ribs. Macro spiral sculpture of only a weak and thin suprasutural cordlet on the first whorls, vanishing already from the penultimate whorl (Fig. 30F). Microsculpture of groups of 5-6 fine spiral threads, alternating with some thicker and more marked (Fig. 30H, I). Umbilical fissure evident. Aperture round-ovate height 0.65 mm, height/aperture height ratio

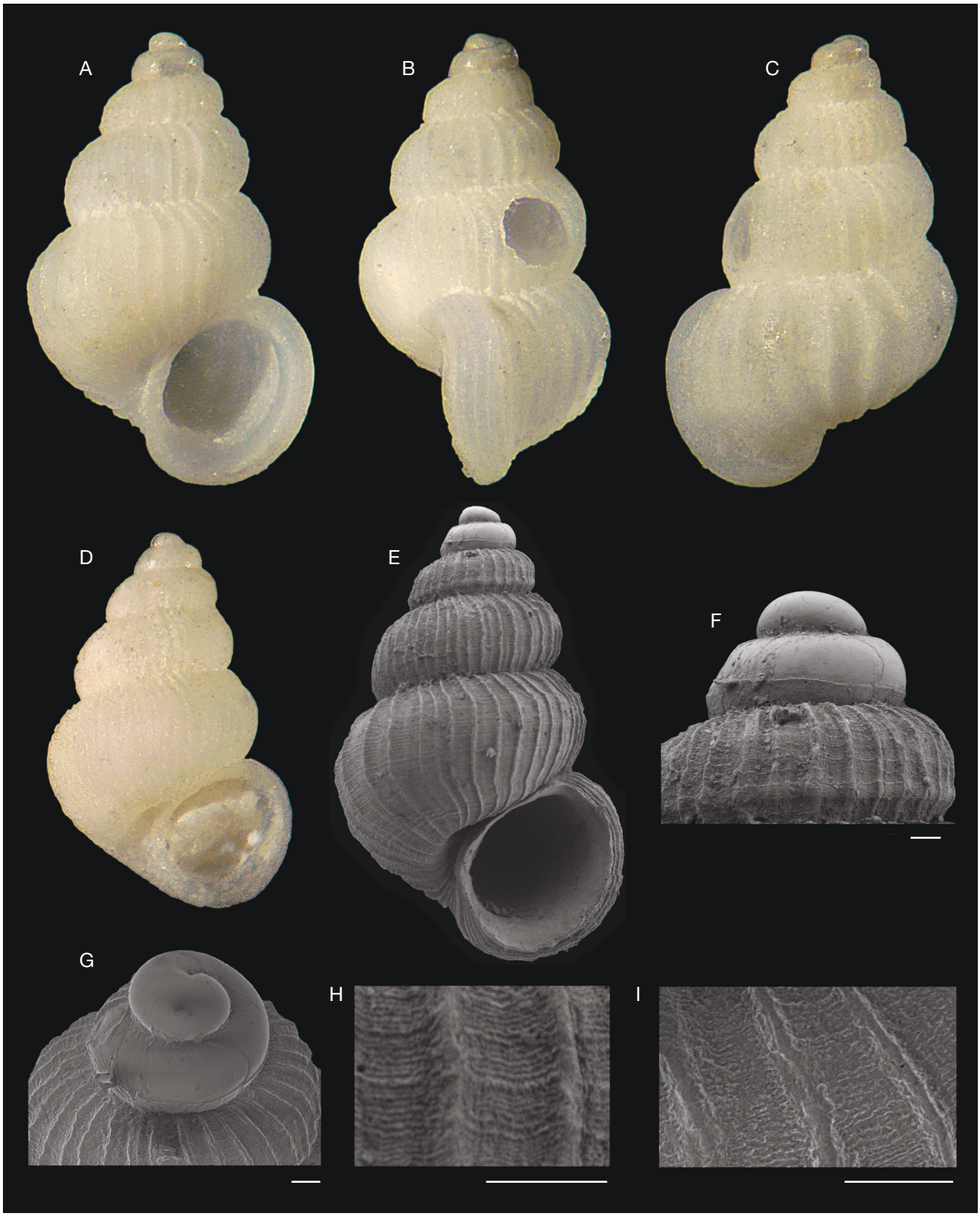


FIG. 30. — *Parashiela rimatara* n. sp.: **A**-**C**, **E**-**I**, holotype, Australes, Rimatara, 1200-1226 m, height 1.53 mm, width 1.00 mm, MNHN-IM-2000-38716; **D**, paratype, Australes, Rimatara, height 1.38 mm, MNHN-IM-2000-38717: shell (**A**-**C**, **E**), details of the first whorls (**F**, **G**.), details of the microsculpture of the first whorl the teleoconch (**H**, **I**). Scale bars: F-I 40 µm.

2.354, peristome duplicated; outer lip orthocline, sinuous, smooth internally, scarcely thickened externally, with numerous growth striae; columellar lip slightly angled.

Colour
Whitish colouration.

Operculum and soft parts
Unknown.

VARIABILITY
Only three specimens examined, all adults, not very variable in shape, but with a remarkable variation in the number of axial ribs on the last whorl, 26, 28 and 54 (Table 5 and Appendix 12).

REMARKS
Parashiela ambulata Laseron, 1956 differs from *P. rimatara* n. sp. in its more robust and larger shell (height 1.85 mm vs height 1.53 mm in *P. rimatara* n. sp.); in the whorl two medially angled with a spiral cordlet vs whorls with barely evident double angle, devoid of major spiral cordlets (only one minor suprasutural cordlet on the first whorls) in *P. rimatara* n. sp.; the umbilical fissure absent or very narrow, more evident in *P. rimatara* n. sp.

Parashiela invisibilis (Hedley, 1899) differs from *P. rimatara* n. sp. in the four spiral cordlets on the last whorl (2 above the aperture) vs only one minor suprasutural cordlet on the first whorls in *P. rimatara* n. sp.

Parashiela liddelliana (Hedley, 1907) differs from *P. rimatara* n. sp. in the lack of umbilical fissure, present in *P. rimatara* n. sp.; the smaller size (height 1.20 mm vs 1.38-1.53 mm in *P. rimatara* n. sp.); the fewer axial ribs with wider interspaces (*c.* 20 vs 26-54 in *P. rimatara* n. sp.).

Parashiela obesula n. sp. differs from *P. rimatara* n. sp. in its slightly more obtuse outline; the thinner and less acute ribs and the narrower umbilical fissure.

See under *P. expansilabrum* n. sp., *P. rotundata* n. sp. and *P. soniae* n. sp. for detailed comparisons.

Parashiela rotundata n. sp.
(Figs 31; 51C; 53M; Tables 4; 5; 6)

urn:lsid:zoobank.org:act:EA50A8A2-ACE6-436B-B867-65EF828766AC

TYPE MATERIAL. — **Holotype. Society Islands** • dd (height 1.10 mm, width 0.77 mm, Figs 31, 53M) • Tahiti, Arue, Matavai Bay; 17°31'1"S, 149°30'35"W; 16-25 m; J. Letourneux leg.; MNHN-IM-2000-38718. **Paratypes. Society Islands** • 5 dd; same locality data as holotype; MNHN-IM-2000-38719.

TYPE LOCALITY. — Society Islands: Tahiti, Arue, Matavai Bay; 17°31'1"S, 149°30'35"W; 16-25 m.

OTHER MATERIAL EXAMINED. — **Society Islands** • 35 dd; Tahiti, Tiarei; 17°32'34"S, 149°20'27"W; <1 m; fringing reef flat; coll. JL • 27 dd; Tahiti, Papeete, Motu Uta; 17°31'51"S, 149°34'51"W; 20 m; wreck, behind breakwater; coll. JL • 20 dd; Moorea; 17°34'1"S, 149°46'58"W; 85 m; coll. JL.

Tuamotu • 4 dd; Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 47-54 m; coll. JL • 4 dd; Rangiroa, Passe Tiputa; 14°58'1"S, 147°37'12"W6; 100 m; coll. JL.

DISTRIBUTION AND SYMPATRY. — The species is at present known in the South Pacific Ocean from Society Islands (Tahiti, Moorea) in <1-85 m, and the Tuamotu (Makemo, Rangiroa) in 47-100 m (Fig. 51C).
Parashiela rotundata n. sp. is sympatric with *P. expansilabrum* n. sp. in the Society (Tahiti) and the Tuamotu (Makemo, Rangiroa); with *P. ambulata* (Laseron, 1956) in the Society (Tahiti) and the Tuamotu (Makemo) (Table 6).

ETYMOLOGY. — Referring to the rounded outline, from the Latin *rotundatus, -a, -um*, rounded.

DIAGNOSIS. — *Parashiela* of small size for the genus, height *c.* 1 mm. Protoconch multispiral. Teleoconch with numerous, thin and low axial ribs, only a partly of them entering the umbilical fissure; convex whorls with no angles, absence of macro spiral sculpture. Microsculpture of groups of 3-4 thin threads, separated by micro furrows. Peristome duplicated, with moderately thickened varix, crossed by evident growth striae.

DESCRIPTION OF HOLOTYPE
Shell (Figs 31A-D; 53M)
Small for the genus, height 1.10 mm, width 0.77 mm, height/width ratio 1.43, rather robust, ovate-conical.

Protoconch (Fig. 31E, F)
Multispiral, low, of 1.35 whorls, height 0.162 mm, nucleus diameter 0.062 mm, first half whorl diameter 0.137 mm, maximum diameter 0.262 mm; protoconch I devoid of sculpture, protoconch II with only a thin spiral cordlet on the lower third. Protoconch I-II boundary weak, sinuous. Protoconch-teleoconch boundary marked, with a sinusigera notch (Fig. 31E).

Teleoconch
Of 2.75 convex whorls. Axial sculpture on the last whorl of 26 thin, flexuose, slightly prosocline ribs, only half of them (every other one) reaching the base and entering the umbilical fissure; interspaces three times as wide as axial ribs. Spiral microsculpture of groups of 3-4 thin threads, separated by micro furrows (Fig. 31G). Umbilical fissure open. Aperture ovate-piriform height 0.50 mm, height/aperture height ratio 2.20, with peristome duplicated; outer lip prosocline, slightly sinuous, internally smooth, externally very thickened and with numerous growth striae; columellar lip slightly angular.

Colour
Colouration white.

Operculum and soft parts
Unknown.

VARIABILITY
Species not very variable (See Table 5 and Appendix 13).

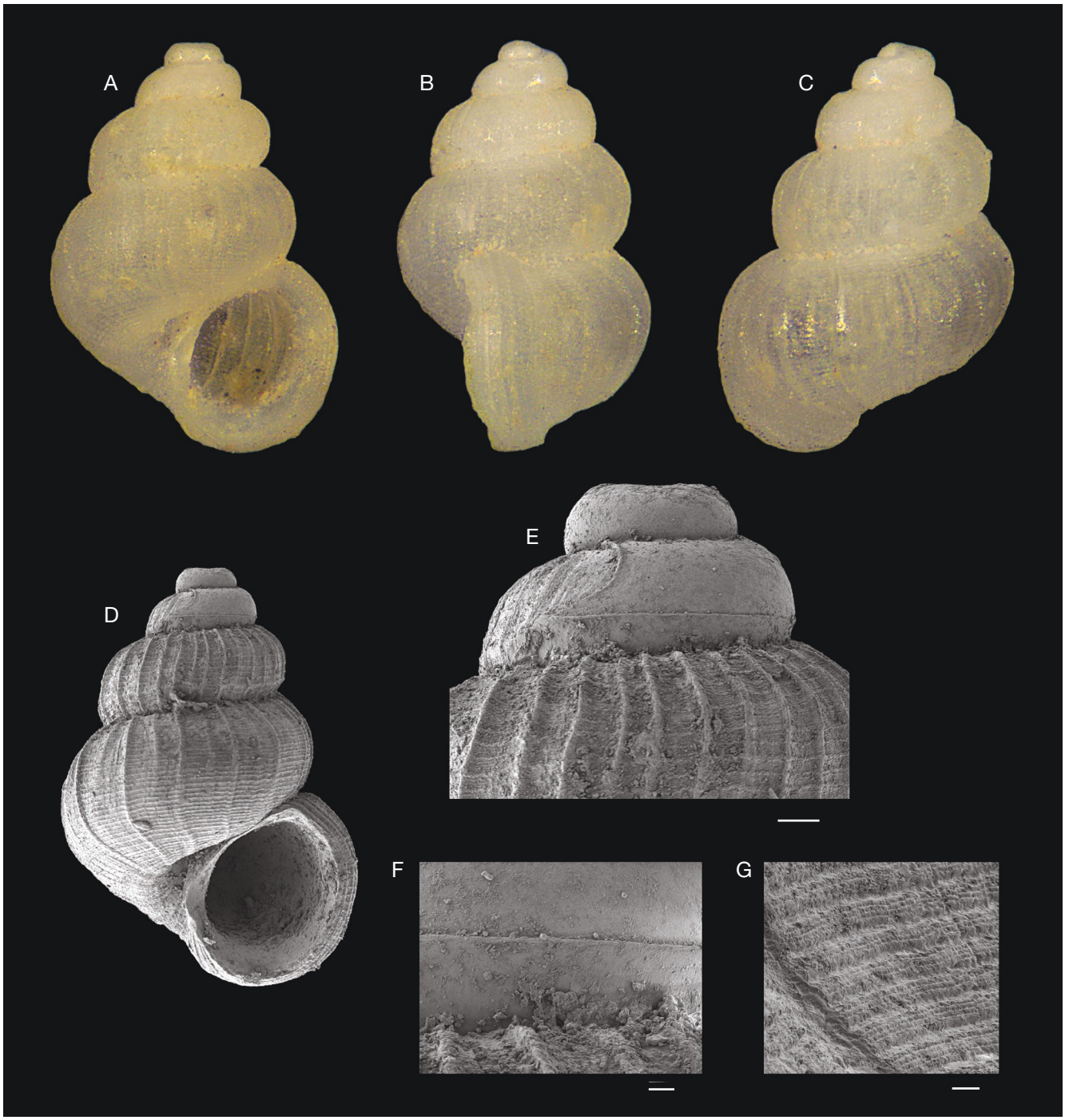


Fig. 31. — *Parashiela rotundata* n. sp.: holotype. Society, Tahiti, Arue, Matavai Bay, 16-25 m, height 1.10 mm, width 0.77 mm, MNHN-IM-2000-38718: **A**-**D** shell; **E**, **F** details of the first whorls; **G**, details of the microsculpture of the teleoconch. Scale bars: E, 40 µm, F, G, 10 µm.

Remarks

Parashiela obesula n. sp. differs from *P. rotundata* n. sp. in its narrower base and umbilical fissure; the more numerous axial ribs (37-41 vs 26-34 in *P. rotundata* n. sp.); the microsculpture of groups of 5-6 thin striae vs groups of 3-4 thin striae divided by microfurrows in *P. rotundata* n. sp.; the higher protoconch.

Parashiela rimatara n. sp. differs from *P. rotundata* n. sp. in the larger size (height 1.38-1.53 mm vs 0.81-1.17 mm in *P. rotundata* n. sp.); the less convex whorls; the axial ribs all entering the umbilical fissure vs half of the ribs (every two) not reaching the base in *P. rotundata* n. sp.; the more numerous axial ribs (40 vs 26 in *P. rotundata* n. sp.; the microsculpture of 5-6 threads alternating some thicker and more marked vs groups of 3-4 thin threads separated by microfurrows in *P. rotundata* n. sp.

See under *P. soniae* n. sp. for detailed comparisons.

TABLE 5. — Measurements of teleoconch and protoconch of Polynesian species of *Parashiela* Laseron, 1956, in mm, with minimum-maximum range and mean [standard deviation in square parentheses]; sample size in parentheses after the species name; **M**, protoconch multispiral; **P**, protoconch paucispiral.

	***Haurakia marmorata* Iredale, 1915 (10)**	***Parashiela ambulata* Laseron. 1956 (10)**	***Parashiela expansilabrum* n. sp. (10)**	***Parashiela obesula* n. sp. (3)**	***Parashiela rimatara* n. sp. (3)**	***Parashiela rotundata* n. sp. (10)**	***Parashiela soniae* n. sp. (10)**
Teleoconch							
Height	1.80-2.25	1.33-1.72	1.12-1.55	1.07- 1.32	1.38-1.53	0.81-1.17	0.93-1.17
	1.96	1.58	1.35	1.21	1.44	1.03	1.06
	[0.150]	[0.143]	[0.162]	[0.127]	[0.081]	[0.103]	[0.082]
Width	1.02-1.25	0.83-1.05	0.80-1.09	0.75-0.88	0.90-1.00	0.64-0.80	0.65-0.73
	1.13	0.95	0.94	0.84	0.94	0.73	0.69
	[0.078]	[0.083]	[0.087]	[0.075]	[0.053]	[0.050]	[0.031]
Height/Width ratio	1.65-1.81	1.60-1.82	1.33-1.47	1.40-1.50	1.52-1.53	1.27-1.47	1.43-1.60
	1.73	1.68	1.43	1.44	1.53	1.42	1.54
	[0.0503]	[0.0573]	[0.0622]	[0.0526]	[0.0057]	[0.0582]	[0.0566]
Aperture height	0.72-0.95	0.52-0.63	0.51-0.67	0.45-0.58	0.53-0.65	0.40-0.52	0.43-0.50
	0.81	0.59	0.59	0.53	0.59	0.46	0.46
	[0.075]	[0.044]	[0.056]	[0.072]	[0.060]	[0.038]	[0.026]
Height/aperture height ratio	2.34-2.71	2.58-2.93	2.11-2.42	2.16-2.38	2.35-2.60	2.03-2.34	2.16-2.37
	2.43	2.68	2.27	2.27	2.45	2.22	2.29
	[0.1126]	[0.1123]	[0.1156	[0.1101]	[0.1305]	[0.0871]	[0.07197]
No. whorls	3.15-3.8	3.15-3.90	2.60-3.25	2.90-3.15	3.45-3.60	2.00-2.80	2.20-2.75
	3.48	3.53	3.03	2.98	3.52	2.59	2.52
	[0.259]	[0.275]	[0.246]	[0.144]	[0.076]	[0.228]	[0.172]
No. axial ribs on last whorls	–	19-25	18-24	37-41	26-54	26-34	12-15
		22	20.6	38.7	36	28.4	13.7
		[2.2]	[1.65]	[2.08]	[15.6]	[2.77]	[0.95]
No. spiral cords on last whorls	–	1	1	1	1	no	no
		1	1	1	1	no	no
		[0]	[0]	[0]	[0]	[-]	[-]
Protoconch							
Height	0.212-0.255	0.212-0.260	0.180-0.212	0.175-0.200	0.175-0.185	0.162-0.187	0.225-0.250
	0.236	0.234	0.194	0.192	0.18	0.173	0.234
	[0.0142]	[0.0152]	[0.0115]	[0.0144]	[0.005]	[0.0110]	[0.0078]
Diameter of nucleus	0.050-0.070	0.067-0.087	0.062-0.100	0.063-0.087	0.062-0.075	0.062-0.075	0.075-0.100
	0.060	0.074	0.072	0.075	0.066	0.068	0.095
	[0.0058]	[0.0055]	[0.0111]	[0.0120]	[0.0075]	[0.0058]	[0.0088]
Diameter of first half whorl	0.100-0.150	0.100-0.160	0.125-0.162	0.137-0.150	0.125-0.150	0.125-0.150	0.175-0.195
	0.120	0.142	0.146	0.141	0.137	0.138	0.182
	[0.0144]	[0.0182]	[0.0114]	[0.0075]	[0.0125]	[0.0099]	[0.0076]
Maximum diameter	0.275-0.300	0.237-0.280	0.225-0.275	0.225-0.250	0237-0.250	0.237-0.262	0.237-0.275
	0.282	0.262	0.251	0.237	0.246	0.251	0.254
	[0.0090]	[0.0154]	[0.0199]	[0.0125]	[0.0075]	[0.0070]	[0.0103]
No. of whorls	1.80-2.10	1.30-1.80	1.20-1.40	1.35-1.40	1.35-1.40	1.30-1.40	1.10-1.20
	1.93	1.56	1.36	1.37	1.38	1.35	1.12
	[0.094]	[0.172]	[0.066]	[0.029]	[0.029]	[0.037]	[0.035]
Type	M	M	M	M	M	M	P

Parashiela soniae n. sp.
(Figs 32; 33; 51C; 53N; Tables 4; 5; 6)

urn:lsid:zoobank.org:act:A878ED1E-73A7-4421-A6B5-A47F77EA564F

TYPE MATERIAL. — **Holotype. Marquesas** • dd (height 1.17 mm, width 0.73 mm, Figs 32A-C; 33; 53N); Nuku Hiva, Les 4 grottes, PAKAIHI I TE MOANA Stn MQ2-GR; 8°56'13"S, 140°7'15"W; 20-23 m; 07, 11-13, 29.I.2012; MNHN-IM-2000-38720.

Paratypes. Marquesas • 8 dd, 7 lv (Fig. 32D-H); same locality data as holotype; MNHN-IM-2000-38721.

TYPE LOCALITY. — Marquesas: Nuku Hiva, Les 4 grottes, PAKAIHI I TE MOANA Stn MQ2-GR; 8°56'13"S, 140°7'15"W; 20-23 m.

OTHER MATERIAL EXAMINED. — **Marquesas** • 3 dd, 4 lv; Tahuata PAKAIHI I TE MOANA Stn MQ12-M; 9°58'12"S, 139°7'33"W; 0-1 m; 15.I.2012; MNHN • 4 dd, 6 lv; Ua Pou, Hatu Iti cave, PAKAIHI I TE MOANA Stn MQ27-GR; 9°23'41"S, 140°7'44"W;

Fig. 32. — *Parashiela soniae* n. sp.: **A**-**C**, holotype, Marquesas, Nuku Hiva, 20-23 m, height 1.17 mm, width 0.73 mm, MNHN-IM-2000-38720; **D**-**F**, paratype, Marquesas, Nuku Hiva, same station as holotype, height 1.15 mm, MNHN-IM-2000-38721; **E**, **F**, details of the first whorls; **G**, paratype, Marquesas, Nuku Hiva, same station as holotype, 20-23 m, height 1.09 mm, MNHN-IM-2000-38721; **H**, paratype, Marquesas, Nuku Hiva, same station as holotype, height 0.95 mm, MNHN-IM-2000-38721. Scale bars: E, F, 20 µm.

5-22 m; 25.I.2012; MNHN • 1 dd; Nuku Hiva, Anao Bay; 8°49'40"S, 140°3'32"W; beached; coll. MB• 5 dd, 10 lv; Nuku Hiva, Matateteiko, PAKAIHI I TE MOANA Stn MQ3-GR; 8°55'58"S, 140°13'33"W; 20-25 m; 8.I.2012; MNHN • 1 lv; Hatutu, Hatutaa Cave, PAKAIHI I TE MOANA Stn MQ32-GR; 7°54'25"S, 140°33'57"W; 17-22 m; 27.I.2012; MNHN • 1 dd; Banc Hinakura, PAKAIHI I TE MOANA Stn MQ31-ACH1 2; 7°55'58"S, 140°58'58"W; 120-300 m; 7.I.2012; MNHN.

Distribution and sympatry. — *Parashiela soniae* n. sp. is at present known in the South Pacific Ocean from the Marquesas, with 28 live specimens collected (along with 23 empty shells) in 0-25 m, and an empty shell from Banc Hinakura in 120-300 m (Fig. 51C). No congener collected sympatrically.

Etymology. — Named after Sonia Turchi, wife of one of the authors (ADG).

Diagnosis. — *Parashiela* of small size for the genus (height *c.* 1 mm). Protoconch paucispiral with strong spiral cordlets. Protoconch-teleoconch boundary very marked and sinuous, with slight adapical detachment. Umbilical fissure evident. Teleoconch microsculpture of sparse dense microgranules.

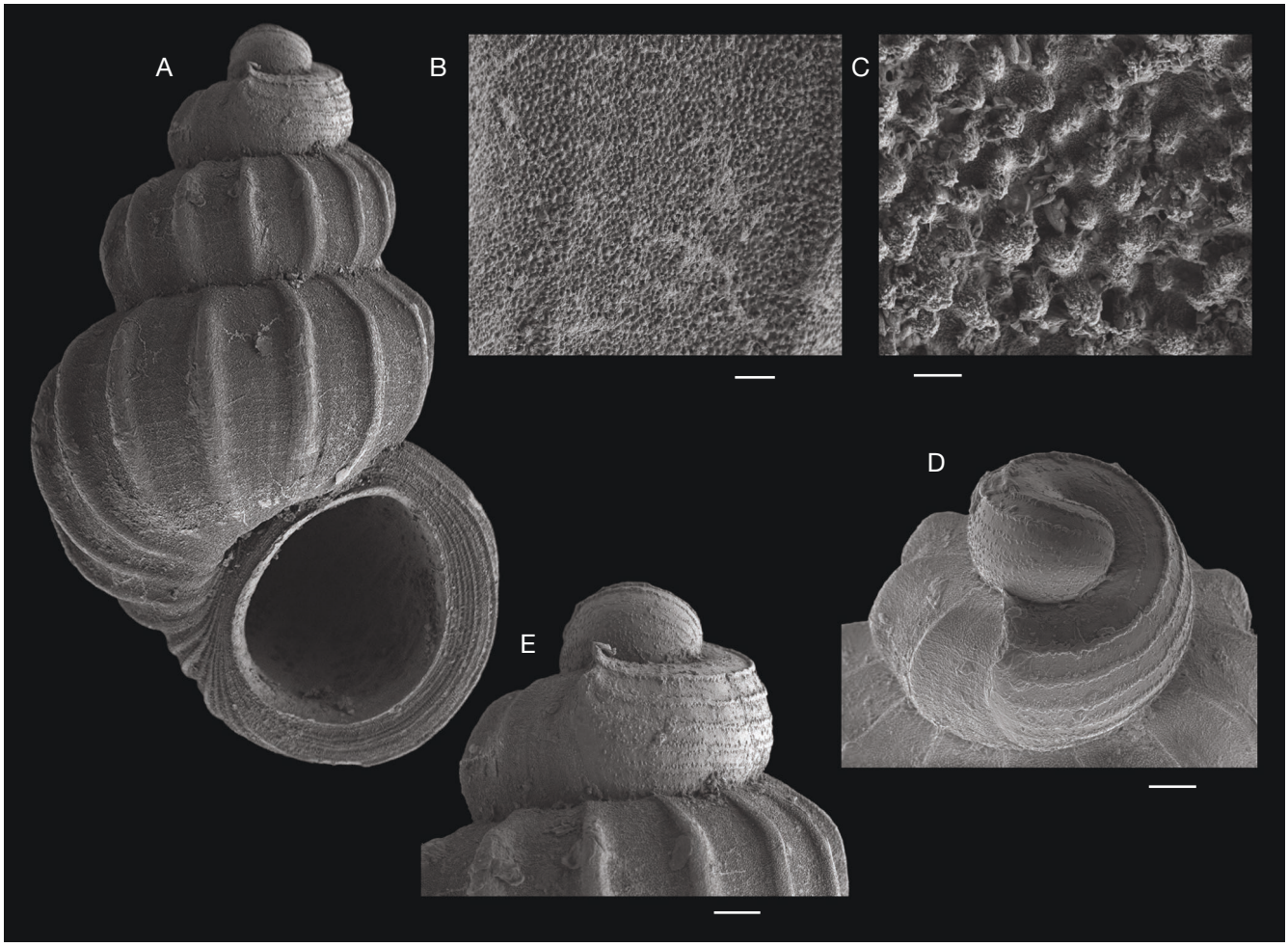


Fig. 33. — *Parashiela soniae* n. sp.: **A**-**E**, holotype, Marquesas, Nuku Hiva, 20-23 m depth, height 1.17 mm, width 0.73 mm, MNHN-IM-2000-38720: shell (**A**); detail of the last whorl microsculpture, subsutural-median portion (**B**, **C**), details of the first whorls (**D**, **E**). Scale bars: B, 10 µm; C, 2 µm; D, E, 40 µm.

Description of holotype

Shell (Figs 32A-C; 33A; 53N)

Small for the genus, height 1.17 mm, width 0.73 mm, height/width ratio 1.60, ovate-conical, rather robust, thick.

Protoconch (Fig. 33D, E)

Paucispiral, with nucleus moderately intorted, of 1.1 convex whorls, height 0.225 mm, nucleus diameter 0.075 mm, first half whorl diameter 0.175 mm, maximum diameter 0.250 mm. Six equidistant strong spiral cordlets made of tightly fused granules (less tightly on nucleus and near the protoconch-teleoconch boundary), the last abapical partially covered by the first teleoconch whorl; an additional adapical thinner cordlet of smaller and less tightly fused granules (Fig. 33D, E). Protoconch-teleoconch boundary very marked, sinuous, with slight adapical detachment (Fig. 33D, E).

Teleoconch

Of 2.75 convex whorls with weak double anglulation on the whorls. Axial sculpture on the last whorl of 14 orthocline and thin ribs, reaching the base and entering the umbilical fissure. Interspaces twice as wide as the axial ribs. Absence of macro spiral sculpture. Microsculpture of dense microgranules vaguely arranged in spiral series (Fig. 33B, C). Umbilical fissure evident. Aperture round-ovate, height 0.50 mm, height/aperture height ratio 2.34; peristome duplicated; outer lip slightly prosocline, internally smooth, externally very thickened and with numerous growth striae; columellar lip slightly angled in the middle.

Colour

Colouration white-yellowish.

Operculum and soft parts

Operculum typical for the genus. Soft parts not examined.

Variability

Based on the examined material, the variability is low (see Table 5 and Appendix 14).

Remarks

Parashiela soniae n. sp. is the first species of the genus formally described, with paucispiral protoconch, indicating non-planktotrophic larval development. However, an unde-

scribed *Parashiela* with a protoconch paucispiral and spirally sculptured, from Madagascar (Indian Ocean, MNHN) was reported by Ponder (1985: 51); another species from Papua New Guinea, https://ingokurtz.jimdofree.com/mollusca-weichtiere/rissoidae/ also has a paucispiral protoconch; it differs from *P. soniae* n. sp. in the presence of an evident subsutural shoulder, absent or very narrow in *P. soniae* n. sp.; the prosocline axial ribs, orthocline or slightly prosocline in *P. soniae* n. sp.; the umbilical fissure very narrow or closed, clearly evident in *P. soniae* n. sp.

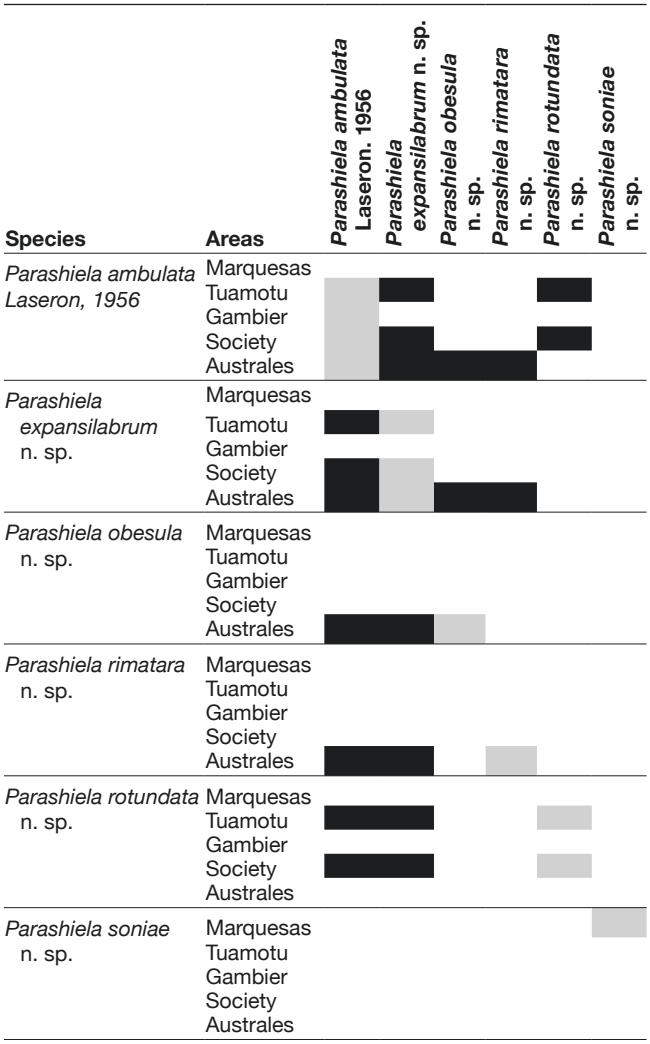
Parashiela expansilabrum n. sp. differs from *P. soniae* n. sp. in the multispiral protoconch (vs paucispiral in *P. soniae* n. sp.); the larger size (height 1.12-1.55 mm, mean 1.35 vs height 0.93-1.17 mm, mean 1.06 in *P. soniae* n. sp.); the more numerous axial ribs (18 vs 14 in *P. soniae* n. sp.); the broader base; the presence of a subsutural cord on the first whorls of teleoconch, absent in *P. soniae* n. sp.

Parashiela liddelliana (Hedley, 1907) differs from *Parashiela soniae* n. sp. in the multispiral protoconch (vs paucispiral in *P. soniae* n. sp.); the more numerous axial ribs (20 vs 14 in *P. soniae* n. sp.).

Parashiela rimatara n. sp. differs from *P. soniae* n. sp. in the multispiral protoconch (vs paucispiral in *P. soniae* n. sp.); the larger size (height 1.38-1.53 mm vs height 0.93-1.17 mm in *P. soniae* n. sp.); the thinner and more numerous axial ribs (26 vs 14 in *P. soniae* n. sp.); the subsutural cord on the first teleoconch whorls, absent in *P. soniae* n. sp.; the slightly wider umbilical fissure; the different teleoconch microsculpture, formed by threads arranged in dense spiral rows vs dense microgranules vaguely arranged in spiral series in *P. soniae* n. sp.

Parashiela rotundata n. sp. differs from *P. soniae* n. sp. in the multispiral protoconch (vs paucispiral in *P. soniae* n. sp.); the wider umbilical fissure; the microsculpture of teleoconch formed by groups of 3-4 thin threads separated by micro furrows vs dense microgranules vaguely arranged in spiral series in *P. soniae* n. sp.

TABLE 6. — List of Recent *Parashiela* Laseron, 1956 from French Polynesia, with their occurrence in the explored areas (**grey shaded cells**) and the sympatric co-occurrence in the same island with other species (**black shaded cells**).



Genus *Simulamerelina* Ponder, 1985

Simulamerelina Ponder, 1985: 49.

TYPE SPECIES. — *Merelina corruga* Laseron, 1956: 436, 479, fig. 136 by original designation.

DIAGNOSIS. — Shell of small to medium size for the family (height 1.1-3.5 mm); ovate-conic, slender, robust; axial and spiral sculpture present, spiral cordlets on the whole teleoconch, axial ribs not reaching the base, with rare exceptions; aperture subcircular, with thickened and duplicated peristome. Protoconch paucispiral with twisted nucleus, smooth spiral keels, the interstices studded with minute granules; the known species have a direct development. Colouration uniform white, and/or coloured teleoconch. Periostracum very thin. Head-foot: cephalic tentacles long, strap-like; pallial and metapodial tentacles present or absent; large, triangular anterior pedal gland; no posterior pedal gland. Operculum: oval, thin, nucleus eccentric, last whorl large (after Ponder 1985: 49).

REMARKS

Simulamerelina Ponder, 1985 was established as a subgenus of *Manzonia* Brusina, 1870 (see Ponder 1985: 49), then raised to genus rank by Faber & Moolenbeek (2004: 60) (Criscione *et al.* 2016: 13; but see also Criscione & Ponder 2011: 82). *Simulamerelina* includes a group of twelve extant recognised species (MolluscaBase 2023d), living from the lower intertidal to the continental shelf, where they are usually associated with algal facies, in the tropical Western Atlantic and the tropical Indo-West Pacific.

Although a revision of the genus is beyond the scope of the present work, we offer here some comments on taxa that show some morphological similarity to *S. corrugata*. Faber & Moolenbeek (1987) described *Alvania* (*Simulamerelina*) *bermudensis* Faber & Moolenbeek, 1987, and *Alvania* (*Flemellia*) *guesti* Faber & Moolenbeek, 1987 from the Caribbean: they both show the same typical features of *Simulamerelina*.

Alvania ferruginea A. Adams, 1861, described from Hakodadi Bay (Japan), 12.8 m (= 7 fathoms) (A. Adams 1861:

138) [Image of syntypes (NMV no. F31420) at https://collections.museumsvictoria.com.au/specimens/620337 and (NHMUK no. 1874.5.18.7) https://www.europeana.eu/it/item/11621/_NHMUK_ZOO_1874_5_19_7] not *Alvania ferruginea sensu* Golikov *et al.* (2001b: 158; identified *Frigidoalvania sitta* (Yokoyama, 1926), see Kantor & Sysoev [2006: 67, pl. 33, fig. B]) is, as suggested by Hasegawa (2014: 99) synonym of *Simulamerelina tokyoensis* (Pilsbry, 1904) from Tokyo harbour (Japan) (Pilsbry 1904: 26, pl. 4, fig. 40).

Lozouet (1998) described three new species from the Upper Oligocene (*Alvania hortensis* Lozouet, 1998, *Alvania boucheti* Lozouet, 1998, *Alvania falsimerelina* Lozouet, 1998), and one (*Alvania andraldensis* Lozouet, 1998), from the Lower Miocene of Aquitaine (France): the slender shells, peristome duplicate, microsculpture of spiral threads over the entire surface, protoconch with spiral sculpture with a predominant adapical cordlets are typical of *Simulamerelina*. If any of the first three is considered as a member of *Simulamerelina*, then the genus would be traceable back to the Oligocene of France. However, caution should be used in assigning fossil species to *Simulamerelina*. For instance, *Fenella tokunagai* Yokoyama, 1927, was described from the Upper Musashino (probably Pleistocene) and Recent of Japan. Hasegawa (2000: 149, pl. 74, fig. 7) figured as "*Manzonia* (*Simulamerelina*) *tokunagai* Yokoyama" a species that might be distinct from the fossil described by Yokoyama (1927). While the fossil cannot be classified with security from the figure (and the types are lost, Oyama 1973: caption to plate 4), the Recent species figured by Hasegawa looks similar to a typical *Simulamerelina*: however, a live collected specimen from Japan, genetically assayed by Criscione *et al.* (2016) resulted more closely related to *Onoba* than to typical *Simulamerelina*.

Other species, clearly belonging to *Simulamerelina*, have been reported in literature from the Pacific. Brook & Marshall (in Brook 1998: 216) reported from the northern Kermadec Islands "*Manzonia* (*Simulamerelina*) sp. aff. *longinqua* (Rehder, 1980)", corresponding to *Merelina pisinna sensu* Oliver (1915: 519); they were possibly referring to "*Merelina pisinna*" *sensu* Powell (1927: 538, pl. 27, fig. 11; not *Alvania pisinna* Melvill & Standen, 1896). Kay & Switzer (1974: 287, fig. 4D) reported "?*Merelina* sp. A", from Fanning Island, Pacific. Ponder (1985: 49) reported two unnamed species of *Simulamerelina* from Lifu, Loyalty Islands, Western Pacific. Mimoto & Nakao (2013: 52, pl.2, fig. 5) figured "*Merelina* sp.† compared with *M. tokyoensis* Pilsbry", actually *Simulamerelina*. A typical *Simulamerelina* sp. from Île des Pins is illustrated at https://ingokurtz.jimdofree.com/mollusca-weichtiere/rissoidae/.

The examination of *c.* 3900 specimens allowed us to identify six species of *Simulamerelina* in French Polynesia, all undescribed: *Simulamerelina australes* n. sp., *Simulamerelina densestriata* n. sp., *Simulamerelina gracilis* n. sp., *Simulamerelina lepteseiras* n. sp., *Simulamerelina micrometrica* n. sp., *Simulamerelina tuamotu* n. sp. Together with the new combinations herein, this brings the total of named species of *Simulamerelina* to 24, representing an increase of 100% (12 sp.) over the currently recognized diversity of the genus (see Table 7).

Simulamerelina australes n. sp.
(Figs 34; 35; 36; 37; 52A; 53O; Tables 7; 8; 9)

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Simulamerelina sp. 3, 4 – Boutet *et al.* 2020: 240.

TYPE MATERIAL. — **Holotype. Australes** • 1 dd (height 2.47, width 1.12 mm, Figs 34; 36; 53O); Rapa, SE of Pointe Tematapu, Atelier RAPA Stn 34; 27°34'47"S, 144°19'1"W; 2-8 m; 19.XI.2002; slope in a large cave, muddy bottom; MNHN-IM-2000-38722.
Paratypes. Australes • 500 dd; same locality data as holotype; MNHN-IM-2000-38723.

TYPE LOCALITY. — Australes: Rapa, SE of Pointe Tematapu, Atelier RAPA Stn 34; 27°34'47"S, 144°19'1"W; 2-8 m.

OTHER MATERIAL EXAMINED. — **Australes** • 2 dd; Marotiri BENTHAUS Stn DW1887; 27°52'1"S, 143°33'0"W; 750-1000 m; 6.XI.2002; MNHN • 1 dd; Marotiri, BENTHAUS Stn DW1885; 27°52'1"S, 143°33'0"W; 700-800 m; 6.XI.2002; MNHN • 3 dd; Marotiri, BENTHAUS Stn DW1886; 27°51'0"S, 143°31'58"W; 620-1000 m; 6.XI.2002; MNHN • 34 dd; E of Rapa, BENTHAUS Stn DW1889; 27°37'1"S, 144°16'1"W; 600-620 m; 7.XI.2002; MNHN • 2 dd; Rapa; 27°37'19"S, 144°22'4"W; 5-20 m; coll. MB • 6 dd; Rapa Baie Pake Atelier RAPA Stn 82; 27°37'4"S, 144°18'28"W; 11,14.XI.2002; MNHN • 36 dd; Rapa Est de la Baia Tupuaki Atelier RAPA Stn 21; 27°34'12"S, 144°20'34"W; 5 m; 12.XI.2002; blocs de corail mort sur fond de sable; MNHN • 3 dd; Rapa Pte Pukitarava Atelier RAPA Stn 89; 27°35.9'S, 144°18.5'W; intertidal; 9.XI.2002; MNHN • 47 dd; Rapa, Anatakuri Bay, Atelier RAPA Stn 69; 27°37'47"S, 144°18'43"W; 3-4 m; 19.XI.2002; coarse sand and algae; MNHN • 115 dd; Rapa, Ahurei Bay; 27°36'57"S, 144°19'48"W; 1 m; coll. JL • 2 dd; Rapa, Ahurei Bay; 27°36'57"S, 144°19'48"W; 10-20 m; coll. MB • 30 dd; Rapa, Akatanui Bay, Atelier RAPA Stn 13; 27°36'7"S, 144°18'53"W; 2 m; 8.XI.2002; sandy pockets; MNHN • 42 dd; Rapa, Akatanui Bay, Atelier RAPA Stn 81; 27°35'52"S, 144°18'28"W; intertidal; 9.XI.2002; rocks; MNHN • 12 dd; Rapa, Anarua Bay, Atelier RAPA Stn 41; 27°36'18"S, 144°22'40"W; 5 m; 25.XI.2002; corals on sandy bottom; MNHN • 37 dd; Rapa, Anarua Bay, Atelier RAPA Stn 41; 27°36'18"S, 144°22'40"W; 5 m; 25.XI.2002; corals on sandy bottom; MNHN • 4 dd; Rapa, Anatakuri Bay, Atelier RAPA Stn 69; 27°37'47"S, 144°18'43"W; 3-4 m; 19.XI.2002; coarse sand and algae; MNHN • 1 dd; Rapa, Anatakuri Bay, Atelier RAPA Stn 69; 27°37'47"S, 144°18'43"W; 3-4 m; 19.XI.2002; coarse sand and algae; MNHN • 117 dd; Rapa, Anatakuri Nako Bay, Atelier RAPA Stn 25; 27°38'24"S, 144°18'53"W; 3 m; 13.XI.2002; blocks of dead coral on sand; MNHN • 18 dd; Rapa, Haurei Bay, Atelier RAPA Stn 47; 27°36'43"S, 144°19'4"W; 33 m; 29.XI.2002; corals on muddy bottom; MNHN • 107 dd; Rapa, Hiri Bay; 27°37'19"S, 144°22'4"W; 3-5 m; coll. JL • 1 dd; Rapa, Hiri Bay; 27°37'19"S, 144°22'4"W; 5-20 m; coll. MB • 2 dd; Rapa, Hiri Bay, Atelier RAPA Stn 9; 27°37'19"S, 144°22'12"W; 3-24 m; 6.XI.2002; amidst corals; MNHN • 85 dd; Rapa, Hiri Bay, Atelier RAPA Stn 9; 27°37'19"S, 144°22'12"W; 3-24 m; 6.XI.2002; amidst corals; MNHN • 733 dd; Rapa, N of Anatakuri Bay, Atelier RAPA Stn 38; 27°37'22"S, 144°18'25"W; 2 m; 22.XI.2002; sediment under a large rock; MNHN • 39 dd; Rapa, N of Anatakuri Bay, Atelier RAPA Stn 38; 27°37'22"S, 144°18'25"W; 2 m; 22.XI.2002; sediment under a large rock; MNHN • 112 dd; Rapa, N of Aturapa I., Atelier RAPA Stn 29; 27°34'19"S, 144°20'59"W; 4-2 m; 15.XI.2002; dead coral; MNHN • 16 dd; Rapa, N of Rapa Iti I., Atelier RAPA Stn 11; 27°37'12"S, 144°18'10"W; 2 m; 7.XI.2002; sandy pockets amidst slabs of dead coral; MNHN • 31 dd; Rapa, N of Rapa Iti I., Atelier RAPA Stn 11; 27°37'12"S, 144°18'10"W; 2 m; 7.XI.2002; sandy pockets amidst slabs of dead coral; MNHN • 27 dd; Rapa, Nord of Pukitarava, Atelier RAPA Stn 14; 27°35'49"S, 144°13'37"W; 2 m;

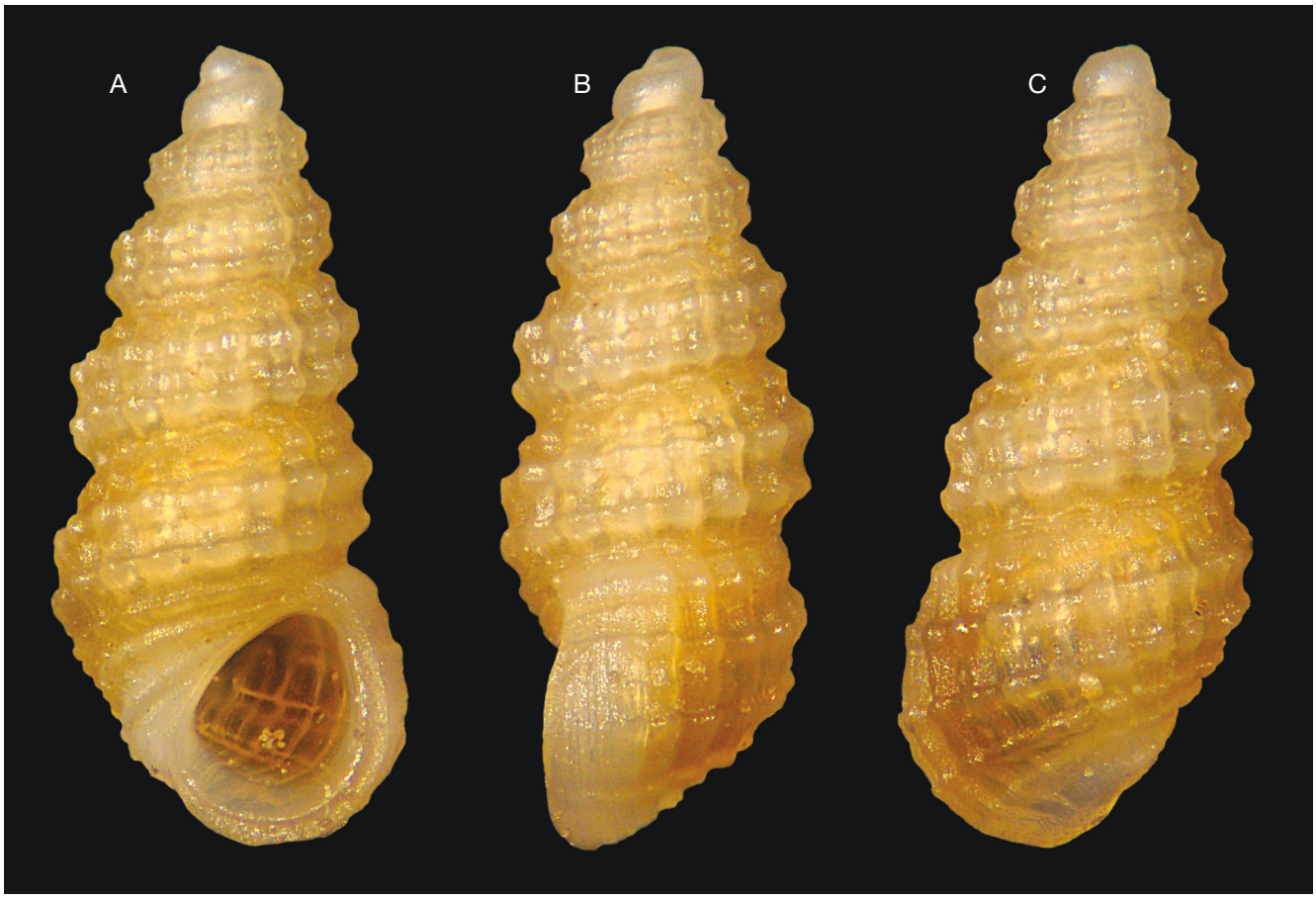

FIG. 34. — *Simulamerelina australes* n. sp.: **A-C**, holotype, Australes, Rapa, cave SE of Pointe Tematapu, Atelier RAPA Stn 34, 2-8 m, height 2.47 mm, MNHN-IM-2000-38722.

8.XI.2002; dead coral blocks on sand; MNHN • 94 dd; Rapa, Nord of Pukitarava, Atelier RAPA Stn 14; 27°35'49"S, 144°13'37"W; 2 m; 8.XI.2002; dead coral blocks on sand; MNHN • 12 dd; Rapa, off Cape Rukuaga, Atelier RAPA Stn 22; 27°33'54"S, 144°21'43"W; 18-22 m; 13.XI.2002; corals on rocky bottom; MNHN • 2 dd; Rapa, off Pointe Rukuaga, Atelier RAPA Stn 48; 27°34'4"S, 144°22'4"W; 36 m; 30.XI.2002; plateau with silty sand; MNHN • 1 dd; Rapa, off Pointe Rukuaga, Atelier RAPA Stn 48; 27°34'4"S, 144°22'4"W; 36 m; 30.XI.2002; plateau with silty sand; MNHN • 1 dd; Rapa, off Pointe Rukuaga, Atelier RAPA Stn 48; 27°34'4"S, 144°22'4"W; 36 m; 30.XI.2002; plateau with silty sand; MNHN • 4 dd; Rapa, Pake Bay, Atelier RAPA Stn 61; 27°37'1"S, 144°18'36"W; 10-15 m; 11-14.XI.2002; sandy mud and coral; MNHN • 102 dd; Rapa, Pake Bay, Atelier RAPA Stn 61; 27°37'1"S, 144°18'36"W; 10-15 m; 11-14.XI.2002; sandy mud and coral; MNHN • 49 dd; Rapa, Pariati Bay, Atelier Rapa Stn 67; 27°34'40"S, 144°21'43"W; 3-4 m; 18.XI.2002; muddy sand and seaweed; MNHN • 2 dd; Rapa, Pariati Bay, Atelier Rapa Stn 67; 27°34'40"S, 144°21'43"W; 3-4 m; 18.XI.2002; muddy sand and seaweed; MNHN • 14 dd; Rapa, Pointe Kauira, Atelier RAPA Stn 36; 27°33'28"S, 144°20'49"W; 27 m; 21.XI.2002; corals, mostly alive; MNHN • 7 dd; Rapa, Pointe Komiré, Atelier RAPA Stn 10; 27°34'47"S, 144°22'47"W; 16-18 m; 7.XI.2002; rocks covered with brown algae; MNHN • 238 dd; Rapa, Pointe Komiré, Atelier RAPA Stn 10; 27°34'47"S, 144°22'47"W; 16-18 m; 7.XI.2002; rocks covered with brown algae; MNHN • 3 dd; Rapa, Pointe Mei, Atelier RAPA Stn 30; 27°38'13"S, 144°18'10"W; 16-20 m; 16-18.XI.2002; drop-off with dead corals; MNHN • 41 dd; Rapa, Pointe Mei, Atelier RAPA Stn 30; 27°38'13"S, 144°18'10"W; 16-20 m; 16-18.XI.2002; drop-off with dead corals; MNHN • 21 dd; Rapa, Pointe Mei, Atelier RAPA Stn 30; 27°38'13"S, 144°18'10"W; 16-20 m; 16-18.XI.2002; drop-off with dead corals; MNHN • 1 dd; Rapa, Pointe Mei, Atelier RAPA Stn 31; 27°38'13"S, 144°18'10"W; 6 m; 16.XI.2002; rocks; MNHN • 32 dd; Rapa, Pointe Mei, Atelier RAPA Stn 31; 27°38'13"S, 144°18'10"W; 6 m; 16.XI.2002; rocks; MNHN • 124 dd; Rapa, Pointe Pukitarava, Atelier RAPA Stn 89; 27°35'52"S, 144°18'28"W; intertidal; 9.XI.2002; MNHN • 4 dd; Rapa, Pointe Taekateke, Atelier RAPA Stn 28; 27°38'24"S, 144°20'34"W; 30 m; 15.XI.2002; rocky blocks with algal cover; MNHN • 1 dd; Rapa, Pointe Taekateke, Atelier RAPA Stn 28; 27°38'24"S, 144°20'34"W; 30 m; 15.XI.2002; rocky blocks with algal cover; MNHN • 1 dd; Rapa, Pte Maomao Atelier RAPA Stn 78; 27°36'35"S, 144°18'53"W; intertidal; 6.XI.2002; beached sediment; MNHN • 7 dd; Rapa, Rarapai I., Atelier RAPA Stn 4; 27°34'19"S, 144°22'4"W; 18 m; 4.XI.2002; rocky blocks covered with brown algae; MNHN • 10 dd; Rapa, Rarapai I., Atelier RAPA Stn 4; 27°34'19"S, 144°22'4"W; 18 m; 4.XI.2002; rocky blocks covered with brown algae; MNHN • 5 dd; Rapa, S of Anatakuri Bay, Atelier RAPA Stn 19; 27°37'40"S, 144°18'43"W; 3 m; 11.XI.2002; coral blocks on sandy bottom; MNHN • 60 dd; Rapa, S of Anatakuri Bay, Atelier RAPA Stn 19; 27°37'40"S, 144°18'43"W; 3 m; 11.XI.2002; coral blocks on sandy bottom; MNHN • 5 dd; Rapa, S of Tarakoi I., Atelier RAPA Stn 5; 27°5'34"S, 144°18'28"W; 8 m; 4.XI.2002; dead corals with algae, muddy-sandy pockets; MNHN • 19 dd; Rapa, S of Tarakoi I., Atelier RAPA Stn 5; 27°5'34"S, 144°18'28"W; 8 m; 4.XI.2002; dead corals with algae, muddy-sandy pockets; MNHN • 3 dd; Rapa, SE of Pointe Tematapu, Atelier RAPA Stn 34; 27°34'47"S, 144°19'1"W; 2-8 m; 19.XI.2002; slope in a large cave, muddy bottom; MNHN • 13 dd; Rapa, SE of Pointe

TABLE 7. — List of the known species of the genus *Simulamerelina* Ponder, 1985 with geographic area, iconographic references.

Species	Geographic area	Iconographic references
Simulamerelina australes n. sp.	Pacific O.	Figs 34A-C; 35A-H; 36A-C; 37A-C; 53N
Simulamerelina caribaea (d'Orbigny, 1842)	W Atlantic O.	d'Orbigny 1842: 21, pl. XI, figs 31, 33
Simulamerelina corruga (Laseron, 1956)	W Pacific O.	Laseron 1956: 436, fig. 136
Simulamerelina crassula (Rehder, 1980)	Pacific O.	Rehder 1980: 30, pl. V, fig. 9
Simulamerelina densestriata n. sp.	Pacific O.	Figs 38; 39; 53O
Simulamerelina didyma (R. B. Watson, 1886)	W Atlantic O.	R. B. Watson 1886: 594, pl. XLIV, fig. 1
Simulamerelina ferruginea (A. Adams, 1861) n. comb.	W Pacific O.	A. Adams 1861: 138, syntypes at https://collections.museumsvictoria.com.au/specimens/620337 and at https://www.europeana.eu/it/item/11621/_NHMUK_ZOO_1874_5_19_7; Pilsbry 1904: 26, pl. IV, fig. 40 (as *Rissoa tokyoensis*)
Simulamerelina gemmata (Powell, 1927)	W Pacific O.	Powell 1927: 537, pl. XXVI, fig. 1
Simulamerelina gracilis n. sp.	Pacific O.	Figs 40; 53P
Simulamerelina granulosa (Pease, 1862)	Pacific O.	Pease 1862: 382, pl. XIII, fig. 10
Simulamerelina hewa (Kay, 1979)	Pacific O.	Kay 1979: 81, 28C, D
Simulamerelina lepteseiras n. sp.	Pacific O.	Figs 41; 53Q
Simulamerelina longinqua (Rehder, 1980)	Pacific O.	Rehder 1980: 29, pl. V, fig. 10
Simulamerelina mauritiana (E. von Martens, 1880)	W Indian O.	von Martens 1880: 285, pl. XX, fig. 17
Simulamerelina micrometrica n. sp.	Pacific O.	Figs 42; 43; 53R
Simulamerelina novemstriata Faber & Moolenbeek, 2004	W Atlantic O.	Faber & Moolenbeek 2004: 60, fig. 2
Simulamerelina tuamotu n. sp.	Pacific O.	Figs 44; 45; 53S
Simulamerelina wanawana (Kay, 1979)	Pacific O.	Kay 1979: 82, fig. 28A, B
Simulamerelina sp.	W Pacific O. (New Zealand and Kermadec Islands)	Powell 1927: 538, pl. 27, fig. 11 as "*Merelina pisinna" sensu* Oliver 1915 (non Melvill & Standen). Brook & Marshall in Brook 1998: 216 as *Manzonia* (*Simulamerelina*) sp. aff. *longinqua* (Rehder, 1980) = *Merelina pisinna* Melvill & Standen *sensu* Oliver 1915
Simulamerelina sp.	W Pacific O.	https://ingokurtz.jimdofree.com/mollusca-weichtiere/rissoidae/
Simulamerelina sp.	Pacific O.	Kay & Switzer 1974: 287, fig. 4D (as ?*Merelina* sp. A)
Simulamerelina sp.	W Pacific O.	Mimoto & Nakao 2013: 52, pl.2, fig. 5 (as *Merelina* sp.† compared with *M. tokyoensis*)
Simulamerelina sp.	W Pacific O.	Ponder 1985: 49
Simulamerelina sp.	W Pacific O.	Ponder 1985: 49
Simulamerelina bermudensis (Faber & Moolenbeek, 1987) n. comb.	W Atlantic O.	Faber & Moolenbeek 1987: 69, figs 1-4
Simulamerelina guesti (Faber & moolenbeek, 1987) n. comb.	W Atlantic O.	Faber & Moolenbeek 1987: 70, figs 5-8
Simulamerelina hortensis (Lozouet, 1998) † n. comb.	Upper Oligocene of France	Lozouet 1998: 76, pl. 8A-C
Simulamerelina boucheti (Lozouet, 1998) † n. comb.	Upper Oligocene of France	Lozouet 1998: 76, pl. 8D-E
Simulamerelina andraldensis (Lozouet, 1998) † n. comb.	Lower Miocene of France	Lozouet 1998: 76, pl. 8F-H; Lozouet *et al.* 2001: 31, pl. 12, fig. 8
Simulamerelina falsimerelina (Lozouet, 1998) † n. comb.	Upper Oligocene of France	Lozouet 1998: 77, pl. 8I-J

Tematapu, Atelier RAPA Stn 35; 27°34'47"S, 144°19'1"W; 2 m; 20.XI.2002; pebbles at cave exit; MNHN • 92 dd; Rapa, SE of Pointe Tematapu, Atelier RAPA Stn 35; 27°34'47"S, 144°19'1"W; 2 m; 20.XI.2002; pebbles at cave exit; MNHN • 2 dd; Rapa, SE of Tauna I., Atelier RAPA Stn 8; 27°36'28"S, 144°17'41"W; 52-57 m; 06-22.XI.2002; rocky bottoms with sandy pockets; MNHN • 27 dd; Rapa, SW of Pointe Gotenaonao, Atelier RAPA Stn 27; 27°38'41"S, 144°19'11"W; 6 m; 14.XI.2002; pebble blocks with algae cover; MNHN • 33 dd; Rapa, SW of Pointe Gotenaonao, Atelier RAPA Stn 27; 27°38'41"S, 144°19'11"W; 6 m; 14.XI.2002; pebble blocks with algae cover; MNHN • 154 dd; Rapa, SW of Pointe Gotenaonao, Atelier RAPA Stn 27; 27°38'41"S, 144°19'11"W; 6 m; 14.XI.2002; pebble blocks with algae cover; MNHN • 5 dd; Rapa, SW of Rarapai I., Atelier RAPA Stn 17; 27°34'37"S, 144°22'40"W; 9 m; 10.XI.2002; rocky boulders on sandy bottom; MNHN • 87 dd; Rapa, SW of Rarapai I., Atelier RAPA Stn 17; 27°34'37"S, 144°22'40"W; 9 m; 10.XI.2002; rocky boulders on sandy bottom; MNHN • 5 dd; Rapa, Vavai, Atelier RAPA Stn 20; 27°35'23"S, 144°23'16"W; 5 m; 12.XI.2002; coral blocks on sand bottom; MNHN • 46 dd; Rapa, Vavai, Atelier RAPA Stn 20; 27°35'23"S, 144°23'16"W; 5 m; 12.XI.2002; coral blocks on sand bottom; MNHN • 53 dd; Rapa, Vavai, Atelier RAPA Stn 32; 27°34'58"S, 144°22'40"W; 15-20 m; 18.XI.2002; coral; MNHN • 3 dd; Rapa, W of Pointe Aukura, Atelier RAPA Stn 15; 27°38'6"S, 144°21'7"W; 20 m; 9.XI.2002; sandy pockets amidst large rocky blocks; MNHN • 14 dd; Rapa, W of Tauna I., Atelier RAPA Stn 16; 27°36'18"S, 144°18'25"W; 5 m; 9.XI.2002; corals, mostly dead; MNHN • 111 dd; Rapa, W of Tauna I., Atelier RAPA Stn 16; 27°36'18"S, 144°18'25"W; 5 m; 9.XI.2002; corals, mostly dead; MNHN • 1 dd; Rapa, wharf of Area, Atelier RAPA Stn 70; 27°36'35"S, 144°19'29"W; 15-20 m; 20.XI.2002; muddy pockets and corals; MNHN • 3 dd; Rapa, wharf of Area, Atelier RAPA Stn 70; 27°36'35"S, 144°19'29"W; 15-20 m; 20.XI.2002; muddy pockets and corals; MNHN • 1 dd; Banc Président Thiers, BENTHAUS Stn DW1933; 24°40'58"S,

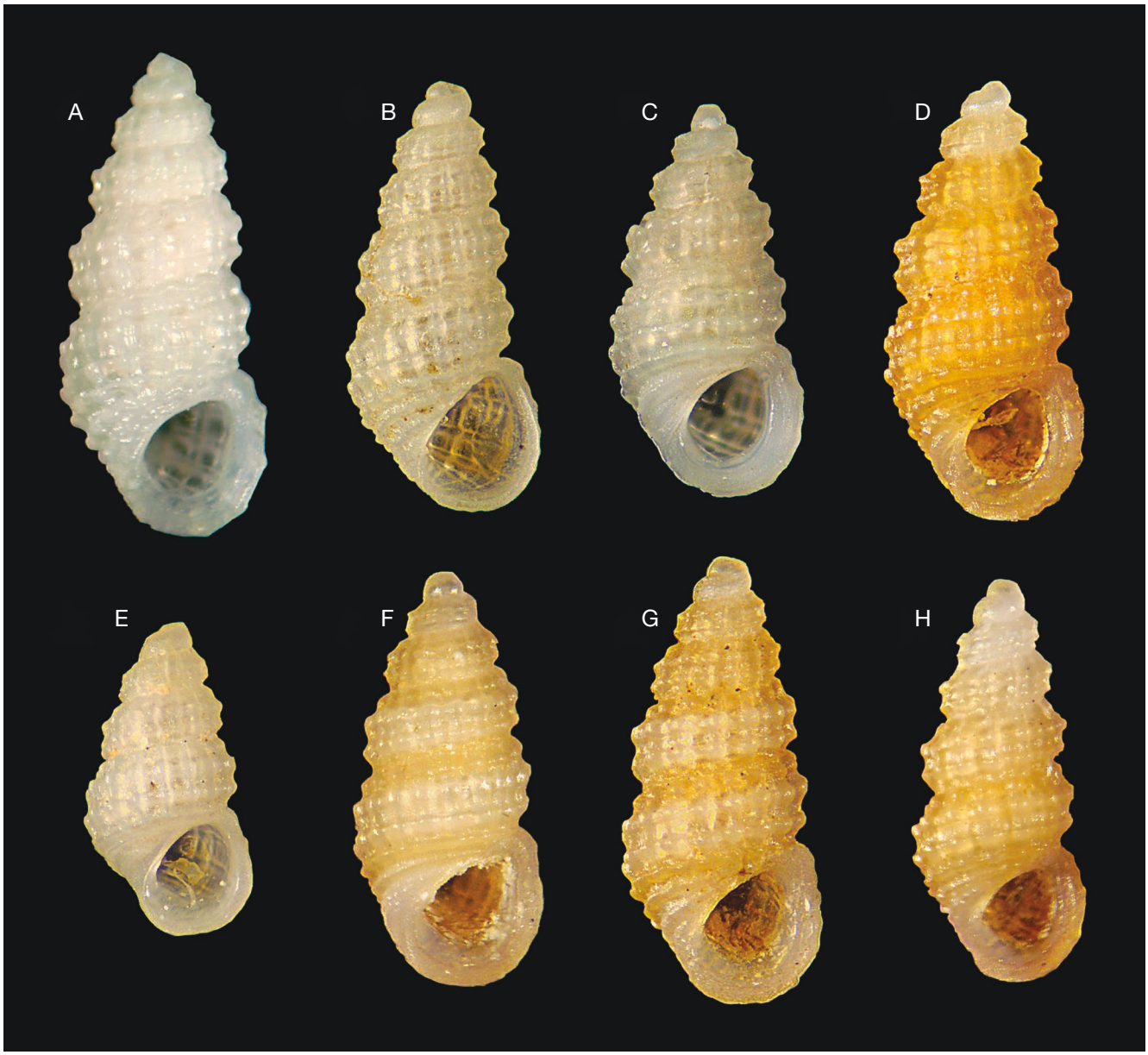

FIG. 35. — *Simulamerelina australes* n. sp.: variability of the species. Australes, E of Rapa, BENTHAUS Stn DW1889, 600-620 m: **A**, height 2.60 mm, MNHN; **B**, height 2.30 mm, MNHN; **C**, height 2.10 mm, MNHN; **D**, height 2.35 mm, MNHN; **E**, height 1.67 mm, MNHN; **F**, height 2.20 mm, MNHN; **G**, height 2.40 mm, MNHN; **H**, height 2.15 mm, MNHN.

146°1'1"W; 500-850 m; 14.XI.2002; MNHN • 1 dd; Banc Arago BENTHAUS Stn DW1974; 23°23'59"S, 150°43'58"W; 450-618 m; 20.XI.2002; MNHN • 1 dd; Banc Arago, BENTHAUS Stn DW1975; 23°23'59"S, 150°43'58"W; 600-691 m; 20.XI.2002; MNHN • 13 dd; S of Rurutu BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN • 9 dd; S of Rurutu, BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN • 8 dd; Rurutu, Toataratara,; 22°31'29"S, 151°20'38"W; beached; coll. MB • 27 dd; Rimatara, BENTHAUS Stn DW2020; 22°37'1"S, 152°49'1"W; 920-930 m; 25.XI.2002; MNHN • 73 dd; Rimatara, BENTHAUS Stn DW2021; 22°37'1"S, 152°49'1"W; 1200-1226 m; 25.XI.2002; MNHN • 18 dd; Maria Island; 21°48'0"S, 154°40'58"W; 20 m; coll. JL.

Society Islands • 5 dd; Tahiti, Arue; 17°31'15"S, 149°31'33"W; <1m; reef flat ('platier') behind tomb of King Pomare V; coll. JL • 17 dd; Tahiti, Mahaena; 17°33'57"S, 149°19'22"W; <1 m; reef flat; coll. JL • 10 dd; Tahiti, Punaauia, La Source; 17°36'7"S, 149°37'15"W; 20 m; coll. JL • 1 dd; Tahiti, Papara lagoon; 17°45'28"S, 149°31'22"W; 1 m; coastal reef flat, in coarse sand; coll. MB • 1 dd; Tahiti, Toahotu lagoon; 17°45'32"S, 149°19'4"W; beached; beached sediment; coll. MB • 36 dd; Moorea; 17°33'57"S, 149°47'13"W; 1 m; lagoon; coll. JL.

Tuamotu • 5 dd; Moruroa; 21°46'37"S, 138°53'31"W; beached; on the sea-line; coll. MB.

DISTRIBUTION AND SYMPATRY. — The species is at present known in the South Pacific Ocean from the Australes (Marotiri, Rapa, Banc Président Thiers, Banc Arago, Rurutu, Rimatara, Maria), Society Islands (Tahiti, Moorea) and Tuamotu (Moruroa) (Fig. 52A). *Simulamerelina australes* n. sp. is sympatric with *S. densestriata* n. sp. in the Australes (Marotiri); with *S. micrometrica* n. sp. in the Australes (Rapa, Banc Président Thiers, Banc Arago, Rurutu, Rimatara); with *S. gracilis* n. sp. in the Tuamotu (Moruroa) (Table 9).

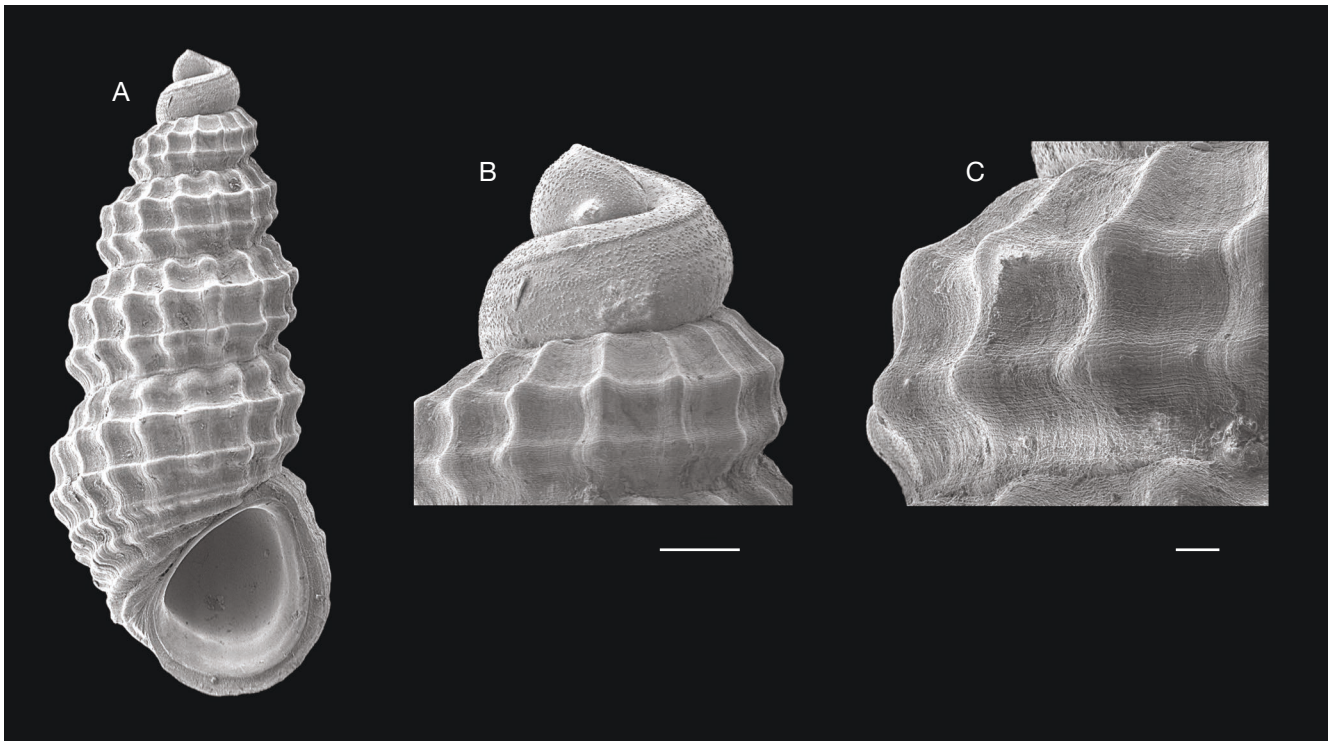

Fig. 36. — *Simulamerelina australes* n. sp.: holotype, Australes, Rapa, cave SE of Pointe Tematapu, Atelier RAPA Stn 34, 2-8 m, height 2.47 mm, width 1.12 mm, MNHN-IM-2000-38722: **A**, shell; **B**, detail of the first whorls; **C**, detail of the microsculpture. Scale bars: B, 100 µm, C, 30 µm.

Etymology. — The name is after the area of the type locality (Australes Islands) used as a noun in apposition.

Diagnosis. — *Simulamerelina* with large size shell for the genus (>2 mm), slender and robust. Protoconch paucispiral. Teleoconch with marked spiral and axial sculpture. Axial ribs reaching the base. Start of 2 spiral cordlets after protoconch-teleoconch boundary. Colouration uniform or with bands of darker colour.

Description of holotype

Shell (Figs 36A; 43A-C; 53O)

Large for the genus, height 2.47 mm, width 1.12 mm height/width ratio 2.21, turriculate-slender, elongate ovate.

Protoconch (Fig. 36B)

Paucispiral with twisted nucleus, of 1.25 convex whorls, height 0.300 mm, nucleus diameter 0.100 mm, first half whorl diameter 0.225 mm, maximum diameter 0.305 mm. Sculpture of a keel on the upper fifth, and micro granules on the whole surface vaguely arranged in spiral bands. Protoconch-teleoconch boundary well marked.

Teleoconch

Of 4.5 convex whorls, suture impressed. Axial sculpture on the last whorl of 15 slightly prosocline ribs, slightly stronger than the spiral cordlets, and narrower than the interspaces, reaching the base. Spiral sculpture of strong non equidistant cordlets, 2 central on the first whorl, three on the next two whorls and 8 on the last whorl, of which 3 above the aperture, 1 on the suture line and 4 on the base. Cordlets II and III starting immediately after the protoconch-teleoconch boundary; cordlet I, subsutural, forming shortly after. Cordlet II located slightly closer to cordlet I. Slightly nodulose thickenings at intersections; interspaces quadrangular. Entire surface covered by dense regularly distributed spiral threads, both on the cordlets and on the interspaces (Fig. 36C). Umbilical fissure very narrow. Aperture oval height 0.83 mm, height/aperture height ratio 2.98, peristome duplicated, internally smooth, externally thickened by a strong opisthocline varix.

Colour

Colouration uniform light brown, slightly darker before the varix; peristome whitish.

Operculum and soft parts

Operculum typical of the genus; soft parts unknown.

Variability

Variable in the height/width ratio (2.01-2.36) and in the outline, from cylindrical to pupoid. Minimum dimensions: adult height 1.67 mm (specimen from the Australes, East of Rapa 600-620 m) and maximum: 2.67 mm (specimen from the Australes, Rapavavai). Colour uniform brown-orange or white with whitish outer lip; frequently with two darker, subsutural and basal bands. Colour fading in old shells (Fig. 35). (See Table 8 and Appendices 15; 16).

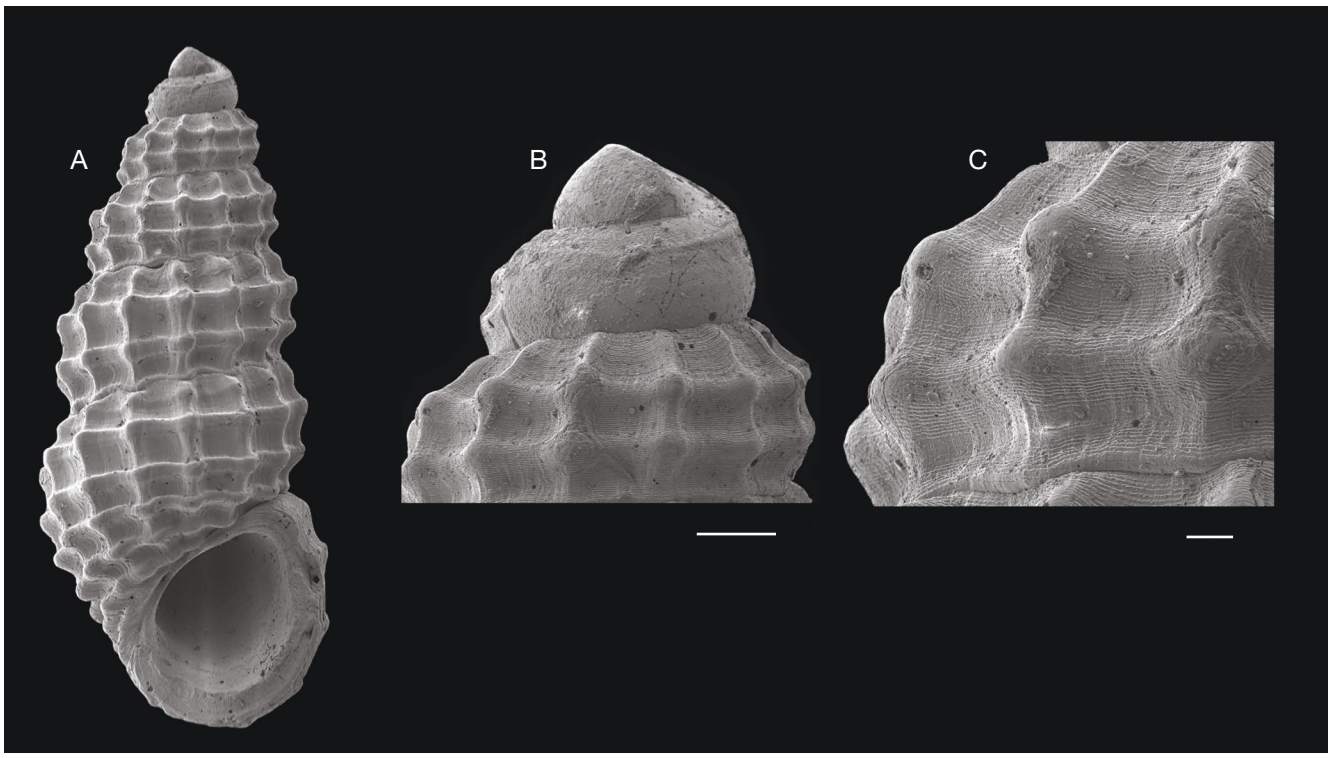

Fig. 37. — *Simulamerelina australes* n. sp.: Australes, E of Rapa, BENTHAUS Stn DW1889, 600-620 m, height 2.60 mm, width 1.15 mm, MNHN: **A**, shell; **B**, detail of the first whorls; **C**, detail of the microsculpture. Scale bars: B, 100 µm, C, 30 µm.

Remarks

Simulamerelina granulosa (Pease, 1862), from Hawaii (Pease 1862: 382, pl. 13, fig. 10), differs from *Simulamerelina australes* n. sp. in the smaller size (2 mm vs >2 mm in *S. australes* n. sp.); the outer lip with 5 short lirae internally (*fide* Kay 1979: 80), smooth internally in *S. australes* n. sp.; the axial ribs stopping on the third spiral cordlet, not reaching the base, vs reaching the base in *S. australes* n. sp.; the protoconch of 1.5 whorls, with a small and smooth first whorl, and spiral striae on the last part (*fide* Kay 1979: 80) vs 1.25-1.40 whorls with a keel on the adapical fifth, with micro granules vaguely arranged in spiral bands in *S. australes* n. sp.

Simulamerelina ferruginea (A. Adams, 1861) n. comb. from Hakodadi Bay (Japan), 7 fathoms (A. Adams, 1861: 138) [synonym of *Simulamerelina tokyoensis* (Pilsbry, 1904)] differs from *Simulamerelina australes* n. sp. in the dome-shaped protoconch devoid of evident keel, vs sculptured by a keel on the adapical fifth, with microgranules vaguely arranged in spiral bands in *S. australes* n. sp.; the teleoconch sculpture of four spiral cordlets on the last whorl above the aperture vs three in *S. australes* n. sp.; the more rounded tubercles vs more protruding in *S. australes* n. sp.; the more prosocline outer lip. Alison Kay ('*in schedis*', on recent label ANSP 70910 of *S. tokyoensis*), hypothesized a synonymy of *S. tokyoensis* (now *S. ferruginea*) with *S. granulosa*. We consider them as distinct species, based on some shell characteristics. Pupoid profile in *S. ferruginea* vs cylindrical in *S. granulosa* and with lower height/width ratio (1.85-1.95 vs 2.16-2.88 in *S. granulosa*); spiral sculpture on the last whorl in greater number 8-9 vs 5-7 in *S. granulosa*; outer lip internally smooth vs with five short denticles in *S. granulosa*, and with a much more marked opisthocline inclination in *S. ferruginea*. Furthermore, the large geographical distance between the two species (Japan vs Hawaii) for both species with non-planktotrophic development would support this specific separation.

Simulamerelina corruga (Laseron, 1956) from Heron I., Capricorn Group (north-eastern Australia) (Laseron 1956: 436, fig. 136), differs from *Simulamerelina australes* n. sp. in the protoconch sculptured with three smooth spiral keels, and minute granules in the interspaces vs a keel on the adapical fifth, with microgranules vaguely arranged in spiral bands in *S. australes* n. sp.

Simulamerelina didyma (R. B. Watson, 1886) from North of Culebra and St Thomas Islands, Virgin Islands, Western Atlantic (R. B. Watson 1886: 594, pl. 44, fig. 1) differs from *Simulamerelina australes* n. sp. in the dome-shaped protoconch devoid of spirals, with microtubercles vs sculptured with a keel on the adapical fifth, with microgranules vaguely arranged in spiral bands in *S. australes* n. sp.; the axial ribs stopping on the first basal cordlets, with smooth basal spiral cordlets vs more robust teleoconch sculpture with narrower interspaces and axial ribs reaching the base in *S. australes* n. sp.

Simulamerelina gemmata (Powell, 1927) from Maro Tiri (Chicken Island, off North I., New Zealand) (Powell 1927: 537, pl. 26, fig. 1), differs from *S. australes* n. sp. in the protoconch dome-shaped, of 1.5 whorls sculptured with three keels vs 1.25 convex whorls, sculptured by a single keel on the adapical fifth, with micro granules vaguely arranged in spiral

bands in *S. australes* n. sp.; in the more acute tubercles at the intersection; in the fewer spiral cordlets on the last whorl [6 (3+1+2) vs 7-8 (3+1+3-4) *S. australes* n. sp.].

The most slender specimens with banded colouration of *Simulamerelina australes* n. sp. are very similar (Fig. 34H) to both *Merelina elegans* (Angas, 1877) and *Merelina taupoensis* Powell, 1939 (Criscione & Ponder 2011: 72, figs 2A-E, 3C, 4C, 8A, B; Criscione *et al.* 2016: 9, fig. 5G; Images from malacology, at https://malacopics.nl/Lironobidae/album/slides/Merelina%20elegans.html and https://malacopics.nl/Lironobidae/album/slides/Merelina%20taupoensis.html; accessed on 26 January 2023). We note that these two taxa may actually represent a single species, considering the very similar shells. However, they differ from *Simulamerelina australes* n. sp. in the deeper and more evident suture; the smaller and more rounded aperture; the protoconch with 11 (*M. elegans*) and 12 (*M. taupoensis*) spiral cordlets vs a single keel on the adapical fifth, with micro granules vaguely arranged in spiral bands in *S. australes* n. sp.

See under *Simulamerelina densestriata* n. sp. for detailed comparisons.

Simulamerelina densestriata n. sp.
(Figs 38; 39; 52B; 53P; Tables 7; 8; 9)

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TYPE MATERIAL. — **Holotype. Australes** • dd (height 2.45 mm, width 1.15 mm, Figs 38A-C, 39, 53P); Marotiri, BENTHAUS Stn DW1885; 27°52'1"S, 143°33'0"W; 700-800 m; MNHN-IM-2000-38724.
Paratypes. Australes • 41 dd (Fig. 38D-G); same locality data as holotype; MNHN-IM-2000-38725.

TYPE LOCALITY. — Australes, Marotiri, BENTHAUS Stn DW1885; 27°52'1"S, 143°33'0"W; 700-800 m.

OTHER MATERIAL EXAMINED. — **Australes** • 12 dd; Marotiri, BENTHAUS Stn DW1886; 27°51'0"S, 143°31'58"W; 620-1000 m; 6.XI.2002; MNHN • 10 dd; Marotiri, BENTHAUS Stn DW 1884; 27°53'59"S, 143°33'0"W; 570-620 m; 6.XI.2002; MNHN • 1 dd; Tubuai, BENTHAUS Stn DW1962; 23°21'0"S, 149°33'0"W; 470-800 m; 19.XI.2002; MNHN.

DISTRIBUTION AND SYMPATRY. — *Simulamerelina densestriata* n. sp. is known from the South Pacific Ocean, in the Australes (Marotiri, Tubuai), with empty shells collected in 570-1000 m (Fig. 52B).
S. densestriata n. sp. is sympatric with *S. australes* n. sp. in the Australes (Marotiri) (Table 9).

ETYMOLOGY. — The name refers to the dense spiral microsculpture on the teleoconch, from the Latin *dense* (meaning densely) and *striatus*, *-a*, *-um* (meaning striated).

DIAGNOSIS. — *Simulamerelina* with large shell for the genus (>2 mm), slender, pupoid and strong. Paucispiral protoconch. Teleoconch with axial and spiral sculpture of the same strength. Axial ribs fading towards the base. Marked spiral microsculpture. Start of 2 spiral cordlets after protoconch-teleoconch boundary. Colouration uniform white to yellowish.

DESCRIPTION OF HOLOTYPE
Shell (Figs 38A-C; 39A; 53P)
Large for the genus, height 2.45 mm, width 1.15 mm height/width ratio 2.17, turriculate-slender, elongate ovate.

Protoconch (Fig. 39B)
Paucispiral with twisted nucleus, of 1.25 convex whorls, height 0.316 mm, nucleus diameter 0.116 mm, first half whorl diameter 0.233 mm, maximum diameter 0.350 mm. Sculpture of 5 spiral cordlets, first, second and fourth more developed; scattered minute granules on last third of whorl. Protoconch-teleoconch boundary well marked.

Teleoconch
Of 4.2 convex whorls, suture large and impressed. Axial sculpture on the last whorl of 14 slightly orthocline ribs, narrower than interspaces, fading toward the base. Spiral sculpture of same strength as axial, of non-equidistant cordlets, 2 on the first whorl, 3 on the second, 8 on the last whorl, of which 3 above the aperture and 5 on the base. Subsutural cordlet more spaced from the others, the basal ones closer each other. Cordlets II and III starting immediately after protoconch-teleoconch boundary; subsutural cordlet I formed on next whorl, weaker; cordlet II most prominent, located on the center of the whorl. Weak, slightly acute tubercles at intersections, interspaces quadrangular. Microsculpture (Fig. 39C) of granulose threads and sparse microgranules. Umbilical fissure very narrow. Aperture oval height 0.82 mm, height/aperture height ratio 2.97, peristome duplicated, internally smooth, externally thickened by a strong opisthocline varix.

Colour
Colouration uniform white to yellowish.

Operculum and soft parts
Unknown.

VARIABILITY
Shell with weak variability. An additional ninth spiral cordlets, entering the narrow umbilical fissure, is infrequently observed. Minimum and maximum height in the examined material, 2.1 and 2.8 mm, respectively. Number of axial ribs on the last whorl varying from 13 to 20. Some specimens orange-pink (see Table 8 and Appendix 17).

REMARKS
Manzonia (*Simulamerelina*) *tokunagai* (*sensu* Hasegawa 2000: 149, pl. 74, fig. 7 non Yokoyama 1927), is very similar to *Simulamerelina densestriata* n. sp., but it differs in the chromatic pattern, light yellow background, often with indistinct brown spiral bands vs uniform white to orange-pink in *S. densestriata* n. sp.; the equally spaced spiral cordlets above the aperture vs the subsutural cordlet more spaced from the other two in *S. densestriata* n. sp.; the number of basal spiral cordlets (4 vs 5-6 in *S. densestriata* n. sp.).

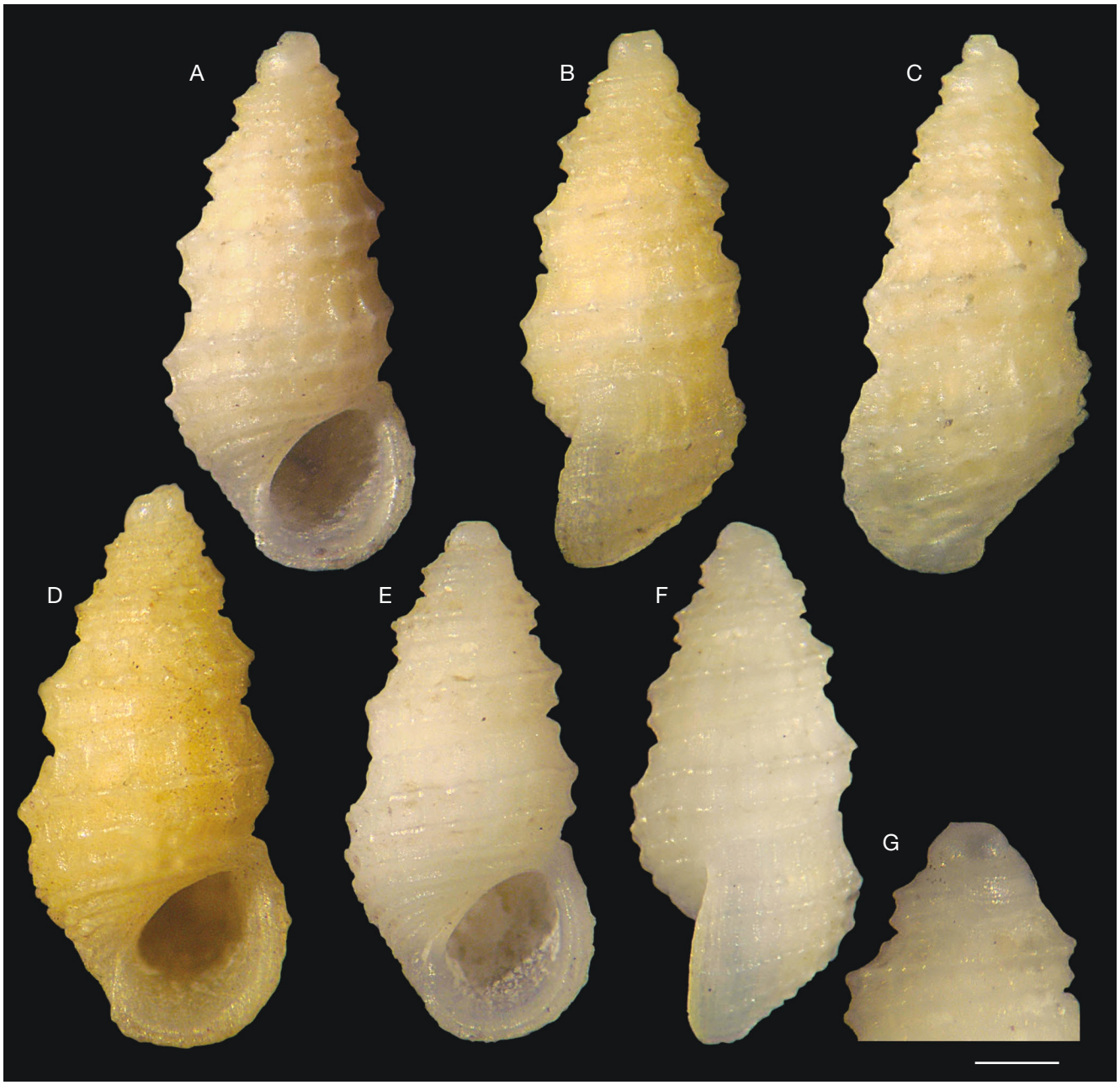

Fig. 38. — *Simulamerelina densestriata* n. sp.: **A**-**C**, holotype, Australes, Marotiri, BENTHAUS Stn DW1885; 700-800 m, height 2.45 mm, MNHN-IM-2000-38724; **D**, paratype, Australes, Marotiri, BENTHAUS Stn DW1885, 700-800 m, height 2.58 mm, MNHN-IM-2000-38725; **E**-**G**, paratype, Australes, Marotiri, BENTHAUS Stn DW1885, 700-800 m, height 2.35 mm, detail of the first whorls (**G**), MNHN-IM-2000-38725. Scale bars: G, 25 µm.

Simulamerelina australes n. sp. differs from *S. densestriata* n. sp. in the weaker microsculpture on the teleoconch; the nodulose tubercles at the intersections (vs weaker and slightly acute in *S. densestriata* n. sp.); the axial ribs reaching the base; the apical sculpture of a keel on the upper fifth, and micro granules on the whole surface vaguely arranged in spiral bands vs five spiral cordlets, the first, second and fourth more developed in *S. densestriata* n. sp.

See under *Simulamerelina gracilis* n. sp. for detailed comparisons.

Simulamerelina gracilis n. sp.
(Figs 40; 52B; 53Q; Tables 7; 8; 9)

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Type material. — **Holotype. Tuamotu** • dd (height 2.45 mm, width 1.08 mm, Figs 40A-C, G-I; 53Q); Moruroa; 21°46'37"S, 138°53'31"W; beached; on the sea-line; MNHN-IM-2000-38726. **Paratype**. **Tuamotu** • 1 dd (height 2.13 mm, width 0.98 mm, Fig. 40D-F); same locality and data as holotype; coll. MB.

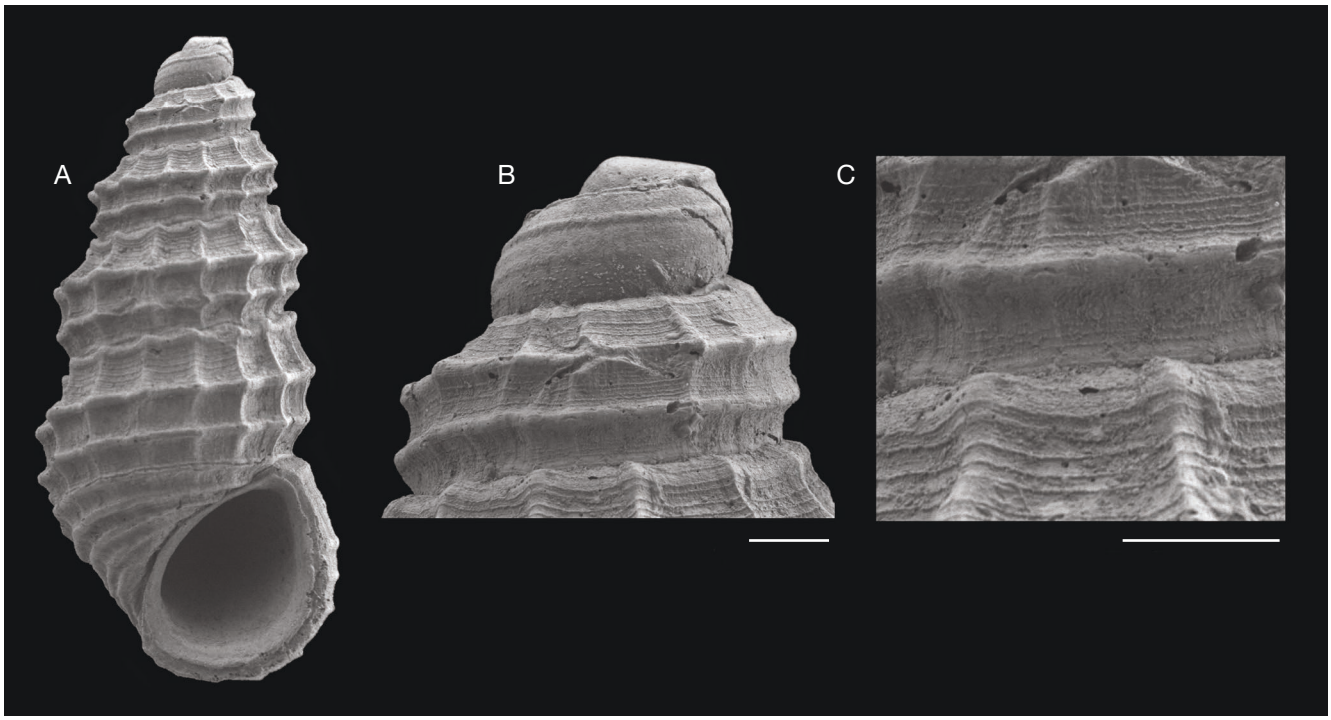


Fig. 39. — *Simulamerelina densestriata* n. sp.: holotype, Australes, Marotiri, BENTHAUS Stn DW1885, 700-800 m, height 2.45 mm, MNHN-IM-2000-38724: **A**, shell; **B**, detail of the first whorls; **C**, detail of the microsculpture between the first and second whorl. Scale bars: B, C, 100 µm.

Type locality. — Tuamotu: Moruroa Atoll; 21°46'37"S, 138°53'31"W; on the sea line.

Distribution and sympatry. — The species is known in the South Pacific Ocean from the Tuamotu (Moruroa), from empty shells only, collected on the sea line (Fig. 52B).
Simulamerelina gracilis n. sp. is sympatric with *S. australes* n. sp. at its type locality (Moruroa) (Table 9).

Etymology. — The name is after the appearance of the shell, from the Latin *gracilis* (meaning slim).

Diagnosis. — *Simulamerelina* with large shell for the genus (>2 mm), acute-slender, turriculate and robust. Protoconch paucispiral. Teleoconch with axial and spiral sculpture of the same strength. Axial ribs reaching the base. Teleoconch with three spiral cordlets, seven on the last whorl. Microsculpture of thin and well spaced uneven spiral threads, with sparse microgranules, in the interspaces; thinner and denser threads on the spiral cordlets. Start of 2 spiral cordlets after protoconch-teleoconch boundary. Colouration uniform white with an orange blotch before the varix.

Description of holotype
Shell (Figs 40A-C, G; 53Q)
Large for the genus, height 2.45 mm, width 1.08 mm height/width ratio 2.27, slender-acute, turriculate and robust.

Protoconch (Fig. 40H)
Paucispiral with twisted nucleus, of 1.20 convex whorls, height 0.312 mm, nucleus diameter 0.112 mm, first half whorl diameter 0.200 mm, maximum diameter 0.275 mm. Sculpture of 5-6 thin, weak and uneven spiral cordlets. Protoconch-teleoconch boundary well marked.

Teleoconch
Of 4.70 convex whorls, suture evident and impressed. Axial sculpture on the last whorl of 11 orthocline ribs, slightly prosocline, almost as broad as the interspaces, reaching the base. Spiral sculpture of same strength as axial, of non equidistant cordlets: 2 on first whorl, three on subsequent whorls, the adapical very weak and barely visible; 7 cordlets on last whorl, 3 above the aperture. Cordlet I weakest, cordlet II most prominent. Rounded tubercles at the intersections, more acute on first whorls; interspaces quadrangular. Microsculpture (Fig. 40I) of spaced and uneven dense spiral threads in the interspaces, thinner and denser on the cordlets, and sparse microgranules. Umbilical fissure absent. Aperture oval, height 0.85 mm, height/aperture height ratio 2.88, peristome duplicated, internally with 4-5 short and weak denticles, externally thickened by a strong and broad opisthocline varix.

Colour
Colouration uniform white with an orange blotch on the last whorl before the varix.

Operculum and soft parts
Unknown.

Variability
Only two specimens are available: the paratype has not reached complete maturity, is smaller than the holotype and has an only slightly thickened varix (see Table 8 and Appendix 18).

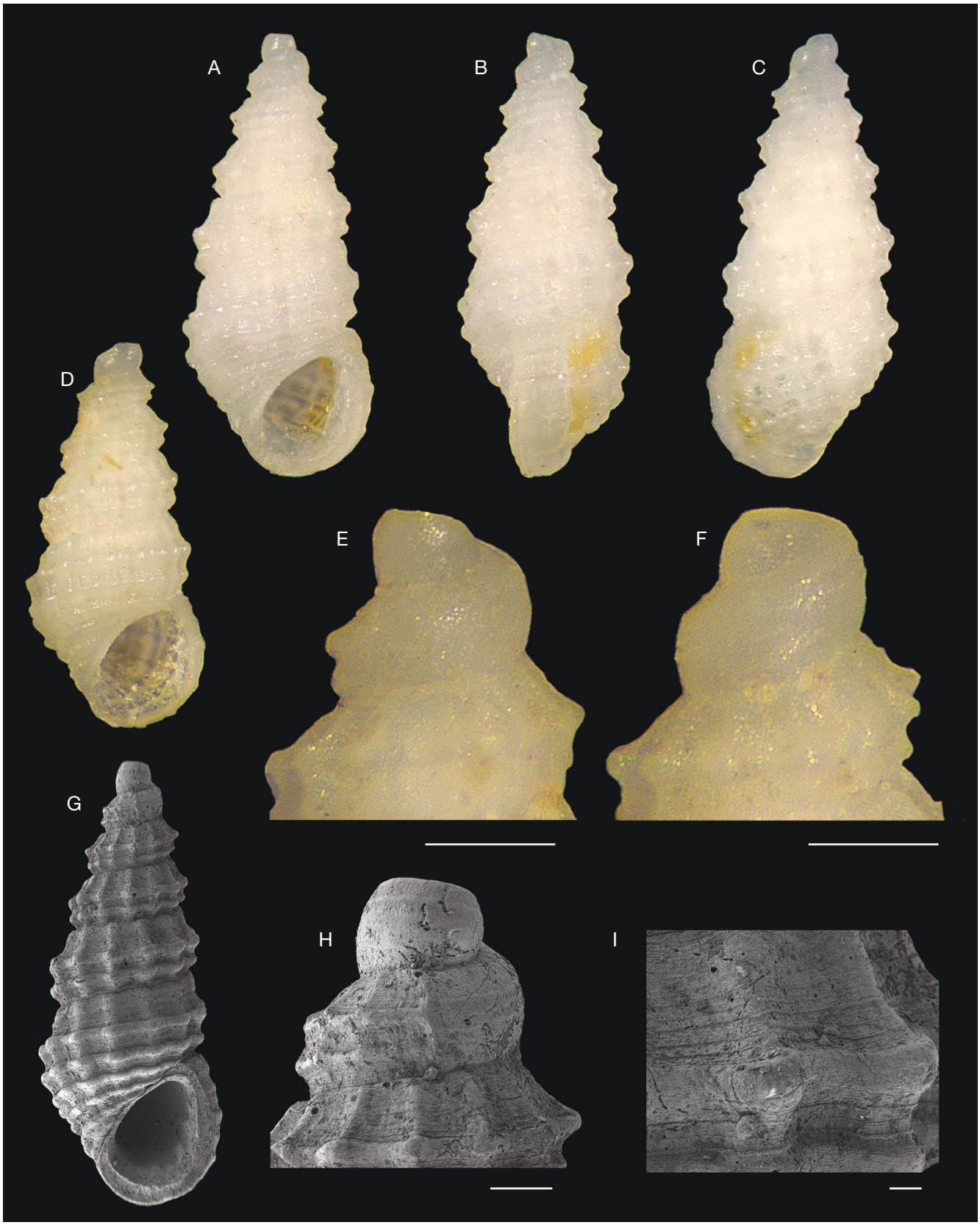


FIG. 40. — *Simulamerelina gracilis* n. sp.: **A**-**C**, **G**-**I**, holotype, Tuamotu, Moruroa, on the sea line, height 2.45 mm, width 1.08 mm, MNHN-IM-2000-38726; **D**-**F**, paratype, same data and locality of the holotype, height 2.13 mm, width 0.98 mm, shell (**D**), detail of the protoconch (**E**, **F**), shell (**G**), detail of the protoconch (**H**), detail of the microsculpture of the teleoconch (**I**); coll. MB. Scale bars: E, F, 20 µm H, 100 µm, I, 30 µm.

Remarks

Simulamerelina australes n. sp. differs from *S. gracilis* n. sp. in its less slender (maximum diameter: 0.300-0.366 mm vs 0.275 mm in *S. gracilis* n. sp.) protoconch with a single keel on the adapical fifth, and micro granules on the whole surface vaguely arranged in spiral bands vs 5-6 thin and irregular spiral cordlets in *S. australes* n. sp.; the less slender outline; the less spiny spiral cordlets on the first whorls, with the subsutural one (still very weak) more evident than in *S. gracilis* n. sp.

Simulamerelina densestriata n. sp. differs from *S. gracilis* n. sp. in its more pupoid outline with rather obtuse first whorls and broader base; the less robust spirals with more rounded nodules at the intersections; the more numerous axial ribs on the last whorl (13-20 vs 11-12 in *S. gracilis* n. sp.); the neatly opisthocline outer lip vs barely opisthocline in *S. densestriata* n. sp.; the broader and less slender protoconch with a maximum diameter of 0.317-0.366 mm vs 0.275 mm in *S. gracilis* n. sp.

Simulamerelina lepteseiras n. sp.
(Figs 41; 52B; 53R; Tables 7; 8; 9)

urn:lsid:zoobank.org:act:7E3425DF-8342-4367-A382-AB0FA931D123

Type material. — **Holotype. Tuamotu** • dd (height 1.47 mm, width 0.88 mm, Figs 41; 53R); Moruroa; 21°46'37"S, 138°53'31"W; beached; on the sea-line; MNHN-IM-2000-38727.

Type locality. — Tuamotu. Moruroa, 21°46'37"S, 138°53'31"W; on the sea-line.

Other material examined. — **Tuamotu** • 1 dd (photograph only); Ana'a, Tukuhora; 17°20'41"S, 145°31'26"W; 1-2 m; lagoon; coll. JL • 1 dd (photograph only); Rangiroa, Tiputa; 14°58'15"S, 147°37'33"W; beached; coll. JL.
Gambier • 1 dd (photograph only); Totegegi; 23°5'2"S, 134°52'58"W; 1-2 m; beached sediment; coll. JL.

Distribution and sympatry. — *Simulamerelina lepteseiras* n. sp. is known from the South Pacific Ocean in the Tuamotu (Moruroa, Rangiroa, Ana'a) and Gambier (Fig. 52B).
S. lepteseiras n. sp. is sympatric with *S. australes* n. sp. and *S. gracilis* n. sp. in the Tuamotu (Moruroa) (Table 9).

Etymology. — For the thin basal cords, from the Greek λεπτά (meaning thin), and σειράς (meaning cords).

Diagnosis. — *Simulamerelina* with small shell for the genus (<1.50 mm), pupoid, moderately robust. Protoconch paucispiral. Teleoconch with axial and spiral sculpture of the same strength. Axial ribs interrupted before reaching the base. Nine spiral cordlets on last whorl, four above the aperture, the second cordlet strongest, acute. Entire surface covered by dense evenly spaced spiral threads. Start of 3 spiral cordlets after protoconch-teleoconch boundary. Colouration uniform white.

Description of holotype

Shell (Figs 41A-C, F; 53R)
Small for the genus, height 1.47 mm, width 0.88 mm height/width ratio 1.67, elongate ovate.

Protoconch (Fig. 41D, E, G)
Paucispiral with barely twisted nucleus, of 1.35 convex whorls, height 0.237 mm, nucleus diameter 0.087 mm, first half whorl diameter 0.175 mm, maximum diameter 0.275 mm. Sculpture of one adapical spiral keel, and sparse microgranules on the whole surface. Protoconch-teleoconch boundary well marked.

Teleoconch
Of 2.9 convex whorls, suture scarcely impressed. Axial sculpture on the last whorl of 12 orthocline or slightly opisthocline ribs, thinner than the interspaces and sharply interrupted before reaching the base. Spiral sculpture of 9 equidistant spiral cordlets on the last whorl, 4 above the aperture, of same strength as axials, cordlet II acute; cordlets II, III, IV starting immediately after protoconch-teleoconch boundary. Subsutural cordlet I very weak, gradually forming after one whorl. Basal cordlets weaker and with wide interspaces. Microsculpture (Fig. 41H) of dense spiral threads, more marked and spaced in the interspaces. Umbilical fissure absent. Aperture oval, height 0.65 mm, height/aperture height ratio 2.26, peristome duplicated, outer lip broad, internally smooth, externally thickened by a strong opisthocline and flexuose varix.

Colour
Colouration uniform white.

Operculum and soft parts
Unknown.

Variability

Minimum and maximum dimensions: height 1.4-1.5 mm, width 0.68-0.86 mm. Number of spiral cords on last whorls 8-9 (4 above aperture) (See Table 8 and Appendix 19).

Remarks

Simulamerelina novemstriata Faber & Moolenbeek, 2004 from the Cayman Islands (Faber & Moolenbeek 2004: 61, 62, fig. 2), differs from *S. lepteseiras* n. sp. in its more slender shell, with a higher height/width ratio (1.88 vs 1.67-1.77 in *S. lepteseiras* n. sp.); the two spiral cordlets starting after the protoconch-teleoconch boundary vs three in *S. lepteseiras* n. sp.; the broader and closer basal spiral cordlets; the more numerous axial ribs (17 vs 12 in *S. lepteseiras* n. sp.); the proportionally smaller aperture (height/aperture height ratio 2.77 vs 2.20-2.26 in *S. lepteseiras* n. sp.).

See under *S. micrometrica* n. sp. for detailed comparison.

Simulamerelina micrometrica n. sp.
(Figs 42; 43; 52C; 53S; Tables 7; 8; 9)

urn:lsid:zoobank.org:act:BFD5B726-DC44-46A7-98A1-C00A1AAE7E36

Simulamerelina sp. 2 – Boutet *et al.* 2020: 240.

Type material. — **Holotype. Australes** • dd (height 1.33 mm, width 0.73 mm, Figs 42A-C; 43A-C; 53S); E of Rapa, BENTHAUS Stn DW1889; 27°37'1"S, 144°16'1"W; 600-620 m; 7.XI.2002; MNHN-IM-2000-38728.

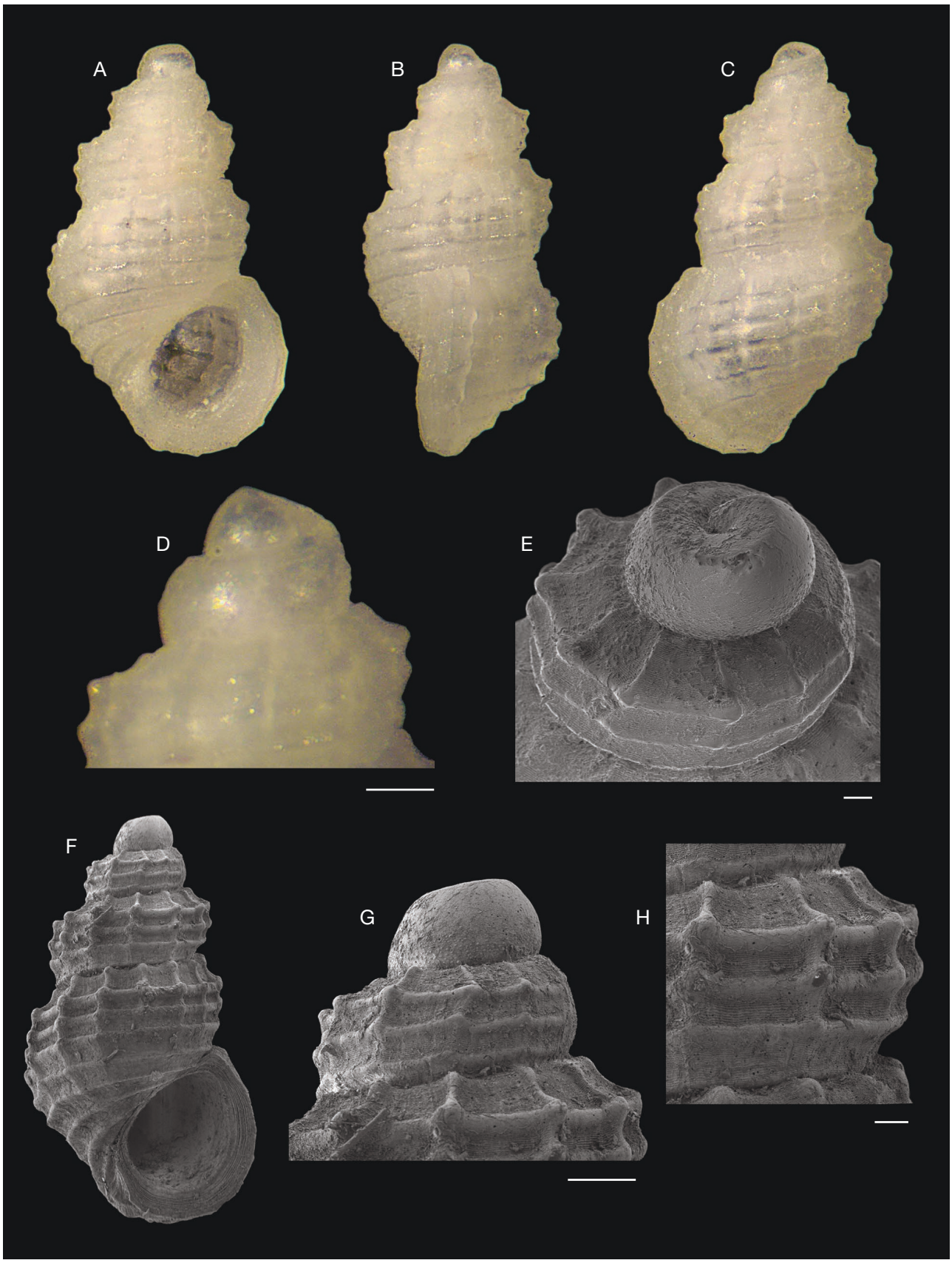


FIG. 41. — *Simulamerelina lepteseiras* n. sp., holotype, Tuamotu. Moruroa, beached, height 1.47 mm, width 0.88 mm, MNHN-IM-2000-38727: **A**-**C**, **F**, shell; **E**, **G**, detail of the protoconch; **H**, detail of the microsculpture of the teleoconch. Scale bars: E, H, 40 µm, D, G, 100 µm.

FIG. 42. — *Simulamerelina micrometrica* n. sp.: **A**-**C**, holotype height 1.33 mm Australes, East of Rapa, BENTHAUS Stn DW1889; 600-620 m, MNHN-IM-2000-38728; **D**, height 1.46 mm, Australes, Banc Président Thiers, BENTHAUS Stn DW1926; 50-90 m, MNHN; **E**, height 1.16 mm, Australes, Banc Président Thiers, BENTHAUS Stn DW1933; 500-850 m, MNHN; **F**-**H**, paratype height 1.46 mm, same locality and data as holotype, MNHN-IM-2000-38729; **I**, height 1.13 mm, Australes, Banc Président Thiers, BENTHAUS Stn DW1926; 50-–90 m, MNHN; **J**, height 1.2 mm, Australes, Banc Président Thiers, BENTHAUS Stn DW1926; 50-90 m, MNHN; **K**, height 1.36 mm, Australes, Banc Arago, BENTHAUS Stn DW1978; 120-180 m, MNHN; **L**, height 1.43 mm, Australes, Banc Président Thiers, BENTHAUS Stn DW1933; 500-850 m, MNHN; **M**, height 1.51 mm, Australes, Rimatara, BENTHAUS Stn DW2020; 920-930 m, MNHN; **N**, height 1.53 mm, Australes, North of Raivavae, BENTHAUS Stn DW1943; 950 m, MNHN; **O**, height 1.55 mm, Australes, Rimatara, BENTHAUS Stn DW2021; 1200-1226 m, MNHN.

Paratype. Australes • 1 dd (height 1.46 mm, Figs 42F-H; 43D-F); same locality and data as holotype; MNHN-IM-2000-38729.

TYPE LOCALITY. — Australes: E of Rapa, BENTHAUS Stn DW1889; 27°37'1"S, 144°16'1"W; 600-620 m.

OTHER MATERIAL EXAMINED. — **Australes** • 5 dd; Banc Président Thiers, BENTHAUS Stn DW1926; 24°38'9"S, 146°0'50"W; 50-90 m; 13.XI.2002; MNHN • 3 dd; Banc Président Thiers, BENTHAUS Stn DW1932; 24°40'58"S, 146°1'58"W; 500-800 m; 14.XI.2002; MNHN • 3 dd; Banc Président Thiers, BENTHAUS Stn DW1933; 24°40'58"S, 146°1'1"W; 500-850 m; 14.XI.2002; MNHN • 3 dd; N of Raivavae, BENTHAUS Stn DW1943; 23°49'1"S, 147°39'0"W; 950 m; 5.XI.2002; MNHN • 11 dd; Tubuai; 23°20'38"S, 149°28'33"W; beached; sea line; coll. JL • 2 dd; Tubuai, BENTHAUS Stn DW1962; 23°21'0"S, 149°33'0"W; 470-800 m; 19.XI.2002; MNHN • 1 dd; Tubuai, BENTHAUS Stn DW1962; 23°21'0"S, 149°33'0"W; 470-800 m; 19.XI.2002; MNHN

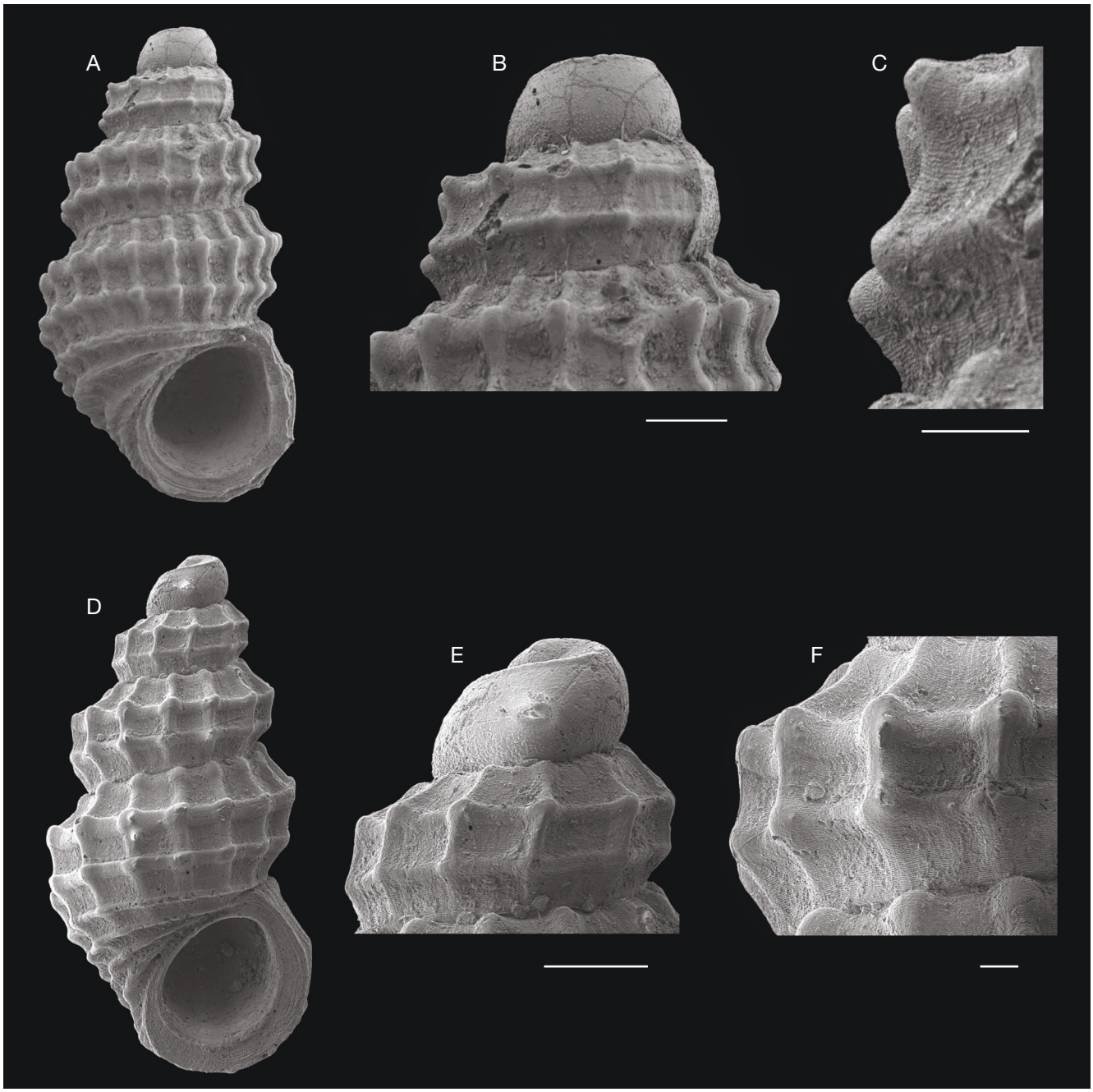


FIG. 43. — *Simulamerelina micrometrica* n. sp.: **A**-**C**, holotype height 1.33 mm Australes, East of Rapa, BENTHAUS Stn DW1889; 600-620 m, MNHN-IM-2000-38728; **D**-**F**, paratype, height 1.46 mm same locality and data as holotype, MNHN-IM-2000-38729. Scale bars: B, E, 100 µm, C, 200 µm, F, 40 µm.

• 1 dd; Tubuai, Motu Motihia; 23°22'4"S, 149°23'52"W; beached; beached sediment; coll. JL • 1 dd; Banc Arago, BENTHAUS Stn DW1978; 23°22'1"S, 150°43'1"W; 120-180 m; 21.XI.2002; MNHN • 19 dd; S of Rurutu BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN • 13 dd; S of Rurutu BENTHAUS Stn DW2010; 22°31'58"S, 151°20'59"W; 520-950 m; 24.XI.2002; MNHN • 1 dd; E coast of Rurutu, BENTHAUS Stn DW2003; 22°28'1"S, 151°19'1"W; 250-330 m; 24.XI.2002; MNHN • 1 dd; Rurutu, Toataratara; 22°31'29"S, 151°20'38"W; beached; beached sediment; coll. MB • 15 dd; Rimatara, BENTHAUS Stn DW2020; 22°37'1"S, 152°49'1"W; 920-930 m; 25.XI.2002; MNHN • 2 dd; Rimatara, BENTHAUS Stn DW2021; 22°37'1"S, 152°49'1"W; 1200-1226 m; 25.XI.2002; MNHN • 4 dd; Rimatara, BENTHAUS Stn DW2021; 22°37'1"S, 152°49'1"W; 1200-1226 m; 25.XI.2002; MNHN. **Gambier** • 1 dd; Mangareva, Rikitea; 23°6'39"S, 134°58'1"W; beached; lagoon; coll. JL • 4 dd; Mangareva, Rikitea; 23°6'39"S, 134°58'1"W beached; beached sediment; coll. MB.

Tuamotu • 1 dd; Gatavake; 23°6'50"S, 134°58'55"W-23°6'50"S, 134°58'55"W; 1-3 m; coll. JL • 1 dd; Tenoko; 23°4'26"S, 135°0'35"W; 1-3 m; coll. JL • 2 dd; Totegegi; 23°5'2"S, 134°52'58"W; 1-3 m; coll. JL • 1 dd; Moruroa; 21°46'37"S, 138°53'31"W; beached; on the sea-line; coll. MB • 1 dd; Vairaatea; 19°19'44"S, 139°13'8"W; beached; coll. MB.

Society Islands • 36 dd; Motu One; 15°48'21"S, 154°30'39"W; 1 m; reef edge; coll. JL.

Distribution and sympatry. — *Simulamerelina micrometrica* n. sp. is known from the South Pacific Ocean, in the Australes (Rapa, Banc Président Thiers, Raivavae, Tubuai, Banc Arago, Rurutu, Rimatara), Gambier, Tuamotu (Moruroa) and Society Islands (Motu One) (Fig. 52C).
Simulamerelina micrometrica n. sp. is sympatric with *S. australes* n. sp. in the Australes (Rapa, Banc Président Thiers Banc, Arago, Rurutu, Rimatara) and with *Simulamerelina densestriata* n. sp. in the Australes (Tubuai) (Table 9).

Etymology. — The name refers to the small size of this species, from the Greek μικρός (meaning small) and μετρικός (meaning metric).

Diagnosis. — *Simulamerelina* with small shell for the genus (< 2 mm), slender, turriculate and robust. Protoconch paucispiral. Teleoconch axial and spiral sculpture of same strength, axials fading at the base. Cordlet II most prominent. Microsculpture of dense spiral threads. Start of 2 spiral cordlets after protoconch-teleoconch boundary. Colouration uniform white.

Description of holotype
Shell (Figs 42A-C; 43A; 53S)
Small for the genus, height 1.33 mm, width 0.73 mm height/width ratio 1.82, turriculate-slender, elongate ovate, robust.

Protoconch (Fig. 43B)
Paucispiral with weakly twisted nucleus, of 1.35 convex whorls, height 0.277 mm, nucleus diameter 0.083 mm, first half whorl diameter 0.167 mm, maximum diameter 0.283 mm. Sculpture of one spiral keel on upper third, microgranules over the entire surface. Protoconch-teleoconch boundary well marked.

Teleoconch
Of 2.9 convex whorls, suture evident and impressed. Axial sculpture on last whorl of 18 orthocline ribs, slightly prosocline, thinner than interspaces and not reaching the base. Spiral sculpture of same strength as axial, of equidistant cordlets, 2 central on first whorl, 3 on the next, 8 on last whorl, of which 3 above the aperture, the subsutural very weak, and 5 on the base. Cordlet II most prominent. Slightly acute tubercles at the intersections, interspaces quadrangular. Microsculpture (Fig. 43C) of dense spiral threads. Umbilical fissure absent. Aperture oval, height 0.50 mm, height/aperture height ratio 2.66, peristome duplicated, internally smooth, externally thickened by a strong slightly prosocline varix.

Colour
Colouration uniform white.

Operculum and soft parts
Unknown.

Variability
Minimum and maximum dimensions: height 1.13-1.67 mm, width 0.68-0.86 mm. Number of axial ribs on the last whorl: 13-24. Outer lip varix breadth corresponding to 3-6 appressed ribs (See Table 8 and Appendix 20).

Remarks
Simulamerelina wanawana (Kay, 1979) from Barbers Point, Oahu, Hawaii (Kay 1979: 82, fig. 28a, b), is similar to *S. micrometrica* n. sp., but differs in the sculpture of the protoconch of 1.5 whorls, with abapical spiral striae vs 1.25-1.4 whorls with one adapical spiral keel on the upper third, and microgranules over the entire surface in *S. micrometrica* n. sp.; the larger size (height 1.75-1.80 mm vs height 1.23-1.67 mm in *S. micrometrica* n. sp.). Hasegawa (2000: 150, 151, fig. 18a-c) has figured two 'forms' of *Merelina wanawana* Kay, 1979 from Japan: its spiny form (Hasegawa 2000: fig. 18c) morphologically fits the real *S. wanawana* of Hawaii; the specimen with more numerous axial ribs (Hasegawa 2000: fig. 18a, b) is very similar to our Polynesian specimens of *S. micrometrica* n. sp., apparently larger (1.8 mm) and with a narrower protoconch.

Simulamerelina longinqua (Rehder, 1980) from Easter Island (Rehder 1980: 29, pl. 5, fig. 10), differs from *S. micrometrica* n. sp. in the larger size (height 1.8-2.01 mm vs height 1.23-1.67 mm), and the different apical sculpture (two or three spiral cordlets, the abapical very weak, the apical forming a keel producing a flattened ramp vs one spiral keel on upper third, microgranules over the entire surface in *S. micrometrica* n. sp.).

Simulamerelina caribaea (d'Orbigny, 1842) from Cuba and Jamaica (d'Orbigny 1842: 21, pl. 11, figs 31-33), superficially resembles *S. micrometrica* n. sp. but can be separated by the chromatic pattern, white background with two reddish-brown subsutural and basal bands vs uniform white in *S. micrometrica* n. sp.; the larger size (height 1.8-2.0 mm vs height 1.23-1.67 mm in *S. micrometrica* n. sp.); the spiral sculpture of three spiral cordlets above the aperture, of the same thickness, vs one (subsutural) very weak and two stronger cordlets In *S. micrometrica* n. sp.

Simulamerelina lepteseiras n. sp. superficially resembles *S. micrometrica* n. sp. but can be separated by its more numerous spiral cordlets (four on the upper whorls, and nine on the last whorl, four above the aperture, vs three on the upper whorls and eight on the last whorl, three above the aperture in *S. micrometrica* n. sp.), and its broader aperture

Simulamerelina tuamotu n. sp. has a protoconch with similar sculpture but with less convex whorls; fewer axial ribs (8-13 vs 13-24 in *S. micrometrica* n. sp.); 4-5 spiral cordlets on the base vs four in *S. micrometrica* n. sp.; the median spiral cordlet decidedly the more protruding and broader vs the spiral cordlets above the aperture almost of the same thickness in *S. micrometrica* n. sp.

Simulamerelina tuamotu n. sp.
(Figs 44; 45; 52C; 53T; Tables 7; 8; 9)

urn:lsid:zoobank.org:act:9CFA60AC-901A-421E-92D2-428F9B62CE43

Simulamerelina sp. 5 – Boutet *et al.* 2020: 240.

Type material. — **Holotype. Tuamotu •** dd (height 1.57 mm, width 0.90 mm, Figs 44A-C; 45; 53T); Makemo, Passe Arikitamiro, Nake; 16°37'1"S, 143°33'43"W; <1 m; reef flat; MNHN-IM-2000-38730. **Paratypes. Tuamotu •** 10 dd (Fig. 44D, E); same locality data as holotype; MNHN-IM-2000-38731.

Fig. 44. — *Simulamerelina tuamotu* n. sp.: **A**-**C**, holotype, Tuamotu, Makemo, Nake, <1 m, height 1.57 mm, width 0.90 mm, MNHN-IM-2000-38730; **D**, paratype, Tuamotu, Makemo, Nake, <1 m, height 1.58 mm, MNHN-IM-2000-38731; **E**, paratype, Tuamotu, Makemo, Nake, <1 m, height 1.27 mm, MNHN-IM-2000-38731.

Type locality. — Tuamotu: Makemo, Passe Arikitamiro, Nake; 16°37'1"S, 143°33'43"W; <1 m.

Other material examined. — **Tuamotu** • 9 dd; Makemo, Passe Arikitamiro; 16°37'15"S, 143°33'50"W; 45-54 m; coll. JL (8), coll. MB (1).

Distribution and sympatry. — *Simulamerelina tuamotu* n. sp. is known only for the Tuamotu (Makemo) (Fig. 52C).
No congener collected sympatrically.

Etymology. — From the type locality, Tuamotu, used as a noun in apposition.

Diagnosis. — *Simulamerelina* with shell small for the genus (<2 mm), slender, turriculated, robust. Protoconch paucispiral with markedly twisted nucleus; outline turriculate-pagodiform, with deep canaliculated suture; axials and spirals forming at their intersection, spiny tubercles. Central cordlet larger and protruding. Axial ribs not reaching the base. Start of 3 spiral cordlets, the subsutural weaker, after protoconch-teleoconch boundary. Entire surface covered by distributed spiral threads, more spaced in the interspaces of spiral cordlets. Colouration uniform white.

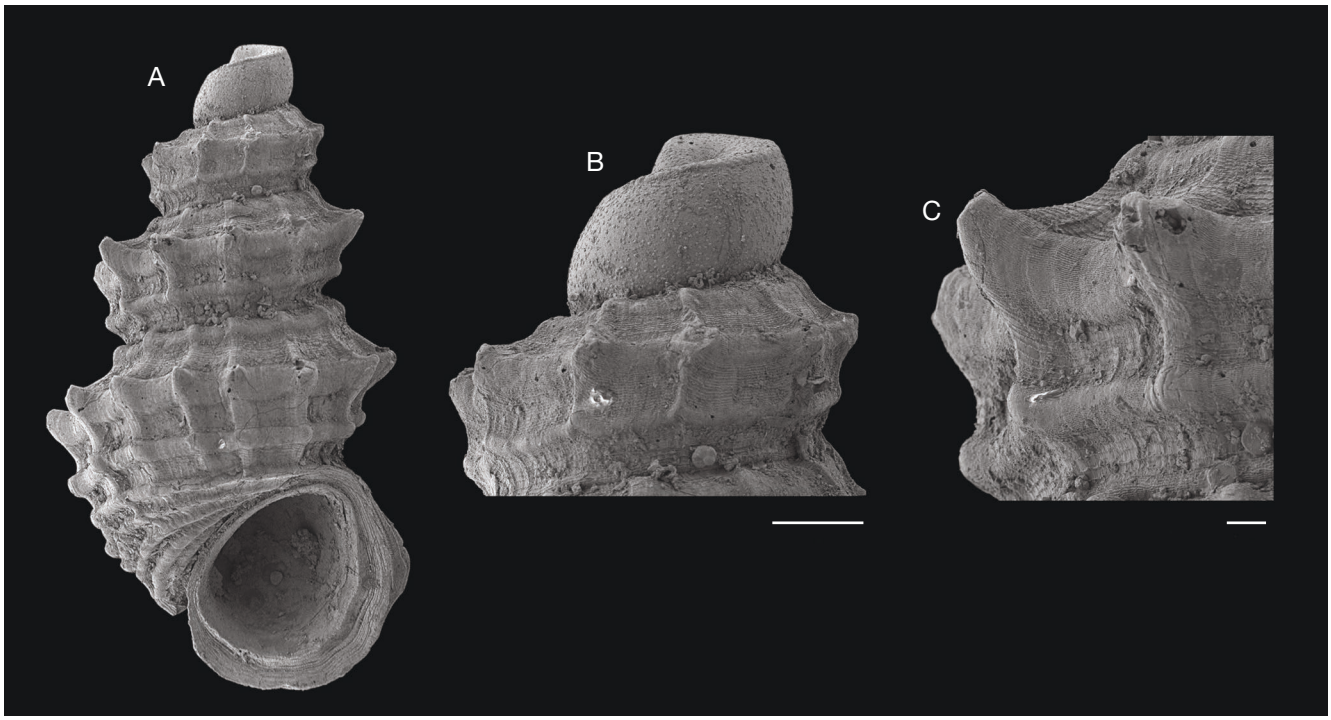


Fig. 45. — *Simulamerelina tuamotu* n. sp.: holotype, Tuamotu, Makemo, Nake, <1 m, MNHN-IM-2000-38730: **A**, shell, height 1.57 mm, width 0.90 mm; **B**, detail of the first whorls; **C**, detail of the microsculpture of the second whorl (MNHN-IM-2000-38730). Scale bars: B, 100 µm, C, 30 µm.

Description of holotype

Shell (Figs 44A-C; 45A; 53T)

Small for the genus, height 1.57 mm, width 0.90 mm height/width ratio 1.74, turriculate-pagodiform, elongate ovate.

Protoconch (Fig. 45B)

Paucispiral with slightly twisted nucleus, of 1.25 convex whorls, height 0.300 mm, nucleus diameter 0.070 mm, first half whorl diameter 0.167 mm, maximum diameter 0.275 mm. Sculpture of one strong adapical spiral keel, and minute granules over the entire surface. Protoconch-teleoconch boundary well marked.

Teleoconch

Of 3.25 convex whorls, suture canaliculated. Axial sculpture on the last whorl of 10 orthocline ribs, thinner than the interspaces and sharply interrupted at the base. Spiral cordlets of same thickness as axials: 2 on the first whorl, three on the next whorls and 3 above the aperture, 8 on the last whorl; cord I weaker, cord II larger and more protruding; 5 basal cords thinner and more closely spaced. Spiny tubercles at intersections; interspaces quadrangular.

Microsculpture (Fig. 45C) of dense spiral threads, more spaced in the interspaces of the spirals. Umbilical fissure absent. Aperture oval, height 0.53 mm, height/aperture height ratio 2.96, peristome duplicated, internally smooth, externally thickened by a strong prosocline varix.

Colour

Colouration uniform white.

Operculum and soft parts

Unknown.

Variability

Height ranging 1.25-1.65 mm. Outer lip orthocline, slightly prosocline or slightly opisthocline (see Table 8 and Appendix 21).

Remarks

Simulamerelina wanawana (Kay, 1979), from Barbers Point, Oahu, Hawaii (Kay 1979: 82, pl. 28, fig. A, B) differs from *S. tuamotu* n. sp. in its larger size (height 1.75 in the holotype vs height 1.25-1.65 mm in *S. tuamotu* n. sp.) and the higher height/width ratio (2.33 vs 1.56-1.77 in *S. tuamotu* n. sp.); in the spiral sculpture of two cords of equal thickness above the aperture vs three cords, of which the subsutural weaker and the median (II) larger and more protruding; the protoconch of 1.5 whorls vs 1.2-1.25 whorls in *S. tuamotu* n. sp.

Simulamerelina longinqua (Rehder, 1980), from Easter Island (Rehder 1980: 29, pl. 5, fig. 10), differs from *S. tuamotu* n. sp. in its larger size (height 1.8-2.01 mm vs 1.25-1.65 mm in *S. tuamotu*); the colouration yellowish white vs uniform white in *S. tuamotu* n. sp.; the protoconch with two or three spiral cords vs one strong adapical spiral keel, and minute granules over the entire surface in *S. tuamotu* n. sp.; the fewer spiral cordlets on the base (3 vs 4-5 in *S. tuamotu*); the spiral cordlets above aperture all of the same thickness vs three cords, of which the subsutural weaker and the median (II) larger and more protruding in *S. tuamotu* n. sp.

Merelina lacunosa (Powell, 1940) from Tom Bowling Bay, northern New Zealand (Powell 1940: 227, pl. 30,

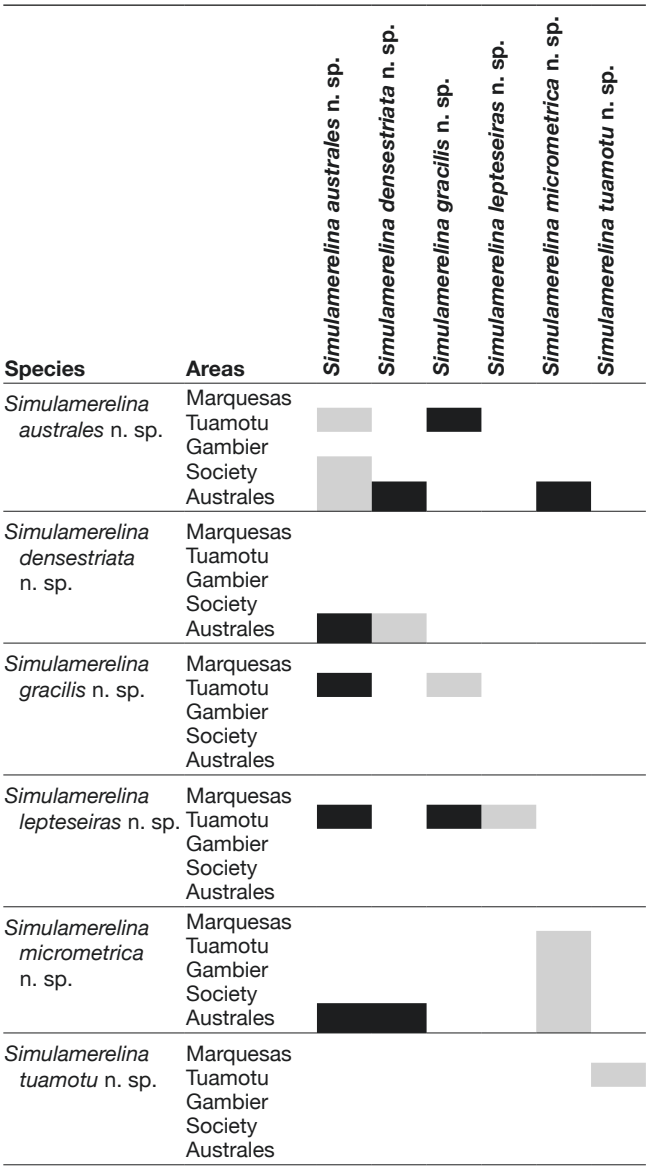
TABLE 8. — Measurements of teleoconch and protoconch of Polynesian species of *Simulamerelina* Ponder, 1985 and *Subestea* Cotton, 1944, in mm, with minimum-maximum range and mean [standard deviation in square parentheses]; sample size in parentheses with the species name; **M**, protoconch multispiral; **P**, protoconch paucispiral.

	***Simulamerelina lepteseiras* n. sp. (1)**	***Simulamerelina australes* n. sp. (21)**	***Simulamerelina gracilis* n. sp. (2)**	***Simulamerelina densestriata* n. sp. (10)**	***Simulamerelina micrometrica* n. sp. (11)**	***Simulamerelina tuamotu* n. sp (10)**	***Subestea moruroa* n. sp. (3)**
Teleoconch							
Height	1.47	2.13-2.67 2.45 [0.183]	2.13-2.45 2.29 [0.226]	2.27-2.75 2.54 [0.149]	1.23-1.63 1.43 [0.137]	1.28-1.65 1.45 [0.145]	1.42-1.96 1.66 [0.162]
Width	0.88	1.00-1.18 1.11 [0.056]	0.98-1.08 1.03 [0.071]	1.05-1.28 1.19 [0.068]	0.68-0.85 0.77 [0.060]	0.76-0.95 0.86 [0.075]	0.82-1.02 0.90 [0.064]
Height/Width ratio	1.67	2.01-2.36 2.19 [0.0779]	2.17-2.27 2.22 [0.067175]	2.03-2.17 2.13 [0.0539]	1.76-1.93 1.84 [0.0526]	1.56-1.77 1.68 [0.0654]	1.73-2.00 1.84 [0.0925]
Aperture height	0.65	0.73-0.97 0.88 [0.068]	0.73-0.85 0.79 [0.085]	0.82-0.97 0.90 [0.049]	0.48-0.63 0.56 [0.059]	0.50-0.60 0.54 [0.048]	0.57-0.72 0.64 [0.044]
Height/aperture height ratio	2.26	2.62-2.98 2.79 [0.090]	2.88-2.92 2.90 [0.026]	2.63-2.98 2.81 [0.123]	2.43-2.66 2.55 [0.066]	2.56-2.96 2.68 [0.121]	2.49-2.72 2.60 [0.089]
No. whorls	2.9	4-4.8 4.4 [0.25]	4.20-4.70 4.45 [0.353]	3.90-4.50 4.2 [0.19]	2.75-3.25 3.04 [0.179]	2.60-3.25 3.02 [0.236]	2.75-3.50 3.04 [0.262]
No. axial ribs on last whorls	12	12-17 14.5 [1.44]	11-12 11.5 [0.71]	13-20 16.4 [2.46]	13-24 17.2 [4.31]	8-13 10.4 [1.43]	9-13 10.9 [1.57]
No. spiral cords on last whorls (above aperture)	9 (4)	7-8 7.7 [0.48]	7 (3) 7 (3) [0 (0)]	8-9 (3) 8.4 (3) [0.52 (0)]	7 (3) 7 (3) [0 (0)]	7- 8 (3) 7.4 (3) [0.52 (0)]	15-18 (8-9) 15.8 (8.6) [1.30 (0.55)]
Protoconch							
Height	0.237	0.283-0.317 0.301 [0.0087]	0.312-0.325 0.3185 [0.0092]	0.300-0.333 0.318 [0.0122]	0.247-0.300 0.274 [0.0148]	0.283-0.316 0.303 [0.0103]	0.237-0.325 0.282 [0.0325]
Diameter of nucleus	0.087	0.06-0.10 0.08 [0.016]	0.100-0.112 0.106 [0.008]	0.107-0.133 0.116 [0.0067]	0.062-0.093 0.079 [0.0109]	0.067-0.083 0.077 [0.0070]	0.100-0.145 0.120 [0.0140]
Diameter of first half whorl	0.175	0.167-0.225 0.199 [0.0130]	0.200-0.212 0.206 [0.0085]	0.220-0.250 0.236 [0.0113]	0.167-0.200 0.176 [0.0122]	0.167-0.193 0.178 [0.0102]	0.200-0.225 0.216 [0.0080]
Maximum diameter	0.275	0.300-0.333 0.323 [0.0121]	0.275 0.275 [0]	0.317-0.366 0.345 [0.0163]	0.250-0.300 0.280 [0.0142]	0.250-0.293 0.271 [0.0119]	0.283-0.362 0.312 [0.0268]
No. whorls	1.35	1.25-1.40 1.28 [0.0373]	1.10-1.20 1.15 [0.0707]	1.15-1.25 1.23 [0.0354]	1.25-1.40 1.30 [0.057]	1.20-1.25 1.24 [0.021]	1.35-1.50 1.41 [0.067]
Type	P	P	P	P	P	P	P

fig. 9), recalls *S. tuamotu* n. sp., in its teleoconch sculpture initially consisting, in both species, of two spiral cordlets of which the central more protruding and the lower, supra-subsutural progressively weaker; it can however be easily distinguished by the apical sculpture typical of the genus *Merelina* Iredale, 1915, with spiral cordlets vs with one strong spiral adapical keel, and minute granules over the entire surface in *S. tuamotu* n. sp.; the larger size (height >2 mm vs height <2 mm in *S. tuamotu* n. sp.) and higher height/width ratio (2.10 vs 1.56-1.77 *S. tuamotu* n. sp.); and for the different colouration (uniform brown vs uniform white in *S. tuamotu* n. sp.).

See under *Simulamerelina micrometrica* n. sp. for detailed comparisons.

TABLE 9. — List of Recent *Simulamerelina* Ponder, 1985 from French Polynesia, with their known occurrence (**grey shaded cells**) and the sympatric co-occurrence in the same island with other species (**black shaded cells**).



Genus *Subestea* Cotton, 1944

Subestea Cotton, 1944: 292.

TYPE SPECIES. — *Alvania seminodosa* May, 1915: 94-95; plate VI, fig. 30 (synonym of *Subestea australiae* (Frauenfeld, 1867)) by original designation.

DIAGNOSIS. — Shell of small size for the family (height *c.* 2 mm); elongate-conical to elongate-oval, rather robust, non-umbilicate, with spiral and axial sculpture varying in strength, spiral sculpture usually stronger than axial sculpture, sometimes subequal, sometimes almost obsolete. Microsculpture from dense spiral stretches. Aperture simple, subcircular. Protoconch paucispiral, dome-shaped, of about 1 ½ whorls, sculptured with smooth spiral lirae, interspaces with granules or micro pits (from Ponder, 1985 with personal modifications).

Head-foot: cephalic tentacles moderately long, ciliated ventrally, with parallel sides or slightly expanded distally; small anterior pallial tentacle and very short, broad, posterior metapodial tentacle; indistinct, triangular anterior pedal gland and no posterior pedal gland. Operculum: oval, thin, nucleus eccentric, last whorl large (after Ponder 1985: 59).

REMARKS

Subestea Cotton, 1844 was sometimes ranked as a subgenus of *Onoba* H. Adams & A. Adams, 1852 (Ponder 1985: 59), and is currently regarded as a valid genus (Criscione *et al.* 2016: 13). It comprises a small group of six species (MolluscaBase 2023e) living from the lower intertidal to the continental shelf, where they are often associated with algal facies, in the tropical western and southern Atlantic, the tropical Indo-West Pacific, and South Africa. A single, undescribed species has been found in the Tuamotu and Gambier.

Subestea moruroa n. sp.
(Figs 46A; 47; 52D; 53U; Tables 7; 10)

urn:lsid:zoobank.org:act:4FBB581D-CB71-4188-988F-C0956F9A2A45

Pusillina sp. – Boutet *et al.* 2020: 240.

TYPE MATERIAL. — **Holotype. Tuamotu** • dd (height 1.96 mm, width 1.02 mm, Figs 46A-C; 47; 53U); Moruroa; 21°46’37”S, 138°53’31”W; beached; on the sea-line; MNHN-IM-2000-38732. **Paratype**. **Tuamotu** • 1 dd; Moruroa; same data as holotype; MNHN-IM-2000-29047

TYPE LOCALITY. — Tuamotu; Moruroa; 21°46’37”S, 138°53’31”W; on the sea-line.

OTHER MATERIAL EXAMINED. — **Tuamotu** • 10 dd; Pinaki; 19°23’56”S, 138°40’1”W; beached; sediment on reef flat; coll. JL • 9 dd; Nukutavake; 19°16’37”S, 138°46’30”W; beached; sediment on reef flat; coll. JL • 2 dd (Fig. 46D, E); Ana’a, Tukuhora; 17°20’41”S, 145°31’26”W; 1-2 m; lagoon; coll. MB • 12 dd; Makemo, Pouheva; 16°37’22”S, 143°35’34”W; 1 m; reef edge behind lighthouse; coll. JL • 8 dd; Makemo, Passe Arikitamiro, Nake; 16°37’1”S, 143°33’43”W; <1 m; reef edge; coll. JL • 10 dd; Raroia; 16°2’9”S, 142°28’37”W; <1 m; reef edge; coll. JL • 8 dd; Fangatau; 15°49’8”S, 140°53’9”W; beached; sediment on reef flat; coll. JL. **Gambier** • 1 dd; Mangareva, Rikitea; 23°6’39”S, 134°58’1”W; beached; beached sediment; coll. JL • 2 dd; Tenoko; 23°4’26”S, 135°0’35”W; 1-3 m; coll. JL • 2 dd; Totegegi; 23°5’2”S, 134°52’58”W; 1-3 m; beached sediment; coll. JL.

DISTRIBUTION AND SYMPATRY. — *Subestea moruroa* n. sp. is known from the South Pacific Ocean, in the Tuamotu (Moruroa, Pinaki, Nukutavake, Ana’a, Makemo, Raroia, Fangatau) and Gambier (Fig. 52D).

ETYMOLOGY. — After the name of the type locality (Moruroa), used as a noun in apposition.

DIAGNOSIS. — *Subestea* with medium sized shell (<2 mm height), robust, slender; protoconch paucispiral, dome-shaped; teleoconch with axial ribs broader but weaker than spirals; convex and angled whorls; marked teleoconch microsculpture; colouration uniform white, occasionally with two spiral series of false blotches (difference in shell transparency).

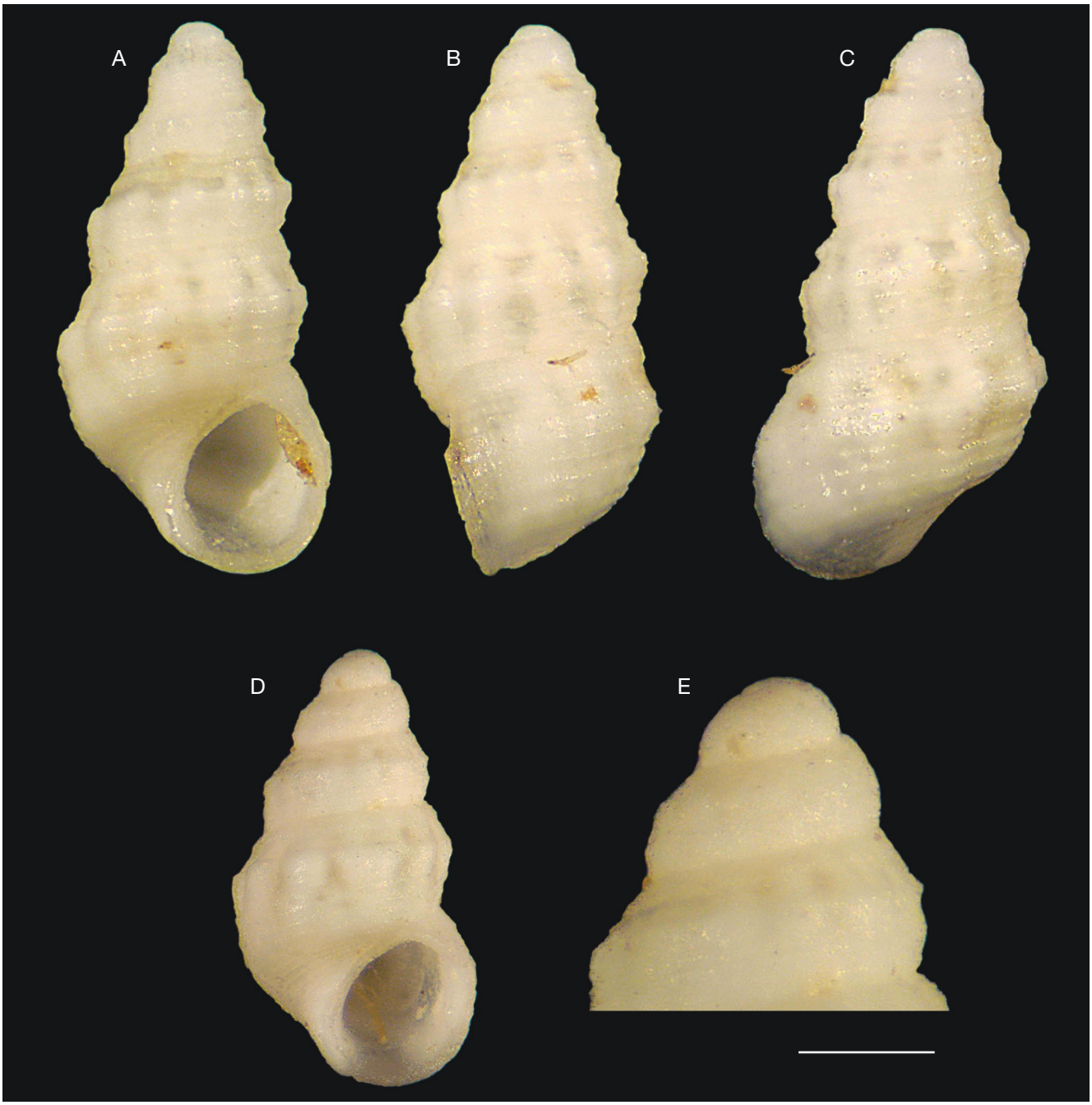


Fig. 46. — *Subestea moruroa* n. sp.: **A**-**C**, holotype, Tuamotu, Moruroa, on the sea-line, height 1.96 mm, MNHN-IM-2000-38732; **D**, **E**, Ana'a, Tukuhora; 1-2 m, height 1.57 mm, Coll. MB: shell (**D**), detail of the first whorls (**E**). Scale bar: E, 25 µm.

Description of holotype

Shell (Figs 46A-C; 47A; 53U)

Small for the genus, height 1.96 mm, width 1.02 mm, height/width ratio 1.92, robust, elongate-conic.

Protoconch (Fig. 47B-D)

Paucispiral, dome-shaped, of 1.5 slightly convex whorls, height 0.237 mm, nucleus diameter 0.112 mm, first half whorl diameter 0.212 mm, maximum diameter 0.287 mm, with 8 thin spiral cordlets, interspaced by dense series of minute pits (Fig. 47C, D). Protoconch-teleoconch boundary well marked.

Teleoconch

Of 3.50 convex whorls, angled in the median part, suture shallow. Axial sculpture on the last whorl of 9 slightly prosocline ribs not reaching the base. Spiral sculpture of 15 unequal and unequally spaced spiral cordlets, narrower than interspaces, 9 above the aperture. Three starting after protoconch-teleoconch boundary.

TABLE 10. — List of the known species of the genus *Subestea* Cotton, 1944 with geographic area and iconographic references.

Species	Geographic area	Iconographic references
Subestea alfredensis (Bartsch, 1915)	Indian O., South Africa	Bartsch 1915: 128, pl. 21, fig. 8; Ponder 1985: 164, pl. 115, figs F-H
Subestea australiae (Frauenfeld, 1867)	Pacific O., S Australia	Frauenfeld 1867: 14, pl. II, fig. 23; Ponder 1985: 164, pl. 115, figs A-E
Subestea glypta (E. A. Smith, 1890)	E Atlantic O. (St. Helena)	Smith E. A. 1890: 288, pl. 23, fig. 39; syntype at MolluscaBase https://www.molluscabase.org/aphia.php?p=taxdetails&id=988087
Subestea lusciniae (R. B. Watson, 1886)	S Atlantic O. (Tristan da Cunha)	R. B. Watson 1886: 597, pl. 44, fig. 3
Subestea moruroa n. sp.	Pacific	Figs 46; 47; 53T
Subestea platia (E. A. Smith, 1890)	E Atlantic O. (St. Helena)	Smith E. A. 1890: 309, pl. 24, fig. 13
Subestea supracostata (May, 1920)	Pacific O., New Zealand and S Australia	May 1920: 62, pl. 15, fig. 16

Microsculpture of raised spiral threads, interspaced by axial riblets (Fig. 47E-G). Umbilical fissure absent. Aperture rounded-piriform, height 0.72 mm, height/aperture height ratio 2.72, peristome continuous, outer lip with slightly thickened varix and sharp edge, prosocline, internally smooth.

Colour
Uniform white.

Operculum and soft parts
Unknown.

VARIABILITY
We examined 66 not particularly fresh specimens (including adults and juveniles). Size ranges from 1.25 mm (from Makemo) to 1.96 mm (from Moruroa).

Species with some variation only in the H/W ratio (1.63-2.00) and in the strength of the axial ribs, which in many specimens are very flattened especially on the last whorl (see Table 8 and Appendix 22). Some specimens show two spiral series of transparent blotches on an otherwise opaque shell.

REMARKS
Subestea moruroa n. sp. differs from *Subestea australiae* (Frauenfeld, 1867), from Sydney, Southeast Australia (Frauenfeld 1867: 14, pl. II, fig. 23; Ponder 1985: 164, pl. 115, fig. A-E), in its more acute spire, the more angled whorls, and the less rounded aperture; in the protoconch with eight thin spiral cordlets, interspaced by dense series of minute pits vs six broader spiral cordlets, interspaced by microtubercles in *S. autraliae.*

Subestea moruroa n. sp. differs from *Subestea alfredensis* (Bartsch, 1915), from South Africa (Bartsch 1915: 128, pl. 21, fig. 8; Ponder 1985: 164, pl. 115, fig. F-H), in the presence of an axial sculpture and in the spiral sculpture with 15 cordlets on the last whorl (nine above the aperture) of different and unequal thicknesses vs 22 thinner and equidistant cordlets (13 above the aperture) in *S. alfredensis*; in the more acute spire and more elongated aperture; in the protoconch with eight thin spiral cordlets, interspaced by dense series of micropits vs spiral cordlets as wide as the deep interspaces, the latter sculptured by microtubercles in *S. alfredensis.*

Subestea moruroa n. sp. differs from *Subestea glypta* (E. A. Smith, 1890), from St. Helena Island, Eastern Atlantic (E. A. Smith 1890: 288, pl. 23, fig. 39; https://www.molluscabase.org/aphia.php?p=taxdetails&id=988087, photo of a syntype), in the more robust axial ribs, almost absent in *S. glypta*; in the fewer spiral cordlets on the last whorl (15, of which nine above the aperture) vs thinner and more numerous (21, of which 11 above the aperture) in *S. glypta.*

Subestea platia (E. A. Smith, 1890) from St. Helena Island, Eastern Atlantic (E. A. Smith 1890: 309, pl. 24, fig. 13), is very similar to the sympatric *Subestea glypta*. *Subestea moruroa* n. sp. differs from it in the first whorls being more slender and more angulated.

Subestea moruroa n. sp. differs from *Subestea lusciniae* (R. B. Watson, 1886) from Nightingale Island, Tristan da Cunha group, South Atlantic (R. B. Watson 1886: 597, pl. 44, fig. 3), in the presence of a weak angulation of the whorls, absent in *S. lusciniae*; in the presence of axial ribs also on the last whorl, absent or weak in *S. lusciniae*; in the fewer axial ribs on the penultimate whorl, 10 vs 16 in *S. lusciniae*; in the more numerous spiral cordlets on the last whorl (15, of which nine above the aperture), with different and unequal thicknesses vs nine, of which three above the aperture in *S. lusciniae.*

CLUSTER ANALYSIS
An UPGMA cluster analysis was performed on a similarity matrix (Jaccard index) based on presence/absence of the studied species in each archipelago plus the Tarava Seamounts. The resulting tree is reported in Figure 53. Among the archipelagos, Tuamotu and Society resulted the most similar, followed by Australes, Gambier and Marquesas; the Tarava Seamounts were the least similar, due to the single species from that area included in this study.

DISCUSSION

The known extant diversity in Polynesia of shallow-water rissoids of the genera *Alvania*, *Haurakia*, *Parashiela*, *Simulamerelina* and *Subestea* was hardly estimated before this revision. We could identify a few of the taxa reported by Tröndlé & Boutet (2009), Salvat & Tröndlé (2017) and Boutet *et al.* (2020) with the taxa listed herein, mostly by discussion with part of the authors and/or by examining voucher in their collections (see under each taxon in the Systematics section). The total number of species of shallow water rissoids (including also other

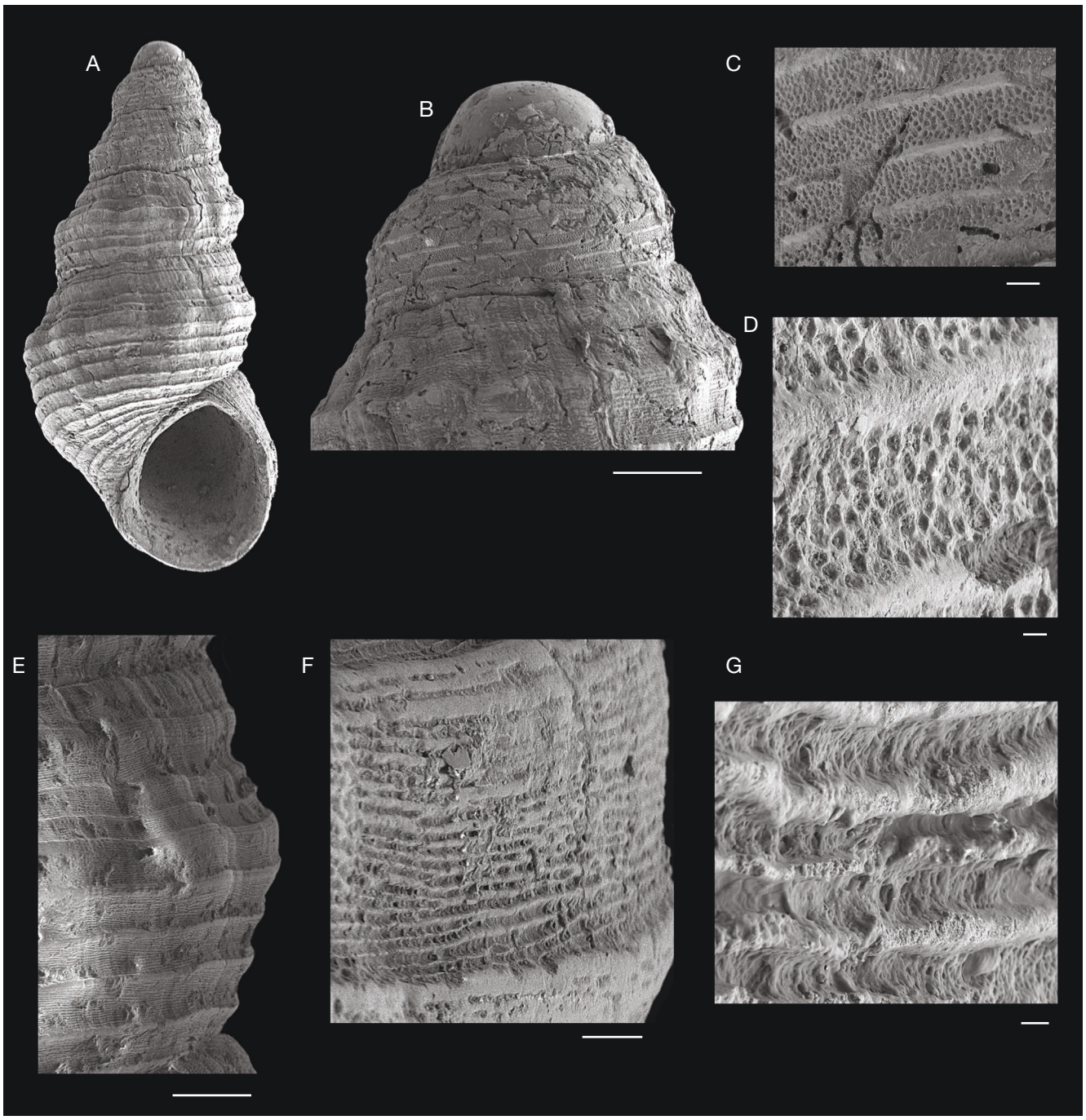


FIG. 47. — *Subestea moruroa* n. sp. SEM.: holotype Tuamotu, Moruroa, on the sea-line, height 1.96 mm, MNHN-IM-2000-38730: **A**, shell; **B**, detail of the protoconch); **C**, **D**, detail of the microsculpture of the protoconch; **E**-**G**, detail of the microsculpture of the teleoconch. Scale bars: B, 100 µm, C, F, 10 µm, D, 2 µm, E, 100 µm, G, 1 µm.

genera, such as *Lucidestea* Laseron, 1956, etc.) goes from five in Salvat & Tröndlé (2017), to 7 in Tröndlé & Boutet (2009), and 14 in Boutet *et al.* (2020). Studying over 11 000 specimens from almost 200 sampling sites in the Marquesas, Tuamotu, Society, Gambier and Austral Islands, we have identified at least 19 species, of which 17 new to science: five in *Alvania*, five in *Parashiela*, six in *Simulamerelina* and one in *Subestea*. Additionally, an undescribed deep-water species that we had preliminarily classified in *Alvania s.l.* (and for this reason included in this revision), was eventually recognised as representing a distinct lineage (*Ellenstrongia* n. gen.)

During this revision three taxa are transferred to *Alvania* as currently conceived: *Rissoa denseclathrata* Thiele, 1925 and *Rissoa proditoris* Thiele, 1925 (from southern Africa), and *Rissoa lusoria* Yokoyama, 1926 (from Japan). The vast majority of the species are currently known only from French Polynesia, and may likely result to be endemic to this area; only two species (*Parashiela ambulata* and *Haurakia marmorata*)

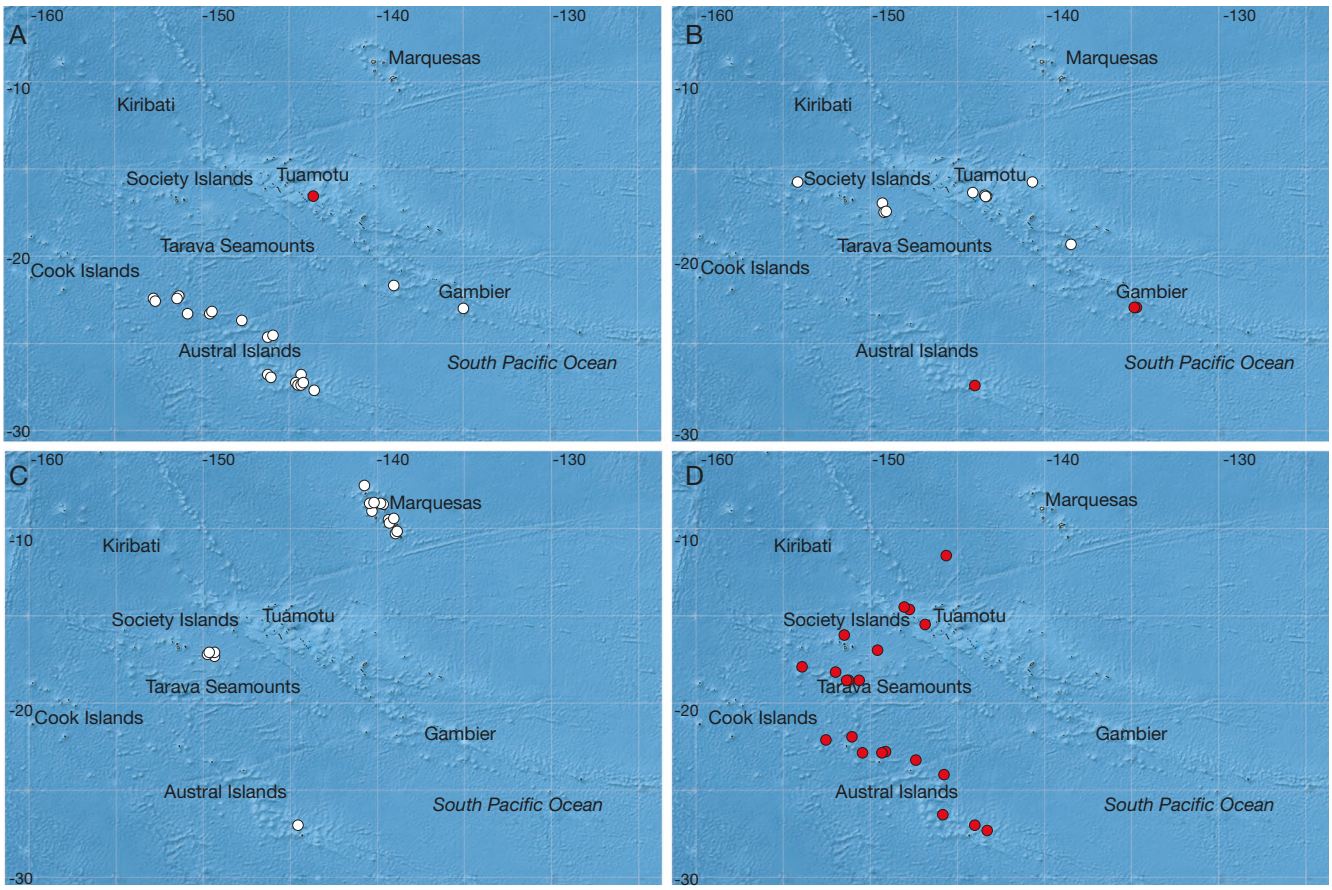


Fig. 48. — Distribution maps of the Polynesian species of *Alvania* Risso, 1826 and *Ellenstrongia* n. gen.: **A**, *Alvania letourneuxi* n. sp. (●) and *Alvania herosae* n. sp. (○); **B**, *Alvania parvimaculata* n. sp. (○) and *Alvania prosocostata* n. sp. (●); **C**, *Alvania uapou* n. sp.; **D**, *Ellenstrongia tarasoc* n. gen., n. sp.

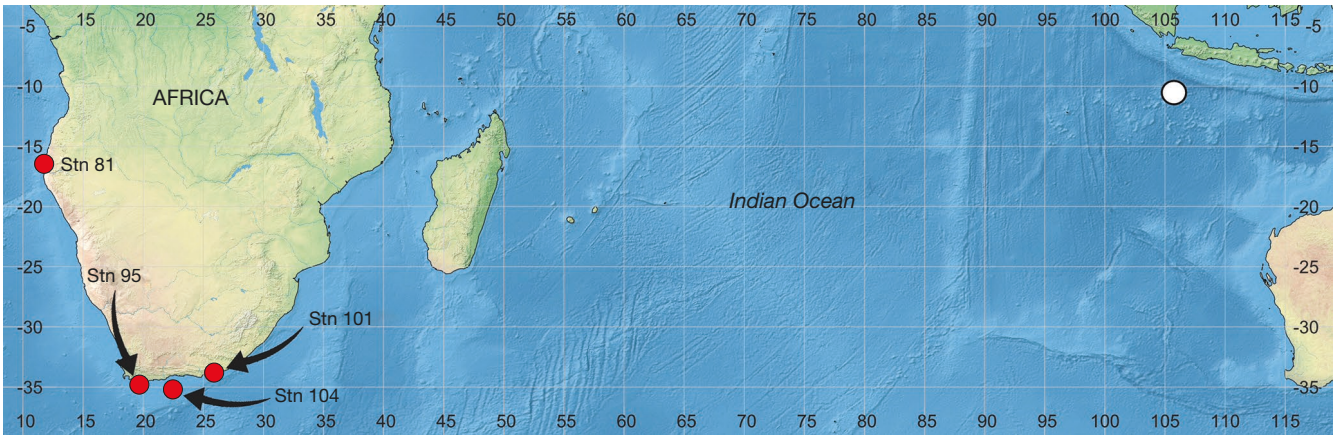


Fig. 49. — Type locality of *Alvania isolata* (Laseron, 1956) (○, Christmas Island), and location of the stations of the "Valdivia" deep-water expedition (●) where types of *Alvania denseclathrata* (Thiele, 1925) (Stns 81, 95 and 104) and of *Alvania proditoris* (Thiele, 1925) n. comb. (Stns 81, 95 and 101) were collected.

have been identified with a nominal taxon reported from other Indo-Pacific areas; especially in the case of *P. ambulata*, complexes of species may be actually involved and a genetic test of conspecificity is desirable.

Excluding the Tarava Seamounts (where only deep-water samplings were done, with a single species included in this revision), Tuamotu and Society are the most similar in faunistic composition, then Australes are less similar, followed by Gambier, whereas the remote Marquesas are faunistically the most dissimilar among the archipelagos. It is likely that the inter-archipelago distances and the pattern of oceanic circulation are the major factors affecting faunistic similarity. Tuamotu and Society are the closest each other (200-250 km) and the most densely distributed islands; Australes are more scattered

Fig. 50. — Type localities of *Parashiela invisibilis* (Hedley, 1899) (Funafuti Atoll: ○), *Parashiela liddelliana* (Hedley, 1907) (Mast Head Reef: ●), *Parashiela ambulata* Laseron, 1956 (Michaelmas Cay: ☆), and *Parashiela beetsi* Ladd, 1966 (Eniwetok Atoll: ★).

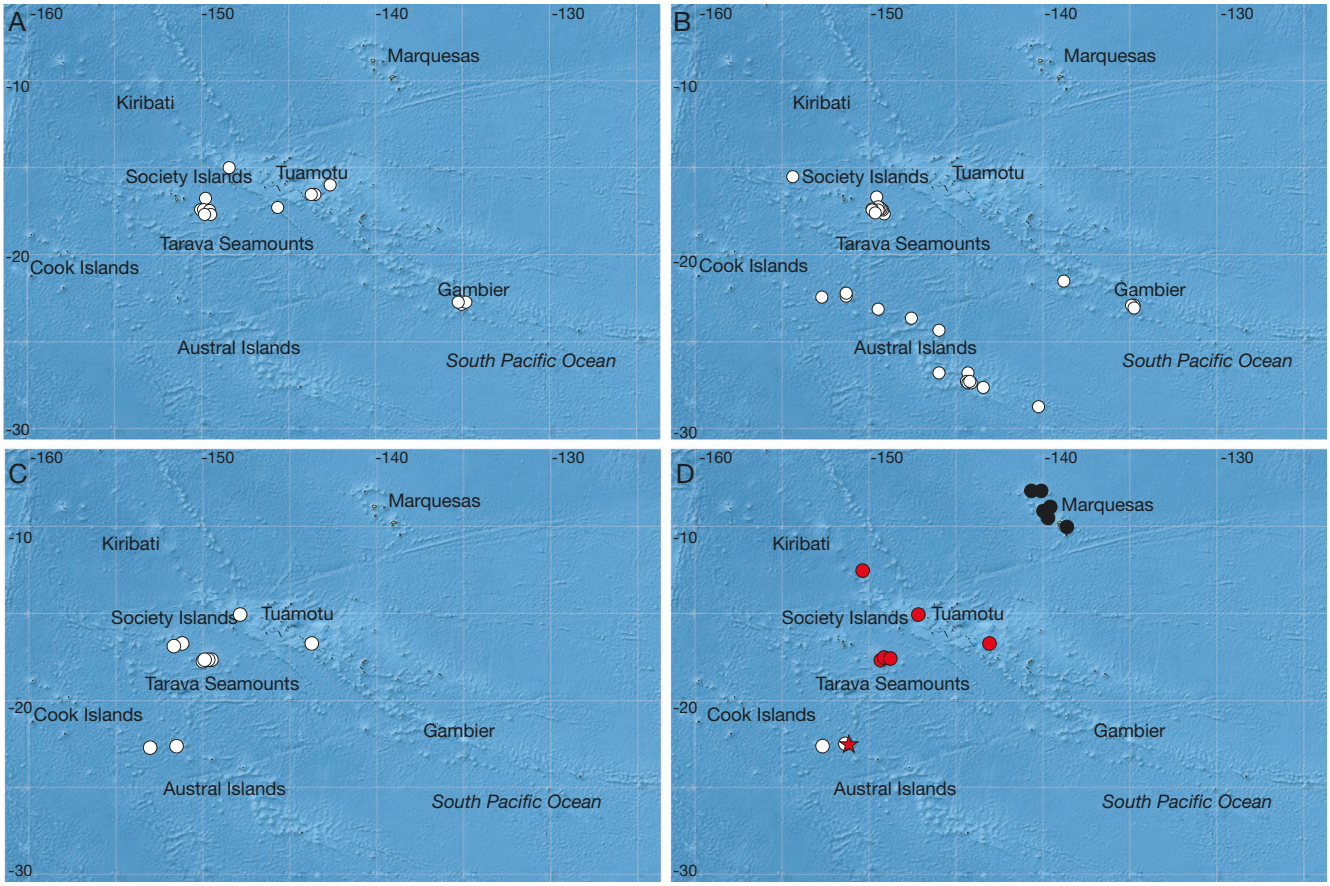


Fig. 51. — Distribution maps of the Polynesian species of *Haurakia* Iredale, 1915, and *Parashiela* Laseron, 1956: **A**, *Haurakia marmorata* (Hedley, 1907); **B**, *Parashiela ambulata* Laseron, 1956; **C**, *Parashiela expansilabrum* n. sp.; **D**, *Parashiela obesula* n. sp. (★), *Parashiela rimatara* n. sp. (○), *Parashiela rotundata* n. sp. (●), *Parashiela soniae* n. sp. (●).

Fig. 52. — Distribution maps of the Polynesian species of *Simulamerelina* Ponder, 1985 and *Subestea* Cotton, 1944: **A**, *Simulamerelina australes* n. sp.; **B**, *Simulamerelina densestriata* n. sp. (○), *Simulamerelina gracilis* n. sp. (●), *Simulamerelina lepteseiras* n. sp. (☆); **C**, *Simulamerelina micrometrica* n. sp. (○), *Simulamerelina tuamotu* n. sp. (●); **D**, *Subestea moruroa* n. sp. (○).

and are at a minimum of 500 km from the Society; Gambier (from where only eight stations were sampled, though) are at a relatively short distance (*c.* 100 km) from the south-easternmost islands of the Society, but at more than 900 km east of Australes; Marquesas are at 500-750 km from Tuamotus. The pattern of oceanic circulation in this area shows some remarkable seasonal fluctuation (Rougerie & Rancher 1994; Martinez *et al.* 2009) and knowledge on the timing of reproduction of the studied rissoids (which is completely lacking) would be necessary for a correct interpretation, along with knowledge on larval ecology which is more easily inferred from protoconch morphology (see e.g. Jablonski & Lutz 1980; Fassio *et al.* 2015). However, in winter, the south-westward flux of the South Equatorial Current (SEC) dominates at least north of 20°, whereas during summer the eastward South Equatorial Countercurrent (SECC) and Subtropical Countercurrent (STCC) play a major role (with a weakening of SEC).

A paucispiral protoconch (indicating lecithotrophic development) was largely the norm in the studied shallow water rissoids: a total of 12 species (63% of the 19 species studied herein) have a paucispiral protoconch. This is dramatically different from the pattern scored in the deep-water *Benthonella-Benthonellania* group (Amati *et al.* 2022), where only 26% (10 out of the 38 species studied therein) showed a paucispiral protoconch and thus, a lecithotrophic development. All the five species of *Alvania*, all the six species of *Simulamerelina*, and *Subestea moruroa*, have a paucispiral protoconch, and thus a lecithotrophic development. Conversely, in the genus *Parashiela*, four species have a multispiral protoconch and a sinusigera outer lip indicating the presence of a planktotrophic veliger, whereas only one species has a paucispiral protoconch (and thus a lecithotrophic development). *Haurakia marmorata* has a multispiral protoconch and thus an inferred planktotrophic larval development. The deep-water *Ellenstrongia tarasoc* n. gen., n. sp. has a multispiral protoconch indicating a planktotrophic development.

In terms of geographic range, 42% of the species (eight out of 19) are currently known from a single archipelago, 26% (five) from two archipelagos, and 32% (six) from three or four archipelagos. Congruently, for most of the species ranging in 1-2 archipelagos a non-planktotrophic development is inferred, whilst a planktotrophic development is inferred for most of the species ranging in 3-4 archipelagos. Although the pattern of development and range-size is relatively consistent, at least two cases are noteworthy: *Parashiela obesula* n. sp. and *P. rimatara* n. sp., which, despite their inferred planktotrophic development, are restricted to the Australes. Their absence in the northern archipelagos can be reliably assumed, while the lack of records in the Gambier may be biased by undersam-

FIG. 53. — *Alvania* Risso, 1826, *Ellenstrongia* n. gen., *Haurakia* Iredale, 1915, *Parashiela* Laseron, 1956, *Simulamerelina* Ponder, 1985 and *Substea* Cotton, 1944: **A**, *Alvania letouneuxi* n. sp., holotype, MNHN-IM-2000 38703, height 1.60 mm; **B**, *Alvania herosae* n. sp., holotype, MNHN-IM-2000-38704, height 2.02 mm; **C**, *Alvania herosae* n. sp. (morph B), MNHN, height 2.16 mm; **D**, *Alvania parvimaculata* n. sp., holotype, MNHN-IM-2000-38706, height 1.65 mm; **E**, *Alvania prosocostata* n. sp., holotype, MNHN-IM-2000-38708 height 2.05 mm; **F**, *Alvania uapou* n. sp., holotype, MNHN-IM-2000-38710, height 1.70 mm; **G**, *Ellenstrongia tarasoc* n. gen., n. sp., holotype, MNHN-IM-2000-39448, height 4.50 mm; **H**, *Haurakia marmorata* (Hedley, 1907), Society Islands, height 1.95 mm, coll. JL; **I**, *Parashiela ambulata* Laseron, 1956, Australes: Rapa Pointe Kauira, height 1.60 mm, MNHN; **J**, *Parashiela expansilabrum* n. sp. holotype, MNHN-IM-2000-38712 height 1.47 mm; **K**, *Parashiela obesula* n. sp. holotype, MNHN-IM-2000-38714, height 1.32 mm; **L**, *Parashiela rimatara n. sp.* holotype, MNHN-IM-2000-38716, height 1.47 mm; **M**, *Parashiela rotundata* n. sp. holotype, MNHN-IM-200038718-, height 1.10 mm; **N**, *Parashiela soniae* n. sp., holotype, MNHN-IM-2000-38720, height 1.17 mm; **O**, *Simulamerelina australes* n. sp. holotype, MNHN-IM-2000-38722, height 2.47 mm; **P**, *Simulamerelina densestriata* n. sp., holotype, MNHN-IM-2000-38724, height 2.45 mm; **Q**, *Simulamerelina gracilis* n. sp., holotype, MNHN-IM-2000-38726, height 2.45 mm; **R**, *Simulamerelina lepteseiras* n. sp., holotype, MNHN-IM-2000-38727, height 1.47 mm; **S**, *Simulamerelina micrometrica* n. sp., holotype, MNHN-IM-2000-38728, height 1.33 mm; **T**, *Simulamerelina tuamotu* n. sp. holotype, MNHN-IM-2000-38730, height 1.57 mm; **U**, *Subestea moruroa* n. sp., holotype, MNHN-IM-2000-38732, height 1.96 mm.

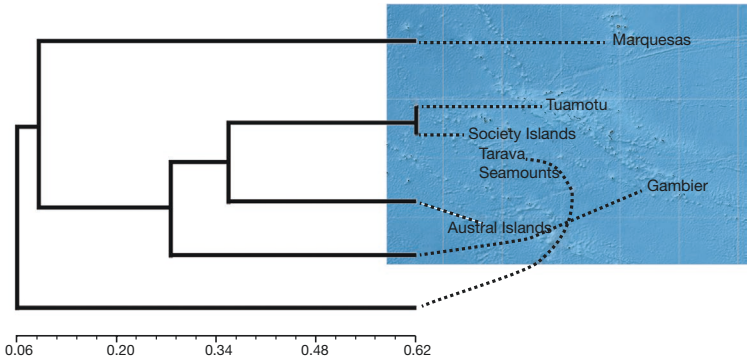


FIG. 54. — Tree-portraying similarity among the studied areas, after an UPGMA cluster analysis on a similarity matrix (Jaccard index) based on presence/absence of the studied species in each archipelago and the Tarava Seamounts.

pling there; at the same time we cannot exclude their presence elsewhere in the Pacific, where a similar study (based on a similar-sized sampling) has not yet been performed.

We highligth that whereas the vast majority of specimens originated from institutional expeditions (85% vs 15% of specimens from private collections), qualitatively, half of the species discussed here (10 out of 20) are known only from the shallow water amateur collecting: *Alvania letourneuxi* n. sp., *Alvania parvimaculata* n. sp., *Alvania prosocostata* n. sp., *Haurakia marmorata* (Hedley, 1907), *Parashiela rotundata* n. sp., *Parashiela obesula* n. sp., *Simulamerelina gracilis* n. sp., *Simulamerelina lepteseiras* n. sp., *Simulamerelina tuamotu* n. sp., *Subestea moruroa* n. sp. This confirms once more the importance of Citizen Science in the study of biodiversity.

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Conflicts of interest
The authors declare that they have no conflicts of interest.

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APPENDICES

APPENDIX 1. — Measurements of teleoconch and protoconch of *Alvania letourneuxi* n. sp. in mm: 1, holotype, Tuamotu, Makemo, Passe Arikitamiro.

Teleoconch	**1**
Height	1.60
Width	0.95
Height/Width ratio	1.74
Aperture height	0.68
Height/aperture height ratio	2.35
No. whorls	2.90
No. axial ribs on last whorls	21
No. spiral cords on last whorls (above aperture)	7 (3)
Start	II, III
Protoconch	**1**
Height	0.250
Diameter of nucleus	0.075
Diameter of first half whorl	0.150
Maximun diameter	0.200
No. whorls	1.00
Paucispiral	yes

APPENDIX 2. — Summary statistics of teleoconch and protoconch measurements of *Alvania herosae* n. sp. (with range and mean in mm and standard deviation), Morph A+B (1-17+1-20 see App. 3 & 4).

Teleoconch	**Min–max**	**Mean**	**Std**
Height	1.55-2.47	2.06	0.254
Width	0.9-1.32	1.13	0.109
Height/Width ratio	1.67-2.02	1.81	0.093
Aperture height	0.7-1.05	0.85	0.086
Height/aperture height ratio	2.15-2.65	2.43	0.130
No. whorls	3-4.2	3.7	0.36
No. axial ribs on last whorls	13-21	16.5	1.98
No. spiral cords on last whorls (above aperture)	7-13 (3-7)	9.6 (4.7)	1.69 (0.96)
Protoconch	**Min–max**	**Mean**	**Std**
Height	0.205-0.275	0.241	0.015
Diameter of nucleus	0.100-0.125	0.115	0.007
Diameter of first half whorl	0.20-0.25	0.22	0.015
Maximun diameter	0.275-0.337	0.308	0.014
No. whorls	1-1.3	1.2	0.05
Paucispiral	yes	–	–

APPENDIX 3. — Measurements of teleoconch and protoconch of *Alvania herosae* n. sp. Morph A, in mm, with range, mean and standard deviation. **1**, holotype, Australes, E Rapa of Tupuaki Bay, Stn 21, 5 m; **2**-**6**, Australes, E Rapa Tupuaki Bay, Stn 21, 5 m; **7**-**10**, Australes, S Rapa of Tarakoi Island, Stn 5, 8 m; **11**-**17**, Rimatara Stn DW2021, 1200-1226 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**Min–max**	**Mean**	**Std**
Height	2.02	1.95	2.15	2.25	2.17	2.02	2.10	2.12	1.75	1.92	2.10	1.92	1.60	1.60	1.72	1.55	1.65	1.55-2.25	1.92	0.228
Width	1.10	1.12	1.25	1.20	1.22	1.12	1.15	1.02	0.97	1.10	1.25	1.15	0.95	0.95	1.02	0.90	0.95	0.95-1.25	1.08	0.114
Height/Width ratio	1.84	1.74	1.72	1.88	1.78	1.80	1.83	1.77	1.80	1.75	1.68	1.67	1.68	1.68	1.69	1.72	1.74	1.67-1.88	1.75	0.062
Aperture height	0.80	0.85	1.00	0.90	0.92	0.80	0.85	0.90	0.75	0.82	0.90	0.82	0.70	0.70	0.77	0.70	0.74	0.70-1.00	0.81	0.087
Height/aperture height ratio	2.53	2.29	2.15	2.50	2.36	2.53	2.47	2.36	2.33	2.34	2.33	2.34	2.29	2.29	2.23	2.21	2.23	2.15-2.53	2.34	0.111
No. whorls	3.75	3.25	4.10	3.80	3.75	3.80	4.00	3.70	3.25	3.25	3.50	3.50	3.00	3.00	3.20	3.10	3.10	3.00-4.10	3.47	0.36
No. axial ribs on last whorls	18	17	15	15	17	20	?	21	?	18	?	?	?	?	?	?	?	15-21	17.6	2.13
No. spiral cords on last whorls (above aperture)	10(5)	10(5)	10(5)	10(5)	10(5)	8(4)	12(6)	11(5)	10(5)	11(6)	11(5)	13(7)	12(6)	12(6)	13(7)	12(6)	12(6)	8-13(4-7)	11 (5.52)	1.3 (0.79)
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**Min–max**	**Mean**	**Std**
Height	0.225	0.250	0.250	0.250	0.250	0.250	0.225	0.250	0.237	0.275	0.250	0.237	0.250	0.225	0.225	0.205	0.225	0.205-0.275	0.240	0.017
Diameter of nucleus	0.112	0.125	0.125	0.125	0.120	0.125	0.112	0.112	0.112	0.112	0.112	0.125	0.112	0.100	0.112	0.112	0.125	0.100-0.125	0.116	0.008
Diameter of first half whorl	0.200	0.212	0.225	0.212	0.225	0.225	0.200	0.200	0.200	0.225	0.237	0.237	0.200	0.200	0.200	0.237	0.225	0.200-0.237	0.215	0.015
Maximun diameter	0.300	0.325	0.325	0.312	0.312	0.312	0.300	0.287	0.312	0.312	0.337	0.325	0.312	0.312	0.300	0.312	0.312	0.287-0.337	0.312	0.012
No. whorls	1.25	1.25	1.20	1.20	1.20	1.20	1.25	1.25	1.20	1.25	1.25	1.25	1.30	1.25	1.20	1.00	1.20	1.00-1.30	1.22	0.064
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

APPENDIX 4. — Measurements of teleoconch and protoconch of *Alvania herosae* n. sp. Morph B, in mm, with range, mean and standard deviation. **1**-**10**, Australes, E Rapa of Tupuaki Bay, Stn 21, 5 m; **11**-**15**, Australes, Rapa Akatamiro Bay Stn 94, intertidal; **16**-**18**, Australes, SW Rapa of Pointe Gotenaonao Stn 27, 6 m; **19**-**20**, Australes, Rapa Anatakuri Nako Bay Stn 25, 3 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**Min-max**	**Mean**	**Std**
Height	2.20	2.25	2.05	2.35	1.67	2.30	2.20	1.87	2.17	2.17	2.40	2.25	2.17	2.20	1.97	2.45	2.47	2.25	2.42	1.87	1.67-2.47	2.18	0.209
Width	1.22	1.20	1.12	1.20	0.97	1.17	1.20	1.02	1.20	1.15	1.22	1.12	1.22	1.17	1.10	1.30	1.32	1.25	1.20	1.00	0.97-1.32	1.17	0.092
Height/Width ratio	1.80	1.88	1.83	1.96	1.72	1.97	1.83	1.83	1.81	1.89	1.97	2.01	1.78	1.88	1.79	1.88	1.87	1.80	2.02	1.87	1.72-2.02	1.87	0.080
Aperture height	0.90	0.87	0.80	0.92	0.70	0.90	0.85	0.80	0.87	0.85	0.95	0.85	0.90	0.87	0.82	0.97	1.05	0.85	0.95	0.75	0.70-1.05	0.87	0.079
Height/aperture height ratio	2.44	2.59	2.56	2.55	2.38	2.56	2.59	2.34	2.49	2.55	2.53	2.65	2.41	2.53	2.40	2.53	2.35	2.65	2.55	2.49	2.34-2.65	2.51	0.091
No. whorls	3.75	4.10	3.90	4.15	3.25	4.00	3.90	3.20	3.70	4.10	4.10	3.90	3.90	3.80	3.70	4.00	3.90	4.00	4.20	3.70	3.20-4.20	3.9	0.27
No. axial ribs on last whorls	15	15	15	17	21	18	15	16	17	15	18	13	17	16	18	14	14	16	15	16	13-21	16.05	1.82
No. spiral cords on last whorls (above aperture)	8(4)	9(4)	8(4)	10(5)	9(4)	8(4)	8(4)	8(4)	8(4)	8(4)	10(5)	8(4)	9(4)	8(4)	7(3)	8(4)	9(4)	8(4)	8(4)	8(4)	7-10 (3-5)	8.3 (4.05)	0.75 (0.39)
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	0.225	0.225	0.225	0.250	0.225	0.250	0.250	0.250	0.250	0.212	0.237	0.250	0.250	0.250	0.250	0.237	0.275	0.225	0.250	0.237	0.212-0.275	0.241	0.015
Diameter of nucleus	0.125	0.112	0.112	0.120	0.112	0.112	0.112	0.125	0.112	0.112	0.100	0.100	0.112	0.125	0.112	0.120	0.112	0.112	0.125	0.112	0.100-0.125	0.114	0.007
Diameter of first half whorl	0.250	0.212	0.212	0.245	0.200	0.212	0.212	0.237	0.237	0.212	0.200	0.200	0.212	0.225	0.212	0.237	0.225	0.225	0.212	0.225	0.200-0.250	0.220	0.015
Maximun diameter	0.325	0.312	0.300	0.312	0.287	0.300	0.300	0.300	0.325	0.275	0.287	0.325	0.312	0.300	0.300	0.312	0.325	0.300	0.275	0.300	0.275-0.325	0.303	0.015
No. whorls	1.15	1.20	1.20	1.20	1.20	1.20	1.30	1.20	1.25	1.20	1.20	1.20	1.25	1.25	1.25	1.20	1.25	1.20	1.25	1.20	1.15-1.30	1.22	0.033
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

Appendix 5. — Measurements of teleoconch and protoconch of *Alvania parvimacula* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Tuamutu, Makemo, Arikitamiro Pass 1-20 m; **2**-**5**, paratypes, Tuamotu, Makemo, Arikitamiro Pass 1-20 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**Min–max**	**Mean**	**Std**
Height	1.65	1.42	1.70	1.47	1.47	1.42-1.70	1.54	0.124
Width	0.95	0.90	0.95	0.95	0.85	0.85-0.95	0.92	0.045
Height/Width ratio	1.74	1.58	1.79	1.55	1.73	1.55-1.79	1.68	0.107
Aperture height	0.70	0.65	0.72	0.70	0.62	0.62-0.72	0.68	0.041
Height/aperture height ratio	2.36	2.18	2.36	2.10	2.37	2.10-2.37	2.27	0.125
No. whorls	3.10	2.45	3.20	2.35	2.80	2.35-3.20	2.78	0.379
No. axial ribs on last whorls	16	16	16	19	17	16-19	16.8	1.30
No. spiral cords on last whorls (above aperture)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7 (3)	0 (0)
Start	II, III	II, III	II, III	II, III	II, III	II, III	–	–
Protoconch	**1**	**2**	**3**	**4**	**5**	**Min–max**	**Mean**	**Std**
Height	0.250	0.250	0.250	0.250	0.262	0.250-0.262	0.252	0.005
Diameter of nucleus	0.100	0.100	0.112	0.112	0.125	0.100-0.125	0.110	0.010
Diameter of first half whorl	0.170	0.187	0.212	0.187	0.212	0.170-0.212	0.193	0.018
Maximun diameter	0.262	0.275	0.275	0.300	0.250	0.250-0.300	0.272	0.019
No. whorls	1.20	1.20	1.20	1.25	1.15	1.15-1.25	1.2	0.03
Paucispiral	yes	yes	yes	yes	yes	yes	–	–

Appendix 6. — Measurements of teleoconch and protoconch of *Alvania prosocostata* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Gambier, Taraururoa, 1-3 m; **2**-**7**, paratypes, Gambier, Taraururoa, 1-3 m; **8**, **9**, Australes, Rapa of Pararaki Bay.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Min-max**	**Mean**	**Std**
Height	2.05	1.95	1.77	2.00	1.82	2.05	1.90	1.95	2.00	1.77-2.05	1.94	0.098
Width	1.20	1.20	1.10	1.25	1.17	1.20	1.15	1.17	1.25	1.10-1.25	1.18	0.047
Height/Width ratio	1.71	1.63	1.61	1.60	1.56	1.71	1.65	1.67	1.60	1.56-1.71	1.64	0.052
Aperture height	0.90	0.87	0.75	0.87	0.85	0.90	0.87	0.87	0.92	0.75-0.92	0.86	0.048
Height/aperture height ratio	2.28	2.24	2.36	2.30	2.14	2.28	2.18	2.24	2.17	2.14-2.36	2.24	0.069
No. whorls	3.50	3.25	3.15	3.40	3.20	3.30	3.25	3.40	3.30	3.15-3.50	3.31	0.110
No. axial ribs on last whorls	24	27	22	25	22	22	29	?28	25	22-29	24.5	2.56
No. spiral cords on last whorls (above aperture)	13(6)	11(5)	?	12(7)	11(6)	14(7)	14(7)	13(7)	11(6)	11-14(5-7)	12.37 (6.37)	1.302 (0.744)
Start I. II. VI-VII	I, II,VI	I, II,VI	I, II,VI	I, II,VI	I, II,VI	I, II,VI	I, II,VI	I, II,VII	I, II,VII	I, II, VII	–	–
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Min-max**	**Mean**	**Std**
Height	0.237	0.250	0.237	0.237	0.220	0.262	0.250	0.275	0.250	0.220-0.275	0.246	0.016
Diameter of nucleus	0.112	0.125	0.125	0.125	0.112	0.125	0.112	0.112	0.112	0.112-0.125	0.117	0.007
Diameter of first half whorl	0.225	0.237	0.237	0.237	0.220	0.237	0.225	0.225	0.212	0.212-0.237	0.228	0.009
Maximun diameter	0.325	0.325	0.312	0.275	0.275	0.320	0.300	0.300	0.300	0.275-0.325	0.304	0.019
No. whorls	1.25	1.25	1.20	1.10	1.20	1.20	1.20	1.20	1.25	1.10-1.25	1.21	0.046
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

Appendix 7. — Measurements of teleoconch and protoconch of *Alvania uapou* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Marquesas, Ua Pou, Motu Mokohe Stn 20, 10-15 m; **2**-**5**, paratypes, Marquesas, Ua Pou, Motu Mokohe Stn 20, 10-15 m; **6**-**10**, Society, Mont Otaha, 788-836 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min–max**	**Mean**	**Std**
Height	1.70	1.72	1.65	1.57	1.72	1.60	1.75	1.72	1.82	1.62	1.57-1.82	1.69	0.076
Width	0.90	0.87	0.85	0.90	0.92	0.97	0.90	0.90	0.95	0.90	0.85-0.97	0.91	0.035
Height/Width ratio	1.89	1.98	1.94	1.71	1.87	1.65	1.94	1.91	1.92	1.80	1.65-1.98	1.86	0.108
Aperture height	0.60	0.65	0.60	0.60	0.62	0.62	0.60	0.65	0.65	0.65	0.60-0.65	0.62	0.024
Height/aperture height ratio	2.83	2.65	2.75	2.62	2.77	2.58	2.92	2.65	2.80	2.49	2.49-2.92	2.71	0.130
No. whorls	3.50	3.35	3.50	3.25	3.30	3.20	3.40	3.50	3.20	3.20	3.20-3.50	3.34	0.129
No. axial ribs on last whorls	14	19	16	17	20	21	?	22	21	25	14-25	19.4	3.36
No. spiral cords on last whorls (above aperture)	9 (4)	8(4)	8(4)	8(4)	8(4)	8(4)	9(4)	9(4)	9(4)	9(4)	8-9(4)	8.5 (4)	0.53 (0)
Start I	0.2	0.5	1	0.25	0.2	0.2	0.4	0.4	0.2	0.4	0.2-1	0.37	0.246
Protoconch	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**Min–max**	**Mean**	**Std**
Height	0.250	0.237	0.262	0.237	0.237	0.275	0.275	0.275	0.287	0.282	0.237-0.287	0.262	0.019
Diameter of nucleus	0.100	0.100	0.100	0.100	0.100	0.120	0.112	0.120	0.125	0.125	0.100-0.125	0.110	0.011
Diameter of first half whorl	0.175	0.187	0.187	0.187	0.187	0.212	0.200	0.200	0.212	0.220	0.175-0.220	0.197	0.015
Maximun diameter	0.287	0.300	0.300	0.300	0.312	0.312	0.300	0.300	0.325	0.337	0.287-0.337	0.307	0.015
No. whorls	1.40	1.35	1.35	1.30	1.35	1.25	1.30	1.35	1.35	1.30	1.25-1.40	1.33	0.042
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

APPENDIX 8. — Measurements of teleoconch and protoconch of *Ellenstrongia tarasoc* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Society, Mont Honu, 787-792 m; **2**-**4**, paratypes, Society, Mont Honu, 787-792 m; **5**-**7**, Society, Montn Otaha 788-836 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Min-max**	**Mean**	**Std**
Height	4.50	4.22	4.13	4.13	4.05	3.95	3.82	3.82-4.50	4.11	0.215
Width	2.12	1.97	1.93	1.90	1.95	1.95	1.82	1.82-2.12	1.95	0.090
Height/Width ratio	2.12	2.14	2.14	2.17	2.08	2.03	2.10	2.03-2.17	2.11	0.049
Aperture height	1.47	1.32	1.40	1.43	1.35	1.32	1.25	1.25-1.47	1.36	0.075
Height/aperture height ratio	3.06	3.20	2.95	2.89	3.00	2.99	3.06	2.89-3.20	3.02	0.098
No. whorls	5.75	5.75	5.25	5.20	5.20	5.20	5.20	5.20-5.75	5.36	0.264
No. axial ribs on last whorls	11	12	12	12	13	13	12	11-13	12.1	0.69
No. spiral cords on last whorls (above aperture)	15 (9)	16 (9)	16 (10)	14(9)	17 (10)	14(9)	15(9)	14-17(9-10)	15.3 (9.4)	1.11 (2.16)
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Min-max**	**Mean**	**Std**
Height	0.467	0.437	0.500	0.483	0.500	0.500	0.525	0.437-0.525	0.487	0.029
Diameter of nucleus	0.062	0.057	0.083	0.083	0.100	0.083	0.127	0.057-0.127	0.085	0.024
Diameter of first half whorl	0.137	0.125	0.160	0.167	0.200	0.183	0.193	0.125-0.200	0.166	0.028
Maximun diameter	0.387	0.400	0.400	0.433	0.400	0.417	0.417	0.387-0.433	0.408	0.015
No. whorls	2.75	3.00	3.20	3.20	3.00	2.75	2.75	2.75-3.20	2.95	0.204
Multispiral	yes	yes	yes	yes	yes	yes	yes	yes		

APPENDIX 9. — Measurements of teleoconch and protoconch of *Haurakia marmorata* (Hedley, 1907) in mm, with range, mean and standard deviation: **1-6**, Society Islands, Tahiti, Arue, <1 m; **7**, **8**, Gambier, Mangareva, Rikitea, 1 m; **9**, **10**, Tuamotu, Makemo, Pouheva, 1 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Heigth	1.90	2.05	1.95	1.85	1.85	1.80	2.17	1.85	1.92	2.25	1.80-2.25	1.96	0.150
Width	1.1	1.2	1.1	1.12	1.02	1.07	1.25	1.07	1.12	1.25	1.02-1.25	1.13	0.078
Heigth/ width ratio	1.73	1.71	1.77	1.65	1.81	1.68	1.74	1.73	1.71	1.80	1.65-1.81	1.73	0.050
Aperture heigth	0.80	0.82	0.72	0.77	0.75	0.77	0.92	0.75	0.82	0.95	0.72-0.95	0.81	0.075
Heigth/Heigth aperture ratio	2.38	2.50	2.71	2.40	2.47	2.34	2.36	2.47	2.34	2.37	2.34-2.71	2.43	0.113
No. whorls	3.35	3.8	3.75	3.5	3.75	3.25	3.25	3.15	3.75	3.25	3.15-3.8	3.48	0.259
Varix	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–
Umbilical	no	no	no	no	no	no	no	no	no	no	no	no	–
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Heigth	0.212	0.225	0.237	0.225	0.237	0.255	0.250	0.250	0.230	–	0.212-0.255	0.236	0.014
Diameter of nucleus	0.062	0.070	0.062	0.062	0.055	0.055	0.062	0.062	0.050	–	0.050-0.070	0.060	0.006
Diameter of first half whorl	0.125	0.120	0.112	0.125	0.105	0.120	0.150	0.125	0.100	–	0.100-0.150	0.120	0.014
Maximum diameter	0.275	0.275	0.275	0.287	0.275	0.287	0.287	0.300	0.275	–	0.275-0.300	0.282	0.009
No. whorls	2.10	1.90	1.80	1.85	2.00	2.00	1.85	1.95	2.0	1.85	1.80-2.10	1.93	0.094
Multispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–

APPENDIX 10. — Measurements of teleoconch and protoconch of *Parashiela ambulata* Laseron, 1956 in mm, with range, mean and standard deviation: **1**, (specimen photographed by SEM), Australes, Rapa Pointe Kauira Stn 36, 27 m; **2-6**, Australes, Rapa Vavai Stn 32, 15-20 m; **7-9**, Rapa Ouest de l'Île Tauna Stn 16, 5 m; **10**, Australes, Rapa Pointe Kauira Stn 36, 27 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	1.60	1.62	1.40	1.43	1.67	1.70	1.70	1.67	1.72	1.33	1.33-1.72	1.58	0.143
Width	0.98	0.97	0.83	0.85	0.92	1.00	1.03	1.00	1.05	0.83	0.83-1.05	0.95	0.083
Height/Width ratio	1.63	1.67	1.69	1.68	1.82	1.70	1.65	1.67	1.64	1.60	1.60-1.82	1.68	0.057
Aperture height	0.62	0.62	0.53	0.55	0.57	0.63	0.62	0.63	0.62	0.52	0.52-0.63	0.59	0.044
Height/aperture height ratio	2.58	2.61	2.64	2.60	2.93	2.70	2.74	2.65	2.77	2.56	2.58-2.93	2.68	0.112
No. whorls	3.25	3.60	3.15	3.25	3.90	3.75	3.75	3.65	3.75	3.25	3.15-3.90	3.53	0.275
No. axial ribs on last whorls	22	20	23	24	21	25	20	21	19	25	19-25	22	2.2
No. spiral cords on last whorls (above aperture)	1	1	1	1	1	1	1	1	1	1	1	1	0
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	0.237	0.225	0.260	0.230	0.250	0.250	0.230	0.220	0.225	0.212	0.212-0.260	0.234	0.015
Diameter of nucleus	0.075	0.075	0.067	0.075	0.087	0.070	0.070	0.075	0.070	0.075	0.067-0.087	0.074	0.006
Diameter of first half whorl	0.150	0.150	0.160	0.150	0.150	0.150	0.120	0.137	0.100	0.150	0.100-0.160	0.142	0.018
Maximun diameter	0.275	0.275	0.267	0.275	0.250	0.270	0.237	0.280	0.245	0.250	0.237-0.280	0.262	0.015
No. whorls	1.70	1.30	1.50	1.50	1.45	1.50	1.75	1.70	1.80	1.35	1.30-1.80	1.56	0.172
Multispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

Appendix 11. — Measurements of teleoconch and protoconch of *Parashiela expansilabrum* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Australes, Rimatara, 920-930 m; **2-6**, Society, Tahiti, Arue 16 m depth (coll. Letourneux J., Tahiti); **7**, Society, Huahine, 801-874 m; **8**, paratype, Australes, Rimatara, 920-930 m; **9-10**, Tuamotu Makemo 47-54 m depth (coll. Letourneux J., Tahiti).

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	1.47	1.50	1.38	1.12	1.34	1.12	1.38	1.47	1.55	1.16	1.12-1.55	1.35	0.162
Width	1.00	0.97	0.97	0.84	0.92	0.80	0.95	1.00	1.09	0.86	0.80-1.09	0.94	0.087
Height/Width ratio	1.47	1.55	1.42	1.33	1.46	1.40	1.45	1.47	1.42	1.35	1.33-1.47	1.43	0.062
Aperture height	0.67	0.62	0.62	0.51	0.60	0.52	0.57	0.61	0.67	0.55	0.51-0.67	0.59	0.056
Height/aperture height ratio	2.19	2.42	2.23	2.20	2.23	2.15	2.42	2.41	2.31	2.11	2.11-2.42	2.27	0.116
No. whorls	3.25	3.15	3.10	2.60	3.10	2.70	3.10	3.25	3.25	2.75	2.60-3.25	3.03	0.246
No. axial ribs on last whorls	18	20	24	19	21	21	22	20	20	21	18-24	20.6	1.65
No. spiral cords on first whorls	1	1	1	1	1	1	1	1	1	1	1	1	0
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	0.200	0.195	0.200	0.180	0.180	0.187	0.212	0.200	0.205	0.180	0.180-0.212	0.194	0.012
Diameter of nucleus	0.100	0.070	0.070	0.062	0.062	0.062	0.075	0.070	0.070	0.075	0.062-0.100	0.072	0.011
Diameter of first half whorl	0.162	0.145	0.162	0.137	0.137	0.125	0.145	0.150	0.150	0.150	0.125-0.162	0.146	0.011
Maximun diameter	0.237	0.275	0.275	0.225	0.237	0.225	0.250	0.275	0.262	0.250	0.225-0.275	0.251	0.019
No. whorls	1.30	1.35	1.40	1.40	1.20	1.40	1.40	1.40	1.35	1.40	1.20-1.40	1.36	0.066
Mulstispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

Appendix 12. — Measurements of teleoconch and protoconch of *Parashiela obesula* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Australes, South coast of Rurutu 520-950 m; **2**, **3**, paratypes, Australes, South coast of Rurutu 520-950 m.

Teleoconch	**1**	**2**	**3**	**Min-max**	**Mean**	**Std**
Height	1.32	1.23	1.07	1.07- 1.32	1.21	0.127
Width	0.88	0.88	0.75	0.75-0.88	0.84	0.075
Height/Width ratio	1.50	1.40	1.43	1.40-1.50	1.44	0.053
Aperture height	0.58	0.57	0.45	0.45-0.58	0.53	0.072
Height/aperture height ratio	2.28	2.16	2.38	2.16-2.38	2.27	0.110
No. whorls	3.15	2.90	2.90	2.90-3.15	2.98	0.144
No. axial ribs on last whorls	37	38	41	37-41	38.7	2.08
No. spiral cords on first whorls	1	1	1	1	1	0
Protoconch	**1**	**2**	**3**	**Min-max**	**Mean**	**Std**
Height	0.200	0.175	0.200	0.175-0.200	0.192	0.014
Diameter of nucleus	0.063	0.087	0.075	0.063-0.087	0.075	0.012
Diameter of first half whorl	0.137	0.150	0.137	0.137-0.150	0.141	0.008
Maximun diameter	0.250	0.237	0.225	0.225-0.250	0.237	0.013
No. whorls	1.35	1.40	1.35	1.35-1.40	1.37	0.029
Mulstispiral	yes	yes	yes	yes	yes	–

Appendix 13. — Measurements of teleoconch and protoconch of *Parashiela rimatara* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Australes, Rimatara, 920-1226 m; **2**, paratype, Australes, Rimatara, 920-1226 m; **3**, Australes, South coast of Rurutu Stn DW2010, 520-950 m.

Teleoconch	**1**	**2**	**3**	**Min-max**	**Mean**	**Std**
Height	1.53	1.38	1.40	1.38-1.53	1.44	0.081
Width	1.00	0.90	0.92	0.90-1.00	0.94	0.053
Height/Width ratio	1.53	1.53	1.52	1.52-1.53	1.53	0.006
Aperture height	0.65	0.53	0.58	0.53-0.65	0.59	0.060
Height/aperture height ratio	2.35	2.60	2.41	2.35-2.60	2.46	0.131
No. whorls	3.60	3.50	3.45	3.45-3.60	3.52	0.076
No. axial ribs on last whorls	26	54	28	26-54	36	15.6
No. spiral cords on first whorls	1	1	1	1	1	0
Protoconch	**1**	**2**	**3**	**Min-max**	**Mean**	**Std**
Height	0.185	0.180	0.175	0.175-0.185	0.18	0.005
Diameter of nucleus	0.062	0.075	0.062	0.062-0.075	0.066	0.008
Diameter of first half whorl	0.125	0.137	0.150	0.125-0.150	0.137	0.013
Maximun diameter	0.250	0.237	0.250	0237-0.250	0.246	0.008
No. whorls	1.40	1.35	1.40	1.35-1.40	1.38	0.029
Mulstispiral	yes	yes	yes	yes	–	–

APPENDIX 14. — Measurements of teleoconch and protoconch of *Parashiela rotundata* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Society, Tahiti, Arue, of Matavai Bay, 16-25 m; **2**-**10**, paratypes, Society, Tahiti, Arue of Matavai Bay, 16-25 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	1.10	0.96	1.10	1.17	1.07	1.06	1.06	1.05	0.94	0.81	0.81-1.17	1.03	0.103
Width	0.77	0.67	0.75	0.80	0.74	0.74	0.75	0.72	0.67	0.64	0.64-0.80	0.73	0.050
Height/Width ratio	1.43	1.43	1.47	1.46	1.45	1.43	1.41	1.46	1.40	1.27	1.27-1.47	1.42	0.058
Aperture height	0.50	0.44	0.47	0.52	0.47	0.49	0.47	0.47	0.41	0.40	0.40-0.52	0.46	0.038
Height/aperture height ratio	2.20	2.18	2.34	2.25	2.28	2.16	2.26	2.23	2.29	2.03	2.03-2.34	2.22	0.087
No. whorls	2.75	2.50	2.75	2.80	2.70	2.60	2.60	2.65	2.60	2.00	2.00-2.80	2.59	0.228
No. axial ribs on last whorls	26	34	28	?	27	?	31	26	28	27	26-34	28.4	2.77
No. spiral cords on first whorls	no	no	no	no	no	no	no	no	no	no	no	–	–
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	0.162	0.187	0.187	0.187	0.162	0.175	0.162	0.175	0.162	0.175	0.162-0.187	0.173	0.011
Diameter of nucleus	0.062	0.070	0.075	0.075	0.075	0.070	0.070	0.062	0.062	0.062	0.062-0.075	0.068	0.006
Diameter of first half whorl	0.137	0.145	0.150	0.137	0.145	0.150	0.125	0.137	0.125	0.125	0.125-0.150	0.138	0.009
Maximun diameter	0.262	0.250	0.250	0.250	0.250	0.262	0.237	0.250	0.250	0.250	0.237-0.262	0.251	0.007
No. whorls	1.35	1.30	1.35	1.30	1.35	1.35	1.30	1.40	1.35	1.40	1.30-1.40	1.35	0.037
Mulstispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

APPENDIX 15. — Measurements of teleoconch and protoconch of *Parashiela soniae* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Marquesas, Nuku Hiva, The 4 caves , 20-23 m; **2**, paratype, Marquesas, Nuku Hiva, The 4 caves , 20-23 m; **3**, paratype, Marquesas, Nuku Hiva, The 4 caves, 20-23 m; **4**, paratype, Marquesas, Nuku Hiva, The 4 caves , 20-23 m; **5**-**7**, Marquesas, Hatu Iti, caves, 5-22 m; **8**-**10**, Marquesas, Tahuata, 0-1 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	1.17	1.15	1.09	0.95	1.03	0.93	1.12	1.12	1.02	1.05	0.93-1.17	1.06	0.082
Width	0.73	0.73	0.72	0.66	0.67	0.65	0.72	0.71	0.66	0.69	0.65-0.73	0.69	0.031
Height/Width ratio	1.60	1.58	1.51	1.44	1.58	1.43	1.56	1.58	1.55	1.52	1.43-1.60	1.53	0.057
Aperture height	0.50	0.50	0.46	0.44	0.45	0.43	0.48	0.49	0.44	0.45	0.43-0.50	0.46	0.026
Height/aperture height ratio	2.34	2.30	2.37	2.16	2.29	2.16	2.33	2.29	2.32	2.33	2.16-2.37	2.29	0.072
No. whorls	2.75	2.65	2.60	2.20	2.50	2.25	2.60	2.60	2.50	2.50	2.20-2.75	2.52	0.172
No. axial ribs on last whorls	14	14	14	15	13	13	14	13	12	15	12-15	13.7	0.95
No spiral cords on first whorls	no	no	no	no	no	no	no	no	no	no	no	–	–
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	0.225	0.250	0.225	0.237	0.225	0.232	0.237	0.232	0.237	0.237	0.225-0.250	0.234	0.008
Diameter of nucleus	0.075	0.100	0.100	0.087	0.100	0.100	0.100	0.100	0.100	0.087	0.075-0.100	0.095	0.009
Diameter of first half whorl	0.175	0.187	0.195	0.175	0.187	0.175	0.187	0.187	0.175	0.175	0.175-0.195	0.182	0.008
Maximun diameter	0.250	0.262	0.250	0.262	0.250	0.237	0.250	0.250	0.250	0.275	0.237-0.275	0.254	0.010
No. whorls	1.10	1.20	1.10	1.10	1.10	1.10	1.10	1.15	1.10	1.15	1.10-1.20	1.12	0.035
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

Appendix 16A. — Measurements of teleoconch and protoconch of *Simulamerelina australes* n. sp. in mm: **1**, holotype, Australes, Rapa Cave SE of Tematapu Point Stn 34, 2-8 m; **2-11**, paratypes, Australes, Rapa Cave SE of Tematapu Point Stn 34, 2-8 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Height	2.47	2.13	2.43	2.47	2.50	2.17	2.57	2.17	2.60	2.32	2.43
Width	1.12	1.00	1.10	1.12	1.13	1.03	1.13	1.00	1.15	1.12	1.12
Height/Width ratio	2.20	2.13	2.21	2.21	2.21	2.11	2.27	2.17	2.26	2.07	2.17
Aperture height	0.83	0.73	0.87	0.88	0.90	0.78	0.87	0.77	0.93	0.85	0.87
Height/aperture height ratio	2.98	2.92	2.79	2.81	2.78	2.78	2.95	2.89	2.80	2.73	2.79
No. whorls	4.50	4.00	4.50	4.50	4.60	4.00	4.60	4.10	4.70	4.15	4.25
No. axial ribs on last whorls	15	17	15	16	14	15	13	15	15	15	16
No. spiral cords on last whorls (above aperture)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Height	0.300	0.300	0.300	0.300	0.300	0.317	0.283	0.300	0.300	0.317	0.310
Diameter of nucleus	0.100	0.067	0.067	0.100	0.067	?	?	0.100	0.067	0.067	0.067
Diameter of first half whorl	0.225	0.200	0.200	0.217	0.200	0.207	0.200	0.217	0.200	0.200	0.193
Maximun diameter	0.305	0.333	0.333	0.333	0.333	0.333	0.327	0.327	0.317	0.333	0.307
No. whorls	1.25	1.25	1.25	1.25	1.25	1.25	1.30	1.25	1.40	1.25	1.30
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Appendix 16B. — Measurements of teleoconch and protoconch of *Simulamerelina australes* n. sp. in mm, with range, mean and standard deviation: **12-21**, Australes, Rapa Vavai, Stn 20, 5 m.

Teleoconch	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**Min-max**	**Mean**	**Std**
Height	2.66	2.33	2.58	2.15	2.27	2.67	2.53	2.63	2.60	2.67	2.15-2.67	2.45	0.183
Width	1.17	1.07	1.17	1.07	1.07	1.13	1.17	1.18	1.17	1.18	1.07-1.18	1.11	0.056
Height/Width ratio	2.27	2.18	2.21	2.01	2.12	2.36	2.16	2.23	2.22	2.26	2.01-2.36	2.19	0.078
Aperture height	0.93	0.82	0.97	0.82	0.85	0.93	0.92	0.95	0.95	0.97	0.82-0.97	0.88	0.068
Height/aperture height ratio	2.86	2.84	2.66	2.62	2.67	2.87	2.75	2.77	2.74	2.75	2.62-2.87	2.79	0.090
No. whorls	4.8	4.15	4.4	4	4.15	4.6	4.5	4.5	4.5	4.5	4-4.8	4.4	0.25
No. axial ribs on last whorls	12	16	12	13	13	16	15	13	13	15	12-16	14.5	1.44
No. spiral cords on last whorls (above aperture)	7(3)	8(3)	8(3)	8(3)	7(3)	8(3)	8(3)	7(3)	8(3)	8(3)	7(3)-8(3)	7.7	0.48
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	0.283	0.300	0.300	0.300	0.300	0.300	0.300	0.317	0.300	0.300	0.283-0.317	0.301	0.009
Diameter of nucleus	0.100	?	0.100	0.073	0.083	?	?	0.060	0.083	0.100	0.060-0.100	0.08	0.016
Diameter of first half whorl	0.193	0.167	0.200	0.183	0.200	0.200	0.183	0.217	0.193	0.193	0.167-0.217	0.199	0.013
Maximun diameter	0.300	0.300	0.333	0.317	0.333	0.333	0.317	0.317	0.333	0.333	0.300-0.333	0.323	0.012
No. whorls	1.30	1.30	1.30	1.30	1.25	1.30	1.30	1.25	1.25	1.30	1.25-1.30	1.28	0.037
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

Appendix 17. — Measurements of teleoconch and protoconch of *Simulamerelina densestriata* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Australes, Marotiri, 700-800 m; **2-10**, paratypes, Australes, Marotiri, 700-800 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	2.45	2.43	2.60	2.63	2.37	2.62	2.63	2.27	2.62	2.75	2.27-2.75	2.54	0.149
Width	1.15	1.15	1.28	1.22	1.17	1.22	1.23	1.05	1.22	1.27	1.05-1.28	1.19	0.068
Height/Width ratio	2.17	2.11	2.03	2.16	2.03	2.15	2.14	2.16	2.15	2.17	2.03-2.17	2.13	0.054
Aperture height	0.82	0.90	0.95	0.97	0.90	0.93	0.93	0.83	0.88	0.93	0.82-0.97	0.90	0.049
Height/aperture height ratio	2.97	2.70	2.74	2.72	2.63	2.82	2.83	2.74	2.98	2.96	2.63-2.98	2.81	0.124
No. whorls	4.20	4.10	4.15	4.20	3.90	4.50	4.25	4.00	4.20	4.50	3.90-4.50	4.2	0.19
No. axial ribs on last whorls	14	17	14	18	20	16	15	20	17	13	13-20	16.4	2.46
No. spiral cords on last whorls (above aperture)	8(3)	8(3)	9(3)	8(3)	8(3)	9(3)	8(3)	8(3)	9(3)	9(3)	8(3)-9(3)	8.4(3)	0.52(0)
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	0.316	0.316	0.300	0.316	0.316	0.333	0.333	0.317	0.333	0.300	0.300-0.333	0.318	0.012
Diameter of nucleus	0.116	0.116	0.133	0.107	0.116	0.116	0.116	0.116	0.110	0.116	0.107-0.133	0.116	0.007
Diameter of first half whorl	0.233	0.233	0.250	0.220	0.250	0.220	0.240	0.250	0.233	0.233	0.220-0.250	0.236	0.011
Maximun diameter	0.350	0.360	0.366	0.333	0.350	0.340	0.366	0.333	0.333	0.317	0.317-0.366	0.345	0.016
No. whorls	1.25	1.25	1.20	1.25	1.20	1.20	1.25	1.15	1.25	1.25	1.15-1.25	1.23	0.035
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

Appendix 18. — Measurements of teleoconch and protoconch of *Simulamerelina gracilis* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Tuamotu, Moruroa Atoll, intertidal; **2**, paratype Tuamotu, Moruroa Atoll, intertidal.

Teleoconch	**1**	**2**	**Min-max**	**Mean**	**Std**
Height	2.45	2.13	2.13-2.45	2.29	0.226
Width	1.08	0.98	0.98-1.08	1.03	0.071
Height/Width ratio	2.27	2.17	2.17-2.27	2.22	0.067
Aperture height	0.85	0.73	0.73-0.85	0.79	0.085
Height/aperture height ratio	2.88	2.92	2.88-2.92	2.9	0.025
No. whorls	4.70	4.20	4.20-4.70	4.45	0.354
No. axial ribs on last whorls	11	12	11-12	11.5	0.707
No. spiral cords on last whorls (above aperture)	7 (3)	7 (3)	7 (3)	7 (3)	0 (0)
Protoconch	**1**	**2**	**Min-max**	**Mean**	**Std**
Height	0.312	0.325	0.312-0.325	0.318	0.009
Diameter of nucleus	0.112	0.100	0.100-0.112	0.106	0.008
Diameter of first half whorl	0.200	0.212	0.200-0.212	0.206	0.008
Maximun diameter	0.275	0.275	0.275	0.275	0
No. whorls	1.20	1.10	1.10-1.20	1.15	0.070
Paucispiral	yes	yes	yes	yes	–

Appendix 19. — Measurements of teleoconch and protoconch of *Simulamerelina lepteseiras* n. sp. in mm. **1**, holotype, Tuamotu, Moruroa.

Teleoconch	**1**
Height	1.47
Width	0.88
Height/Width ratio	1.67
Aperture height	0.65
Height/aperture height ratio	2.26
No. whorls	2.9
No. axial ribs on last whorls	12
No. spiral cords on last whorls (above aperture)	9 (4)
Protoconch	**1**
Height	0.237
Diameter of nucleus	0.087
Diameter of first half whorl	0.175
Maximun diameter	0.275
No. whorls	1.35
Paucispiral	yes

Appendix 20. — Measurements of teleoconch and protoconch of *Simulamerelina micrometrica* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Australes, E of Rapa, 600-620 m; **2**-**4**, Australes, Rimatara, 920-930 m; 5, Australes, Banc Arago, 120-180 m; **6**-**8**, Australes, South coast of Rurutu, 520-950 m; **9**, Australes, Tubuai, 470-800 m; **10**, Australes, South coast of Rurutu, 520-950 m; **11**, paratype, Australes, E of Rapa, 600-620 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**Min-max**	**Mean**	**Std**
Height	1.33	1.53	1.52	1.53	1.37	1.53	1.23	1.27	1.27	1.63	1.50	1.23-1.63	1.43	0.137
Width	0.73	0.82	0.85	0.83	0.75	0.82	0.68	0.72	0.70	0.83	0.78	0.68-0.85	0.77	0.060
Height/Width ratio	1.82	1.87	1.79	1.84	1.83	1.87	1.81	1.76	1.81	1.93	1.92	1.76-1.93	1.84	0.053
Aperture height	0.50	0.60	0.60	0.63	0.53	0.62	0.48	0.50	0.50	0.63	0.57	0.48-0.63	0.56	0.059
Height/aperture height ratio	2.66	2.55	2.53	2.43	2.59	2.47	2.56	2.54	2.54	2.59	2.63	2.43-2.66	2.55	0.066
No. whorls	2.90	3.20	3.00	3.15	3.10	3.20	2.80	2.75	2.90	3.25	3.20	2.75-3.25	3.04	0.179
No. axial ribs on last whorls	18	13	13	14	22	14	24	21	22	15	13	13-24	17.2	4.31
No. spiral cords on last whorls (above aperture)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7(3)	7 (3)	0 (0)
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**Min-max**	**Mean**	**Std**
Height	0.277	0.267	0.293	0.283	0.283	0.267	0.267	0.267	0.247	0.267	0.300	0.247-0.300	0.274	0.015
Diameter of nucleus	0.083	0.093	0.083	0.067	0.067	0.083	0.067	0.093	0.083	0.083	0.062	0.062-0.093	0.079	0.011
Diameter of first half whorl	0.167	0.193	0.183	0.167	0.167	0.167	0.167	0.200	0.167	0.183	0.170	0.167-0.200	0.176	0.012
Maximun diameter	0.283	0.283	0.283	0.283	0.283	0.293	0.267	0.300	0.267	0.293	0.250	0.250-0.300	0.280	0.014
No. whorls	1.35	1.25	1.25	1.35	1.40	1.35	1.25	1.25	1.35	1.25	1.30	1.25-1.40	1.30	0.06
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

Appendix 21. — Measurements of teleoconch and protoconch of *Simulamerelina tuamotu* n. sp. in mm, with range, mean and standard deviation. **1**, holotype, Tuamotu, Makemo, Make, reef flat after Arikitomiro pass <1 m; **2**-**10**, paratypes, Tuamotu, Makemo, Make, reef flat after Arikitomiro pass <1 m.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	1.57	1.55	1.56	1.30	1.58	1.28	1.65	1.30	1.38	1.32	1.28-1.65	1.45	0.145
Width	0.90	0.93	0.93	0.76	0.95	0.82	0.93	0.78	0.87	0.77	0.76-0.95	0.86	0.075
Height/Width ratio	1.74	1.67	1.68	1.71	1.66	1.56	1.77	1.67	1.59	1.71	1.56-1.77	1.68	0.065
Aperture height	0.53	0.60	0.58	0.50	0.60	0.50	0.60	0.50	0.50	0.50	0.50-0.60	0.54	0.048
Height/aperture height ratio	2.96	2.58	2.69	2.60	2.63	2.56	2.75	2.60	2.76	2.64	2.56-2.96	2.68	0.121
No. whorls	3.25	3.15	3.10	2.75	3.25	2.60	3.25	2.80	3.10	2.90	2.60-3.25	3.02	0.236
No. axial ribs on last whorls	10	10	12	10	11	9	13	8	10	11	8-13	10.4	1.43
No. spiral cords on last whorls (above aperture)	8(3)	7(3)	8(3)	7(3)	8 (3)	7(3)	8(3)	7(3)	7(3)	7(3)	7(3)- 8(3)	7.4(3)	0.52(0)
Protoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Min-max**	**Mean**	**Std**
Height	0.300	0.316	0.300	0.300	0.300	0.300	0.300	0.316	0.316	0.283	0.283-0.316	0.303	0.010
Diameter of nucleus	0.070	0.083	0.083	0.083	0.083	0.067	0.077	0.067	0.083	0.073	0.067-0.083	0.077	0.007
Diameter of first half whorl	0.167	0.183	0.183	0.193	0.193	0.167	0.173	0.173	0.183	0.167	0.167-0.193	0.178	0.010
Maximun diameter	0.275	0.260	0.293	0.273	0.266	0.267	0.283	0.273	0.267	0.250	0.250-0.293	0.271	0.012
No. whorls	1.25	1.20	1.25	1.25	1.20	1.25	1.25	1.25	1.25	1.25	1.20-1.25	1.24	0.021
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	–	–

APPENDIX 22. — Measurements of teleoconch and protoconch of *Subestea moruroa* n. sp. in mm, with range, mean and standard deviation: **1**, holotype, Tuamotu, Moruroa Atoll; **2**, **3**, Tuamotu, Anaa Atoll; **4**-**7**, Tuamotu, Nukutavake.

Teleoconch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Min-max**	**Mean**	**Std**
Height	1.96	1.57	1.67	1.65	1.70	1.67	1.42	1.42-1.96	1.66	0.162
Width	1.02	0.88	0.90	0.92	0.85	0.93	0.82	0.82-1.02	0.90	0.064
Height/Width ratio	1.92	1.78	1.86	1.79	2.00	1.80	1.73	1.73-2.00	1.84	0.093
Aperture height	0.72	0.63	0.63	0.65	0.65	0.63	0.57	0.57-0.72	0.64	0.044
Height/aperture height ratio	2.72	2.49	2.65	2.54	2.63	2.65	2.49	2.49-2.72	2.59	0.089
No. whorls	3.50	2.75	3.00	3.10	3.20	3.00	2.75	2.75-3.50	3.04	0.262
No. axial ribs on last whorls	9	10	9	12	13	12	11	9-13	10.9	1.57
No. spiral cords on last whorls (above aperture)	15(9)	n. m.	n. m.	15(8)	16(9)	18(8)	15(9)	15-18(8-9)	15.8 (8.6)	1.30 (0.55)
Start	**3**	**3**	**n. m.**	**3**	**3**	**3**	**3**	**3**	**3**	**0**
Protoconch	1	2	3	4	5	6	7	Min-max	Mean	Std
Height	0.237	0.312	0.325	0.250	0.283	0.300	0.267	0.237-0.325	0.282	0.033
Diameter of nucleus	0.112	0.125	0.145	0.100	0.117	0.127	0.117	0.100-0.145	0.120	0.014
Diameter of first half whorl	0.212	0.225	0.220	0.220	0.217	0.200	0.217	0.200-0.225	0.216	0.008
Maximun diameter	0.287	0.325	0.362	0.312	0.283	0.300	0.317	0.283-0.362	0.312	0.027
No. whorls	1.50	1.50	1.40	1.35	1.35	1.35	1.40	1.35-1.50	1.41	0.067
Paucispiral	yes	yes	yes	yes	yes	yes	yes	yes	–	–