New genus and new species of Solariellidae (Gastropoda: Trochoidea) from New Caledonia, Fiji, Vanuatu, Solomon Islands, Philippines, Papua New Guinea and French Polynesia

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ABSTRACT

Elaphriella n. gen. is a new genus of small to fairly large (up to 18 mm) solariellids superficially resembling the genus *Archiminolia* Iredale, 1929. The latter differs, among others, by a much thicker columella, spiral cords or grooves that often continue on the body whorl and spiral cords inside the umbilicus. The two genera form distinct clades in a molecular phylogeny of the family Solariellidae. Seven new species are described, all from deep water (300-900 meters) in the South and West Pacific: *Elaphriella cantharos* n. sp., *E. eukhonikhe* n. sp., *E. paulinae* n. sp., *E. wareni* n. sp., *E. dikhonikhe* n. sp., *E. helios* n. sp. and *E. leia* n. sp.

RÉSUMÉ

Nouveau genre et nouvelles espèces de Solariellidae (Gastropoda: Trochoidea) de Nouvelle-Calédonie, Fidji, Vanuatu, Iles Salomon, Philippines, Papouasie Nouvelle-Guinée et Polynésie française.

Elaphriella n. gen. est un genre nouveau de Solariellidae de taille adulte petite à relativement importante (jusqu'à 18 mm). Le genre *Archiminolia* Iredale, 1929, lui ressemble superficiellement, mais en diffère, entre autres, par une columelle beaucoup plus épaissie, des cordons ou sillons spiraux qui s'étendent fréquemment jusqu'au dernier tour, et des cordons spiraux à l'intérieur de l'ombilic. Les deux genres constituent des clades distincts dans la phylogénie moléculaire des Solariellidae. Sept espèces nouvelles sont décrites, toutes originaires du bathyal (300-900 mètres) du Pacifique Sud et Ouest : *Elaphriella cantharos* n. sp., *E. eukhonikhe* n. sp., *E. paulinae* n. sp., *E. wareni* n. sp., *E. dikhonikhe* n. sp., *E. helios* n. sp. et *E. leia* n. sp.

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INTRODUCTION

Many authors (*e.g.*, Quinn 1979; Herbert 1987) have pointed out that the genus *Solariella*, with a number of subgenera, was used in the past to classify miscellaneous species many of which are in fact not Solariellidae; most often, these species belong to the Umboniinae. Over the past forty years, and particularly in the last ten years, MNHN deep-sea expeditions have obtained unprecedented collections of deep-water species, including a large collection of solariellid specimens. The marine gastropod family Solariellidae comprises relatively small species that occur predominantly in deep water and show a wide range of morphological adaptations for living in this environment. These new samples come from around New Caledonia, Vanuatu, Solomon Islands, Philippines, Norfolk Ridge, the Chesterfield Plateau, French Polynesia, Madagascar and the Mozambique Channel, and include many new species. The present contribution continues the work of Vilvens (2009) and Vilvens, William & Herbert (2014) to describe these new species.

MATERIAL AND METHODS

The material described in this paper was collected by French MNHN-IRD expeditions covering a large area of the Indo-Pacific, focusing in particular on New Caledonia, Fiji, Vanuatu, Solomon Islands and French Polynesia (Society Islands) (see Table 1; and http://basexp).

CAMPAIGN	SAMPLING AREA	DATE (M/Y)
BENTHAUS	French Polynesia, Austral Islands	11/2002
BIOPAPUA	Papua New Guinea, Bismarck Sea	8-10/2010
BOA 1	Vanuatu	9/2005
EBISCO	Coral Sea	10/2005
MUSORSTOM 7	Wallis and Futuna Islands	5-6/1992
MUSORSTOM 10	Fiji	8/1998
PANGLAO 2005	Philippines (Bohol and Sulu Seas)	5/2005
SALOMON 1	Solomon Islands	9/2001
SALOMON 2	Solomon Islands	10-11/2004
SALOMONBOA 3	Off Guadalcanal and Malaita	9-10/2007
TARASOC	French Polynesia: Tuamotu Archipelago and Society Islands	9-10/2009
TERRASSES	New Caledonia	10/2008

TABLE 1
List of Indo-Pacific MNHN-IRD expeditions that produced material described herein.

For bathymetric ranges, we take the inner values of the deepest and shallowest stations as explained by Bouchet *et al.* (2008). For the morphological descriptions, the main conchological features of interest include (see Figure 2):

– shell shape: height and shape of spire [conical, cyrtoconoid (*i.e.* convex cone), coeloconoid (*i.e.* concave cone)];
– size and shape of protoconch;
– whorl profile: convex, concave, straight; with or without shoulder or keel;
– spiral sculpture of teleoconch: ontogeny, number, and texture (beaded or smooth) of cords, distance between cords, features of subsutural cord;
– axial sculpture of teleoconch;
– aperture shape, features of outer and inner lip;
– shape and ornament of base [number of cords, texture (beaded or smooth) and distance between cords];

– umbilicus: open or closed, relative size, rounded or carinate edge, smooth or beaded carina, axial threads around umbilical area, shape and number of axial pleats (counted around last whorl), teeth inside adapical border, spiral cords around or inside umbilicus;
– columella thickness;
– colour: pattern, iridescence (note: these are more pronounced in live-collected specimens, with colour of live-collected specimens often more greenish).

For ridges and wrinkles on the whorls and base, we use the following terminology:
– threads: fine ridges, most commonly on early whorls;
– folds: much larger wrinkles, appearing more or less from third whorl;
– subsutural pleats: beaded wrinkles along suture;
– basal pleats: high, rather thick wrinkles produced by axial sculpture around umbilicus;
– basal threads: high, rather thin ridges produced by axial sculpture around umbilicus;
– axial lines: incised lines producing recessed axial sculpture around umbilicus.

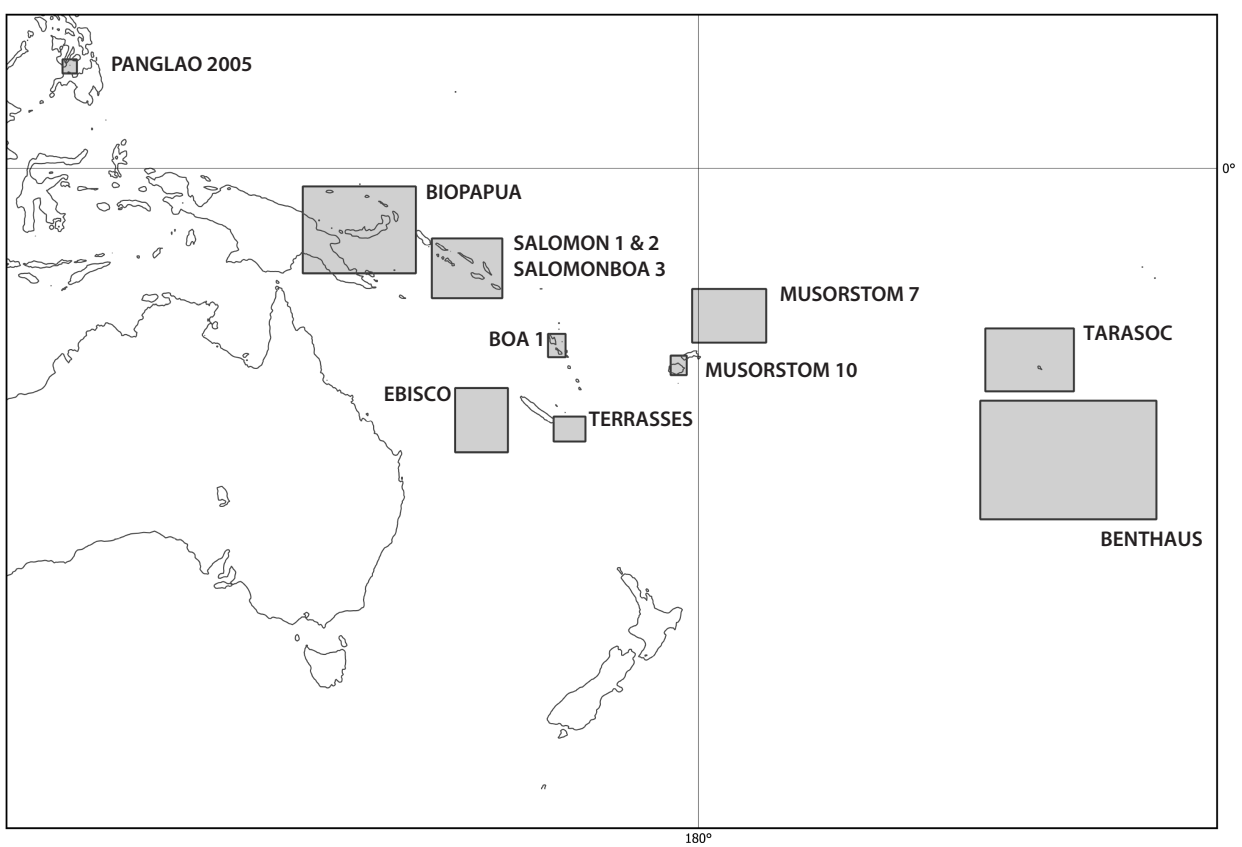


FIGURE 1

Locations of MNHN-IRD expeditions discussed herein: SALOMON 1, SALOMON 2, SALOMONBOA 3; MUSORSTOM 10; BIOPAPUA; EBISCO; TERRASSES; BENTHAUS, TARASOC. (See also the web site http://expeditions.mnhn.fr/)

ABBREVIATIONS

Repositories

AM Australian Museum, Sydney;
CV collection Claude Vilvens;
MNHN Muséum national d'Histoire naturelle, Paris;
NHMUK The Natural History Museum, London;
NSMT National Science Museum, Tokyo.

Specimens

dd empty shell(s);
H height;
HA height of aperture;
juv juvenile;
lv live-collected specimen(s);

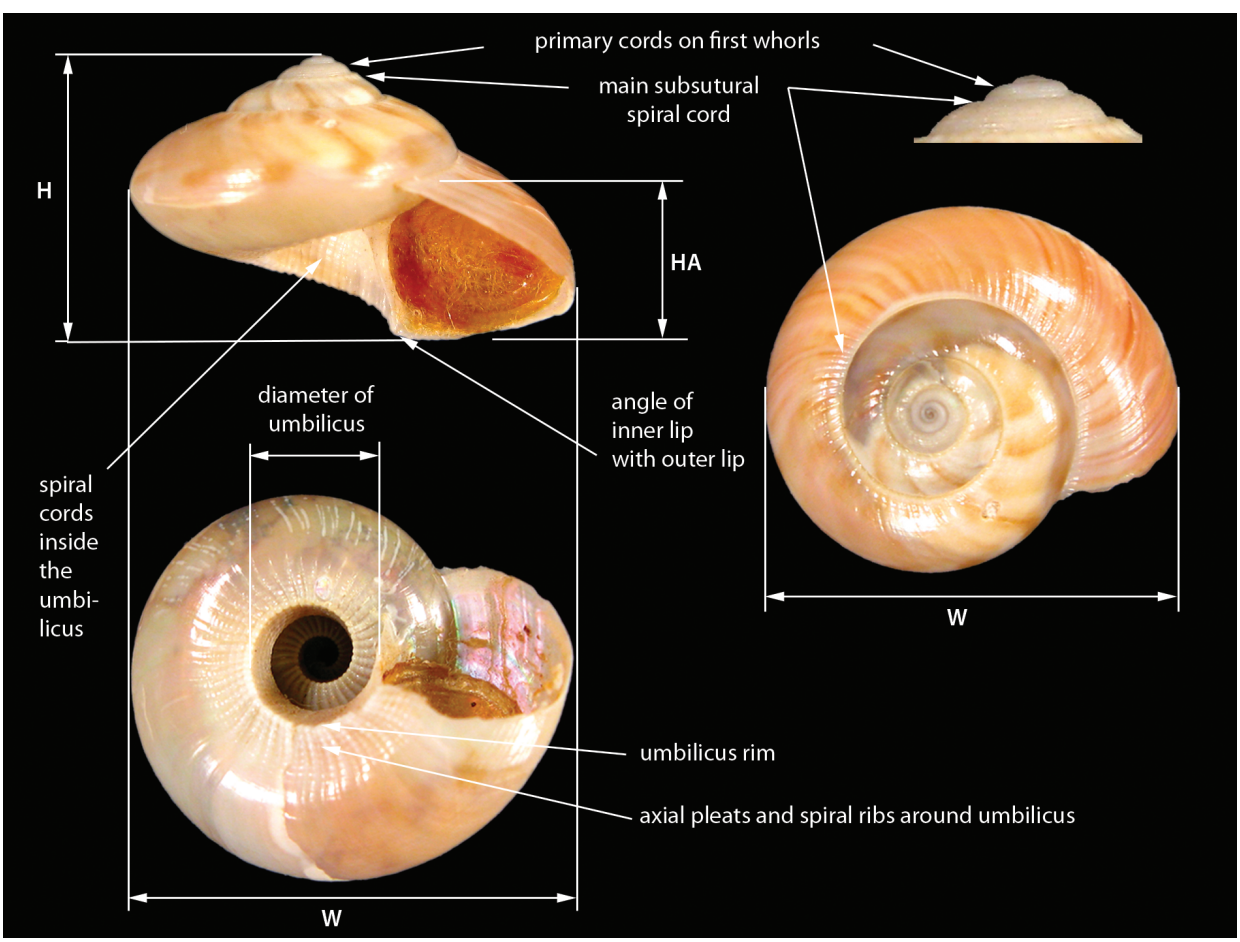


FIGURE 2

Features of Solariellidae shells: H: height; W: width; HA: aperture height.

mm millimetre;
P1, **P2**, **P3** primary cords (from adapical to abapical);
S1, **S2**, **S3** secondary cords (from adapical to abapical);
sub subadult;
TW number of teleoconch whorls;
µm micron;
W width.

Station data
m metre;
stn station;
CP beam trawl;
DW Warén dredge.

SYSTEMATIC ACCOUNT

Formerly treated as a subfamily of Trochidae (Hickman & McLean 1990), we here follow the classification of Williams (2012) with Solariellidae ranked as a family of Trochoidea with Trochidae, Calliostomatidae, Turbinidae and Liotiidae.

Superfamily TROCHOIDEA Rafinesque, 1815
Family SOLARIELLIDAE Powell, 1951 [= Minoliinae Kuroda, Habe & Oyama, 1971]

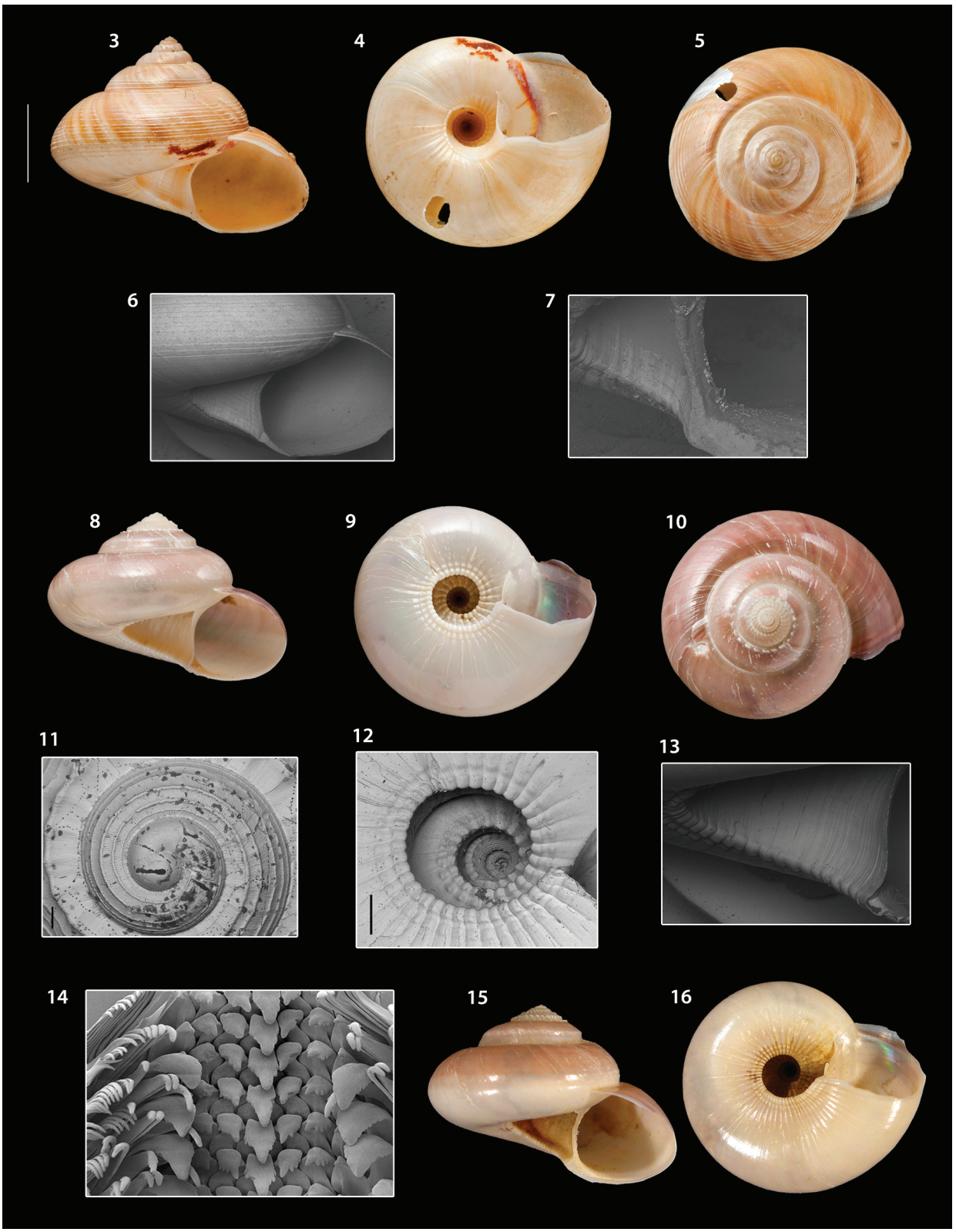
Genus ***ELAPHRIELLA*** n. gen.

Type species. *Elaphriella cantharos* n. sp., here designated**;** Recent, Solomon Islands.

DIAGNOSIS — Shell rather small to fairly large (up to 18 mm wide), more or less conical in shape, with rather depressed to moderately elevated spire. Early whorls usually with thick spiral cords, often with distinct axial threads, becoming axial ribs on later whorls. Last whorls lacking spiral cords, but occasionally with a granular, subsutural cord. Columella thin, with slightly reflected edge overlapping umbilicus and small flange at base. Peristome incomplete. Aperture with band of columnar nacre around inside lip forming almost complete circle, and columnar nacre on inside edge of columella. Convex base with axial lines and several rows of beads around umbilicus. Umbilicus broad, rim angulate, bearing thin axial threads and lacking spiral cords within; axial threads visible in perspective to apex.

REMARKS — Diagnosis of the new genus is based on the seven new species described here. Living specimens have been collected to date from depths of 287-884 m.

The new genus is most similar to *Archiminolia* Iredale, 1929 [type species *Monilea oleacea* Hedley & Petterd, 1906, by original designation; Recent, eastern Australia (Figures 3-7)], but *Archiminolia* has a much thicker columella, especially at the base, spiral cords or grooves that often continue onto the body whorl and spiral cords inside the umbilicus; early axial ornament of growth lines only, with axial ribs on early whorls lacking. The new genus *Elaphriella* corresponds to "Clade C" in the recent molecular phylogeny of the Solariellidae published by Williams *et al.* (2013). Molecular evidence also shows that *Elaphriella* and *Archiminolia* are distinct (Williams *et al.* 2013).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ETYMOLOGY — Greek ελαφροζ, α, ον, light in weight, adjective, in reference to the thin, light columella that distinguishes this genus from *Archiminolia*; gender feminine.

Elaphriella cantharos n. sp.

Figures 8-18; Table 2

TYPE MATERIAL — Holotype MNHN IM-2007-18534, 3 paratypes MNHN IM-2000-26535-26536, 2 NHMUK 20120017, 20120018, 1 CV (as listed below).

TYPE LOCALITY — Solomon Islands, 07°43'S, 156°27'E, 518-527 m [SALOMON 2: stn CP2243].

MATERIAL EXAMINED — Solomon Islands. SALOMON 1: stn DW1772, 8°16'S, 160°40'E, 570-756 m, 2 lv, 1 dd sub., 1 lv juv. – Stn CP1804, 9°32'S, 160°37'E, 309-328 m, 3 lv, 1 lv juv. – Stn CP1830, 10°11'S, 161°19'E, 500-563 m, 3 lv, 2 paratypes MNHN IM-2000-26535, 1 paratype NHMUK 20120017, 1 lv juv. – Stn CP1833, 10°12'S, 161°19'E, 367-533 m, 1 dd. – SALOMON 2: stn CP2243, 07°43'S, 156°27'E, 518-527 m, 7 lv, holotype MNHN IM-2007-18534 (Figures 8-16), 1 paratype NHMUK 20120018, 1 paratype CV, 2 sub dd, 1 dd juv. – Stn CP2249, 07°31'S, 156°18'E, 782-884 m, 3 dd, 1 sub dd. – SALOMONBOA 3: stn CP2839, 10°26'S, 161°20'E, 506-597 m, 3 dd, 1 dd. Papua New Guinea. BIOPAPUA: stn CP3740, 09°12'S, 152°16'E, 556-645 m, 1 lv. – Stn DW3749, 05°39'S, 153°59'E, 620-663 m, 2 lv. – Stn CP3760, 03°58'S, 153°43'E, 613-660 m, 1 lv. French Polynesia. Society Islands. Bora Bora, 16°28'S, 151°47'E, 562 m, 6 lv, 1 paratype MNHN IM-2000-26536 (Figures 17-18). – TARASOC: stn DW3422, 16°43'S, 151°04'W, 430-620 m, 1 lv. – Stn DW3425, 16°43'S, 151°03'W, 557 m, 2 lv. – Stn DW3464, 17°34'S, 149°54'W, 460 m, 1 lv. – Stn DW3489, 17°47'S, 149°23'W, 450-720 m, 1 lv.

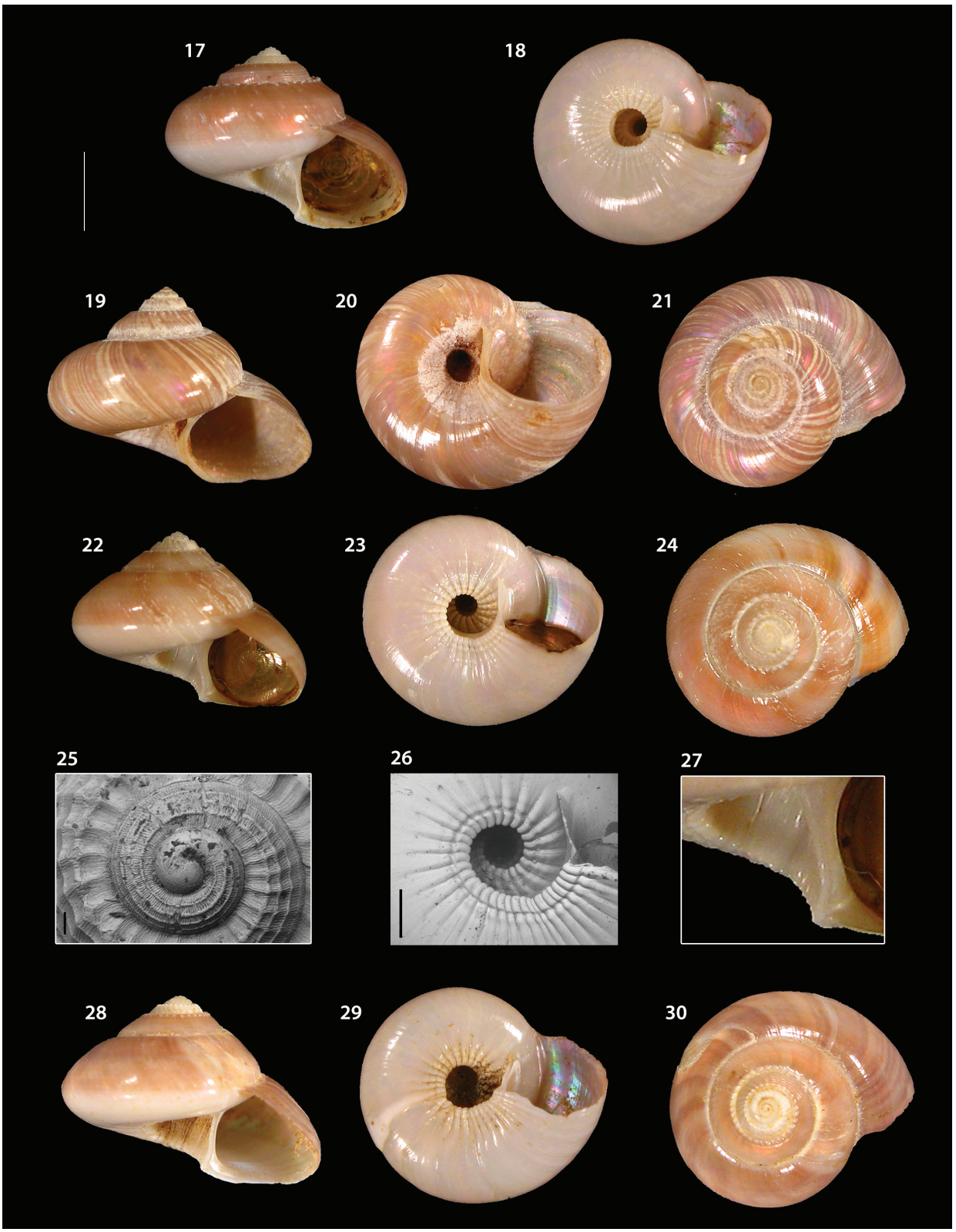
DISTRIBUTION — Solomon Islands, 328-782 m, collected alive in 328-570 m; Society Islands, alive in 460-562 m; Papua New Guinea, alive in 620-645 m.

DIAGNOSIS — Shell shape more or less conical, spire rather depressed, early whorls with almost horizontal subsutural ramp and strong prosocline folds, single beaded spiral cord and submedian keel on intermediate whorls, weakening to angulation on penultimate whorl and becoming obsolete on last whorl, umbilicus broad surrounded by strong axial pleats and two or three strongly granular spiral cords around umbilicus.

DESCRIPTION — Shell tall for genus (H up to 13.7 mm, W to 18.4 mm), much wider than high, shape conical, thin-shelled, highly polished; spire rather depressed, height *ca.* 0.7x width, 1.9-2.6x aperture height; periphery rounded; umbilicus broad, deep. Protoconch *ca.* 350-400 µm wide, 1.25 whorls, rounded, with tiny, crisp granules and very thin terminal lip. Teleoconch of up to 6.1 strongly convex whorls with sloping subsutural ramp with angulate rim except on two last whorls, suprasutural angulation on intermediate whorls becoming submedian angulation on penultimate whorl and disappearing on last whorl, strong axial folds on subsutural area of three early whorls; early whorls with *ca.* six to seven equally spaced spiral cords of similar size; antepenultimate whorl with single, strongly granular adapical cord at rim of subsutural ramp; last whorls smooth. Suture canaliculated except on two last whorls.

FIGURES 3-16

3-7, *Archiminolia oleacea* (Hedley & Petterd, 1906), holotype AMS C24440, New South Wales; **3-5**, shell, apertural, basal and apical views (H 12.8, W 15.7 mm); **6**, detail of columellar area; **7**, detail of lower part of columella. **8-16**, *Elaphriella cantharos* n. sp. 8-13, holotype MNHN IM-2007-18534 , Solomon Islands, SALOMON 2 stn CP2243, 518527 m; **8-10**, shell, apertural, basal and apical views (H 10.6, W 15.4 mm); **11**, detail of protoconch; **12**, detail of umbilical area; **13**, detail of lower columella; **14**, anterior radular ribbon; **15-16**, paratype MNHN IM-2000-26535, apertural and basal views (H 11.1, W 16.0 mm). Solomon Islands, SALOMON 1 stn CP1830, 500-563 m. Scale bars = 5 mm, except 11, scale = 100 µm, and 12, scale = 2 mm.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First whorl convex, sculptured with six to seven spiral cords appearing immediately; cords more or less equally spaced; P2 at rim of subsutural ramp; axial, weakly prosocline threads between cords. On second whorl, P1 vanishing and not visible beyond mid whorl; other cords similar in size and shape, granular at intersections with axial threads; axial threads thickening rapidly to axial folds across entire surface, distance between folds *ca.* 1.5-2x thickness of folds. On third whorl, axial threads stronger and cords nodular; S2 and S3 may appear, similar in size to P3; P4 producing submedian keel; P3, P5 and P6 vanishing at end of whorl or at subsequent whorl. On fourth whorl, P2 much stronger, with strong, elongated nodules; suture less canaliculated; P4 becoming smooth cord forming a keel. On last whorls, P2 disappearing and angulation of P4 diminishing, producing smoothly rounded whorl. On last whorls, P2 and angulation of P4 vanishing, producing completely smooth whorls.

Aperture more or less circular; peristome incomplete; outer and inner lip thin; inner lip with strong, elongated, weakly channelled, basal thickening against umbilical rim. Base moderately convex, smooth except for inner third with *ca.* 35-45 (up to 55 on large specimens) axial pleats and two spiral cords around umbilicus; innermost cord at rim of umbilicus strongly granular, twice as thick as other cords; second cord granular, not clearly defined on some specimens. Umbilicus broad (diameter 20-22% of shell width), subcentral, with angulate rim; concave wall with thin axial threads and no spiral cords; granular spiral cords at umbilical rim visible in perspective to apex. Teleoconch light pink in colour, with very thin, prosocline, light brownish flammules on adapical half of whorls; base white; protoconch off white, translucent.

Radula rhipidoglossate, formula 12 + 4 + 1 + 4 +12; two inner lateral teeth similar to rachidian tooth; lateral plate well-developed.

REMARKS — *Elaphriella cantharos* n. sp. is rather similar to *E. wareni* n. sp. (Figures 46-57) from Fiji and the Solomon Is., but the latter is slightly smaller, has a more elevated spire, a taller last whorl with several weak spiral cords, a subsutural cord still beaded further on shell, intermediate whorls lacking a submedian keel, a narrower umbilicus (*ca.* 15% of shell width, compared to *ca.* 21%) surrounded by fewer axial pleats (30-35 compared to 35-45).

The new species weakly resembles *Archiminolia iridescens* (Habe, 1961) (Figures 19-21) from Japan, but this similarly sized species has a more elevated spire, a subsutural spiral cord with much weaker granules and a very different funnel-shaped umbilicus, surrounded neither by spiral cords nor axial pleats.

TABLE 2

Elaphriella cantharos n. sp. Type specimen measurements (in mm).

	TW	H	W	HA	H/W	H/HA	H/TW
Holotype	5.6	10.6	15.4	4.9	0.69	2.16	1.89
paratype 1	5.7	11.1	16.0	4.2	0.69	2.64	1.95
paratype 2	5.4	9.2	13.9	4.1	0.66	2.24	1.70
paratype 3	5.3	9.2	12.7	3.9	0.72	2.36	1.74
paratype 4	5.8	12.8	17.6	6.0	0.73	2.13	2.21
paratype 5	6.1	13.7	18.4	5.2	0.74	2.63	2.25
paratype 6	5.2	9.7	14.3	5.0	0.68	1.94	1.87

FIGURES 17-30

17-18, *Elaphriella cantharos* n. sp. paratype MNHN IM-2000-26536, apertural and basal views (H 9.7, W 14.3 mm). French Polynesia, Bora Bora, 562 m. **19-21**, *Archiminolia iridescens* (Habe, 1961), holotype NSMT-Mo 49790, apertural, basal and apical views (H 12.6, W 16.4 mm). Japan, 200-300 m. **22-30**, *Elaphriella eukhonikhe* n. sp. **22-27**, holotype MNHN IM-2000-26537, SALOMONBOA 3 stn DW2786, 320520 m; **22-24**, shell, apertural, basal and apical views (H 7.9,W 11.0 mm); **25**, details of protoconch and first whorl; **26**, detail of umbilical area; **27**, detail of lower columella; **28-30**, paratype MNHN IM-2000-26538, apertural, basal and apical views (H 7.9, W 11.3 mm). SALOMON 2 stn CP2187, 482-604 m. Scale bars = 5 mm, except 25, scale = 100 µm, and 26, scale = 1 mm.

Despite the large gap in geographic distribution, the specimens from French Polynesia match those from the Solomon Islands well, with the exception that the spiral cords persist to the fifth whorl, and there is an additional third spiral cord around the umbilicus. There are no molecular data for samples from French Polynesia.

ETYMOLOGY — Greek κανθαροζ, *cantharos*, a Greek vase, used as a noun in apposition, in reference to the shape of the shell, reminiscent of an overturned ancient vase.

Elaphriella eukhonikhe n. sp.

Figures 22-30; Table 3

TYPE MATERIAL — Holotype MNHN IM-2000-26537, 2 paratypes MNHN IM-2000-26538-26539, 1 NHMUK 20120019, 1 CV (as listed below).

TYPE LOCALITY — Solomon Islands, 08°31'S, 160°41'E, 320520 m [SALOMONBOA 3: stn DW2786].

MATERIAL EXAMINED — Solomon Islands. SALOMON 1: stn DW1770, 8°20'S, 160°39'E, 453-542 m, 2 dd, 1 dd sub, 1 dd juv. – Stn CP1835, 10°10'S, 161°24'E, 464-482 m, 1 dd, 1 dd sub, 1 dd juv. – SALOMON 2: stn DW2164, 8°57'S, 159°09'E, 391-396 m, 2 dd, 1 paratype CV. – Stn CP2187, 08°18'S, 160°00'E, 482-604 m, 1 dd, paratype MNHN IM-2000-26538 (Figures 28-30). – SALOMONBOA 3: stn DW2786, 08°31'S, 160°41'E, 320-520 m, 3 lv, holotype MNHN IM-2000-26537 (Figures 22-27), paratype MNHN IM-2000-26539, paratype NHMUK 20120019, 1 sub lv.

DISTRIBUTION — Solomon Islands, 396-482 m.

DIAGNOSIS — Shell shape conical, spire moderately depressed, early whorls with weakly sloping subsutural ramp and strong prosocline folds, strongly granular subsutural spiral cord vanishing on last whorl, last whorl entirely smooth, umbilicus rather narrow, surrounded by strong axial pleats and two strongly granular spiral cords.

DESCRIPTION — Shell of medium size for genus (H up to 8.1 mm, W to 11.4 mm), wider than high, shape conical, thin-shelled, polished; spire moderately depressed, height *ca.* 0.7x width, 2.1-2.5x aperture height; periphery subangular; umbilicus deep. Protoconch *ca.* 300 µm wide, 1.25 whorls, rounded, with tiny, crisp granules and very thin, sometimes indistinct, terminal lip. Teleoconch of up to 5.3 weakly convex whorls with sloping subsutural ramp with angulate rim except on two last whorls, strong axial folds on first three whorls; early whorls with five equally spaced spiral cords of similar size; penultimate whorl with single, strongly granular adapical cord; last whorl smooth. Suture canaliculated except on two last whorls.

First whorl convex, sculptured with five spiral cords appearing immediately; cords more or less equally spaced; P2 at rim of subsutural ramp; axial, close, weakly prosocline threads between cords; axial, weakly prosocline folds appearing at end of whorl, distance between folds *ca.* 1.5x thickness of folds. On second whorl, P1 reaching rim of subsutural ramp; cords similar in size and shape, granular at intersections with axial threads; axial folds stronger on adapical part of whorl, distance between folds *ca.* 2x thickness of folds. On third whorl, P1 stronger than other cords; P1 and P2 remaining granular, other cords nearly smooth past mid-whorl; all cords vanishing near end of whorl except P1. At beginning of fourth whorl, P1 with strong nodules; suture less canaliculated; P1 gradually diminishing to thin, low, smooth spiral cord, disappearing at end of whorl. Last whorl completely smooth.

Aperture subcircular; peristome incomplete; outer and inner lip thin; inner lip with strong, elongated, weakly channelled, basal thickening against umbilical rim. Base moderately convex, smooth except for inner third with *ca.* 24-30 axial pleats and two spiral cords around umbilicus; innermost cord at rim of umbilicus strongly granular, twice as thick as other cords; second cord granular, not clearly defined on some specimens. Umbilicus rather narrow (diameter 13-16% of shell

width) to rather broad (18-19%) on tall specimens, subcentral, with angulate rim; wall weakly concave with very thin axial threads and no spiral cords; granular spiral cords similar to cords at rim visible in perspective to apex. Teleoconch light pink in colour; three last whorls with thin, prosocline, light brownish flammules; base white ivory; protoconch off white. Operculum brown, corneous, circular, multispiral, with short growing edge.

TABLE 3
Elaphriella eukhonikhe n. sp. Type specimen measurements (in mm).

	TW	H	W	HA	H/W	H/HA	H/TW
holotype	5.3	7.9	11.0	3.4	0.72	2.32	1.49
paratype 1	5.2	7.4	10.7	3.5	0.69	2.11	1.42
paratype 2	4.9	7.0	10.0	3.2	0.70	2.19	1.43
paratype 3	5.2	8.1	11.4	3.3	0.71	2.45	1.56
paratype 4	5.2	7.9	11.3	3.4	0.70	2.32	1.52

REMARKS — *Elaphriella eukhonikhe* n. sp. is rather similar to *E. wareni* n. sp. (Figures 46-57) from Fiji and the Solomon Is., but the latter is slightly smaller, has a more elevated spire, a taller last whorl with several weak spiral cords, a narrower umbilicus (*ca.* 15% of shell width, compared to 19%) surrounded by fewer axial pleats (30-35, compared to 24-30).

The new species weakly resembles *Elaphriella cantharos* n. sp. (Figures 8–18), but the latter is taller, has a slightly larger protoconch (up to 350 µm compared to *ca.* 300 µm), a median angulation on the whorls, a wider umbilicus (*ca.* 20-22% of shell width compared to 13-19%) surrounded by more numerous axial pleats (35-45 compared to 24-30).

ETYMOLOGY — Greek Χωνιχοζ, η, ον, and ευ, used as a prefix, true conical, adjective, used in agreement with a feminine noun, in reference to the strictly conical shape of the shell.

Elaphriella paulinae n. sp.

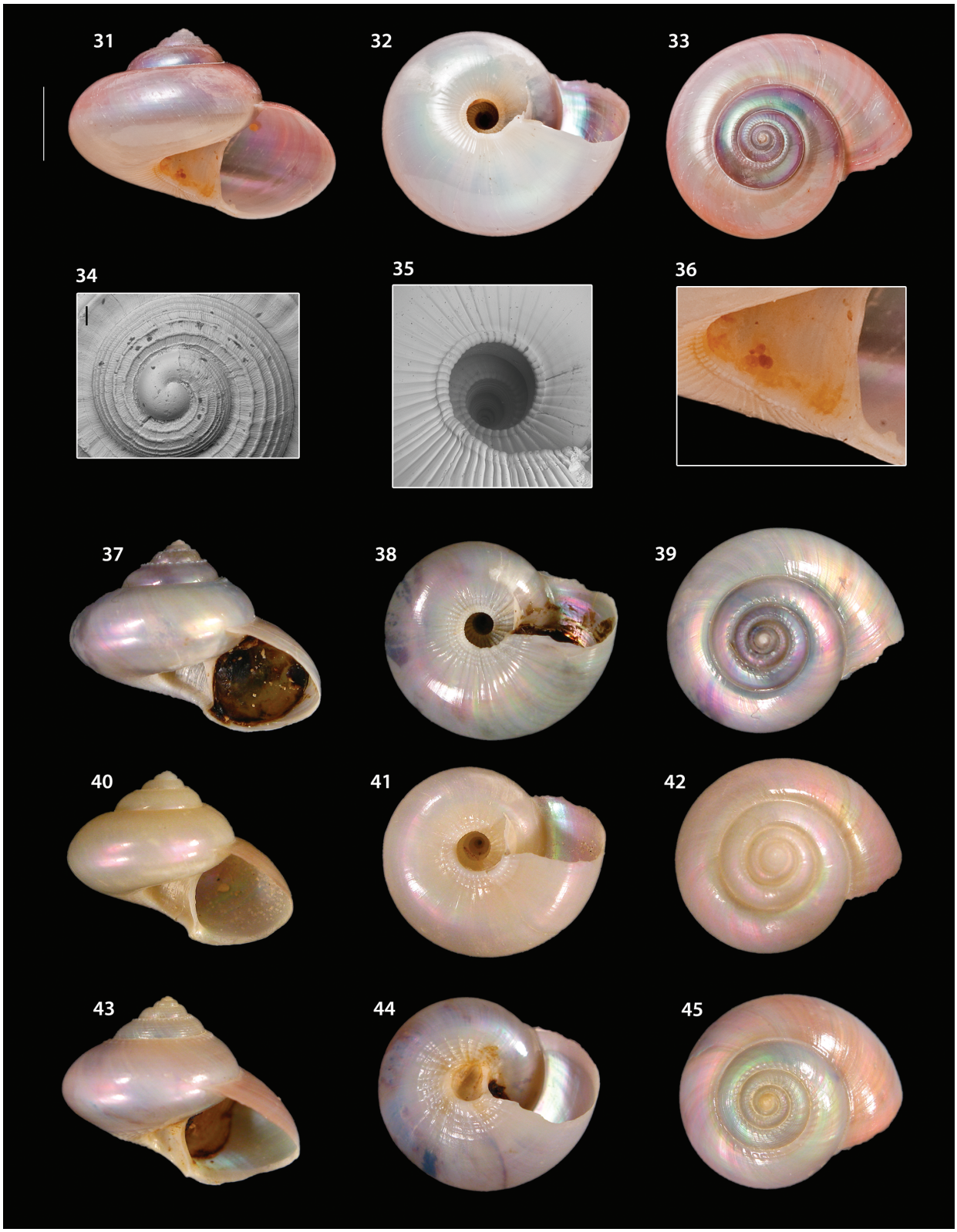
Figures 31-42; Table 4

TYPE MATERIAL — Holotype MNHN IM-2009-8861, 3 paratypes MNHN IM-2000-26541, 1 NHMUK 20120020, 1CV (as listed below).

TYPE LOCALITY — Loyalty Ridge, 23°48'S, 169°46'E, 660-710 m [TERRASSES: stn DW3045].

MATERIAL EXAMINED — **Coral Sea**. Lansdowne Bamk. EBISCO: stn CP2615, 19°35'S, 158°48'E, 680-722 m, 5 lv, 3 paratypes MNHN IM-2000-26541 (Figures 37-39), 1 paratype NHMUK 20120020, 1 paratype CV. – Stn CP2623, 20°06'S, 160°19'E, 691-886 m, 3 lv, 1 lv sub. **Loyalty Ridge**. TERRASSES: stn DW3036, 22°41'S, 168°58'E, 800 m, 1 lv. – Stn DW3041, 23°59'S, 169°44'E, 800-840 m, 1 lv. – Stn DW3045, 23°48'S, 169°46'E, 660-710 m, 1 lv, holotype MNHN IM-2009-8861 (Figures 31-36). **French Polynesia**. Austral Islands, East of Rapa. BENTHAUS: stn DW1890, 27°39'S, 144°16'W, 800-822 m, 1 dd. **Solomon Islands**. SALOMON 1: stn CP1836, 10°10'S, 161°22'E, 439-486 m, 1 dd.

DISTRIBUTION — Coral Sea, 691-722 m; Loyalty Ridge, 710-800 m; French Polynesia (one empty shell); Solomon Islands (one empty shell).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DIAGNOSIS — Spire moderately elevated, very large last whorl with rounded periphery, smooth spiral cords on two early whorls, subsequent whorls smooth except for single, granular subsutural cord that disappears on last whorl, base convex, umbilicus narrow, surrounded by strong granular cord producing angulate rim.

TABLE 4

Elaphriella paulinae n. sp. Type specimen measurements (in mm).

	TW	H	W	HA	H/W	H/HA	H/TW
holotype	5.4	12.5	17.0	7.1	0.74	1.76	2.31
paratype 1	5.6	12.2	16.0	6.2	0.76	1.97	2.18
paratype 2	5.4	10.6	14.0	6.0	0.76	1.77	1.96
paratype 3	5.4	10.1	13.3	5.5	0.76	1.84	1.87
paratype 4	5.7	11.8	15.9	6.2	0.74	1.90	2.07
paratype 5	5.4	12.5	17.0	7.1	0.74	1.76	2.31

DESCRIPTION — Shell of medium size for genus (H up to 12.5 mm, W to 17.0 mm), wider than high, shape conical, thin-shelled, highly polished; spire moderately elevated, height 0.7-0.8x width, 1.8-2.0x aperture height; periphery rounded; umbilicus deep, subcentral and rather wide. Protoconch *ca.* 350 µm wide, 1.25 whorls, rounded, somewhat translucent, with tiny, crisp granules, up to two very thin spiral threads and very thin, straight terminal lip. Teleoconch of up to 5.7 convex whorls with horizontal subsutural ramp with angulate rim slightly overhanging suture and bearing strong, granular spiral cord, except on last whorl; strong axial threads on subsutural area except on last whorl. Suture visible but not canaliculated.

First whorl convex, sculptured with eight smooth spiral cords appearing immediately, P1 weak, subsequent three adapical cords stronger than other cords; distance between cords decreasing abapically; strong, equally spaced axial threads between cords; P2 at edge of rim of subsutural ramp. On second whorl, P1 disappearing, P2 and P3 stronger; P2 reaching rim of ramp; smooth, very thin secondary cords S4, S5 and S6 appearing at end of whorl; S2 and S3 visible on some specimens, very weak when present; axial threads becoming weaker, disappearing towards end of second whorl. On third whorl, strong axial folds appearing in subsutural area; P2 much stronger than other cords; adapical cords subgranular at intersections with axial folds; abapical cords still visible, but weakening. On fourth whorl, P2 much stronger, with strong, large nodules; all other cords vanishing, the abapical cords first, leaving P2 as single spiral cord. On last whorls, subsutural ramp and subsutural axial folds disappearing. Past mid fifth whorl, P2 rapidly becoming thinner and smoother, diminishing to thin, smooth subsutural cord or completely disappearing.

Aperture roundly triangular; peristome incomplete; outer and inner lip thin; outer lip meeting inner lip at thickened base of columella with short, hollowed channel. Base convex, outer half smooth, inner half with *ca.* 40-50 flat axial pleats around umbilicus, pleats near end of last whorl half as thick as earlier ones; one strong, thick, granular spiral cord at rim of umbilicus, surrounded by one to three weaker, granular spiral cords. Umbilicus fairly broad (diameter *ca.* 15-19% of

FIGURES 31-45

31-42, *Elaphriella paulinae* n. sp. **31-36**, holotype MNHN IM-2009-8861, Loyalty Ridge, TERRASSES stn DW3045, 660-710 m; **31-33**, shell, apertural, basal and apical views (H 12.5, W 17.0 mm); **34**, detail of protoconch; **35**, detail of umbilical area; **36**, detail of lower columella; **37-39**, paratype MNHN IM-2000-26541, apertural, basal and apical views (H 11.8, W 15.9 mm), Coral Sea, South of Lansdowne, EBISCO stn CP2615, 680-722 m; **40-42**, shell, apertural, basal and apical views (H 10.2, W 13.4 mm), French Polynesia, Austral Islands, East of Rapa, BENTHAUS stn DW1890, 800-822 m (MNHN). **43-45**, *Archiminolia diadema* Marshall, 1999, apertural, basal and apical views (H 11.2, W 14.3 mm), Northern New Caledonia, BATHUS 4 stn CP913, 777-820 m (MNHN). Scale bars = 5 mm, except **34** scale = 100 µm.

shell width), subcentral, with angulate rim; weakly concave, thin, often translucent wall with very thin axial threads and thin spiral threads. Teleoconch nacreous white in colour, with thin, prosocline greyish-blue threads; first teleoconch whorls sometimes almost completely greyish-blue or pink (holotype); innermost spiral cord around umbilicus white; protoconch translucent off-white.

REMARKS — *Elaphriella paulinae* n. sp. is fairly similar to *Archiminolia diadema* Marshall, 1999 (Figures 43-45) from New Zealand and New Caledonia, but this similarly sized species has fewer axial pleats (*ca.* 20, vs. up to 50) around the umbilical area, an umbilicus covered in adults by a thin, translucent septum, a protoconch with four to five thin spiral threads (vs. up to two threads), a subsutural granular spiral cord present almost to the beginning of the last whorl and a subcircular aperture without basal channel at junction of inner and outer lip.

ETYMOLOGY — In honour of the second author's mother, Pauline Williams.

Elaphriella wareni n. sp.

Figures 46-57, Table 5

TYPE MATERIAL — Holotype MNHN IM-2009-13009 4 paratypes MNHN IM-2000-26543, IM-2009-13008, 2 NHMUK 20120021, 1 CV (as listed below).

TYPE LOCALITY — Solomon Islands, 07°31'S, 156°18'E, 782-884 m [SALOMON 2: stn CP2249].

MATERIAL EXAMINED — **Fiji**. MUSORSTOM 10: stn CP1342, 16°46'S, 177°40'E, 650-701 m, 2 lv, 16 dd, 1 sub lv (1 lv, 2 dd paratypes MNHN IM-2000-26543 (Figures 52-57), 1 lv, 1 dd paratypes NHMUK 20120021, 1 dd paratype CV). **Wallis and Futuna Islands**. MUSORSTOM 7: stn CP550, Combe Bank, 12°15'S, 177°28'W, 800-810 m, 2 dd. **Solomon Islands**. SALOMON 2: stn CP2249, 07°31'S, 156°18'E, 782884 m, 3 lv, holotype MNHN IM-2009-13009 (Figures 46-51), 1 paratype MNHN IM-2009-13008. – Stn CP2250, 07°29'S, 156°17'E, 845-970 m, 2 lv. **Vanuatu**. BOA 1: stn CP2466, 16°44'S, 167°59'E, 786-800 m, 2 lv. **Coral Sea**. EBISCO: stn CP2651, SE Fairway Reef, 21°29'S, 162°36'E, 883-957 m, 1 lv.

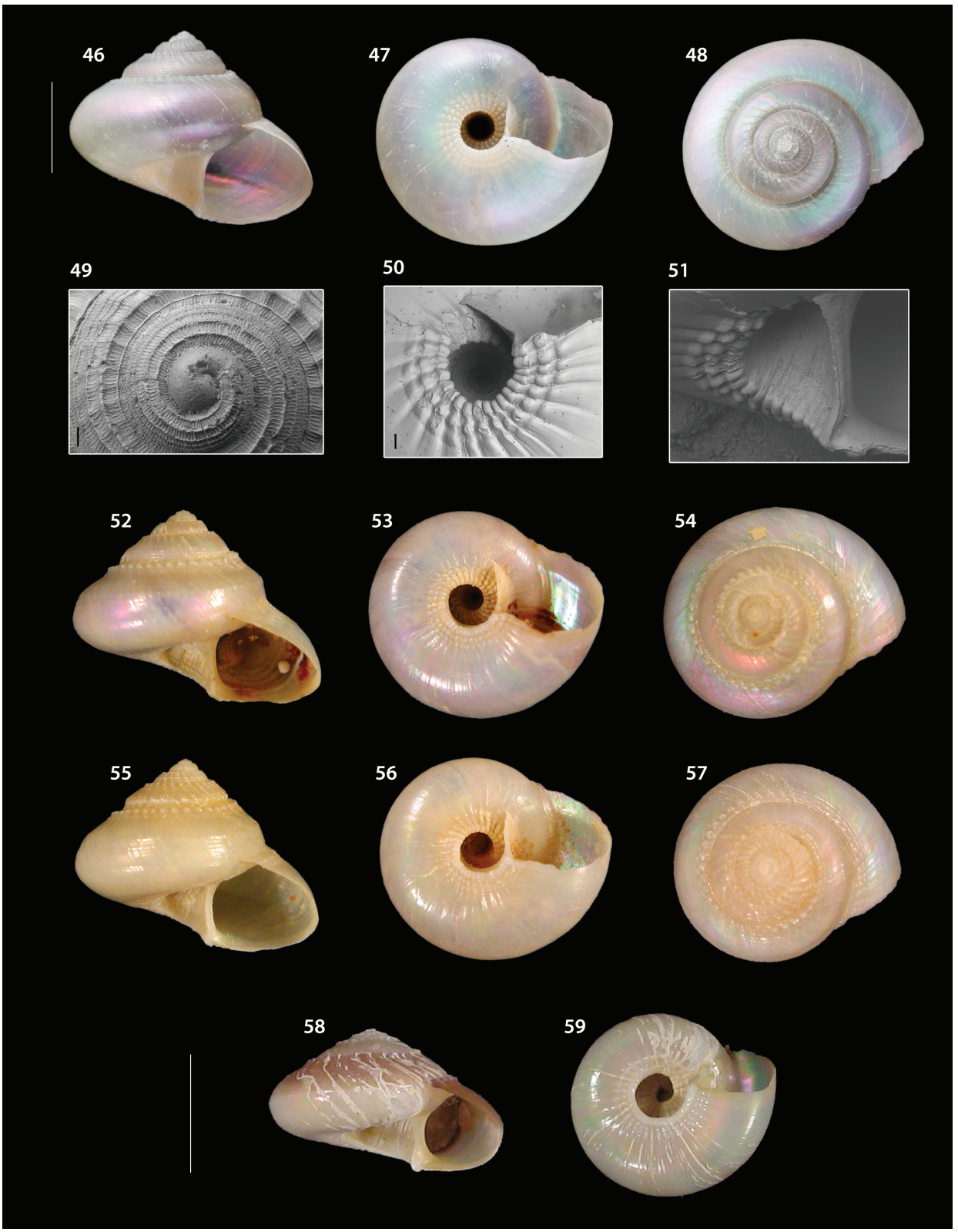
DISTRIBUTION — Fiji; Wallis and Futuna Islands (two empty shells); Solomon Islands, collected alive in 845-884 m; Vanuatu; New Caledonia.

DIAGNOSIS — Shell shape weakly cyrtoconoid, spire rather elevated, early whorls with horizontal subsutural ramp and strong prosocline folds, last whorl with weak angulation, umbilicus moderately broad, surrounded by strong axial pleats and three strongly granular spiral cords.

DESCRIPTION — Shell of medium size for genus (H up to 9.9 mm, W to 13.5 mm), wider than high, shape weakly cyrtoconoid, thin-shelled, highly polished when in good condition, most dull; spire rather elevated, height 0.7-0.8x width, 2.1-2.6x aperture height; periphery rounded; umbilicus deep, rather wide. Protoconch *ca.* 400-450 µm wide, 1.25 whorls,

FIGURES 46-59

46-57, *Elaphriella wareni* n. sp. **46-51**, holotype MNHN IM-2009-13009, Solomon Islands, SALOMON 2 stn CP2249, 782-884 m; **46-48**, shell, apertural, basal and apical views (H 9.4, W 12.0 mm); **49**, detail of protoconch; **50**, detail of umbilical area; **51**, detail of lower columella; **52-57**, paratypes MNHN IM-2000-26543, Fiji, MUSORSTOM 10 stn CP1342, 650-701 m; **52-54**, shell, apertural, basal and apical views (H 8.8, W 11.3 mm); **55-57**, shell, apertural, basal and apical views (H 8.3, W 10.6 mm). **58-59,** *Microgaza corona* Lee & Wu, 2001, apertural and basal views (H 5.4, W 8.6 mm), Indonesia, Tanimbar Islands, KARUBAR stn DW28, 443-468 m (MNHN). Scale bars = 5 mm, except **49**, scale = 100 µm, and **50**, scale = 200 µm.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rounded, with very thin, irregular indistinct terminal lip. Teleoconch of up to 5.3 convex whorls with horizontal subsutural ramp with angulate rim except on last whorl, suprasutural angulation on intermediate whorls and submedian angulation on last whorl, subsutural area with strong axial folds; whorls with *ca.* six unequally spaced spiral cords of dissimilar size; last whorl with strongly granular adapical cords often terminating before end of shell, and with smooth abapical cords. Suture canaliculated.

First whorl convex, sculptured with seven spiral cords appearing immediately; cords more or less equally spaced, P1 close to suture, P7 sometimes partly covered by suture; P2 at rim of subsutural ramp; cords granular at intersection with numerous axial, weakly prosocline threads. On second whorl, P1 weaker (Solomon Islands) or vanishing by mid whorl (Fiji); P2 slightly stronger than other cords; axial threads stronger. On third whorl, axial threads becoming thick, equally spaced prosocline folds across entire whorl; cords granular at intersection with axial folds; P2 slightly stronger, almost nodular; some secondary cords (at least S2) appearing at end of whorl. On fourth whorl, P2 much stronger, with strong, large nodules; P3 and P4 weakening; axial folds becoming obsolete abapically, producing smooth P5, P6 and P7; P5 forming weak keel; all cords but P2 and S2 almost vanishing at end of whorl. On last whorl, P2 and S2 nodular, nodules diminishing and cords becoming nearly smooth by end of whorl; P6 and P7 very weak, disappearing on some specimens; P5 producing weak median angulation, disappearing near end of whorl; subsutural ramp becoming smooth subsutural cord.

Aperture roundly triangular; peristome incomplete; outer lip thin; inner lip thin at rim, slightly thickened inside; inner lip with strong, basal thickening at umbilical rim. Base moderately convex, smooth except for inner third with *ca.* 30-35 axial pleats and three thick, strongly granular spiral cords around umbilicus; cord at rim twice as thick as other cords. Umbilicus rather broad (diameter *ca.* 15-20% of shell width), with angulate rim; wall convex with thin axial threads and no spiral cords; granular spiral cords similar to cords at rim visible in perspective to apex. First teleoconch whorls pinkish-white in colour; last whorls nacreous white to pink, occasionally green; protoconch off white; surface of shell often complexly etched imparting dull appearance.

	TW	H	W	HA	H/W	H/HA	H/TW
Holotype	5.2	9.4	12.0	4.0	0.78	2.35	1.81
paratype 1	5.3	9.9	13.5	4.0	0.73	2.48	1.87
paratype 2	5.2	8.8	11.3	3.8	0.78	2.32	1.69
paratype 3	5.2	8.3	10.6	3.2	0.78	2.59	1.60
paratype 4	5.1	8.7	11.8	3.8	0.74	2.29	1.71
paratype 5	5.2	8.4	11.0	4.0	0.76	2.10	1.62
paratype 6	5.0	8.0	10.8	3.3	0.74	2.42	1.60
paratype 7	4.8	7.6	10.3	3.5	0.74	2.17	1.58

TABLE 5

Elaphriella wareni n. sp. Type specimen measurements (in mm).

REMARKS — *Elaphriella wareni* n. sp. may be compared with *Archiminolia diplax* Marshall, 1999 from northern New Zealand with respect to the sculpture and subsutural ramp, but the latter species has a larger protoconch (600 µm compared to 400-450 µm), a median angulation that continues to the end of the last whorl producing a characteristically angulate aperture, and the umbilicus is surrounded by two low, rounded spiral cords (rather than three strong, granular spiral cords in the new species).

Microgaza corona Lee & Wu, 2001 (Figures 58-59) from Taiwan and northeastern Indonesia is similar to the new species (particularly juveniles) from a basal point of view, but the former species has a more depressed spire, lacks the submedian carina and has a nodular, persistent, strictly subsutural spiral cord that is not separated from the suture by a smooth spiral cord. This species could belong to the new genus *Elaphriella*.

ETYMOLOGY — In honour of Anders Warén (Swedish Museum of Natural History), in recognition both of his expertise and long-term interest in solariellids and his involvement in recent MNHN expeditions.

Elaphriella dikhonikhe n. sp.

Figures 60-68, Table 6

TYPE MATERIAL — Holotype MNHN IM-2007-18507, 3 paratypes MNHN IM-2000-26546-26547, 2 NHMUK 20120022, 20120023, 1 CV Vilvens (as listed below).

TYPE LOCALITY — Solomon Islands, 09°32'S, 160°37'E, 309-328 m [SALOMON 1: stn CP1804].

MATERIAL EXAMINED — Solomon Islands. SALOMON 1: stn CP1804, 09°32'S, 160°37'E, 309-328 m, 3 lv, holotype MNHN IM-2007-18507 (Figures 60-65), 1 sub dd, 1 juv dd. – Stn DW1837, 10°13'S, 161°29'E, 381-383 m, 5 dd, 5 lv sub, 3 lv juv. – SALOMON 2: stn DW2164, 8°57'S, 159°09'E, 391-396 m, 1 dd. – Stn CP2192, 08°24'S, 159°29'E, 335-432 m, 1 dd. – Stn CP2193, 08°24'S, 159°27'E, 362-432 m, 11 dd. – SALOMONBOA 3: stn CP2832, 10°45'S, 162°20'E, 410-430 m, 6 dd, 2 paratypes MNHN IM-2000-26546, 1 paratype NHMUK 20120023, 1 paratype CV. – Stn CP2837, 10°26'S, 161°22'E, 381-422 m, 2 lv, 1 paratype MNHN IM-2000-26547 (Figures 66-68), 1 paratype NHMUK 20120022.

DISTRIBUTION — Solomon Islands, 328-410 m, collected alive in 328-381 m.

DIAGNOSIS — Shell shape conical, spire moderately elevated, last whorl smooth, bicarinate, with strongly granular, subsutural spiral cord, umbilicus rather wide surrounded by strong axial pleats and three strongly granular spiral cords.

DESCRIPTION — Shell small for genus (H up to 5.9 mm, W to 8.4 mm), wider than high, shape conical to slightly cyrtoconoid, thin-shelled, polished; spire moderately depressed, height *ca.* 0.7x width, 2.3-3.2x aperture height; periphery subangular; umbilicus deep. Protoconch *ca.* 300-350 µm wide, 1.25 whorls, rounded, with tiny, crisp granules; three thin, smooth, unequally spaced spiral lines and more or less straight terminal lip. Teleoconch of up to 5.9 weakly convex whorls; thin axial threads on two early whorls; early whorls with five spiral cords, subsequent whorls with two adapical and abapical spiral cords, last whorl smooth except subsutural, strongly granular cord and bicarinate periphery. Suture slightly canaliculated.

First whorl convex, sculptured with five spiral cords appearing immediately, P2 at rim of subsutural ramp, stronger than other cords, rapidly becoming strongly nodular; P1 vanishing after mid whorl; cords unequally spaced, distance between P1, P2 and P3 much greater; P5 and P4 vanishing at end of whorl; axial, closely spaced, weakly prosocline threads between cords; axial, prosocline folds appearing at end of whorl, distance between folds *ca.* three times thickness of folds. Second whorl weakly convex, with only P2 and P3 remaining, both strongly nodular; P2 and P3 advancing toward adapical and abapical sutures, respectively; axial threads and folds weakening. On third whorl, P2 subsutural, stronger than suprasutural P3, both nodular; nodules of P3 horizontally elongated; axial sculpture obsolete. On fourth whorl, P3 disappearing, leaving weak but distinct peripheral keel on last whorl; whorls nearly smooth, except P2 persisting until end of whorl; on last whorl, one to three weak, very low, smooth spiral cords between keel and periphery.

Aperture subtriangular; peristome incomplete; outer lip rather thin, curved, with rounded base joining outer lip at rounded angle and inner lip at almost right angle; inner lip thin. Columella weakly arcuate, vertical, with small flange at base. Base weakly convex, smooth except for inner third with *ca.* 18-25 axial pleats and three granular, spiral cords around umbilicus; innermost cord at umbilicus rim stronger, twice as thick as other cords. Umbilicus moderately broad (diameter 14-20% of shell width), with angulate rim; wall weakly concave, with very thin axial threads and no spiral cords; granular spiral cords similar to cords at rim visible in perspective to apex. Teleoconch nacreous pink in colour, with thin, light brownish flammules; base white; protoconch nacreous pink. Operculum brown, corneous, circular, multispiral, with short growing edge.

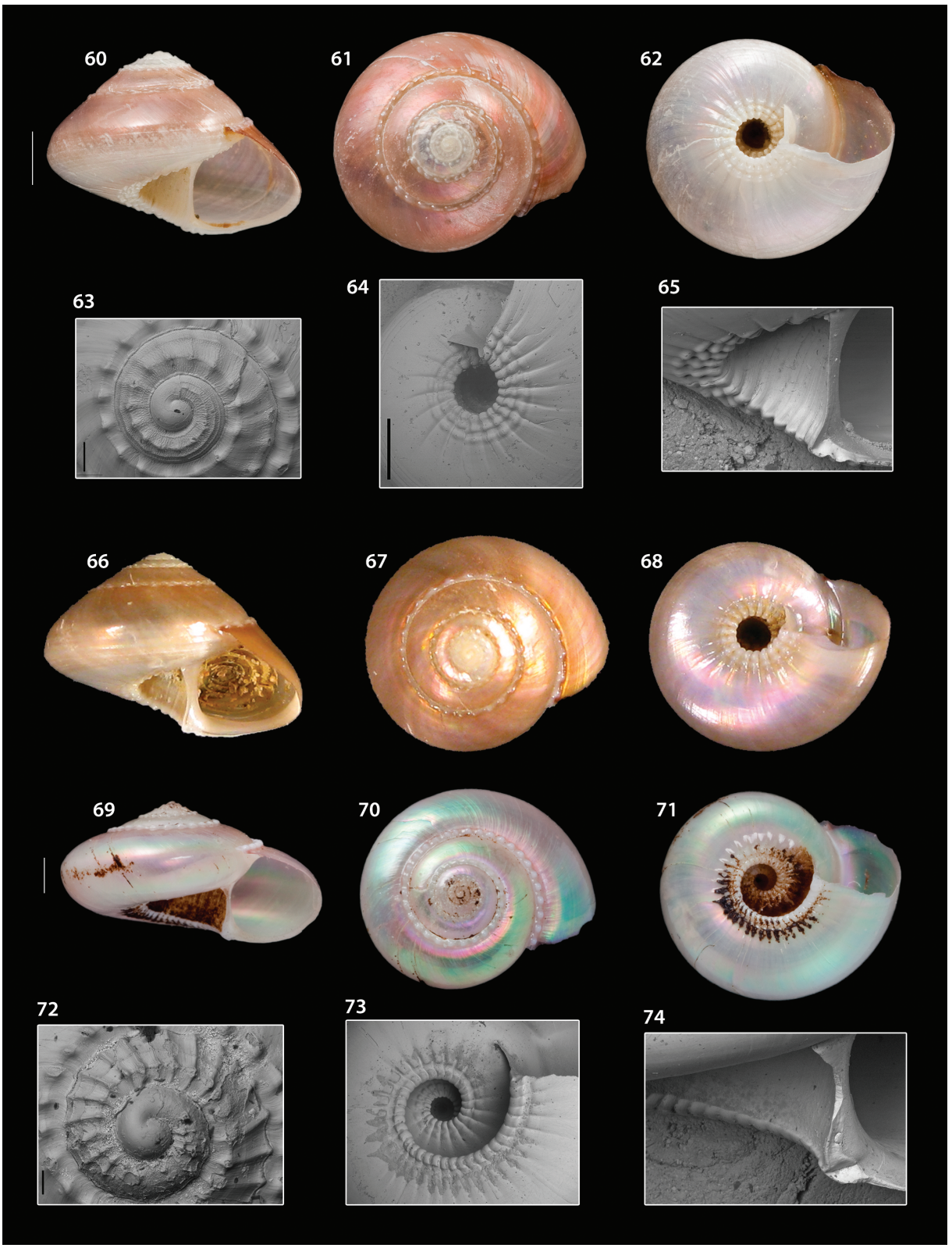
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TABLE 6

Elaphriella dikhonikhe n. sp.
Type specimen measurements (in mm).

	TW	H	W	HA	H/W	H/HA	H/TW
holotype	4.6	4.4	6.0	1.9	0.73	2.32	0.96
paratype 1	4.6	4.6	6.6	1.8	0.70	2.56	1.00
paratype 2	4.8	4.6	6.9	1.8	0.67	2.56	0.96
paratype 3	5.0	5.7	8.4	2.4	0.68	2.38	1.14
paratype 4	4.9	5.7	8.3	1.8	0.69	3.17	1.16
paratype 5	4.8	5.9	7.9	2.6	0.75	2.27	1.23
paratype 6	4.8	5.2	7.3	1.7	0.71	3.06	1.08

REMARKS — *Elaphriella dikhonikhe* n. sp. is rather similar to *Microgaza corona* Lee & Wu, 2001 (Figures 58-59) from Taiwan and northeastern Indonesia, but this similarly sized species has a more depressed spire, a rounded, rather than slightly bicarinate, periphery and only two spiral cords around the umbilicus.

ETYMOLOGY — Greek χωνιχοζ, η, ον, and δι, used as a prefix, biconical, adjective, used in agreement with a feminine noun, in reference to the shape of the shell.

Elaphriella helios n. sp.

Figures 69-74

TYPE MATERIAL — Holotype MNHN IM-2007-18426 (Figures 69-71).

TYPE LOCALITY — Philippines, Bohol Sea, off Balicasag Island, 9°33'N, 123°41'E, 713-731 m.

MATERIAL EXAMINED — Known only from the type material.

DISTRIBUTION — Philippines, Bohol Sea, off Balicasag Island.

DIAGNOSIS — Spire depressed, last whorls smooth with strongly nodular subsutural spiral cord, umbilicus very broad, surrounded by strong axial pleats, spiral groove and strong, granular spiral cords.

DESCRIPTION — Shell (holotype) small for genus (H up to 5.1 mm, W to 8.9 mm), wider than high, spire conical with large, rounded last whorl (aperture damaged in only available specimen), thin-shelled, polished; spire depressed, height less than 0.6x width, 1.9x aperture height; periphery rounded; umbilicus broad, deep. Protoconch *ca.* 300 µm wide, 1.25 whorls, rounded, partly damaged but apparently nearly smooth; terminal lip slightly curved, without varix. Teleoconch of 4.4 weakly convex whorls; strong axial ribs on two early whorls; early whorls with three spiral cords, subsequent whorls smooth except subsutural, strongly nodular cord. Suture canaliculated on two early whorls, not canaliculated but visible on subsequent whorls.

FIGURES 60-74

60-68. *Elaphriella dikhonikhe* n. sp. **60-65**, holotype MNHN IM-2007-18507, SALOMON 1 stn CP1804, 309-328 m; **60-62**, shell, apertural, apical and basal views (H 4.4, W 6.0 mm); **63**, details of protoconch and first whorl; **64**, detail of umbilical area; **65**, detail of lower columella; **66-68**, paratype MNHN IM-2000-26547, apertural, apical and basal views (H 4.6, W 6.6 mm), SALOMONBOA 3 stn CP2837, 381422 m. **69-74**, *Elaphriella helios* n. sp., holotype MNHN IM-2007-18426, Philippines, Bohol Sea, off Balicasag Island, 713-731 m; **69-71**, shell, apertural, apical and basal views (H 5.1, W 8.9 mm); **72**, details of protoconch and first whorl; **73**, detail of umbilical area; **74**, detail of lower columella. Scale bars = 1 mm, except **63**, and **72**, scale = 100 µm.

First whorl convex, sculptured with three spiral cords appearing almost immediately; P1 at rim of subsutural ramp, rapidly becoming much stronger than other cords; strong axial, widely spaced, more or less orthocline ribs, producing beads at intersection with spiral cords; distance between ribs *ca.* three to four times thickness of ribs; numerous thin axial threads between ribs; P3 advancing toward abapical suture at end of whorl. On second whorl, P1 much stronger, beads becoming strong nodules; P2 vanishing first, P3 reduced to thin suprasutural cord connecting strong beads; axial ribs disappearing after mid whorl; P3 vanishing at end of whorl. On third whorl, subsutural ramp weakening, P1 subsutural with strong nodules; remainder of surface smooth. On last whorls, P1 nodules thicker, horizontally elongated; weak groove below P1.

Aperture subcircular; outer lip thin. Columella very weakly arcuate, vertical, with small flange at base. Base convex, smooth except for inner third with single, strong granular cord at rim of umbilicus, spiral groove outside cord, almost as wide as cord, bordered by *ca.* 30 axial pleats. Umbilicus rather broad (diameter 18% of shell width), with angulate rim; wall almost vertical, with very thin axial threads and no spiral cords; spiral cord, groove and pleats visible in perspective to apex. Teleoconch nacreous pinkish-white in colour, subsutural spiral cord lighter; protoconch nacreous pink. Operculum brown, corneous, circular, multispiral, with short growing edge.

REMARKS — *Elaphriella helios* n. sp. has somewhat peculiar features, comparable only with those of *Microgaza corona* Lee & Wu, 2001 (Figures 58-59) from Taiwan and northeastern Indonesia, but this similarly sized species has a much more globose-conic shape, a weak keel on the last whorl and a narrower umbilicus.

ETYMOLOGY — Greek ηλιοζ, *helios*, sun, used as a noun in apposition, in reference to the axial pleats around the umbilicus visible in basal view, reminiscent of rays of sunlight.

Elaphriella leia n. sp.

Figures 75-83, Table 7

TYPE MATERIAL — Holotype (lv) MNHN IM-2007-18539 (Figures 75-80), 1 (lv) paratype MNHN IM-2009-43075 (Figures 81-83).

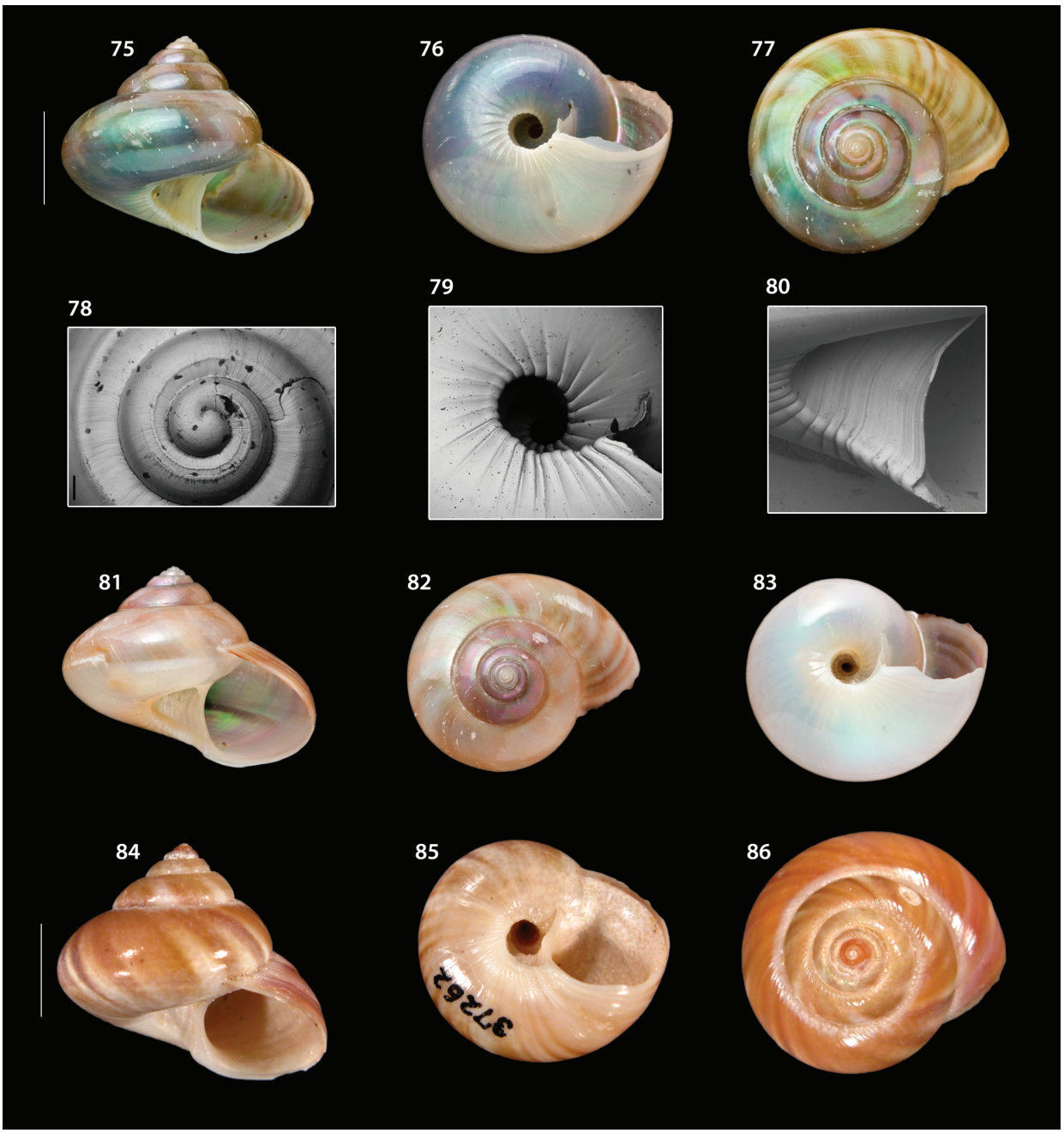
TYPE LOCALITY — Solomon Islands, Vella Gulf, 8°04'S, 156°55'E, 396-423 m [SALOMON 2: stn DW2259].

MATERIAL EXAMINED — Known only from the type material.

DISTRIBUTION — Solomon Islands, Vella Gulf.

DIAGNOSIS — Shell shape conical, spire rather elevated, whorls smooth, convex, suture canaliculated except on last whorl, umbilicus moderately broad surrounded by axial pleats.

DESCRIPTION — Shell of moderate size for genus (H to 11.4 mm, W to 13.6 mm), wider than high, shape conical, thin-shelled, highly polished; spire elevated, height *ca.* 0.8x width, 2.3-2.6x aperture height; periphery rounded; umbilicus deep. Protoconch *ca.* 320 µm wide, 1.25 whorls, rounded, worn in all samples but apparently with two thin, smooth widely spaced spiral lines; terminal lip straight, without varix. Teleoconch of up to 5.8 convex whorls; first whorl with five spiral cords, all disappearing rapidly except subsutural cord; thin, indistinct axial threads on two early whorls; subsequent whorls smooth. Suture canaliculated except on last whorl.



FIGURES 75-86

75-83. *Elaphriella leia* n. sp., Solomon Islands, SALOMON 2 stn DW2259, 396-423 m; **75-80**, holotype MNHN IM-2007-18539; **75-77**, shell, apertural, basal and apical views (H 11.4, W 13.6 mm); **78**, details of protoconch and first whorl; **79**, detail of umbilical area; **80**, detail of lower columella; **81-83**, paratype MNHN IM-2009-43075, apertural, apical and basal views (H 9.6, W 12.4 mm). **84-86**, *Archiminolia katoi* (Kuroda & Habe *in* Habe, 1961), holotype NSMT-Mo 37262, apertural, basal and apical views (H 16.4, W 17.6 mm), Japan, 200-300 m. Scale bars = 5 mm, except **78**, scale = 100 µm.

First whorl convex, suture canaliculated, sculptured with five spiral cords appearing immediately; P2 stronger at beginning of whorl; at mid whorl, P3, P4, P5 disappearing and P1 strongest; P2 vanishing and P1 approaching rim of sutural channel; very thin axial threads across entire surface. On second whorl, P1 low, wide, smooth, only cord remaining. On third, fourth and fifth whorl, P1 wider, then vanishing at end of fifth whorl; axial sculpture lacking. On last whorl, suture simple, non-canaliculated, entire surface smooth.

Aperture subcircular to subelliptic; peristome incomplete; outer lip thin, curved with rounded base forming weak angle at junction with outer lip. Columella weakly arcuate, vertical, with small flange at base. Base convex, smooth except for inner quarter with *ca.* 25 axial pleats around umbilicus. Umbilicus moderately broad (diameter *ca.* 15% of shell width), with angulate rim; wall concave abapically, convex adapically; with very thin axial threads and no spiral cords; axial pleats visible in perspective to apex. Teleoconch beige in colour, with hazel and pinkish flames; base greyish-white; protoconch white; live-collected specimens greenish.

	TW	H	W	HA	H/W	H/HA	H/TW
holotype	5.8	11.4	13.6	4.4	0.84	2.59	1.97
paratype	5.2	9.6	12.4	4.1	0.77	2.34	1.85

TABLE 7
Elaphriella leia n. sp. Type specimen measurements (in mm).

REMARKS — *Elaphriella leia* n. sp. is rather similar to *E. paulinae* n. sp. (Figures 31-42) from New Caledonia and Solomon Islands, but the latter species is slightly taller, has a less elevated spire, a simple, non-canaliculated suture, a much more convex last whorl and more numerous axial pleats around the umbilicus. The new species may also be compared to *Archiminolia katoi* (Kuroda & Habe *in* Habe, 1961) (Figures 84-86) from Japan, but that species is taller, has prosocline threads on the subsutural area and more numerous axial pleats around the umbilicus. The new species also weakly resembles *Archiminolia wanganellica* Marshall, 1999 from Norfolk Ridge, but that species is smaller, has a more stepped spire, a much larger protoconch (*ca.* 470-480 μm) and the first two early whorls bear numerous spiral threads (up to 19).

ETYMOLOGY — Greek λειοζ, α, ον, smooth, adjective, used in agreement with a feminine noun, in reference to the completely smooth upper surface of the last whorl.

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