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Pecten sulcicostatus G.B Sowerby II, 1842, external and internal views of right valve.

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The Pectinoidea (Bivalvia, Propeamussiidae and Pectinidae) of Walters Shoal, with descriptions of six new species

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ABSTRACT
Nine species of Pectinoidea Rafinesque, 1815 (six Propeamussiidae Abbott, 1954, three Pectinidae Rafinesque, 1815) are herein reported from Walters Shoal, south of Madagascar. Six species are described as new to science and are considered endemic to this region, whereas three are well-known species. The new species are: *Parvamussium cancellinum* n. sp., *Parvamussium laetum* n. sp., *Parvamussium pustulatum* n. sp., *Cyclopecten broii* n. sp., *Cyclopecten simardi* n. sp. and *Talochlamys janiqueae* n. sp. The previously known species are: *Propeamussium meridionale* (E. A. Smith, 1885), *Pecten sulcicostatus* G. B. Sowerby II, 1842 and *Cryptopecten bullatus* Dautzenberg & Bavay, 1912. In addition, *Chlamys jousseaumei* Bavay, 1904 is transferred from *Veprichlamys* Iredale, 1929 to *Talochlamys* Iredale, 1929.

KEY WORDS
Mollusca,
Propeamussiidae,
Pectinidae,
Walters Shoal,
new combination,
new species.

RÉSUMÉ
Les Pectinoidea (Bivalvia, Propeamussiidae et Pectinidae) du banc de Walters, avec la description de six nouvelles espèces.
Neuf espèces de Pectinoidea Rafinesque, 1815 (six Propeamussiidae Abbott, 1954, trois Pectinidae Rafinesque, 1815) sont signalées ici du banc Walters Shoal, au sud de Madagascar. Six espèces sont nouvelles pour la science et considérées comme endémiques de cette région, tandis que trois sont déjà bien connues. Les nouvelles espèces sont : *Parvamussium cancellinum* n. sp., *Parvamussium laetum* n. sp., *Parvamussium pustulatum* n. sp., *Cyclopecten broii* n. sp., *Cyclopecten simardi* n. sp. et *Talochlamys janiqueae* n. sp. Les espèces déjà connues sont : *Propeamussium meridionale* (E. A. Smith, 1885), *Pecten sulcicostatus* G. B. Sowerby II, 1842 et *Cryptopecten bullatus* Dautzenberg & Bavay, 1912. En outre, *Chlamys jousseaumei* Bavay, 1904 est transféré de *Veprichlamys* Iredale, 1929 à *Talochlamys* Iredale, 1929.

MOTS CLÉS
Mollusques,
Propeamussiidae,
Pectinidae,
récif de Walters,
combinaison nouvelle,
espèces nouvelles.

INTRODUCTION

Walters Shoal is a remote seamount, discovered in 1962 and situated in international waters about 700 kilometres south of Madagascar. The shoal is culminating at only 30 m below sea level. Seamounts can be seen as biodiversity hotspots, providing critical habitat for a variety of marine species and, owing to their geographic isolation, frequently exhibit high degrees of endemism. In 1964, the first sampling of Walters Shoal was done by the US R/V *Anton Bruun* resulting in the description of some crinoids and crustaceans. In the 1970's and 80's, a few more French and Soviet expeditions operated in the region but all were concentrating mainly on fishes and lobsters. Smaller marine life was still a mystery. In 2017, a French expedition was organised to explore the fauna of the Walters Shoal seamount with main focus on the biodiversity of the smaller and benthic invertebrates.

Walter Shoals remained unexplored until the 2017 expedition and this is the first report of Pectinoidea. In 2015, two of the authors of this study published a paper where 25 Pectinoidea species were treated, describing eight new species from the deep-sea campaigns around northeastern South Africa, Mozambique Channel and northwestern and southern Madagascar. The pectinoid fauna of the shoal comprises a relatively low number of species, but the quantity of specimens is high. Nine Pectinoidea species were sampled of which six are new to science, suggesting a high percentage of endemic species for that region. Two species, viz. *Propeamussium meridionale* (E. A. Smith, 1885), known from bathyal and abyssal depths of the Indo-Pacific (Dijkstra & Marshall 2008: 3), and *Cryptopecten bullatus* (Dautzenberg & Bavay, 1912), also known from the upper bathyal depths of the south-western Indian Ocean (Dijkstra & Kilburn 2001: 309), are well-known and widely distributed throughout the tropical Indo-Pacific.

For a key to the genera of Propeamussiidae in the south-western Indian Ocean see Dijkstra & Maestrati (2015: 586).

MATERIAL AND METHODS

From April 30th to May 15th 2017, a team of the Muséum national d'Histoire naturelle (MNHN) and the French National Research Institute for Sustainable Development (IRD) explored the fauna of the Walters Shoal with the French research vessel "*Marion Dufresne*". The acronym "MD208" designates the ship and its cruise number. Because of the excellent weather conditions for this area, sampling techniques such as brushing and suction were used to collect material, together with the usual methods as diving, trawling and dredging. All new species discovered during the cruise MD208 were collected by trawling or dredging during a total of 44 hauls in deep Walters Shoal water (up to 2000 m of depth). Only three trawl hauls were made below 1500 m (Stns CP4913; CP4914; CP4915), with a depth range between 1539 and 2058 m). No pectinoid material was found during the course of a dozen dives, employing brushing, suction and hand-picking techniques, undertaken on the summit plateau of the seamount, at depths of 30-40 m.

All images were acquired using a digital camera, while high-resolution microstructural details were obtained through scanning electron microscopy (SEM). The SEM images of the prodissoconchs from all newly described species are compiled on Figure 9, located at the end of the paper.

All studied material is deposited in the Muséum national d'Histoire naturelle (MNHN) in Paris, with some voucher specimens at Naturalis Biodiversity Center, Leiden, The Netherlands (per. Henk Dijkstra).

ABBREVIATIONS

Institutions

MNHN	Muséum national d'Histoire naturelle, Paris;
NBC	Naturalis Biodiversity Center, Leiden.

Other

D	shell convexity;
H	hell height (dorsal-ventral);
lv	left valve(s);
MD	R.V. *Marion Dufresne*;
pr	live taken specimen;
rv	right valve(s);
W	shell width (anterior-posterior).

RESULTS

Superfamily PECTINOIDEA Rafinesque, 1815
Family PROPEAMUSSIIDAE Abbott, 1954

Genus *Propeamussium* de Gregorio, 1884

Propeamussium de Gregorio, 1884: 119.

TYPE SPECIES. — *Pecten* (*Propeamussium*) *ceciliae* de Gregorio, 1884 by original designation.

Propeamussium meridionale (E. A. Smith, 1885)
(Fig. 1A-E)

Amussium meridionale E. A. Smith, 1885: 316-317, pl. 24, figs 1, 1a.

Propeamussium meridionale – Dijkstra 1995: 19, figs 15-18, 143-146.

TYPE LOCALITY. — *Challenger* Stn 158, 50°01'S, 123°E, southern Indian Ocean, depth 3292 m.

MATERIAL EXAMINED. — **Walters Shoal** • 1 rv, 1 lv; south plain; 33°52'S, 44°05'E; depth 1539-1615 m; 11.V.2017; Stn CP4913; MNHN-IM-2013-67062 • 2 pr, living, DNA tissue sample, 9 rv, 9 lv; south plain; 33°55'S, 44°03'E; depth 1598-1714 m; 11.V.2017; Stn CP4914; MNHN-IM-2017-3544.

DISTRIBUTION. — A relatively deep-water species, widely distributed in the south-west Pacific, Philippines, Indonesia, New Caledonia, also western Australia and the Indian ocean from the Arabian Sea to South Africa; collected at two neighbouring stations on the surrounding plains of Walters Shoal CP4913 and CP4914, living specimens retrieved at depths between 1598 and 1714 m.

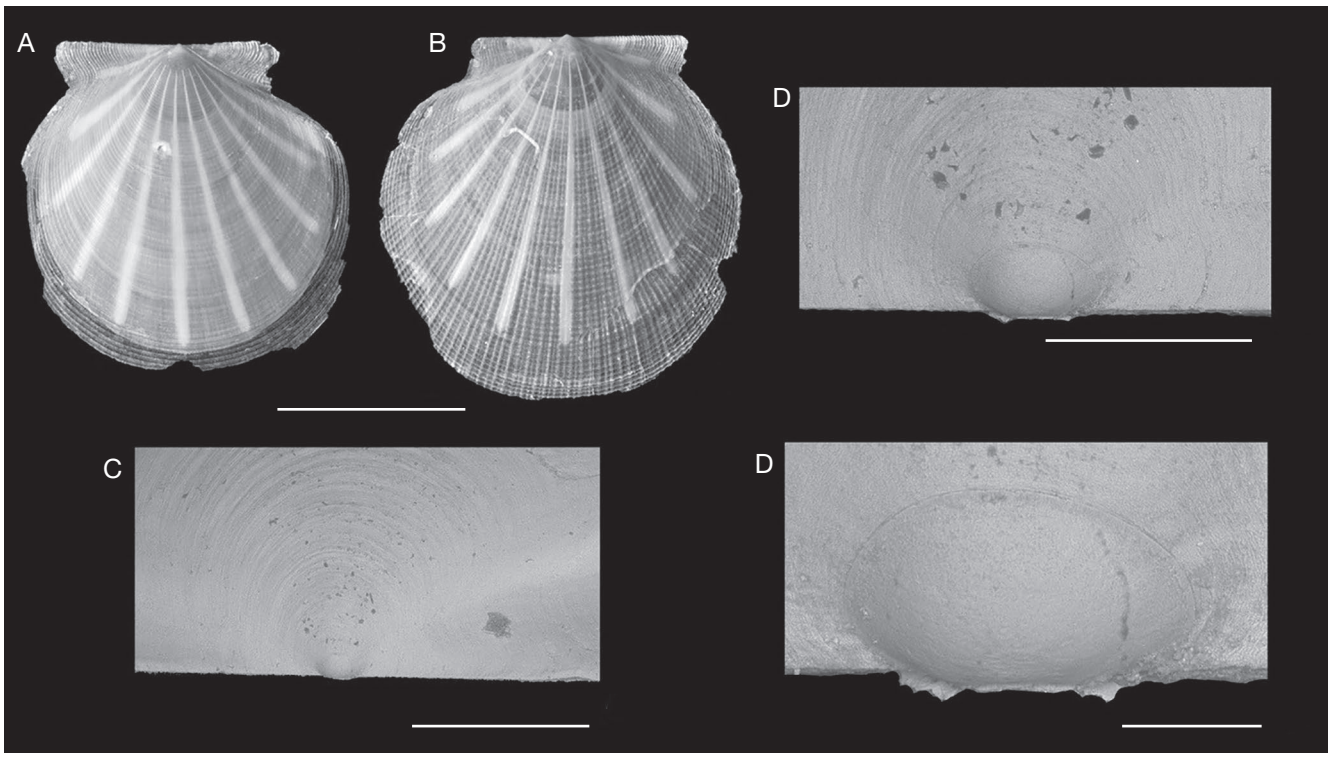

Fig. 1. — *Propeamussium meridionale* (E. A. Smith, 1885), Stn CP4913, depth 1539-1615 m: **A**, external view of right valve; **B**, external view of left valve; **C**-**E**, prodissoconch left valve. Scale bars: A, B, 10 mm; C, 1 mm; D, 400 µm; E, 100 µm.

Remarks

Propeamussium meridionale was found alive at one station (CP4914), at least two paired valves and several disarticulated ones with soft parts still attached to the left valves. In a previous paper (Dijkstra & Maestrati 2015), the authors did not report its occurrence in the Mozambique Channel from the recent campaigns Miriky and Mainbaza, where only four stations out of a total of 168, exceeded 1000 m depth (1000-1400 m).

Genus *Parvamussium* Sacco, 1897

Parvamussium Sacco, 1897: 102.

Type species. — *Pecten* (*Pleuronectes*) *duodecimlamellatus* Bronn, 1832 by original designation.

Note. — For synonymy, diagnosis, distribution and discussion of the genus *Parvamussium* see Dijkstra (1995: 25).

Parvamussium cancellinum n. sp.
(Figs 2; 9C-D)

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Material examined. — **Holotype. Walters Shoal** • 1 lv; slopes; 32°46'S, 44°18'E; depth 964-965 m; 10.V.2017; Stn CP4911; MNHN-IM-2000-34159.
Paratypes. Walters Shoal • 1 lv, 1 rv; same data as for holotype; MNHN-IM-2000-34160.

Other material. — **Walters Shoal – slopes** • 4 lv, 1 rv; 33°32'S, 44°00'E; depth 1000-1052 m; 9.V.2017; Stn CP4905; MNHN-IM-2017-3571 • 8 lv, 6 rv; 33°29'S, 44°00'E; depth 900-950 m; 9.V.2017; Stn CP4908; NBC • 2 rv; 32°45'S, 44°06'E; depth 966-968 m; 10.V.2017; Stn CP4910; MNHN-IM-2017-3570 • >50 lv, >50 rv; 32°46'S, 44°18'E; depth 964-965 m; 10.V.2017; Stn CP4911; MNHN-IM-2018-6314 • 5 lv, 18 rv; 33°49'S, 44°23'E; depth 961-966 m; 10.V.2017; Stn CP4912; MNHN-IM-2018-6315.

Distribution. — Known only from the slopes of Walters Shoal, 32°45'S- 33°49'S, 44°00'E-44°23'E; on soft substrate at 950-1000 m, shells only, no live-taken specimens.

Etymology. — From *cancelli* L – lattice-work; in reference to the small latticed sculpture on the left valve.

Description

Shell up to 6.8 mm in height, circular, semi-transparent to opaque, almost equivalve, rather inflated, left valve slightly more convex than right valve, auricles unequal in shape and size, umbonal angle *c.* 110°, colour whitish.

Left valve with reticulated sculpture, intersecting, closely spaced (10 per mm) commarginal and radial sculpture throughout shell disc, commencing after 1.5 mm shell height and extending to ventral margin, more closely spaced near periphery. Radial riblets and commarginal lamellae of even strength. Auricles with closely spaced commarginal lamellae, finer and more closely arranged on posterior than on anterior. Right valve with regularly arranged commarginal lirae (10 per mm on central part of disc). Anterior auricle, demarcated from shell disc, with closely spaced, coarse commarginal lamellae, more delicate and more close set on posterior. Hinge

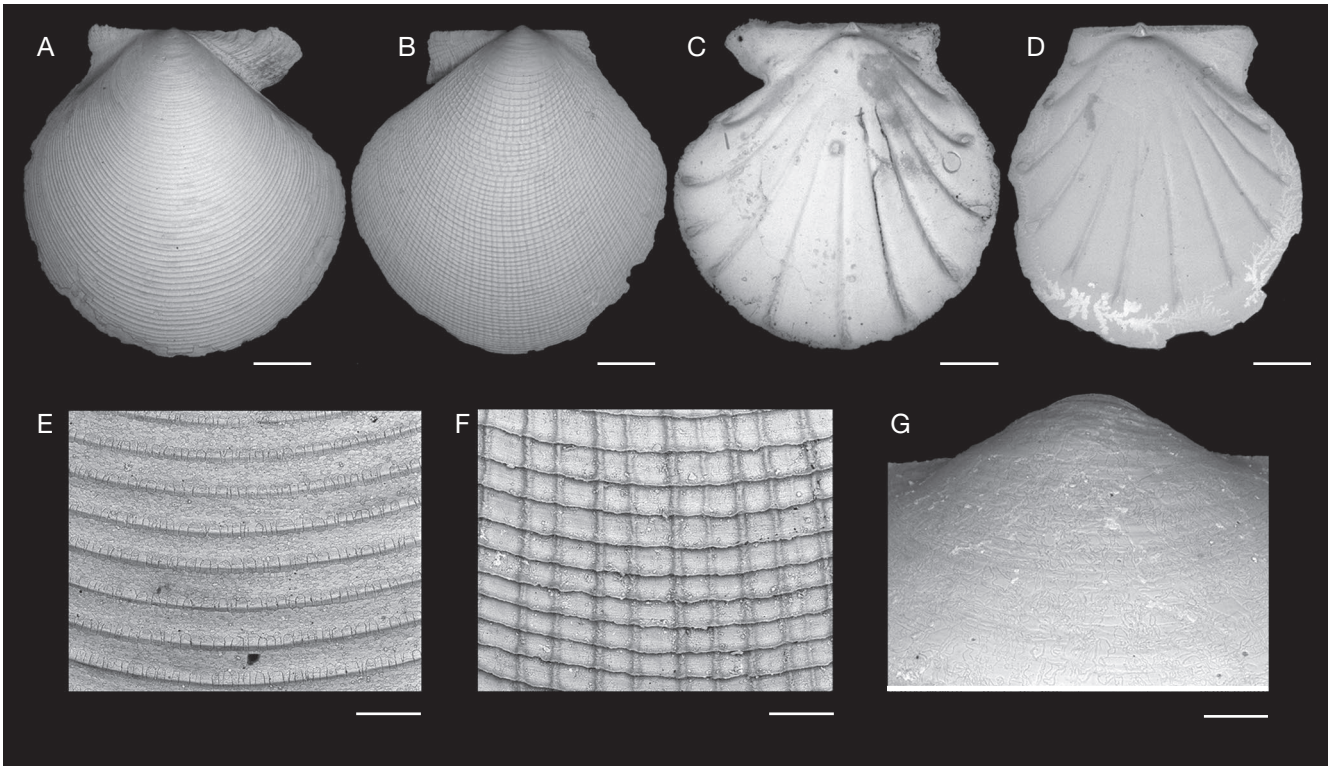

Fig. 2. — *Parvamussium cancellinum* n. sp.: **B**, **F**, **G**, holotype MNHN-IM-2000-34159: **B**, external view of the left valve; **F**, detail of sculpture of the left valve; **G**, prodissoconch area of left valve; **A**, **C**, **D**, **E**, paratype MNHN-IM-2000-34160: **A**, external view of the right valve; **C**, internal view of the right valve; **D**, internal view of the left valve; **E**, detail of external sculpture of the right valve. Scale bars: A-D, 1 mm; E-F, 200 µm; G, 100 µm.

line straight. Byssal notch shallow, byssal fasciole narrow. Interior with 8-10 strongly developed ribs, one interstitial rudimentary in some specimens near the ventral margin, one weak auricular on each side, starting at 1 mm shell height and reaching close to ventral margin.

Prodissoconch (Figs 2G; 9C-D): length 150 µm.

Dimensions: holotype, height 7 mm, width 6.5 mm, convexity 1.1 mm.

Remarks

The most similar congeneric species is *Parvamussium biformatum* Dijkstra & Maestrati, 2008 from bathyal depths (453-542 m) off the Solomon Islands. *Parvamussium cancellinum* n. sp. morphologically differs from *P. biformatum* by having a latticed sculpture throughout on the left valve (*P. biformatum* has more widely spaced commarginal lamellae in early growth stages, and a more delicate reticulate sculpture in late growth stages), and by having more numerous internal riblets that develop earlier (*P. cancellinum* n. sp. 10, *P. biformatum* 8). Another close congener is *Parvamussium retiaculum* Dijkstra, 1995, known from bathyal depths of the south-western Pacific (Dijkstra & Marshall 1997: 81; Dijkstra 2001: 85; Dijkstra & Maestrati 2008: 93, 2012: 392, 2017: 477). However, the present species differs from *P. retiaculum* by having a circular shape (*P. retiaculum* is longer than wide); by having a more closely spaced latticed sculpture on the left valve (*P. retiaculum* has a reticulate sculpture of widely spaced commarginal lamellae and narrowly spaced radial riblets), and by having fewer internal riblets, which start earlier (*P. cancellinum* n. sp. 8-10, *P. retiaculum* 12). A somewhat similar congener with latticed sculptured is *Parvamussium retiolum* Dijkstra, 1995, also known from bathyal depths of the south-western Pacific (Dijkstra 2001: 85; Dijkstra & Marshall 2008: 10; Dijkstra & Maestrati 2008: 93, 2013: 473, 2017: 477). However, the present species is much smaller (*P. cancellinum* up to 7 mm, *P. retiolum* up to 16 mm in height), and has a circular shape (*P. retiolum* is longer than wide and posteriorly oblique).

Parvamussium laetum n. sp.
(Figs 3; 9G-H)

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Material examined. — **Holotype. Walters Shoal** • 1 pr; slopes; 33°16'S, 43°50'E; depth 377-382 m; 2.V.2017; R/V *Marion Dufresne* Stn DW4881; MNHN-IM-2013-67057.
Paratypes. Walters Shoal • 1 lv + 1 rv; slopes; 33°16'S, 43°50'E; depth 377-382 m; 2.V.2017; R/V *Marion Dufresne* Stn DW4881; MNHN-IM-2013-67059 • 1 lv + 1 rv; slopes; 33°16'S, 43°50'E; depth 377-382 m; 2.V.2017; R/V *Marion Dufresne* Stn DW4881; MNHN-IM-2000-34161.

Other material. — **Walters Shoal – Slopes** • 2 lv, 5 rv; 33°10'S, 43°49'E; depth 217-256 m; 1.V.2017; Stn DW4877; MNHN-IM-2017-3555 • 1 pr; 33°09'S, 43°50'E; depth 221-256 m; 1.V.2017; Stn DW4878; MNHN-IM-2017-3551 • 9 lv, 50 rv; 33°16'S, 43°50'E; depth 377-382 m; 2.V.2017; Stn DW4881; MNHN-IM-2017-3548/3557 • >50 pr; 33°14'S, 43°51'E; depth

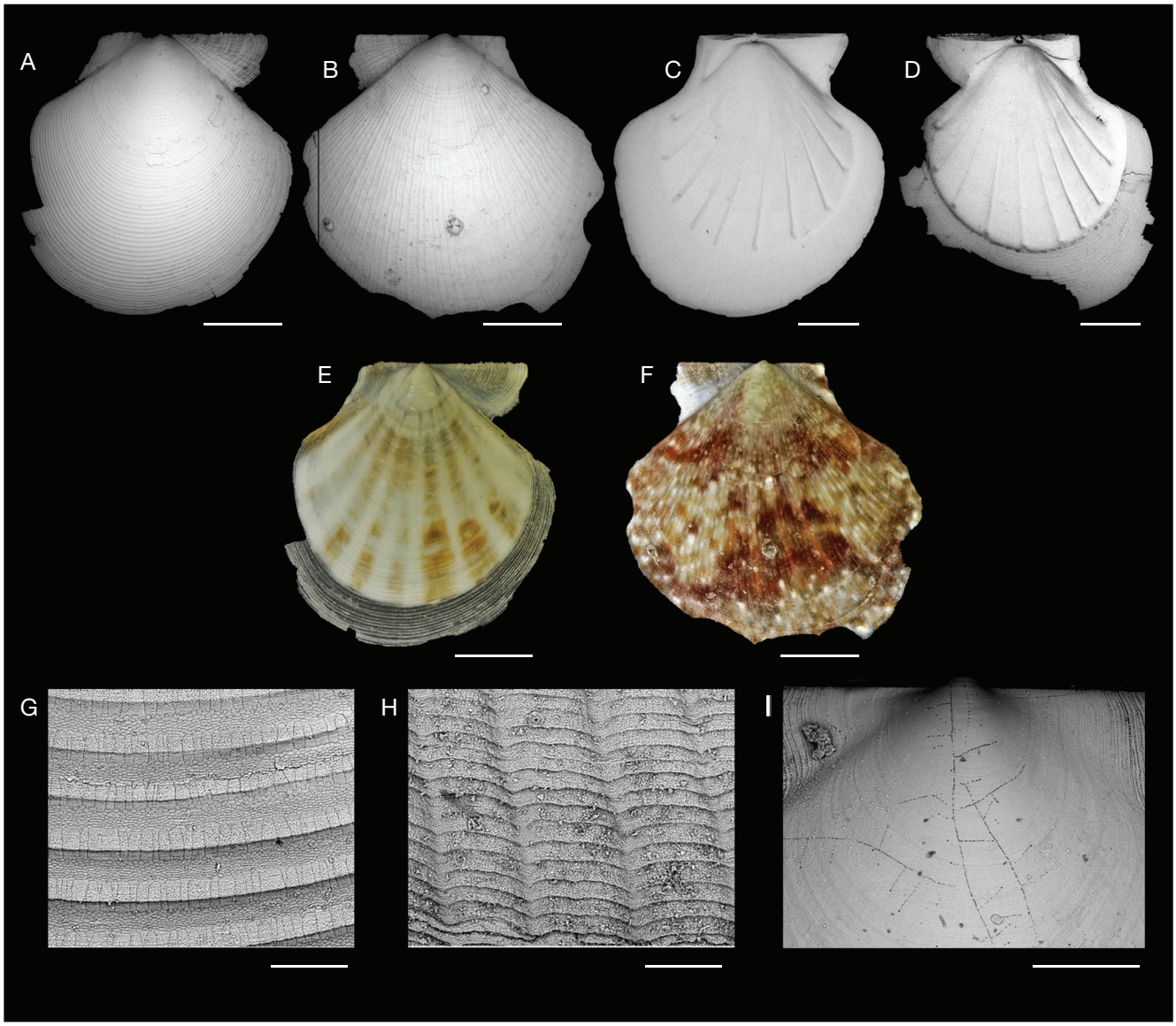

Fig. 3. — *Parvamussium laetum* n. sp.: **A**, **B**, **E**, **F**, **H**, **I**, holotype MNHN-IM-2013-67057; **A**, external view of right valve; **B**, external view of left valve; **E**, digital image of right valve; **F**, digital image of left valve; **H**, details of the external side of the left valve; **I**, prodissoconch area of left valve; **C**, paratype 1 MNHN-IM-2013-67059; **C**, internal view of left valve; **D**, **G**, paratype 2 MNHN-IM-2000-34161; **D**, internal view of right valve; **G**, detail of the external side of right valve. Scale bars: A-F, 2 mm; G-H, 200 µm; I, 500 µm. All low vacuum SEM images, not coated.

290-326 m; 2.V.2017; Stn DW4883; MNHN-IM-2017-3522 • 4 lv, 20 rv; 33°17'S, 43°55'E; depth 272-380 m; 3.V.2017; Stn DW4885; MNHN-IM-2018-6310 • 18 lv, 69 rv; 33°17'S, 43°56'E; depth 573-582 m; 3.V.2017; Stn DW4886; MNHN-IM-2017-3549/3554 • 7 lv, 16 rv; 33°17'S, 43°57'E; depth 599-640 m; 3.V.2017; Stn DW4887; MNHN-IM-2017-3553 • 1 pr; 33°10'S, 43°57'E; depth 299-311 m; 3.V.2017; Stn DW4888; MNHN-IM-2017-3556 • 6 lv, 3 rv; 33°09'S, 43°58'E; depth 353-465 m; 3.V.2017; Stn DW4889; MNHN-IM-2017-3547/3550 • 7 lv, 15 rv; 33°09'S, 43°59'E; depth 492-588 m; 4.V.2017; Stn DW4890; MNHN-IM-2018-6309 • 3 lv; 33°16'S, 43°58'E; depth 623-629 m; 4.V.2017; Stn DW4893; MNHN-IM-2017-3552 • 2 pr; 33°09'S, 43°49'E; depth 238-283 m; 5.V.2017; Stn DW4895; MNHN-IM-2018-6311 • 1 pr, 1 lv, 1 rv; 33°07'S, 43°51'E; depth 325-357 m; 5.V.2017; Stn DW4896; MNHN-IM-2017-3546 • 1 pr, 1 rv; 33°09'S, 43°59'E; depth 490-584 m; 5.V.2017; Stn DW4897; MNHN-IM-2018-6308.

Distribution. — Known only from Walters Shoal 33°07'S-33°17'S, 43°49'E-43°59'E; inhabits bathyal zones characterized by soft substrates, occurring at depths ranging from 221 to 584 m, with a typical distribution between 256 and 490 m.

Etymology. — From *laetus* L. – richly coloured; in reference to the multi-coloured left shell disc.

Description

Shell up to 11 mm in height, almost circular, somewhat oblique posteriorly, opaque, weakly inflated, auricles unequal, umbonal angle *c.* 110°, multi-coloured.

The shell disc of left valve in early ontogeny glossy and smooth to 1 mm below umbo, followed for 1 mm by dull and smooth surface of pre-radial stage. Numerous (25-35) irregularly spaced delicate radial riblets starting after 2 mm below umbonal apex,

increasing in number towards ventral margin, and crossed by very closely spaced (*c.* 12 per mm) over-running fine commarginal lamellae, showing a somewhat reticular sculpture. Commarginal lamellae more closely arranged near periphery (*c.* 15 per mm). Anterior auricle larger in size than posterior one (3.5: 2), and both set with very weak radial riblets (6-12) and over-running closely spaced lamellae, pronounced on anterior and weaker on posterior. Right valve sculptured throughout with delicate commarginal lirae (*c.* 8 per mm) and semi-transparent, internal riblets visible through shell disc. Anterior auricle somewhat demarcated from the shell disc with 6-10 fine radial riblets and closely set commarginal lamellae, more prominent on the dorsal margin. Posterior auricle more continuous with shell disc, sculptured with very closely set, fine commarginal lamellae near posterior margin. Internal radial riblets equally spaced, numbering 10 in most specimens, a few specimens with one or two interstitial rudimentary riblets in late growth stage near periphery; riblets small, beginning *c.* 3 mm below dorsal margin and extending to ventral submarginal area. A small auricular lira produced on each border. Byssal notch small and shallow, ctenolium on suture absent. Hinge line straight; cardinal crura rather broad and resilial pit triangular. Colour of left valve variegated, uniformly whitish, creamy or brownish, or brightly maculated with multi-coloured dots and/or streaks.

Prodissoconch (Figs 3I; 9G-H): Length 150 µm.

Dimensions: Holotype, height 9.2 mm, width 9.1 mm, convexity 2.0 mm.

Remarks

The most similar congeneric species is *Parvamussium virgatum* Dijkstra, 1991 from upper bathyal depths of the western, south-western and southern Pacific (Dijkstra 1991: 20, 2001: 88; Dijkstra & Kastoro 1997: 265; Dijkstra & Maestrati 2008: 97, 2017: 477). The present species differs from *P. virgatum* in having a more posteriorly oblique shell shape (*P. virgatum* is circular, see Dijkstra 1991: fig. 72), in having a shorter glossy surface in the early growth stage of the left valve (*P. laetum* n. sp. 1 mm, *P. virgatum* 2 mm, see Dijkstra 1991: fig. 74), in having more prominent sculpture on the left valve, comprising radial riblets and commarginal lamellae (weaker and finer in *P. virgatum*, see Dijkstra 1991: figs 62, 64 and Dijkstra & Kastoro 1997: fig. 99) and in the bright colouration of the left valve (*P. virgatum* is opaque whitish). Other morphological characters of both species are almost similar.

Another morphologically close congener is *Parvamussium formosum* (Melvill *in* Melvill & Standen, 1907), known from upper bathyal depths of the north and south-western Indian Ocean (Dijkstra & Knudsen 1998: 45; Dijkstra & Janssen 2013: 191; Dijkstra & Maestrati 2015: 601). *Parvamussium laetum* n. sp. is characterized by a more prominent sculpture of radial riblets and commarginal lamellae on the left valve while *P. formosum* is almost smooth on the central part of the shell disc with a very weak radial lateral sculpture (see Oliver 1992: 70, Fig. 6). Additionally, *Parvamussium laetum* n. sp. has a constant number of internal ribs (10 versus *P. formosum* 8-11, with occasionally additional rudimentary interstitial riblets) and has in general a more colourful left valve.

Parvamussium pustulatum n. sp.
(Fig. 4; 9I-J)

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Material examined. — **Holotype. Walters Shoal** • 1 pr; slopes; 33°09'S, 43°59'E; depth 492-588 m; 4.V.2017; Stn DW4890; MNHN-IM-2013-67061.
Paratypes. Walters Shoal • 1 lv + 1 rv; same data as for holotype; MNHN-IM-2000-34162.

Other material. — **Walters Shoal – Slopes** • 1 lv; 32°46'S, 44°18'E; depth 964-965 m; 10.V.2017; Stn CP4911; NBC • 5 lv; 33°17'S, 43°57'E; depth 599-640 m; 3.V.2017; Stn DW4887; MNHN-IM-2017-3566/3568 • 2 lv; 33°09'S, 43°59'E; depth 492-588 m; 4.V.2017; Stn DW4890; MNHN-IM-2017-3563 • 1 rv; 33°12'S, 44°01'E; depth 650-653 m; 4.V.2017; Stn DW4891: MNHN-IM-2017-3561 • 12 lv, 19 rv; 33°12'S, 44°01'E; depth 624-646 m; 4.V.2017; Stn DW4892; MNHN-IM-2017-3564 • 1 rv; 33°09'S, 43°59'E; depth 490-584 m; 5.V.2017; Stn DW4897; MNHN-IM-2018-6313 • 1 pr, 24 lv, 49 rv; 33°09'S, 44°01'E; depth 652-668 m; 6.V.2017; Stn DW4898; MNHN-IM-2017-3565/3569 • 35 lv, >50 rv; 33°09'S, 44°02'E; depth 707-720 m; 6.V.2017; Stn DW4899; MNHN-IM-2017-3562/3567 • 18 lv, 23 rv; 33°10'S, 44°01'E; depth 660-670 m; 6.V.2017; Stn DW4900; MNHN-IM-2017-3558 • 1 pr, 1 lv; 33°11'S, 44°01'E; depth 652 m; 6.V.2017; Stn DW4904; MNHN-IM-2017-3560 • 1 lv; 33°26'S, 44°00'E; depth 799-837 m; 9.V.2017; Stn CP4906; MNHN-IM-2017-3559.

Distribution. — Known only from the bathyal zone off Walters Shoal, 33°09'S-33°26'S, 43°57'E-44°02'E; on soft substrata at a depth range of 492-588 m and 964-965 m.

Etymology. — From *pustulatus* L. – with vesicles; in reference to the vesicular sculpture of the left valve.

Description

Shell small, height up to 11 mm, circular, almost equilateral, weakly inflated, anterior auricle slightly larger than posterior, semi-transparent, opaque whitish in coloration.

Left valve disc smooth, somewhat glossy in early growth stage to *c.* 2 mm from dorsal margin, followed by *c.* 10 radial rows of distant vesicles (*c.* 5-6 per mm) increasing in number by intercalated radial rows of vesicles to *c.* 60-80 near ventral margin. Commarginal sculpture on the disc absent. The anterior auricle with prominent, closely spaced, commarginal lamellae (*c.* 8 per mm), the posterior auricle nearly identical, commarginal lamellae slightly more closely spaced and less prominent (*c.* 10 per mm). The hinge line straight. The right valve with very closely spaced, delicate commarginal lirae (*c.* 10-12 per mm). The anterior auricle slightly twisted, strongly marked with widely spaced commarginal lamellae, the posterior auricle with fine, very closely spaced commarginal lamellae. The byssal notch narrow and shallow. Internal riblets prominent, nine plus one auricular on the posterior side; more widely spaced centrally than laterally, start in early growth stage and extend to ventral submarginal area.

Prodissoconch (Fig. 4G; 9I-J): length 240 µm.

Dimensions: holotype, height 11.0 mm, width 11.2 mm, convexity 2.9 mm.

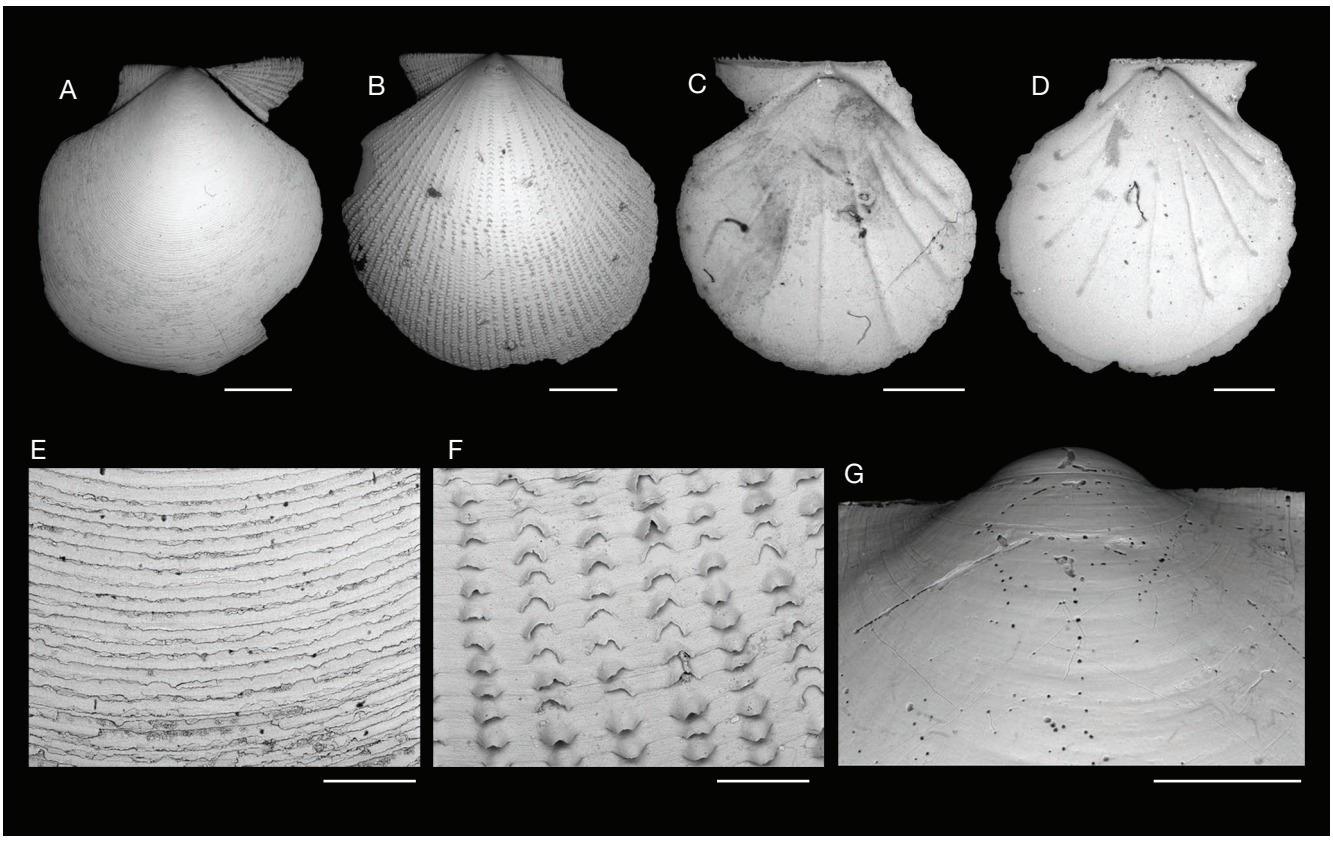

FIG. 4. — *Parvamussium pustulatum* n. sp.: **A**, **B**, **E**, **F**, **G**, holotype MNHN-IM-2013-67061; **A**, external view of right valve; **B**, external view of left valve; **E**, details of external side of the right valve; **F**, details of the external side of the left valve; **G**, prodissoconch area of left valve; **C**, **D**, paratype MNHN-IM-2000-34162; **C**, internal view of right valve; **D**, internal view of left valve. Scale bars: A-D, 2 mm; E, 500 µm; F-G, 200 µm. All low vacuum SEM images, not coated.

REMARKS

The only similar congeneric species is *Parvamussium vesiculosum* Dijkstra & Maestrati, 2013, known by empty shells from bathyal depths of the Tarava Seamounts and the Society Islands (French Polynesia). *Parvamussium pustulatum* n. sp. morphologically differs from *P. vesiculosum* in having a more delicate vesicular sculpture on the left valve of more radially arranged vesicles (*P. pustulatum* n. sp. *c.* 60-80, *P. vesiculosum c.* 40), in having less, commencing earlier, internal riblets (*P. pustulatum* n. sp. 9 + 1 auricular, *P. vesiculosum* 12 + 2 auricular).

Genus *Cyclopecten* Verrill, 1897

Cyclopecten Verrill, 1897: 70.

TYPE SPECIES. — *Pecten pustulosus* Verrill, 1872 [synonym of *Pecten hoskynsi* E. Forbes, 1844] by subsequent designation (Sykes *et al.* 1898: 75).

REMARK

For synonymy, diagnosis, distribution and discussion of the genus *Cyclopecten* see Dijkstra (1995: 41).

Cyclopecten broii n. sp.
(Figs 5; 9A, B)

urn:lsid:zoobank.org:act:FB79FB69-1E3D-4715-AA94-A4E996634C50

MATERIAL EXAMINED. — **Holotype. Walters Shoal** • 1 lv; slopes; 33°49'S, 44°23'E; depth 961-966 m; 10.V.2017; Stn CP4912; MNHN-IM-2000-34163.
Paratypes. Walters Shoal • lv + 1 rv; same as for holotype; MNHN-IM-2000-31164.

DISTRIBUTION. — Known only from the type locality.

ETYMOLOGY. — This new species is named after Victor Broi, captain of the R/V *Marion-Dufresne*, serving on his last cruise before retirement.

DESCRIPTION

Shell up to 4.8 mm in height, fragile, semi-transparent, circular, inequivalve, almost equilateral, auricles unequal in size and shape, umbonal angle *c.* 110°, whitish opaque. Prodissoconch length 160 µm.

Left valve with narrow but distinct commarginal hollow curved lamellae, widely spaced, more closely spaced in late growth stage. Delicate radial sculpture of wavy radial lines, more definitive at abutment with commarginal lamellae, not

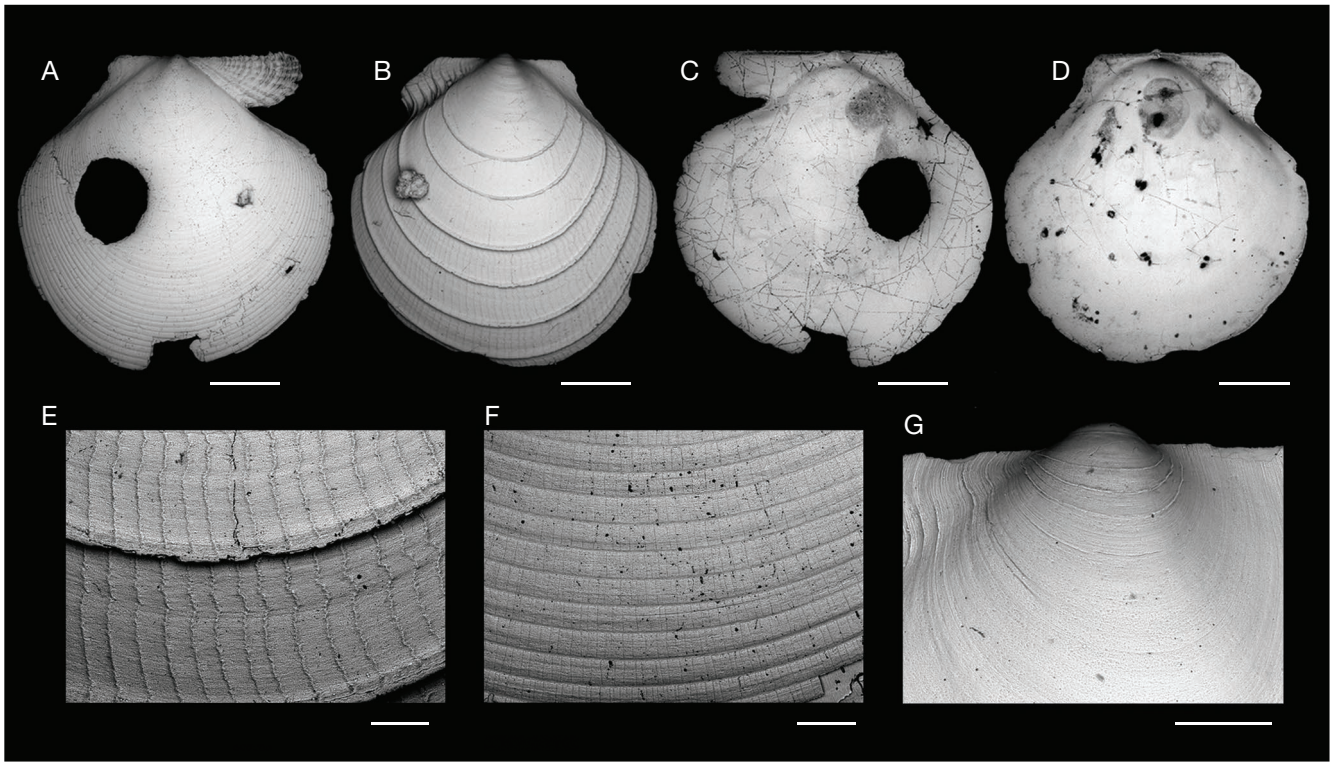

FIG. 5. — *Cyclopecten broii* n. sp.: **B**, **D**, **E**, **G**, holotype MNHN-IM-2000-34163; **B**, external view of the left valve; **D**, internal view of the left valve; **E**, detail of the external sculpture of the left valve; **G**, prodissoconch of the left valve; **A**, **C**, **F**, paratype MNHN-IM-2000-31164; **A**, external view of the right valve; **C**, internal view of the right valve; **F**, detail of the external side of the right valve. Scale bars: A-D, 1 mm; E-G, 200 µm.

intersecting. The lamellae continued on the anterior and posterior auricles, although closer spaced. Right valve with early prodissoconch quite smooth, gradual onset of closely spaced, regularly arranged commarginal striae. Auricles weakly sculptured with commarginal striae, anterior auricle with distinct radial folds. Hinge line straight, dorsal margin weakly denticulate. Internal surface smooth. Byssal notch well developed, byssal fasciole narrow, no ctenolium.

Prodissoconch (Figs 5G; 9A,B): length 160 µm.

Dimensions: holotype, height 4.8 mm, width 4.8 mm, convexity 0.9 mm.

REMARKS

The most similar congeneric species is *Cyclopecten cincinnatus* Dijkstra & Gofas, 2004 from bathyal depths of the northeastern Atlantic Lusitanian seamounts. *Cyclopecten broii* n. sp. morphologically differs from *C. cincinnatus* in having fewer and more widely spaced commarginal lamellae (*C. broii* n. sp. *c.* 6, *C. cincinnatus* 6-10), in having weaker commarginal lamellae on the left valve (*C. cincinnatus* more prominent and curved), in having finer and weaker interlamellar radial striae, even lacking anteriorly (*C. cincinnatus* with more prominent striae, commencing earlier). Other morphological characters of both species are identical.

Another comparable species with somewhat similar commarginal sculpture and weak interlamellar striae on the left valve is *Parvamussium australanum* Dijkstra & Maestrati, 2010, from bathyal depths off the Austral Islands (French Polynesia). *C broii* n. sp. differs from *P. australanum* in size (*C. broii* n. sp. almost 5 mm in height, *P. australanum* 11.5 mm), in shape (*C. broii* n. sp. is slightly more oblong, *P. australanum* circular) and in internal riblets (lacking in *C. broii* n. sp., numerous in *P. australanum*).

Cyclopecten simardi n. sp.
(Fig. 6; 9K-L)

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MATERIAL EXAMINED. — **Holotype. Walters Shoal** • 1 pr; slopes; 33°08'S, 44°02'E; depth 700-711 m; 7.V.2017; Stn CP4902; MNHN-IM-2000-34165.
Paratypes. Walters Shoal • 2 lv + 2 rv; same data as for holotype; MNHN-IM-2000-34166.

OTHER MATERIAL. — **Walters Shoal – Slopes** • 1 pr; 33°11'S, 44°01'E; depth 620-642 m; 7.V.2017; Stn CP4903; NBC • 1 lv, 1 rv; 33°17'S, 43°56'E; depth 573-582 m; 3.V.2017; Stn DW4886; MNHN-IM-2017-3574 • 1 lv, 1 rv; 33°17'S, 43°57'E; depth 599-640 m; 3.V.2017; Stn DW4887; MNHN-IM-2017-3575 • 1 lv, 2 rv; 33°12'S, 44°01'E; depth 624-646 m; 4.V.2017; Stn DW4892; MNHN-IM-2017-3577 • 3 lv, 1 rv; 33°09'S, 44°01'E; depth 652-668 m; 6.V.2017; Stn DW4898; MNHN-IM-2000-34166 • 2 lv, 1 rv; 33°09'S, 44°02'E; depth 707-720 m; 6.V.2017; Stn DW4899; MNHN-IM-2017-3576; MNHN-IM-2018-6321.

DISTRIBUTION. — Known only from the slopes of Walters Shoal, on soft substrate at 620-711 m.

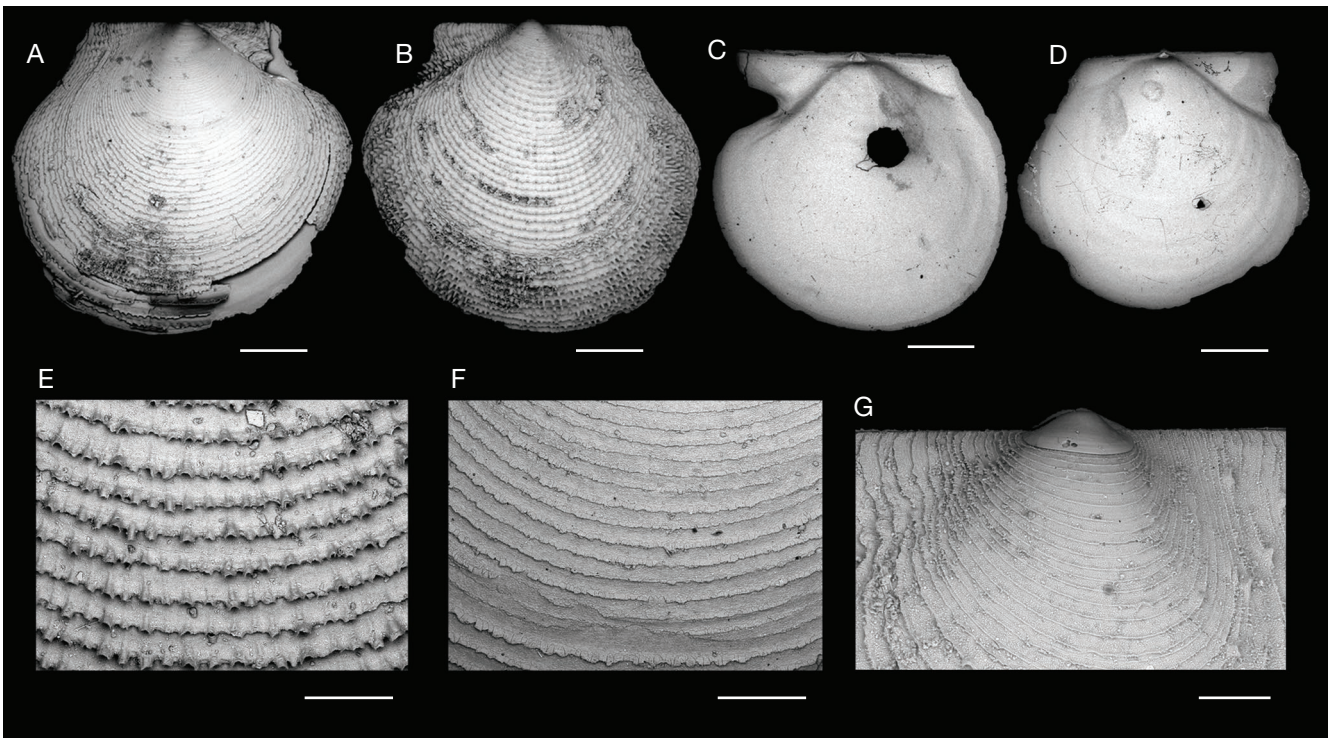

Fig. 6. — *Cyclopecten simardi* n. sp.: **A**, **B**, **E**, holotype MNHN-IM-2000-34165; **A**, external view of right valve; **B**, external view of left valve; **E**, details of the external side of the left valve; **C**, **D**, **F**, **G**, paratype MNHN-IM-2000-341661; **C**, internal view of right valve; **D**, internal view of left valve; **F**, details of the external side of the right valve; **G**, prodissoconch area of left valve. Scale bars: A-D, 1 mm; E-F, 500 µm; G, 200 µm. All low vacuum SEM images, not coated.

Etymology. — This new species is named after François Simard, Deputy Director of IUCN Global Marine and Polar Programme, and Principal Investigator of the FFEM-Southwest Indian Ocean project, under the umbrella of which the Walters Shoal expedition took place.

Description

Shell up to 6 mm in height, circular, inequivalve, left valve slightly more inflated than right valve, auricles nearly equal in size, umbonal angle *c.* 125°, whitish opaque.

Left valve with regularly arranged, very narrowly spaced, commarginal lamellae (8-10 per mm), numerous (10-12 per mm), prominent, hemitubular scales (erect hollow spines), arrangement in radial rows, multiplying by intercalation. Crowded microscopic granules between the commarginal lamellae. Auricles with sculpture identical to disc surface. Right valve smooth and glossy near umbonal area to *c.* 1 mm shell height, regular commarginal lirae, very close-set, transformation into more widely spaced, undulating commarginal lamellae with delicate spines near ventral margin. Granulate microsculpture between commarginal lirae and lamellae. Anterior auricle with three radial riblets covered with fine commarginal lamellae. Posterior auricle almost continuous with disc, surface with very close-set commarginal lirae. Hinge line straight. Antero-dorsal margin with scales, squamae weakly developed on postero-dorsal margin. Byssal notch deep, byssal fasciole broad.

Prodissoconch (Figs 6G; 9 K-L): Length 280 µm.

Dimensions: holotype, height 5.1 mm, width 5.8 mm, convexity 1.0 mm.

Remarks

The most similar congeneric species is *Cyclopecten horridus* Dijkstra, 1995 from bathyal depths of the south-western Pacific and off South Africa (Dijkstra & Marshall 1997: 87, 2008: 16; Dijkstra & Maestrati 2015: 617). The present species morphologically differs from *C. horridus* in having a much more delicate sculpture on the left valve of hemitubular scales on the commarginal lamellae (10-12 scales in *C. simardi* n. sp. vs 6-8 in *C. horridus*), in having more closely spaced commarginal lamellae in late growth stage, with more delicate spinous scales, in having a finer sculpture on the right valve with more closely arranged commarginal lamellae, almost lacking spinose scales (*C. horridus* with wider set commarginal spinous lamellae).

Another comparable species of similar shape and size, and with hemitubular sculpture on the left valve is *Parvamussium araneum* Dijkstra, 1991 from bathyal depths of the south-western Pacific (Dijkstra & Kastoro 1997: 255; Dijkstra & Maestrati 2008: 85; Dijkstra 2011: 40, 2013: 17). *Cyclopecten simardi* n. sp. is morphologically distinguishable from *P. araneum* in lacking radial sculpture on the left valve (*P. araneum* also has radial sculpture with hemitubular scales on the intersections of the radial riblets and commarginal lamellae), and in having a closer spaced commarginal sculpture, and in lacking internal riblets (*P. araneum* has rudimentary, laterally placed riblets).

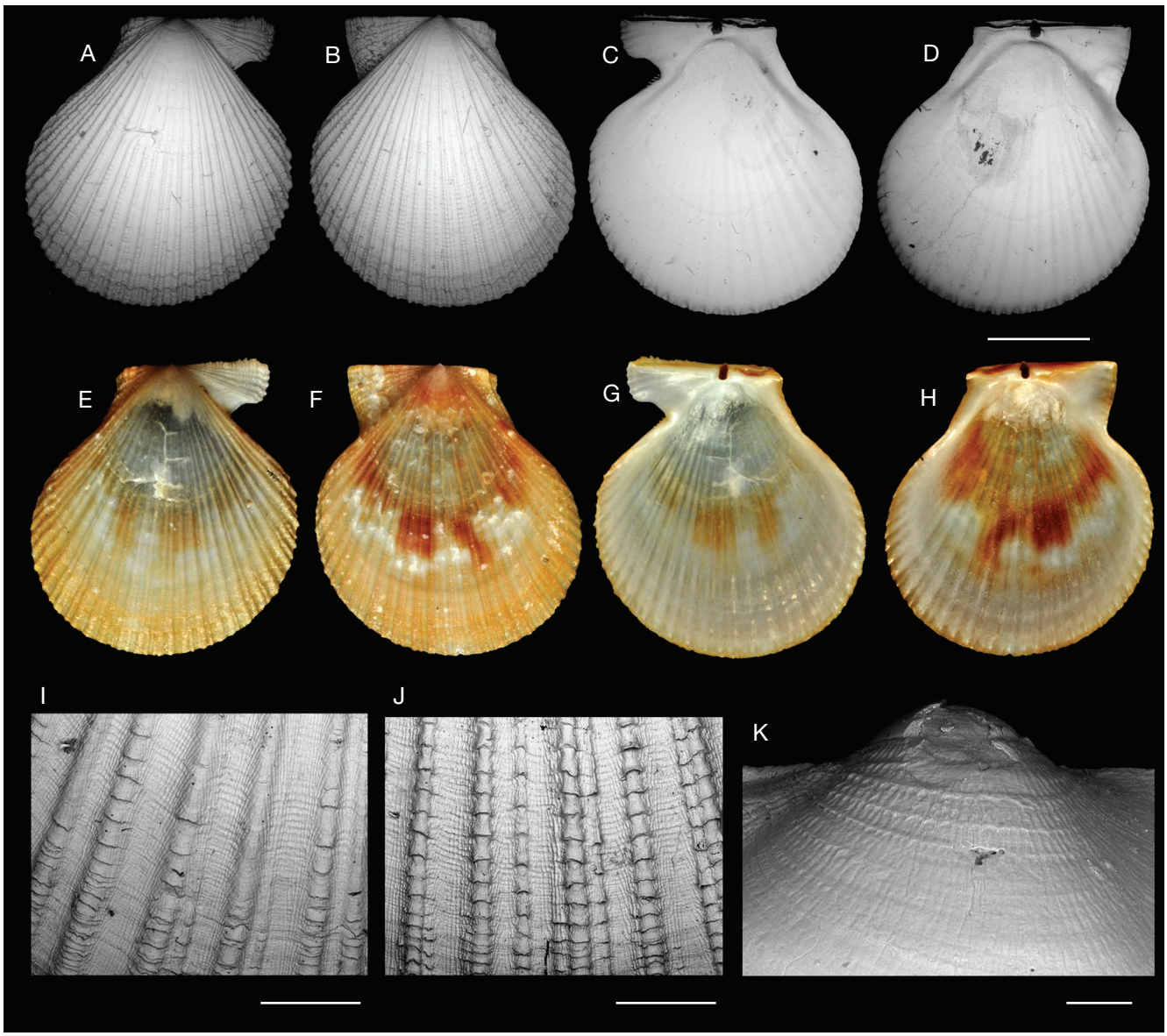

Fig. 7. — *Talochlamys janiqueae* n. sp.: holotype MNHN-IM-2013-67070: **A**, external view of right valve; **B**, external view of left valve; **C**, internal view of the right valve; **D**, internal view of left valve; **E**, digital image of external right valve; **F**, digital image of external left valve; **G**, digital image of internal right valve; **H**, digital image of internal left valve; **I**, details of the external side of the right valve; **J**, details of the external side of the left valve; **K**, prodissoconch area of left valve. Scale bars: A-H, 5 mm; I-J, 1 mm; K, 100 µm. A-D and I-K low vacuum SEM images, not coated.

Family Pectinidae Rafinesque, 1815

Remark

Formerly attributed to Wilkes (1810), but that work is not entirely binominal. For a diagnosis see Dijkstra (2013: 24).

Genus *Talochlamys* Iredale, 1929

Talochlamys Iredale, 1929: 188.

Type species. — *Chlamys famigerator* Iredale, 1925 [synonym of *Pecten pulleineanus* Tate, 1887] by original designation.

Remark

For diagnosis, distribution and discussion of the genus *Talochlamys* see Dijkstra & Marshall (2008: 51).

Talochlamys janiqueae n. sp.
(Figs 7; 9E-F)

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Material examined. — **Holotype. Walters Shoal** • 1 pr, living, DNA tissue sample; slopes; 33°10'S, 43°49'E; depth 217-256 m; 1.V.2017; Stn DW4877; MNHN-IM-2013-67070.
Paratypes. Walters Shoal • 3 pr; same data as for holotype; living, DNA tissue samples; MNHN-IM-2013-67069, 67071, 67072.

OTHER MATERIAL. — **Walters Shoal – Slopes** • 20 lv, 21 rv; 33°10'S, 43°49'E; depth 217-256 m; 1.V.2017; Stn DW4877; MNHN-IM-2017-3515 • 5 pr, 9 lv, 2 rv; 33°09'S, 43°50'E; depth 221-256 m; 1.V.2017; Stn DW4878; MNHN-IM-2017-3509 • 3 pr, 4 lv, 5 rv; 33°17'S, 43°52'E; depth 288-300 m; 1.V.2017; Stn DW4879; MNHN-IM-2017-3512 • 2 pr, 30 lv, 9 rv; 33°17'S, 43°51'E; depth 275-318 m; 1.V.2017; Stn DW4880; MNHN-IM-2017-3504 • 5 lv, 4 rv; 33°16'S, 43°50'E; depth 377-382 m; 2.V.2017; Stn DW4881; MNHN-IM-2017-3505 • 1 lv; 33°14'S, 43°51'E; depth 290-326 m; 2.V.2017; Stn DW4883; MNHN-IM-2018-6319 • 5 pr, 20 lv, 9 rv; 33°17'S, 43°55'E; depth 272-380 m; 3.V.2017; Stn DW4885; MNHN-IM-2017-3514 • 10 lv, 3 rv; 33°10'S, 43°57'E; depth 299-311 m; 3.V.2017; Stn DW4888; MNHN-IM-2017-3506/3573; MNHN-IM-2018-6316 • 6 lv, 1 rv; 33°09'S, 43°58'E; depth 353-465 m; 3.V.2017; Stn DW4889; MNHN-IM-2017-3508/3510; MNHN-IM-2018-6317 • 1 lv; 33°12'S, 44°01'E; depth 650-653 m; 4.V.2017; Stn DW4891; MNHN-IM-2018-6318 • 4 lv, 2 rv; 33°12'S, 44°01'E; depth 624-646 m; 4.V.2017; Stn DW4892; MNHN-IM-2017-3572; MNHN-IM-2018-6320 • 6 pr, 18 lv, 8 rv; 33°09'S, 43°50'E; depth 199-261 m, 5.V.2017; Stn DW4894; MNHN-IM-2017-3507 • 12 lv, 8 rv; 33°09'S, 43°49'E; depth 238-283 m; 5.V.2017; Stn DW4895; MNHN-IM-2017-3511 • 7 lv, 3 rv; 33°07'S, 43°51'E; depth 325-357 m; 5.V.2017; Stn DW4896; MNHN-IM-2017-3513.

DISTRIBUTION. — Known only from the slopes of Walters Shoal, living in the bathyal zone on soft substrata between 199-261 m and 650-653 m.

ETYMOLOGY. — This new species is named after Janique Etienne, Project Officer with the Fonds Français pour l'Environnement Mondial FFEM, in recognition of the Fund's support to the IUCN Southwest Indian Ocean project and her interest in the exploration of Walters Shoal.

DESCRIPTION

Shell up to 22 mm in height, most specimens up to *c.* 15 mm, thin, weakly inflated, about equally convex, inequivalve, almost equilateral, weakly prosocline, anterior auricles considerably larger and longer than posterior ones, umbonal angle *c.* 90°, colour cream with pale radial or divergent streaks and/or blotches.

Left valve sculptured with 9-10 unevenly spaced, simple, subobsolete primary radial costae until central part of disc, irregular increase by intercalation of scaly secondary riblets on each side of primary costae, in middle of intercostal space. Interstitial microsculpture of radial scratches in centre of disc, laterally more divergent and/or antimarginal. Anterior auricle strongly ridged and scaly with 6-8 radial riblets, interstitial microsculpture granular and/or with irregular scratches. Posterior auricle with 4-6 radial riblets with closely spaced scales, interstitial microsculpture with commarginal scratches near disc, more antimarginal near margin. Right valve sculptured as left valve, although more subobsolete with weaker scaled radial riblets. Anterior auricle with 4 radial riblets with close-set lamellae, more prominent near dorsal margin, posterior auricle with four spinous riblets. Byssal notch moderately deep, byssal fasciole broad. Functional ctenolium well-developed, with *c.* six teeth.

Dimensions: Holotype, height 15.0 mm, width 13.6 mm, convexity 4.0 mm.

REMARKS

The most similar congeneric species is *Talochlamys pulleineana* (Tate, 1887) from upper bathyal depths off southern Australia (Raines & Poppe 2006: 288). *Talochlamys janiqueae* n. sp. mainly differs morphologically from *T. pulleineana* in having a more prominent smooth shell disc in early growth stages, up to *c.* 4 mm in shell height (*T. pulleineana* up to *c.* 1 mm), in having simple, less scaly primary radial riblets, subobsolete towards the centre shell disc (*T. pulleineana* already scaly in early growth stages), in having closer set lamellae on the primary and secondary radial riblets near the ventral margin (*T. pulleineana* more prominently spinose).

The similarly shaped, sized and brightly coloured congener *Talochlamys humilis* (G. B. Sowerby III, 1904) from deep water off South Africa (Dijkstra & Kilburn 2001: 298), has a different intercostal microsculpture of commarginal lamellae (*T. janiqueae* n. sp. has radial and antimarginal scratches). *Talochlamys janiqueae* n. sp. also has fewer primary radial riblets (*c.* 30, *T. humilis c.* 55-70). Moreover, *T. janiqueae* n. sp. has numerous secondary radial riblets (*T. humilis* only a few) and its radial ribs are scalier (*T. humilis* has subobsolete or weak squamae).

Talochlamys multicolor (Melvill & Standen, 1907) endemic to Gough Island (southern Atlantic) also resembles the present species in size, shape and colour. However, *T. janiqueae* n. sp. differs morphologically in having weaker primary radial ribs on the left valve (prominent on *T. multicolor*), in lacking secondary intercostal riblets in early growth stages, having one or two in late ontogeny (*T. multicolor* 1-2 in early, 4-5 prominent and scaly in adult), in having wider irregularly spaced radial riblets on the right valve (*T. multicolor* more closely spaced), in having 6 squamose radial riblets on the anterior auricle of the left valve (*T. multicolor* has 8 nodulose radial riblets).

Talochlamys jousseaumei (Bavay, 1904)
n. comb.

Veprichlamys jousseaumei Bavay, 1904: 203.

REMARK

Another species similar to *Talochlamys. janiqueae* n. sp.is is *Talochlamys jousseaumei* (Bavay, 1904), from upper bathyal depths in the Sea of Japan, East China Sea and South China Sea (Raines & Poppe 2006: 252, as *Veprichlamys jousseaumei*). In earlier literature, this species was placed in the genus *Veprichlamys* Iredale, 1929, but most morphological characters (e.g. shell shape: circular, and sculpture: numerous secondary radial riblets) are correlated with *Talochlamys*. *Talochlamys janiqueae* n. sp. differs from *T. jousseaumei* in having more closely and irregularly spaced primary radial riblets (*T. janiqueae* n. sp. *c.* 30, *T. jousseaumei* regularly and more widely spaced, *c.* 20), and in having more numerous secondary intercostal radial riblets (*T. jousseaumei* only a few laterally).

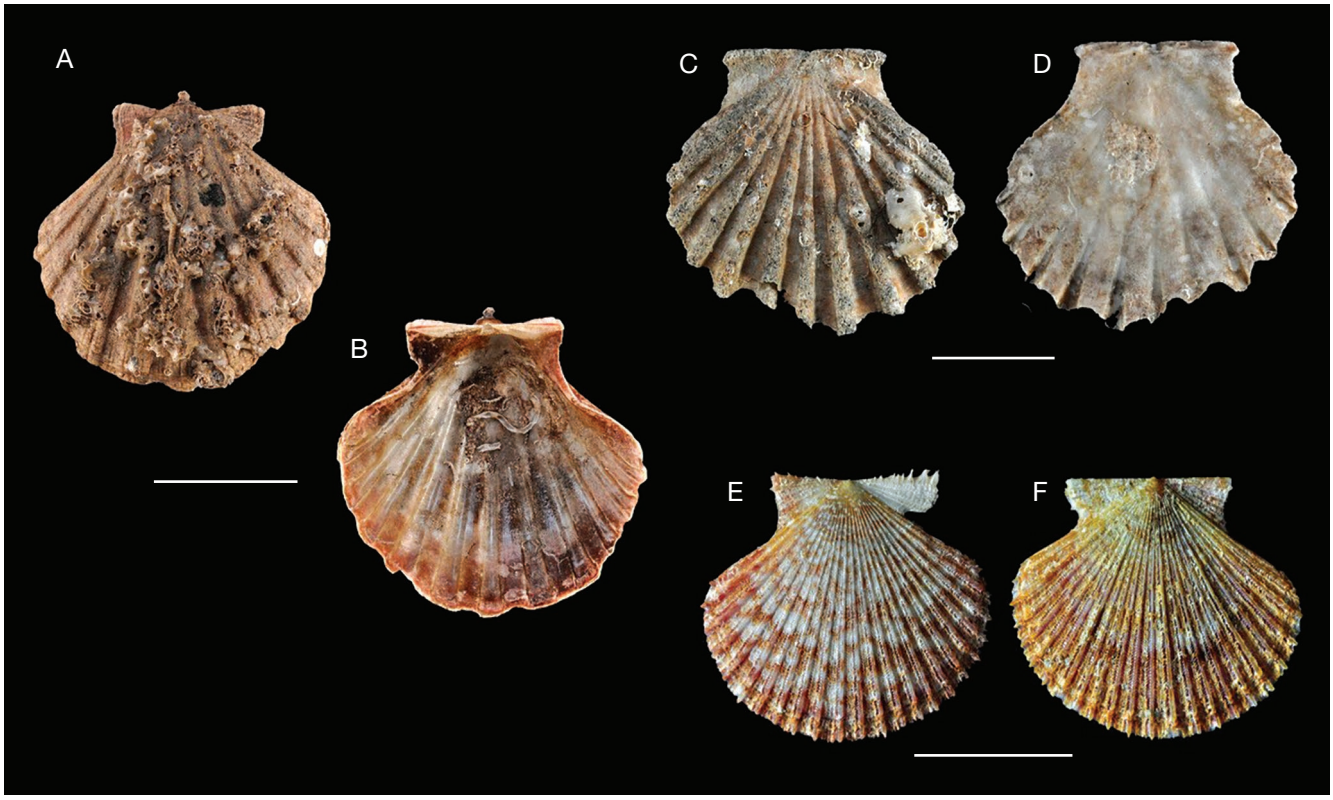

FIG. 8. — *Pecten sulcicostatus* G.B Sowerby II, 1842: **A**-**D**, Stn CP4903; depth 620-642 m; **A**, external view of right valve; **B**, internal view of right valve; **C**, external view of left valve; **D**, internal view of left valve; *Cryptopecten bullatus* (Dautzenberg & Bavay, 1912): **E**, **F**, Stn DW4880, depth 275-318 m; **E**, external view of right valve; **F**, external view of left valve. Scale bars: A-B, 25 mm; C-D, 15 mm; E-F, 10 mm.

Genus *Cryptopecten* Dall, Bartsch & Rehder, 1938

Cryptopecten Dall, Bartsch & Rehder, 1938: 93.

TYPE SPECIES. — *Cryptopecten alli* Dall, Bartsch & Rehder, 1938 [synonym of *Pecten bullatus* Dautzenberg & Bavay, 1912], by original designation.

Cryptopecten bullatus Dautzenberg & Bavay, 1912 (Fig. 8E, F)

Pecten (*Chlamys*) *bullatus* Dautzenberg & Bavay, 1912: 17, pl. 27, figs 1, 2.

Cryptopecten bullatus – Dijkstra & Kilburn 2001: 309, fig. 59.

TYPE LOCALITY. — Sulu Archipelago, Philippines, 6°08'N, 121°19'E, depth 275 m.

MATERIAL EXAMINED. — **Walters Shoal – slopes** • 1 rv, 1 lv; 33°10'S, 43°49'E; depth 217-256 m; 1.V.2017; Stn DW4877; MNHN-IM-2017-3516 • 1 rv, 1 lv; 33°09'S, 43°50'E; depth 221-256 m; 1.V.2017; Stn DW4878; MNHN-IM-2017-3520 • 1 pr; 33°17'S, 43°51'E; depth 275-318 m; 1.V.2017; Stn DW4880; MNHN-IM-2013-67058 • 1 rv; 33°17'S, 43°51'E; depth 275-318 m; 1.V.2017; Stn DW4880; MNHN-IM-2017-3519 • 1 fragment lv; 33°17'S, 43°55'E; depth 272-380 m; 3.V.2017; Stn DW4885; MNHN-IM-2017-3521 • 1 rv; 33°10'S, 43°57'E; depth 299-311 m; 3.V.2017; Stn DW4888; MNHN-IM-2017-3517 • 1 rv, 1 lv; 33°09'S, 43°49'E; depth 238-283 m; 5.V.2017; Stn DW4895; MNHN-IM-2017-3518.

DISTRIBUTION. — Known throughout the western, south-western and central Pacific and western Indian Ocean, here extended to the south-western Indian Ocean. Walters Shoal samples collected on the slopes of the seamount, depth 217-380 m.

REMARK

This species was collected only dead on the slopes of Walters Shoal. Its occurrence there is not surprising, given its wide Indo-Pacific distribution.

Genus *Pecten* O. F. Müller, 1776

Pecten O. F. Müller, 1776: 248.

TYPE SPECIES. — *Ostrea maxima* Linnaeus, 1758 subsequent designation (Schmidt 1818: 67).

Pecten sulcicostatus G. B. Sowerby II, 1842 (Fig. 8A-D)

Pecten sulcicostatus G. B. Sowerby II, 1842: 47, pl. 13, figs 35-36. — Dijkstra & Kilburn 2001: 286, figs 20-22.

TYPE LOCALITY. — False Bay, South Africa, depth 40 m (designated by Dijkstra & Kilburn 2001: 286)

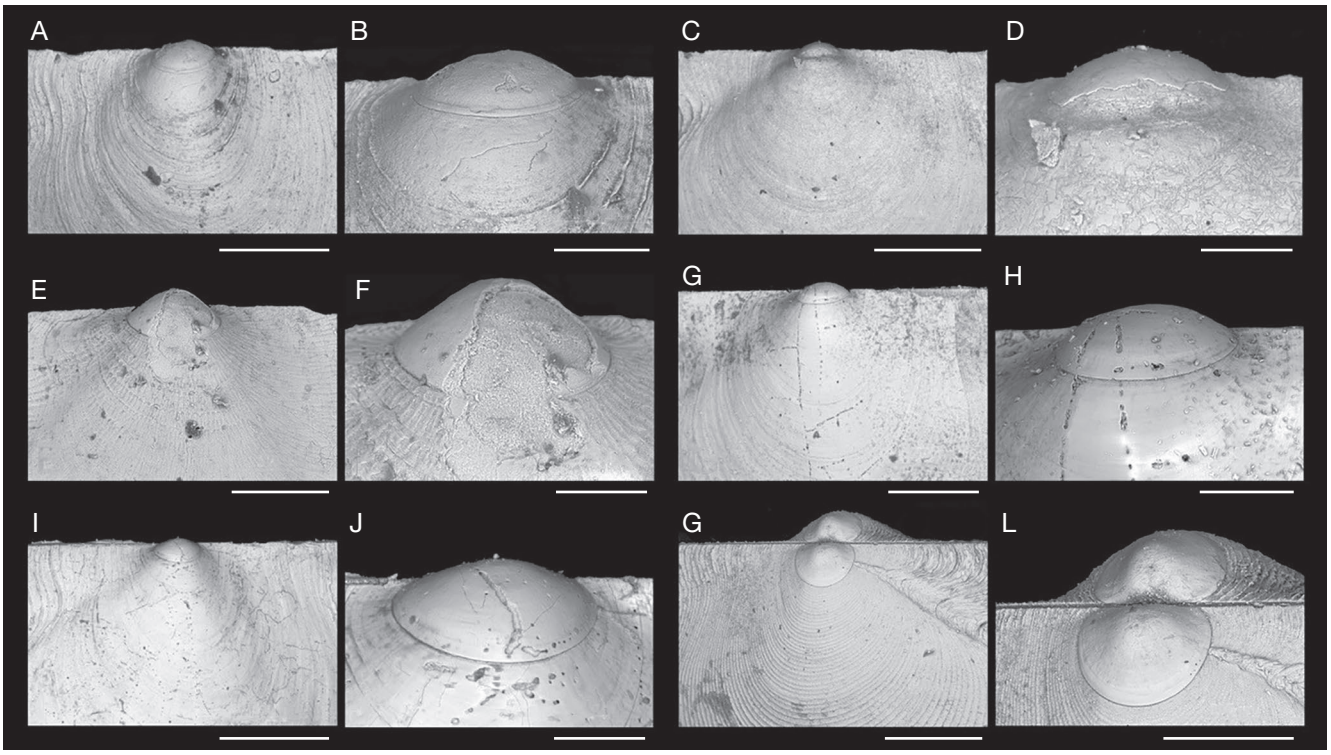

FIG. 9. — Prodissoconch pictures of the newly described species: *Cyclopecten broii* n. sp.: **A**, **B**, holotype MNHN-IM-2000-34163; **A**, prodissoconch area of the left valve; **B**, prodissoconch left valve; **C**, **D** *Parvamussium cancellinum* n. sp.: , holotype MNHN-IM-2000-34159; **C**, prodissoconch area of the left valve; **D**, prodissoconch left valve; **E**, **F**, *Talochlamys janiqueae* n. sp. holotype MNHN-IM-2013-67070; **E**, prodissoconch area of the left valve; **F**, prodissoconch left valve; **G**, **H**, *Parvamussium laetum* n. sp. holotype MNHN-IM-2013-67057; **G**, prodissoconch area of the left valve; **H**, prodissoconch left valve; **I**, **J**, *Parvamussium pustulatum* n. sp. holotype MNHN-IM-2013-67061; **I**, prodissoconch area of the left valve; **J**, prodissoconch left valve; **K**, **L**, *Cyclopecten simardi* n. sp.: holotype MNHN-IM-2000-34165; **K**, prodissoconch area of the left valve; **L**, prodissoconch left valve. Scale bars: A, E, L, 300 µm; B, D, F, H, J, 100 µm; C, I, K, 500 µm; G, 400 µm.

MATERIAL EXAMINED. — **Walters Shoal – Slopes** • 1 lv; 33°09'S, 44°01'E; depth 647-672 m; 6.V.2017; Stn CP4901; MNHN-IM-2017-3524 • 2 lv, 2 rv; 33°11'S, 44°01'E; depth 620-642 m; 7.V.2017; Stn CP4903; MNHN-IM-2017-3523.

REMARKS

To date, this species has been recorded only from the inner continental shelf off South Africa, living at sublittoral depths (30-70 m) (Dijkstra & Kilburn 2001). Its occurrence at bathyal depths off Walters Shoal is thus surprising. The dozen samples collected, primarily by brushing and suction methods on the summit plateau of the seamount, did not contain any *P. sulcicostatus* specimens or even fragments thereof, nor any other Pectinidae. Nonetheless, it is possible that the species occurs there in low numbers that escaped detection. Stochastic colonisation of the shoal may perhaps occasionally occur by means of larvae transported from southern Africa via the Agulhas Return Current, sporadic northward flowing eddies of which flow in the vicinity of the shoal (Lutjeharms & Ansorge 2001). All five shells were rather old and encrusted juvenile valves (Fig. 9A-D) and were most likely transported from shallower water by post-mortem downslope translocation. We do not believe it likely that they represent net debris contamination from fishing vessels.

DISCUSSION

The endemic pectinoid species of Walters Shoal, (5 Propeamussiidae, 1 Pectinidae), exhibit distinct morphological features that clearly differentiate them from other taxa. These traits, however, show notable congruence with those of Indo-Pacific congeners, respectively *Parvamussium laetum* n. sp. to *P. virgatum*, *P. pustulatum* n. sp. to *P. vesiculosum*, *P. cancellinum* n. sp. to *P. biformatum*, *Cyclopecten simardi* n. sp. to *C. horridus*, and *Talochlamys janiqueae* n. sp. to *T. pulleineana*, supporting the hypothesis of a shared ancestral origin. Remarkably, one propeamussiid species, *Cyclopecten broii* n. sp. is more similar to the north-eastern Atlantic congener *Cyclopecten cincinnatus* Dijkstra & Gofas, 2004 from the Lusitanian seamounts, than it does with the French Polynesian *Parvamussium australanum* Dijkstra & Maestrati, 2010.

All the pectinoid species collected on Walter Shoal were from upper to lower bathyal depths (199-1714 m), as living specimens – two Pectinidae species: *Talochlamys janiqueae* n. sp. (199-380 m) and *Cryptopecten bullatus* (275-318 m), four Propeamussiidae species: *Propeamussium meridionale* (1539-1714 m), *Parvamussium laetum* n. sp. (221-584 m), *Parvamussium pustulatum* n. sp. (492-668 m), *Cyclopecten simardi* n. sp. (620-711 m), and as dead shells only – one Pectinidae species: *Pecten sulcicostatus* and two Propea-

mussiidae species: *Parvamussium cancellinum* n. sp. (961-1052 m) and *Cyclopecten broii* n. sp. (961-966 m). The high endemicity of Walter Shoal Pectinoidea (six out of nine species) is closely linked to the geographically remote location of the seamount and its peripheral position at the south-western limit of the Indo-Pacific marine region. Isolation limits dispersal and promotes speciation, while prodissoconch morphology indicates non-planktotrophic larval development, further restricting connectivity. Together, these factors explain the proportion of endemic species of Walter Shoal.

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