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Biodiversity Quadrupled—Revision of Easter Island and Salas y Gómez Bivalves

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Abstract

Seventy-one bivalve species, including fifteen new species living in the waters of Easter and Salas y Gómez Islands are herein described: *Nuculana* (s.l.) *anakena* sp. nov., *Lasaea eastera* sp. nov., *Borniola pasca* sp. nov., *Hyalokellia tahaia* sp. nov., *Tellimya pauciradiata* sp. nov., *Tellimya tahaia* sp. nov., *Thecodonta rainesi* sp. nov., *Acrosterigma triangulare* sp. nov., *Herouvalia rapanui* sp. nov., *Moerella laperousea* sp. nov., *Abranda lamprelli* sp. nov., *Timoclea keegani* sp. nov., *Hyphantosoma crassum* sp. nov., *Hyphantosoma tenue* sp. nov. and *Austroneaera eastera* sp. nov. Illustrated for the first time is the type material of *Tindaria salaria* Dall, 1908. Results of this study also revise previously accepted levels of endemicity as well as species affiliation with other biogeographical areas.

Key words: Indo-Pacific, Rapanuian, Mollusca, Bivalvia, New species, Downwind

Introduction

Easter Island and its companion islet, Salas y Gómez, are located approximately 3,300 km from the coast of Chile. They are the only land masses within the unique and remote biogeographical area of the eastern Indo-Pacific known as the Rapanuian subprovince (Schilder 1965). Contributing to the isolation are circular ocean currents, especially the pronounced upwelling between the South Pacific and Mentor currents. In terms of marine ecosystems, this insularity has produced a high degree of radiation in many groups. The marine benthic fauna can essentially be described as typical Pacific fauna with a relatively high number of endemic species. The depauperate benthic community employs a variety of adaptive strategies for survival in an environment stressed by scouring waves, multiple currents, and the absence of mineral nutrients. Most of the corals and other bottom invertebrates are typical of Indo-Pacific reefs, but a robust reef system has not formed.

Although there are a few tide pools and two small sandy beaches, Easter Island's intertidal zone is made up primarily of an unprotected rocky coastline which is scoured by strong wave activity. Furthermore, the sublittoral areas provide little or no refuge from the harsh environment above since most of the island is surrounded by a series of steep slopes and benches. There are many areas where the substrate can easily be near a 1000 m deep within 2 to 3 km of shore. Survival in this environment is based on a species' ability to adapt to living within small crevices and pockets of sediment between erosion channels and active downslope sediment transport.

Easter and Salas y Gómez Islands are currently the only rises of the Salas y Gómez Ridge, which are not submarine. While they are among the youngest mountains in the chain, their age is in question. Early studies have suggested they arose sometime between 2 to 3 million years ago, whereas more recent estimates show that Easter Island may only be 700 thousand years old or younger. This discrepancy is purportedly due to sample contamination in the earlier analysis (Haase *et al.* 1997).

According to Duda and Lee (2009), the populations of widespread Indo-Pacific species at Easter Island have for the most part not deviated genetically from populations elsewhere in the region. They attributed this pattern to either high rates of gene flow or recent colonization.

Reported endemic rates on the molluscan fauna range from 37–42%, (Rehder 1980; DiSalvo *et al.* 1988; Raines 2002). In preparation of his Easter Island treatise, Rehder reviewed and summarized all previous molluscan studies and examined over 7,000 specimens, of which, 3,480 littoral specimens were collected during his 1974 visit to the island. Separate research efforts conducted by DiSalvo and Osorio during the 1980s and 1990s continued to expand our knowledge of the island's littoral and sublittoral zones down to 60 meters (DiSalvo *et al.* 1988; Osorio & Cantuarias 1989; Osorio 1995). A map has been included to show the sampling locations of various research efforts during the past fifty years (Fig. 1).

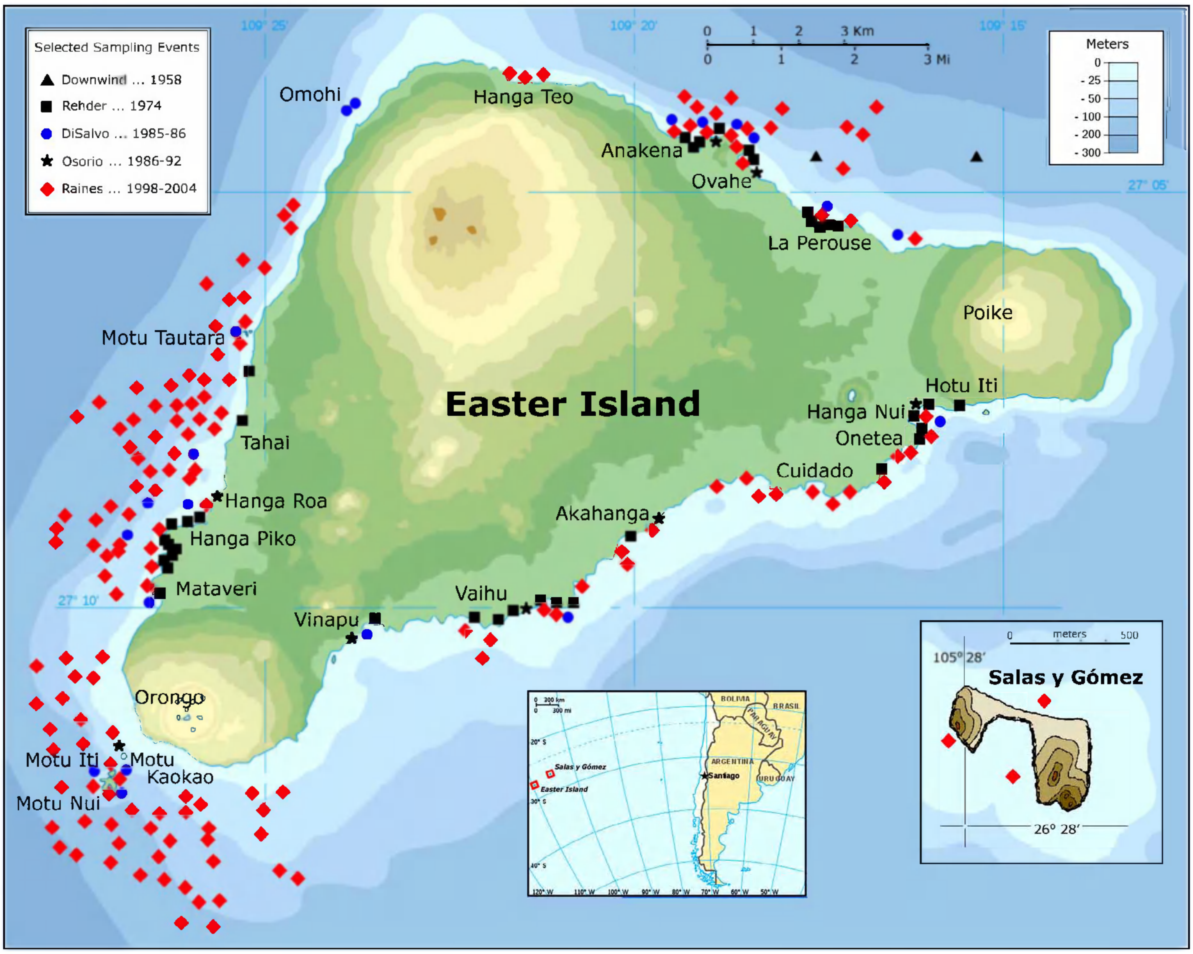

FIGURE 1. Selected sampling locations conducted during the past 50 years: Downwind Expedition (1958), Rehder (1974), DiSalvo (1985–1986), Osorio (1986–1992), and Raines (1998–2004). Base map adopted and modified from Wikipedia Commons (http://upload.wikimedia.org/wikipedia/commons/b/bc/Easter_Island_map-en.svg). License rules of the original also apply to the modified map (http://creativecommons.org/licenses/by-sa/3.0/).

This study resulted in the identification of over seventy bivalve species living in the waters of Easter and Salas y Gómez Islands. In many cases the opinions of earlier Easter Island workers had to be corrected. Several corrections were made at the specific level, many at the generic level, and in two cases at the familial level (Ostreidae to Gryphaeidae) and (Anomiidae to Dimyidae). To date no Ostreidae have been found at Easter Island, and a large majority of "anomiids" proved to represent juvenile dimyids. However, a few specimens indicated the presence of the genus *Monia*. Rehder's (1980: 114) Teredinidae record is still considered adventitious, based only on a single specimen found attached to a piece of floating pumice. Easter Island is not disposed to providing favorable habitats for teredinid populations. Regarding *Hiatella arctica* (Linnaeus, 1767), at present it is a cosmopolitan species with over 60 synonyms. Although there may well be a couple of hidden cryptic species, habitat and morphology did not allow separating the Easter Island specimens unambiguously from European or American forms. For the time being Coan *et al.* (2000: 485) is followed.

Anatomical analyses were not possible and genetic analysis could not be undertaken. In a few species, e.g. in *Barbarca tenella* (Reeve, 1844), or *Lima tomlini* Prashad, 1932, it cannot be excluded that the separation from the nominate species occurred long ago, and the current Easter Island population may represent a distinct species. However, this also affects questions of speciation which reaches beyond the scope of this review.

Material and methods

This study is based mainly on material collected by the senior author during his research trips to Easter Island in 1998, 2000 and 2002, as well as material collected on his behalf by Michel García, a local resident and dive master, who visited Salas y Gómez Island in 2004. In addition, we were able to study nearly all of the specimens collected during previous investigations conducted by Rehder, DiSalvo and Osorio, as well as those specimens collected during the 1957/58 Downwind Expedition (Scripps Institution of Oceanography) and from the 1904/05 U.S.S. Albatross (National Museum of Natural History, Washington D.C.) visits. The type material of *Tindaria salaria* Dall, 1908, from off Salas y Gómez Island was studied and is here illustrated for the first time. The type material of the extralimital *Hyphantosoma festoui* (Harte, 1993), from Tahiti is here illustrated for comparison.

All samples collected by the senior author were done so either by scuba diving or by dredging at depths ranging from 10 to 220 meters. To expedite the sorting process, samples were screened through sieves of varying mesh sizes and washed with fresh water. Over the course of several years, these samples were then subsequently sorted under a stereo microscope resulting in the examination of more than 21,000 specimens.

The large majority of species is present from dead valves only, though often collected in large numbers. Species identification is based on a morphological comparison with an extensive collection of Hawaiian, Marquesas and Indo-Pacific material. These comparisons were conducted with the use of optical as well as scanning electron microscopy (SEM).

In virtually all species, the original description and in most species the type material, at least from photos, was studied. For some of the more difficult species, notably within the isognomonids, spondylids, lucinids, galeommatids, cardiids and tellinids, the views of leading specialists were sought to help solidly base our conclusions.

Digital images were taken with a Nikon Coolpix 5000 camera attached to a Bausch and Lomb Stereo Zoom 7 optical microscope. Specimens were photographed multiple times at different depths of focus. The images were then stacked using Helicon Focus 4.8, which resulted in final images having a greater depth of field in focus. In order to enhance contrast and some shell details, images were edited using Adobe Photoshop CS2.

Measurements were taken using digital calipers. Height of specimens were determined by measuring from the umbo to a parallel point at the ventral margin. Length of specimens were determined by measuring the longest distance between the anterior and posterior sides. When measuring prodissoconch stages, the height was determined by measuring the longest distance perpendicular from the larval shell hinge line to a ventral end point. Length was determined by measuring the longest distance between the anterior and posterior sides parallel to the larval shell hinge line.

With the exception of a few paratypes, all type material of the new species and voucher specimens of each species recorded is housed either at the Natural History Museum of Los Angeles County, or at the Scripps Institution of Oceanography. The remaining material resides in our private reference collections.

Abbreviations

Institutions. ANSP: Academy of Natural Sciences, Philadelphia. MNHN: Muséum National d'Histoire Naturelle, Paris. NHMLAC: Natural History Museum of Los Angeles County, Los Angeles (formerly LACM). NHMUK: Natural History Museum, London (formerly BMNH). NMNH: National Museum of Natural History, Washington D.C. (formerly USNM). NMNZ: Museum of New Zealand Te Papa Tongarewa, Wellington. SIO: Scripps Institution of Oceanography. UCMP: University of California, Museum of Paleontology, Berkeley.

Geography. *EI*: Easter Island. *SyG*: Salas y Gómez Island. *HAW*: Hawaiian Islands. *POL*: French Polynesia. *NZK*: New Zealand and Kermadec Islands.

Geographic range groups. E1: Endemic to Easter and Salas y Gómez Islands. **E2**: Easter Island, Salas y Gómez Island, and the Hawaiian Islands only. **E3**: Easter and Salas y Gómez Islands, and the greater New Zealand region to include the Kermadec Islands only. **E4**: Indo-Pacific region, including Easter and Salas y Gómez Islands, French Polynesia, but not the Hawaiian Islands, New Zealand or the Kermadec Islands. **E5**: Indo-Pacific region, including Easter and Salas y Gómez Islands, French Polynesia, the Hawaiian Islands, New Zealand and/or the Kermadec Islands. **E6**: Pan-pacific.

Shell. LV: Left valve. RV: Right valve. P1: Early larval prodissoconch stage. P2: Second larval prodissoconch stage. N: nepioconch, early dissoconch stage. SF: supradorsal fusing.

Systematics. MT: Monotypy. T: Tautonomy. SM: Subsequent monotypy. OD: Original designation. SD: Subsequent designation.

Authors. BR: Bret Raines. MHU: Markus Huber.

Main Findings

The number of species living around Easter and Salas y Gómez Islands is much higher than in all earlier reports. The actual number of 71 species more than quadruples the first systematic review of Rehder (1980), who recorded fifteen bivalves from *EI* and *SyG*. A similar case was recently noted by the junior author (Huber 2010: 43) for the Marquesas Islands with a biodiversity of around 80 species, compared to the much lower earlier records. In her *Pacific Island Marine Mollusks*, Kay (1995) still noted only fifteen bivalves for Easter Island. Inferring from the present reality, her other findings, e.g. for Guam, Kwajalein, Society Islands and Pitcairn may also be far too low and have to be critically reassessed.

Nonetheless, the overall number of species is low and reflects the scarce diversity in remote and insular environments. Adding extensive deep water trawls, the diversity of *EI* and *SyG* may reach that of the Marquesas Islands (around 80 bivalves), but it is still only half than that found in the Hawaiian Islands (in excess of 160 bivalve species). Compared to the richest areas for bivalves globally, the Philippines and Indonesia (in excess of 1,500 bivalve species) (Huber 2010: 42), simply dwarf the number of *EI* species. As noted for the Marquesas Islands as well, most of the species present at *EI* and *SyG* are found in large numbers. This is in contrast to the richest areas, where a high diversity is encountered, but most species are found in very limited numbers.

Remarkably, the sizes in most species are much smaller than in continental or larger island conditions. Except, e.g. in *Arcopsis sculptilis* (Reeve, 1844), or *Spondylus exiguus* Lamprell & Healy, 2001, which reach maximum sizes at Easter Island. In most of the wider ranging species the sizes are less than 50% of the known maximum. Overall, less than 30 specimens were in excess of 20 mm, while several thousand specimens were at or below 5 mm. The largest bivalve studied was a worn chamid of 47 mm, and no large bivalve, i.e. over 100 mm, has ever been collected around *EI* or *SyG*. As evident in many other reports, this confirms a typical trait for small insular locations with limited adequate habitat.

In his investigation, Rehder (1980) summarized that 42.5% of the Easter Island species overall were either shared only with the Hawaiian Islands and/or the Pitcairn Islands, Rapa and the Kermadec Islands. Brook (1998) reported that 21% of all the Kermadec Islands species were also shared with Easter Island. In both cases the numbers appear to be significant, however, after a closer examination the relevance becomes questionable. Of the fifteen bivalve species reported by Rehder, just three were shared only with the Hawaiian Islands, and none were shared only with the Pitcairn or Kermadec Islands. The same type of scenario is found within Brook and Marshall (1998), where there are forty-five bivalve species reported, of which only two species are in common, and neither are shared only with Easter Island.

In our study, 71 species are recorded from *EI* and *SyG* with an endemic factor of 31%. Table 1 provides a summary of the biogeographical affinities to various faunal areas. Despite a significant increase in the total number of bivalves, just seven species (roughly 10%) are shared only with the Hawaiian Islands. And while we did find ten bivalves in common with New Zealand and/or the Kermadec Islands, there were no species shared only with this area. In contrast, the *EI* and *SyG* bivalves show a much greater affinity with species shared only with French Polynesia (16 species, or 22%), and with the Indo-Pacific region as a whole (24 species, or 34%). The biogeographical affinities of the *EI* and *SyG* bivalve fauna are clearly with the western Indo-Pacific rather than with Hawaiian, New Zealand or Kermadec Island fauna. In only two cases, *Malleus regulus* (Forsskål *in* Niebuhr, 1775), and *Hiatella arctica* (Linnaeus, 1767), an *EI* presence is shared eastward with the Panamic fauna (Coan, pers. comm., 2010).

Additionally, even the congeners of the newly described species are virtually in all cases found in the west, rather than the north or east. This further reinforces the westward Indo-Pacific relationship. Nonetheless, Easter Island and the Hawaiian Islands share nearly 41% of the bivalve species including five species previously reported as endemic to the Hawaiian Islands. Consequently, this study also reduces the endemic factor of the Hawaiian bivalve fauna.

Many of the *EI* bivalves represent far reaching Indo-Pacific species. Roughly one fourth also live in the waters off eastern Africa and thus, extends over the entire range of the Indo-Pacific.

TABLE 1. Summary of Easter and Salas y Gómez Islands affinity to various faunal areas.

	EI & *SyG*	Endemic	*HAW* only	*NZK* only	Indo-Pacific (including *POL* only)	Indo-Pacific (including *POL*, *HAW*, *NZK*)	Pan-pacific
		E1	**E2**	**E3**	**E4**	**E5**	**E6**
PROTOBRANCHIA	**3**	2	0	0	1	0	0
PTERIOMORPHIA	**34**	3	5	0	12	13	1
HETERODONTA	**34**	17	2	0	3	11	1
Total BIVALVIA	**71**	22	7	none	16	24	2
Percentage		**31%**	**10%**	**0%**	**22%**	**34%**	**3%**

Although the overall bivalve endemic factor is 31%, within the better known pteriomorphs this factor is currently below 15%, and only within the lesser known heterodonts is it at 50%. These numbers however, need to be tempered with the fact that a comprehensive review of Indo-Pacific tellinids and galeommatids is still lacking. For example, Bouchet *et al.* (2002: 433) recorded 60 galeommatids from New Caledonia, of which many are still undescribed. Thus, it may be expected that the total number of endemic Heterodonta will significantly diminish sometime in the future. In fact, the endemic factor of *EI* and *SyG* may eventually drop to 20–25%.

The familial composition of the area is interesting to note. Of the roughly 100 marine bivalve families (Bouchet *et al.* 2010), only 31% are found on Easter Island. This low familial diversity, however, is comparable to the Hawaiian Islands (39%) or Marquesas Islands (+25%). In contrast, the richest Indo-Pacific areas, Indonesia and the Philippines, have in excess of 80% of all marine bivalve families known.

Protobranchs are poorly represented, with only a few species present. This is consistent with recent findings of the Hawaiian Islands (Severns 2011), and for other Pacific Islands (e.g. Society and Tuamotu Islands, Northern Marianas and Marshall Islands among others; see Kay 1995). However, this may be due in part to the sampling techniques, which did not include trawls at depths below 220 meters.

Most notable in pteriomorphs is the absence of pinnids and ostreids. These families are poorly represented in the Hawaiian and Marquesas Islands as well, and seem to prefer conditions and habitats not found around Easter Island. As expected, strongly represented are pectinids and spondylids. Notable is the rather common presence of two *Dimya* species, and the sparse presence of anomiids. Highly remarkable is also the large number of pteriomorphs compared to heterodonts (*EI* and *SyG*: 1 : 1). Globally, heterodonts outnumber pteriomorphs by almost 3 : 1 (Huber 2010: 23).

Noteworthy in Heterodonta is the absence of *Donax* species, which is most likely due to the lack of their preferred habitat (wide sandy beaches), also largely absent on *EI*. On the other hand tellinids are well represented, three of which are considered new species. Similar as in New Caledonia and the Hawaiian Islands, numerous galeommatids are found at *EI*, and except for one, all the other six species proved to be new to science. Missing are corbulids, which are neither found in the Hawaiian Islands, nor in the Marquesas Islands. Sparsely represented are members of the otherwise largest bivalve family, with only three venerids collected, all of which are new to science.

The low number of Anomalodesmata may be due to the lack of deep water trawls. Inferring from global relationships, it is expected that a few more unrecorded protobranchs and/or anomalodesmatans are living off Easter and Salas y Gómez Islands.

Herein, two species are proposed as new synonyms, and fifteen species are described as new to science. At present these new species are only known from Easter Island, but the bivalve fauna of the tropical Pacific Islands is not particularly well known as yet, especially with regards to minute-sized species. Generically, all species including the galeommatids and tellinids, could be accommodated with existing genera. However, the genus *Nuculana* is applied in the widest sense.

Furthermore, possible new species of *Myonera* and *Vasticardium* are indicated. However, due to limited or fragmented material a formal description is premature. These species are briefly discussed, illustrated and treated as endemic, but remain unnamed. Confirmation with complete and/or adult material is needed for three posteriorly damaged *Leiosolenus* aff. *laevigatus*, a very juvenile *Lonoa* aff. *hawaiensis*, a very juvenile *Plicatula* aff. *plicata* and fragments of *Spondylus* aff. *mimus*.

Lastly, unresolved are a *Limaria* (*Limatulella*) species, a *Divarilima* species, and a *Monia* species. Further progress is restricted due to the limited and too juvenile material in combination with the unknown variability of similar Indo-Pacific species. These species are briefly discussed and illustrated.

Systematics

Class BIVALVIA Linnaeus, 1758

Subclass PROTOBRANCHIA Pelseneer, 1889

Superfamily NUCULOIDEA Gray, 1824

Family NUCULIDAE Gray, 1824

Genus *Nucula* Lamarck, 1799

Subgenus *Nucula* Lamarck, 1799

[Type species: *Arca nucleus* Linnaeus, 1758 (MT)]

Nucula (*Nucula*) *hawaiensis* Pilsbry, 1921

Figures 2 A–H

Nucula hawaiensis Pilsbry, 1921: p. 327, fig. 11.
Nucula hawaiensis Pilsbry, 1921—Dall *et al.*, 1938: p. 7, pl. 7, figs. 4–7; Kay, 1979: p. 497, figs. 160 C–D; Severns, 2011: p. 428, pl. 195, fig. 2.
Nucula polynesica Rehder, 1980: p. 106, pl. 13, figs. 1–2. **(syn. nov.)**
Nucula polynesica Rehder, 1980—Tröndlé & Boutet, 2009: p. 4.

Material examined. More than 100 articulated specimens and single valves (2 to 3 mm) from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU), and the holotype (ANSP 116351) of *Nucula hawaiensis*.

Diagnosis. Shell small (up to 3 mm in length), solid and obliquely ovate. Strongly inequilateral with the umbones near the posterior end. Anterior margin long and evenly rounded, while the posterior margin is short, broadly rounded to somewhat subtruncate. Exterior surface smooth near the umbones which is gradually followed by fine commarginal growth striae, increasing in strength near the ventral margin. Interior nacreous, pallial sinus simple, ventral margin finely crenulated. Hinge line arched and consisting of chevron-shaped taxodont teeth, anterior with 6–10, and posterior with 4–5. Color white with brown periostracum on fresh specimens.

Remarks. Rehder (1980: 106) proposed a new species living in *EI*, from five worn valves collected in sand above the high tide level. He based his new species on three differentiating characters, namely a slightly larger size, a perceived lack of commarginal ridges, and number of hinge teeth.

After studying the holotype of *Nucula hawaiensis* Pilsbry, 1921, and comparing specimens from both the Hawaiian Islands and *EI*, we came to the following conclusions: First, the size of 2.8 mm for the Hawaiian material, Kay (1979: 497), and 3.1 mm for the *EI* material, Rehder (1980: 106), is too close to be significant. Furthermore, none of the one hundred plus specimens collected by the senior author exceeded 3 mm.Second, not only the hinges but the dentition as well are very close. The Hawaiian specimens studied were within the range of Rehder's species with 6–10 teeth. Kay (1979: 497) gave 10–11 teeth for adult Hawaiian specimens. Lastly, the decisive character, the lack of ventral ridges is non-existent. In well preserved *EI* specimens, these same ventral ridges are visible as in *N. hawaiensis* (Fig. 2 B). Moreover, the shape is identical, the depth ranges are comparable and the general biogeography matches for 40% of all *EI* bivalves. Unless strong genetic signals were to separate them, we see little reason for two species.

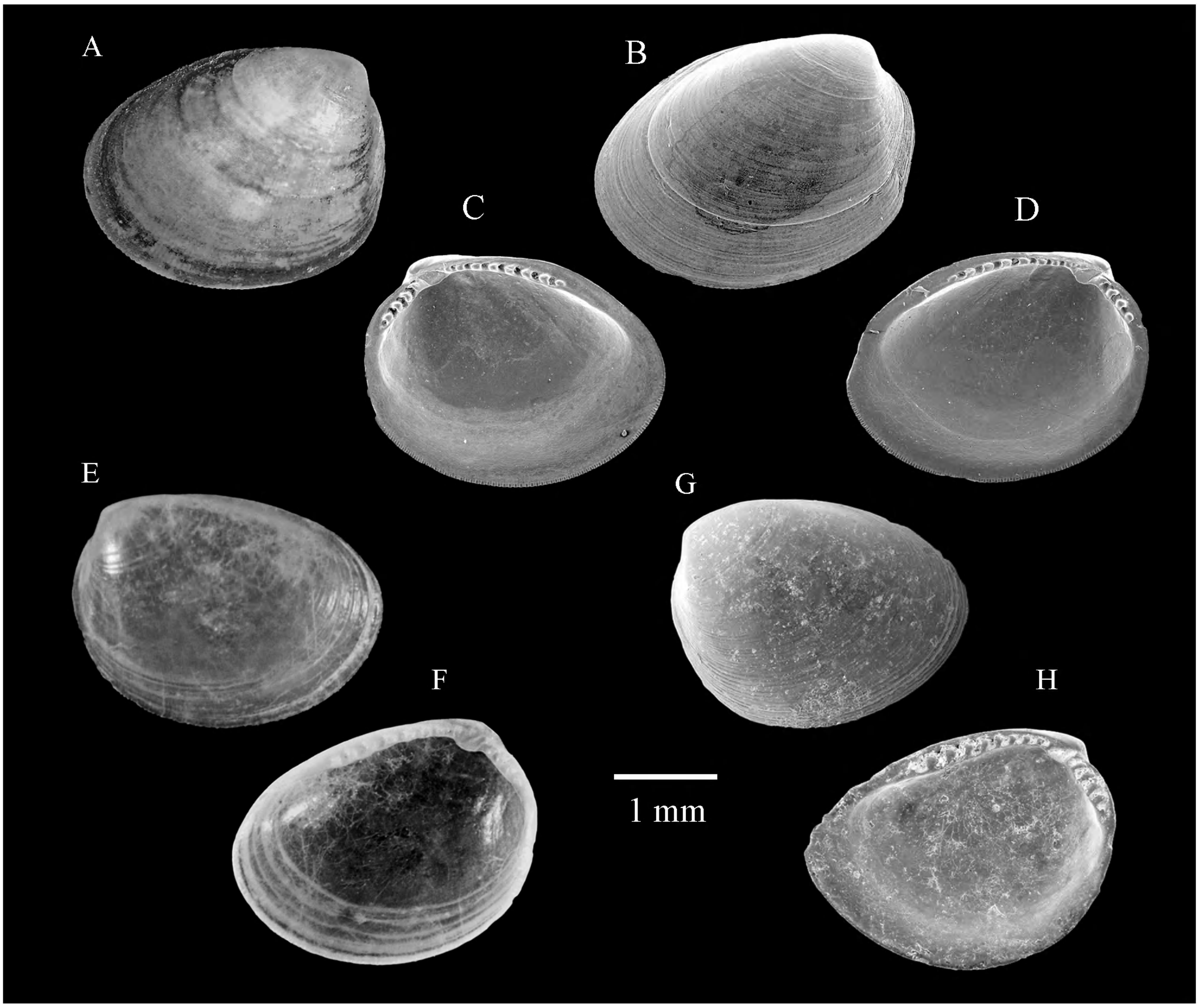

FIGURE 2. **A–D**, *Nucula* (*Nucula*) *hawaiensis* Pilsbry, 1921, (Easter Island); **A**, Exterior LV with periostracum partially present, 2.9 mm in length; **B**, Exterior LV, 3 mm in length; **C**, Interior LV, 2.8 mm in length; **D**, Interior RV, 2.8 mm in length; **E–F**, *Nucula hawaiensis*, (Hawaiian Islands); **E**, Exterior RV, 2.9 mm in length; **F**, Interior of same valve; **G–H**, *Nucula hawaiensis*, (Holotype, ANSP 116351); **G**, Exterior RV, 2.8 mm in length; **H**, Interior of same valve.

Habitat. Commonly found around *EI* and *SyG*, in sand from 20–150 m.

Distribution. Currently *Nucula hawaiensis* is known from the Hawaiian Islands, Easter and Salas y Gómez Islands, as well as the Austral Islands—**E4**.

Superfamily NUCULANOIDEA H. Adams & A. Adams, 1858

Family NUCULANIDAE H. Adams & A. Adams, 1858

Subfamily NUCULANINAE H. Adams & A. Adams, 1858

Genus *Nuculana* Link, 1807

[Type species: *Arca rostrata* Bruguière, 1789 (OD) =*Nuculana pernula* (Müller, 1779)]

Nuculana (s.l.) *anakena* sp. nov.

Figures 3 A–E

Type Material. Holotype: LACM 3148, 1 articulated specimen, 2.2 mm. Paratypes 1–3: LACM 3149, 3 single valves, 2.3–3.9 mm.

Type Locality. Along the base of cliffs in sand and rubble at 20 m off Punta Rosalia, east side of Anakena, Easter Island, 27°04'18" S, 109°19'45" W.

Description. A small, semi-translucent white *Nuculana* species, with raised subcentral umbones. Shell small (up to 4 mm in length), not very fragile, subtriangular, only slightly inflated, equivalve. Umbones raised, nearly centrally located. Prodissoconch, P1 round, smooth, boundary often weakly defined, ca. 247 µm length by 186 µm height, P2 not present. Anterior and posterior margins of adult valves subequal, with posterior margin shorter. Exterior surface smooth with commarginal growth lines, increasing in strength towards ventral margin. No posterior sulcus. Interior non-nacreous, lacks deep pallial sinus. Hinge line highly arched, consisting of split dentition with central resilifer; anterior with 7–9 teeth, posterior with 4–6 teeth. Color white.

TABLE 2. Selected measurements from the type material.

N. **(s.l.)** ***anakena*** **sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	2.2	1.6	250 x 200	–
Paratype 1	3.9	2.6	250 x 190	–
Paratype 2	2.5	1.8	240 x 170	–

Comparative diagnosis. A non-nacreous interior together with the shape excludes the genus *Ennucula* (=*Leionucula* auctt.). The shape, lack of a deep pallial sinus, and solid structure excludes the genera *Yoldiella* Verrill & Bush, 1897, and *Scissileda* Kilburn, 1994. The presence of a resilifer rules out all malletiids including *Neilonella* Dall, 1881. The lack of a sulcus combined with a rather shallow depth rules out the genus *Ledella* Verrill & Bush, 1897. The lack of a very thin hinge with few weak teeth and distinct shape exclude all Sareptidae Stoliczka, 1870.

Remarks. Although the shape and weak commarginal sculpture do not match typical *Jupiteria* very well, the closest species appears to be *Nuculana* (*Jupiteria*) *manawatawhia* Powell, 1937, from New Zealand. More and better material is needed to determine, if a new genus is warranted.

Distribution. *Nuculana* (s.l.) *anakena* is occasionally found at several locations around *EI*, in sand or rubble, from 10–100 m—**E1**.

Etymology. Named after the type locality.

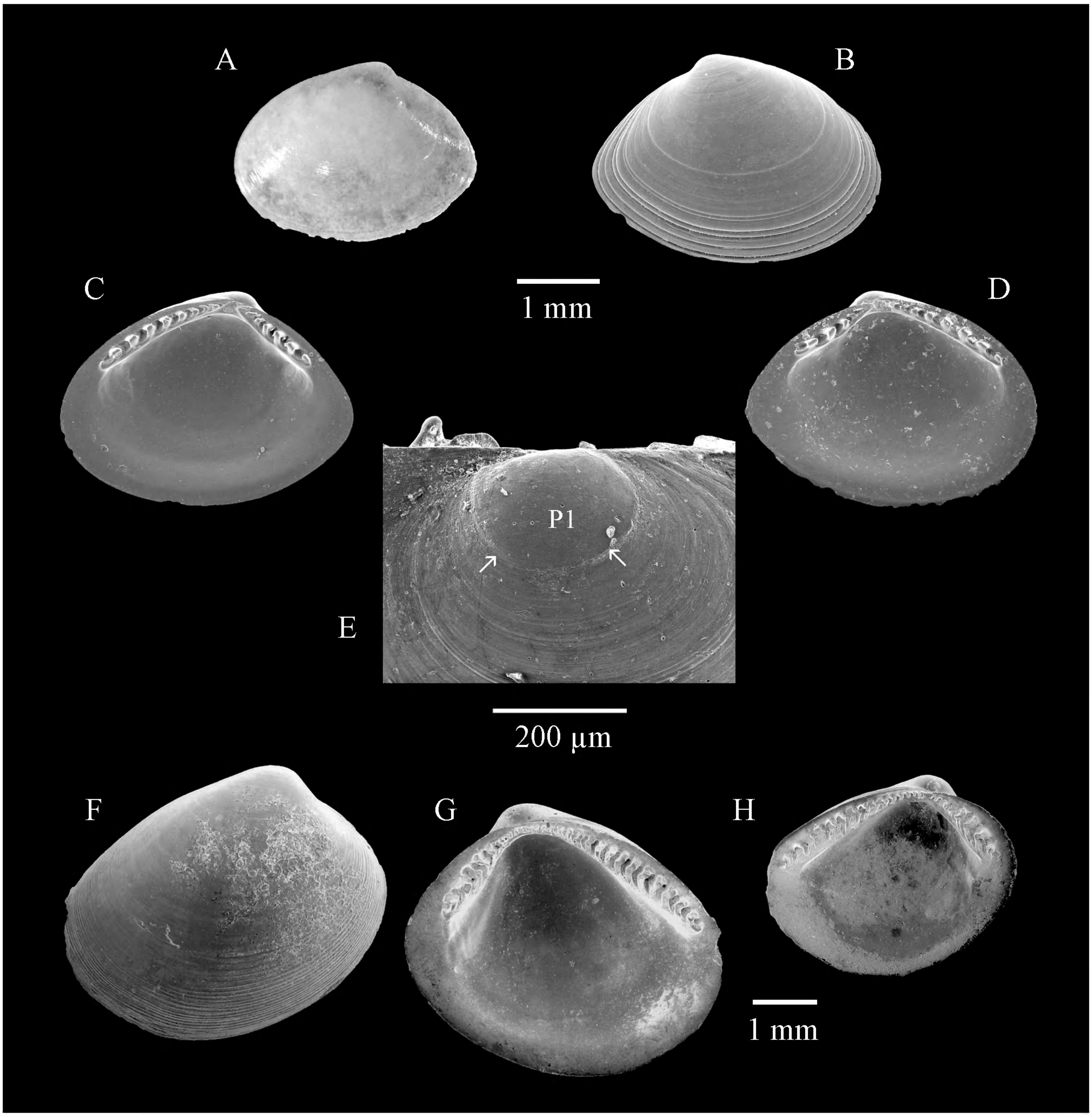

FIGURE 3. **A–E**, *Nuculana* (s.l.) *anakena* sp. nov.: **A**, Exterior LV, 2.8 mm in length; **B**, Exterior RV, 3.4 mm in length; **C**, Interior of same valve; **D**, Interior LV, 3.3 mm in length; **E**, Close up of the prodissoconch of a RV, arrows indicating boundary; **F–H**, *Tindaria salaria* Dall, 1908, (Syntypes, USNM 110695); **F**, Exterior RV, 5.2 mm in length; **G**, Interior of same valve; **H**, Interior LV, 3.5 mm in length.

Family TINDARIIDAE Verrill & Bush, 1897

Genus *Tindaria* Bellardi, 1875

[Type species: *Tindaria arata* Bellardi, 1875 (MT)]

Tindaria salaria Dall, 1908

Figures 3 F–H

Tindaria salaria Dall, 1908: p. 387.
Tindaria salaria Dall, 1908—Villarroel & Stuardo, 1998: p. 117.

Type Material. The type material USNM 110695, composed of three single valves (03/06: 5.2 mm; 01/04: 4.9 mm; 02/05: 3.5 mm) and two additional small fragments.

Type Locality. Dredged off Salas y Gómez Island, 26°30'S, longitude 105°45'W, by the U.S.S. Albatross in 1904, at Station 4693, in gravel at 2089 m.

Original description. "Shell pale cream color or white, nuculiform, smooth on the beaks, near the dorsal slopes and ends of the shell; basally concentrically striated, polished; the shell is very nearly the shape of a small *Nucula proxima* Say; ligament small, amphidetic, mostly posterior; resilium obsolete or none; there is no trace of a chondrophore; hinge line arched, with no lunule, the escutcheon narrow, long, feebly defined; interior white, porcellaneous, polished; pallial line not sinuated, margins entire; hinge with seven to eight anterior and eighteen to twenty posterior hinge teeth, small below the beaks, but forming an apparently continuous arch with no central gap." (Dall 1908: 387.)

Remarks. Although described over one hundred years ago, this is the first time *Tindaria salaria* has ever been illustrated (Figs. 3 F–H). The specimens resemble the genus *Tindaria* by lacking a pallial sinus, and by having a solid, ovate and rather inflated shape with ventrally marked commarginal sculpture, as well as by missing resilium and uninterrupted dentition (Fig. 3 G). Other than noted by Dall (1908: 387), no trace of a resilium was detected and the external ligament condition is perceived as opisthodetic, not amphidetic (Fig. 3 H). This further supports the placement within *Tindaria* along with its broad and strong hinge, which is characteristic of the genus.

No other eastern Pacific tindariid comes close to this species, notably not *T. compressa* Dall, 1908, or *T. kennerlyi* (Dall, 1908), (Coan *et al.* 2000: pl. 16), nor the doubtful *Tindaria thea* Dall, 1908, from Peru with a marked distinct shape or the many other tindariids illustrated in Knudsen (1970). Comparable in shape is *T. antarctica* Thiele & Jaeckel, 1931, but this species lives in much deeper water, grows to twice the size and has a much narrower hinge line. Thus to date, *T. salaria* is perceived as correctly placed and as an endemic species.

Distribution. At present *Tindaria salaria* is only known from the type locality, off Salas y Gómez Island—**E1**.

Subclass PTERIOMORPHIA Beurlen, 1944

Superfamily MYTILOIDEA Rafinesque, 1815

Family MYTILIDAE Rafinesque, 1815

Subfamily SEPTIFERINAE Scarlato & Starobogatov, 1979

Genus *Septifer* Récluz, 1848

[Type species: *Mytilus bilocularis* Linnaeus, 1758 (SD by Stoliczka, 1871)]

Septifer cumingii Récluz, 1849

Figures 4 A–H (juvenile specimens), Figures 5 A–F (adult specimens)

Septifer cumingii Récluz, 1849: p. 117, fig. 3.
Septifer cumingii Récluz, 1849—Huber, 2010: p. 115, fig. 9; Spencer *et al.*, 2011: p. 1; Severns, 2011: p. 438, pl. 200, fig. 6
Septifer furcillata Gould, 1861: p. 39.
Congeria bryanae Pilsbry, 1921: p. 323.
Septifer bryanae (Pilsbry, 1921)—Dall *et al.* 1938: p. 51, pl. 9, figs. 1–4; Kay 1979: p. 512, figs. 164 P–Q; Rehder, 1980: p. 107, pl. 13, figs. 9–12; Preece, 1995: p. 350; Tröndlé & Boutet, 2009: p. 4.
Septifer sp. cf. *bryanae* (Pilsbry, 1921)—Brook & Marshall, 1998: p. 211.

Material examined. Over 50 single valves (3.1 to 11.4 mm) from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU) and Pitcairn Island (BK).

Diagnosis. Shell small (rarely in excess of 11 mm), rather solid, only moderately inflated, equivalve, elongate-pyriform. Surface sculptured with numerous, fine divaricating, nodulose riblets. Ligament situated in a long narrow groove. Small, subumbonal tooth-like tubercles. Inner margin distinctly crenulated. The characteristic triangular, calcareous septum at the anterior end. Thin periostracum with a few fine unbranched hairs. Highly variable in color and in shape.

Remarks. This is a typical, small *Septifer* species widely distributed from the eastern Mediterranean and throughout the entire Indo-Pacific. *Septifer cumingii* is extremely variable in color (Figs. 4 A–H) and in shape (Figs. 5 A–F). In *EI* and *SyG* the reddish white colors were most commonly encountered.

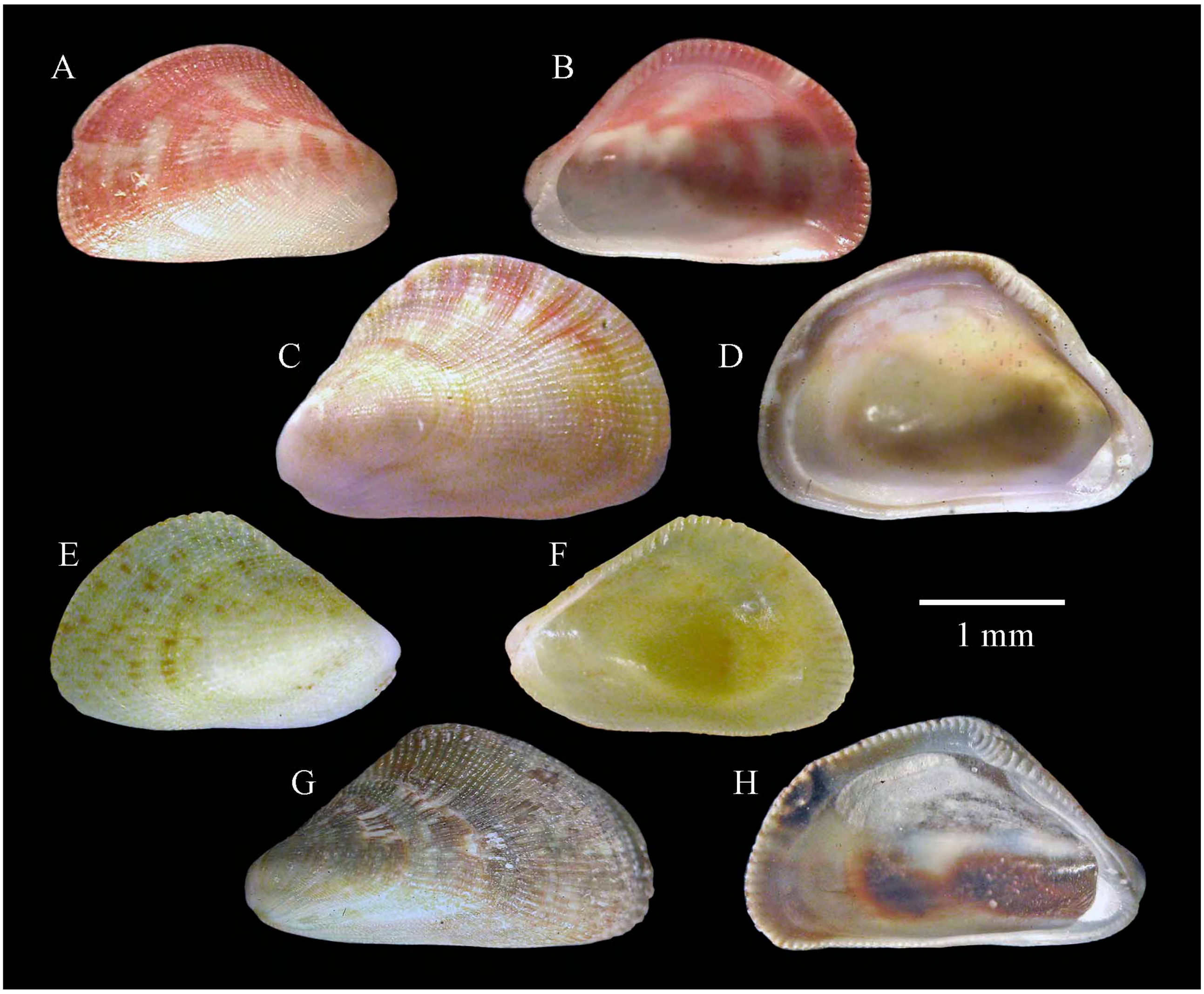

FIGURE 4. **A–H**, *Septifer cumingii* Récluz, 1849, (juvenile specimens): **A**, Exterior RV, 2.3 mm in length; **B**, Interior of same valve; **C**, Exterior LV, 2.7 mm in length; **D**, Interior of same valve; **E**, Exterior RV, 2.5 mm in length; **F**, Interior of same valve; **G**, Exterior LV, 2.8 mm in length; **H**, Interior of same valve.

Comparable in size, shape and sculpture is *S. rudis* Dall, Bartsch & Rehder, 1938, which is widely distributed as well. However, *S. rudis* has fewer and broader radiating riblets, and the colors are more subdued, or often just cream colored. This species was not encountered in any of the *Septifer* lots studied from Easter Island.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand, from 20–100 m.

Distribution. *Septifer cumingii* was originally described from the Anaa Atoll in the Tuamotu Archipelago, French Polynesia, but widely distributed from the eastern Mediterranean to the Hawaiian Islands, including the Society Islands, Austral Islands, Pitcairn Islands, eastern Australia, Lord Howe Island, Norfolk Island, northern New Zealand, Kermadec Islands, Easter and Salas y Gómez Islands—**E5**.

Subfamily MODIOLINAE G. Termier & H. Termier, 1950

Genus *Modiolus* Lamarck, 1799

[Type species: *Mytilus modiolus* Linnaeus, 1758 (ICZN 1955, opinion 325)]

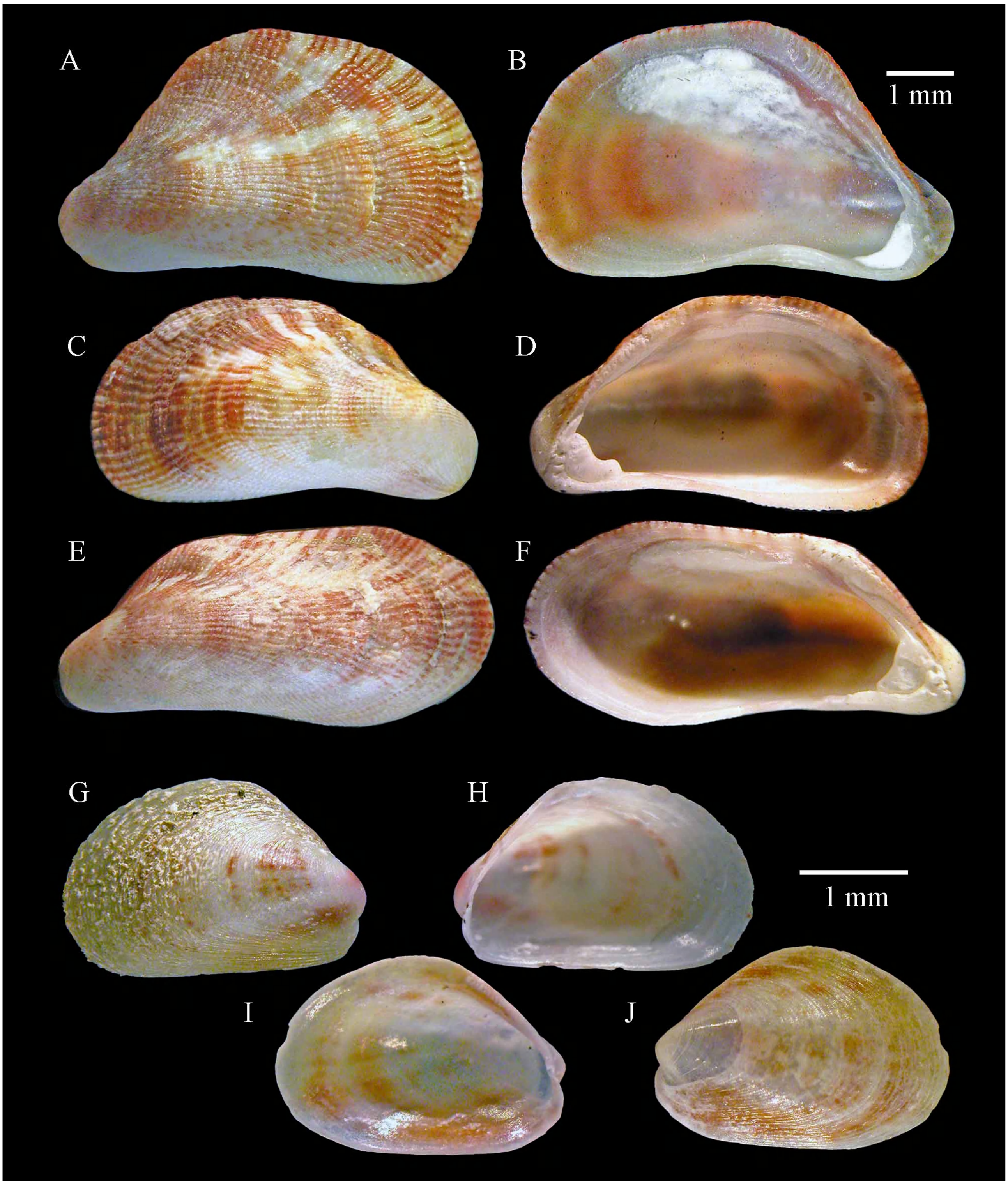

FIGURE 5. A–F, *Septifer cumingii* Récluz, 1849, (adult specimens); **A**, Exterior LV, 6.4 mm in length; **B**, Interior of same valve; **C**, Exterior RV, 5.9 mm in length; **D**, Interior of same valve; **E**, Exterior LV, 6.5 mm in length; **F**, Interior of same valve; **G–J**, *Modiolus matris* Pilsbry, 1921; **G**, Exterior RV with periostracum present, 2.6 mm in length; **H**, Interior of same valve; **I**, Interior LV, 2.7 mm in length; **J**, Exterior of same valve with periostracum partially present.

Modiolus matris Pilsbry, 1921

Figures 5 G–J

Modiolus matris Pilsbry, 1921: p. 321, pl. 12, fig. 18.
Volsella matris Pilsbry, 1921—Dall *et al.*, 1938: p. 44, pl. 7, figs. 12–15.

Modiolus matris Pilsbry, 1921—Kay, 1979: p. 512, figs. 164 K–L; Rehder, 1980: p. 107, pl. 13, figs. 7–8; Preece, 1995: p. 350; Tröndlé & Boutet, 2009: p. 4; Huber, 2010: p. 123, fig. 6; Severns, 2011: p. 438, pl. 200, fig. 3.

Material examined. Ten single valves (3.2 to 6.7 mm) from *EI*, plus specimens from the Hawaiian Islands (MHU), Marquesas Islands (MHU) and Pitcairn Island (BK).

Diagnosis. Shell small, somewhat rhomboidal, equivalve, inflated, thin and fragile, with a rounded dorsal margin and a gently concave ventral margin. Exterior surface consisting of fine, close-set commarginal threads, with a thin, hairy periostracum. Color creamy white to pale yellow background with irregular reddish brown radial streaks and blotches.

Remarks. The *EI* specimens conform to the Hawaiian and Marquesas material, though small compared to the maximum Hawaiian size of 19.3 mm.

Habitat. Occasionally found at several locations around *EI*, in fine sand, from 30–100 m.

Distribution. *Modiolus matris* was originally described from Oahu, Hawaii, but also known from Marquesas Islands, Austral Islands, Pitcairn Islands and Easter Island—**E5**.

Genus *Amygdalum* Megerle von Mühlfeld, 1811

[Type species: *Amygdalum dendriticum* Megerle von Mühlfeld, 1811 (MT)]

Amygdalum peasei (Newcomb, 1870)

Figures 6 A–C

Modiola peasei Newcomb, 1870: p. 163, pl. 17, fig. 2.
Volsella (*Amygdalum*) *peasei* (Newcomb, 1870)—Dall *et al.*, 1938: p. 45, pl. 8, figs. 11–14.
Amygdalum plumeum Kuroda & Habe *in* Kuroda *et al.*, 1971: p. 533, pl. 73, fig. 17.
Amygdalum peasei (Newcomb, 1870)—Kay, 1979: p. 509, figs. 164 C–D; Okutani, 2000: p. 875, pl. 435, fig. 68; Raines, 2002: p. 31, fig. 34; Tröndlé & Boutet, 2009: p. 4; Huber, 2010: p. 127, fig. 6; Severns, 2011: p. 436, pl. 199, fig. 3.

Material examined. Four live taken specimens (8.3 to 16.2 mm) and nearly two dozen fragments from *EI* (BK), plus specimens from the Hawaiian Islands (MHU) and Marquesas Islands (MHU).

Diagnosis. Shell small (up to 16 mm in length) elongate, moderately inflated, thin and fragile. Umbones low, hyaline. Prodissoconch, P1 not visible, P2 round, smooth, yellow to brown coloration, ca. 1.1 mm length and 900 µm height. Nepioconch elongate, smooth, translucent white, ca. 3.2 mm length and 4 mm height. Exterior surface of adult valves smooth to polished. Interior pearly, margins gaping. Hinge simple and weak. Color ivory white with reddish brown streaks and speckles posteriorly.

Remarks. The genus *Amygdalum* was tentatively placed in the subfamily Bathymodiolinae by Huber (2010: 542). However, until genetic information becomes available, we have kept it here in its more recognized subfamily Modiolinae. The *EI* specimens conform well to the Hawaiian and Marquesas material, though their size is well below the maximum of 38 mm (Hawaii).

Habitat. Occasionally found at several locations around *EI*, in sand, from 20–50 m.

Distribution. *Amygdalum peasei* was originally described from the Hawaiian Islands, but is also known from the Philippines, Society Islands, Marquesas Islands, Japan and Easter Island—**E5**.

Subfamily LITHOPHAGINAE H. Adams & A. Adams, 1857

Genus *Leiosolenus* Carpenter, 1857

Subgenus *Leiosolenus* Carpenter, 1857

[Type species: *Leiosolenus spatiosus* Carpenter, 1857 (MT)]

Leiosolenus (*Leiosolenus*) aff. *laevigatus* (Quoy & Gaimard, 1835)

Figures 6 D–G

Lithodomus laevigatus Quoy & Gaimard, 1835: p. 464, pl. 78, figs. 17, 18.

Lithophaga laevigata (Quoy & Gaimard, 1835)—Tröndlé & Boutet, 2009: p. 4.
Leiosolenus (*Leiosolenus*) *laevigatus* (Quoy & Gaimard, 1835)—Huber, 2010: p. 119, fig. 10.

Material examined. Three partial valves (ca. 9 to 11 mm) (BK).

Diagnosis. *Leiosolenus laevigatus* is a small lithophagid up to 40 mm, thin, fragile and with a smooth exterior. The ventral margin is straight to slightly convex, gradually bending upwards at both ends; the dorsal margin is centrally angulated, gently bending to a straight line at both extremities. The periostracum is pale yellowish at the anteroventral end and light brown at the posterodorsal end. The posterior incrustations are firmly adhered and protrude slightly, up to 1–2 mm only, ending in a somewhat serrated pattern.

Remarks. The size, shape and calcareous deposits clearly place these partial valves within the genus *Leiosolenus*. Unfortunately, the important specific level characteristics are unavailable due to the missing posterior portions of each specimen. However, from the lack of oblique sculpture *L. mucronatus* (Philippi, 1846), known from Marquesas Islands and the Hawaiian Islands, can be excluded. From the color, shape and sculpture *L. aristatus* (Dillwyn, 1817), known from the Hawaiian Islands, is also excluded. Lastly, the shape and sculpture would exclude *L. malaccanus* (Reeve, 1857), well known from Marquesas Islands and likely also found in the Hawaiian Islands.

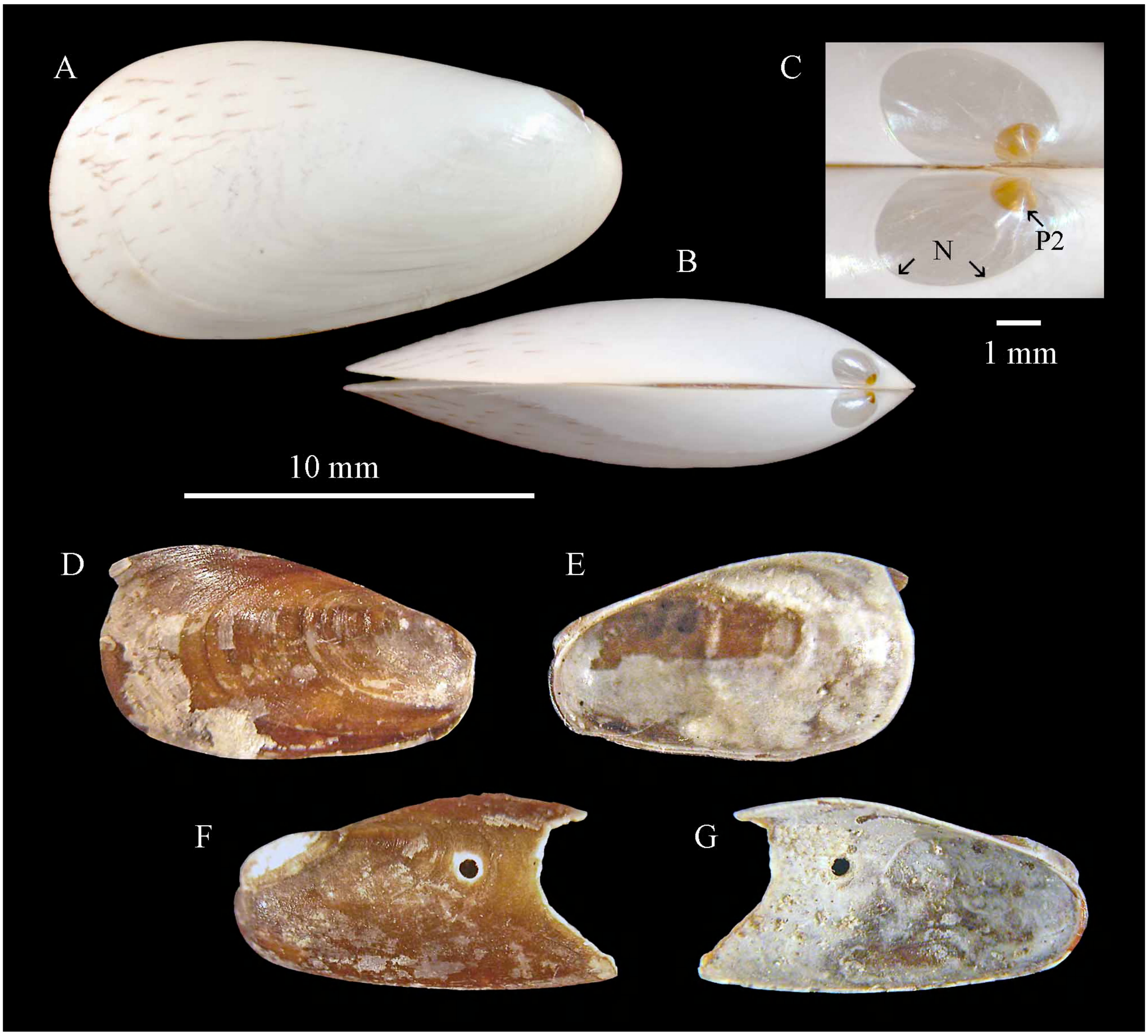

FIGURE 6. **A–C**, *Amygdalum peasei* (Newcomb, 1870); **A**, Exterior RV, 16.23 mm in length; **B**, Dorsal view of same specimen; **C**, Close-up of the prodissoconch and nepioconch, arrows indicating boundaries; **D–G**, *Leiosolenus* (*Leiosolenus*) aff. *laevigatus* (Quoy & Gaimard, 1835); **D**, Exterior RV, ca. 11 mm in length; **E**, Interior of same valve; **F**, Exterior LV, ca. 10.5 mm in length; **G**, Interior of same valve.

Leiosolenus laevigatus is known from the Marquesas Islands, and for also being comparatively small in size elsewhere. As with other species in this group, *L. laevigatus* chemically bores into various living corals, as well as shells.

Habitat. Occasionally found at several locations around *EI*, dead in sand, from 30–80 m.

Distribution. *Leiosolenus laevigatus* was originally described from Port Dorey, New Guinea, but ranges from Timor, Indonesia to Okinawa, as well as the Society Islands, Marquesas Islands, Tuamotu Archipelago and Gambier Islands. However, it is not known from the Hawaiian Islands, Kermadec Islands or New Zealand. Easter Island appears to be a possible range extension—**E4**.

Superfamily ARCOIDEA Lamarck, 1809

Family ARCIDAE Lamarck, 1809

Genus *Acar* Gray, 1857

[Type species: *Byssoarca divaricata* G.B. Sowerby I, 1833 (SD by Stoliczka, 1871) =*Arca plicata* Dillwyn, 1817]

Acar plicata (Dillwyn, 1817)

Figures 7 A–F

Arca plicata Dillwyn, 1817: p. 227.
Acar plicata (Dillwyn, 1817)—Preece, 1995: p. 350; Brook & Marshall, 1998: p. 211; Okutani, 2000: p. 849, pl. 422, fig. 18; Tröndlé & Boutet, 2009: p. 4; Huber, 2010: p. 130, fig. 5; Spencer *et al.*, 2011: p. 1; Severns, 2011: p. 432, pl. 197, fig. 6.
Byssoarca divaricata G.B. Sowerby I, 1833: p. 18.
Acar hawaiensis Dall *et al.*, 1938: p. 14, pl. 1, figs. 5–8.
Barbatia (*Acar*) *divaricata* (Sowerby, 1833)—Kay, 1979: p. 501, figs. 161 E–G.
Barbatia (*Acar*)—Luke, 1995: p. 106.
Arca sp.—Trego, 1997: p. 199.

Material examined. Over 100 single valves (6 to 16.1 mm) (BK), including material from the 1957/58 Downwind Expedition (SIO Benthic Collection, M1442).

Diagnosis. Shell small, elongated trapezoidal, inflated, equivalve, inequilateral, not fragile. Umbones elevated. Posterior end comes to a point at the ventral margin. Exterior surface of pronounced commarginal ridges crossed by radiating ribs. Hinge consisting of numerous teeth continuous under the umbones, slanted, and larger distally. Color creamy white to tan.

Remarks. As usual the *EI* specimens are quite small, but conform well to Indo-Pacific and Hawaiian material. The *Barbatia* (*Acar*) and *Arca* species noted by Luke (1995) and Trego (1997) from the SIO Benthic Collection, M1442 (Figs. 7 D–F) represent this species as well.

Habitat. Commonly found at many locations around *EI*, dead in sand, from 50–150 m.

Distribution. *Acar plicata* is widely distributed from the Red Sea throughout the Indo-Pacific, to include the Society Islands, Tuamotu Archipelago, Pitcairn Islands, Hawaiian Islands, eastern Australia, Lord Howe Island, Norfolk Island, and the Kermadec Islands. Easter Island is now considered a range extension—**E5**.

Genus *Calloarca* Gray, 1857

Subgenus *Coraliarca* Habe & Okutani, 1968

[Type species: *Calloarca* (*Barbarca*) *nuttingi* Dall *et al.*, 1938 (OD)]

Calloarca (*Coraliarca*) *nuttingi* (Dall, Bartsch & Rehder, 1938)

Figures 7 G–I

Calloarca (*Barbarca*) *nuttingi* Dall *et al.*, 1938: p. 26, pl. 4, figs. 17–20.
Barbatia nuttingi Dall *et al.*, 1938—Kay, 1979: p. 503, figs. 162 I–J.

Barbatia cf. *nuttingi* Dall *et al.*, 1938—Rehder, 1980: p. 106, pl. 12, figs. 12–15.
Barbatia sp. cf. *nuttingi* (Dall *et al.*, 1938)—Brook & Marshall, 1998: p. 211; Spencer *et al.*, 2011: p. 1.
Calloarca (*Coraliarca*) *nuttingi* (Dall *et al.*, 1938)—Severns, 2011: p. 430, pl. 196, fig. 6.

Material examined. Several hundred single valves (4.2 to 10.1 mm) from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU) and Pitcairn Island (BK).

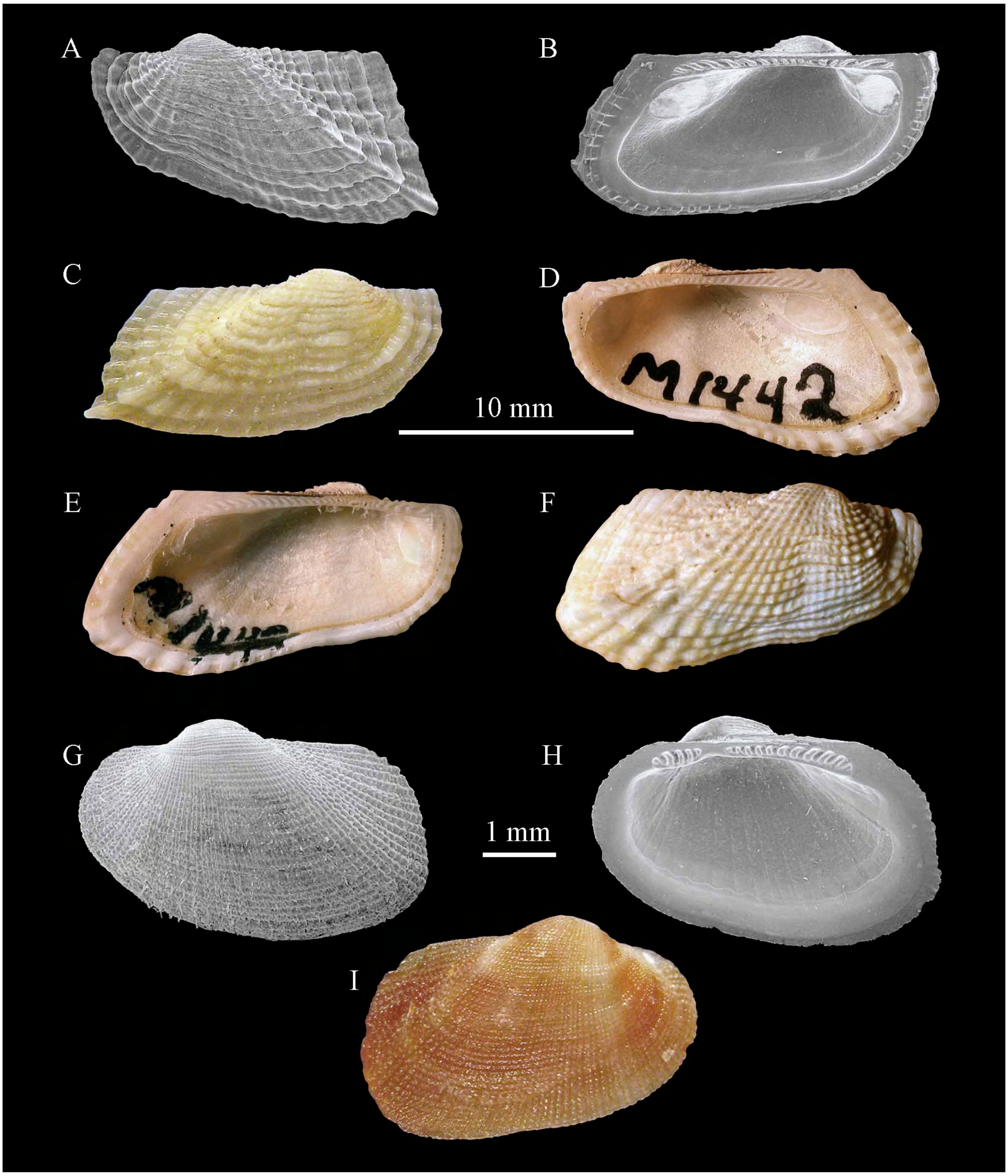

FIGURE 7. **A–F**, *Acar plicata* (Dillwyn, 1817); **A**, Exterior LV, 14.5 mm in length; **B**, Interior LV, 15.4 mm in length; **C**, Exterior RV, 15 mm in length; **D**, Interior RV, 16.1 mm in length (SIO); **E**, Interior LV of same specimen; **F**, Exterior RV of same specimen; **G–I**, *Calloarca* (*Coraliarca*) *nuttingi* (Dall, Bartsch & Rehder, 1938); **G**, Exterior LV, 4.65 mm in length; **H**, Interior RV, 4.7 mm in length; **I**, Exterior RV, 4.5 mm in length.

Diagnosis. Shell small, subovate, equivalve, inflated, not fragile. Umbones elevated. Posterior end curved but obliquely rounded at the junction with the ventral margin; anterior end well rounded. Exterior surface of fine, nodulous radial riblets. Ventral margin and hinge line subparallel. Hinge consisting of numerous teeth separated under the umbones, slanted, and larger distally. Color from dark tan to reddish brown, with white blotches or rays.

Remarks. Although the *EI* specimens are smaller, they conform well to Hawaiian material. *Calloarca* (*Barbarca*) *nuttingi* is the type species, by OD of *Coraliarca* Habe & Okutani, 1968. As such, Rehder's (1980) tentative identification is specifically confirmed. However, his selection of the related genus *Barbatia* is not.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand, from 10–80 m.

Distribution. *Calloarca* (*Coraliarca*) *nuttingi* is known from French Polynesia, Pitcairn Islands, Easter and Salas y Gómez Islands, Norfolk Island, Kermadec Islands and the Hawaiian Islands—**E5**.

Subgenus *Barbarca* Dall, Bartsch & Rehder, 1938

[Type species: *Calloarca* (*Barbarca*) *hua* Dall *et al.*, 1938 (OD) =*Arca tenella* Reeve, 1844]

Calloarca (*Barbarca*) *tenella* (Reeve, 1844)

Figures 8 A–C

Arca tenella Reeve, 1844: sp. 91, pl. 14, fig. 91.
Calloarca (*Barbarca*) *hua* Dall *et al.*, 1938: p. 24, pl. 4, figs. 5–8.
Barbatia tenella (Reeve, 1844)—Tröndlé & Boutet, 2009: p. 5; Kay, 1979: p. 504, figs. 162 C–D.
Barbatia (*Barbarca*) *tenella* (Reeve, 1844)—Oliver, 1992: p. 36, pl. 2.
Calloarca (*Barbarca*) *tenella* (Reeve, 1844)—Huber, 2010: p. 131, fig. 7; Severns, 2011: p. 430, pl. 196, fig. 5.

Material examined. Over one hundred single valves (4.1 to 6.2 mm) from *EI* and *SyG* (BK), plus specimens from the Hawaiian and Marquesas Islands (MHU).

Diagnosis. Shell small, elongated ovate, equivalve, inflated, not fragile. Umbones elevated. Posterior and anterior ends rounded. Ventral margin sinuous. Exterior surface of fine radial riblets and commarginal threads. Hinge consisting of numerous teeth separated under the umbones, slanted, and larger distally. Color creamy white.

Remarks. All the *EI* specimens are exceedingly small, so it cannot be completely excluded that the current *EI* population may represent a distinct species. However, without strong genetic data to support it, there is no way to separate them. As with most families the *EI* material consists of smaller examples overall, which is probably due in part to a combination of the insular isolation, harsh environment and a scarce food supply.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand, from 10–80 m.

Distribution. *Calloarca* (*Barbarca*) *tenella* is a widely distributed species from eastern Africa to Marquesas Islands, Tuamotu Archipelago, Austral Islands and the Hawaiian Islands. However, it is not known from New Zealand or the Kermadec Islands. Easter and Salas y Gómez Islands are now considered a range extension—**E5**.

Family NOETIIDAE Stewart, 1930

Genus *Arcopsis* Koenen, 1885

[Type species: *Arca limopsis* Koenen, 1885 (SD by Reinhart, 1935)]

Arcopsis sculptilis (Reeve, 1844)

Figures 8 D–F

Arca sculptilis Reeve, 1844: sp. 118, pl. 17, fig. 118.
Arcopsis sculptilis (Reeve, 1844)—Huber, 2010: p. 147, fig. 8.
Barbatia (*Acar*)—Luke, 1995: p. 106.

Material examined. Several articulated specimens and nearly fifty single valves (4 to 8.5 mm) (BK), including material from the 1957/58 Downwind Expedition (SIO Benthic Collection, M1447), plus specimens from the Red Sea (MHU), Philippines (MHU) and Borneo (MHU).

Diagnosis. Shell small, subovate, equivalve, inflated, not fragile. Umbones elevated. Posterior end obtusely rounded, anterior rounded. Exterior surface latticed with raised fine radial and commarginal threads. Diamond-shaped ligament. Hinge consisting of numerous teeth separated under the umbones, slanted, and larger distally. Color white to pale tan.

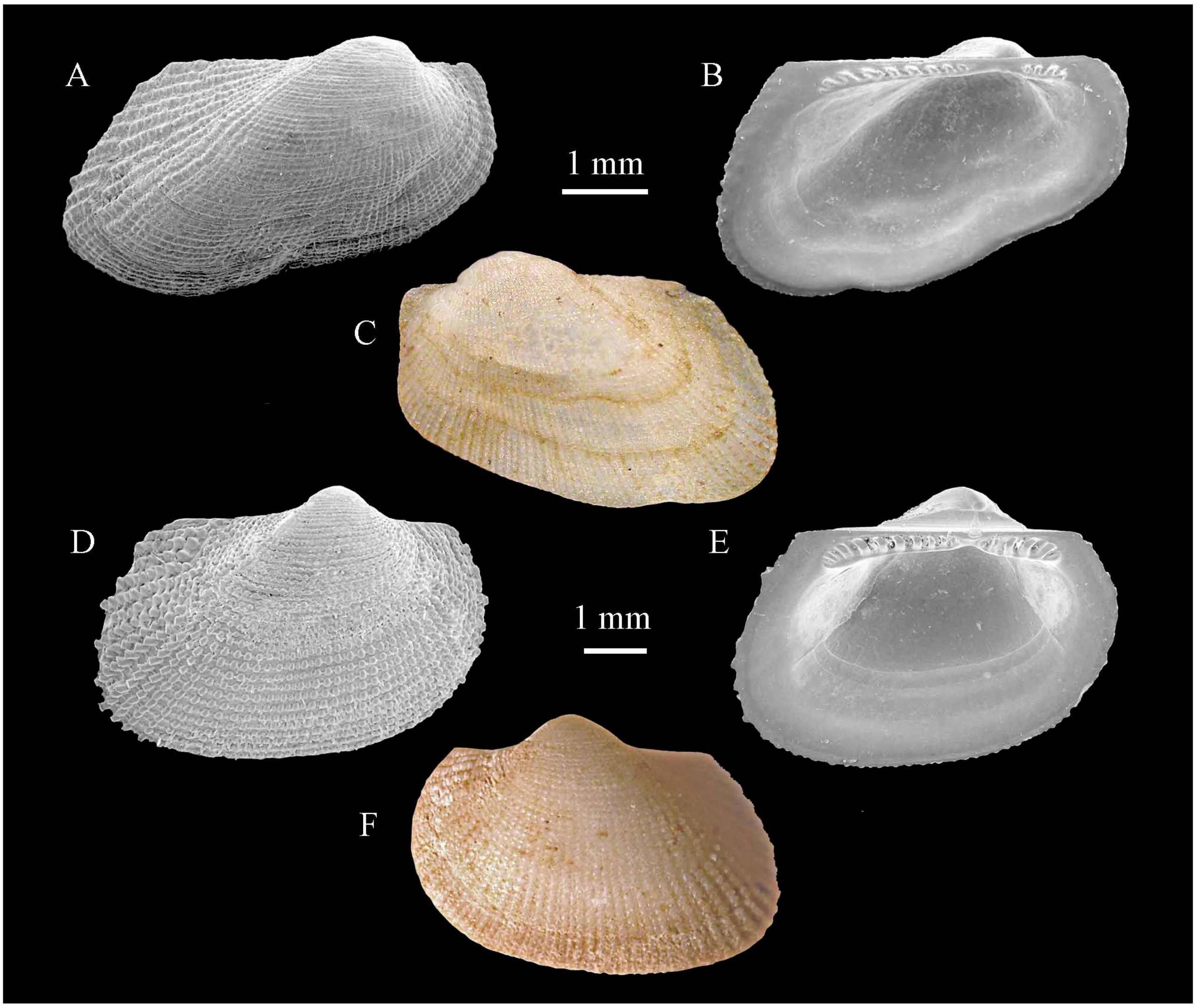

FIGURE 8. A–C, *Calloarca* (*Barbarca*) *tenella* (Reeve, 1844): **A**, Exterior RV, 5 mm in length; **B**, Interior LV, 4.6 mm in length; **C**, Exterior LV, 4.2 mm in length; **D–F**, *Arcopsis sculptilis* (Reeve, 1844): **D**, Exterior RV, 6 mm in length; **E**, Interior LV, 5.9 mm in length; **F**, Exterior LV, 5.8 mm in length (SIO).

Remarks. The *EI* material was compared with Red Sea, Philippine and Borneo material, which showed the same variations in shape and sculpture. Currently, this is the only true *Arcopsis* species known from the Indo-Pacific. Unusual is the fact, that some of the *EI* specimens actually exceed the norm in size (WRS 8.5 mm from Anakena). However, this may be due to restricted collecting elsewhere. The *Barbatia* (*Acar*) species noted by Luke (1995) from the SIO Benthic Collection, M1447 (Fig. 8 F) represents this species as well.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand, from 10–180 m.

Distribution. *Arcopsis sculptilis* is a widely distributed species throughout the Indo-Pacific including the Red Sea. However, it is not known from the Hawaiian Islands, New Zealand or the Kermadec Islands. Easter and Salas y Gómez Islands are now considered a range extension—**E4**.

Family GLYCYMERIDIDAE Dall, 1908

Genus *Tucetona* Iredale, 1931

[Type species: *Pectunculus flabellatus* Tenison-Woods, 1878 (OD)]

Tucetona kauaia (Dall, Bartsch & Rehder, 1938)

Figures 9 A–E

Glycymeris kauaia Dall *et al.*, 1938: p. 40, pl. 7, figs. 2–3.
Glycymeris—Luke, 1995: p. 106.
Glycymeris sp—Trego, 1997: p. 199.
Tucetona kauaia (Dall *et al.*, 1938)—Severns, 2011: p. 434, pl. 198, fig. 5.

Material examined. Two valves from the SIO Benthic Collection, M1444, RV, 28.8 mm x 29.5 mm, LV, 24.9 mm x 25 mm.

Diagnosis. Shell small to medium (up to 30 mm in height), irregular ovate, inequilateral and stout. Umbones well elevated. Exterior surface of 22–29 flattened-top radiating ribs crossed by commarginal lamellae. Internal ventral margin fluted. Hinge consisting of up to 12 teeth both posteriorly and anteriorly separated under the umbones. Color white with a reddish brown wash.

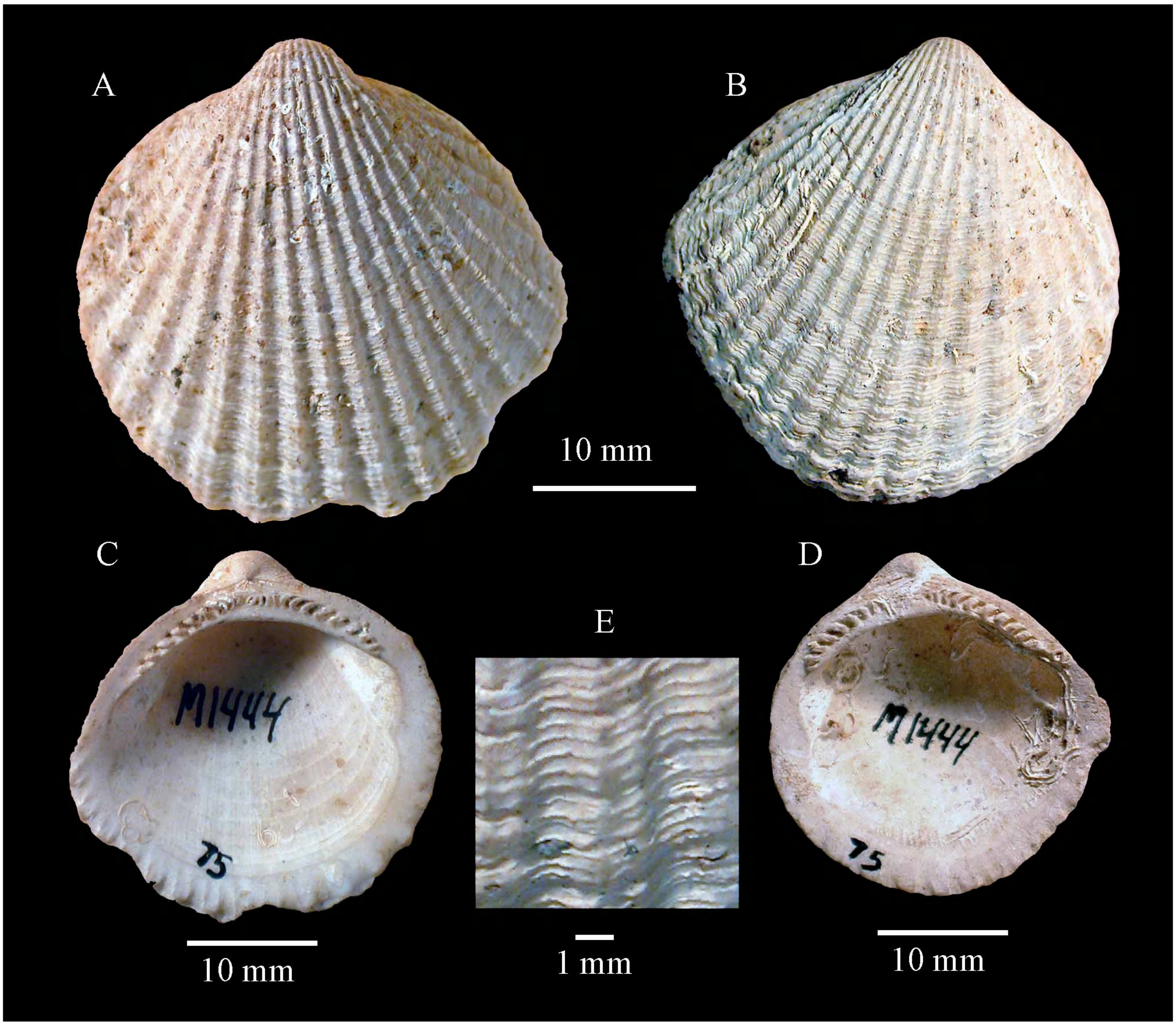

FIGURE 9. **A–E**, *Tucetona kauaia* (Dall, Bartsch & Rehder, 1938) (SIO); **A**, Exterior LV, 29.5 mm in height; **B**, Exterior RV, 25 mm in height; **C**, Interior of same LV; **D**, Interior of same RV; **E**, Close-up of sculpture.

Remarks. There are no species of *Glycymeris* known from the Hawaiian Islands or *EI*, only species of *Tucetona*; nor have any glycymeridid been recorded from the Marquesas Islands. Although *T. kauaia* was described from a single valve with 29 ribs, fewer ribbed Hawaiian specimens have been studied. A genetic comparison would definitely be useful here to provide a more solid basis for the identification.

Habitat. Trawled from 40–100 m, La Perouse Bay, Easter Island, 1957/58 Downwind Expedition (DWHD-76).

Distribution. *Tucetona kauaia* is only known from the Hawaiian Islands and Easter Island—**E2**.

Family PHILOBRYIDAE F. Bernard, 1897

Genus *Cratis* Hedley, 1915

[Type species: *Cratis progressa* Hedley, 1915 (OD)]

Cratis kanekoi Hayami & Kase, 1993

Figures 10 A–G

Cratis kanekoi Hayami & Kase, 1993: p. 36, figs. 103–110.

Cratis kanekoi Hayami & Kase, 1993—Hayami & Kase, 1996: p. 61; Okutani, 2000: p. 861, pl. 428, fig. 2; Tröndlé & Boutet, 2009: p. 5.

Material examined. Eleven single valves from *SyG*, and one badly worn valve from *EI* (1.8 to 2.77 mm) (BK).

Diagnosis. Shell small (up to 2.77 mm in height), polygonal-ovate, thick and not fragile. Umbones located anteriorly, with a large, hat-shaped prodissoconch which is characterized by a low conical central base and coarsely frilled brim margin, ca. 260 μm length and 250 μm height. Exterior surface with 7–9 beaded radial ribs crossed by regular commarginal lamellae. Intervals between ribs are broadly concave. Interior margin with a few strongly marked interlocking tubercles restricted to postero-ventral area. Hinge consisting of a large tubercular tooth in the anterior of each valve and numerous perpendicular denticles placed dorsally and interrupted by the ligament, resulting in a row of anterior and posterior denticles. Color translucent white and sparse orange blotches in adults.

Remarks. From the ten described philobryid genera, *Cratis* matches well by exhibiting the strong cap, clear dentition, trigonal ligament pit, dorsal denticles and pinctadoid shape. The sculpture of the *EI* material, however, is less beaded than in the type species and in most of the congeners. Internally, the posteroventrally 4–5 marked interlocking tubercles are similarly found in *Cratis delicata* Bergmans, 1970, which, has a very distinct hinge and dentition. The type species *C. progressa* has similar tubercles also placed anteroventrally, and a much stronger dentition as well as a strong, narrowly beaded sculpture.

Nothing known from the Hawaiian Islands resembles this species, and from the nine described Pacific *Cratis* species, only one merits close comparison, namely, *C. kanekoi* Hayami & Kase, 1993, from Miyako Island. All other species are at once separated by sculpture and/or stronger dentition and/or missing or additional tubercles.

Cratis kanekoi is identical in shape and in sculpture with widely spaced radials and lamellate commarginals. Position and sculpture of the cap are indistinguishable. Internally, the posterodorsal tubercles are very similarly arranged. At first glance the hinges seem to differ in that the tooth socket is placed left or posterior to the large cardinal of the scarce Okinawan material. However, in the numerous *EI* and *SyG* material studied both conditions were encountered, with the socket placed left or right of the prominent tubercular tooth. This is consistent with Tevesz's (1977: 15) observation of high intraspecific variability of the *Cratis* dentition. Thus, no significant morphological differences to *C. kanekoi* remain.

The *EI* and *SyG* material, however, does provide *C. kanekoi* a new maximum size of 2.77 mm, variability in position of cardinal tooth and socket, as well as an additional feature in adult specimens, that it is occasionally being found with orange blotches. The availability of the material also suggests it has a more common occurrence than originally recorded by Hayami and Kase (1993).

Habitat. Apparently common from *SyG*, but less so on *EI*, in sand, from 20 m.

Distribution. *Cratis kanekoi* was originally described from Okinawa, but has been recorded from the Society Islands and the Tuamotu Archipelago as well. Easter and Salas y Gómez Islands are now considered a range extension—**E4**.

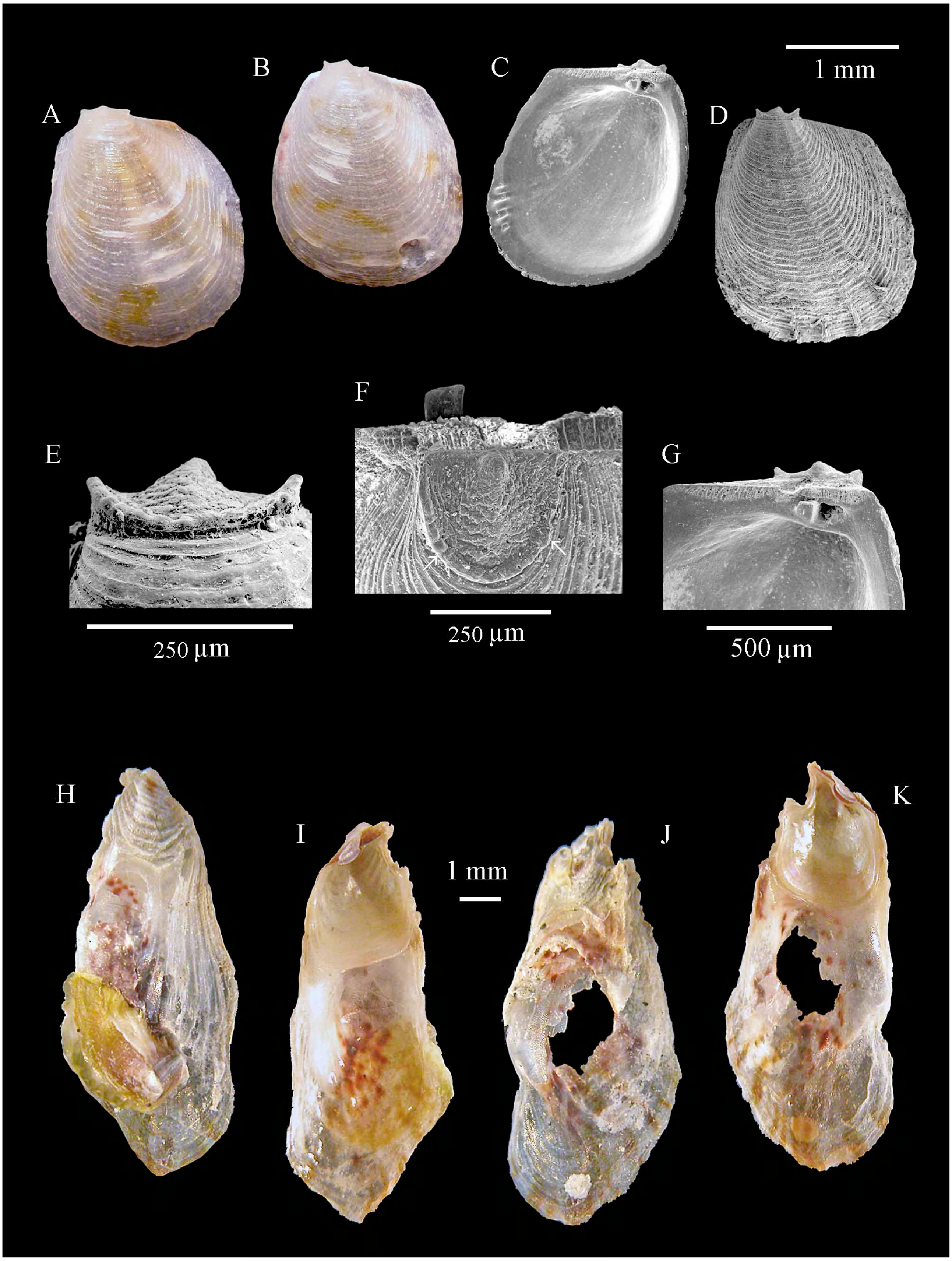

FIGURE 10. A–G, *Cratis kanekoi* Hayami & Kase, 1993; **A**, Exterior LV, 2.2 mm in height; **B**, Exterior LV, 1.95 mm in height; **C**, Interior LV, 2 mm in height, SEM; **D**, Exterior RV, 2.1 mm in height, SEM; **E**, Close-up of the prodissoconch, LV, SEM; **F**, Close-up of the prodissoconch, LV, SEM, arrows indicating boundary; **G**, Close-up of the hinge and dentation, LV, SEM; **H–K**, *Malleus regulus* (Forsskål *in* Niebuhr, 1775); **H**, Exterior LV, 9.4 mm in height; **I**, Interior LV of same specimen; **J**, Exterior RV of same specimen; **K**, Interior RV of same specimen.

Superfamily PTERIOIDEA Gray, 1847

Family MALLEIDAE Lamarck, 1818

Genus *Malleus* Lamarck, 1799

[Type species: *Ostrea malleus* Linnaeus, 1758 (T)]

Malleus regulus (Forsskål *in* Niebuhr, 1775)

Figures 10 H–K

Ostrea regula Forsskål *in* Niebuhr, 1775: p. 124.
Ostrea regula Forsskål, 1775—Yaron *et al.*, 1986: p. 183, figs. 26–27.
Malleus maculosus Reeve, 1858a: sp. 9, pl. 3, fig. 9.
Malleus maculosus Reeve, 1858—Tröndlé & Boutet, 2009: p. 5.
Malleus (*Malvufundus*) *maculosus* (Reeve, 1858)—Rehder, 1980: p. 108, pl. 14, figs. 10–13.
Malvufundus regula (Forsskål, 1775)—Oliver, 1992: p. 65, pl. 10, figs. 3 A–C.
Malleus regulus (Forsskål *in* Niebuhr, 1775)—Huber, 2010: p. 174, figs. 2–3; Severns, 2011: p. 446, pl. 203, fig. 6.

Material examined. Several articulated specimens and more than two dozen single valves (3.2 to 23.1 mm) from *EI* (BK), plus specimens from the Hawaiian and Marquesas Islands (MHU), Saipan (BK), Kwajalein Atoll (BK)and Pitcairn Island (BK).

Diagnosis. "Shell generally small, but occasionally reaching a length of 35 mm, very irregular in growth form, main part of shell broadly ovate, anterior wing above byssal sinus short or absent, ventrally irregularly prolonged to varying length; early part of shell externally sculptured with irregular concentric lamellae, prolongation irregularly rugose and often showing blister-like laminations; color whitish often with irregular reddish purple maculations. Internally the main nacreous part of shell is sharply delimited from the ventral extension by its margin which may be strongly raised; the left valve is usually more deeply cupped than the RV, and both valves are whitish or golden in color, occasionally infused in places with purplish red; the shelly prolongation often shows a subcentral pallial ridge running partway down the prolongation." (Rehder 1980: 108, of *M. maculosus* Reeve, 1858.)

Remarks. Rehder's diagnosis of this highly polymorphic species is one of the best ever reviewed and has been included.

Without genetic data a distinct Polynesian/Easter Island species cannot be substantiated. Morphologically there are no obvious differences to the Pan-pacific *M. regulus*.

Habitat. Commonly found at many locations around *EI*, in sand, from 0–80 m.

Distribution. *Malleus regulus* was originally described from the Suez, Red Sea, but is widely distributed throughout the Indo-Pacific, introduced into the Mediterranean, and is also known from eastern Africa, the Philippines, Micronesia, Marquesas Islands, Tuamotu Archipelago, Gambier Islands, Australia, Easter islands, the Hawaiian Islands and from the Panamic area (Coan, pers. comm., 2010). However, it is unreported from New Zealand or the Kermadec Islands—**E6**.

Family ISOGNOMONIDAE Woodring, 1925

Genus *Isognomon* Lightfoot, 1786

Subgenus *Isognomon* Lightfoot, 1786

[Type species: Isognoma lignea Lightfoot, 1786 (T) =Ostrea isognomum Linnaeus, 1758]

Isognomon (*Isognomon*) *incisum* (Conrad, 1837)

Figures 11 A–B

Perna incisa Conrad, 1837: p. 245, pl. 19, fig. 9.
Isognomon (*Melina*) *incisa* (Conrad, 1837)—Dall *et al.*, 1938: p. 64, pl. 13, figs. 1–8.
Isognomon incisum (Conrad, 1837)—Kay, 1979: p. 520, figs. 167 E–F; Osorio, 1995: p. 200, figs. 1 & 4; Severns, 2011: p. 446, pl. 203, fig. 2.

Material examined. Illustrations of the two live collected specimens, which were provided to us for this study (Osorio, pers. comm., 2010).

Diagnosis. Shell medium in size, stout, and irregularly ovate. The LV larger and more inflated than the RV. Surface consisting of fine commarginal lamellae and low broad radial ribs. Well developed byssal notch. Hinge line straight with five to six elongate-transverse teeth. Color variable, with the margins often quite dark.

Remarks. This species as well as the next isognomonid were first recorded by Osorio (1995). Although additional examples have yet to be collected by other workers, these specimens were found at opposite ends of the island and collected during separate trips. This would infer that the two species are naturally occurring and not a by-product of human activities.

Habitat. One specimen (30.8 x 30.9 mm) was collected from the intertidal zone, byssally attached to the underside of a rock (Anakena), while another specimen (8.3 x 9 mm) was collected from a depth of 20 m, attached to a colony of *Pocillopora* Lamarck, 1816 (off Motu Kaokao).

Distribution. *Isognomon incisum* was originally described from the Hawaiian Islands, but also collected live from Easter Island. Recent reports from offshore Panamic Islands should be instead refer to as *I. recognitus* (Mabille, 1895) (Coan, pers. comm., 2010)—**E2**.

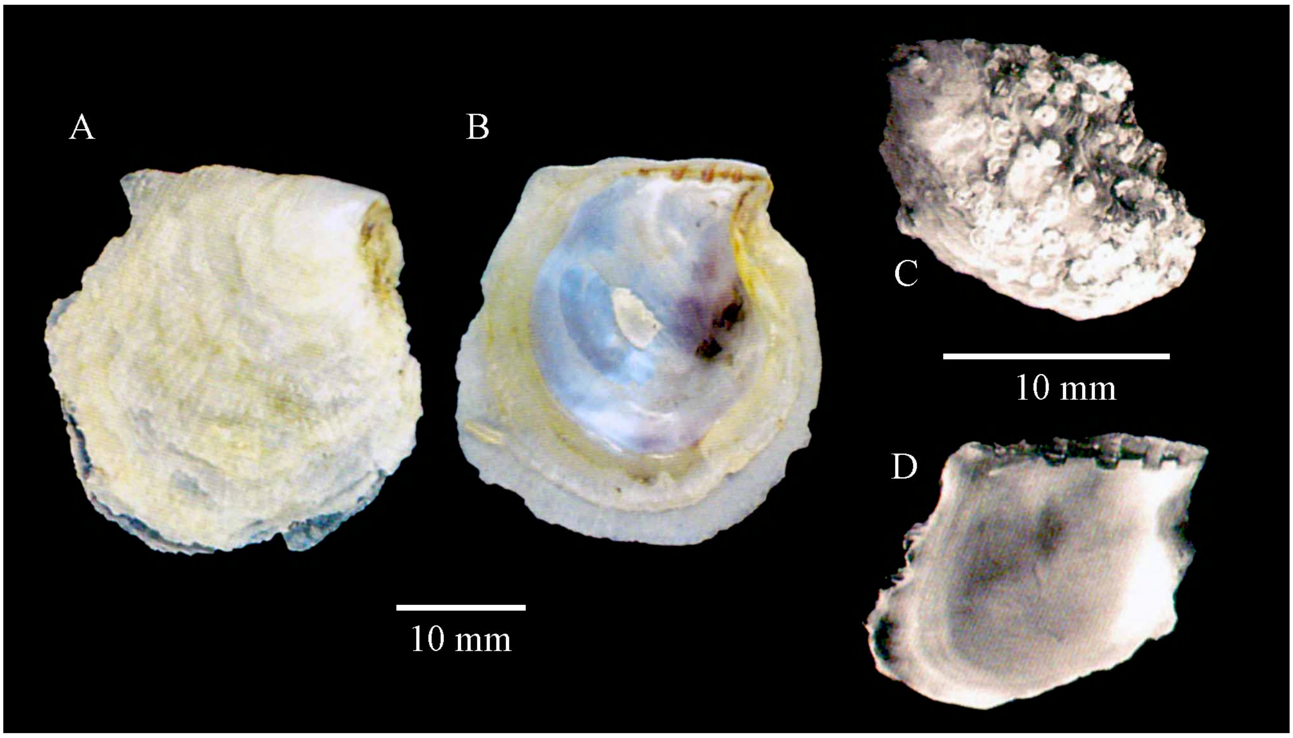

FIGURE 11. A–B, *Isognomon* (*Isognomon*) *incisum* (Conrad, 1837); **A**, Exterior RV, 30.9 mm in height; **B**, Interior LV of same specimen; **C–D**, *Isognomon* (*Parviperna*) *nucleus* (Lamarck, 1819); **C**, Exterior LV, 12.5 mm in height; **D**, Interior of same valve. All images provided by C. Osorio.

Subgenus *Parviperna* Iredale, 1939

[Type species: *Parviperna perexigua* Iredale, 1939 (OD) =*Perna nucleus* Lamarck, 1819]

Isognomon (*Parviperna*) *nucleus* (Lamarck, 1819)

Figures 11 C–D

Perna nucleus Lamarck, 1819: p. 68.
Perna pectinata Reeve, 1858b: sp. 2, pl. 1, fig. 2.
Isognomon pectinata—Osorio, 1995: p. 200, figs. 2–3, 5; Tröndlé & Boutet, 2009: p. 5.
Isognomon nucleus (Lamarck, 1819)—Tröndlé & Boutet, 2009: p. 5.
Isognomon (*Parviperna*) sp. cf. *nucleus* (Lamarck, 1836)—Brook & Marshall, 1998: p. 212; Spencer *et al.*, 2011: p. 1.
Isognomon (*Parviperna*) *nucleus* (Lamarck, 1819)—Oliver, 1992: p. 68, pl. 11; Huber, 2010: p. 176, fig. 6.

Material examined. Illustrations of the two live collected specimens, and one pair of matching valves, which were provided to us for this study (Osorio, pers. comm., 2010).

Diagnosis. Shell small, obliquely-subovate, fairly solid and not fragile. Exterior surface of course commarginal lamellae, and usually encrusted. Interior smooth and nacreous, ventral margin the same color as the exterior. Hinge stout, consisting of numerous elongate teeth. Color variable, brownish-purple to greyish-black.

Remarks. *Isognomon* (*Parviperna*) *pectinata* was synonymized with *P. nucleus* by Lamy (1933), and accepted by subsequent authors. The species recorded as *I. pectinata* by Osorio (1995) matches the widely distributed *P. nucleus* well.

Habitat. Two matching valves of a fresh dead specimen (14.3 x 12.5 mm) were collected from the intertidal zone, (near Vaihu), while two other live specimens (2.6 x 2.3 mm & 4.6 x 3.3 mm) were collected from a depth of 20 m, attached to a colony of *Pocillopora* (off Motu Kaokao).

Distribution. *Isognomon* (*Parviperna*) *nucleus* is widely distributed throughout the Indo-Pacific, from South Africa to the Kermadec Islands including the Society Islands, Marquesas Islands, Tuamotu Archipelago, Gambier Islands, Austral Islands, Pitcairn Islands, eastern Australia and Easter Island. However, it is not known from the Hawaiian Islands—**E5**.

Superfamily OSTREOIDEA Rafinesque, 1815

Family GRYPHAEIDAE Vyalov, 1936

Subfamily PYCNODONTEINAE Stenzel, 1959

Genus *Parahyotissa* Harry, 1985

Subgenus *Parahyotissa* Harry, 1985

[Type species: *Ostrea thomasi* McLean, 1941 (OD) =*Mytilus roseus* Gmelin, 1791]

Parahyotissa (*Parahyotissa*) *inermis* (G.B. Sowerby II, 1871)

Figures 12 A–I

Ostrea inermis G.B. Sowerby II, 1871: sp. 82, pl. 28, fig. 82.
Ostrea imbricata Lamarck, 1819: p 213, *non* Gmelin, 1791.
? *Parahyotissa numisma* (Lamarck)—DiSalvo *et al.*, 1988: p. 459.
Ostrea—Luke, 1995: p. 106.
Parahyotissa (*Parahyotissa*) *inermis* (G.B. Sowerby II, 1871)—Huber, 2010: p. 185, figs. 2–3; Severns, 2011: p. 464, pl. 212, fig. 4.

Material examined. More than a dozen single valves (up to ca. 33 mm) (BK), including several valves collected by the 1957/58 Downwind Expedition (SIO Benthic Collection, M1438 and M1451).

Diagnosis. Shell medium to large, irregularly shaped, ovate-subovate, rather thin and somewhat fragile. Exterior surface of 9–12 radial plicated folds, which may be angular or rounded with flattened spines, and dense overlapping commarginal lamellae. Interior nacreous, with a yellowish-white ventral margin. Hinge stout with numerous vermicular chomata, marginally placed (Fig. 12 E). Characteristic vesicular (honeycomb) sculpture. Color extremely variable, from creamy white to dark yellow, brownish purple, or reddish.

Remarks. The *Parahyotissa numisma* (Lamarck) recorded by DiSalvo *et al.* (1988) cannot be confirmed. Unfortunately, it was one of the few specimens which DiSalvo had misplaced and was unable to provide it for our study. However, in all likelihood it was *P. inermis* which he had actually found. The '*Ostrea*' specimens noted by Luke (1995) from the SIO Benthic Collection, M1438 and M1451 (Figs. 12 F–I) are not *Ostrea*, but is *P. inermis* as well.

Kirkendale *et al.* (2004) proposed the synonymy of genus *Parahyotissa* with *Hyotissa* Stenzel, 1971. We do not accept the species or the specimens analyzed as sufficient basis for such a substantial change. Apart from the very limited material analyzed, none of the specimens were from their type localities. Furthermore, some of the more taxonomically important species were not addressed at all; not *Hyotissa fisheri* (Dall, 1914), *Hyotissa sinensis* (Gmelin, 1791), or *Hyotissa fusca* (Lamarck, 1819). Also not included, was the most common Indo-Pacific species *Parahyotissa inermis* (G.B. Sowerby II, 1871), nor the Panamic *Parahyotissa quercina* (G.B. Sowerby II, 1871). Until a wider analysis is presented, Harry's 1985 original arrangement is being followed.

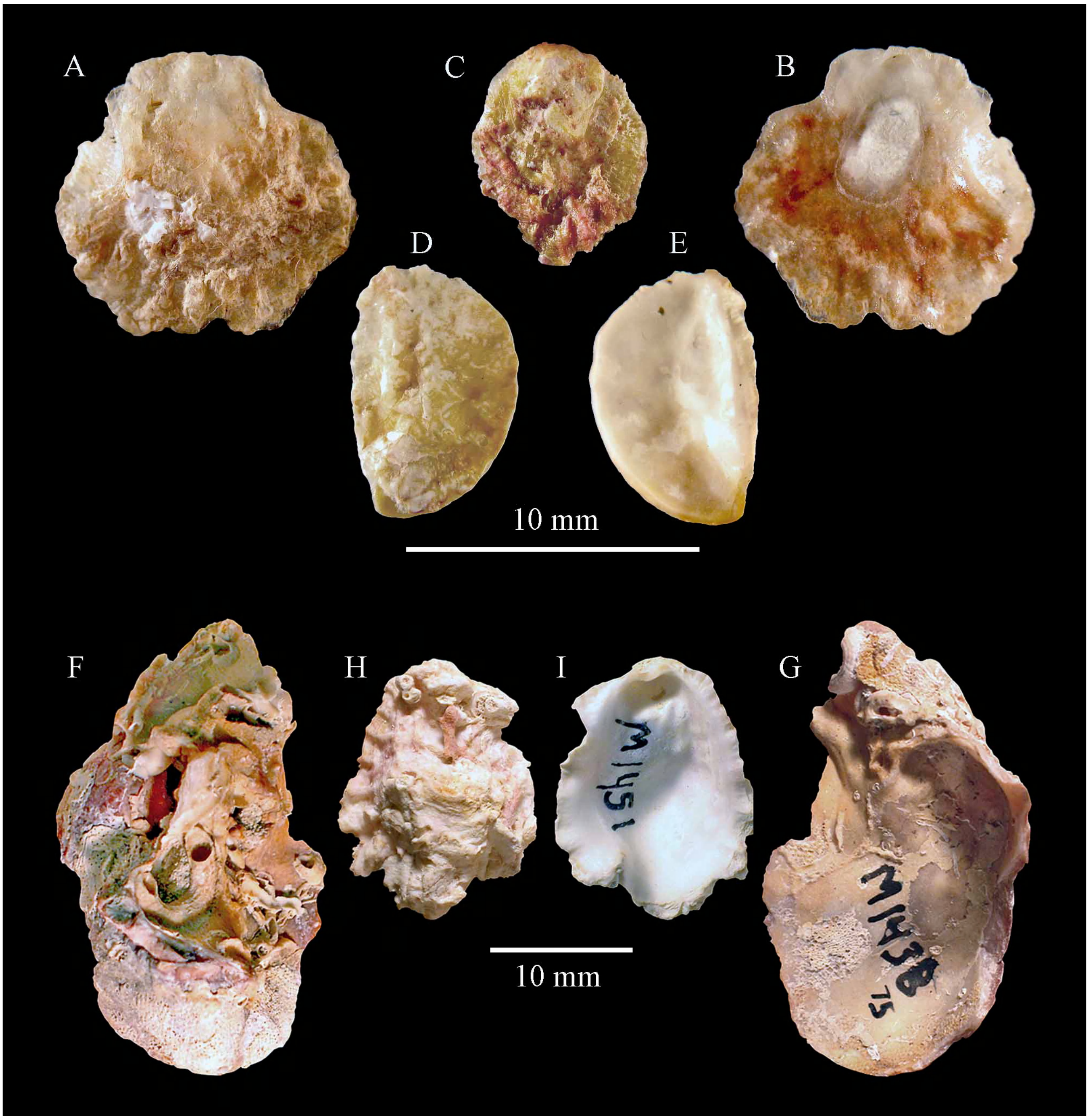

FIGURE 12. A–I, *Parahyotissa* (*Parahyotissa*) *inermis* (G.B. Sowerby II, 1871): **A**, Exterior LV, 10 mm in height; **B**, Interior of same valve; **C**, Exterior RV, 7.5 mm in height; **D**, Exterior RV, 8.2 mm in height; **E**, Interior of same valve; **F**, Exterior LV, 33 mm in height (SIO); **G**, Interior of same valve; **H**, Exterior RV, 17.5 mm in height (SIO); **I**, Interior of same valve.

Habitat. Commonly found at many locations around *EI*, dead in sand, from 30–100 m.

Distribution. *Parahyotissa inermis* is a widely distributed species from eastern Africa to the Hawaiian Islands, but not known from New Zealand or the Kermadec Islands. Now reported from Easter Island—**E5**.

Genus *Neopycnodonte* Stenzel *in* Moore, 1971
[Type species: *Ostrea cochlear* Poli, 1795 (OD)]

***Neopycnodonte cochlear* (Poli, 1795)**
Figures 13 A–B

Ostrea cochlear Poli, 1795: p. 179, pl. 28, fig. 28.
Ostrea laysana Dall *et al.*, 1938: p. 111, pl. 32, figs. 5–8.
Ostrea laysana Dall *et al.*, 1938—Kay, 1979: p. 538.
Neopycnodonte cochlear (Poli, 1795)—Oliver, 1992: p. 89, pl. 16; Huber, 2010: p. 185, fig. 8; Severns, 2011: p. 464, pl. 212, fig. 3.

Material examined. Single very juvenile upper valve (6.2 mm) from *EI* (BK), plus specimens from the Hawaiian Islands (MHU).

Diagnosis. Shell small to medium, suboval to subcircular, inequivalve, inequilateral, somewhat fragile. Upper valve flat and much smaller than the concave lower cemented valve. Exterior surface of commarginal ridges and irregular laminar layers. Interior margin typically with vermicular chomata on both sides of the resilifer. Color variable, buff to yellowish green.

Remarks. Although quite small, this single upper valve matches in texture, muscle scar, chomata and hinge very well. It is expected that deep water trawls will provide additional and larger material given the species prefers deeper water.

Habitat. Found at 100 m at Ovahi, *EI.*

Distribution. This deep water species is widely distributed. Although originally described from Sicily, Italy, *Neopycnodonte cochlear* is also known from the Red Sea, eastern Africa, Japan, the Hawaiian Islands and Australia. However, it has never been recorded from western America, New Zealand, or the Kermadec Islands. Easter Island is now considered a range extension—**E5**.

Superfamily DIMYOIDEA Fischer, 1886

Family DIMYIDAE Fischer, 1886

Genus *Dimya* Rouault, 1850
[Type species: *Dimya deshayesiana* Rouault, 1850 (MT)]

***Dimya molokaia* Dall, Bartsch & Rehder, 1938**
Figures 13 E–I, 14 A–D

Dimya molokaia Dall *et al.*, 1938: p. 79, pl. 19, figs. 3.
Dimya molokaia Dall *et al.*, 1938—Severns 2011: p. 454, pl. 207, fig. 1.
Anomia sp.—DiSalvo *et al.*, 1988: p. 459.

Material examined. Several single valves (3 to 6 mm) from *EI* (BK), the '*Anomia* sp.' specimen recorded by DiSalvo *et al.* (1988) (BK) and the Hawaiian USNM holotype of *D. molokaia.*

Diagnosis. Shell small, irregularly orbicular, inequivalve, rather fragile. RV firmly attached to the substrate, no byssal foramen. LV slightly more inflated. Sculpture of commarginal lamellae. Supradorsal fusing present above the umbones. Prodissoconch, P1 somewhat erroded, P2 well defined, round, smooth with the exception of growth striae, ca. 270 µm length and 250 µm height. Interior of adult valves with coarse radial fluting toward the margins. Two distantly placed elongate muscle scars, with the posterior bilobed. White to yellowish white in color.

Remarks. After studying Malchus' (2000a) work on the early shell stages of a Dimyidae species, this species as well as the next had to be examined more closely. The supradorsal fusing at the umbones (Fig. 13 I), the distant, elongate and unequal posterior and anterior muscle scars (Figs. 13 D & G) of the *EI* material are consistent with Dimyidae. The *EI* specimens conform well to the Hawaiian USNM holotype of *D. molokaia* (Figs. 14 A–D). The '*Anomia* sp.' recorded by DiSalvo *et al.* (1988) is not *Anomia* species at all, but it is consistent in being a very juvenile example of *D. molokaia.*

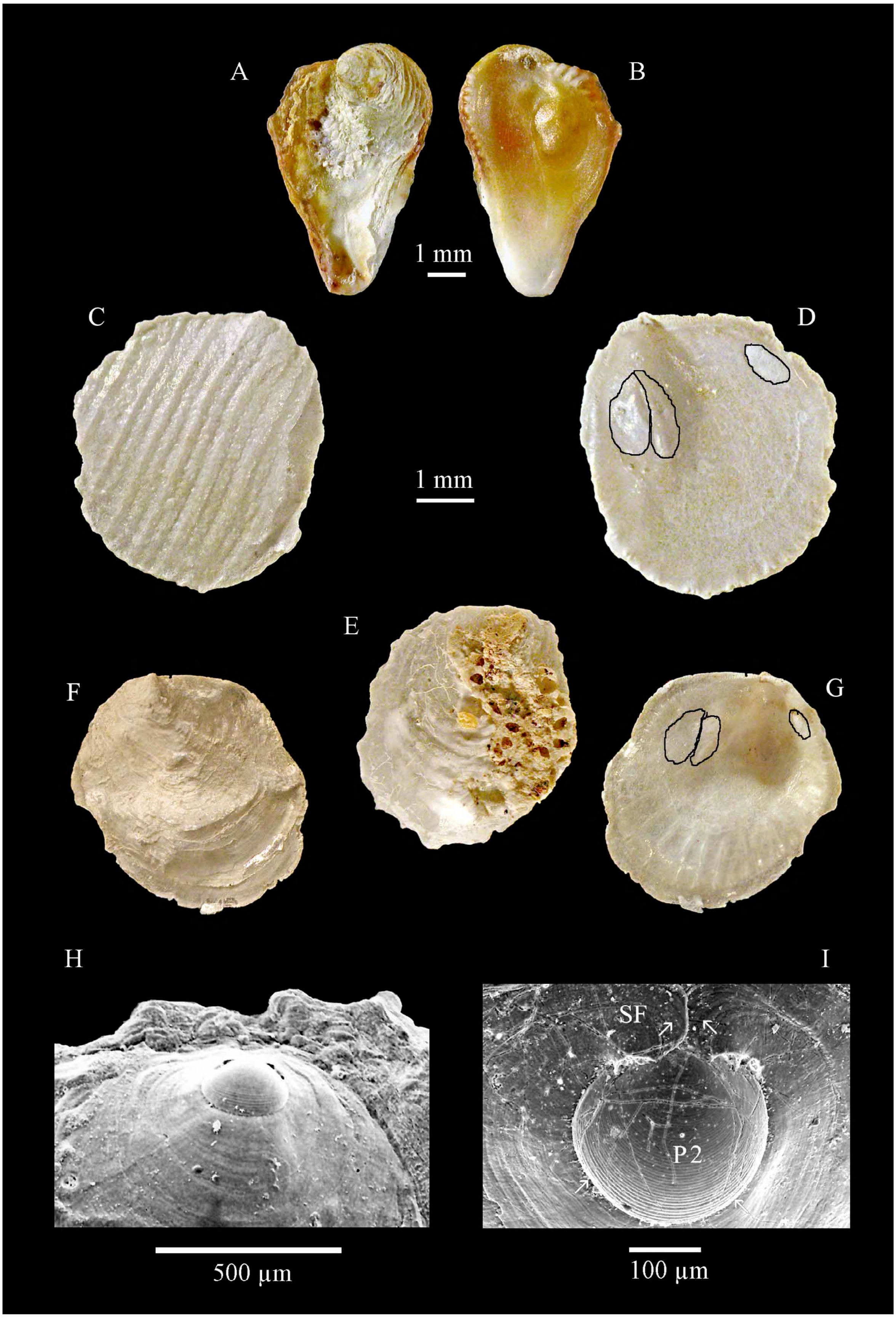

FIGURE 13. A–B, *Neopycnodonte cochlear* (Poli, 1795); **A**, Exterior RV, 6.2 mm in height; **B**, Interior of same valve; **C–D**, *Dimya mimula* Dall, Bartsch & Rehder, 1938; **C**, Exterior RV, 5.2 mm in height; **D**, Interior of same valve; **E–I**, *Dimya molokaia* Dall, Bartsch & Rehder, 1938; **E**, Exterior LV, 4.5 mm in height; **F**, Exterior RV, 4.2 mm in height; **G**, Interior of same valve; **H–I**, Close-up of the prodissoconch, LV, SEM, arrows indicating boundaries of prodissoconch and supradorsal fusing.

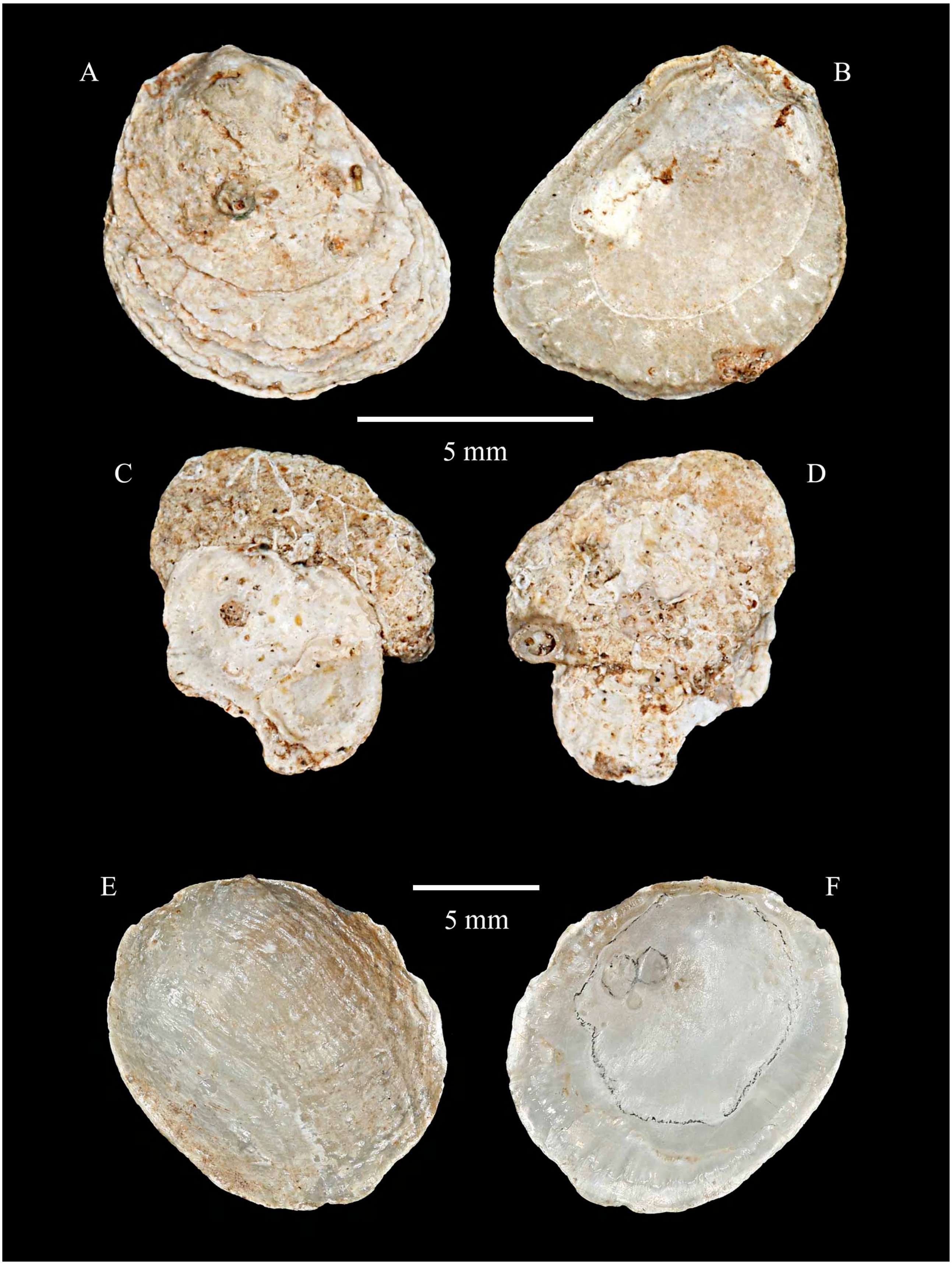

FIGURE 14. A–D, *Dimya molokaia* Dall, Bartsch & Rehder, 1938, (Holoytype, USNM 190431); **A**, Exterior RV, 8.4 mm in height; **B**, Interior of same valve; **C**, Exterior LV of same specimen; **D**, Interior of same valve; **E–F**, *Dimya mimula* Dall, Bartsch & Rehder, 1938, (Holoytype, USNM 173002); **E**, Exterior RV, 14 mm in height; **F**, Interior of same valve.

Habitat. Occasionally found at several locations around *EI*, in sand, from 30–80 m.

Distribution. *Dimya molokaia* was previously only known from the Hawaiian Islands, but has now been extended to Easter Island—**E2**.

Dimya mimula Dall, Bartsch & Rehder, 1938

Figures 13 C–D, 14 E–F

Dimya mimula Dall *et al*., 1938: p. 78, pl. 19, figs. 1–2.
Dimya mimula Dall *et al*., 1938—Severns 2011: p. 454, pl. 207, fig. 2.

Material examined. Several single valves (4.5 to 6 mm) from *EI* (BK), plus the Hawaiian USNM holotype of *D. mimula*.

Diagnosis. Shell small, orbicular-elongate, inequivalve. RV attached to the substrate, no byssal foramen. LV sculptured with somewhat scaly radial riblets. Prodissoconch somewhat worn, but appears round and smooth. Interior of adult valves with finely denticulate margins. Two distantly placed elongate muscle scars, with the posterior bilobed. Yellowish white outside, whitish inside.

Remarks. *Dimya mimula* is an exceedingly rare species. As far as is known, this is the first time it has been recorded since its description from a single upper valve collected from a depth of 235 m.

The upper valves of the *EI* specimens match the USNM holotype of *D. mimula* (Figs. 14 E–F) well and the largest valve (13.8 mm) also reaches nearly its 14 mm size. The radial surface sculpture is characteristic for this species. The bilobed posterior scars are well visible (Figs. 13 D, 14 F). The rounded contour, yellowish color and notably the characteristic dense crenulations along the outer margins (Fig. 13 D) are all consistent with *D. mimula.*

Habitat. Occasionally found at several locations around *EI*, in sand, from 30–80 m.

Distribution. *Dimya mimula* was previously only known from the Hawaiian Islands, but has now been extended to Easter Island—**E2**.

Superfamily ANOMIOIDEA Rafinesque, 1815

Family ANOMIIDAE Rafinesque, 1815

Genus *Monia* Gray, 1850

[Type species: *Placunanomia zealandica* Quoy [*sic*] (SD by Kobelt, 1881) =*Monia zelandica* (Gray *in* Dieffenbach, 1843)]

Monia sp.

Figures 15 A–I

Anomia—Luke, 1995: p. 106.

Material examined. Several single valves (3.6 to 14 mm) from *EI* (BK) and a single, partly damaged articulated specimen from the SIO Benthic Collection, M1449.

Diagnosis. Shell very small, 14 mm, rather thin, irregularly rounded and rather flat; LV slightly inflated with strong, dense radial riblets or irregular, somewhat spinose ridges; smaller RV thin, fragile and transparent, with byssal foramen. Supradorsal fusing present above the umbones. Prodissoconch, P2 well defined, round, smooth with the exception of growth striae, ca. 220 µm length and 210 µm height. Adult valves yellowish-white to light brown in color.

Remarks. In addition to the few upper valves collected, the '*Anomia*' specimen (Figs. 15 H–I) noted by Luke (1995) from the SIO Benthic Collection, M1449, was the only articulated specimen encountered. The thinness of the lower valve, the sculpture of the upper valve and the two elongate, central scars (Fig. 15 B) seem to resemble the genus *Monia*, than *Anomia*. The specific identity of this rare species remains unresolved. The type species *M. zelandica* from New Zealand and *M. nobilis* (Reeve, 1859) from the Hawaiian Islands both reach 70 mm and differ substantially in sculpture and color. However, B. A. Marshall (pers. comm., 2011) mentioned a similar species commonly found at Kermadec Islands.

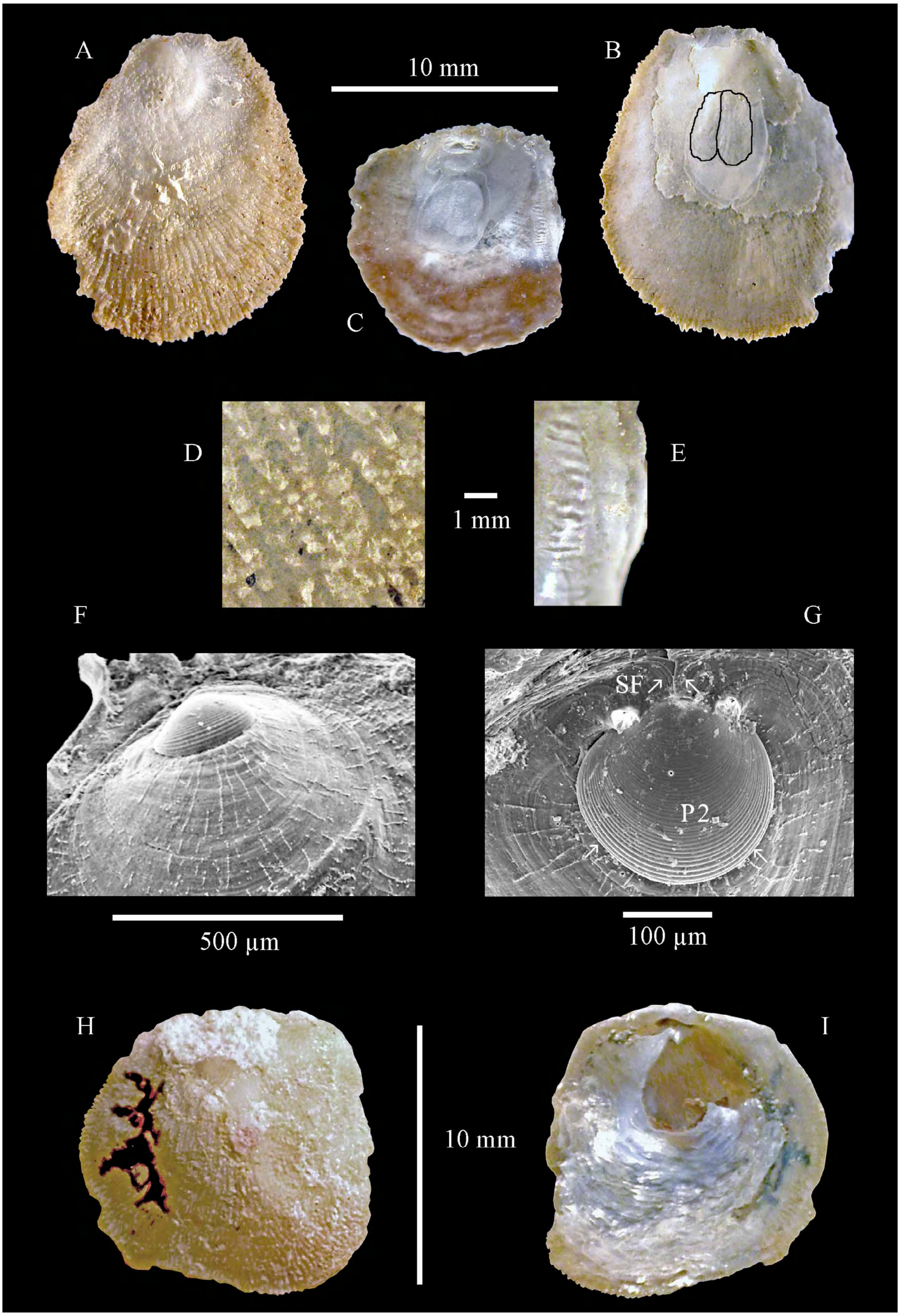

FIGURE 15. A–I, *Monia* sp.: **A**, Exterior LV, 13.8 mm in height; **B**, Interior of same valve; **C**, Interior LV, 10.1 mm in height; **D**, Close-up of exterior sculpture, LV; **E**, Close-up of interior LV; **F–G**, Close-up of the prodissoconch, LV, SEM, arrows indicating boundaries of prodissoconch and supradorsal fusing; **H**, Exterior LV, (SIO), ca. 11 mm in height; **I**, Exterior RV of same specimen.

Habitat. Trawled from 40–100 m, La Perouse Bay, Easter Island, 1957/58 Downwind Expedition (DWHD-76).

Distribution. Although this *Monia* sp. was found at Easter Island, given that all living anomiids are planktic-planktotrophic developers (Malchus, 2000b: 245), a westward distribution cannot be excluded at this time—**E4**.

Superfamily PECTINOIDEA Rafinesque, 1815

Family PROPEAMUSSIIDAE Abbott, 1954

Genus *Parvamussium* Sacco, 1897

[Type species: *Pecten duodecimlamellatum* Bronn, 1831 (OD)]

Parvamussium scitulum (E.A. Smith, 1885)

Figures 16 A–E

Amussium scitulum E.A. Smith, 1885: p. 312, pl. 23, figs. 4 A–B.

Parvamussium scitulum (E.A. Smith, 1885)—Okutani, 2000: p. 913, pl. 454, fig. 7; Raines, 2002: p. 32, fig. 36; Dijkstra & Maestrati, 2008: p. 94; Dijkstra & Maestrati, 2010: p. 339; Huber, 2010: p. 224.

Material examined. Several articulated specimens and over one hundred single valves from *EI* (BK), plus specimens from New Guinea (BK), Fiji (BK), the Philippines (MHU) and Okinawa (BK).

Diagnosis. Shell small, thin and flattish; valves unequal, with the RV smaller than LV. Exterior surface sometimes with irregular sculpture or radiating ridges and commarginal growth striae. Interior of both valves with 7–11 internal ribs. Auricles subequal. Color of LV cream with white or yellow-brown maculations; RV cream colored.

Remarks. Although the *EI* specimens are somewhat smaller, they conform well to *P. scitulum* from Okinawa, Japan and New Guinea.

Habitat. Commonly found at many locations around *EI*, in sand and rubble, from 50–150 m.

Distribution. *Parvamussium scitulum* is a widely distributed species, which is known from New Guinea to Japan, including the Philippines, Indonesia, New Caledonia, Loyalty Islands, Fiji, Tonga and Easter Island. However, it has not been recorded from the Hawaiian Islands, New Zealand or the Kermadec Islands—**E4**.

Family PECTINIDAE Rafinesque, 1815

Subfamily PECTININAE Rafinesque, 1815

Genus *Mirapecten* Dall, Bartsch & Rehder, 1938

[Type species: *Mirapecten thaanumi* Dall *et al.*, 1938 (OD) =*Pecten mirificus* Reeve, 1853]

Mirapecten mirificus (Reeve, 1853)

Figure 16 F

Pecten mirificus Reeve, 1853: sp. 104, pl. 26, fig. 104.

Mirapecten thaanumi Dall *et al.*, 1938: p. 84, pl. 21, figs. 7–8.

Mirapecten mirificus (Reeve, 1853)—Kay, 1979: p. 526, figs. 158 B, 169 A–B; Preece, 1995: p. 350; Raines, 2002: p. 33, fig. 37; Raines & Poppe, 2006: p. 130, pls. 77–79; Raines, 2007: p. 82; Dijkstra & Maestrati, 2010: p. 354, figs. 5 G–H; Huber, 2010: p. 199, fig. 4; Severns, 2011: p. 448, pl. 204, fig. 5.

Material examined. Several valves and more than one dozen fragments from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU), Fiji (BK), Australia (BK) and Okinawa (BK).

Diagnosis. Shell small, thin, oblique and rather flat; RV slightly more convex than the LV; both valves carry 8–10 low, radial ribs or folds, which are sparsely covered with thorn-like curved scales; auricles equal. Color variable from red, cream or light purple; RV paler.

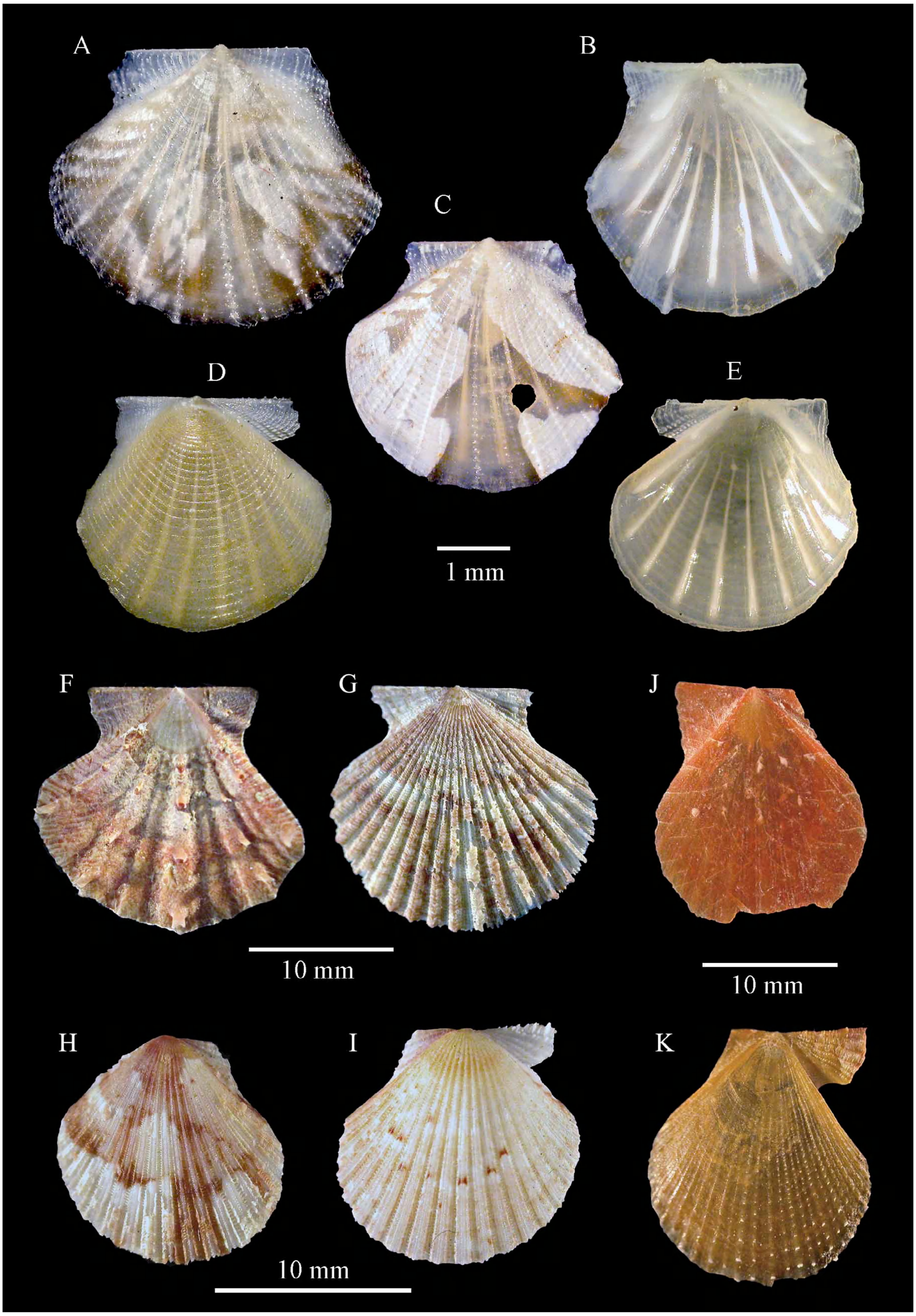

FIGURE 16. A–E, *Parvamussium scitulum* (E.A. Smith, 1885); **A**, Exterior LV, 4 mm in height; **B**, Interior LV, 3.5 mm in height; **C**, Exterior LV, 3.5 mm in height; **D**, Exterior RV, 3.2 mm in height; **E**, Interior RV, 3.3 mm in height; **F**, *Mirapecten mirificus* (Reeve, 1853), Exterior LV, 16 mm in height; **G**, *Cryptopecten bullatus* (Dautzenberg & Bavay, 1912), Exterior LV, 16.4 mm in height; **H–I**, *Cryptopecten nux* (Reeve 1853); **H**, Exterior LV, 11.8 mm in height; **I**, Exterior RV, 12 mm in height; **J–K**, *Laevichlamys squamosa* (Gmelin, 1791); **J**, Exterior LV, 18 mm in height; **K**, Exterior RV, 20 mm in height.

Habitat. Occasionally found at several locations around *EI* and *SyG*, in sand and rubble, from 20–80 m.

Distribution. *Mirapecten mirificus* is found throughout the Indo-Pacific region to include eastern Africa, the Red Sea, Malaysia, Indonesia, Japan, China, Philippines, Papua New Guinea, Solomon Islands, Austral Islands, Pitcairn Islands, New Caledonia, Fiji, eastern Australia, the Hawaiian Islands and Easter Island. However, it is not known from New Zealand or the Kermadec Islands—**E5**.

Subfamily AEQUIPECTININAE Nordsieck, 1969

Genus *Cryptopecten* Dall, Bartsch & Rehder, 1938

[Type species: *Cryptopecten alli* Dall *et al.*, 1938 (OD) =*Pecten bullatus* Dautzenberg & Bavay, 1912]

Cryptopecten bullatus (Dautzenberg & Bavay, 1912)

Figure 16 G

Pecten (*Chlamys*) *bullatus* Dautzenberg & Bavay, 1912: p. 17, pl. 27, figs. 1–2.
Cryptopecten alli Dall *et al.*, 1938: p. 93, pl. 23, figs. 1–4, 7.
Chlamys alli Dall *et al.*, 1938—Kay, 1938: p. 524, fig. 168 A.
Cryptopecten bullatus (Dautzenberg & Bavay, 1912)—Raines, 2002: p. 33, fig. 39; Raines & Poppe, 2006: p. 312, pl. 275; Raines, 2007: p. 82; Dijkstra & Maestrati, 2008: p. 109; Dijkstra & Marshall, 2008: p. 69; Tröndlé & Boutet, 2009: p. 6; Dijkstra & Maestrati, 2010: p. 350; Huber, 2010: p. 203, fig. 6; Spencer *et al.*, 2011: p. 1; Severns, 2011: p. 448, pl. 204, fig. 4.

Material examined. Nearly two dozen valves, but no live specimens from *EI* (BK), plus specimens from the Hawaiian Islands (MHU), Marquesas Islands (MHU), Okinawa (BK) and the Philippines (MHU).

Diagnosis. Shell small, delicate, wider than tall; valves inequilateral, with 19–26 radial ribs, which are covered with short broad squamae, and usually three ribs of the LV are more pronounced. Auricles subequal. Coloration of tan to reddish brown with white markings, and rays of color on the pronounced ribs.

Habitat. Commonly found at many locations around *EI*, in sand, from 50–80 m.

Distribution. *Cryptopecten bullatus* is found throughout the Indo-Pacific region, including eastern South Africa, Japan, East China Sea, Philippines, Indonesia, eastern Australia, New Caledonia, Vanuatu, Fiji, Tonga, Marquesas Islands, Austral Islands, Lord Howe Island, Norfolk Island, Kermadec Islands, Hawaiian Islands and Easter Island—**E5**.

Cryptopecten nux (Reeve 1853)

Figures 16 H–I

Pecten coruscans Reeve, 1853: sp. 143, pl. 32, fig. 143, *non* Hinds, 1845.
Pecten nux Reeve, 1853: errata page.
Cryptopecten nux (Reeve 1853)—Raines & Poppe, 2006: p. 312, pl. 276; Raines, 2007: p. 82; Dijkstra & Maestrati, 2008: p. 109; Tröndlé & Boutet, 2009: p. 6; Dijkstra & Maestrati, 2010: p. 350; Huber, 2010: p. 203, fig. 11.

Material examined. Over a dozen single valves, including juveniles from *EI* (BK), plus specimens from Australia (MHU), Marquesas Islands (MHU), Okinawa (BK) and the Philippines (MHU).

Diagnosis. Shell small, solid, globose and inequilateral; RV more convex than LV. Both valves with 16–19 ribs equally pronounced; LV sometimes ornamented with short squamae. Auricles very unequal. Coloration moderately variable from white to creamy background, with irregular reddish-brown or purplish markings.

Remarks. *Cryptopecten nux* was first recorded from Easter Island by Raines (2007). Its identification can sometimes be difficult and subadult specimens are often misidentified as *C. bernardi* (Philippi, 1851). However, the distribution of *C. bernardi* is restricted to the French Polynesian region, see Dijkstra (1991).

Habitat. Commonly found at many locations around *EI*, in sand, from 30–80 m.

Distribution. *Cryptopecten nux* has been widely reported throughout the Indo-Pacific to include southern and eastern Africa, the Red Sea, Oman, Seychelles, Andaman Islands, Japan, Philippines, Indonesia, New Caledonia, northern and eastern Australia, Solomon Islands, Loyalty Islands, Fiji, Tonga, Marquesas Islands, Austral Islands, Lord Howe Island, and Easter Island. However, it is not known from the Hawaiian Islands, New Zealand or the Kermadec Islands—**E4**.

Subfamily CHLAMYDINAE Teppner, 1922

Genus *Laevichlamys* Waller, 1993

[Type species: *Pecten multisquamatus* Dunker, 1864 (OD)]

Laevichlamys squamosa (Gmelin, 1791)

Figures 16 J–K

Ostrea squamosa Gmelin, 1791: p. 3319.

Laevichlamys squamosa (Gmelin, 1791)—Raines, 2002: p. 33, fig. 38; Raines & Poppe, 2006: p. 208, pls. 151–152; Tröndlé & Boutet, 2009: p. 6; Huber, 2010: p. 208.

Material examined. Several single valves from *EI* (BK), plus specimens from Australia (BK), Fiji (BK), Marquesas Islands (MHU), Okinawa (BK) and the Philippines (MHU).

Diagnosis. Shell small, thin and flattish; RV only slightly convex, with as much as 20 low, narrow ribs and finely scaled; LV flattened with 12–15 low, narrow ribs which are coarsely scaled. Scales are often partly worn away. Auricles unequal. Color extremely variable from brownish black, white, purple, red, orange, yellow with white zigzag pattern or speckles.

Remarks. Since the first report of this species from *EI* by Raines (2002), only two other valves have been collected. Although adults will typically reach 40–50 mm in height, the largest found at *EI* has only been 25 mm.

Habitat. Occasionally found at many locations around *EI*, in sand, from 30–80 m.

Distribution. *Laevichlamys squamosa* is found throughout the Indo-Pacific region to include eastern Africa, Japan, Philippines, Australia, Marquesas Islands, Society Islands and Easter Island. However, it is not known from the Hawaiian Islands, New Zealand and the Kermadec Islands—**E4**.

Genus *Pascahinnites* Dijkstra & Raines, 1999

[Type species: *Pecten* (*Chalmys*) [*sic*] *pasca* Dall, 1908 (OD)]

Pascahinnites pasca (Dall, 1908)

Figures 17 A–H

Pecten (*Chalmys*) [*sic*] *pasca* Dall, 1908: p. 401.

Chlamys pasca (Dall, 1908)—Rehder, 1980: p. 109, pl. 13, figs. 3–6.

Pascahinnites pasca (Dall, 1908)—Dijkstra & Raines, 1999: p. 200, figs. 1–2; Raines & Poppe, 2006: p. 222, pl. 170, figs 1–4; Tröndlé & Boutet, 2009: p. 6; Dijkstra & Maestrati, 2010: p. 339, figs. 3 L–M.

Material examined. Over one hundred articulated specimens and single valves (3.2 to 19.6 mm) (BK).

Diagnosis. Chlamydoid shell, small (up to 20 mm in height), slightly equivalve and equilateral; umbonal angle ca. 90–95°. Left valve with 12–14 prominent primary radial ribs, and numerous intercalated secondary ribs toward the ventral margin. Shagreen microsculpture throughout except on crest of ribs, where fine spines may be present. Radial ribs of RV bi- or tripartite, and weaker and less angulated than those of the LV. Auricles unequal in size (anterior larger than posterior), with small prickly radial riblets, more prominent on anterior auricle. In juveniles and subadults, byssal notch moderately deep, with active well developed ctenolium consisting of 4–6 teeth. Valves of mature specimens distort after 9–11 mm, due to changes in preferred habitat. Color variable, whitish, creamy, yellowish or rose-pink with spots and/or streaks; RV paler than LV.

Remarks. Adults up to about 10 mm are either free swimming or byssally attached. Once mature they appear to prefer colder water and live cemented to hard substratum. This change in habitat tends to strongly distort the valves in order to accommodate the surface of the selected substrate.

Habitat. Commonly found at many locations around *EI* and *SyG*, from 10–150 m. Free swimming or byssally attached as juveniles in shallow water (10–30 m), while adults are cemented to substratum below 50 m.

Distribution. *Pascahinnites pasca* was previously thought to be endemic to *EI* and *SyG*, but it has been recently recorded from the Austral Islands as well, Dijkstra and Maestrati (2010)—**E4**.

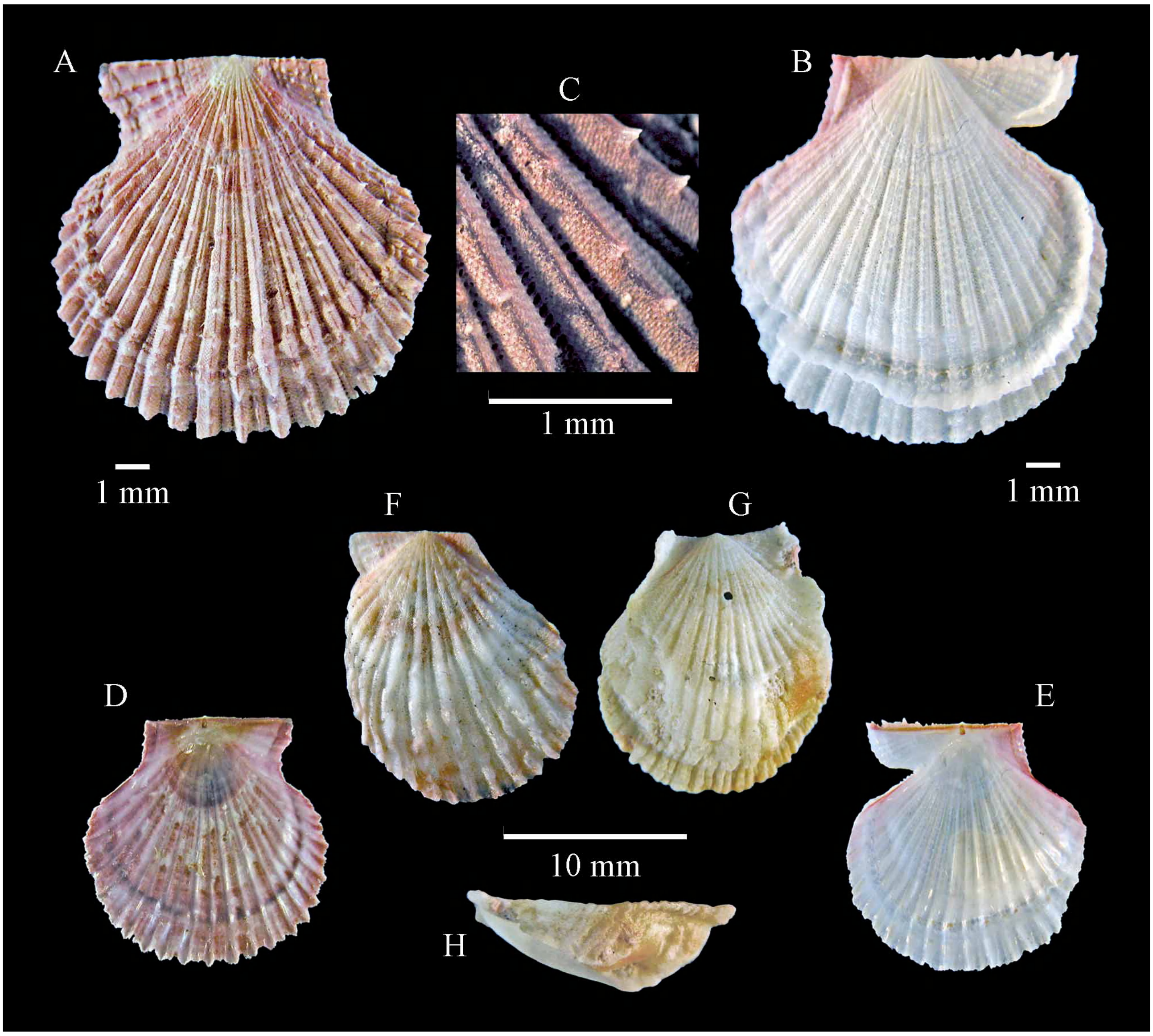

FIGURE 17. A–H, *Pascahinnites pasca* (Dall, 1908): **A**, Exterior LV, 13 mm in height; **B**, Exterior RV of same specimen; **C**, Close-up of exterior sculpture, LV; **D**, Interior LV, same specimen; **E**, Interior RV, of same specimen; **F**, Exterior LV, 15.7 mm in height; **G**, Exterior RV, 15.4 mm in height; **H**, Dorsal view of same valve.

Family SPONDYLIDAE Gray, 1826

Genus *Spondylus* Linnaeus, 1758

[Type species: *Spondylus gaederopus* Linnaeus, 1758 (SD by Schmidt, 1818)]

Spondylus exiguus Lamprell & Healy, 2001

Figures 18 A–B

Spondylus exiguus Lamprell & Healy, 2001: p. 117, figs. 2 C–J.
Spondylus exiguus Lamprell & Healy, 2001—Raines, 2002: p. 34, fig. 40.

Material examined. Over a dozen single valves and fragments (4.4 to 9.2 mm) (BK).

Diagnosis. Shell small, (up to 9.2 mm in height) pear-shaped, moderately solid, and nearly equivalve; auricles relatively small. Sculpture consisting of 35–40 pronounced, flattened, scabrous radial ribs; spines are scale-like and angulated; interstices narrow. Color variable from uniformly cream to orange and yellow.

Remarks. The *EI* and *SyG* material is identical in shape and sculpture to *Spondylus exiguus*. However, at least two specimens are in excess of 9 mm and thus represent new maximum size for this small species.

Habitat. Commonly found at many locations around *EI*, in sand and rubble, from 30–80 m.

Distribution. *Spondylus exiguus* was originally described from New Caledonia, but is also known from Easter Island. It has never been recorded from the Hawaiian Islands, New Zealand or the Kermadec Islands—**E4**.

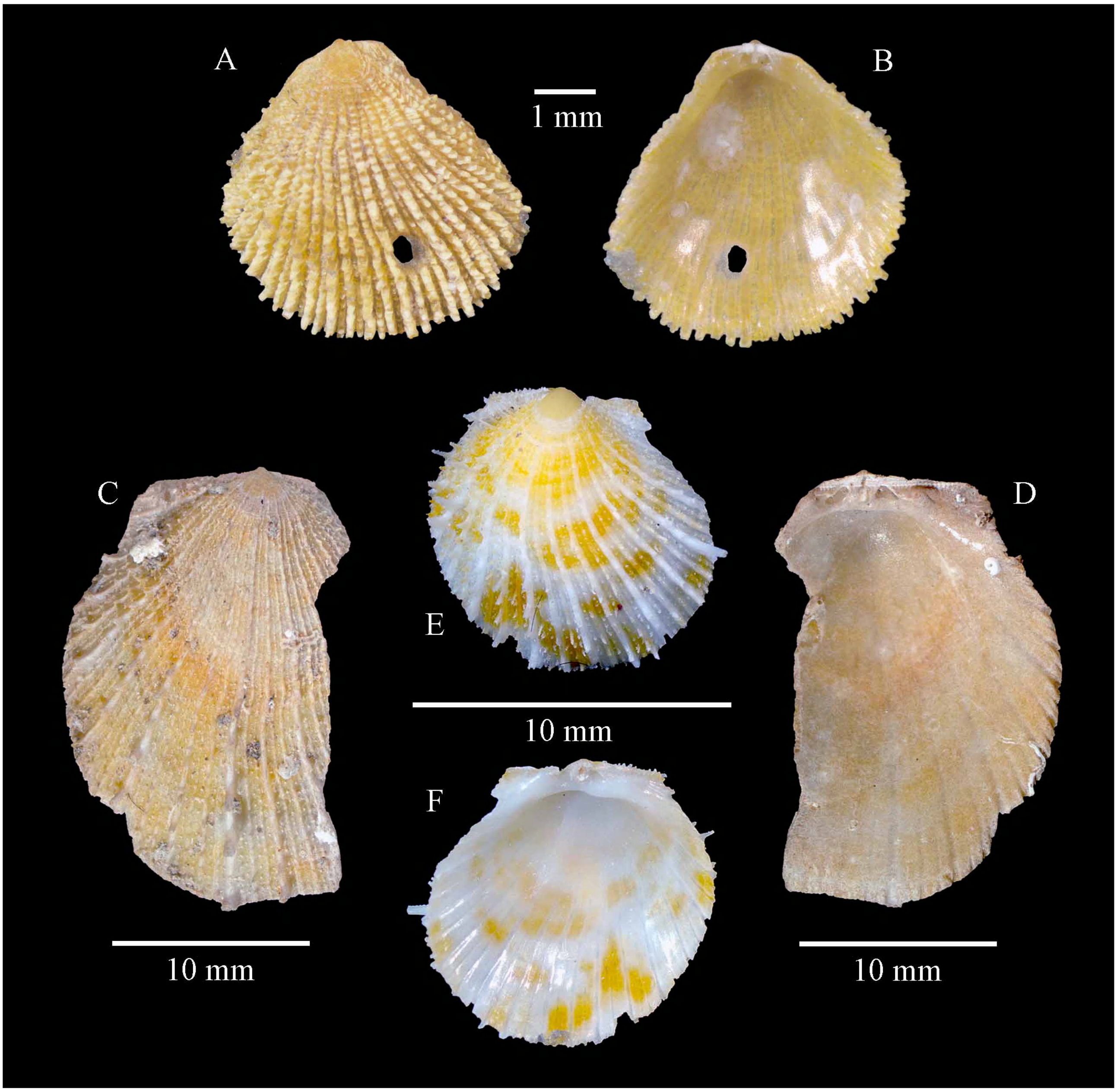

FIGURE 18. **A–B**, *Spondylus exiguus* Lamprell & Healy, 2001; **A**, Exterior LV, 4.8 mm in height; **B**, Interior of same valve; **C–F**, *Spondylus orstomi* Lamprell & Healy, 2001; **C**, Exterior LV, 8.5 mm in height; **D**, Interior of same valve; **E**, Exterior LV, 23.3 mm in height; **F**, Interior of same valve.

Spondylus orstomi Lamprell & Healy, 2001

Figures 18 C–F

Spondylus orstomi Lamprell & Healy, 2001: p. 120, figs. 3 D–G.
Spondylus cf. *orstomi* Lamprell & Healy, 2001—Raines, 2002: p. 35, fig. 42.
Spondylus orstomi Lamprell & Healy, 2001—Huber, 2010: p. 220, figs. 3–4.

Material examined. Several single valves and fragments from *EI* (BK), plus the MNHN type material.

Diagnosis. Shell small to medium, elongate ovate, moderately thin, and inequivalve; auricles relatively small. Sculpture consisting of 12–16 well defined, low, rounded, primary radial ribs with 1–3 secondary riblets in the interstices. Both ribs and interstices covered in densely imbricated spines, with some spines occasionally being longer, thin and upright. Color variable from uniformly light brown, orange and bright yellow to maculations of orange and white.

Remarks. Since the first report of this species at *EI* by Raines (2002), more valves have been collected, so we can now confirm that the species is indeed *S. orstomi*.

Habitat. Occasionally found at several locations around *EI*, in sand and rubble, from 30–50 m.

Distribution. Although *Spondylus orstomi* was originally described from New Caledonia, this deep water species has a much wider distribution. It is known from the Coral Sea, Philippines, and off China. The maximum size currently known is 60.6 mm from its furthest range in the East China Sea (coll. MHU). It has not been recorded from the Hawaiian Islands, New Zealand or the Kermadec Islands—**E4**.

Spondylus occidens G.B. Sowerby III, 1903

Figures 19 A–F

Spondylus occidens G.B. Sowerby III, 1903: p. 77, fig. 9.
Spondylus occidens G.B. Sowerby III, 1903—Dijkstra & Marshall, 2008: p. 76, figs. 64 C–D, J; Huber, 2010: p. 220, figs. 1–2; Spencer *et al.*, 2011: p. 1.
Spondylus mireilleae Lamprell & Healy, 2001: p. 123. figs. 4 E–D.
Spondylus mireillae [*sic*] Lamprell & Healy, 2001—Raines, 2002: p. 34, fig. 41.

Material examined. Several single valves and fragments (7.3 to 12.4 mm) from *EI* (BK), plus over one hundred specimens throughout the Indo-Pacific (MHU), the MNHN type material of *Spondylus mireilleae* as well as fresh material from New Caledonia (MHU).

Diagnosis. Shell small to medium, inflated, thin but not fragile, oblique and somewhat equivalve; auricles relatively small, with the left auricle smaller than the right. Exterior surface sculpture variable consisting of nearly 50 primary radial ribs, which are low and flattened umbonally, and become stronger, raised and ovate with narrow interstices at the margins; some specimens may also have a secondary radial riblet within each interstice; or may have ribs which are ornamented with numerous raised, irregular spines, especially when juvenile. Color from yellow to reddish-brown.

Remarks. This species was first reported as *S. mireilleae* by Raines (2002), however, Huber (2010: 631) synonymized that species with the widely distributed *S. occidens* based on type and numerous fresh material studied.

This common species was recently addressed by Dijkstra and Marshall (2008: 76) from Norfolk and Kermadec Islands. Although *S. mireilleae* was not treated, Lamprell (2006: 96)'s former synonymy of *S. jamarci* Okutani, 1983, was resolved by differences in ribbing. However, the numerous *S. occidens* studied by the junior author throughout the Indo-Pacific demonstrated not only a high variability in ribbing, but also in color which supported instead Lamprell's synonymy. In the end, only broad genetic data can reliably resolve spondylids.

Habitat. Occasionally found at several locations around *EI*, in sand and rubble, from 30–50 m.

Distribution. *Spondylus occidens* is a widely distributed species, which has been recorded from eastern Africa to the Kermadec Islands, including Saya de Malha Bank, (Indian Ocean, and largest submerged bank in the world), Japan, Indonesia, Vanuatu, New Caledonia, eastern Australia, West Norfolk Ridge, and Easter Island. However, it has not been recorded from the Hawaiian Islands—**E5**.

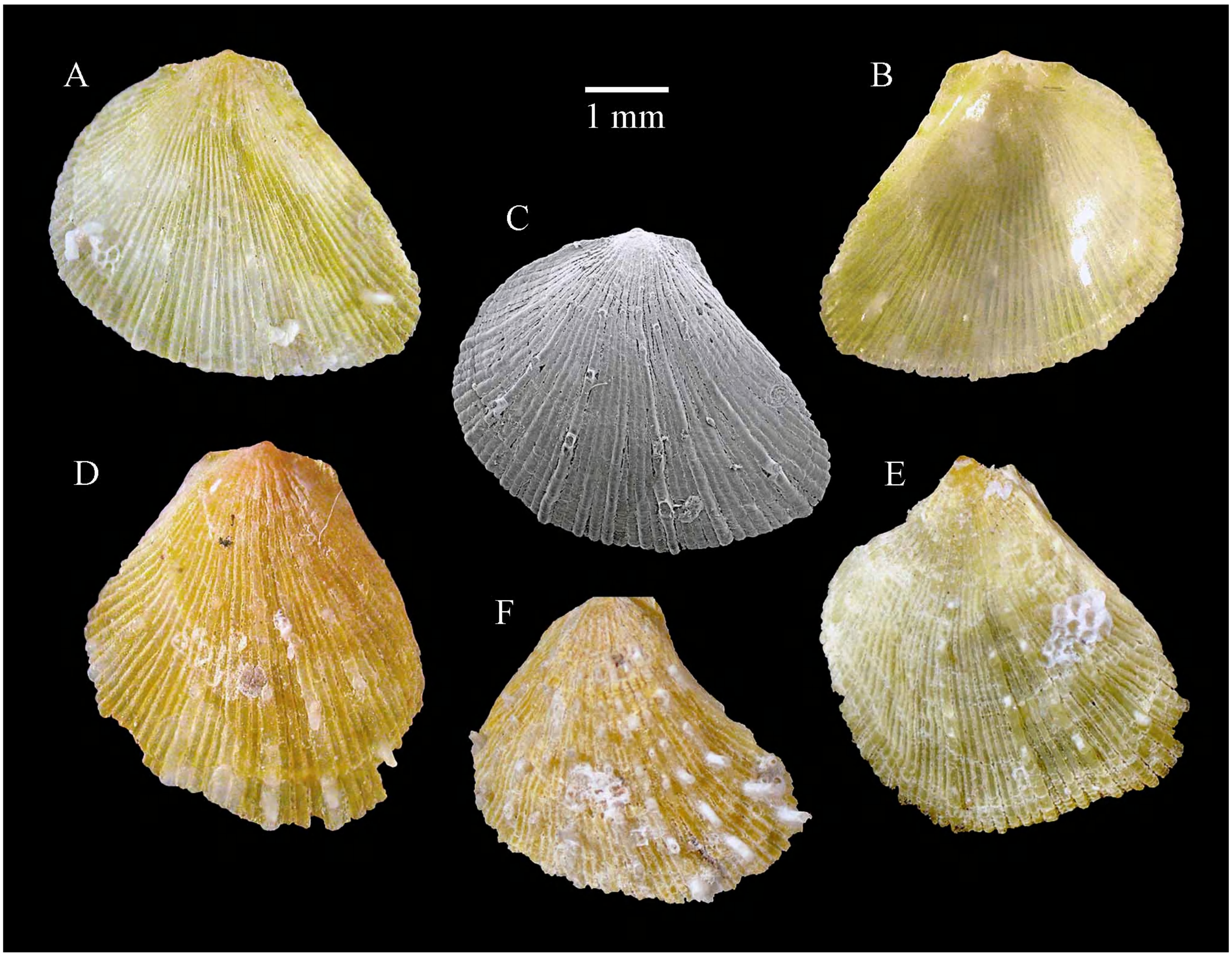

FIGURE 19. **A–F**, *Spondylus occidens* G.B. Sowerby III, 1903; **A**, Exterior LV, 3.8 mm in height; **B**, Interior of same valve; **C**, Exterior of same valve, SEM; **D**, Exterior LV, 4.7 mm in height; **E**, Exterior LV, 4.5 mm in height; **F**, Exterior LV, 3.7 mm in height.

Spondylus aff. *mimus* Dall, Bartsch & Rehder, 1938

Figures 20 A–D

Spondylus—Luke, 1995: p. 106.
Spondylus sp.—Trego, 1997: p. 199.

Material examined. Two fragments (ca. 31 mm) (BK), including a partial valve collected by the 1957/58 Downwind Expedition (SIO Benthic Collection, M1441) and the juvenile holotype of *S. kauaiensis* Dall *et al.*, 1938 (=*S. mimus* Dall *et al.*, 1938).

Diagnosis. Shell small, subcircular, inequivalve, inequilateral, not fragile. Exterior surface consisting of about twelve radiating ribs which are heavily spined. Spines spaced fairly far apart and concave toward the ventral margin. Between the main ribs are finer intercostal riblets with the center riblet more pronounced than the others and also spined. Internal ventral margin fluted. Hinge consisting low median teeth and deep impressed pits to accommodate the opposite valve's teeth. Color variable, creamy white to pale yellow background with irregularly spaced red to reddish orange radial rays.

Remarks. An Easter Island spondylid represented by a single glossy, yellow fragment collected by the senior author and a partial LV from the 1957/58 Downwind Expedition could not be accommodated with any of the above species.

Of the related species, *Spondylus mimus* from the Hawaiian Islands appears to be the closest congener. M. Severns, (pers. comm., 2010), conceded there were similarities in shape, color and spines, but noted the somewhat coarser and wider ridges between these spines, compared to *S. mimus*. Although he conceded there were also close similarities in the hinge, he did not accept the *EI* species conspecific with *S. mimus*.

Spondylus mimus is a very rare species and its variability is barely known. The *EI* material consists of fragments and juvenile material only, so at present it cannot be firmly identified. Further Hawaiian and *EI* material is needed for a better understanding of this/these species. For the time being, the *EI* fragments are treated as possibly endemic.

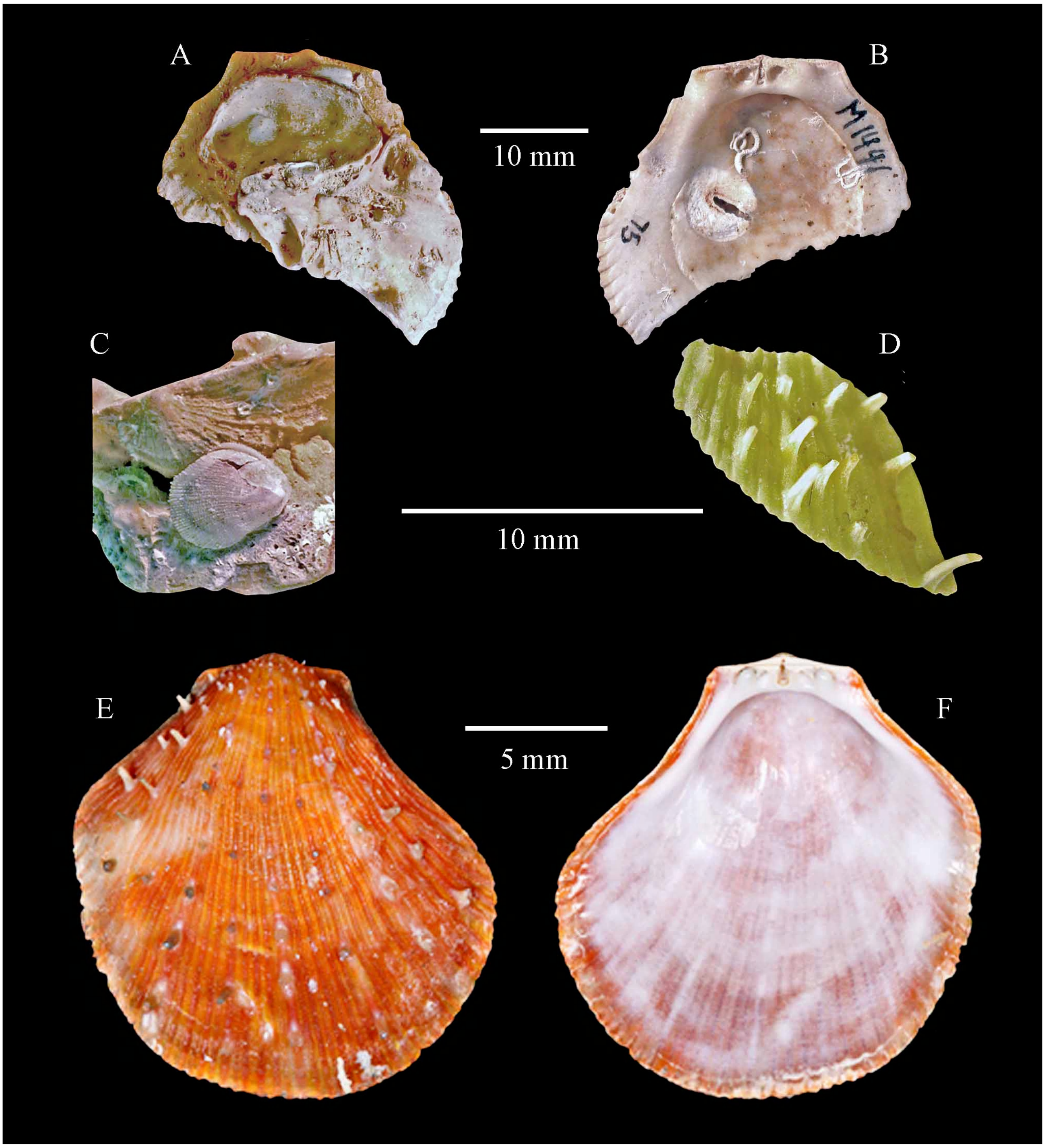

FIGURE 20. A–D, *Spondylus* aff. *mimus* Dall, Bartsch & Rehder, 1938 (SIO); **A**, Exterior partial LV, ca. 31 mm in length; **B**, Interior of same valve; **C**, Exterior close-up of same valve; **D**, Exterior of LV fragment; **E–F**, *Spondylus kauaiensis* Dall, Bartsch & Rehder, 1938, (Holoytype, USNM 335638); **E**, Exterior LV, 16.2 mm in height; **F**, Interior of same valve. Images E–F provided by M. Severns.

Dijkstra and Marshall (2008: 74) treated *Spondylus asperrimus* G.B. Sowerby II, 1847, from Norfolk and Kermadec Island, and synonymized several Hawaiian species of Dall *et al.*, 1938, notably *S. mimus*, *S. gloriosus* and *S. kauaiensis*.

Spondylus gloriosus however, is a characteristic Hawaiian species, well known under its former, erroneous name "*S. linguafelis*" (Huber, 2009). *Spondylus gloriosus* is also known from offshore Panamic Islands, but does not live in waters of Norfolk or Kermadec Islands (Huber, 2009: 107, fig. 11; Huber, 2010: 216, fig. 1; Severns, 2011: 456, pl. 208, fig. 4).

Although we agree that the Hawaiian *S. mimus* and *S. kauaiensis* are conspecific, we do not concur with them being synonymized with *S. asperrimus* which is another characteristic species and well known from the Philippines and Australia. Neither the juvenile holotype of *S. kauaiensis* (Figs. 20 E–F) nor the adult *S. mimus* have any resemblance to *S. asperrimus*. Furthermore, nothing similar to the type material of *S. asperrimus*, housed in Natural History Museum of London, has ever been seen from the Hawaiian Islands (see Huber, 2010: 216, figs. 2 and 3; Severns, 2011: pls. 207–209).

Habitat. Rarely found at a few locations around *EI*, in sand and rubble, from 50–80 m.

Distribution. At present the species is only known from Easter Island—**E1**.

Superfamily PLICATULOIDEA Gray, 1854

Family PLICATULIDAE Gray, 1854

[Type species: *Spondylus plicatus* Linnaeus, 1767 (SD by Schmidt, 1818)]

Plicatula aff. *plicata* (Linnaeus, 1767)

Figures 21 A–F

Spondylus plicatus Linnaeus, 1767: p. 1136.
Spondylus plicatus Forsskål, 1775—Yaron *et al.*, 1986: p. 179, figs. 19–20.
Plicatula plicata (Linnaeus, 1767)—Huber, 2010: p. 192, figs. 1-3.

Material examined. A single damaged valve, ca. 3.4 mm (BK).

Diagnosis. Shell small (ca. 3.4 mm in height), ovate, equilateral, thin, and very fragile. Prodissoconch P1 somewhat eroded, small and round, ca. 150 µm length and 95 µm height, P2 not present. Nepioconch with a microsculpture of fine elongate pitting, ca. 1.4 mm length and 1.3 mm height. Primary adult sculpture begins rather abruptly with pronounced commarginal lamellae which are widely spaced, and starts about mid-valve to ventral margin. Interior consisting of eleven primary radial ribs with intercostate and rudimentary secondary riblets along margin. Auricles equal, weakly developed. Hinge straight, with two crurae flanking the resilifer. Color creamy white to pale yellow.

Remarks. This extremely fragile valve was already damaged upon discovery and unfortunately received further damage while in transit. A few sculptural elements of this small species are shared with Propeamussiidae. However, the hinge construction contradicts that placement. Without any doubt it is neither Propeamussiidae nor Pectinidae. This opinion was confirmed by H. Dijkstra, (pers. comm., 2010). The crurae-hinge suggests either Spondylidae or Plicatulidae. However, there is no known spondylid (recent or fossil) with this combination of exterior sculptural elements and internal riblets.

This type of hinge configuration with two crurae on both sides of the resilifer in combination with internal riblets does support a plicatulid placement. Despite the valve's initial exterior appearance, the interior morphology and hinge suggests this to be a left (=non attached) valve. Moreover, in smaller *Plicatula plicata* (e.g. Huber 2010: 192, fig. 1) such characteristic as commarginal lamellae adjacent to the extended nepioconch are still visible. The color and the number of radial ribs in adults would equally match. There remains little doubt that this species represents a very juvenile plicatulid.

However, due to the scarcity of material along with missing records from Marquesas Islands and the Hawaiian Islands, we recommend further collecting. Until an identity with the widely distributed *P. plicata* is proven this *EI* species is treated as eventually being endemic.

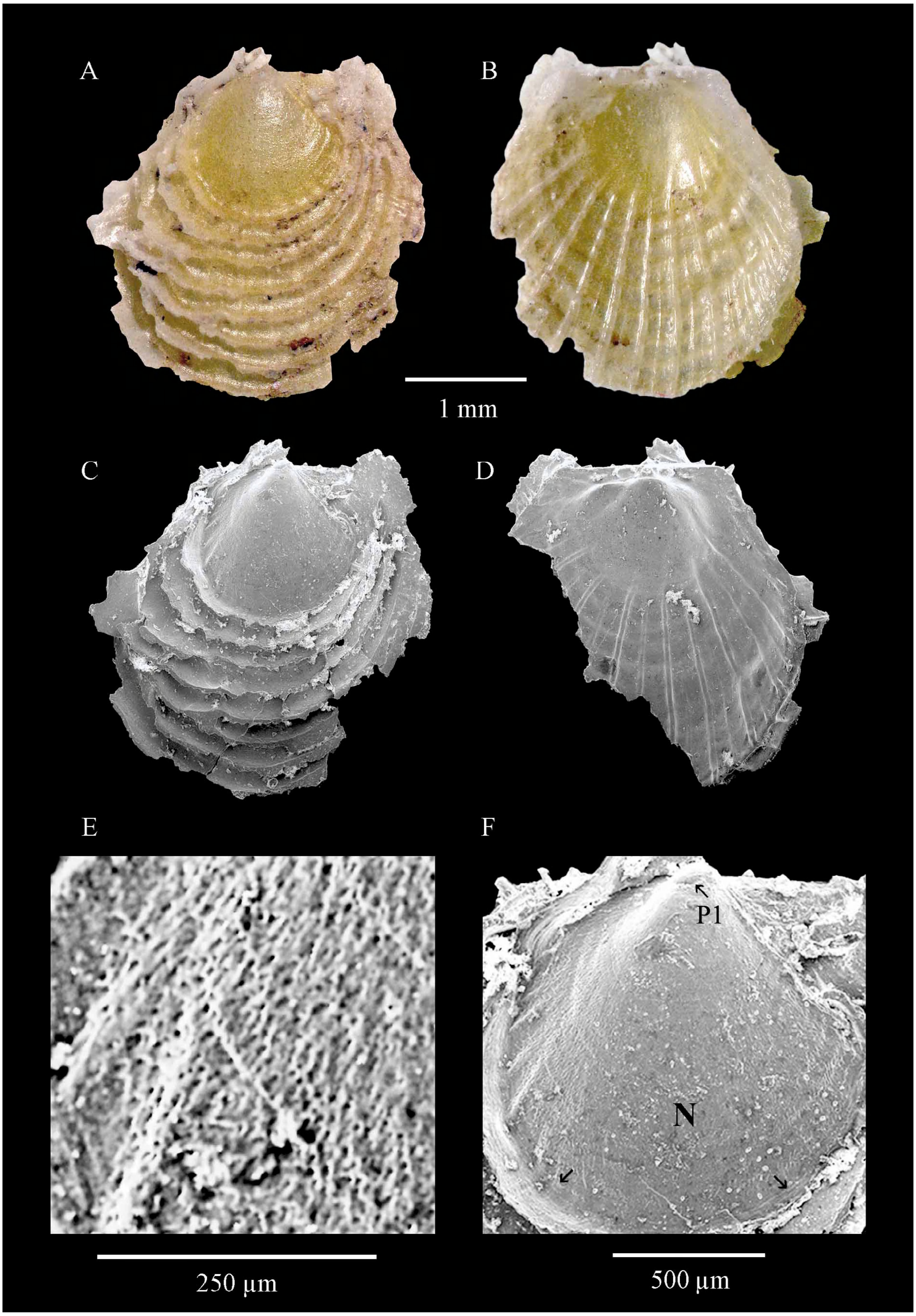

FIGURE 21. A–F, *Plicatula* aff. *plicata* (Linnaeus, 1767): **A**, Exterior LV, 3.4 mm in height; **B**, Interior of same valve; **C**, Exterior of same valve, SEM; **D**, Interior of same valve, SEM; **E**, Close-up of exterior nepioconch microsculpture, SEM; **F**, Close-up of the prodissoconch and nepioconch of same valve, SEM, arrows indicating boundaries.

Material recently studied by the junior author from Tahiti indicates that an additional undescribed *Plicatula* species lives there, previously misidentified as *P. plicata*. However, conspecifity with the *EI* species is not obvious.

Habitat. Dredged at 50–80 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Distribution. Although widely distributed throughout the Indo-Pacific, including the Red Sea, eastern Africa, Chagos Islands, Japan, China, Philippines, Indonesia, and Australia, *Plicatula plicata* has never been recorded from the Hawaiian Islands, New Zealand or the Kermadec Islands —**E4**.

Superfamily LIMOIDEA Rafinesque, 1815

Family LIMIDAE Rafinesque, 1815

Genus *Lima* Bruguière, 1797

[Type species: *Lima alba* Cuvier, 1797 (SM) =*Ostrea lima* Linnaeus, 1758]

Lima disalvoi Raines, 2002

Figures 22 A–B

Lima disalvoi Raines, 2002: p. 31, fig. 35.
Lima species—Rehder ,1980: p. 109.
Lima sp. nov.—DiSalvo *et al.*, 1988: p. 459.

Material examined. The holotype (LACM 2946) and nearly two dozen single valves (BK).

Diagnosis. Shell small to medium in size, up to 40 mm in height, equivalve, subquadrate; somewhat thin, but not fragile. Exterior with 34–38 equally spaced radial ribs, which are low, but raised sharply and covered with low rounded squamae. Interstices with fine commarginal striae. Interior smooth except along the ventral margin, which is crenulated by the ribs. Umbones small, elevated, with an angle of ca. 80°. Triangular ligament area somewhat large, with its height more than half of its length. Valves slightly gaping. Anterior auricle very small with 2–3 radial riblets. Posterior auricle much larger with 5–6 radial riblets. Color creamy white to pale yellow.

Remarks. Rehder (1980) was the first to recognize this species as being potentially new, but lacked fresh material and simply recorded it as '*Lima* species'. Several years later, DiSalvo collected live taken examples, which Rehder confirmed to be the same species.

Habitat. Commonly found under rocks at 10 to 30 m, off Anakena, Easter Island.

Distribution. *Lima disalvoi* is currently only known from Easter Island—**E1**.

Lima tomlini Prashad, 1932

Figures 22 C–E

Lima tomlini Prashad, 1932: p. 123, pl. 3, figs .29–31.
Lima lata Pelseneer, 1911: p. 34, pl. X, fig. 4, *non* E.A. Smith, 1885.

Material examined. Several articulated specimens and over fifty single valves (3 to 6.5 mm) (BK).

Original description. "Shell small, thin, almost transparent, very oblique, below anterior slope almost circular in outline, moderately swollen; anterior slope rather short, almost straight, greatly reduced anterior auricles nearly hidden in the heart shaped concavity of the front excavated area; posterior auricles narrow but distinct; posterior slope evenly arched, running imperceptibly into the ventral margin; hinge-area very short, with a short, subcentral, triangular ligamental pit; sculpture consisting of 35–46 very regular, closely placed and rounded ridges separated by almost linear interspaces, the ridges further bear several rows of short, delicate, triangular spines more prominently on the distal halves of the shells; shell margin finely dentate. Color white, inner surface polished, showing impressions of external radial sculpture." (Prashad 1932: 123.)

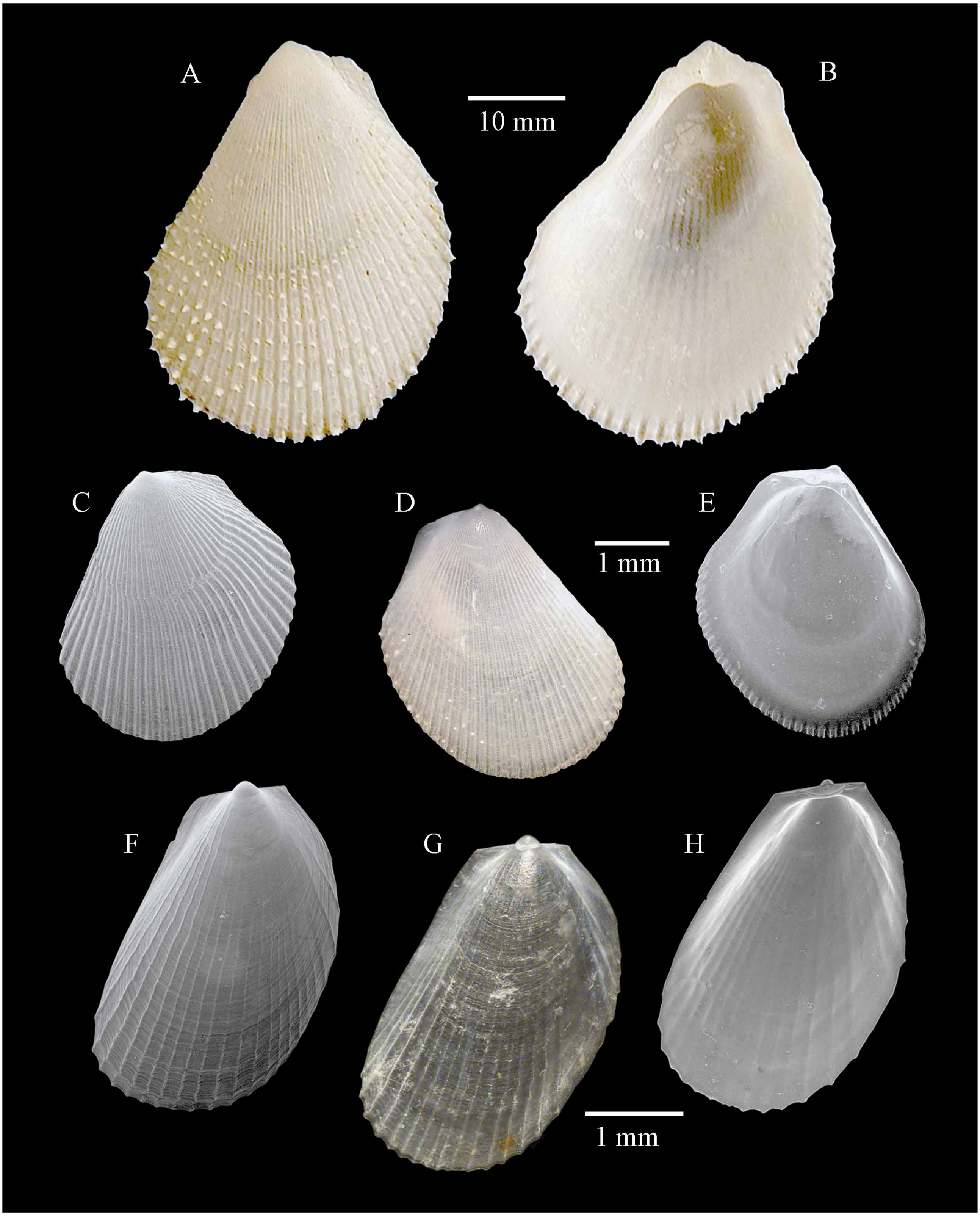

FIGURE 22. A–B, *Lima disalvoi* Raines, 2002, (Holoytype, LACM 2946): **A**, Exterior LV, 40 mm in height; **B**, Interior RV of same specimen; **C–E**, *Lima tomlini* Prashad, 1932; **C**, Exterior LV, 3.5 mm in height, SEM; **D**, Exterior RV, 3.6 mm in height; **E**, Interior LV of same specimen, SEM; **F–H**, *Limaria* (*Promantellum*) *parallela* (Dall, Bartsch & Rehder, 1938); **F**, Exterior LV, 3.2 mm in height, SEM; **G**, Exterior LV, 3.3 mm in height; **H**, Interior RV, 3.1 mm in height, SEM.

Remarks. From the rib count (about 34–38) of the *EI* specimens, *Lima benthonimbifer* Iredale, 1925, *L. fujitai* Oyama, 1943, *L. nakayasui* Habe, 1987, *L. perfecta* Smith, 1904, *L. sagamiensis* Masahito, Kuroda & Habe *in*

Kuroda *et al.*, 1971, *L. spectata* (Iredale 1929) and *L. vulgatula* Yokoyama, 1922 can be excluded. From biogeography and stronger sculpture *L. quantoensis* Yokoyama, 1920 can be excluded as well. Only *L. tomlini* appears to be consistent with the rib count, depth, size and shape.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 20–200 m. Live specimens at 150 m.

Distribution. Although originally described from the Arafura Sea, *Lima tomlini* is known from Indonesia to China and Japan. However, it is not known from the Hawaiian Islands. Easter and Salas y Gómez Islands are now recorded as a range extension—**E4**.

Genus *Limaria* Link, 1807

Subgenus *Promantellum* Iredale, 1939

[Type species: *Promantellum parafragile* Iredale, 1939 (OD) =*Ostrea fragilis* Gmelin, 1791]

Limaria (*Promantellum*) *parallela* (Dall, Bartsch & Rehder, 1938)

Figures 22 F–H

Lima parallela Dall *et al.*, 1938: p. 106, pl. 27, figs. 9–12.
Limaria (*Promantellum*) *fragilis* (Gmelin, 1791)—Rehder, 1980: p. 110.
Limaria (*Promantellum*) *parallela* (Dall *et al.*, 1938)—Severns, 2011: p. 460, pl. 210, fig. 2.

Material examined. Over two dozen single valves (2.8 to 8.6 mm) from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU).

Diagnosis. Shell small, obliquely-elongate, equivalve, thin and fragile. Posterior and anterior margins parallel the last third of the shell, and with long gapes. Exterior surface consisting of 22–24 fine radial threads, which are crossed by finer commarginal striae. Ventral margin with serrated appearance. Hinge short and straight, with wide ligament. Color translucent white.

Remarks. Although Rehder (1980) was correct in selecting *Promantellum*, he misidentified this species as *P. fragilis*. The largest *EI* specimen slightly exceeds the 8 mm Hawaiian type specimen. However, *Limaria* (*P.*) *fragilis* (Gmelin, 1791) grows up to 35 mm, lives in very shallow water and is distributed further west with an Indian Ocean type locality.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 20–80 m.

Distribution. *Limaria* (*Promantellum*) *parallela* is currently known only from the Hawaiian Islands, Easter Island and Salas y Gómez Island—**E2**.

Subgenus *Limatulella* Sacco, 1898

[Type species: *Lima loscombi* G.B. Sowerby I, 1823 (OD)]

Limaria (*Limatulella*) sp.

Figures 23 A–C

Limaria parallela (Dall *et al.*)—DiSalvo *et al.*, 1988: p. 459.

Material examined. One live taken specimen and two single valves (5 to 9 mm) (BK).

Diagnosis. Shell small, less than 10 mm, obliquely-ovate, equivalve, thin and fragile. Valves oblique, moderately inflated and not gaping. Exterior surface consisting of numerous (ca. 35) fine radial ribs, crossed by fine commarginal striae. Color translucent white.

Remarks. *Limatulella* encompasses species related to *Limaria* s.s. It is smaller, somewhat less ventricose, thinner, with very numerous radial ribs, but with closed or nearly closed valves.

The limatulellid shape, the small size, the inflation and the non-gaping structure place this species in *Limatulella*. No respective species is known from the Hawaiian Islands, but two larger species *Limaria* (*Limatulella*) *amakusaensis* (Habe, 1960), *L. viali* (Jousseaume *in* Lamy 1919), are known from the Indo-Pacific and Japan. Unfortunately, the minute size, limited material and the barely known variability of its congeners makes a comparison or a new description exceedingly difficult. The *Limaria* (*Promantellum*) *parallela* (Fig. 23 B) recorded by DiSalvo *et al.* (1988) is not *L.* (*P.*) *parallela* at all, but it is consistent with the subgenus *Limatulella.*

Habitat. Currently only found off the western coastline of *EI*, in sand and rubble, from 20–150 m. One live taken specimen collected at 100 m.

Distribution. At present this *Limaria* (*Limatulella*) sp. is only known from Easter Island—**E1**.

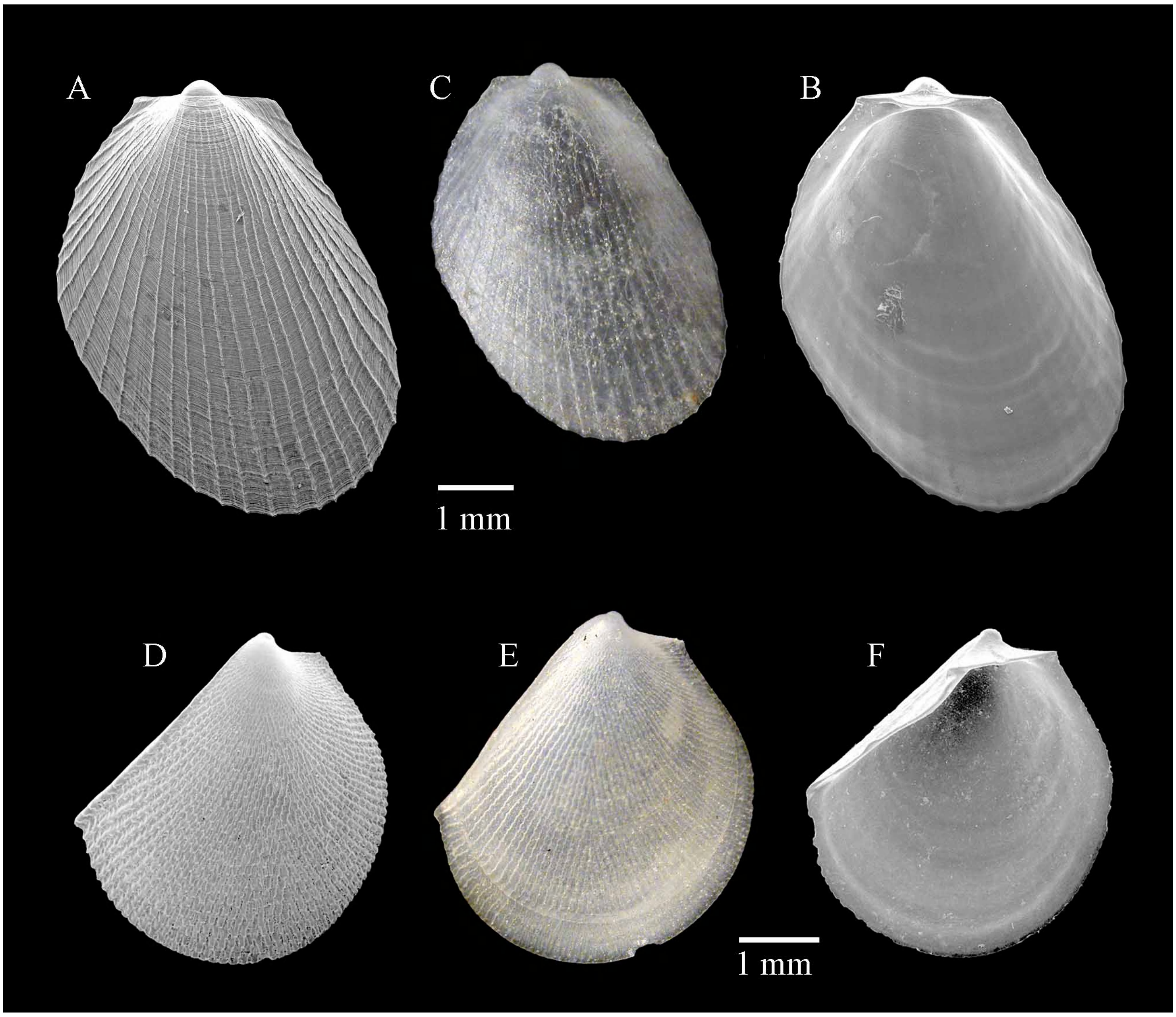

FIGURE 23. A–C, *Limaria* (*Limatulella*) sp.; **A**, Exterior RV, 5 mm in height, SEM; **B**, Interior LV of same specimen; **C**, Exterior RV, 5.7 mm in height, SEM; **D–F**, *Divarilima* aff. *sydneyensis* (Hedley, 1904); **D**, Exterior LV, 3.7 mm in height, SEM; **E**, Exterior LV, 4 mm in height; **F**, Interior RV, 3.6 mm in height, SEM.

Genus *Divarilima* Powell, 1958
[Type species: *Lima sydneyensis* Hedley, 1904 (OD)]

Divarilima aff. *sydneyensis* (Hedley, 1904)
Figures 23 D–F

Lima sydneyensis Hedley, 1904: p. 200.
Divarilima sydneyensis (Hedley, 1904)—Brook & Marshall, 1998: p. 212; Spencer *et al.*, 2011: p. 1.

Material examined. More than fifty single valves up to 4.5 mm (BK).

Diagnosis. Shell small, thin, translucent, semicircular, strongly convex. Umbones well elevated and located anteriorly. The lunule is deeply excavated. Dorsal margin straight and relatively short. Anterior margin relatively short and concave along the dorsal area. Exterior of valves completely covered with delicate punctations which are arranged in such a way to form numerous divaricate or zigzag rows. Interior smooth with pallial sinus running from muscle to muscle. Hinge plate very wide and triangular. Color translucent white.

Remarks. Of the six *Divarilima* species described from the Indo-Pacific, only *D. sydneyensis* approaches the *EI* species. *Divarilima abscisa* (Barnard, 1964), from South Africa was excluded based on morphology and biogeography. Equally excluded was *D. elegans* Hayami & Kase, 1993, from Okinawa, which is understood to be distinct from *D. abscisa.* The Japanese *Divarilima iwaotakii* (Habe, 1961), does not match in either biogeography or morphology.

Nothing similar has been recorded from the Hawaiian Islands, and the deeper water fauna of the Marquesas Islands is barely known. Of the described species, the type species *D. sydneyensis* from Australia appears to be closest to the *EI* species. On the other hand, Spencer *et al.* (2009: 198) recorded five *Divarilima* from New Zealand, of which, four are unnamed. Moreover, *D. sydneyensis* may be restricted to the Australia region. This complex group needs much more work and more material. At present it can neither be excluded that the *EI* species is conspecific with a western species, nor that it represents a valid and endemic *Divarilima* species.

Habitat. Commonly found at many locations around *EI*, in sand and rubble, from 100–200 m.

Distribution. Unknown at present. The conspecifity with other western species cannot be excluded. However, *D. sydneyensis* is reliably known from eastern Australia and Norfolk Island only. The records from New Zealand or Kermadec Islands may refer to undescribed species—**E5**.

Subclass HETERODONTA Neumayr, 1884

Superfamily LUCINOIDEA Fleming, 1828

Family LUCINIDAE Fleming, 1828

Genus *Ctena* Mörch, 1861

[Type species: *Lucina pectinata* Carpenter, 1857, *non* Gmelin, 1791 (SD by Dall *et al.* 1938) =*Codakia* (*Jagonia*) *mexicana* Dall, 1901]

Ctena bella (Conrad, 1837)

Figures 24 A–D

Lucina bella Conrad, 1837: p. 254, pl. 19, fig. 11.

Ctena bella (Conrad, 1837)—Dall *et al.*, 1938: p. 129, pl. 35, figs. 1–8; Kay, 1979: p. 543, figs. 176 A–D; Preece, 1995: p. 350; Tröndlé & Boutet, 2009: p. 7; Severns, 2011: p. 468, pl. 214, fig. 2.

Codakia (*Epicodakia*) *bella* (Conrad, 1837)—Rehder, 1980: p. 110.

Ctena bella (Conrad, [*sic*] 1834)—Brook & Marshall, 1998: p. 212; Spencer *et al.*, 2011: p. 1.

Epicodakia bella (Conrad, 1837)—Okutani, 2000: p. 929, pl. 462, fig. 5.

Material examined. Several hundred articulated specimens and single valves from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU), Marquesas Islands (MHU), Australia (MHU) and Pitcairn Island (BK).

Diagnosis. Shell small (up to 20 mm in length) broadly ovate to suborbicular shape, equivalve, inequilateral, not fragile. Umbones somewhat elevated; lunule moderately impressed and elongate. Exterior surface of rounded radiating ribs crossed by commarginal ridges forming low elongate nodules on the ribs. Interior muscle scars unequal, with pallial sinus running nearly continuous; margin crenulate. Hinge with two cardinals, which are bifid in the right posterior and left anterior, and opposing laterals in each valve. Color creamy white to pale yellow.

Remarks. The *EI* specimens conform well to the Hawaiian material. Dall *et al.* (1938) corrected the erroneous original type locality for *C. bella* from San Diego to the Hawaiian Islands. The Hawaiian species was accepted by J. Taylor, (pers. comm., 2010) to represent *bella*. The Japanese *Ctena delicatula* (Pilsbry, 1904), is a similar, but a morphologically distinct species and most noticeable in adult valves by having finer radial ribs and fewer commarginal ridges.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 10–50 m.

Distribution. *Ctena bella* is widely distributed throughout the Indo-Pacific, ranging from the Hawaiian Islands to the Kermadec Islands to include the Society Islands, Marquesas Islands, Tuamotu Archipelago, Gambier Islands, Austral Islands, eastern Australia, Norfolk Island, and Pitcairn Islands, as well as Easter and Salas y Gómez Islands—**E5**.

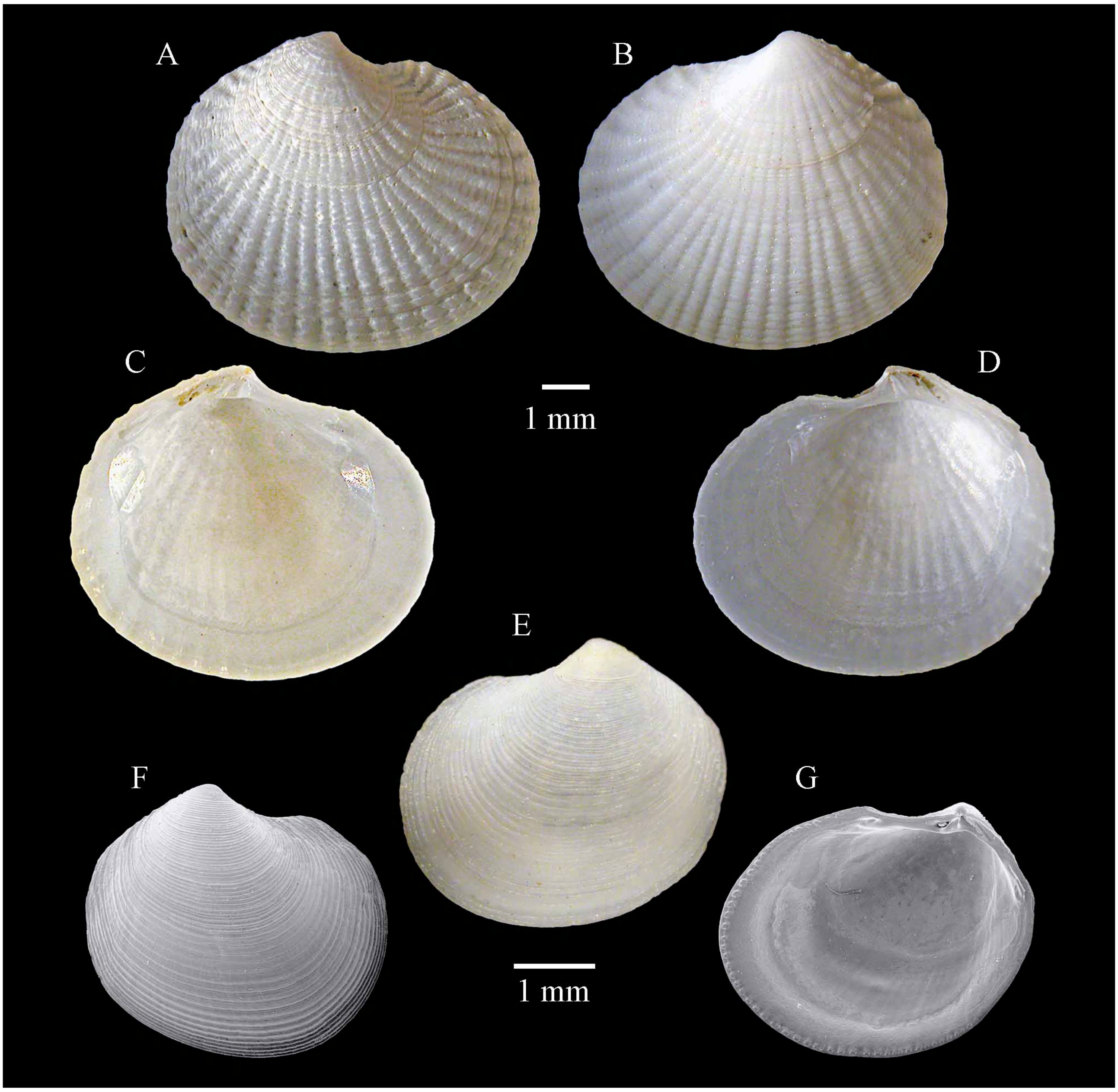

FIGURE 24. A–D, *Ctena bella* (Conrad, 1837): **A**, Exterior RV, 7.2 mm in length; **B**, Exterior LV, 7.1 mm in length; **C**, Interior LV of same valve; **D**, Interior RV, 6.8 mm in length; **E–G**, *Funafutia levukana* (E.A. Smith, 1885): **E**, Exterior LV, 4 mm in length; **F**, Exterior RV, 3.6 mm in length, SEM; **G**, Interior RV of same valve, SEM.

Genus *Funafutia* Glover & Taylor, 2001

[Type species: *Lucina* (*Codakia*) *levukana* E.A. Smith, 1885 (OD)]

Funafutia levukana (E.A. Smith, 1885)

Figures 24 E–G

Lucina levukana E.A. Smith, 1885: p. 181, pl. 13, fig. 6.
Funafutia levukana (E.A. Smith, 1885)—Glover & Taylor, 2001: p. 286, figs. 22 A-D; Tröndlé & Boutet, 2009: p. 8.

Material examined. More than fifty single valves from *EI* and *SyG* (BK), plus specimens from the Marquesas Islands (MHU).

Diagnosis. Shell small (up to 6 mm in length), suborbicular, equivalve, inequilateral, not fragile. Umbones elevated. Exterior surface of irregularly spaced prominent, rounded commarginal lamellae, microscopic radials. Interior smooth with continuous pallial line; margins finely crenulate. Hinge stout, consisting of two cardinals in the LV, and one cardinal in the RV with prominent posterior and anterior laterals. Color white.

Remarks. The oblique shape, lamellate sculpture with microscopic radials, the crenulated margin and the hinge configuration closely approach the type species *Funafutia levukana* (E.A. Smith 1885). Species within the genus *Levukana* are typically known from shallow water to 40 m, with a size of 6 mm. The *EI* species is known from 20–100 m, also from caves in 35–40 m (Motu Tantara) with a maximum size of 5 mm.

Although the *EI* material has a somewhat denser commarginal sculpture with weaker radials and a slightly less pronounced anterior lateral in the LV, J. Taylor, (pers. comm., 2010) confirmed the specimens to be within the normal variability of *F. levukana.* Sizes and depths are comparable. Most likely, this species conforms to Kay (1995: 155) *Lucina* species from Easter Island.

Habitat. Commonly found at many locations around *EI* and *SyG*, in fine sand, from 20–100 m.

Distribution. *Funafutia levukana* is known from eastern Africa to the Marquesas Islands, but has not been recorded from the Hawaiian Islands. The presence of this species on Easter and Salas y Gómez Islands represents a range extension—**E4**.

Superfamily GALEOMMATOIDEA Gray, 1840

Family GALEOMMATIDAE Gray, 1840

Genus *Lasaea* Brown, 1827

[Type species: *Cardium rubrum* Montagu, 1803 (MT)]

Lasaea hawaiensis Dall, Bartsch & Rehder, 1938

Figures 25 A–D

Lasaea hawaiensis Dall *et al.*, 1938: p. 141, pl. 38, figs. 1–4, text fig. 18.
Lasaea hawaiensis Dall *et al.*, 1938—Kay, 1979: p. 547, figs. 178 A & 179 A; Rehder, 1980: p. 111, pl. 14, figs. 7–9; Tröndlé & Boutet, 2009: p. 8; Severns, 2011: p. 470, pl. 215, fig. 5, *non* fig 4.

Material examined. Over one hundred live taken specimens and single valves from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU) and Pitcairn Island (BK).

Diagnosis. Shell large for the genus (up to 6 mm in length), suborbicular to broadly ovate, inflated, and not fragile. Umbones elevated. Exterior surface of commarginal growth lines and dense punctate microsculpture. Pallial line continuous; margins smooth. Hinge stout, consisting of broad lateral teeth. Color variable only in intensity, translucent white and tinged with reddish purple which is darker toward the umbones, and the posterior and anterior ends. Hinge and dorsal margin are usually stained as well.

Remarks. This species is similar in shape and color to the moderately smaller *L. hinemoa* Finlay, 1928, from New Zealand and the much smaller European type species *L. rubra* (Montagu, 1803). The genus *Lasaea* has been a subject of great interest for the last twenty-five years. This near-cosmopolitan genus has the ability to brood their young either to a planktotrophic veliger or a crawl-away juvenile stage of development (Ó Foighil, 1989: 349). Furthermore, it challenges our preconception regarding planktotrophic species distribution. Several genetic studies on this genus indicate that *Lasaea* species with crawl-away juvenile stages actually have a greater geographic range than those with planktotrophic larvae. This is especially true among oceanic island groups. However, over time these non-planktotrophic genetic clones tend to become morphologically distinct (Ó Foighil 1986 & 1989; Taylor & Ó Foighil 2000; Ó Foighil *et al.* 2001).

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 5–80 m, living to around 20 m.

Distribution. *Lasaea hawaiensis* was originally described from the Hawaiian Islands, but is also known from the Marquesas Islands, Gambier Islands, Austral Islands, Pitcairn Islands, as well as Easter and Salas y Gómez Islands—**E5**.

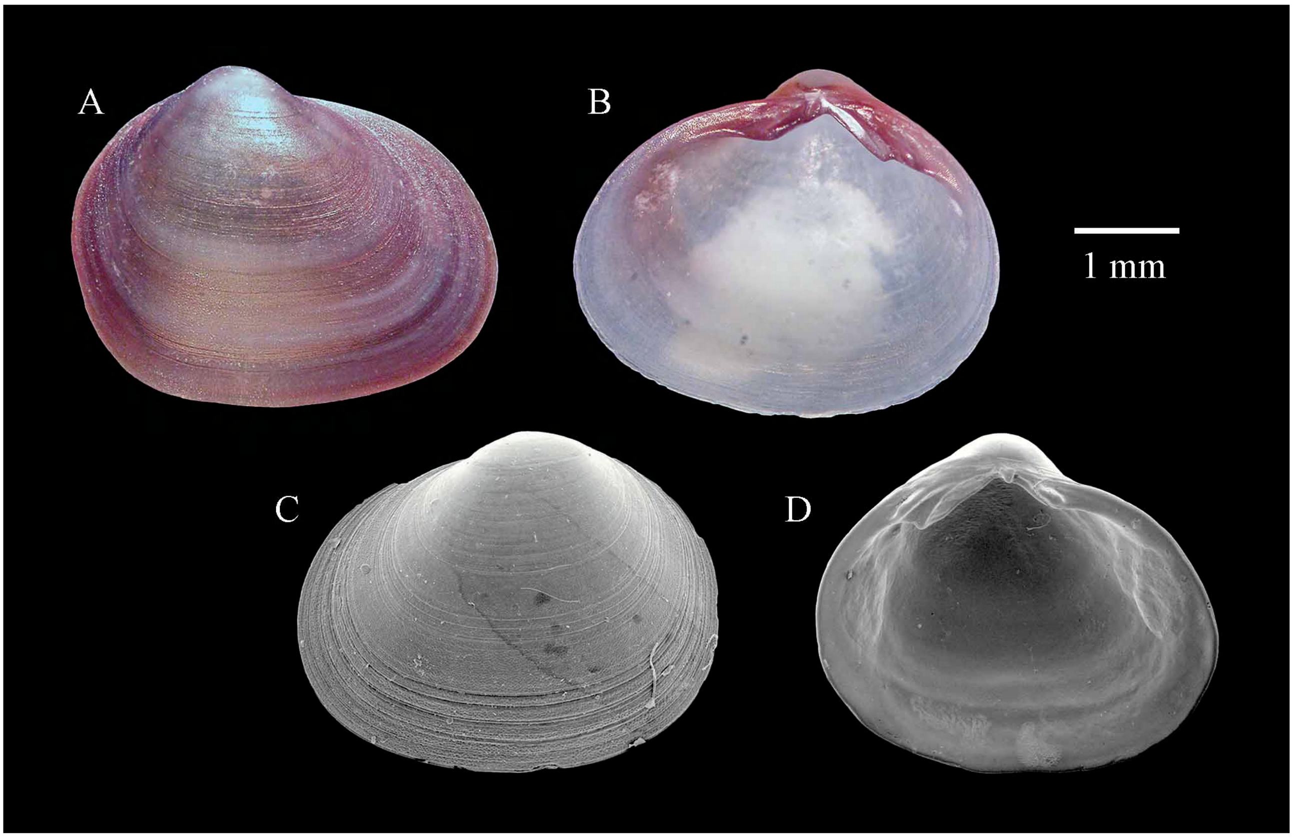

FIGURE 25. A–D, *Lasaea hawaiensis* Dall, Bartsch & Rehder, 1938; **A**, Exterior RV, 4 mm in length; **B**, Interior RV, 4 mm in length; **C**, Exterior LV, 3.9 mm in length, SEM; **D**, Interior LV, 3.7 mm in length, SEM.

Lasaea eastera sp. nov.

Figures 26 A–H

Type Material. Holotype: LACM 3150, 1 articulated specimen, 2.9 mm. Paratype: LACM 3151, 1 articulated specimen, 2 mm.

Type Locality. Dredged at 30–80 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Description. A small, translucent white *Lasaea* species, with narrow, subcentral umbones. Shell small, below 3 mm, equivalve, subequilateral, oval with almost straight ventral margin; thin and translucent; uniformly whitish-yellow outside, whitish inside; umbones narrow, pointed, subcentral, weakly prosogyrate. Prodissoconch, P1surface somewhat eroded, ovate and pronounced, ca. 75 µm length by 50 µm height, P2 smooth, with nearly obsolete growth striae, ca. 350 µm length by 340 µm height. Adult valves weakly inflated. Sculpture of weak commarginal striae, rather widely and somewhat irregularly spaced, radial elements absent. Hinge line thin, cardinals largely fused to lamellar posterior lateral and to shorter lamellar anterior lateral, laterals separated by a wide depression. Pallial line continuous. Ligament elongate, very thin and very narrow, marginally, embedded posterior to the umbones; resilifer subumbonal. Margins smooth.

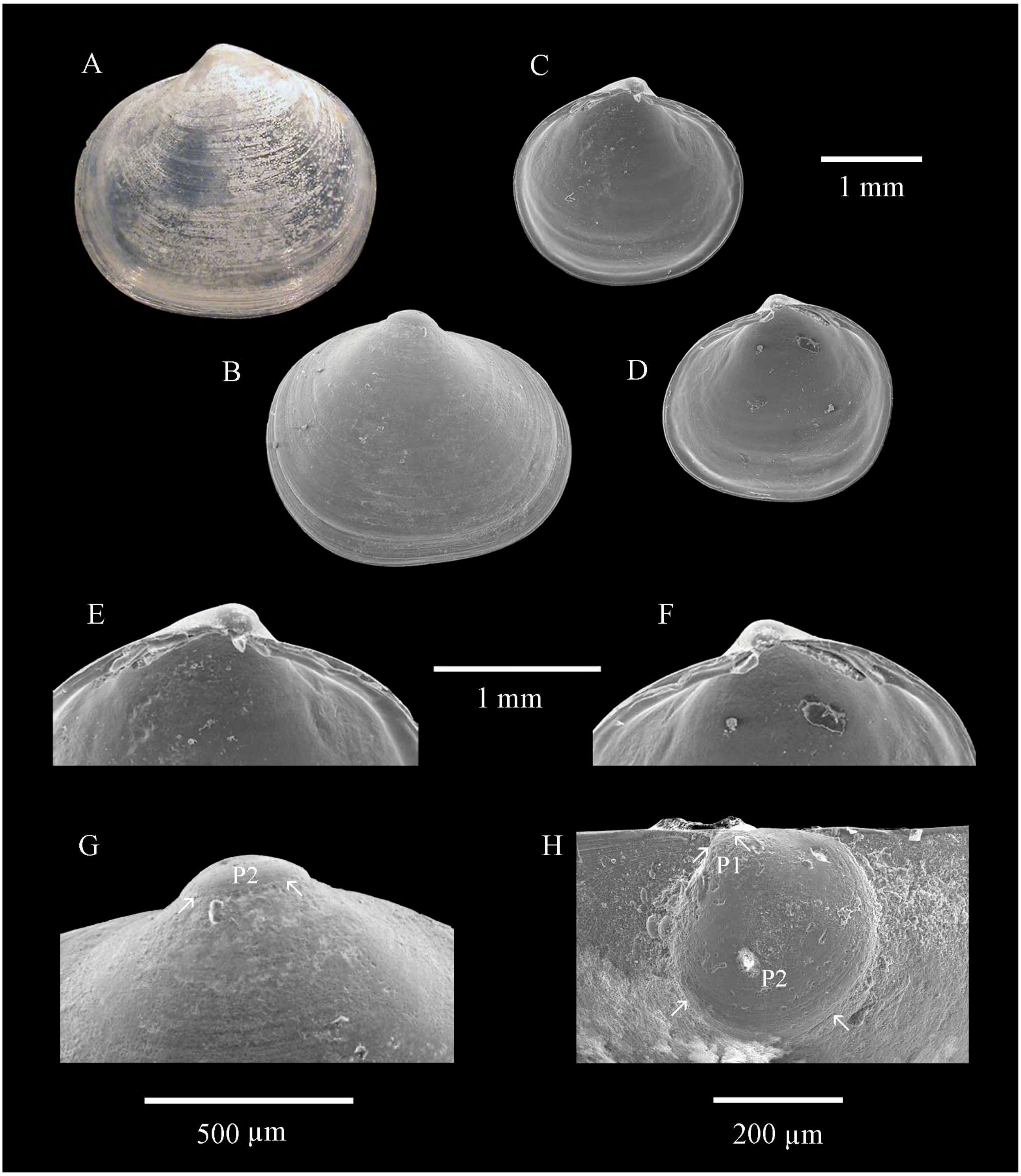

FIGURE 26. A–H, *Lasaea eastera* sp. nov.: **A**, Exterior LV, 2.9 mm in length; **B**, Exterior RV of same specimen, SEM; **C**, Interior LV, 2 mm in length, SEM; **D**, Interior RV of same specimen, SEM; **E**, Close-up of the hinge, LV, SEM; **F**, Close-up of the hinge, RV, SEM; **G–H**, Close-up of the prodissoconch, LV, SEM, arrows indicating boundaries.

TABLE 3. Selected measurements from the type material.

L. eastera sp. nov.	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	2.9	2.6	not visible	375 x 370
Paratype 1	2	1.8	ca. 75 x 50	320 x 310

Comparative diagnosis. *Lasaea hawaiensis*, originally described from the Hawaiian Islands, was recorded early by Rehder (1980) from *EI* and is present with numerous specimens. However, these are very uniform in shape, solidity and color, typically with reddish staining in the umbonal area. No other *Lasaea* species has been described from the Hawaiian Islands.

The new species has the same basic hinge configuration, though with a weaker, narrower hinge line and finer dentition. The structure is more fragile and translucent. The color is whitish and absent of any staining. The commarginal lines are wider and somewhat irregular. The umbones of adult *L. eastera* are most notably more pointed, narrower and stronger, exceeding the dorsal line and nearly centrally located.

Lasaea australis (Lamarck, 1818), from South Australia is more solid, with distinct color, stronger sculpture, and rather trigonal in shape with posteriorly placed umbones. It also grows to a much larger size, 6.5 mm. *Lasaea colmani* Ó Foighil & Thiriot-Quiévreux, 1999, from Sydney is less than half the size, broader with very low broad, posteriorly placed umbones.

Numerous species have been described from New Zealand. Thereof, *L. hinemoa* Finlay, 1928, (syn. *L. rossiana* Finlay, 1928), is similar in shape and color to *L. hawaiensis*, and shares similar distinctive markings as *L. eastera*, notably colors and stronger hinge. *Lasaea hinemoa* also grows larger (4.6 mm) than the *EI* species. *Lasaea maoria* (Powell 1933), shares its fragile structure, small size and white color with that of *L. eastera*, but the pronounced broader umbones and the lower and broader shape do not match. In addition, the hinge line of *L. eastera* is narrow and the dentition weak, whereas even the smaller *L. maoria* has a comparatively more solid and stronger dentition. *Lasaea parengaensis* Powell, 1935, is very distinct in oblique-trigonal shape.

Remarks. While *L. hawaiensis* is commonly encountered, *L. eastera* is very uncommon.

The deeper habitat of the two *EI* species is highly unusual compared to the otherwise shallow global *Lasaea* species. This change in habitat is probably influenced by the active downslope sediment transport noted by DiSalvo *et al.* (1988: p. 454).

Distribution. At present *Lasaea eastera* is only known from the type locality—**E1**.

Etymology. The name reflects the type locality.

Genus *Hyalokellia* Habe, 1960

[Type species: *Hyalokellia polita* Habe, 1960 (OD)]

Hyalokellia tahaia sp. nov.

Figures 27 A–E

Type Material. Holotype: LACM 3152, a 4.7 mm single LV. Paratypes 1–3: LACM 3153, 2 single RV (2.9 & 4.1 mm), and 5.1 mm single LV from the type locality.

Type Locality. Dredged at 30–50 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Description. A small *Hyalokellia* species, rarely over 5 mm in length, oval, equally rounded at both ends, produced posteriorly, straight ventrally, thin and fragile; inequilateral; umbones in the anterior third, somewhat erect, small, rounded, slightly above the dorsal line, weakly prosogyrate. Prodissoconch, P1when visible is D-shaped and somewhat smooth, ca. 135 µm length by 120 µm height, P2 suboval, well defined, irregularly growth lines, ca. 311 µm length by 266 µm height. Adult valves weakly inflated, non-gaping; color semi-translucent to opaque white. Moderate variability in shape could be observed during growth, with smaller specimens being less evenly rounded, but slightly less broad on the attenuated posterior side. Surface polished glossy and smooth, weak growth lines marginally, no radial elements. Hinge simple, RV with a single, rather strong and knobby cardinal, situated anteriorly to the subumbonal resilifer pit, no anterior lateral, but a rather long, somewhat oblique posterior lateral, positioned on the lower margin of the hinge line. Above this lateral tooth is a ridge positioned in midst of the hinge line, parallel to the dorsal margin. The LV lateral matches with corresponding ridge and the marginal lateral. LV with a single weak anterior cardinal and a long posterior lateral. Pallial line continuous, muscle scars very weakly impressed, the posterior-one rounded, the anterior-one reniform, both scars are much closer to the dorsal than to the ventral margin. Ligament internal, resilifer obliquely placed in a subumbonal pit. Margins smooth.

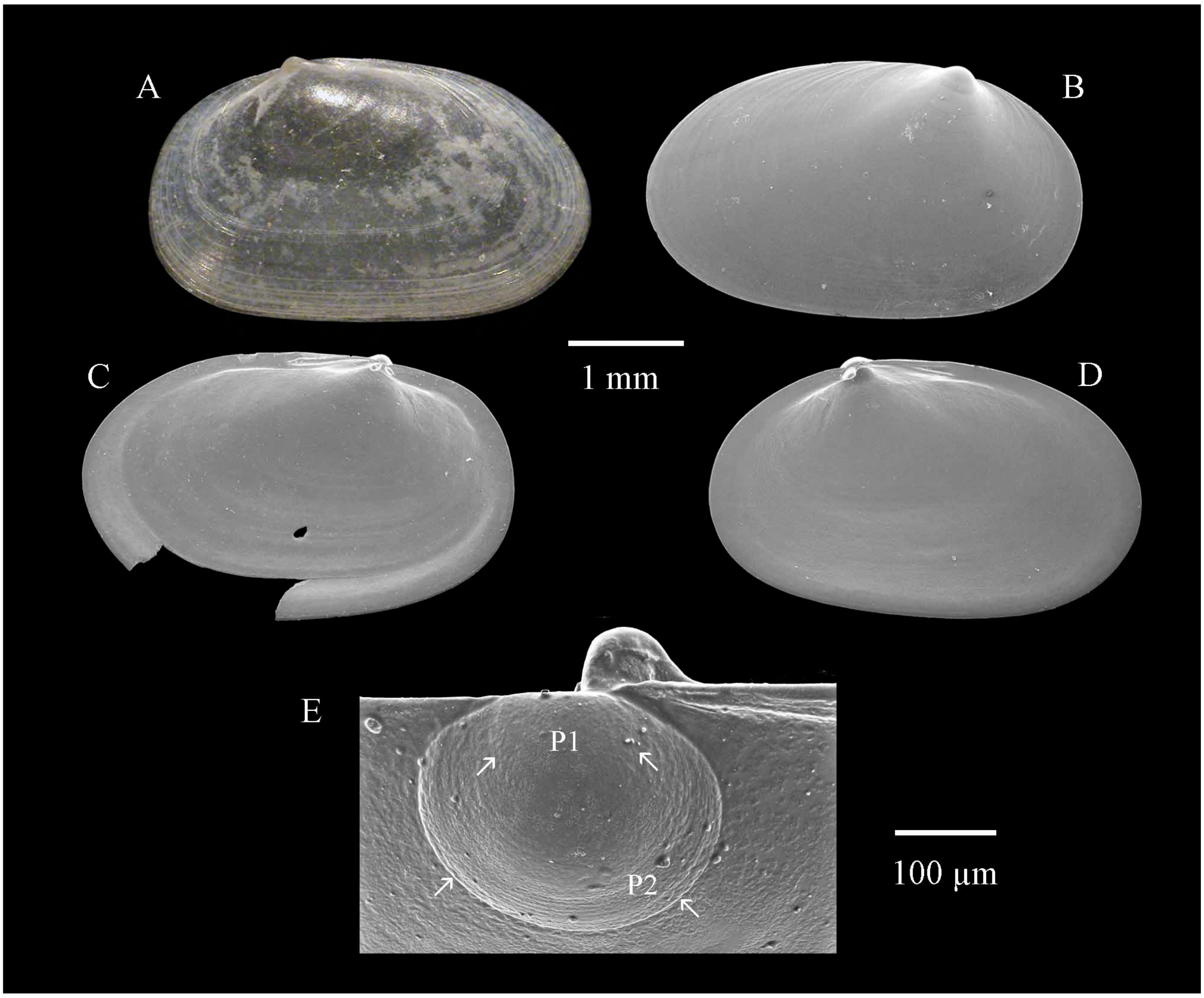

FIGURE 27. A–E, *Hyalokellia tahaia* sp. nov.; **A**, Exterior LV, 3.7 mm in length; **B**, Exterior RV, 3.8 mm in length; SEM; **C**, Interior LV, 3.6 mm in length, SEM; **D**, Interior RV, 3.7 mm in length, SEM; **E**, Close-up of the prodissoconch, RV, SEM, arrows indicating boundaries.

TABLE 4. Selected measurements from the type material.

***H. tahaia* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	4.7	2.8	not visible	300 x 240
Paratype 1	2.9	1.7	not visible	300 x 275
Paratype 2	4.1	2.5	ca. 135 x 120	325 x 275
Paratype 3	5.1	3.2	not visible	320 x 275

Comparative diagnosis. Habe's *Hyalokellia* species from Tomioka, Japan and Laseron's *Parvikellia* species from southeastern Australia merit close comparison.

Laseron (1956: 9) followed by Chavan *in* Moore (1969: N522), illustrated the RV of the type species *Parvikellia isolata* Laseron, 1956. These conform by having a single cardinal, situated anteriorly, a subumbonal resilifer and a posterior lateral present, but anterior lateral absent. However, apart from the lower and longer posterior lateral in *H. tahaia* there is a further elongate ridge between lateral and dorsal margin for the reception of the LV lateral. The hinges of the respective left valves are significantly distinct. Assuming *Parvikellia depressa* Laseron, 1956, as congeneric, as did Laseron, Chavan, and Lamprell and Healy (1998: sp. 420), then a *Parvikellia* LV consists of two small diverging cardinals and anterior laterals. In contrast, the hinge of *H. tahaia* consists of a single anterior cardinal without anterior laterals. In addition, the genus *Parvikellia* has more rounded and stronger inflated valves and the umbones of *P. isolata* and *P. depressa* are acutely pointed and rather orthogyrate.

Very close in fragility, with bean-shaped valves, having small prosogyrate and rounded umbones, by its size, and hinge configuration with a single cardinal in each valve is *Hyalokellia polita* Habe, 1960. To date this genus is monospecific. It was based on a Japanese species from Tomioka, Kyushu and in 1981 also recorded from Kii, Honshu. P. Middelfart, (pers. comm., 2010) recognized close affinities to the *EI* species. *Hyalokellia polita* was described, but not illustrated by Habe, 1960. The holotypic RV, 5.1 mm, of *H. polita* is illustrated in Higo *et al.* (2001: B693). The paratypic LV, 5.8 mm, was described by Habe (1960: 291). Both species share a similar size and a sublittoral habitat (shallower than 50 m). The hinge configuration is identical. However, *H. tahaia* is more regularly ovate, notably on the dorsal side. The hinge line is also broader and more solid.

Chavan *in* Moore (1969: N537) placed the then unfigured *Hyalokellia* under *'genera dubia'*. Habe (1960: 290) originally placed *Hyalokellia* within the invalid family Erycinidae (Bouchet *et al.* 2010). Modern Japanese authors (e.g. Higo *et al.* 2001) place it near *Kellia* Turton, 1822. This view is shared and *Hyalokellia tahaia* is placed in its vicinity.

Remarks. There is nothing similar known from the Hawaiian Islands, Marquesas Islands nor New Zealand. However, material recently studied from Tahiti by the junior author indicates that an additional undescribed *Hyalokellia* species lives there, which is larger (8 mm) and very distinct by being more oval and higher in shape.

Distribution. This is an uncommon species from Easter Island and at present is only known from the type locality—**E1**.

Etymology. Named after the type locality.

Genus *Borniola* Iredale, 1924

[Type species: *Bornia lepida* Hedley, 1906 (OD)]

Borniola pasca sp. nov.

Figures 28 A–F

Type Material. Holotype: LACM 3154, 1 single LV, 3.2 mm. Paratypes 1–3: LACM 3155, 3 single valves up to 2.2 mm from Tahai, 27°07'20" S, 109°26'30" W, 30–80 m. Paratypes 4–10: LACM 3156, 8 single valves up to 3 mm from the type locality. Paratypes 11–13: LACM 3157, 2 articulated specimens and 1 single valve, up to 3.4 mm, Motu Iti, 65 m. Paratypes 14–16: Coll. MHU, 1 articulated specimen and 2 single valves from Motu Iti, 65 m.

Type Locality. Dredged at 50–100 m, in sand, La Perouse Bay, Easter Island, 27°04'26" S, 109°16'50" W.

Description. A small, opaque white, shape-variable *Borniola* with a well defined disjunct dentition and the typical radial sculpture. Shell small, below 3.5 mm, variable in shape from rounded ovate to subquadrate, equivalve; no lunule; inequilateral; umbones prominent, pointed, opisthogyrate, posteriorly placed. Prodissoconch, P1 smooth, D-shaped, weakly defined, ca. 175 µm length by 142 µm height, P2 round, commarginally lined, ca. 356 µm length by 306 µm height. Adult valves rather compressed; non-gaping. Sculpture of dense, somewhat irregular, commarginal growth lines, crossed by dense, diverging radial striae. Hinge rather solid, without cardinals. RV with two strong, divergent, elongate laterals separated by a small depression; LV nearly edentate with a weakly expressed extended anterodorsal lamellar ridge parallel to the margin and a shorter, slightly more curbed lamellar ridge, parallel to the posterior margin. Weak hinge plate present. Pallial line continuous. Ligament internal, subumbonal. Margins smooth.

TABLE 5. Selected measurements from the type material.

B. pasca sp. nov.	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	3.2	2.8	not visible	350 x 310
Paratype 1	2.2	1.8	ca. 150 x 120	325 x 290
Paratype 4	2.8	2.3	ca. 190 x 170	375 x 300
Paratype 11	3.4	2.9	ca. 185 x 135	375 x 325

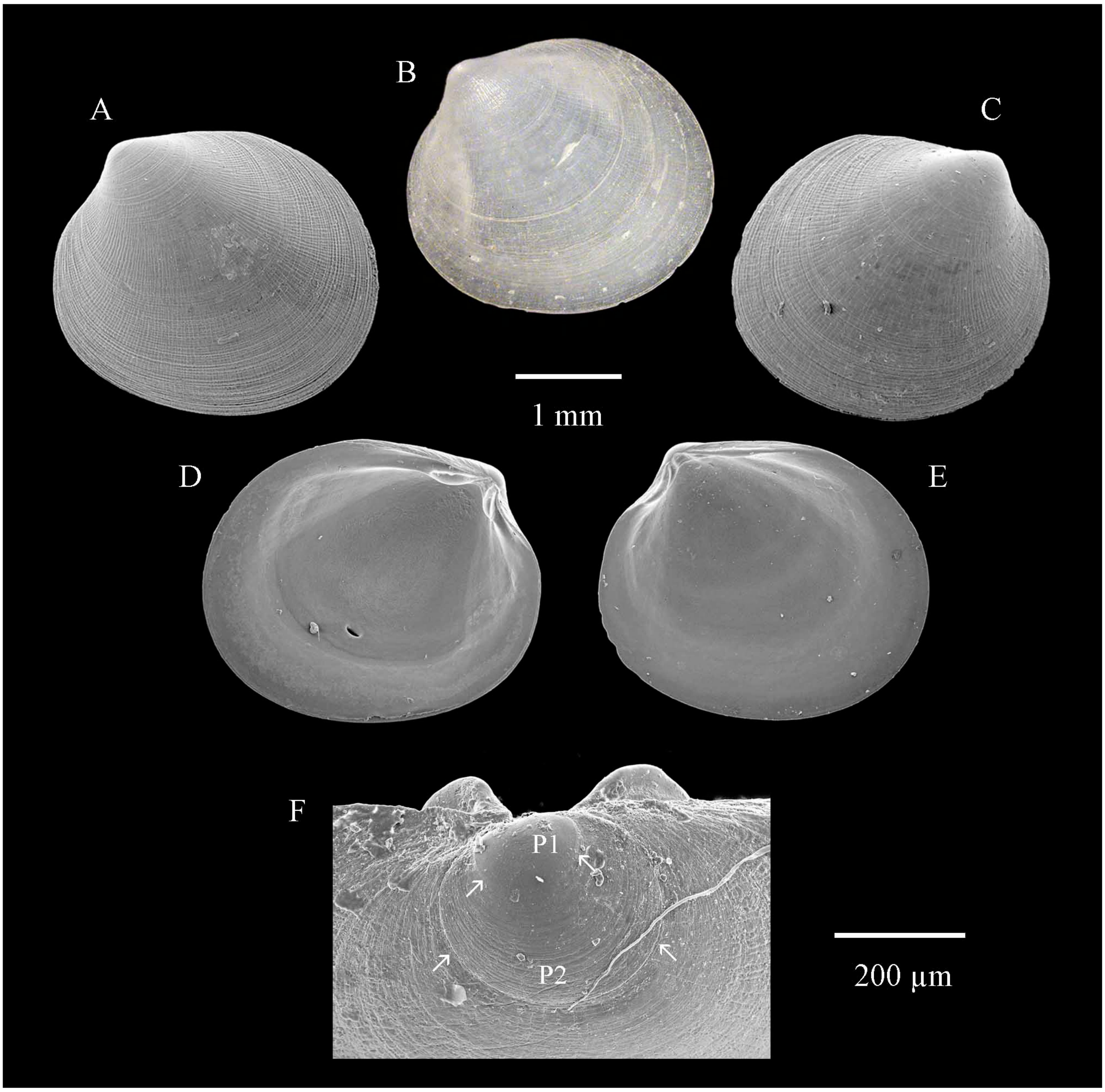

FIGURE 28. **A–F**, *Borniola pasca* sp. nov.: **A**, Exterior RV, 3 mm in length; **B**, Exterior RV, 2.7 mm in length, SEM; **C**, Exterior LV, 2.9 mm in length, SEM; **D**, Interior RV, 3.1 mm in length, SEM; **E**, Interior LV, 3 mm in length, SEM; **F**, Close-up of the prodissoconch, RV, SEM, arrows indicating boundaries.

Comparative diagnosis. The hinge configuration somewhat approaches the genus *Kurtiella* Gofas & Salas, 2008. They (2008: 122) interpreted the spread teeth in the RV, but also the marginal ridges in the LV as laterals. As such

species of *Kurtiella* have no cardinal teeth, but two marked laterals in the RV and much weaker dentition in the LV. However, the remote biogeography and distinct shape exclude it from this group. Moreover a weak hinge plate is present in *B. pasca* and the subumbonal pit in the RV is much less pronounced than in species of *Kurtiella*.
From the Hawaiian Islands nothing similar is known, but numerous *Borniola* species from New Zealand are comparable (e.g. Powell, 1979: fig. 97). Notably, *Borniola powelli* Crozier, 1966, shares traits in hinge and shape with *B. pasca*.

The genus *Borniola* was erected by Iredale (1924: 207) for the Sydney *Bornia lepida* (Hedley, 1906). Iredale gave no distinguishing remarks other than "very interesting species". Hedley (1906: 543) illustrated the denticulate *B. lepida* hinge with two divergent teeth in one valve, but did not comment on the dentition in the other, nor did Chavan *in* Moore (1969: N523). Though reversing the left and right valves, Laseron (1956: 16) captured the *Borniola* species well, illustrating the type and other specimens, and noting the other hinge as edentate. As such, the hinge configuration within the genera *Kurtiella* and *Borniola* is comparable, although with a weak hinge plate still present in *Borniola*. In addition the genus *Borniola* is characterised by its radial sculpture. The shape is compressed, typically subequilateral, but in most species inequilateral. *Borniola* species are small in size, rarely surpassing 10 mm.

Remarks. Due to a simple, non-reflected and non-tentaculate mantle, a single inner demibranch in most species and the hinge morphology of *Borniola* neatly sits in between *Kurtiella* and *Mysella*. Today, *Borniola* is placed within the montacutinids. Per Bouchet *et al.* (2010), the family Borniolidae Iredale & McMichael, 1962, is treated as invalid.

Distribution. *Borniola pasca* is rather common from several locations around Easter Island, in fine sand from 30–100 m, also in subtidal caves in Motu Tantarra, *EI*, 35–40 m—**E1**.

Etymology. The name reflects its rather common occurrence at Isla de Pascua.

Genus *Tellimya* Brown, 1827

[Type species: *Mya ferruginosa* Montagu, 1808 (SD by Gray, 1847)]

Tellimya pauciradiata sp. nov.

Figures 29 A–E

Type Material. Holotype: LACM 3158, 1 single LV, 7.9 mm. Paratypes 1–10: LACM 3159, 10 single valves, 2 to 8.8 mm from the type locality. Paratypes 11–12: LACM 3160, 2 single RV from Hanga Roa, Easter Island, dredged 70–100 m. Paratypes 13–18: Coll. MHU, 6 single valves from the type locality.

Type Locality. Dredged at 30–50 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Description. A typical, subelliptical, comparatively large *Tellimya* species, fragile in structure and sculptured with weak radials. Shell rather small, though large for the genus, at or below 8.8 mm; subelliptical, slightly narrower anteriorly, equivalve, inequilateral with umbones close to the bulging posterior end; thin, translucent; umbones rounded, pointed, and, as in the type species rather orthogyrate. Prodissoconch, P1 small, but typically worn away, ca. 93 µm length by 65 µm height, P2 with faint commarginal lines, ca. 325 µm length by 276 µm height, P2/N boundary weakly defined. Adult valves white internally and externally; weakly inflated, non-gaping. Surface superficially smooth, except for numerous, weak commarginal lines, crossed by about a dozen weakly impressed, spaced radial lines. The radial sculpture is strongest centrally, vanishing anteriorly and posteriorly. Hinge simple; in both valves with a strong anterior tooth, interpreted for both valves as montacutinid lateral, directed ventrally. Behind this front tooth follows a deep resilial recess. Its posterior end is followed by an oblique, characteristic ridge which was erroneously interpreted as an oblique left lateral by Chavan *in* Moore (1969: N532) for *T. ferruginosa*.

Corresponding to this ridge, the posterodorsal margin is bulged. Pallial line continuous, muscle scars unequal, the narrowly shaped anterior scar is significantly larger. Ligament internal and subumbonal. Margins smooth, very fragile.

TABLE 6. Selected measurements from the type material.

***T. pauciradiata* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	7.9	4.7	worn away	375 x 300
Paratype 1	3	1.7	ca. 95 x 70	325 x 300
Paratype 2	8.8	5.1	worn away	300 x 240
Paratype 3	4.1	2.4	ca. 90 x 60	300 x 265

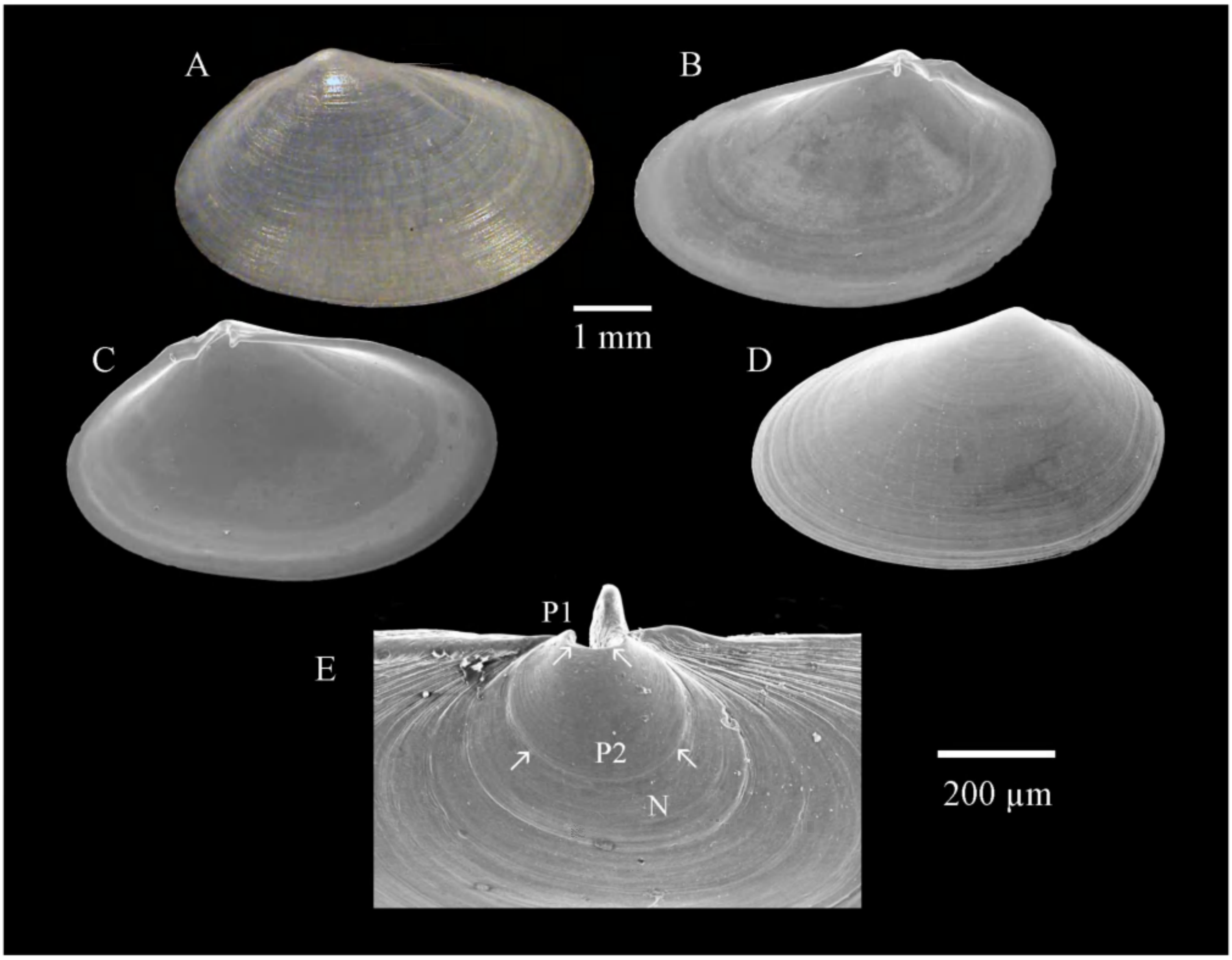

FIGURE 29. A–E, *Tellimya pauciradiata* sp. nov.; **A**, Exterior RV, 5.5 mm in length; **B**, Interior RV, 5.4 mm in length, SEM; **C**, Interior LV, 5.4 mm in length, SEM; **D**, Exterior LV, 5.2 mm in length, SEM; **E**, Close-up of the prodissoconch, RV, SEM, arrows indicating boundaries.

Comparative diagnosis. The *EI* material matches the genus *Tellimya*, and the European type species *T. ferruginosa* is morphologically very close. This placement was proposed by P. Middelfart, (pers. comm., 2010).

There is nothing similar currently known from the Hawaiian or the Marquesas Islands. However, another undescribed *Tellimya* species, 4.5 mm, somewhat similar to *T. benthicola* (Dell, 1956), was recently studied from Tahiti. From New Zealand three species are placed within the genus *Tellimya*, *T. aupouria* (Ponder, 1968), *T. benthicola* (Dell, 1956), and *T. reinga* (Crozier, 1966). The first was originally described in the montacutid subgenus *Tellimya* (Ponder, 1968: 127). The other two were originally described in the genera *Scintillona* Finlay, 1926, and *Thracia* G.B. Sowerby I, 1823, respectively. However, Marshall (2002: 223) demonstrated that morphologically *T. benthicola* and *T. reinga* are closest in shape and hinge to *Tellimya*. Anatomy and mode of life of the last two species are unknown.

Morphologically, anatomically and in commensal mode of life, *T. aupouria* matches *Tellimya* well. Compared to this rather close New Zealand congener, the shape of *T. pauciradiata* is more attenuated, muscle scars are significantly larger, notably the anterior one, and the *EI* species grows much larger. Both species however, share the typical sublittoral habitat of *Tellimya* species. As with the other species of *Tellimya*, *T. aupouria* is also commensal, here on the echinoid *Brissus gigas* Fell, 1947. Unfortunately the mode of life and host of *T. pauciradiata* is unknown.

Tellimya benthicola is shorter, more tumid in shape, much smaller in size (less than 4 mm) and prefers a bathyal habitat. *Tellimya reinga* is distinctly shaped and reversed in breath, broader anteriorly than posteriorly. In addition, *T. reinga* is nearly 12 mm which is among the largest *Tellimya* and it also prefers bathyal depths. In both species the anterior lateral is weakly expressed.

In shape, including the posterodorsal bulge, and in sculpture *T. pauciradiata* is virtually identical to the European *T. ferruginosa*, e.g. from Brittany. Both share the large sizes for this group with nearly 9 mm and 14 mm respectively. Chavan *in* Moore (1969: E32 2a) illustrated a non-typical, strongly truncate specimen. The typical rusty deposit of *T. ferruginosa*, however, was not encountered in the *EI* species. In addition, the valves of the latter are even more fragile with the commarginal lines weakly expressed and the anterior lateral being more pronounced. The three other European *Tellimya* species, i.e. *T. semirubra* (Gaglini, 1992), *T. tenella* (Lovén, 1846) and *T. voeringi* (Friele, 1877) are smaller than *T. pauciradiata* and distinct in their shorter shape.

"*Tellimya*" *ephippiolum* Melvill & Standen, 1899, from Boydong Cays in northern Australia is removed from *Tellimya*, but approaches the genus *Kelliopsis* Verrill & Bush, 1898.

Due to its morphology, anatomy and the commensal mode of life *Tellimya* species are well placed in montacutinids.

Remarks. There is nothing similar known from the Hawaiian or Marquesas Islands.

Distribution. *Tellimya pauciradiata* is known from many locations around Easter Island, from 30–100 m—**E1**.

Etymology. The name reflects the weakly marked radial sculpture.

Tellimya tahaia sp. nov.

Figures 30 A–F

Type Material. Holotype: LACM 3161, 1 single RV, 6.9 mm. Paratypes 1–2: LACM 3162, 1 single RV, 6.8 mm and 1 single LV, 5.5 mm Motu Iti, Easter Island, dredged in 65 m.

Type Locality. Dredged at 30–50 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W. Mode of life and host are unknown.

Description. An ovate, comparatively large *Tellimya* species fragile in structure with rounded posterior margin. Shell small, below 7 mm, ovate, narrower and shorter posteriorly, equivalve, inequilateral with umbones closer to the rounded posterior end; thin; umbones rounded, broad, orthogyrate. Prodissoconch, P1 small, but typically worn away, P2 ovate, boundary ill defined, faint commarginal lines nearly obsolete, ca. 317 µm length by 220 µm height. Nepioconch with weakly raised radial lines. Adult shell white internally and externally with irregular opaque blotches; weakly inflated, non-gaping, surface superficially smooth. Hinge simple; in both valves with a strong anterior lateral, directed ventrally. Behind this front tooth follows a deep resilial recess. Its posterior end is followed by an oblique, characteristic, tooth-like ridge. Pallial line continuous and comparatively broad; muscle scars unequal, the narrowly shaped anterior scar is significantly larger; the posterior scar is rounded-ovate. Ligament internal and subumbonal. Margins smooth, very fragile.

TABLE 7. Selected measurements from the type material.

***T. tahaia* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	6.9	4.8	worn away	300 x 200
Paratype 1	6.8	4.9	worn away	300 x 220
Paratype 2	5.5	3.9	worn away	350 x 240

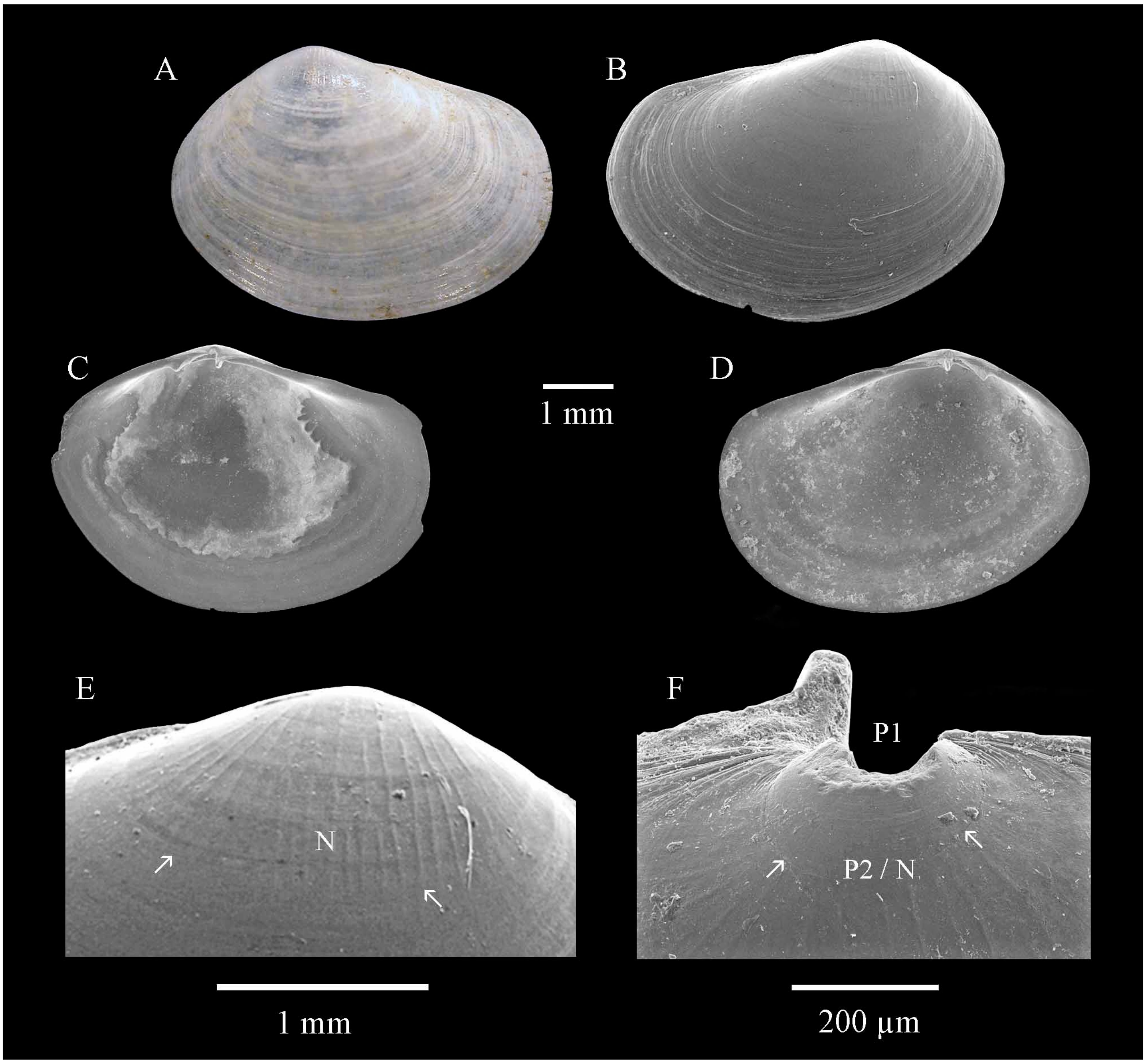

FIGURE 30. A–F, *Tellimya tahaia* sp. nov.; **A**, Exterior RV, 5.2 mm in length; **B**, Exterior LV, 5.4 mm in length, SEM; **C**, Interior LV, ca. 5.2 mm in length, SEM; **D**, Inxterior RV, 5 mm in length, SEM; **E**, Close-up of the nepioconch, LV, SEM; **F**, Close-up of the prodissoconch, LV, SEM, arrows indicating boundaries.

Comparative diagnosis. Comparable to the new species is *T. pauciradiata* also from *EI*. Both share a very similar dentition. However, the posterodorsal margin of *T. tahaia* is evenly rounded, not bulged as in *T. pauciradiata* and in the type species *T. ferruginosa*. The shape of *T. tahaia* is higher and significantly shorter. Consequently, the umbones are broader and more pronounced. *Tellimya tahaia* is not known to reach the large size of *T. pauciradiata*. Whereas *T. pauciradiata* is commonly encountered, *T. tahaia* has only been rarely found.

The three New Zealand species are significantly distinct in shape. Moreover, *T. benthicola* and *T. reinga* have an anterior lateral which is less pronounced and they live in deeper water.

Remarks. There is nothing similar known from the Hawaiian or Marquesas Islands.

Distribution. *Tellimya tahaia* is rather rare and only known from the type locality and Motu Iti—**E1**.

Etymology. The name reflects the type locality.

Genus *Thecodonta* A. Adams, 1864

[Type species: *Thecodonta sieboldi* A. Adams, 1864 (MT)]

Thecodonta rainesi Huber *in* Raines & Huber sp. nov.

Figures 31 A–G

Type Material. Holotype: LACM 3201, single LV, 3.7 mm. Paratype 1: LACM 3202, single RV, 3.2 mm, from type locality. Paratype 2: LACM 3203, single LV, 3.6 mm, from *EI*, Mataveri Bay, 50 m. Paratypes 3–4: Coll. MHU, 2 single valves, from *EI*, Hanga Roa, 50 m. Paratypes 5–6: Coll. BR, 2 single valves, from type locality.

Type Locality. Dredged at 30–50 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Description. A small, whitish *Thecodonta* species, ovate, smooth, with low and strongly prosogyrate umbones. Shell small, not exceeding 3.7 mm; ovate, gently rounded posteriorly and anteriorly; equivalve, strongly inequilateral; rather compressed; thin; white, showing spots and blotches in the substance of shell which lend to it a watered silk effect. The umbones are low and strongly prosogyrate and are situated near the anterior end. Prodissoconch, P1 typically eroded, possibly D-shaped, ca. 130 µm length by 85 µm height, P2 ovate with slender growth lines, white to tan in color, ca. 430 µm length by 369 µm height. In adult valves the dorsal line curves gently from the umbo to the posterior end. The surface is nearly smooth, marked by weak commarginal growth stops only. The elongate lateral dorsal tooth, stronger expressed in the receiving LV is marginally placed. The shorter anterior laterals are equally marginally placed. The single cardinal tubercles in either valve rest at the upper margin of the anterior lateral. The laterals are smooth not serrated. The posterior scar is narrow, elongate, rather small and marginally placed; the posterior scar is suborbicular, also small and marginally placed. The connecting, continuous pallial line is very weakly impressed, but comparatively broad and patchily interrupted. The margins are smooth.

TABLE 8. Selected measurements from the type material.

T. rainesi **sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	3.7	2.4	not visible	425 x 375
Paratype 1	3.2	1.9	ca. 130 x 85	450 x 375
Paratype 2	3.6	2.3	not visible	425 x 375
Paratype 5	2.2	1.4	not visible	420 x 350

Comparative diagnosis. The very inequilateral-ovate shape and thin structure, together with a continuous pallial line, characteristic dentition, and minute size closely resembles the small *Thecodonta*-group.

In umbonal position Bernard's (1983: 68) prosogyrate view for thecodontinids is still applied. Prosogyrate beaks were also diagnosed by Chavan *in* Moore (1969: N532) for *Thecodonta*. However, Dall, Bartsch and Rehder (1938: 148) noted the reverse montacutinid opisthogyrate position. The as yet unknown anatomy of *Thecodonta* will be needed to decide once and for all.

Japanese authors synonymized Dall, Bartsch & Rehder, 1938's genus *Kona* with *Thecodonta* and recognized only the type species as valid from Japan (e.g. Higo *et al.*, 1999: N732). Possible syntypes of smaller and larger Japanese specimens are illustrated in Higo *et al.* (2001 B732 and B732s). Severns (2011: 470, pl. 215 fig. 6) recognized only *Thecodonta symmetrica* Pilsbry, 1921, as valid from the Hawaiian Islands, and consequently *Kona bucki* Dall, Bartsch & Rehder, 1938 as a synonym. Both views are shared.

Moreover, due to a similar morphology, the nearly identical shape changes during growth and similar maximum sizes 4.7 mm (*T. sieboldi*) and 4 mm (*T. symmetrica*) synonymy cannot be completely excluded, because genetic data may one day reveal these two as conspecific. Most distinct at present are their habitats, i.e. subtidal 2–10 m (*T. symmetrica*) and sublittoral 50–100 m (*T. sieboldi*).

The respective data of *T. rainesi* is within 30–50 m. There is no commensal mode of life data recorded for either the Japanese or Hawaiian species of *Thecodonta*. Severns (2011) noted the habitat as silty sand, inshore of the reef, Japanese authors recorded sandy and muddy bottoms, while *T. rainesi* is found on fine sandy bottoms.

Morphologically, *T. rainesi* differs significantly in shape from its two congeners. Equal sized *T. sieboldi* and *T. symmetrica* are shorter and oblique in shape. Larger congeners approach *T. rainesi* somewhat more, but still have a stronger curved ventral margin and stronger developed teeth. The nearly smooth sculpture with watery blotches is similar to Japanese specimens, whereas all Hawaiian specimens seen are rather dull.

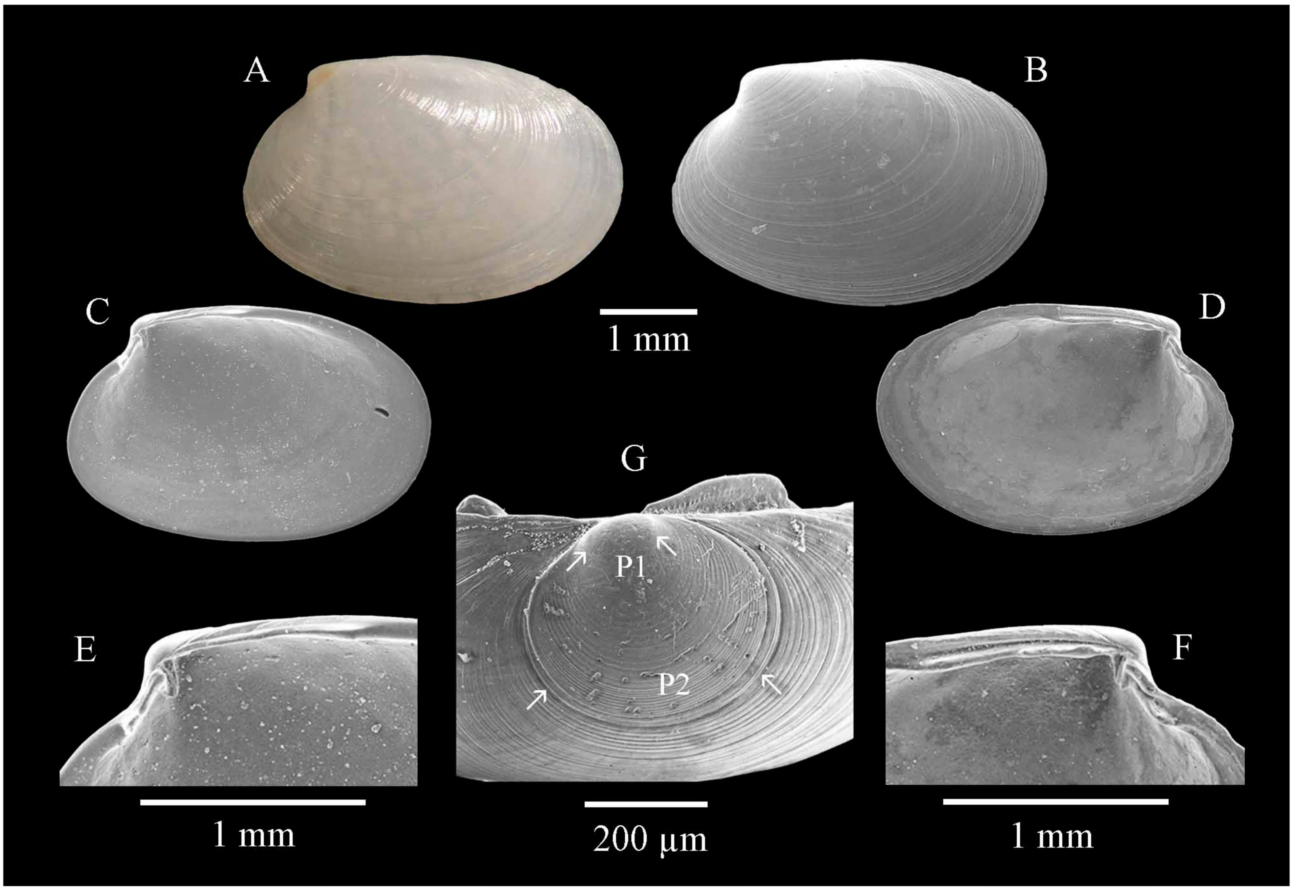

FIGURE 31. A–G, *Thecodonta rainesi* Huber *in* Raines & Huber sp. nov.; **A**, Exterior LV, 3.7 mm in length; **B**, Exterior LV, 3.6 mm in length, SEM; **C**, Interior RV, 3.5 mm in length, SEM; **D**, Interior LV, 3.4 mm in length, SEM; **E**, Close-up of hinge, RV, SEM; **F**, Close-up of hinge, LV; **G**, Close-up of the prodissoconch, LV, SEM, arrows indicating boundaries.

Remarks. At first this species was misidentified by the junior author. However, the senior author observed differences which finally led to a new description by the junior author.

Habitat. Occasionally found at several locations around *EI*, dead in sand, from 30–50 m.

Distribution. At present *Thecodonta rainesi* is only known from Easter Island—**E1.**

Etymology. This new species honors Bret Raines' relentless efforts during many years of his life for a better understanding of the bivalve fauna of Rapa Nui.

Superfamily CYAMIOIDEA G.O. Sars, 1878

Family SPORTELLIDAE Dall, 1899

Genus *Basterotia* Hörnes, 1859

[Type species: *Basterotia corbuloides* Hörnes, 1859 (SD by Dall, 1900)]

Basterotia lutea (Dall, Bartsch & Rehder, 1938)

Figures 32 A–C

Anisodonta lutea Dall *et al.*, 1938: p. 124, pl. 34, figs. 7–10.

Anisodonta lutea Dall *et al.*, 1938—Kay, 1979: p. 552, fig. 170 M; Raines, 2002: p. 35, fig. 43; Tröndlé & Boutet, 2009: p. 8.
Basterotia lutea (Dall *et al.*, 1938)—Severns, 2011: p. 472, pl. 216, fig. 2.

Material examined. Over one hundred single valves (3 to 7 mm) from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU).

Diagnosis. Shell small (up to 7 mm in length), subquadrate and inflated. Dorsal and ventral margins nearly parallel. Posterior end obliquely rounded with a low ridge from the umbo to the ventral margin; anterior end well rounded. Sculpture consisting of only commarginal growth lines. Hinge consistent with genus having a hook-like tooth below the beak of the LV. Color creamy white.

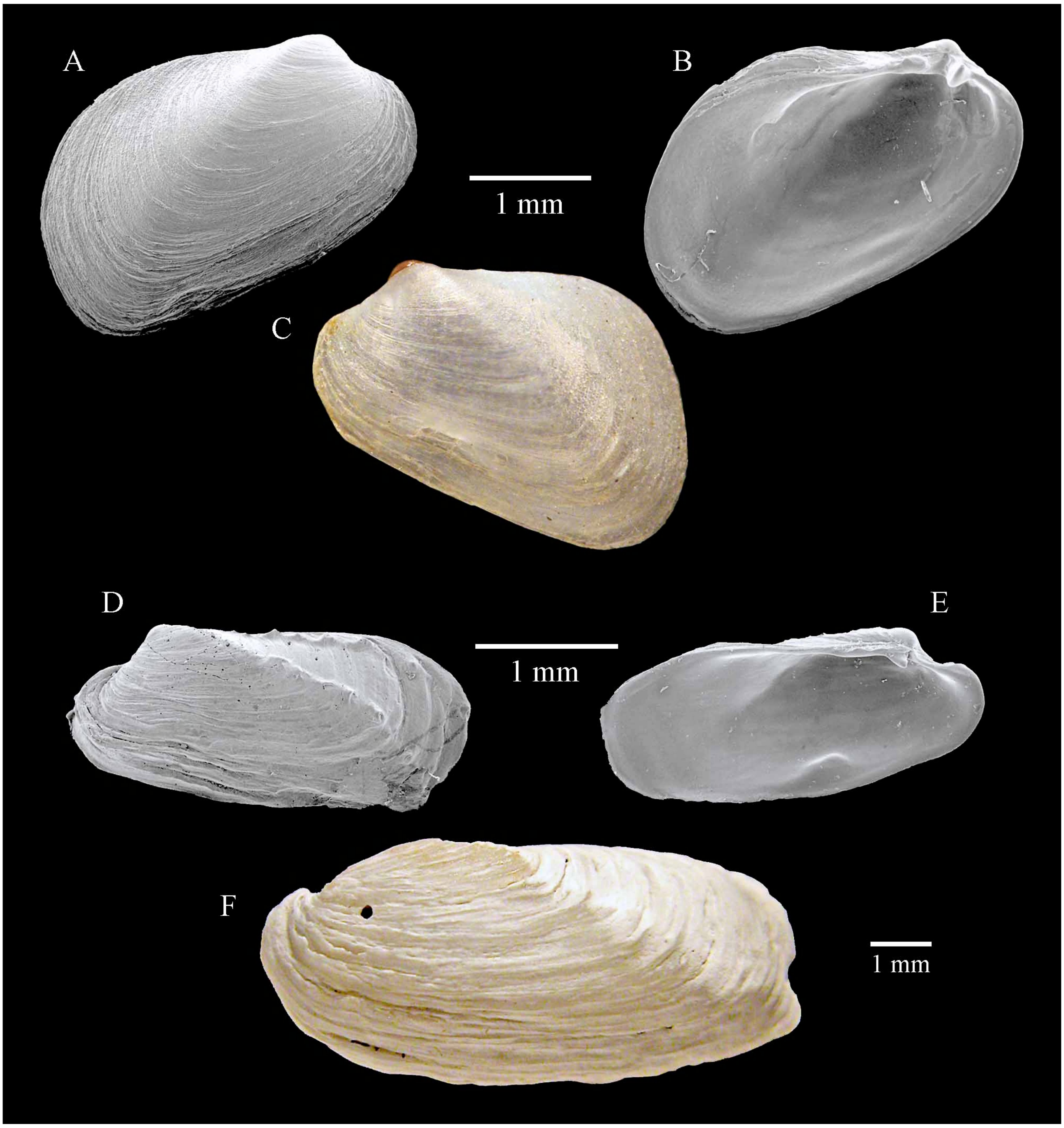

FIGURE 32. **A–C**, *Basterotia lutea* (Dall, Bartsch & Rehder, 1938): **A**, Exterior RV, 3 mm in length, SEM; **B**, Interior LV, 3 mm in length, SEM; **C**, Exterior LV, 3 mm in length; **D–F**, *Hiatella arctica* (Linnaeus, 1767): **D**, Exterior LV, 2.8 mm in length, SEM; **E**, Interior LV, 2.7 mm in length, SEM; **F**, Exterior LV, 9 mm in length.

Remarks. The specimens from *EI* and *SyG* conform well to the Hawaiian material. *Basterotia lutea* was originally placed within the genus *Anisodonta* Deshayes, 1858, but this genus is limited to European fossils only (Huber 2010: 663).

Hawaiian specimens were not described or recorded above 6 mm.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 20–50 m.

Distribution. *Basterotia lutea* is currently known from the Hawaiian Islands, Society Islands, Tuamotu Archipelago, Easter and Salas y Gómez Islands—**E4**.

Superfamily HIATELLOIDEA Gray, 1824

Family HIATELLIDAE Gray, 1824

Genus *Hiatella* Bosc, 1801

[Type species: *Hiatella monoperta* Bosc, 1801 (SD by Winckworth, 1932) =*Mya arctica* Linnaeus, 1767]

Hiatella arctica (Linnaeus, 1767)

Figures 32 D–F

Mya arctica Linnaeus, 1767: p. 1113.
Saxicava hawaiensis Dall *et al.*, 1938: p. 200, pl. 50, figs. 13–14.
Hiatella hawaiensis (Dall *et al.*, 1938)—Rehder, 1980: p. 113, pl. 14, figs. 1–4.
Hiatella arctica (Linnaeus, 1767)—Kay, 1979: p. 572, figs. 185 F–G; Preece, 1995: p. 351; Huber, 2010: p. 275, fig. 1; Spencer *et al.*, 2011: p. 1; Severns, 2011: p. 484, pl. 222, fig. 4.

Material examined. Nearly fifty single valves from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU) and Pitcairn Island (BK).

Diagnosis. Shell small to medium, ovate to trapezoidal, often distorted and inflated. Posterior end longer than the anterior and usually gaping. Sculpture of irregular commarginal riblets or striae, rarely with one or two posterior radial ridges with minute spines. Hinge line weak, with one obscure cardinal tooth in RV, two in LV, Color chalky white.

Remarks. The specimens from *EI* and *SyG* conform to Hawaiian material, but are too close to European and American material to be separated without solid genetic data. Panamic material is currently also identified as *H. arctica* (Coan, pers. comm., 2010).

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 20–80 m.

Distribution. This widespread Atlantic and Pan-pacific species can be found from the Arctic Ocean to New Zealand, including the Pitcairn Islands, Hawaiian Islands and Easter Island—**E6**.

Superfamily CHAMOIDEA Lamarck, 1809

Family CHAMIDAE Lamarck, 1809

Genus *Chama* Linnaeus, 1758

[Type species: *Chama lazarus* Linnaeus, 1758 (SD by Children, 1823)]

Chama asperella Lamarck, 1819

Figures 33 A–E

Chama asperella Lamarck, 1819: p. 95.
Chama asperella Lamarck, 1819—Lamprell & Whitehead, 1992: pl. 25, fig. 155; Preece, 1995: p. 350; Tröndlé & Boutet, 2009: p. 7; Huber, 2010: p. 281, figs. 5–7.
Chama cf. *broderipii* (Reeve)—DiSalvo *et al.*, 1988: p. 459.

Material examined. Over fifty single valves (up to 10 mm in length) (BK), and the '*Chama* cf. *broderipii*' specimen of DiSalvo *et al.* (1988) (BK).

Diagnosis. Shell rather small, elongate to ovate, not fragile. The LV is the lower attached valve. Specimens are usually dextral with the umbo pointing anteriorward, but occasionally sinistral with the umbo pointing posteriorward. Valves vary significantly in convexity, with lower LV even cupped. Exterior surface with close-set commarginal lamellae, as well as very numerous, pronounced, short spines. Interior margin with fine crenulations. Color usually white with reddish radial rays.

Remarks. While the specimens at *EI* and *SyG* are small, they conform well to the conservative colors, numerous short spines and finely crenulated margins of the widely distributed *C. asperella*. The *Chama* cf. *broderipii* specimen (Fig. 33 A) recorded by DiSalvo *et al.* (1988) is a small, but very characteristic *C. asperella*.

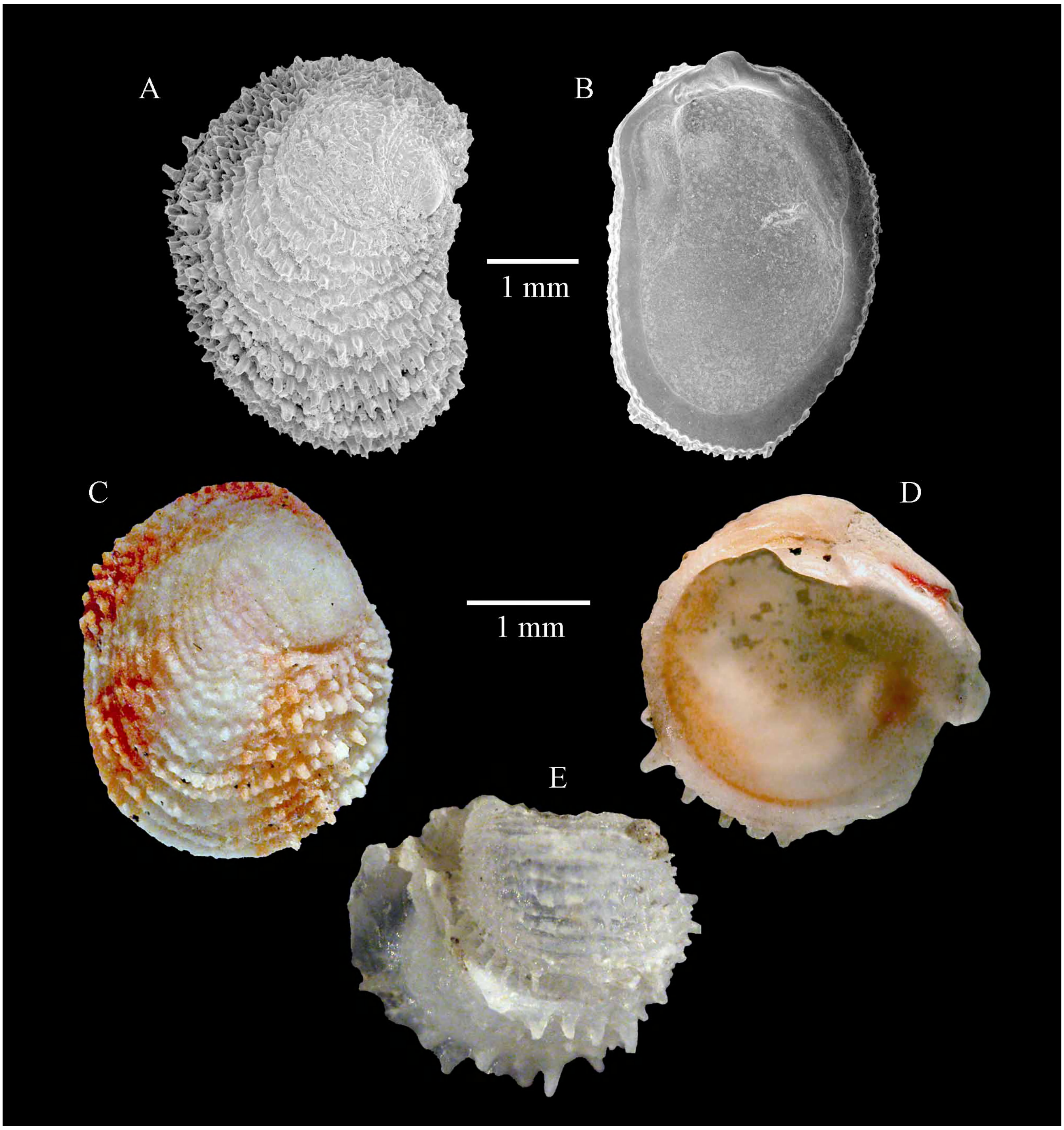

FIGURE 33. **A–E**, *Chama asperella* Lamarck, 1819; **A**, Exterior RV, 4.3 mm in height, SEM; **B**, Interior RV, 4.2 mm in height, SEM; **C**, Exterior RV, 3 mm in height; **D**, Interior LV, ca. 2.8 mm in height; **E**, Exterior LV, ca. 2.4 mm in height.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 10–150 m.

Distribution. *Chama asperella* is widely distributed from the Mediterranean (immigrated) to Midway Island, including the Society Islands, Austral Islands. Pitcairn Islands, and now Easter and Salas y Gómez Islands—**E5**.

Chama croceata Lamarck, 1819

Figures 34 A–F

Chama croceata Lamarck, 1819: p. 96.
Chama croceata Lamarck, 1819—Huber, 2010: p. 282, figs. 10–12.
Chama imbricata Broderip, 1835, p. 304, pl. 39, fig. 2, *non* Lamarck, 1801
Chama imbricata Broderip, 1835—Oliver, 1992: p. 105, pl. 26.
Chama savignyi Jousseaume *in* Lamy, 1921: p. 238—Huber, 2010: p. 676.
Chama plinthota Cox, 1927: p. 98. **(nom. nov.)**
Chama plinthota Cox, 1927—Lamprell & Whitehead, 1992: pl. 24, fig. 152; Brook & Marshall, 1998: p. 213; Spencer *et al.*, 2011: p. 1.
Chama ratoi Boshoff, 1965 p. 151, pl. 4, fig. 2—Kilburn, 1973: p. 708.
Chama—Luke, 1995: p. 107. (Lot M1452 in part)

Material examined. Several single valves (up to 47 mm in length) (BK), including valves collected by the 1957/58 Downwind Expedition (SIO Benthic Collection, M1452), plus specimens from the Marquesas Islands (MHU).

Diagnosis. Shell medium to large, occasionally subcircular but usually oblong. The LV is the lower attached valve. Specimens are usually dextral with the umbo pointing anteriorward, but occasionally sinistral with the umbo pointing posteriorward. Exterior surface of commarginal lamellose, and typically covered by incrustations. Typical dorsal ridge. Hinge strongly curved with broad folds and deep teeth. Color extremely variable from yellowish brown to greyish purple. In fresh specimens with the typical vertical or radial dark brown to orange marks below the dorsal ridge, continuing on the lower valve. Margins smooth.

Remarks. Some of the worn *Chama* material identified by Luke (1995) from the SIO Benthic Collection, M1452 (Figs. 34 C–F) approaches the shape and ridge, but a firm identification is obviously impossible.

Chama croceata is often erroneously referred to as the preoccupied *C. imbricata* Broderip, 1835, or its nom. nov. *C. plinthota* Cox, 1927, as well as *C. ratoi* Boshoff, 1965, described from Mozambique, and *C. savignyi* Jousseaume *in* Lamy, 1921, described from the Red Sea. However, all have proved to be consistent with the type material of *C. croceata*. Huber (2010: 676) clarified *C. croceata* type locality as the Red Sea.

The 47.3 mm specimen represents the largest bivalve ever found on Easter Island. Elsewhere, *C. croceata* grows to 100 mm.

Habitat. Occasionally found at several locations around *EI*, in sand and rubble, from 30–80 m.

Distribution. *Chama croceata* is known from the Red Sea to the Kermadec Islands, including the Marquesas Islands, Australia, and Norfolk Island, but is not known from the Hawaiian Islands. Easter Island is now considered a range extension—**E5**.

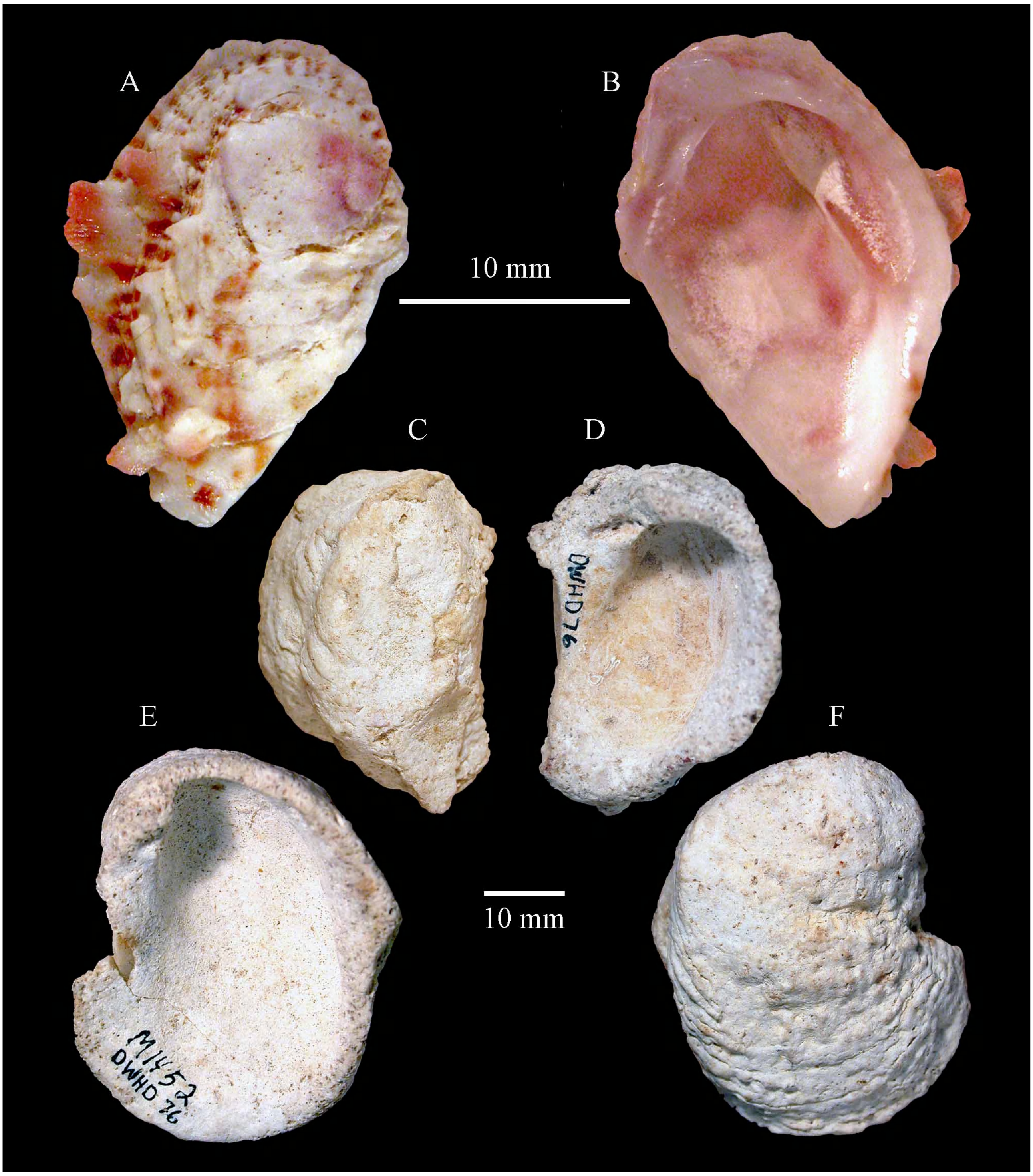

FIGURE 34. A–F, *Chama croceata* Lamarck, 1819; **A**, Exterior RV, ca. 23 mm in height; **B**, Interior of same valve; **C**, Exterior RV, 34.4 mm in height; **D**, Interior of same valve; **E**, Interior RV, 47.3 mm in height; **F**, Exterior of same valve.

Chama limbula Lamarck, 1819

Figures 35 A–H

Chama limbula Lamarck, 1819: p. 95.

Chama limbula Lamarck, 1819—Lamprell & Whitehead, 1992: pl. 24, figs. 151 a & b; Oliver, 1992: p. 105, pl. 25; Preece, 1995: p. 350; Huber, 2010: p. 283, figs. 10–11; Severns, 2011: p. 466, pl. 213, fig. 2.

Chama iostoma Conrad, 1837—Rehder, 1980: p. 112; Tröndlé & Boutet, 2009: p. 7.
Pseudochama sp.—DiSalvo *et al.*, 1988: p. 459.
Chama—Luke, 1995: p. 106 & 107. (Lot M1452 in part)

Material examined. Nearly one hundred single valves (up to 44 mm in length) (BK), including valves collected by the 1957/58 Downwind Expedition (SIO Benthic Collection, M1437 and M1452), and the '*Pseudochama* sp.' specimen reported by DiSalvo *et al.* (1988) (BK).

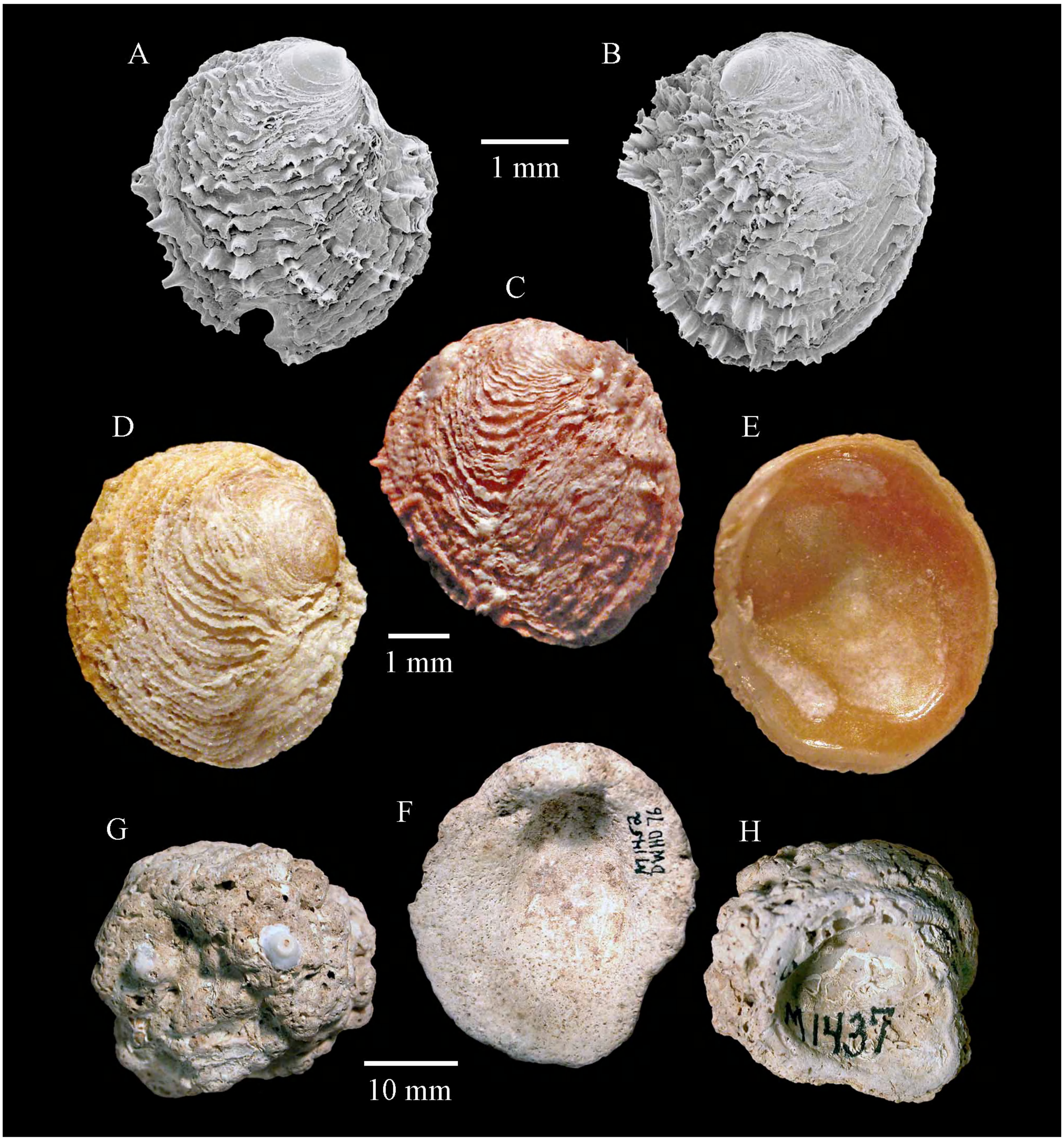

FIGURE 35. A–H, *Chama limbula* Lamarck, 1819; **A**, Exterior RV, dextral, 3.5 mm in height, SEM; **B**, Exterior RV, sinistral, 3.7 mm in height, SEM; **C**, Exterior RV, 5.4 mm in height; **D**, Exterior RV, ca. 5.5 mm in height; **E**, Interior of same valve; **F–H**, *Chama limbula* (SIO); **F**, Interior RV, 44.3 mm in height; **G**, Exterior RV, ca. 30 mm in height; **H**, Interior of same valve.

Diagnosis. Shell medium, occasionally oblong, but usually subcircular. The LV is the lower attached valve. Specimens are more often dextral with the umbo pointing anteriorward, but commonly sinistral with the umbo pointing posteriorward. Exterior surface strongly commarginal lamellose, and typically covered by incrustations. Occasionally with a less pronounced dorsal ridge. Hinge strongly curved with broad folds and deep teeth. Color extremely variable from yellowish brown to reddish purple, fresh material is often reddish-purple. Margins smooth, typically darker purplish colored.

Remarks. It appears that Rehder (1980) had the smooth margined *C. iostoma* Conrad, 1837, in mind when reporting the species, which is a synonym of Lamarck's earlier *C. limbula* (cf., Delsaerdt, 1986). The *Pseudochama* sp. (Fig. 35 B) recorded by DiSalvo *et al.* (1988) is perceived as a worn sinistral *C. limbula.* Lastly, some of the larger *Chama* material noted by Luke (1995) from the SIO Benthic Collection, M1437 and M1452 (Figs. 35 F–H) seems to represent this species as well.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 10–150 m.

Distribution. *Chama limbula* is widely distributed from the Rea Sea to the Hawaiian Islands, as well as the Society Islands, Tuamotu Archipelago, Austral Islands, Pitcairn Islands, Easter and Salas y Gómez Islands. However, it has not been recorded from New Zealand or the Kermadec Islands—**E5**.

Superfamily CARDIOIDEA Lamarck, 1809

Family CARDIIDAE Lamarck, 1809

Subfamily TRACHYCARDIINAE Stewart, 1930

Genus *Acrosterigma* Dall, 1900

[Type species: *Cardium dalli* Heilprin, 1887 (OD)]

Acrosterigma triangulare sp. nov.

Figures 36 A–D

Type Material. Holotype: LACM 3163, 1 single LV 16.5 mm, 48 ribs. Paratype 1: LACM 3164, 1 single LV ca. 13 mm, 43 ribs, from the type locality. Paratypes 2–9: LACM 3165, 8 fragments, partly colored, 7.1–20.2 mm, dredged at 100 m, sand and rubble off Orongo, Easter Island, 27°11'58" S, 109°29'28" W.

Type Locality. Dredged at 30–50 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Description. A rather fragile and thin-shelled *Acrosterigma* species with a discriminating sculpture of 6–8 triangular ribs on the medio-posterior quarter of the shell. The largest complete valve, selected as holotype, measures 16.5 mm, but paratype fragments indicate a much larger size exceeding 30 mm; ovoid and nearly equilateral in shape, moderately higher than long, without a posterior truncation; umbones pointed, orthogyrate. Prodissoconch unknown, worn. The thin adult shells of the studied material are often fragmented. Complete valves are moderately inflated. Whitish in color, with irregular yellow-rose blotches; these are correspondingly found on the glossy white interior. Lunule virtually absent, ribbing almost reaching the margin; periostracum not observed. Sculpture of regular, rather broad ribs anteriorly and centrally. This regular sculpture changes into 6–8 acutely triangular ribs in the medio-posterior quarter, with the strongest sculpture expressed ventrally; the posteriormost 8–9 weakly but regularly spined ribs are again rather regular and broad. The sculpture on the anteriormost ribs is scaly; these scales are nearly commarginally placed and fade towards the central portion of the valve. Interstices are narrow, much narrower than the ribs, rounded and smooth. Rib count in the holotype: 48 (16.5 mm), and in the paratype 1: 43 ribs (13 mm). Hinge line weak and thin, asymmetrical with a closer posterior and a remote and stronger anterior lateral, ligament on a small, quadrangular nymph. Pallial line continuous; scars small, ovate, starting near the end of the laterals and extending ventrally.

TABLE 9. Selected measurements from the type material.

A. triangulare sp. nov.	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	15.2	16.5	not visible	not visible
Paratype 1	12	13	not visible	not visible

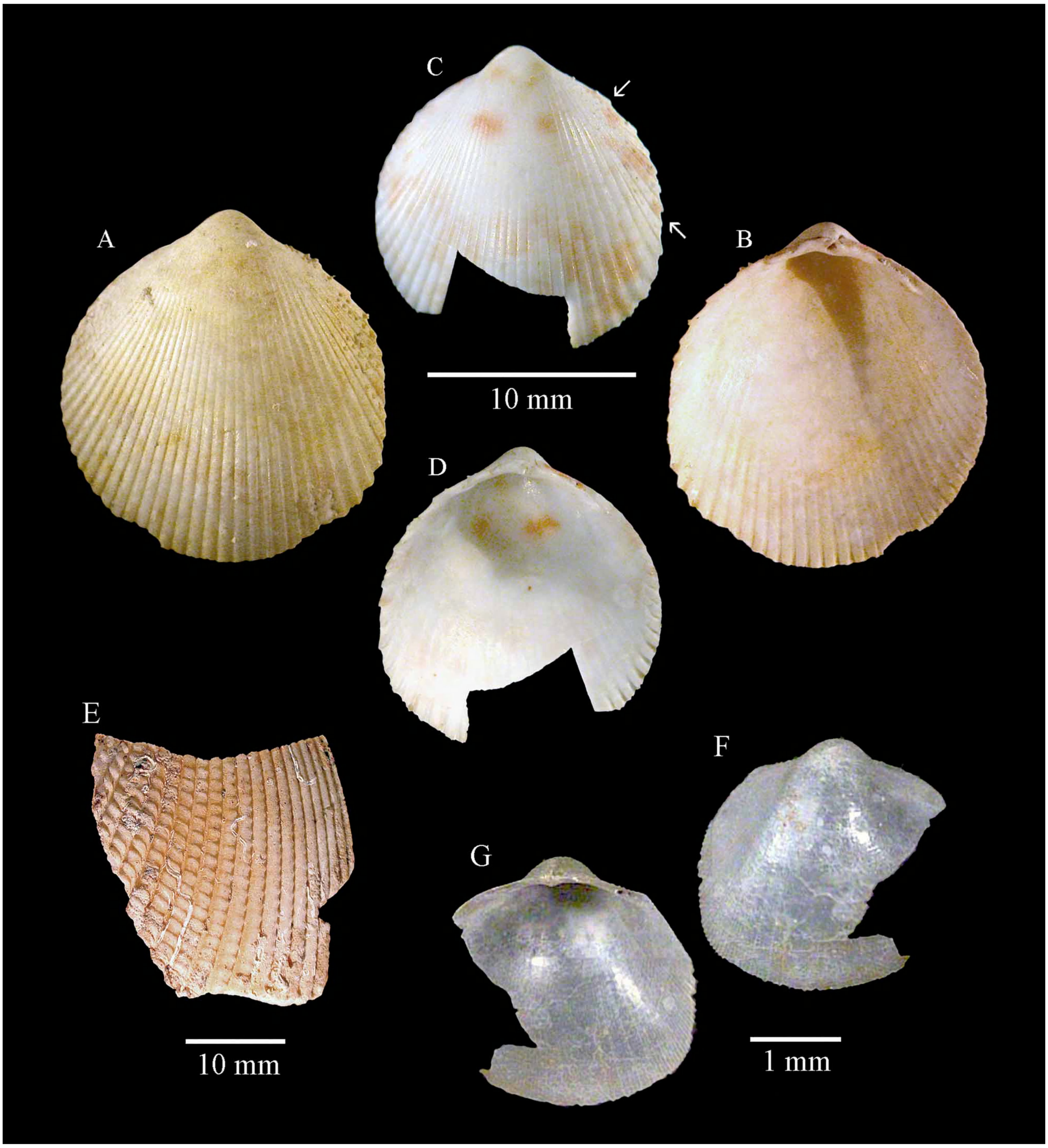

FIGURE 36. A–D, *Acrosterigma triangulare* sp. nov.; **A**, Holotype, Exterior LV, 16.5 mm in height; **B**, Interior of same valve; **C**, Exterior LV, 13 mm in height, arrows indicating location of triangular ribs; **D**, Interior of same valve; **E**, *Vasticardium* sp. fragment (SIO); **F–G**, *Frigidocardium thaanumi* (Pilsbry, 1921); **F**, Exterior RV, 4 mm in height; **G**, Interior of same valve.

Comparative diagnosis. The late Jacques Vidal considered this species to be in the genus *Acrosterigma*, and likely new to science. J.J. ter Poorten, (pers. comm., 2010) studied the material, comparing it with other described species and considered it a new *Acrosterigma* species as well. He noted that *A. triangulare* falls into Vidal's (1999: 285) species-group of *A. variegatum* (G.B. Sowerby II, 1840), and is related to *A. discus* Vidal, 1999, and *A. mauritianum* (Deshayes 1854).

Acrosterigma discus is mainly an Indian Ocean species extending to the Philippines, but is not known from Australia or other tropical Pacific Islands. Its shape is more circular and the rib count appears to be from 53–63, with a mean of 56.3, which are more pronounced than in the *EI* species. The internal stains in the new species are yellowish-rose, instead of purplish found in *A. discus*. Finally, the rib sculpture in *A. triangulare* is characteristically acutely triangular in the medio-posterior quarter, whereas in *A. discus* this trait is less pronounced and the ribs are more rounded.

Acrosterigma mauritianum is currently only known from a very restricted area within the Western Indian Ocean, Mauritius (type locality) through Seychelles to Sri Lanka. Here, the rib count (41–47 and a mean of 44.1) as well as the coloring is comparable. However, the shape of *A. mauritianum* is distinctly angular posteriorly and straight ventrally. The ribs in the medio-posterior quarter of the valves are strongly broader and less acutely triangular than in the new species.

Acrosterigma variegatum, which ranges from Queensland, Australia to Melanesia, and as far north as Japan, is easily distinguished from *A. triangulare*. Similar sized specimens are very distinct by having a more quadrangular shape, fewer number of stronger ribs and more vivid colors, externally and internally. The hinge line is stronger and the anterior lateral tooth is closer to the cardinals.

Remarks. Here, the quality and number of specimens available is at the limit for a new description. Nonetheless it was ventured, as the two most eminent experts on cardiids independently came to the same conclusion. Furthermore, there is nothing similar known from the Hawaiian Islands. And in French Polynesia only the generically distinct *Vasticardium mendanaense* (G.B. Sowerby III, 1897), is readily found.

Distribution. *Acrosterigma triangulare* is occasionally found sublittoral, from ca. 30–100 m, and only known from a few locations around Easter Island—**E1**.

Etymology. The name refers to the characteristic rib sculpture on the medio-posterior quarter.

Genus *Vasticardium* Iredale, 1927

[Type species: *Vasticardium nebulosum* Iredale, 1927 (OD) =*Cardium elongatum* Bruguière, 1789]

Vasticardium sp.

Figure 36 E

Acrosterigma (*Vasticardium*)—Luke, 1995: p. 106.
Cardium sp.—Trego, 1997: p. 199.

Material examined. One large fragment from the 1957/58 Downwind Expedition, noted as *Acrosterigma* (*Vasticardium*) by Luke (1995), and *Cardium* sp. by Trego (1997), in the SIO Benthic Collection, M1440 (Fig. 36 E).

Diagnosis. Shell fragment 30 mm, (maximum size appears to reach at least 40 mm in height), probably equivalve, inequilateral, not fragile. Exterior surface consisting of coarse radial ribs, with prominent scales. Hinge is expected to be stout and well developed. Flesh colored.

Remarks. The fragment has been identified as *Vasticardium* spec. indet. by J.J. ter Poorten, (pers. comm., 2010), due to its coarse sculpture. The missing discriminating posterior quarter did not allow any specific identification.

The identity with the two biogeographically closest congeners *Vasticardium hawaiensis* (Dall, Bartsch & Rehder, 1938), from the Hawaiian Islands and *Vasticardium mendanaense* (G.B. Sowerby III, 1897), from Marquesas Islands appears unlikely. M. Severns, (pers. comm., 2010) did not recognize it as a Hawaiian cardiid.

Acrosterigma sorenseni (Powell, 1958), from Kermadec Island was discussed and identified by Vidal (1999: 280) as member of the *A. cygnorum* group. However, this species does not resemble any *EI* species in shape or sculpture, and is generically distinct from *Vasticardium* sp.

Thus, we cannot exclude the possibility that an additional undescribed cardiid may be present at *EI*. For the time being this species is treated as unnamed and endemic.

Habitat. Trawled from La Perouse Bay, *EI*, 40–100 m, 1957/58 Downwind Expedition (DWHD-76).

Distribution. At present this *Vasticardium* sp. is only known from Easter Island—**E1**.

Subfamily LAEVICARDIINAE Keen, 1951

Genus *Frigidocardium* Habe, 1951

[Type species: *Cardium* (*Fragum*?) *eos* Kuroda, 1929 (OD)]

Frigidocardium thaanumi (Pilsbry, 1921)

Figures 36 F–G

Cardium thaanumi Pilsbry, 1921: p. 232, pl. 12, fig. 24.
Microcardium thaanumi (Pilsbry, 1921)—Dall *et al.*, 1938: p. 153, pl. 41, figs. 5–8.
Nemocardium thaanumi (Pilsbry, 1921)—Kay, 1979: p. 555, pl. 180, figs. H–I.
Frigidocardium thaanumi (Pilsbry, 1921)—Tröndlé & Boutet, 2009: p. 9; Huber, 2010: p. 307, fig. 7; Severns, 2011: p. 474, pl. 217, fig. 2.

Material examined. One single RV (BK).

Diagnosis. Shell small, nearly hemispherical, equivalve, thin and very fragile. Umbo strongly elevated. Sculpture homogenous, exterior surface covered by numerous fine radiating threads which are crossed by even finer commarginal threads. Margins minutely crenulated. Hinge narrow, consisting of subequal erect cardinals and elongated laterals. Color translucent white and irregularly streaked with orange rays.

Remarks. A single RV was dredged at 150 m, with a size of 4 mm, but is now largely destroyed. The illustrated, a very juvenile specimen, conforms by its quadrate shape, fragile structure, fine radial sculpture, orange-white color and by its hinge with that of *F. thaanumi*. *Frigidocardium thaanumi* is a small species, reaching 12 mm in the Hawaiian Islands and 18.4 mm in the Marquesas Islands. The depth range is 15–200 m. J.J. ter Poorten, (pers. comm., 2010) confirmed the identity.

Habitat. Dredged at 150 m in fine sand and mud, off the western coastline near Tahai.

Distribution. *Frigidocardium thaanumi* was originally described from the Hawaiian Islands, but is also known from the Marquesas Islands and now Easter Island as well—**E4**.

Superfamily TELLINOIDEA Blainville, 1814

Family TELLINIDAE Blainville, 1814

Genus *Cadella* Dall, Bartsch & Rehder, 1938

[Type species: *Tellina* (*Maera*) *lechriogramma* Melvill, 1893 (OD)]

Cadella mauia Dall, Bartsch & Rehder, 1938

Figures 37 A–H

Cadella mauia Dall *et al.*, 1938: p. 197. pl. 50, figs. 1–4.
Cadella mauia Dall *et al.*, 1938—Rehder, 1980: p. 113, pl. 12, fig. 16–17; Raines, 2002: p. 36, fig. 44.

Material examined. Over one hundred live specimens and single valves (2.7–8.2 mm) (BK).

Original description. "Shell small, elongate-ovate, pale yellowish white with spots and blotches in the substance of shell that give it a watered silk effect, with a tinge of red posterior to the umbo. The umbones are situated at the anterior end of the posterior fourth of the length of the shell. The dorsal edge is slightly curved posterior to the umbo; anterior to it, it is slightly concave and then it suddenly rounds toward the ventral margin. The anterior margin forms almost a semicircle and the ventral margin is moderately evenly curved. Prodissoconch small, subglobular, the portion following it marked by slender lines of growth. The adult shell is marked by numerous, closely spaced, radiating threads which are only a trifle stronger on the posterior end than on the rest of the shell. These threads are separated by narrow impressed lines. The interior is white with a reddish tinge posterior to the umbo. The external ligament is rather short and situated on a broadly lanceolate escutcheon. The anterior cardinal is stout and triangular. The posterior cardinal is short and rather thin. The laterals are fused with the margin. The pallial sinus is rather large and broad, its basal margin being fused with the pallial line." (Dall *et al.* 1938: 197.)

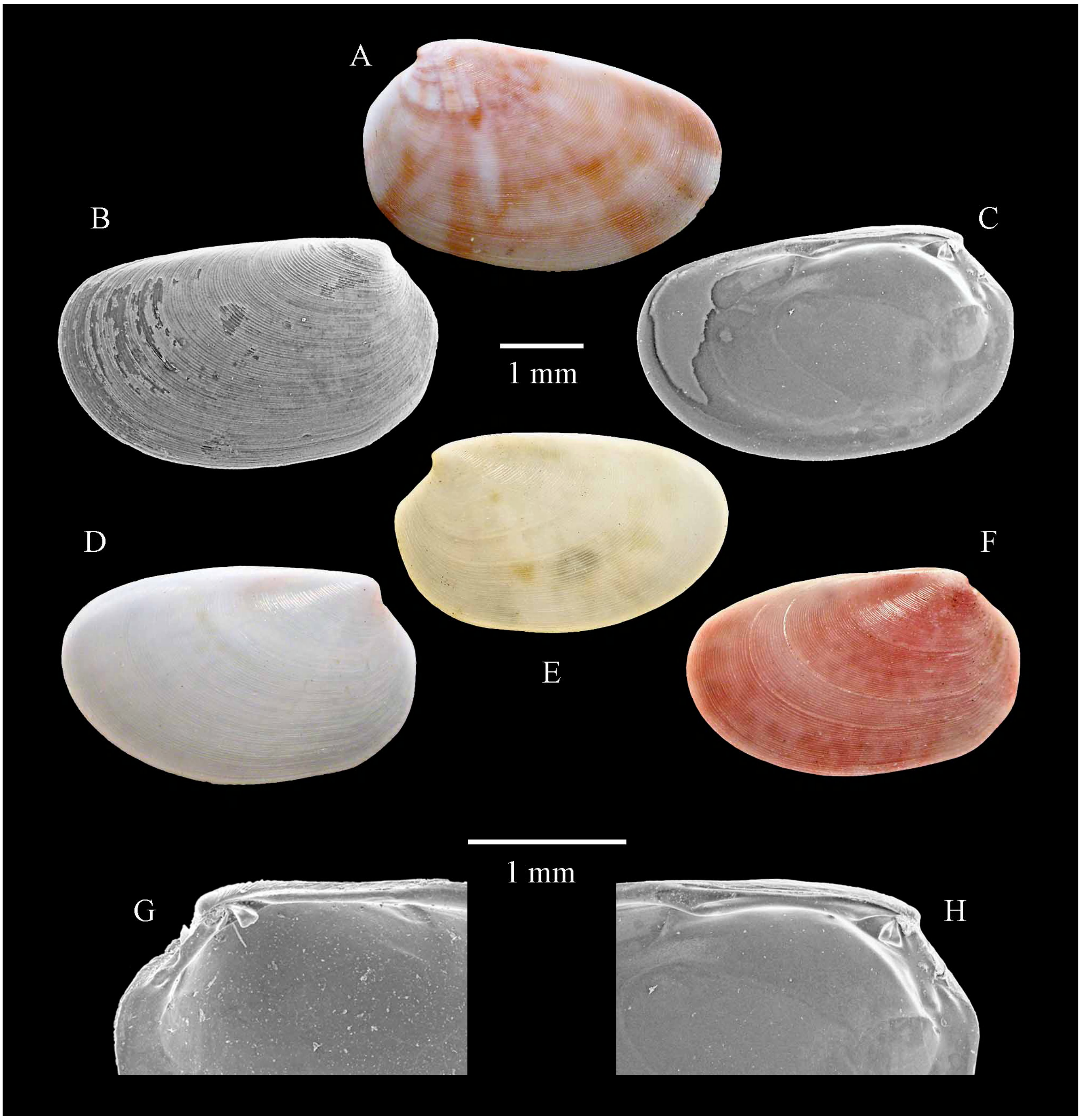

FIGURE 37. A–H, *Cadella mauia* Dall, Bartsch & Rehder, 1938; **A**, Exterior LV, 4.2 mm in length; **B**, Exterior RV, 4.3 mm in length, SEM; **C**, Interior LV, 4.2 mm in length, SEM; **D**, Exterior RV, 4.1 mm in length; **E**, Exterior LV, 3.8 mm in length; **F**, Exterior RV, 3.9 mm in length; **G**, Close-up of hinge, RV, SEM; **H**, Close-up of hinge, LV, SEM.

Remarks. Kay (1979: 561) erroneously synonymized this species to *Cadella oahuana* Dall, Bartsch & Rehder, 1938. However, *Cadella oahuana* has a rougher sculpture, is more ovate-triangular in shape, and has a stouter hinge construction as illustrated in Severns (2011: p. 478, pl. 219, fig. 1). And although *Cadella mauia* specimens from *EI* tend to be even more colorful than those from the Hawaiian Islands, the material conforms well to the original description, confirmed by A. Langleit, (pers. comm., 2010).

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 10–50 m.

Distribution. *Cadella mauia* is known from the Hawaiian Islands, Easter and Salas y Gómez Islands, and has been collected from the Marquesas Islands as well. However, it is not known from New Zealand or the Kermadec Islands—**E5**.

Genus *Herouvalia* Cossmann *in* Harris & Burrows, 1891

[Type species: *Asaphinella semitexta* Cossmann, 1886 (SD by Cossmann, 1892)]

Herouvalia rapanui sp. nov.

Figures 38 A–H

Elliptotellina caelata (A. Adams, 1854)—Raines, 2002: p. 36, fig. 45.

Type Material. Holotype: LACM 3166, 1 articulated specimen, 5.9 mm. Paratypes 1–3: LACM 3167, 3 single valves, 5.4 to 11.2 mm from the type locality. Paratypes 4–11: LACM 3168, 8 single valves from La Perouse Bay, Easter Island, 27°04'26" S, 109°16'50" W, 60 m.

Paratypes 12–17: Coll. MHU, 6 single valves from Motu Iti, Easter Island, 65 m. Paratypes 18–21: Coll. BR, 1 articulated specimen and 3 single valves from the type locality. Paratypes 22–24: Coll. BR, 3 single valves from Salas y Gómez Island, 22 m.

Type Locality. Dredged at 30–50 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Description. A subrectangular, finely lamellate *Herouvalia* species with a cancellate posterior sculpture and a short, quadrate psammobid nymph. Shell rather large for this group, reaching 11.2 mm; equivalve, subrectangular, slightly broader posteriorly, acutely rounded anteriorly; a very weak posterior flexure present; rather thin but solid; variable in color, from uniform white to red, sometimes with two reddish rays or spots; umbones small, moderately acute, weakly opisthogyrate, subcentral, nearer to the posterior end. Prodissoconch, P1 strongly pronounced, erect, round, ca. 97 µm length and 82 µm height, P2 ovate, smooth with the exception of faint growth striae, ca. 174 µm length and 155 µm height. Nepioconch deeply incised. Adult valves weakly inflated, sculpture of 25–30 fine, regular commarginal lamellae, intercalated by irregular, dense radial threads; on the narrower anterior end the sculpture is comparable to the central portion, with the commarginals slightly thinner and the radials slightly broader; on the broader posterior portion the sculpture is distinctly cancellate caused by stronger expressed radials. Microsculpture consisting of irregular pitting covers the entire surface. Hinge line solid, RV with two cardinals, the posterior stronger and knobby and two strong, elongate laterals; LV with two cardinals, the anterior knobby and two weak, distant marginal laterals. Well visible is the short "psammobid" nymph as identically figured by Keen *in* Moore (1969: E116 fig. 2c) for the type species *H. semitexta*. Pallial sinus strongly ascending, broad and rounded, deep and clearly surpassing midline. External ligament brownish on a nymph. Margins solid, posteroventrally and posteriorly weakly fluted due to the strong radial sculpture.

TABLE 10. Selected measurements from the type material.

***H. rapanui* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	5.9	3.4	90 x 80	180 x 150
Paratype 4	5.3	3.1	100 x 80	175 x 150
Paratype 10	7.8	4.6	100 x 85	165 x 165

Comparative diagnosis. The closest species to *H. rapanui* are its two described congeners, the widely distributed *Gafrarium* (*Corbis*) *caelatum* A. Adams, 1854, (syn. *Tellina euglypta* Gould, 1861; *Tellina fabrefacta* Pilsbry, 1904, and *Gari erasmia* Melvill, 1898), from the Arabian Peninsula to Japan and *Chione pulchella* H. Adams, 1870, (syn. *Gari granulifera* Lamy, 1938), from the Red Sea. Also congeneric and comparable is an undescribed species from the Marquesas Islands (coll. MHU), which has denser and finer anterior sculpture and a stronger pronounced posterior sculpture as similarly found in *H. pulchella*.

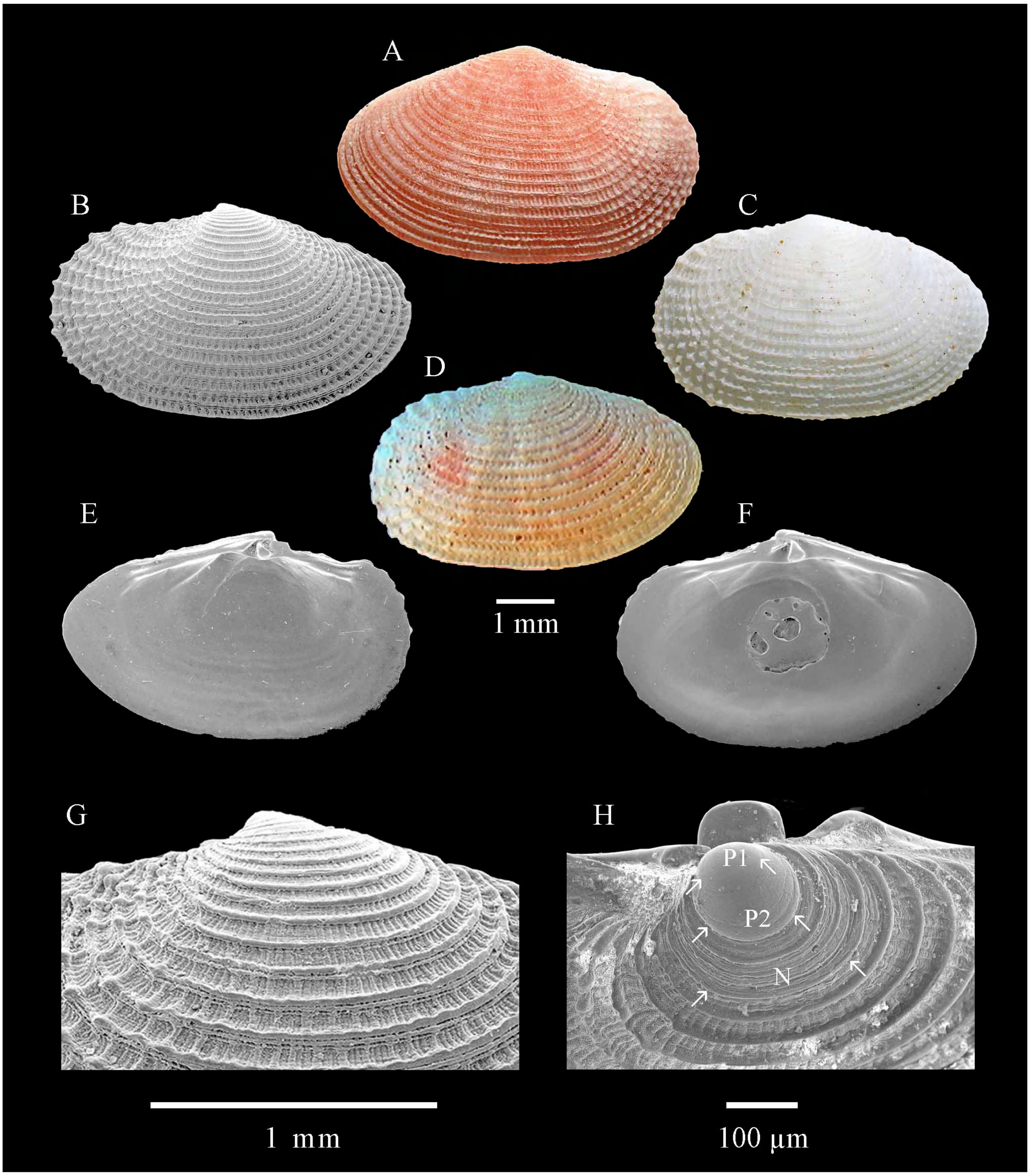

FIGURE 38. **A–H**, *Herouvalia rapanui* sp. nov.: **A**, Exterior LV, 6.4 mm in length; **B**, Exterior RV, 6.3 mm in length; **C**, Exterior RV, 5.8 mm in length; **D**, Exterior RV, 5.8 mm in length; **E**, Interior RV, 6 mm in length, SEM; **F**, Interior LV, 6.3 mm in length; **G**, Close-up of sculpture, RV, SEM; **H**, Close-up of the prodissoconch and nepioconch, RV, SEM, arrows indicating boundaries.

Most authors place these species erroneously in the genus *Elliptotellina* Cossmann, 1887. However, *Elliptotellina* is based on a Paris Eocene fossil, which has a sculpture of only fine commarginal lirae and has a small pallial sinus, but it lacks the lateral dentition in the LV and the psammobid nymph. Instead the genus *Herouvalia*, also based on a Paris Eocene fossil, matches this unique group well. *Herouvalia* fits both in size and by having the characteristic posterior and anterior sculpture, as well as by having the ascending, broad and deep pallial sinus, an external ligament resting on a small nymph, and with lateral dentition, strong in the RV and weak marginal laterals in the LV.

In contrast to Keen *in* Moore (1969), Afshar (1969: 34, pl. 8) well recognized *Elliptotellina* and *Herouvalia* species as related tellinid genera. He characterised both and illustrated the Paris Basin material.

Herouvalia rapanui differs from the Red Sea *H. pulchella* by its shorter and higher shape and by having only commarginal anterior sculpture. The holotype of *Gafrarium* (*Corbis*) *caelatum* A. Adams, 1854 (BMNH 1963867) originally described from Luzon, Philippines proved to represent the same species as Gould's later, well known *T. euglypta*, often illustrated from Japan. *Herouvalia caelata* is similar in appearance and widely distributed throughout the Indo-Pacific. However, the *EI* species has a much finer sculpture with many more and thinner commarginal lamellae. Its shape is subrectangular, less trigonal with a straighter hinge line and less pronounced umbones. Both species, however, share a similar broad, ascending pallial sinus, a comparable maximum size and both occur in reddish and whitish-yellow coloration.

Remarks. The *Herouvalia* group is widely distributed in the Indo-Pacific, from the Red Sea to Easter Island, but is not known from the Hawaiian Islands.

The London holotype of the long enigmatic 9.7 mm *Gafrarium* (*Corbis*) *scitulum* A. Adams, 1854, proved to represent an unrelated Philippine lucinid, belonging to the *Myrtea* Turton, 1822 group, as identified by J. Taylor, (pers. comm., 2010).

Distribution. *Herouvalia rapanui* is commonly found from 20–100 m at many locations around Easter and Salas y Gómez Islands—**E1**.

Etymology. The name reflects Rapa Nui, the indigenous name for Easter Island.

Genus *Moerella* Fischer, 1887

[Type species: *Tellina donacina* Linnaeus, 1758 (MT)]

Moerella laperousea sp. nov.

Figures 39 A–F

Type Material. Holotype: LACM 3169, 1 articulated specimen, 10.5 mm. Paratypes 1–4: LACM 3170, 4 single valves from the type locality. Paratypes 5–6: LACM 3171, 2 articulated specimens, 4.5 mm from Tahai, 30–50 m. Paratypes 7–12: LACM 3172, 1 articulated specimen and 5 single valves, up to 12.5 mm from Tahai, 50–100 m. Paratypes 13–18: Coll. MHU, 1 articulated specimen and 5 single valves from Tahai, 50–100 m.

Type Locality. Dredged at 50–150 m in sand, La Perouse Bay, Easter Island, 27°04'26" S, 109°16'50" W.

Description. A finely commarginally sculptured, radially orange-red colored *Moerella* with the characteristic short and strong anterior lateral tooth in the RV and an opisthogyrate position of the umbones. Shell moderately small, not exceeding 13 mm, elongate-ovate, posteriorly with a weak flexure and obscurely rostrate; rather thin; white with 5–6 broad orange-red radial streaks, emanating from the umbones; internal posteriorly and in the nymphal area rose red in some, otherwise white; no lunule; umbones very low, small, opisthogyrate, situated at the posterior third of the valve. Prodissoconch round, moderately elevated, P1 somewhat pitted, ca. 118 µm length by 93 µm height, P2 with faint to weak commarginal lines, ca. 228 µm length by 185 µm height. Adult valves compressed. Sculpture of dense, regular, commarginal threads. Hinge line rather thin, in RV with a strong, bifid posterior and a weak anterior cardinal, a short, strong anterior lateral and a nymphal posterior lateral. LV with a single strong bifid cardinal, laterals thin and vanishing. Pallial sinus very deep, ventrally surpassing anterior adductor scar, confluent; both muscle scars are comparatively large. External ligament rather short and strong, resting on a nymph, yellowish-brown. Margins smooth.

TABLE 11. Selected measurements from the type material.

M. laperousea sp. nov.	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	10.5	5.7	not visible	not visible
Paratype 1	6.2	3.3	130 x 100	225 x 190
Paratype 4	9.1	4.8	125 x 90	230 x 185
Paratype 7	6	3.2	100 x 90	230 x 180

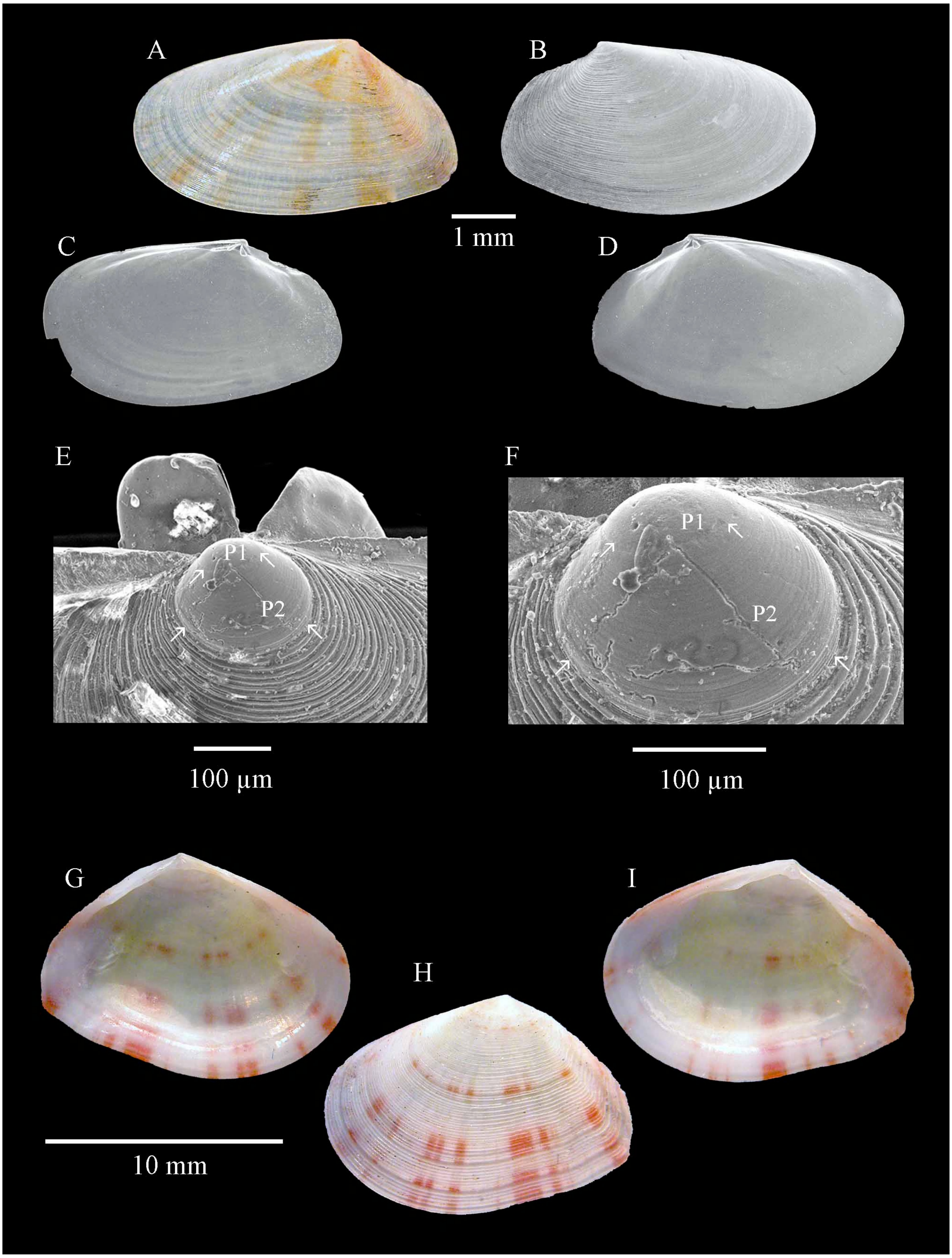

FIGURE 39. A–F, *Moerella laperousea* sp. nov.: **A**, Exterior LV, 5 mm in length; **B**, Exterior RV, 4.8 mm in length, SEM; **C**, Interior RV, 4.4 mm in length, SEM; **D**, Interior LV, 4.7 mm in length, SEM; **E–F**, Close-up of the prodissoconch, RV, SEM, arrows indicating boundaries; **G–I**, *Pristipagia radians* (Deshayes, 1855); **G**, Interior LV, 13 mm in length; **H**, Exterior of same valve; **I**, Interior RV of same specimen.

Comparative diagnosis. With regard to placement of this new species, the commarginal sculpture and lateral dentition exclude *Loxoglypta* Dall, Bartsch & Rehder, 1938, and the finer sculpture and lateral dentition exclude *Nitidotellina* Scarlato, 1965, as well. The hinge with a pronounced anterior lateral in the RV, vanishing laterals in the LV and the deep, confluent pallial sinus, together with shape, size and sculpture match the European type species of *Moerella* quite well. This assessment was shared by A. Langleit, (pers. comm., 2010). None of the illustrated *Moerella* species from Australia, New Zealand or Japan are particularly close.

Remarks. There is nothing similar known from the Hawaiian Islands.

Distribution. *Moerella laperousea* is commonly found from 30–200 m in fine sand, at various Easter Island locations, notably off the western coastline near Tahai—**E1**.

Etymology. The name reflects the type locality.

Genus *Pristipagia* Iredale, 1936

[Type species: *Pristipagia gemonia* Iredale, 1936 (OD)]

Pristipagia radians (Deshayes, 1854) comb. nov.

Figures 39 G–I

Tellina radians Deshayes, 1854: p. 366.

Tellina (*Tellinella*) *radians* Deshayes, 1854—Lamprell & Whitehead, 1992: p. 88, pl. 42, fig. 290; Brook & Marshall, 1998: p. 213; Spencer *et al.*, 2011: p. 1.

Material examined. Several articulated specimens and single valves (5 to 15.7 mm) (BK).

Diagnosis. Shell small (up to 20 mm in length), elongate-ovate, equivalve, inequilateral, not fragile. Umbones elevated. Posterior end obliquely truncate with a narrow ridge from the umbo to the ventral margin; anterior end well rounded. Exterior surface of uniform commarginal ridges. Interior smooth with pallial sinus running from muscle to muscle. Hinge stout, consisting of divergent cardinals and long laterals on the posterior and anterior. Color variable, creamy white to pale yellow background with irregularly spaced red to reddish orange radial rays.

Remarks. The pallial sinus of the *EI* specimens runs from muscle to muscle, thus, juvenile *Tellinella staurella* (Lamarck, 1818), and *Tellinella virgata* (Linnaeus, 1758), are excluded. Lamprell and Whitehead (1992) placed *P. radians* in *Tellinella* Mörch, 1853, but that does not fit the shape or pallial sinus, and *Tellinella* is generally more elongate and much larger in size. However, the genus *Pristipagia* which is related to *Serratina* Pallary, 1922, does match. This opinion was confirmed by A. Langleit, (pers. comm., 2010).

The type is illustrated in Higo *et al.* (2001: B912). Originally described without location, *Pristipagia radians* has been recorded from Australia to Japan and also from the Kermadec Islands. The type specimen is moderately larger (21 mm) and higher in shape than the *EI* material. However, the same shape variability of *P. radians* was also seen in *Pristipagia adamsii* (Bertin, 1878), of the Red Sea.

Habitat. Occasionally found at several locations around *EI*, in sand and rubble, from 10–150 m. Live taken at 30 m.

Distribution. *Pristipagia radians* is known from Australia to Japan, including the Kermadec Islands, but not the Hawaiian Islands. Easter Island is now considered a range extension—**E5**.

Genus *Abranda* Iredale, 1924

[Type species: *Abranda rex* Iredale, 1924 (OD) = *Tellina modestina* Tate, 1891 (see Ponder, 1975)]

Abranda lamprelli sp. nov.

Figures 40 A–G

Type Material. Holotype: LACM 3173, single RV 5.7 mm. Paratypes 1–9: LACM 3174, 9 single valves up to 7 mm from the type locality. Paratypes 10–14: LACM 3175, 5 single valves up to 5.4 mm from Mataveri, 150 m. Paratypes 15–24: LACM 3176, 10 single valves up to 7.1 mm from Tahai, 50–100 m. Paratypes 25–32: Coll. MHU, 8 single valves from Tahai, 50–100 m.

Type Locality. Dredged at 50–100 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Description. A small, elongate whitish *Abranda* species, with a disjunct dentition and an internal ligament portion. Shell small, barely exceeding 7 mm in length, equivalve, elongate-elliptical with a posterior flexure, marked by a weak posterodorsal angle; thin and fragile; whitish with faint radial traces of yellow or orange; no lunule; umbones small, slightly extending the dorsal line, orthogyrate, situated posterior to midline. Prodissoconch pronounced, P1 round, smooth, ca. 88 µm length by 78 µm height, P2 ovate with faint commarginal lines, ca. 155 µm length by 182 µm height. Adult valves weakly inflated. Sculpture of fine commarginal lamellae crossed by microscopic radials; lamellae are easily rubbed off and leave a smooth, glossy surface. Hinge line rather thin, in RV with an anterior and a bifid posterior cardinal, two marked, long laterals extending to dorsal and posterior midline. LV with stronger anterior and a weaker ridge-shaped posterior cardinal, laterals fused to margin and virtually absent. Pallial sinus weakly impressed, in LV broadly rounded, deep and almost reaching anterior scar, halfway confluent with pallial line; in RV shorter, broad, reaching midline, largely confluent. External ligament portion yellowish-brown, moderately extended and narrow; internal portion narrow, obliquely situated behind posterior lateral. Margins rather acute, smooth.

TABLE 12. Selected measurements from the type material.

***A. lamprelli* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	5.7	3.8	85 x 80	175 x 200
Paratype 1	4.1	2.8	90 x 75	160 x 175
Paratype 7	2.8	1.6	90 x 80	130 x 170

Comparative diagnosis. Closest to the new species is the type species of *Abranda*, *Tellina modestina* Tate, 1891. This assessment was confirmed by A. Langleit, (pers. comm., 2010).

Abranda is an unusual tellinid genus mainly known from Australian waters. It shares an internal ligament portion with semelids, and has a disjunct dentition with weak or absent laterals in the LV. The valves are comparatively small, thin and commarginally sculptured.

Compared to *Abranda modestina* (Tate, 1891), the pallial sinus in *A. lamprelli* is deeper in the LV, reaching the anterior scar, the two laterals in the RV are wider, more elongate and the shape is even more attenuated. *Abranda modestina* reaches 14 mm, whereas *A. lamprelli* is not known above 7 mm. *Abranda hypelliptica* (Salisbury, 1934), from Australia and the closely related *A. radiatolineata* (Yokoyama, 1924), share a similar size, but are shorter and higher in shape and often found in reddish colors. *Abranda jeanae* (Healy & Lamprell, 1992), from Australia is distinct by having a higher shape, stronger sculpture and much larger size.

Remarks. There is nothing similar known from the Hawaiian Islands. The genus *Abranda* seems to be excluded from the Caribbean *Tellina* species in biogeography, shell morphology, hinge and size. Instead *Abranda* approaches the genera of *Pinguitellina* Iredale, 1925, or *Arcopagia* Brown, 1827, but is here generically separated.

Distribution. *Abranda lamprelli* is commonly found at many locations around Easter Island, in fine sand, from 50–200 m—**E1**.

Etymology. The name given to this species is in honor of the late Kevin Lamprell, who provided the senior author with years of advice prior to his passing 2003.

Genus *Semelangulus* Iredale, 1924

[Type species: *Tellina tenuilirata* G.B. Sowerby II, 1867 (OD)]

Semelangulus nebulosus Dall, Bartsch & Rehder, 1938

Figures 40 H–K

Semelangulus nebulosus Dall *et al.*, 1938: p. 180, pl. 47, figs. 5–8.
Semelangulus nebulosus Dall *et al.*, 1938—Rehder & Randall, 1975: p. 35.
Semelangulus crebrimaculatus (Sowerby, [*sic*] 1868)—Preece, 1995: p. 351.

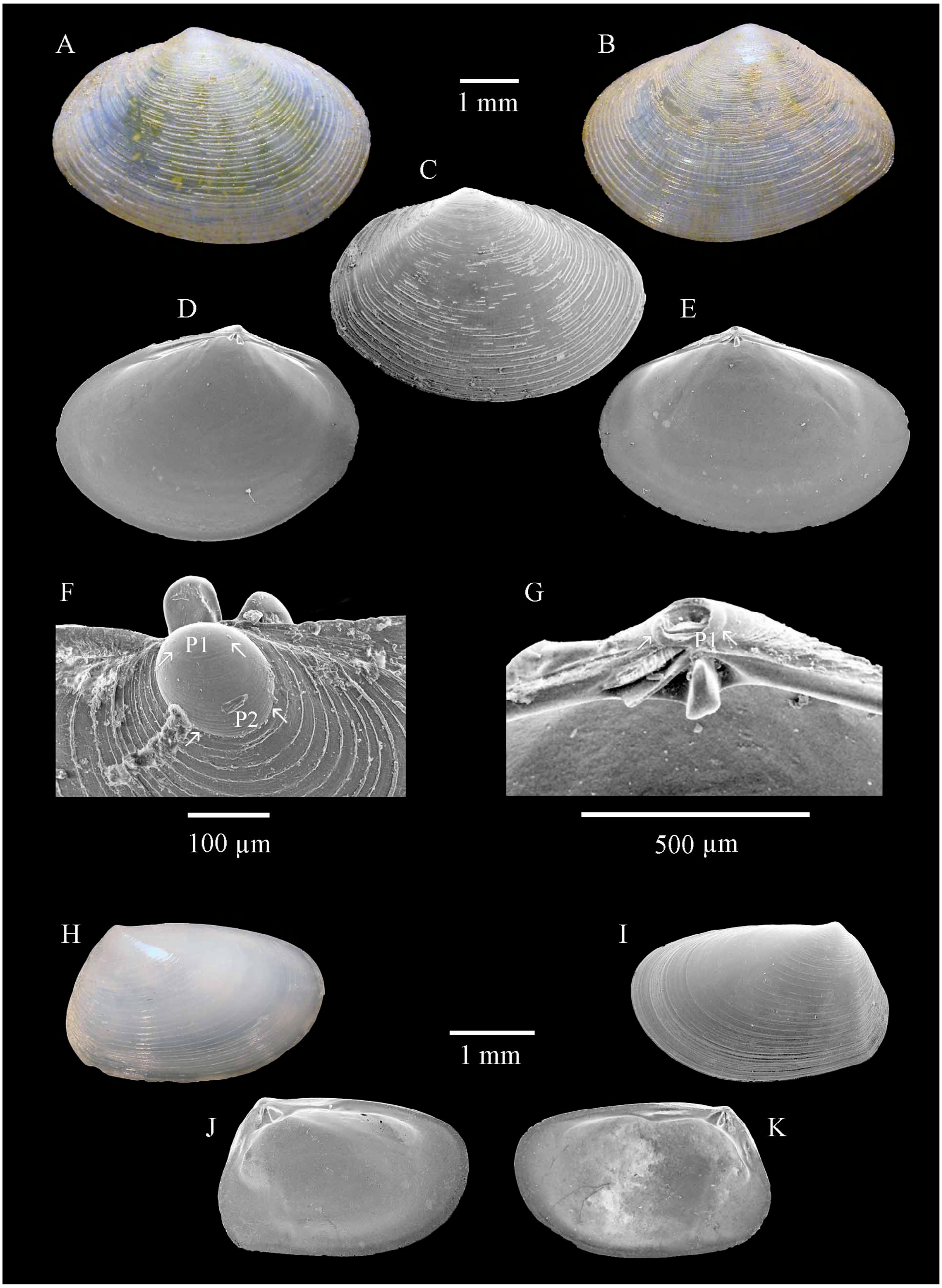

FIGURE 40. A–G, *Abranda lamprelli* sp. nov.: **A**, Exterior RV, 5.5 mm in length; **B**, Exterior LV, 5.2 mm in length; **C**, Exterior RV, 5.3 mm in length, SEM; **D**, Interior RV, 5 mm in length, SEM; **E**, Interior LV, 5.2 mm in length, SEM; **F**, Close-up of the prodissoconch, RV, SEM, arrows indicating boundaries; **G**, Close-up of the prodissoconch, LV, SEM, arrows indicating boundaries; **H–K**, *Semelangulus nebulosus* Dall, Bartsch & Rehder, 1938; **H**, Exterior RV, 3.2 mm in length; **I**, Exterior LV, 3 mm in length, SEM; **J**, Interior LV, 2.9 mm in length, SEM; **K**, Interior RV, 2.9 mm in length, SEM.

Material examined. Over fifty articulated specimens and single valves (2.8 to 5 mm) (BK), as well as several specimens from Pitcairn Island (BK).

Diagnosis. Shell small (up to 5 mm in length), donaciform, stout and equivalve. Posterior end obliquely truncate; anterior end well rounded. Umbones elevated. Surface very smooth, glossy, except for some weak irregular commarginal sculpture. Hinge consisting of distinctly pronounced dentition with two clear laterals in the RV, while in the LV they are nearly obsolete. Color milky white and mottled with whiter spots.

Remarks. Kay (1979) synonymized *Semelangulus nebulosus* as well as *S. dichrous*, *S. diodorus* and *S. oahuensis* Dall, Bartsch & Rehder, 1938, to *S. crebrimaculatus* G.B. Sowerby II, 1867. Although the other species may indeed be synonymous, we believe *S. nebulosus* to be very distinct. It is unique by its rather truncate and comparatively higher shape, by the milky white color and by the comparatively weak commarginal sculpture. It is the smallest of the Hawaiian species. *Semelangulus nebulosus* is here considered a valid species and a new record for *EI*, accepted by A. Langleit, (pers. comm., 2010).

Habitat. Silty mud at 15 m in cave, on northern coast off Hanga-Teo, *EI*. 27°03'37" S, 109°21'58" W.

Distribution. *Semelangulus nebulosus* is known from the Hawaiian Islands, Pitcairn Islands, and now a new record for Easter Island—**E5**.

Family SEMELIDAE Stoliczka, 1870

Genus *Semele* Schumacher, 1817

[Type species: *Tellina proficua* Pulteney, 1799 (ICZN 1979, opinion 1141)]

Semele australis (G.B. Sowerby I, 1832)

Figures 41 A–C

Amphidesma australe G.B. Sowerby I, 1832: p. 200.
Semele tita Dall *et al.*, 1938: p. 177, pl. 45, figs. 1–4.
Semele australis (G.B. Sowerby I, 1832)—Kay, 1979: p. 566, figs. 183 M–N; Rehder, 1980: p. 112, pl. 14, figs. 5–6; Preece, 1995: p. 351; Tröndlé & Boutet, 2009: p. 9; Huber, 2010: p. 340, figs. 8–10; Severns, 2011: p. 476, pl. 218, fig. 2.

Material examined. Over two hundred articulated specimens and single valves from *EI* and *SyG* (BK), plus specimens from the Hawaiian Islands (MHU), Marquesas Islands (MHU), Okinawa (BK), Pitcairn Island (BK) and from the Indian Ocean (MHU).

Diagnosis. Shell small for the genus, subcircular, stout, equivalve and equilateral. Umbones elevated. Surface sculpture consisting of strong commarginal lamellae. Hinge short and strong with two divergent cardinals in each valve, as well as anterior and posterior laterals. Very broad, but comparatively short ascending pallial sinus. Color white to pale yellow.

Remarks. The *EI* specimens are just short of the maximum size of 28 mm reported from Australia, and conform precisely to numerous specimens studied from the Mascarenes to Japan, including the Marquesas Islands and the Hawaiian Islands.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 10–50 m.

Distribution. *Semele australis* is known throughout the Indo-Pacific, ranging from the Mauritius Islands, Japan, Marshall Islands, Australia, Marquesas Islands, Tuamotu Archipelago, Gambier Islands, Austral Islands, Society Islands, Loyalty Islands, Cook Islands, Pitcairn Islands, and the Hawaiian Islands, as well as Easter and Salas y Gómez Islands. However, it has not been recorded from New Zealand or the Kermadec Islands—**E5**.

Genus *Ervilia* Turton, 1822

[Type species: *Mya nitens* Montagu, 1808 (MT)]

Ervilia bisculpta Gould, 1861

Figures 41 D–H

Ervilia bisculpta Gould, 1861: p. 28.

Ervilia bisculpta Gould, 1861—Preece, 1995: p. 351; Brook & Marshall, 1998: p. 213; Tröndlé & Boutet, 2009: p. 9; Huber, 2010: p. 345, figs. 4–5; Spencer, *et al.*, 2011: p. 1; Severns, 2011: p. 476, pl. 218, fig. 4.
Ervilia (*Spondervilia*) *ambla* Dall *et al.*, 1938: p. 171, pl. 44, figs. 5–8.
Ervilia (*Spondervilia*) *bisculpta* Gould (1861)—Kay, 1979: p. 558, figs. 181 A–B, *non* C–D.
Mactridae species—Osorio & Cantuarias, 1989: p. 306.

Material examined. Several hundred live taken specimens and single valves (up to 6 mm) (BK), as well as the 'Mactridae' specimen reported by Osorio and Cantuarias (1989).

Diagnosis. Shell small (up to 6 mm in length), elongate-ovate, subequilateral, strong and inflated. Umbones pronounced. Exterior surface sculpture of commarginal lirae with radial riblets on posterior and anterior ends. Interior ventral margin minutely denticulate, muscle scars subequal, pallial line with a somewhat deep sinus. Hinge rather stout, with the LV containing a narrow, low cardinal tooth on the anterior and a strong rather long lateral, while the posterior lateral is short and knob-like; the RV contains one pronounced anterior cardinal tooth, and a weak lateral on the posterior. Color variable from cream to pink, which may be uniform, spotted or with streaks.

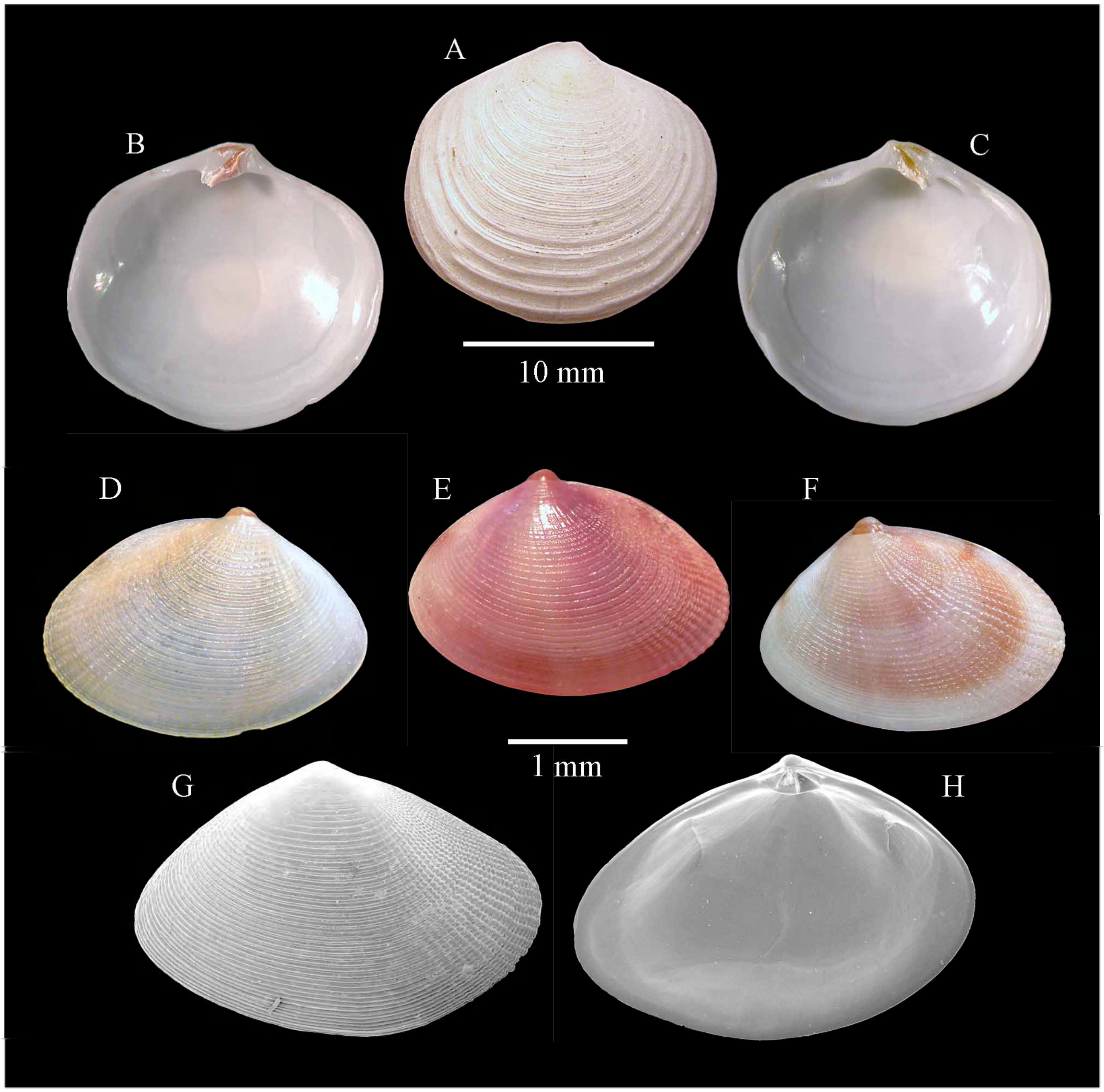

FIGURE 41. **A–C**, *Semele australis* (G.B. Sowerby I, 1832); **A**, Exterior RV, 16 mm in length; **B**, Interior LV, 15 mm in length; **C**, Interior RV, 14.5 mm in length; **D–H**, *Ervilia bisculpta* Gould, 1861; **D**, Exterior RV, 2.6 mm in length; **E**, Exterior LV, 2.5 mm in length; **F**, Exterior LV, 2.5 mm in length; **G**, Exterior LV, 3.4 mm in length, SEM; **H**, Interior LV, 3.3 mm in length, SEM.

Remarks. The *EI* material conforms to the type in Higo *et al.* [2001: B1039 and 1039s (=*E. livida* Gould, 1861)], which also indicates a similar variability in shape and color as found in Japan, and the smaller sizes as typical for *EI*. It is probably the most abundant bivalve species on *EI*.

Habitat. Commonly found at many locations around *EI* and *SyG*, in sand and rubble, from 10–150 m.

Distribution. *Ervilia bisculpta* is known throughout the Indo-Pacific, ranging from eastern Africa to Japan including the Philippines, Australia, Marquesas Islands, Society Islands, Austral Islands, Pitcairn Islands, Kermadec Islands, Hawaiian Islands, and now recorded from Easter and Salas y Gómez Islands—**E5**.

Genus *Lonoa* Dall, Bartsch & Rehder, 1938

[Type species: *Lonoa hawaiensis* Dall *et al.*, 1938 (OD)]

Lonoa aff. *hawaiensis* Dall, Bartsch & Rehder, 1938

Figures 42 A–C

Lonoa hawaiensis Dall *et al.*,1938: p. 179, pl. 46, figs. 5–8.

Lonoa hawaiensis Dall *et al.*,1938—Kay, 1979: p. 565, fig. 183 I; Paulay, 1987: p. 16; Preece, 1995: p. 351; Tröndlé & Boutet, 2009: p. 9; Severns, 2011: p. 476, pl. 218, fig. 5.

Material examined. A single articulated specimen (1.5 mm) (BK).

Diagnosis. Shell very small (1.5 mm in height), ovate, translucent, fragile, with posteriorly placed small, pointed umbones. Exterior surface glossy, growth lines with irregularly placed weak radial streaks. Hinge consisting of a strong single and a split cardinal, the cardinals comparatively large, the split cardinal posterior in the RV and anterior in the LV, hinge plate non-indented; no laterals.

Remarks. This unique and very strong hinge was not encountered in any other *EI* species. From the hinge structure galeommatids are excluded. Most of the traits in shape, sculpture and hinge are shared with the genus *Lonoa*. A very juvenile *Lonoa* species can at present not be excluded.

Habitat. Dredged at 30–80 m in fine sand, off the western coastline near Tahai, *EI*, 27°07’20” S, 109°26’30” W.

Distribution. *Lonoa hawaiensis* was originally described from the Hawaiian Islands, but has been recorded from the Cook Islands, Society Islands, Austral Islands, Pitcairn Islands and now possibly Easter Island—**E5**.

Family SOLECURTIDAE Orbigny, 1846

Genus *Solecurtus* Blainville, 1824

[Type species: *Solen strigilatus* Linnaeus, 1758 (SD by Deshayes, 1829)]

Solecurtus baldwini Dall, Bartsch & Rehder, 1938

Figures 42 D–I

Solecurtus baldwini Dall *et al.*,1938: p. 176, pl. 45, figs. 9–10.

Solecurtus baldwini Dall *et al.*,1938—Kay, 1979: p. 564, fig. 183 H; Severns, 2011: p. 480, pl. 220, fig. 4.

Material examined. Over fifty broken valves, up to 17 mm from *EI* (BK), plus the Hawaiian type specimen (USNM).

Diagnosis. Shell small (up to 17 mm in length), thin, very fragile, elongated oval. Anterior and posterior ends rounded; parallel dorsal and ventral margins. Exterior surface consisting of commarginal growth lines and fine radiating striae dorsally, while on the central and posterior portions of the valve they are stronger, incised oblique lines which divaricate to form triangles. Interior is translucent and the exterior sculpture can been seen through the valve. Hinge consists of two cardinal teeth in each valve. In the LV the anterior tooth is strong and hook-like, while the posterior is obscure and divergent. In the RV the anterior tooth is also strong and hook-like, but in the posterior it is divergent and erect. Color white.

Remarks. The Easter Island material conforms to the holotype of *S. baldwini* (Figs. 42 H–I) originally described from the Hawaiian Islands, although the *EI* material is rather small compared to the Hawaiian maximum size of 27.5 mm.

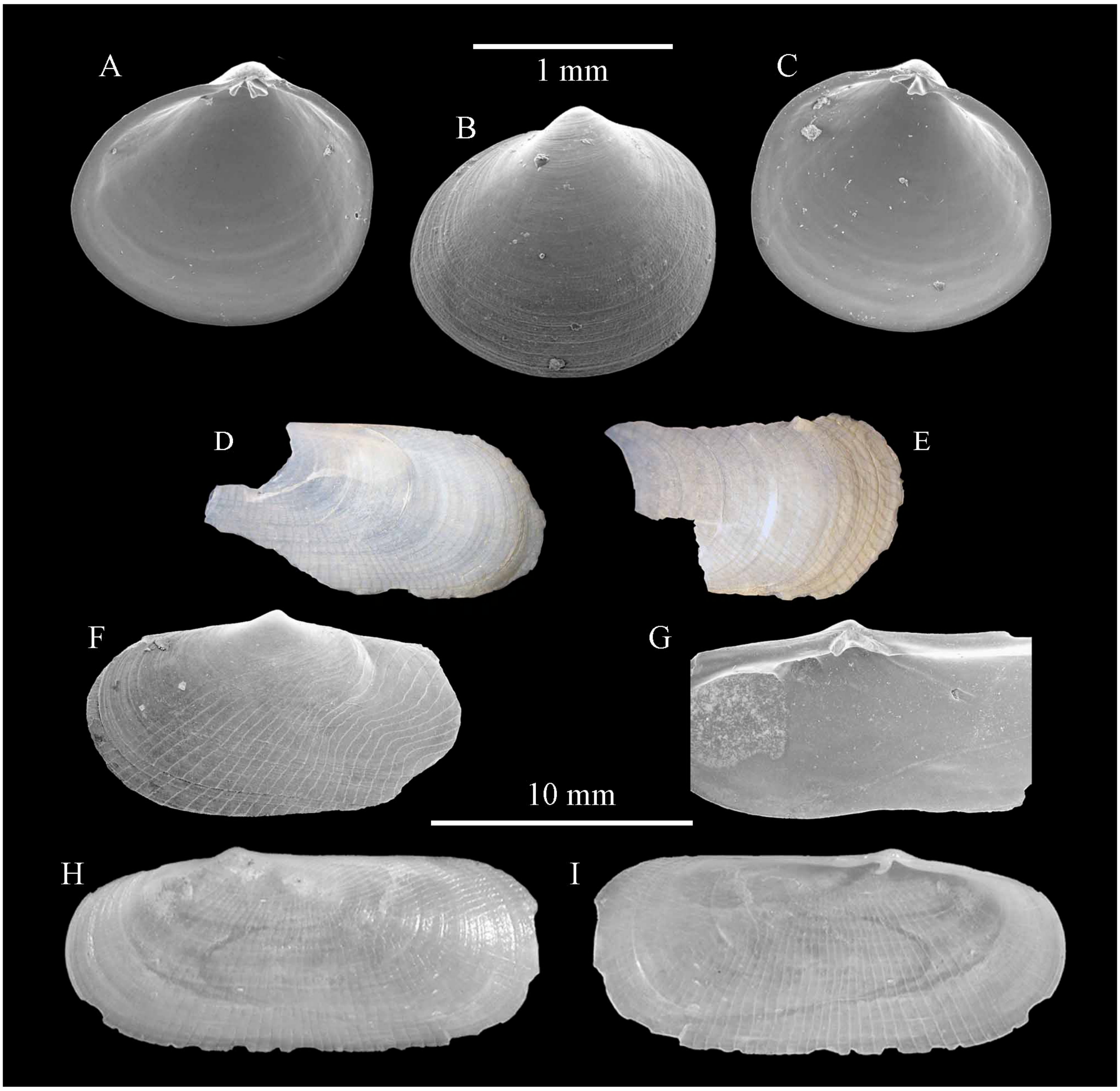

FIGURE 42. A–C, *Lonoa* aff. *hawaiensis* Dall, Bartsch & Rehder, 1938; **A**, Interior RV, 1.5 mm in height, SEM; **B**, Exterior LV, of same specimen, SEM; **C**, Interior LV, of same valve, SEM; **D–I**, *Solecurtus baldwini* Dall, Bartsch & Rehder, 1938; **D**, Exterior partial LV; **E**, Exterior partial LV; **F**, Exterior partial LV; **G**, Close-up of hinge, RV; **H–I**, *Solecurtus baldwini*, (Holotype, USNM 335618); **H**, Exterior LV, 17.1 mm in length; **I**, Interior of same valve.

Habitat. Dredged at 180–220 m in fine sand collected off the southwestern coast near Orongo, Easter Island. 27°11'58" S, 109°29'28" W.

Distribution. At present *Solecurtus baldwini* is only known from Easter Island and the Hawaiian Islands—**E2**.

Superfamily GLOSSOIDEA Gray, 1847

Family KELLIELLIDAE Fischer, 1887

Genus *Kelliella* M. Sars, 1870

[Type species: *Kelliella abyssicola* M. Sars, 1870 (MT) =*Kellia abyssicola* Forbes, 1844]

Kelliella rotunda (Thiele & Jaeckel, 1931)

Figures 43 A–D

Vesicomya rotunda Thiele & Jaeckel, 1931: p. 231, pl. IV, fig. 105a.
Vesicomya rotunda Thiele & Jaeckel, 1931—Boss, 1970: p. 76, figs. 12, 15–16.
Kelliella japonica Hayami & Kase, 1993: p. 91, figs. 321–330. **(syn. nov.)**
Kelliella japonica Hayami & Kase, 1993—Okutani, 2000: p. 993, pl. 495, fig. 2.

Material examined. One articulated specimen and nearly two dozen single valves (2 to 3 mm) (BK).

Diagnosis. Shell small (up to 3 mm in length), suborbicular and strongly inflated. Umbones low, while the lunule is pronounced and well defined. Exterior surface hyaline with commarginal sculpture. Interior shiny, with a fine furrow which runs along the entire margin. Hinge consists of two subparallel teeth in the RV, while the LV has one tubercular and one lamellar tooth.

Remarks. Hayami and Kase (1993) described the minute, 2.5 mm *Kelliella japonica* from bottom sediments in subtidal caves from Ie Islet, Okinawa. From *EI* the species is represented by 17 single valves, dredged from 30–50 m, and ranging in size from 1.8–3 mm. These conform to the hinge, suborbicular outline, size, defined lunule, and shiny surface with a commarginal sculpture to that of *K. japonica*.

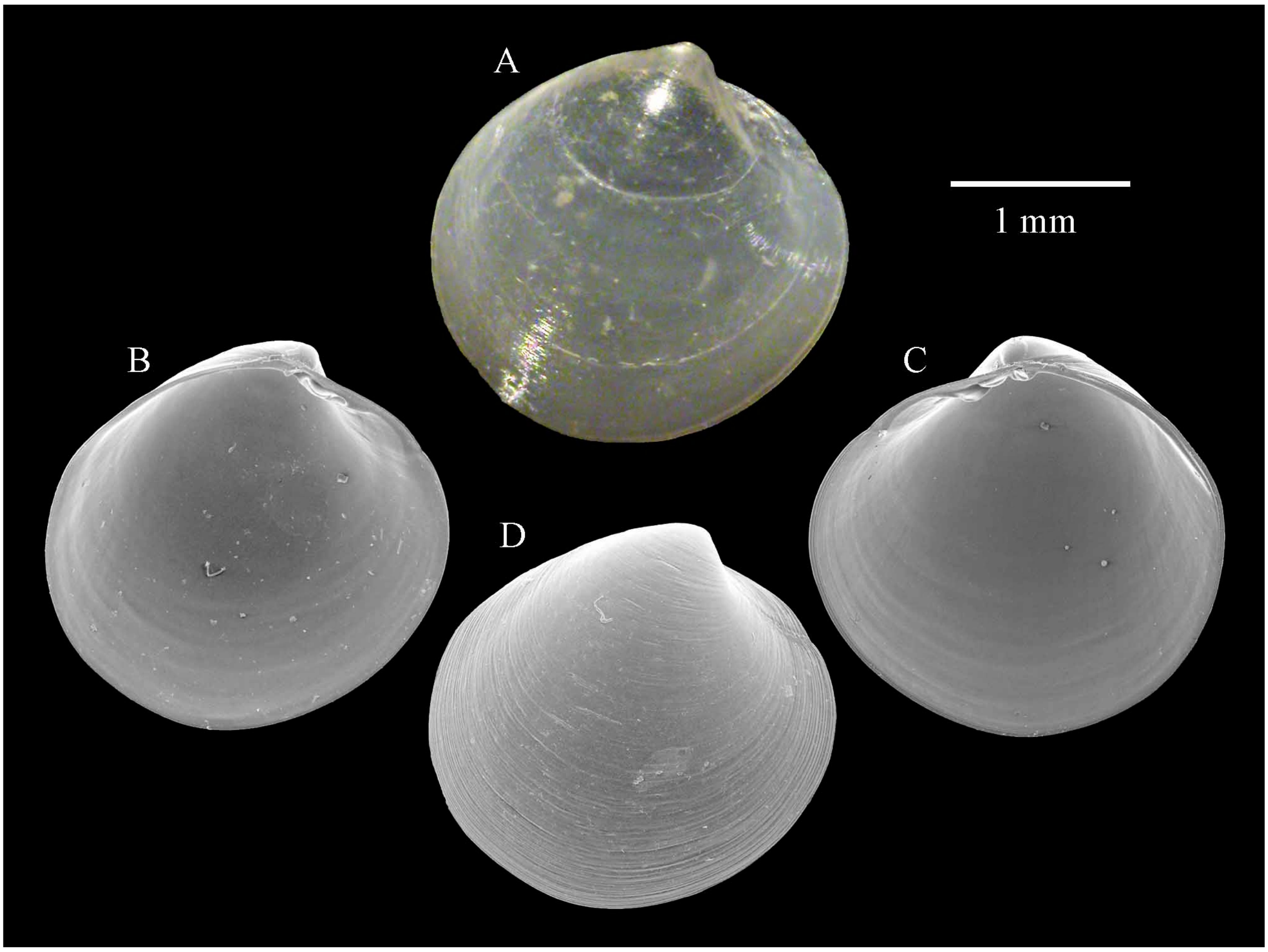

FIGURE 43. A–D, *Kelliella rotunda* (Thiele & Jaeckel, 1931); **A**, Exterior RV, 2.1 mm in height; **B**, Interior LV, 2.3 mm in height; **C**, Exterior RV of same specimen; **D**, Interior RV, 2.1 mm in height.

Hayami and Kase compared their new species with *K. galatheae* Knudsen, 1970, *K. elegantula* R.F. Bernard, 1989, and *K. sundaensis* Knudsen, 1970, as well as with the fossil species *K. barbara* Studencka, 1987, and *K. nakayamai* Habe, 1953. Unfortunately, they overlooked *Vesicomya rotunda* Thiele & Jaeckel, 1931 from Indonesia, also recorded from the Philippines and the South China Sea. *Kelliella rotunda* also shares the name giving rounded shape, the shiny and commarginally sculptured surface, the minute size of 2–3 mm, the defined lunule and the weakly protruding umbones. Furthermore, it lives in the same biogeographic area. Boss (1970: 76) redescribed and illustrated this species, including the hinge, and provided further records.

We see no arguments to keep *K. japonica* separate from the earlier *K. rotunda*. Thus, *Kelliella japonica* is here formally synonymized and the range of *K. rotunda* enlarged to include Okinawa and Easter Island.

Boss provisionally assigned *rotunda* to *Kelliella*. Allen (2001: 224) and Huber (2010: 706) confirmed the kelliellid placement.

Krylova & Sahling (2010) recently proposed a different view and advocated the genus *Vesicomya* Dall, 1886 for *rotunda*. However, their inclusion of the type species of *Kelliella*, namely, *K. abyssicola*, into *Vesicomya* which confirms that *Vesicomya* is a junior synonym of *Kelliella*.

They further proposed a separation of the group into small and large vesicomyids. However, substantial anatomical or genetic support for this new grouping was not provided. Consequently, the views of Allen (2001) and Huber (2010) are followed and *Kelliella rotunda* retained in Kelliellidae.

Habitat. Commonly found at various sublittoral locations around Easter Island, in fine sand, from 30–150 m, Recorded from sublittoral and lower bathyal, as well as in subtidal caves from other locations.

Distribution. Previously *Kelliella rotunda* was only known from Sumatra, the Philippines, South China Sea and Okinawa. Easter Island is now considered a range extension—**E4**.

Superfamily VENEROIDEA Rafinesque, 1815

Family VENERIDAE Rafinesque, 1815

Genus *Timoclea* Brown, 1827

[Type species: *Venus ovata* Pennant, 1777 (MT)]

Timoclea keegani sp. nov.

Figures 44 A–H

Veneridae—Luke, 1995: p. 106.
Chione sp.—Trego, 1997: p. 199.

Type Material. Holotype: LACM 3177, 1 articulated specimen, 10.2 mm x 9.1 mm, (Figs. 44 A–D). Paratype 1–2: LACM 3178, 2 juvenile live taken specimens, 2–2.6 mm, from type locality. Paratypes 3–4: LACM 3179, 2 single valves, 5.2–10 mm, from *EI*, Mataveri Bay, 30–60 m. Paratypes 5–6: LACM 3180, 2 single valves, 4.2–4.6 mm, from *EI*, Hanga Roa, 80–100 m. Paratype 7: SIO M1448, 1 RV, 8.7 mm x 7.6 mm, from *EI*, La Perouse Bay, 40–100 m, 1957/58 Downwind Expedition (DWHD-76), (Figs. 44 E–F). Paratypes 8–12: Coll. BR, 5 single valves, 4.5–6.7 mm, from type locality. Paratypes 13–15: Coll. MHU, 3 single valves from *EI*, Mataveri Bay, 30-60 m, 5-6.5 mm.

Type Locality. Dredged at 30–80 m in fine sand, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W.

Description. A small, colorful *Timoclea* species, solid, with elevated umbones. Shell small (up to 10.2 mm in length), solid, ovate, equivalve, somewhat inflated. Umbones elevated well above the hinge line. Prodissoconch well defined, turned obliquely under the umbo and not visible in adults, P1 round, smooth, ca. 85 µm length by 77 µm height, P2 ovate with weak commarginal ridges, ca. 170 µm length by 140 µm height. Exterior surface of adult valves highly sculptured with pronounced radial cords crossed by commarginal ridges, which form small raised nodes at each intersection giving a scalloped appearance. Secondary intercalated radial cords near ventral margin. Lunule well marked, inset, commarginally striate. Interior margins crenulated, pallial sinus weak and shallow. Hinge strong, consisting of the typical three cardinals in each valve and additionally a strong anterior tubercle, occasionally divided into two portions. Color creamy white with irregular reddish orange blotches.

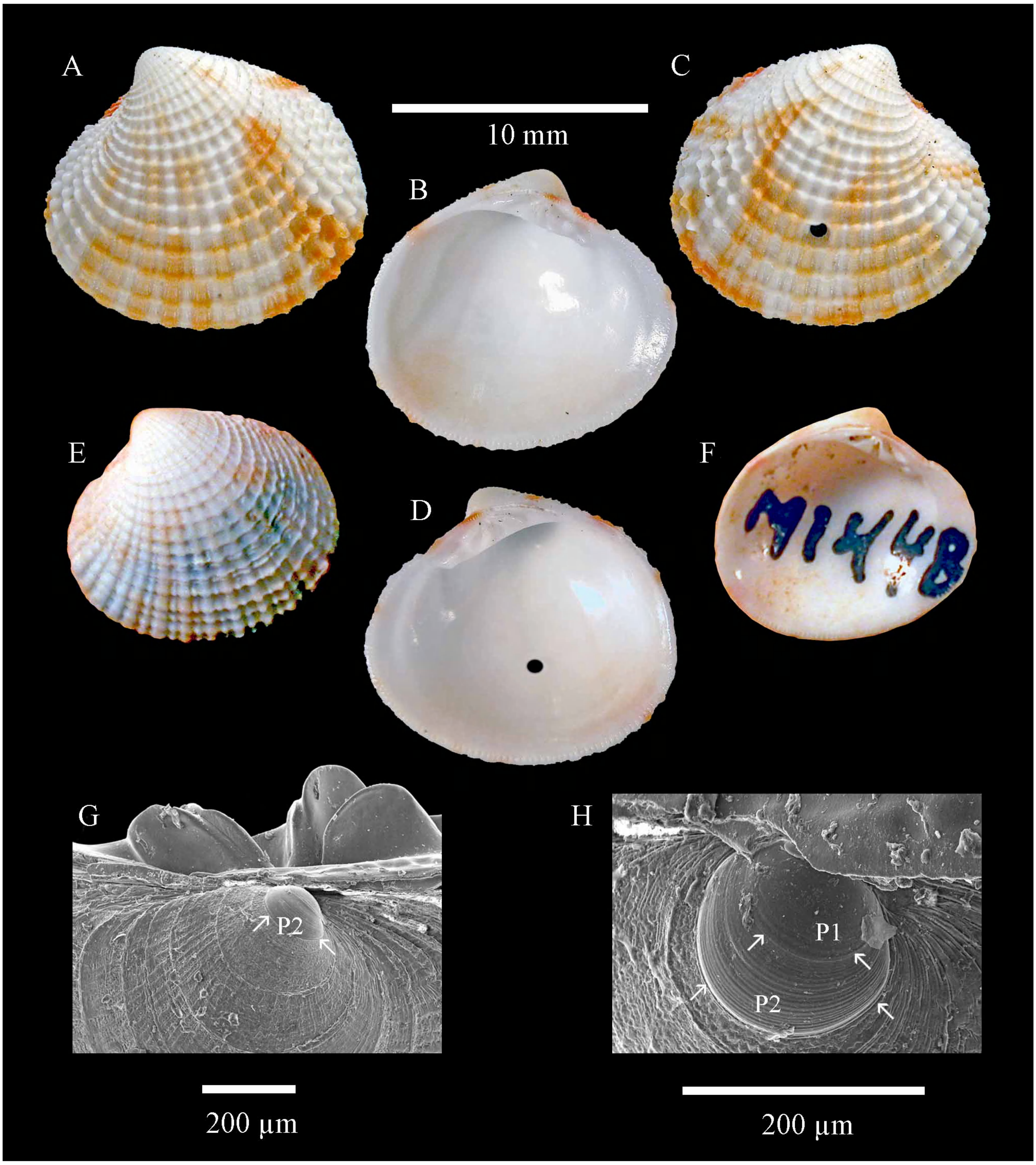

FIGURE 44. **A–H**, *Timoclea keegani* sp. nov.: **A**, Holotype, Exterior LV, 10.2 mm in height; **B**, Interior of same valve; **C**, Holotype, Exterior RV; **D**, Interior of same valve; **E**, Exterior LV, 7.64 mm in height (SIO); **F**, Interior of same valve; **G–H**, Close-up of the prodissoconch, RV, SEM, arrows indicating boundaries.

TABLE 13. Selected measurements from the type material.

***T. keegani* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	10.2	9.1	not visible	not visible
Paratype 4	10	9	not visible	not visible
Paratype 6	4.6	4.3	80 x 75	180 x 150
Paratype 8	4.5	4.1	90 x 80	160 x 130

Comparative diagnosis. None of the known twenty-five *Timoclea* species from South Africa to Japan matches the new *EI* species. Young *T. keegani* may appear similar to a few other Indo-Pacific *Timoclea* species, namely, *T. infans* (E.A. Smith, 1885), *T. scabra* (Hanley, 1844) or *T. siamensis* (Lynge, 1909), but all differ in shape, sculpture, color and hinge. The hinge of *T. keegani* is most similar to that found in *T. mindanensis* (Smith, 1885), but here the shape, sculpture and color differ. Lastly, the European type species, *T. ovata* lacks anterior tubercular teeth.

Remarks. There are no *Timoclea* species known from the Hawaiian Islands, nor have any been collected from the Marquesas Islands. A single valve from the 1957/58 Downwind Expedition, noted as Veneridae by Luke (1995) and *Chione* species by Trego (1997) in the SIO Benthic Collection, M1448 (Figs. 44 E–F) is consistent with *T. keegani.*

Distribution. *Timoclea keegani* is commonly found at many locations off Easter Island, sublittoral from ca. 30–100 m—**E1**.

Etymology. The name given to this species is in honor of the senior author's son Keegan Raines.

Genus *Hyphantosoma* Dall, 1902

[Type species: *Cytherea carbasea* Guppy, 1866 (OD)]

Hyphantosoma crassum sp. nov.

Figures 45 A–G

Pitar cf. *pellucida*—Luke, 1995: p. 106. (Lot M1446 in part)
Pitar sp.—Trego, 1997: p. 199. (Lot M1443 in part)

Type Material. Holotype: SIO M1443, 1 RV, 39.5 mm x 32.3 mm, (Figs. 45 A & B). Paratype 1: SIO M12339, 1 LV, umbonal portion missing, ca. 45 mm x ca. 39 mm from the type locality, ex-M1443. Paratype 2: SIO M12340, 1 RV, ventral portion missing, 22.9 mm, from *EI*, La Perouse Bay, 40–100 m, 1957/58 Downwind Expedition (DWHD-76), ex-M1446, (Fig. 45 D). Paratype 3: SIO M12341, 1 LV, dorsal portion missing, 38.2 mm, from *EI*, La Perouse Bay, 40–100 m, 1957/58 Downwind Expedition (DWHD-76), ex-M1446, (Fig. 45 C). Paratype 4: LACM 3181, 1 LV, ventral portion missing, ca. 22.8 mm, from *EI*, near Tahai, 50–80 m, (Figs. 45 E & F). Paratype 5: LACM 3182, 1 RV, umbonal fragment, 5 mm, from *EI*, near Tahai, 50–80 m.

Type Locality. Dredged at 132–174 m off northeastern Poike Peninsula, *EI*, 27° 04' S, 109° 16' W.

Description. A medium-sized, solid *Hyphantosoma* species with a strongly marked chevron-sculpture and a solid and thick hinge plate. A very large species for *EI*, reaching at least 45 mm, equivalve, ovate; solid and comparatively thick-shelled for this genus; white with irregular brown marks and deep red umbones; lunule incised, heart shaped; umbones low, only slightly extending the dorsal line, prosogyrate, situated in the anterior third of the valve. Prodissoconch turned obliquely under the umbo and not readily visible, but assumed to be small, round and smooth. Adult valves moderately inflated. Sculpture of characteristic chevron marks, clearly and strongly expressed anteriorly and posteriorly, becoming somewhat irregular centrally; weak periostracum rubbed off. Hinge line solid, broad, rather short, in LV with two dorsally connected and a separate elongate posterior cardinal, the central cardinal knobby and prominent, additionally a pointed, strong anterior lateral tubercle; RV with dorsally connected anterior and posterior cardinal and a central, unconnected cardinal, which is the strongest, additionally two anterior lateral ridges for the reception of the lateral tubercle of the LV. Pallial sinus comparatively short, broadly-rounded, ventral leg ascending, dorsal leg almost horizontal. External ligament, brownish, strong, narrowly-extended and inset in a dorsal ridge. Margins smooth.

TABLE 14. Selected measurements from the type material.

***H. crassum* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	39.5	32.3	not visible	not visible
Paratype 1	ca. 45	ca. 39	not visible	not visible

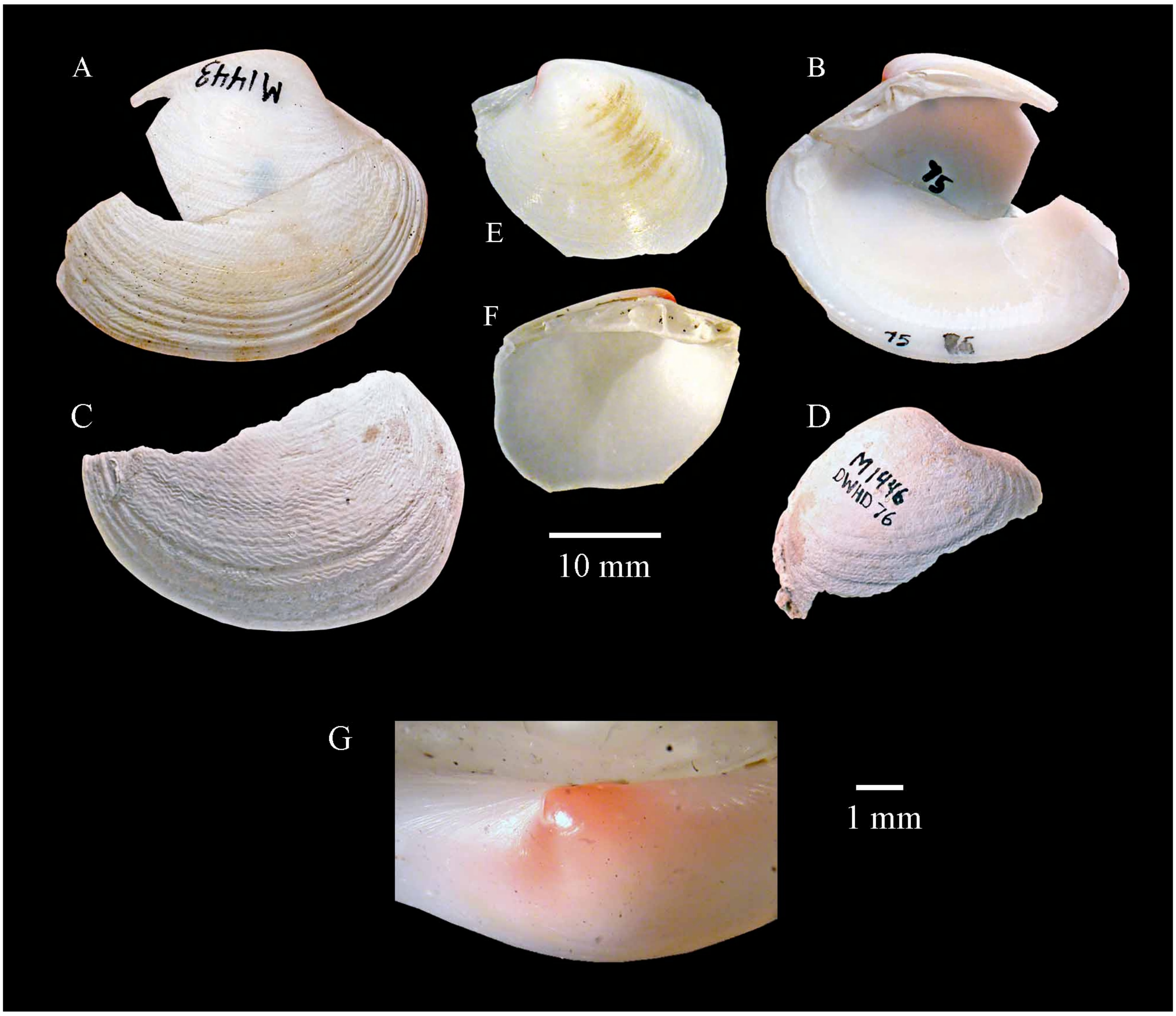

FIGURE 45. A–G, *Hyphantosoma crassum* sp. nov.: **A**, Holotype, Exterior RV, 39.5 mm in length (SIO); **B**, Interior of same valve; **C**, Exterior LV, ca. 38.2 mm in length (SIO); **D**, Exterior RV, 22.9 mm in length (SIO); **E**, Exterior LV, ca. 22.8 mm in length; **F**, Interior of same valve; **G**, Close-up of the umbo, LV.

Comparative diagnosis. Of the nine described *Hyphantosoma* species, this new *EI* species shares characteristics with *H. festoui* (Harte, 1993), and *H. healyi* (Lamprell & Stanisic, 1996), known from French Polynesia and Melanesia. These two species are closely related to each other and are easily distinguished from *H. crassum* by the more fragile structure with rather delicate hinges. The chevron sculpture is not as pronounced and typically visible only with a lens. The umbones are more prominent in both, and neither is known to reach sizes approaching that of *H. crassum*. The pallial sinus in *H. festoui* is deeper and the upper leg closer to the dorsal line.

Hyphantosoma intricatum (Dautzenberg, 1907), described from Queensland is closer in size to the new species and is widely distributed within the Indo-Pacific. However, the shape of *H. intricatum* is very distinct, being more elongate, longer posteriorly, with a stronger descending anterior slope. The umbones are more prominent, more rounded and wider, protruding above the dorsal line. Reddish umbones are not present in any of the *H. intricatum* studied, but occur in all well preserved *H. crassum*. The chevron-sculpture in *H. intricatum* is more regular and finer. Both species, however, share similar hinge configuration and similar pallial sinus position.

The other known Indo-Pacific *Hyphantosoma* species are very distinct by their smaller size and/or weaker structure, usually with a visible chevron-sculpture only on the anterior (Huber 2010: 402).

Remarks. There are no *Hyphantosoma* species known from the Hawaiian Islands. At present, with a size reaching at least 45 mm, *H. crassum* represents one of the largest bivalves ever found at *EI*, surpassed only by a worn *Chama* specimen. All specimens identified as "*Pitar* sp." or even as "*Pitar* cf. *pellucida*" by previous authors have proven to represent the genus *Hyphantosoma*. True species of *Pitar* Römer, 1857, appear absent from *EI*.

Distribution. *Hyphantosoma crassum* is occasionally found at several locations off Easter Island, sublittoral from ca. 50–150 m—**E1**.

Etymology. The name *crassum* reflects the solid structure and the stronger hinge compared to its, also newly described Easter Island congener *H. tenue*.

Hyphantosoma tenue sp. nov.

Figures 46 E–J

Pitar cf. *pellucida*—Luke, 1995: p. 106 (Lot M1446 in part)
Pitar sp.—Trego, 1997: p. 199 (Lot M1452 in part)

Type Material. Holotype: LACM 3183, 1 RV, 25.6 mm x 20.5 mm, (Figs. 46 E–F). Paratype 1: SIO M1446, 1 LV, 35.9 mm, from *EI*, La Perouse Bay, 40–100 m, 1957/58 Downwind Expedition (DWHD-76), (Figs. 46 G–H). Paratype 2: LACM 3184, 1 RV posterior part missing 5 mm, from *EI*, near Tahai, 50–80 m. Paratypes 3–4: LACM 3185, 1 LV 5 mm, and 1 RV 2.5 mm, from *EI*, Mataveri Bay, 50 m.

Type Locality. Dredged at 50 m in Mataveri Bay, *EI*, 27° 08' 44" S, 109° 26' 46" W.

Description. A medium-sized, ovate-elongate *Hyphantosoma* species, rather fragile and compressed. A large species for *EI*, reaching at least 35.9 mm, equivalve, subquadrate; rather fragile and thin shelled, as usual in this genus; white with irregular brown marks and deep red umbones; lunule not incised; umbones low, only slightly extending the dorsal line, prosogyrate, situated in the anterior third of the valve. Prodissoconch round, smooth, clearly defined, turned obliquely under the umbo and not readily visible in adults, P1 ca. 127 µm length by 93 µm height, P2 ca. 275 µm length by 227 µm height. Adult valves rather compressed. Sculpture of characteristic chevron marks, rather weakly impressed; periostracum whitish, dehiscent, as typically found in this group, still anteriorly and posteriorly preserved on holotype. Hinge line rather thin, broad, rather short, in LV with two dorsally connected and a separate elongate posterior cardinal, the central cardinal strongest and a marked, pointed anterior lateral tubercle; RV with dorsally connected anterior and posterior cardinal, central, unconnected cardinal strongest, two anterior lateral ridges for the reception of the strong lateral tubercle of the LV. Pallial sinus extending to about 40% of length, trigonal, broadly rounded, ventral leg ascending, dorsal leg weakly descending. External ligament brownish, narrowly extended and inset in a dorsal ridge. Margins smooth.

TABLE 15. Selected measurements from the type material.

***H. tenue* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	25.6	20.5	not visible	not visible
Paratype 1	35.9	–	not visible	not visible
Paratype 2	4.5	4	130 x 95	300 x 225
Paratype 3	ca. 5.6	–	125 x 90	250 x 230

Comparative diagnosis. Of the ten described venerid *Hyphantosoma* species, this new *EI* species shares characteristics notably with *H. festoui* and *H. healyi*. The new species is best compared to *H. festoui* described from Tahiti. Its holotype [*Pitar* (*Hyphantosoma*) *festoui* Harte, 1993, UCMP 398606] (Figs. 46 A–D), and a slightly larger specimen from Okinawa were studied for comparison. Both *H. festoui* and *H. tenue* share a comparable pallial sinus, a fragile structure, a rather narrow hinge, red umbones and a white background color with irregular brownish marks. However, they differ in shape, *H. festoui* is more ovate-rounded, comparatively higher, with stronger rounded, prominent umbones, which significantly protrude above the dorsal line. As with many *Hyphantosoma* species, *H. festoui* is a very inflated species, whereas *H. tenue* is rather compressed, thus the respective difference in depth measurements 0.64 vs. 0.54. The anterior lateral tubercle in the LV is more pronounced in *H. tenue* than in *H. festoui*. *Hyphantosoma festoui* has a clearly incised lunule, whereas none could be detected in the holotype of *H. tenue*. *Hyphantosoma tenue* reaches nearly 36 mm in height, a size which is unknown for *H. festoui* with a current maximum of 25 mm, or for the closely related *H. healyi* which only reaches 17.1 mm.

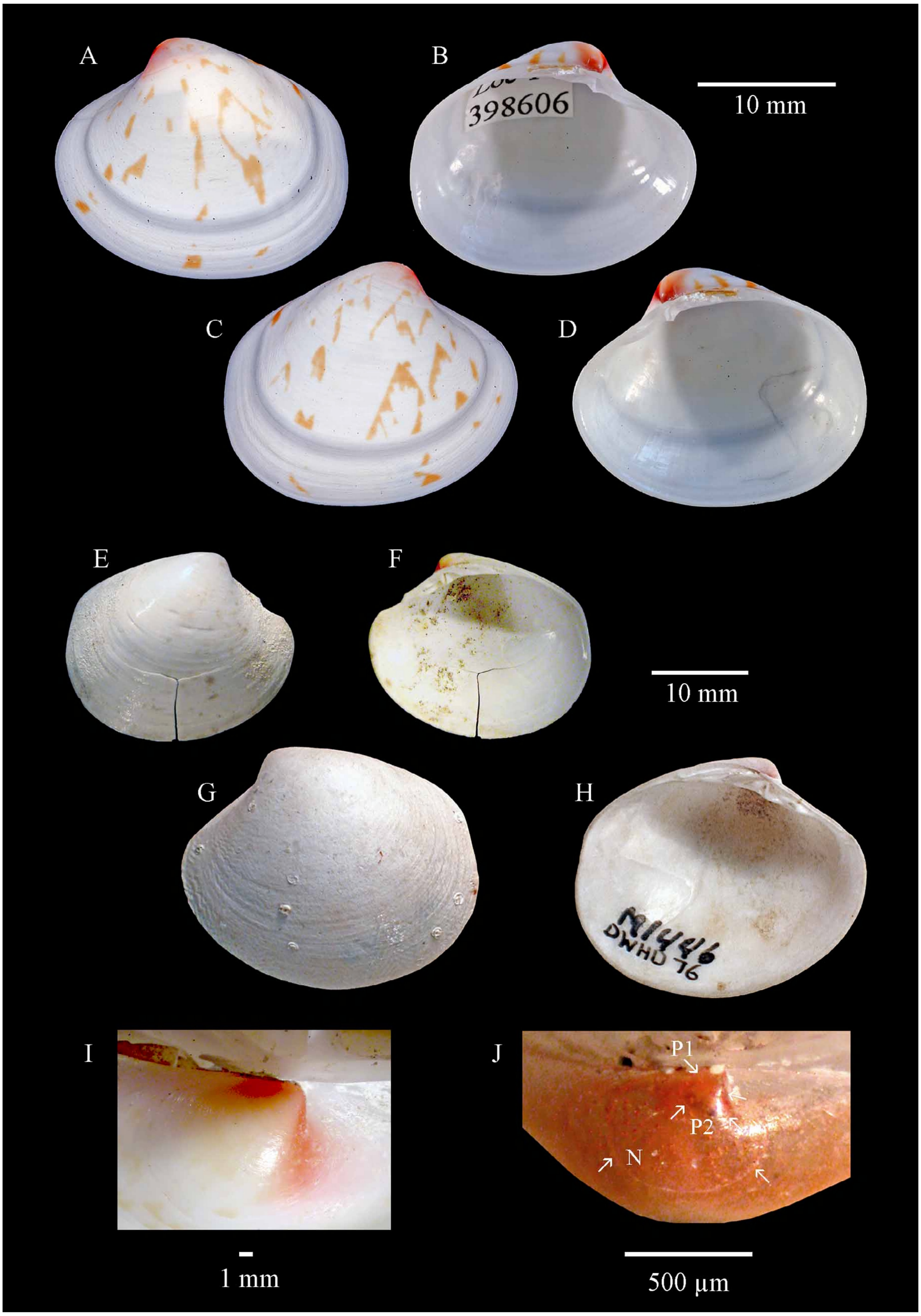

FIGURE 46. A–D, *Hyphantosoma festoui* (Harte, 1993), (Holoytype, UCMP 398606); **A**, Exterior LV, 22 mm in length; **B**, Interior of same valve; **C**, Exterior RV, of same specimen; **D**, Interior of same valve; **E–J**, *Hyphantosoma tenue* sp. nov.; **E**, Holotype, Exterior RV, 25.6 mm in length; **F**, Interior of same valve; **G**, Exterior LV, 35.9 mm in length (SIO); **H**, Interior of same valve; **I**, Close-up of the umbo, RV; **J**, Close-up of the prodissoconch, RV, arrows indicating boundaries.

The newly described *H. crassum*, also from *EI* has thicker and more solid valves, is more inflated, and grows even larger. Furthermore, it has a weakly incised lunule, and a shorter pallial sinus. Both species, however, share similar colors, a white background with brown markings and reddish umbones. The other known Indo-Pacific *Hyphantosoma* species are very distinct from *H. tenue* by having a stronger inflation, shape, and/or colors (Huber 2010: 402).

Distribution. *Hyphantosoma tenue* is occasionally found at several locations off Easter Island, sublittoral from ca. 40–100 m—**E1**.

Etymology. The new name reflects the rather fragile structure and the narrower hinge compared to its, also newly described Easter Island congener *H. crassum.*

Superfamily CUSPIDARIOIDEA Dall, 1886

Family CUSPIDARIIDAE Dall, 1886

Subfamily CUSPIDARIINAE Dall, 1886

Genus *Austroneaera* Powell, 1937

[Type species: *Austroneaera brevirostris* Powell, 1937 (OD)]

Austroneaera eastera sp. nov.

Figures 47 A–H

Type Material. Holotype: LACM 3186, 1 live taken specimen, 2.9 mm. Paratypes 1–4: LACM 3187, 1 live taken specimen, 3.1 mm, 3 single valves. Paratypes 5–7: Coll. BR, 3 single valves, 2.8–4.2 mm. Paratypes 8–10: Coll. MHU, 3 single valves, 2.3–4.7 mm. All specimens from the type locality.

Type Locality. Dredged at 50–200 m in fine sandy and mud, off the western coastline near Tahai, Easter Island, 27°07'20" S, 109°26'30" W, live taken at 200 m.

Description. A small, translucent white *Austroneaera* species, with a weak rostrum. Shell small (less than 5 mm in length), thin, fragile, ovate-triangular, inflated, with a somewhat truncate, weakly developed posterior rostrum. Umbones raised slightly above dorsal line and centrally located. Prodissoconch, P1 ovate, smooth, well defined with pronounced ridge, ca. 167 µm length by 140 µm height, P2 not present. Anterior margin of adult valves rounded, posterior margin more or less straight. Exterior surface sculpture variable, ranging from smooth with weak commarginal growth striae to pronounced undulations; ridge separating the rostrum. Interior smooth. Hinge with two wide posterior and anterior lateral teeth in the RV, and an edentulous LV. Color translucent white.

TABLE 16. Selected measurements from the type material.

***A. eastera* sp. nov.**	Length (mm)	Height (mm)	P1 (L x H) (µm)	P2 (L x H) (µm)
Holotype	2.9	2	175 x 150	–
Paratype 5	2.8	2	165 x 135	–
Paratype 7	4.2	2.6	160 x 135	–

Comparative diagnosis. The hinge configuration closely resembles that of the type species *A. brevirostris* Powell, 1937. Specifically, none of the nine global species of *Austroneaera* matches the *EI* material.

Remarks. Nothing similar is known from the Hawaiian Islands, but this genus is represented with many species in New Zealand and the Kermadec Islands. From the known habitats of its congeners, *A. eastera* may be expected to range much deeper than only 200 m.

Distribution. At present *Austroneaera eastera* is only known from Easter Island—**E1**.

Etymology. The name reflects the type locality.

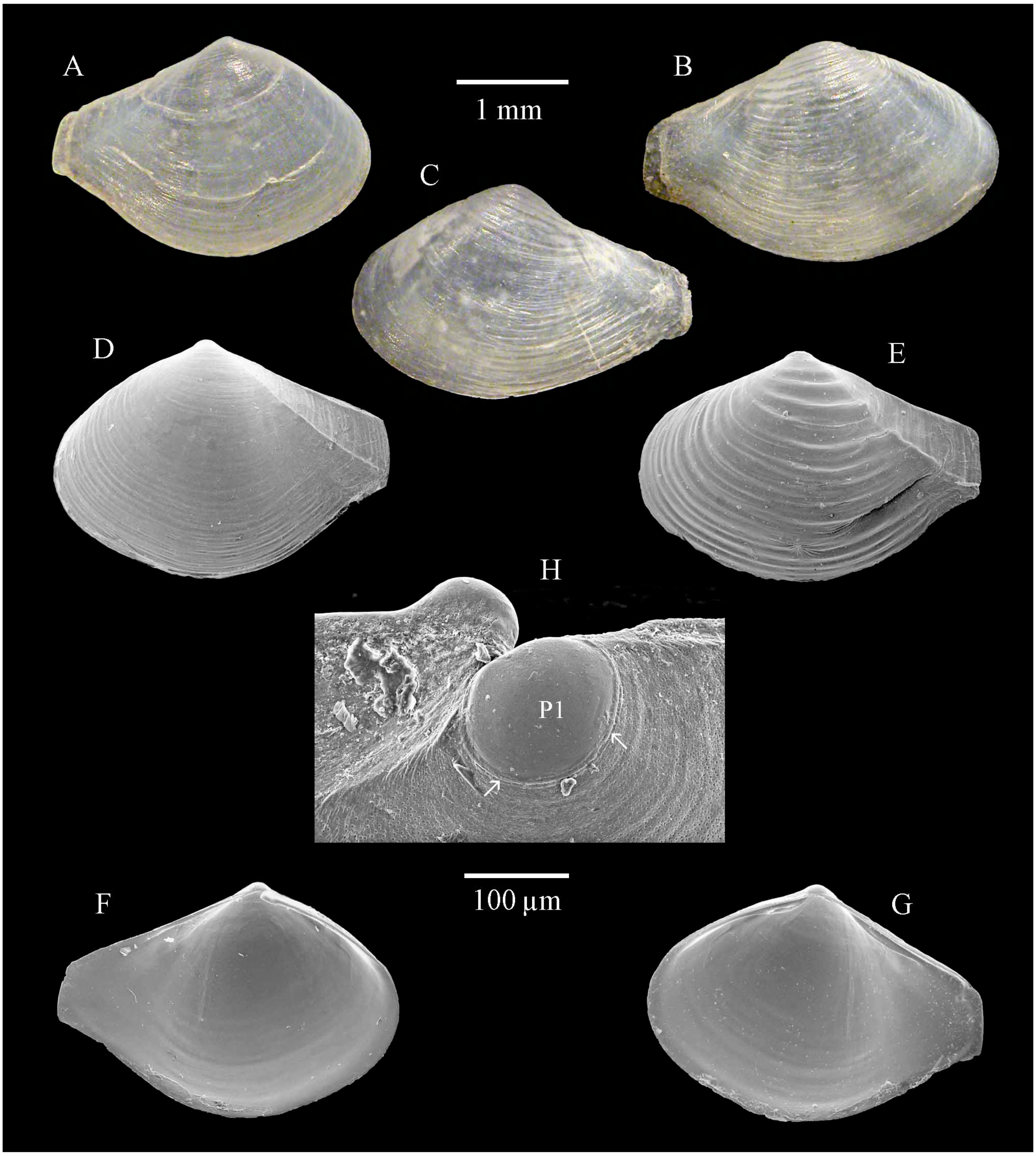

FIGURE 47. A–H, *Austroneaera eastera* sp. nov.; A, Exterior RV, 2.8 mm in length; B, Exterior RV, 3.2 mm in length; C, Exterior LV, 3.1 mm in length; D, Exterior LV, 2.9 mm in length, SEM; E, Exterior LV, 3 mm in length, SEM; F, Interior LV, 3 mm in length, SEM; G, Interior RV, 2.95 mm in length, SEM; H, Close-up of the prodissoconch, LV, SEM, arrows indicating boundaries.

Genus *Myonera* Dall & E.A. Smith *in* Dall, 1886
[Type species: *Myonera paucistriata* Dall, 1886 (OD)]

Myonera sp.
Figures 48 A–D

Material examined. A single RV, 7.5 mm (BK).

Description. Shell small (7.5 mm in length), thin, fragile, somewhat inflated, ovate, with pronounced posterior rostrum. Both anterior and posterior margins curved. Umbones elevated above the hinge line. Exterior surface with rather widely spaced commarginally lamellate sculpture, ridge separating the rostrum. Interior smooth. Hinge simple and edentate. Color translucent white.

Remarks. The shape, thin structure, commarginally lamellate sculpture, a ridge separating the rostrum, together with an edentate hinge approaches the damaged USNM syntypes of *Myonera pailoloana* (Dall, Bartsch & Rehder 1938). The latter is known from two valves from 915 m off the Pailolo Channel, Hawaii. The better preserved syntype is illustrated in Severns (2011: 486, pl. 223, fig. 1). [Note: Dall *et al.* (1938)'s type material, differs in shape, size and sculpture from the specimen illustrated in Kay (1979: pl. 191, fig. H)].

Although the *EI* species measures about half the size of the largest *M. pailoloana* syntype, the lamellar ridges appear to be fewer in number, wider spaced and fading ventrally. The shape seems to be more elongate and the rostrum comparatively longer as well. The Hawaiian material was dredged dead from 915 m, whereas the *EI* material was found much shallower from approximately 50–80 m.

Myonera tasmanica (Knudsen, 1970), from New Zealand was also considered. However, here too, the rostrum is shorter, the shape higher and the sculpture denser. Furthermore, *M. tasmanica* was described from an abyssal depth of 4,390 m. The *EI* species cannot be confused with any of the other known Indo-Pacific and Hawaiian *Myonera*, notably, *M. bicarinata* E.A. Smith, 1896, *M. dautzenbergi* Prashad, 1932, *M. dispar* (Dall, Bartsch & Rehder, 1938), *M. lischkei* (E.A. Smith, 1891), and *M. rostra* Poutiers & R.F. Bernard, 1995, due to the stronger sculpture and/or shorter rostration.

In all likelihood this is an undescribed *Myonera* species, endemic to the waters of *EI*. However, due to the limited amount of *EI* material and the unknown variability of *M. pailoloana* a formal description is premature. This species is illustrated and treated as endemic, awaiting further finds.

Habitat. Dredged at 50–80 m in sandy mud, off the western coastline near Tahai, Easter Island, 27°07’20” S, 109°26’30” W.

Distribution. At present this *Myonera* sp. is only known from Easter Island—**E1**.

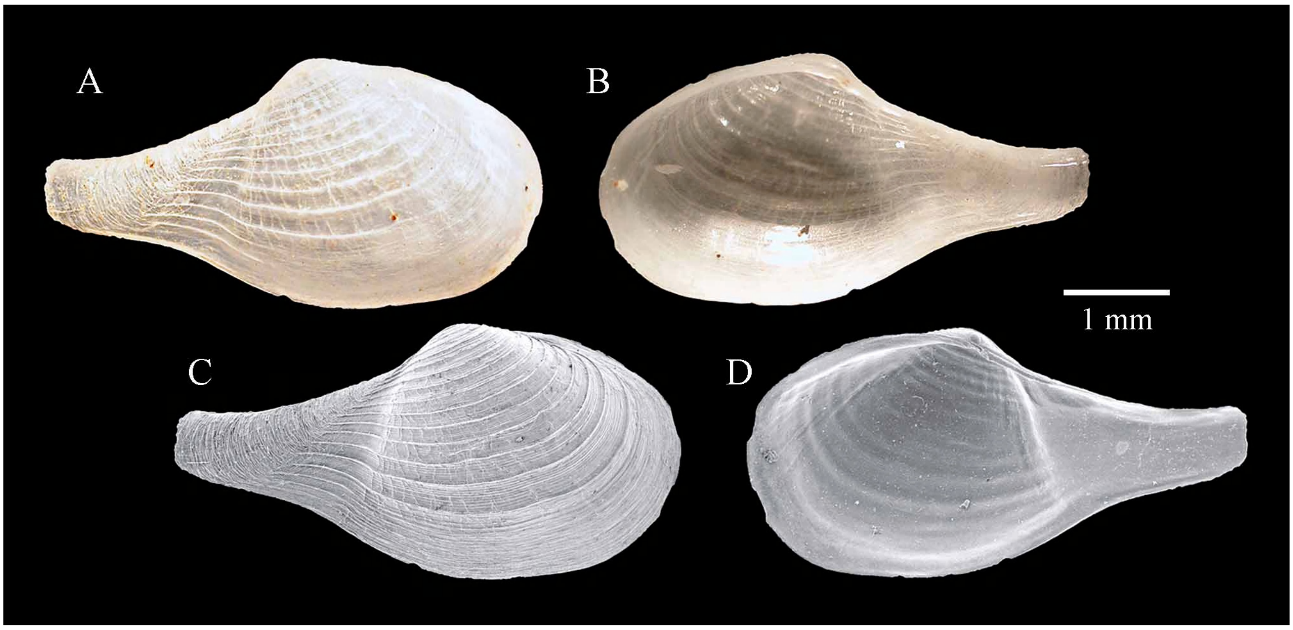

FIGURE 48. A–D, *Myonera* sp., **A**, Exterior RV, 7.5 mm in length; **B**, Interior of same valve; **C**, Exterior same valve, SEM; **D**, Interior of same valve, SEM.

Family LYONSIELLIDAE Dall, 1895

Genus *Lyonsiella* G.O. Sars, 1872

[Type species: *Pecchiolia abyssicola* G.O. Sars, 1872 (MT)]

Lyonsiella pacifica Dall, 1908
Figures 49 A–D

Lyonsiella pacifica **Dall, 1908: p. 428.**
Lyonsiella pacifica Dall, 1908—Knudsen, 1970: pl. 15, figs. 3–4.

Type Material. Holotype: USNM 110583.

Type Locality. Dredged off Salas y Gómez Island, 26°30'S, 105°45'W, by the U.S.S. Albatross in 1904, at Station 4693, in gravel at 2089 m.

Original description. "Shell small, plump, white, subquadrate, microscopically radiately closely granulately striate, covered more or less densely with adherent sand grains and foraminifera; beaks large for the size of the shell, high, prosogyrate with a small cordate impressed area in front of them; anterior end very short, small, posterior longer, wider, rounded; base arcuate, prominent in the middle; no external ligament; surface closely covered with radial rows of extremely minute granules. Lon. 3; alt. 2.7; diam. 1.8 mm." (Dall 1908: 428.)

Remarks. The species was described from a single specimen, with the holotype (Figs. 49 A–D) being first illustrated in Knudsen (1970). As far as is known, this species has not been recorded since (e.g. Poutiers & R.F. Bernard 1995). There is nothing similar known from the Hawaiian Islands or New Zealand. *Lyonsiella pacifica* is treated as an endemic species.

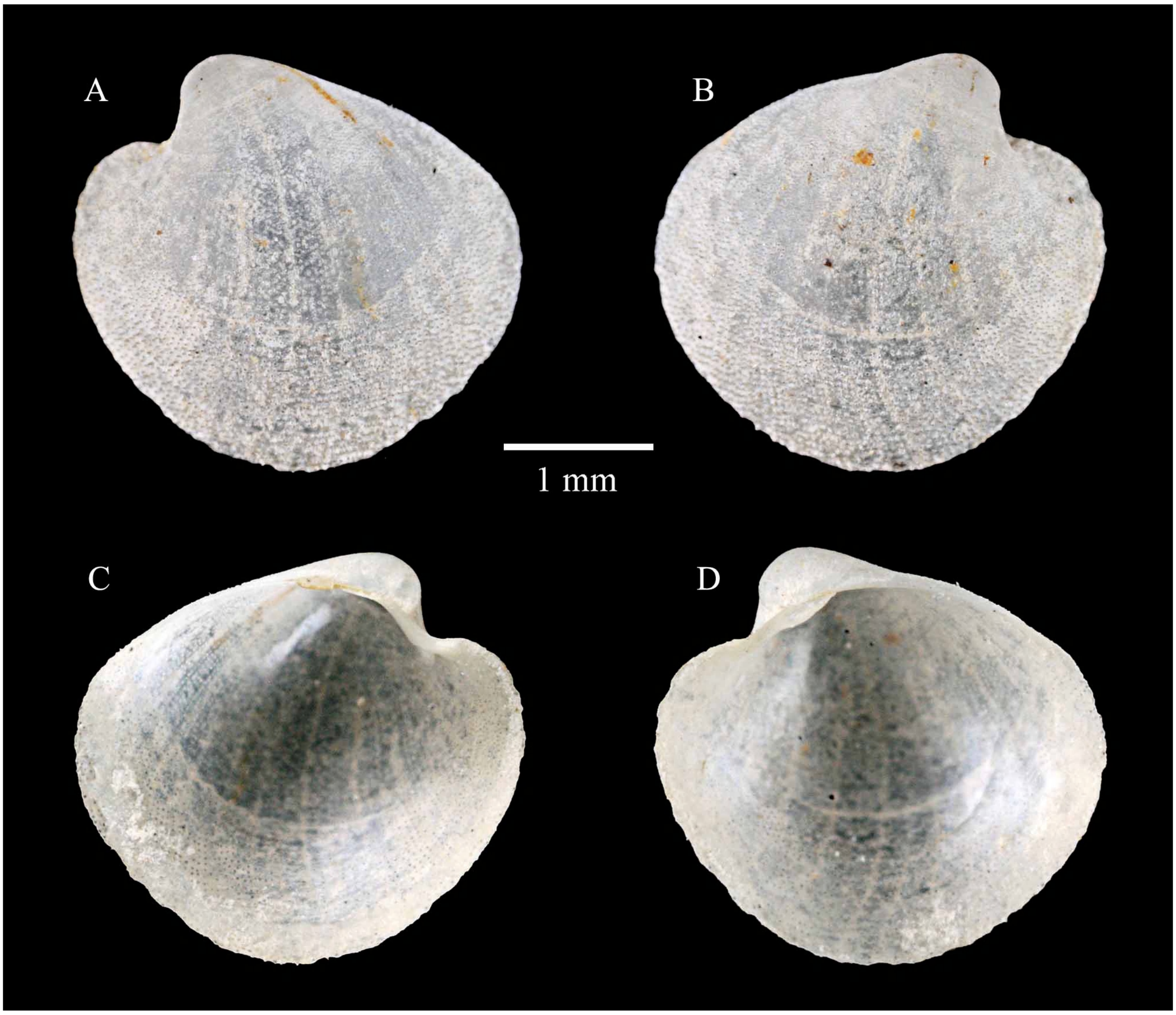

FIGURE 49. A–D, *Lyonsiella pacifica* Dall, 1908, (Holoytype, USNM 110583): **A**, Exterior LV, 3 mm in height; **B**, Exterior RV of same specimen; C, Interior LV; D, Interior RV.

Distribution. At present *Lyonsiella pacifica* is only known from the type locality, off Salas y Gómez Island—**E1**.

Conclusions

The identification of 71 bivalve species from Easter and Salas y Gómez Islands, of which, nearly one fourth have proven to be new, is considerably higher compared to earlier reports. This result is largely due to extensive trawls and dredging by the senior author during the last 12 years, which covered nearly all the waters around Easter Island. These dredgings revealed a multitude of minute species not recognized by previous researchers or not found in recognizable condition. Some of the larger species were known to earlier workers, but remained unnamed or were erroneously identified. Given the majority of the material was dead collected a notional vertical distribution of all the species is summarized in Table 17. Future workers will need to substantiate further several of the *EI* and *SyG* species, where there was too limited material available for this study. It is expected that deep water trawls may well reveal 8–10 additional protobranchs and anomalodesmatans, resulting in a bivalve fauna at or even above 80 species for the Rapanuian subprovince. Finally, the range of many minute heterodonts, here newly described, may be revealed to have a much wider distribution once the bivalve fauna of the tropical Pacific Island is better known.

TABLE 17. Vertical distribution of *EI* and *SyG* bivalves (depth in meters).

	0–49	50–99	100–149	150–179	180–220	2000+
Nucula hawaiensis	X	X	X			
***Nuculana* (s.l.) *anakena* sp. nov.**	X	X				
Tindaria salaria						X
Septifer cumingii	X	X				
Modiolus matris	X	X				
Amygdalum peasei	X					
Leiosolenus* aff. *laevigatus	X	X				
Acar plicata		X	X			
Calloarca* (*Coraliarca*) *nuttingi	X	X				
Calloarca* (*Barbarca*) *tenella	X	X				
Arcopsis sculptilis	X	X	X	X		
Tucetona kauaia		X				
Cratis kanekoi	X					
Malleus regulus	X	X				
Isognomon incisum	X					
Isognomon* (*Parviperna*) *nucleus	X					
Parahyotissa inermis	X	X				
Neopycnodonte cochlear			X			
Dimya molokaia	X	X				
Dimya mimula	X	X				
***Monia* sp.**		X				
Parvamussium scitulum		X	X			
Mirapecten mirificus	X	X				
Cryptopecten bullatus		X				
Cryptopecten nux	X	X				
Laevichlamys squamosa	X	X				
Pascahinnites pasca	X	X	X	X		
Spondylus exiguus	X	X				

...... continued on the next page

TABLE 17 (continued)

	0–49	50–99	100–149	150–179	180–220	2000+
Spondylus orstomi	X					
Spondylus occidens	X					
Spondylus aff. *mimus*		X				
Plicatula aff. *plicata*		X				
Lima disalvoi	X					
Lima tomlini	X	X	X	X	X	
Limaria (*Promantellum*) *parallela*	X	X				
Limaria (*Limatulella*) sp.	X	X	X	X		
Divarilima aff. *sydneyensis*			X	X	X	
Ctena bella	X					
Funafutia levukana	X	X				
Lasaea hawaiensis	X	X				
Lasaea eastera sp. nov.	X					
Hyalokellia tahaia sp. nov.	X					
Borniola pasca sp. nov.	X	X				
Tellimya pauciradiata sp. nov.	X	X				
Tellimya tahaia sp. nov.	X					
Thecodonta rainesi sp. nov.	X					
Basterotia lutea	X					
Hiatella arctica	X	X				
Chama asperella	X	X	X			
Chama croceata	X	X				
Chama limbula	X	X	X			
Acrosterigma triangulare sp. nov.	X	X				
Vasticardium sp.		X				
Frigidocardium thaanumi				X		
Cadella mauia	X					
Herouvalia rapanui sp. nov.	X	X				
Moerella laperousea sp. nov.		X	X	X	X	
Pristipagia radians	X	X	X			
Abranda lamprelli sp. nov.		X	X	X	X	
Semelangulus nebulosus	X					
Semele australis	X					
Ervilia bisculpta	X	X	X			
Lonoa aff. *hawaiensis*	X	X				
Solecurtus baldwini					X	
Kelliella rotunda	X	X	X			
Timoclea keegani sp. nov.	X	X				
Hyphantosoma crassum sp. nov.		X	X			
Hyphantosoma tenue sp. nov.		X				
Austroneaera eastera sp. nov.		X	X	X	X	
Myonera sp.		X				
Lyonsiella pacifica						X

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