Recent brachiopods from the Austral Islands, French Polynesia, South-Central Pacific

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ABSTRACT
Four Recent brachiopod species, including one new, *Acrobrochus marotiriensis* n. sp., *Dallithyris pacifica* Bitner, 2006, *Megerlia truncata* (Linnaeus, 1767) and *Thecidellina maxilla* (Hedley, 1899), have been recognised in the material collected during the French BENTHAUS Expedition to the Austral Islands (French Polynesia) in 2002. The Austral Islands are situated on the south-eastern limit of the Indo-West Pacific biogeographic Province. This is the first record of brachiopods from off the Australs. *Dallithyris pacifica*, *M. truncata* and *T. maxilla* have been already reported from the southern Pacific, while the genus *Acrobrochus* is noted for the first time from the Pacific. *Acrobrochus marotiriensis* n. sp. belongs to the short-looped brachiopods. Its loop is characterized by a very broad, gently folded transverse band. The triangular outer hinge plates are margined by a small elevation of the crural bases. This species differs from congeneric species in its smaller size, its less elongate outline and its greater convexity.

KEY WORDS
Brachiopoda, biodiversity, biogeography, BENTHAUS, Austral Islands, South Pacific, new species.

RÉSUMÉ
Brachiopodes actuels des îles Australes, Polynésie française, Pacifique sud-central.
Quatre espèces de brachiopodes actuels, dont une nouvelle, *Acrobrochus marotiriensis* n. sp., *Dallithyris pacifica* Bitner, 2006, *Megerlia truncata* (Linnaeus, 1767) et *Thecidellina maxilla* (Hedley, 1899), ont été identifiées dans le matériel récolté pendant l'expédition française BENTHAUS aux îles Australes (Polynésie française) en 2002. Les îles Australes sont situées en limite sud-est de la province biogéographique Indo-Ouest Pacifique. Des brachiopodes y sont signalés pour la première fois dans la région des Australes. *Dallithyris pacifica*, *M. truncata* et *T. maxilla* avaient déjà été trouvées dans le Pacifique Sud, mais le genre *Acrobrochus* est signalé pour la première fois du Pacifique. *Acrobrochus marotiriensis* n. sp. appartient aux brachiopodes ayant une boucle courte. Sa boucle se caractérise par une bande transverse très large, légèrement pliée. Les plaques cardinales sont triangulaires et bordées par une élévation des bases crurales. Cette espèce se distingue des autres espèces du genre par sa taille plus petite, sa forme générale moins allongée et sa convexité plus grande.

MOTS CLÉS
Brachiopoda, biodiversité, biogéographie, BENTHAUS, îles Australes, Pacifique Sud, espèce nouvelle.

INTRODUCTION

Although intensively studied in the Western Pacific, brachiopods are poorly known from the French Polynesia region. The presence of *Frenulina sanguinolenta* (Gmelin, 1791) from Tahiti was noted by Thomson (1927) and Richardson (1973a, b). *Thecidellina maxilla* (Hedley, 1899) was reported from the Tuamotu and Gambier archipelagos (Pajaud 1970; Lee & Robinson 2003). The only taxonomic description of brachiopods from French Polynesia is that from the Marquesas Islands where two species, *Eucalathis* cf. *murrayi* (Davidson, 1878) and *Frenulina sanguinolenta*, were noted (Bitner 2006a).

The present paper deals with the brachiopods which were collected by Warén dredge (DW) during the French cruise BENTHAUS around the Austral Islands, French Polynesia. The BENTHAUS Expedition was organized as a part of the research program on marine biodiversity in the South Pacific, by the Institut de la Recherche pour le Développement, Nouméa, and by the Muséum national d'Histoire naturelle, Paris, on RV *Alis*, and took place from October 28 to November 28, 2002. The Austral Islands are a volcanic island group composed of seven islands and several islets, situated south of the Society Islands in the South Pacific on both sides of the Tropic of Capricorn, and forming part of French Polynesia. This archipelago is situated at the south-eastern extremity of the tropical Indo-West Pacific biogeographic Province.

The brachiopods described in this paper have been found in 18 out of 161 stations which were sampled in the upper bathyal zone and in circalittoral depths (50-1000 m). This is the first record of brachiopods from the Austral Islands. The diversity of brachiopods is low and they are represented by only four species: *Acrobrochus marotiriensis* n. sp., *Dallithyris pacifica* Bitner, 2006, *Megerlia truncata* (Linnaeus, 1767), and *Thecidellina maxilla* (Hedley, 1899). Most of the material is represented by empty shells.

The investigated material is deposited in the Muséum national d'Histoire naturelle in Paris (MNHN BRA-3043-3055). The exact location, depth and species identified at each station are given in the Appendix.

SYSTEMATICS

The brachiopod classification used in this paper follows that used in the revised edition of the *Treatise on Invertebrate Paleontology* (part H) *Brachiopoda* (Kaesler 1997, 2000a, b, 2002, 2006).

Order TEREBRATULIDA Waagen, 1883
Superfamily TEREBRATULOIDEA Gray, 1840
Family TEREBRATULIDAE Gray, 1840
Subfamily TEREBRATULINAE Gray, 1840

Genus *Acrobrochus* Cooper, 1983

TYPE SPECIES. — *Liothyrella? vema* Cooper, 1973 by original designation (Cooper 1983: 248).

Acrobrochus marotiriensis n. sp.
(Figs 1A-H; 2A, B; Table 1)

HOLOTYPE. — BENTHAUS, stn DW 1886, specimen on Figure 1C-E (MNHN BRA-3043).

PARATYPES. — BENTHAUS, stns DW 1884, DW 1886 (MNHN BRA-3044-3046).

TYPE LOCALITY. — Austral Islands, Marotiri, BENTHAUS, stn DW 1886, 27°51.27'S, 143°32.39'W, 620-1000 m.

ETYMOLOGY. — Geographic name, from the Marotiri Island where the holotype was collected.

MATERIAL EXAMINED. — **Austral Islands.** Marotiri, BENTHAUS, stn DW 1884, 8 complete specimens, 41 ventral valves, 32 dorsal valves. — Stn DW 1885, 5 complete specimens, 1 ventral valve, 1 dorsal valve. — Stn DW 1886, 1 complete specimen, 2 ventral valves, 2 dorsal valves. — Stn DW 1887, 1 dorsal valve. — Neilson Reef, stn DW 1923, 4 ventral valves, 3 dorsal valves. All complete specimens are empty shells.

DEPTH RANGE. — 360-1000 m.

MEASUREMENTS. — See Table 1.

DIAGNOSIS. — *Acrobrochus* of medium size, strongly biconvex, loop with subparallel descending branches and very broad, gently folded transverse band.

DESCRIPTION

The shell is of medium size (max. length 20.7 mm), strongly biconvex, smooth with numerous weakly

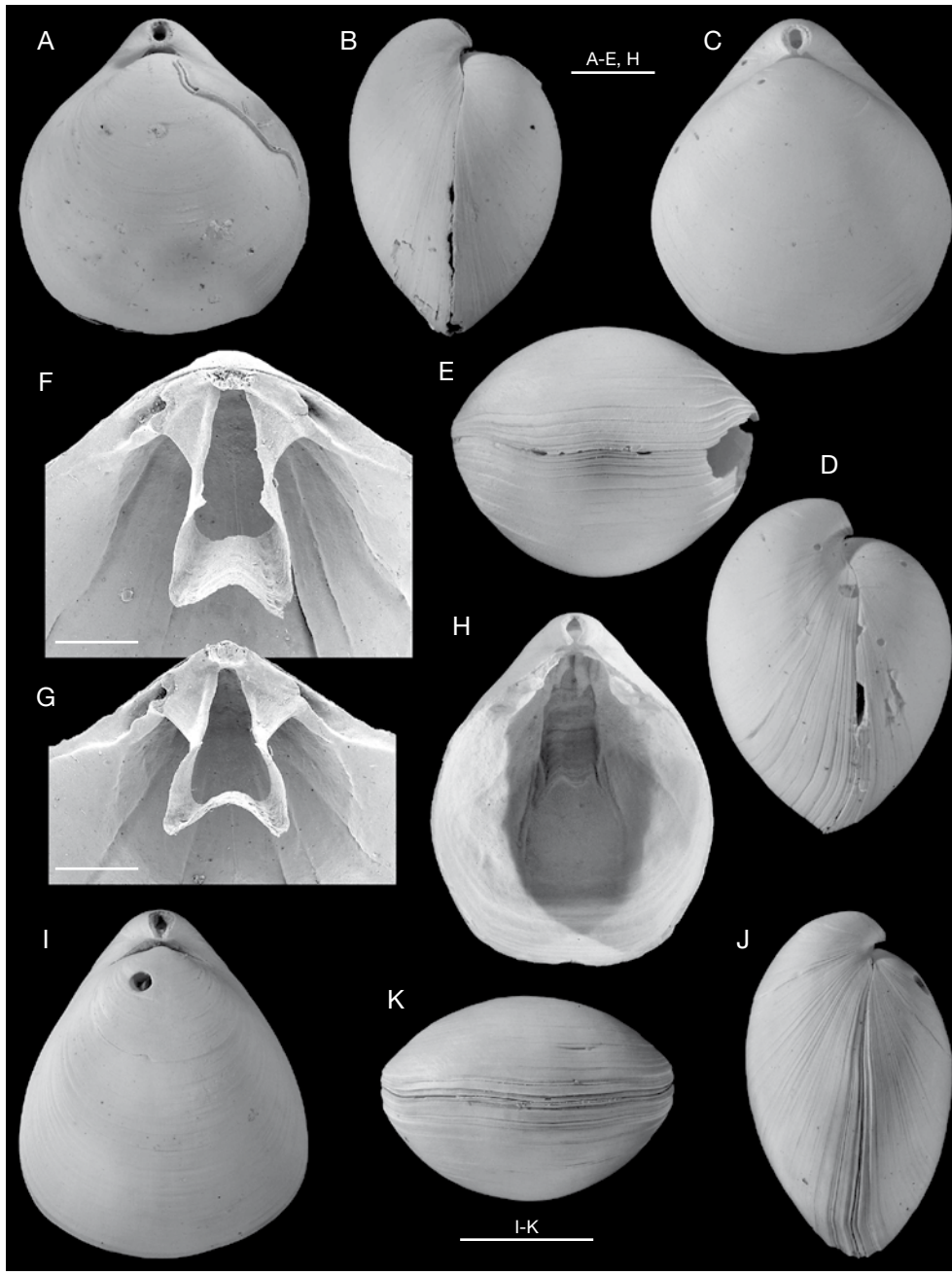

FIG. 1. — **A**-**H**, *Acrobrochus marotiriensis* n. sp., Marotiri Island; **A**, **B**, dorsal and lateral views of complete specimen, paratype (MNHN BRA-3044), stn DW 1884, 570-620 m; **C**-**E**, dorsal, lateral and anterior views of complete specimen, holotype (MNHN BRA-3043), stn DW 1886, 620-1000 m; **F**, **G**, paratype (MNHN BRA-3045), stn DW 1884, 570-620 m, SEM enlargement of the loop of brachial skeleton of the dorsal valve (**F**) and enlargement of brachial skeleton tilted (**G**) to show gently folded transverse band; **H**, inner view of ventral valve, paratype (MNHN BRA-3046), stn DW 1886, 620-1000 m; **I**-**K**, *Dallithyris pacifica* Bitner, 2006, dorsal, lateral and anterior views of complete specimen (MNHN BRA-3048), Marotiri Island, stn DW 1885, 700-800 m, note gastropod boring on I. Scale bars: A-E, H, 0.5 cm; F, G, 2 mm; I-K, 1 cm.

TABLE 1. — Measurements (in mm) of *Acrobrochus marotiriensis* n. sp. Abbreviations: **L**, length; **W**, width; **T**, thickness.

Station number	L	W	T
DW 1884	20.7	16.9	–
DW 1884	19.0	16.3	13.7
DW 1884 (paratype)	18.8	17.2	12.8
DW 1884	12.7	11.5	8.0
DW 1884	9.3	8.3	5.2
DW 1885	16.1	13.9	11.0
DW 1886 (holotype)	19.6	17.5	14.4

defined growth lines. The outline is variable, from elongate oval to subpentagonal, dorsal valve often subcircular. The shell is relatively thick with a greatly thickened muscle region. The beak is erect to slightly curved, no beak ridges are observed. The pedicle opening is of medium size, permesothyrid, labiate. The symphytium is small, partly visible to nearly concealed. The lateral commissures are straight to slightly ventrally curved, while the anterior commissure is rectimarginate to slightly uniplicate in adult.

The ventral valve interior has small, short teeth not supported by dental plates. The pedicle collar is short, excavated, forming a tube. The dorsal valve interior has short inner socket ridges. The cardinal process is prominent, semicircular. The outer hinge plates are triangular, relatively narrow, slightly concave and margined by a small elevation of the crural bases. The crural processes are blunt and short. The loop is short, about one-third of valve length, and narrow. The descending branches are wide, subparallel; the transverse band is very broad and gently folded. The muscle scars are deeply impressed.

Ultrastructural analysis was carried out on the transverse section made perpendicular to the plane of symmetry in the centro-anterior part of the pedicle valve. The shell is composed of three layers (Fig. 2A, B). The primary layer is 16-38 µm thick and built of microgranular calcitic crystallites. The secondary layer is thicker than the primary one (28-55 µm) and made up of sheaves of fibres which are anvil-like in transverse section. The tertiary layer, much thicker than the two previous (727-790 µm), is composed of large calcitic prisms perpendicular to the shell surface. The total thickness of the shell is 817-890 µm at the observed section.

REMARKS

The loop character and cardinalia of the investigated specimens are consistent with those of the genus *Acrobrochus* (Cooper 1973, 1983). *Acrobrochus* differs from *Liothyrella* Thomson, 1916 in loop characters; *Liothyrella* has a widely triangular loop with relatively narrow transverse band (Cooper 1983). *Gryphus* Megerle von Mühlfeldt, 1811 lacks elevated crural bases, characterized for *Acrobrochus*. The crural bases in *Gryphus* flush with the inner margin of the outer hinge plates giving the appearance of a wide, flat plate. Also its loop is wider with slightly diverging descending branches (Cooper 1983). *Acrobrochus* differs also from two other short-looped genera, *Dolichozygus* Cooper, 1983 and *Dysedrosia* Cooper, 1983, in having shorter crural processes without sharp points (Cooper 1983).

Three species of *Acrobrochus* have been hitherto described from Recent seas (Cooper 1973, 1982, 1983; Foster 1974, 1989). All of them occur in the bathyal zone at high latitudes in the South Atlantic and Antarctica. The newly described species differs from the type species, *A. vema* in being much smaller, more convex and in having a smaller foramen and straight lateral commissure (Cooper 1973, 1982, 1983). *Acrobrochus blochmanni* (Jackson, 1912) from off Antarctica differs from the studied material in being larger, more elongate and less convex (Foster 1974, 1989; Cooper 1983). *Acrobrochus hendleri* (Cooper, 1982) from the southern Atlantic is nearly twice as large as *A. marotiriensis* n. sp., more elongate in outline and less convex.

The shell of terebratulide brachiopods is usually built of primary and secondary layers but some of them possess also a tertiary layer which modifies from the secondary layer. The presence of the tertiary layer in *Acrobrochus* is not surprising as this layer is found in closely related genera such as *Liothyrella*, *Gryphus* and *Dallithyris* Muir-Wood, 1959 (MacKinnon & Williams 1974; present paper). MacKinnon & Williams (1974) examined 33 fossil and two living genera of short-looped

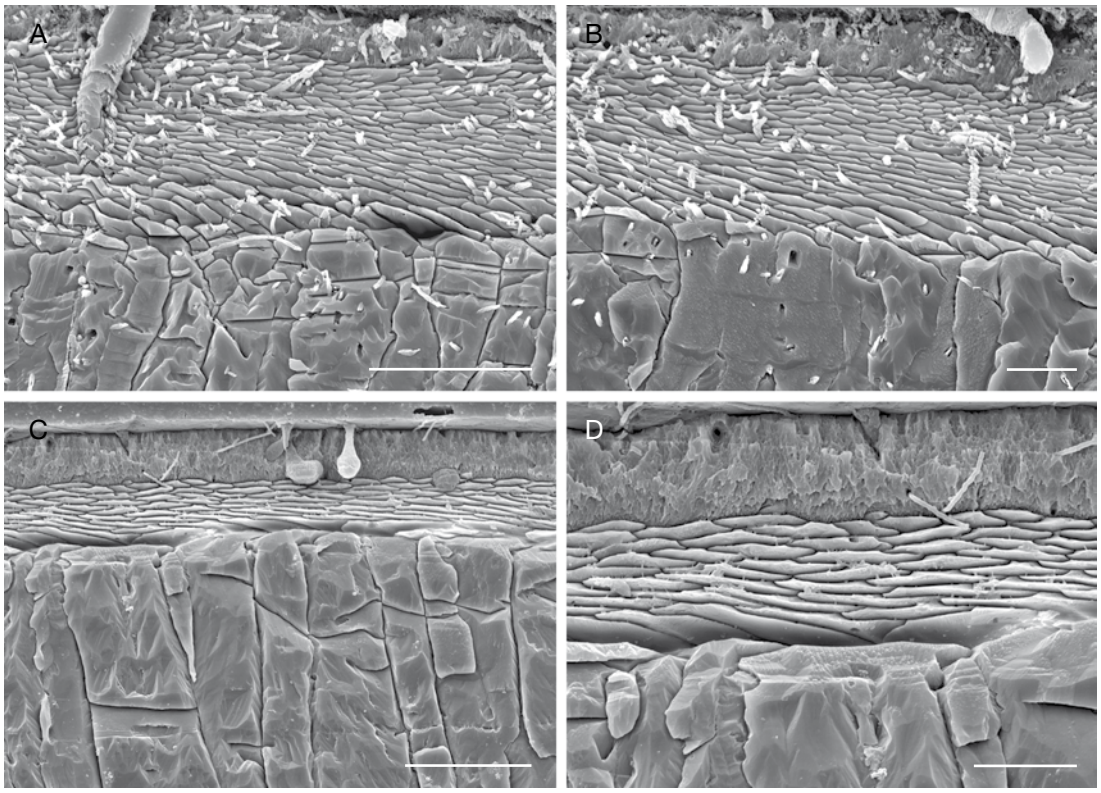

FIG. 2. — **A**, **B**, *Acrobrochus marotiriensis* n. sp. (MNHN BRA-3047), SEM micrographs, Marotiri Island, stn DW 1884, 570-620 m, transverse sections of the entire shell showing thin primary layer (top), secondary layer built of anvil-shaped fibres and prismatic tertiary layer; **C**, **D**, *Dallithyris pacifica* Bitner, 2006 (MNHN BRA-3049), SEM micrographs, Marotiri Island, stn DW 1885, 700-800 m; **C**, transverse section of the entire shell showing the acicular primary layer (top) underlain by the fibrous secondary layer, passing into the prismatic tertiary layer; **D**, section of the shell showing anvil-shaped fibres of the secondary layer. Scale bars: A, B, 50 µm; C, D, 20 µm.

brachiopods. The tertiary layer was identified in the majority of the examined genera, only six of them lack this layer.

With its smooth shell and short loop *Acrobrochus marotiriensis* n. sp. somewhat resembles *Dallithyris pacifica*, a species also present in the collection. It can be distinguished from the latter species by its smaller size, greater convexity and thicker shell. Also the outer hinge plates in *D. pacifica* are wider, and the transverse band of the loop is angularly arched. *Acrobrochus marotiriensis* n. sp. is the most common species in the studied collection.

The genus *Acrobrochus* is also reported from the Tertiary of Australia and New Zealand (Cooper 1983; MacKinnon *et al*. 1993).

Subfamily DALLITHYRIDINAE Katz & Popov, 1974

Genus *Dallithyris* Muir-Wood, 1959

TYPE SPECIES. — *Dallithyris murrayi* Muir-Wood, 1959 by original designation (Muir-Wood 1959: 305).

Dallithyris pacifica Bitner, 2006 (Figs 1I-K; 2C, D; Table 2)

Dallithyris pacifica Bitner, 2006b: 20-22, fig. 2A-J.

MATERIAL EXAMINED. — **Austral Islands.** Marotiri, BENTHAUS, stn DW 1884, 2 ventral valves. — Stn DW 1885, 4 complete specimens, 6 ventral valves, 2 dorsal

TABLE 2. — Measurements (in mm) of *Dallithyris pacifica* Bitner, 2006. Abbreviations: **L**, length; **W**, width; **T**, thickness.

Station number	L	W	T
DW 1885 (Fig. 1I-K)	26.0	21.4	15.4
DW 1885	25.4	22.5	–
DW 1885	25.2	21.2	15.4
DW 1885	21.7	18.5	12.7
DW 1923	25.5	23.2	16.6

valves. — Neilson Reef, stn DW 1923, 1 complete specimen, 1 ventral valve. All complete specimens are empty shells.

DEPTH RANGE. — 360-840 m.

MEASUREMENTS. — See Table 2.

REMARKS

Dallithyris pacifica was originally described from off the Fiji Islands. The studied specimens differ from those previously described in being slightly larger (maximum observed length is 32 mm). The shell is subtriangular in outline, thin, biconvex, smooth with fine numerous growth lines. The anterior commissure is rectimarginate. The beak is suberect, labiate with large permesothyrid foramen. The pedicle collar is short, excavated. The cardinalia have long, slender inner socket ridges and a small, transverse cardinal process. The outer hinge plates are wide, triangular. The loop is short with a very broad, angularly arched transverse band. *D. pacifica* differs from another short-looped brachiopod in the investigated material, *Acrobrochus marotiriensis* n. sp., in being larger and having a much thinner shell. Those two species also differ strongly internally in the width of outer hinge plates and the nature of the transverse band.

The shell ultrastructure of *Dallithyris* has been investigated for the first time. The analysis shows the shell consisted of three layers (Fig. 2C, D). The primary layer is thin (18-24 µm) and built of acicular crystallites. The secondary layer is 23-45 µm thick and made up of anvil-shaped fibres. The tertiary layer is much thicker (550-577 µm) than the two first and composed of prismatic calcite. The thickness of the shell is 620-643 µm at the observed section. Thus, *Dallithyris* belongs to the group of short-looped brachiopods with triple-layered shell.

In the revised edition of the *Treatise* only two species have been assigned to the genus *Dallithyris* (Logan in press). The type species, *D. murrayi* Muir-Wood, 1959, from the central Indian Ocean is much bigger than *D. pacifica* and has a uniplicate anterior commissure. *Dallithyris fulva* (Blochmann, 1906) from southern Australia and Tasmania differs from *D. pacifica* in its outline and larger foramen (Cooper 1983). This species occurs in shallower waters than *D. pacifica*.

Superfamily KRAUSSINOIDEA Dall, 1870
Family KRAUSSINIDAE Dall, 1870

Genus *Megerlia* King, 1850

TYPE SPECIES. — *Anomia truncata* Linnaeus, 1767, by original designation (King 1850: 145).

Megerlia truncata (Linnaeus, 1767)
(Fig. 3I, J)

Anomia truncata Linnaeus, 1767: 1152, no. 229.

Megerlia truncata – Logan 1979: 68-72, text-fig. 21, pl. 9, figs 1-23. — Bitner 1990: 145-147, text-fig. 10, pl. 2, figs 6-9; pl. 7, figs 3-6; pl. 8, figs 1-7.

Megerlia gigantea – Cooper 1981a: 27, 28, pl. 6, figs 1-26. — d'Hondt 1987: 38, 39.

Megerlia echinata – Laurin 1997: 452, 453, figs 38, 39.

MATERIAL EXAMINED. — **Austral Islands.** Rurutu, BENTHAUS, stn DW 2009, 1 complete specimen, including soft parts.

DEPTH RANGE. — 320-450 m.

MEASUREMENTS. — Length 4.5 mm, width 5.7 mm, thickness 1.9 mm.

REMARKS

Although the material consists of only one complete specimen, *Megerlia truncata* is an easily distinguishable species. The studied specimen has a small shell, wider than long, weakly biconvex; ventral valve convex, dorsal valve is posteriorly convex and anteriorly irregularly concave. The surface of the

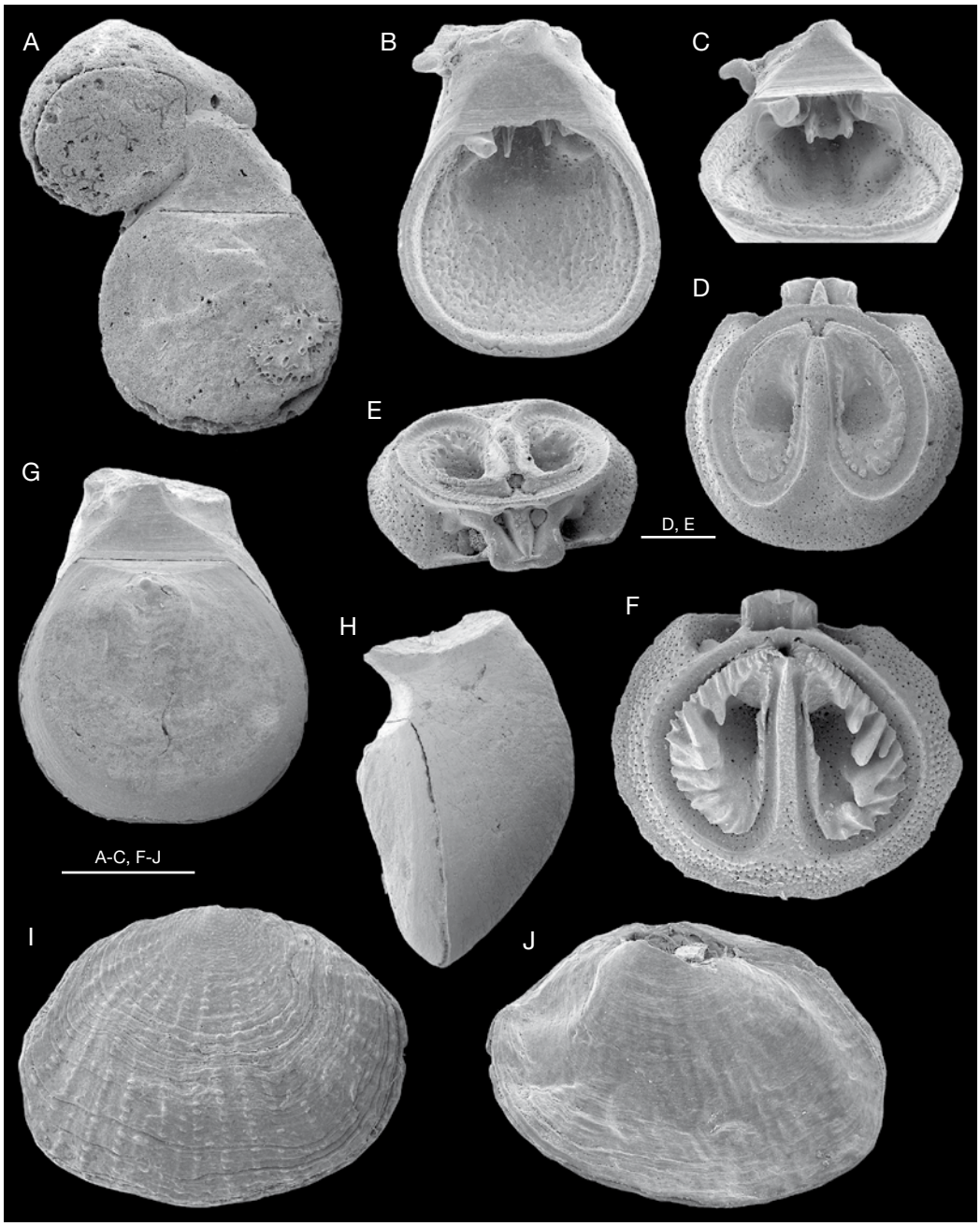

FIG. 3. — **A**-**H**, *Thecidellina maxilla* (Hedley, 1899); **A**, dorsal view of complete specimens attached to each other (MNHN BRA-3051), Ruturu Island, stn DW 2001, 200-550 m; **B**, **C**, inner view of ventral valve (**B**) and tilted (**C**) to show hemispondylium (MNHN BRA-3052), Ruturu Island, stn DW 2003, 250-330 m; **D**, **E**, inner view of dorsal valve (**D**) and posterior view (**E**) to show trilobed cardinal process (MNHN BRA-3053), Ruturu Island, stn DW 1998, 250-302 m; **F**, inner view of dorsal valve (MNHN BRA-3054), Arago Bank, stn DW 1978, 120-180 m; **G**, **H**, dorsal and lateral views of complete specimen (MNHN BRA-3055), Ruturu Island, stn DW 2001, 200-550 m; **I**, **J**, *Megerlia truncata* (Linnaeus, 1767), ventral and dorsal views of complete specimen (MNHN BRA-3050), Ruturu Island, stn DW 2009, 320-450 m. All SEM. Scale bars: A-C, F-J, 2 mm; D, E, 1 mm.

TABLE 3. — Measurements (in mm) of *Thecidellina maxilla* (Hedley, 1899). Abbreviations: **L**, length; **W**, width; **T**, thickness.

Station number	L	W	T
DW 1968	3.6	3.1	2.3
DW 1978	6.2	5.2	–
DW 2001	5.8	4.1	3.1
DW 2002	7.0	4.8	3.5
DW 2002	6.3	5.1	3.7
DW 2003	5.5	4.6	3.4
DW 2003	5.5	4.9	–

dorsal valve is very irregular, reflecting the irregularity of the substrate. Except a small fragment, it gives no indication of radial ornamentation (Fig. 3J), while the ventral valve bears numerous fine ribs. The foramen is large, and present on the dorsal valve as well.

Re-examination of the material kept in the Muséum national d'Histoire naturelle, Paris, and described as *Megerlia gigantea* (Deshayes, 1863) by Cooper (1981a) and d'Hondt (1987) shows that those specimens certainly belong to *M. truncata*, as pointed by Davidson (1880). Deshayes (1863) created his species based on a single specimen, and attributed it to the genus *Morrisia* (junior synonym of *Platidia*). His specific name *gigantea* followed from the fact that he believed it to be the largest species of *Platidia*.

The specimen from the Indian Ocean described by Zezina (1987) as *Megerlina gigantea* is characterized by the absence of crura, and may belong to *Megerlia acrura* Hiller, 1986 originally described from off South Africa. The latter species is very similar to *M. truncata*, differing in the lack of crura (Hiller 1986).

Order THECIDEIDA Pajaud, 1970
Superfamily THECIDEOIDEA Gray, 1840
Family THECIDELLINIDAE Elliott, 1953
Subfamily THECIDELLININAE Elliott, 1953

Genus *Thecidellina* Thomson, 1915

TYPE SPECIES. — *Thecidium barretti* Davidson, 1864 by original designation (Thomson 1915: 462).

Thecidellina maxilla (Hedley, 1899)
(Fig. 3A-H; Table 3)

Thecidea maxilla Hedley, 1899: 508-510, fig. 57.

Thecidellina maxilla – Dall 1920: 283. — Thomson 1927: 140. — Cooper 1954: 317, pl. 81, figs 1-10. — Zezina 1985: 208. — Laurin 1997: 453, 454, fig. 40A, B. — Lee & Robinson 2003: 350-352, figs 28-35.

Thecidellina cf. *T. maxilla* – Cooper 1964: 1118, pl. 301, figs 15, 16, 18, 19.

MATERIAL EXAMINED. — **Austral Islands.** Tubuai, BENTHAUS, stn DW 1955, 2 complete specimens. — Stn DW 1956, 3 complete specimens. — Stn DW 1958, 2 complete specimens. — Stn DW 1961, 4 complete specimens. — Arago Bank, stn DW 1968, 2 complete specimens. — Stn DW 1969, 1 complete specimen. — Stn DW 1978, 2 complete specimens. — Rurutu, stn DW 1998, 1 complete specimen. — Stn DW 2001, 4 complete specimens. — Stn DW 2002, 4 complete specimens, 1 dorsal valve. — Stn DW 2003, 1 complete specimen, 2 ventral valves. — Stn DW 2004, 2 complete specimens. Several complete specimens include soft parts.

DEPTH RANGE. — 80-990 m.

MEASUREMENTS. — See Table 3.

DESCRIPTION

The shell is small (maximum length 7.0 mm), variable in outline from nearly circular to subtriangular, with a smooth surface ornamented only by numerous growth lines. The ventral valve has a triangular, flat interarea marked only by subparallel growth lines; there is no trace of a pseudodeltidium. No ventral median septum is present. The hemispondylium has two slender prongs extending anteriorly. The dorsal valve possesses a prominent, trilobed cardinal process and long straight median septum. Interior margin strongly tuberculate.

REMARKS

Although not the most common species in the investigated material, *Thecidellina maxilla* was found in the largest number (12) of stations. This species is widely distributed in the Pacific (Cooper 1954, 1964; Zezina 1985; Laurin 1997; Lee & Robinson 2003; Bitner 2005), being known from the Miocene. The specimens of *Thecidellina* described by Cooper (1978) from the Miocene of Java and Fiji, and

from the Pleistocene of Vanuatu are very similar to *T. maxilla*, and might be conspecific with the latter species (see also Lee & Robinson 2003).

The species *Thecidellina japonica* (Hayasaka, 1938) described from off Japan (Hatai 1940) displays a great similarity to *T. maxilla*, suggesting that those two species are conspecific (see discussion in Lee & Robinson 2003: 355).

ECOLOGICAL REMARKS

Around the Austral Islands the brachiopods were collected in the neritic and upper bathyal zones from depths of 80-1000 m. Except for the specimen of *Megerlia truncata* and some of *Thecidellina maxilla*, all material is represented by empty shells, thus it is difficult to estimate the real depth range of the Austral brachiopods. However, the depth ranges of all the species, except *Thecidellina maxilla*, overlap with the ranges given in the literature for those genera and species (Logan in press). *Thecidellina maxilla* inhabits shallow water environments down to a maximum depth of about 150 m (Lee & Robinson 2003; Logan in press). This species is a cementing form occurring typically in cryptic habitats. In many stations around the Austral Islands *T. maxilla* was collected from much deeper water, down to 990 m, and was most probably redeposited from shallower water.

Many brachiopod shells bear traces of bioerosion. Most specimens are encrusted by epifaunal organisms, such as calcareous algae, forams, serpulids, bryozoans or corals. The epifaunal distributions clearly indicate that the epifauna was associated both with living and dead brachiopods.

Nine of the 16 specimens of *Dallithyris pacifica* bear traces of gastropod drilling predation, as does only one specimen of *Acrobrochus marotiriensis* n. sp. There are also other non-gastropod types of borings, not piercing the valve, probably of algal and sponge origin. There are also rounded etching scars which can be of bivalve and/or barnacle origin. One specimen shows signs of repairing of shell damage, interpreted as failed crushing predation. Those latter types of bioerosion were observed only on the *A. marotiriensis* n. sp. shells.

BIOGEOGRAPHIC REMARKS

The Austral Islands Archipelago is situated at the south-eastern extremity of the tropical Indo-West Pacific biogeographic Province. This is the first record of brachiopods from that region, with the four species, including a new form, described here.

The Austral Islands brachiopods gather together one cosmopolitan species and a southern hemisphere group. The cosmopolitan species *Megerlia truncata* is common in the Mediterranean Sea and the eastern North Atlantic (Logan 1979, 1993; Cooper 1981b; Álvarez & Emig 2005). It is also noted from the Indian Ocean (Jackson 1921; Cooper 1981a; d'Hondt 1987) and western Pacific (Laurin 1997). *Megerlia truncata* is one of the commonest species in the Neogene of the Paratethys and the Mediterranean region (Bitner 1990; Baumiller *et al.* 2006).

The three other species found off the Australs belong to the southern hemisphere group. *Dallithyris pacifica* is known only from the West Pacific as it was originally described from off Fiji (Bitner 2006b) and the present record is its second occurrence. However, two other species of *Dallithyris* are known from the central Indian Ocean and southern Australia, respectively (Logan in press).

This is the first reported occurrence of the genus *Acrobrochus* from the Pacific, and the first report of *Acrobrochus* from low latitudes. All three species of *Acrobrochus* hitherto described occur at high latitudes in the South Atlantic and Antarctica (Foster 1974, 1989; Cooper 1983; Logan in press). *Acrobrochus* has also been recorded from Australia and New Zealand during the Tertiary (Cooper 1983; MacKinnon *et al.* 1993).

Thecidellina maxilla is widespread in the southern Pacific Ocean (Pajaud 1970; Laurin 1997; Lee & Robinson 2003). It was also recorded from the Indian Ocean, Réunion Island (d'Hondt 1987). This species, as with most living thecidioids, occupies shallow waters in tropical and subtropical areas (Lee & Robinson 2003; Logan in press).

When compared to the brachiopod fauna from Fiji and New Caledonia (d'Hondt 1987; Laurin 1997; Bitner 2005, 2006b, c) the biodiversity of the fauna from the Australs is very low. In the Pacific,

a decrease in species diversity from the west to east can be observed in all groups of invertebrates, including articulate brachiopods (Zezina 1997, 2001; Bitner 2006a).

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APPENDIX

Station list of the BENTHAUS cruise in the Austral Islands.

Station	Location	Depth (m)	Species
Marotiri			
DW 1884	27°53.75'S, 143°32.90'W	570-620	*Acrobrochus marotiriensis* n. sp., *Dallithyris pacifica*
DW 1885	27°51.87'S, 143°32.59'W	700-800	*Acrobrochus marotiriensis* n. sp., *Dallithyris pacifica*
DW 1886	27°51.27'S, 143°32.39'W	620-1000	*Acrobrochus marotiriensis* n. sp.
DW 1887	27°51.59'S, 143°32.68'W	750-1000	*Acrobrochus marotiriensis* n. sp.
Neilson Reef			
DW 1923	27°01.29'S, 146°05.29'W	360-840	*Acrobrochus marotiriensis* n. sp., *Dallithyris pacifica*
Tubuai			
DW 1955	23°18.52'S, 149°25.71'W	750-850	*Thecidellina maxilla*
DW 1956	23°18.42'S, 149°26.96'W	600-990	*Thecidellina maxilla*
DW 1958	23°19.64'S, 149°30.30'W	80-150	*Thecidellina maxilla*
DW 1961	23°20.89'S, 149°33.51'W	470-800	*Thecidellina maxilla*
Arago Bank			
DW 1968	23°22.88'S, 150°43.52'W	100-120	*Thecidellina maxilla*
DW 1969	23°21.97'S, 150°43.25'W	200-640	*Thecidellina maxilla*
DW 1978	23°22.02'S, 150°43.41'W	120-180	*Thecidellina maxilla*
Rurutu			
DW 1998	22°24.81'S, 151°22.17'W	250-302	*Thecidellina maxilla*
DW 2001	22°26.59'S, 151°20.12'W	200-550	*Thecidellina maxilla*
DW 2002	22°26.67'S, 151°20.15'W	247-250	*Thecidellina maxilla*
DW 2003	22°27.58'S, 151°18.94'W	250-330	*Thecidellina maxilla*
DW 2004	22°27.72'S, 151°18.70'W	430-850	*Thecidellina maxilla*
DW 2009	22°31.98'S, 151°19.85'W	320-450	*Megerlia truncata*