A new species of living scallop of the genus *Mirapecten* (Bivalvia, Pectinidae) from French Polynesia

Henk H. Dijkstra

Netherlands Centre for Biodiversity (NCB Naturalis), Department of Marine Zoology,
P.O. Box 9517, 2300 RA Leiden, The Netherlands; henk.dijkstra@ncbnaturalis.nl

Mirapecten boutetorum spec. nov. is described from French Polynesia. It is compared with several congeneric species from the Indo-Pacific and *Gloripallium spiniferum* (Sowerby 1st, 1835) from French Polynesia.

Key words: Bivalvia, Pectinidae, *Mirapecten*, new species, French Polynesia.

Introduction

Recently Messrs. Michel Boutet and Jean Letourneux (Tahiti, French Polynesia) sent me images of live-taken specimens of a previously undescribed, rare, coral-dwelling pectinid from French Polynesia. In the past this species has been identified erroneously, mainly based on single valves of juvenile material, as "*Gloripallium spiniferum* (Sowerby 1st, 1835)", also a rare coral-dwelling species from the same region. The new species is described in the present paper. It is the second *Mirapecten* species known from French Polynesia. For comparison, the type material of the congeneric species *Comptopallium spiceri* Rehder, 1944, from the Line Islands is figured here, as well as the holotype of *Pecten spiniferus* G.B. Sowerby 1st, 1835, from the Tuamotu Archipelago.

Acronyms and abbreviations: BDR, P. Bouchet, B. Dayrat & B. Richer de Forges; GNS, GNS Science, Lower Hutt, New Zealand; MNHN, Muséum national d'Histoire naturelle, Paris, France; NCB Naturalis, Netherlands Centre for Biodiversity, Leiden, The Netherlands; NHMUK, Natural History Museum, London, United Kingdom; NMNH, National Museum of Natural History, Smithsonian Institution, Washington DC, United States; ZMA, Zoological Museum Amsterdam, now part of the Netherlands Centre for Biodiversity (NCB Naturalis), Leiden, The Netherlands.

For shell characters: C, convexity (thickness of both valves); H, height (dorsal-ventral); lv, left valve (upper valve); pr, paired (articulated) valves; rv, right valve (lower valve); W, width (anterior-posterior).

The type material of *M. boutetorum* is preserved in MNHN (holotype) and ZMA (paratype). Additional studied material is also kept in these institutes.

Systematic part

Family Pectinidae Rafinesque, 1815
Subfamily Pectininae Rafinesque, 1815
Tribe Decatopectinini Waller, 1986

Mirapecten Dall, Bartsch & Rehder, 1938

Mirapecten Dall, Bartsch & Rehder, 1938: 84, pl. 21 figs 7-8. Type species (by original designation): *Mirapecten thaanumi* Dall, Bartsch & Rehder, 1938 (junior synonym of *Pecten mirificus* Reeve, 1853). Recent, Indo-Pacific.

Somalipecten Waller, 1986: 41. Type species (by original designation): *Somalipecten cranmerorum* Waller, 1986; Recent, off Somalia.

Diagnosis. — Medium-sized species of Decatopectinini, with 5-7 evenly spaced primary squamous lirae to 7-11 unevenly spaced primary and secondary lirae, squamous on most specimens, noduliferous or smooth on others; inequivalve, valves flattened, subcircular to circular, right valve slightly more convex than left one, inequilateral to equilateral, auricles unequal in size; microsculpture of closely spaced commarginal lamellae; internal rib carinae present. Hinge with prominent dorsal teeth and weak resilial teeth, intermediate teeth lacking; byssal notch moderately deep, byssal fasciole rather narrow, ctenolium well-developed.

Distribution. — Miocene to Recent (Hayami, 1989: 16). Tropical Indo-West Pacific; living littorally to sublittorally amongst coral or coral rubble on soft sediments.

Discussion. — Hertlein (1969: N366) treated *Mirapecten* as a subgenus of *Semipallium* [Jousseaume] Lamy, 1928, and placed it in the suprageneric group of *Decatopecten*. Waller (1986: 40), followed by Vaught (1989: 119), considered *Mirapecten* to be a full genus in the tribe Decatopectinini. *Mirapecten* can be distinguished from *Gloripallium* by the following morphological characters, in having generally dissimilar developed primary and secondary radial sculpture (*Gloripallium* similar developed primary radial sculpture), in lacking macrosculpture on the anterior auricles (*Gloripallium* with prominent noduliferous macrosculpture), in having weak internal rib carinae commencing in late growth stage (*Gloripallium* with strongly developed internal rib carinae commencing in early growth stage). For comparison with *Somalipecten* Waller, 1986, see Dijkstra & Kilburn (2001: 283).

Mirapecten boutetorum spec. nov. (Figs 1-12)

Gloripallium spiniferum (Sowerby); Dijkstra, 1989: 15, fig., [31], colour photograph;

Rombouts, 1991: pl. 15 fig. 6; Raines & Poppe, 2006: 125 (figured rv), pl. 74 fig. [5] (lv). Not *Pecten spiniferus* G.B. Sowerby 1st, 1835.

Material examined. — French Polynesia: **Society Islands**, Tahiti, NNW-coast, Arue, ocean-side of barrier reef, 17°30'S 149°31'W, 60 m, alive, dive, 2008, 2 pr (holotype, MNHN 23879, paratype ZMA Moll. 4.11.013); Maupiti, 16°25'S 152°17'W, 437-536 m, dead, dredged, N.O. "Alis", leg. P. Bouchet et al., 12.x.2009 (TARASOC, stn DW 3408), 1 lv (MNHN); Moorea, 17°28'S 149°48'W, 485-560 m, dead, dredged, leg. P. Bouchet et al., 19.x.2009 (TARASOC, stn DW 3459), 1 lv (MNHN); Tahiti, 17°47'S 149°21'W, 400-440 m, dead, dredged, leg. P. Bouchet et al., 23.x.2009 (TARASOC, stn DW 3487), fragment rv (MNHN); Tahiti, 17°34'S 149°18'W, 350 m, dead, dredged, leg. P. Bouchet et al., 25.x.2009 (TARASOC, stn DW 3503), fragment rv (MNHN).
Austral Islands, Rurutu, Avera, 22°29'S 151°21.8'W, 212-450 m, dead, dredged, N.O. "Alis", leg. IRD-MNHN, 23.xi.2002 (BENTHAUS, stn DW 1995), fagment lv (MNHN).
Marquesas Islands, Ua Pou, 9°19'S 140°06'W, 200 m, dead, dredged, N.O. "Alis", leg. BDR, 22.viii.1997 (MUSORSTOM 9, stn DW 1146), 1 rv (MNHN); Nuku Hiva, 8°45.6'S 140°03.9'W, 90-120 m, dead, dredged, N.O. "Alis", leg. P. Bouchet, B. Dayrat & B. Richer de Forges, 26.viii.1997 (MUSORSTO(M 9, stn DR 1182), 2 rv (MNHN); Hiva Oa, 9°52.7'S 139°02.2'W, 60-61 m, dead, dredged, N.O. "Alis", leg. BDR, 28.viii.1997 (MUSORSTOM 9, stn DW 1203), 1 rv (MNHN); Hiva Oa, 9°48.9'S 139°09.5'W, 117 m, dead, dredged, N.O. "Alis", leg. BDR, 28.viii.1997 (MUSORSTOM 9, stn DW 1208), 2 rv (MNHN); Hiva Oa, 9°50.2'S 139°02.5'W, 85 m, dead, dredged, N.O. "Alis", leg. BDR, 29.viii.1997 (MUSORSTOM 9, stn DW 1209), 1 lv (MNHN); Hiva Oa, 9°44.2'S 138°52.5'W, 84-85 m, dead, dredged, N.O. "Alis", leg. BDR, 30.viii.1997 (MUSORSTOM 9, stn CP 1227), 2 lv (MNHN); Hiva Oa, 9°44.6'S 138°51.5'W, 107-108 m, dead, dredged, N.O. "Alis", leg. BDR, 30.viii.1997 (MUSORSTOM 9, stn CP 1228), 1 lv (MNHN); Hiva Oa, 9°42'S 139°04'W, 95-305 m, dead, dredged, N.O. "Alis", leg. BDR, 31.viii.1997 (MUSORSTOM 9, stn CP 1237), 1 lv (MNHN); Fatu Hiva, 10°28'S 138°42.1'W, 1015-1020 m, dead, dredged, N.O. "Alis", leg. BDR, 01.ix.1997 (MUSORSTOM 9, stn DR 1244), 1 lv (MNHN); Eiao Island, 7°54.6'S 140°40.1'W, 100-120 m, dead, dredged, N.O. "Alis", leg. BDR, 05.ix.1997 (MUSORSTOM 9, stn DW 1274), 7 lv, 5 rv (MNHN), 1 lv (ZMA); Motu One, 7°48'S 140°21'W, 450-455 m, dead, dredged, N.O. "Alis", leg. BDR, 07.ix.1997 (MUSORSTOM 9, stn DW 1281), 10 lv, 5 rv (MNHN), 1 rv (ZMA); Eiao, 7°54'S 140°40'W, 163-245 m, dead, dredged,

N.O. "Alis", leg. BDR, 07.ix.1997 (MUSORSTOM 9, stn DW 1287), 1 lv, 3 rv (MNHN); Ua Huka, 8°54.1'S 139°37.8'W, 95-100 m, dead, dredged, N.O. "Alis", leg. BDR, 08.viii.1997 (MUSORSTOM 9, stn DR 1292), 1 juvenile lv (MNHN); Nuku hiva, 8°49'S 140°17'W, 405-418 m, dead, dredged, N.O. "Alis", leg. BDR, 09.ix.1997 (MUSORSTOM 9, stn DR 1299), 1 lv (MNHN).

Tuamotu Archipelago, Tuamotu, ocean-side of reef, 18°23'S 140°43'W, 14-16 m, dead, leg. M. Marescot, 1985, 1 lv, 1 rv (ZMA); Niau, 16°10'S 146°23'W, 490-560 m, dead, dredged, leg. P. Bouchet et al., 03.x.2009 (TARASOC, stn DW 3363), 2 lv, 1 rv (MNHN); Kaukura, 15°41'S 146°54'W, 390-420 m, dead, dredged, leg. P. Bouchet et al., 05.x.2009 (TARASOC, stn DW 3385), 2 lv (MNHN).

Description. — Shell up to c. 35 mm high, weakly inflated, valves almost equally convex, strongly inequivalve, nearly equilateral, circular (immature specimens) to slightly elongate (mature shells), auricles unequal in shape and size, umbonal angle c. 100°. Colour pale orange or yellowish with reddish maculations on left valve, right valve more uniform reddish or yellowish, exterior pigmentation not prominent.

Left valve sculptured with 7 regularly arranged radial plicae, which are widely spaced, bearing prominent curved scales on their crests (c. 5 per cm on central part of disc) and one small lateral lira anterior and posterior to each plica; plical interspaces smooth, bearing microscopic, close-set, weakly developed, commarginal lamellae near ventral margin. Auricles also with microscopic, closely spaced commarginal lamellae; scales strongly developed on antero- and postero-dorsal margins.

Right valve with 6 regularly arranged radial plicae of dissimilar widths, bearing prominent, closely spaced, imbricated scales on their crests (c. 12 per cm on central part of disc, almost covering radial interstices), with two radial lirae on each side of each plica, bearing more widely set scales; interstices each narrower than one plica, with similar commarginal microsculpture to that of left valve. Auricles with similar commarginal microsculpture to that of left valve, with 3-4 radial ribs on anterior auricle, bearing strongly developed scales on antero- and postero-dorsal margins.

Hinge line of left valve straight, of right valve slightly raised; byssal fasciole broad, byssal gape rather shallow; active ctenolium with 6 teeth; auricular crura well-developed; resilium triangular, elongate; weak auricular ridges near anterior and posterior margins. Inner surface plicated and glossy, with short and weak internal rib, carinate edges on interior ridges corresponding to interspaces between exterior plicae.

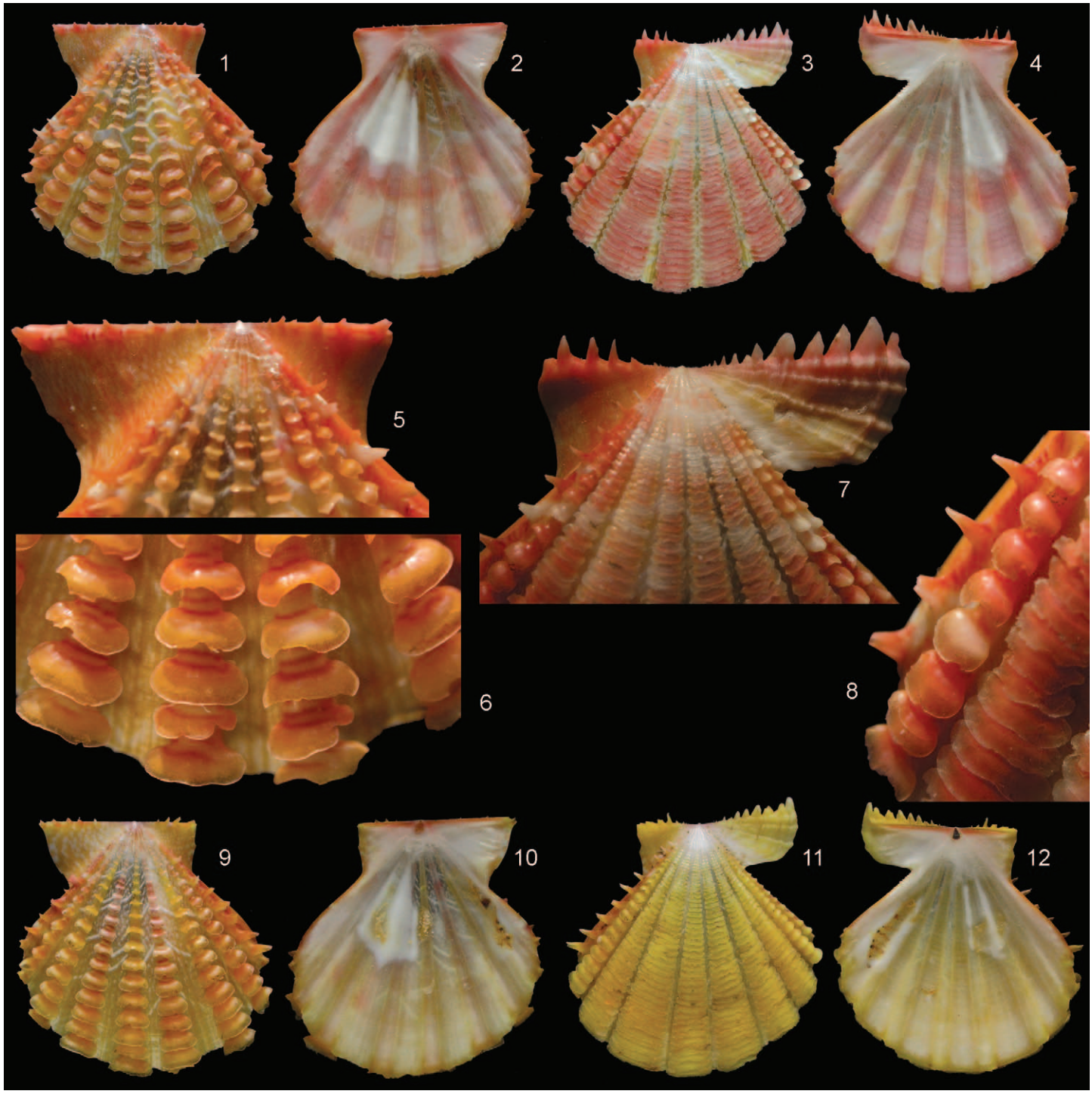
Dimensions of holotype: H 31.1 mm, W 31.2 mm, C 8.7 mm.

Distribution. — Society Islands, Austral Islands, Marquesas Islands and Tuamotu Archipelago (French Polynesia), living amongst coral in shallow water outside reefs.

Comparison. — The present species has been identified incorrectly in the past (Dijkstra, 1989: 15; Rombouts, 1991: pl. 15 fig. 6; Raines & Poppe, 2006: 125) as *Gloripallium spiniferu*m (Sowerby 1st, 1835), also known from French Polynesia. Both coral-dwelling species are rare and only very few specimens have been collected alive, probably due to the habitat. Immature specimens could easily be confused with other species, especially single immature right valves. *Mirapecten boutetorum* spec. nov. differs morphologically from *G. spiniferum* (see Waller, 1978: 4, pl. 4 figs 58-63) by having 6 radial plicae on both valves (*G. spiniferum* has 7 on the lv, 8 on the rv), by having more widely spaced scales on the plicae of the left valve (more closely set in *G. spiniferum*), by lacking macrosculpture on the auricles of the left valve and on the posterior auricle of the right valve (radial macrosculpture is present in *G. spiniferum*), and by having commarginal microsculpture on the auricles and radial interspaces, at least in the late growth stage (radial microsculpture on the plicae and interspaces in *G. spiniferum*).

(next page)

Figs 1-12. *Mirapecten boutetorum* spec. nov., French Polynesia, Society Islands, Tahiti, NNW-coast, Arue, ocean-side of barrier reef, 17°30'S, 149°31'W, 60 m, alive, dive, 2008. **1-8**, holotype (pr), MNHN 23879, height 31.1 mm, width 31.2 mm, thickness of paired valves 8.7 mm; **1**, exterior lv; **2**, interior lv; **3**, exterior rv; **4**, interior rv; **5**, close up dorsal area lv; **6**, close up dorsal area rv; **7**, close up lamellae ventral area lv; **8**, close up lamellae and spines postero-ventral area rv. **9-12**, paratype (pr), ZMA Moll. 4.11.013, height 26.0 mm, width 26.2 mm, thickness 7.3 mm; **9**, exterior lv; **10**, interior lv; **11**, exterior rv; **12**, interior rv.


1
2
3
4
5
6
7
8
9
10
11
12


13
14
15
16
17
18
19
20
21
22
23
24

	M. boutetorum	*M. spiceri*	*M. rastellum*	*G. spiniferum*
plicae lv	smaller than interspaces	much smaller than interspaces	slightly smaller than interspaces	smaller than interspaces
plicae rv	broader than interspaces	equally sized	slightly smaller than interspaces	broader than interspaces
scales lv	strong, widely set curved lamellae	almost lacking	weak widely set lamellae	strong, closely set curved lamellae
scales rv	strongly imbricated lamellae	almost lacking or weak vesicular	delicate spinous	strongly imbricated lamellae
interspaces	wide on lv, narrow on rv	wide on lv, narrower on rv	wide on lv, wide on rv	wide on lv, narrow on rv
commarginal sculpture	auricles and interspaces	throughout	throughout	auricles and interspaces
radial sculpture	only on anterior auricle	present on both valves	on anterior auricle	secondary throughout
colour	orange, reddish or yellowish	brightly maculated	variegated	whitish, or brightly maculated

Table 1. Compared morphological characters.

Mirapecten boutetorum spec. nov. differs from *M. spiceri* (Rehder, 1944), known from the Line Islands, by having broader plicae and narrower interspaces (narrower plicae and wider interspaces in *M. spiceri*), by having strongly developped scales on the plicae (almost lacking or with small, weak nodules in *M. spiceri*), and by lacking delicate radial sculpture on both valves (present in *M. spiceri*).

(previous page)

Figs 13-24. *Gloripallium* and *Mirapecten* spp. **13-16**, *Gloripallium spiniferum* (G.B. Sowerby 1st, 1835), holotype (pr), NHMUK (formerly BMNH) 1950.11.14.69, Lord Hood Island (now Marutea), Tuamotu Archipelago, height 22.9 mm, width 22.6 mm; **13**, exterior lv; **14**, interior lv; **15**, exterior rv; **16**, interior rv. **17-20**. *Mirapecten spiceri* (Rehder, 1944), Central Pacific, Line Islands, Christmas Island, 1°55'N, 157°20'W; **17-18**, holotype (rv), USNM 518010, height 39.8 mm, width 37.9 mm; **17**, exterior rv; **18**, interior rv; **19-20**, paratype (lv), USNM 518011, height 35.2 mm, width 32.2 mm; **19**, exterior lv; **20**, interior lv. **21-24**, *Mirapecten rastellum* (Lamarck, 1819), holotype (pr), MHNG 1088/24, "Les mers du nord" (incorrect type locality), height 32.5 mm, width 34.5 mm; **21**, exterior rv; **22**, exterior lv; **23**, interior rv; **24**, interior lv.

Mirapecten boutetorum spec. nov. differs from *M. rastellum* (Lamarck, 1819), a well-known Indo-West Pacific species (Raines & Poppe, 2006: 132, pl. 81 figs 1-6, pl. 82 figs 1-6), by having strongly developed and closely arranged scales on the plicae of both valves (almost lacking or weakly developed and more widely spaced on the left valve, and delicate spines on the right valve of *M. rastellum*), by having more weakly developed commarginal microsculpture (more prominent in *M. rastellum*), and by lacking secondary radial sculpture in the late growth stage near the ventral margin (present in *M. rastellum*).

Mirapecten yaroni Dijkstra & Knudsen, 1998, known from the Red Sea, is much larger (up to c. 70 mm in height) than the present species (up to c. 35 mm) and has only small scales on the radial plicae of the right valve (strongly developed, large, imbricated lamellae on the present species).

Etymology. — Named after Mr Michel Boutet and Mrs Hélène Boutet (Papara, Tahiti, French Polynesia).

Acknowledgements

I am much indebted to Dr Philippe Bouchet (MNHN) for providing important pectinid material for study. I am also

grateful to Dr Alan Beu (GNS), who kindly corrected the text and gave constructive suggestions.. Thanks are also due to Messrs. Michel Boutet and Jean Letourneux (Tahiti, French Polynesia) for supplying images and Mr Michel Boutet for donating material of the new species. For photographs I wish to thank Dr Ellen E. Strong (NMNH), Ms Kathie Way and Mr Phil Hurst (NHMUK), Mr Henk Dekker (Winkel, The Netherlands), and for mounting the plates Dr Bas Kokshoorn (NCB Naturalis). I finally thank Messrs. Philippe Maestrati (MNHN) and Robert G. Moolenbeek (ZMA) for assistance in various ways.

References

Dijkstra, H.H., 1989. Les Pectinidae de Polynésie Française (exposé préliminaire) / Pectinidae from French Polynesia (a preliminary report). — Xenophora 48: 11-19.

Dijkstra, H.H., 1994. Type specimens of Recent species of Pectinidae described by Lamarck (1819), preserved in the Muséum d'Histoire Naturelle of Geneva and the Muséum National d'Histoire Naturelle of Paris (with 30 plates). — Revue Suisse de Zoologie 101: 465-532.

Dijkstra, H.H. & Kilburn, R.N., 2001. The family Pectinidae in South Africa and Mozambique (Mollusca: Bivalvia: Pectinoidea). — African Invertebrates 42: 263-321.

Dijkstra, H.H. & Knudsen, J., 1998. Some Pectinoidea (Mollusca: Bivalvia: Propeamussiidae, Pectinidae) of the Red Sea. — Molluscan Research 19: 43-104.

Hayami, I., 1989. Outlook on the Post-Paleozoic historical biogeography of pectinids in the western Pacific region. In: Ohba, H., Hayami, I. & Mochizuki, K., eds, Current aspects of biogeography in West Pacific and East Asian regions. — The University Museum, The University of Tokyo, Nature and Culture, No. 1: 1-25 [reprinted].

Hertlein, L.G., 1969. Family Pectinidae Rafinesque, 1815. In: Moore, R.C., ed., Treatise on Invertebrate Paleontology, Part N, 1, Mollusca 6, Bivalvia: N348-N373. Lawrence.

Raines, B.K. & Poppe, G.T., 2006. A conchological iconography. The family Pectinidae: 1-402, pls 1-320. Hackenheim.

Rehder, H.A., 1944. A new pectinid shell from the Pacific Ocean, with a note on the genus *Pallium* Schroeter. — The Nautilus 58: 52-54.

Rombouts, A., 1991. Guidebook to Pecten shells. Recent Pectinidae and Propeamussiidae of the world: i-xiii, 1-157, pls 1-29. Oegstgeest.

Sowerby, G.B. 1st, 1835. Characters of and observations on new genera and species of Mollusca and Conchifera collected by Mr. Cuming. — Proceedings of the Zoological Society of London 3: 109-112.

Vaught, K.C., 1989. A classification of the living Mollusca: i-xii, 1-195. Melbourne, U.S.A.

Waller, T.R., 1978. The Pectinidae (Mollusca : Bivalvia) of Eniwetok Atoll, Marshall Islands. — The Veliger 14: 221-264.

Waller, T.R., 1986. A new genus and species of scallop (Bivalvia: Pectinidae) from off Somalia, and the definition of a new tribe Decatopectinini. — The Nautilus 100: 39-46.