A new living scallop  
(Bivalvia: Pectinidae) from the southwestern Pacific

Henk H. Dijkstra (1) and Paul C. Southgate (2)

(1) Zoological Museum, University of Amsterdam,  
P.O. Box 94766, 1090 GT Amsterdam, The Netherlands  
(E-mail: h.h.dijkstra@wxs.nl).

(2) School of Marine Biology & Aquaculture,  
James Cook University, Townsville, Queensland 4811, Australia  
(E-mail: paul.southgate@jcu.edu.au).

Abstract  
Pallio/um minutulum n. sp. is described from New Caledonia, northern Queensland (Australia), the  
Solomon Islands, Fiji and Kiribati. This is the first living Pallio/um known from the Indo-Pacific.

Key words: Mollusca: Bivalvia: Pectinidae, Pallio/um minutulum n. sp., southwestern Pacific.

Introduction  
During the Montrouzier Expedition to the Touho and Koumac areas of New Caledonia from August 23rd to 5 November 5th 1993 (Bouchet, 1994) a new small pallioline pectinid was collected alive, mainly by algae washings. Additional material from northern Queensland was collected alive amongst algae attached to submerged nets at a depth of 6 m.

The type material is housed at the Muséum national d'Histoire naturelle, Paris (MNHN). Other studied material is kept in the AMS, HD, MNHN, NMNZ, and PS.

Abbreviations  
AMS, Australian Museum, Sydney  
HD, H.H. Dijkstra collection, Sneek  
PS, P.C. Southgate collection, Townsville  
MNHN, Muséum national d'Histoire naturelle, Paris  
NMNZ, Museum of New Zealand Te Papa Tongarewa, Wellington  
db, articulated valves  
lv, left valve  
rv, right valve

Systematics  
Superfamily PECTINOIDEA Wilkes, 1810  
Family PECTINIDAE Wilkes, 1810  
Subfamily Pectininae Wilkes, 1810  
Tribe Palliolini Korbkov in Eberzin, 1960  
Genus Pallio/um Monerosato, 1884
Palliolum Monterosato, 1884: 5 [Proposed as a section of Pecten].
Type species (by subsequent designation [Crosse, 1885]): Pecten incomparabilis Monterosato, 1828; living, Mediterranean Sea.

Diagnosis: Palliolini with prominent antimarginal microsculpture, antimarginal macrosculpture nearly absent, no shagreen microsculpture or commarginal macrosculpture, foliated calcite (uniformly oriented laths) outside of pallial line, byssal notch and sinus shallow throughout ontogeny, a weak ctenolium with closely spaced teeth, small auricular crura.

Distribution: Eocene-Recent (Hertlein, 1969: N354). Boreal Atlantic (Waller, 1991: 35) and southwestern Pacific; shallow to deep water.

Discussion: So far the present species is the only living Palliolum from the Indo-Pacific region. Representative genera of Palliolini, mainly fossil, are enumerated by Beu (1995: 19) and Beu & Darragh (in prep.) from New Zealand and southern Australia.

For phylogeny and stratigraphy see Waller (1991: 35; 1993: 198), Waller & Marinovich (1992: 219), Beu (1995: 19) and Beu & Darragh (in prep.). It differs from Delectopecten by a more depressed and less circular shell (Delectopecten is more convex and circular of shape), by absence of scales on intersections on left valve (generally present in Delectopecten), by a declined hinge line of the right valve (hinge line straight in Delectopecten), and a less demarcating byssal fasciole with anterior auricle (strongly demarcating in Delectopecten), and a more colourfull shell (Delectopecten only whitish). Delectopecten is also living in deeper water (bathyal to abyssal depths), Palliolum littorally to sublittorally.

Palliolum minutulum n. sp.
(Figs 1-7)

Description: Shell small, orbicular, equiconvex, equilateral, translucent, up to ca. 9 mm high, auricles nearly equal in size, umbonal angle about 90°. Prodissococonch ca. 110 μm in height. Left valve smooth, glossy, with minuscule antimarginal scratches and commarginal lirae near anterior margins of auricle and disc. Microscopic sculpture lacking near posterior and ventral margins. Anterior and posterior auricles gradually transitionally developed into disc without demarcating disc flanks. Hinge line nearly straight, antero-dorsal margin slightly raised. Auricular crura without dorsal and intermediate teeth. Resilifer wide triangular. Right valve with similar microsculpture to that of left valve. Anterior auricle prominent, somewhat curved, with four irregularly arranged radial riblets bearing fine gemmae where they are crossed by the fine commarginal lirae. Byssal fasciole rather broad; byssal notch weakly indented; ctenolium well developed on suture, functional segment with 10 small teeth (active ctenolium). Exterior translucent cream, with white tent-shaped maculations; soft parts dark brown.
Figures:
Figures 1-7. *Palliolum minutulum* n. sp. 1-4. Holotype (MNHN), 6.8 x 6.6 mm (db). 1. Left valve, exterior. 2. Left valve, interior. 3. Right valve, exterior. 4. Right valve, interior. 5-7. Paratypes (MNHN). 5. Left valve, prodissoconch. 6. Right valve, exterior, active ctenolium. 7. Right valve, exterior, anterior auricle.
Dimensions of the holotype:
- Height 6.8 mm,
- Length 6.6 mm,
- Depth (diameter) 1.0 mm.

Type material:
Holotype (db) MNHN and 6 paratypes (db) (MNHN, 5 db; HD 6691, 1 db).

Type locality:
New Caledonia, coral reef lagoon off Koumac, between mainland and Infernet reef, 20°34.4'S, 164°13.0'E, 12-14 m, bottom of flat slabs with gorgonians and ooze, live, Montrouzier stn 1299, Oct. 1993.

Other material examined:
New Caledonia. MNHN, 3 lv, 2 rv, HD 6692 (1 lv, 1 rv), NW New Caledonia, 20°34'S, 164°16'E, 0-2 m, dead, Montrouzier stn 1277, Oct. 1993; MNHN, 2 lv, NW New Caledonia, 20°34.5'S, 164°15.5'E, 3-7 m, dead, Montrouzier stn 1297, Oct. 1993; MNHN, 1 lv, NW New Caledonia, 20°35.8'S, 164°12.7'E, 9-10 m, dead, Montrouzier stn 1302, Oct. 1993; MNHN, 1 rv, NW New Caledonia, 20°40'S, 164°11.2'E, 12 m, dead, Montrouzier stn 1316, Oct. 1993.

Australia. AMS C.165165, 2 rv, Queensland, Lizard Island, Granite Bluff, in 23 m, sandy mud bottom, many forams, some green mixed algae & Caulerpa spp., leg. W.F. Ponder, 7 Dec. 1974; AMS C.165166, 1 rv, Queensland, Lizard Island, off East Face, ca. 20 m, foraminiferous, leg. W.F. Ponder, P.H. Colman, I. Loch, 11 Dec. 1974; AMS C.165167, 1 rv, Queensland, Endeavour Reef, 14°57'S, 145°35'E, 8-10 m, rubble wash on outer reef slope, leg. I. Loch, 9 Dec. 1984; HD 6733, 11 db, 7 lv, N Queensland, Pioneer Bay, Orpheus Island, 18°35'S, 146°29'E, from submerged nets, live, 6 m, leg. P. Southgate.

Solomon Islands. AMS C.165168, 2 lv, 2 rv, W Malaita Island, Aoki Harbour, on sheltered side of reef on slopes, 3-7.5 m, coral & rubble bottom, brown algae washings, leg. P.H. Colman, 18 Aug. 1973; NMNZ MF.30460, 8 lv, 6 rv, Vangunu Island, Marovo Lagoon, between Telina Island and Mbareki Peninsula, amongst shell grit & rubble, 9 m, 6 Oct. 1965; NMNZ MF.59756 and NMNZ MF.59756, 4 lv, 4 rv, Vangunu Island, Marovo Lagoon, off Telina Island, amongst shell grit & rubble, 11 m, 26 Oct. 1965; PS P.1314, 4 db, Nusa Tupe Island, Gizo, attached to submerged nets, live, 6-10 m, leg. K. Friedman.

Fiji. PS P.1315, 1 db, off Savusavu on the island of Vanua Levu, 16°34'S, 179°15'E, attached to submerged nets, live, 8-10 m, leg. P. Southgate.

Kiribati. PS P.1332, 7 db, lagoon of Abaiang atoll, off Taburao, 0°59'N, 172°59'E, attached to submerged nets, live, 6-8 m, leg. A. Beer.

Distribution: Solomon Islands, northern Queensland (Australia), New Caledonia, Fiji and Kiribati, 0-14 m, living in 6-14 m amongst algae on soft sediments.

Discussion
Palliolium minutulum is closest in outline to Palliolium incomparabile (Risso, 1826), known from the Mediterranean Sea and the adjacent area of the eastern Atlantic. Both species are almost circular in shape, fragile, usually transparent and highly...
New scallop from the southwestern Pacific

coloured. However, *P. incomparabile* is larger (up to ca. 13 mm high) with prominent antimarginal microsculpture; *P. minutulum* is smaller (up to ca. 10 mm high, usually smaller to 8 mm) with minuscule antimarginal scratches or smooth.

**Remarks**
The present species is live collected amongst algae in shallow water. The size attained by live specimens held under culture conditions for up to 8 months was 6-8 mm in height. The largest specimen examined, from Gizo in the Solomon Islands, was 9.2 mm in height.

**Etymology**
The species is named after its small dimension (Latin minutulus, adj. = very small).

**Acknowledgements**
We are most grateful to Dr Philippe Bouchet (MNHN) for making the "Montrouzier" pectinids from New Caledonia available for study. Thanks are also due to Dr Winston F. Ponder, Mr Phil H. Colman, Mr Ian Loch (AMS) and Mr Bruce A. Marshall (NMNZ) for allowing us to study additional pectinid material and for relevant information of the present new pectinid. We also appreciate to thank Dr Rudo von Cosel and Mr Pierre Lozouet (MNHN) for preparing photographs and SEM-micrographs.

**References**
Beu, A.G., 1995. Pliocene limestones and their scallops. Lithostratigraphy, pectinid biostratigraphy and paleogeography of eastern North Island late Neogene limestone. *Institute of Geological & Nuclear Sciences monograph* 10. (Institute of Geological & Nuclear Sciences Limited: Lower Hutt), iv + 243 pp.

Beu, A.G. & Darragh, T.A. [in prep.]. Revision of southern Australian Cenozoic fossil Pectinidae (Mollusca: Bivalvia). *Proceedings of the Royal Society of Victoria.*

Bouchet, P., 1994. Atelier biodiversité récifale Expédition Montrouzier TOUHO - KOUMAC, Nouvelle-Calédonie 23 août - 5 novembre 1993. ORSTOM *Rapports de Missions, Sciences de la Mer*, No. 24: 1-63.

Crosse, J.C.H., 1885. [Review of Monterosato's Nom. gen. e spec. d'alcune Conch. Medit...'] 1884.] *Journal de Conchyliologie* 33: 139-142.

Eberzin, A.G., 1960. Mollyuski-pantsirnye, dvustvorchatye, Lopatonojcie, in: 'Osnovy Paleontologii'. Orlov, Y.A. (ed.), (USSR Academy of Science: Moscow), pp. 1-300.

Hertlein, L.G., 1969. Family Pectinidae Rafinesque, 1815, in: 'Treatise on Invertebrate Paleontology', Part N, Vol. 1 (of 3), pp. N348-N373. Mollusca 6, Bivalvia. R.C. Moore (ed.), (Geological Society of America and University of Kansas Press: Lawrence).

Risso, A., 1826. *Histoire naturelle des principales productions de l'Europe Méridionale et particulièrement de celles des environs de Nice et des Alpes Maritimes*, Vol. 4. (Levrault: Paris, Strasbourg), iv + 439 pp.

Waller, T.R., 1978. Morphology, morphoclines and a new classification of the Pteriomorpha (Mollusca: Bivalvia). *Philosophical Transactions of the Royal Society of London, B*, 284: 345-365.
Waller, T.R., 1991. Evolutionary relationships among commercial scallops (Mollusca: Bivalvia: Pectinidae), in: 'Scallops: biology, ecology and aquaculture'. Shumway, S.E. (ed.), (Elsevier Science Publishers: Amsterdam, etc.), pp. 1-73.

Waller, T.R., 1993. The evolution of "Chlamys" (Mollusca: Bivalvia: Pectinidae) in the tropical western Atlantic and eastern Pacific. American Malacological Bulletin 10(2): 195-249.

Waller, T.R. & Marincovich L. Jr., 1992. New species of Camptochlamys and Chlamys (Mollusca: Bivalvia: Pectinidae) from near the Cretaceous/Tertiary Boundary at Ocean Point, North Slope, Alaska. Journal of Paleontology 66(2): 215-227.

Wilkes, J., 1810. Conchology, in: 'Encyclopaedia Londinensis; or, Universal Dictionary of Arts, Sciences, and Literature'. (London), pp. 14-41.