

A new living species of *Cyclochlamys* (Bivalvia, Pectinoidea, Cyclochlamydidae) from Wake Atoll (Pacific)

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Cyclochlamys wakensis spec. nov. is described from Wake Atoll, Pacific. It is compared with a morphologically close congeneric species from Ryukyu Islands, Japan.

Key words: Bivalvia, Pectinoidea, Cyclochlamydidae, *Cyclochlamys*, new species, Wake Atoll, Pacific.

INTRODUCTION

Micromolluscs at Wake Atoll (7.38 km², 19°18'N, 166°38'E), a coral atoll with a coastline of 19 km in the North Pacific Ocean, were sampled by Bret K. Raines. For further information of this atoll, see Wikipedia (Anon., 2012). This remote atoll is an unorganized, unincorporated territory of the United States, administrated by the Office of Insular Affairs, U.S. Department of the Interior. The coral atoll comprises three islands, i.e., Wake Island, Peale Island and Wilkes Is-

land, and a reef surrounding a central lagoon. It is now part of the Pacific Reefs National Wildlife Refuge Complex and the present specimens were collected under United States Fish and Wildlife Service (USFWS) Permit 12521-12004.

Acronyms and abbreviations: LACM, Natural History Museum of Los Angeles County, Los Angeles, U.S.A.; ZMA, Zoological Museum Amsterdam, Amsterdam (now part of Naturalis Biodiversity Center, Leiden). Lv, left valve. Rv, right valve.

The examined material is preserved in the LACM at Los Angeles and the Naturalis Biodiversity Center at Leiden.

SYSTEMATIC PART

Cyclochlamydidae Dijkstra & Maestrati, 2012

Cyclochlamydidae Dijkstra & Maestrati, 2012: 393.

Remarks. — This family includes three genera, i.e., *Cyclochlamys* Finlay, 1926, *Chlamydella* Iredale, 1929, and

Micropecten Dijkstra & Maestrati, 2012, previously classified in Propeamussiidae.

Cycloclamys Finlay, 1926

Cycloclamys Finlay, 1926: 452. Type species (by original designation): *Pecten* (*Pseudamusium*) *transenna* Suter, 1913; Recent, New Zealand.

Remarks. — For diagnosis, distribution and discussion, see Dijkstra & Marshall (2008: 22).

Cycloclamys wakensis spec. nov. (Figs 1-8)

Type material. — Holotype (lv, LACM 3236). Paratypes (LACM 3237, 1: Figs 3, 4; LACM 3239, 1: Fig. 8; LACM 3240, 1: Fig. 5; LACM 3256, 1: Fig. 7; LACM 3257, 1: Fig. 6; LACM 3238, 5; ZMA Moll. 391595, 15). All paratypes from type locality.

Measurements of type material: Holotype (lv, LACM 3236) height 1.8 mm, length 1.9 mm; figured paratype (rv, LACM 3237) height 1.1 mm, length 1.1 mm; figured paratype (lv, LACM 3239) height 1.9 mm, length 1.9 mm; figured paratype (lv, LACM 3240) height 1.4 mm, length 1.4 mm; 7 paratypes (5 lv and 2 rv, LACM 3238) height lv 1.5 mm to 2.2 mm, length lv 1.5 mm to 2.3 mm, height rv 1.1 mm to 1.4 mm, length rv 1.2 to 1.5 mm; 15 paratypes (11 lv and 4 rv, ZMA Moll. 391595) height lv 1.7 to 2.2 mm, length lv 1.7 mm to 2.3 mm, height rv 1.1 mm to 1.9 mm, length 1.1 mm to 1.9 mm.

Type locality. — Pacific: Wake Atoll, off the south side of Wake Island, 19°17'24"N, 166°36'33"E, 15-18 m, dead, sand and rubble, leg. B.K. Raines, vi. 2012.

Description. — Shell up to 2.2 mm high, strongly inequivalve, left valve slightly more inflated than right valve, inequilateral, nearly circular to posteriorly oblique, about as wide as high, opaque whitish. Outline irregular, variable, typically changing during ontogeny, in most specimens associated with change in spacing of commarginal lamellae, direction of radial riblets.

Prodissoconch 215 µm high (fig. 2), roundly conical, PI and PII boundary unclear; sculptured with fine, crisp, irregularly anastomosing threads, more pronounced near bound-

ary; anterior boundary indented (rudimentary byssal notch).

Dissoconch left valve disc (0.3 mm) commencing immediately after prodissoconch boundary, without a border formed by strong flange-like commarginal rim (see Dijkstra & Marshall, 2008), weakly sculptured by 7 to 10 short and long irregularly spaced radial threads.

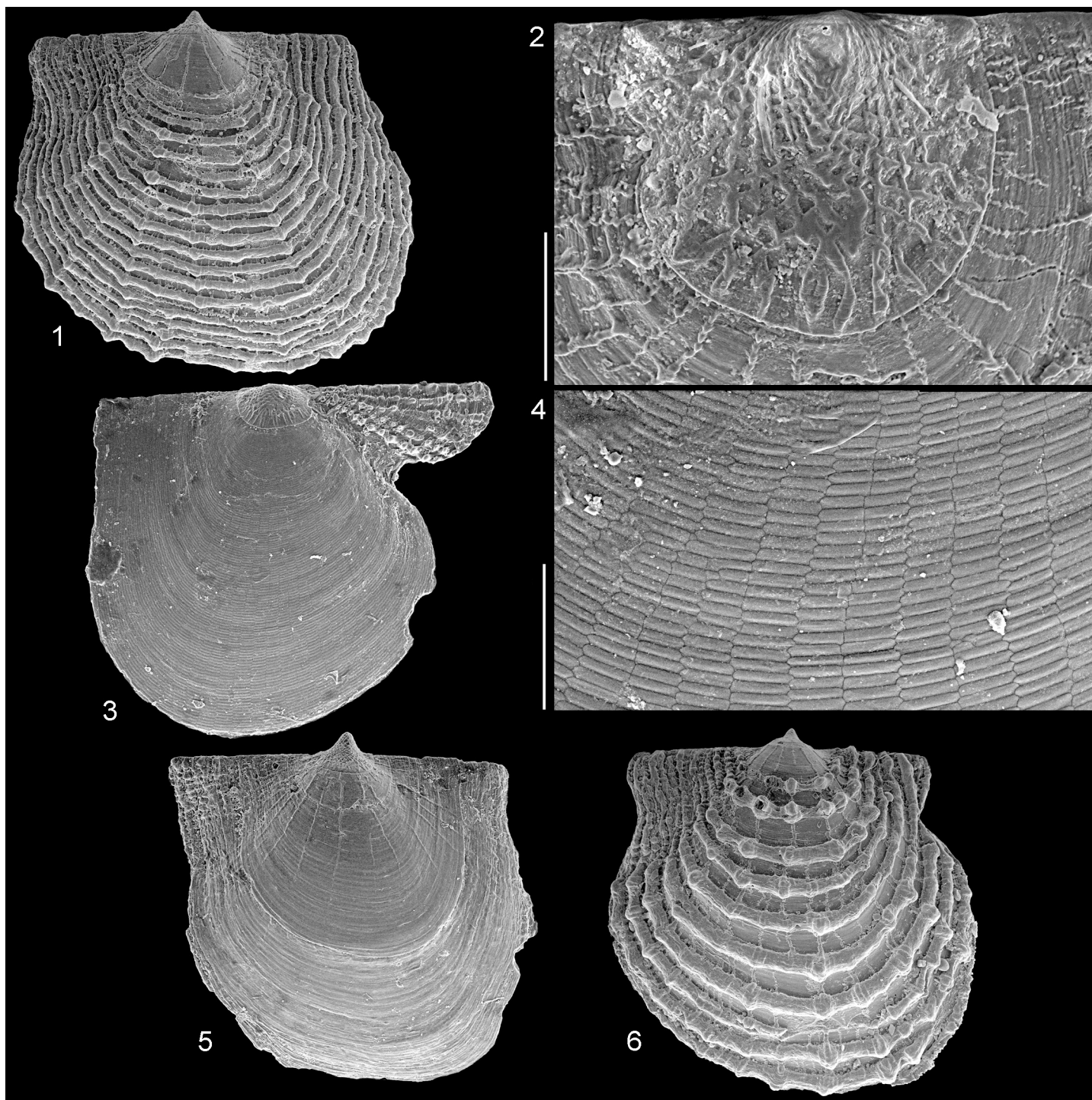
Commarginal lamellae distinct throughout (figs 1, 8), faint throughout (fig. 5), weak in early growth stage (fig. 6) or faint in late ontogeny (fig. 7), commencing after 0.3 mm high, developed to the shell margin, variable in number (10-20), with weak tubercles on 7 or 8 intersections of commarginal lamellae, small radial riblets; interspaces more or less as wide as those of commarginal lamellae, widest over centre of disc, bearing delicate closely spaced radial threads. Auricles continuous with shell disc, similarly sculptured.

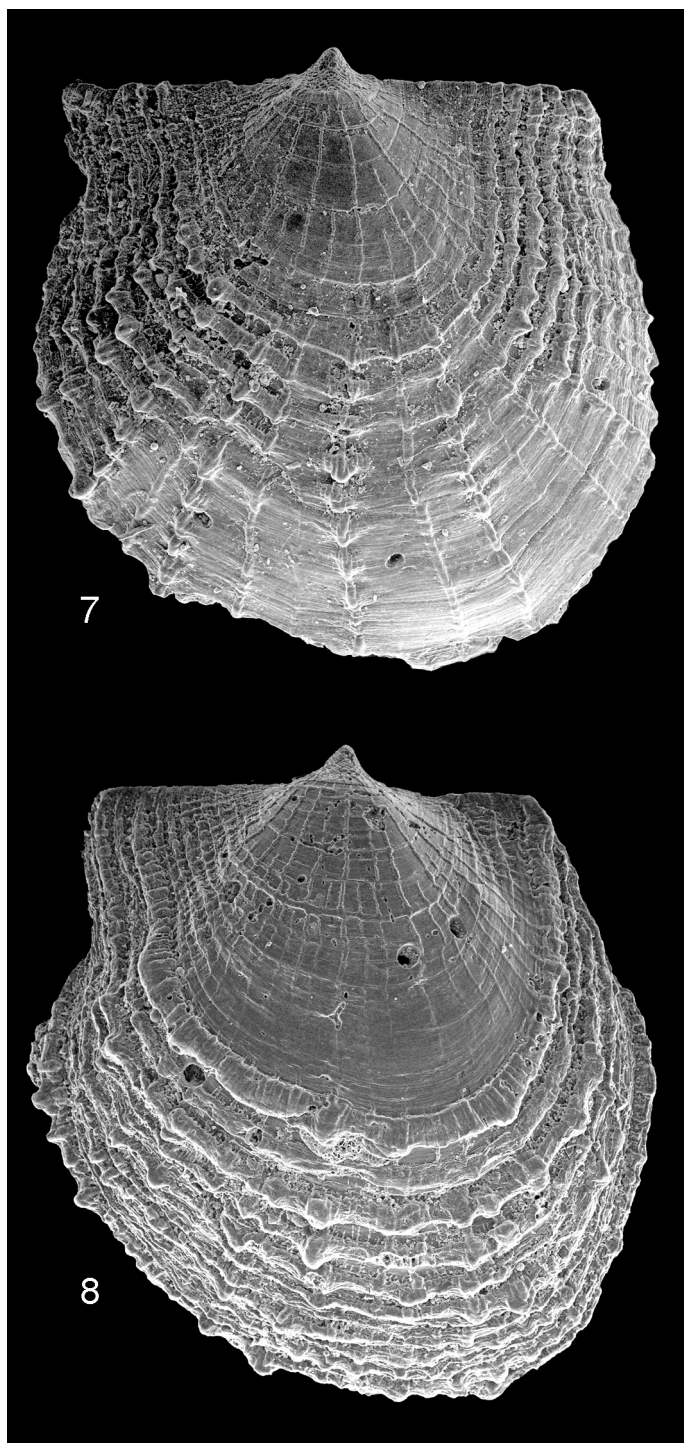
Prodissoconch right valve disc slightly inflated, similarly sculptured as prodissoconch of left valve; surface of shell disc with outer layer of commarginally elongated, hexagonal prisms, each prism c. 40 µm wide and c. 8.5 µm high in centre of disc; posterior auricle continuous with shell disc, anterior auricle strongly declined, with 4 or 5 tubercular radial riblets. Byssal notch of moderate depth, byssal fasciole rather broad.

Distribution. — Wake Atoll, 15-18 m, sand and rubble. So far only single valves have been sampled. It is most likely that the present species is living somewhat deeper.

Comparison. — *Cycloclamys wakensis* spec. nov. is morphologically closest to the similarly sized congeneric species *C. incubata* (see Hayami & Kase, 1993: 62, figs 202-212), recorded from the Ryukyu Islands, Japan. Both species dif-

Figs 1-6. *Cycloclamys wakensis* spec. nov., Pacific, Wake Atoll, off the south side of Wake Island, 19°17'24"N, 166°36'33"E, 15-18 m, dead, sand and rubble, leg. B.K. Raines, vi. 2012. **Figs 1-2**, holotype (lv), LACM 3236, height 1.8 mm, length 1.9 mm; **1**, exterior; **2**, close up prodissoconch; **3-4**, paratype (rv), LACM 3237, height 1.1 mm, length 1.1 mm; **3**, exterior; **4**, close up longitudinal hexagonal structure; **5**, paratype (lv) LACM 3240, height 1.4 mm, length 1.4 mm, exterior, faint commarginal sculpture throughout; **6**, paratype (lv), LACM 3257, height 1.6 mm, length 1.6 mm, faint commarginal sculpture in early growth stage.





fer strongly in sculpture of the left valve. *Cyclochlamys wakensis* has strongly variable, prominent commarginal sculpture, whereas *C. incubata* has reticulate sculpture of equally developed radial and commarginal riblets. The commarginal sculpture of *C. wakensis* also commences later in the dissoconch stage (after c. 3 mm below the prodissoconch boundary) than of *C. incubata* (after c. 1 mm). The weak and small radial riblets are fewer and more widely spaced in *C. wakensis*, more equally spaced and more numerous in *C. incubata*. Moreover, *C. wakensis* has closely spaced intercommarginal secondary radial threads, which *C. incubata* lacks.

The other 12 species of *Cyclochlamys* from the southwestern Pacific mainly differ from *C. wakensis* in having a different prodissoconch and sculpture of the left valve (Dijkstra & Maestrati 2010: 341, figs 3A-E; 2012: 394, figs 1A-E; Dijkstra & Marshall, 2008: 22-37, figs 20-29).

Remarks. — Representative species of *Cyclochlamys* are principally recorded from the southern hemisphere (Southern Ocean, southern Australia and New Zealand region) and are not recorded from the Atlantic Ocean and Indian Ocean. Only four species are presently known from the tropical western and southwestern Pacific, i.e. *C. incubata* from Japan and Vanuatu, *C. wakensis* from the Wake Atoll, *C. aperta* Dijkstra & Maestrati, 2012 from Vanuatu, and *C. australensis* Dijkstra & Maestrati, 2010 from the Austral Islands. Most species (10) are recorded from the New Zealand region. *Cyclochlamys* species are not yet known from the Philippine and the Indonesian Archipelagos, probably due to proper sampling techniques (brushing technique of epibenthos on hard substrates) not being used or by erroneously determining these micromolluscs as juveniles of Pectinoidea.

Etymology. — Named after the remote coral Wake Atoll in the northwestern Pacific.

Figs 7-8. *Cyclochlamys wakensis* spec. nov., Pacific, Wake Atoll, off the south side of Wake Island, 19°17'24"N, 166°36'33"E, 15-18 m, dead, sand and rubble, leg. B.K. Raines, vi. 2012; 7, paratype (lv), LACM 3256, height 1.7 mm, length 1.7 mm, weak commarginal sculpture in late growth stage; 8, paratype (lv), LACM 3239, height 1.9 mm, length 1.9 mm, exterior, strongly distinct commarginal sculpture.

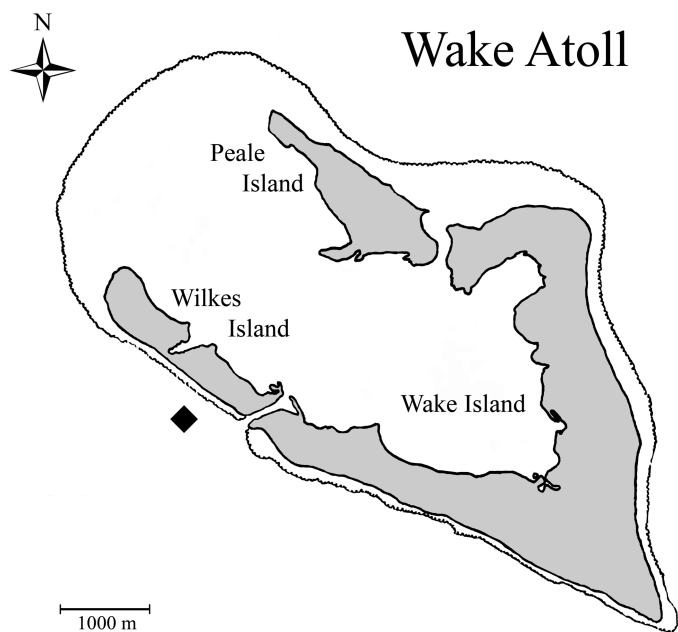


Fig. 9. Type locality of *Cycloclamys wakensis* spec. nov.

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REFERENCES

- ANONYMOUS, 2012. Wake Island. Wikipedia: http://en.wikipedia.org/wiki/Wake_Island (accessed date 27 Aug. 2012).
- DIJKSTRA, H.H. & MAESTRATI, P., 2010. Pectinoidea (Mollusca, Bivalvia, Propeamussiidae, Entoliidae and Pectinidae) from the Austral Islands (French Polynesia). — *Zoosystema* 32: 333-358.
- DIJKSTRA, H.H. & MAESTRATI, P., 2012. Pectinoidea (Mollusca, Bivalvia, Propeamussiidae, Cycloclamydidae n. fam., Entoliidae and Pectinidae) from the Vanuatu Archipelago. — *Zoosystema* 34: 389-408.
- DIJKSTRA, H.H. & MARSHALL, B.A., 2008. The Recent Pectinoidea of the New Zealand region (Mollusca: Bivalvia: Propeamussiidae, Pectinidae and Spondylidae). — *Molluscan Research* 28: 1-88.
- HAYAMI, I. & KASE, T., 1993. Submarine cave Bivalvia from the Ryukyu Islands: systematics and evolutionary significance. — *The University Museum, The University of Tokyo, Bulletin* 35: i-vi, 1-133.

