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New bathyal species and records of Pectinoidea (Bivalvia: Propeamussiidae and Pectinidae) from Taiwan

Henk H. Dijkstra¹, Philippe Maestrati²

1. Zoological Museum, Department of Malacology, Faculty of Natural Sciences, University of Amsterdam, Mauritskade 61, 1092 AD Amsterdam, The Netherlands.
E-mail: H.H.Dijkstra@uva.nl
2. Département de Systématique et Evolution UMS 602 Taxonomie et Collection, F - 55 rue de Buffon, 75005 Paris, France E-mail: maestrati@mnhn.fr

Abstract

New species: *Parvamussium liaoi* n. sp., *Scaechlamys squamea* n. sp. New records for Taiwan: *Propeamussium siratama*, *Parvamussium aldeynzeri*, *Parvamussium cristatellum*, *Parvamussium undisonum*, *Parvamussium vesiculatum*, *Ciclopecten fluctuatus*, *Delectopecten musorstomi*.

Key words: Bivalvia, Propeamussiidae, Pectinidae, taxonomy, Taiwan

Introduction

This paper deals with new, deep-water, Recent pectinoid species and records (Propeamussiidae and Pectinidae) from Taiwanese waters taken by three French/Taiwanese cruises Taiwan 2000, Taiwan 2001, and Taiwan 2004. The cruise “TAIWAN 2000” on board R/V Fisheries Researcher No. 1 was supported by the National Taiwan Ocean University (NTOU), Taiwan Fisheries Research Institute, National Science Council, Taiwan, R.O.C. (NSC), Muséum National d'Histoire Naturelle, Paris (MNHN) and the IRD (Institut de Recherche pour le Développement, France). The cruise “TAIWAN 2001” on trawler Chung Tung Long No. 26 was supported by the NTOU, NSC, National Museum of Marine Science & Technology (Taiwan, R.O.C.; NMMST), MNHN, and the IRD.

The cruise “TAIWAN 2004” on commercial trawler “Rih-Jheng 101” and R/V “Ocean Researcher 2” was supported by the NSC, R.O.C., National Museum of Marine Science & Technology R.O.C., and MNHN.

Twenty-six pectinoids (9 Propeamussiidae and 17 Pectinidae) are recorded (Table 1) of which nine pectinoids (6 Propeamussiidae and 3 Pectinidae) are listed or described and figured. One propeamussiid and one pectinid are new to science and five Propeamussiidae and two Pectinidae are new records for Taiwan. The remain species are records from previous publications and only enumerated.

The primary types of *Parvamussium liaoi* and *Scaechlamys squamea* are deposited in the National Museum of Natural Science at Taichung, Taiwan, and other material in the Muséum National d'Histoire Naturelle at Paris, France. Some voucher specimens are placed in the private pectinoid reference collection of the senior author.

Acronyms

AMS, Australian Museum, Sydney

HD, Henk H. Dijkstra colln, Sneek, The Netherlands

MNHN, Muséum National d'Histoire Naturelle, Paris

NMNS, National Museum of Natural Science, Taichung

NSMT, National Science Museum of Tokyo, Tokyo

WAM, Western Australian Museum, Perth

ZMA, Zoological Museum Amsterdam, Amsterdam

Abbreviations

H, height (dorsal-ventral)

W, width (anterior-posterior)

D, depth (convexity of paired valves)

lv, left valve (upper valve)

pr, paired (articulated) valves

rv, right valve (lower valve)

v, valve(s)

Systematics

Superfamily PECTINOIDEA Rafinesque, 1815

Family Propeamussiidae Abbott, 1954

Genus *Propeamussium* de Gregorio, 1884

Propeamussium siratama (Oyama, 1951) (Pl.1, figs 1-4)

Ctenamusium (*Micramussium*) *siratama* Oyama, 1951: 80, pl. 13, figs 5-7.

Propeamussium siratama (Oyama); Dijkstra & Kastoro, 1997: 253, figs 20-23 [references, type data, description, distribution, discussion].

Material examined**Taiwan**

TAIWAN 2001: Stn CP 68, 24°50'N, 122°01'E, 370 m, alive, 9 pr; stn CP 77, 24°54'N, 122°03'E, 360 m, alive, 1 pr; stn CP 89, 24°54'N, 122°01'E, 310-420 m, alive, 12 pr; stn CP 97, 24°54'N, 122°03'E, 377 m, alive, 3 pr; stn CP 98, 24°54'N, 122°03'E, 362-400 m, alive, 25 pr; stn CP 103, 24°49'N, 122°06'E, 367-424 m, alive, >150 pr; stn CP 108, 24°48'N, 122°08'E, 295-337 m, alive, 6 pr; stn CP 115, 24°54'N, 122°02'E, 381-440 m, alive, 7 pr; stn CD 129, 22°06'N, 121°05'E, 1271-1275 m, alive, 3 pr, 2 v.

Distribution

Japan (Okutani, 2000: 913, 100-300 m), Indonesia (Dijkstra & Kastoro, 1997: 253, 283-285 m) and New Caledonia (Dijkstra, 2001: 81, 316-533 m). Now also Taiwan, living at 310-440 m.

Remarks

The present specimens from Taiwan fit the original description (type material untraceable) and studied material from Japan (HD, NSMT), but differ in size (up to ca. 17 mm high, typical ca. 7.5 mm), in having fewer internal ribs (7 + 2 auricular, typical 8 + rudimentary + 2 auricular), and in colour (left valve orange, typical whitish). Other morphological character are identical.

Genus *Parvamussium* Sacco, 1897

Parvamussium liaoi n. sp. (Pl. 1, figs 5-8)

Type locality

Taiwan, 21°55'N, 120°36'E, 305 m, Warén dredge, TAIWAN 2000 stn DW 36, leg. Bouchet, Richer & Chan, 31.07.2000.

Material examined**Taiwan**

TAIWAN 2000: Stn DW 36, 21°55'N, 120°36'E, 305 m, lv (holotype, NMNS-5903-001) + rv (paratype, NMNS-5903-002); stn DW 37, 21°52'N, 120°36'E, 420 m, 2 rv (paratypes, MNHN 21267).

Description

Shell small and fragile, up to c. 10 mm high, nearly circular and flattened, equivalve and equilateral, both valves of similar convexity, texture of left valve reticulate, and of right valve commarginal, anterior and posterior auricles unequal in size and shape, umbonal angle about 105°, internal ribs rudimentary near ventral margin (up to 19), colour whitish and opaque.

Left valve sculptured with about 25 prominent radial riblets, commencing about 1 mm below the umbonal top and increasing ventrally, and about 40 weaker commarginal lamellae, with scales on the intersections. Anterior auricle with prominent commarginal lamellae, posterior weak reticulated.

Right valve with closely spaced, regularly arranged commarginal lamellae. Anterior auricle with 4-6 delicate radial riblets, posterior nearly smooth. Byssal notch shallow, ctenolium lacking.

Measurements

holotype: H 8.9 mm, W 9.0 mm.

Distribution

So far only known from Taiwan, dead at 305-420 m.

Comparison

The most resembling congeneric species is *Parvamussium araneum* Dijkstra, 1991, known from Indonesia. The present species differs from *P. araneum* in having a coarser reticulate sculpture on the left valve and many more internal riblets (up to 19, *P. araneum* 4). *Parvamussium carbaceum* Dijkstra, 1991, also known from Indonesia, which is more circular than *P. liaoi*, has 17 internal riblets, which are more developed, and a more delicated commarginal sculpture on the left valve. *Parvamussium vidalense* (Barnard, 1964), known from southeastern Africa, also resembles *P. liaoi*, but has overrunning commarginal lamellae (*P. liaoi* has interstitial commarginal lamellae) and only a few rudimentary internal riblets.

Etymology

This species is named after Prof. I-Chiu Liao, then Director General of Taiwan Fisheries Research Institute, who kindly made R/V Fisheries Researcher No.1 available for exploring the deep-sea fauna around Taiwan.

Parvamussium aldeynzeri Dijkstra, 2003 (Pl. 2, figs 9-13)

Parvamussium aldeynzeri Dijkstra, 2003: 128, figs 7-17.

Material examined**Taiwan**

TAIWAN 2000: Stn CP 35, 22°02'N, 120°27'E, 246 m, alive, 2 pr + 1 v.

Distribution

Philippines (Dijkstra, 2003: 128). Now also Taiwan, living at 246 m.

Remarks

The present specimens from Taiwan are similar to the type material, but differ in

colour (yellow, white or creamy with white dots, typical creamy white) and the shell is more opaque (typical translucent).

Parvamussium cristatellum (Dautzenberg & Bavay, 1912) (Pl. 2, figs 14-17)

Pecten (Amussium) cristatum Bavay, 1905: 187, pl. 17, figs 2a-c [not *Pecten cristatus* Bronn, 1828].

Amussium cristatellum Dautzenberg & Bavay, 1912: 36, pl. 28, figs 5-8 [replacement name].

Parvamussium cristatellum (Dautzenberg & Bavay); Dijkstra, 1991: 13, figs 28-32 [references, synonymy, description, discussion].

Material examined

The type material (see Dijkstra & Kastoro, 1997: 261).

Taiwan

TAIWAN 2000: Stn DW 7, 22°20'N, 119°13'E, 260 m, 1 v; stn DW 34, 22°02'N, 120°36'E, 246 m, 2 v; stn DW 44, 22°47'N, 121°27'E, 442 m, 35 v; CP 49, 22°55'N, 121°22'E, 266 m, 1 v.

Distribution

Andaman Islands (Bavay, 1905, depth unknown), Indonesia (Dijkstra & Kastoro, 1997: 261, 174-445 m, only dead records), Kermadec Islands (Dijkstra & Marshall, 1997: 80, 256-549 m, only dead records), New Caledonia, Wallis and Futuna and Vanuatu (Dijkstra, 2001: 83, 330-495 m), Lord Howe Rise and Kermadec Ridge (Dijkstra & Marshall, 2008: 7, 348-900 m, dead records). Now also Taiwan, dead at 260-442 m.

Remarks

The present specimens from Taiwan are similar to the type material, but differ in having weaker radial ribs and somewhat more prominent commarginal lamellae on the left valve. Other morphological characters of both valves are identical.

Parvamussium undisonum Dijkstra, 1995 (Pl. 3, figs 18-21)

Parvamussium undisonum Dijkstra, 1995: 37, figs 55-58.

Material examined**Taiwan**

TAIWAN 2000: Stn DW 44, 22°47'N, 121°27'E, 442 m, 3 v.

TAIWAN 2004: Stn CP 269, 24°30'N, 122°04'E, 397-417 m, alive, 1 pr.

Distribution

New Caledonia, Loyalty Islands and New Hebrides Arc (Dijkstra, 1995: 37, 700-710 m), Wallis and Futuna (Dijkstra, 2001: 87, 552-600 m). Now also Taiwan, dead at 442 m.

Remarks

The present specimens from Taiwan are similar to the type material, but slightly differ in having closer spaced commarginal lamellae on the right valve. Other morphological characters are identical.

Parvamussium vesiculatum Dijkstra, 1995 (Pl. 3, figs 22-24)

Parvamussium vesiculatum Dijkstra, 1995: 37, figs 59-62, 93-96.

Material examined**Taiwan**

TAIWAN 2000: Stn DW 44, 22°47'N, 121°27'E, 442 m, alive, 2 pr.

Distribution

New Caledonia, Loyalty Islands and Norfolk Ridge (Dijkstra, 1995: 39, 260-650 m), Indonesia (Dijkstra & Kastoro, 1997: 265, 205-212 m), Wallis, Futuna and Vanuatu (Dijkstra, 2001: 87, 291-600 m), West Norfolk Ridge, southern Kermadec Ridge, and northern New Zealand (Dijkstra & Marshall, 2008: 12, 205-650 m). Now also Taiwan, alive at 442 m.

Remarks

The present specimens from Taiwan are similar to the type material, but slightly differ in having a larger glossy umbonal area (1 mm, typical 0.3 mm), a weaker texture and is more transparent. Other morphological characters are identical.

Family Pectinidae Rafinesque, 1815

Genus *Ciclopecten* Seguenza, 1877

Ciclopecten fluctuatus (Bavay, 1905) (Pl. 3, figs 25-28)

Pecten (Chlamys) fluctuatus Bavay, 1905: 188-189, pl. 17, figs 3a-b.

Delectopecten fluctuatus (Bavay); Dijkstra, 1995: 51, figs 83-86 [type data, description, distribution, discussion].

Material examined

The type material (see Dijkstra, 1995: 51).

Taiwan

TAIWAN 2000: Stn DW 36, 21°55'N, 120°36'E, 305 m, 1 v; stn FP 16, 22°17'N, 119°15'E, 350 m, 1 v.

TAIWAN 2001: CP 97, 24°54'N, 122°03'E, 377 m, alive, 1 pr; stn CP 107, 24°48'N, 122°11'E, 335-420 m, alive, 2 pr.

Distribution

Andaman Islands (Bavay, 1905: 188, depth unknown), Indonesia (Dijkstra & Kastoro, 1997: 266, 225-288 m), Loyalty Islands (Dijkstra, 1995: 51: 538 m), Vanuatu (Dijkstra, 2001: 91, 536-566 m), Kermadec Ridge (Dijkstra & Marshall, 2008: 48, 538 m, dead record). Now also Taiwan, dead at 305-350 m.

Remarks

This species was formerly placed in *Delectopecten* (see Dijkstra, 2001). After examination of Pliocene material from Italy of *C. peloritanus*, the type species of *Ciclopecten*, the present species is morphologically closer to *Ciclopecten* than to *Delectopecten*. It has similar commarginal undulations and antimarginal microsculpture.

The present specimens from Taiwan are similar to the type material, but slightly differ in its size (up to 6 mm high, typical 10 mm), in having a weaker radial sculpture on the left valve and more commarginal sculpture (typical nearly lacking), and in colour (whitish semi-transparent, typical brownish opaque). Other morphological characters are identical.

Delectopecten musorstomi Poutiers, 1981 (Pl. 4, figs 29-31)

Delectopecten musorstomi Poutiers, 1981: 331, pl. 1, figs 2-3.

Material examined

The type material (see Poutiers, 1981: 331).

Taiwan

TAIWAN 2000: Stn DW 5, 23°41'N, 119°56'E, 234 m, 1 v.

Distribution

Philippines (Poutiers, 1981: 331, 150-159 m), Indonesia (Dijkstra, 1991: 130-495 m, dead records only), New Caledonia (Dijkstra, 1995: 53, 250 m; Dijkstra, 2001: 91, 233-367 m), Norfolk Island (Dijkstra & Marshall, 1997: 88, 201 m, dead record). Now also Taiwan, dead at 234 m.

Remarks

The present specimen from Taiwan is identical to the type material.

Scaeoclamys squamea n. sp. (Pl. 4, figs 32-36)

Chlamys lemniscata (Reeve). – Abbott & Dance, 1982: 312, fig.; Rombouts, 1991: 15, pl. 6, fig. 2; Xu & Zhang, 2008: 81, fig. 225 (not *Pecten lemniscatus* Reeve, 1853).

Chlamys (Azumapecten) squamata (Gmelin). – Springsteen & Leobrera, 1986: 328, pl. 93, fig. 11 (not *Ostrea squamata* Gmelin, 1791).

Chlamys (Laevichlamys) lemniscata (Reeve). – Okutani, 2000: 899, pl. 447, fig. 9 (not *Pecten lemniscatus* Reeve, 1853).

Coralichlamys lemniscata (Reeve). – Wang, 2002: 183, pl. 5, fig. 5 (not *Pecten lemniscatus* Reeve, 1853).

Scaeoclamys livida (Lamarck). – Raines & Poppe, 2006: 230 [partly], pl. 179, fig. 1 (not *Pecten lividus* Lamarck, 1819).

Type locality

Taiwan, 24°57'N, 122°02'E, 115-170 m, beamtrawl, TAIWAN 2001 stn CP 76, leg. Bouchet, Richer & Chan, 07.05.2001.

Material examined**Taiwan.**

TAIWAN 2000: Stn DW 7, 22°20'N, 119°13'E, 260 m, 6 v; stn DW 8, 22°19'N, 119°15'E, 266 m, 1 v; stn DW 34, 22°02'N, 120°36'E, 246 m, 3 v; stn DW 35,

22°02'N, 120°27'E, 246 m, 1 v; stn DW 36, 21°55'N, 120°36'E, 305 m, 5 v.

TAIWAN 2001: Stn CP 74, 24°51'N, 121°59'E, 220 m, 4 v; stn CP 76, 24°57'N, 122°02'E, 115-170 m, alive, 1 pr (holotype, NMNS-5904-001), 1 v (paratype, NMNS-5904-013); stn CP 78, 24°54'N, 121°57'E, 100-118 m, 5 v; stn CP 83, 24°51'N, 121°57'E, 75-110 m, 22 v (paratypes, 20 MNHN 21268, 2 ZMA Moll. 4.09.007); stn CP 88, 24°51'N, 122°03'E, 650 m, 1 v; stn CP 94, 24°53'N, 121°58'E, 153 m, 2 v; stn DW 118, 24°56'N, 122°02'E, 128-136 m, 1 v.

TAIWAN 2004: Stn DW 255, 24°58'N, 122°02'E, 120-128 m, 3 v.

Description

Shell up to ca. 60 mm high, commonly smaller than 40 mm, weakly inflated, nearly equally convex to opisthogyrate, elongate (somewhat posteriorly oblique), inequivalve, inequilateral, auricles strongly unequal in shape and size, umbonal angle ca. 85-90°, colour strongly variable, nearly all gradations and patterns of white, orange, red, yellow, pink, purple and brown.

Left valve sculptured with ca. 24-30 irregularly spaced scaly radial ribs, strongly different of development, of which 8-9 more prominent, commencing with ca. 8 at 1 mm shell height, increasing intercostally and extending to the ventral margin. Intercalate reticulate or shagreen microsculpture in early growth stage and antimarginal microsculpture in early radial stage and posteriorly. Anterior auricle much larger in shape and size than posterior, with 6-10 weak squamous radial riblets and reticulate or shagreen microsculpture, posterior auricle nearly smooth.

Right valve with ca. 30-36 irregularly spaced scaly radial ribs, less different of prominence than of left valve. Anterior auricle with 4 weak radial ribs and overrunning commarginal lamellae, prominent dorsally. Posterior auricle nearly smooth. Byssal notch deep, byssal fasciole rather broad. Functional ctenolium well-developed with 5-7 teeth.

Distribution

Southern Japan (Okutani, 2000: 899, 30-300 m), East China Sea and South China Sea (Xu & Zhang, 2008: 81), Philippines (Springsteen & Leobrera, 1986: 328), southwards to the tropical waters of Australia (unpubl. data, AMS, WAM).

Comparison

Specimens from the western Pacific are by previous authors often attributed to *Pecten lemniscatus* Reeve, 1853, placed in *Laevichlamys* (see Waller, 1993: 204), occurring in the south-western Indian Ocean, or to *Ostrea squamata* Gmelin, 1791, placed in *Scaeo-chlamys*, commonly occurring in Japan, and to *Pecten lividus* Lamarck, 1819, also placed in *Scaeo-chlamys*, occurring in the temperate waters of Australia. *L. lemniscata* is closest to the present species and could be distinguished by the following characters: *S. squamea* has a coarser radial macrosculpture on the right valve with less radial riblets (30-36) than *S. lemniscata* (up to 50) and lacks an antimarginal microsculpture on the right valve. Moreover, *S. squamea* has a persistent reticulate or shagreen microsculpture on the left valve, which is lacking in typical *S. lemniscata*.

Characters	<i>Scaeo-chlamys lemniscata</i>	<i>Scaeo-chlamys squamea</i>
Size	ca. 50 mm high	ca. 50 mm high
Shape	flattened, weakly and nearly equally inflated	nearly flattened, weakly and nearly equally inflated
Auricles	strongly unequal	strongly unequal
Sculpture LV	ca. 10 primary ribs	ca. 10 primary squamose ribs
Secondary radial riblets	3-4 small intercostal spinose riblets	very weak (broad) or lacking
Sculpture RV	ca. 40-50 fine squamose riblets	ca. 20 squamose riblets
Microsculpture	commarginal and antimarginal	and shagreen and antimarginal
Colour	variable	variable

A closely resembling congeneric species is *Scaeo-chlamys squamata* (Gmelin, 1791), known from the western Pacific, which differs from *S. squamea* in having less prominent radial ribs (5-6) on the left valve (*S. squamea* 8-9), in having weaker early radial sculpture on the right valve and a few more radial ribs (6-7) on the anterior auricle of the right valve (*S. squamea* 4) and a reticulate microsculpture throughout on both valves (*S. squamea* only on the left valve in early ontogeny). Other characters like an opisthograte form and antimarginal microsculpture are identical.

Etymology

Shell with squamous texture (Lat. squameus, adj. = squamous).

Acknowledgements

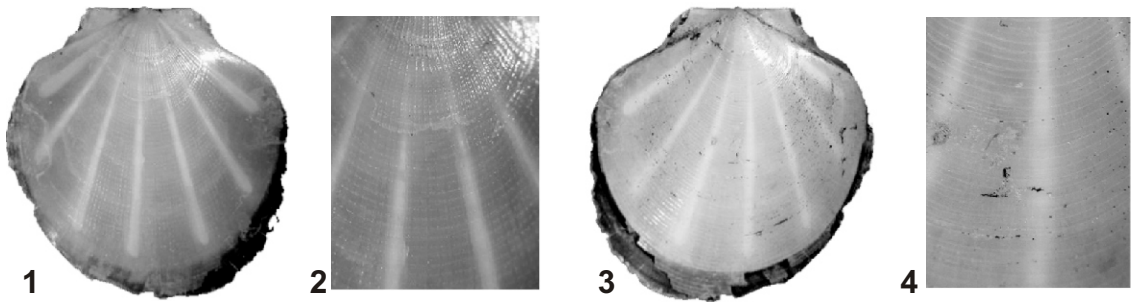
Prof. P. Bouchet thanks Prof. I-Chiu Liao, Director of Taiwan Fisheries Research Institute, Dr Ding-An Lee, Principal Investigator of the cruise “TAIWAN 2000”, and Prof. Tin-Yam Chan for their invitation and participation of the cruises “TAIWAN 2000”, “TAIWAN 2001”, and “TAIWAN 2004”.

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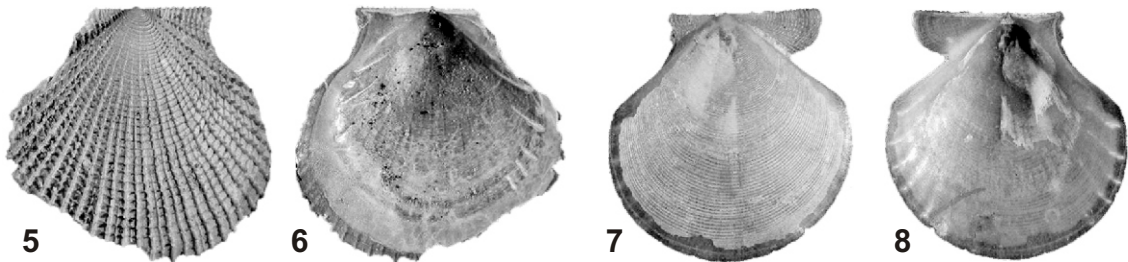
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Plate 1

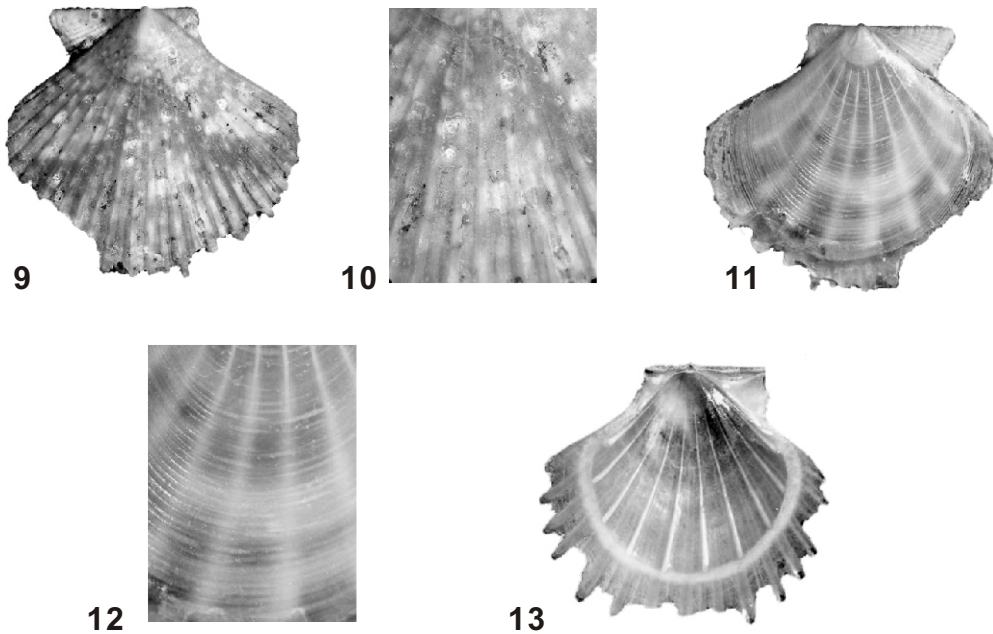


Figs 1-4. *Propeamussium siratama*, stn CP 103. 1. Left valve of paired specimen, exterior (17 mm). 2. Left valve, exterior, close up central part of disc. 3. Right valve of paired specimen, exterior. 4. Right valve, exterior, close up of central part of disc.

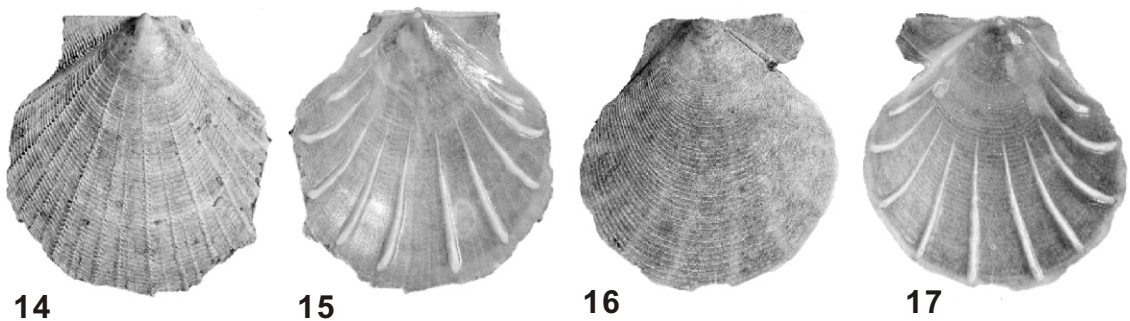


Figs 5-8. *Parvamussium liao* n. sp., stn DW 36. 5. Left valve, holotype, exterior (8.9 mm). 6. Left valve, holotype, interior. 7. Right valve, paratype, exterior (8.8 mm). 8. Right valve, paratype, interior.

Plate 2

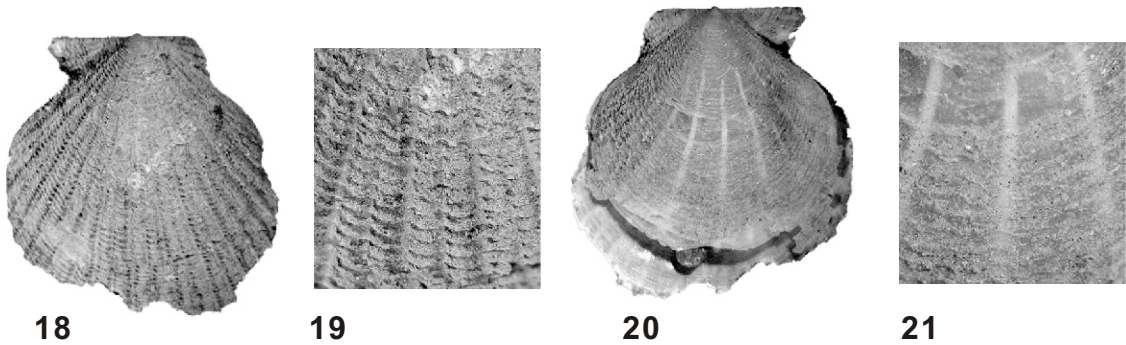


Figs 9-13. *Parvamussium aldeynzeri*, stn CP 35. 9. Left valve of paired specimen, exterior (9.7 mm). 10. Left valve, exterior, close up central part of disc. 11. Right valve of paired specimen, exterior. 12. Right valve, exterior, close up central part of disc. 13. Left valve, interior (9 mm).



Figs 14-17. *Parvamussium cristatellum*, stn DW 44. 14. Left valve, exterior (6.1 mm). 15. Left valve, interior. 16. Right valve, exterior (6.2 mm). 17. Right valve, interior.

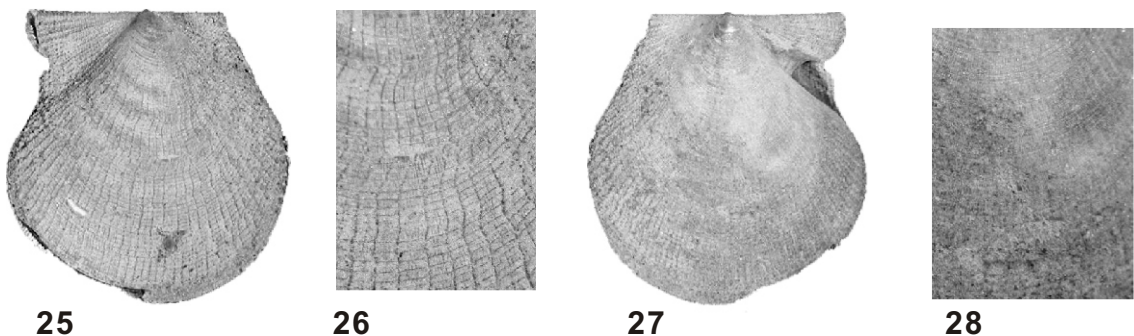
Plate 3



Figs 18-21. *Parvamussium undisonum*, stn CP 269. 18. Left valve, exterior (11.5 mm). 19. Left valve, exterior, close up central part of disc. 20. Right valve of paired specimen, exterior. 21. Right valve, exterior, close up central part of disc.



Figs 22-24. *Parvamussium vesiculatum*, stn DW 44. 22. Left valve of paired specimen, exterior (6.6 mm). 23. Right valve of paired specimen, exterior. 24. Right valve, exterior, close up central part of disc.

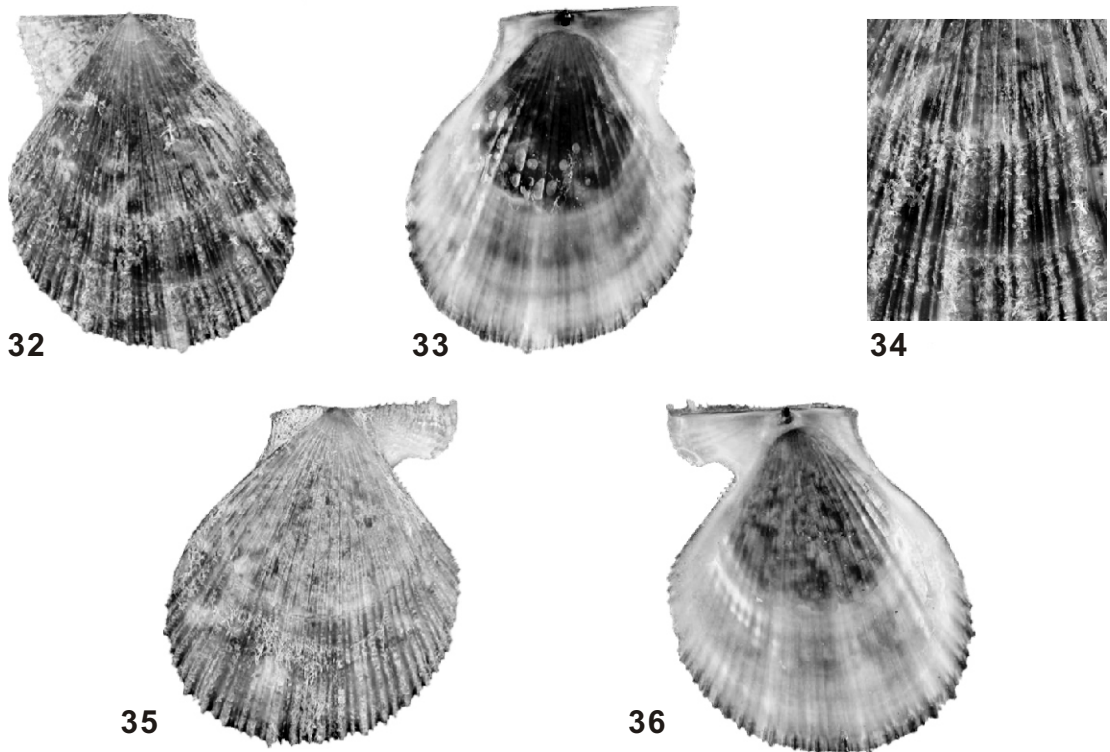


Figs 25-28. *Ciclopecten fluctuatus*, stn CP 107. 25. Left valve of paired specimen, exterior (6.7 mm). 26. Left valve, exterior, close up central part of disc. 27. Right valve of paired specimen, exterior. 28. Right valve, exterior, close up central part of disc.

Plate 4



Figs 29-31. *Delectopecten musorstomi*, stn DW 5. 29. Right valve, exterior (4.9 mm). 30. Right valve, interior. 31. Right valve, exterior, close up antero-ventral part of disc.



Figs 32-36. *Scaeoclamys squamea* n. sp., stn CP 67. 32. Left valve of paired specimen, holotype, exterior (22.5 mm). 33. Left valve, interior. 34. Left valve, exterior, close up central part of disc. 35. Right valve of paired specimen, exterior. 36. Right valve, interior.

Table 1. Pectinoidea of Taiwan (NR – new records)

Species Pectinidae	NR	Stations
<i>Ciclopecten fluctuatus</i>	x	16, 36, 97, 107
<i>Cryptopecten bullatus</i>		36
<i>Cryptopecten nux</i>		7, 34, 35, 36
<i>Cryptopecten vesiculosus</i>		7, 34, 35, 36, 37, 44, 50, 60, 76, 78, 79, 88, 94, 117, 118
<i>Decatopecten plica</i>		7, 79
<i>Delectopecten alcocki</i>		45
<i>Delectopecten musorstomi</i>	x	5
<i>Excellichlamys histrionica</i>		83
<i>Glorichlamys quadrilirata</i>		1
<i>Haumea minuta</i>		88
<i>Mimachlamys cloacata</i>		3, 4, 75
<i>Minnivola pyxidata</i>		2, 4
<i>Pecten albicans</i>		5
<i>Scaeoclamys squamata</i>		4, 5, 7, 83, 109
<i>Scaeoclamys squamea</i>	x	7, 8, 34, 35, 36, 74, 76, 78, 83, 88, 94, 118, 255
<i>Semipallium coruscans</i>		83
<i>Veprichlamys jousseaumei</i>		36, 44
Species Propeamussiidae		
<i>Parvamussium aldeynzeri</i>	x	35
<i>Parvamussium cristatellum</i>	x	7, 34, 44, 49
<i>Parvamussium liaoi</i>	x	36, 37
<i>Parvamussium undisonum</i>	x	44, 269
<i>Parvamussium vesiculatum</i>	x	38, 44
<i>Propeamussium caducum</i>		28
<i>Propeamussium jeffreysii</i>		19, 28, 269
<i>Propeamussium sibogai</i>		248, 269
<i>Propeamussium siratama</i>	x	38, 68, 77, 89, 97, 98, 103, 108, 115, 129,