

New species of Veneridae, Cardiidae, Crassatellidae, Tellinidae and Mactridae from Australia (Veneroida, Bivalvia, Mollusca)

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ABSTRACT

Ten new species of veneroid bivalves from Australia are described including four species of the Veneridae (*Pitar (Pitarina) marrowae*, *P.(P.) potteri*, *Dosinia lochi*, *Dosinia queenslandica*), three species of Cardiidae (*Acrosterigma kerslakae*, *A. punctolineata*, *Fulvia voskuili*), a crassatellid (*Talabrica donharrisi*), a tellinid (*Tellina (Abranda) jeanae*) and a mactrid (*Spisula (Notospisula) colganae*). With the exception of *Dosinia lochi* which is known only from Boucaut Bay, Arnhem Land (type locality), all of the new species described occur in Queensland waters. *Acrosterigma kerslakae*, however, ranges south to Collaroy Beach, Sydney, New South Wales.

INTRODUCTION

Over the last ten years much of the focus on new molluscs from Australia has been on the Gastropoda. Despite this, a significant number of undescribed bivalves have also come to light during this period. As part of an on-going research program dealing with this extensive fauna, we describe herein ten new veneroid bivalves, most of which are shallow water, subtidal species from central to tropical Queensland. Some of these new species have been collected recently whilst others were discovered after scrutiny of existing Australian state museum holdings and comparison with type material.

MATERIAL AND METHODS

All specimens used in the present study derive from the collections of the Queensland Museum, Australian Museum and from the personal collection of K. Lamprell. All measurements were done by the authors using vernier dial calipers. Photographs were prepared by the photographic department of the Queensland Museum.

ABBREVIATIONS

AM, Australian Museum; QM, Queensland Museum; WAM, Western Australian Museum; MV, Museum of Victoria; lv., left valve; rv., right valve; pv., paired valves; NSW, New South Wales; NT, Northern Territory; Qld, Queensland; m, metres; M, established by monotypy; n.sp., new species; OD, original designation; SD, subsequent designation; Stn, station.

SYSTEMATICS

The systematic arrangement at family, generic and subgeneric level follows that of the Treatise on Invertebrate Paleontology (Moore, 1969) except in the case of the Cardiidae where we have followed the generic diagnoses given by Wilson and Stevenson (1977).

Order Veneroida H. Adams & A. Adams, 1856

Superfamily Veneroidea Rafinesque, 1815

Family Veneridae Rafinesque, 1815

Genus *Pitar* Römer, 1857

Type species: *Venus tumens* Gmelin, 1791; M.

Subgenus *Pitarina* Jukes-Browne, 1913

Type species: *Cytherea citrina* Lamarck, 1818; OD.

***Pitar (Pitarina) marrowae* n.sp.**

Plate 1a-d

Description

Shell ovate, equivalve, inequilateral (the anterior end of shell being less than one quarter of maximum length), well inflated, lightweight but sturdy; umbones prosogyrate; lunule well developed, heart-shaped, raised centrally, striate, defined by a faint impressed line; antero-dorsal margin short, slightly convex, sharply sloping, narrowly convex terminally; postero-dorsal margin slightly convex, gently sloping, evenly convex posteriorly; ventral margin evenly convex. Shell smooth with the exception of concentric growth ridges, eroded posteriorly. Periostracum, not observed. Ligament narrow, impressed, light brown in colour. Hinge of left valve with anterior lateral tooth well developed, peg-like, ventrally excavate; anterior cardinal thin, joined to median cardinal forming an inverted v-shape; posterior cardinal long, ridge-like, separated from the median cardinal by a deep pit; posterior lateral thin, parallel to nymph. Hinge of right valve with paired anterior lateral teeth (dorsal knob-like, ventral ridge-like); anterior cardinal short, narrow; median cardinal solid, bifid, triangular; posterior cardinal bifid, elongate; posterior lateral low ridge-like, remote. Muscle attachment scars well defined; anterior adductor scar teardrop-shaped, posterior adductor scar larger and more ovate. Pallial line thin, ragged. Pallial sinus wide, moderately deep, ascending, pointed terminally. External shell colouration cream-yellow with a broad purple ray extending posteriorly over one third of shell surface, umbones cream, escutcheon pale, surrounded by yellow and purple bands; internally white to cream with a purple stain limited to area of pallial sinus and posterior adductor scar; posterior margin brown.

Type Material

Holotype: QM-MO32900, 1 pv, on sandy mud flats at low tide, Dingo Beach, N.Qld, 20°05'S, 148°30'E. 1985, J.Lamprell.

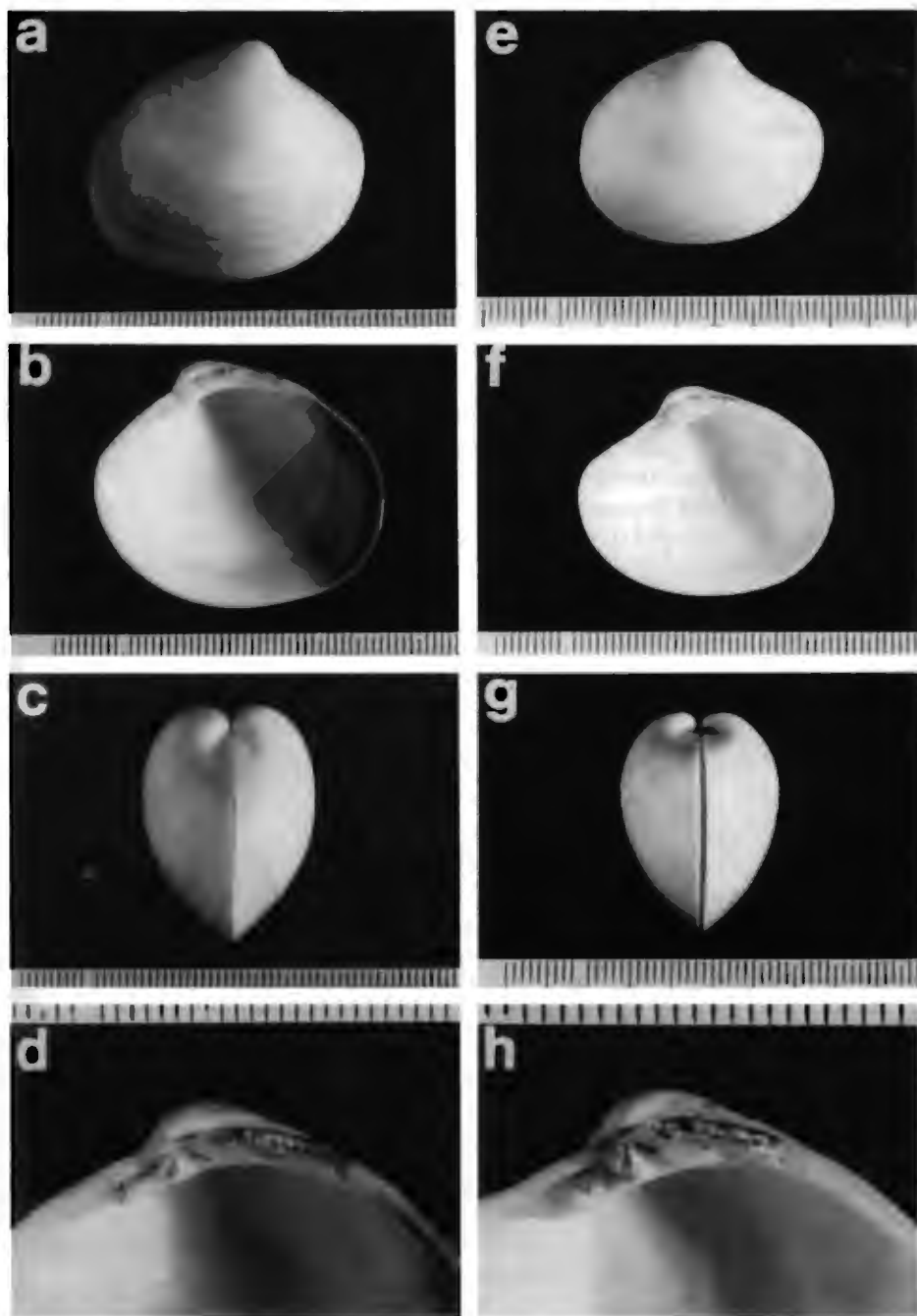


Plate 1. **a-d.** *Pitar (Pitarina) marrowae* n.sp. Holotype; QM-MO32900, Dingo Beach, N.Qld. J. Lamprell. **a**, rv, exterior; **b**, rv, interior; **c**, anterior view of pv; **d**, rv, hinge. **e-h.** *Pitar (Pitarina) potteri* n.sp. Holotype; QM-MO32902, 9-12 m Palm Island, N.Qld. K. Lamprell, P. Spoor. **e**, rv, exterior; **f**, rv, interior; **g**, anterior view of pv; **h**, rv, hinge. (All scales in mm).

Paratypes: AM-C166905, MV-F60432, WAM 559-91, 3 pv, Palm Island, N. Qld, 18°40'S, 146°35'E, subtidal, 1990, K. Lamprell; QM-MO32901, 3 pv, Palm Island, 18°40'S, 146°35'E, N.Qld; subtidal. 1990, K.Lamprell.

Other Material

Lamprell collection: Shelley Beach, Townsville, N.Qld, subtidal. 1990, K. Lamprell; Palm Island, N.Qld, subtidal. 1990, K. Lamprell.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
Holotype				
QM-MO32900	1pv	38.1	33	23.8
Paratypes				
AM-C166905	1pv	39.1	34.4	25.7
WAM 559-91	1pv	37.8	33.8	23.7
MV-F60432	1pv	35	29.9	23.1
QM-MO32901	1pv	39.5	33.2	27.2
"	1pv	33.1	28.7	21.4
"	1pv	24.3	21	15.8

Sample size: 7pv. Length:height ratio-mean 1.15:1, range 1.12-1.19:1, length:width ratio-mean 1.54:1, range 1.45-1.6:1.

Remarks

Perhaps most similar to *Pitar (Pitarina) trevori* Lamprell and Whitehead, 1990 and *Pitar (Pitarina) spoori* Lamprell and Whitehead, 1990, *Pitar marrowae* can be distinguished from these species by colour (uniformly cream in *P. trevori*, posterior band brown with chevrons in *P. spoori*); depth of pallial sinus (wide in *P. spoori*, narrow in *P. trevori* and *P. marrowae*); ventral margin (flattened in *P. spoori*, well rounded in *P. trevori*, and intermediate in *P. marrowae*); position of umbones (closer to posterior margin in *P. spoori* and *P. marrowae* than in *P. trevori*). *Pitar (Pitarina) subpellucidus* (Sowerby, 1851) is similar to *P. marrowae* in shape, but is brown (darker posteriorly in region of broad ray) with a dark blotch on the lunule (blotch also seen in *P. spoori*). *Pitar citrina* (Lamarck, 1818) differs from *P. marrowae* in the marked thickness and angular margin of its shell, and robust teeth set on a broad, heavy hinge plate. Similarly, *Pitar potteri* (described below) differs from *P. marrowae* in being a heavier shell with thicker cardinal teeth. It can also be distinguished from *P. marrowae* by its margin profile (strongly convex anteriorly, truncate posteriorly), internal colour (uniformly white) and external colour (multiple brown rays which degenerate into chevrons near the umbones). *P. marrowae* is consistent both in colour and shell form.

Distribution

Apparently restricted to northern Queensland where it has been recorded from the type locality (Dingo Beach), Bowen, Shelley Beach, Townsville and Palm Island. This species occurs buried in littoral sand and can usually be collected after rough weather.

Etymology

Named for Mrs. Lorna Marrow who has generously provided bivalve material for study by one of us (KL).

***Pitar (Pitarina) potteri* n.sp.**

Plate 1e-h

Description

Shell ovate, equivalve, inequilateral (the anterior end of shell being less than one third of maximum length), well inflated, solid; umbones prosogyrate; lunule well developed, heart-shaped, flattened, striate, defined by a faint impressed line; antero-dorsal margin short, straight, sharply sloping, narrowly convex terminally; postero-dorsal margin broadly convex, gently sloping; ventral margin evenly convex. Shell smooth with the exception of finely incised, concentric growth lines; periostracum not observed. Ligament narrow, impressed, brown in colour. Hinge of left valve with anterior lateral tooth strongly developed, peg-like; anterior cardinal thin, joined to solid, triangular median cardinal forming an inverted v-shape; posterior cardinal solid, thin, oblique; posterior lateral thin, parallel to nymph. Hinge of right valve, anterior lateral teeth paired, ridge-like, separated by a deep socket; anterior and median cardinals narrow and short; posterior cardinal bifid, elongate; posterior lateral low ridge-like, remote. Muscle attachment scars well defined, anterior teardrop-shaped, posterior rounded. Pallial line thin, smooth on its ventral edge. Pallial sinus well developed extending one third of shell length, wide, rounded terminally. External shell colouration cream/yellow with prominent chevron markings umbonally, fusing into a variable number of brown rays which extend ventrally across shell surface; umbones white; posterior margin of lunule with purple blotch; shell internally white.

Type Material

Holotype: QM-MO32902, 1pv, Palm Island, N.Qld, 18°40'S, 146°35'E, trawled in 9-12 m in sand and rubble Nov 1990, K. Lamprell, P. Spoor.

Paratypes: AM-C142109, 1pv, Broadhurst Reef east of Townsville, N.Qld, 18°57'S, 147°47'E, subtidal 27-28 Sept 1975, I. Loch; AM-C105246, 1pv, Watsons Bay, Lizard Island, N.Qld, 14°40'S, 145°27'E, 10.5 m on sandy bottom. Dec 1975, W. Ponder, P. Colman, I. Loch; AM-C142108, 1pv, Rudder Reef, NE Port Douglas, N. Qld, 16°13'S, 145°40'E, intertidal. 1977, I. Loch; AM-C8621, 1pv, Lizard Island, N. Qld, 14°40'S, 145°28'E, A. E. Finchk; WAM 560-91, MV-F60433, 2pv Palm Island, N.Qld, 18°40'S, 146°35'E subtidal. Nov 1990, K. Lamprell, P. Spoor.

Other Material

Lamprell collection: Palm Island, N.Qld, subtidal. Nov 1990, K. Lamprell, P. Spoor; Shelley Beach, Townsville, N.Qld. 1988, P. Spoor.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
Holotype				
QM-MO32902	1pv	32.5	27.5	19.8
Paratypes				
AM-C142109	1pv	32.3	28	22.1
AM-C105246	1pv	32.2	28	19
AM-C142108	1pv	30.5	26.5	19.4
AM-C8621	1pv	32	27.2	20.3
WAM 560-91	1pv	31.4	27.5	19.8
MV-F60433	1pv	33.2	28.2	21.4

Sample size: 7pv. Length:height ratio - mean 1.16:1, range 1.14-1.18:1; length:width - mean 1.59:1, range 1.46-1.82:1.

Remarks

The combination of a relatively thick shell, robust hinge teeth and plate, distinct colouration (internally white, externally with brown rays which become chevrons umbonally and obsolete ventrally) and the profile of anterior and posterior margins clearly distinguish *P. potteri* from other *Pitarina* species found in Australian waters. Individually these character states can be found in other species: the thick shell and teeth (*Pitar (Pitarina) citrina*); uniformly white interior (some *Pitar (Pitarina) pellucidus*, *Pitar (Pitarina) nancyae*, *Pitar (Pitarina) trevori*); chevron pattern externally (*Pitar (Pitarina) spoori*, *P. nancyae*); truncate posterior margin and pointed anterior margin (*P. spoori*, *P. nancyae*). Apart from variation in the extent of the chevron patterning around the umbones, the morphological characters of this species appear to be very consistent.

Distribution

The species occurs in Queensland, from the mainland (Dingo Beach and Townsville) to offshore islands (Palm Island, Lizard Island) and the Great Barrier Reef (Batt Reef, Rudder Reef, Broadhurst Reef); and also in Western Australia (Monkey Mia) where it attains a much larger maximum size (length 56 mm, height 52 mm and width 35.5 mm). Usually found buried in sand around coral reefs but also in littoral sand, usually after rough weather.

Etymology

Named for Mr Darryl Potter, Queensland Museum in recognition of his assistance in this work and previous projects.

Genus *Dosinia* Scopoli, 1777

Type species: *Venus concentrica* Born, 1778 fide Fischer-Piette, 1942; M.

Dosinia lochi n.sp.

Plate 2a-d

Description

Shell ovate, equivalve, inequilateral (the anterior end of shell being more extended than the posterior end), slightly inflated, solid; umbones prosogyrate,

lunule narrow, poorly defined; antero-dorsal margin extended, almost straight, sloping, narrowly convex at the anterior margin; postero-dorsal margin slightly convex, sloping; ventral margin evenly convex. Shell with fine concentric striae and noticeable, irregular growth lines; internally with faint radial grooving marginally. Periostracum and ligament not preserved; escutcheon narrow, elongate. Hinge plate narrow. Hinge of left valve with anterior lateral tooth low, peg-like; anterior cardinal blade-shaped and bifid; median cardinal solid, bifid, posterior section of tooth markedly larger than anterior section; posterior cardinal elongate, curved, blade-shaped. Hinge of right valve with obsolete anterior laterals forming an elongate socket to accomodate anterior lateral of left valve; anterior cardinal short, ridge-like; median cardinal solid, triangular; posterior cardinal bifid, posterior section larger than anterior. Muscle attachment scars well defined, anterior adductor scar teardrop-shaped; posterior adductor scar elongate ovate. Pallial line thin; pallial sinus narrow, deep, rounded terminally, sharply ascending. Shell colouration internally and externally cream-yellow.

Type Material

Holotype: AM-C61569, 1rv, low tide, Boucaut Bay, Arnhem Land, NT, 12°01'S, 134°28'E. Apr 1938, Mel Ward.

Paratypes: AM-C61569, 6lv, 6rv, same data as holotype.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
Holotype				
AM-C61569	1rv	24.9	23	6.7
Paratypes				
AM-C61569	1lv	24.5	22.7	6.4
	6rv	28.8	26	8 (largest)

Sample size: 13 valves (6lv, 7rv). Length:height ratio - mean 1.09:1, range 1.08-1.11:1; length:width -mean 1.85:1, range 1.79-1.95:1.

Remarks

Dosinia lochi differs from all other representatives of the genus in having a markedly produced anterior margin and in the poorly defined nature of the lunule (deeply impressed in other species). Such differences may necessitate the creation of a new subgenus or even a new genus for this species. However the subfamily Dosiniinae is in need of revision, and for this reason we retain *D. lochi* within *Dosinia* s.l. *Dosinia kaspiowi* Fischer-Piette and Delmas, 1967, *Dosinia diana* Adams and Angas, 1868 and *Dosinia queenslandica* n.sp (see below) show similar very fine concentric ridges to those observed in *D. lochi*, but all these species differ from *D. lochi* in having the escutcheon depressed and defined by raised ridges. Escutcheonal ridges are also absent in *D. sculpta* and *D. circinaria* but these species differ from *D. lochi* in shell shape and in having yellow umbones (externally), a wider pallial sinus and in *D. sculpta* radial ridges (stronger anteriorly). Since all available material of *D. lochi* was dead-collected over 50 years ago, it remains to be demonstrated that this species is still extant. Hopefully further collecting in the area around Boucaut Bay will help to settle the issue.

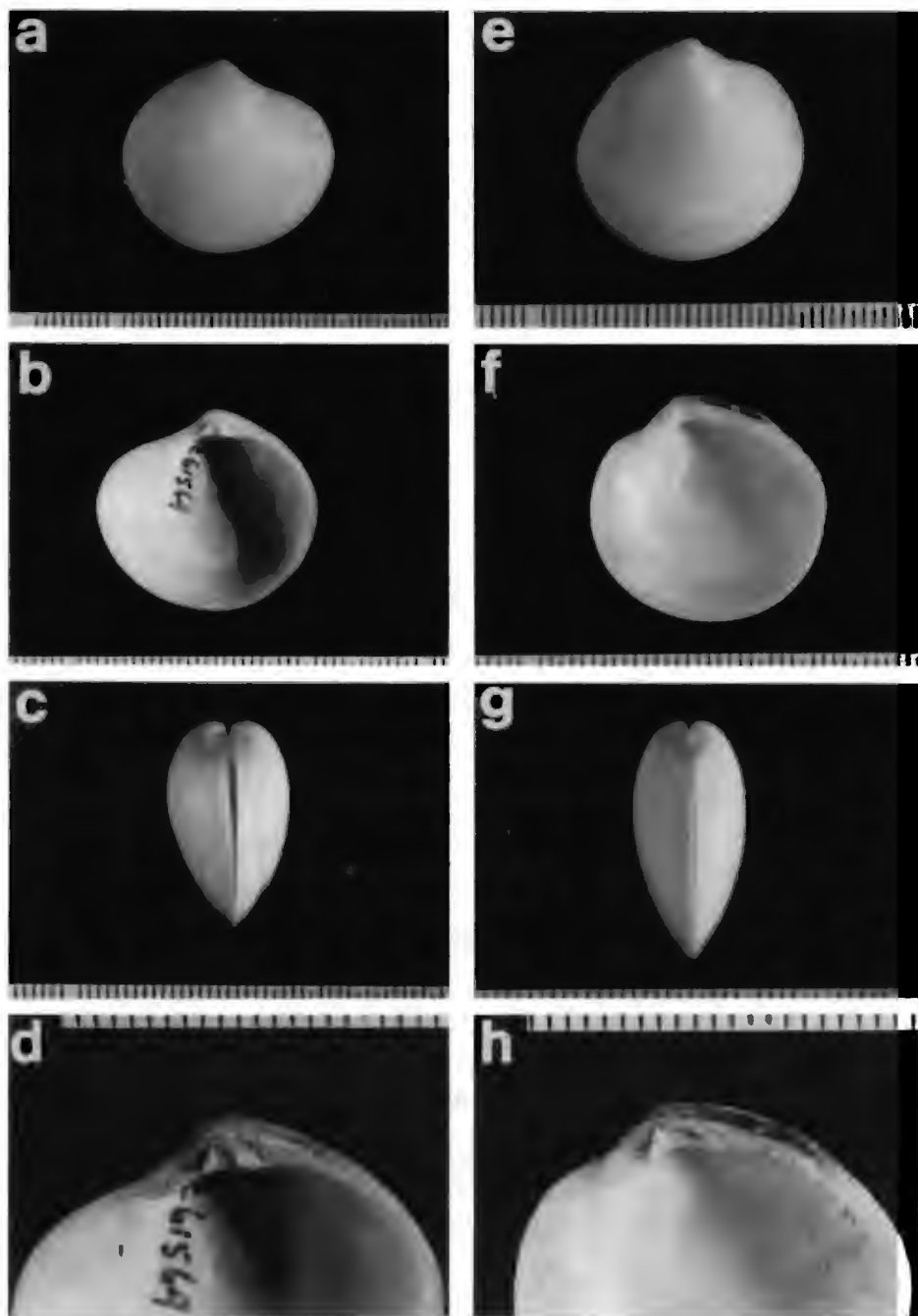


Plate 2. **a-d.** *Dosinia lochi* n.sp. Holotype; AM-C61569, Boucaut Bay Arnhem Land, N.T. M. Ward. **a**, rv, exterior; **b**, rv, interior; **c**, anterior view of holotype (rv) paired with similar sized lv paratype; **d**, rv, hinge. **e-h.** *Dosinia queenslandica* n.sp. Holotype; QM-MO32903, trawled 9 m between Palm and Fantome Islands, N.Qld. K. Lamprell, P. Spoor. **e**, rv, exterior; **f**, rv, interior; **g**, anterior view of pv; **h**, rv, hinge. (All scales in mm).

Distribution

Known only from the type locality.

Etymology

Named for Mr. Ian Loch, Collection Manager at the Australian Museum (Malacology) for his continued interest and assistance in the ongoing study of the Australian Bivalvia.

Dosinia queenslandica n.sp.

Plate 2e-h

Description

Shell ovate, equivalve, inequilateral (the posterior being three quarters longer than the anterior) weakly inflated, solid; umbones prosogyrate; lunule lanceolate, raised centrally, impressed peripherally, surrounded by the raised ends of the concentric ridges, striate; escutcheon long, narrow, raised centrally, defined by a raised ridge; ligament partially impressed; antero-dorsal margin short, convex, sloping, widely convex at the anterior margin; postero-dorsal margin slightly convex, sloping, becoming widely convex at the posterior margin; ventral margin evenly and widely convex. Shell with fine concentric ridges becoming lamellose at the antero- and postero-dorsal margins, with regular growth-rest lines; periostracum pale straw coloured. Ligament long narrow, olive in colour. Hinge plate narrow. Hinge of left valve with anterior lateral tooth low; anterior cardinal blade-shaped and bifid; median cardinal solid, triangular, slightly curved; posterior cardinal elongate, curved, blade-shaped. Hinge of right valve with socket to accommodate anterior lateral of left valve; anterior cardinal short, ridge-like; median cardinal solid, triangular; posterior cardinal bifid, elongate. Muscle attachment scars well defined, anterior adductor scar teardrop-shaped; posterior adductor scar elongate-ovate. Pallial line thin. Pallial sinus deep, rounded terminally, sharply ascending. Shell colouration internally and externally off-white.

Type Material

Holotype: QM-MO32903, 1pv, between Palm and Fantome Islands, N.Qld, 18°40'S, 146°35'E trawled 9 m, 1989, K. Lamprell, P. Spoor.

Paratypes: AM-C166906, MV-F60434, WAM 561-91, 6 pv, same data as holotype.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
Holotype				
QM-MO32903	1pv	22.3	21.8	10.2
Paratypes				
AM-C166906	2pv	21	19	10.3
		22	21	9.5
MV-F60434	2pv	21.3	20	9
		20.7	19	8.7
WAM 561-91	2pv	20.8	19.3	9.7
		19.5	19	9.1

Sample size: 7pv. Length:height ratio - mean 1.06:1, range 1.02-1.11:1; length:width ratio - mean 2.24:1, range 2.04-2.4:1.

Remarks

A relatively small member of the genus, *Dosinia queenslandica* shares with *Dosinia kaspiewi* Fisher-Piette and Delmas, 1967 and *Dosinia diana* Adams and Angas, 1868 a depressed escutcheon defined by raised ridges and with fine concentric striae. *D. queenslandica* differs from these two species in having the umbones only slightly raised above the lunule area (umbones well raised in *D. kaspiewi*, *D. diana* and *D. lochi*) a feature also observed in *Dosinia sculpta* (Hanley, 1845) and *Dosinia circinaria* Deshayes, 1853. Differences in size, sculpture and umbonal colour however, easily separate *D. queenslandica* from *D. sculpta* and *D. circinaria*. We have observed little variation in either colour or shell structure in this new species.

Distribution

From south (Hervey Bay) to north (off Palm Island and from Little Trunk Reef) Queensland. Collected after rough weather in littoral areas and dredged live to 10 m, buried in coarse sand.

Etymology

Named for Queensland.

Superfamily Cardioidea Lamarck, 1809

Family Cardiidae Lamarck, 1809

Genus *Acrosterigma* Dall, 1900

Type species: *Cardium dalli* Heilprin, 1887; OD

Acrosterigma kerslakae n.sp.

Plate 3a-d

Description

Shell ovate, equivalve, inequilateral, moderately inflated, light-weight; umbones prosogyrate, lunule short, narrow, flattened; anterior margin more convex than posterior; posterior margin slightly truncate; ventral margin evenly convex. Ribs 38-42 (mean 40), low, rounded, becoming angulate posteriorly; outline of ribs and rib interstices faintly impressed internally, stronger marginally; margins crenulate; rib interstices very narrow, almost obsolete. Ornamentation of ribs consisting of raised scales which become obsolete centrally and knob-like posteriorly. Periostracum not observed. Ligament external, short, well developed, brown in colour, divided by nymphs. Hinge of left valve, anterior lateral tooth raised, triangular; cardinals unequal, anterior much larger than the posterior; posterior lateral forming a low wide ridge; right valve anterior lateral tooth paired, the ventral much longer and more strongly developed; anterior cardinal poorly developed, joined dorsally to well developed posterior cardinal, forming a deep socket for anterior cardinal of left valve; posterior lateral strong, ridge-like. Nymphs plate-like, smooth, well developed. Muscle attachment scars defined, rounded, approximately equal in size, smooth ventrally rugose dorsally. Pallial line complete, convex ventrally. Shell colouration cream-yellow with prominent pink-brown blotches, fused near umbones. Lunule pink-brown, umbones white with flecks of colour. Internally white, often with pink spots umbonally.

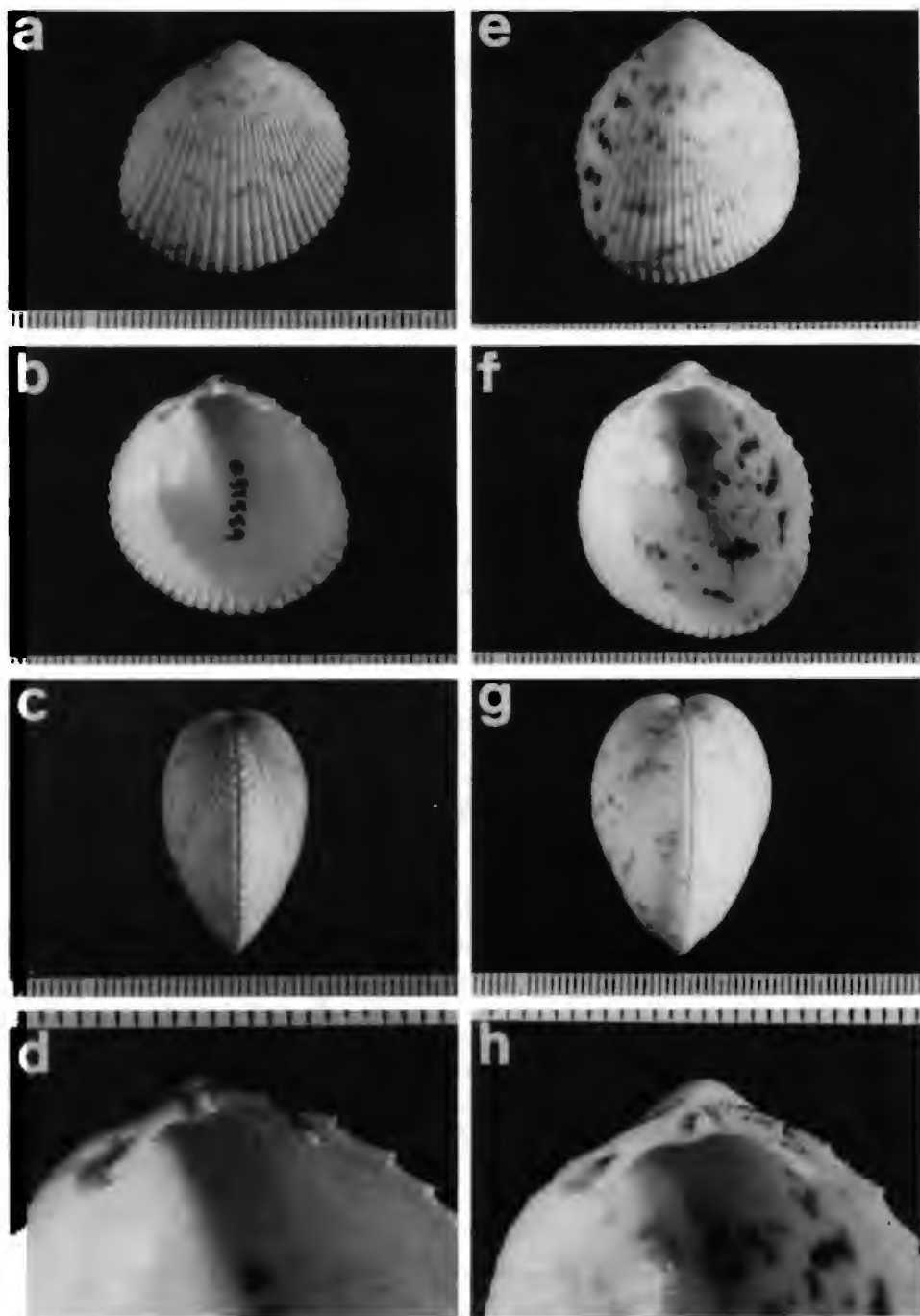


Plate 3. **a-d.** *Acrosterigma kerslakei* n.sp. Holotype; AM-C31559, Burpengary Qld. **a**, rv, exterior; **b**, rv, interior; **c**, anterior view of pv; **d**, rv, hinge. **e-h.** *Acrosterigma punctolineata* n.sp. Holotype; QM-MO32905, 9 m Little Trunk Reef N.Qld. K. Lamprell, P. Spoor. **e**, rv, exterior; **f**, rv, interior; **g**, anterior view of pv; **h**, rv, hinge. (All scales in mm).

Type Material

Holotype: AM-C31559, 1pv, Burpengary, Qld, 27°10'S, 152°57'E.

Paratypes: AM-C80164, 6rv, 5lv, 1pv, Long Reef, Collaroy, NSW, 33°45'S, 151°19'E. P.Colman; QM-MO32904, 5rv, 1lv, Southport Qld, beach, 27°58'S, 153°25'E; QM-MO33056, 3rv, 2lv, Caloundra, Qld, beach, 26°48'S, 153°09'E.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
Holotype				
AM-C31559	1pv	27.9	28	16.5
Paratypes				
AM-C80164	6rv	35.2	39.7	12.8 (largest)
	4lv	34	36.4	11.5 (largest)
	1pv	25.2	26.5	17.4
QM-MO32904	5rv	28.1	30.1	9.3 (largest)
	1lv	19.3	20	6
QM-MO33056	3rv	32	27	11 (largest)
"	2lv	32	22	11 (largest)

Sample size: 2pv, 14rv, 7lv. Length:height ratio - mean 0.91:1, range 0.8-0.99:1; length:width ratio - mean 1.45:1, range 1.28-1.69:1.

Remarks

The general shell structure and colouration of *Acrosterigma kerslakeae* appear very close to the southern Australian species *A. cygnorum* (Deshayes, 1855). The new species however differs consistently from *A. cygnorum* in its smaller adult size, the narrow, almost obsolete nature of the rib interstices (narrow but nevertheless clearly visible in *A. cygnorum*) and the superficial nature of the internal impressions of the rib interstices (well developed and extending almost to the centre of each valve in *A. cygnorum*). The species appears to be remarkably consistent in colour throughout its known range (southern Queensland to Sydney, New South Wales), in contrast to *A. cygnorum* which may be mottled, white or uniformly yellow. According to Wilson & Stevenson (1977), *A. cygnorum* ranges north to Montague Island (New South Wales, 300 km south of Sydney) on the east coast. Mr. Philip Colman advises that the Australian Museum has specimens of *A. cygnorum* from as far north as Nowra (120 km south of Sydney). Despite this gap between the known ranges of the two species, it is possible that further collecting may reveal sympatric populations of *A. kerslakeae* and *A. cygnorum* in the vicinity of, or just south of Sydney.

Distribution

Southern Queensland to Sydney, New South Wales. Habitat unknown. Found on the shore after rough weather.

Etymology

Named for the late Mrs Joy Kerslake who, while assisting in curation of the bivalve section of the Australian Museum Collection, recognized this species as distinct.

Acrosterigma punctolineata n.sp.

Plate 3e-h

Synonyms: *Cardium foveolatum* Sowerby. Reeve, 1845; pl.18, fig. 87. (non *Cardium foveolatum* Sowerby, 1840).

Cardium foveolatum Sowerby. Hanley, 1842-1856; p.138, pl.17, fig.31 (non Sowerby, 1840).

Description

Shell dorso-ventrally elongate, equivalve, slightly inequilateral, strongly inflated, light-weight; umbones prosogyrate, lunule short, narrow, flattened; anterior margin weakly convex; posterior margin truncate; ventral margin unevenly convex. Ribs 45-50 (mean 48), low, rounded, becoming angulate posteriorly; outline of ribs visible internally; valve margins crenulate; interstices narrow. Ornamentation of ribs consisting of weak scales anteriorly, becoming obsolete centrally and knob-like to spinose posteriorly. Periostracum thin, olive coloured. Ligament external, short, well developed, divided by nymphs. Hinge of left valve with anterior lateral tooth well developed, triangular; cardinals paired, anterior much larger than posterior; posterior lateral small, knob-shaped; right valve anterior lateral teeth paired, long, broadly triangular, ventral markedly stronger than dorsal; cardinals paired, anterior almost obsolete, connecting dorsally with strongly developed, triangular posterior cardinal; posterior lateral strong, triangular, raised. Nymphs plate-like, well developed, finely pustulose. Muscle attachment scars defined, approximately equal in size. Pallial line entire, convex ventrally. Shell colouration white with broken green-brown lines and black spots posteriorly. Lunule white; umbones white with flecks of colour; nymphs pinkish. Internally white with scattered purple blotches.

Type Material

Holotype: QM-MO32905, 1pv, Little Trunk Reef, N.Qld, 18°20'S, 146°46'E, by dredge 9 m. Nov 1990, K. Lamprell, P. Spoor.

Paratypes: AM-C103660, 1pv, off Rocky Point, Lizard Island, N.Qld, 9 m coral and sand bottom 14°40'S, 145°26'E, Dec 1974, W. F. Ponder, P. H. Colman, I. Loch; AM-C165368, 1pv, Stn 2067, N.Qld, 13°49'S, 144°17'E. 7-10 m, scattered coral heads on sand, NW side of reef. 7 Dec 1981, I. Loch; AM-C165369, 1pv, Stn 2368, Macgillivray Cay, N.Qld, 14°39'S, 145°29.5'E, 9-15 m, sand rubble and coral, NW side. I. Loch, D. Young, R. Johnson; AM-C165370, 1rv, Stn 2383, No.10 Ribbon Rf, N.Qld, 14°55'S, 145°42'E, 4.5-18 m, sandy rubble and scattered coral heads. 17 Dec 1982, I. Loch.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
Holotype				
QM-MO32905	1pv	29.9	35.7	24
Paratypes				
AM-C103660	1pv	26.5	30.8	19.2
AM-C165368	1pv	20.5	24	15.8

Dimensions

		Length (mm)	Height (mm)	Width (mm)
AM-C165369	Ipv	18.6	21.4	13.4
AM-C165370	Irv	19.6	23.4	7.4

Sample size: 5pv. Length:height ratio - mean 0.85:1, range 0.84-0.87:1; length:width ratio - mean 1.32:1, range 1.24-1.38:1.

Remarks

A distinct, small to moderate-sized *Acrosterigma* previously confused in the literature with other species. Reeve (1843-1878) and Hanley (1842-1856) both associated the name '*Cardium*' *foveolatum* Sowerby, 1840 with this species. However, there is considerable uncertainty as to the actual status of Sowerby's species, because of the apparent absence of any designated type material. Sowerby's original description and good, coloured illustration (1840a,b,fig 65) clearly do not correlate with the specimens illustrated (also in colour) under the name '*Cardium foveolatum*' Sowerby by either Reeve or Hanley. In addition, Sowerby's stated locality for '*Cardium foveolatum*' ('Swan River' — that is, in the vicinity of Perth, Western Australia), is inconsistent with the known Australian range of *A. punctolineata* (Queensland only) although we have examined *A. punctolineata* from the Philippines (Lamprell and Marrow collections). Mr Ron Voskuil (Netherlands, pers. comm.) has demonstrated to us that Reeve's illustrated specimen of '*Cardium foveolatum*' Sowerby, matches our *A. punctolineata*. In the absence of designated type material the identity of Sowerby's '*C. foveolatum*' is at present impossible to resolve. What is certain is that the name does not apply to our new species (*A. punctolineata*) even though Reeve and Hanley illustrated our shell as '*C. foveolatum*' Sowerby. Although species such as *Acrosterigma fultoni* (Sowerby, 1916) and occasional specimens of *Acrosterigma flava* (Linnaeus, 1758) also show a dark-flecked pattern, these are coarsely-ribbed, robust shells, not easily confused with the thin, finely-ribbed *A. punctolineata*. *Acrosterigma vlamingi* Wilson & Stevenson is similar in size to *A. punctolineata*, but differs from the new species in external and internal shell colouration, rib count and degree of sloping of antero-dorsal and postero-dorsal margins. The new species appears to be very consistent in shell morphology and colouration though occasional specimens may lack the black spotting on the posterior.

Distribution

This species appears to have a wide distribution in the Indo-Pacific region, having been recorded from the Philippines (this study), the Solomon Islands and Indonesia (Voskuil pers. comm.), and in Australian waters, from most parts of the Great Barrier Reef (this study). It is found in coarse sand around coral reefs.

Etymology

Mrs. Thora Whitehead suggested the name for this new species. The name refers to the unusual colouration of the valves: dark lines posteriorly and spots and

blotches elsewhere; *punctolineata* from the Latin, *punctata* = spotted, *lineata* = marked with lines.

Genus *Fulvia* Gray, 1853

Type species: *Cardium apertum* Bruguière, 1789; M.

Fulvia voskuili n.sp.

Plate 4a-d

Description

Shell glossy, ovate, equivalve, inequilateral, well inflated, fragile and semitranslucent; umbones prosogyrate, raised well above margins; lunule large, broad, heart-shaped; anterior margin convex; posterior margin gently sloping, truncate terminally, with a fold on both valves extending from the umbones to the posterior extremity; ventral margin evenly convex. Sculpture of 34 or 35 low, superficial ribs; the interstices of the anterior 14 ribs are ornamented with raised minute denticles which are most pronounced towards the ventral margin; early posterior ribs are bifid, becoming almost obsolete towards the umbones; rib interstices wide. Fine concentric striae extend from the umbonal area to approximately one-third to one-half of the shell surface. Periostracum thin, light brown. Ligament external, short, well developed, straw coloured. Hinge of left valve with anterior lateral tooth long, blade-like, triangular; anterior cardinal raised, peg-shaped; posterior cardinal almost obsolete; posterior lateral low, ridge shaped; in right valve anterior lateral teeth paired, elongate, ventral strongly developed, dorsal poorly developed; anterior and posterior cardinals present, knob-like, with a deep pit ventral to anterior cardinal, posterior lateral ridge-shaped. Nymphs elongate, pinkish. Muscle attachment scars poorly defined. Pallial line entire, poorly defined. External shell colouration cream; umbones yellow with purple blotch anteriorly; lunule yellowish; posterior margin purplish; internally cream, lavender posteriorly.

Type Material

Holotype: QM-MO32906, 1pv, Kelso Reef, N.Qld, 18°20'S, 146°46'E, trawled 10-12 m. 1987, K. Lamprell, P. Spoor.

Paratypes: AM-C166907, 1pv, same data as holotype; MV-F60471, 1pv, Dingo Beach, N.Qld, 20°05'S, 148°30'E, after rough weather. 1987, J. Lamprell.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
Holotype				
QM-MO32906	1pv	33.8	34.3	22
Paratypes				
AM-C166907	1pv	31	31	20.6
MV-F60471	1pv	28.4	28	17.7

Sample size: 3pv (type material), 4pv (Lamprell collection). Length:height ratio - mean 1:1, range 0.98-1.03:1; length:width ratio - mean 1.55:1, range 1.5-1.6:1.

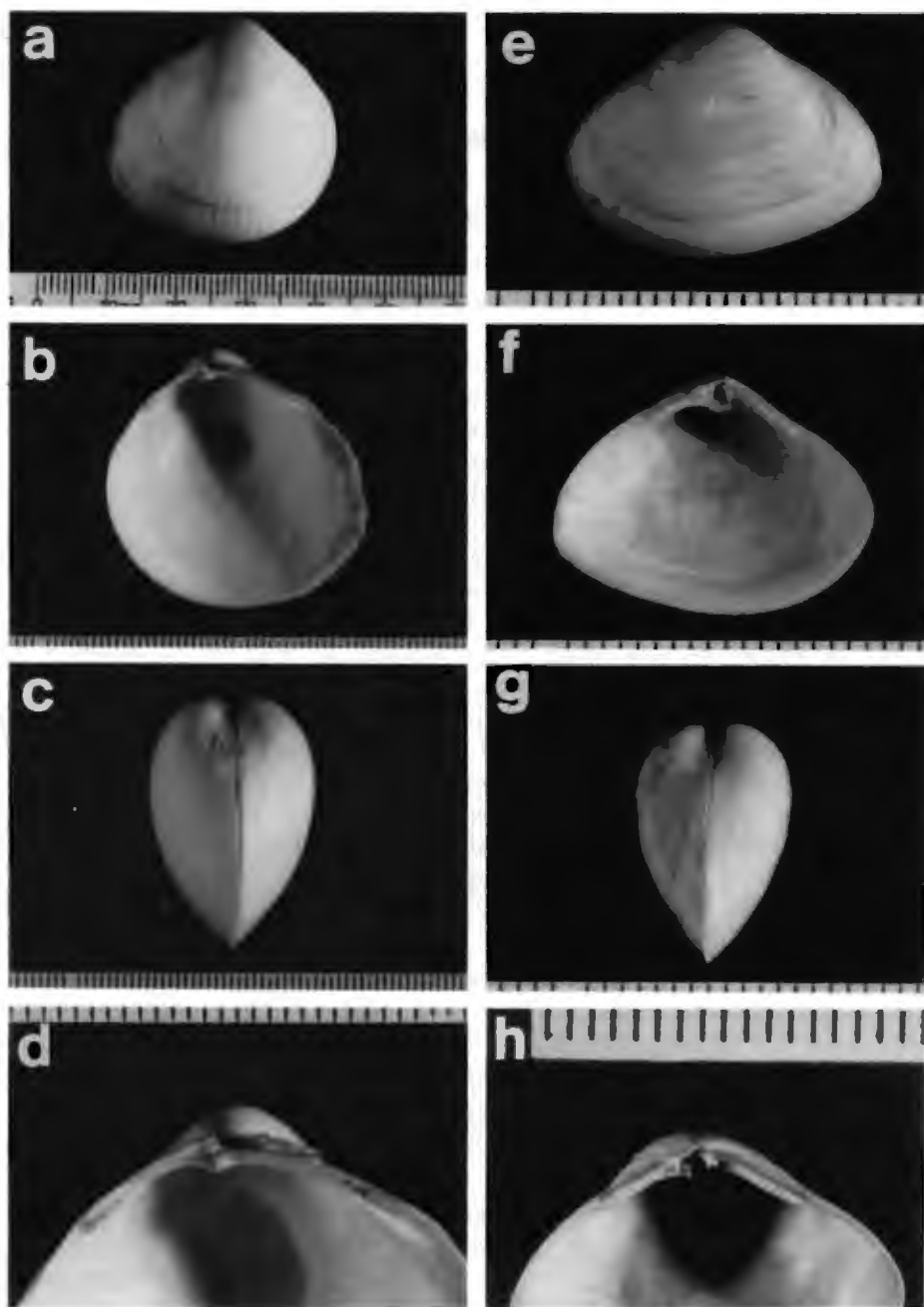


Plate 4. **a-d.** *Fulvia voskuili* n.sp. Holotype; QM-MO32906, 10-12 m Kelso Reef N.Qld. K. Lamprell, P. Spoor. **a**, rv, exterior; **b**, rv, interior; **c**, anterior view of pv; **d**, rv, hinge. **e-h.** *Spisula* (*Notospisula*) *colganæ* n.sp. Holotype; AM-C157345, Kurrumba Gulf of Carpentaria, Qld. D. McMichael, J. Yaldwyn. **e**, lv, exterior; **f**, lv, interior; **g**, anterior view of holotype (lv) paired with similar sized rv paratype; **h**, lv, hinge. (All scales in mm).

Remarks

This species shows all the features characteristic of the genus *Fulvia*, the shell being fragile, ovate, with well inflated valves and microscopically fine denticles associated with the anterior half of the shell. Other species from the Australian region with which *F. voskuili* can be compared are *F. australe* (Sowerby, 1834), *F. aperta* (Bruguière, 1789) and *F. tenuicostata* (Lamarck, 1819). *Fulvia tenuicostata* differs from *F. voskuili*, in its thicker shell, more clearly defined ribs and cream-white colouration with no trace of purple spotting. *Fulvia australe* and *F. aperta* differ from *F. voskuili* in external colouration (pink or orange blotched versus cream in *F. voskuili*), their more numerous ribs, more pronounced posterior extension and straighter dorso-posterior margins. In addition *F. aperta* has a marked posterior gape. *Fulvia voskuili* and *F. aperta* usually both exhibit a large purple blotch posteriorly within each valve. *Fulvia voskuili* appears closest to *F. australe* and in fact occurs sympatrically with this species off the Gove Peninsula. Although some species of *Fulvia* can vary in external colouration (for example *F. australe*), *F. voskuili* appears constant both in shell form and colour.

Distribution

From central Queensland to the Gove Peninsula, Northern Territory. This species is usually found on beaches after rough weather or dredged in shallow water to 12 m.

Etymology

Named for Mr. Ron Voskuil who has provided us with photographs of types, advice and assistance.

Superfamily Mactroidea Lamarck, 1809

Family Mactridae Lamarck, 1809

Genus *Spisula* Gray, 1857

Type species: *Cardium solida* Linnaeus, 1758; SD.

Subgenus *Notospisula* Iredale, 1930

Type species: *Gnathodon parvum* Petit, 1853 [= *Mactra trigonella* Lamarck, 1818]; OD.

Spisula (Notospisula) colganæ n.sp.

Plate 4e-h

Description

Shell subtrigonal to elongate, equivalve, almost equilateral, slightly inflated, moderately thin but strong; umbones orthogyrate, raised slightly above margins, with a poorly developed keel to postero-ventral margin; antero-dorsal margin slightly convex, sloping; anterior margin widely convex; postero-dorsal margin convex, sloping; posterior margin widely truncate; ventral margin gently convex. Sculpture similar on both valves, consisting of fine concentric striae; periostracum not observed. Hinge of left valve with long laterals of equal length, finely ridged

dorsally and ventrally, cardinal bifid; right valve with paired finely ridged laterals, cardinals forming a v-shape. Ligament-pit well developed. Muscle attachment scars well defined, anterior adductor scar rounded, posterior adductor scar tear-drop shaped. Pallial sinus shallow, broad, rounded. Shell colouration white internally and externally.

Type Material

Holotype: AM-C157345, 1lv, Karumba, Gulf of Carpentaria, Qld, 17°29'S, 140°50'E. Dec 1963. D. McMichael, J. Yaldwyn.

Paratypes: AM-C157345, 77lv, 50rv, same data as holotype; AM-C95541, 1rv, 1lv, Boucaut Bay, Arnhem Land, NT, 12°01'S, 134°28'E. Mel Ward.

Other Material

AM-C165371, 4lv, 5rv, Beach near Edward River, Gulf of Carpentaria, Qld, 14°46'S, 141°35'E. 1976, E. Rhodes; AM-C107076, 1lv, 1rv, W of Pt Burrowes SE Gulf of Carpentaria, Qld, 16°57'S, 140°16'E, trawled 18 m. CSIRO Tropical Prawn Project Cruise, RPO 1-76, Stn 3.6, Dec 1976, I. Loch.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
Holotype				
AM-C157345	1lv	18.1	13.5	4.5
Paratypes				
AM-C157345	50rv	19.5	13.5	4.5 (largest)
	77lv	20	15.3	4.4 (largest)
AM-C95541 (pt)	1rv	21.5	14.5	5
	1lv	23	17.5	6

Sample size: 51rv, 79lv. Length:height ratio - mean 1.39:1, range 1.31-1.48:1; length:width ratio - mean 2.14:1, range 1.92-2.4:1.

Remarks

A species obviously close to *Spisula* (*Notospisula*) *trigonella* (Lamarck, 1819), but distinguishable by its elongate valves and poorly inflated valve profile. *Spisula* (*Notospisula*) *austini* Lamprell and Whitehead, 1990 differs from *S. colganæ* in being very thin-shelled with strongly inflated valves, more prominent umbones, less developed ligament pit and an almost obsolete posterior fold. Because no live-collected specimens were available for study (all material derived from the Australian Museum), there remains the possibility that this species is actually subfossil. Further collecting within the Gulf of Carpentaria will be required to confirm the living status of the new species.

Distribution

Known only from Gulf of Carpentaria and Boucaut Bay, Arnhem Land, Northern Territory. Habitat unknown.

Etymology

Named for Ms. Katherine Colgan, from the Bureau of Rural Resources, Fisheries Resource Branch, Canberra.

Superfamily Tellinoidea Blainville, 1814

Family Tellinidae Blainville, 1814

Genus *Tellina* Linnaeus, 1758

Type species: *Tellina radiata*; SD.

Subgenus *Abranda* Iredale, 1924

Type species: *Abranda rex* Iredale, 1924 (pro *T. elliptica* Sowerby, 1868 (non Brocchi, 1814); OD.

***Tellina (Abranda) jeanae* n.sp.**

Plate 5a-d

Description

Shell elongate-ovate, equivalve, equilateral, weakly inflated, fragile, glossy, with typical tellinoidean posterior flexure; umbones opisthogyrate, lunule narrow, lanceolate; ligament olive coloured, well developed, external portion resting on nymphs; antero-dorsal margin slightly but evenly convex, widely convex terminally; postero-dorsal margin straight, attenuate posteriorly; ventral margin evenly convex. Sculpture of fine but strongly incised, concentric ridges and very faint radial striae. Periostracum not observed. Hinge of left valve with anterior lateral poorly defined; anterior cardinal thick, bifid; posterior cardinal ridge-shaped, oblique; posterior lateral tooth remote, almost obsolete; hinge of right valve with oblique anterior lateral tooth close to anterior cardinal; anterior cardinal thin, upright; posterior cardinal oblique, bifid; posterior lateral remote, strong. Muscle scars well defined, anterior teardrop-shaped, posterior smaller and rounded. Pallial sinus well developed, broad, extending almost to the anterior muscle scar in both valves. Shell white internally and externally, translucent; opaque white blotch in the vicinity of umbones.

Type Material

Holotype: QM-MO32907, 1pv, Little Trunk Reef, N.Qld, 18° 10'S, 146° 46'E, trawled 9-12 m in coral sand. Nov 1990, K. Lamprell, P. Spoor.

Paratypes: AM-C165372, 4pv, 3rv, 3 lv, Watsons Bay, Lizard Island, N.Qld, 14° 40'S, 145° 27'E, 10.5 m on sandy bottom. Dec 1975, W. Ponder, P. Colman, I. Loch; WAM 564-91, 1pv, same data as holotype.

Dimensions

	Length (mm)	Height (mm)	Width (mm)
Holotype			
QM-MO32907, 1pv,	24.8	17.3	7.3
Paratypes			
AM-C165372, 4pv,	24.5	16.9	7.4 (largest)
3rv,	21	15.5	3 (largest)
3lv,	27.5	19	4 (largest)
WAM 564-91 1pv	25.2	17.8	7.5

Sample size: 6pv, 3rv, 3lv. Length:height ratio - mean 1.41:1, range 1.35-1.45:1; length:width ratio -mean 3.4:1, range 3.31-3.5:1.

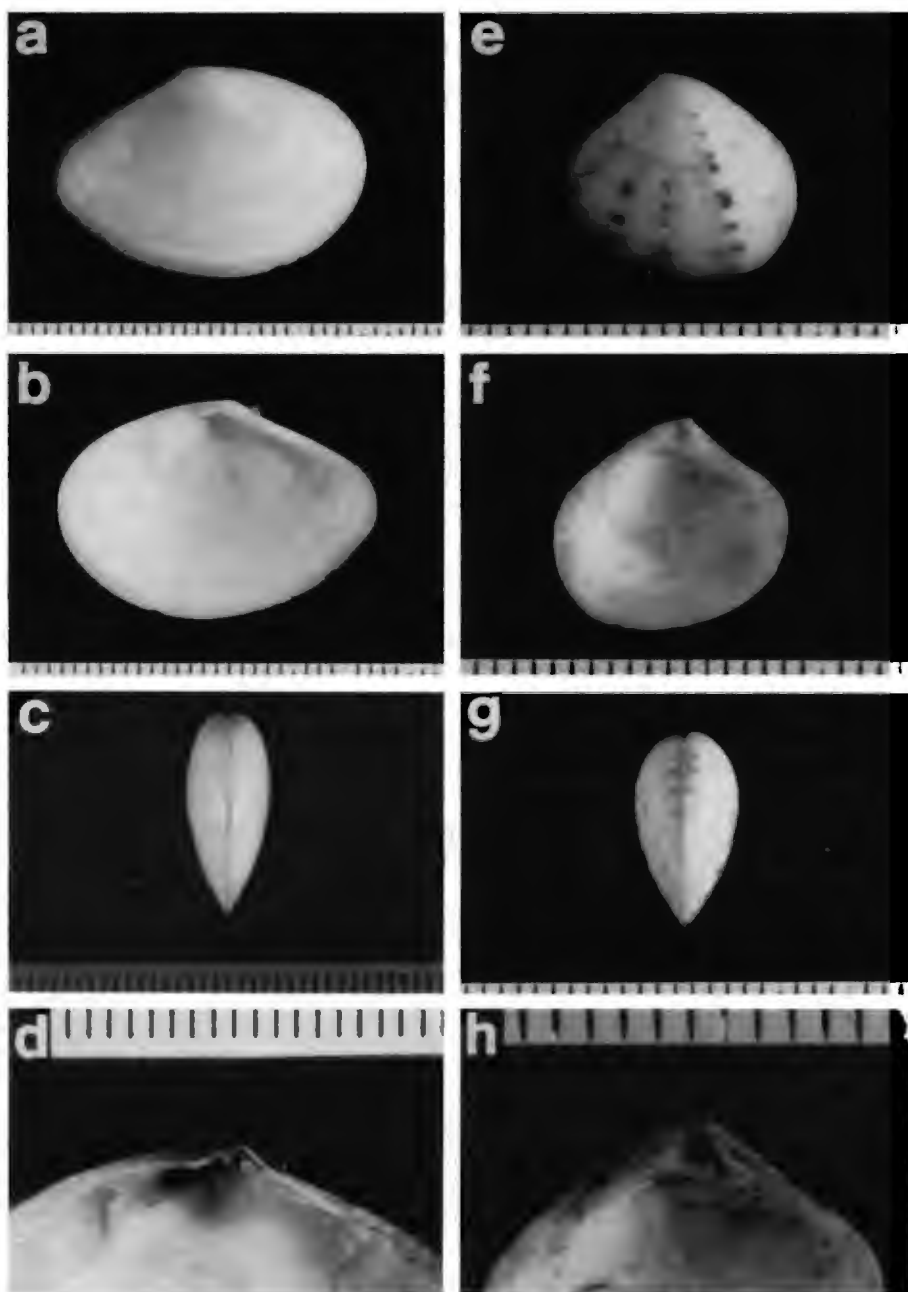


Plate 5. **a-d.** *Tellina (Abranda) jeanae* n.sp. Holotype; QM-MO32907, 9-12 m Little Trunk Reef N.Qld. K. Lamprell, P. Spoor. **a**, rv, exterior; **b**, rv, interior; **c**, anterior view of pv; **d**, rv, hinge. (All scales in mm). **e-h.** *Talabrica donharrisi* n.sp. Holotype; AM-C66728, 101-119 m E of Caloundra, Qld. T. A. Garrard. **e**, rv, exterior; **f**, rv, interior; **g**, anterior view of pv; **h**, rv, hinge. (All scales in mm).

Remarks

Occurring sympatrically with *Macoma (Scissulina) dispar* (Conrad, 1837) at certain localities but easily separated from that species by the sculpture (fine concentric striae, overlain on right valve with parallel, diagonal striations in *M. dispar*); colouration (typically yellow to rose in *M. dispar*); and pallial sinus position in relation to the anterior muscle scar (sinus much closer to scar in *M. dispar*). The strongly incised nature of the concentric ridges also distinguishes *T. jeanae* from other white tellins (including other *Tellina* spp.) of similar shape and it is partly on this basis that we assign the species to the subgenus *Abranda*. The species appears constant in colour and shell morphology throughout its range.

Distribution

Apparently restricted to northern Queensland; occurs both littorally (Townsville, Shelley Beach, Dingo Beach) after rough weather, sublittorally on offshore islands (Palm Island, Lizard Island, Lindeman Islands) and Great Barrier Reef (Little Trunk Reef and Swains Reef). Dredged to 12 m.

Etymology

Named after Mrs. Jean Lamprell who has, over many years, collected much of the bivalve material used in this and previous studies.

Superfamily Crassatelloidea Férussac, 1822

Family Crassatellidae Férussac, 1822

Genus *Talabrica* Iredale, 1924

Type species: *Crassatella aurora* Adams and Angas, 1863; OD.

Talabrica donharrisi n.sp.

Plate 5e-h

Description

Shell trigonally suboval, equivalve, inequilateral, posteriorly elongate, weakly inflated, solid; umbones prosogyrate, lunule well defined, lanceolate; ligament internally situated in the resilifer pit posterior to the posterior cardinal tooth; antero-dorsal margin straight, steeply sloping, narrowly convex terminally; postero-dorsal margin slightly convex, shallow sloping, truncate posteriorly; ventral margin widely convex. Sculpture of coarse, well defined, evenly spaced concentric ridges. Periostracum thin, pale straw coloured. Hinge of left valve with anterior lateral elongate, thin, anterior and median cardinals thick, wedge shaped, posterior lateral long, robust, both laterals pustulose, pinkish. Hinge of right valve, anterior lateral tooth long, ridge-like, anterior cardinal thin parallel to lunule, median cardinal thick, wedge-shaped, posterior lateral thin, both laterals pustulose, pinkish. Muscle scars well defined, anterior reniform, posterior rounded. Pallial line well developed and entire, situated well inside and parallel to the margin. Shell colouration externally, white with 4-5 radiating pink rays, overlain with brown blotches, lunule and escutcheon pink, bordered on each valve by a row of 5 blotches in a stitching pattern.

Type Material

Holotype: AM-C66728, 1pv, 101-119 m E of Caloundra, Qld. T. A. Garrard Coll.

Paratypes: AM-C66728, 1pv, same data holotype; QM-MO32908, MV-F60472, 2pv, Lady Musgrave Lagoon, Qld, 23°55'S, 152°24'E. 1985, D. Harris, V. Harris.

Dimensions

		Length (mm)	Height (mm)	Width (mm)
<hr/>				
Holotype				
AM-C66728	1pv	11.8	10.5	5.7
Paratypes				
AM-C66728	1pv	9	7.5	4.1
QM-MO32908	1pv	11.8	10	5.3
MV-F60472	1pv	8.5	7.1	4

Sample size: 4pv. Length:height ratio - mean 1.19:1, range 1.18-1.2:1; length:width ratio - mean 2.15:1, range 2.07-2.23:1.

Remarks

Little is known about Australian members of the genus *Talabrica*. *Talabrica donharrisi* can be compared with the southern Australian species *T. aurora* (Adams and Angas, 1867), *T. fulvida* (Angas, 1871) (type species of *Salaputium*) and *T. bellula* (A. Adams, 1854). *Talabrica fulvida* reaches only one-third to one-half the size of *T. donharrisi*, has coarser concentric ribbing and is almost uniformly dark pink. *Talabrica aurora* and *T. bellula* on the other hand share similar colouration with *T. donharrisi* but differ in possessing coarser concentric ribbing (wavy in *T. bellula*) and a noticeably elongate shape. The colour pattern of *T. donharrisi* is variable; some specimens have marked pink spotting over the pink rays, some have rays blended with brown, triangular mottlings and others have pink rays only. Morphologically however, the features of the shell are very consistent.

Distribution

Apparently restricted to south and central Queensland in shallow to moderately deep water. Dredged in coarse sand adjacent to coral reefs.

Etymology

Named after Mr Don Harris of Yeppoon who dredged this species and donated specimens for study.

ACKNOWLEDGEMENTS

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LITERATURE CITED

- Hanley, S. 1842-1856. An illustrated and descriptive catalogue of Recent bivalve shells. Williams and Norgate, London. 392 pp.
- Lamprell, K. and Whitehead, T. 1990. Eight new marine bivalves from Australia (Mollusca, Bivalvia). J. Malac. Soc. Aust. 11: 33-52.
- Moore, R. C. (ed.), 1969. Treatise on invertebrate paleontology. Part N, Mollusca 6, Bivalvia 1-2. Geol. Soc. Am. Univ. Kansas. 952 pp.
- Reeve, L. A. 1844b-1845. Conchologia Iconica: or illustrations of the shells of molluscous animals. Vol 11, *Cardium*,. Lovell Reeve, London.
- Sowerby, G. B.(2). 1840. On some new species of the genus *Cardium*, chiefly from the collection of H. Cuming, Esq. Proc. Zool. Soc. Lond. 1840: 105-115.
- Sowerby, G. B.(2). 1832-1841. The conchological illustrations. London.
- Wilson, B. R and Stevenson, S. E. 1977. Cardiidae of Western Australia. Western Australian Museum Special Publication, No. 9:1-114.