

Acrosterigma sewelli (Prashad, 1932), a valid species from the central Indo-Pacific, compared with *Acrosterigma flava* (Linnaeus, 1758) (Bivalvia, Cardiidae)

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The validity of *Acrosterigma sewelli* is demonstrated and a comparison is made with *A. flava*. A detailed description and new data on the distribution are given. Relationships with other *Acrosterigma* species are discussed and diagnostic features are given.

Key words: Bivalvia, Cardiidae, *Acrosterigma*, Indo-Pacific.

Prashad (1932) introduced *Cardium (Trachycardium) sewelli* based on a single complete juvenile specimen, dredged in Indonesia during the Siboga Expedition (1899-1900). His accompanying description is very incomplete. In the extant literature, the species has been cited only by Fischer-Piette (1977: 34) and by Hylleberg (1994: 118-119). Both authors list it as a valid species, at the same time expressing their doubts about the validity, referring to similarities with the well-known *Acrosterigma flava* (Linnaeus, 1758). It seems highly plausible that they did not study specimens that really belong to *A. sewelli*, but based their opinion solely on Prashad's description and figures, probably due to the fact that samples in collections are relatively scarce. For instance, there are no specimens of *A. sewelli* among the circa 200 samples of *A. flava* in the collection of the Nationaal Natuurhistorisch Museum, Leiden (NNM). However, recently more material has become available, enabling the taxonomic confusion to be clarified.

In the present paper the status of *A. sewelli* is discussed and it is compared with *A. flava*. An additional diagnosis is given, together with some remarks about the distribution. Following Wilson & Stevenson (1977), both taxa are assigned to the genus *Acrosterigma* Dall, 1900, which is placed by Schneider (1992) in the subfamily Cardiinae.

Abbreviations: AMS = Australian Museum, Sydney; MNHN = Muséum National d'Histoire Naturelle, Paris; ZMA = Zoologisch Museum, Amsterdam; DW = private collection H. Dekker, Winkel; PA = private collection J.J. ter Poorten, Amsterdam; VD = private collection R.P.A. Voskuil, Delft; H = height; L = length; W = width; p.v. = paired valves; l.v. = left valve; r.v. = right valve.

Acrosterigma sewelli (Prashad, 1932) (figs. 2, 3, 6-9)

Cardium (Trachycardium) sewelli Prashad, 1932: 268, pl. 6 figs. 25-26; Hylleberg, 1994: 118-119.

Cardium (Trachycardium) laddi Abrard, 1946: 33-34, pl. 3 figs. 1-2.

Laevicardium (Vasticardium) sewelli Prashad - Fischer-Piette, 1977: 34.

Type material. - Holotype (ZMA Moll. 3.32.116) L x H x W = 28.7 x 30.8 x 22.0 mm. The type locality is Indonesia, Salibabu Island, anchorage off Lirung (Siboga Expedition, 1899-1900, sta. 133).

Original diagnosis. "This beautiful species, which I associate with the name of my chief, Lt. Col. R. B. Seymour Sewell, Director, Zoological Survey of India, Indian

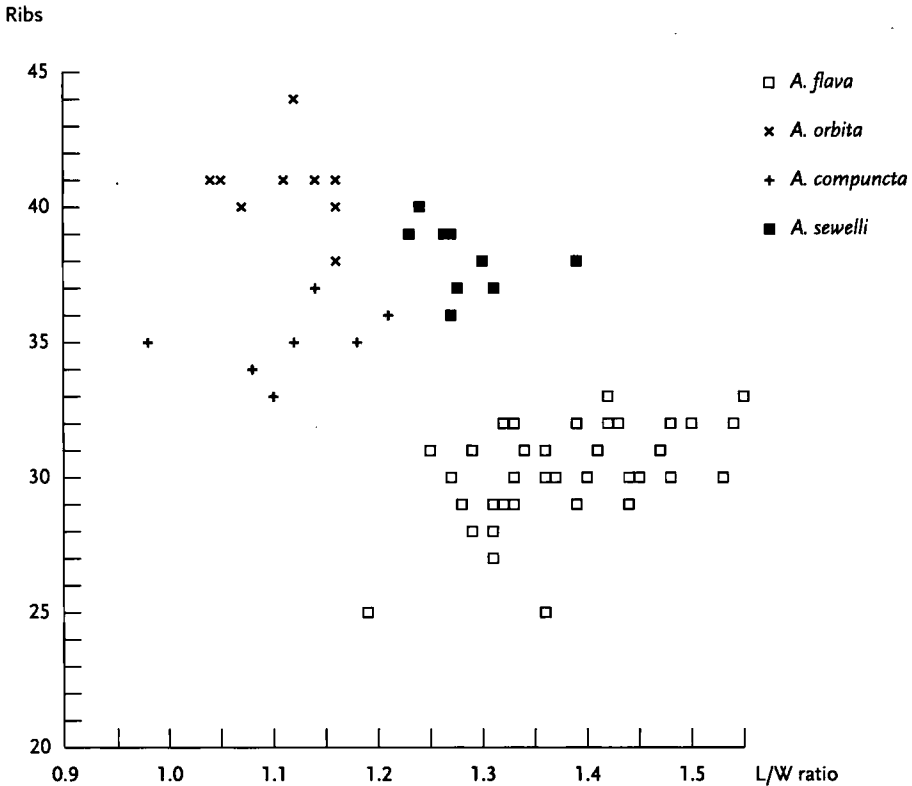


Fig. 1. Relation between length and width and the number of ribs in four allied *Acrosterigma* species. Ribs on left valves were counted. Material studied: *A. flava* - South Africa (PA 521); Mozambique, Inhambane (PA 594); Tanzania, Zanzibar (PA 649); Seychelles, Mahé (PA 96); Maldives (PA 335); Thailand, Phuket (PA 48, 171); Malaysia (PA 522, 523); Philippines (PA 518), Cebu (PA 642), Eastern Quezon Province (PA 97), Luzon (PA 170); Indonesia, Ambon (PA 519), Bali (PA 13, 515), Sumatra (PA 356); Papua New Guinea (PA 17), Krenket Is. (PA 377); Solomon Is., Guadalcanal (PA 169); Australia, Queensland (PA 288); New Caledonia (PA 520). *A. orbita* - Hawaii (PA 49, 210, 321; VD 168, 175, 3968). *A. compuncta* - Japan, Amami Oshima Is. (PA 517, VD 2489, 4778), Okinawa (PA 55, 140). *A. sewelli* - Indonesia, Salibabu Is. (ZMA 3.32.116); Papua New Guinea, Milne Bay District (AMS c.083705); Solomon Is., Guadalcanal (VD 4461); Australia, Queensland (AMS c.168444); New Caledonia, Grand Récif de Koumac (MNHN), Canala (MNHN), Poindimié (MNHN); Fiji Is., Viti Levu (PA 441); Unknown provenance (DW).

Museum, Calcutta, is closely allied to *Cardium* (*Trachycardium*) *flavum* Linn. It is distinguished, however, by the shell being much more quadrate, the anterior ventral and posterior margins almost straight, the umbones neither so prominent nor so convex, the shell more ventricose, and the number of radial ridges as many as 38 as against 28-30 in *C. (T.) flavum*. The ridges further are all ornamented with beautiful scales, which increase in size from the umbonal area to the ventral margin. The grooves between the ridges are also covered with minute scales." (Prashad, 1932: 268).

Additional diagnosis. - Shell relatively large, up to 65 mm in height, solid, higher than long, almost equilateral and strongly inflated (length/height ratio 0.83-0.96, mean 0.89; length/width ratio 1.23-1.31, mean 1.28). Juveniles show a tendency to be more rounded, a characteristic feature of many *Acrosterigma* species. Umbones weakly prosogyrate. Marginal serrations on postero-ventral margin form pointed overlapping teeth. Ribs 36-40 in studied material. Anterior and medial ribs rounded with pronounced, closely set imbricating scales, rounded on anterior slope (fig. 9), more or less chevron-shaped and slightly transverse on central part (fig. 8). Posterior ribs flattened with raised, transverse imbricating scales, more distantly placed and wearing off easily. Interstices about half the width of the medial ribs, narrower on anterior and posterior slopes, with fine growth striae. Periostracum thin, tan-coloured. Lunule and escutcheon narrow but clearly defined. Hinge strong, broad and weakly arched. Left anterior and right posterior cardinal teeth strong, wedge-shaped; left posterior cardinal small; right anterior cardinal very small, close to dorsal margin; left posterior lateral small, with a narrow but deep pit ventrally; left anterior lateral high and compressed, heavily pitted ventrally. Right anterior lateral ventral tooth strong, dorsal one almost obsolete; separated by large, broad notch; right posterior lateral short and moderately high. In both valves lateral teeth approximately equidistant from cardinals. Exterior colouration variable, ranging from white, pale yellow to pale pink, mottled with tan-orange or brownish blotches. Lunule and escutcheon may be pink or purple-coloured. Interior and hinge generally completely white except for lunular margin, which may be pink coloured. Umbonal cavity sometimes pale cream; margins, especially posterior margin, sometimes reddish brown or yellowish brown. Impressions of the rib interstices internally only visible near the margins.

Distribution. - *A. sewelli* seems to be restricted to the tropical part of the central Indo-Pacific. It was formerly known exclusively from its type locality, Indonesia, but more material has become available from Papua New Guinea, Australia, the Solomon Islands, New Caledonia and the Fiji Islands, implying a considerable eastward and southward range extension. The present distribution is still not completely elucidated because the material from Indonesia and the Fiji Islands has not been recently collected. These localities need confirmation. Although not mentioned by Lamprell & Whitehead (1992), *A. sewelli* is also recorded off the coasts of Queensland. The only known live taken specimen originates from a depth of 20-30 metres.

Stratigraphical distribution. - Abrard (1946) introduced *Cardium (Trachycardium) laddi*, which is clearly a junior synonym of *A. sewelli*. It was reported from the Upper Miocene of Foreland Bay, Epi, in Vanuatu.

Discussion. - The investigated material, although originating from widely scattered localities, is rather constant in shape. The characteristic imbricating scales, appearing on all the ribs, are not found in any other congeneric species.

A. flava is very variable, but most forms are less inflated (figs. 1 and 5), more inequilateral, with ribs more or less curved, lacking intercostal sculpture. The posterior ribs carry rather short spatulate spines, the medial ribs have only ridges, usually mainly on their posterior side (fig. 10), and the anterior ribs carry well spaced rugae (fig. 12). The number of ribs is always much lower (mean: 30, range 25-33, fig. 1) and the impressions of the rib interstices are clearly visible internally. The exterior colour ranges from white to tan or pale yellow, sometimes with grey-black blotches or with a pale purple posterior part. The interior is white, sometimes stained with yellow or purple, especially in South-East Asian populations. *A. flava* is common and widely distributed

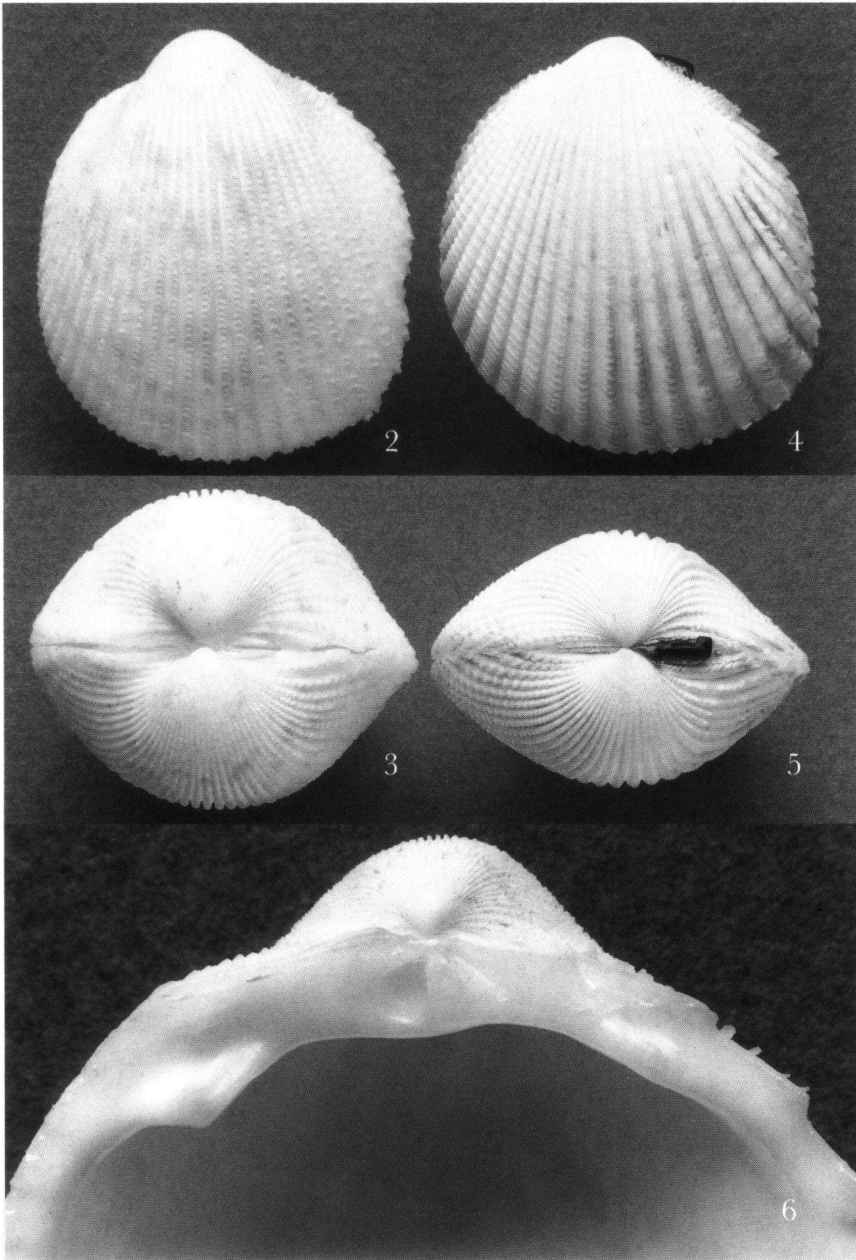


Fig. 2-6. Shells of *Acrosterigma* species. 2-3, 6, *A. seveli* (Prashad), Fiji Is.: Viti Levu, South part, Mbengga Is. (PA 441). 2, left valve, x 1.3; 3, dorsal view, x 1.3; 6, hinge right valve x 3.6. 4-5, *A. flava* (L.), Indonesia: North Sumatra, Banyak Archipelago, 0.5-2 m, 01.1994, leg. A. Roza (PA 356). 4, left valve, x 1.3; 5, dorsal view, x 1.3.

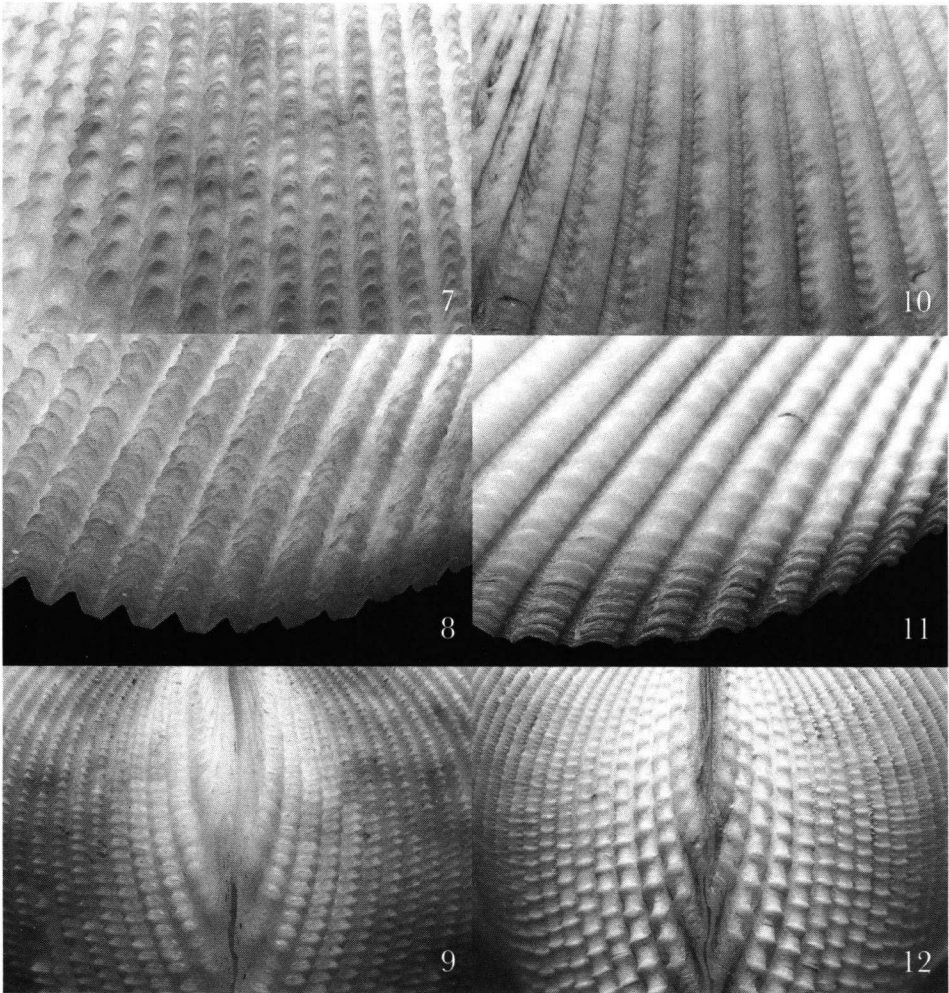


Fig. 7-12. Details of sculpture of shells of *Acrosterigma* species. 7-9, *A. sewelli* (Prashad). Fiji Is.: Viti Levu, South part, Mbengga Is. (PA 441). 7, medial ribs right valve, x 2.9; 8, antero-ventral margin right valve, x 2.6; 9, antero-dorsal side right and left valves, x 3.1. 10-12, *A. flava* (L.). Indonesia: North Sumatra, Banyak Archipelago, 0.5-2 m, 01.1994, leg. A. Roza (PA 356). 10, medial ribs right valve, x 2.7; 11, antero-ventral margin right valve, x 2.6; 12, antero-dorsal side right and left valves, x 3.1. Photographs by J.J. ter Poorten.

in the Indo-West Pacific ranging from the Red Sea and East Africa to Japan, Queensland and the Solomon Islands.

On the basis of the differences in shell morphology mentioned above, it can be concluded that *A. sewelli* is a distinct species, occurring sympatrically with *A. flava* in the central Indo-West Pacific. Both taxa prove to be easily separable.

A. sewelli shows some affinities with the West Pacific species *A. orbita* (Broderip &

Sowerby, 1833) but the latter is more inflated, has a more rectangular-ovate outline with higher, more triangular ribs separated by narrow, deep interstices and a relatively wide lunule. The interior is white with deep purple margins and often two orange stripes from beneath the umbones. *A. compuncta* (Kira, 1955) is also close in appearance, but this species appears to be confined to Japanese waters; is also more inflated, with a rectangular-ovate outline; has an orange-brown mottled exterior and lacks the raised imbricated sculpture. *A. variegata* (G.B. Sowerby 2nd, 1841) has a quite similar outline but can easily be distinguished by its typical ribbed lunule which is elevated and discrepant, being much wider in the right valve; furthermore it is less inflated and bears numerous fine rugae on the anterior ribs. *A. kengaluorum* Voskuil & Onverwagt, 1992, is smaller (maximum height known so far 43 mm), has anterior ribs carrying rugae, medial ribs with ridges on their sides and posterior ribs with small ridges anteriorly and large oblique scales posteriorly.

Material. - AUSTRALIA: Queensland, Lizard Is., South Is., 14°42'S-145°27'E, off E. reef face, depth 0.5-12 m, 13.12.1975, leg. W.F. Ponder and I. Loch (AMS c.168444/1 p.v.); FIJI ISLANDS: Viti Levu, South part, Mbengga Is. (PA 441/1 p.v.); INDONESIA: Salibabu Island, anchorage off Lirung (holotype, ZMA Moll. 3.32.116/p.v.); NEW CALEDONIA: Coral Sea, Lansdowne Fairway, 20°50'S-161°37'E, depth 62 m, ORSTOM 20.07.1988 sta. DW 02, leg. B. Richer de Forges (MNHN/1 r.v.); 20°52'S-161°38'E, depth 63 m, ORSTOM 20.07.1988 sta. DW 08, leg. B. Richer de Forges (MNHN/1 l.v.); 20°44'S-161°00'E, depth 69 m, ORSTOM 21.07.1988 sta. DW 18, leg. B. Richer de Forges (MNHN/1 r.v.); Grand Récif de Koumac, 20°41'S-164°15'E, depth 20-30 m, alive, MONTROUZIER 10.1993 sta. 1318 (MNHN/1 p.v.); Grand Récif du Sud, 22°39'S-167°17'E, depth 40-60 m, ORSTOM 24.01.1985 sta. 413, leg. B. Richer de Forges (MNHN/1 r.v.); 23°00'S-167°02'E, depth 50 m, ORSTOM 17.07.1985 sta. 578, leg. B. Richer de Forges (MNHN/1 l.v.); Canala, 21°23'S-166°01'E, depth 34-35 m, ORSTOM 11.08.1986 sta. 713, leg. B. Richer de Forges (MNHN/1 p.v.); Poindimié, 20°52'S-165°23'E, depth 32 m, ORSTOM 10.01.1987 sta. 821, leg. B. Richer de Forges (MNHN/1 p.v.); Iles Bélep, 19°24'S-163°47'E, depth 39 m, ORSTOM 27.10.1989 sta. 1139, leg. B. Richer de Forges (MNHN/1 l.v.); PAPUA NEW GUINEA: Milne Bay District, China Straits, Logeia (=Rogeia) Is., 10°39'S-150°39'E, N.E. end, sand and rocks, 20.07.1971, leg. Logeia Primary School (AMS c.083705/1 p.v.); SOLOMON ISLANDS: Guadalcanal, Marau Sound, 1991 (VD 4461/1 p.v.); UNKNOWN PROVENANCE: (DW/1 p.v.).

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