

NOTES ON *SPONDYLUS* LINNAEUS WITH DESCRIPTIONS
OF TWO NEW SPECIES
FROM WESTERN AUSTRALIA (MOLLUSCA: BIVALVIA: SPONDYLIDAE)

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Two new species of Spondylidae, *Spondylus clarksoni* sp.nov. and *S. eastae* sp.nov., are described from Western Australia. Additional taxonomic notes are presented on other Recent Spondylidae. *Spondylus asperrimus* Sowerby, 1847 is elevated to specific rank; *S. butleri* Reeve, 1856 is removed from the synonymy of *S. longitudinalis*; *S. erinaceus* Reeve, 1856 is relegated to the synonymy of *S. gilvus* Reeve, 1856; *S. pratti* Parth, 1990 is placed in the synonymy of *S. pictorum* Schreibers, 1793; a reliable locality is established for *S. gravis* Fulton, 1915; *S. raoulensis* Oliver, 1915 (July) is given priority over *S. iredalei* Fulton, 1915 (October); and *S. prionifer* Iredale, 1931 is redescribed. □ Mollusca, Bivalvia, Spondylidae, *Spondylus*, new species, taxonomy, Western Australia.



Kevin Lamprell, Queensland Museum, PO Box 3300, South Brisbane, Queensland 4101, Australia; 3 February, 1992.

Since publication of *Spondylus: Spiny Oyster Shells of the World* (Lamprell, 1987), I have studied type specimens in overseas museums and a range of new material from the Australian region. Two undescribed species of *Spondylus* from Western Australia were recognised and taxonomic information on several previously described species was updated.

Abbreviations used in text: AM = Australian Museum; QM = Queensland Museum; WAM = Western Australian Museum; MV = Museum of Victoria; pv = paired valves.

SYSTEMATICS

Family SPONDYLIDAE Gray, 1826

Spondylus Linnaeus, 1758

Spondylus clarksoni sp.nov.

(Fig. 1a-d)

ETYMOLOGY

For Mr Peter Clarkson who donated specimens for study.

MATERIAL EXAMINED

HOLOTYPE: WAM562-91, 1 pv, exposed on dead coral faces, 9-13m, Bennett Shoal, central Exmouth Gulf, W.A., 1991, P. Clarkson. Height 100mm, length 86mm, width 48mm.

PARATYPES: AMC167693, MVF6552, QMMO32909, 3 pv, exposed on sponge covered limestone reef in tide rip, 15-22m, S end South Muiron I., Exmouth Gulf, W.A., 1991, P. Clarkson.

OTHER MATERIAL: Four specimens from Pt Lefroy, southern end Exmouth Gulf, north W.A., P. Clarkson.

DIAGNOSIS

Shell pecten-shaped, slightly oblique, solid. Hinge typical for the genus. Top (left) valve moderately convex, more so umbonally; internally, slightly excavated under the hinge plate with a strong, wide, crenulated margin; hinge-line moderately wide. Sculpture of five, strong, rounded, principal radial ribs ornamented by strong, upright, spatulate spines which are channelled on the underside, narrow and strong at their bases, wide and flattened at their tips. Rib interstices with five to twelve minor radial ribs, central longer and stronger ornamented with dense, sharp, overlapping spines, and whose interstices contain smaller ribs which are ornamented with even smaller and finer spines or nodules. Lower (right) valve equally as convex as the top valve; cardinal area triangular and moderately deep; internally, moderately deep under the hinge plate with a strong, wide, crenulated margin. Sculpture (where not affixed) of thin concentric foliations with few, irregularly placed, strong spines. Area of attachment varying from 50-100% of the lower surface. Colouration pure white with pink-rose umbonally extending approximately one-third down the shell surface. Height 70-100mm, length 70-87mm, width 38-54mm.

HABITAT AND DISTRIBUTION

Covered in red sponge attached to low-profile limestone reefs, on a sandy bottom, among spon-

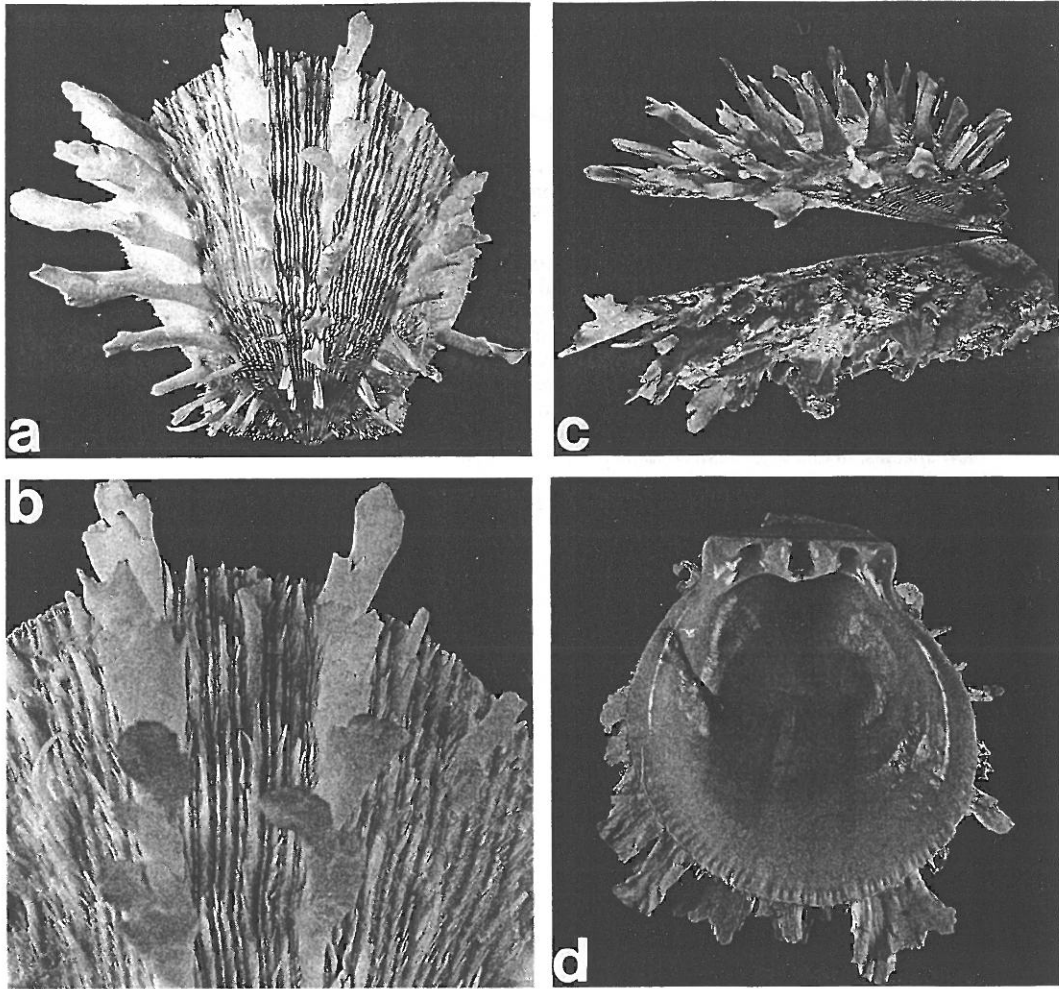


FIG. 1. *Spondylus clarksoni* sp.nov. a-d, Bennett Shoal, central Exmouth Gulf, Western Australia. WAM562-91, holotype. a, top valve. b, sculpture on top valve. c, side view. d, interior of lower valve.

ges and gorgonian corals. Apparently restricted to north Western Australia (Shark Bay to Broome).

ribs in both valves of *S. tenellus* are always orange or pink whereas those of *S. clarksoni* are white.

REMARKS

Compared with *Spondylus clarksoni*, *S. sinensis* Schreibers, 1793 has fewer, stronger, interstitial ribs devoid of ornamentation, strong principal ribs on the lower valve (absent in *S. clarksoni*) and a very small attachment area. *Spondylus victoriae* Sowerby, 1843, which occurs sympatrically, has long, sharp to spatulate principal spines on both valves and fewer, stronger interstitial spines. Compared with *S. tenellus* Reeve, 1856, which occurs in southern Australia, *S. clarksoni* is larger and heavier, has stronger ribs, wide, spatulate spines and weaker interstitial spining. The spining and

Spondylus eastae sp.nov.

(Fig. 2a-d)

ETYMOLOGY

For Aileen East who has donated material for study.

MATERIAL EXAMINED

HOLOTYPE: WAM563-91, 1 pv, 7-11m, Schofield Shoal, SW Exmouth Gulf, W.A., 1991, P. Clarkson. Height 82mm, length 64mm, width 37mm.

PARATYPES: QM MO32910, AM C167694, MV F6553, 3 pv, exposed on sponge covered limestone reef

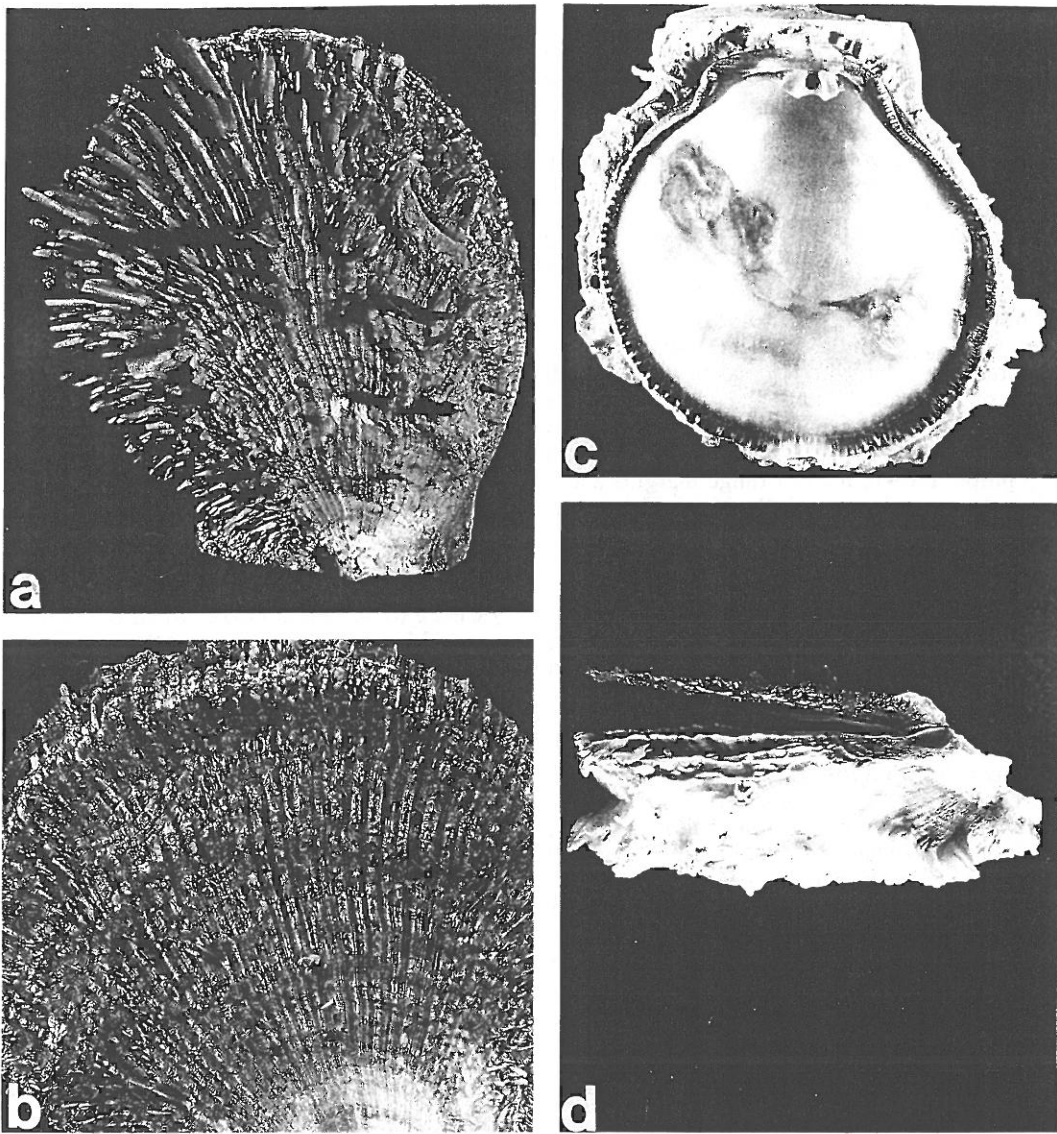


FIG. 2. *Spondylus eastae* sp. nov. a. Schofield Shoal, South West Exmouth Gulf, Western Australia. WAM563-91, holotype. b-d, Muiron I., Exmouth Gulf, Western Australia, paratype. a, top valve. b, sculpture of top valve. c, interior of lower valve. d, side view.

in tide rip, 15-22m, S end South Muiron I., Exmouth Gulf, W.A., 1991, P. Clarkson.

OTHER MATERIAL: Cape Keraudren, W.A., attached to rock at low tide, Sept. 1987, K. Lamprell; Port Hedland, W.A., attached to coral, low tide, Sept. 1987, K. Lamprell; Exmouth Gulf, Town Beach, 6m, attached to rocks, Sept. 1987, K. Lamprell and P. Spoor; Cape Keraudren, W.A., Sept. 1982, L. Marrow.

DIAGNOSIS

Shell ovate to pear-shaped; solid. Hinge typical for the genus. Top (left) valve moderately convex umbonally, remainder of surface depressed to moderately concave; internally smooth, slightly excavated under the hinge plate, with a strong, wide, moderately crenulated margin; sculpture of numerous, weak radial ribs, ornamented by short,

dense, strong, depressed, sharp spines and a few longer, irregular, flat, spatulate spines which are stronger at their bases. Rib interstices with a few irregular, obsolete radial ridges which are ornamented with dense, nodules or small spines. Lower (right) valve convex, moderately shallow to deep; cardinal area narrowly triangular, shallow; internally moderately excavate with wide, moderately crenulated margin; sculpture (where not affixed) of thin concentric foliations covering most of the surface, or otherwise with similar ribs and ornamentation to upper valve. Area of attachment varying from 10-70% of lower surface. Colouration typically brown/maroon to brick-red, orange or purple; umbones white with small flecks of brown; lower valve with similar colouration to top valve; internally blue-white centrally with deep purple-brown, red or orange margins and a dark brown margin towards the hinge. Height 72-93mm, length 57-79mm, width 30-42mm.

HABITAT AND DISTRIBUTION

Embedded in dead coral boulders and depressions on reef, among sponges and gorgonian corals; usually covered in red sponge. Restricted to north Western Australia.

REMARKS

Compared with *Spondylus eastae*, *S. barbatus* Reeve, 1856 has five or six strong, principal ribs with alternating, dense, sharp and spatulate spines, and colour bars or bands at the auricles. *Spondylus violascens* Lamarck, 1819 has been confused with *S. eastae* but has much stronger and denser spining on both valves, much less affixation and spatulate spines which are hollow rather than flat. The north-west Australian distribution given by Lamprell (1987) for *S. violascens* represents the range of *S. eastae*. *Spondylus multimuricatus* Reeve, 1856 is similar in shape and size to *S. eastae* but has stronger radial ribs ornamented with hollow, blunted spines (not spatulate) and with interstices that have few, irregular, smaller stout spines.

ADDITIONAL NOTES

Spondylus asperrimus Sowerby, 1847

REMARKS

Lamprell (1987: pl.3, fig. 1a-c) considered this species to be a form of *S. linguafelis* Sowerby, 1847. However it can be separated from that species by its more elongate shape, shorter spines and rows of fine nodulose spines in the interstices.

It is usually affixed by almost the entire lower valve (or surface) whereas *S. linguafelis* is usually affixed by the cardinal area.

DISTRIBUTION

Philippines, north Western Australia and central Queensland coastal areas.

Spondylus butleri Reeve, 1856

REMARKS

Lamprell (1987: pl.4, fig. 2a-c) considered *S. longitudinalis* Lamarck, 1819 to be a prior name for the more widely used *S. butleri*. The type of *S. longitudinalis* (Museum of Natural History, Geneva) was examined and considered to be the same as *S. zonalis* Lamarck, 1819. Another specimen figured and referred to by Chenu (1845: pl.9, fig 2-2a) as *S. longitudinalis* (but not marked as a type), was even more similar to the type of *S. zonalis*. Fulton (1915:360, species 86) remarked, 'I have received a photograph of the shell figured by Chenu (*S. longitudinalis*), which is now in the Geneva Museum; the authorities there cannot say with any certainty that it is the actual type specimen'. *Spondylus butleri* should be used for the species figured in Lamprell (1987: pl.4, fig 2a-c).

DISTRIBUTION

Philippines, Madagascar, Micronesia and the Great Barrier Reef, Queensland.

Spondylus gilvus Reeve, 1856

S. erinaceus Reeve, 1856.

REMARKS

Although figured separately by Lamprell (1987: pl. 17, fig. 2a, b; pl. 17, fig. 1), types (British Museum Natural History) of *S. gilvus* and *S. erinaceus* revealed insufficient variation to maintain their separation.

Spondylus pictorum Schreibers, 1793

S. crassisquamatus Lamarck, 1819.

S. pratti Parth, 1990.

REMARKS

Three specimens of *S. pratti* from the type locality (Somalia) were compared with *S. pictorum*. Two were very mature but retained most of their sculpture; the third was younger with full sculpture. In describing *S. pratti*, Parth referred to

the two valves as unequal, the top valve larger and more gibbose. In all specimens examined, each valve was equally convex and gibbose. Parth also referred to both valves of *S. pratti* as equally sculptured with six principal ribs. In two of the specimens the top valve had six principal ribs while in the lower valve, one specimen had six and the other seven principal ribs.

While Parth (1990:6) only compared *S. pratti* with *S. americanus* 'because of its large size', numerous other *Spondylus* are equally as large or larger than this species: in particular, *S. pictorum* Schreibers, 1793 (Lamprell, 1987: pl. 23, fig. 1a-d), which shares a similar distribution to *S. pratti*, viz Somalia. *Spondylus pictorum* is equally as convex as *S. pratti*, has similar sculpture, rib count, interstitial sculpture and spining; and both have stout, upright principal spines that are channelled beneath, extending the full length of the spine. Colouration in specimens examined was similar to *S. pictorum*: white in base colour with bands of pink, red or brown and pink in the umbonal area. The juvenile specimen had white in the interstices and pink spines whereas, in some specimens of *S. pictorum*, the interstices are white and red or orange-brown. I am unable to find any features, apart from this interstitial colour variation, to separate *S. pratti* from *S. pictorum*.

Spondylus gravis Fulton, 1915

REMARKS

The type is in the British Museum (Natural History) without a specified locality. Recent trawling of several specimens (Lamprell, 1987: pl. 28, fig. 1) in 200-300m off Capo Ras Hafun, Somalia, gives reliable locality data.

Spondylus raoulensis Oliver, 1915

S. iredalei Fulton, 1915.

REMARKS

Lamprell (1987: pl. 29, fig. 4) incorrectly listed this species as *S. iredalei*. Fulton's work was published in two parts and the section naming *S. iredalei* was included in the second part printed in October 1915. The description of *S. raoulensis* by Oliver was published on the 12 July 1915 and thus has priority over *S. iredalei*.

Spondylus prionifer Iredale, 1931

REMARKS

Lamprell (1987: pl.25, fig.1) incorrectly listed

Spondylus prionifer as a synonym of *S. tenellus* Reeve, 1856. The holotype (Australian Museum, Sydney) is immature and superficially similar to *S. tenellus*. However, numerous specimens recently collected on the Gneering Shoals, Mooloolooba, south Queensland, differed from *S. tenellus*. On the basis of this material, a more detailed description of *S. prionifer* follows. The species was figured by Lamprell (1987: pl. 25, fig. 3b; pl. 30, figs 1, 2).

DESCRIPTION

Shell height to 85mm, width to 65mm and depth of conjoined valves to 45mm, pecten-shaped. Top (left) valve slightly convex to depressed; lower (right) valve moderately deep, cup-like, cardinal area trigonal, moderately extended; internally with the margins strongly crenulated; area under the lunule and hinge plate, deep and extended; sculpture of both valves with 35-40 strong radial ribs with weaker intermediate ribs in the interstices; ribs ornamented with numerous depressed or hooked spines which vary from sharp to spatulate, stronger marginally and with a longitudinal furrow beneath and finely denticulate edges; interstitial ribs with two or three rows of fine spines or striae. Area of attachment of the lower valve variable but usually restricted to the umbonal area. Colouration variable, usually white with concentric bands of red and white ribs marginally, rarely all orange or red-brown; internally blue-white with margin crenulations variegated white and red or orange.

HABITAT AND DISTRIBUTION

Attached to corals or rock to 33m. Central Queensland (Capricorn Channel), south Queensland (Gneering Shoals) and Sydney Harbour, N.S.W.

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