

**A new species of recent scallop of the genus *Serratovola* (Bivalvia, Pectinidae)
from the tropical Indo-West Pacific**

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The present paper deals with *Serratovola angusticostata* spec. nov., a species that has often been erroneously identified as a described *Serratovola* in the literature.

Key words: Bivalvia, Pectinidae, *Serratovola*, tropical Indo-West Pacific.

INTRODUCTION

During several visits to the major natural history museums in Europe and Australia I had the opportunity to examine the specimens and type material of the pectinid genus *Serratovola* Habe, 1951. While doing so, an erroneously determined, undescribed species turned up. For comparison with congeners, the primary types of the *Serratovola* species are figured herein.

Acronyms for collections: BMNH, The Natural History Museum, London; KBIN, Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels; NNM, Nationaal Natuurhistorisch Museum 'Naturalis', Leiden; SNSD, Staatliche Naturhistorische Sammlungen Dresden; ZMA, Zoological Museum Amsterdam. Abbreviations for shell characters: C, convexity of both articulated valves; h, height (dorsal-ventral); lv, left valve (upper valve); rv, right valve (lower valve); w, width (anterior-posterior).

The type series of the new species contains articulated specimens without soft parts only. This material is preserved in the type collection of the Zoological Museum, Amsterdam.

SYSTEMATIC PART

Family Pectinidae Rafinesque, 1815
Subfamily Pectininae Rafinesque, 1815
Tribe Pectinini Rafinesque, 1815

Serratovola Habe, 1951

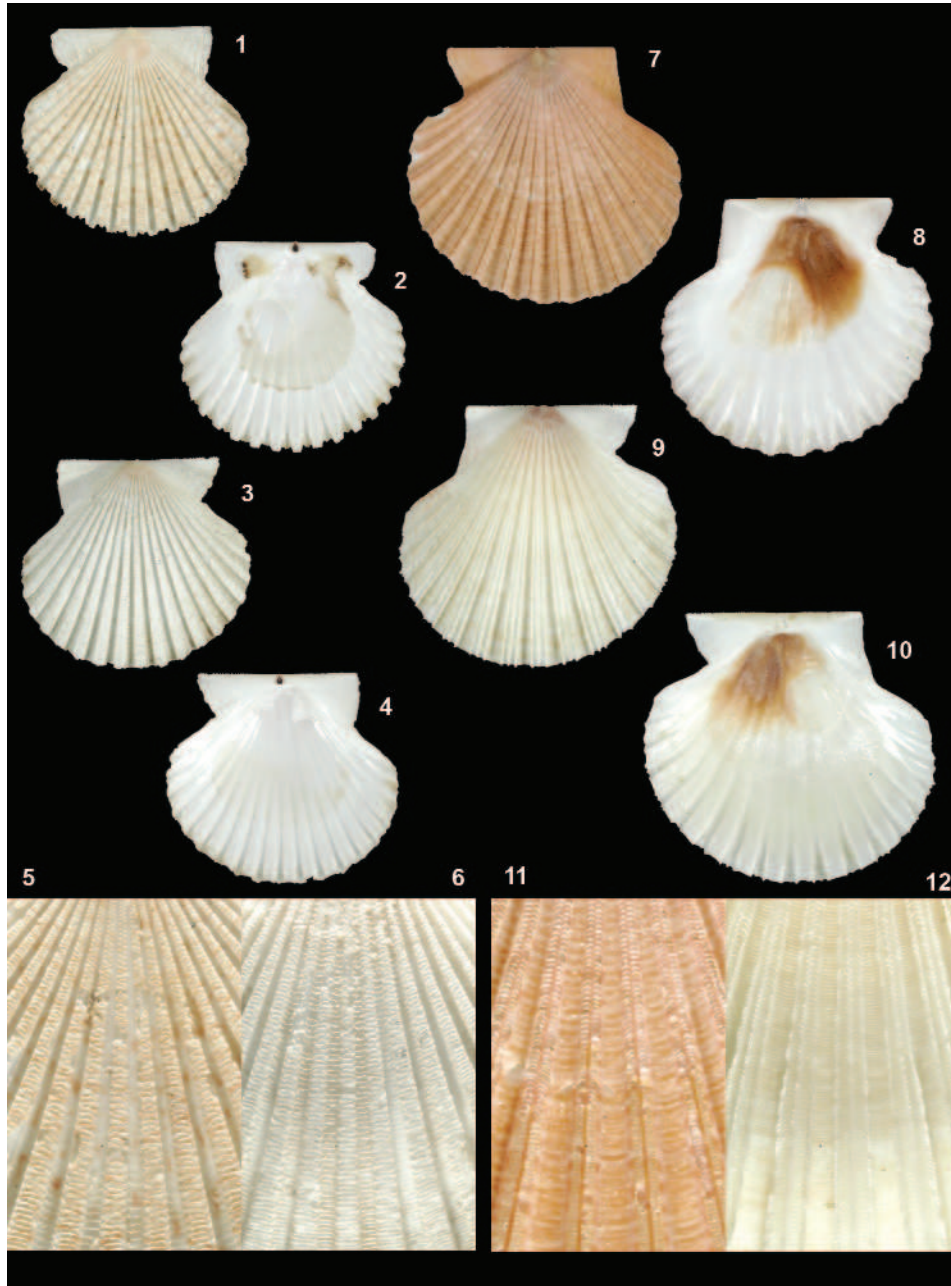
Serratovola Habe, 1951: 81 [in Japanese]. Type species (original designation): *Pecten tricarinatus* Anton, 1838 (not DeFrance, 1825) [= *Pecten rubicundus* Récluz, in Chenu, 1843, nomen novum]. China.

Studied type material of *Serratovola* species. — *Pecten tricarinatus* Anton, 1838: 19; China. Lectotype SMTD 6937, designated by Dijkstra (1998: 29). Not *Pecten tricarinatus* DeFrance, 1825.

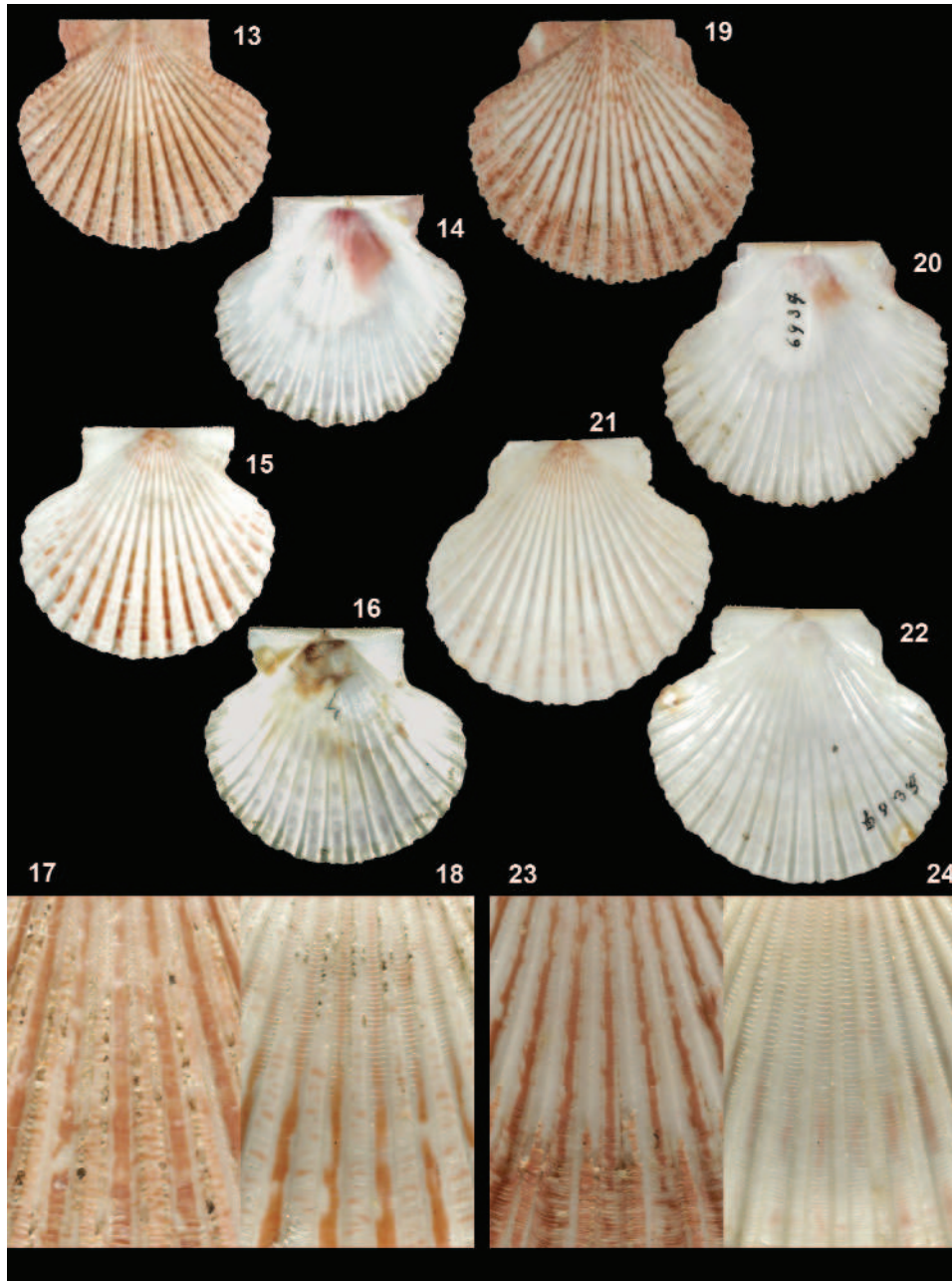
Pecten asper G.B. Sowerby II, 1842: 50, pl. 19 figs 196, 197 (not G.B. Sowerby II, in Reeve, 1842: 161, pl. 114 fig. 6, junior homonym); "New Guinea", leg. Mr Hinds. Seven possible syntypes BMNH 20080065.

Pecten rubicundus Récluz in Chenu, 1843: 3, pl. 7 figs 4, 5 (nomen novum for *Pecten asper* Sowerby, not Lamarck, 1819).

Pecten passerinus Hinds, 1845: 61 (also a replacement name for *Pecten asper* Sowerby, not of Lamarck,



Figures 1-6. *Janira gardineri* Smith, 1903, Maldives Islands, holotype BMNH 1903.9.17.48, spm (22.6 x 24.9 mm); 1, lv, exterior; 2, lv, interior; 3, rv, exterior; 4, rv, interior; 5, lv, exterior, detail central part of disc; 6, rv, exterior, detail central part of disc. Figures 7-12. *Serratovola angusticostata* spec. nov., Philippine Islands, Cebu, Mactan Island, Punta Engano, 10.31667 N, 124.0167 E, 80-150 m, alive, 'tangle-net' fishing, 1981, holotype ZMA Moll. 4.08.014, spm (34.7 x 37.1 mm); 7, lv, exterior; 8, lv, interior; 9, rv, exterior; 10, rv, interior; 11, lv, exterior, detail central part of disc; 12, rv, exterior, central part of disc.



Figures 13-18. *Pecten asper* Sowerby II, 1842, New Guinea, largest possible syntype BMNH 20080065, spm (32.2 x 35.4 mm); 13, lv, exterior; 14, lv, interior; 15, rv, exterior; 16, rv, interior; 17, lv, exterior, detail central part of disc; 18, rv, exterior, detail central part of disc. Figures 19-24. *Pecten tricarinatus* Anton, 1839, China, lectotype SMTD 6937, spm (28.8 x 31.1 mm); 19, lv, exterior; 20, lv, interior; 21, rv, exterior; 22, rv, interior; 23, lv, exterior, detail central part of disc; 24, rv, exterior, central part of disc.

1819). See also Arkel (1954).

Janira gardineri E.A. Smith, 1903: 622, pl. 36, figs 21, 22; Maldive Islands, S Nilandu Atoll and Felidu Atoll, 1-36 fathoms (= 1.8-65.8 m). Holotype BMNH 1903.9.17.48, 2 paratypes BMNH 1903.9.17.45-46.

Serratovola pallula Dijkstra, 1998: 28, pl. 4 figs 1-6; Papua New Guinea, Hansa Bay, S of Duangit, 60 m, dredged, leg. B. Tursch. Holotype KBIN 25.955.471.

Diagnosis. — Free living Pectinini with a nearly flat to somewhat concave left valve and a convex right valve; sub(circular), inequivalve, slightly inequilateral, auricles unequal in shape and nearly equal in size, radial macrosculpture of solid or hollow segmented ribs, byssal notch and ctenolium rudimentary in late ontogeny. Internal rib cari-

	<i>S. angusticostata</i>	<i>S. gardineri</i>	<i>S. rubicunda</i>	<i>S. pallula</i>
shape lv	slightly inflated in early ontogeny	flattened	slightly inflated	slightly concave
ribs lv	small	medium	medium	broad
interstices lv	broad	medium	medium	narrow in late growth stage
ribs rv	angular	angular	rounded in late growth stage	angular
microsculpture lv	antimarginal in interstices	commarginal	commarginal	commarginal
colour	red-brown with dots in interstices	pale creamy with red spots	creamy with red / creamy spots	red-brown with red dots

Table 1. Morphological characters of *Serratovola* species.

nae present, lacking intermediate dorsal teeth.

Remarks. — Habe (1951) introduced *Serratovola* as a valid genus, but Hertlein (1969) considered it a synonym of *Pecten*. *Serratovola* species, however, differ from *Pecten* by the subequal auricles and the hollow sections in the radial costae.

Recent species of *Serratovola* are: *Serratovola rubicunda* (Récluz, in Chenu, 1843) from the tropical Indo-West Pacific, *Serratovola gardineri* (E.A. Smith, 1903) from the Maldive archipelago, *Serratovola pallula* Dijkstra, 1998, from Papua New Guinea and northern Australia, and *Serratovola angusticostata* spec. nov. from the tropical Indo-West Pacific. All are living sublittorally and bathyally on mud or muddy sand.

Serratovola angusticostata spec. nov. (figs

Serratovola tricarinata (Anton, 1839 [sic]); Abbott & Dance, 1982: 304, ill. (not *Pecten tricarinatus* Anton, 1838); Springsteen & Leobrera, 1986: 326, pl. 93 fig. 3 (not Anton).

Pecten (*Serratovola*) *tricarinatus* Anton, 1839 [sic]; Rombouts, 1991: 55, pl. 20 fig. 7 (not Anton).

Serratovola gardineri (Smith, 1903); Dijkstra, 1991: 49 (pro parte); Dijkstra, 1994: 14, figs; Okutani, 2000: 909, pl. 452 fig. 52 (not *Janira gardineri* Smith, 1903).

Holotype and paratypes. — **Philippine Islands**, Cebu, Mactan Island, Punta Engano, 10.31667 N, 124.0167 E, 80-150 m, alive, 'tangle-net' fishing, 1981 (ZMA Moll. 4.08.014, holotype; ZMA Moll. 4.08.015/8). Punta Engano, 10.31667 N, 124.0167 E, 110-150 m, alive, 'tangle-net' fishing, 1982 (ZMA Moll.

4.08.016/2). Luzon, Manila Bay, off Port of Manila, 14.51917 N, 120.7700 E, 150-180 m, alive, trawled by local fishing-boat, 1982 (ZMA Moll. 4.08.017/4). Manila Bay, off Port of Manila, 14.5 N, 120.7667 E, 45-65 m, alive, trawled by local fishing-boat, 1982 (ZMA Moll. 4.08.018/2). **Taiwan**, S-coast, off T'ainan, 22.81667 N, 120.1 E, 70-100 m, alive, trawled by local fishing-boats, 1973 (ZMA Moll. 146001/6). S-coast, off T'ainan, 22.8488 N, 120.0909 E, 60-80 m, alive, trawled by local fishing-boat, 1980 (ZMA Moll. 140030/1). **Thailand**, Kantang, Libong Island, 7.25 N, 99.3833 E, 40-60 m, alive on muddy sand, local fishing-boat, 1986 (ZMA Moll. 143671/3). Ranong, off Ranong, 9.75 N, 98.6667 E, 30-60 m, alive on a sandy bottom, 1990 (ZMA Moll. 142292/1). Phuket, Ko Raya Noi, 11.95 N, 102.4167 E, 25-30 m, alive on muddy sand, compressor dive by local fishermen, 1993 (ZMA Moll. 145487/3). **Indonesia**, Makassar Strait, -1.13 S, 117.3117 E, 49 m, alive, 30 October 1980, "Corindon-Makassar" Expedition, stn CH 205 (ex MNHN, ZMA Moll. 142294/3). Kalimantan Tengah, off Matua (Matuwa), -3.0321 S, 110.7678 E, 55 m, alive on muddy sand and rubble, local fishing-boat, 1992 (ZMA Moll. 143712/1). **Papua New Guinea**, Hansa Bay, -4.1667 S, 144.8833 E, 50 m, alive on muddy sand, dredged, leg. B. Tursch (ZMA Moll. 146352/1).

Description. — Shell up to ca. 35 mm high, circular, inequivalve, equilateral. Left valve flat or slightly inflated; right valve convex. Auricles nearly equal in size, unequal in shape. Umbonal angle ca. 115°. Left valve creamy red-brownish with commarginal brownish maculations and brownish radial streak on the ribs; right valve off-white with minute red-brownish dots near the umbo, inside whitish with large brown dot near adductor scar.

Left valve sculptured with 18, regularly spaced, narrow angular radial costae with hollow sections laterally, separated by a solid central radial keel. The interspaces (2.5 mm) are broader than the radial ribs (1.5 mm) near the central part of the ventral margin. The anterior (11.9 mm) and posterior (11 mm) hinge of the auricles are nearly equal in size. The anterior auricle is slightly smaller than the posterior one (antero-margin 7 mm, postero-margin 9 mm); both auricles have a few very weak radial ridges (2 anterior, 3 posterior) and a closely spaced commarginal lamellar sculpture near the disc of the anterior auricle. Antimarginal microsculpture is present in the intercostal spaces.

Right valve with 19, regularly spaced, angular radial ribs with a tripartite appearance by 'dentrition', also with hollow sections laterally and separated by a solid central radial keel. Interspaces (1.5 mm) somewhat narrower than the radial costae (2 mm) near the ventral margin with closely spaced (7-8 per mm) commarginal lamellae. Anterior and posterior auricles with 3-4 very weak radial ridges. Byssal notch shallow. Functional ctenolium lacking.

Measurements of the type material. — Holotype: H 34.7 mm, W 37.1 mm, C 10.4 mm. Paratypes: height 14.6-32.4 mm.

Distribution. — Tropical Indo-West Pacific: Taiwan, Philippines, Indonesia, westwards to Thailand and eastwards to Papua New Guinea. Depth range 30-150 m, living on soft bottom assemblages.

Comparison. — *Serratovola angusticostata* is morphologically close to *S. gardineri*, but the present species has a slightly more inflated left valve when juvenile. *Serratovola gardineri* is flat and differs in having smaller radial costae and wider intercostal spaces on both valves; it has broad ribs and narrow interspaces. The commarginal microsculpture on the left valve of *S. angusticostata* is only present on the anterior auricle near the disc and throughout the left valve in *S. gardineri*. An antimarginal microsculpture is present in the interspaces of the left valve of *S. angusticostata*, and a commarginal microsculpture in *S. gardineri*. Moreover, the groundcolour of the left valve of *S. angusticostata* is reddish brown with minute brownish commarginal dots, versus creamy with red scattered markings in *S. gardineri*. The internal colour of *S. angusticostata* is whitish with a large brown spot, and uniform white in *S. gardineri*.

Serratovola angusticostata differs from the sympatric *S. rubicunda* in having slightly smaller radial costae, with broader hollow sections laterally and a smaller central keel. *Serratovola rubicunda* has wider, more flat-topped ribs and smaller hollow sections laterally and a broader central keel. *Serratovola angusticostata* has a commarginal sculpture on the anterior auricle of the left valve and *S. rubicunda* has a prominent commarginal sculpture throughout on ribs, interstices and auricles. The radial ridges on the auricles are weaker and less numerous in *S. angusticostata* (anterior 2, posterior 3) versus *S. rubicunda* (anterior 5, posterior 6). Moreover, the ribs of the right valve are solid and rounded, with a delicate or without a commarginal sculpture in the interstices in late growth stage of *S. angusticostata*, and angular with hollow sections and a prominent commarginal sculpture in the interstices of *S. rubicunda*. The groundcolour of *S. angusticostata* is red-brownish and creamy, and creamy in *S. rubicunda*. *Serratovola angusticostata* has minute dots in early growth stage, versus scattered prominent dots on both valves in *S. rubicunda*. The internal colour of *S. angusticostata* is whitish or yellowish white with a large brown spot and white throughout in *S. rubicunda*.

Serratovola angusticostata is clearly larger than *S. pallula*, measuring ca. 35 mm versus ca. 17 mm in height. The left valve of *S. angusticostata* is slightly inflated in early growth stage, whereas that of *S. pallula* is slightly concave. *Serratovola angusticostata* has small ribs and wide interstices, and *S. pallula* broad ribs, lacking the intercostal spaces in early growth stage and very narrow interstices when fully grown. The microsculpture of the left valve of *S. angusticostata* is commarginal, partly on the anterior auricle and antimarginal in interstices, whereas fully grown *S. pallula* has a commarginal microsculpture on both auricles and interstices. *Serratovola angusticostata* has commarginal dots in intercostal spaces and brown streak on keel, whereas *S. pallula* has more scattered dots on the ribs and interstices.

Etymology. — With small ribs (Latin, adj.), alluding to the radial macrosculpture on both valves.

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REFERENCES

- ABBOTT, R.T., & S.P. DANCE, 1982. Compendium of seashells: i-ix, 1-411. New York.
- ANTON, H.E., 1839 [1838]. Verzeichniss der Conchylien welche sich in der Sammlung von Hermann Eduard Anton befinden: i-xvi, 1-110. Halle.
- ARKEL, W.J., 1954. Opinion 311. Validation, under the plenary powers, of the specific name "*asper*" Lamarck, 1819, as published in the combination "*Pecten asper*" (class Pelecypoda). — Opinions and Declarations rendered by the International Commission on Zoological Nomenclature 8: 367-374.
- CHENU, J.C., 1843-1846. *Pecten*. In: Illustrations Conchyliologique ou descriptions et figures de toutes les coquilles connues vivants et fossiles, classées suivant le système de Lamarck, [...] 3: 1-8, pls 2-58. Paris [For bibliographic data, see: Sherborn & Smith 1901; Johnson 1963.]
- DIJKSTRA, H.H., 1991. A contribution to the knowledge of the pectinacean Mollusca (Bivalvia: Propeamussiidae, Entoliidae, Pectinidae) from the Indonesian archipelago. — Zoologische Verhandelingen 271: 1-57.
- DIJKSTRA, H.H., 1994. Les Pectinidae de Nouvelle Calédonie / The Pectinidae of New Caledonia 34. *Serratovola gardineri* (E.A. Smith, 1903). — Rossiniana 60: 14-15.

- DIJKSTRA, H.H., 1998. Pectinoidea (Mollusca: Bivalvia: Pectinidae: Propemussiidae) from Hansa Bay, Papua New Guinea. — *Molluscan Research* 19: 11-52.
- HABE, T., 1951. Genera of Japanese shells. *Pelecypoda*, No. 1: 1-96. Tokyo. [In Japanese]
- HAYAMI, I., 1989. Outlook on the Post-Paleozoic historical biogeography of pectinids in the western Pacific region. In: I. OHBA, I. HAYAMI & K. MOCHIZUKI, eds, Current aspects of biogeography in West Pacific and East Asian regions. — The University Museum, The University of Tokyo, Nature and Culture 1: 1-25. Tokyo.
- HERTLEIN, L.G., 1969. Family Pectinidae Rafinesque, 1815. In: R.C. Moore (ed.), *Treatise on Invertebrate Paleontology. Part N1, Mollusca 6, Bivalvia*: 348-373. Boulder, Lawrence.
- HINDS, R.B., 1844-1845. The zoology of the voyage of H.M.S. 'Sulphur', under the command of Capt. Sir E. Belcher..., during the years 1836-42, 2 (Mollusca): 1-72. London.
- JOHNSON, R.I., 1963. The arrangement and comments of the genera described in J.C. Chenu's *Illustrations Conchyliologique (1843-1853)*. — *Journal of the Society for the Bibliography of Natural History* 4: 92-95.
- OKUTANI, T., 2000. Marine mollusks in Japan: i-xlvi, 1-1173. Tokyo.
- PETIT, R.E., 2007. Lovell Augustus Reeve (1814-1865): malacological author and publisher. — *Zootaxa* 1648: 1-120.
- RAINES, B.K., & G.T. POPPE, 2007. A conchological iconography. The family Pectinidae: 1-402. Hackenheim.
- REEVE, L.A., 1841-1842. *Conchologia Systematica, or complete system of conchology; in which the Lepades and Conchiferous Mollusca are described and classified according to their natural organization and habits. Volume I (1841-1842): 1-195; Volume II (1842): 1-337. London [See for bibliographic data: Petit (2007: 48)].*
- ROMBOUTS, A., 1991. Guidebook to pecten shells. Recent Pectinidae and Propeamussiidae of the world: i-xiii, 1-157. Oegstgeest.
- SHERBORN, C.D., & E.A. SMITH, 1911. A collation of J.C. Chenu's *Illustrations conchyliologiques*, and a note on P.L. Duclos' *Hist. Nat. Gén. et Part. Coquilles*. — *Proceedings of the Malacological Society of London* 9: 264-267.
- SMITH, E.A., 1903. Marine Mollusca. In: J.S. GARDINER, ed., *The fauna and geography of the Maldives and Laccadive archipelagoes II (2)*: 589-630. Cambridge.
- SOWERBY, G.B. 2nd, 1842. *Monograph of the genus Pecten. Thesaurus Conchyliorum, or figures and descriptions of recent shells 1 (2)*: 45-82. London.
- SPRINGSTEEN, F.J., & F.M. LEOBRERA, 1986. *Shells of the Philippines: 1-377. Malate.*