

European marine Mollusca: notes on less well-known species. XVII. *Parvicardium carrozzai* spec. nov., with notes on *P. minimum* (Philippi, 1836) and *Cardium perrieri* Dautzenberg & Fischer, 1897 (Bivalvia, Heterodonta, Cardiidae)

J.J. VAN AARTSEN & J. GOUD

National Museum of Natural History, P.O. Box 9517, NL 2300 RA Leiden, The Netherlands

In addition to earlier notes on Mediterranean-Lusitanian *Parvicardium* species, *P. carrozzai* spec. nov. is described, and the synonymy of *P. minimum*, in particular the status of *Cardium perrieri*, is discussed.

Key words: Bivalvia, Cardiidae, *Parvicardium*, Lusitanian, Mediterranean, taxonomy, nomenclature.

INTRODUCTION

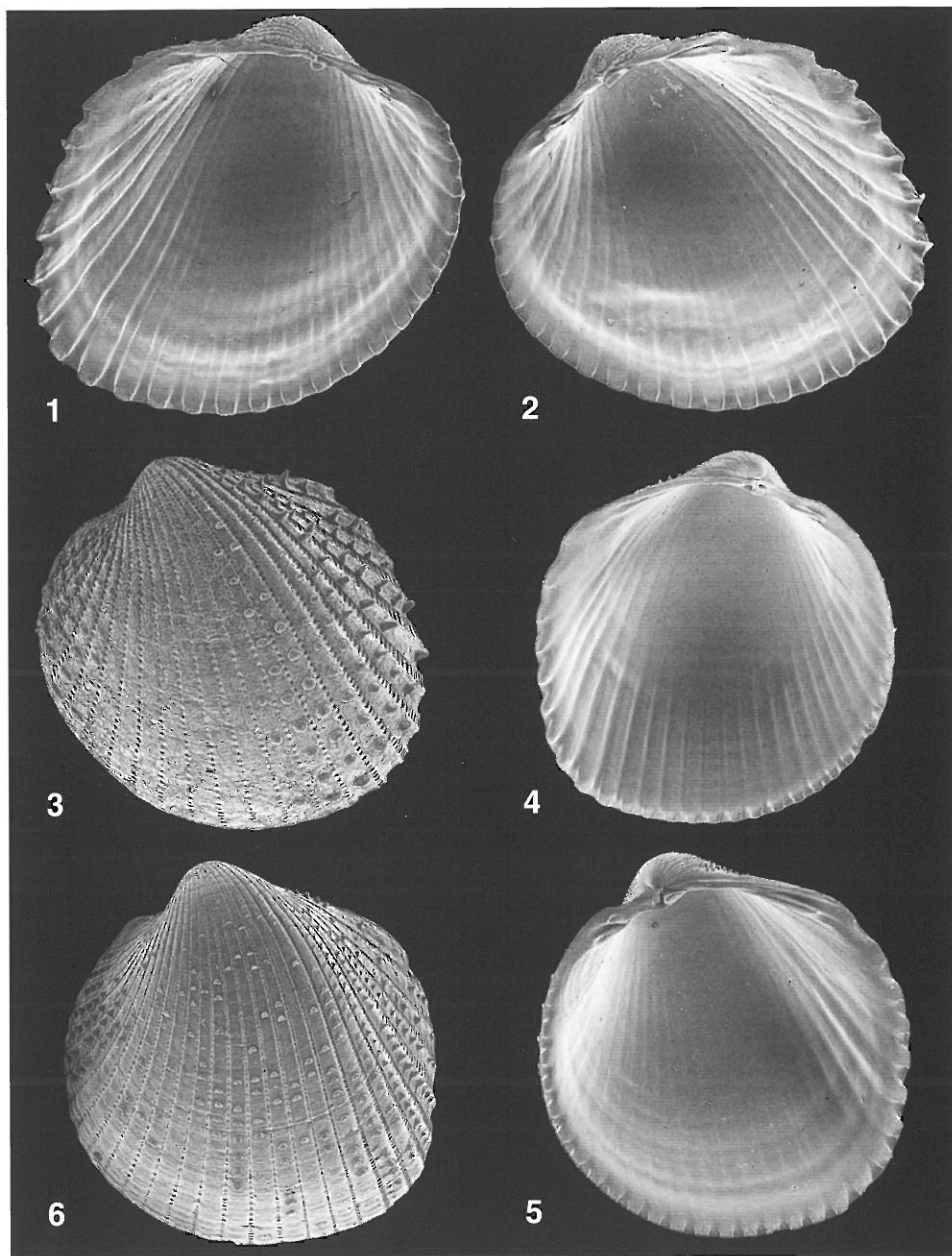
Recently we studied the Mediterranean-Lusitanian species of *Parvicardium* Monterosato, 1884, and gave notes on nomenclature and synonymy (Van Aartsen & Goud, 2000). (Lusitanian was used in the sense that it includes the Mediterranean). At that time we had a few valves belonging to the genus *Parvicardium* which could not be identified with one of the known species dealt with. These valves originated from about 100 m deep in the Aegean Sea. The only well-known Mediterranean-Lusitanian *Parvicardium* species from deeper water is *Parvicardium minimum* (Philippi, 1836), but a first comparison showed them to be different from that species. In the meantime we received a number of valves as well as a few complete specimens for identification from Ferdinando Carrozza. This material originated from the Tuscan Sea at depths from 200 to 300 m and belonged to the same species. As these shells were larger and better preserved than the ones we possessed originally, it became evident that we were dealing with a new species. This species is described here as *Parvicardium carrozzai* spec. nov.

For collections, the following abbreviations are used: AD, colln J.J. van Aartsen, Dieren; CS, colln F. Carrozza, Soiana; RMNH, National Museum of Natural History, Leiden; RP, colln Rocchini, Pistoia.

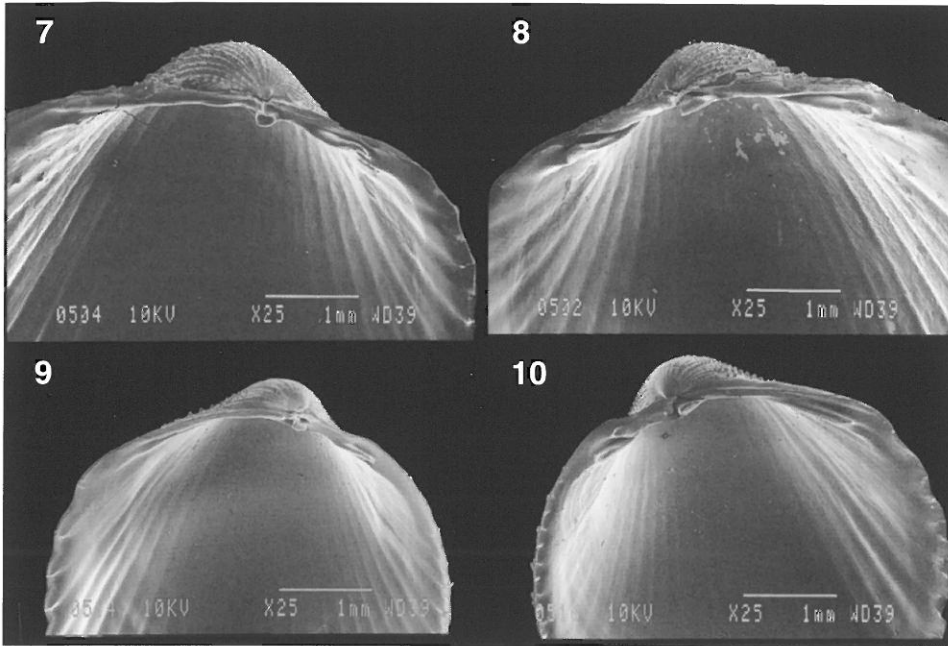
SYSTEMATIC PART

Parvicardium carrozzai spec. nov. (figs 1-3, 7, 8, 11)

Material (paratypes if not stated otherwise). – Italy, Tuscan Sea, 200-300 m (RMNH 85868/holotype, ex CS; AD 29304/ 2 specimens; CS/8 specimens and 7 valves); idem, 30-40 m (RP/4 specimens); Aegean Sea, 90-130 m (AD 22485/> 20 valves; RMNH 85869/4 valves); Malta, 29 m (AD 22916/2 valves); Greece, Crete, from a fishing boat in Elounda (AD 24864/1 specimen and 4 valves).



Figs 1-6. *Parvicardium* spec. Figs 1-3. *P. carrozzai* spec. nov. 1-2, inside of left and right valve of holotype (6.1 x 6.5 mm), Italy, Tuscan Sea, 200-300 m (RMNH 85868); 3, outside of left valve, paratype (3.6 x 3.7 mm), Greece, Aegean Sea, 90-130 m (RMNH 85869). Figs 4-6. *P. minimum*, Greece, Aegean Sea, 90-130 m (RMNH 85869). 4-5, inside of left (4.2 x 4.3 mm) and right valve (4.3 x 4.4 mm); 6, outside of left valve (4.4 x 4.4 mm).



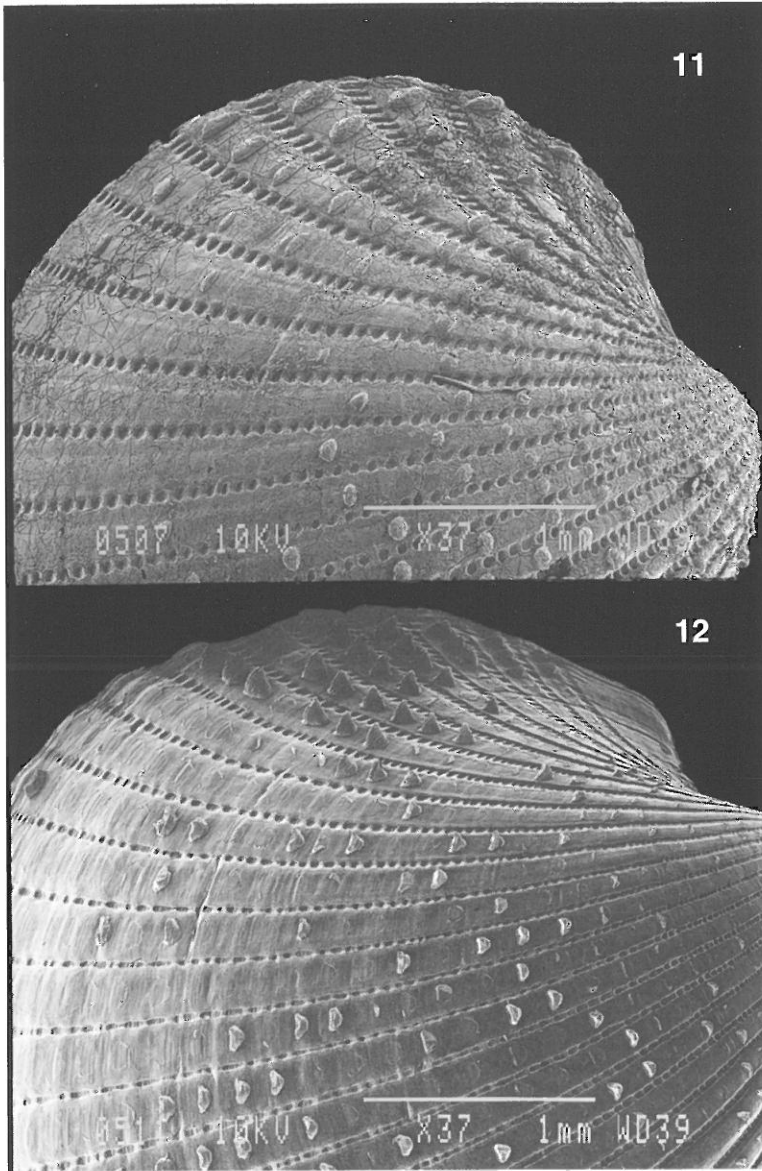
Figs 7-10. *Parvicardium* spec., hinges (25 x). Figs 7-8. *P. carrozzai* spec. nov., Tuscan Sea, Italy, 200-300 m, left and right valve of holotype (6.1 x 6.5 mm), Italy, Tuscan Sea, 200-300 m (RMNH 85868). Figs 9-10. *P. minimum*, Greece, Aegean Sea, 90-130 m (RMNH 85869), left (4.2 x 4.3 mm) and right valve (4.3 x 4.4 mm).

Description. – Shell rounded, more or less equilateral and inflated. Valves thin and transparent: the outside ribs shine through over most of the inside of the shell. There are about twenty-five ribs. The anterior ribs are decorated with straight plates, most of the ribs in the middle are smooth but a few are decorated with round dots. These ribs are relatively close to each other. On the posterior side five to seven ribs carrying strong spines are present. The interstices between the ribs show many concentrically placed thickened growth lines. The smooth prodissoconch measures 110-140 μ m. The hinge is rather weak, the cardinal teeth protruding ventrally below the narrow hinge plate. Many of the shells are variegated with light-brown blotches on a yellowish background. No white specimens have been seen.

Dimensions (height x width) up to 9 x 9 mm. The holotype measures 6.1 x 6.5 mm.

Etymology. – This species is named after Ferdinando Carrozza, Soiana, Italy, well-known malacologist and long-time friend of the first author.

Remarks. – *Parvicardium carrozzai* spec. nov. is similar to *P. minimum* which differs by the more straight posterior side (compare figs 4 and 5 with figs 1 and 2), the higher number of ribs, viz. 30 instead of 25 (compare fig. 6 with fig. 3), as well as by its different hinge (compare fig. 7 with fig. 9 and fig. 8 with fig. 10). *Parvicardium minimum* also has a much larger prodissoconch, e.g. 220-250 μ m instead of 110-140 μ m in *P. carrozzai* spec. nov., as can be seen by comparing fig. 7 with fig. 9. The decoration of the ribs with triangular scales in *P. minimum* is quite different from the plates and knobs seen in *P. carrozzai* (compare figs 11 and 12).



Figs 11-12. *Parvicardium* spec. 11, *P. carrozzai* spec. nov., detail of fig. 3, 30 x; 12, *P. minimum*, detail of fig. 6 (left valve), 30x.

Parvicardium carrozzai spec. nov. has much in common with *P. pinnulatum* (Conrad, 1831) [= *P. ovale* (Sowerby, 1840)]. In both species the ribs are closely spaced and the interstices therefore very narrow. The central ribs are smooth and unarmed. The shells are rather thin and, as a consequence, the ribs shine through over most of the inside (see figs 1-3 and Van Aartsen & Goud, 2000: figs. 22-24). There are also several important differences. Compared with *P. pinnulatum*, the posterior side is much more strongly indented in *P. carrozzai*, the spines on the posterior ribs are much more pronounced and the hinge is quite different, especially the cardinal teeth, as can be seen in the figures cited above. Moreover, the prodissoconch of *P. pinnulatum* measures 200-250 µm, instead of only 110-140 µm in *P. carrozzai*.

In comparison with *Parvicardium carrozzai* spec. nov., *P. scabrum* (Philippi, 1844) has a thicker shell, a well-developed hinge, and a completely different decoration on the anterior ribs (see fig. 11 and Van Aartsen & Goud, 2000: fig. 29).

Parvicardium minimum (Philippi, 1836) (figs 4-6, 9, 10, 12)

Cardium minimum Philippi, 1836: 51.

Cardium suedense Reeve, 1845 (March): pl. 22 fig. 132.

Cardium loveni Thompson, 1845 (May): 317, pl. 19 fig. 7.

Cardium suecicum (Reeve) Lovén emend., 1846: 36; Forbes & Hanley, 1849: 33, pl. 32 fig. 6.

Cardium perrieri Dautzenberg & Fischer, 1897: 212, pl. 6 fig. 17.

Parvicardium minimum; Van Aartsen & Goud, 2000: 183.

Notes. – In addition to our former remarks about this species (Van Aartsen & Goud, 2000), we now give some figures as well.

The name *Cardium suecicum* Lovén, 1846, is sometimes used to denote the Atlantic-boreal specimens. This is a replacement name for Reeve's *C. suedense*, as stated by Lovén (1846: 36): "269. *Cardium suecicum* Reeve, 132 ("*Suedense*"- lapsus calami) = *C. loveni* Thompson. "

Cardium perrieri Dautzenberg & Fischer, 1897, was described from deep water in the East Atlantic (47°10' N, 8°08' W, between 748 and 1262 m). Dautzenberg & Fischer do not really compare their species with any other *Parvicardium* species but merely state: "Il ne nous a été possible de l' assimiler à aucun des petits *Cardium* européens connus, ...".

As cited by Fischer-Piette (1977: 90), Mars (1965: 90) was apparently the first author to synonymize *Cardium perrieri* with *Parvicardium minimum*. This was repeated by a number of authors (Nordsieck, 1969: 99; Voskuil & Onverwagt, 1989: 72; Sabelli et al., 1990: 310; Poppe & Goto, 1993: 98), but there is no indication that Mars or any of the other authors had ever seen original material. We therefore studied the holotype and only specimen, kept in the 'Musée Océanographique de Monaco', and concluded that it belongs without doubt to *Parvicardium minimum*. Thus the synonymy is established now on the basis of the original material.

ACKNOWLEDGEMENT

We thank Ms. M. Bruni from the Musée Océanographique de Monaco for permitting us to study the holotype of *Cardium perrieri*.

ADDITIONAL REFERENCES

For most references see Van Aartsen & Goud, 2000.

- AARTSEN, J.J. VAN, & J. GOUD, 2000. European marine Mollusca: notes on less well-known species. XV. Notes on Lusitanian species of *Parvicardium* Monterosato, 1884, and *Afrocardium richardi* (Audouin, 1826) (Bivalvia, Heterodonta, Cardiidae). – *Basteria* 64: 171-186.
- DAUTZENBERG, Ph., & H. FISCHER, 1897. Dragages effectués par l'Hirondelle et par la Princesse-Alice: 1. – *Mémoires de la Société Zoologique de France* 10: 139-234.
- LOVÉN, S.L., 1846. Index Molluscorum litora Scandinaviae occidentalia habitantium: 1-50. Holmiae. Also published as "Nordens Haffs Mollusker" – *Öfersigt af Kongelige Vetenskaps-Akademiens Förhandlingar*, Stockholm 3: 134-160; 182-204 (1847).
- MARS, P., 1965. Fauna marine des Pyrénées-Orientales. Fascicule 5. Mollusques Aplacophores, Polyplacophore, Scaphopodes et Bivalves. – *Vie et Milieu* 15(4), Supplément: 1-156. Paris.
- REEVE, L.A., 1844-1845. *Conchologia Iconica: or illustrations of the shells of molluscous animals*. Vol. 2, *Cardium*: pls 1-22. London.
- THOMPSON, W., 1845. Additions to the Fauna of Ireland, including descriptions of some apparently new species of Invertebrata. – *Annals and Magazine of Natural History* 15: 308-321.