

**A large Trachycardiinae from the Indo-West Pacific:
Vasticardium papuanum, new species.
 (Mollusca, Cardiidae)**

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ABSTRACT. *Vasticardium papuanum* is a large (maximum 96.5 mm high) Trachycardiinae currently known by five Recent specimens from Papua New Guinea, Solomon Is., the Moluccas and the Philippines, and by numerous fossil shells in the Neogene of Niue (Cook Is.). It is close to *Vasticardium orbita*, with which it shares several characters, but differs by rib morphology and hinge.

RESUME. *Vasticardium papuanum* est un grand Trachycardiinae (maximum 96,5 mm de hauteur) actuellement connu par cinq spécimens récents de Papouasie-Nouvelle-Guinée, des îles Salomon, des Moluques et des Philippines, et par de nombreuses coquilles fossiles dans le Néogène de Niue (îles de Cook). Il est proche de *Vasticardium orbita*, avec qui il a plusieurs caractères en commun, mais en diffère par la morphologie des côtes et la charnière.

MATERIAL AND METHODS

Five Recent specimens, all selected as types, come from the following Museums:

IRSNB: Institut Royal des Sciences Naturelles de Belgique, Bruxelles.

MNHN: Muséum National d'Histoire Naturelle, Paris.

ZMA: Zoologisch Museum, Amsterdam.

WAM: Western Australian Museum, Perth.

Fossil material is in :

UGML: University of Guam Marine Laboratory, Mangilao, Guam. I have examined three complete valves and several fragments.

Rib morphology is a primordial element for specific identification. For examination, the shells are divided externally into four radial "quarters": AQ: Anterior Quarter; MAQ: Medio-Anterior Quarter; MPQ: Medio-Posterior Quarter; PQ: Posterior Quarter. The rib morphology changes from a quarter to another. Two parts are also schematically considered in each shell: a "juvenile" part near the umbo, of variable length, and a larger "adult" part following the latter until the ventral margin. The rib morphology progressively changes from one part to the other.

Abbreviations used are also: H= Height, L= Length, W= Width.

SYSTEMATICS

Family CARDIIDAE Lamarck, 1809

Subfamily TRACHYCARDIINAE

Stewart, 1930

Genus *Vasticardium* Iredale, 1927.

Type species: *Cardium elongatum* Bruguière, 1789, by original designation (Iredale 1927: 75).

Diagnosis

Shell medium to large-sized, ovoid and symmetrical to asymmetrical and posteriorly expanded, obliquely or not, "winged" or truncated. Variably but moderately elongated and inflated. Mean rib number small to medium, range 30-42, exceptionally 45. Hinge line moderately angled. Cardinal teeth in right valve separated or merely touching at their base and never connected by a high and narrow dorsal saddle. In juvenile median and anterior parts, ribs becoming quickly high, square sided and fully ornamented, directly following millimetric smooth very primitive shell. In PQ, ribs always high and square-sided in juvenile shells, always simple, not divided into two parts; top scales or nodules always arranged in a single row along the apex. In other quarters of adult shells, ribs generally high, often squared

and overhanging interstices, rarely triangular, often bearing scales or tubercles in MPQ with crenulated margins, cross-bars in anterior half. Interstices rather deep and wide, with a flat bottom, smooth or finely striated independently from flanks of ribs, never notched or hollowed.

Remark

In previous papers (VIDAL, 1991, 1993), I used provisionally the genus *Acrosterigma* Dall, 1900, for species belonging to the same genus as the one described here. But now I think that the genus *Vasticardium*, as defined above, is more appropriate.

Vasticardium papuanum sp. nov.

Figs. 1-7.

Types

Holotype MNHN, Kale Bay, Western Manus Is., Admiralty group, Papua New Guinea, collected by Mr K. Silva, coll. Vidal.

Paratype No 1 MNHN, Philippines (?), no other data (found in Manila shop), coll. Vidal.

Paratype No 2 IRSNB IG26132, Hansa Bay, Laing Is, S. reef, Papua New Guinea, dredged 15 m, coll. Tursch & Pierret. **Paratype No 3** ZMA, Moluccas, coll. F. von Heukelom.

Paratype No 4 WAM 38-95, San Cristobal, Kira-Kira, Solomon Is., 161° 55' E - 10° 27' S, coll. B. R. Wilson.

Description

Shell reaching 96.5 mm in height. Practically equilateral and not elongated. Presence of a small posterior "winging" in the holotype and paratypes No 1 and 4. Tendency to the expansion of the shell limited to the MPQ particularly marked in the paratype No 3, and some fossil specimens.

Lunule rather large and well delineated, with the raised margins of the shell forming like a double wall in its axis.

External colour rather uniform, except in the juvenile part: red-brown in the holotype and paratypes No 2 and 4, light brown in the paratype No 1 and whitish in the paratype No 3. Internal margin vividly coloured, except for the paratype No 3 which is hardly tinted.

Number of ribs 37-39 in the Recent specimens, 34-36 in the fossils.

Rib morphology

PQ: In the young shells, the ribs, square-sided, have a particular sculpture (Fig. 6) with large, a little twisted, oblique scales disposed in the posterior half of the ribs, and intercalated

with small crenulations in the posterior flank of the ribs, and more numerous anterior small scales or crenulations on the anterior edge. In the adult shells, the ribs flatten and even become concave, the interstices become extremely narrow; the large posterior scales become smaller, more numerous, less regular, then turn into a cicatricial ridge, separated on the rib by a furrow. The anterior scales disappear or become very lamellated and slanted, or form a small riblet.

MPQ: The sculpture of the young shell is constant: ribs more or less flatly rounded or slightly triangular with crenulations on both sides, which tend to join across the top and form transverse rugae; interstices separated from the ribs and striated. In adult shells the MPQ zone is very variable from one specimen to another, and also according to the position of the rib in the quarter: the ribs can be flatly rounded (holotype), to asymmetrically triangular (posterior side shorter). Interstices narrow but generally well delineated by a slight overhanging of the ribs; they are rather irregularly, strongly striated (about 30 striae per centimeter at a distance between 3 and 4cm from the umbo, versus about 60 in the *Vasticardium orbita* group.

The posterior crenulations can remain, become longer and form rugae on the flank, or disappear. The anterior crenulations can also disappear or become very long and slanting, or can form a very small pseudo-rib (particularly in the Niue fossils). The top zone of the ribs can be smooth (like in the holotype and paratype No 3) or bear additional tubercles or oblique scales equivalent of the main scales of the PQ. Sometimes, in the very adult part, particularly in the Niue fossils, the long posterior rugae issued from the crenulations reinforce when reaching the top and form tubercles on the triangular crest, and sometimes a double ornamentation with the also reinforced more marginal part of the rugae. The figures illustrate the progressive variability of the adult MPQ, from smoothest in paratype No 3 (Figs. 3-4) to most ornamented in Niue fossils.

MAQ and AQ: Ribs becoming somewhat square-sided, and ornamented with regular, slightly curved, transverse rugae, rarely forming a well characterized herringbone structure.

Measurements:

see Table 1.

| | Height (mm) | Length (mm) | Width (mm) | L/H | W/L | Ribs |
|---------------------------------|----------------|----------------|---------------|------|------|------|
| Holotype, MNHN (Figs. 1-2) | 83.1 | 72.2 | 53.0 | 0.87 | 0.73 | 37 |
| Paratype No 1, MNHN (Fig. 6) | 75.0 | 63.1 | 47.8 | 0.84 | 0.76 | 38 |
| Paratype No 2, IRSNB | 61.4 | 53.3 | 38.3 | 0.87 | 0.72 | 39 |
| Paratype No 3, ZMA (Figs. 3-4) | 96.5 | 81.4 | 57.0 | 0.84 | 0.70 | 39 |
| Paratype No 4, WAM | 74.8 | 65.0 | 44.5 | 0.87 | 0.68 | 37 |
| Niue fos. reef 1, UGML | 85.8 | 71.2 | (56.0) | 0.83 | 0.79 | 36 |
| Niue fos. reef 1, UGML (Fig. 7) | 81.4 | 63.0 | (52.0) | 0.77 | 0.82 | 34 |
| Niue fos. reef 2, UGML (Fig. 5) | 50.5 | 41.4 | (32.0) | 0.82 | 0.77 | 35 |

Table 1. Measurements.

Remarks

The shell figured by VOSKUIL and ONVERWAGT (1991: pl. 3, fig. 10) as *Trachycardium enode* (Sowerby, 1840), reported as coming from Solomon Is., may belong to this species (specimen not seen). *Vasticardium papuanum* mainly differs from *Vasticardium elongatum enode* by its characteristic PQ, by the presence of ornaments on top and margins of ribs in the MPQ (smooth in *enode*) and by its striated interstices (smooth in *enode*).

The rib morphology of *V. papuanum* in MPQ and mainly in PQ (Fig. 6) is very characteristic, and similar elaborate features are never observed in any other Trachycardiinae. This species resembles *V. orbita* (Broderip & Sowerby, 1833) as far as general shape, lunule, internal colours, sculpture of the ribs of adult shells in anterior half and striated interstices are concerned. It differs by its uniform external colour, the sculpture of the juvenile shells (presence in the PQ of secondary marginal small scales or crenulations, ribs not smooth on the top in the three other quarters), the sculpture of the MPQ in the adult shells (with often double ornamentation), its more roughly striated interstices even in adult shells, and its hinge with no "hooked" and pointed basement of the basement of the anterior teeth, which is always rounded and not prominent. This latter macroscopic character is very distinct from *V. orbita*. It is interesting to note that in Niue Is. both species are found in the same deposits, and are also sympatric today in Hansa Bay (Papua New Guinea).

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Figures 1-7 (*opposite page*).

- 1-2. Holotype of *Vasticardium papuanum*. MNHN, ex coll. Vidal. L=72.2 mm.
- 3-4. *Vasticardium papuanum*, paratype No 3. ZMA, ex coll. von Heukelom. L=81.4 mm.
5. *Vasticardium papuanum*, from the Mio-Pliocene of Niue Is. UGML, ex coll. Paulay.
L=41.4 mm.
6. *Vasticardium papuanum*, paratype No 1: detail of the rib morphology in juvenile PQ and three ribs of MPQ. Scale= x 3.5.
7. *Vasticardium papuanum*, from the Mio-Pliocene of Niue. UGML, ex coll. Paulay.
L=63.0 mm.

