

## A new *Vasticardium* (Bivalvia: Cardiidae) from Vietnam

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**ABSTRACT** A new species of genus *Vasticardium* Iredale, 1927 is described from Khánh Hòa, Central Vietnam and compared to three other species of this genus: *Vasticardium elongatum wilsoni* (Voskuil & Onverwagt, 1991), *Vasticardium hyllebergi* Thach, 2014 and *Vasticardium philippinense* (Hedley, 1899).

**Key words:** Mollusca, Bivalvia, Cardiidae, *Vasticardium*, Central Vietnam, Khánh Hòa, Southeast of Nha Trang area, Ninh Thuận, Bình Thuận, sand, new.

### INTRODUCTION

The genus *Vasticardium* Iredale, 1927, is a principal genus of the cardiid subfamily Trachycardiinae with many species collected in Vietnam. During August, 2013 an unknown cockle was found that was not listed in the works by Hylleberg & Kilburn (2003). It belongs to the genus *Vasticardium* and is a newly described species.

### ABBREVIATIONS

ANSP = Academy of Natural Sciences of  
 Drexel University, Philadelphia, USA  
 MNHN= Muséum national d'Histoire  
 Naturelle Paris, France  
 NBC = Naturalis Biodiversity Center Leiden,  
 The Netherlands  
 NMNH= National Museum of Natural  
 History Tokyo  
 KBIN = Royal Belgian Institute of Natural  
 Sciences, Belgium  
 NNT = Collection N.N. Thach  
 SH = Shell height  
 SL = Shell length  
 SW = Shell width  
 LV = Left valve  
 RV = Right valve

### SYSTEMATICS

Class Bivalvia Linnaeus, 1758  
 Family Cardiidae Lamarck, 1809  
 Subfamily Trachycardiinae Stewart, 1930  
 Genus *Vasticardium* Iredale, 1927 [Type  
 species: *Vasticardium nebulosum* Iredale, 1927]

*Vasticardium berschaueri* n. sp.

Figures 1-8

### DESCRIPTION

The shell is large for the family (90-110mm in average adult height, reaching 121.8mm), taller in height than length and quadrate ovate in outline with a short anterior part and broader posterior part. Dorsal margin strongly curved, ventral margin regularly convex and highly crenulated. Anterior margin is regularly convex with posterior margin straight. Shell length less than height (mean SL/SH= 74.9%, Table 1). Valves rather inflated (mean SW/SH= 61.7%, Table 1) and flattened at postero-dorsal area. Sculpture consisting of about 39.7 radial ribs (within a small range of 38-42 ribs, Table 1), contrary to *Vasticardium elongatum wilsoni* having a much wider range of 35-43 ribs (Lamprell & Whitehead, 1992).

Posterior radial ribs ornamented with scale like spines are skewed (oblique towards anterior side) while anterior ribs are ornamented with cross bars and skewed (oblique towards posterior side). Median radial ribs usually rounded with numerous cross bars. Hinge teeth

are strong, ligament exterior is black, shiny and well visible. Lateral teeth well separated from cardinal teeth. Color is exteriorly whitish with pink stripes on radial ribs and interiorly white with orange margins. Periostracum is straw-colored.

Specimen	SH (mm)	SL (mm)	SL/S H	Mean SL/SH	SW (mm)	SW/S L	Mean SW/SH	Number of radial ribs LV - RV	Mean Number of ribs
1 (Holotype)	117.5	89.9	0.765	0.749 (74.9%)	75.0	0.638	0.617 (61.7%)	40 - 41	39.7 ribs
2 (Paratype 1)	105.6	80.0	0.758		61.9	0.586		41 - 42	
3 (Paratype 2)	101.8	76.8	0.754		64.5	0.634		38 - 38	
4 (Paratype 3)	108.7	81.9	0.753		62.9	0.579		38 - 38	
5 (Paratype 4)	117.2	85.5	0.730		73.0	0.623		41 - 41	
6 (Paratype 5)	99.6	76.2	0.765		60.6	0.608		40 - 40	
7	115.7	86.4	0.747		70.3	0.608		39 - 40	
8	121.8	90.2	0.741		80.0	0.657		40 - 40	
9	99.0	75.7	0.765		61.8	0.624		42 - 42	
10	100.6	74.7	0.743		62.6	0.622		41 - 41	
11	98.6	74.2	0.753		62.7	0.636		39 - 39	
12	100.5	74.8	0.744		61.3	0.610		39 - 40	
13	103.3	73.0	0.707		61.4	0.594		38 - 39	
14	103.1	73.2	0.710		66.0	0.640		39 - 40	
15	92.5	71.4	0.772		55.7	0.602		39 - 39	
16	89.2	68.6	0.769		54.7	0.613		38 - 38	

**Table 1.** Mean SL/SH, SW/SH and number of ribs of *Vasticardium berschaueri*.



**Figures 1-8:** *Vasticardium berschaueri* n.sp., Khánh Hòa, Vietnam- **1&2:** Holotype 117.5mm SH (uncleaned) with exterior and interior views, ANSP- **3:** Paratype 1: 105.6mm SH, NBC- **4:** Paratype 2, 101.8mm SH, MNHN- **5:** Paratype 3: 108.7mm SH (uncleaned), NMNH- **6:** Paratype 4: 117.2mm SH, NNT- **7:** Enlarged radial ribs (Holotype 117.5mm)- **8:** Lateral view with ligament (Paratype 1, 105.6mm SH)- **9:** *Vasticardium elongatum wilsoni* Paratype 78mm (Photo of Natural History Museum Rotterdam) for comparison- **10:** *Vasticardium hyllebergi* Paratype, 97mm SH (Photo by Thach, 2014) for comparison- **11:** *Vasticardium philippinense* 64.9mm SL in NhaTrang, Vietnam (Photo by Thach, 2005) for comparison- **12:** *Vasticardium elongatum wilsoni* in Queensland, Australia (Photo by Lamprell & Whitehead, 1992) for comparison.

**Type material:** Holotype 117.5mm high in ANSP (Figs. 1-2). Paratypes: all from type locality, Paratype 1: 105.6mm high in NBC (Fig.3 & 8). Paratype 2: 101.8mm high in MNHN (Fig.4). Paratype 3: 108.7mm high in NMNH (Fig.5). Paratype 4: 117.2mm high in NNT (Fig.6). Paratype 5: 99.6mm high in KBIN (not illustrated). Specimens No 7-16 are in NNT.

**Type locality:** Southeast of Nha Trang area, Khánh Hòa Province, Central Vietnam.

**Range and habitat:** Along the Central Vietnam coast, from Khánh Hòa Province to Ninh Thuận and Bình Thuận Provinces. The specimens live sympatrically with *Vasticardium hyllebergi* and

*Vasticardium philippinense* on the sandy bottom at 1-15m. The type specimens were collected at 10m depth.

**Etymology:** This new species is named in honor of David P. Berschauer of the United States for his interest in publishing articles on new species of mollusks from Vietnam.

#### DISCUSSION

- *Vasticardium berschaueri* n.sp. is close to *Vasticardium elongatum wilsoni* (Fig. 9 and 12) but differs in ten characteristics summarized in Table 2.

	<i>Vasticardium berschaueri</i> n. sp.	<i>Vasticardium elongatum wilsoni</i>
<b>Size</b>	Very large adult size (exceeding 90 mm SL)	Large adult size (up to 82 mm SL)
<b>Shape</b>	Quadrato-ovate (SL = 74.9 % SH)	Dorso-ventrally elongate
<b>Convexity</b>	Flattened at postero-ventral area	Regularly inflated
<b>Ventral part</b>	Broad	Narrow
<b>No. of radial ribs</b>	Slightly variable (38-42ribs)	Highly variable (35-43 ribs)
<b>Shape of radial ribs</b>	Skewed ribs at two lateral sides	Flat-topped ribs
<b>Interstices</b>	Moderately deep	Very deep
<b>Spines at posterior ribs</b>	Not sharp	Sharp
<b>Posterior margin</b>	Not concave	Slightly concave
<b>Color</b>	Whitish with pink stripes on radial ribs	Yellow

**Table 2.** Comparison of *Vasticardium berschaueri* n. sp. and *Vasticardium elongatum wilsoni*.

- *Vasticardium berschaueri* n.sp. differs from *Vasticardium hyllebergi* Thach, 2014 (paratype, Fig.10) in its obese shape, much larger adult size, more numerous radial ribs and flatter at postero-ventral area.
- *Vasticardium berschaueri* n.sp. differs from *Vasticardium philippinense* (Hedley, 1899) (Fig. 11) in its less ovate shape, larger adult size and lacking broad dark brown band along posterior inner margins.

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## Errata

Please find below a short list correcting minor errors in our last two quarterly issues.

1. Our May 2014 quarterly issue should be numbered as Volume 46(3)
2. Our August 2014 quarterly issue should be numbered as Volume 46(4)
3. In the August 2014 article "Disentangling the Hidden Biodiversity of the Genus *Jaspidiconus* on page 126, in the grouping of shells depicted on Figure 1 as "D" the shell on the far left (with dorsal and ventral views) is *Jaspidiconus damasomonterioi* Petuch & Myers, 2014.
4. In the August 2014 article "A Brief Review of an Iconography of the *Haliotis* Species and Subspecies of Australia and New Zealand - Including Notes on Current Largest Recorded Specimens" on page 102 in the "Acknowledgments" section the authors erroneously credited Daniel Geiger for editing the final manuscript - when in fact Dr. Geiger reviewed an earlier draft years before and did not review the final manuscript.

Thank you - The Editors.