

Short Communication

Notes on the existence of Broad Cockle *Maoricardium pseudolatum* Voskuil & Onverwagt, 1991 (Bivalvia: Cardiida: Cardiidae) in Indian water

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Received 22 July 2024; revised 28 August 2024

The present report briefly notes the occurrence and distribution of *Maoricardium pseudolatum* Voskuil & Onverwagt, 1991, from the Indian territory. This species was described based on holotype examples from Indonesia and paratype examples from six countries, including India. Indian paratypes are from Madras (near Aquarium and Adyar River) on the east coast of India. Still, there is no such remarkable information on the occurrence of this species in Indian bivalve literature except Edward *et al.* 2022. The present note is based on the specimens collected from different localities of Gujarat, Tamil Nadu, Andhra Pradesh and Odisha coast. Also, it is the first ever report of *Maoricardium pseudolatum* Voskuil & Onverwagt, 1991, from the Gujarat, Andhra Pradesh and Odisha coast.

[**Keywords:** Cardiidae, Distribution, East coast, Gujarat, Indo-Pacific]

Introduction

The family Cardiidae Lamarck, 1809 consists of true cockles and giant clams. Most species inhabit marine water, except for a few species of brackish water¹ of tropical to temperate seas worldwide, with a few species also found in Arctic waters. However, most extant taxa are found in tropical and subtropical waters². These are primarily infaunal to epifaunal in soft sand or mud, occupying shallow water up to a depth of 500 m and are suspension feeders². Shell small to large size, rounded and bilaterally symmetrical, heart shape if viewed from side, subtrigonal or subquadrate but generally higher than long and usually inequilateral with porcelaneous texture¹. External surface ornamented with several radial ribs or striae, usually covered with weak or transparent periostracum, umbo prominent and

inwards, margin denticulate or undulated. The interior of the shell is porcelaneous but not nacreous. Live animals can be capable of jumping and swimming and perform leaping movements¹.

This family comprises about 50 genera worldwide and about 256 extant species². Out of these, 10 genera and about 36 species are known so far from India^{1,3}. The *Maoricardium* Marwick, 1944 is a genus of this family with three extant species^{4,5}. The genus is characterised by a large shell, umbones prosogyrous and positioned at the anterior third or fourth of the shell. Lunule with raised margin, escutcheon not clear, shell ornamented with blunt radial ribs bearing cup shaped tubercles. Only one species, *M. setosum* Marwick, 1944, appears in the most of the Indian bivalve literature^{1,6}, while *M. pseudolatum* Voskuil & Onverwagt, 1991 might be overlooked with its congeners, hence not reflected in the literatures. This species was recently reported from the Gulf of Mannar, Tamil Nadu⁷ and recorded from the south west coast of Kerala with a doubtful image⁸. The *M. pseudolatum* is described by using two valves as paratypes, collected from Madras (near aquarium and Adyar River) and it is distributed throughout the Indo-Pacific region. The Madras coast is one of the paratype localities along with five other countries: Australia, Indonesia, Pakistan, Solomon Islands, and Sri Lanka⁴. The present report is a brief note on the occurrence and distribution of *M. pseudolatum* in Indian waters, and the first report from the coast of Gujarat, Andhra Pradesh and Odisha.

The following abbreviations are used in the study: dt - date of collection, MARC - Marine Aquarium and Regional Centre, Digha; NZC - National Zoological Collections of MARC; Reg. no - Registration number of the voucher specimen in NZC, ZSI - Zoological Survey of India.

Materials and Methods

The specimens examined during the present study were collected from both the east and west coasts of India, *i.e.* Gujarat, Tamil Nadu, Andhra Pradesh and Odisha coast (Fig. 1), and all specimens are deposited at the NZC of MARC, Digha. The details of the examined specimens are as follows: Gujarat coast – Beyt Dwarka (22°27'46.3" N; 69°06'00.7" E), two

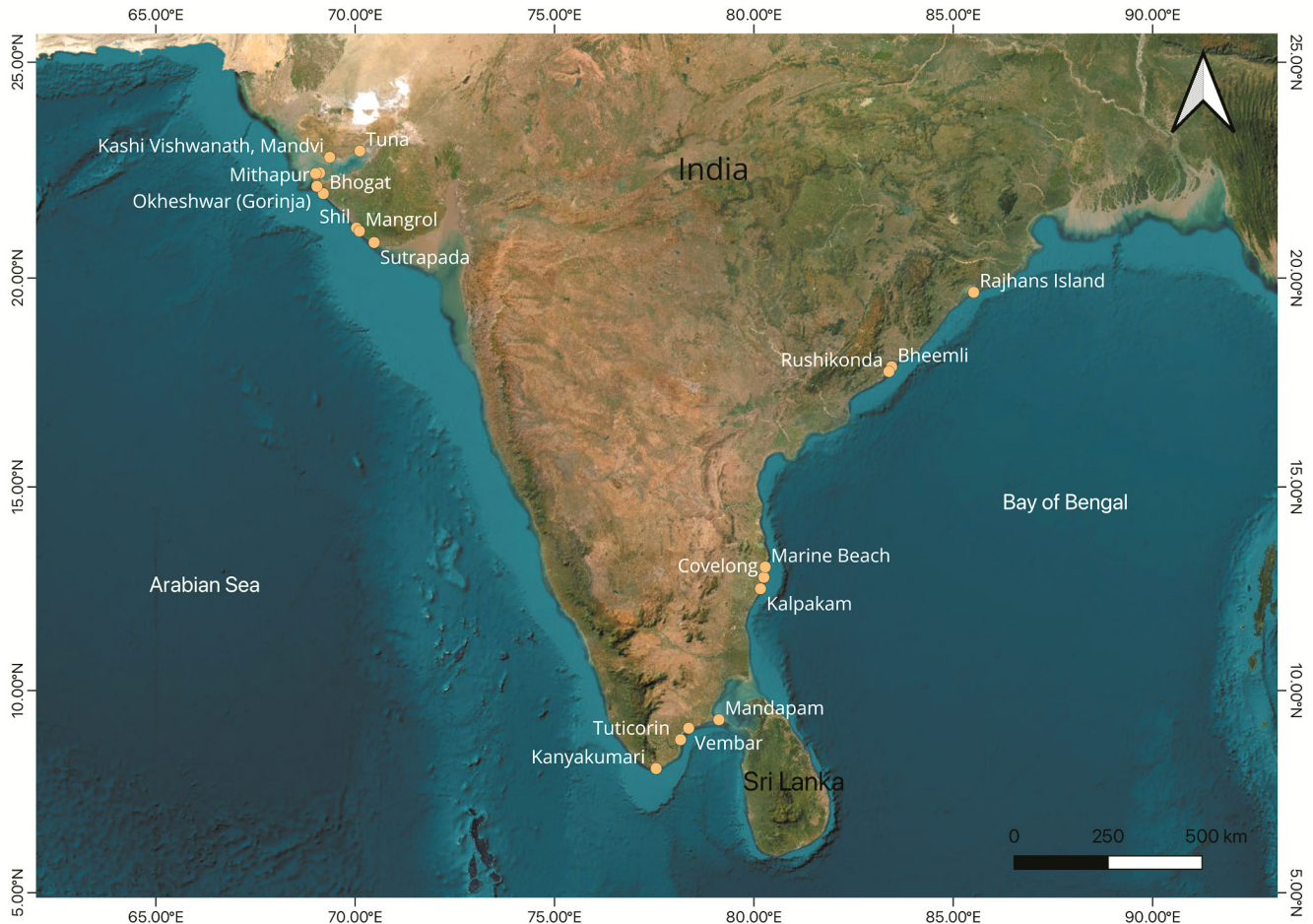


Fig. 1 — Map of the collection localities of *Maoricardium pseudolatatum* Voskuil & Onverwagt, 1991 along the Indian coast

valves, dt. 22.07.2011, Reg. no. MARC/M2490; Tuna (22°58'13.5" N; 70°05'48.8" E), fifteen valves, dt. 27.07.2011, Reg. no. MARC/M2506; Kashi Vishwanath, Mandvi (22°49'10.8" N; 69°21'24.5" E), five valves, dt. 30.07.2011, Reg. no. MARC/M2528; Mithapur (22°25'16.1" N; 68°59'35.9" E), one valve, dt. 22.08.2011, Reg. no. MARC/M2532; Shil (21°10'31.8" N; 70°01'52.9" E), two right valves, dt. 25.11.2011, Reg. no. MARC/M7593; Sutrapada (20°50'03.3" N; 70°29'14.9" E), one right valve, dt. 24.11.2011, Reg. no. MARC/M7600; Off Bhogat (21°58'06.2" N; 69°12'50.5" E), one valve, dt. 26.02.2011, Reg. no. MARC/M6595; Mangrol (21°06'12.9" N; 70°06'25.0" E), one valve, dt. 25.02.2021, Reg. no. MARC/M6605; Okheshwar (Gorinja) (22°08'51.4" N; 69°02'25.7" E), three valves, dt. 26.02.2011, Reg. no. MARC/M6614; Tamil Nadu coast – Kanyakumari (8°05'49.0" N; 77°33'50.5" E), seven valves, dt. 12.09.2014, Reg. no. MARC/M4031; Tuticorin (8°47'34.5" N; 78°09'38.2" E), one valve,

dt. 09.09.2014, Reg. no. MARC/M4239; Covelong (12°47'25.0" N; 80°15'12.6" E), three valves, dt. 27.06.2014, Reg. no. MARC/M6086; Kalpakam (12°31'44.5" N; 80°10'00.8" E), two valves, dt. 29.06.2014, Reg. no. MARC/M6532; Mandapam (9°16'34.4" N; 79°09'09.3" E), one valve, dt. 04.09.2019, Reg. no. MARC/M6887; Vembar (9°04'35.7" N; 78°21'55.4" E), five valves, dt. 22.09.2023, Reg. no. MARC/M11072; Marina Beach (Chennai) (13°03'04.3" N; 80°17'02.3" E), one valve, dt. 18.02.2024, Reg. no. MARC/M11276; Andhra Pradesh coast – Bheemli (17°53'33" N; 83°27'18" E), one valve, dt. 21.03.2022, Reg. no. MARC/M9428; Rushikonda (17°46'53" N; 83°23'07" E), four valves, dt. 21.03.2022, Reg. no. MARC/M9579; Odisha coast – Rajhans Island (near new mouth of Chilika Lake) (19°39'50" N; 85°30'29" E), one valve, dt. 17.09.2021, Reg. no. MARC/M8711. The species identification and description follow Voskuil & Onverwagt⁴ and classification follows the ter Poorten⁵. The

morphometric measurements (height and length) were accomplished with a digital calliper (WorkZone), and photographs were taken with digital camera with a macro-lens (Sony, DSC α6100).

Results

Systematics

Class: Bivalvia Linnaeus, 1758^(ref. 10)

Order: Cardiida Ferussac, 1822^(ref. 11)

Family: Cardiidae Lamarck, 1809^(ref. 12)

Genus: *Maoricardium* Marwick, 1944^(ref. 13)

Maoricardium pseudolatum Voskuil & Onverwagt, 1991^(ref. 4) (Fig. 2a–d)

Diagnosis

Shell solid and elongated, length 10.5 to 44.7 mm long, and height 7.4 to 32.6 mm (Fig. 2). Length and height ratio ranges from 1.26 to 1.53, with 32 to 42 flat ribs which are surrounded with many minute papillae, and which are more closely set on the anterior slope and larger and more distant on the posterior slope. Ribs of the juvenile specimens have more papillae and are surrounded by greenish colour periostracum. Ribs quite broadly spaced near the extreme postero-dorsal area. Ventral margin much less rounded, usually straight, or clearly oblique. Lunule faintly definite, only a small, somewhat raised area is noticeable, close to the umbones. Intercostal spaces narrow and smooth or with unevenly placed transverse scales. Ribs not well detectable from inside. Exterior of the shell with dirty white, posterior slope, ventral margin and extreme anterior part more brightly coloured with pink or orange. Interior white

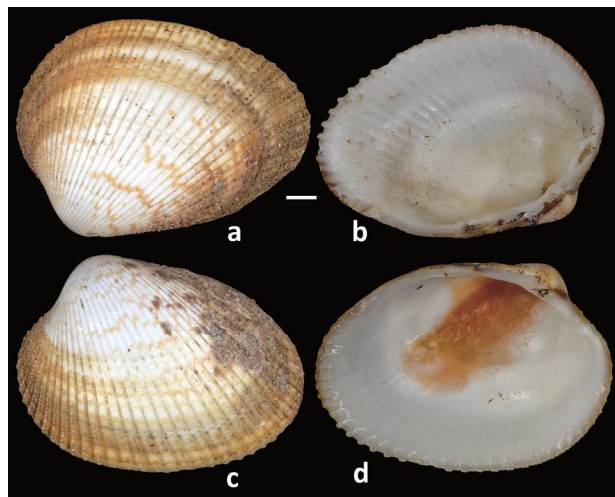


Fig. 2 — (a–d) *Maoricardium pseudolatum* Voskuil & Onverwagt, 1991: a, b) Right valve; c, d) Left valve; scale = 5 mm, collection locality - Vembar (MARC/M11072)

with orange at umbo. Periostracum heavy in fresh specimens, especially near the ventral margin.

Distribution

This species is widely distributed in the Indo-Pacific region, including Australia, Indonesia, Pakistan, Solomon Islands, India, Sri Lanka⁴ and Philippines¹⁴. For the present study, the specimens were collected from Sutrapada, Shil, Mithapur, Bhagat, Okheswar, Mangrol, Beyt Dwarka, Tuna and Kashivishwanath (Mandvi) of the Gujarat coast, Kanyakumari, Tuticorin, Vembar, Kalpakkam, Marina Beach, Mandpam and Covelong of the Tamil Nadu coast, Bheemli, Rushikonda of Andhra Pradesh and Rajhans Island (near sea mouth of Chilika Lake) of the Odisha coast (Fig. 1).

Discussion

As it is mentioned, the present species *Maoricardium pseudolatum*, was described in 1991 by Voskuil & Onverwagt during a review of the family Cardiidae of the world and the holotype specimen was from Indonesia. The paratypes are from six countries including, India. This species is widely distributed in the Indo-Pacific region. Paratype locality from India was the Madras coast, which is the present-day Chennai coast along the east coast of India. Although, this coast was one of the paratype localities, but this species was missing from recent renowned Indian bivalve literatures, *i.e.* Ramakrishna & Dey⁶ and Subba Rao¹. However, it was only reflected in one recent literature⁷. Another reference from south-west coast of Kerala⁸ indicates the presence of this species, but the images provided seems to be doubtful. This paper presents the distribution of this species along the Indian coast, marking its first report from Gujarat, Andhra Pradesh and Odisha states. This species may be misidentified with its congener species, *M. setosum* Marwick, 1944, which is commonly available in Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Odisha and the Andaman coast of India. The *M. pseudolatum* is easily recognised as having a less rounded ventral margin, an oblique ventral margin, and a somewhat elongated shape as compared to *M. setosum*, which has a more rounded ventral margin, and a less elongated shape.

Acknowledgements

We are immensely thankful to Dr Dhriti Banerjee, Director, ZSI, Kolkata for her guidance and support.

Our sincere thanks to Dr. Prasanna Yennawar, Former Scientist-D, Freshwater Biology Regional Centre, Zoological Survey of India, Hyderabad and Dr. Anil Mohapatra, Scientist-E & Officer-in-Charge, Estuarine Biology Regional Centre, Zoological Survey of India, Gopalpur-on-Sea, Odisha for leading the survey during collection of specimens. We express our sincere thanks to the anonymous reviewers for thoroughly examining article and suggestions which improved the manuscript. Our thanks to supporting staffs of MARC, Digha, especially Mr. Arun Kumar Kar, former Field Attendant and Mr. Somnath Dutta, Laboratory Assistant for their involvements in collection and/or processing of specimens.

Conflict of Interest

The authors declare that they have no conflict of interest.

Author Contributions

PCT: Specimen examination, identification, data collection, preparation of manuscript; LKM: Manuscript revision and preparation of distribution map with collection localities; SB: Data compilation and manuscript revision. All authors have been approved the manuscript for publication.

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