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Research article

New record of *Bathytormus acuminatus* (Kobelt, 1885) from India (Mollusca, Bivalvia, Crassatellidae)

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Abstract: *Bathytormus acuminatus*, was first described by Kobelt in 1885 from Singapore and never been reported after the original description. However, during the previous survey conducted by the scientist of the Zoological Survey of India, *B. acuminatus* was collected from 30 m off Gangavaram coast of Andhra Pradesh coastal water, India. The current study provides updates on the distribution and nomenclature of *B. acuminatus* in Indian Ocean waters.

Keywords: East coast, taxonomy, distribution, heterodonta, new record, India

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Introduction

The family Crassatellidae are mostly filter feeders, and live buried in shallow water of the sea; the family is divided into two subfamilies *viz.* Crassatellinae and Scambulinae are representing nearly 30 living species and are widely distributed across the world (Huber, 2010; Subba Rao, 2017; MolluscaBase, 2021). Out of these, three genera and four species of subfamily Crassatellinae are reported from Andaman Islands and different parts of the Indian waters (Ramakrishna & Dey, 2010; Subba Rao, 2017).

The genus *Bathytormus* Stewart, 1930 is stands out as one of the prevalent genera among tropical marine gastropods within the Crassatellinae. This genus encompasses with 13 fossil and four extant species, which are restricted to Indo-pacific region (Huber, 2010; Subba Rao, 2017; MolluscaBase, 2021). *Bathytormus* has most conspicuous morphological characters. The shells are elongated throughout its ontogeny, the margins postero-ventrally strongly acuminate and longitudinally expanded, and the ventral internal crenulate. The lunula is flattened and noticeably narrower than in *Crassatella*, the resiliferous is sub-elliptical, wide and concave, extending up to the ventral margin of the hinge plate, and the adductor scars large, margin usually crenulated (Stewart, 1930; Santelli & del Río, 2014; Subba Rao, 2017). In India, only two species *viz*. *Bathytormus jousseaumei* (Lamy, 1919) and *B. radiatus* (Sowerby, 1825) have been reported from different coastal regions of Andhra Pradesh and Andaman Island (Ramakrishna & Dey, 2010; Subba Rao, 2017). The present study reports the occurrence of *B. acuminatus* (Kobelt, 1885) species for the first time from Indian waters.

Material and Methods

Specimen was collected from the 30 m off Gangavarm, Visakhapatnam coast of Andhra

Pradesh, east coast of India (Lat. 17.616152 N - Long. 83.238002 E) on 20th September, 1996 and remains unidentified in the collection of Mollusca Section, Zoological Survey of India. The collected valves were photographed with Leica M205A stereo zoom microscope, post-processing has been done in Adobe Photoshop CS6.

The collected specimen was identified and confirmed as *Bathytormus acuminatus* as follow (Huber, 2010). The hinge was described following method as suggested by Santelli & del Río (2014), and Berezovsky (2022). The voucher specimen was deposited in the National Zoological Collections of the Zoological Survey of India at Kolkata.

Abbreviation: fig. — figure (in cited publications); figs. — figures (in cited publications); Fig. — Figure (in this publication); leg. — legit; NZSI — National Zoological Collection of the Zoological Survey of India (when citing specimens deposited in the ZSI); pl. — plate; s. str. — sensu stricto; ZSI — Zoological Survey of India (Kolkata, India).

Results

Taxonomy

Superfamily : Crassatelloidea Férussac, 1822
Family : Crassatellidae s. str.
Subfamily : Crassatellinae s. str.
Genus : *Bathytormus* Stewart, 1930

Bathytormus Stewart, 1930: 137–138, Chavan, 1939: 27–30, Chavan, 1952: 120, Darragh, 1965: 95, Chavan, 1969: N574, Wingard, 1993: 79, Subba Rao & Dey, 2000: 240, Ramakrishna & Dey, 2010: 147, Huber 2010: 240, DeVries, 2016: 663, Subba Rao, 2017: 201–202.

Crenocmssatella — Habe, 1951: 105.

Crassatella (*Bathytormus*) — Glibert and Van De Poel, 1970: 92, Berezovsky, 2022: 27.

Type species. *Bathytormus protextus* (Conrad, 1832) [= *Crassatella protexta* Conrad, 1832 (fossils), type by original designation.

Distribution. Indo-Pacific region.

Remarks. Stewart (1930) comprehensive analysis of the genera of Crassatellidae clarified many taxonomic questions. He named and described the genus *Bathytormus* and identified *Crassatella protexta* Conrad as the type species (see pl. 21, figs. 11 and 13 for an example); *C. alaeformis* Conrad was recognized as a member of this genus. *Bathytormus* Stewart is distinguished from *Crassatella* Lamarck by a ligamental cavity that extends to the ventral border of the hinge plate (Stewart, 1930, p. 137).

***Bathytormus acuminatus* (Kobelt, 1885)**

(Fig. 1a–e)

Crassatella acuminata Kobelt, 1885: 185.

Bathytormus acuminatus — Huber, 2010: 242 (fig.).

Type locality. "Singapore".

Material examined. INDIA • 1 shell, 30 m off Gangavaram, Vishakhapatnam district, Andhra Pradesh (17.610892N, 83.235212E), 20.IX.1996, leg. Dr. N. V. Subba Rao, coll. Zoological Survey of India (ZSI), NZSI M.37032/10.

Description. Shell small, elongately-trigonal up to 13.3 mm in length, thick and equilateral, anteriorly abbreviated, posteriorly produced into a long and pointed beak like structure, depressed, solid in relation to its size with wide, deeply excavated concentries ridges and intervening ribs compressing the posterior crest not going beyond to the front edge of the rib short but distinct intervening, sculptured, of a single yellow color. The anterior and posterior margin of the striatus, the lower first being rounded afterwards slightly blunt. The resiliferous is sub-elliptical, wide, and concave, extending up to the ventral margin of the hinge plate. The right valve (RV) has three cardinal and two lateral teeth; the middle tooth 3b is wedge-shaped and strong. Teeth 3a are thin, whereas the 5b are lamellar, strong and thick. Anterior lateral tooth AI is ridge-shaped and elongated. Posterior lateral tooth PI is long, occurring in the middle of the hinge margin of the escutcheon, the left valve (LV) has two cardinal (2 and 4b) and three lateral teeth (AII, PII and PIV). The cardinal teeth (4b) wide and strong, whereas 2 predominantly thinner and strong, the right valve (RV) has three cardinal (3a, 3b, 5b) and three lateral teeth (PI, AI, AIII). In addition, two pedal retractors are present (AR); the anterior pedal retractor is crescent shaped and distinct and is located above the anterior adductor (AA) and below the edge of the hinge plate; the posterior pedal retractor is continuous with the posterior adductor (PA) and forms a notch in the anterior-dorsal corner of the

scar. The pallial line is distinct and entire, and the ventral border somewhat faintly crenulated. The ligament is internal, originates at the beak, and extends up to the hinge plate. the inner surface white (Fig. 1d-e).

Habitat. The shells are collected from 30m off Gangavaram coast, Vishakhapatnam district, Andhra Pradesh.

Distribution. *India*: 30m off, Gangavaram, Vishakhapatnam district, Andhra Pradesh (current locality). *Elsewhere*: Singapore (Kobelt, 1885).

Remarks. The finding of *Bathytormus acuminatus* (Kobelt, 1885) is new record for the India water. This specimen quite resembles its congener species *B. radiatus* (Sowerby, 1825). However, differ from its shape, structure, size and widely spaced lamellar concentric ribs.

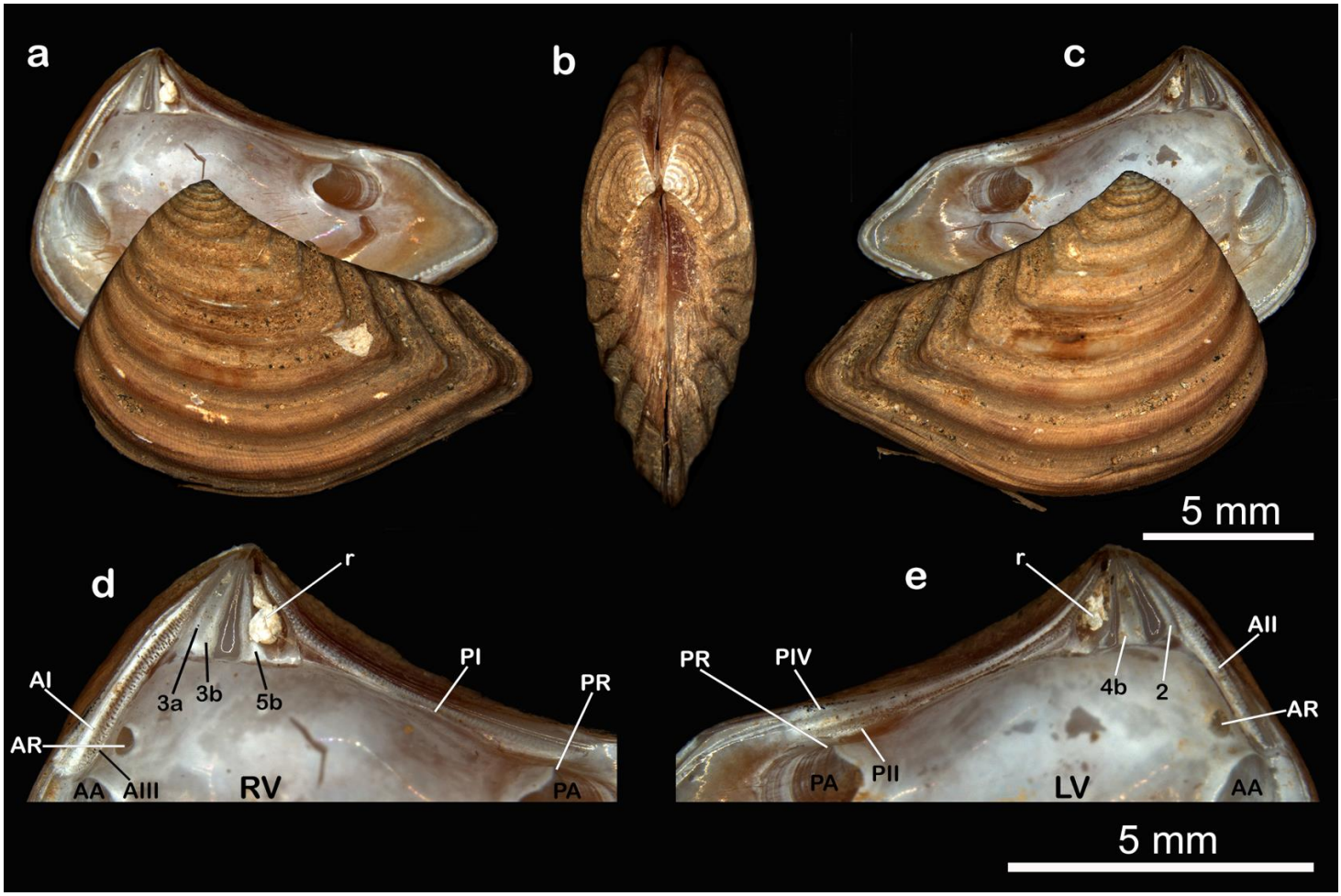

Figure 1. Shell of *Bathytormus acuminatus* (NZSI M.37032/10), from Andhra Pradesh, East coast of India **(a–c)**; Structure and symbol of the hinge, right valve (RV) and left valve (LV); (2), (3a), (3b), (4b), and (5b) cardinal teeth; AI, AII, AIII, PI, PII, and PIV, lateral teeth; AA- anterior adductor; AR- anterior pedal retractor; PA- posterior adductor; PR- posterior pedal retractor; r- resilifer (d–e).

Conclusion

The genus *Bathytormus* Stewart, 1930 of the family Crassatellidae is represented by two species *viz. B. jousseaumei* (Lamy, 1919) and *B. radiatus* (Sowerby, 1825) from Indian waters (Subba Rao, 2017). The discovery of *B. acuminatus* in Andhra Pradesh, India, for the first time, adds significantly to our knowledge of the marine bivalve's diversity of this area. Though *B. acuminatus* was formally reported from the type locality "Singapore", the exact locality is unknown (Kobelt, 1885) and never been recorded after the original description. Therefore, we assumed that this is the rare bivalve species present in the Indian Ocean. Thus, further systematic sampling needs to be carried out through the coast for better

understanding of the diversity and species composition in Indian Ocean.

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Ethical Approval
Not applicable

Conflicts of Interest
The authors declare that they have no conflict of interest.

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