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Short Communication

Two new occurrence records of bivalve species with the first report of the Genus *Lutraria* Lamarck, 1799, along the Odisha coast from Bahuda estuary

S Acharya[a,b], P C Tudu[c], S Patro[b] & Anil Mohapatra*[,a]

[a]Estuarine Biology Regional Centre, Zoological Survey of India, Gopalpur-on-Sea, Odisha – 761 002, India

[b]Department of Marine Sciences, Berhampur University, Bhanja Bihar, Berhampur, Odisha – 760 007, India

[c]Marine Aquarium and Regional Centre, Zoological Survey of India, Digha, West Bengal – 721 428, India

*[E-mail: anil2k7@gmail.com]

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This paper reports new occurrence records of two bivalve species, *Lutraria impar* Reeve, 1854, and *Meretrix lusoria* (Röding, 1798) from the Odisha coast on the basis of the collection from Bahuda estuary, Ganjam, Odisha. The genus *Lutraria* Lamarck, 1799, was not yet reported from the State, and the report of *Lutraria impar* is the first report of the genus from the Odisha coast. These specimens were collected from the sandy seabed near the mouth of the Bahuda estuary in Odisha.

[**Keywords**: *Lutraria impar*, Mactridae, *Meretrix lusoria*, Mollusks, Veneridae]

Introduction

Mollusks exhibit remarkable diversity, characterized by variations in their shell outlines, colours, dentition, and habitats. To date, 496 species from 261 genera, 124 families, and 33 orders across five classes have been documented along the Odisha coast[1]. The present report includes two families of the order Venerida, *i.e.*, Mactridae and Veneridae. In the case of mactrids concentric plications throughout the shell surface and fragile valves are present[2]. Venus clams inhabit a wide range of substrates and are frequently a significant species of sand flats and the more solidified mud of offshore. They are a common intertidal and inshore fauna[2]. Within the genus *Meretrix*, which is comprised of 14 species worldwide[3], three species, *Meretrix casta* (Gmelin, 1791), *Meretrix meretrix* (Linnaeus, 1758), and *Meretrix morphina* (Lamarck, 1818), have been reported from Odisha[1]. While *Meretrix casta* and *M. meretrix* are found along the entire Odisha coast, *M. morphina* has only been reported from the Gopalpur coast[1]. The genus *Lutraria* includes 22 valid species globally[4], but from India, three species, *i.e.*, *Lutraria complanata* (Gmelin, 1791), *L. impar* Reeve, 1854, and *L. rhynchaena* Jonas, 1844, are reported to date[3]. The genus *Lutraria* has not been previously documented along the Odisha coast. The current study in the Bahuda estuary introduces two new additions to the bivalve diversity of Odisha.

Materials and Methods

During a local survey, five dry shells were collected by handpicking method from Bahuda estuary (19°7'6.384" N and 84°47'24.702" E), Odisha, on July 23, 2022 (Fig. 1). The samples were collected during random sampling nearer to the mouth region of the estuary. The depth of living of *Meretrix lusoria* is seen at about 0 – 5 meters. The shells were cleaned and photographed using Nikon P900 camera. The shells were dry-preserved for further analysis and identification. The measurements were made by a digital calliper, and morphological characters were observed using a Leica S9i digital stereo

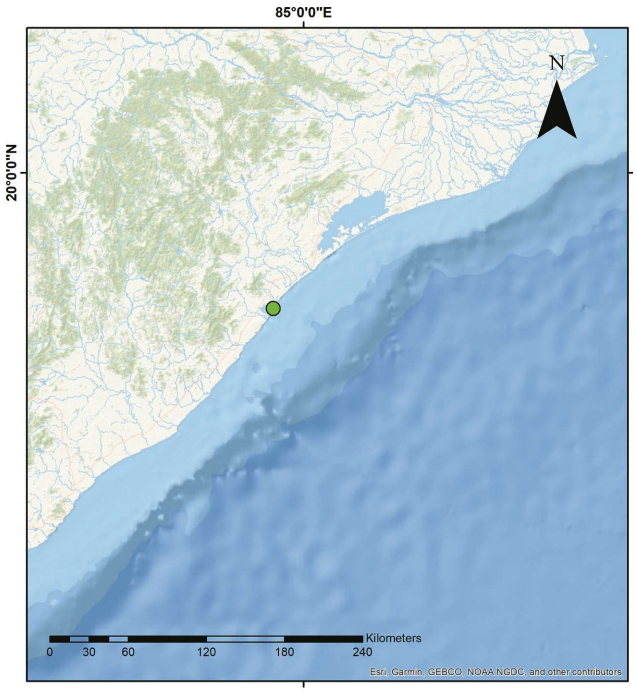

Fig. 1 — Map showing the collection locality of *Lutraria impar* and *Meretrix lusoria*

microscope. Identification of the specimens was done following the keys of Suba Rao[2], Vonpanich[5] and Rupavath *et al*.[6]. All the identified specimens were deposited at the Estuarine Biology Regional Centre (EBRC), Zoological Survey of India (ZSI), and Gopalpur-on-Sea for future reference and study with registration numbers EBRC/ZSI/M 14167 and EBRC/ZSI/M 14168.

Results

A brief description of the morphological characteristics of the new records is described below.

Systematics

Phylum: Mollusca
Class: Bivalvia
Order: Venerida Gray, 1854
Family: Mactridae Lamarck, 1809
Genus: *Lutraria* Lamarck, 1799

***Lutraria impar* Reeve, 1854**

Material examined: EBRC/ZSI/M 14168, 01 specimen, length 81 mm (left valve).

Diagnosis: Shell rectangular, elongated, and large, delicate and thin, measuring 81 mm in length, 39 mm in height, and 11 mm in depth (Fig. 2a). Uniformly rounded ends on both anterior and posterior (broken), with a light grey colour on the upper part and a white interior. The exterior displays strong, concentric, irregular ridges. Additionally, it has a tiny beak, and a flattened umbo placed anteriorly, along with a short, round anterior margin. The pallial sinus is characterized by a bluntly rounded anterior end, depth is two third in shell length, cylindrical in shape, and attached to the pallial line. Rounded and larger posterior adductor muscle scar; elliptical and smaller anteriorly. Lateral teeth are absent. It stands out within the mactrids because of its increased presence of rectangular shapes and a higher density of concentric ridges (Fig. 2a).

Distribution: Bahuda estuary, Odisha coast (Present report); Andhra Pradesh, Goa & Maharashtra from Indian Coast[4].

Habitat: Mostly buried on the sandy and muddy bottom below the watermark, and their siphons extended to the sea bottom.

Family: Veneridae Rafinesque, 1815

***Meretrix lusoria* (Röding, 1798)**

Material examined: EBRC/ZSI/M 14168, 04 specimens, length 36 – 55 mm (both left and right valve).

Diagnosis: Meretrix lusoria is differentiated by having a particularly straight posterior dorsal margin. The shell of *M. lusoria* is medium-sized, sub-trigonal, and equilateral. The umbo, which is very small, is inflated at the top of the anterior margin. The posterior region of the shell is slightly convex, and the posterior dorsal margin slopes slightly downward at the posterior end (Fig. 2b). The hinge plate of the shell consists of two cardinal teeth, a single lateral tooth, and a socket. The lunule is weakly defined, while the eustcheon is large, very distinct, and extends to one-third of the shell's length. The exterior of the shell is smooth and adorned with fine concentric growth lines. A unique characteristic of the species is the shape of the pallial sinus scar, which is located near the posterior adductor muscle scar forming an "L" pattern. This "L" pattern results from the protrusion of the pallial line scar from the pallial sinus scar (Fig. 2b).

Distribution: Bahuda estuary, Odisha coast (Present report); Andaman Sea, Andhra Pradesh, Goa & Maharashtra from India coast[4].

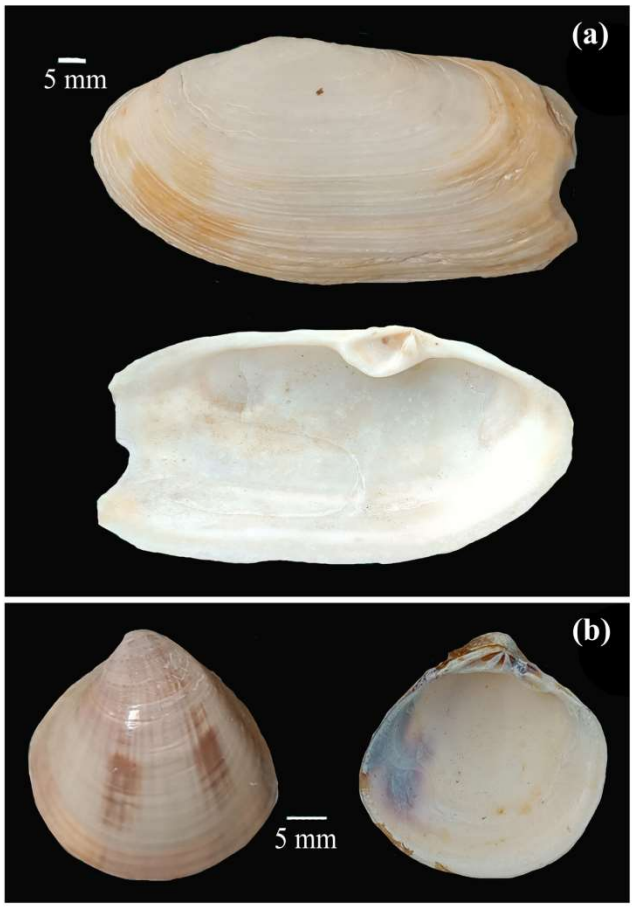

Fig. 2 — a) *Lutraria impar* EBRC/ZSI/M 14168; and b) *Meretrix lusoria* EBRC/ZSI/M 14167

Habitat: Mostly found in the estuarine area of the sandy and muddy bottom.

Discussion

Four genera, *Mactra* Linnaeus, 1767, *Mactrinula* Gray, 1853, *Standella* Gray, 1853, and *Raeta* Gray, 1853, of the Mactridae family have been previously documented from the Odisha coast[1]. However, the genus *Lutraria* had not been recorded along the Odisha coast until now. The present study documented the occurrence of the *Lutraria impar* from the Bahuda estuary, thus claiming the first record of the species along the Odisha coast. Globally, *L. impar* is reported from Australia, the Gulf of Thailand, and India. Along the Indian coast, the species has been reported from the Andaman Sea, Maharashtra, Goa, and Andhra Pradesh[2,5-9]. In the Indian Ocean, the genus *Lutraria* is represented by three species including *Lutraria rhynchaena* Jonas, 1844, found in the Persian Gulf, Red Sea, Gulf of Oman, and Arabian Sea and this species also has been reported from Gujarat[10]; Yemen[11]; Qatari waters[12]; and the Arabian Gulf; *Lutraria angustior* R. A. Philippi, 1844, and *Lutraria curta* Reeve, 1854, have been reported from Yemen[11]; *Lutraria complanata* (Gmelin, 1791) is reported from Andhra Pradesh & Maharashtra[10]. Further during the study, it was observed that *Meretrix lusoria*, a commercially important bivalve belonging to the family Veneridae, is found throughout the year in the Bahuda estuary but has not been reported previously. The species is widely distributed along the coast of the Yellow Sea, the Southern Sea, and Jeju Island in the Korean Peninsula, as well as in China within its natural ecosystem[9]. Four dry shells were collected from the estuary during the study. *Meretrix* can be found in sandy tidal flats, intertidal zones, and areas up to 0 – 20 meters deep in seawater[13]. Along the Indian coast, *Meretrix lusoria* was first time reported from Andhra Pradesh[6]. The present documentation of *Meretrix lusoria* enhances the total species number of the genus along Odisha's coast to four. Further research on these bivalve species is necessary to comprehend their ecological significance and potential for conservation efforts.

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Conflict of Interest

There are no conflicts of interest among authors.

Ethical Statement

The organisms under the study neither in the schedule list nor in any other protection categories, hence an ethical clearance certificate is not necessary.

Author Contributions

SA: Collection, photography, identification and manuscript preparation; PCT: Identification, overall designing of the manuscript; SP & AM: Critical analysis of the manuscript.

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