ON SOME MOLLUSCA COLLECTIONS FROM DIFFERENT BEACHES OF SOUTH ODISHA COAST OF INDIA

PREMALATA PATI AND R. C. PANIGRAHY
Department of Marine Sciences
Berhampur University, Berhampur 760007, Odisha, India
E-mail: premalata09@gmail.com

INTRODUCTION

The study of the molluscs in India although ows its origin to 18th century initiated by the Asiatic Society of Bengal (1784), marine malacology obtained significance only in 20th century with initiatives taken by the Zoological Survey of India (ZSI), Central marine Fisheries of India (CMFRI) and many maritime universities. Several surveys have been conducted to record the marine molluscan fauna of India starting with Preston (1910,1914) to Subba Rao(1968) and Apte (2009). Venkataraman (2012) has reported that 3370 species of molluscs have been recorded from Indian marine habitats where in over 100 species were from Andaman and Nicobar group of Islands, 428 species from Gulf of Manar and 424 species Lakshadweep. Many of the publications brought out by ZSI on molluscs also mentions about the Odisha coast.

Odisha as maritime state in Indian East coast is bestowed with variety of coastal ecosystems comprising of estuaries, coastal lagoons, creeks, intertidal mudflats, sandy beaches and mangrove swamps sustaining high molluscs diversity. The taxonomic study of molluscs in this state began from Chilka Lake in the early parts of 20th century along with other faunal groups and continued for a long period (Annandale,1915-24; Subba Rao et. al., 1995). The subsequent studies were extended to Mahanadi estuary (Subba Rao, 1968; Subba Rao and Mukherjee,1975; Surya Rao and Maitra, 1998), Rushikulya Estuary (Rama Rao et. al., 1992) and Bahuda Estuary (Pati et. al., 2008). The present communication deals with the faunal diversity of marine and estuarine molluscs of the south Odisha coast comprising of two estuaries, one pocket lagoon and the coastal track between Patisunapur to Rushikulya Sea turtle rookery.

MATERIALS AND METHODS

Study Area

Beach samples were collected from three locations namely Rushikulya estuary (Lat. 19°24' N & Long. 85°05' E), Bahuda estuary (Lat. 19°04' N & Long. 84°35' E) and Gopalpur Creek (Lat.19°10' N & Long. 85°35' E) and their adjoining beaches. These three coastal ecosystems are quite diverse in their physiographic features and hydrographical attributes. The Rushikulya estuary is typical shallow tidal estuary having perennial connection with the Bay of Bengal. It is influenced by semi diurnal tide. Sea water penetration can reach up to a distance of 7 km upstream from its mouth. The estuarine basin is predominantly sandy and major part of the basin remains exposed during lowest low water spring. Bahuda estuary is also shallow. positive estuary influenced by similar semidiurnal tide. But, the sea water penetration can reach up to a distance of 10 km upstream from the mouth. The estuary in its mid ridges, forms an expanded mud flat with clam and oyster beds. The Gopalpur creek is a small and shallow brackish water environment that remains cut of from the sea for most part of the year. The process of water exchange have taken place through seepage based on tidal rhythm. The morphology, physicochemical
characteristics and biological attributes of this creek confirms the requirements of a "pocket lagoon" as defined by Phleger (1981). The substratum of this creek is muddy and major part of its upstream remains exposed during lowest low water spring.

**METHODOLOGY**

Direct search method was adopted in this study. Monthly survey was conducted for one year from May, 2011 – April, 2012 for sample collections. Collection of samples were made during low tide period. Live specimens and dead shells were collected through hand picking from randomly selected areas of the exposed substratum of the study areas. The number of samples of each species varied from 1-5 depending upon their abundance. Each sample was washed in sea water thoroughly at the collection sites to remove the impurities. After studying the morphological characters, live specimens were fixed with 5% neutralised formaldehyde and brought to the laboratory. They are finally preserved in glycerin ethyl alcohol mixture in the ratio of 1:19 as recommended by Gosner (1971). Washed shells were preserved in polythene bags. Each specimen were photographed before their preservation.

**Identification procedure**

The identification of specimens were made based on their morphological characters following the taxonomic monographs of Vaught (1989).

**RESULTS**

Detailed information on the first report till last published records have been cited for each specimen. A brief description of each sample viz. location, collector, year of collection and number of examples is presented.

**Class GASTROPODA**

Subclass PROSOBRANCHIA

Prosobranch gastropods have either gills situated within the mantle cavity towards the front of the animal, for which they can enable to occupy the different kind of habitats. They have different types of radula, which are so distinct that have been the basis for classification of the group. Most of the radula consists of transverse rows of teeth, variously arranged. The member of the superfamily Conoidea have harpoon like detachable barbs associated with a poison apparatus. Many species have a chitinous or calcareous plate, the operculum attached to the foot. This structure assumes different forms according to the species and is important aid to identification. Many species enable to seal their aperture with the help of this structure, but in some group e.g. cones, it is so reduced in size that it seems to serve no useful function.

**Subfamily NERITINAE**

Genus *Theodoxus* Montfort, 1810

1852. *Thelostyla Moerch, Cat. Conch, Yoldi.*, 1: 167. Type Species: *Nerita albicilla Linnaeus*

Subgenus *Clithon* Montfort, 1810

1852. *Thelostyla Moerch, Cat. Conch, Yoldi.*, 1: 167. Type Species: *Nerita albicilla Linnaeus*

1. *Theodoxus (Clithon) oualaniensis* (Lesson)


**Material Examined:** 2 exs.

**Measurement:** Length 7–8 mm

**Diagnostically Characters:** Shell small, moderately ovate, polished, olive green and marked finely in black and crimson lines in various patterns, irregularly or in spiral bands.

**Distribution:** India: Andaman and Nicobar Islands, Andhra Pradesh, Gujarat, Karnataka, Kerala, Orissa, Tamil Nadu.

**Elsewhere:** Sri Lanka, Thailand, Indonesia: Java, Sumatra; Polynesia.

**Remarks:** Occurs on intertidal grass flats.

**Place of Collection:** Rushikulya estuary.

**Order MESOGASTROPODA**

**Family CERITHIIDAE**

**Subfamily CERITHIINAE**

**Genus Cerithium** Bruguiere, 1789


2. *Cerithium scabridum* (Philippi)


**Materials examined:** 2 exs.

**Measurement:** Length 1.9–2 cm.

**Diagnostically Characters:** Shell small, slender and oblong, turreted, with 10-14 whorls and distinct sutures. Aperture narrow and obliquely ovate with short and wide anterior canal and shallow posterior canal, flanked by strong columnellar plait, outer lip thickened outside and crenulated inside, columnella concave with strong calyx. Colour white with reddish brown spots on cords and nodules, aperture and columnella white.

**Distribution:** India: Gujarat, Tamil Nadu.

**Elsewhere:** Red sea, Persian Gulf, Gulf of Aden, Australia.

**Remarks:** Occurs in sand in subtidal zone.

**Place of collection:** Rushikulya estuary.

**Family BURSIDAE**

**Genus Bursa** Roeding, 1798


3. *Bursa rana* (Linnaeus)


1990. *Bursa rana*: Finn, Sea Snails of Pondicherry, Nehru Science Centre, p. 63, fig. 106.


*Material Examined*: 1 exs.

*Measurement*: Length 7 cm.

**Diagnosic Characters**: Shell moderately large, oblong-ovate, dorsiventrally depressed; spire conical and elevated, varices prominent and with spines; sculpture with fine granulose spiral threads and spinose nodes; body whorls with 2 rows of nodes and the lower rows smaller, ridges at the lower part finely granular and undulated; outer lip denticulate, columella lacks a calloused parietal shield; aperture oblong, ovate, siphonal canal short or extended; white or creamy stained with reddish brown.

*Distribution*: India: Andaman and Nicobar Islands, Andhra Pradesh, Orissa, Puducherry, Tamil Nadu, West Bengal; Elsewhere: Indo-Pacific.


*Place of collection*: Rushikulya estuary

**Order NEOGASTROPODA**

**Superfamily MURICOIDEA**

**Family MURICIDAE**

**Subfamily MURICINAE**

**Genus Murex** Linnaeus 1758


4. *Murex carbonnieri* (Jousseaume)


*Material Examined*: 2 exs.

*Measurement*: Length 8.2-8.4 cm.

**Diagnosic Characters**: Shell club shaped, spire elevated, consist of 7-9 whorls; whorls subangulate, suture simple, deep, crossed by growth lamellae; aperture acute, ovate, outerlip margin crenulated, lower part with small labial tooth, inner lip partly adherent on posterior, body whorl large, preceding the whorls along with the body whorl with three prominent varices, provided with long spines, shoulder spine largest, open straight curved terminally, sculpture consists of three prominent spirals cords; siphonal canal and cords, provided with straight spines up to two third of its length, gradually decreases in length.

*Distribution*: India: Andaman Islands, Andhra Pradesh, Maharashtra, Orissa, Puducherry, Tamil Nadu; Elsewhere: Mauritius, Zanzibar, Sri Lanka, Bangladesh, Philippines.

*Remarks*: Intertidal, rocks, corals, Indo-Pacific.

*Place of collection*: Rushikulya estuary


1990. *Bullia vittata*: Pinn, Sea Snails of Pondicherry, Nehru Science Centre, p. 76, fig. 132.


2003. Bullia (Dorsanum) vittata: Subba Rao, Rec. zool. Surv. India Occ. Paper No., 192: 265, Fig. 34, pl. 63, fig. 1.


Material Examined: 18 shells

Measurement: Length 1.3-3.6 cm

Diagnostic Characters: Shell moderate, elongated, turreted, protoconch consists of three whorls, aperture wide, outer lip smooth, callus smooth, anterior canal short; sculpture with irregular spiral grooves and subsutural ridges, spiral groove more prominent at the base of the body whorl, yellowish to pale brown often with dark brown wavy axial streaks.

Distribution: India: Andaman Islands, Andhra Pradesh, Maharashtra, Orissa, Puducherry, Tamil Nadu; Elsewhere: Mauritius, Zanzibar, Sri Lanka, Bangladesh, Philippines.

Remark: Estuarine

Place of Collection: Rushikulya estuary

Family OLIVIDAE
Subfamily OLIVINAE
Genus Oliva Bruguier, 1789


6. Oliva oliva (Linnaeus)


1990. Oliva Oliva: Pinn, Sea Snails of Pondicherry, Nehru Science Centre, p. 85, fig. 152.


Material Examined: 18 shells

Measurement: Length 1.3-3.6 cm

Diagnostic Characters: Shell moderate, polished, spire short, sutural grooves narrow and deep, aperture narrow, columella with a callus on the anterior two- third and oblique, highly variable in colour, white, creamy, brown, yellow or black, ornamented with dark spots and blotches, aperture brown, white or pink.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Gujarat, Lakshadweep,
Maharashtra, Orissa, Puducherry, Tamil Nadu; Elsewhere: Tropical Indo-pacific.

Remarks: Common.

Place of collection: Rushikulya estuary

Genus *Olivancilularia* d'Orbigny, 1841


7. *Olivancilularia gibbosa* (Born)


1990. *Olivancilularia (Olivana) gibbosa*: Pinn, Sea Snails of Pondicherry, Nehru Science Centre, p. 85, fig. 155.


Material Examined: 2 shells

Measurement: Length 5-5.7 cm

Diagnostic Characters: Shell thick, solid, moderate, elongately ovate, spire acuminate, short, body whorl inflated, suture channelled, aperture wide with slit like posterior canal, columella with thick callus, pale yellowish brown with prominent yellow band at base, mottled or streaked with black spots, sometimes with zigzag transpiral brownish bands, aperture bluish white.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Gujarat, Maharashtra, Orissa, Puducherry, Tamil Nadu, West Bengal; Elsewhere: Sri Lanka, Bangladesh, Myanmar.

Remarks: Common.

Place of collection: Rushikulya estuary

Superfamily NATICOIDEA
Family NATICIDAE Forbes, 1838
Subfamily POLINICINAE
Genus *Polinices* Montfort, 1810


8. *Polinices (Glossaulax) didyma* (Roeding)


1990. *Natica didyma*: Pinn, Sea Shells of Pondicherry, Nehru Science Centre, p. 35, fig. 50.


Material Examined: 1 shell

Measurement: Length 3 cm

**Diagnostic Characters:** Shell small (up to 3 cm long), ovate-conic in shape, with globose body whorl, short conical spire, convex whorls and moderately impressed suture. Outer surface smoothish. Umbilicus deep and narrowly open, U-shaped, partly occluded centrally by a broad and rounded internal rib forming a callus at colummellar margin. Calloused margin of posterior part of inner lip poorly developed, not confluent with the central callus of umbilicus. Operculum calcareous, with a single spiral groove along its outer margin. Outside of shell creamy white, with a dense pattern of wavy, axial orange-brown lines, becoming thicker, less numerous and strongly pointing forward within 3 spiral bands, those below the suture and near periphery being strongest. Base and umbilical area white, with a single spiral row of short or angle brown streaks.

**Distribution:** India: Andhra Pradesh, Orissa, Puducherry, Tamil Nadu, West Bengal; Elsewhere: Indo-Pacific.

**Remarks:** Indo-pacific

**Place of collection:** Bahuda estuary

**Family FICIDAE**

**Genus Ficus Roeding, 1798**


9. *Ficus gracilis* (Sowerby)

1825. *Pyura gracilis* Sowerby, Cat. Tank., pl. 17.

1990. *Ficus gracilis*: Pinn, Sea Shells of Pondicherry, Nehru Science Centre, p. 53, fig. 87.


Material Examined: 1 shell

**Measurement:** Length 9 cm

**Diagnostic Characters:** Shell thin, pear-shaped, drawn out anteriorly into a long, tapered and gracefully curved siphonal canal. Operculum absent.

**Distribution:** India: Andhra Pradesh, Orissa, Pondicherry, West Bengal; Elsewhere: Persian Gulf, Malagasy, Seychelles, South Japan.
Remarks: Indo-pacific

Place of collection: Gopalpur Beach

Family HARPIDAE
Subfamily HARPINAE
Genus Harpa Roeding, 1798


10. Harpa major (Roeding)


Material Examined: 1 shell

Measurement: Length 7.5 cm


Distribution: India: Andhra Pradesh, Pondicherry, Tamil Nadu.

Elsewhere: Indo-Pacific.

Remarks: Indo-Pacific

Place of collection: Gopalpur Beach

Subclass HETEROBANCHIA
Order ALLOGASTROPODA
Superfamily ARCHITECTONICOIDEA
Family ARCHITECTONICIDAE
Genus Architectonica (Roeding), 1798

1798. Architectonica Roeding, Mus. Bolten., 2: 78

11. Architectonica laevigata (Lamarck)


1990. Architectonica laevigata: Pinn, Sea Shells of Pondicherry, Nehru Science Centre, p. 16, fig. 19.


Material Examined: 1 shell

Measurement: Length 3 cm

Diagnostic Characters: Shell wider than long, with a large, rather flat base. Umbilicus broadly open, within which can be seen the inverted larval shell. A nodular spiral rib bordering the umbilicus. Aperture without a siphonal canal. Operculum corneous, with a tubercle internally. Soft body coloration resulting from a combination of black and white markings in the epidermis and from the internal organ Coloration showing through most developed on tentacles and the anterior part of the foot.
Distribution: India: Andhra Pradesh, Orissa, Pondicherry, Tamil Nadu, West Bengal; Elsewhere: Persian Gulf, South African coast, Pakistan coast, Iran.

Remarks: Tropical, Warm-temperate

Place of collection: Bahuda estuary

Class BIVALVIA
Subclass PROTOBRANNCHIA
Order MYTILOIDA
Superfamily MYTILOIDEA
Family MYTILIDAE
Subfamily MYTILINAE
Genus *Perna* Philipsson, 1788


Type species: *P. magellanica* Linnaeus = *Mya perna* Linnaeus; subsequent designation, Soott-Ryen, 1955

12. *Perna viridis* (Linnaeus)


Material Examined: 2 valves

Measurement: Length 4.2-7.5 cm

Diagonistic Characters: Shell thick, elongate, triangularly-ovate, inequilateral; umbo terminal; lunule bent inwards forming 1-2 tooth like ridges; sculpture smooth and only with growth lines; ligament thick; anterior adductor scar absent, posterior adductor scar large, cylindrical and located at the posterior half of the shell; greenish or ochre brown.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Puducherry, Tamil Nadu, West Bengal; Elsewhere: Red sea, Pakistan coast, Thailand, Indonesia, Philipppines, China.

Remark: Indo-pacific, estuarine

Place of collection: Gopalpur beach

Superfamily MACTROIDEIA
Family MACTRIDAE
Subfamily MACTRINAE
Genus *Mactra* Linnaeus, 1767


Subgenus *Mactra* sst.

13. *Mactra granis* (Gmelin)


Material Examined: 6 valves

Measurement: Length 3.3-3.6 cm
238

Diagonalistic Characters: Shell triangular in shape, equilateral, moderately thick, inflated; umbo small, dorsal margin on either side of umbo gradually sloping, anterior margin broadly rounded, posterior narrower, ventral evenly rounded; surface smooth except for growth lines; hinge narrow, arrangement of teeth similar to that in the preceding species; colour light brown—umbonal region and tip violet; interior smooth, white, with violet blotch near umbonal cavity.


Remarks: Intertidal area
Place of Collection: Rushikulya estuary

14. Mactra symmetrica (Deshayes)

Material Examined: 2 valves
Measurement: Length 3.1-4.8 cm

Diagonalistic Characters: Shell triangular in shape, equilateral, moderately thick, inflated; umbo small, dorsal margin on either side of umbo gradually sloping, anterior margin broadly rounded, posterior narrower, absent of concentric grooves on its anterior part and violet in colouration.


Remarks: Marine, Sandy soft bottom
Place of collection: Rushikulya estuary

Genus Siliqua Megerle, 1811
15. Siliqua radiata (Linnaeus)


Material Examined: 1and half valve
Measurement: Length 7.7 cm

Diagonalistic Characters: Shell thin, elongately compressed, elliptical, gaping at both the ends; umbo anterior, beaks slightly in front of midline; anterior side short, excavated near umbone; posterior elongated; dorsal margin almost straight; ventral margin convex, arched, sloping upwards towards the end of both sides; internal ribs almost straight; brown to lilac with four white radial rays.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Goa, Gujarat, Kerala, Maharashatra, Orissa, Tamil Nadu, West Bengal; Elsewhere: South African coast, Sri Lanka, Maynmar, Indonesia, Philippines.

Remarks: Estuarine
Place of collection: Bahuda estuary

Superfamily VENEROIDEA
Family VENERIDAE
Subfamily VENERINAE
Subfamily SUNETINAE
Genus Sunetta Link, 1807
16. **Sunetta meroe** (Linnaeus)


**Material Examined:** 9 valves

**Measurement:** Length 1.8-4.7 cm

**Diagostic Characters:** Shell subovate, anterior end rounded, posterior subtruncated; umbo posterior; beak slightly in front of midline; sculpture with prominent concentric ridges; more prominent in the middle; escutcheon deeply excavated; beigh to lilac; with dark brown or yellowish brown zig-zag lines throughout the body; inner ventral margin crenulated.

**Distribution:** India: Andhra Pradesh, Maharashtra, Orissa, Puducherry, Tamil Nadu; Elsewhere: Sri Lanka, Indonesia, Myanmar, Philippines.

**Remarks:** Indo-pacific, estuarine

**Place of Collection:** Rushikulya estuary

17. **Sunetta scripta** (Linnaeus)


**Material Examined:** 5 valves

**Measurement:** Length 1.9-3.8 cm

**Diagostic Characters:** Shell wedge shaped; umbo posterior, beak slightly in front of midlines; anterior end rounded, posterior truncate; sculpture at smooth only growth lines; escutcheon deeply excavated; variable in colour pattern, white or beige, lilac with brown violet zig-zag lines or with deep violet patches; inner ventral margin crenulated.

**Distribution:** India: Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Orissa, Tamil Nadu; Elsewhere: Sri Lanka, Indonesia, Myanmar, Philippines.

**Remarks:** Indo-pacific, estuarine

**Place of Collection:** Rushikulya estuary

Subfamily MERETRICINAE

Genus *Meretrix* Lamarck, 1799


18. **Meretrix casta** (Gmelin)


**Material Examined:** 10 valves

**Measurement:** Length 3.9-4 cm

**Diagnostitic Characters:** Shell medium, solid, but less heavy than *M. meretrix*; umbo slightly anterior, beak more attenuated; lunule well developed and about two-third more of anterior dorsal margin; variable in shape and colour; anterior cardinal teeth more strong on left valve; pallial line well impressed, pallial sinus absent.

**Distribution:** India: Andaman and Nicobar Islands, Andhra Pradesh, Gujarat, Karnataka, Kerala, Orissa, Puducherry, Tamil Nadu; elsewhere: Indo-Pacific.

**Remarks:** Estuarine, common

**Place of collection:** Rushikulya estuary and Bahuda estuary

19. *Meretrix meretrix* (Linnaeus)


Material Examined: 4 valves

Measurement: Length 2.2-4.6 cm

Diagnostic Characters: Shell moderately large, heavy, ventricose, compressed, hinge narrow; umbo almost central, beak attenuated; lunule heart shaped and almost half of anterior dorsal margin; sculpture smooth only growth lines; anterior cardinal teeth more strong on left valve; muscle scars well impressed, anterior adductor smaller, semilunar, posterior adductor scar large with narrow anterior end; pallial line slightly arched posteriorly; variable in colour.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Orissa, Puducherry, Tamil Nadu.

Elsewhere: Widely distributed in Indo-Pacific.

Remarks: Indo-Pacific

Place of collection: Bahuda estuary

Genus *Marcia* H. and A. Adams, 1857


Type species: *Venus pinguis* Chemnitt = *Venus opima* Gmelin; subsequent designation, Kobelt, 1881

20. *Marcia pinguis* (Schroeter)


Material Examined: 2 valves

Measurement: Length 3.5-4.8 cm

Diagnostic Characters: Shell medium, subovate, anterior rounded, posterior becoming subtruncate; umbo anterior, beak more attenuated; lunule well defined, depressed and cordate; sculpture smooth with growth lines only; adductor muscles scars almost equal; pallial line deep, pallial sinus well developed and more than half of the shell; beige with brown, grey umbal region.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Gujarat, Kerala, Lakshadweep, Orissa, Tamil Nadu.

Elsewhere: Indo-Pacific.

Remarks: Indo-Pacific

Place of collection: Rushikulya estuary

21. *Marcia recens* (Dillwyn)


Material Examined: 2 shells

Measurement: Length 2.3-3.2 cm

Diagnostic Characters: The shell surface is more or less concentrically grooved and gives a varnished look. The tip of the umbo is some times pink or blue.
Distribution: India: Maharashtra, Orissa, Tamil Nadu; Elsewhere: Indo-Pacific.

Remarks: Indo-Pacific, estuarine

Place of collection: Rushikulya estuary

Genus *Paphia* Roeding, 1758


22. *Paphia alapapiliones* Roeding


Material Examined: 2 valves

Measurement: Length 4.6 cm

Diagonistic Characters: Shell elongately-ovate, arched, much longer than high; umbo anterior; beak well infront of midline; lunule developed; sculpture with concentric ridges, fine on umbal region and gradually coarse and more on the posterior slope; colour orange brown with four brown blotches arranged in longitudinal fashion.

Distribution: India: Andman Islands, Gujarat, Tamil Nadu.

Elsewhere: Indian Ocean.

Remarks: Indian Ocean, estuarine

Place of collection: Rushikulya estuary, Gopalpur beach

23. *Paphia malabarica* (Schroeter)

1788. *Venus malabarica* Schroeter, *Namen. Register.*, p. 112, pl. 6, figs. 4, 4a, 4b.


Material Examined: 2 shells

Measurement: Length 5.2 cm

Diagonistic Characters: Shell cordately-ovate, arched, much longer than high; umbo anterior; beak well infront of midline; lunule developed and two third of the length of anterior dorsal margin; sculpture with concentric ridges, fine on umbal region and gradually coarse and more on the posterior slope; beige to orange brown; adductor muscle scars almost equal; pallial sinuis developed towards the umbo and occupy more than half of the width of shell.
**Distribution**: India: Andaman and Nicobar Islands, Andhra Pradesh, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu. 

**Elsewhere**: Persian Gulf, Gulf of Aden, Pakistan, Sri Lanka, Myanmar, Malaysia, Indonesia, Philippines, China.

**Remarks**: Indian Ocean, estuarine

**Place of collection**: Rushikulya estuary

---

**Order A**RCOIDA  
Superfamily A**RCOIDEA**  
Suborder PINN**INA**  
Superfamily PINNOIDEA  
Superfamily CARDITOIDEA  
Superfamily MACTROIDEA  
Superfamily VENEROIDEA  
Class BIVALVIA  
Subclass PROTOBRANCHIA  
Subfamily ANADARINAE  
Genus *Anadara* Gray, 1847  

**Type species**: *Arca antiquata* Linnaeus, 1758

**Material Examined**: 2 bivalves  
**Measurement**: Length 5.9 cm

**Diag**nostic **Chars**: Shell inequivalve, solid, inequilateral, obliquely ovate and elongate in outline, with an extended posteroventral part. Umbones much inflated, situated rather forwards, cardinal area narrow and elongate. About 40 radial ribs (35 to 44) at each valve; ribs usually with a narrow median groove on top, most visible towards the anterior ventral margin of valves in mature specimens. Periostracum coarse and velvety, often eroded on umbones. Internal margins with strong crenulations corresponding with the external radial ribs. No byssal gape. Colour: outside of shell greyish white, often stained darker grey on umbonal and posterior areas; periostracum dark brown. Inner side white, sometimes light yellow in the umbonal cavity.

---


**Remarks**: Inertidal, estuarine

**Place of collection**: Bahuda estuary

---


25. *Cardites bicolour* (Lamarck)


**Material Examined**: 1 valve  
**Measurement**: Length 1.9 cm

**Diag**nostic **Chars**: Shell inequivalve, often stout and inflated, trigonal ovate to trapezoidal in outline, inequilateral. Umbones generally anterior, prosogyrate, and prominent. Lunule short and deep. Exterior mostly with strong radial ribs. Ligament external, attached behind umbones on well-marked nynmphs. Hinge plate strong, usually with 2 cardinal teeth, unequal and often with fine transverse striations; lateral teeth frequently more or less reduced to absent. Two adductor muscle scars slightly unequal.


**Remarks**: Indo-pacific

**Place of collection**: Rushikulya estuary

---

**DISCUSSION AND CONCLUSION**

During the present study, a total of 11 examples of gastropods and 14 examples of bivalves consisting of 20 genera and 25 species were identified. Most of the molluscs were marine forms except for one (*Bellamya bengalensis*) whose occurrence is of accidental in nature and not a...
common species in the coastal area of south Odisha. However, further investigations is necessary which may reveal new species and new records from the coast.

ACKNOWLEDGEMENTS

The authors wish to express their sincere thanks to Dr. Shantabala Devi Gurumayum, Estuarine Biological Station (ZSI), Gopalpur –on Sea for her help in identification of specimens. Dr, Basudev Tripathy, ZSI, Calcutta has rendered help in identification of some species and also has critically reviewed the manuscript. We record our sincere thanks to him. We also wish to express our thanks to the Head of the Department of Marine Sciences for facilities and encouragement, Ms Premalata Pati is indebted to the DST, Govt of India for award of Fellowship.

REFERENCES


Theodoxus oualaniensis

Cerithium scabnidum

Bursa rana
Murex carboneiri

Bulla vittata

Oliva oliva
Olivancilla gibbosa

Polinices didyma

Ficus gracilis
*Harpa major*

*Architectonica laevigata*

*Perna viridis*
Mactra grandis

Mactra symmetrica
Sunetta meroe

Sunetta scripta

Meretrix casta
Meretrix meretrix

Marcia pinguis

Marcia recens
Paphia alapapilio

Paphia malabarica

Anadara antiquata
Cardites bicolor