

# A preliminary study on the diversity of macrobenthic and aquatic insect fauna of Subhadra Estuary, Ganjam, Odisha

Swetapadma Dash<sup>1</sup>, S. D. Gurumayum<sup>2\*</sup> and Pallabi Priyadarsini<sup>3</sup>

<sup>1</sup>Zoological Survey of India, Kolkata - 700053, India, Email: oasisnainital@yahoo.co.in

<sup>2</sup>Arunachal Pradesh Regional Centre, Zoological Survey of India, Itanagar – 791113, Arunachal Pradesh, India; Email: santaguru@rediffmail.com

<sup>3</sup>Central Zone Regional Centre, Zoological Survey of India, Jabalpur - 482 002, Madhya Pradesh, India

## Abstract

A preliminary study was conducted to understand diversity of macrobenthic components and aquatic insect fauna of Subhadra estuary, Ganjam, Odisha. A total of 81 specimen of Aquatic Insects belonging to 6 species and 5 genera, 52 mollusca species/subspecies along with 9 species of crab were identified. Apart from that, four species of hermit crabs under 2 genera and 2 families were also identified from 95 specimens from the study locality.

**Keywords:** Aquatic Insect, Estuary, Macrobenthic, Mollusca, Odisha

## Introduction

The coastal stretch of Bay of Bengal along Ganjam district is about 120 km and the only township along the coast is Gopalpur. Immediately north of the Gopalpur, a perennial river Subhadra along with a small body of backwater i.e., the Haripur creek joins the sea in the northeastern direction and forms the Subhadra estuary. Subhadra River originated from Gobindpur, Ganjam which is 15 km upstream from the estuary. Estuarine environments are among the most productive natural habitat on earth (Schubel, 1984). Now-a-day's estuaries get lots of attention because of these areas are amongst the most highly populated areas throughout the world. There are big industrial set up like Indian Rare Earth, Caustic soda manufacturing industry, Titanium dioxide plant etc. situated along the course of this estuary as well. In Odisha the study of macro faunal diversity was conducted by different researcher on various water bodies, Chilika lake (Patnaik, 1972; Annandale, 1924), Rushikulya estuary (Rama Rao *et al.*, 1992, Pati & Panigrahy, 2012). Till now,

very few researches were worked on fauna of Subhadra estuary. The present study was taken up to understand the faunal diversity particularly the macro benthos faunal composition along with aquatic insects of the Subhadra estuary.

## Material and Methods

Survey of the Subhadra estuary was conducted 6 times during 2013-2015. Collection of specimens were made from 4 sampling stations along the stretch of the estuary, viz. Narayanpur, Basnaputi, Kalipali and Haripur. Crabs and hermit crabs were collected using forceps and bigger one were handpicked. Similarly molluscs were handpicked from the exposed mud flats of the estuarine bed. Aquatic Insects were collected using "D" shaped insects nets. Crabs samples were preserved in 4% Formaldehyde solution and Hermit Crab, Insects were preserved in 90% alcohol. Dead and dried molluscan samples collected were kept in a air tight plastic bags. All the examples collected are deposited

\* Author for correspondence

in National Zoological Collections (NCZ) of EBRC, ZSI. Aquatic Coleoptera were identified by literature of Vazirani (1970, 1984), Biswas and Mukhopadhyaya (1995) and aquatic Hemiptera were identified following Thirumalai (1999, 2002). Brachyuran Crab were identified by literature of Reddy (1995), Reddy & Dev Roy (2008), Reddy and Krishnamurthy (1998) and Khan & Natrajan (1984).

## Study Site

Estuarine Parts of Subhadra river from Kalipali up to the river mouth were surveyed (Figure 1). Four survey sites have been chosen for the study. i.e.,: Kalipali (19°18'08.35"N, 84°54'55.64" E), Basnaputi (19°17'19.38" N, 84°54'40.73" E), Narayanpur (19°16'20.61" N, 84°54'24.92" E) and Haripur (19°15'49.26" N, 84°54'50.42" E).

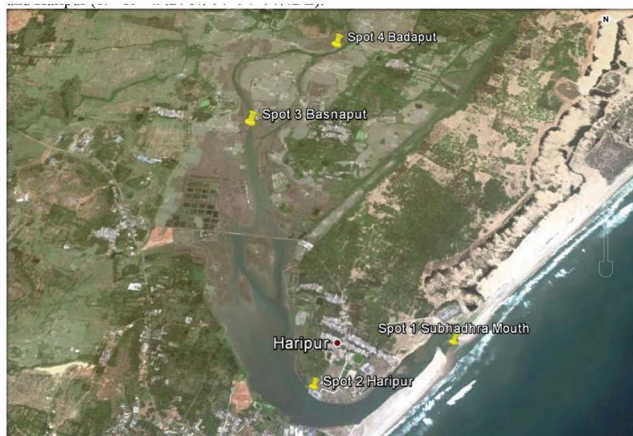


Figure 1. Sampling locations at Subhadra Estuary.

## Results

A preliminary taxonomic study of the faunal samples collected from the four different sampling sites of the estuary was carried out. The study comprised of 81 specimens of aquatic insects which belongs to 6 species, 5 genera and 3 families. A total of 53 mollusca species were identified from 798 examples collected from the estuary. Nineteen bivalve species were found out from 282 examples which come under 3 orders and 5 families. A total of 34 gastropods species/subspecies were identified from 5 orders and 14 families from 516 gastropod examples. Similarly, from 64 crab specimens belongs to 9 species under 8 genera and 4 families are identified. And

from 95 specimens of Hermit Crab belongs to 4 species under 2 genera and 2 families were found out. The List of species identified under different groups are listed below.

### Molluscs (Gastropoda)

1. *Angulyagra microchaetophora* (Annandale, 1921)
2. *Bellamya bengalensis* (Lamarck, 1822)
3. *Bellamya bengalensis* form *typica* (Lamarck, 1822)
4. *Bellamya bengalensis* form *annandalei* (Kobelt, 1909)
5. *Bellamya bengalensis* form *halophila* (Kobelt, 1909)
6. *Bellamya dissimilis* (Mueller, 1774)
7. *Cantharidus* sp.
8. *Cassidula nucleus* (Gmelin, 1791)
9. *Pirenella cingulata* (Gmelin, 1791)
10. *Cerithidea* sp.
11. *Cerithium scabridum* Philippi, 1848
12. *Cerithium tenellum* Sowerby II, 1855
13. *Melampus ceylonicus* (Petit de la Saussaye, 1843)
14. *Indoplanorbis exustus* (Deshayes, 1832)
15. *Indothais blanfordi* (Melvill, 1893)
16. *Melanoides crebra* (Lea, 1850)
17. *Melanoides tuberculata* (Mueller, 1774)
18. *Nassarius stolatus* (Gmelin, 1791)
19. *Notocochlis gualteriana* (Recluz, 1844)
20. *Nerita chamaeleon* (Linnaeus, 1758)
21. *Neripteron violaceum* (Gmelin, 1791)
22. *Neritina* sp.
23. *Pila globosa* (Swainson, 1822)
24. *Pila globosa* var. *minor* (Nevill, 1877)
25. *Pila* sp.
26. *Pila virens* (Lamarck, 1822)
27. *Polinices mamailla* (Linnaeus, 1758)
28. *Rhinoclavis (Proclava) sordidula* (Gould, 1849)
29. *Septaria lineata* (Lamarck, 1816)
30. *Stenomelania torulosa* (Bruguieere, 1789)
31. *Tarebia lineata* (Gray, 1828)
32. *Tarebia granifera* (Lamarck, 1816)
33. *Telescopium telescopium* (Linnaeus, 1758)
34. *Clithon oualaniens* (Lesson, 1831)

**Molluscs (Bivalvia)**

1. *Corbicula striatella* Deshayes, 1854
2. *Corbicula* sp.
3. *Magallana cuttackensis* (Newton & Smith, 1912)
4. *Saccostrea cucullata* (Born, 1778)
5. *Pulvinus micans* (Hanley, 1844)
6. *Lamellidens corrianus* (Lea, 1834)
7. *Lamellidens marginalis* (Lamarck, 1819)
8. *Parreysia (Radiatula) caerulea* (Lea, 1831)
9. *Parreysia corrugata* (Müller, 1774)
10. *Parreysia favidens* (Benson, 1862)
11. *Tegillarca granosa* (Linnaeus, 1758)
12. *Tegillarca nodifera* (Martens, 1860)
13. *Marcia opima* (Gmelin, 1791)
14. *Meretrix casta* (Gmelin, 1791)
15. *Meretrix meretrix* (Linnaeus, 1758)
16. *Meretrix* sp.
17. *Paphia rotundata* (Linnaeus, 1758)
18. *Paratapes undulatus* (Born, 1778)
19. *Telenia* sps.

**Crabs**

1. *Scylla serrata* (Forskål, 1775)
2. *Austruca lactea* (De Haan, 1835)
3. *Ashtoret lunaris* (Forskål, 1775)
4. *Varuna litterata* (Fabricius, 1798)
5. *Charybdis feriata* (Linnaeus, 1758)
6. *Portunus pelagicus* (Linnaeus, 1758)
7. *Matuta victor* (Fabricius, 1781)
8. *Portunus sanguinolentus* (Herbst, 1783)
9. *Ocypoda macrocera* (Edward, 1852)

**Hermit Crabs**

1. *Clibanarius padavensis* de Maan, 1888
2. *Clibanarius clibanarius* (Herbst, 1791)
3. *Clibanarius olivaceus* (Henderson, 1915)
4. *Coenobita cavipes* (Stimpson, 1858)

**Insects**

1. *Ranatra elongata* (Fabricius, 1790)
2. *Anophelis interruptus* (Puri, 1929)
3. *Anophelis annandalai* (Prasha, 1918)

4. *Manasonia uniformis* (Theobald, 1901)
5. *Culex quinquefasciatus* (Say, 1823)
6. *Halobates (Halobates) formidabilis* (Distant, 1910)
7. *Halobates (Halobates) galatea* (Herring, 1961)
8. *Limnogonus fossarum fossarum* (Fabricius, 1775)
9. *Halobates germanus* (White, 1883)
10. *Limnogonus nitidus* (Mayr, 1865)
11. *Laccophilus parvulus* (Aubé, 1838)
12. *Neogerris parvula* (Stal, 1859)
13. *Plea frontalis* (Fieber, 1844)
14. *Agraptocorixa hyalinipennis* (Fabricius, 1803)
15. *Mesovelis vittigera* (Horvath, 1895)
16. *Micronecta siva* (Kirkaldy, 1897)
17. *Micronecta quadristrigata* (Breddin, 1905)
18. *Sigara* Sp.
19. *Diplonychus annulatus* (Fabricius, 1781)
20. *Aquarius adelaidis* (Dohrn, 1860)
21. *Aquarius philippinensis* (Zettel and Ruiz, 2003)

**Discussion**

Generally in estuaries, high productivity has been reported from many estuaries of the world reflecting rich bio diversity. This high productivity of estuaries is based on their ability to retain detritus material derived from the sea, rivers or salt marshes. Feeding on this detritus are three main taxa of animals, the annelids, the crustaceans and the molluscs. However, only the two groups of molluscs, the gastropods and the bivalves, form the most conspicuous part of the estuarine macrofauna (McLusky, 1981). In the present study as well molluscan fauna both gastropods and bivalves shadowed the maximum diversity in comparison to insects or crustaceans. A total of 89 different faunal examples were observed reflecting richness of the estuary which includes both live and dead shells. The collected faunal examples also included both freshwater and marine species which is generally encountered in estuarine ecosystem.

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*Scylla serrata* (Forsk.)



*Austruca lactea* (De Haan)



*Coenobita cavipes* Stimpson



*Clibanarius padavensis* De Maan



*Agraptocorixa hyalinipennis* (Fabricius)



*Limnogonus nitidus* (Mayr)



*Magallana cuttackensis* (Newton & Smith)



*Tegillarca granosa* (Linnaeus)



*Meretrix casta* (Gmelin) & *Meretrix meretrix* (Linnaeus)



*Pirenella cingulata* (Gmelin)



*Telescopium telescopium* (Linnaeus)