



ORIGINAL ARTICLE

Molluscan Diversity of Bhavanapadu Mangroves, Northeast Coast of Andhra Pradesh, India

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ABSTRACT

The Bhavanapadu mangroves are located (Long: 18° 33' 52" to 18° 32' 11" N; Lat: 84° 21' 26" to 84° 18' 22" E) on the Bay of Bengal North East Coast of Andhra Pradesh. Survey has been made on molluscan fauna in the mangroves along the Tekkali Creek upto Kothalingudu. 19 species of molluscs of which 15 gastropods and four bivalves were recorded.

Keywords: Bhavanapadu, Mangrove, Malacofauna.

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INTRODUCTION

Mangroves are salt-tolerant plants inhabiting the tropical and subtropical estuarine regions. They are ranked among the most productive ecosystem of the earth [1]. Mangrove ecosystem provides an ideal nursery and breeding grounds to most of the marine and brackish water fish and shellfish. Indian mangroves represent a rich diversity of soil dwelling organisms which include micro, meio and macro forms [2]. Mangrove derived detritus is an important food source for benthic food webs [3,4]. Mangrove molluscs occupy at all the levels of food web as herbivores, predators, detritivores and filter feeders with horizontal and vertical distribution and play an important role in the productivity of mangroves [5]. Gastropods and bivalves are two important molluscan groups in mangrove areas. The present survey has been made to procure an inventory of molluscs in unexplored Bhavanapadu mangroves.

MATERIALS AND METHODS

Study area:

Bhavanapadu mangroves (Long: 18° 33' 52" to 18° 32' 11" N; Lat: 84° 21' 26" E to 84° 18' 22" E) have been situated on the North East coast of Andhra Pradesh, adjoining the Bay of Bengal (Fig.1). It consists of backwaters, adjacent salt pans and aquaculture farms covering an approximate extent of mangrove marshy land of 2000 ha which comes under revenue land. Many marine fisherman habitations have been located in the vicinity. Mangroves are dwarf, mostly dominated by *Avicennia marina* on the right and left banks. Eight species of halophytes and two sea grasses have already been reported [6].

Collection of samples:

Field survey was taken up in the mangrove area from April, 2012 to December, 2013. The mangrove molluscs were collected by hand picking and by digging the substratum [7]. The arboreal forms (crawlers) were gathered from the stems, roots and other parts of the vertically growing mangrove plants [8]. The recorded specimens were sampled from mud banks, mud flats, mangroves, sand-mud swamps, wooden posts, rocky boulders etc. For correct identification, standard keys were followed [9, 10, 11, 12].

RESULTS AND DISCUSSIONS

Gastropods and bivalves are the two major classes of molluscs occupying mangrove areas. A total of 19 species of molluscs representing 10 orders, 9 families and 13 genera were recorded from the mangroves (Table 1; Fig. 2 to 20). The mangrove molluscs have been divided into three categories (1) arboreal, those

who live attached to stem and roots of mangrove vegetation (2) epifauna, those lying on the mud (3) infauna, those burying in the mud and some live in overlapping habitat [13, 14, 15].

The rich diversity of mangrove periwinkles (*Littoraria* sp.) and the common nerites have been densely found on the leaves, trunks and pneumatophores as well as on the stilt roots of mangrove plants. The crawling *Littoraria* sp., were recorded on the mangrove vegetation up to 1 meter height. *Assiminea nitida*, *Cassidula nucleus*, *Cerethidea obtusa*, *Haminoea* sp., *Onchidium* sp., have been found on the mud as well as on the stem and root system of mangroves. *Cerethidea cingulata* and *Telescopium telescopium* are two dominant mud crawlers. Gastropods graze on decomposing fallen leaves and also consume the mud mainly formed by mangrove litter [16, 17, 18].

Table 1: List of gastropods and bivalves recorded in Bhavanapadu mangroves

No.	Order	Family	Scientific name
Gasropods			
1	Littorinimorpha	Assiminidae	<i>Assiminea nitida</i> (Pease, 1865)
2	Caenogastropoda	Potamididae	<i>Cerithidea cingulata</i> (Gmelin, 1791)
3	Caenogastropoda	Potamididae	<i>Cerithidea obtusa</i> (Lamarck, 1822)
4	Caenogastropoda	Potamididae	<i>Telescopium telescopium</i> (Linnaeus, 1758)
5	Littorinimorpha	Littorinidae	<i>Littoraria melanostoma</i> (Gray, 1839)
6	Littorinimorpha	Littorinidae	<i>Littoraria carnifera</i> (Menke, 1830)
7	Littorinimorpha	Littorinidae	<i>Littoraria angulifera</i> (Lamarck, 1822)
8	Littorinimorpha	Littorinidae	<i>Littoraria pallescens</i> (Philippi, 1846)
9	Littorinimorpha	Littorinidae	<i>Littoraria conica</i> (Philippi, 1846)
10	Cycloneritimorpha	Neritidae	<i>Clithon oualaniensis</i> (Lesson, 1831)
11	Cycloneritimorpha	Neritidae	<i>Neritina violacea</i> (Gmelin, 1791)
12	Cycloneritimorpha	Neritidae	<i>Nerita histrio</i> (Linnaeus, 1758)
13	Cephalaspedia	Haminoeidae	<i>Haminoea</i> sp. (Carrington, 1830)
14	Bassomatophora	Ellobium	<i>Cassidula nucleus</i> (Gmelin, 1791)
15	Systellommatophora	Onchidiidae	<i>Onchidium</i> sp. (Agassiz, 1846)
Bivalves			
16	Arcoida	Arcidae	<i>Anadara granosa</i> (Linnaeus, 1758)
17	Eulamellibranchiata	Veneridae	<i>Meretrix meretrix</i> (Linnaeus, 1758)
18	Mytiloida	Mytilidae	<i>Perna viridis</i> (Linnaeus, 1758)
19	Ostreoida	Ostreidae	<i>Crassostrea madrasensis</i> (Preston, 1916)

Fig.1: General map of the study area

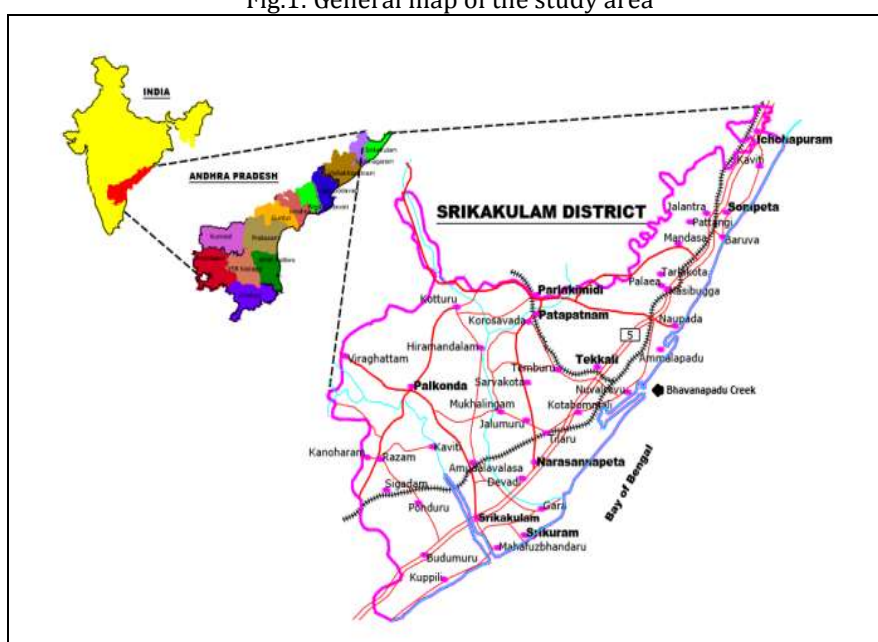


Fig.2: *Assiminea nitida* Fig.3: *Cerithidea cingulata*



Fig.4: *Cerithidea obtuse* Fig.5: *Telescopium telescopium*



Fig.6: *Littoraria melanostoma* Fig.7: *Littoraria carnifera*



Fig.8: *Littoraria angulifera* Fig.9: *Littoraria pallescens*



Fig.10: *Littoraria conica* Fig.11: *Clithon oualaniensis*



Fig.12: *Neritina violacea* Fig.13: *Nerita histrio*



Fig.14: *Haminoea* sp. Fig.15: *Cassidula nucleus*



Fig.16: *Onchidium* sp. Fig.17: *Anadara granosa*



Fig.18: *Meretrix meretrix* Fig.19: *Perna viridis*Fig.20: *Crassostrea madrasensis*

Bivalve molluscs have been found attached to wooden jetties, dykes, wooden posts and even to the shells when a suitable substratum is not available. The oyster, *Crassostrea madrasensis*, the mussel *Perna viridis*, the clam *Meretrix meretrix* and the blood cockle *Anadora granosa* have been recorded as beds along the banks of the Creek. These edible bivalves are abundant in the local estuaries [19]. Maximum number of species has been observed from mud flats of the mangroves. Oysters in particular are seen attached to calcareous substratum and also seen attached to other structures like the gaps of the cracks and rocky boulders along the banks in addition to various calcareous hard materials lying in the muddy substratum. *M. meretrix* and *A. granosa* have been found buried in the soft mud. *Perna viridis* was found attached to fibre like roots and root nodules of mangrove plants with their distribution restricted to mouth region and harbour area. *C. madrasensis* has been also found more in the middle of the Creek by forming beds. Molluscs dwell on the sediment surface or reside in burrows, others live on pneumatophores and lower tree trunks or prop-roots, burrow in decaying wood, or can even be found in the tree canopies [8, 20]. In India numerous explorations have been covered so far, out of which 6 species reported from Nuvvalarevu backwaters [21], 9 from Krishna estuary [22], 10 from Pitchavaram mangroves [23], 11 from Godavari estuary [24], 13 species from Vellar estuary [25], 20 from Mahanadi estuary [26], not more than 100 species of mangrove associated molluscs were reported [27] and hundred species from Andaman and Nicobar islands [28].

CONCLUSION

In the present survey 19 species of molluscs were recorded on the mud banks, mud flats, mangrove forest, sandy muddy area and swamps in Bhavanapadu mangroves. Predominant occurrence of *Cerethidea cingulata* and *Telescopium telescopium* was observed on the mud banks and mud flats. The distributions of mangrove molluscs are threatened with various anthropogenic pressures, nothing much is known about the fate of the diversity of molluscs associated with these mangroves. Mangrove molluscs add up to food for other faunal species in higher trophic levels, including humans. In this aspect the mangrove molluscs along the densely populated Indian coasts, require much more attention from conservation biologists.

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