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ON THE WOOD BORERS OF MANGROVES OF ANDAMAN AND NICOBAR ISLANDS, INDIA, WITH NOTE ON THE GALLERY PATTERN OF SOME INSECT BORERS

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INTRODUCTION

Mangrove ecosystem, though highly resilient, is unique in that it harbours a community of plants that can not exist anywhere else except in tidal mudflats with particular soil conditions and topography. Though not very extensive, and confined mostly to estuaries and sheltered coastlines in tropical and sub-tropical belt, mangroves form a very important and compensatory coastal niche, supporting not only a specialised plant community but also interesting faunal associations.

The present paper deals with one such faunal community, the marine and terrestrial borers that occur in the mangrove habitats in the Andaman and Nicobar Islands. Because of the damage caused to marine installations and timber, marine borers, particularly teredinid and pholadid bivalves, have received considerable attention, but boring insects are comparatively ignored. We got the opportunity to study two species of cerambycid beetles (Insecta : Coleoptera) infesting *Rhizophora apiculata* trees in the South Andaman and Car Nicobar mangroves, with praticular reference to gallery pattern which is described here. In addition remarks on other borers, ten species of bivalves (Mollusca) and one crustacean (isopod), are also included.

In the mangrove formations two zones of study can be demarcated. Horizontally, mangroves occupy coastal land between the highest highwater mark and the sub-littoral zone. Vertically the study zone extends between tree tops and the substratum. Whether horizontally, or vertically, some zones are constantly or frequently inundated by tidal water. Along the heights the portion of the trees above highest highwater mark (generally upper portion of the trunk and canopy) are never inundated, and one can demarcate the faunal communities inhabiting the mangrove communities into aquatic, semi-aquatic (or

amphibious) and terrestrial types, the last including forms occupying the portion of vegetable communities above tidal influence. The borers inhabiting the zone inundated (either constantly or periodically) by water mostly belong to the marine communities (principally molluscs), and the terrestrial borers are non-marine in origin, and so far known to comprise of insects only.

Marine Wood Borers of Mangroves

(Pl. XIV, Figs. A-D)

Marine or estuarine wood borers of mangroves have been investigated in India in some detail (*see* Nair and Saraswati, 1968 ; Subba Rao, 1968). From the Andaman mangroves Das and Dev Roy (1980) have recently recorded eight species of wood-boring bivalves from South Andaman. Later field work revealed the occurrence of two more species of teredinid bivalves, *viz. Nausitora dunlopei* Wright from Car Nicobar and *Bankia rochi* Moll from the Middle Andaman. Among the crustacean wood-borers, the isopod *Sphaeroma terebrans* Spence-Bate is very common among mangroves, particularly in South Andamans, where it attacks the live pneumatophores of *Avicennia* and stilt roots of *Rhizophora.* Though Ganapati and Lakshmana Rao (1960) have recorded five species of marine wood-boring isopods of the genus *Limnoria* from the wooden jetty in Chatham, Port Blair, we have so far, been unable to collect any species of *Limnoria* from the mangrove habitats in these islands.

A list of marine wood-bores known from mangroves of Andaman and Nicobar Islands is given in Table-1.

Except for the Isopod *Sphaeroma terebrans* which attacks live trees at their pneumatophores or stilt roots, all the other marine borers were found infesting floating logs or dying and decaying mangroves wood. There does not seem to be any host specificity and their distribution on mangroves appears to be random as already pointed by Das and Dev Roy (*op. cit.*).

Among the molluscan borers *Bankia rochi* Moll is being recorded for the first time from the Andaman group of islands, and *Nausitora dulopei* from Car Nicobar. Earlier Rajagopal and Daniel (1972) reported *N. dunlopei* from the Great Nicobar (southernmost island in the Nicobar group), but not from mangrove communities.

Insect Borers of Mangrove

Beeson (1941) has reported seven species of insect borers from mangrove plants. All these are beetles belonging to family Scolytidae of the order Coleoptera, and are listed in Table-2.

Except *Xyloborus cognatus,* which is a true wood borer, the remaining six species were reported by Beeson to attack germinating

seedlings, fruits or bark of mangrove trees. Under infestation by *Xyloborus cognatus* the mangrove wood becomes dotted with pinholes or black spots.

During our field work we have been able to collect two species of true wood borers (Xylophagus), both belonging to family Cerambycidae (Coleoptera), i. e. *Aeolesthes holosericea* (Fabricius) and *Ceresium flavipes* (Fabricius), from mangroves in Andamans and Car Nicobar Island. Larval and pupal stages of both these species were collected from their galleries inside the wood. The gallery pattern of these species was observed, and has been described below. Though these two species have been earlier reported from several localities in India and Andamans, there is no record of their recovery from mangroves, and the present constitutes the first record of these borers attacking mangrove wood.

THE GALLERY PATTERN OF CERAMBYCID BEETLES IN MANGROVE WOOD

Beeson (1941) has described the life history and gallery pattern of both these species from inland timber. The gallery patterns noticed by us in mangrove wood generally agree with those described by Beeson. The details of galleries noticed by us are described below.

Aeolesthes holosericea (Fabricius)
(Pl. XV, Figs. A-C)

These beetles were found to attack logs and dying branches of *Rhizophora apiculata* in the supra littoral zone. The larval gallery found in the sub-cortical zone is wide and irregular, and filled with a mixture of granular and fibrous frass. The pupal tunnel first extends horizontally to the sapwood for some distance and then abruptly turns vertically up or down to end in the pupal chamber. The outer end of pupal chamber (from which the insect emerges) is closed by a calcareons operculum, as described by Beeson. The adult emerges by breaking through the operculum.

Cerecium flavipes (Fabricius)
(Pl. XV, Figs. D, E)

This species of beetles have been found attacking dead and unhealthy portions of the living mangroves in Andamans and Car Nicobar. Larval galleries of this species is irregular and closely crowded and packed tightly with a fine powdery frass. Mature larva after its entrance inside the wood excavates its gallery more or less parallel to the wood fibre. But just before the construction of the pupal chamber it suddenly moves deeper for a small distance somewhat obliquely. The pupal chamber is, however, built on the same axis as that of the larval mine (pl. XV, fig. E). The adult emerges by tunnel and escapes through the operculum in the pupal chamber.

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SUMMARY

In the present paper both the marine and terrestrial borers of the mangrove community of Andaman and Nicobar islands have been dealt with. The marine borers consist of ten species of teredinid and pholadid bivalves (Mollusca) and one species of isopod (Crustacea) while the terrestrial borers include two species of cerambycid beetles. Gallery pattern of both the species of cerambycid borers is also described.

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Table 1. *List of marine wood borers of the mangroves of Andaman and Nicobar Islands*

Sl. No.	Name of the Species	Locality
	Phylum : Mollusca Class : Bivalvia Order : Myoida Family : Teredinidae	
1.	*Bactronophorus thoracites* (Gould)	Guptapara, Wright Myo, Shippighat, Wandoor, Chydyatapu, Rangachan, Lohabari, Baratang Island (All in South Andaman)
2.	*Dicyathifer manni* (Wright)	Guptapara, Wright Myo, Sippighat (All in South Andaman) Bakultala (Middle Andaman)
3.	*Uperotus rehderi* (Nair)	Rangachan (South Andaman)
4.	*Lyrodus pedicellatus* (Quatrefages)	Chidyatapu, Rangachan (South Andaman)
5.	*Nototeredo edax* (Hedley)	Chidyatapu (South Andamans)
6.	*Nausitora hedleyi* Shepmann	Wright Myo, Sippighat, Chidyatapu, Rangachan (All in South Andamans), Bakultala (Middle Andaman)
7.	*Nausitora dunlopei* Wright	Car Nicobar
8.	*Bankia bipenneta* (Turton)	Chidyatapu, Rangachan (South Andaman), Bakultala, Myabunder (Middle Andamans)
9.	*Bankia rochi* Moll.	Bakultala (Middle Andaman)
10.	*Martesia* (*Martesia*) *striata* (Linn)	Wright Myo, Chidyatapu, Kadakachang (All in South Andamans)
	Phylum : Arthropoda Class : Crustacea Order : Isopoda Family : Sphaeromidae	
11.	*Sphaeroma terebrans* Bate	Commonly available in South Andaman mangroves