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ON SOME INSECT BORERS OF MANGROVES OF ANDAMAN AND NICOBAR ISLANDS

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ABSTRACT

Biological observations on four species of insect borers from the mangrove forest ecosystem of Andaman and Nicobar islands are presented. These borers comprise of two species of cermbycid beetles, *viz.*, *Plocaederus obesus* Gahan, *Megopis* (*Aegosoma*) *sulcipennis* (White), one species of curculionid beetle, *Camptorrhinus humeralis* Chev. and one undetermined species of moth of the family Pyralidae. All these species constitute first record as borers of mangrove trees.

Introduction

Mangroves are very important component in the forest ecosystem of Andaman and Nicobar islands and occupy about 20 per cent and 2 per cent of the total land area of the Andamans and the Nicobars respectively (Sahany, 1957). The borers invading the mangrove plants can be categorised under two broad subheads, the marine borers and terrestrial borers.

While the marine borers of mangroves of these islands have been studied in some detail (Das and Dev Roy 1980, 1981, 1984, Dev Roy and Das, 1985 ; Tiwari *et. al.*, 1980) the insect borers of this ecosystem are almost neglected. Only seven species of insect borers have been recorded so far from the mangroves of these islands (Beeson, 1941 ; Tiwari *et. al.*, 1980 ; Das and Dev Roy, 1982 ; Das, Dev Roy and Mitra *in press*). Recently, the present authors have collected and studied four species of insect borers from mangrove ecosystem, of which two are cerambycid beetles, the third one is curculionid beetle and the fourth one is an unknown moth of the family Pyralidae (Lepidoptera). Both the species of cerambycids, namely, *Plocaederus obesus* Gahan and *Megopis* (*Aegosoma*) *sulcipennis* (White) attacked the sapwood ; while the curculionid beetle, *Camptorrhinus humeralis* Chev. and the undetermined moth were found to bore in the fruits. These are being dealt with in the present communication. All the insect borers recorded in the present paper are being reported for the first time as the borers of mangrove trees.

Material and Mathod

Infested mangrove logs and fruits procured from different mangrove areas of South Andaman islands were brought to the laboratory of the Zoological Survey of India

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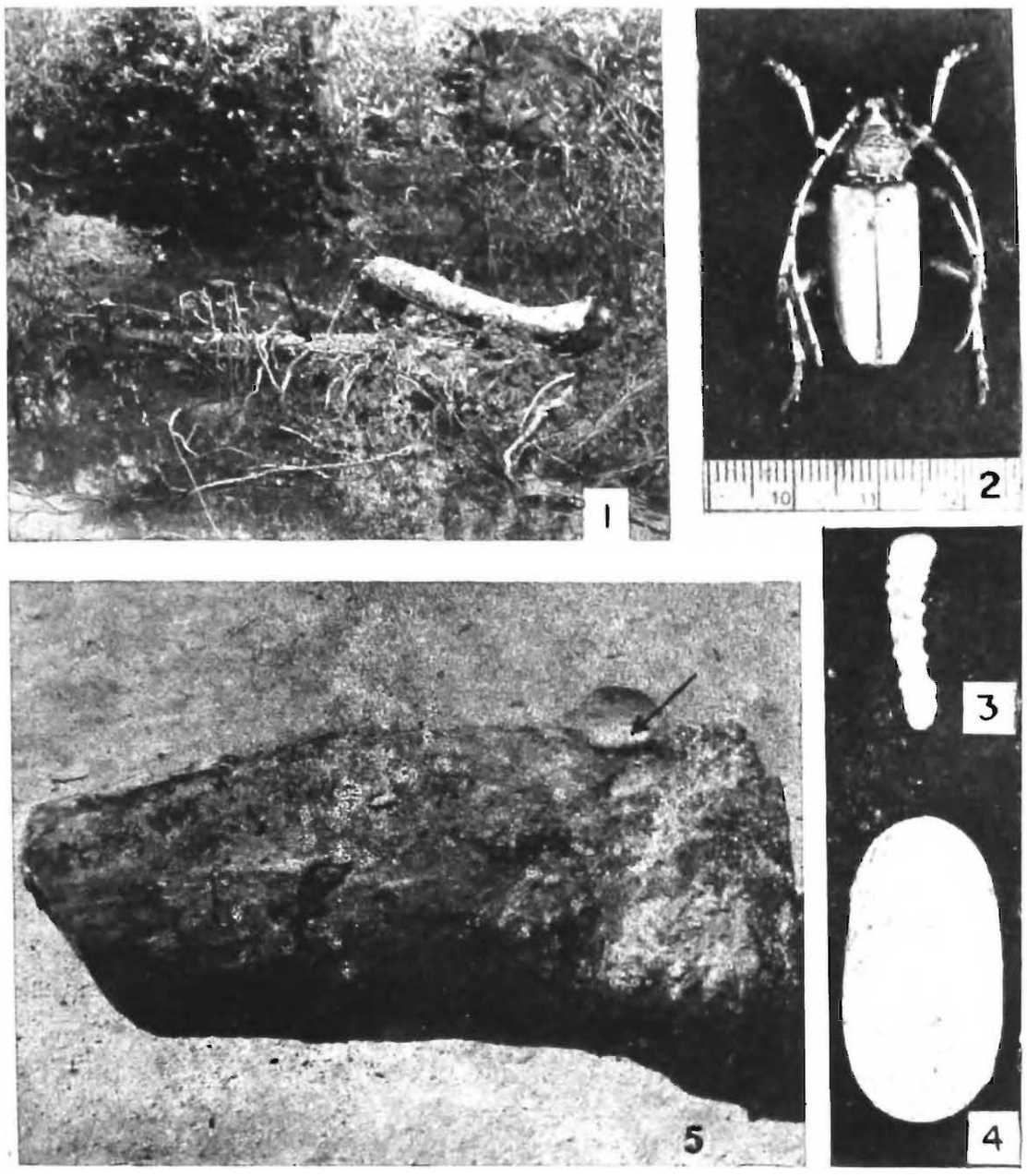
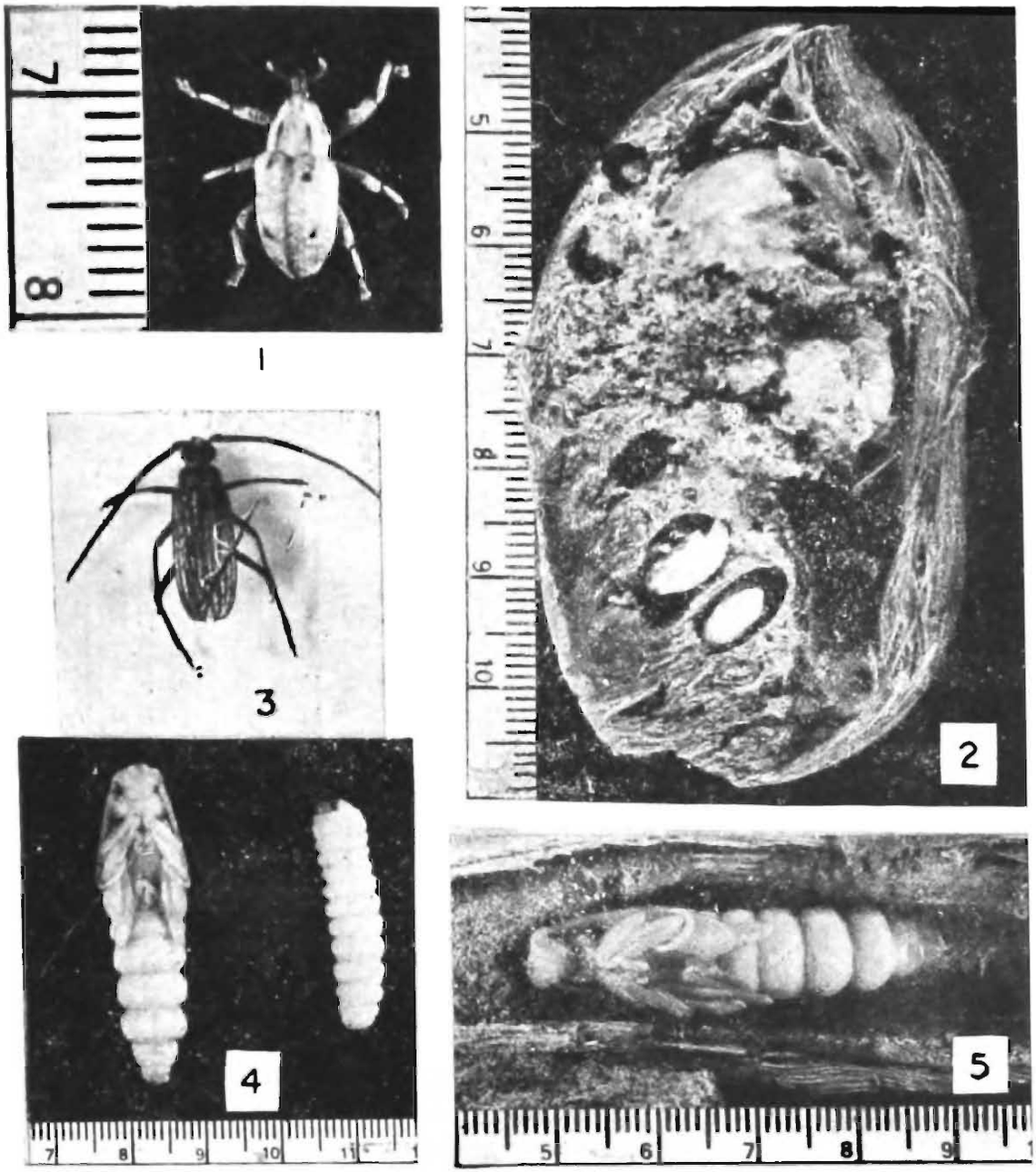


Figs. 1-5. 1. Intertidal zone showing felled mangrove infested with *Plocaederus obesus* Gahan 2-4. *P. obesus* 2. Adult ; 3. Larva ; 4. Pupa 5. Cocoon of *P. obesus* inside the shallow pit of a mangrove log



Figs. 1-5. 1. *Camptorrhinus humeralis* Chev. just after emergence from the mangrove fruit of *Heritiera littoralis*, 2. L. S. of the fruit of *H. littoralis* infested with the larvae of *C. humeralis*, 3-5. *Megopis* (*Aegosoma*) *sulcipennis* (White); 3. Adult; 4. Larva (at the right) and Pupa; 5. Pupa inside the pupal chamber

at Port Blair for insectary studies. Some of the larvae and pupae were preserved in Pampel's fluid for further studies. The pattern of gallery formation of the larval forms was also noted. Infested logs were kept inside galvanized iron chambers (70 cm × 37 cm × 37 cm) with one glass bottle on the top. But infested fruits were kept in glass jars (30 cm × 28 cm × 26 cm) with tops covered with mulmul. These were examined every day regulary between 9 hrs. and 10 hrs. IST.

Similar materials from the other islands were initially kept in the field laboratory and subsequently brought to Port Blair following the same method. Salinity of the creek water was measured by Harvey's method (1966) employing correction factors.

Observations

A. Wood borers

1. **Plocaederus obesus** Gahan (Coleoptera : Cerambycidae) (Plate X)

This cerambycine species is reported to be very common in the timber extraction and logging centres, timber depots and forest areas throughout the Andaman islands (Khan and Maiti, 1983). Although this borer has been collected from 13 species of host plants of these islands (Beeson and Bhatia, 1939 ; Khan and Maiti, 1983) still it has neven been reported from any mangrove trees of Andaman islands as well as mainland India.

During the present study this borer has been collected from three felled logs of a mangrove tree, *Heritiera littoralis* in Bamboo-flat (South Andaman) within the mangrove areas in such part of the intertidal zone where seawater can reach only during the high tide and submerge the logs completely (Plate X, Fig. 1). These logs were found to be heavily infested with larvae which excavated wide and very irregular galleries in the sapwood. These galleries were packed tightly with coarse fibrous frass. Exact larval period of this species could not be ascertained. Pupation took place in solid cocoon and pupal chamber was formed inside a shallow pit under the bark. Cocoons are white, hard, thick, calcareous and oval or 'Tortoise-egg' shaped having 3.5 to 4 cm in length and 1.8 to 2 cm in width. In the laboratory pupal period varies from 240 to 270 days. The mature beetles emerged by breaking the cocoons.

Beeson (1941) described this species as a heartwood borer. Khan and Maiti (1983) corroborated the same with the exception of several instances where they observed this species to from pupal chamber in the sapwood. In the present case, the borer completed its life-cycle in the sapwood of the upper portion of the logs which were found to remain completely submerged under seawater during the hightide, the sailinity of which ranged from 32.47‰ to 34.53‰ during the present study.

That the pupa within the cocoon is quite tolerant of seawater for a considerable period is ascertained by the fact that adult beetles emerged safely from the cocoon even after keeping the same up to 6 hrs. per day for successive three days in the seawater of 34.53‰ salinity and then placing the same in the pupal pit again in the laboratory. But it is not quite clear how larvae withstand saline wrter in the present circumstances. Rather, it has been seen that larvae cannot survive if they are exposed to seawater of the

above ranged salinity directly for more than an hour. It is yet to be studied whether seawater is soaked by the thick layer of frass granules in such a state that water which could reach the larvae does not affect their further development. Mention may be made here that larval infestation of the logs were first noticed during May 1982. From one lot of those larvae reared in the laboratory adult beetles emerged in the month of April 1983.

2. **Megopis (Aegosoma) sulcipennis** (white)
(Coleoptera : Cerambycidae)
(Plate XI, Figs. 3-5)

These beetles were found to attack dried up stumps of another mangrove tree, *Sonneratia alba* towards supralittoral zone of the mangrove forest near Uttara jetty, Kadamtala, Middle Andaman. The larvae tunnelled the sapwood, formed irregular but extensive galleries and occasionally penetrated upto the heartwood. As usual, the larval galleries were packed tightly with the coarse fibrous frass. After forming a larval chamber inside the tunnel the mature larvae underwent pupation. The pupal chamber was more or less parallel to the wood fibres.

In this case also, larval period could not be ascertained. Size of mature larva ranged from 2.8 to 3.3 cm and that of pupa from 3.5 to 4 cm in length. Pupation took place between 8 and 10 days in the laboratory. The adult beetles emerged by penetrating the distal end of the pupal chamber forming a more or less circular exit hole of 0.60 to 1.0 cm in diameter.

The larvae infested logs were kept in the laboratory on 28.3.83 and adult beetles emerged during 25.4.83 to 5.5.83. A total of 19 adults were collected, out of which 11 were males and 8 females.

This species is so far known from Andaman islands and Burma. From the available litterature it appears that no work has been published so far on the biology or boring habit of this beetle.

B. Fruit borers

2. **Camptorrhinus humeralis** Chev.
(Coleoptera : Curculionidae)
(Plate XI, Figs. 1-2)

Fruits of *Heritiera littoralis* fallen on the ground in the mangrove forest of Bamboo flat, South Andaman were found heavily infested with the larvae of this beetle during March 1983.

These larvae fed on the kernal portion and formed pupal chamber in the mesocarp of the fruits (Plate XI, Fig. 2). Size of pupal chamber varied from 0.65 to 0.75 cm in length and 0.4 to 0.5 cm in width. In the laboratory pupal period ranged from 12 to 18 days. Adults emerged through the exit holes, the diameter of which varied from 0.35 to 0.4 cm. One to five exit holes per fruit were observed.

C. humeralis is so far recorded from the Andamans only. Its biology is yet to be studied. From India, only two species of *Camptorrhinus*, namely *C. affinis* and *C. albizziae* are known as borers, that too, as wood-borers (Beeson, 1941). The former is reported from the host plants, *Albizzia lucida* and *Shorea robusta* while the latter from *Mangifera indica*.

4. Unknown moth (Lepidoptera : Pyralidae)

From some infested fruits of *Heritiera*

littoralis collected on the floor of the mangrove forest of Bambooflat (South Andaman) and kept in the insect rearing chambers in the laboratory adult moths belonging to the family Pyralidae were found to emerge. The identity of this moth is yet to be determined. The larvae were found to be covered with loosely packed frass material. The mature larvae formed pupal chamber within those frass metetial and underwent pupation. The pupa was enclosed in a white, transparent silken cocoon, the dimension of which ranged from 0.7 to 1.1 cm. Pupal period varied from 3 to 5 days under laboratory condition.

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