

Insect Pests of the Sundarbans Mangroves of Bangladesh

M. W. Baksha¹ and E. B. Lapis²

¹Bangladesh Forest Research Institute, P. O. Box 273
Chittagong 4000, Bangladesh

²Centre for Forest Pest Management and Research, Ecosystem Research and
Development Bureau, Los Banos, College, Laguna 4031, Philippines

Abstract

Sundarbans, the largest single continuous tract of natural mangroves in the world, is endowed with a diverse group of plants and animals and has recently been given the status of 'World Heritage Site' by the UNESCO. This paper gives a brief account of 31 species of insect pests attacking Sundarbans mangroves of Bangladesh. The pests include five species of defoliators, three stem borers, eight fruit borers, two gall makers, one sap sucker, one root feeder and 11 wood borers. These include 17 species of Coleoptera, 11 species of Lepidoptera, two species of Diptera and one species of Homoptera.

সারসংক্ষেপ

পৃথিবীর সর্ববৃহৎ একক বিস্তৃত ম্যানগ্রভ বনাঞ্চল সুন্দরবন বিভিন্ন প্রকার উদ্ভিদ ও প্রাণীর আবাসস্থল, যা ইউনেস্কো কর্তৃক 'বিশ্ব ঐতিহ্যপূর্ণ স্থান' হিসেবে সম্প্রতি স্বীকৃত। এ প্রবন্ধে বাংলাদেশের সুন্দরবন ম্যানগ্রভের ক্ষতিকর ৩১ প্রজাতির কীট-পতঙ্গের সংক্ষিপ্ত বিবরণ দেয়া হয়েছে। এসব কীট-পতঙ্গের মধ্যে পাঁচ প্রজাতির পাতাভোজী, তিন প্রজাতির কান্ড ছিদ্রকারী, আট প্রজাতির ফল ছিদ্রকারী, দু' প্রজাতির গল সৃষ্টিকারী, এক প্রজাতির রস শোষণকারী, এক প্রজাতির শিকড়ভোজী এবং ১১ প্রজাতির কাঠ ছিদ্রকারী পোকা রয়েছে। এগুলোর মধ্যে ১৭ প্রজাতির Coleoptera, ১১ প্রজাতির Lepidoptera, দু' প্রজাতির Diptera এবং এক প্রজাতির Homoptera রয়েছে।

Key words : Bangladesh, insect pests, mangrove pests, natural mangroves, Sundarbans

Introduction

The Sundarbans is the largest single continuous tract of natural mangroves in the world, occupying about 10,000 km² of which about 62% lie in Bangladesh (and the rest in India). It has been given the status of 'World Heritage Site' by the UNESCO in December 6, 1997. This dynamic ecosystem is endowed with a diverse group of plants and animals interacting with each other.

The faunal study, particularly on the insects, of this ecosystem is greatly neglected. Very little is known about the insect fauna of the Sundarbans of Bangladesh. Bulk of the information on the subject is available in Beeson (1941). But such information is incomplete and scattered. However, 19 species including two unidentified insect pests have been reported to attack the mangrove species, *Sonneratia apetala* in

Bangladesh (Baksha and Islam 1997). In this paper an attempt has, therefore, been made to identify the two unidentified specimens and to give an additional list with short account of insect pests so far recorded on various mangrove species.

Materials and methods

General observations on pest incidence on major mangrove species were made by periodic visits in the Sundarbans during 1996-98. The infested plant parts (leaves, twigs, fruits, logs, etc.) with insects were collected and brought to the Forest Entomology Laboratory of the Bangladesh Forest Research Institute (BFRI), Chittagong. The infested logs were kept inside rearing cages and leaves, twigs and fruits were kept in glass jars with mouth covered by muslin cloth and examined daily at regular intervals. In the process of rearing the insects, any parasites that emerged were collected. The immature stages and the soft-bodied adults were preserved in small vials containing 70% ethyl alcohol, while the other reared adults were killed in killing jar containing ethyl acetate, dried and preserved for identification and further study. Observations on the nature of damage, biology and ecology of the pests were made during field visits and rearings in the laboratory. The specimens were identified by comparing with the voucher specimens of the reference collection of the Forest Insect Museum of BFRI and by the CAB International Institute of Entomology, London.

Results and discussion

The recorded insect pests include defoliators, stem borers, fruit borers, gall makers, sap suckers, root feeders, and wood borers. A brief account of them is given below.

A. Defoliators

1. Keora leaf roller, *Caloptilia* sp. nr. *scaeodesma* (Meyrick) (Gracillariidae : Lepidoptera)

The larva of this small moth rolls keora (*Sonneratia apetala*) leaf in a characteristic

pyramidal manner inside which it feeds on the epidermal tissue of the leaf (Fig. 1). Infestation is most commonly found in nurseries and natural regeneration areas. Though the seedlings are not killed, the photosynthetic potential of the leaf is reduced and, thus, the growth is hampered.

2. Keora leaf folder, *Ophiorrhabda leverii* (Bradley) (Tortricidae : Lepidoptera)

The larva of this small moth folds the leaf or ties together two leaves of keora (*Sonneratia apetala*) with a silk thread produced by the larva. The larva feeds on the leaf surface inside the folded leaves. Infested leaves become yellow and usually dry up. Infestation is heavy in nurseries and low in natural regeneration areas. *Apanteles* sp. nr. *salutifer* (Braconidae : Hymenoptera) was found to parasitize the larvae.

3. Gorjan defoliator, *Euproctis* sp. (Lymantriidae : Lepidoptera)

Gorjan (*Rhizophora mucronata*) is sometimes defoliated by the larva of this species of moth. It also feeds on baen (*Avicennia* spp.) and keora (*Sonneratia apetala*). In severe infestation the plants become completely leafless. Young trees are most commonly damaged. The eggs are laid on the underside of leaves in masses. The larva is provided with poisonous long and light brown hairs along its sides and white and red tufts of hairs on the back. Pupation occurs in a cocoon firmly attached to the stem. *Brachymeria* sp. (Braconidae : Hymenoptera) parasitizes a large number of larvae.

4. Gewa defoliator, *Dasychira* sp. (Lymantriidae : Lepidoptera)

The larva of this large moth feeds on the leaf of gewa (*Excoecaria agallocha*). During the day they are found taking shelter in large masses on the stem.

5. Atlas moth, *Attacus atlas* Linn. (Saturniidae: Lepidoptera)

The adult moth was collected in resting condition from near Sharonkhola Forest Range



Figure 1. Keora leaves rolled by keora leaf roller.

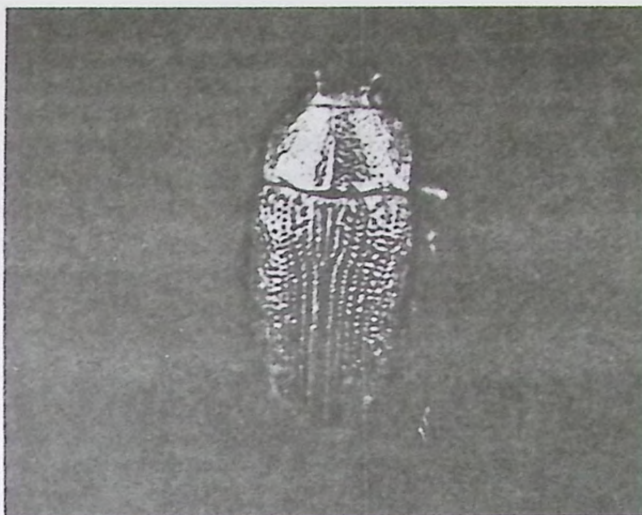


Figure 2. Adult beetle of gewa collar borer.

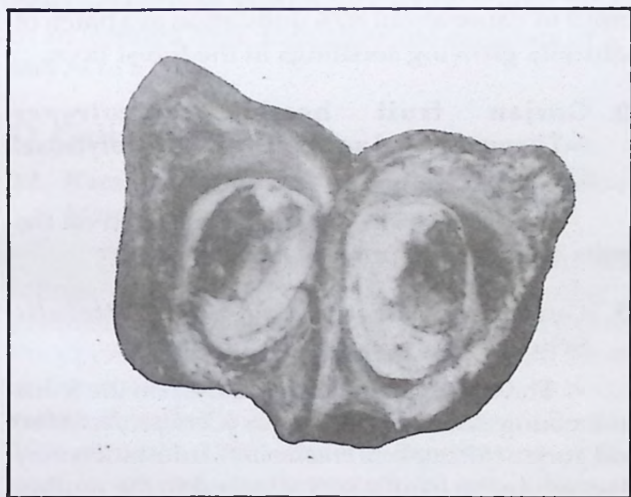


Figure 3. Sundri fruit bored by sundri fruit moth.



Figure 4. Leaf gall of baen caused by gall midge.

Office of the Sundarbans. The recorded food plants of its larva include mahogany (*Swietenia macrophylla*), jarul (*Lagerstroemia speciosa*), kushum (*Schleichera* sp.), mango (*Mangifera indica*), rain tree (*Samanea saman*), bhat (*Clerodendrum* sp.) and tea (Browne 1968). However, none of them are

mangroves. The wings, each with a triangular transparent patch, vary from rich tawny to purplish brown, reaching a span of about 28 cm when spread. It is the largest moth of the Indian region (Beeson 1941).

B. Stem borers

6. Gewa collar borer, *Chrysoderma* sp. (Buprestidae : Coleoptera)

The infestation by this pest was first detected at Hiron Point of the Sundarbans in 1996. Later it was reported from other parts of the forest. The larva of this beetle bores and makes large, long and winding tunnel in the lower part of gewa (*Excoecaria agallocha*) stem close to the ground. The tunnel may extend down to the root. The infestation is widespread requiring immediate attention as gewa occupying 16% of the Sundarbans is a commercially important tree supplying raw material for the Khulna News Print Mills. During harvesting the trees are usually cut above the collar region leaving enough wood for the insect to bore and continue tunnelling downwards. Fresh stumps are also left in the forest floor which could serve as breeding places. Cutting trees at the lower part of the bole and destroying stumps after felling seem to destroy the habitat of the borer.

7. Kirpa borer, unidentified (Cossidae : Lepidoptera)

The larvae of this moth make tunnels inside the stem of kirpa (*Lumnitzera racemosa*) where they feed and take shelter. When the tunnels are numerous the strength of the stem is reduced, causing them to break. Infestation is widespread and severe.

8. Hargoza borer, unidentified (Lepidoptera)

Hargoza (*Acanthus ilicifolius*) is a shrubby mangrove which is often found heavily attacked by the larvae of a small moth. The larvae feed on the cortical and subcortical tissues of the stem resulting in the formation of a cavity. Granules of frass come out from the holes and remain adhered to the stem. Pupation takes place in May inside the stem, and the pupa is enclosed in a brown cocoon. Pupation lasts for 13 days. The empty cavity after the emergence of the adult in June is occupied by ants.

C. Fruit borers

9. Passur fruit moth, *Hypsipyla robusta* Moore (Pyralidae : Lepidoptera)

The larvae of this moth bore in the fruits of dhundul (*Xylocarpus granatum*) and passur (*X. mekongensis*). The pupal period lasts for 9-12 days.

10. Sundri fruit moth, *Hymenoptychis sordida* Zellar (Pyralidae : Lepidoptera)

The larvae of this moth bore in the green fruits of sundri, *Heritiera fomes* (Fig. 3).

11. Kankra fruit beetle, *Coccotrypes* (= *Thamnurgides*) *fallax* (Eggers) (Scolytidae : Coleoptera)

The adults and the larvae feed on the fruits of kankra (*Bruguiera sexangula*) and goran (*Ceriops decandra*) killing the germinating seedlings. The pest is a major threat to regeneration as it was found to cause about 80% infestation in a batch of naturally growing seedlings in the forest floor.

12. Gorjan fruit beetle, *Coccotrypes* (= *Thamnurgides*) *nepheli* (Eggers) (Scolytidae : Coleoptera)

Both the larvae and the adults feed on the fruits of gorjan (*Rhizophora mucronata*).

13. Goran fruit beetle, *Cryphalus littoralis* Schedl. (Scolytidae : Coleoptera)

The adults and the larvae feed on the fruits and young seedlings of goran (*Ceriops decandra*) and gorjan (*Rhizophora mucronata*). Infestation may start while the fruit is still attached to the mother tree. The pest probably hampers seriously the establishment of young seedlings.

14. Sundri fruit weevil, *Camptorrhinus humeralis* Chev. (Curculionidae : Coleoptera).

The weevil attacks seriously the fallen ripe fruits of sundri (*Heritiera fomes*). The attack is heavy in March. Pupation occurs inside the fruit and lasts for 12-18 days in the laboratory. Adults

emerge from the fruit through the exit holes, which may be one to five per fruit.

15. Kankra fruit moth, unidentified (Lepidoptera)

Green fruit of kankra (*Bruguiera sexangula*) is attacked by the larva of an unidentified moth. Pupation takes place outside the fruit. Pupa adheres to the fruit by extraneous materials. Emergence of the moth occurs in March-April. Exit holes are irregular. Each infested fruit contains one larva.

16. Keora fruit moth, unidentified (Lepidoptera)

Fruit of keora (*Sonneratia apetala*) is attacked by the larva of an unidentified moth. Pupation occurs inside the fruits in September and emergence of moth takes place in October. Exit holes are circular. Maximum four holes were found in an infested fruit, indicating the existence of 1-4 larvae in a fruit.

D. Gall makers

17. Karanja gall midge, *Microdiplosis pongamiae* Mani (Cecidomyidae : Diptera)

The larva of this gall midge feeds on the foliage of karanja (*Pongamia pinnata*) causing a greenish, hollow, polypoid, and pedicelled gall on the upper surface of the leaflet. The adult moth is 1 mm long. The larva is reported to occur together with a mite, *Eriophyes cheriani* (Beeson 1941, Browne 1968). Several generations of the pest in a year are reported to occur (Beeson 1941).

18. Baen gall midge, unidentified (Cecidomyidae: Diptera)

This gall midge forms large-sized galls on the leaf of baen, *Avicennia* spp. (Fig. 4). The adult emerges through a hole on the gall, after which the gall dries and falls. Infestation was found heavy at Tengragiri natural mangrove forest, Patuakhali.

E. Sap sucker

19. Goran red wax scale, *Ceroplastes rubens* Maskell (Coccidae : Homoptera)

Both the nymph and the adult scale suck sap from the leaves of goran (*Ceriops decandra*). This results in the yellowing and drying up of the affected parts of the leaf. They secrete honey dew on which sooty mould fungus grows.

F. Root feeder

20. Hargoza root feeder, *Adoretus lacustries* Arrow (Scarabaeidae : Coleoptera)

The larva feeds on the roots of hargoza (*Acanthus ilicifolius*), while the adult feeds on the leaves of baen (*Avicennia officinalis*) biting small irregular holes on the leaves between the main veins, forming a lacy network. The eggs are laid in the soil in which the larva lives. Pupation occurs in the soil.

G. Wood borers

21. *Plocaederus obesus* Gahan (Cerambycidae : Coleoptera)

It is the most common wood borer of sundri (*Heritiera fomes*) in logging sites and timber depots attacking felled logs submerged only by high tidal water. The larva makes wide, irregular galleries beneath the bark and in the wood and eventually pupates deep in the wood, in cells lined with wood fibres and calcium carbonate. The beetle takes about seven months to complete its life cycle (Das *et al.* 1988).

22. *Acolesthes holocericea* Fabr. (Cerambycidae : Coleoptera)

The beetle breeds in dead and fallen trees and dying branches of gewa (*Excoecaria agallocha*). The eggs are laid on injured bark. The larva on hatching makes wide, irregular galleries between the bark and sapwood, which is tightly packed with a mixture of granular and fibrous frass. Pupal tunnel runs horizontally to sapwood to some distance and turns abruptly vertically down to

heartwood to end in a pupal chamber. A calcareous operculum closes the outer end of the chamber. The beetle takes about eight months to complete its life cycle.

23. *Megopis* (= *Aegosoma*) *sulcipenne* White (Cerambycidae : Coleoptera)

The beetle infests dried stumps of keora (*Sonneratia apetala*). The larva tunnels in the sapwood forming irregular and extensive galleries and occasionally penetrates deep in the heartwood. The larval galleries are tightly packed with coarse fibrous frass. Pupal chamber is more or less parallel to the wood fibres. Pupal period lasts for 8-10 days (Das *et al.* 1988).

24. *Chrysocroa* sp. (Buprestidae : Coleoptera)

The beetle attacks dead and dying trees of sundri, *Heritiera fomes* (Choudhury and Baksha 1983). The larva feeds in the sapwood and heartwood. Mature larva attains a length of 15 cm and makes a large tunnel from which it ejects frass and sap through circular holes. The life cycle is probably annual (Beeson 1941).

25. *Xyleborus bidentatus* (Motschulsky) (Scolytidae : Coleoptera)

The beetle attacks dead and dying trees of gorjan (*Rhizophora mucronata*). The larva makes horizontally extended tunnels in the sapwood. The tunnels are tiny and pin-headed at their surfaces.

26. *Xyleborus cognatus* Blandford (Scolytidae : Coleoptera)

The beetle is 2.6-2.8 mm long. The larva makes transverse tunnels in the sapwood of kankra (*Bruggiera* spp.), gewa (*Excoecaria agallocha*), sundri (*Heritiera fomes*) and gorjan (*Rhizophora mucronata*).

27. *Xyleborus bicolor* Blandford (Scolytidae : Coleoptera)

The beetle attacks sapwood of sundri (*Heritiera fomes*)

28. *Crossotarsus saundersi* Chapuis (Platypodidae : Coleoptera)

The beetle bores into the sapwood of dying and newly felled sundri (*Heritiera fomes*). The beetle is 4 mm long, chestnut brown and cylindrical. The larva is 5 mm long, legless and white.

29. *Crossotarsus squamulatus* Chapuis (Platypodidae : Coleoptera)

The gallery system is composed of a horizontal main gallery with vertical branch galleries which split into terminal subsidiary branches ending as pupal cells. The larva is 6 mm long.

30. *Platypus maritimus* Schedl (Platypodidae : Coleoptera)

The beetle attacks sapwood of keora (*Sonneratia apetala*).

31. *Platypus uncinatus* Blandford (Platypodidae : Coleoptera)

The beetle is 3.5-3.7 mm long which attacks sapwood of sundri (*Heritiera fomes*).

Conclusion

It is quite possible that many more species may be found to infest the Sundarbans natural mangrove forest with more intensive surveys in the future. Some of the insect pests listed above cause considerable damage, to which immediate attention needs to be given.

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