

Role and Interaction of insect pests in mangrove vegetations of central Kerala

Jain J Therattil

P.G. Department of Zoology, St. Aloysius College, Thrissur, Kerala, India

Abstract

Insects are an ancient group of animals. Mangrove vegetation of Kerala is distributed in nine coastal districts. The order Hymenoptera (Insecta) of mangrove ecosystem is economically important because they are pollinators, predators, and Phytophagous and parasitic species. Many insects especially honey bees inhabit in the mangrove vegetation. Mangrove associated insects mostly include variety of insect species includes Mosquitoes, Gall forming insects, Coccids, Biting insects etc. Destructive insects are classified and surveyed in Kerala are mainly under Plant borers and Fruit borers. They enormously damaging the plants and reducing the leaf falling. Coleopterans and termites are also destructive in nature. Honeybees play an important ecological role as pollinators of many plant species. Among this study another group of insects reported are harmful insects. They are broadly classified into Borers and miners. Mangrove associated insects mostly include variety of insects species includes Mosquitoes, Gall forming insects, Coccids, Biting insects etc. Leaf miners and borers destroy xylem, phloem and epidermal layers of the leaves. This reduces rate of photosynthetic activity, leaf defoliation, thus leads to the death of the plants. They may enormously damage the vegetation so that preventive measures should be taken for the healthy growth and development of the unique Ecosystem.

Keywords: Mangrove Vegetation, Insect pests, Kerala

1. Introduction

Mangroves are the most productive ecosystems, which can fertilize the sea, potentially protect the coastal zone and serve as the breeding, feeding and nesting ground for many animals. The Indian mangroves support rich faunal resources. Mangrove vegetation of Kerala is distributed in nine coastal districts. The study area comprises 14 species of true mangroves and 8 species of associated mangroves. Mangrove associated insects mostly include variety of insect species includes Mosquitoes, Gall forming insects, Coccids, Biting insects etc. Destructive insects are classified and surveyed in Kerala are mainly under Plant borers and Fruit borers. They enormously damaging the plants and reducing the leaf falling.

Study Area

Mangrove vegetation of Kerala is distributed in nine coastal districts. Study area includes three r coastal districts of Kerala. They are Kadalundi (Malappuram), Puthuvypu (Ernamkulam) Chettuvai (Thrissur).

2. Materials and Methods

The present study was from September 2013 to February 2015. The entire area was surveyed. Intensive and extensive collections of insects were done from the study area. All the species were collected by using sweeping net, hand net specially made for the purpose. Light traps, screens were used for the specimen collection. The preserved specimens will be kept in specially made insect boxes using Asta insect pins (38 x 0.5 mm). Taxonomic identification of the specimens was carried out with the help of experts done by wide stereo zoom microscope. The figures were drawn using Camera Lucida. A check list of insect of study area was prepared.

3. Results and Discussion

During the course of the study, the insect pests are classified according to the mode action, are mainly boring insects. They are broadly classified into Heart wood borers, Sapwood borers, Stem borers, Seedling borers and Fruit borers. The present study shows 18species, 8 orders and 11 families of insects were generally affects mangrove vegetation. These insects are very seriously affecting the vitality of plant, growth and photosynthetic activity. They may also seriously damage the different parts of the plant including the roots. In field no.1 (Chettuvai, Thrissur), the growth of the plant were seriously affected by insect pests. But in field no.2 (Kunjhimangalam, Kannur), insects are mainly in stem borers and leaf miners.^[1] Maximum gall causing plants were reported from Dharmadam. The destruction of the insect pattern and infestation is almost common in all fields. The severe destruction reported from Kunjhimangalam (Kannur) and least from Puthuvypu (Ernakulum). The host plant of maximum infestation reported in *Rhizophora mucronata* and *Bruguiera cylindrica* in all field area. The present study shows that Mangrove ecosystems in Kerala have a potential threat by insect pests; especially by boring insects. They may enormously damage the vegetation so that preventive measures should be taken for the healthy growth and development of the unique ecosystem^[2]

Table 1: Major Insects in Study area

Sl. No	Scientific name of Insect	Occurrence	Host plant
1	<i>Papiliopolyxenes</i>	+++	<i>Acanthus illicifolius</i>
2	<i>Tirumalaseptentrionis</i>	++	<i>Avicenniaofficinalis</i>
3	<i>Plocaoderusobseus</i>	++	<i>Avicennia marina</i>
4	<i>Apismellifera</i>	+	<i>Rhizophora mucronata</i>
5	<i>Apis florae</i>	++	<i>Excoecariaagalocha</i>
6	<i>Danauschrysippus</i>	+	<i>Kandeliacandel</i>
7	<i>Oecophyllasmaragdina</i>	+++	<i>Sonneratia alba</i>

8	<i>Amegillacingulata</i>	++	<i>Rhizophora apiculata</i>
9	<i>Brachycyttarus subteralbata</i>	++	<i>Bruguiera cylindrica</i>
10	<i>Belionotaprasina</i> Thunberg	+	<i>Kandeliacandel</i>
11	<i>Calosomascrutator</i> Fabr.	+	<i>Acanthus illicifolius</i>
12	<i>Ceresium flavipes</i> (Fabr.)	+	<i>Bruguiera gymnorhiza</i>
13	<i>Macrotomaplagiata</i> Lameree	++	<i>Sonneratia alba</i>
14	<i>Saperdocalcarata</i> Say.	++	<i>Excoecaria agallocha</i>
15	<i>Di cladispa armigera</i> (Fabr.)	++	<i>Kandeliacandel</i>
16	<i>Coccinellaseptempunctata</i>	+++	<i>Excoecaria agallocha</i>
17	<i>Epilachna</i> sp. <i>Excoecaria</i> sp	++	<i>Sonneratia alba</i>
18	<i>Photinus pyralis</i> L.	+	<i>Acanthus illicifolius</i>
19	<i>Mylabris pustulata</i> Thunberg	++	<i>Avicennia officinalis</i>
20	<i>Oryctes rhinoceros</i> (L.)	++	<i>Bruguiera gymnorhiza</i>
21	<i>Macrodactylus subspinosus</i>	+	<i>Avicennia officinalis</i>
22	<i>Amarygmuscuprarius</i> Web.	+	
23	<i>Gonocephalum hofmanseggi</i>	++	<i>Acanthus illicifolius</i>
24	<i>Aedes albopictus</i> (Skuse)	++	<i>Sonneratia alba</i>
25	<i>Aedes albopictus</i> (Skuse)	++	<i>Excoecaria agallocha</i>
26	<i>Anopheles</i> sp.	+	<i>Avicennia officinalis</i>
27	<i>Culex</i> sp.	+++	<i>Bruguiera parviflora</i>
28	<i>Tabanus striatus</i> Fabr.	+	<i>Avicennia officinalis</i>
29	<i>Limoria</i> sp.	+	<i>Avicennia officinalis</i>
30	<i>Aleurodicus dispersus</i> Russell	++	<i>Rhizophora mucronata</i>
31	<i>Aspidiotus destructor</i>	++	<i>Kandeliacandel</i>
32	<i>Enicocephalus basalis</i> Westwood	++	<i>Excoecaria agallocha</i>
33	<i>Apis dorsata</i> Fabr.	+++	<i>Rhizophora mucronata</i>
34	<i>Chalcis</i> sp.	+	<i>Avicennia officinalis</i>
35	<i>Eurytoma agalica</i> Narendran	++	<i>Acanthus illicifolius</i>
36	<i>Iridomyrmex humilis</i> (Mayr)	+	<i>Avicennia officinalis</i>
37	<i>Oecophylla</i> sp.	+++	<i>Excoecaria agallocha</i>
38	<i>Megachila</i> sp.	+++	<i>Rhizophora mucronata</i>
39	<i>Ammophilalae vigata</i>	+	<i>Rhizophora mucronata</i>
40	<i>Monobia quadridens</i> L.	++	<i>Acanthus illicifolius</i>
41	<i>Xylocopa aestuans</i> L.	+++	<i>Avicennia officinalis</i>
42	<i>D. Melissa</i> Cramer	+	<i>Acanthus illicifolius</i>
43	<i>A. argillacea</i> Hub.	++	<i>Acanthus illicifolius</i>
44	<i>Pachliopta aristolochiae</i>	+	<i>Avicennia officinalis</i>
45	<i>Pteromaplagiophleps</i> Hampson	++	<i>Rhizophora mucronata</i>

+++ Major, ++ Moderate, + Less frequent

4. Conclusion

Mangrove ecosystems have a potential threat by insect pests; especially by boring insects. They may enormously damage the vegetation so that preventive measures should be taken for the healthy growth and development of the unique Ecosystem. The threats to the mangrove ecosystem could be broadly grouped into two: Natural and Anthropogenic. These factors may affect the system as a whole or any one entity within the system, etc. The natural threats include: Climatic changes, Cyclones and Physical processes. Diseases, deterioration, pollution, grazing, agriculture, aquaculture and human encroachment (including reclamation), etc., are considered as the anthropogenic threats to the ecosystem. The factors that affect this mangrove plants are broadly classified into two: General Factors and Specific Factors. General factors include loss of habitat, human interference, and trade over exploitation of fishery etc. But in some specific or exclusive factors which cause habitat destruction in several areas. Invasion of the islands by encroachers made extensive clearing and degradation of many areas. Any damage or

destruction to this ecosystem can destroy 'coastal balance' of the nature.

5. References

1. Das AK, Devroy MK. Insect borers of mangroves in India. Bull. zool. surv. India, 1984; 7(2-3):251-254
2. Jain J Therattil. Proceedings of International symposium on Recent Trends in Biodiversity in Asian Continents, Zoological Survey of India, 2008, 76-78.
3. Beazley M. The International book of Forest. M.B. Publishers, International Ltd., Shaftesburg Avenue, London, 1981.
4. Sidhu SS. Studies on the mangroves of India. I. East Godavari region. Indian For. 1963; 89:337-351.
5. A brief report of flower visitors & pollinators in Indian Region (Richard T. Corlett, 2004). Biological Reviews Cambridge University Press. 2004; 79(3):497-532.
6. Chapman JL, Reiss MJ. Ecology-Principles and Applications. Cambridge University Press, 1992.
7. Santhakumaran LN, Remadevi OK, Sivaramakrishnan VR. A new record of the insect defoliator,

- Pteromaplaphleps Hamp. (Lepidoptera: Psychidae) from mangroves along the Goa coast (India). Indian forester. 1995; 121:153-155.
8. Sureshan PM. On a collection of Chalcidoidea (Hymenoptera: Insecta) from the mangrove ecosystem of Kerala, South India with the description of a new species. Records of Zoological Survey of India. 2005; 104:133-140.
 9. Oswin SD, Kannadasan P. Mangrove insects and spiders of Muthupet, Tamil Nadu. Environment and Ecology. 1998; 16(4):932-936.