INSECT PESTS ASSOCIATED WITH SOME FUELWOOD AND MULTIPURPOSE TREE SPECIES IN NEPAL

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Received November 1990

NEUPANE, F.P. 1992. Insect pests associated with some fuelwood and multipurpose tree species in Nepal. Insect pests associated with some of the fuelwood and multipurpose tree species in the Chitwan District and some other places of Nepal were investigated during 1989. The tree species included *Acacia auriculiformis, A. catechu, Paraserianthes* spp., *Dalbergia sissoo, Leucaena* spp., and *Melia azedarach.* This report presents brief descriptions of the various insect pests that were found on these plant species.

Key words: Fuelwood trees - multipurpose trees - insect pests

NEUPANE, F.P. 1992 Serangga perosak terhadap beberapa jenis kayu bahan api dan jenis pelbagai guna di Nepal. Serangga perosak yang dikaitkan dengan beberapa spesies kayu untuk bahan api dan spesies pelbagai guna di Daerah Chitwan dan beberapa tempat lain di Nepal telah dikaji pada tahun 1989. Spesies-spesies pokok adalah seperti *Acacia auriculiformis, A. catechu, Paraserianthes* spp., *Dalbergia sissoo, Leucaena* spp. dan *Melia azedarach.* Laporan ini memberi penerangan ringkas mengenai pelbagai jenis serangga perosak yang terdapat pada spesies pokok tersebut.

Introduction

Nepal is an agricultural country where over 90% of the total population is engaged in subsistence farming. In the past, Nepal could boast of a good forest resource. This resource is, however, now fast depleting because of the growing population (about 2.5% annual increase). The people have been depending on the forest for fuelwood, timber, fodder, *et cetera.* Deforestation has become a very serious problem leading to, for example, an increase in soil erosion which is affecting agricultural production in Nepal.

The Government of Nepal has realised that the forests have to be preserved and the people, especially the farmers, are to be educated as to the overall effect of deforestation. There are various kinds of training programmes being held to teach farmers about deforestation. The farmers are advised to grow their own trees for fuelwood, timber, fodder and other purposes. Hence, the emphasis is given to multipurpose tree species.

In Nepal, some farmers have started raising their own nurseries of various fuelwood and multipurpose tree species. Some of the popular tree species in Nepal are *Melia azedarach, Dalbergia sissoo, Paraserianthes* spp. and *Acacia catechu.* Multipurpose and fuelwood trees introduced are *Leucaena* spp. and *Acacia auriculiformis.*

One of the problems the farmers are facing in raising trees in nurseries and establishing forest plantations is insect pests damaging and killing trees. In Nepal entomological attention has been directed towards agricultural crops in preference

over forest plants. Hence, there is little or no research in forest entomology. In this context this present study was made to survey and identify various insect pests associated with the plant species mentioned above and assess their damage. This study was conducted mostly in Chitwan and partly in Kaski, Makawanpur and Rupandehi Districts of Nepal during 1989.

Materials and methods

Species of trees

The following fuelwood and multipurpose tree species were selected for this study: *Acacia catechu, A. auriculiformis, Paraserianthes* spp., *Dalbergia sissoo, Leucaena* spp. and *Melia azedarach.*

Raising of nursery plants

Nurseries ($10 \times 1\,m$) of each plant species were raised in the Farm-Forestry block of the Institute of Agriculture and Animal Sciences (IAAS), Rampur, Chitwan, during the spring of 1989. All recommended practices were followed to raise the nursery plants.

Insect survey

The sites selected for the insect survey were: (a) Chitwan District - (i) IAAS research farm, (ii) Sharadanagar village, (iii) Mangalpur village, (iv) Meghauli village; (b) Makawanpur District - Hetauda; (c) Kaski District - Pokhara; and (d) Rupandehi District - Paklihawa.

The various plant species in the Chitwan District were observed at two-week intervals. In the nursery ($10 \times 1\,m$) about 5% of the total plants, and in the case of grown-up plants on the farmer's fields or on community lands at each site, 100 plants of each species selected randomly were observed carefully for various insects and their infestations. The nature and extent of damage due to individual insect species were recorded.

Other locations such as Hetauda, Pokhara and Paklihawa were surveyed only two to three times during the study period.

Insect rearing

Various stages (adults, eggs, larvae and pupae) of different insect pests collected from various tree species were brought to the laboratory. They were reared on their natural food in the laboratory as well as in field cages. In the laboratory they were reared in petri-dishes and rearing cages. The adults were killed and preserved dry. The natural enemies of various insect pests, which were found during the course of insect rearing and the field survey, were collected and preserved.

Results and discussion

The insect pests recorded on various tree species are listed in Table 1.

Table 1. Insect pests associated with some fuelwood and multipurpose tree species in Nepal

Insects	Order and family	Plant part damaged	Nature of damage	Severity
		Dalbergia sissoo		
	Lepidoptera			
Euthrix laeta (Walker)	Lasiocampidae	Leaves	Larvae defoliate the plants	Not severe
Plecoptera reflexa Guenee	Noctuidae	Leaves	Larvae defoliate the plants	Not severe
Spodoptera litura (Fab.)	Noctuidae	Leaves	Larvae defoliate the plants	Not severe
	Coleoptera			
Apoderus sissu Marshall	Curculionidae	Leaves	Female beetle cuts individual leaf and then folds in a typical manner which looks like a tight roll, and also defoliates the plants	Not severe
Myllocerus undecim-pustulatus Faust	Curculionidae	Leaves	Adults feed on the leaves from the sides	Not severe
Lepropus lateralis (Fab.)	Curculionidae	Leaves	Adults feed on the leaves from the sides	Not severe
Monolepta signata	Chrysomelidae	Leaves	Adults feed on the leaves by making small holes	Not severe
Phyllophaga sp.	Scarabaeidae	Leaves & roots	Adults feed on the leaves and grubs feed on the roots	Not severe
Anomala sp.	Scarabaeidae	Leaves & roots	Adults feed on the leaves and grubs feed on the roots	Not severe
	Orthoptera			
Brachytrypes portentosus Lichtenstein	Gryllidae	Leaves & tender stems	Both adults and nymphs cut the young plants in the nursery	Severe in some locations
	Isoptera			
Odontotermes parvidens Holmgren	Termitidae	Stems & twigs	Makes earthen galleries on the main stems and twigs of the plants and feeds on the dead bark	Severe in some locations
		Paraseerianthes spp.		
	Lepidoptera			
Spirama retorta (L.)	Noctuidae	Leaves	Larvae feed on the leaves	Not severe
Inderbela sp.	Metarbelidae	Bark & hard wood	Larvae feed on the bark, make long galleries and bore into the stem	Not severe
	Hemiptera			
Homoeocerus (*Tagus*) *walkeri* Kirby	Coreidae	Feeding habit not known		

(continued)

Table 1 . continued

	Homoptera			
Oxycarenus sp.	Membracidae	Stem and twigs	Both adults and nymphs suck the plant sap from the stem and twigs	Severe in some locations on small plants
	Orthoptera			
Brachytrypes portentosus Licht.	Gryllidae	Leaves & tender shoots	Both adults and nymphs cut the young plants in the nursery	Severe in some locations
	Coleoptera			
Mallophaga sp.	Scarabaeidae	Leaves & roots	Adults feed on the leaves and grubs feed on the rootlets	Not severe
Anomala sp.	Scarabaeidae	Leaves & roots	Adults feed on the leaves and grubs feed on the rootlets	Not severe
	Leucaena spp.			
	Homoptera			
Heteropsylla cubana Crawford	Pauropsyllidae	Leaves & tender shoots	Both nymphs and adults suck sap from the tender shoots and leaves	Very severe
	Coleoptera			
Phytoscaphus sp.	Curculionidae	Tender stems & leaves	Adults damages the tender stems and leaves	Not severe
	Acacia catechu			
	Lepidoptera			
Perioyma sp. probably *umbrina* Guenée	Noctuidae	Leaves	The larvae feed on the leaves	Not severe
	Acacia auriculiformis			
	Coleoptera			
Mallophaga sp.	Scarabaeidae	Leaves & roots	Adults feed on the leaves and grubs feed on the rootlets	Not severe
Anomala sp.	Scarabaeidae	Leaves & roots	Adults feed on the leaves and grubs feed on the rootlets	Not severe
	Orthoptera			
Brachytrypes portentosus Licht.	Gryllidae	Leaves & tender stems	Both adults and nymphs cut the young plants in the nursery	Severe in some locations

(continued)

Table 1. continued

		Melia azedarach		
	Orthoptera			
Brachytrypes pertentosus Licht.	Gryllidae	Leaves & tender stems	Both adults and nymphs cut the young plants in the nursery	Severe in some locations

Dalbergia sissoo

Twelve insect species were identified on this plant. Among these, *Brachytrypes portentosus* and *Odontotermes parvidens* were serious in some locations in the nursery and on the grown-up plants respectively. Beside these pests, the following unidentified lepidopterans were also recorded as minor pests: (a) a black semilooper and (b) a stem borer.

Spodoptera litura, which is a serious pest on tobacco and several other cultivated plants (Neupane 1989), was also found feeding on *D. sissoo.* The weevil *Apoderus sissu* was found in all the survey sites. It has been reported from the neighbouring country India (Stebbing 1914). *Myllocerus undecimpustulatus* is also a pest of cotton, maize, pegion pea and several other crops (Neupane 1989).

Paraserianthes spp.

On these plants six species of insect pests were identified. Of them, two species, namely, *Brachytrypes portentosus* and *Oxycarenus* sp., were serious in the nursery and grown-up plants respectively. In addition to these insects, two unidentified lepidopterans, (a) a leaf folder and (b) a pierid butterfly were recorded as minor pests. The unidentified leaf folder caterpillars were preyed upon by *Eocanthecona furcellata* (Wolff) (Pentatomidae: Hemiptera).

B. portentosus is widely distributed and is found commonly in the Himalayas and the adjacent plains (Lefroy & Howett 1984). It is highly polyphagous feeding on crop plants, ornamental plants and forest plants (Neupane *et al.* 1989).

Leucaena spp.

Leucaena leucocephala and *L. diversifolia* are newly introduced plants in Nepal. The cultivation of these plants has been a failure due to severe attack of *Heteropsylla cubana* which has been spreading from east to west in Nepal (Joshi 1990). The severity of this insect can be realised from the fact that an international workshop was held solely on it in Bogor, Indonesia (Napompeth & MacDicken 1989). Yang and Fang (1986) have described the morphology of this insect.

Acacia auriculiformis

Brachytrypes portentosus was a serious pest in the nursery. The chaffer beetles, *Malophaga sp.* and *Anomala sp.*, did some damage on the foliage.

Melia azedarach

In *M. azedarach, B. portentosus* did considerable damage in the nursery. No other insects were recorded on this plant. One of the reasons for this lack of pest infestation could be that this plant contains pesticidal properties.

Conclusion

Overall it was seen that *Brachytrypes portentosus* was a serious pest and the scarabaeid beetles (adults) were general defoliators (though not serious) in the nursery of all the plant species observed. *Heteropsylla* has been a real challange for *Leucaena* cultivation in Nepal.

Acknowledgements

This research was supported by the Winrock International (F/FRED) (PSA No. LAC-5547-C-00-5124-00) and Tribhuvan University, Institute of Agriculture and Animal Sciences (IAAS), Rampur, Chitwan, Nepal. I thank K.N. Pyakuryal, the former Dean of IAAS, for encouraging me to work on this project. The following specialists assisted in identifying most of the insects collected in this study: M.L. Cox (CIE), D.H. Hollway (CIE), I.M. White (CIE), G.M. Stonedah (CIE), M.R. Wilson (CIE), D. Hollis (NHM) and S. Bacchus (ODNRI). I am also grateful to K.M. Harris, Director, CAB Institute of Entomology, United Kingdom; B. Napompeth, Regional Coordinator, Regional Research Programme for *Leucaena* Psyllid Control, National Biological Control Research Center, Kasetsart University, Bangkok; and K.G. MacDicken, Team Leader/MPTS Network Specialist, Winrock International F/FRED, for their assistance.

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