STUDY OF INSECT PESTS OF POPLAR IN PAKISTAN

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ABSTRACT

A survey was conducted in 35 selected localities of Poplar plantations of Pakistan. From each locality 9 Poplar plantations were surveyed with random sampling, a total of 315 plantations were surveyed. Most of the survey was conducted from *Populus deltoides* plantations. Insect pests representing 5 orders, 35 families and 76 species were recorded during the study. Lepidoptera represented by 12 families (35%) comprised of 28 insect species (37%), Coleoptera consisted of 12 families (34%) had 22 insect species (29%), whereas order Homoptera represented by 5 families (14%) with 8 insect species (10%), Hemiptera by 4 families (11%) with 16 insect species (21%) and Isoptera by 2 families (6%) with 2 insect species (3%) were recorded in the surveyed.

INTRODUCTION

Poplars are among the fast growing species of wood which have been grown extensively on farm lands due to their economic importance and owing to their great potential for providing industrial raw material. In Pakistan, the match industry is the major user of Poplar wood grown on farmlands and more than 50 % of match factories are totally dependent on Poplar wood for raw material. Poplar wood is also frequently used for packing, shuttering, veneer, furniture, sports goods, chipboard industry, pulp and paper industry and matches due to its white colour, good workability, softness, light weight, relatively high strength in proportion to weight and resistance to splintering. The introduction of Poplars in the country initially encouraged the progressive farmers to grow this fast growing tree alongside water courses, around agricultural fields and as wind breaks. The quick and high wood yield providing handsome extra income from the same land without much care or additional inputs generated huge interest among other farmers. Various species of Poplars indigenous as well as exotic particularly different clones of hybrids have been tested for their climatic and regional suitability (Chaudhry 1985).

Being fast growing, such a valuable trees are subject to heavy infestation by insect pests. Chaudhry and Chaudhry (1968) and Chaudhry et al (1969) registered some insect pests and disease of Poplars in West Pakistan. Detailed study of insect defoliators, their population dynamics and their control have been conducted by Chaudhry and Shah (1973), followed by biological and ecological studies of Poplar stitcher, *Gypsonoma hapalsarca* Meyr and Poplar defoliator, *Ichthyura anastomosis* Steph (Chaudhry and Ahmad 1974). Mathur and Singh (1960) listed 42 insect species, mostly indigenous to India and adjacent countries

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that caused damage to Poplar and its timber in India. Chandel and Verma (1998) worked on the bionomics of large Poplar leaf beetle, *Chrysomela populi* found in the hills.

The main objective of this research study was to collect, identify insect pest species responsible for economic loss to this important tree species of Pakistan.

MATERIAL AND METHODS

Random sampling surveys were conducted from 2006-2011 in some 35 selected localities of Poplar plantations from Pakistan (Fig-1). From each locality 9 Poplar plantations were surveyed, so a total of 315 plantations were surveyed. Most of the survey was conducted from *Populus deltoides* plantations. During the survey samples were taken not only from Poplar grown around water channels (agro-forestry) but also from block plantations. Collection was made randomly by netting, hand picking and light trapping. Immature stages were bought in the laboratory and reared till emergence. Insect were identified comparing with already preserved specimens in Insect Museum of Pakistan Forest Institute, Peshawar, literature available (Beeson, 1941, Gahan 1906, Maulik 1919, Jacoby 1908 and Stebbing 1914), and experts (acknowledgements).

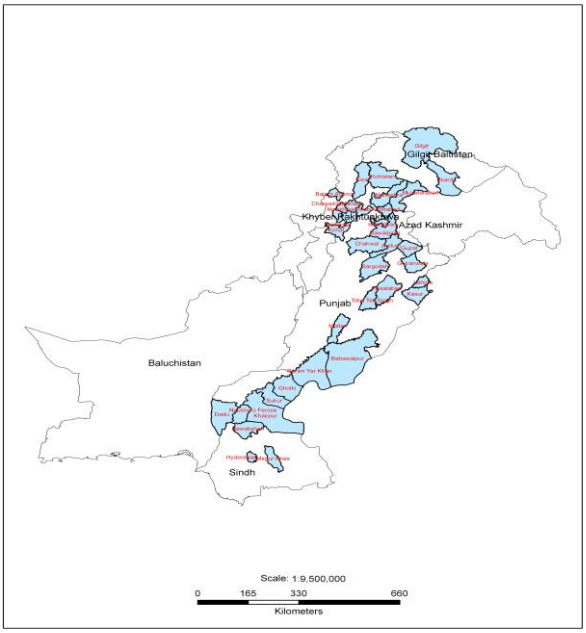

Fig.1 Map of the study area

RESULTS AND DISCUSSIONS

Insect pests representing 5 orders, 35 families and 76 species were recorded during the study (Table 1). Of the order Lepidoptera, Noctuidae, Notodontidae and Tortricidae were dominant families with each had 4 insect species. In Coleoptera, Gallerucidae was dominant family with 5 insect species, followed by Cermbycidae with 4 insect species. Pentatomidae, in Hemiptera, was most dominant family among all families with 11 insect species in terms of species richness, whereas in Homoptera, Coccidae and Flatidae were dominant families with each consisted of 2 insect species.

Table1. List of insect pests of Poplar identified in the study area

Order	Family	S. Name	Nature of damage	Previous references
Lepidoptera	Aegeriidae	*Aegeria* sp.	Bark borer	Chaudhry *et al*. 1966, Browne *et al*. 1968,
	Arctiidae	*Spilosoma obliqua* Walk	Leaf feeder	Gupta *et al*. 2008, Chaudhry *et al*. 1966
		Amsacta moorei Butl.	Leaf eating caterpillar	Browne *et al*. 1968, Beeson 1941
	Cossidae	*Cossus* sp.	Bark borer	Chaudhry *et al*.1976,
		Zeuzera sp.	Stem and branch borer	Chaudhry *et al*.1976,
		Indarbela quadrinotata Walk.	Trunk borer (Bark eating caterpillar)	Chaudhry *et al*.1976, Beeson 1941, Browne *et al*. 1968,
	Eucosmidae	*Acroclita vigescens Meyr*	Leaf stitcher	Chaudhry *et al*. 1966
	Gracillardiidae	*Lithocolletis* sp.	Leaf miner	Browne *et al*. 1968, Beeson 1941
		Leucoptera sp.	Leaf miner	Chaudhry *et al*.1973
	Geometridae	*Ascotis imparata* Wlk.	Leaf feeder	Chaudhry *et al*.1972,
	Lymantriidae	*Euproctis* sp.	Defoliator	Beeson 1941, Browne *et al*. 1968,
		Lymantria sp.	Leaf feeder	Beeson 1941, Browne *et al*. 1968,
	Noctuidae	*Earias* sp.	Shoot borer	Chaudhry *et al*. 1966
		Nycteola diplographa Hams.	Leaf feeder	Chaudhry *et al*.1976,
		Heliothes armigera Hb.	Leaf feeder	Browne *et al*. 1968, Beeson 1941,
		Spodoptera litura Fab.	Leaf feeder	Browne *et al*. 1968, Beeson 1941,
	Notodontidae	*Ichthyura anastomosis* Steph.	Defoliator	Chaudhry *et al*.1993,

		Ichthyura anachoreta F.	Defoliator	Chaudhry *et al.*1973
		Neocera (Cerura) wisei Swin.	Leaf feeder	Thakur 1999,
		Pygaera restitura Walk.	Defoliator	Chaudhry *et al*. 1966,
	Pyralidae	*Pyrausta diniasalis* Wlk.	Leaf feeder	Chaudhry *et al*. 1966,
		Hypsopygia costalis Bdv.	Leaf feeder	Chaudhry *et al*. 1973
	Tortricidae	*Archips subsidiaria* Meyr.	Leaf roller	Chaudhry *et al*.1976, Browne *et al*. 1968
		Gypsonoma hapaolsarca Meyr.	Leaf roller	Chaudhry *et al.*1993, Chaudhry *et al*. 1966,
		Gypsonoma minutana Hb.	Leaf roller	Chaudhry *et al*. 1966
		Gypsonoma anastomosis Steph	Leaf roller	Chaudhry *et al*. 1966
	Xyloryctidae	*Aeolanthus sagulata Meyr.*	Leaf feeder	Chaudhry *et al.*1970,
		Odites sp.	Leaf feeder	Chaudhry *et al*. 1973
Coleoptera	Bruchidae	*Bruchidius* sp.	Leaf feeder	Chaudhry *et al.*1970,
	Buprestidae	*Melanophila picta* Pall.	Bark borer	Chaudhry *et al.*1993, Chaudhry *et al.*1970, Browne *et al*. 1968, Beeson 1941
	Cassidae	*Cassida subtilis* Weise.	Leaf feeder	Chaudhry *et al.*1970,
	Cerambycidae	*Aeolesthes sarta* Solsky.	Bark borer	Chaudhry *et al.*1993, Browne *et al*. 1968, Beeson 1941, Chaudhry *et al*. 1966
		Apriona cinerea Chev.	Bark borer	Chaudhry *et al.*1993, Browne *et al*. 1968, Beeson 1941, Chaudhry *et al*. 1966
		Bactocera rubus L.	Bark borer	Chaudhry *et al*. 1966, Browne *et al*. 1968
		Bactocera rufomaculata	Bark borer	Thakur 1999
	Chrysomelidae	*Plagiodera versicolora* Laich.	Leaf feeder	Chaudhry *et al.*1970, Chaudhry *et al.*1993,
		Chrysomela populi L.	Leaf feeder	Ahmed *et al*. 1981
	Curculionidae	*Alcidodes fabricii* F.	Leaf feeder	Chaudhry *et al.*1970,
		Apoderus sissu	Leaf feeder	Browne *et al*. 1968
	Clytridae	*Aspidolopha* sp.	Leaf feeder	Chaudhry *et al.*1970,
	Eumolpidae	*Cleoporus* sp.	Leaf feeder	Chaudhry *et al*. 1966
	Gallerucidae	*Galerupipla brunnea* Mlk.	Leaf feeder	Chaudhry *et al.*1970
		Galerucida bicolor Hope.	Leaf feeder	Chaudhry *et al*. 1973
		Mimastra cyanura Hope.	Leaf feeder	Chaudhry *et al*. 1973
		Palpoxena sp.	Leaf feeder	Chaudhry *et al*. 1973
		Haplasoma sp.	Leaf feeder	Chaudhry *et al*. 1973
	Halticidae	*Hermaeophaga* sp.	Leaf feeder	Chaudhry *et al*. 1973

		Poylliodes brettinghami Baly.	Leaf feeder	Chaudhry *et al*. 1973
	Lagriidae	*Geocoris quadrimaculata* Hope.	Leaf feeder/ Sap sucker	Chaudhry *et al*. 1966, Browne *et al*. 1968
	Rutelidae	*Adoretus* sp.	Leaf feeder	Chaudhry *et al*.1970,
Homoptera	Aphididae	*Aphis sp.*	Leaf feeder/ Sap sucker	Chaudhry *et al*.1970,
		Pemphigus sp.		Thakur 1999
	Cicadidae	*Melampsalta continuata* Dist.	Leaf feeder	Chaudhry *et al*.1970,
	Coccidae	*Drosicha* sp.	Leaf feeder/ Sap sucker	Chaudhry *et al*.1970,
		Drosicha stebbengii Grenn	Leaf feeder/ Sap sucker	Chaudhry *et al*.1970,
	Dictyopharidae	*Dictyophara* sp.	Leaf feeder	Chaudhry *et al*. 1966
	Flatidae	*Unnata intracta* Walk	Leaf feeder	Chaudhry *et al*.1970,
		Ketumala sp.		Chaudhry *et al*. 1973
Hemiptera	Cydnidae	*Aethus* sp.		Chaudhry *et al*. 1973
	Lygaeidae	*Lygaeus civilis* Wollf.	Leaf feeder	Chaudhry *et al*.1970,
		Lygaeus rubriceps Horv.	Leaf feeder	Chaudhry *et al*.1970,
		Oxycarenus laetus Kby.	Leaf feeder	Chaudhry *et al*.1970,
	Pentatomidae	*Acrosternum* sp.	Leaf feeder/ Sap sucker	Chaudhry *et al*. 1966
		Apodiphus integriceps Horv.	Leaf feeder	Chaudhry *et al*. 1966
		Dalpada eremica Hoberl	Leaf feeder	Chaudhry *et al*. 1966
		Cantheconidea furcellata Wollf.	Leaf feeder/ Sap sucker	Chaudhry *et al*. 1966
		Menida sp.	Leaf feeder	Chaudhry *et al*.1970,
		Nezara viridula Linn.	Leaf feeder/ Sap sucker	Chaudhry *et al*.1970,
		Nezara antennata Scott.	Leaf feeder/ Sap sucker	Chaudhry *et al*.1970,
		Sastragala murreeana Dist.	Leaf feeder/ Sap sucker	Chaudhry *et al*. 1966
		Andrallus spinidens Fabr.	Leaf feeder	Chaudhry *et al*. 1966
		Dolycoris indicus Stol.	Leaf feeder	Chaudhry *et al*.1970,
		Eysarcoris sp.	Leaf feeder	Chaudhry *et al*.1970,
	Pyrrhocoridae	*Dysdercus* sp.	Leaf feeder	Chaudhry *et al*.1970,
Isoptera	Rhinotermitidae	*Heterotermes indicola* Wasmann	bark feeder	Thakur 1999, Beeson 1941,
	Termitidae	*Odontotermes distans*	bark feeder	Thakur 1999, Beeson 1941,

In the study area (Table 2), Lepidoptera represented by 12 families (35%) comprised of 28 insect species (37%). Result showed that Lepidoptera and

Coleoptera were dominated insect orders with 12 families each, however, in terms of insect species Lepidoptera was dominant order represented by 28 insect species (37%).

Table 2. Total number and percentage of species and families of observed order

Order	Family		Species	
	No.	%	No.	%
Lepidoptera	12	35	28	37
CColeoptera	12	34	22	29
Homoptera	5	14	8	10
Hemiptera	4	11	16	21
Isoptera	2	6	2	3
Total (5)	35	100	76	100

Similarly Coleoptera consisted of 12 families (34%) had 22 insect species (29%), whereas order Homoptera represented by 5 families (14%) with 8 insect species (10%), Hemiptera by 4 families (11%) with 16 insect species (21%) and Isoptera by 2 families(6%) with 2 insect species (3%) in the surveyed. At this point, it is worth mentioning that these are not only insects that appear in the Poplar plantations in Pakistan but also the intensity and appearance rate are not the same for all species.

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