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DIVERSITY OF PESTIFEROUS BORERS OF MANGO IN PUNJAB

SANDEEP SINGH AND GURLAZ KAUR

ICAR-Consortium Research Platform on Borers in Network Mode
Department of Fruit Science, Punjab Agricultural University, Ludhiana 141 004, Punjab, India

E-mail: sandeep_pau.1974@pau.edu

ABSTRACT

Roving surveys were conducted in the mango growing areas of Punjab to observe the biodiversity of borer insect-pests infesting mango crop, during 2013-2014 and 2014-15 along with fixed plot surveys at Fruit Research Farm and college orchard of Punjab Agricultural University (P.A.U.), Ludhiana. Different life stages of these insect-pests were collected and reared in Fruit Entomology Laboratory in the Department of Fruit Science. Samples of these insect-pests were sent to concerned taxonomists at different laboratories for identification. The results of this study reports five borer insect-pests, infesting different parts of mango plants in Punjab. Mango fruit borer, *Dichocrocis* (*Conogethes*) *punctiferalis* (Guenee), mango shoot borer, *Chlumetia transversa* (Walker), trunk borer, *Batocera rubra* (L.) & *B. rufomaculata*, bark eating caterpillar, *Indarbela* sp. and buprestid stem borer, *Belionota prasina* (Thunberg) were observed in mango orchards in Punjab.

INTRODUCTION

Mango, *Mangifera indica* Linnaeus, is known as the king of fruits. It originated in India and is among the most ancient fruits. In India, mango orchards cover an area of 250,000 hectares, with a production of 180, 02,000 MT and a productivity of 7.2 MT/ha (NHB 2013). In Punjab, Mango ranks third in area (6743 ha) and production (107572 MT) after citrus and guava (Anonymous 2015).

A number of insect pests attack mango in India which include hoppers, mealy bug, stem borer, shoot borer, fruit flies, stone weevil, leaf and flower feeding caterpillars, fruit borers, fruit sucking moths, leafminers, termites, scale insects, thrips, aphids and ants (NICRA 2012). Under Punjab conditions mango mealy bug, mango hoppers, mango scale, stem borer and shoot borer are major insect-pests (Anonymous 2015). Recently, borer insect-pests have emerged as new threat for the mango growers. The present survey was aimed for studying the biodiversity of different borer insect-pests infesting mango plants in Punjab.

MATERIALS AND METHODS

Roving and fixed plot surveys were conducted in mango growing areas of Punjab to record the biodiversity of borer insect-pests during 2013-14 and 2014-15. Fifty plants from each of the orchards were observed randomly to record the presence or absence of borer pests. Fixed plot surveys were also done at Fruit Research Farm and college orchard of Punjab Agricultural University (P.A.U), Ludhiana. Different life stages of borer insect-pests were collected and reared in Fruit Entomology Laboratory in the Department of Fruit Science, PAU, Ludhiana. Specimens of different borer insect-pests were got identified from National Bureau of Agricultural Insect Resources (N.B.A.I.R.), Bangalore and Modern College of Zoology, Pune.

RESULTS AND DISCUSSION

This study reports five borer insect-pests infesting different parts of mango plants under Punjab conditions (Table 1). Mango fruit borer, *Dichocrocis* (*Conogethes*) *punctiferalis* (Guenee) (Lepidoptera: Crambidae), was observed infesting fruits of mango during May to June 2014 and May 2015. It was observed in the districts of Ludhiana, Hoashiarpur and Patiala. Larvae were observed to bore inside the fruit by joining two fruits together. Black frass was also seen near entrance and attacked fruits rot and drop off from the tree prematurely. Approximately one larva per fruit was observed causing 10 per cent damage to the trees (Figure 1). Singh *et al* (2002) observed *C. punctiferalis* boring into unripe mango fruits near stalk end in Uttar Pradesh. It is reported to attack mango fruit during April-June in Tirupati, Andhra Pradesh (Kannan and Rao 2007).

Mango shoot borer, *Chlumetia transversa* (Walker) (Lepidoptera: Noctuidae) was observed causing damage on shoots of mango trees during October to November 2014 in the districts Ludhiana, Hoshiarpur and Patiala. One larva per shoot was observed on an average causing a damage upto 30 per cent. Larvae were observed boring inside the tender shoots. It is reported to cause 43.3 to 57.7 per cent infestation in young grafted plants and 42.3

Table 1. Diversity of borer insect-pests of mango in Punjab

Common name of the pest	Zoological name (Order: Family)	Plant parts infested	District	Activity period	Population
Mango fruit borer	*Dichocrocis* (*Conogethes*) *punctiferalis* (Guenee) (Lepidoptera: Crambidae)	Fruit	Ludhiana, Hoshiarpur and Patiala	May-June	1 larva/fruit
Mango shoot borer	*Chlumetia transversa* (Walker) (Lepidoptera: Noctuidae)	Shoot	Ludhiana, Hoshiarpur and Patiala	October-November	1 larva/shoot
Trunk borer	*Batocera rubus* (L.) & *B. rufomaculata* (Coleoptera: Cerambycidae)	Stem & branches	Ludhiana, Hoshiarpur and Patiala	May, September-October	10 holes/plant
Bark eating caterpillar	*Indarbela* sp. (Lepidoptera: Metarbelidae)	Bark	Ludhiana, Hoshiarpur and Patiala	April-November	13 larvae/plant
Mango tip borer	*Penicillaria jocosatrix* Guenee (Lepidoptera: Noctuidae)	Shoot, leaves and flower stalks	Ludhiana, Hoshiarpur and Patiala	September	2 larvae/tip
Jewel beetle/ adults/trunk buprestid stem borer	*Belionota prasina* (Thunberg) (Coleoptera: Buprestidae)	Dead trunk	Tehsil Samrala, Ludhiana	March-April	20

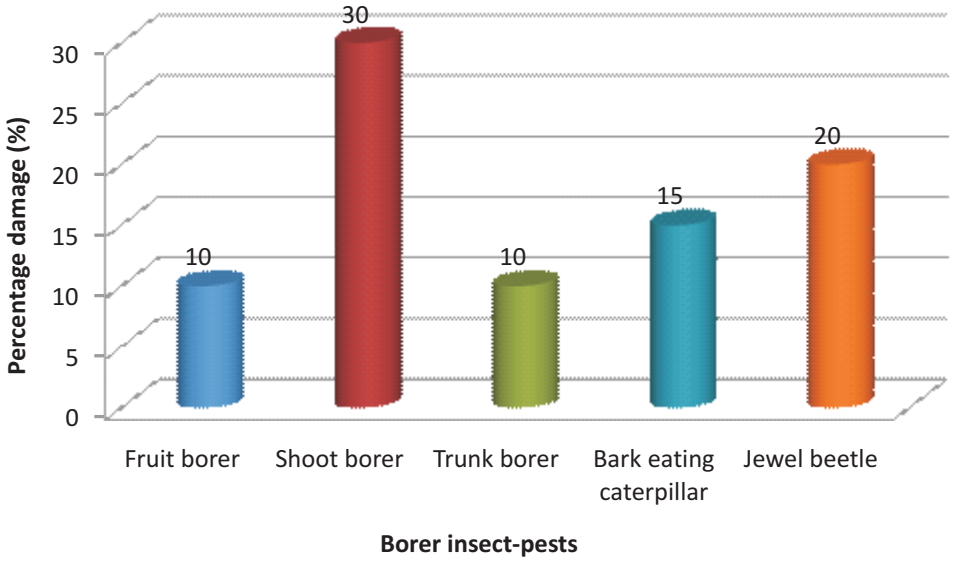

Figure 1. Damage caused by borer insect-pests on mango during 2013-14 and 2014-15

to 50 per cent among different aged plants in Himachal Pradesh (Singh and Thakur 1996). In Bangalore, Karnataka *C. transversa* showed peak percent infestation in September and November during 1996 and 1997, respectively (Verghese and Devi 1998). Bhatia and Sharma (1999) reported *C. transversa* causing average incidence of 66-100 per cent in different cultivars with minimum incidence of 45 per cent in *Totapuri*. *Chlumetia transversa* is reported to attack all the cultivars of mango with maximum infestation on *Amarpali* during the peak activity in September at Hisar, Haryana (Handa 2006). It is also reported to be a major pest of mango in China out of ninety four total insect pests as reported by Chen *et al* (2010).

Two species of mango trunk borer, *Batocera rubus* (Linnaeus) and *B. rufomaculata* De Geer (Coleoptera: Cerambycidae), were found infesting stem and branches of mango plantation during May, September-October 2014 and March 2015. Ludhiana, Hoshiarpur and Patiala districts were observed to have infestation of trunk borer. On an average ten holes per plant were observed along

with a damage of about 10 per cent. Sap was observed exuding from the holes of attacked stems and mass of frass was also observed hanging from the holes. Larvae were found feeding inside the stems on internal tissues. Infested trees demonstrated drying of leaves and branches. The damage was observed more in old and neglected orchards. Kannan and Rao (2006) also reported *B. rufomaculata* to attack predominantly on older trees which were more than 15 years old as compared to younger mango trees.

Bark eating caterpillar, *Indarbela* sp. (Lepidoptera: Metarbelidae), was observed feeding on bark of the mango trees from April to November 2014 and April to May 2015, in the districts of Ludhiana, Hoshiarpur and Patiala. Thirteen larvae per plant were observed along with 15 per cent damage to the trees. The larvae were observed nibbling on the tree trunk and also observed to bore into the same. Excreta of larvae entangled in silken webbing were also observed as a main identifying symptom for the presence of bark eating caterpillar. These larvae were observed mostly in old and neglected orchards. Poorly maintained mango orchards are more prone to attack of bark eating caterpillar with an incidence of 88 to 92 per cent (Gupta *et al* 2014).

Mango jewel beetle, *Belionota prasina* (Thunberg) (Coleoptera: Buprestidae), also known as Buprestid stem borer and metallic wood boring beetle, was observed during March-April 2015 in tehsil Samrala of district Ludhiana. It was mainly found in dead trunks of the mango trees. Twenty adults per trunk were observed along with a number of holes on the trunk of infested plant. Approximately, 20 per cent damage to the mango trees was done by *B. prasina*.

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