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A NOTE ON THE OCCURRENCE OF CERAMBYCID *COPTOPS AEDIFICATOR* (F.) ON MANGO IN PUNJAB

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ABSTRACT

Roving and fixed plot surveys were carried out in the mango orchards in Punjab to record the emerging insect pests. During these, a longhorn beetle *Coptops aedificator* (F.) (Coleoptera: Cerambycidae) was observed for the first time, infesting stems of 20 to 35 years old trees in Hoshiarpur district. Larvae were observed in the stem and below the bark. About 10% trees were found to be infested.

Key words: Cerambycidae, Coleoptera, *Coptops aedificator*, mango, new record, Punjab, damage, infestation, Hoshiarpur

Mango (*Mangifera indica* L.) is being cultivated throughout the tropics and subtropics. In India, it is the most important fruit crop with a productivity of 8.7 mt/ha. India contributes 42.2% of total world production of mango followed by China, which contributes 11.2% (National Mango Database, 2020). Mango cultivation in Punjab covers an area of 6.75 thousand ha with a production of 115.35 thousand mt (Package of Practices of PAU, 2018). However, the mango crop suffers heavy damage due to several insect pests causing yield losses directly or indirectly. About 400 species of insect pests are known in different parts of the world (Tandon and Verghese, 1985; Reddy et al., 2018). About 30 insect pests had been reported from Punjab, and recently, another important borer *Aeolesthes holosericea* (F.) (Coleoptera: Cerambycidae) had been observed (Singh and Sreedevi, 2019). Members of Cerambycidae have assumed increasing prominence as pests of agricultural, forest and shade trees, shrubs and raw wood products and as vectors of tree diseases. There are 1536 Indian species classified under 72 tribes, 440 genera and eight subfamilies (Kariyanna et al., 2017; 2019). All these are either phytophagous or xylophagous and can cause huge damage to live, dead and decaying trees (Duffy, 1953). Larvae of this family typically feed on the phloem tissues and later in the xylem portion and causes economic losses (Monné et al*.,* 2017). Keeping in view the increasing demand of mango fruits in Punjab, surveys were carried out to study the infestation of longhorn beetles in mango.

MATERIALS AND METHODS

Roving and fixed plot surveys were carried out during 2017 and 2018 in the mango growing areas of the sub mountainous zone of Punjab (31°31'38.4780''N, 75°54'49.2228''E) to record the diversity of insect pests. Twenty trees from each of the orchard were observed randomly. Serious damage by longhorn beetle larvae was noticed, where trees showed wilting of the branches. The larvae were collected from the damaged trees and reared in Fruit Entomology Laboratory in the Department of Fruit Science, Punjab Agricultural University, Ludhiana. Adults of longhorn beetle collected during these surveys were sent to ICAR-National Bureau of Agricultural Insect Resources, Bengaluru for identification. The new record observed was identified as *Coptops aedificator* (F.).

RESULTS AND DISCUSSION

During the surveys, *C. aedificator* was observed on mango from District Hoshiarpur, Punjab. Upon scrapping the bark of the affected trees, larvae were observed feeding on stem of 20 to 35 years old trees (Fig. 1a). Fully mature larvae were yellowish white, which became dark brown in male (Fig. 1b) and female (Fig. 1c). The beetles were active during June. Males are smaller (13$\pm$ 0.04 mm) than the females (14.9$\pm$ 0.04 mm) and possess long antennae**.** Oviposition commonly takes place in cracks or crevices of the bark or in and around injured areas. Ovipositing adults often spend

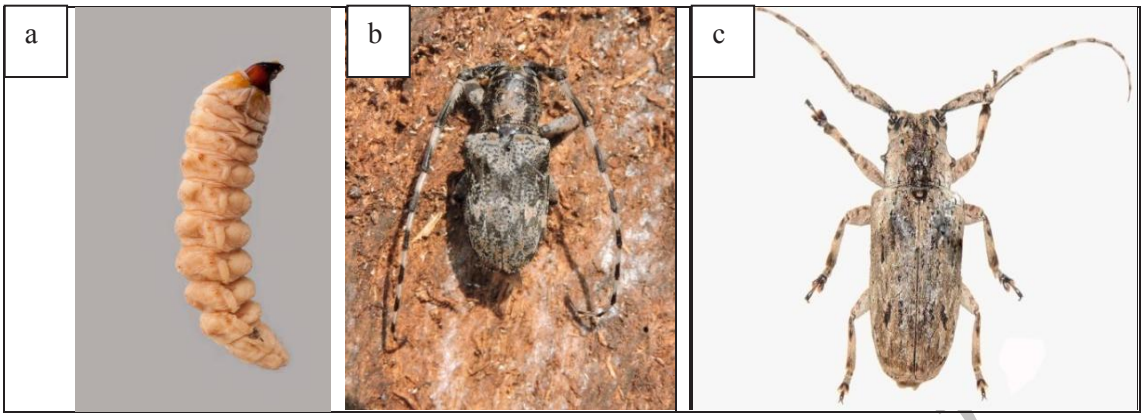

Fig. 1a-c. *C. aedificator* on mango. a, larva; b, male; c, female

a considerable period of time exploring the surface of the wood in an effort to find suitable sites which are inaccessible to predators. The beetle is phototactic. *Coptops aedificator* is a bark borer rather than sapwood borer of dead trees. Larvae of this species feed on the inner bark, and the damage done to the sapwood is only superficial. Also, pupal chambers are constructed almost entirely in the bark (Beeson and Bhatia, 1939). The adult emergence hole is circular, but usually somewhat ragged. The life cycle normally lasts a year.

Host plants: *Acacia arabica*, *Acrocarpus fraxinifolius*, *Aegle marmelos*, *Albizzia lebbek*, *Bauhinia purpurea*, *B. retusa*, *B. vahlii*, *B. variegata*, *Bombax malabaricum*, *Buchanania latifolia*, *Careya arborea*, *Cassia siamea*, *Coffea sp.*, *Dalbergia paniculata*, *Ficus glomerata*, *F. religiosa*, *Ficus* spp., *Garuga pinnata*, *Hevea braziliensis*, *Holoptelea integrifolia*, *Lannea grandis*, *Pongamia glabra*, *Pterocarpus marsupium*, *Shorea robusta*, *Spatholobus roxburghii*, *Terminerlia belerica*, *T. tomentosa* and *Wrightia tinctoria* (Beeson and Bhatia 1939).

Distribution**:** Cameroon, Cape Verde, Central African Republic, China, Comoros, Democratic Republic of Congo, Djibouti, Ethiopia, Fernando Po, Gabon, India, Ivory Coast, Kenya, Liberia, Madagascar, Malawi, Mauritius, Namibia, Natal, Nigeria, Oman, Pakistan, Philippines, Principe Island, Reunion Island (Kariyanna *et al.* 2017), Senegambia, Saudi Arabia, Senegal, Seychelles, Somalia, South Africa, Sri Lanka, Taiwan, Tanzania, Hawaii (USA), W. Uganda, Yemen, Zambia, Zimbabwe (Kariyanna et al*.,* 2019).

India**:** Andaman and Nicobar Islands, Dehradun (Uttrakhand), East Siang and Pasighat (Arunachal Pradesh), Tamil Nadu, Lucknow (Uttar Pradesh), Bengaluru (Karnataka), Tripura, West Bengal, Kolhapur district, northern western Ghats, Maharashtra and recently Andhra Pradesh and Tamil Nadu (Kariyanna et al*.,* 2019).

In the present study, the larvae were observed to damage green and healthy trees, weak trees as well as fallen trees. The damage is mainly done by larvae, which make galleries in branches as well as main trunks. Frass can be observed coming out of the holes. Sometimes, there is oozing of sap from these holes. Kidney shaped holes were observed on the infested tree. The main symptoms of damage of the larvae observed on the affected trees include emergence of frass coming out of live holes on the trunk and branches. Lot of frass was observed on the ground below the infested trees. The most harmful and serious stage of this stem borer is the larvae as it make longitudinal or transverse galleries on the stem or trunk. As a result, vitality of the tree is greatly reduced. Adult beetles were observed to debark the tender twigs, near their point of emergence on the tree trunk. Larvae were observed to feed into the sapwood under the bark on mango trees in Saudi Arabia (Dawah et al*.,* 2013). According to Monné et al*.,* (2017), larvae belonging to Cerambycidae family feed on the phloem and xylem portion and causes huge economic losses.

Diagnosis: Head vertical in front; genal margin directed posteriorly; last maxillary palpi acute at apex. Body ovoid in shape; eyes subdivided; lower lobes relatively smaller and half of the upper lobe. Antennal tubercles hardly elevated, antennae long, as long as the body, fringed with suberect short setae; scape long with prominent scar laterally, making the segment appear obliquely truncate at apex, slightly thickened apically, third and fourth segment appears equal in

length, slightly lesser than scape and longer than fifth segment onwards, antennomeres distally ringed with black 5th antennal segment onwards. Pronotum wider than long, with some indistinct discal tubercles in the centre; each side near apical margin usually with a small dull projection; pronotum without lateral spines; pro- and mesosternum not raised, prosternal process with extremity usually well swollen posteroventrally, almost truncate in lateral view, but sometimes hardly swollen and more or less roundly sloped in lateral view. Elytra without basal crest, apically not costate, marbled with light yellow and white colours without variable colours, but with a broad faint brown oblique band appearing '/ \' near base, apically with submedian short streaks like dark brown markings, warty near base, strongly convex, little below base; fore tibia with medial sinus; mesotibiae notched externally, tarsal claws strongly divergent.

Longhorn beetles are more diverse and economically most important group of insects comprising mainly tree or trunk borers. Of them, *C. aedificator* is one of the widespread borer reported on 36 host plants from India (Beeson and Bhatia, 1939; Kariyanna et al., 2017; 2019). Duffy (1953) reported it from *Artocarpus* sp. while Fraser (1949) recorded this species on *Afzelia*. *Coptops aedificator* had been known as most important longhorn beetles and is a pest of quarantine importance (Wang, 2017). Literature revealed that it is a serious pest of more than 50 subtropical forest trees (Beeson and Bhatia, 1939). Butani and Verma (1981) reported it on drumstick from India. Mukhopadhyay and Biswas (2002) and Agarwala and Bhattacharjee (2012) reported *C. aedificator* from Tripura. Dawah et al. (2013) observed this borer on mangoin Saudi Arabia. This borer has been reported from reserve forests of Dooars, West Bengal (Saha et al., 2013). Reddy et al. (2015) reported *Coptops* sp. as a stem borer of mango from Bengaluru, Karnataka and the infestation was observed during July to October. Bhawane et al. (2015) collected this beetle from forest area of Western Ghats, Maharashtra, India. Kumawat et al. (2015) reported this borer on Pomegranate and mango in Arunachal Pradesh. The occurrence of C. aedificator on mango in Punjab is reported for the first time. Intensive agriculture and large-scale deforestation coupled with global warming has resulted in migration of several trunk boring long-horn beetle species into agroecosystems and becoming serious pests of fruit and plantation crops. Some long-horn species had permanently established outside their distribution ranges. The perusal of literature revealed that *C. aedificator* has not been reported on mango trees so far in Punjab. Thus, *C. aedificator* is emerging pest of mango in Punjab.

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