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Short Communication

First record of *Archips micaceana* (Walker) (Lepidoptera: Tortricidae) on peach, *Prunus persica* (Linnaeus) Batsch in India

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ABSTRACT

Over the last few decades, an expansion in the geographic range along with host range of insect-pests has been observed. In this study, we aimed to report the first record of tortrix, *Archips micaceana* (Walker) (Lepidoptera: Tortricidae) on peach from India. The list of possible host crops and its distribution both worldwide and in India has also been discussed. About 30 per cent fruit infestation was observed in peach variety, Shan-e-Punjab during 2012 to 2024. The critical scrutiny of literature revealed that this is the first report of occurrence of *A. micaceana* on peach in India.

Keywords: *Archips micaceana*, leaf roller, peach, pest species, Tortricidae

INTRODUCTION

Peach, *Prunus persica* (Linnaeus) Batsch is widely grown in Asia and Europe. The total 32 per cent share (4.4 million ton) of world peach production comes from China (Hedrick et al., 1917; Bodh et al., 2019; Chauhan et al., 2022). In India, it is cultivated in tropical and sub-tropical climate of northern plains in states of Punjab, Haryana and the adjacent areas of Western Uttar Pradesh, Uttarakhand and Himachal Pradesh (Devi et al., 2018). In Punjab, it is cultivated over an area of 2623 ha with a total production of about 46979 metric tons and with a productivity of 17910 kg/ha (Anonymous, 2023). The harvesting season of peach range from April to July. It is generally consumed fresh. However, delicious squash and other processed products are also prepared from its varieties, *viz*., Sharbati, Shan-e-Punjab, Saharanpuri, Prabhat and Florida Red, cultivated in the North Indian plains. The major obstructions in peach production in India are insect-pests and diseases. More than 500 species of insects are known to infest peach in India, but only few have attained the pest status. The pests such as peach leaf curl aphid (*Brachycaudus helichrysi* Kaltenbach), peach black aphid (*Pterochlorus persicae* [Cholodkovsky]), chaffer beetles (*Adoretus* sp.), hairy caterpillars (*Euproctis* sp.), fruit flies (*Bactrocera dorsalis* Hendel and *Bactrocera zonata* Saunders) are known to damage peach fruits. Severe attack by fruit flies, *B. dorsalis* and *B. zonata* was reported on peach in Punjab during 2015 (Singh et al., 2015). Singh et al. (2023) has reported incidence of mealy plum aphid, *Hyalopterus pruni* (Geoffroy) on peach from Punjab, India. Introduction of improved varieties, intensive farming operations and irrigation methods lead to unpredictable rise in insect-pests of peach. Also the changing climate over the years has led to expansion in host and geographical range of various insect species. Insects have become capable of damaging new hosts as *Archips micaceana* (Walker), also known as the leaf rolling moth, occur in China in Guangxi Province and are considered an economic pest of longan and lychee. Outside China, *A. micaceana* is known to occur in South Vietnam, Myanmar, northern Thailand and India (Tuck, 1990). A catalogue of Tortricidae Latreille consisting of 487 species belonging to 168 genera has been documented (Pathania et al., 2020). In India, heavy infestation of *A. micaceana* has been reported on grapevine, *Vitis vinifera* L., under field conditions at Mysore (Puttarudriah et al., 1961). *Archips micaceana* had been identified as the cause of shoot and inflorescence damage in Vanilla, *Vanilla lanifolia* Andrews during 2004 and 2005 at Tamil Nadu, India (Vanitha et al., 2011 & 2012). This borer is also reported as serious pest on avocado fruits in field conditions in Hong Kong (Lee & Winney, 1981). Similarly, *A. micaceana* had caused damage in Finger

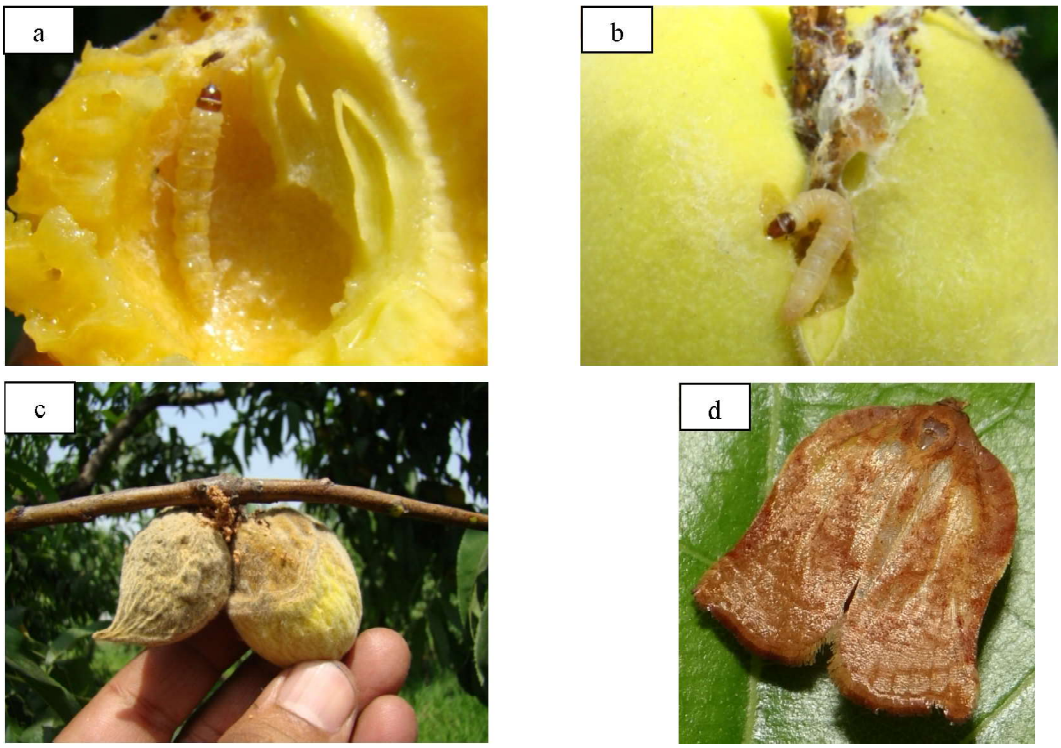

Fig. 1 : *Archips micaceana* (Walker) on peach. a, larva inside fruit; b, damaged fruit webbed along with larva; c, two fruits webbed together; d, adult

millets, *Eleusine coracana* L. during 2018 and 2019 at Karnataka, India (Chikkarugi et al., 2020). Shamrao (2020) reported its incidence on apricot, *Prunus armeniaca* in India.

The study was undertaken by roving surveys throughout the peach growing regions of Punjab from 2012 to 2024 and fixed plot surveys were carried out in the Fruit Research Farm, Punjab Agricultural University, Ludhiana, Punjab, India. For the extensive exploration, twenty peach trees were randomly observed in the field. The peach fruits were found to be infested with a fruit borer. All the infested fruits were collected and kept in the Fruit Entomology Laboratory, Department of Fruit Science of the University in the different rearing jars for rearing of the larvae. The adult specimens were killed with ethyl acetate. Specimens were pinned using different size entomological pins (No. 0, 1) and stretching was done on the spreading board. The specimens were labelled and were sent to taxonomist at Zoological Survey of India, Solan, Himachal Pradesh for identification. The species was identified as *Archips micaceana* (Walker) (Lepidoptera: Tortricidae) as per published literature (Razowski, 1977, 1987, 1993; Kuznetsov, 2001; Pathania et al., 2020). This species is commonly known as leaf roller, polyphagous pest and had been observed on stone fruits from tropical and subtropical regions of Southeast Asian countries. It is a pest of fruit crops. Damaging stage is the larval stage. Moths are generally more abundant during hot and humid seasons. Larvae of *Archips micaceana* (Walker, 1863) were observed infesting peach fruits (Fig. 1) for the first time in India during May 2012.

Genus: Genus *Archips* Hubner, 1822

Type species: *Phalaena piceana* Linnaeus, 1758, *Syst. Nat.* (Edn 10), 1:530 by subsequent designation by Meyrick, 1913, in Wytsman, *Genera Insect.,* 149:23.

Archips Hubner, 1822, *Sys.-alphab.Verz.*:58-66.

The species of the genus *Archips* Hubner have often been described either under the genus *Tortrix* Linnaeus or *Cacoecia* Hubner, the latter beside other names such as *Archiceps* Weiss and Dickerson, *Archippus* Freeman and *Pararchips* Kuznetsov being considered as synonyms of the genus *Archips* by Razowski (1977)a. As such, while revising this genus, Razowski (1977)b has mentioned that it is represented in the Oriental, Palaearctic and Nearctic regions with 25, 46 and 16 species from the respective regions. Larval

hosts of *A. micaceana* reported by previous workers are as follows, *Cordyline fruticosa* (Asparagaceae), *Alangium salviifolium* (Alanggiaceae), *Mangifera indica* (Anacardiaceae), *Annona* spp. (Annonaceae), *Areca catechu* (Arecaceae), *Helianthus annuus* (Asteraceae), *Ricinus* (Euphorbiaceae), *Erythrina* spp. (Fabaceae), *Michelia champaca* (Magnoliaceae) and *Morus alba* (Moraceae) (Fletcher, 1920; Fletcher, 1932; Mathur et al., 1958; Varma, 1984; Gouda et al., 1987; Rajashekhargouda et al., 1992; Kuroko & Lewvanich, 1993; Robinson et al., 2023).

The scientific classification of *Archips micaceana* (Walker 1863) is provided below:

Kingdom: Animalia

Phylum: Arthropoda

Subphylum: Uniramia

Class: Insecta

Order: Lepidoptera

Family: Tortricidae

Genus: *Archips*

Species: *micaceana* (Walker, 1863)

The moth oviposits on the stalks of the bunch and berries. Eggs are laid in batches. It takes 2-3 days for hatching and newly emerged larva is creamy in colour. Head is dark brown. The adults of *A. micaeana* are bell shaped. The adults were having reddish orange forewings with red coloured wavy lines in between. There were grey marking on the inner side of light yellowish coloured hind wings (Fig. 1). About 30 per cent fruits of variety Shan-e-Punjab were observed to be infested by larvae. The fruit damage ranged from 15-31 per cent during 2012-2024 at Fruit Research Farm, Punjab Agricultural University, Ludhiana, Punjab, India (Fig. 2). Infestation was also observed in Faridkot district.

The larvae feed from the surface of the fruits and pulp making tunnels through the fruit and make webs. In case of heavy infestation, the whole fruit from inside was eaten up and damaged while the outer surface had holes of entrance. Fruits get dried, became empty and turn brown. Brownish excreta were observed near the entry hole on the surface of the fruit. Webbing by the borer results in joining of damaged fruits with each other. They also damage grapevines at Bangalore and Mysore (Puttarudriah et al., 1961), indicating *A. micaceana* is capable of persisting in climates suitable for grape production.

Thus, in the present study, we revealed that peach is a new host tree of *A. micaceana* and had not been reported so far in the field conditions from any other country on peaches. This is the first report of the occurrence of *A. micaceana* on peach fruits in the orchard in the months of May and June. The borer is generally widely distributed under field conditions as a serious pest of other fruits in India and other parts of the world. But the changing agricultural practices,

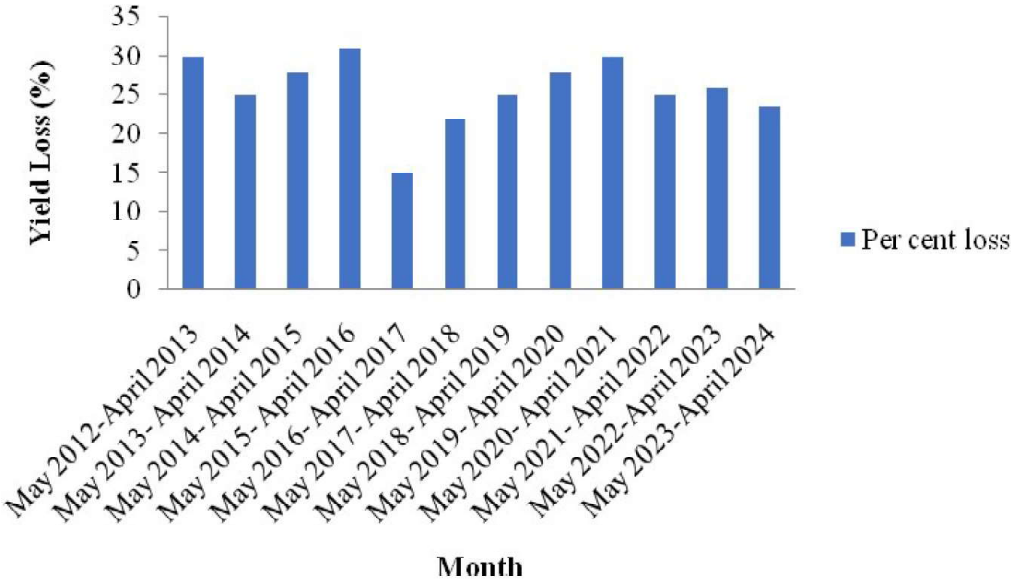

Fig. 2: Per cent losses caused by *A. micaceana* on peach crop at Fruit Research Farm, Punjab Agricultural University, Ludhiana, India from 2012-2024

intensive cultivation and the changing climatic conditions might have resulted in wider host ranges. Further studies on its occurrence and potential damage on other fruit and field crops need to be studied.

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