

## **First Report of the Mango Fruit Borer, *Citripestis eutraphera* (Meyrick) (Lepidoptera: Pyralidae) as a Seedling Borer of Cashew, *Anacardium occidentale* L. (Anacardiaceae)**

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FIRST REPORT OF THE MANGO FRUIT BORER, *CITRIPESTIS EUTRAPHERA* (MEYRICK)  
(LEPIDOPTERA: PYRALIDAE) AS A SEEDLING BORER OF CASHEW,  
*ANACARDIUM OCCIDENTALE* L. (ANACARDIACEAE)

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**ABSTRACT.** The invasive mango fruit borer, *Citripestis eutrapphera* (Meyrick) (Lepidoptera: Pyralidae, Phycitinae), is reported for the first time as a seedling borer of cashew. Infestation on the seedlings probably indicates opportunistic use of vegetative portions as fruits are seasonal and unavailable during most of the year. Infestation was also observed on the fruits of mango and cashew in the State of Kerala for the first time.

**Additional key words:** *Anacardium occidentale*, *Citripestis eutrapphera*, India, pest, seedling borer

The invasive mango fruit borer, *Citripestis eutrapphera* (Meyrick, 1933) (Lepidoptera: Pyralidae, Phycitinae) (Fig. 1), originally described from Java, is a significant pest of the crop in South and South-East Asia and the Northern Territory of Australia (Anderson & Tran-Nguyen, 2012). Meyrick (1930-1936) mentioned that the type specimens were bred from larvae feeding in fruits of *Mangifera*. Kalshoven (1981) provided further information on its life history as a fruit borer of mango, *Mangifera indica* L. in Indonesia. According to him, “the larvae feed mostly on the soft piths of young fruits and also in fruit petioles and in the shoots”. He recorded “kebembem” (?*Mangifera odorata* Griffith) as an additional host plant of the pest. It is also known to bore into the fruits of *M. andamanica* King (Bhumannavar, 1991) and cashew, *Anacardium occidentale* L. (Jacob et al. 2004) in the south Andaman Islands. Anderson and Tran-Nguyen (2012) provided diagnosis and biology of *C. eutrapphera* following its introduction and establishment in Australia. Jayanthi et al. (2014) reported its invasion and spread in mainland India. It is also known to occur in Bangladesh as a minor pest on mango (Ali et al., 2015). Other host plants of *C. eutrapphera* include *Dipterocarpus baudii* Korth., *D. chartaceus* Symington (Dipterocarpaceae), *Mangifera caesia* Jack (Anacardiaceae), and *Parkia javanica* Merr. (Fabaceae) (Robinson et al. 2010).

Larvae of *C. eutrapphera* bores into the shoot and fruit stalk of *M. indica* (Kalshoven, 1981). Infestation on the stem of cashew was hitherto unknown. However, heavy infestation of *C. eutrapphera* was observed on cashew seedlings and grafts at the District Agricultural Farm, Peringamala, Trivandrum, Kerala (N 08°45'37.3" E 077°02'56.8"; 136 m above sea level) in July–August, 2016. About 80% of the grafts kept enclosed in humid chambers for hardening were killed. Infestation was also observed on seedlings (5–8 leaf stage) grown in polybags

and meant to be used as root stock for the production of grafts. Infestation on the fruits of cashew was observed in the succeeding fruiting season in February, 2017.

#### **The infestation, ex situ**

Larvae started infestation by boring into the cotyledons of the seedlings (Fig. 1 c, d). Generally only a single cotyledon was infested. When both cotyledons were infested, they were webbed together. From the cotyledons, they bored into the stem at the point of attachment of the cotyledon with the stem (Fig. 1 c). The larva initially tunneled down towards the root and then moved up inside the stem (Fig. 1 e). The larval tunnels contained fecal matter. Larval tunneling inside a stem resulted in wilting and death of the seedling. In the case of grafts, the larvae were mostly confined to the rootstock. In some cases they bored into the scion from the rootstock, crossing through the graft union. In each cotyledon, one or two larvae were observed. However, only a single larva was observed inside the stem of any one seedling. The bore holes were usually covered with frass and excreta (Fig. 1 f). Pupation occurred in a loose cocoon of silk covered with frass and soil on surface near the base of the plant or rarely inside the larval burrow.

#### **The infestation, in situ**

In the laboratory, when tender leaves were provided, the larvae webbed together and fed on the leaves and reached maturity. At Peringamala, no infestation was observed on the shoots of grown up cashew trees. Cashew started flowering in December, 2016 and 3.3 to 24.3% infestation was observed on developing fruits of cashew during the first fortnight of February, 2017 (Figs 1 g–k). Larvae bored into the apple at the region of attachment with the nut (Figs 1 g, h) or near the fruit stalk (Figs 1 i, j) and made galleries within the apple. They initially scraped externally and produced frass before entering into the apple. The bore holes were covered with excreta and frass. Larvae often bored holes

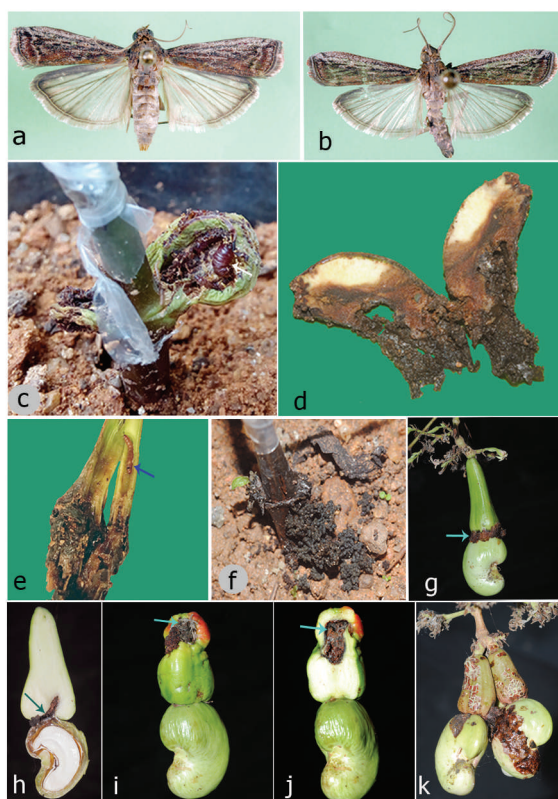


FIG. 1. *Citripestis eutraperha* (Meyrick) (a) female moth, (b) male moth, (c) infested cotyledon, (d) cross section through infested cotyledon, (e) rootstock with larva inside, (f) bore hole at the base of a graft, covered with frass and excreta, seen externally, (g) cashew fruit infested at the point of attachment of apple with the nut, (h) cross section of fruit infested near the point of attachment of apple with the nut, (i) cashew fruit infested near the fruit stalk, (j) cross section of infested fruit with larval entry near fruit stalk, (k) tender nuts scraped by larvae.

and scraped the surface of tender nuts. However, they did not enter into the nut through the hard shell. Moths were collected at light at the College of Agriculture, Vellayani (N 08° 25' 47.5" E 76° 59' 8.3"; 18 m above sea level) during August, 2016. However, no infestation was observed on cashew fruits or seedlings at Vellayani. Widespread infestation was observed on mango fruits in and around Vellayani beginning on the third week of September, 2016.

#### DISCUSSION

The only information on *C. eutraperha* as a pest of cashew was provided by Jacob et al. (2004) who recorded it as a major pest of the crop that bores into the apple during March–May in the Andaman and Nicobar Islands. Further information on the nature of damage and symptoms of infestation on cashew are provided here.

All the known host plants of *C. eutraperha* are trees that put forth flowers during a narrow temporal window in a year, so that the susceptible stage of the fruit is not available for survival during most of the year. Observation of *C. eutraperha* as a stem borer of seedlings probably shows the opportunistic use of vegetative parts as the fruits are seasonal and unavailable during most of the year. It is also noteworthy that the larva that initially bores into the cotyledon still retains a semblance of its fruit boring nature. Laval feeding and survival on the tender leaves in the laboratory indicates possible infestation of *C. eutraperha* on the leaves too. Thus *C. eutraperha* is potentially a serious invasive pest of mango and cashew capable of damaging radicle, fruits, stem and leaves. Removal of the cotyledon, though it may affect the vigor of the seedlings, would save the seedlings and grafts from infestation. This is the first report of *C. eutraperha* as a seedling borer of cashew as well as its occurrence in Kerala State.

Voucher specimens of *C. eutraperha* are deposited in the ICAR-National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bangalore and the Natural History Museum, London.

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