International Journal of Entomology Research
www.entomologyjournals.com
ISSN: 2455-4758
Received: 13-07-2024, Accepted: 12-08-2024, Published: 27-08-2024
Volume 9, Issue 8, 2024, Page No. 172-174

Exploring the effect of fruit piercing moths (*Genus eudocima*) on different horticultural crops from Aurangabad district (M.S) India

Kukkadgaonkar AP[1], Lakhe AD[1], Lakhe SK[2]
[1] Department of Zoology, Arts, Commerce and Science College, Kille Dharur, Beed, Maharashtra, India
[2] Matsyodari Arts, Commerce and Science College, Tirthpuri, Jalna, Maharashtra, India

Abstract
Eudocima is a major fruit crop pest which causes severe damage to various cash and horticultural crops. They are the major fruit piercers, with secondary fruit feeders causing significant harm to both commercial and horticulture crops. A field survey was conducted to study the effect of fruit piercing moths on different horticultural crops during May 2022 to April 2024 from Aurangabad, Maharashtra. The main objective of this study was to provide a brief overview of damaging effects of fruit piercing moths (*Eudocima*).

Keywords: *Eudocima*, fruit piercing, damage, horticultural crops

Introduction

The Noctuidae, also called owlet moths, are an influential family of moths that comprise about 35,000 recognized species in over 4,200 genera, out of a possible 100,000 total. Currently, 48 species belonging to the genus Eudocima (Zilli & Hogenes 2002, Zilli *et al*., 2017) [13, 14] are primarily found in tropical regions of the planet, with occasional expansion into temperate zones. Fruit-piercing moths (Eudocima spp. [= Othreis spp.], Noctuidae: Catocalinae) are a major pest of ripening fruit in subtropical and tropical regions such as Africa, Southeast Asia, and western Pacific countries (Waterhouse and Norris 1987). According to Pedigo and Rice (2009) [9], the term 'pest' refers to destructive or disruptive actions. As a result, pest status in agricultural settings encompasses both crop sensitivity and destructive insect activities that affect crop productivity. Insect behaviours that result in economic damage to food crops can be categorized into injury guilds (Root, 1967) [10], which group comparable types of destructive activity. These guilds can be used to categorize insect pests based on the responses they generate in their crop hosts, making them more useful when studying community structure. The moth, unlike most other moth and butterfly pests, is difficult to eliminate because the immature stages live only on twining vines of the Menispermaceae family in scrub and forest environments, frequently far from orchards (Denton *et al*., 1991) [3].

Fruit-piercing moths are a major pest of various crops, including citrus, pomegranate, guava, mango, papaya, grapes, and tomatoes (Sundarababu and David, 1973; Leong and Kueh, 2011) [12, 7]. Adult fruit-piercing moths have a long, thick proboscis that is suited to enter the skin of hard, undamaged fruit, permitting the moths to nourish on the juice and pulp inside. A large area underneath the skin gets bruised and frequently becomes honey-combed. Fruit-rotting germs quickly penetrate the wound, causing fermentation and decomposition. Secondary microorganism invasions grow into harmed tissues, creating spoiled and untimely fruit drops (Sands *et al*., 1993) [11]. The problem of fruit piercing moth may become a serious concern with the main cash crops in Maharashtra and Marathwada. The present article focuses on the damaging effects of fruit piercing moths (*Genus eudocima*) on different horticultural crops from Aurangabad district.

Material and Methods

This investigation was carried out in the Aurangabad district of Maharashtra, which is located at 19.88º N 75.32º E. Adult moth samples were collected in various agricultural and horticultural regions in the Aurangabad district between May 2022 and April 2024. Handpicking, sweeping nets, and light traps were used for collection. These moths were destroyed using ethyl acetate. Photography of collected specimens and damaged plant parts was done. To preserve the collected specimens, they were dried, pinned, and placed in wooden boxes. Each specimen was labelled with information on the host plants, locality, and date. Each species obtained specimens were carefully examined for all details using a stereoscopic microscope. The obtained specimens were recognized up to the species level using standard literature and keys such as Hargreaves (1936) [4], Bhumannvar, and Viraktamath (2001) [2], Lees and Zilli (2019) [6].

Photo Plate 1: Material & Methods

Result and Discussion

A field study was conducted to observe the damaging effects of fruit piercing moths on different horticultural crops during May 2022 to April 2024 from Aurangabad district. During this study, damaging effects of fruit piercing moths was observed.

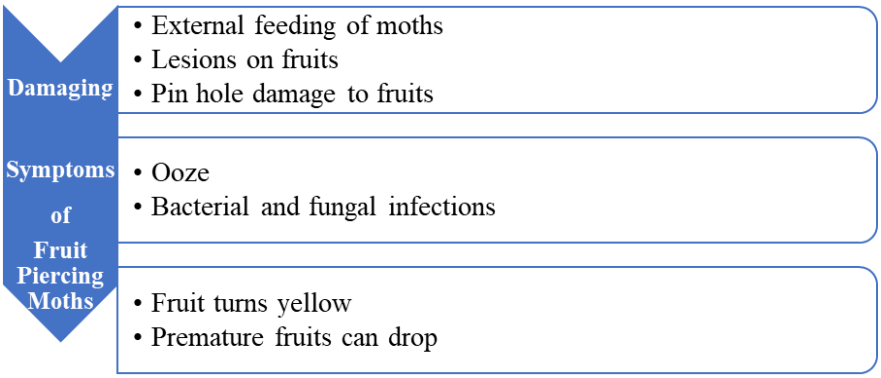

Fig 1

Adult moths pierce the fruits to consume the liquid and cause characteristic pin-hole damage. Bacterial and fungal infections occur at the site of attack. The fruit turns yellow, falls off the tree, and appears to be an early harvest. In severe circumstances, all the fruits are lost.

Photo Plate 2: Damaging effect of fruit piercing moths (*Genus Eudocima*)

Table 1: Damaging effects of fruit piercing crops (*Genus eudocima*) on different horticultural crops from Aurangabad district.

Name of the Species	Host Plants	Damage Symptoms
Eudocima materna	Banana, Citrus, Mango, Pomegranate, Tomato & *Tinosporia cordifolia* (Gulvel)	▪ Penetration and sucking of juice. ▪ Skin of the fruit gets bruised, rotting germs cause decomposition.
Eudocima phalonia	Pomegranate, Citrus, *Tinosporia cordifolia* (Gulvel), Tomato.	▪ Internal feeding ▪ Damaged parts become spongy & show lesions. ▪ Fruits may show premature drop.
Eudocima homaena	Pomegranate, Citrus, *Tinosporia cordifolia* (Gulvel), Gauva.	▪ Skin of the fruit gets bruised, rotting germs cause decomposition and premature fruits can drop.

Many researchers have conducted studies on damaging effects of fruit-piercing moths on various horticultural crops. The degree and type of damage that caterpillars inflict on pomegranates has been studied by Bhumannavar and Viraktamath (2001) [2]. They concluded the genus Eudocima, are regarded as among the hazardous agricultural pests in the world. Balikai *et al*., (2011) [1] reported that *E. fullonia*, *E. materna*, and *E. homaena* were the major fruit-piercing moths on the pomegranate from Karnataka. Fruit-piercing moths can penetrate fruit either directly or indirectly. Gurule and Nikam (2011) observed the occurrence of three species of fruit- piercing moths (*E. phalonia*, *E. homaena*, and *E. materna*) in North Maharashtra from Nasik, Dhule, Jalgaon, and Nandurbar districts. Primary fruit piercers are a nuisance in orchards, causing direct harm to fruit (Klem and Zaspel, 2019) [5]. Over 100 horticultural crops have significant damage from this insect, which also reduces crop production (Leroy *et al*., 2021) [8]. These moths can have an impact on the total output and seriously harm a variety of horticulture crops. To combat the severe infestations of these pests, further research on efficient management measures is needed, with an emphasis on environmentally benign techniques.

Conclusion

The main purpose of this article is to study the damaging effects of fruit-piercing moths. Several entomologists have noted that these pests have become heavily infested the various crop fields. Fruit-piercing moths can have a detrimental effect on overall productivity and cause significant damage to several horticulture crops. There is still much to learn about the damaging effects of these moths as the present work has only focused on the horticultural crops of Aurangabad district. More research on effective management strategies is required to tackle the severe infestations of these pests.

References

1. Balikai RA, Kotikal YK, Prasanna PM. Status of pomegranate pests and their management strategies in India. Acta Hortic,2011:890:569-83.
2. Bhumannavar BS, Viraktamath CA. Larval host specificity, adult feeding and oviposition preference of the fruit piercing moth, Othreis homaena Hübner (Lepidoptera: Noctuidae) on different Menispermaceae host plants. J Entomol Res,2001:25(3):165-81.
3. Denton GRW, Muniappan R, Marutani M, McConnell J, Lali TS. Biology and natural enemies of the fruit-piercing moth Othreis fullonia (Lepidoptera: Noctuidae) from Guam. Res Ext Ser-College Trop Agric Hum Resour, Univ Hawaii, Coop Ext Serv, 1991.
4. Hargreaves E. Fruit-piercing lepidoptera in Sierra Leone. Bull Entomol Res,1936:27(4):589-605.
5. Klem CC, Zaspel J. Pest injury guilds, Lepidoptera, and placing fruit-piercing moths in context: A review. Ann Entomol Soc Am,2019:112(5):421-32.
6. Lees D, Zilli A. Moths: Their biology, diversity and evolution. London: Natural History Museum, 2019.
7. Leong SCT, Kueh RJH. Seasonal abundance and suppression of fruit-piercing moth Eudocima phalonia (L.) in a citrus orchard in Sarawak. Sci World J,2011:11(1):2330-8.
8. Leroy L, Mille C, Fogliani B. The common fruit-piercing moth in the Pacific Region: a survey of the current state of a significant worldwide economic pest, Eudocima phalonia (Lepidoptera: Erebidae), with a focus on New Caledonia. Insects,2021:12(2):117.
9. Pedigo LP, Rice ME. Entomology and Pest Management. 6th ed. Upper Saddle River, NJ: Pearson Prentice Hall, 2009.
10. Root RB. The niche exploitation pattern of the blue-gray gnatcatcher. Ecol Monogr,1967:37(4):317-50.
11. Sands DPA, Liebregts WJMM, Broe RJ. Biological control of the fruit piercing moth, Othreis fullonia (Clerk) (Lepidoptera: Noctuidae) in the Pacific. Micronesica,1993:4:25-31.
12. Sundarababu PC, David BV. South Indian Hort,1973:21(4):134-6.
13. Zilli A, Hogenes W. An annotated list of the fruit piercing moth genus Eudocima Billberg, 1820 (sensu Poole) with descriptions of four new species (Lepidoptera: Noctuidae, Catocalinae). Quadrifina,2002:5:153-207.
14. Zilli A, Brou VA, Klem C, Zaspel J. The Eudocima Billberg, 1820 of the Australian Region (Lepidoptera: Erebidae: Calpinae). In: Telnov D, Barclay MVL, Pauwels OSG, editors. Biodiversity, Biogeography and Nature Conservation in Wallacea and New Guinea, 2017, 631-55.