



## **Cardamom Shoot and Capsule Borer**



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## Introduction

The shoot and capsule borer, *Conogethes sahyadriensis* Shashank, Kammar, Mally & Chakravarthy (Previously known as *C. punctiferalis* Guenée) (Lepidoptera: Crambidae) is a serious pest of cardamom and a wide range of host plants. In cardamom (*Elettaria cardamomum*), it is considered a major pest due to the significant damage it causes to both vegetative and reproductive parts of the plant. Its infestation weakens plant vigor and leads to substantial yield loss. The pest attacks both nursery and main field plants, boring into shoots, panicles, and capsules. Incidence levels of *C. sahyadriensis* on cardamom vary by region and plant part. Shoot and capsule infestation range up to 15%, with yield losses reaching as high as 70–80% in severely affected plantations.

## Host Range

Cardamom shoot borer has been observed feeding on other Zingiberaceous species, including *Curcuma neilgherrensis* in field conditions, and on *Hedychium* spp., *Alpinia* spp., *Amomum* spp., And *Amomum subulatum* under laboratory conditions in India.

## Nature and Symptoms of Damage

The larvae of the cardamom shoot and capsule borer cause significant damage by boring into various parts of the plant, including shoots, panicles, and capsules. Infestation begins in the early larval stages, with larvae tunnelling in to unopened leaf buds, immature panicles, and

developing capsules. As they mature, the larvae bore deeper into the pseudostems and feed on the central shoot, leading to the drying of the terminal leaf and the appearance of the characteristic “dead heart” symptom. The affected panicles dry off, from the portion beyond the entry hole. Larval feeding inside capsules destroys the seeds, resulting in empty capsules. A key visual indicator of infestation is the presence of frass (insect excreta) protruding from boreholes on pseudostems, capsules, and other affected parts. The combination of bored holes, extrusion of frass from the bore holes, and dried central shoots clearly indicates the presence of the shoot borer.

## Identification

The adult moths of the cardamom shoot and capsule borer are medium-sized, with a wingspan ranging from 24 to 29 mm. They have pale straw yellow to orange-yellow wings adorned with small black spots. Males can be distinguished by the presence of a black anal tuft. Eggs are laid singly or in small clusters and initially appear creamy white, gradually turning pink as they near hatching. The larvae emerge pale white with black heads and later develop a uniform pale pink coloration as they mature. There are five larval instars; fully grown larvae are light greenish-brown or pale pink with sparse hairs and measure about 30–35 mm in length.



Shoot borer adult



Infested shoot with frass

The pupae are pale at first, gradually darkening to deep brown as they mature.

## Biology

The biology of *C. sahyadriensis* has been studied in various locations. The life cycle of the cardamom shoot and capsule borer varies depending on environmental conditions but generally follows a consistent developmental pattern. The egg stage typically lasts between 3 to 8 days. Larval development, which causes the most significant damage to the plant, can range widely from 10 to 62 days. The prepupal stage, lasts approximately 2 to 7 days. The pupal period generally spans from 8 to 27 days. These durations reflect the influence of temperature and other environmental factors, with longer development times often occurring under cooler conditions.

## Seasonal abundance

The pest is prevalent throughout the year but higher incidence is noticed during the months of January–February, May–June, and September–October. The peak infestation periods of shoot borer vary by location, occurring during January–February, May, and September–October in Idukki; January, March, June, August, and October in Thadiyankudisai; and September–October in Mudigere.



Shoot borer



Pupa



Larva feeds on Capsule

## Management of cardamom shoot borer

- Remove and destroy infested tillers during September–October when infestation is below 10%.
- Regularly monitor and destroy adult insects, which are commonly found on the underside of leaves, to reduce the pest population.
- Malabar type cultivar is considered to be comparatively tolerant to shoot and capsule borer among the three cultivars of cardamom. Among them, var. PV-1 was reported tolerant probably due to the smaller girth of pseudostem.
- Natural enemies are found to play a significant role in reducing shoot borer population. Parasitism of shoot borer larvae and pupae varied across locations, with Idukki (Kerala) recording 1.0–18% parasitism by *Agrypon* sp., *Friona* sp., and *Apanteles taragamae*. At Appangala (Karnataka), *Xanthopimpla australis* caused 10.5–11.1% parasitism, while the highest rates were observed in Mudigere (Karnataka), where *Agrypon* sp. and *Temelucha* sp. caused 53.8–100% parasitism.
- Target insecticide sprays at the early larval stages (first and second instar), as late-stage larvae residing inside shoots are less susceptible to chemical treatments.
- Avoid spraying insecticides during peak honey

bee activity, as this can negatively impact pollinators.

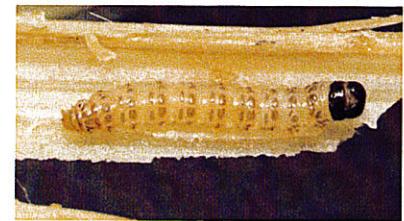
- The following insecticides are approved by the Central Insecticides Board and Registration Committee (CIBRC, 2024) for the control of cardamom shoot borer. Diafenthuron 50% WP can be applied at a dosage of 800g in 1000 litres of water for the effective management of cardamom shoot borer. A waiting period of 7 days must be followed, and capsules should only be harvested after this period. Similarly, Lambda-cyhalothrin 4.9% CS is recommended for the control of shoot borer at a dosage of 400 ml in 1000 litres of water. A waiting period of 34 days is recommended from the date of Application.
- Alternatively, application of newer generation insecticides like Chlorantraniliprole 18.5 SC and Spinosad 45 SC at 0.5 ml per litre during December–January, February–March, April–May, and September–October was also found to be effective.

### Further details contact

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