



OUTBREAK OF DEFOLIATOR *COCONYMPHA IRIARCHA* MEYRICK ON COCONUT

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ABSTRACT

A sporadic outbreak of the rare lepidopteran insect pest *Coconympha iriarcha* Meyrick (Gelechiidae: Lepidoptera) was recorded on the coconut palm (*Cocos nucifera* L.) (Arecales: Areaceae). The larvae of these can be differentiated from the larvae of *Opisina arenosella*, the black headed caterpillar, by its size and colour. The former is with yellowish cream body with a pale brown head and is small (< 4 mm); latter is with a greenish body with red dorsal lines and a black head, and >11 mm long. In this study, reoccurrence of *C. iriarcha* is documented and it is redescribed with illustrations and damage symptoms.

Key words: Coconut, *Coconympha iriarcha*, *Opisina arenosella*, damage, defoliator, reoccurrence, redescription, illustrations, larva, differences

Coconut (*Cocos nucifera* L.) (Arecales: Areaceae) is susceptible to >830 insect and mite species, 173 fungi, and 78 nematode species (CPCRI, 1979; Josephraj Kumar et al., 2018). Of these, red palm weevil (*Rhynchophorus ferrugineus* Olivier), rhinoceros beetle (*Oryctes rhinoceros* L.), and coconut black-headed caterpillar (*Opisina arenosella* Walker) are the most important. Nevertheless, owing of their small size, lack of regularity in occurrence, and limited damage, certain minor pests go unnoticed. *Coconympha iriarcha* Meyrick (Lepidoptera: Gelechiidae) is one of the palm defoliators which was reported way back in 1928 on coconut fronds from Kozhikode, Kerala, India with specimens deposited in the Natural History Museum (NHM), London. However, it was described only in 1931 with erection of the genus *Coconympha*. Later, its incidence as a minor pest was reported on coconut from Malabar Coast (Lepesme, 1947), Kayamkulam (ICAR- CPCRI, 1956-57), *Calamus manan* Miq. from Malaysia (Steiner, 2001), rattan palm from Southeast Asia (Dransfield, 1979). During regular survey on monitoring of insect pests on coconut palms, incidence of *C. iriarcha* Meyrick (Lepidoptera: Gelechiidae) was observed in association with black headed caterpillar (BHC) *Opisina arenosella* in the coconut gardens (8- 10 years old) in the research farm at ICAR-Central Plantation Crops Research Institute (CPCRI), Kasaragod, Kerala (12°30'N, 75°00'E) during February 2020. The details of its incidence, nature of damage on coconut along with taxonomic redescription are provided herein.

MATERIALS AND METHODS

Coconympha iriarcha larvae collected from the infested coconut palm at the research farm were brought to the Entomology laboratory, CPCRI, Kasaragod. Larvae were placed in plastic containers and coconut leaflets were provided as food on daily basis until adult emergence. Biology was studied in the laboratory conditions at 26± 2°C, 65± 5%RH. Developmental stages were observed under Nikon SMZ 800 N stereozoom microscope and images were captured. The emerged adults were collected, processed and identified using Clarke (1963) and the voucher specimens were deposited in the National Pusa Collection (NPC), Indian Agricultural Research Institute (IARI), New Delhi.

RESULTS AND DISCUSSION

The first negligible instance of *C. iriarcha* was found at the ICAR - CPCRI research farm in the nursery seedlings in the second fortnight of August 2019; later in February 2020, it was noticed in the dwarf coconut gardens (8- 10 years old) in association with *Opisina arenosella*. During February 2020, with high temperature coupled with the relative humidity, localized pest outbreak was observed. The damage symptoms include dried patches on the upper epidermis of the leaves and presence of larva and pupal stages in silken galleries made up of excreta and copious frass materials on the adaxial surface of leaflets (Fig. 1); thus symptoms are quite similar to that of *O. arenosella*, with



Fig. 1-4. *Coconympha iriarcha*; 1, 2. early larval instars; 3. Late larval instar covered with silken galleries; 4. Pupa

which symptom is initially noticed in only the older leaves. Feeding by scrapping off the under surfaces of the leaflets and later necrosis are observed as the primary mode of damage. During the outbreak all the developmental stages were observed, with large number of larvae, pupae and adults seen inside the silken galleries on the infested leaves. Nearly 38% of the coconut palms had the infestation in the affected garden (0.6 ha) and on an average, 9.06 ± 3.42 larva/ leaflet was noticed. Freshly emerged instar was yellowish (0.4- 0.6 ± 0.3 mm long), which turned greenish in the third and fourth instar (2.4- 3.8 ± 0.6 mm). Grown up larvae had two rows of prominent red patches running dorsally and with radiating spines on the lateral sides (Fig. 1-3). Pupa is obiect with chestnut to dark brown (2.6 ± 0.4 mm) (Fig. 4). Adult moth was small, grey coloured with a silvery median transverse, dorsal line. Duration from first instar to adult emergence took around $11- 17 \pm 2.02$ days.

Adult head with ocelli absent, having silvery yellowish rough scales on vertex and frons; labial palpus long, three segmented, porrect; basal segment small covered with whitish yellow, second segment narrow anteriorly and wider posteriorly, third segment long,

curved, clothed with pale brown scales interspersed with black and silvery scales. Antennae long, filiform furnished with darkish brown scales. Thorax silvery brownish interspersed with yellowish scale. Unmodified three pairs of legs clothed with dark greyish scales. Hind femur with a pair of tibial spurs covered with dark gray scales. Wingspan 10-11 mm (n=5) in female and 8- 9 mm (n= 6) in male, half of the forewing olive-green interspersed with small grey scales with a metallic blue patch extending along the basal third of the costa, median transverse line silvery-white, followed by a metallic blue streak, area beyond this black with a coppery-purple-metallic fascia just before the termen, silvery white scales all along the apical margin; hindwings are dark fuscous with the basal half rather lighter. Abdomen with its first three segments clothed with metallic bluish interspersed with olive green colored scales, remaining abdomen with metallic bluish grey scales and anal tuft metallic blue scales (Fig. 5-7).

Male genitalia with uncus short; tegumen distinctly broadened at middle, tapering terminally and rounded apically. Socius small with 5- 6 needle like spines. Gnathos reduced. Valva oblong, hairy, terminally bifurcated. Sacculus sclerotized basely and membranous

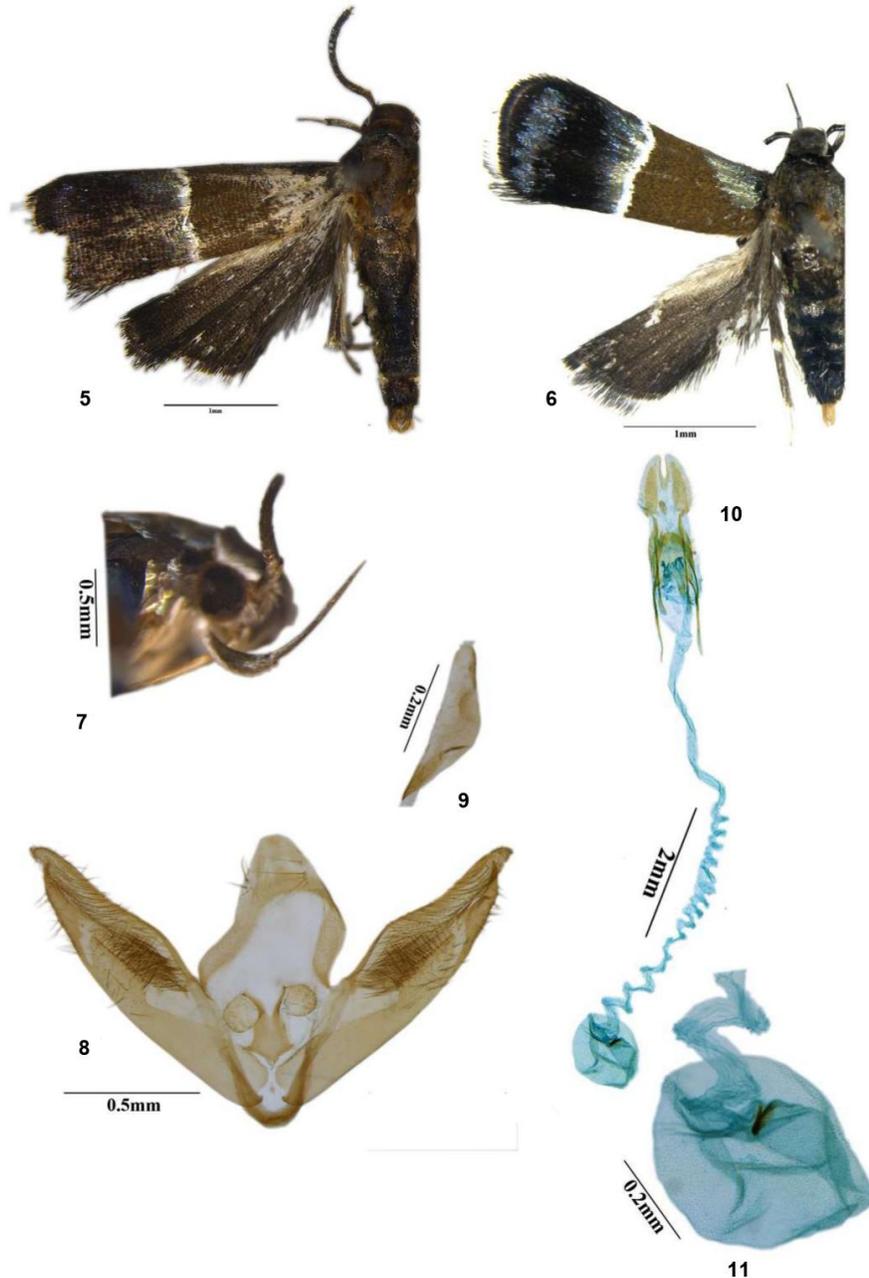


Fig. 5-11. *Coconympha iriarcha* Male, female, genitalia: 5. Male; 6. Female; 7. Labial palp; 8. Male genitalia; 9. Aedeagus; 10. Female genitalia; 11. Corpus bursae

towards anterior. Juxta well developed and distinct. Vinculum well sclerotized. Aedeagus short, broad at middle, rounded apically (Fig. 8, 9). Female genitalia with papilla analis medium sized, lightly setosed with micro setae. Posterior apophyses longer than anterior apophyses. Corpus bursae small to medium, spherical, dilated, signum present and elongated. Ductus bursae very long, basal half spiraled and 6x times the width of corpus bursae (Fig. 10, 11).

Although its damage to coconut fronds had been reported long ago in 1928 from Malabar Coast, Kerala, and reported as minor pest from Kayamkulam during 1956-57, information about its damage symptoms, existence and description are very scarce. In fact, it is among the least studied species that affect coconuts. It was observed that the larvae were able to infest 38% of the palms in an acre of coconut garden, indicating its ability to cause significant damage if not managed.

Profuse feeding on the coconut fronds by scrapping the green matter and inhabiting inside the silken galleries with frass material are the characteristic symptoms of *C. iriarcha* infestation which corroborates with the findings of Binoy et al. (2021) and Steiner (2001). Binoy et al., (2021) observed *C. iriarcha* infestation from Kozhikode, Kerala along with parasitic wasps viz., *Pediobius coconymphagus* Binoy and Sureshan, and *Goniozus coconymphagus* Santhosh, from its pupae and larvae. The occurrence of *C. iriarcha* incidence on coconut got overlooked because of its cooccurrence with a dominant defoliator, *O. arenosella* in the past years. However, detailed studies on its distribution pattern, biology and management strategies are required.

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