

Short Communication

Outbreak of *Glyphodes caesalis* (Lepidoptera, Pyraloidea, Crambidae, Spilomelinae) on exotic varieties of jackfruit (*Artocarpus heterophyllus*) and a note on records of its occurrence in Kerala

Sangamesh R. Hiremath^{1,2}, T. Santhoshkumar² and K.D. Prathapan^{2*}

¹Department of Agriculture, Karunya Institute of Technology and Sciences, Coimbatore 641 114, Tamil Nadu, India

²College of Agriculture, Kerala Agricultural University, Thiruvananthapuram 695 522, Kerala, India

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Abstract

Outbreak of the jackfruit borer *Glyphodes caesalis* is reported in commercial plantations of Tekam Yellow (J 33) and Vietnam Super Early varieties in Kerala in January 2021 and March 2022 respectively. Fruit damage of 24.6 per cent on Tekam Yellow and 6.64 per cent on Vietnam Super Early were observed. *Archemis* sp. (Crambidae, Spilomelinae, Trichaeini) was observed infesting jack fruit along with *G. caesalis*. Records of occurrence of *G. caesalis* in Kerala are reviewed.

Keywords: *Archemis* sp., India, Pest.

The jackfruit (*Artocarpus heterophyllus* Lam.) is a neglected crop as it grows well naturally and yields profusely. Seasonal availability of the fruit in plenty in areas such as Kerala, where the conditions are ideal for its growth, makes it a 'low value fruit', despite being a staple with potential for value addition through processing. Very little research has gone into its scientific cultivation and genetic improvement, except for the propagation of select clones through grafting. As the commercial cultivation of jackfruit is yet to gain momentum, the lion's share of the produce is from non-descript trees developing from seedlings. However, the potential of jackfruit as a commercial crop is being realized by innovative farmers, who experiment with exotic commercial varieties.

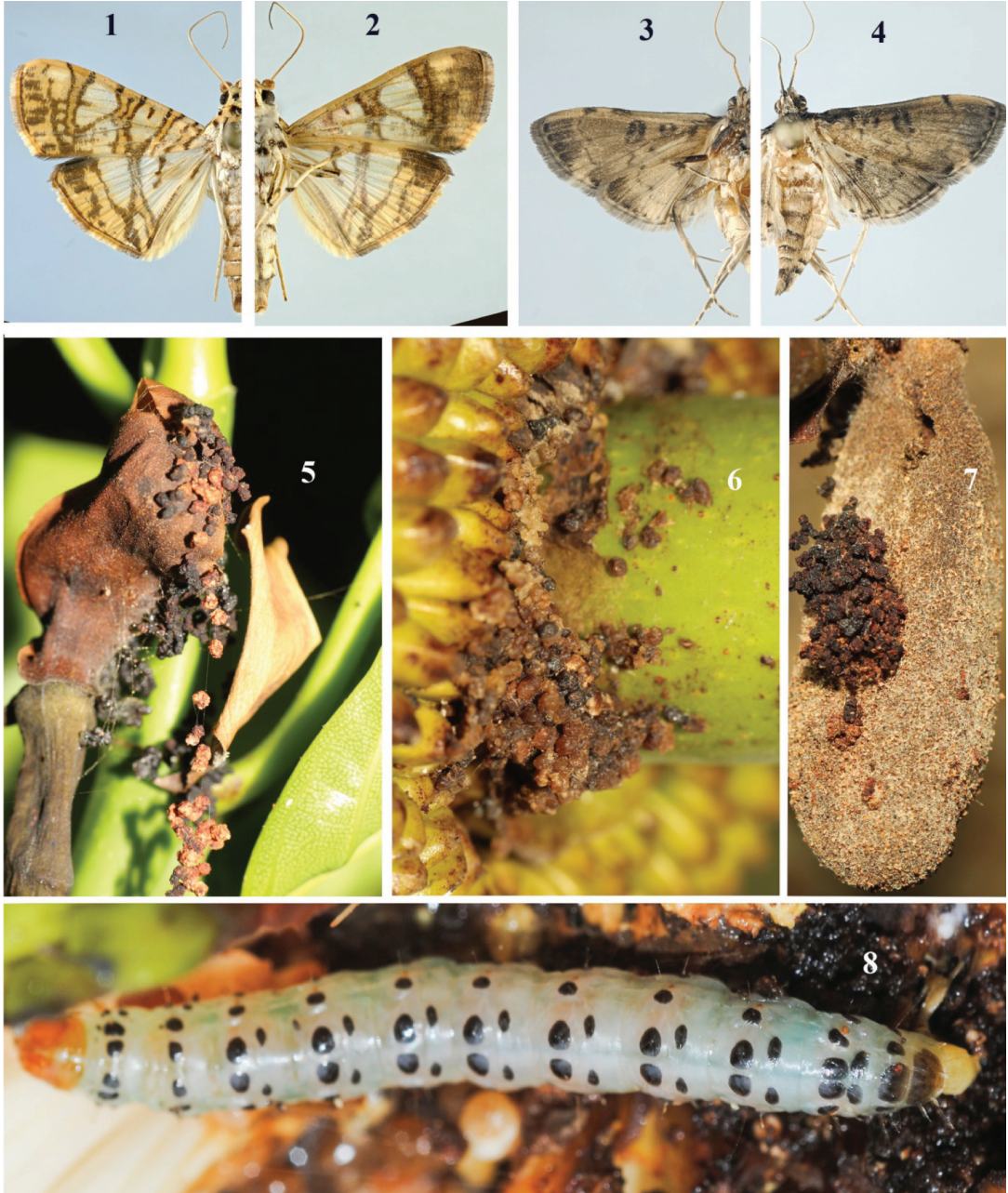
The jack shoot and fruit borer *Glyphodes caesalis* Walker, 1859 (Figs. 1, 2, 8) (Lepidoptera, Pyraloidea, Crambidae, Spilomelinae) (synonyms: *Glyphodes analagoalis* Rothschild, 1915; *Glyphodes assimilis* Rothschild, 1915; *Diaphania*

caesalis (Walker); *Margaronia caesalis* (Walker)) that damages fruits of all stages, is the most important pest of the crop (Soumya et al., 2019, 2020). It is known to occur in Asia (China, Taiwan, Fiji, Hong Kong, India, Indonesia, Malaysia, Papua New Guinea, Sri Lanka, Thailand, Timor-Leste) and Australia (GBIF, 2021). *Glyphodes caesalis* was described by Walker in 1859 based on specimens in the British Museum of Natural History, collected by R. Templeton in 'Ceylon' and Archdeacon Clerk in 'Hindustan'. The host plant of the species was first recorded by Fletcher (1914) from south Kanara and Godavari. He briefly described the larva and pupa and indicated the pupal period, besides accurately describing the nature of the attack: "A minor pest, the caterpillar boring into flower buds and young fruits". Soumya et al. (2015) reported its occurrence in Kerala (as *Diaphania caesalis*), in all districts north of Trichur in 2014. In August 2015, an outbreak was recorded by Soumya et al. (2015) in Kasaragod and Palakkad districts, the levels of infestation being 30 - 40 per cent and 20 -30 per

*Author for Correspondences: Phone: 9446053297, Email: prathapan.kd@kau.in

cent, respectively. However, they did not specify whether the level of infestation was recorded based on fruit or shoot damage or both. They stated that the outbreak “indicates invasiveness of *D. caesalis* to Kerala from the neighbouring states”. Further,

the authors claimed that “This is the first report of *D. caesalis* from Kerala, which is a major pest of jackfruit in other states like Tamil Nadu and Karnataka.” However, the occurrence of the pest was recorded in Kerala even before independence



Figures: 1 – 7. 1. *Glyphodes caesalis*, dorsal view; 2. *G. caesalis*, ventral view; 3. *Archemis* sp., ventral view; 4. *Archemis* sp., dorsal view; 5. *Glyphodes caesalis* infestation on tender stem; 6. Infestation on region of attachment of peduncle with fruit; 7. Infested male inflorescence; 8. *Glyphodes caesalis* larva.

and formation of the state. T. V. Ramakrishna Ayyar reported the pest in Kerala in 1923: "At the time when buds and fruits begin to form, a shoot-boring caterpillar (*Glyphodes caesalis*) and a fruit-borer weevil are seen to do some damage in parts of Malabar, Mysore, and Godavari" (Ayyar, 1923). Soumya et al. (2015) further overlooked the classical textbooks on crop pests by Ayyar (1940) and Nair (1978), wherein the occurrence of the pest is recorded from Kerala. Ayyar (1940) stated that the pest causes substantial damage in places such as Malabar, Godavari, etc. Soumya et al. (2020) reported 4.75 percent incidence in Kerala between April - November during 2013 - 2016.

Infestation of *G. caesalis* was observed in a three year old plantation of Tekam Yellow (J 33) variety at Erumeli, Pathanamthitta district, Kerala (9° 29' 21.81" N 76° 51' 1.632" E) on 4 February 2021. Tekam Yellow is a popular variety of jack cultivated on a commercial scale in Malaysia, known for its taste and consumer preference (Ismail and Kaur, 2013). There were 162 trees raised from grafts, of which 32 were non-bearing younger ones planted as replacements for the dead plants. The three year old trees were bearing young fruits at different stages of development. Of the 20 trees randomly observed, fruits were infested by *G. caesalis* in 16 trees (80%). Of the 118 fruits observed, 29 (24.6 %) were damaged. The symptoms (Figs 5 – 7) observed were typical, as described by Manjunatha (2002) and Khan and Islam (2004). A single application of quinalphos 0.5% spray on 7 February 2021 did not yield satisfactory control, according to the farmer. Hence flubendiamide (Fame 1 ml/10 l) was applied on 3 and 24 March 2021. The result of the second spray of flubendiamide was promising, according to the farmer. On 22 February 2022 and 3 March 2022, the farmer tried *Bacillus thuringiensis kurstaki* (DiPel-8L), which gave satisfactory control.

A commercial farm of Vietnam Super Early having 310 three year old trees at Elikulam, Kottayam (9° 36' 49.7" N 76° 42' 49.2" E) was visited on 26 March 2022. Here tender fruits are harvested once in three

days. As the fruits are harvested regularly at short intervals, the infested fruits are also selectively removed during the harvest. However, of the 15 trees observed randomly, 11 were infested (73.3 %). Of the 226 fruits observed, 15 (6.64 %) were infested. According to the farmer, *Beauvaria bassiana* (Bals.-Criv.) Vuill. provided satisfactory control of the pest.

Besides *G. caesalis*, another Crambidae, *Archemis* sp. (Spilomelinae, Trichaeini) (Figs 3, 4) also emerged from the infested fruits in both the localities. More studies are necessary to ascertain its role as a pest of jack.

Voucher specimens of *G. caesalis* (Accession number NIM/NBAIR/LEP(7)/71021) and *Archemis* sp. (Accession numbers NIM/NBAIR/LEP/ARCH/30522-1 & NIM/NBAIR/LEP/ARCH/30522-2) are deposited in the National Bureau of Agricultural Insect Resources, Bengaluru.

As the state is poised for an expansion of the commercial cultivation, processing, and marketing of jackfruit, through an initiative of the Government of Kerala, there is an urgent need for the development of integrated management strategies, including biological, mechanical, and chemical methods, against *G. caesalis*.

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