



First Global Host Report and New Distribution Record of *Bactrocera penecorrecta* Drew (Diptera: Tephritidae) from Bihar, India

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Authors' contributions

This work was carried out in collaboration among all authors. Authors AK and GK performed the fieldwork and sample collection. Authors CSP and MPS identified the fruit fly by morphological characteristics and taxonomic keys. Authors CSP and MKS did overall monitoring and wrote and edited the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

This study showed that brinjal, *Solanum melongena* Linnaeus is the first global host of the fruit fly, *Bactrocera penecorrecta* Drew (Diptera: Tephritidae) from Bihar, North India. Earlier report of *B. penecorrecta* was from Kerala, South India. In the present investigation, *B. penecorrecta* was recorded 22 years after its discovery in Kerala, South India in 2002 by R. A. I. Drew and S. Raghu. The record of brinjal as the first host of *B. penecorrecta* warrants in in-depth investigation of the level of infestation and sanitary and phytosanitary protocol development for the export as many recent invasions by different *Bactrocera* species in various part of the world beyond their native distributional records.

Keywords: Fruit fly; *Bactrocera*; Tephritidae; brinjal; India; host plant.

1. INTRODUCTION

The fruit fly, *Bactrocera penecorrecta* Drew, was first described by R. A. I. Drew [1] in 2002 and reported by Drew and Raghu in 2002 from New Amarambalam Forest, Kerala, India. *B. penecorrecta* belongs to the tribe Dacini of the family Tephritidae. The tribe Dacini is a highly diverse tribe within the family Tephritidae and contains around 1000 species, a fifth of all known species in the family [2,3,4,5]. All tephritid fruit flies fall under the tribe Dacini and are frugivorous or florivorous. About 10% of the 932 currently recognized species are economic pests of fruits and vegetables around the world [4,5,6,7,8,9,10,11]. These flies are also internationally significant pests of fruits and vegetables as adults lay their eggs into sound fruit on plant, where the subsequent larval feeding causes fruit loss [11,12]. Knowledge of potential host plants of fruit flies is important in areas where fruit crops are grown commercially because damage to these crops may be caused by fruit fly migration from nearby host plants [13].

2. MATERIALS AND METHODS

The collection of fruit flies infested fruits of Brinjal (only two fruits with maggots were found in the field) from the Dumraon area, Buxar, Bihar, India (Latitude: 25.56° N and Longitude 84.14° E) was carried out during May 2024 and brought to the laboratory of the Department of Entomology, Veer Kunwar Singh College of Agriculture, Dumraon, Bihar India. The infested fruits were kept in a transparent plastic jar of 1000 cc capacity with a 5 cm layer of sawdust in the base of the jar for pupation. After ten days of fruit collection, one adult emerged from the pupa. The emerged adult fly was preserved in 96% ethyl

alcohol for identification. The identification of the adult specimen of fruit fly was carried out with the published key and description available in Drew and Raghu [1], Drew and Romig [14,15]. For the photography of the specimen, fruit flies were pinned and used for photography (Make: Panasonic, Model: DMC-TZ80 under macro setting). The specimen was preserved in the Insect Museum, Veer Kunwar Singh College of Agriculture, Dumraon, Bihar, India, (Cat. No.: FFBPc-01)

3. RESULTS AND DISCUSSION

Based on morphological taxonomic keys and descriptions available in Drew and Raghu [1] and Drew and Romig [14,15] the fruit fly species reared from infested brinjal was identified as *B. penecorrecta*. The important identification characters of *B. penecorrecta* was face fulvous with a pair of transverse oval black spots; scutum black with red brown posterolateral to lateral postsutural vittae; moderately broad parallel-sided lateral postsutural yellow vittae; scutellum yellow except for a moderately black basal band; legs with all femora entirely fulvous; fore tibiae fuscous, hind tibiae dark fuscous; wings with narrow fuscous costal band confluent with R_{2+3} and ending at apex of the vein before continuing as a larger oval fuscous spot across apex of R_{4+5} ; abdominal terga III-V black except dark fuscous spots posterocentrally on tergum III-V black except dark red-brown spots posterocentrally on terga IV and V either side of a medial longitudinal black band, a pair of oval dark red-brown shining spots on tergum V. The photographs of different parts of *B. penecorrecta* are presented in Fig. 1. The *B. penecorrecta* was first described by Drew in 2002 [1].

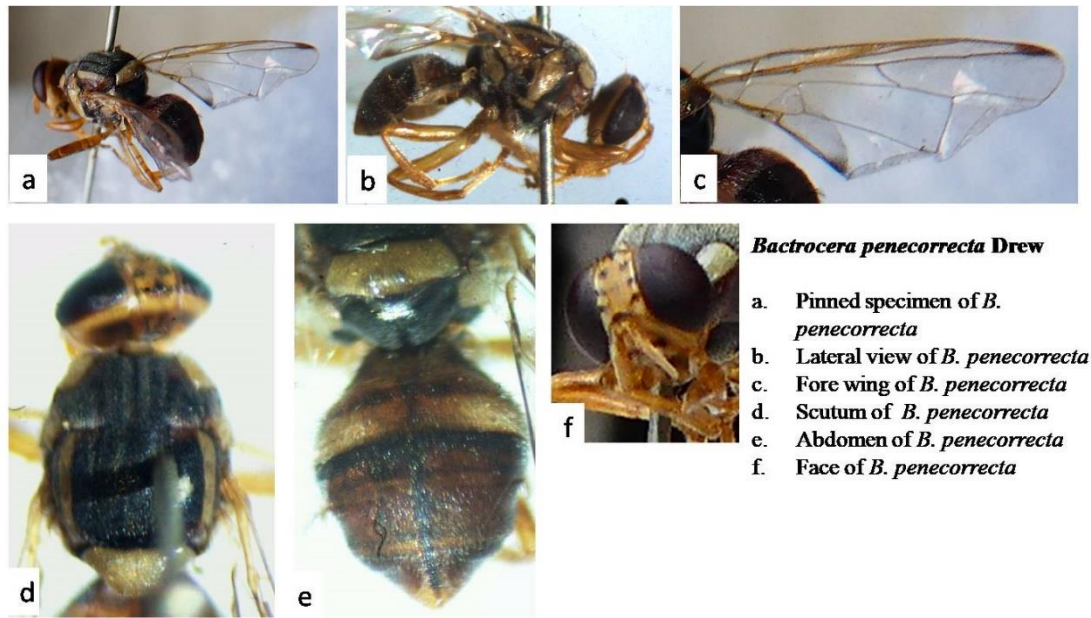


Fig. 1. Photograph of different parts of *B. penecorrecta* reared from Brinjal

To date, the host plant of *B. penecorrecta* is unknown and has not been reported in published literature. We report here the brinjal (egg plant) as the first global host record of *B. penecorrecta* from Dumraon, Bihar, India. Also, the earlier geographical distribution record of *B. penecorrecta* is limited to South India [1,14]. In the present investigation, *B. penecorrecta* reported from Dumraon, Bihar (a north and east state of India) is a new geographical distribution record for the species. The present location of the collection of *B. penecorrecta* is about 2000 km far away from its first site of collection from New Amarambalam forest, Kerala, India. Other tephritids recorded from brinjal and other solanaceous plant species in India are *Bactrocera latifrons* (Hendel), *Bactrocera prabhakari* Maneesh et al. and *Zeugodacus tau* (Walker) [16,17,18].

4. CONCLUSION

More information on biology, other host plants, and the level of infestation to be generated to further enhance the knowledge about *B. penecorrecta*. Also, as other tephritid fruit flies are the invasive and economic pest of many fruit and vegetable crops, a close watch is warranted for the entire state for any economic losses from the species along with the development of sanitary and phytosanitary protocol for the export as many recent invasion by different *Bactrocera* species in various part of the world beyond their native distributional records.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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