

Article

Pictorial keys for predominant *Bactrocera* and *Dacus* fruit flies (Diptera: Tephritidae) of north western Himalaya

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Abstract

A pictorial key for 13 species of fruit flies under 2 genera namely *Bactrocera* and *Dacus* of subfamily Dacinae (Diptera: Tephritidae) is presented in this paper based on actual photographs of fruit flies collected from north western Himalaya of India during 2009-2010. Among these, *Bactrocera diversa* (Coquillett), *Bactrocera scutellaris* (Bezzi), *Bactrocera tau* (Walker), *Bactrocera cucurbitae* (Coquillett), *Bactrocera zonata* (Saunders), *Bactrocera correcta* (Bezzi), *Bactrocera dorsalis* (Hendel), *Bactrocera latifrons* (Hendel) and *Dacus ciliatus* Loew are the pests of agricultural and horticultural ecosystems. *Bactrocera latifrons*, *Bactrocera nigrofemoralis* White & Tsuruta, *Dacus longicornis* Wiedemann and *Dacus sphaeroidalis* (Bezzi) are the new records from the region of which host range has yet to be investigated. The pictorial keys developed for these species will help the researchers for their easy and accurate identification.

Keywords fruit fly; *Bactrocera*; *Dacus*; *Callantra*; Dacinae; Tephritidae; taxonomic key.

1 Introduction

The family Tephritidae is one of the largest families of insect order Diptera (Drew, 1989a), comprising of predominantly medium sized, pictured-winged and highly ornamented flies commonly known as “fruit flies” as a number of species infest a wide variety of fruits, vegetables, flower heads, seeds, leaves and other plant parts (White and Elson-Harris, 1992; Agarwal and Sueyoshi, 2005; Prabhakar et al., 2012). They are found in nearly all habitats with suitable plant life. Their distribution is cosmopolitan covering tropical, subtropical and temperate regions and they occupy habitats ranging from rainforests to open savannah except in Arctic and Antarctic regions (Kapoor et al., 1980; Drew, 1989a, b; McPherson and Steck, 1996; Norrbom et al., 1998; Michaux and White, 1999; Agarwal and Sueyoshi, 2005; De Meyer et al., 2010). These flies are widespread over the entire world and richly predominant in the tropical and subtropical areas. Although the economically important species account for only about 5 per cent of all tephritid species, they are a driving force for various tephritid studies, including taxonomic ones.

In Indian subcontinent, the knowledge of family Tephritidae has been based largely upon the monumental monograph of Bezzi published in 1913 (Kapoor et al., 1980). Of 243 known species in 79 genera from India, 41 species of 27 genera have been reported from Himachal Pradesh (Agarwal and Sueyoshi, 2005). Recently,

six fruit fly species were reported for the first time from Himachal Pradesh by Prabhakar et al. (2012). Out of 47 species of fruit flies reported from Himachal Pradesh, 13 species belong to genus *Bactrocera* and *Dacus* and majority of them are economically important pests of agricultural and horticultural crops of several countries including India. The accurate identification of pest species is essential for any pest management programme and regulating the entry of pest species to a pest free zone, but due to homoplasmy in morphological characters of fruit flies, the accurate identification of species is very difficult for fruit fly researchers who are not taxonomists, farm workers and graduate students. Taxonomic keys are of utmost importance in the identification of the species during different research programmes. Although there are a number of taxonomic keys to identify the fruit flies of different areas/regions, but none is pictorial. Therefore, an attempt has been made to prepare coloured pictorial identification keys for accurate identification of most important pest fruit fly species of genus *Bactrocera* and *Dacus*.

2 Pictorial Keys of Fruit Flies

1. Abdomen oval or elongate.....2
..... (Genus *Bactrocera*)



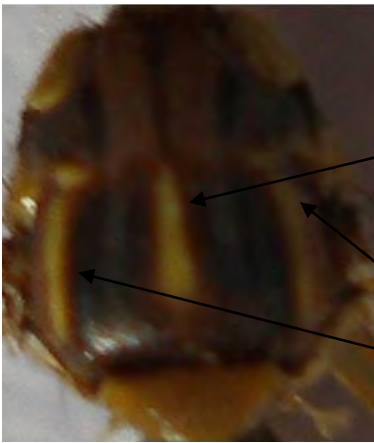
Oval abdomen

- Abdomen petiolate and elongate..... 11
..... (Genus *Dacus*)



Elongated abdomen

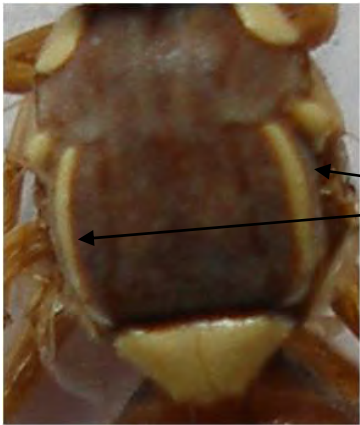
- 2 (1). Lateral and medial postsutural yellow vittae present 3



Medial postsutural yellow vittae

Lateral postsutural yellow vittae

- Lateral postsutural yellow vittae present, medial postsutural yellow vittae absent 6



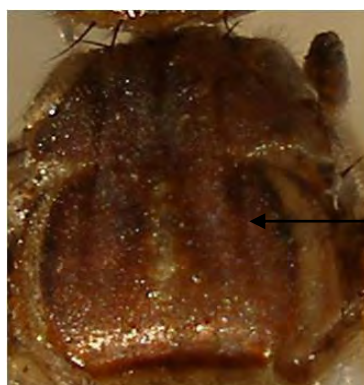
Lateral postsutural yellow vittae

- 3 (2). Scutum black 4



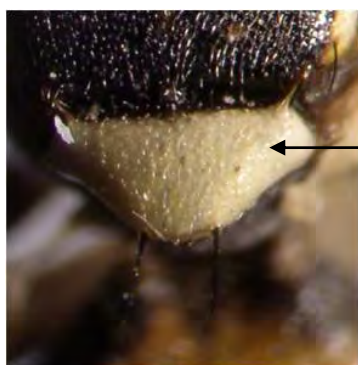
Scutum

- Scutum mostly red brown 5



Scutellum

- 4 (3). Scutellum yellow without an apical black spot
 *Bactrocera (Hemigynodacus) diversa* (Coquillett)



Scutum

*Bactrocera diversa* (Coquillett)

- Scutellum yellow with an apical black spot
 *Bactrocera (Zeugodacus) scutellaris* (Bezzi)



Scutellum

*Bactrocera scutellaris* (Bezzi)

- 5 (3). Fore wings with cubital streak and costal band with a distinct large spot in wing apex *Bactrocera (Zeugodacus) tau* (Walker)



Bactrocera tau (Walker)

- Fore wings with infuscation on dm-cu crossveins in addition to cubital streak and costal band with a distinct large spot in wing apex *Bactrocera (Zeugodacus) cucurbitae* (Coquillett)



Bactrocera cucurbitae (Coquillett)

- 6 (2). Scutum base colour red brown 7



- Scutum base colour black 8



- 7 (6). Fore wings with costal band but either discontinuous or with an extremely narrow section distal to apex R_{2+3} before expanding into a spot in wing apex
Bactrocera (Bactrocera) zonata (Saunders)



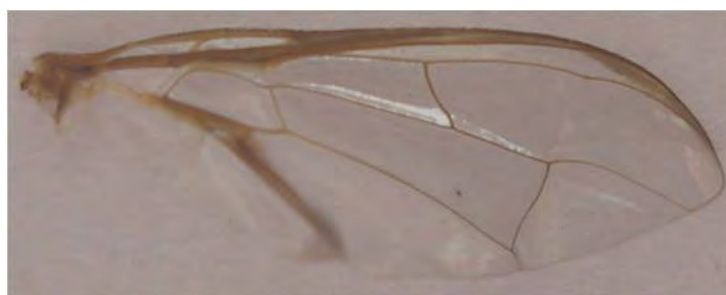
Bactrocera zonata (Saunders)

- 8(6) Fore wings with costal band but either discontinuous or with an extremely narrow section distal to apex R_{2+3} before expanding into a spot in wing apex ***Bactrocera (Bactrocera) correcta* (Bezzi)**



***Bactrocera correcta* (Bezzi)**

- Wings with continuous costal band confluent with R_{2+3} 9



- 9 (8). All femora with dark black marking
***Bactrocera (Bactrocera) nigrofemoralis* White & Tsuruta**



***Bactrocera nigrofemoralis* White & Tsuruta**

- All femora entirely fulvous 10



- 10 (9) Costal band confluent with R_{2+3} not expanding into a distinct spot in wing apex *Bactrocera (Bactrocera) dorsalis* (Hendel)



Bactrocera dorsalis (Hendel)

- Costal band confluent with R_{2+3} expanding into a small spot in wing apex *Bactrocera (Bactrocera) latifrons* (Hendel)

-



Bactrocera latifrons (Hendel)

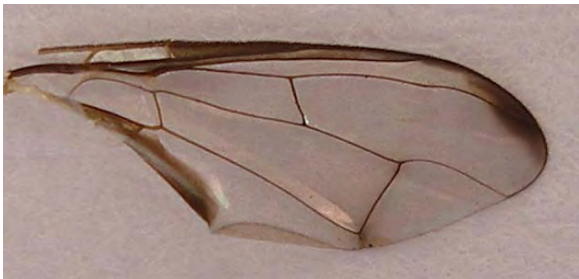
- 11 (1). Scutum red brown with postsutural medial yellow vittae, lateral postsutural yellow vittae absent *Dacus (Callantra) discophorus* (Hering)



- Scutum red brown without postsutural lateral and medial yellow vittae 12



- 12(11). Costal band narrow, confluent with vein R_{2+3} except at apex *Dacus (Didacus) ciliatus* Loew



- Costal band broad, usually confluent or overlapping vein R_{4+5} 13



- 13 (12). Costal band broad, usually confluent or overlapping vein R_{4+5} not expanding into a large spot in wing apex..... ***Dacus (Callantra) longicornis* Wiedemann**



***Dacus longicornis* Wiedemann**

- Costal band broad, usually confluent or overlapping vein R_{4+5} expanding into a large spot in wing apex, reaching and crossing vein M
***Dacus (Callantra) sphaeroidalis* (Bezzi)**



***Dacus sphaeroidalis* (Bezzi)**

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