

New species, redescriptions and phylogenetic revision of tribe Dacini (Diptera: Tephritidae: Dacinae) from India based on morphological characters

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Abstract

The tribe Dacini comprising four genera, namely *Bactrocera* Macquart, *Dacus* Fabricius, *Monacrostichus* Bezzi and *Zeugodacus* Hendel, is a derived lineage in Tephritidae. It is one of the most economically important tribes in Tephritidae harbouring several species of quarantine concern across the world. We describe two new species of *Bactrocera* Macquart, *B. (Parazeugodacus) conica* David & Ramani, sp. n. & *B. (B.) prabhui* David, sp. n. from India. Postabdominal structures of males and/or females of 23 species of *Bactrocera*, 16 species of *Zeugodacus* and 8 species of *Dacus* from India are illustrated and described for the first time, which revealed similarities between *Dacus* and *Zeugodacus* with respect to epandrial shape and praeputium patterning. *Bactrocera* is unique in possessing oval shaped epandrium and an unpatterned praeputium. An analysis of phylogenetic relationships between three genera of the tribe Dacini from India based on morphological characters has been attempted for the first time. Cladistic analysis employing 51 characters of 62 species in Dacini, with seven species as outgroups revealed the monophyly of Dacini, *Bactrocera* and *Dacus* with supporting non-homoplasious synapomorphies. *Ichneumonopsis* Hardy, often included in the Gastrozonini, does not possess any synapomorphies of Dacini, even though it appeared at the base of the Dacini clade. *Zeugodacus* was retrieved as a monophyletic sister-group to *Dacus* based solely on a single homoplasious host plant character, with weak statistical support.

Key words: Dacinae, new species, *Bactrocera*, *Dacus*, *Zeugodacus*

Introduction

The tribe Dacini is predominantly tropical in distribution with four genera recognised, namely *Bactrocera* Macquart, *Dacus* Fabricius, *Monacrostichus* Bezzi and *Zeugodacus* Hendel (Virgilio *et al.*, 2015; San Jose *et al.*, 2018; Doorenweerd *et al.*, 2018). Members of this tribe are often wasp mimics, usually black to brown with yellow vittae and predominantly hyaline wing with well developed costal band and anal streak. Forty-five species of this taxon have been documented as pests of various crops by White & Elson-Harris (1992). Nine hundred and thirty two species of Dacini have been listed by Doorenweerd *et al.* (2018) in the world checklist for tribe Dacini. Drew & Romig (2013; 2016) considered *Ichneumonopsis* to be a member of Dacini, whereas Kovac *et al.* (2006, 2013) and Freidberg *et al.* (2017) included it in Gastrozonini owing to its host plant association and distinct postabdominal structures, respectively. Eighty five species of Dacini are documented from India in three genera except for *Monacrostichus* (Agarwal & Sueyoshi, 2005; David & Ramani, 2011; Drew & Romig, 2013; David *et al.*, 2016a, 2017a,b). Most of the descriptions of *Bactrocera* and *Dacus* species are based purely on external morphology. Sculpturing of spicules on distal end of eversible membrane of several species of *Bactrocera* and *Dacus* were well illustrated by Drew (1989) and Drew and Hancock (1994). Tsuruta & White (2001) illustrated