

ADDITIONS AND AMENDMENTS TO A RECENT CLASSIFICATION OF *DACUS* FABRICIUS (DIPTERA: TEPHRITIDAE: DACINAE)

D.L. HANCOCK

PO Box 2464, Cairns, Qld 4870

Abstract

Twenty-nine newly described or recognised species of Afrotropical and Indo-Australian *Dacus* Fabricius are placed within a classification proposed for all species. In addition, the Australian species *D. concolor* Drew is placed as a new synonym of *D. (Neodacus) salamander* Drew & Hancock, stat. rev., the African species *D. chrysomphalus* (Bezzi) is transferred from subgenus *Mictodacus* Munro to the *D. (Leptoxyda) eminus* group and the Afrotropical *scaber* group is transferred from subgenus *Psilodacus* Collart to subgenus *Didacus* Collart. *Metidacus* Munro, *Coccinodacus* Munro and *Andriadacus* Munro are placed as new synonyms of *Leptoxyda* Macquart. *Saccodacus* Munro is placed as a new synonym of *Didacus* and the *scaber* group is regarded as a close ally of the Sri Lankan species *D. (Didacus) keiseri* (Hering).

Introduction

Two recent contributions on the classification of the widespread fruit fly genus *Dacus* Fabricius (Hancock and Drew 2006, White 2006) agreed in many respects but differed substantially in others. These differences largely result from the different interpretation of three key features: the geographical centre of origin of the genus, its primitive host plant group and the nature of the yellow marking along the mesonotal suture in the ancestral species. These were regarded, respectively, as Southeast Asia, Asclepiadaceae and broadly connected to the notopleural callus by Hancock and Drew (2006), or as Africa, Cucurbitaceae and an isolated spot by White (2006). Further evidence is needed to determine which (if either) of these sets of assumptions is correct and if the outgroup selections are appropriate. Contrary to White (2006), a broadly connected sutural marking is present in several Indo-Australian species of *Bactrocera* Macquart, in both the *Bactrocera* and *Zeugodacus* groups of subgenera (e.g. *B. (Bactrocera) mendosa* (May), *B. (Asiadacus) brachycera* (Bezzi) [= *fuscans* Wang], *B. (Sinodacus) hochii* (Zia), *B. (S.) binoyi* Drew, *B. (S.) transversa* (Hardy), *B. (S.) perpusilla* (Drew), *B. (Zeugodacus) gavis* (Munro), *B. (Z.) macrovittata* Drew). The sutural marking is also connected in the basal genus *Monacrostichus* Bezzi.

Discussion

With the loss of some species to synonymy (White 2006) and the addition of newly described or recognised taxa from the Afrotropical Region (White 2006) and Bhutan (Drew *et al.* 2007), the number of *Dacus* species now recognised is 249 (177 Afrotropical and 72 Indo-Australian). Incorporation of the new data provided by White (2006) maintained a high degree of stability within the classification of Hancock and Drew (2006), except that biological information requires the transfer of the *scaber* group from subgenus *Psilodacus* Collart to subgenus *Didacus* Collart. In addition, the *D. (Dacus) venetatus* and *D. (Psilodacus) semisphaereus* groups should, on

morphological evidence (White 2006), be combined with the *D. (D.) eclipsis* and *D. (P.) mulgens* groups respectively.

One anomalous species that tests both classifications is *D. chrysomphalus* (Bezzi). Placed in subgenus *Mictodacus* Munro by Hancock and Drew (2006) and in subgenus *Dacus* by White (2006), it has the sutural yellow mark often interrupted medially; hence this character could be interpreted either as united with the notopleuron or isolated. Its host plant has been recorded as *Marsdenia abyssinica* (Asclepiadaceae) (White 2006) and, although this record has not yet been repeated, it is considered to be reliable. This, together with the variable sutural mark, an apically expanded costal band that does not cross vein M and several other morphological characters (e.g. structure of the aedeagus and shape of the surstyli), suggests an affinity with species placed in subgenus *Leptoxyda* Macquart. *D. chrysomphalus* is placed here within the *D. (Leptoxyda) eminus* group; it retains supra-alar setae and three distinct postsutural yellow vittae and keys to couplet 11 in Hancock and Drew (2006). As a consequence of this transfer, recognition of subgenus *Metidacus* Munro (= *Coccinodacus* Munro; = *Andriadacus* Munro) becomes untenable and all three names are regarded here as new synonyms of *Leptoxyda*.

White (2006) noted that four species in the *scaber* group of Hancock and Drew (2006), viz. *D. apostata* (Hering) [= *retextus* (Munro)], *D. triater* Munro, *D. phloginus* (Munro) and *D. rufoscutellatus* (Hering), were bred from the fruit of *Zehneria* (Cucurbitaceae). Thus they cannot remain in subgenus *Psilodacus sensu* Hancock and Drew (2006) which, by definition, includes no cucurbit-feeding species. White (2006) placed the above species, together with *D. nigriscutatus* White, in subgenus *Lophodacus* Collart but they lack the medial vitta on the scutum and breed in fruit rather than the stamens of male flowers, both used as defining characters of *Lophodacus* by Hancock and Drew (2006). They also lack the black face seen in all other *Lophodacus* species except *D. (L.) elegans* (Munro) and are best placed in subgenus *Didacus sensu* Hancock and Drew (2006). The host plant data, lack of lure response and similarity in general appearance (including the small size and lack of an anal streak) suggest a close relationship between the *scaber* group and the Sri Lankan *D. (Didacus) keiseri* (Hering) but the relationships of the Southeast Asian *D. (D.) hainanus* Wang & Zhao remain uncertain. As a result of this transfer, *Saccodacus* Munro (with type species *D. triater*) becomes a new synonym of *Didacus* Collart.

Other species included in the *scaber* group by Hancock and Drew (2006) were retained in subgenus *Psilodacus* by White (2006), but the very similar structure of the male aedeagus (with a centralised apicodorsal rod and large apical membrane) suggests all members of the group belong in *Didacus*; consequently, *D. scaber* Loew, *D. basifasciatus* (Hering) and *D. namibiensis* Hancock & Drew are also transferred. The entirely yellow face and loss of all or most of the microtrichia in cell br above cell bm distinguishes this group.

Table 1. Placement of newly described, misplaced or previously unrecognised species of *Dacus* according to the classification of Hancock and Drew (2006).

| As currently listed or recently described | Suggested placement |
|---|--|
| Indo-Australian taxa | |
| <i>D. (Mellesis) dorjii</i> Drew & Romig * | <i>D. (Mellesis) siamensis</i> group |
| <i>D. (Mellesis) fletcheri</i> Drew * | <i>D. (Mellesis) siamensis</i> group |
| <i>Bactrocera salamander</i> (Drew & Hancock) * | <i>D. (Neodacus) absonifacies</i> group |
| Afrotropical taxa | |
| <i>D. (Dacus) apiculatus</i> White * | <i>D. (Dacus) eclipsis</i> group |
| <i>D. (Dacus) limbipennis</i> Macquart | <i>D. (Dacus) armatus</i> group |
| <i>D. (Dacus) madagascariensis</i> White * | <i>D. (Dacus) armatus</i> group |
| <i>D. (Dacus) deltatus</i> White | <i>D. (Dacus) fasciolatus</i> group |
| <i>D. (Dacus) segunii</i> White * | <i>D. (Dacus) fasciolatus</i> group |
| <i>D. (Ambitidacus) pulchralis</i> White * | <i>D. (Dacus) fasciolatus</i> group |
| <i>D. (Ambitidacus) katonae</i> Bezzi | <i>D. (Psilodacus) brevistriga</i> group |
| <i>D. (Didacus) briani</i> White | <i>D. (Psilodacus) mulgens</i> group |
| <i>D. (Didacus) congoensis</i> White | <i>D. (Psilodacus) binotatus</i> group |
| <i>D. (Didacus) fissuratus</i> White | <i>D. (Psilodacus) freidbergi</i> group |
| <i>D. (Didacus) nairobiensis</i> White | <i>D. (Psilodacus) macer</i> group |
| <i>D. (Didacus) yemenensis</i> White | <i>D. (Leptoxyda) mirificus</i> group |
| <i>D. (Didacus) copelandi</i> White | <i>D. (Leptoxyda) eminus</i> group |
| <i>D. (Didacus) elatus</i> White | <i>D. (Leptoxyda) eminus</i> group |
| <i>D. (Leptoxyda) kakamega</i> White | <i>D. (Leptoxyda) eminus</i> group |
| <i>D. (Leptoxyda) mediovittatus</i> White * | <i>D. (Leptoxyda) eminus</i> group |
| <i>D. (Leptoxyda) nigrolateris</i> White | <i>D. (Leptoxyda) eminus</i> group |
| <i>D. (Leptoxyda) parvimaculatus</i> White | <i>D. (Leptoxyda) eminus</i> group |
| <i>D. (Leptoxyda) arabicus</i> White | <i>D. (Leptoxyda) obesus</i> group |
| <i>D. (Leptoxyda) apectus</i> White | <i>D. (Psilodacus) binotatus</i> group |
| <i>D. (Leptoxyda) pleuralis</i> Collart | <i>D. (Mictodacus) sphaeristicus</i> group |
| <i>D. (Lophodacus) nigriscutatus</i> White | <i>D. (Didacus) scaber</i> group |
| <i>D. (Lophodacus) umehi</i> White | <i>D. (Leptoxyda) umehi</i> group |
| <i>D. (Mictodacus) chrysomphalus</i> (Bezzi) ¹ | <i>D. (Leptoxyda) eminus</i> group |
| <i>D. (Neodacus) quilicii</i> White * | <i>D. (Neodacus) xanthaspis</i> group |
| <i>D. (Psilodacus) gabonensis</i> White | <i>D. (Dacus) purus</i> group |
| <i>D. (Psilodacus) merzi</i> White | <i>D. (Dacus) purus</i> group |
| <i>D. (Psilodacus) okumuae</i> White ² | <i>D. (Didacus) ciliatus</i> group |
| <i>D. (Psilodacus) scaber</i> group ³ | <i>D. (Didacus) scaber</i> group |

* = collected in cue-lure traps; ¹ = bred from fruit of *Marsdenia* (Asclepiadaceae); ² = bred from fruit of *Gerrardanthus* (Cucurbitaceae); ³ = bred from fruit of *Zehneria* (Cucurbitaceae).

The Australian *Dacus* (*Neodacus*) *salamander* Drew & Hancock, stat. rev. (= *concolor* Drew, syn. n.) has fused abdominal tergites and a very weak supernumerary lobe on the wing. Accordingly, it is transferred from

Bactrocera (*Sinodacus*) Zia to the *D. (N.) absonifacies* group. The postpronotal lobes are either entirely yellow or anteriorly darkened and the medial postsutural yellow vitta is a little variable in shape.

The 29 nominal species recently recognised or described by White (2006) and Drew *et al.* (2007), plus the misplaced taxa discussed above, are listed in Table 1, together with an indication of where they belong according to the system of Hancock and Drew (2006). Several synonyms were proposed by White (2006) but, apart from *D. (Mictodacus) tubatus* Munro (now regarded as a synonym of *D. (Leptoxyda) aspilus* Bezzi), their subgeneric placements remain unchanged. Species transferred here from subgenus *Didacus* to subgenus *Leptoxyda* appear to belong in either the *D. (L.) mirificus* group (*D. yemenensis* White, which has fuscous costal cells and a reduced anal stripe), or the *D. (L.) eminus* group, close to *D. carnesi* (Munro) (with fulvous costal cells and a distinct anal stripe). *D. umehi* White was included provisionally in *Lophodacus* by White (2006); however, the presence of a slender medial vitta plus a distinct anal stripe and no pecten suggest it is best placed as a monotypic group within *Leptoxyda*, close to the *herensis* group.

In Hancock and Drew (2006: Appendix 2), character 32 for *D. (Mellesis) pedunculatus* (Bezzi) and *D. (Didacus) apostata* (Hering) should read '0' [pecten present], not '2'; characters 25-27 for *D. (Didacus) namibiensis* should read '222', not '333'; character 3 for *D. (Leptoxyda) externellus* (Munro) should read '0' [anterior notopleural seta present], not '1'; character 3 for *D. (Psilodacus) elutissimus* Bezzi should read '1' [anterior notopleural seta absent], not '0'; and characters for *D. (P.) semisphaereus* Becker should read '0110 3-300 02022 11110 20100 0020? 600'. In White (2006: cd-rom file D2), the record of *D. scaber* from 'Kilimanjaro' probably refers to a farm in South Africa, not Mt Kilimanjaro in Tanzania, whereas the record of '*D. humeralis*' from Mackay, Q[ueensland] refers to *Bactrocera neohumeralis* (Hardy), a replacement name for '*Dacus*' *humeralis* Perkins, not Bezzi.

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