

Pictorial Key to Dacine Fruit Flies Associated with Economic Plants in Sri Lanka

Kenji TSURUTA

Research Division, Yokohama Plant Protection Station, Ministry of Agriculture,
Forestry and Fisheries, Shinyamashita, Yokohama, 231-0801, Japan

H.M.J. BANDARA, H. RAJAPAKSE, S.A.H. SUNDARAPERUMA,
S.B.M.U.C. KAHAWATTA and G.B.J.P. RAJAPAKSE

National Plant Quarantine Services, Katunayake, Sri Lanka

Abstract : A pictorial key to 15 pest species of the dacine fruit flies associated with cultivated plants in Sri Lanka is given. The species included are as follows; *Bactrocera caryeae*, *B. caudata*, *B. correcta*, *B. cucurbitae*, *B. diversa*, *B. dorsalis*, *B. kandiensis*, *B. latifrons*, *B. trilineata*, *B. versicolor*, *B. verbascifoliae*, *B. zonata*, *B. sp. near tau*, *Dacus ciliatus*, and *D. discophorus*. *B. dorsalis*, *B. kandiensis*, and *B. cucurbitae* are serious pest species in Sri Lanka.

Key words : Pictorial key, Diptera, Tephritidae, Dacini, Fruit flies, Pests, Sri Lanka.

Introduction

About 35 species belonging to the tribe Dacini are now known in Sri Lanka. These fruit flies include serious pest species such as *Bactrocera dorsalis*, *B. kandiensis*, and *B. cucurbitae*. Moreover, 12 other species, most of which seem to be potential pests, are included. The preparation of the keys for the identification of these fruit flies has been awaited. The identification of these Sri Lankan fruit flies should become much easier by using this pictorial key.

Materials

Fruit flies were collected from almost all parts of Sri Lanka except for Northern and Eastern regions using trapping and fruit collection methods. Methyl eugenol and cue lure were used as attractants for the trapping method. The collections were made for three years (1993~1996) in individual technical cooperation programmes and NPQS (National Plant Quarantine Services) project, both of them were funded by JICA. A total of about 150 locations were selected for trapping. The locations included both cultivated and natural vegetation areas.

Diagnostic notes for fruit flies included in this key

Most of the pest species in Sri Lanka are included in this key. In principle, fruit flies that attack minor economic plants are excluded. The fruit flies not attacking major economic plants in Sri Lanka are included, when they have been recorded to infest major

economic plants in foreign countries other than Sri Lanka. Fruit flies included in this key are listed below with diagnostic notes. Characters used here are those other than used in each part of this pictorial key. Confirmation of the species using these characters listed here would be strongly recommended for accurate identification.

Terminology

Terminology followed CABIKEY (WHITE & HANCOCK, 1997), and shown in plate I.

1. *Dacus (Callantra) discophorus** (Hering)

Large brown species. Wing length 5~7 mm. Face with two black spots, one in each antennal furrow. Scutum with a medial vitta. Anterior supra-alar setae present. * *Wattakaka volbilis* (L.) is known as host plant, which is grown locally in home gardens in Sri Lanka. Although the plant is not a major economic plant, this fruit fly is included for comparison with other fruit flies of different subgenus or genus.

2. *Dacus (Didacus) ciliatus* Loew

Small brown species. Wing length 4~5 mm. Face with two black spots, one in each antennal furrow. Scutum without medial vitta. Male with pecten on abdominal tergite 3. Wing with complete costal band. Anepisternal stripe narrow, not reaching anterior notopleural seta. Abdomen largely pale, usually with two isolated marks on tergite 3. Presence of this species in Sri Lanka was confirmed (Tsuruta *et al.*, 1997)

3. *Bactrocera (Bactrocera) caryae* (Kapoor)

Medium species. Wing length 5~6 mm. Scutellum with one pair of scutellar setae. Scutum with anterior supra-alar setae. Face largely yellow, with a black spot in each antennal furrow. Scutum with prescutellar acrostichal setae. Wing; basal narrow portion of cell br usually with extensive covering of microtrichia. Lateral postsutural vittae very narrow and postpronotal lobe partly dark. Lateral marking on tergite 5 broad, extending laterally to a point above the ceromata. Presence of this species is not confirmed. Description given here is based on the specimens borrowed from the Natural History Museum, UK.

4. *B. (B.) correcta* (Bezzi)

Small species. Wing length 4~5 mm. Scutellum with one pair of scutellar setae. Scutum with anterior supra-alar setae. Scutum with prescutellar acrostichal setae. Lateral postsutural vittae broad. All femora entirely pale.

5. *B. (B.) dorsalis* (Hendel)

Medium species. Wing length 5~6 mm. Scutellum with one pair of scutellar setae. Scutum with anterior supra-alar setae. Face largely yellow, with a black spot in each antennal furrow. Scutum with prescutellar acrostichal setae. Lateral postsutural vittae broader than those of *B. kandiensis*. Postpronotal lobe entirely pale. Scutum brown to

black. Lateral postsutural vittae parallel sided and ending near intra-alar setae. Ceromata pale. Tergite 3 with a basal dark band that is rarely extended down the sides of the sclerite. Tergite 5 usually with no more than a trace of an antero-lateral dark mark.

6. *B. (B.) kandiensis* Drew and Hancock

Medium species. Wing length 5~6 mm. Scutellum with one pair of scutellar setae. Scutum with anterior supra-alar setae. Face largely yellow, with a black spot in each antennal furrow. Scutum with prescutellar acrostichal setae. Lateral postsutural vittae very narrow and postpronotal lobe partly dark. Lateral marking on tergite 5 absent or narrow, not extending laterally above the ceromata. Lateral markings on tergites 3 and 4 usually narrow.

7. *B. (B.) latifrons* (Hendel)

Medium species. Wing length 4~6 mm. Scutellum with one pair of scutellar setae. Scutum with anterior supra-alar setae. Face largely yellow, with a black spot in each antennal furrow. Scutum with prescutellar acrostichal setae. Basal narrow portion of cell br usually with extensive covering of microtrichia.

8. *B. (B.) verbascifoliae* Drew and Hancock

Smaller species than *B. dorsalis*. Wing length 4~5 mm. Distributed only in up countries with the elevation of more than 1,400 m. Scutellum with one pair of scutellar setae. Scutum with anterior supra-alar setae. Face largely yellow, with a black spot in each antennal furrow. Postpronotal lobe entirely pale. All femora entirely pale. Scutum usually black. Lateral postsutural vittae parallel sided or sub-parallel and ending near intra-alar setae. Ceromata pale. Tergite 3 with a basal band almost always extended broadly down sides of sclerite. Tergite 5 with an antero-lateral dark marking that almost always extends laterally so that its inner-most edge is above the ceromata.

9. *B. (B.) versicolor* (Bezzi)

Medium to large species. Wing length about 6 mm. Scutellum with one pair of scutellar setae. Scutum with anterior supra-alar setae. Scutum with prescutellar acrostichal setae. Abdomen without a distinct medial dark stripe. Lateral postsutural vittae broad. All femora entirely pale.

10. *B. (B.) zonata* (Saunders)

Small species. Wing length 4~5 mm. Scutellum with one pair of scutellar setae. Scutum with anterior supra-alar setae. Scutum with prescutellar acrostichal setae. Lateral postsutural vittae broad. All femora entirely pale.

11. *B. (Hemigymnodacus) diversa* (Coquillett)

Medium species. Wing length 4~6 mm. Face entirely yellow in male. Anepisternal stripe of medium width, reaching anterior notopleural seta. Male without a pecten on abdominal tergite 3.

12. *B. (Javadacus) trilineata* (Hardy)

Small species. Wing length 4~5.5 mm. Face entirely yellow in male. Anepisternal stripe broad, reaching postpronotal lobe. Male with a pecten.

13. *B. (Zeugodacus) caudata* (Fabricius)

Medium species. Wing length 4~6 mm. Abdominal tergite 4 without a complete basal dark band. Male with a pecten on abdominal tergite 3. Aculeus with a truncate apex and a central small point in female.

14. *B. (Z.) cucurbitae* (Coquillett)

Medium species. Wing length 5~6 mm. Anepisternal stripe narrow, at most reaching anterior notopleural seta. Usually with only one pair of scutellar setae.

15. *B. (Z.)* sp. near *tau*

Medium species. Wing length about 6 mm. Anepisternal stripe narrow, at most reaching anterior notopleural seta. Two pairs of scutellar setae.

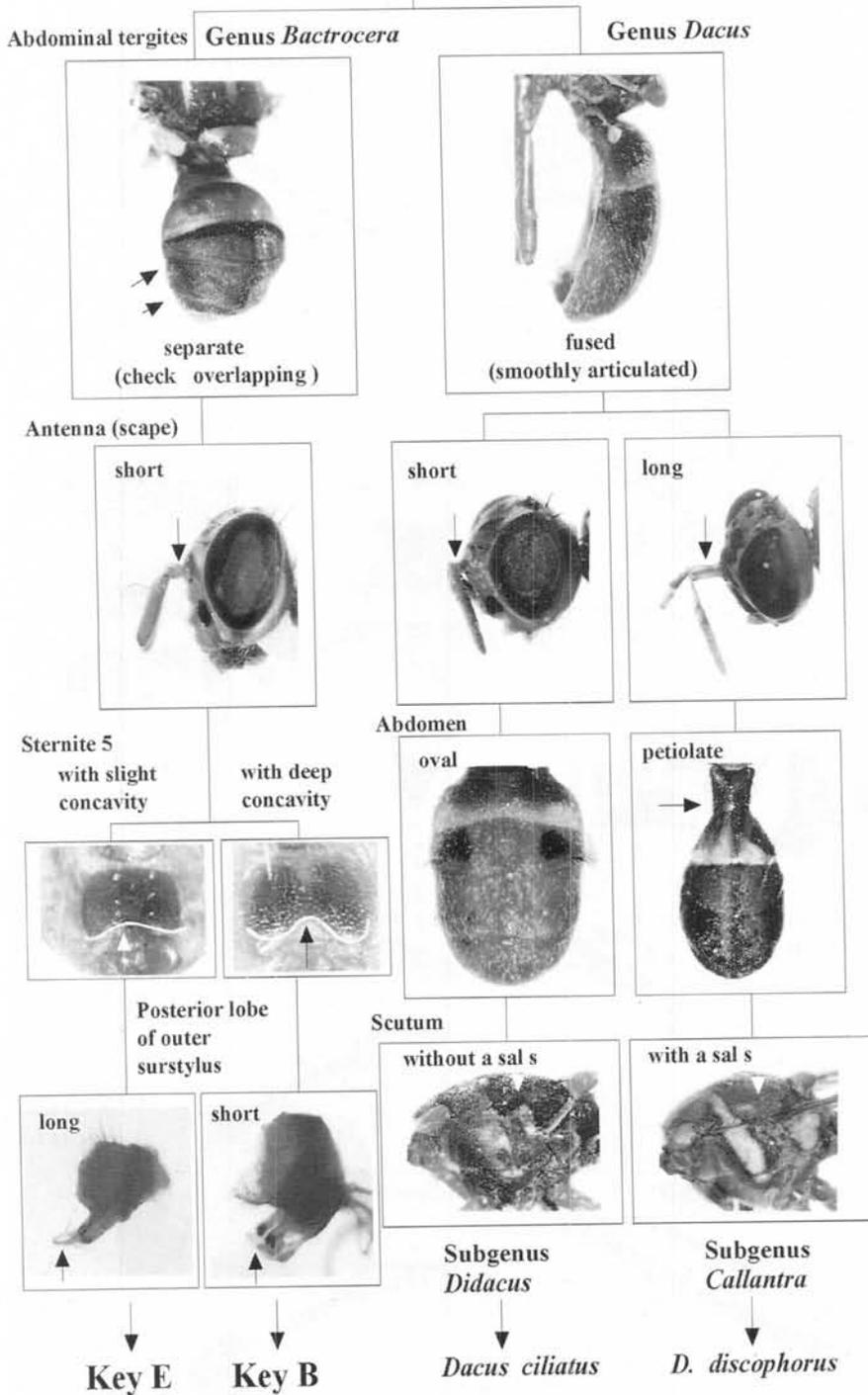
Acknowledgments

The authors wish to thank Drs. M.J.P. FERNANDO, Director of Seed Certification and Plant Protection Centre, Department of Agriculture, Sri Lanka and S.M.C. Subasinghe, Director of National Plant Quarantine Services, Sri Lanka, for their assistance in conducting fruit fly faunal survey. Our cordial thanks are also due to Drs. I.M. WHITE, International Institute of Entomology, UK and D.L. HANCOCK, Department of Primary Industries and Energy, Australia for their valuable comments on our fruit fly collection. We are much indebted to Y. IKEGAMI, team leader, NPQS project for his support in many ways, and to staff members of Yokohama Plant Protection Station, especially of the Export and Domestic Section, for their assistance in providing the male attractants used for our trapping survey.

References

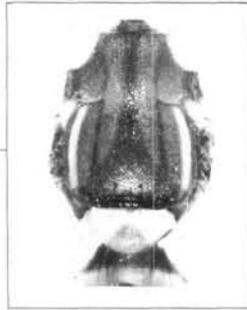
- DREW, R.A.I. and D.L. HANCOCK (1994) The *Bactrocera dorsalis* complex of fruit flies (Diptera : Tephritidae : Dacinae) in Asia. *Bull. ent. Res. Suppl. Ser. No 2.*: 1-68.
- HERING, E.M. (1956) Trypetidae (Dipt.) von Ceylon. *Verh. Naturf. Ges. Basel.* **67**: 62-74.
- KAPOOR, V.C. (1993) *Indian Fruit Flies*. 228 pp. International Science Publisher, New York.
- TSURUTA *et al.* (1997) A preliminary note on host plants of fruit flies of the tribe Dacini (Diptera ; Tephritidae) in Sri Lanka. *ESAKIA.* **37**: 149-160.
- WHITE, I.M. and M.M. ELSON-HARRIS (1994) *Fruit flies of economic significance: their identification and Bionomics*. 601 pp. Wallingford, CAB International.
- WHITE, I.M. and D.L. HANCOCK (1997) *CABIKEY, Dacini of Indo-Australasia*. Wallingford, CAB International.

Key A

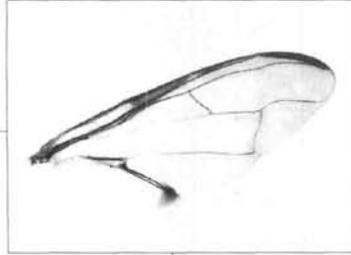


Key B

Lateral vittae present
Medial vitta absent

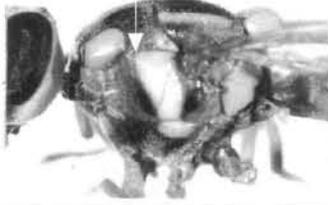


Wing with complete costal band
(without separate apical spot)



Anepisternal marking

extends to a npl s

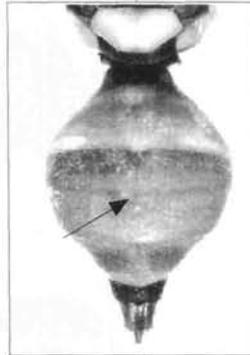


► Key C Species similar to members of *B. dorsalis* species complex

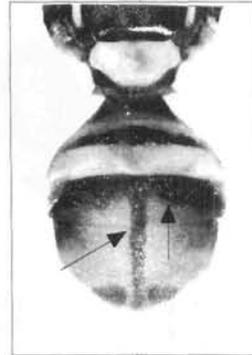
ends before a npl s



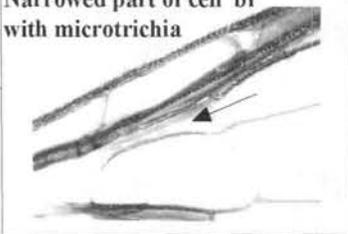
Abdominal tergites without distinct black pattern



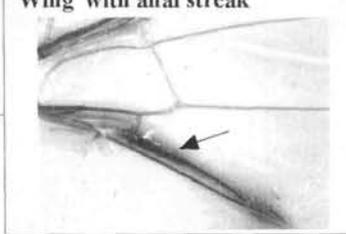
with distinct black pattern



Narrowed part of cell br with microtrichia

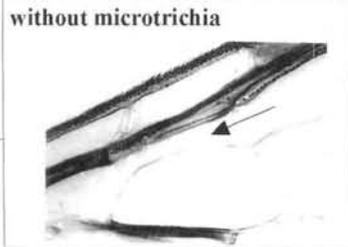


Wing with anal streak

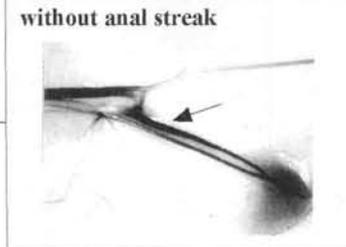


► Key C
Members of *B. dorsalis* species complex

without microtrichia

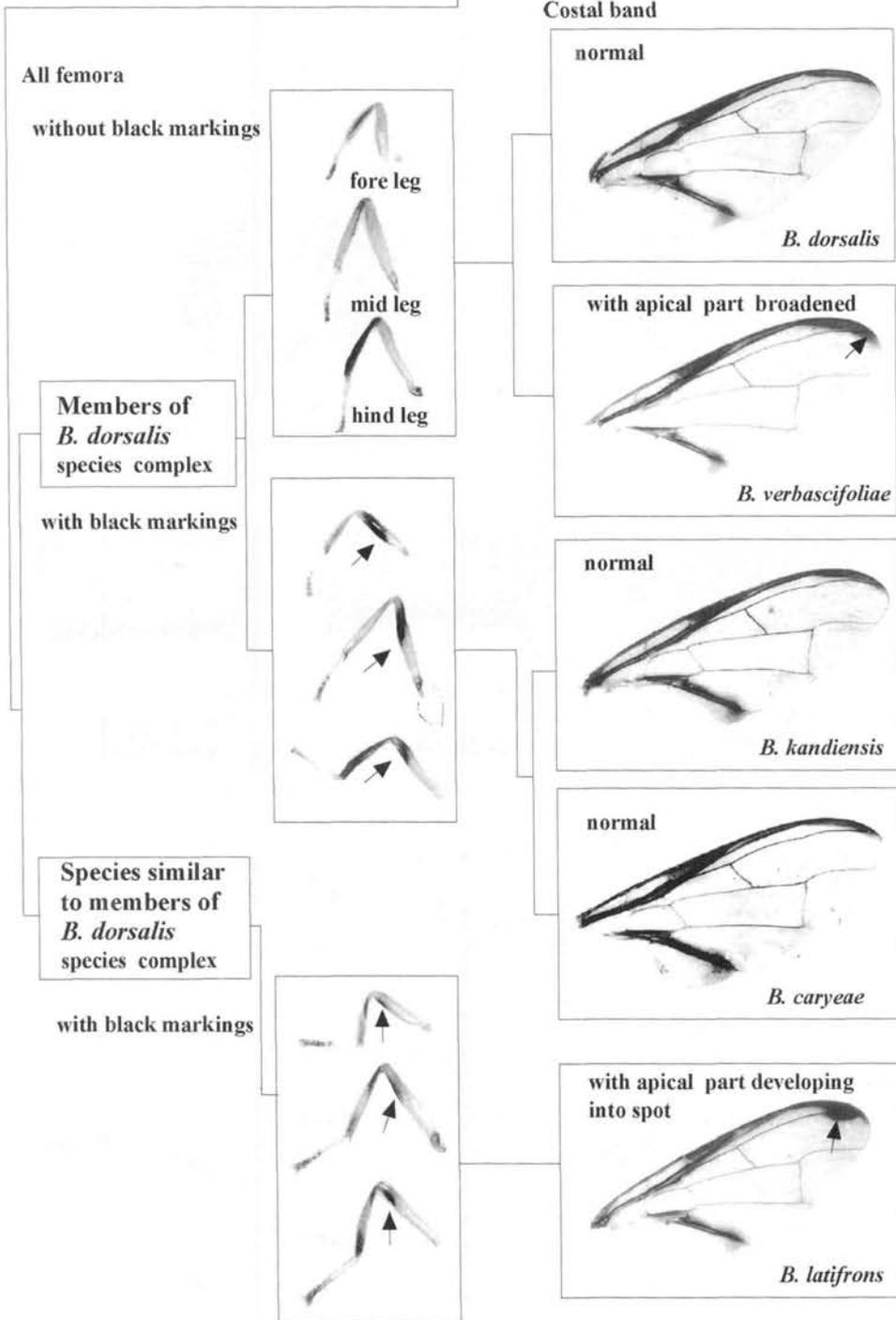


without anal streak



► Key D
Members of *B. zonata* species complex

Key C

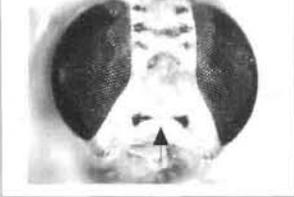


Key D

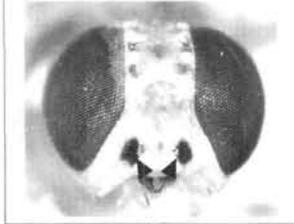
Members of
B. zonata
species complex

Facial spots

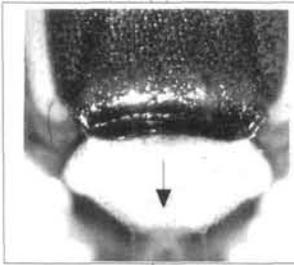
often forming transverse line



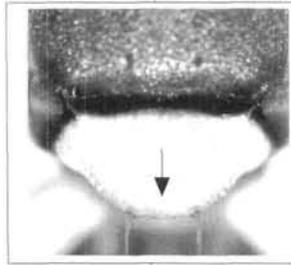
separate



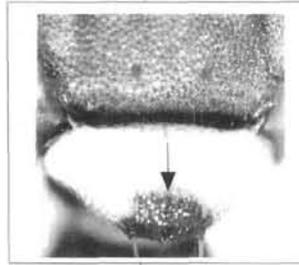
Scutellum



without apical spot

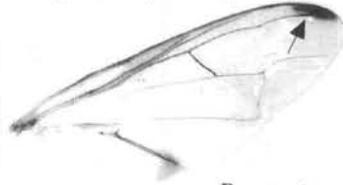


without apical spot



with apical spot

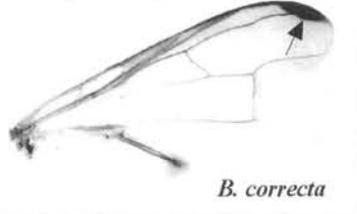
mostly with separate spot



B. zonata

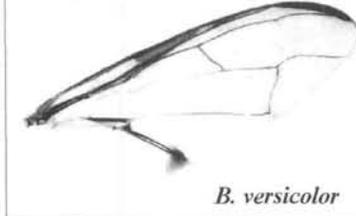
Costal band

mostly with separate spot



B. correcta

complete



B. versicolor

Key E

		Scutum	Wing
Frons	with separate spots	red brown	with marking on vein dm-cu <i>B. cucurbitae</i>
	with transverse facial line	with brown area	without marking on vein dm-cu <i>B. sp. near tau</i>
	without facial spots in male	with spindle shaped medial vitta	Costal band with apical expansion <i>B. caudata</i>
Scutum	with a sal s	with medial vitta (larger than that of <i>B. trilineata</i>)	with apical expansion <i>B. diversa</i>
	without a sal s	with small medial vitta	with apical expansion <i>B. trilineata</i>

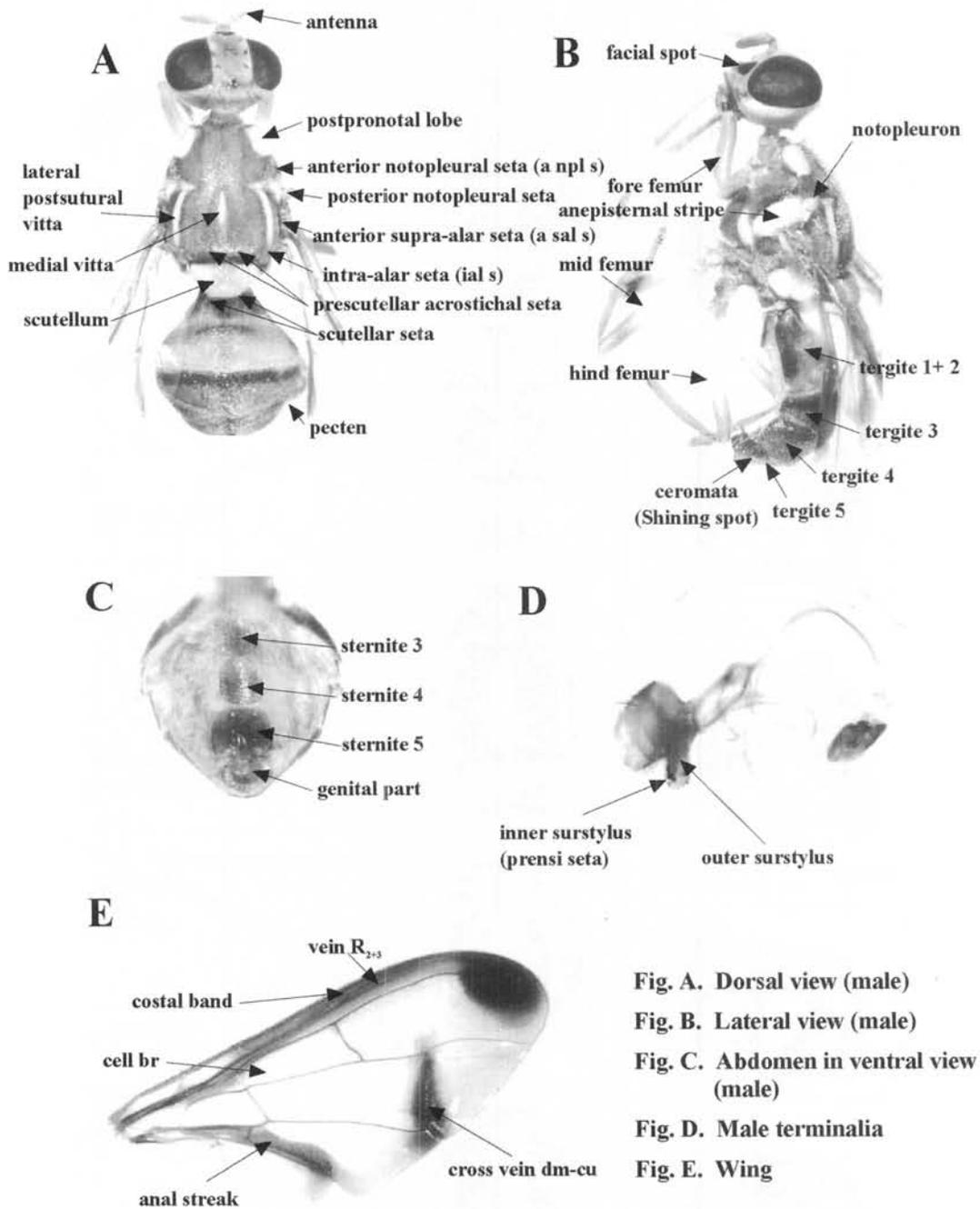


Fig. A. Dorsal view (male)

Fig. B. Lateral view (male)

Fig. C. Abdomen in ventral view (male)

Fig. D. Male terminalia

Fig. E. Wing

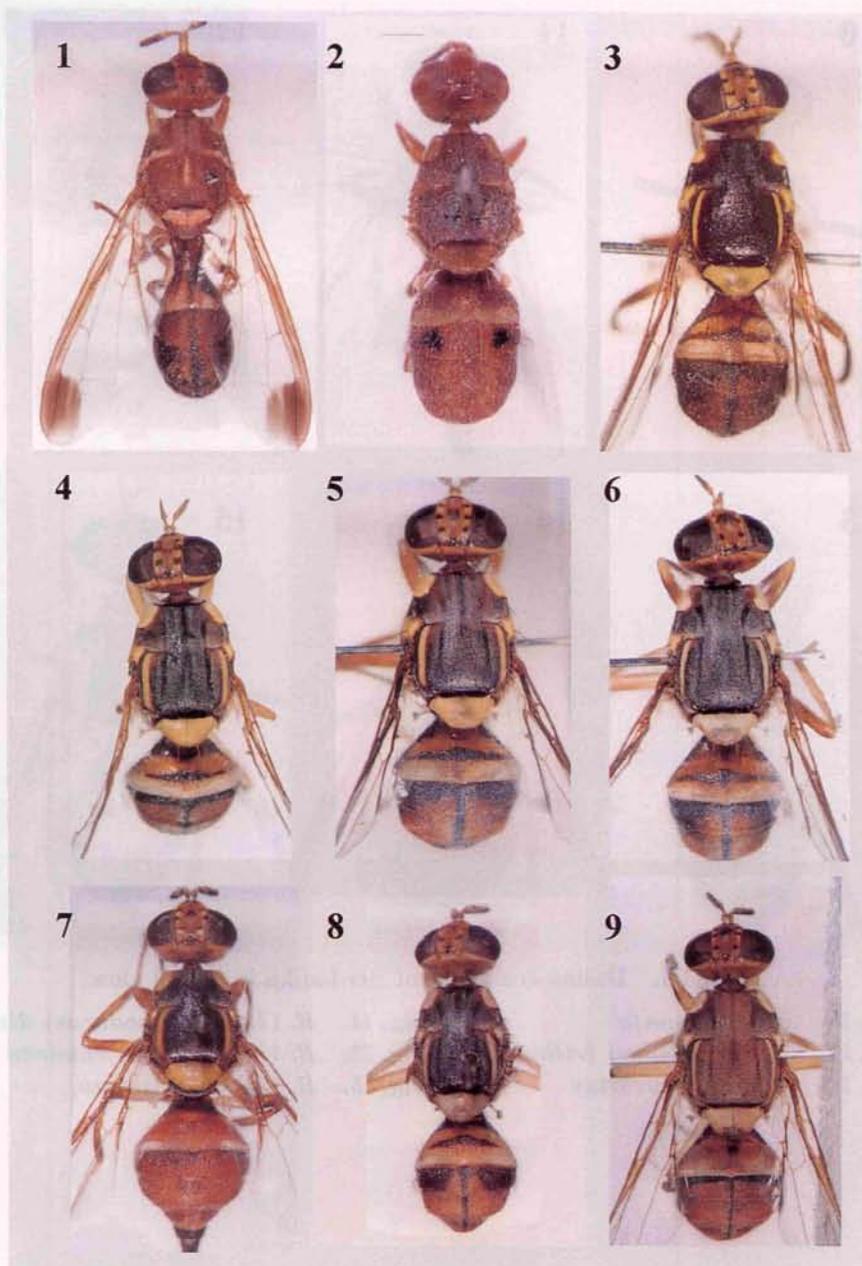


Plate II. Dacine fruit flies of Sri Lanka in dorsal view

- Fig. 1. *Dacus (Callantra) discophorus*
 Fig. 3. *Bactrocera (Bactrocera) caryeae*
 Fig. 5. *B. (B.) dorsalis*
 Fig. 7. *B. (B.) latifrons*
 Fig. 9. *B. (B.) versicolor*

- Fig. 2. *D. (Didacus) ciliatus*
 Fig. 4. *B. (B.) correcta*
 Fig. 6. *B. (B.) kandiensis*
 Fig. 8. *B. (B.) verbascifoliae*

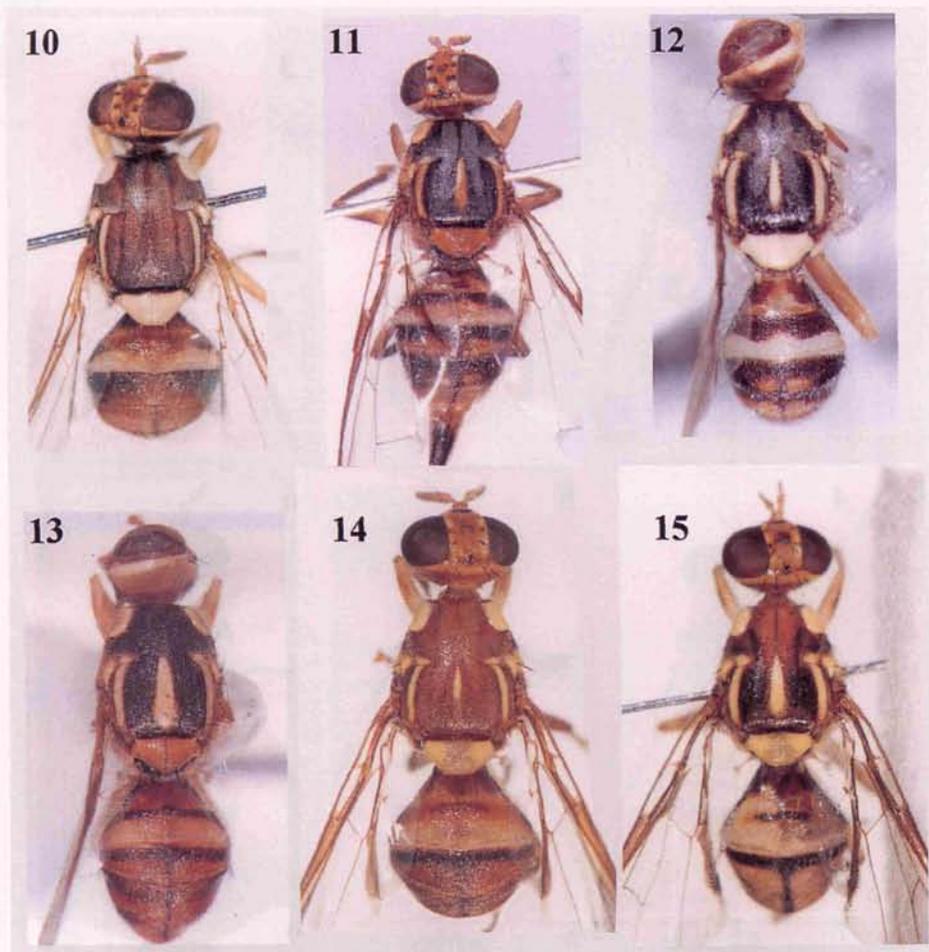


Plate III. Dasine fruit flies of Sri Lanka in dorsal view

Fig. 10. *B. (B.) zonata*

Fig. 11. *B. (Hemigymnodacus) diversa*

Fig. 12. *B. (Javadacus) trilineata*

Fig. 13. *B. (Zeugodacus) caudata*

Fig. 14. *B. (Z.) cucurbitae*

Fig. 15. *B. (Z.) sp. near tau*

和 文 摘 要

スリランカの害虫として重要なミバエ
(ハエ目; ミバエ科) の図解検索表

鶴 田 賢 治

横浜植物防疫所調査研究部

H.M.J. BANDARA, H. RAJAPAKSE, S.A.H. SUNDARAPERUMA,
S.B.M.U.C. KAHAWATTA and G.B.J.P. RAJAPAKSE

スリランカ国立植物検疫所昆虫部

現在, スリランカにはミバエ族に属する約 35 種のミバエが分布していることが判明している。これらのうち, 主として栽培植物を寄主とする種を対象として, その同定を容易にするための図解検索表を作成した。この検索表は *Bactrocera dorsalis* (ミカンコミバエ) や *B. kandiensis*, *B. cucurbitae* (ウリミバエ) のようなスリランカにおいて特に重要なミバエ 3 種の他, 栽培植物を寄主植物とする以下の 12 種を対象としている; *B.*

caryeae, *B. caudata*, *B. correcta* (セグロモモミバエ), *B. diversa*, *B. latifrons* (マレーシアミバエ), *B. trilineata*, *B. versicolor*, *B. verbascifoliae*, *B. zonata* (モモミバエ), *B. sp. near tau*, *Dacus ciliatus* (ヒメウリミバエ), *D. discophorus*。検索表の部で使用している形質以外で識別のために役立つと考えられるものについては, 本文のミバエ各種の説明に補足した。それらの形質についても確認することでより正確な同定が可能となる。