SYSTEMATIC AND DISTRIBUTIONAL NOTES ON SOME AUSTRALASIAN AND AFRICAN SPECIES OF *PLATENSINA* ENDERLEIN AND *DICHENIOTES* MUNRO (DIPTERA: TEPHRITIDAE: TEPHRITINAE), WITH DESCRIPTION OF A NEW SPECIES OF *DICHENIOTES* FROM KENYA

DAVID L. HANCOCK

8/3 McPherson Close, Edge Hill, Cairns, Qld 4870

Abstract

The tephritine genera *Platensina* Enderlein and *Dicheniotes* Munro are discussed, with several new distribution records and keys to all known species provided. The Australian *Platensina trimaculata* Hardy & Drew and SE Asian *P. quadrula* Hardy are returned to *Platensina*; the East Asian *P. assimilis* (Shiraki), comb. n. and *P. shirouzui* (Ito), comb. n. are transferred from *Bezzina* Munro; *P. voneda* (Walker) is placed as a new synonym of *P. acrostacta* (Wiedemann) and its type locality presumed to be Bengal, India; *P. fukienica* Hering is placed as a new synonym of *P. tetrica* Hering; *P. platyptera* Hendel, stat. rev. (= *P. malaita* Curran, syn. n.; = *P. dubia* Malloch, syn. n.) and *P. dilatata* Hering are removed from synonymy with *P. amplipennis* (Walker), with *P. dilatata* placed as a new synonym of *P. ampla* de Meijere; a record of '*Pliomelaena* sp. B' from Papua New Guinea and all records of *P. amplipennis* from the Australian Region are referred to *P. platyptera*. The primarily Afrotropical *Dicheniotes aeneus* (Munro), *D. alexina* (Munro), *D. asmarensis* (Munro), *D. enzoria* (Munro), *D. parviguttatus* (Hering), *D. sokotrensis* (Hering) and *D. ternarius* (Loew) are transferred as new combinations from *Pediapelta* Munro. *Dicheniotes kakamegae* sp. n. is described from western Kenya.

Introduction

Hancock (2001) placed the tephritine genus *Bezzina* Munro in the *Platensina* group of genera, within the tribe Dithrycini, subtribe Platensinina (= Oedaspidina), a distinctive assemblage of flies known to form stem galls on various species of Asteraceae, Goodeniaceae and Onagraceae. However, a molecular investigation by Han *et al.* (2010 and pers. comm.) has indicated that the type species of *Bezzina*, the Afrotropical *B. margaritifera* (Bezzi), appears to be much more closely related to *Chipingomyia manica* Hancock (provisionally referred to the *Campiglossa* group in tribe Tephritini by Hancock 2006) than to platensinines such as *Oedaspis* Loew and *Platensina* Enderlein. Accordingly, the four non-African species assigned to *Bezzina* by Hancock (2001) are currently misplaced. This error is corrected below and notes on several other *Platensina* species are included, including the removal of all current synonyms of *P. amplipennis* (Walker) to other species.

Hancock (2010) noted that all except the type species currently included in the African genus *Pediapelta* Munro (with one record from SE Queensland), in tribe Tephrellini, appeared to be better placed in *Dicheniotes* Munro, a possibility initially suggested by Munro (1947) when describing *Pediapelta*. Examination of most of the included species has supported this suggestion.

Abbreviations: AQIS - Australian Quarantine and Inspection Service, Cairns; BMNH - Natural History Museum, London; OUMNH - Oxford University Museum of Natural History, Oxford.

This paper is dedicated to the memory of Courtenay N. Smithers who, like the present writer, experienced the pleasures of working in both Africa and Australia. We both worked, at different times, on tsetse flies and plant pests for the then Rhodesian Departments of Veterinary Services (Tsetse & Trypanosomiasis Control Branch) and Research and Specialist Services (Plant Protection Research Institute) before becoming Museum curators.

Systematic and distributional notes

Tribe Dithrycini (subtribe Platensinina)

Platensina Enderlein, 1911

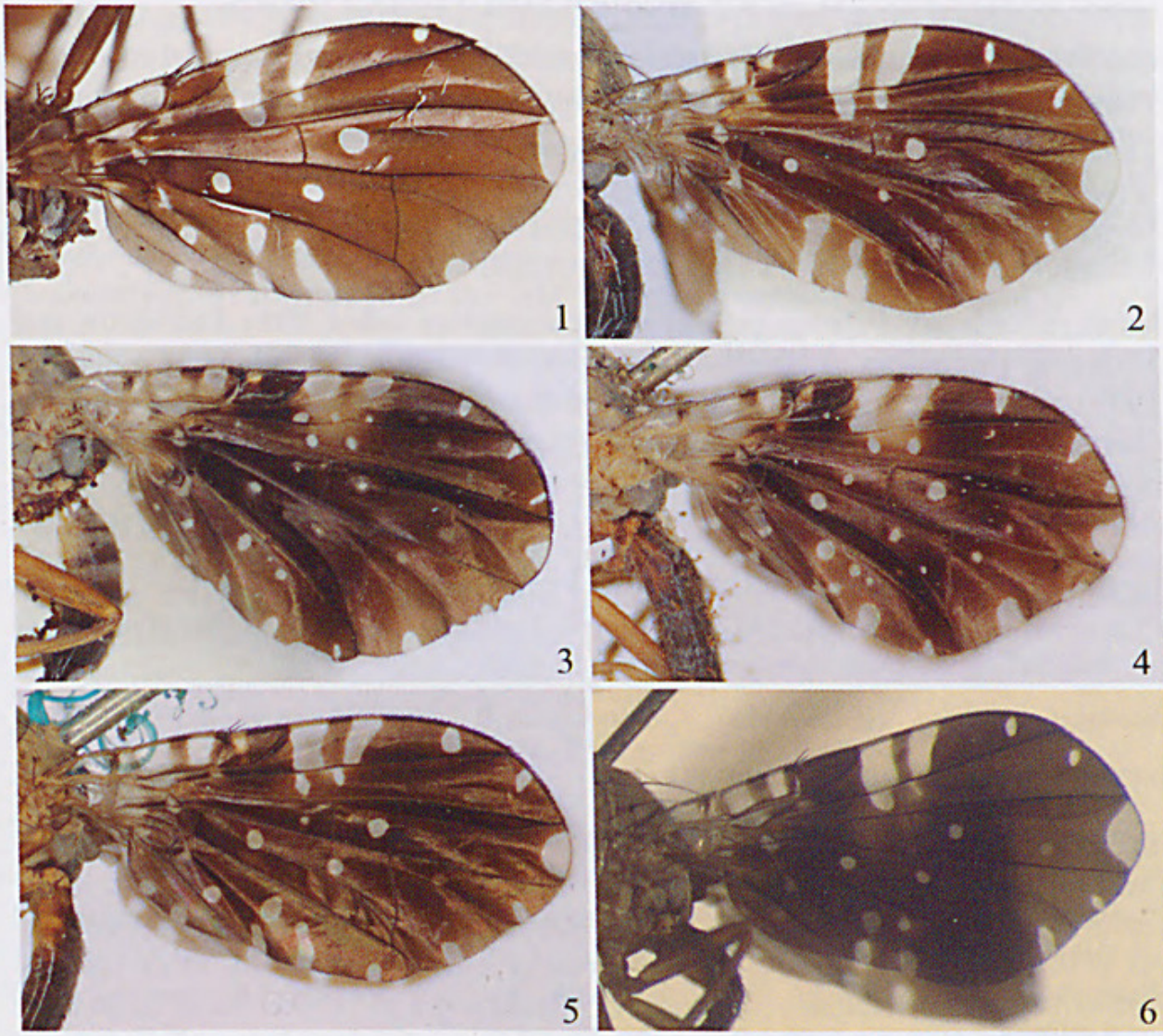
Reevaluation of the morphology and relationships of the four non-African species included in *Bezzina* by Hancock (2001) suggests that they properly belong in *Platensina*, even though their wings are not as broad as is usual in that genus. In all species the scutum is densely greyish pubescent and covered with flattened, subrecumbent, yellow-white setulae, the apical scutellar setae are about half the length of the basal pair and the hyaline indentations in wing cell m are all short, as in typical species of *Platensina*. They differ from *Collessomyia* Hardy & Drew in the frequent presence of a small, marginal hyaline indentation in cell r_{2+3} and in a non-elongate glans lacking a long, flagellum-like and microsetose apical rod. Accordingly, these four species are returned or newly transferred to *Platensina*, as *P. assimilis* (Shiraki), **comb. n.**, *P. quadrula* Hardy, **stat. rev.**, *P. shirouzui* (Ito), **comb. n.** and *P. trimaculata* Hardy & Drew, **stat. rev.** *Platensina amita* Hardy, from Luzon (Philippines), also has a relatively narrow wing and is possibly related.

Platensina fukienica Hering, described from Fujian Province, China (Hering 1939b) is treated here as a new synonym of *P. tetrica* Hering, described from Tamil Nadu, India (Hering 1939a), based on examination of a paratype female and recently collected male of *P. fukienica* from Fujian (in BMNH) in comparison with material of *P. tetrica* from West Malaysia (also in BMNH).

Trypeta voneda Walker, first placed in *Platensina* by Norrbom *et al.* (1999), is treated here as a new synonym of *P. acrostacta* (Wiedemann), based on examination of the lectotype female (Fig. 1) and a paralectotype female in BMNH. Its stated type locality of 'Bahia, Brazil' was regarded as possibly erroneous by Foote (1964) and that is certainly the case. The type labels bear the data 'Brazil, Bahia, ?Collector'. The true type locality is likely to be 'Bengal, India', which is also the type locality of *Trypeta stella* Walker, another synonym of *P. acrostacta* described at the same time (Walker 1849). The small hyaline spot near the apex of cell r_1 present in the lectotype of *P. voneda* occasionally occurs, on one or both wings, in other specimens of *P. acrostacta* from India and Sri Lanka.

Platensina dilatata Hering, *P. dubia* Malloch, *P. malaita* Curran and *P. platyptera* Hendel are removed from synonymy with *P. amplipennis* (Walker) (Fig. 2). These taxa are discussed below.

The only known host record for *Platensina* is of *P. acrostacta* from stem galls on *Ludwigia* (= *Jussiaea*) (Onagraceae) in southern India (Hardy 1973; specimens in BMNH: 2 ♀♀, Kodaguhalli [Kodihalli, Bangalore], 7.v.1963, larvae causing galls on *Jussiaea* sp.).



Figs 1-6. *Platensina* spp., wings: (1) Lectotype female of *P. voneda*, a synonym of *P. acrostacta*; (2) female of *P. amplipennis* from West Java; (3-4) *P. ampla*: (3) female from Papua New Guinea; (4) male from Solomon Islands; (5-6) *P. platyptera*: (5) male from Sarawak; (6) female from Trinity Park, Qld. Photos 1-5 by K. Goodger © Natural History Museum, London.

Platensina ampla de Meijere (Figs 3-4)

Platensina ampla de Meijere, 1914: 217. Type localities Batavia [Jakarta] and Semarang, Java, Indonesia.

Platensina dilatata Hering, 1941b: 63, fig. 11; **syn. n.** Type locality Stephansort [Bogadjim], Astrolabe Bay, Papua New Guinea.

Material examined. PAPUA NEW GUINEA: 1 ♀, Laloki, Central Province, 23.iii.1986, J.W. Ismay (BMNH). SOLOMON ISLANDS: 1 ♂, British Solomons, i.1933, R.J.A.W. Lever (BMNH).

Platensina dilatata, described from Astrolabe Bay in Papua New Guinea (Hering 1941b), is removed from synonymy with *P. amplipennis* and placed as a new synonym of *P. ampla*. This species is distinguished by the presence of two hyaline marginal indentations in cell r_{2+3} and isolation of the hyaline discal spots in that cell. Newly recorded from Solomon Islands.

Platensina amplipennis (Walker) (Fig. 2)

Trypeta amplipennis Walker, 1860: 159. Type locality Makassar, Sulawesi.

Material examined. INDONESIA (SULAWESI): Lectotype ♀, Macassar, Celebes, W.W. Saunders, B.M. 1868-4 (BMNH). INDONESIA (JAVA): 1 ♀, Preanger, Wynkoops Bay, West Java, iii.1935 (BMNH). MALAYSIA (WEST): 1 ♀, Wang Tangga, Perlis, 18.iii.1936, ex FMS Museum (BMNH).

Most records of *P. amplipennis* from countries other than Indonesia and Malaysia (including Australia) belong to *P. platyptera*; others (*e.g.* Hardy 1973) require confirmation. Length of the apical scutellar setae and wing characters, particularly the shape and orientation of the hyaline indentations in cells r_1+ r_{2+3} and m (*c.f.* Figs 2-6), separate it from similar species.

Platensina euryptera (Bezzi)

Tephritis euryptera Bezzi, 1913: 162. Type locality Tenasserim, Burma.

Platensina extincta Hering, 1952: 47, fig. 4. Type locality Wai Lekabe, Baing, east Sumba I., Indonesia. Synonymy by Hardy 1988.

Material examined. VIETNAM: 1 ♂, Indo-China, R.V. de Salvaza, 1918-1 (BMNH).

Newly recorded from Vietnam.

Platensina platyptera Hendel, **stat. rev.** (Figs 5-6)

Platensina platyptera Hendel, 1915: 461. Type locality Taihorin, Taiwan.

Platensina malaita Curran, 1936: 29, pl. 1; **syn. n.** Type locality Tai Lagoon, Malaita, Solomon Islands.

Platensina dubia Malloch, 1939: 459; **syn. n.** Type locality Gordonvale, Qld, Australia.

Platensina amplipennis: authors, *nec* Walker, 1860. Misidentifications.

Material examined. AUSTRALIA (QUEENSLAND): 1 ♀, Warnambool St, Trinity Park, Cairns, 16°48'S 145°42'E, 28.iv.2010, J. Olive (AQIS). VANUATU: 1 ♀, Nombur, Gaua, Santa Maria I., Banks Is, 15.x.1922, T.T. Barnard (BMNH); 1 ♂, native garden near Hog Harbour, Elephant I., Espiritu Santo, 0-50', 17.iv.1927, J.R. Baker & Percy Sladen (OUMNH). SOLOMON ISLANDS: 1 ♂, Solomon Is, xi.1932, R.A. Lever (BMNH); 2 ♂♂, Lingatu, Russel I., 26.viii.1936, R.A. Lever (BMNH). INDONESIA (FLORES): 1 ♂, Wae Rana, W. Flores, 26.i.1927 (BMNH). MALAYSIA (SARAWAK): 1 ♀, R. Kapah trib. of R. Tinjah, 5.x.1932, undergrowth, B.M. Hobby & A.W. Moore, Oxford Univ. Expd. (BMNH). BURMA: 1 ♀, Rangoon, 23.xii.[19]04-3.i.[19]05, Brunetti (BMNH).

Platensina platyptera, described from Taiwan (Hendel 1915), is also removed from synonymy with *P. amplipennis*, from which it differs in wing pattern characters and the shorter and weaker apical scutellar setae (about

a quarter length of basals, rather than half). *P. platyptera* closely resembles *P. zodiacalis* (Bezzi) and, like that species, is widespread; however, *P. zodiacalis* lacks apical scutellar setae.

Hardy (1954) also recorded this species from Espiritu Santo (as *P. malaita*) and Hering (1941a) previously recorded the Flores specimen. It also occurs at Tapini in Papua New Guinea (Hardy 1988, as *Pliomelaena* sp. B), Andaman Islands, India (K.J. David pers. comm., photograph examined) and Ryukyu Islands, Japan (Wang 1998, as *P. amplipennis*). Records from Thailand, Laos, Vietnam and Micronesia (Hardy 1973) probably also belong here but confirmation is required; his illustration is of *P. amplipennis*. Illustrations in Hardy and Drew (1996) are also of *P. amplipennis* and the Trinity Park female (Fig. 6) appears to be the first Australian specimen illustrated.

Platensina zodiacalis (Bezzi)

Tephritis zodiacalis Bezzi, 1913: 163. Type locality Calcutta, India.

Material examined. INDIA: 1 ♀, ex Brunetti (BMNH). NEPAL: E. shore of R. Arun below Tumlingtar, Arun Valley, c1800', 23.xii.1961, swept from *Ricinus communis* L. (BMNH). BURMA: 1 ♂, Rangoon, 23.xii.[19]04-3.i.[19]05, Brunetti (BMNH). CHINA: 1 ♂, Xishuangbanna, Yunnan, 650 m, 6.iv.1958, L.Y. Zhang & S.P. Hong (BMNH). THAILAND: 1 ♂, Sathorn Rd, [Bangkok], 26.xi.1933, W.R.S. Ladell (BMNH). SINGAPORE: 1 ♂, Singapore, H.N. Ridley, 99-126 (BMNH).

Newly recorded from Burma and Singapore.

Tribe Tephrellini

***Dicheniotes* Munro, 1938**

Examination of material in BMNH has confirmed the view that all except the type species of *Pediapelta*, the South African *Pediapelta spadicescens* Munro [3 females from Katberg examined], should be transferred to *Dicheniotes*; it differs from all other species included in *Pediapelta* by Munro (1947) and Hancock *et al.* (2003) in significant wing pattern characters (wing with base largely infuscated including middle of cell c, not with base and middle of cell c broadly hyaline; R-M crossvein aligned with middle of basal hyaline indentation across cell r_1, not between the two; the large hyaline spot in cell r_{4+5} lies on line of outer hyaline indentation across cell r_1 and before, not beyond, line of DM-Cu crossvein), head shape (lower occiput distinctly swollen) and a larger, more robust body. In addition, cell dm is with or without a subapical spot placed just beyond the line of R-M crossvein and the postpronotal lobes are dark fulvous with a fuscous tint to entirely fuscous. The affinities of *P. spadicescens* are uncertain but the dark band in cell c and the position of the hyaline spot in cell r_{4+5} suggest it belongs in tribe Tephritini; unfortunately only females have been recorded.

All other species are referable to *Dicheniotes*, considered here to comprise 19 species, including the following seven new combinations, all transferred from *Pediapelta* [all species examined]: *D. aeneus* (Munro), *D. alexina* (Munro),

D. asmarensis (Munro), *D. enzoria* (Munro), *D. parviguttatus* (Hering), *D. sokotrensis* (Hering) and *D. ternarius* (Loew). One new species is described.

The pale thoracic pubescence or 'dust' varies from fine and sparse to coarse and relatively dense; the postocular setae also vary from black to reddish-brown, yellowish or creamy-white (often mixed). In the examined material, the 'dust' appears coarsest and the postocular setae palest in *D. parviguttatus* and *D. sokotrensis*. Such variation, particularly in the colour of the postocular setae, also occurs in other tephrelline genera such as *Metasphenisca* Hendel and *Pristaciura* Hendel. *Dicheniotes dispar* (Bezzi) has been bred from flowers of *Becium obovatum* (Lamiaceae) and others found associated with, but not bred from, *Ocimum suave* (Lamiaceae) (Munro 1947).

Fig. 7. *Dicheniotes kakamegae* sp. n., wing of holotype female. Photo by K. Goodger © Natural History Museum, London.

***Dicheniotes kakamegae* sp. n.** (Fig. 7)

Type. Holotype ♀, KENYA: Kakamega Forest, 5200 feet, 20.xii.1970, A.E. Stubbs, B.M. 1972-211 (in BMNH).

Descrption. Female. Length of body (excluding oviscape) 3.0 mm, of wing 3.2 mm. Head oval, a little higher than long, largely black with face and antennae fulvous; lower occiput not distinctly swollen; frons brown, paler anteriorly; antennae shorter than face, with 3rd segment apically rounded, arista pubescent; 2 pairs orbital and 2 pairs frontal setae, all black; postocular and genal setae thin and black; ocellar setae as long as frontals; epistome slightly protruding; palpi and labellum fulvous.

Thorax shining black; scutal pubescence very fine, dark and sparse; scutum with a brownish tinge; pleura dark brown, pubescence coarser and pale

ventrally and on lower margin of katepisternum; dorsocentral setae slightly in front of line of supra-alar setae, about half way between supra-alars and suture; apical scutellar setae well developed, nearly as long as basals.

Legs fulvous except fore femora brown, mid and hind femora and basal 2/3 of hind tibiae dark brown to black; mid tibiae with an apical black spine.

Wing (Fig. 7) similar to that of *D. enzoria* but 2nd hyaline indentation in cell r_1 beyond stigma not crossing all of cell r_{2+3} and cell m with an outer hyaline spot present (*c.f. D. aeneus*); both indentations in cell cu_1 crossing cell and of approximately even width (*c.f. D. alexina*). Halteres cream-coloured; squamae with a brownish tinge.

Abdomen shining black with fine, sparse pubescence that is longer, denser and pale ventrally; tergite VI about 0.7 length of tergite V. Oviscape shining black, length 0.6 mm, about as long as tergites IV-VI combined, narrowing posteriorly; aculeus fulvous, apically acute, narrow and needle-like.

Etymology. Derived from the type locality.

Distribution. Known only from the Kakamega Forest in western Kenya.

Comments. This species resembles *D. enzoria* and, like that species, the scutum has no discernible 'dust'. It differs from *D. enzoria* in the slightly broader and less elongate wing coupled with wing pattern differences, and from both it and *D. alexina* in having 3 hyaline spots in cell m.

Key to *Platensina* species

Modified from Hardy (1973, 1974, 1988), Hardy and Drew (1996) and Wang (1998) by combination and inclusion of subsequently assigned species. An additional Asian species described by Wang (1998), plus the African species included by Munro (1947) and Norrbom *et al.* (1999), were transferred to *Pseudafreutreta* Hering (in tribe Pliomelaenini) by Hancock (2001) and Hancock *et al.* (2003) respectively.

1 Wing cell c and basal two-thirds of stigma hyaline; hyaline marginal spots (including 2 in cell m and 3 in cell cu_1) present but pale discal spots absent; head with 1-2 pairs of frontal setae; wing relatively narrow, not distinctly angled posteriorly near apex of cell cu_1 [Philippines (Luzon)] ... . *P. amita* Hardy, 1974

– Wing cell c not entirely hyaline; stigma with at most a hyaline basal spot; pale discal spots usually present; head with 3 pairs of frontal setae; wing often relatively broad and angled posteriorly near apex of cell cu_1 2

2 Wing without hyaline discal or marginal spots or indentations except for a pair of small costal spots at bases of stigma and cell r_1 adjacent to veins Sc and R_1 respectively; wing broad and almost circular beyond basal third, the apex evenly rounded and entirely dark [Philippines (Luzon)] ... . *P. bezzii* Hardy, 1974

– Wing usually with hyaline discal and submarginal spots or indentations; wing often broad but distinctly longer than wide, the apex at least slightly produced and with at least a hyaline spot at apex of cell r_{4+5} 3

3 Wing with hyaline apical spot extending across veins R_{4+5} and M; cell cu_1 with 2 elongate hyaline marginal indentations; cell r_1 without a hyaline preapical spot [Taiwan; male unknown] ..... *P. apicalis* Hendel, 1915

– Not as above; if hyaline apical spot crosses veins R_{4+5} and M and cell cu_1 with 2 elongate hyaline indentations, then apical spot extends at least halfway into cells r_{2+3} and m and cell r_1 with a hyaline preapical spot 4

4 Wing with hyaline apex a crescentic band from cell r_{2+3} to cell m, crossing apices of both veins R_{4+5} and M; cell dm without a hyaline subapical spot 5

– Wing with hyaline apex an oval or quadrate spot confined to cell r_{4+5}; cell dm normally with a hyaline subapical spot 7

5 Male wing without hyaline spots or indentations apart from a small indentation from costa in cell r_1 at apex of vein R_1 and the apical band; female wing cell r_1 with 2 elongate hyaline indentations from costa and a small preapical spot, cell dm with a hyaline basal spot, cell r_{4+5} without a basal spot and cell cu_1 with 1 or 2 small round indentations from wing margin [China (Yunnan)] ..... *P. nigripennis* Wang, 1998

– Male wing cell r_1 with 2 narrow or 1 broad hyaline indentation from costa beyond stigma and a small preapical spot, cells r_{4+5} and dm either with or without distinct basal spots and cell cu_1 with a pair of short or elongate indentations from posterior margin; female unknown 6

6 Male wing cell r_1 with 2 narrow hyaline indentations crossing vein R_{2+3} into cell r_{2+3}, cells r_{4+5} and dm each with a hyaline basal spot and cell cu_1 with a pair of elongate transverse indentations from wing margin almost reaching vein Cu_1 [NE Burma] ..... *P. alboapicalis* Hering, 1938

– Male wing cell r_1 with 1 broad hyaline indentation crossing vein R_{2+3} into cell r_{2+3}, cells r_{4+5} and dm without hyaline basal spots and cell cu_1 with a pair of small round indentations from wing margin [Australia (NE Queensland)] ..... *P. parvipuncta* Malloch, 1939

7 Wing with 2 elongate hyaline indentations from costa in cell r_1, both crossing vein R_{2+3} into cell r_{2+3}, no marginal preapical hyaline spots in cell r_{2+3}, large hyaline spots near base of cell r_{4+5} and near base and apex of cell dm, 1 marginal spot in cell m near apex of vein Cu_1, 2 indentations in cell cu_1 and 1 or 2 spots along margin of anal lobe; stigma black, without a hyaline basal spot 8

– Wing markings not as above; marginal preapical hyaline spots in cell r_{2+3} usually present; cell m usually with 2 or 3 hyaline marginal spots; stigma often with a hyaline basal spot 9

8 Male with face largely black in male, yellow in female; hyaline indentations in cell cu_1 of approximately equal length, almost crossing cell but the basal spot sometimes medially divided; basal marginal hyaline spot in anal lobe much smaller than second marginal spot or absent [India, Sri Lanka, Bangladesh, Burma, China (Yunnan), Thailand and Cambodia; *Ensina guttata* Wiedemann, 1824, *Trypeta stella* Walker, 1849 and *Trypeta voneda* Walker, 1849 are regarded as synonyms] .... *P. acrostacta* (Wiedemann, 1824)

– Male with face yellow, female unknown; basal hyaline indentation in cell cu_1 much smaller than second indentation, not almost crossing cell; the two marginal hyaline spots in anal lobe of approximately equal size [India (Maharashtra)] ..... *P. fulvifacies* Hering, 1941

9 Wing cell r_1 with a large, single hyaline indentation in basal portion that crosses vein R_{2+3} and almost all of cell r_{2+3}; cells m and cu_1 each with a single marginal indentation, that in cell cu_1 crossing cell [Philippines (Luzon)] ..... *P. aptata* Hardy, 1974

– Wing cell r_1 with no or 2 hyaline indentations in basal portion, the outer sometimes reduced to a rounded spot or largely united with the basal one; cells m and cu_1 not both with a single marginal indentation 10

10 Wing cell r_{2+3} with 2 hyaline marginal indentations from costa; cell r_1 with indentations in basal portion often medially constricted or reduced to marginal spots and spots in cell r_{2+3} below them isolated [Indonesia (Java, Ambon), Papua New Guinea and Solomon Islands; *P. dilatata* Hering, 1941 is regarded as a new synonym] ..... *P. ampla* de Meijere, 1914

– Wing cell r_{2+3} with at most a single hyaline marginal indentation from costa; cell r_1 with indentations in basal portion distinct and crossing cell, reduced to isolated costal spots or absent 11

11 Two scutellar setae, the apical pair absent [India (Bihar, Karnataka, West Bengal: type locality), Nepal, Sri Lanka, Bangladesh, Burma. China (Yunnan, Guangdong, Hainan), Thailand, Laos, Cambodia, Philippines (Luzon, Mindoro), West Malaysia, Singapore, Indonesia (Java, Maluku) and Australia (NT, Qld)] ..... *P. zodiacalis* (Bezzi, 1913)

– Four scutellar setae, the apical pair distinct 12

12 Wing relatively broad, distinctly angled posteriorly near apex of cell cu_1; cell m with at most 2 hyaline marginal indentations 13

– Wing relatively narrow, evenly rounded posteriorly and not distinctly angled near apex of cell cu_1; cell m with 2 or 3 hyaline marginal indentations 18

13 Wing cell r_{4+5} with a very small hyaline spot at apex [Indonesia (Java, Sumba); type species of *Platensina*] ..... *P. sumbana* Enderlein, 1911

– Wing cell r_{4+5} with a broad or elongate hyaline spot at apex, crossing all or most of cell 14

14 Wing often without hyaline spots except along margin, the discal area at most with hyaline spots in cells dm and base of r_{4+5} beyond R-M crossvein; second hyaline indentation in basal portion of cell r_1 narrow and often united with basal one, leaving an isolated dark costal spot; anal lobe brown, the hyaline marginal spots absent or vestigial [S Burma, Thailand, Vietnam, Indonesia (Sumba); *P. extincta* Hering, 1952 is regarded as a synonym] ..... *P. euryptera* (Bezzi, 1913)

– Wing usually with distinct hyaline or subhyaline spots, at least in cells dm and base of r_{4+5}; hyaline indentations in basal portion of cell r_1 distinct, reduced or absent; anal lobe with hyaline marginal spots usually distinct 15

15 Wing with discal spots often subhyaline; cell r_1 with 0-2 small hyaline indentations from costa in basal portion beyond stigma, often neither partly fused nor crossing cell (especially in males); cell cu_1 with 3 small, isolated, hyaline marginal spots and with or without additional small, isolated discal spots [India (Tamil Nadu), China (Guangxi, Fujian), Taiwan, Vietnam and West Malaysia; *P. fukienica* Hering, 1939 is regarded as a new synonym] ..... *P. tetrica* Hering, 1939

– Wing with distinct discal hyaline spots; hyaline indentations in basal portion of cell r_1 with at least the inner one broad and crossing cell in both sexes; cell cu_1 with 2 or 3 hyaline indentations, the basal pair normally elongate but often medially divided into 2 separate spots 16

16 Wing cell m with at most 1 small hyaline marginal spot; cell cu_1 with 2 undivided indentations almost crossing cell [Thailand, Cambodia and Vietnam] ... . *P. intacta* Hardy, 1973

– Wing cell m with 2 hyaline marginal spots; cell cu_1 with 2 or 3 hyaline marginal spots, the basal pair short or divided into separate spots, the outer spot often reduced or absent 17

17 Basal hyaline indentations in wing cells r_1 and r_{2+3} more or less convergent, those in r_{2+3} aligned with those in r_1; hyaline apical spot relatively narrow and filling entire apex of cell r_{4+5}; basal hyaline indentation in cell m narrow, elongate and perpendicular; anal lobe with hyaline marginal spots vestigial or absent; apical scutellar setae distinct, about half length of basals [?S Thailand, West Malaysia, ?Singapore and Indonesia (Java, Sulawesi)] ..... *P. amplipennis* (Walker, 1860)

– Basal hyaline indentations in wing cells r_1 and r_{2+3} more or less parallel, those in r_{2+3} small and off centre with those in r_1; hyaline apical spot relatively broad and not filling entire apex of cell r_{4+5}; basal hyaline indentation in cell m often short and broad; anal lobe with hyaline

marginal spots round and distinct; apical scutellar setae weak, about a quarter length of basals [India (Utranchal, Andaman Is), Burma, Japan (Ryukyu Is), Taiwan, Northern Marianas, Guam, Micronesia, ?Thailand, ?Laos, ?Vietnam, Malaysia (Sarawak), Indonesia (Flores), Papua New Guinea (Admiralty Is, Central Province), Solomon Is (Malaita, Russel), Vanuatu (Espiritu Santo, Banks) and Australia (Queensland); *P. malaita* Curran, 1936 and *P. dubia* Malloch, 1939 are regarded as synonyms] ... . *P. platyptera* Hendel, 1915, **stat. rev.**

18 Wing cells m and cu_1 each with 3 hyaline indentations from margin, those in cell cu_1 all small and isolated 19

– Wing cell m with 2 and cell cu_1 with 2 or 3 hyaline indentations from margin, often with at least one of those in cell cu_1 elongate and crossing most of cell 20

19 Wing cell dm with 3 rounded hyaline spots; cell m with 2 hyaline spots in anterobasal half [Australia (NE Queensland)] .... *P. trimaculata* Hardy & Drew, 1996

– Wing cell dm with 2 rounded hyaline spots; cell m with 1 hyaline spot in anterobasal half [Japan (Ryukyu Is), Taiwan and China (Sichuan, Guangxi)] ..... *P. assimilis* (Shiraki, 1968), **comb. n.**

20 Wing cell cu_1 with 3 hyaline indentations from margin, with at least the basal pair broad and crossing cell; anal cell with a transverse hyaline indentation crossing vein Cu_2+A_1 into cell cu_1; face with silvery spots in male [India, Thailand, Cambodia, Vietnam] ..... *P. quadrula* Hardy, 1973

– Wing cell cu_1 with 2 or 3 narrow hyaline indentations from margin, the basal pair constricted or divided into two separate spots; anal cell with only small, round marginal hyaline spots; face without silvery spots [Japan (Ryukyu Is) and China (Sichuan); a male from Indonesia (West Papua), illustrated by Hardy (1988) as *Pliomelaena* sp. A, is possibly this species] ..... *P. shirouzui* (Ito, 1984), **comb. n.**

Key to *Dicheniotes* species

Modified from Munro (1947) by inclusion of subsequently described or assigned species. * = new country records based on material in BMNH.

1 Stigma with a subhyaline basal spot from costa; apex of cell r_{2+3} with a hyaline spot near tip of vein R_{2+3}; outer of 3 hyaline indentations in cell m reduced to an isolated, rounded, submarginal spot; postocular setae largely white 2

– Stigma without a subhyaline spot from costa; apex of cell r_{2+3} with or without a hyaline spot near tip of vein R_{2+3}; outer of 3 hyaline indentations in cell m, when present, often elongate and crossing most of cell; postocular setae pale or dark 4

2 Wing cell m with middle marginal spot large and quadrate; cell cu_1 with 2 hyaline spots, the basal spot large and quadrate; cell r_1 without an additional subapical spot crossing cell; submarginal spot in cell r_{2+3} large and situated just below tip of vein R_{2+3}; female oviscape as long as abdomen [Kenya] ..... *D. polyspilus* (Bezzi, 1924)

– Wing cell m with middle marginal spot small and round; cell cu_1 with 3 hyaline spots, the basal spot divided into two; cell r_1 with an additional subapical spot crossing cell; submarginal spot in cell r_{2+3} small and situated nearer midline of cell; female oviscape much shorter than abdomen 3

3 Wing cell r_1 with inner hyaline indentation narrow and strap-like and the middle indentation small and confined to costal margin [Ethiopia] .... *D. parviguttatus* (Hering, 1952), **comb. n.**

– Wing cell r_1 with inner hyaline indentation broad and subquadrate and the middle indentation large and quadrate [Kenya, Tanzania, Saudi Arabia and Yemen] ..... *D. multipunctatus* Merz & Dawah, 2005

4 Wing cell m with 2 large hyaline spots, the inner one marginal, the outer submarginal; cell r_{2+3} with 2 small hyaline spots near tip of vein R_{2+3}; postocular setae largely white [Sokotra] .... *D. sokotrensis* (Hering, 1939), **comb. n.**

– Wing cell m mostly brown or with 2 or 3 hyaline indentations, the outer often reduced to a small, rounded spot, if 2 then both are marginal and cell r_{2+3} without a small hyaline spot near tip of vein R_{2+3}; postocular setae pale or dark 5

5 Wing cell r_{2+3} with a round, hyaline spot near the tip of vein R_{2+3} that does not reach the wing margin; cell m with 3 hyaline indentations from wing margin, the outer one often reduced to a small spot; cell dm with a pair of isolated and well separated hyaline spots 6

– Not as above; wing cell r_{2+3} without a round, hyaline spot near the tip of vein R_{2+3}; cell m usually with at most 2 hyaline indentations from wing margin; cell dm sometimes without a pair of isolated hyaline spots 9

6 Outer hyaline indentation from costa in cell r_1 confined to that cell, not crossing vein R_{2+3} [Sudan, Saudi Arabia and Yemen] .... *D. angulicornis* (Hendel, 1931)

– Outer hyaline indentation from costa in cell r_1 crossing vein R_{2+3} at least half way into cell r_{2+3} 7

7 Outer hyaline indentation in cell m elongate and crossing most of cell [Uganda] ..... *D. acclivis* Munro, 1947

– Outer hyaline indentation in cell m no more than a small, rounded, marginal or submarginal spot 8

8 Labellum greatly enlarged; wing cell r_{2+3} with a hyaline basal spot near base of stigma; femora blackened [Uganda and Kenya] .... *D. turgens* Munro, 1947

– Labellum not greatly enlarged; wing cell r_{2+3} without a hyaline spot near base of stigma; fore femur often fulvous, others black [Kenya and Tanzania] ..... *D. aeneus* (Munro, 1947), **comb. n.**

9 Wing cell m with 3 elongate hyaline indentations, the outer 2 both crossing vein M into and across cell r_{4+5} [Eritrea] .... *D. asmarensis* (Munro, 1955), **comb. n.**

– Wing cell m with at most 2 elongate hyaline indentations (sometimes mostly brown) and with or without a small outer spot 10

10 Femora fulvous; wing cell m with outer hyaline indentation broadly crossing vein M into cell r_{4+5} to or almost to vein R_{4+5}; cell cu_1 with 2 hyaline indentations 11

– Femora largely black; wing cell m with outer hyaline indentation often confined to cell, if crossing vein M into cell r_{4+5} then cell cu_1 with a single broad hyaline indentation 13

11 Wing cell dm without a pair of hyaline spots [Kenya] .... *D. sexfissatus* (Becker, 1909)

– Wing cell dm with a pair of hyaline spots 12

12 Wing cell dm with a pair of isolated and well separated hyaline spots [Tanzania, Zimbabwe and South Africa; records from Namibia are errors (Hancock 2000); *Brachyaciura discoguttata* Hering, 1941 is regarded as a synonym] ..... *D. distigma* (Bezzi, 1924)

– Wing cell dm with a pair of large hyaline spots united with the indentations in cell cu_1 [Democratic Republic of Congo, Uganda, Kenya and Tanzania] ..... *D. erosa* (Bezzi, 1924)

13 Sexes distinctly dimorphic; wing largely brown with diffuse longitudinal pale streaks and patches (some males) or cell r_1 with 1 broad or 2 transverse hyaline indentations from costa, cell cu_1 with a single, broad hyaline indentation extending broadly into cell dm in females, not in males; cell m with 2 hyaline indentations, the outer one crossing vein M into cell r_{4+5} and cell dm without a pair of isolated hyaline spots 14

– Sexes not distinctly dimorphic; wing cell r_1 with 2 narrow hyaline indentations from costa; cell cu_1 with 2 narrow hyaline indentations not extending into cell dm; cell m with 2 narrow hyaline indentations and at most a small outer spot, none crossing vein M into cell r_{4+5}; cell dm with a pair of well separated hyaline spots 15

14 Wing cell m almost entirely filled (including apex at tip of vein M) by 2 broad hyaline indentations separated by at most a dark transverse band; the 2 hyaline indentations from costa in cells r_1 and r_{2+3} combined into a single broad band in males, separated in females [South Africa; type species of *Dicheniotes*] ..... *D. dispar* (Bezzi, 1924)

– Wing cell m largely brown with at most a pale anterobasal streak and a diffuse posterobasal spot and cell cu_1 with hyaline indentation divided into 2 separate spots (males), or with the outer of the 2 hyaline indentations in cell m narrow and not almost filling apex of cell (females) [Eritrea and Ethiopia (2♂♂, 3♀♀, Simien, ravine on W side of Mai Shaba valley, 9000', 14.xii.1952, H. Scott*)] ..... *D. tephronotus* (Bezzi, 1908)

15 Wing cell m with inner indentation more or less parallel with DM-Cu crossvein and with a small rounded outer spot in addition to basal and medial indentations [Kenya, Tanzania, Yemen (2♂♂, Wadi Doreija, W of Dhala, 4500', xi.1937*) and South Africa] ..... *D. katonae* (Bezzi, 1924)

– Wing cell m with inner indentation oblique, converging with DM-Cu crossvein anteriorly and meeting wing margin posteriorly beyond apex of vein Cu_1 and with or without a small rounded outer spot 16

16 Wing cell m with 3 hyaline indentations, the outer spot present [Kenya] ... . *D. kakamegae* **sp. n.**

– Wing cell m with only 2 hyaline indentations, the outer spot absent 17

17 Wing cell r_1 with the outer hyaline indentation not crossing vein R_{2+3} into cell r_{2+3} [Kenya, Zimbabwe and South Africa; one record from Australia (SE Queensland), presumably introduced (Hancock and Drew 2003)] ... . *D. ternarius* (Loew, 1861), **comb. n.**

– Wing cell r_1 with the outer hyaline indentation crossing vein R_{2+3} into cell r_{2+3} 18

18 Wing with line of DM-Cu crossvein meeting costa on the outer hyaline indentation in cell r_1 or close to its outer margin; squamae with a brown to blackish tinge [Uganda] ..... *D. enzoria* (Munro, 1947), **comb. n.**

– Wing with line of DM-Cu crossvein meeting costa well beyond the outer hyaline indentation in cell r_1, at least its width away; squamae yellow; a row of 3 hyaline discal spots in cells r_{2+3} and r_{4+5} present or absent [Zimbabwe and South Africa (1♂, Eshowe, KwaZulu-Natal, vi.1926, R.E. Turner*)] ..... *D. alexina* (Munro, 1947), **comb. n.**

Acknowledgements

I thank Sally Cowan (AQIS), Kim Goodger and Nigel Wyatt (BMNH) and Zoë Simmons and James Hogan (OUMNH) for the loan of or access to specimens in their care, Kim Goodger (BMNH) for Figs 1-5 & 7, K.J. David (National Bureau of Agriculturally Important Insects, India) for photographs

and new records of *P. platyptera* and *P. quadrula* from India, Anthony Rice (AQIS, Cairns) for assistance with producing Fig. 6 and Albert Orr for helpful discussions on nomenclature.

References

BEZZI, M. 1913. Indian trypaneids (fruit-flies) in the collection of the Indian Museum, Calcutta. *Memoirs of the Indian Museum* **3**: 53-175, pls 8-10.

CURRAN, C.H. 1936. The Templeton Crocker expedition in the western Polynesian and Melanesian islands, 1933. No. 30. *Proceedings of the California Academy of Sciences* (4) **22**: 1-67.

de MEIJERE, J.C.H. 1914. Studien über südostasiatische Diptern IX [concl.]. *Tijdschrift voor Entomologie* **57**: 169-275.

FOOTE, R.H. 1964. Notes on the Walker types of New World Tephritidae (Diptera). *Journal of the Kansas Entomological Society* **4**: 316-326.

HAN, H.-Y., RO, K.-E. and FREIDBERG, A. 2010. Phylogeny and classification of the Tephrellini (Diptera: Tephritidae: Tephritinae). P. 105, in: *7th International Congress of Dipterology, San José, Costa Rica. Abstracts Volume*: 296 pp.

HANCOCK, D.L. 2000. Tephritidae (Diptera: Tephritoidea). Pp 239-248, in: Kirk-Spriggs, A.H. and Marais, E. (eds), Dâures – biodiversity of the Brandberg Massif, Namibia. *Cimbebasia Memoir* **9**. National Museum of Namibia, Windhoek; iv + 389 pp.

HANCOCK, D.L. 2001. Systematic notes on the genera of Australian and some non-Australian Tephritinae (Diptera: Tephritidae). *Australian Entomologist* **28**(4): 111-116.

HANCOCK, D.L. 2006. Taxonomic updates in some genera and species of Afrotropical Tephritinae (Diptera: Tephritidae). *African Entomology* **14**(2): 391-394.

HANCOCK, D.L. 2010. A review of the fruit fly tribe Tephrellini (Diptera: Tephritidae: Tephritinae) in the Indo-Australian Region. *Australian Entomologist* **37**(1): 1-6.

HANCOCK, D.L. and DREW, R.A.I. 2003. A new genus and new species, combinations and records of Tephritinae (Diptera: Tephritidae) from Australia, New Zealand and the South Pacific. *Australian Entomologist* **30**(4): 141-158.

HANCOCK, D.L., KIRK-SPRIGGS, A.H. and MARAIS, E. 2003. New records of Namibian Tephritidae (Diptera: Schizophora), with notes on the classification of subfamily Tephritinae. *Cimbebasia* **18**: 49-70.

HARDY, D.E. 1954. Notes and descriptions on Australian fruit flies (Diptera: Tephritidae). *Proceedings of the Hawaiian Entomological Society* **15**(2): 327-333.

HARDY, D.E. 1973. The fruit flies (Tephritidae–Diptera) of Thailand and bordering countries. *Pacific Insects Monograph* **31**: 1-353, pls 1-8.

HARDY, D.E. 1974. The fruit flies of the Philippines (Diptera: Tephritidae). *Pacific Insects Monograph* **32**: 1-266, pls 1-6.

HARDY, D.E. 1988. The Tephritinae of Indonesia, New Guinea, the Bismarck and Solomon Islands (Diptera: Tephritidae). *Bishop Museum Bulletin in Entomology* **1**: vii + 1-92.

HARDY, D. E. and DREW, R.A.I. 1996. Revision of the Australian Tephritini (Diptera: Tephritidae). *Invertebrate Taxonomy* **10**(2): 213-405.

HENDEL, F. 1915. H. Sauter's Formosa-Ausbeute. Tephritinae. *Annales Musei Nationalis Hungarici* **13**: 424-467, pls viii-ix.

HERING, E.M. 1939a. Neue Trypetiden der Erde. *Verhandlungen Siebenter Internationale Kongress für Entomologie* (1938) (7) **1**: 165-190.

HERING, E.M. 1939b. Vier neue Bohrfliegen von Fukien (Dipt. Trypet.). *Decheniana* **98**(B): 143-147.

HERING, E.M. 1941a. Dipteren von den Kleinen Sunda-Inseln. *Arbeiten über Morphologische und Taxonomische Entomologie aus Berlin-Dahlem* **8**(1): 24-45.

HERING, E.M. 1941b. Fruchtfliegen von Neu-Guinea (Dipt.) II. *Annales Musei Nationalis Hungarici Pars Zoologica* **37**: 54-65.

HERING, E.M. 1952. Trypetidae (Dipt.) von Sumba und Flores. *Verhandlungen der Naturforschenden Gesellschaft in Basel* **63**: 41-48.

MALLOCH, J.R. 1939. The Diptera of the territory of New Guinea. XI. Family Trypetidae. *Proceedings of the Linnean Society of New South Wales* **64**(3-4): 409-465, pl. xi.

MUNRO, H.K. 1947. African Trypetidae (Diptera). A review of the transition genera between Tephritinae and Trypetinae, with a preliminary study of the male terminalia. *Memoirs of the Entomological Society of Southern Africa* **1**: i-vii + 1-284 + 16 pp figs.

NORRBOM, A.L., CARROLL, L.E., THOMPSON, F.C., WHITE, I.M. and FREIDBERG, A. 1999. Systematic database of names. Pp 65-251, in: Thompson, F.C. (ed.), Fruit fly expert identification system and systematic information database. *Myia* **9**: ix + 524 pp.

WALKER, F.M. 1849. *List of the specimens of the dipterous insects in the collection of the British Museum*. Volume 4, pp 1005-1042.

WALKER, F.M. 1860. Catalogue of the dipterous insects collected at Makessar in Celebes, by Mr. A.R. Wallace, with descriptions of new species [concl.]. *Journal of the Proceedings of the Linnean Society of London, Zoology* (1861) **4**: 145-172.

WANG, X.-J. 1998. The fruit flies (Diptera: Tephritidae) of the East Asia Region. *Acta Zootaxonomica Sinica* **21**(Supplement): viii + 338 pp + 268 figs + 41 pls.