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Signal Flies of the Genus *Duomyia* (Diptera: Platystomatidae) in the Northern Territory, Australia

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Abstract. A key is given to the species of *Duomyia* Walker, 1849, (approximately 26) recognized in the Northern Territory of Australia. The following new species are described: *D. nodosa*, *D. rapida*, *D. grahami*, *D. tricurva*, *D. bucina*, *D. recta*, *D. prensans*, *D. praeflava*, *D. korneyevi*, *D. lana*, *D. collessi*, *D. maceveyi*, *D. whittingtoni*. *Duomyia sericea* Hendel and *D. serra* McAlpine are newly recorded for the Northern Territory; *D. foliata* McAlpine is newly recorded for New South Wales; *D. tomentosa* Hendel is newly recorded for Western Australia; and *D. eremia* McAlpine is newly recorded for South Australia. The question of possible recent extinction of *D. irregularis* Malloch is raised, and the urgent need to establish the population status of other rarely seen species is mentioned.

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Nine of the 26 recorded Australian genera of Platystomatidae, or signal flies, are known in the Northern Territory, viz. *Achias*, *Aetha*, *Duomyia*, *Elassogaster*, *Euprosopia*, *Lamprogaster*, *Plagiostenopterina*, *Rhytidortalis*, and *Rivellia* (see McAlpine, 2001, for key to genera). This compares with 25 genera living in Queensland, and illustrates the decline in wet forest taxonomic diversity, as one proceeds from east to west in the Australian tropics, and a degree of isolation of the NT seasonally wet zone from that of the eastern Australian tropics.

The endemic Australian platystomatid genus *Duomyia* includes 70 previously described species (see McAlpine, 1973, 2001, 2011), but study of collections indicates that over 110 species exist. About 26 species are here recognized for the NT, of which 13 appear to be endemic to the Territory. Several apparent species, represented by material that is inadequate for precise characterization, are assigned provisional numbers.

The larger number of *Duomyia* species in the NT compared with that in other NT platystomatid genera correlates with the ability of numerous *Duomyia* species to survive in relatively dry climates. By contrast, the genus *Euprosopia* has only two species in the NT, compared with at least 29 species in the Queensland tropics (some undescribed).

Duomyia irregularis Malloch, from vicinity of Darwin, has apparently not been collected for more than 100 years (see p. 147). As it is a small, inconspicuous insect and recent collecting in the area has not been thorough, I do not regard this as firm evidence of extinction. The following species have each been collected on only one occasion: *Duomyia rapida* n.sp., *D. bucina* n.sp., *D. prensans* n.sp., *D. lana* n.sp.; also, some other species are known from very few specimens. Investigation of the population status of these insects by locally resident entomologists is needed.

A summary of general information on the genus *Duomyia*, including generic synonymy and a little information on habits and ecology, was previously given (McAlpine, 2001). A key to species was given by McAlpine (1973, supplemented by McAlpine, 2011).

The division of such a large genus as *Duomyia* into subgenera or species groups seems desirable, but this desideratum has not yet proved attainable. Although there are some small groups of evidently related species, many other species do not readily fit into groups or are intermediate between such groups. Malloch (1929) proposed the subgenus *Duomyza* for *D. tomentosa* Hendel. Some species are closely

related to *D. tomentosa*, but a range of species shows a gradation in character states and combinations, and some species sharing with that species the possession of minor scutellar setulae are probably not close phylogenetically. Also, the presence of spinescent posteroventral bristles on the fore femur cannot be used to define a natural group within the genus, although Enderlein (1924) proposed the genus *Helocnemia* for one such species [*Duomyia apicalis* (Walker) of Western Australia].

In this paper I recognize the informal *tomentosa* alliance, indicated below in the key to species, but less well defined outside the NT; also the *grahami* alliance, apparently endemic to the NT, including *D. grahami*, *D. tricurva*, *D. bucina*, and *D. recta*; and I have previously recognized the *ameniina* alliance (McAlpine, 2011), of which *D. ameniina* and *D. rugula* live in the NT. A less well defined *spinifemorata* alliance is discussed under *D. spinifemorata*.

Terminology and abbreviations

Descriptive terminology is that used in my previous papers (McAlpine, 1973, 2011). Terminology for parts of the aedeagus is shown in Figs 10, 22. The following abbreviations refer to institutions housing specimens:

AM	Australian Museum, Sydney
ANIC	Australian National Insect Collection, CSIRO, Canberra
BM	The Natural History Museum, London
DEI	Deutsches Entomologisches Institut, Müncheberg
NTM	Northern Territory Museum, Darwin
QM	Queensland Museum, South Brisbane. Insect collection formerly at University of Queensland
SAM	South Australian Museum, Adelaide

In my text the abbreviation NT refers to the Northern Territory of Australia. The following collectors' names are abbreviated to the initials: T.L. Bancroft, G.R. Brown, G. Cassis, D.H. Colless, A. Daniels, G. Daniels, D.E. Havenstein, K. Hill, P. Horne, M. Humphrey, K.A. Kopestonsky, Z.R. Liepa, D. Marshall, D.K. McAlpine, B.J. Moulds, M.S. Moulds, C. Owen, H. Pelz, N.B. Tindale, M.S. Upton, J.L. Wassell.

Seasonal occurrence of adults

Although collecting activity for platystomatids has not been consistent enough to establish precisely the months of adult activity for individual species, there is some evidence for seasonal difference in activity among the species living in the seasonally wet north of the Northern Territory. The field work of D. H. Colless, centred around November 1972, produced series of the following species which have not been collected at other times of the year: *Duomyia collessi*, *D. lana*, and *D. praeflava*. In February–March 1996 G. R. Brown and the author obtained 2 or more specimens of *D. grahami*, *D. tricurva*, and *D. whittingtoni*. *Duomyia spinifemorata* is known from material collected in late December to February. These last four species are not recorded for as early as November. *Duomyia korneyevi* was collected by D.H.C. in both November 1972 and March 1973. *Duomyia sericea* has been collected in the area during January, February, April, June, and August, and in Lawn Hill National Park, Queensland, near the border with Northern Territory, in May. Thus it appears that *D. korneyevi* may have two broods and *D. sericea* a greater number during the year. Several other species have been collected on only one or two occasions, but their dates are inadequate for any conclusions regarding seasonal occurrence.

Key to species of *Duomyia* of Northern Territory

1	Scutellum extensively setulose dorsally, with two pairs of marginal bristles ..... [*tomentosa* alliance]	2
——	Scutellum without dorsal setulae, with three or more pairs of marginal bristles	10
2	Humeral callus entirely pale-pruinescent; scutellum tawny, at least in part, with pale pruinescence dorsally	3
——	Humeral callus shining black, without obvious pale pruinescence; scutellum black to brown, without pale pruinescence dorsally	7
3	Fore and hind femora with some black dorsal bristles; scutellum with some black dorsal setulae in addition to yellow ones	sp. 44 (p. 128)
——	Fore and hind femora with all dorsal bristles pale; scutellum with all setulae pale	4
4	Fore femur with at least two black, stout posteroventral spines; male: hind basitarsus with large posterodorsal terminal gibbosity	sp. 43 (p. 125)

—— Fore femur usually without black posteroventral spines, with pale posteroventral bristles and setulae only; male: hind basitarsus variable (females not easily specifically identifiable) 5

5 Male: hind tibia without dorsal gibbosity visible in anterior view; glans of aedeagus basally strongly narrowed and curved, without sub-basal spine or tubercle; each terminal filament with subterminal lobe (Fig. 4) ..... *foliata* (p. 128)

—— Male: hind tibia with conspicuous dorsal gibbosity or tubercle; glans not much curved basally, with sub-basal spine or tubercle; terminal filament without subterminal lobe 6

6 Male: hind basitarsus with large posterodorsal terminal gibbosity, thus very asymmetrical; hind tibia with moderate dorsal gibbosity, slightly keeled at summit and with posterodistal concavity (Fig. 6); habitat in NT mainly S of 17°S ..... *nodosa* (p. 127)

—— Male: hind basitarsus without posterodorsal gibbosity, only slightly asymmetrical; hind tibia with large gibbosity surmounted by compact rounded tubercle (Fig. 7); habitat in NT mainly N of 17°S ..... *tomentosa* (p. 128)

7 Fore femur with several large black posteroventral spines; hind femur distally with short black anteroventral spinescent bristles ..... *rapida* (p. 129)

—— Fore femur without black posteroventral spines; hind femur without anteroventral bristles 8

8 Abdominal tergites 3 and 4 black, each with large, whitish-pruinescent zone on lateral margin (zone also white-haired); mesoscutal transverse suture of each side connected across median line by deep groove, apparent in profile; parafacial neither rugose nor with setiferous pits; male: glans of aedeagus very short, ovoid; membranous bulb much longer than glans; each terminal filament little longer than bulb ..... *sericea* (p. 130)

—— Abdominal tergites 3 and 4 brown to blackish, without whitish-pruinescent lateral zones (sometimes with longer whitish lateral hairs or macrotrichia); mesoscutum without transverse groove crossing median line; parafacial either rugose or with setiferous pits; male: aedeagus not as above 9

9 Parafacial quite without setiferous pits; first basal cell bare on c. basal half or more; male: aedeagus with membranous caeca vestigial and terminal filaments little longer than glans (Fig. 9) ..... *eremia* (p. 130)

—— Parafacial with numerous setiferous pits, at least on upper part; first basal cell microtrichose on almost whole length; male: aedeagus with much longer membranous caeca and terminal filaments ..... *marginalis–chaetostigma* alliance (p. 131)

10 Much of thorax, including entire mesoscutum and scutellum, with tawny ground colour; mesoscutum entirely densely pruinescent on otherwise smooth cuticle ..... [*grahami* alliance] 11

—— Thorax with black ground colour, sometimes with greenish or bluish reflections; mesoscutum with very little pruinescence except near lateral margins 14

11 Hind femur straight, in anterior view with both dorsal and ventral outlines similarly slightly convex; male: terminal filament of aedeagus at least slightly shorter than glans 12

—— Hind femur strongly (male) or slightly (female) curved, the ventral outline in anterior view at least slightly concave in contrast to the dorsal outline; male: terminal filament of aedeagus at least slightly longer than glans 13

12 Mesopleuron, sternopleuron, and pteropleuron each with diffuse dark brown spot; wing with apical brownish suffusion very slightly developed, not extending near discal crossvein; male: hind trochanter with slight ventral gibbosity bearing very small brush of yellow setulae; preglans of aedeagus expanding distally, somewhat trumpet-like; each terminal filament only slightly shorter than glans ..... *bucina* (p. 134)

—— Thoracic pleura without dark marks; wing, in mature specimens, with indistinct brownish distal zone extending to discal crossvein; male: hind trochanter without trace of ventral gibbosity and brush; preglans slender, not expanding distally; each terminal filament not more than 0.75 of length of glans ..... *recta* (p. 134)

13 Abdominal tergite 5 with tawny posterior zone; second basal cell almost entirely microtrichose; indistinct apical brownish wing cloud very restricted, not approaching discal crossvein; male: hind trochanter with long, spatulate, apically notched process (Fig. 13); hind tibia bent beyond base ..... *tricurva* (p. 132)

—— Abdominal tergite 5 usually almost unicolorous grey-brown; second basal cell with definite basal bare zone; indistinct apical wing cloud more extensive, enclosing discal crossvein (undeveloped in immature specimens); male: hind trochanter with stout ventral tubercle only, bearing brush of black and yellow setulae (Fig. 12); hind tibia straight ..... *grahami* (p. 132)

14 Prosternum widely separated from propleuron by membranous zone, without pair of elongate anterolateral lobes (Fig. 37); antenna (excluding arista) short, potentially reaching no more than two thirds distance from basal socket to centre of epistomal margin of face; arista with well developed hairing near base 15

—— Prosternum on each side connected to propleuron by sclerotized precoxal bridge (Fig. 36), or at least anterolateral angle of prosternum narrowly produced and almost touching propleuron; antenna longer, usually potentially reaching almost or quite to centre of epistomal margin; arista variable 19

15 Capitellum of halter dark brown; vertical surface between supra-alar bristle and wing base glossy, without pruinescence ..... *ameniina* (p. 145)

—— Capitellum of halter tawny-yellow to whitish; vertical surface below supra-alar bristle extensively pruinescent 16

16 Most of first basal cell and large areas in marginal and submarginal cells bare; length of some hairs on arista as great as width of antennal segment 3; fore femur with neither posteroventral tooth-like keel nor spinescent posteroventral bristles ..... *rugula* (p. 145)

—— First basal, marginal, and submarginal cells entirely microtrichose; hairs on arista all shorter than greatest width of segment 3; fore femur with either posteroventral tooth-like keel or spinescent bristles or both 17

17 Fore femur without posteroventral bristles or spines, with short, rounded tooth-like posteroventral keel (at least in male); humeral bristle present ..... *whittingtoni* (p. 145)

—— Fore femur with spinescent posteroventral bristles, sometimes also with tooth-like keel; humeral bristle absent 18

18 Posterior part of humeral callus and upper margin of sternopleuron with greyish white pruinescence; postfrons with blackish spot between ocelli, without lateral marks; fore femur with prominent posteroventral tooth-like keel, at least in male (female unknown); male: hind trochanter with small simple setulae only ..... *irregularis* (p. 147)

—— Humeral callus and sternopleuron mostly glossy, without pruinescence; postfrons with large blackish mark covering ocellar triangle and a similar mark on each side covering upper orbit; fore femur without tooth-like keel; male: hind trochanter with rather long mollisetae ..... *spinifemorata* (p. 147)

19 Fore femur with several conspicuous posteroventral black spines; vertex of head sharply carinate; discal crossvein strongly curved outwards 20

—— Fore femur without posteroventral spines, usually with slender posteroventral bristles; vertex subcarinate; discal crossvein variable 21

20 Arista bare; marginal cell of wing hyaline; fore and hind basitarsi dark brown to black ..... *serra* (p. 136)

—— Arista with numerous hairs on basal part of segment 6, some as long as its basal diameter; marginal cell suffused with yellow-brown; fore and hind basitarsi tawny-orange ventrally, darker distodorsally ..... *prensans* (p. 135)

21 Antenna (excluding arista) and palpus yellow; postfrons yellow, not browned anteriorly; scutellum not smooth and glossy 22

—— Antenna and palpus at least partly tawny to brown; postfrons extensively brown, at least on anterior part; scutellum glossy and smooth, or almost so 23

22 Scutellum pale grey-pruinescent dorsally; squama slightly narrowing distally, with posterobasal part of margin concave (Fig. 23, p.138); halter brownish-tawny; male: each terminal filament of aedeagus at least 7× as long as glans ..... *praeflava* (p. 137)

—— Scutellum without grey pruinescence, with fine, dense parallel ridges; squama broadly rounded distally (Fig. 24, p.138); halter pale yellow; male: terminal filament shorter than glans ..... *korneyevi* (p. 137)

23 Arista with numerous short hairs on basal part of segment 6; postfrons with low median hump in front of ocelli; male: hind basitarsus more than 3× as long as wide ..... *maceveyi* (p. 143)

—— Arista without such hairs; postfrons without median hump; male: hind basitarsus less than 3× as long as wide 24

24 Cheek and parafacial brown; fore and hind tarsi largely dark brown; male: lower sternopleuron, fore coxa, and fore femur with conspicuously long and numerous, crimped pale hairs; fore tarsus very asymmetrical; hind tarsus very broadly depressed, with basitarsus less than twice as long as wide ..... *lana* (p. 140)

—— Cheek and parafacial yellow; all tarsi fulvous basally; male: sternopleuron, fore coxa, and fore femur without conspicuously long or crimped hairs; fore tarsus approximately symmetrical; hind tarsus slightly depressed, with basitarsus slightly more than twice as long as wide ..... *collessi* (p. 142)

Duomyia sp. 43

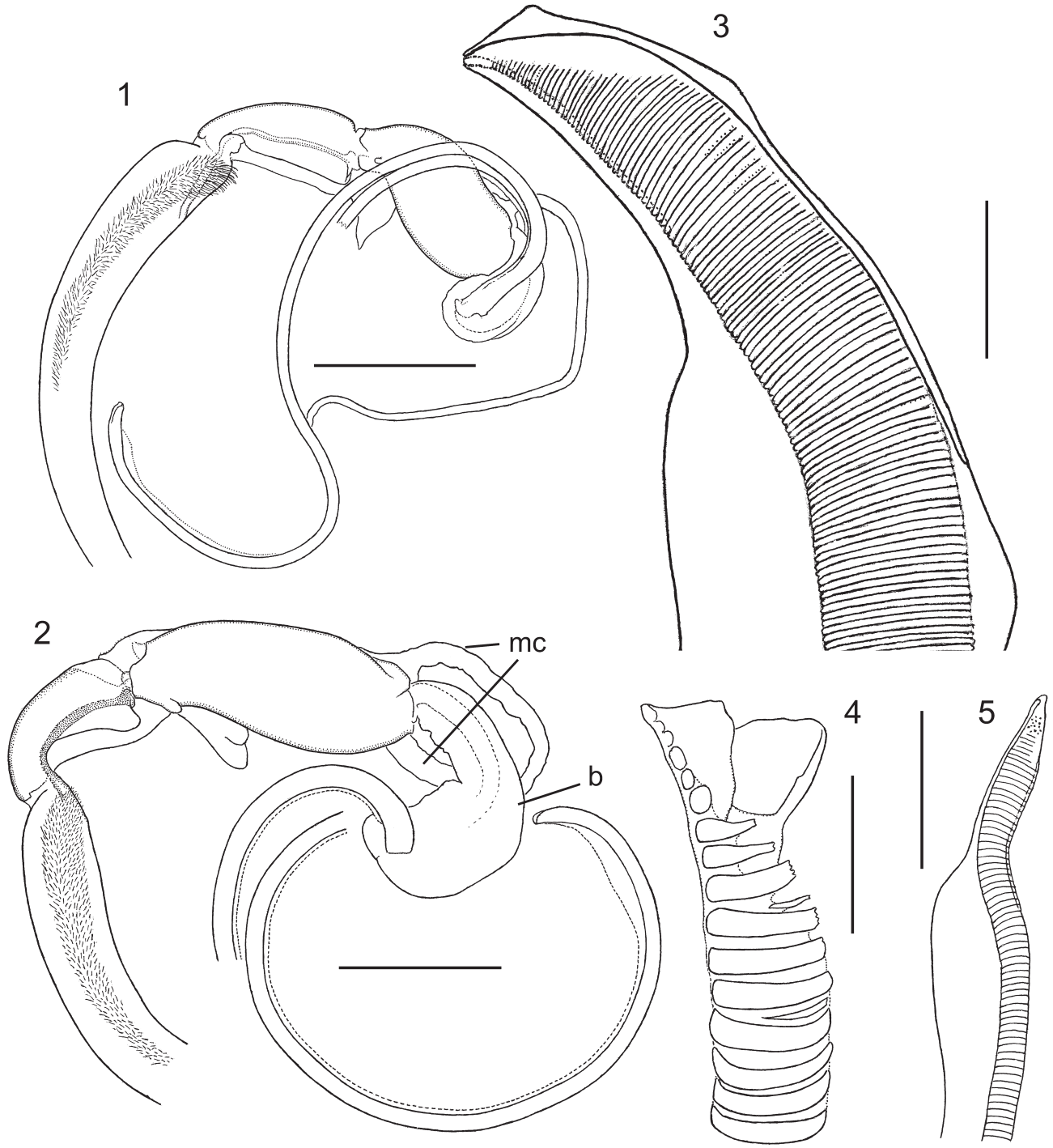
Fig. 1

Material examined. NT: 1♂, 1♀, 3 mi NE of Gosses Bluff, 23°48'S 132°21'E, April 1969, H.P. (ANIC); 1♀, Reedy Rockhole, near King's Canyon [c. 24°18'S 131°36'E], Jan. 1984, M.S.M., B.J.M. (AM).

Description. (♂, ♀). Resembling *D. pallipes* McAlpine, *D. nodosa*, and *D. tomentosa*; agreeing in most characters with description of *D. nodosa* except as indicated below.

Thorax. Fore femur with two to six black spinescent posteroventral bristles, in addition to the usual yellow bristles; hind femur of male only slightly narrowed and curved basally; hind tibia and hind tarsal segment 1 of male much modified as in *D. nodosa*.

Abdomen. Male postabdomen: stipe of aedeagus with terminal posterior concavity bounded by sclerotized ridge on right side, surface of concavity not bearing pubescence but overlapped by relatively long pubescence on and near ridge; preglans c. 0.8 as long as glans, with right membranous wing less widened distally and much less narrowed basally than



Figs 1–5. *(1) Duomyia* sp. 43, Gosse's Bluff, NT, aedeagus; only part of left terminal filament shown; only one of two membranous caeca shown. *(2) D. nodosa*, near Mulga Park, aedeagus, left terminal filament omitted, right one shown in two parts. *(3)* the same, detail of apex of terminal filament. *(4) D. foliata*, Mon Repos, the same part. *(5) D. monteithi*, near Warwick, Queensland, the same part. Scales for Figs 1, 2 = 0.5 mm. Scales for Figs 3–5 = 0.05 mm. *b*, bulb; *mc*, membranous caeca.

in *D. nodosa*, narrower throughout than in *D. pallipes*; glans more narrowed and curved basally than in *D. nodosa* and *D. tomentosa*, with very short sub-basal tubercle; each terminal filament c. 6× as long as glans, not attenuated distally.

Dimensions. Total length,♂ 5.1 mm (estimated), ♀ 8.3–9.6 mm; length of thorax,♂ 2.3 mm, ♀ 3.5–4.3 mm; length of wing,♂ 4.8 mm, ♀ 7.0–7.8 mm; length of glans of aedeagus, 0.61 mm (undersized♂).

Distribution. Northern Territory: S of 21°S ("central Australia").

Notes. This form may perhaps represent a distinct species, but the available sample of two females and a probably very undersized male leaves me in doubt. It resembles *Duomyia pallipes* of eastern New South Wales and south-eastern Queensland in the presence of posteroventral black spines on the fore femur and the nature of the modifications of the male hind tibia and tarsus, but it differs in the lack of a terminal pubescent right posterolateral prominence on the stipe (the sclerotized ridge described above appears not to form such a terminal prominence); the right membranous wing of the preglans is much narrower, and the small

sub-basal tubercle on the glans is unlike the large curved basal process of *D. pallipes* (McAlpine 1973: fig. 27). *Duomyia* sp. 43 also resembles the sympatric *D. nodosa* but differs in the presence of black posterodorsal spines on the fore femur and the differences in the aedeagus given above; the apices of the terminal filaments are somewhat similar in the two species, but in *D.* sp. 43 the dense transverse ridging covers the extreme tips.

Duomyia nodosa n.sp.

Figs 2, 3, 6

Type material. Holotype ♂, NT: Lasseter's Cave, 25°01'S 129°24'E, 31.xii.1995, M.S.M., B.J.M., K.A.K. (AM K292954). Impaled on long pin, aedeagus in microvial on pin. Paratypes. NT: 1♀, Tilmouth Well, Napperby Creek, 22°48'S 132°35'E, Jan. 2001, M.S.M., B.J.M. (AM); 1♂, Old Andado, Simpson Desert, Sept. 1972, Z.R.L. (ANIC); 1♂, 1♀, 26 km WSW of Mulga Park homestead, 26°00'S 131°25'E, Jan. 1982, D.C.R., B.G.R., R.H. (ANIC).

Other material (localities only given). Western Australia: Fitzroy River crossing, Derby–Broome road (AM); 1 km N of Millstream (ANIC); Crossing Pool, Millstream (ANIC); 13 km NE of Newman (ANIC); Minilya River (ANIC); Murchison River (ANIC); Kalbarrie (AM).

Description. (♂, ♀). Moderate-sized dull greyish fly with yellow head.

Coloration. Postfrons and parafacial yellow, face paler yellow; occipital region with greyish zone not reaching near vertex. Antenna tawny-yellow; arista becoming dark brown distally. Prelabrum and palpus tawny-yellow or paler yellow. Thorax with ground colour of cuticle largely dark brown to blackish or in part tawny-orange, particularly on parts of pleura (the latter perhaps in immature specimens), with general covering of dense grey pruinescence except on parts of sternopleuron and sometimes on five very narrow black stripes on mesoscutum; humeral callus and scutellum tawny, with pale pruinescence and setulae. Legs tawny-yellow; tibiae often slightly browned apically, fore and hind tibiae often with brown anterior mark beyond mid-length. Wing clear; subcostal cell pale yellow; apical greyish zone very indistinct or absent. Halter dull yellow. Abdominal tergites entirely densely pruinescent, tergites 1 to 4 grey (pale grey pruinescence covering brown cuticle), or largely tawny yellow; tergite 5 tawny yellow, often with grey lateral zone in female; sternite 1 brown, largely glossy, with grey pruinescent lateral margins; sternite 2 almost entirely grey pruinescent.

Head. Postfrons with irregular pitting, most marked anterolaterally, without median hump, its width near mid-length c. 0.47–0.51 of width of head; fronto-orbital and ocellar bristles absent; eye much higher than long; height of cheek c. 0.36–0.41 of height of eye; facial carina broad, sharply margined, strongly plicate, between antennal bases at least twice as wide as each antennal socket; parafacial very broad, with setiferous pits only at upper extremity. Antenna potentially extending c. 0.8–0.9 of distance from basal socket to centre of epistomal margin of face in male, extending c. 0.7 of that distance in female; segment 3 slender, acute or subacute dorsoapically; arista with simple, fine apex, without pubescence and rays on segment 6. Prelabrum reduced, very shallow; palpus moderately developed; proboscis short, with broad prementum and labella.

Thorax. Mesoscutum and scutellum with very numerous pale, short curved setulae; scutellum rounded, dorsally convex, with two pairs of stout bristles; pteropleuron with numerous entirely pale setulae on anterior part and on pteropleural ridge, with no larger bristles; other thoracic bristles typical of genus (as given for *D. grahami* below). Fore femur with numerous yellow dorsal bristles and a series of similar posteroventral bristles but without black spinescent bristles; mid femur with subapical posterior comb of yellow bristles; hind femur not curved, stout on basal half, with a dorsal to anterodorsal series of yellow bristles; hind tibia of male much modified, with prominent preapical dorsal gibbosity which has a slight longitudinal keel on distal part of summit and slight posterodistal concavity; tarsi rather broad, depressed, basitarsi least depressed; fore tarsal segment 1 asymmetrical in apical outline and distribution of ventral setulae; hind tarsus asymmetrical, particularly segments 1 and 4 of male; hind tarsal segment 1 with large terminal posterodorsal gibbosity, which is absent in female. Wing: distal section of vein 3 with only slight curvature; basal section of vein 4 1.1–1.3× as long as second section; distal section of vein 4 with sigmoid curvature, strongly convergent with vein 3 to terminate well in front of apex; membrane largely microtrichose, with variable bare zones in second basal and anal cells and base of submarginal cell.

Abdomen. Tergite 5 slightly longer than tergite 4 in both sexes; sternite 1 subquadrate, broadest at anterior margin; sternite 2 subtriangular; sternites 3 and 4 vestigial or little sclerotized; sternite 5 broad and well sclerotized in male, narrow and little sclerotized in female. Male postabdomen: distal section of outer surstylus surpassing that of inner surstylus, not much narrowed nor apically expanded but with small angular posterior prominence; stipe of aedeagus very stout, with longitudinal band of dense pubescence which is broadened towards distal end, without defined concave terminal zone seen in *Duomyia* sp. 43; preglans rather slender, strongly curved, c. half as long as glans, separated from stipe by deep constriction, but connected to it by strong sclerotization on posterior (concave) surface, with pair of very unequal posterior longitudinally attached membranous wings, the smaller right wing of characteristic shape, broad and rounded at distal end, much narrowed at basal end and discontinued well before reaching base of preglans; glans elongate–ovoid, only slightly curved basally, with sub-basal posterior tubercle; pair of long membranous caeca arising at junction of glans and membranous bulb; paired terminal filaments not much tapered distally, of equal length, each between 4× and 5× as long as glans, with the usual annular ridges very fine and numerous, present approximately to apex (Fig. 3).

Dimensions. Total length,♂ 7.4–9.9 mm, ♀ 8.3–10.0 mm; length of thorax,♂ 3.2–4.1 mm, ♀ 3.8–4.1 mm; length of wing,♂ 6.3–7.7 mm, ♀ 7.4–7.7 mm; length of glans of aedeagus, 0.82–0.91 mm.

Distribution. Northern Territory: S of c. 21°S ("central Australia"). Western Australia: coastal districts between c. 17°S and 27°S.

Notes. *Duomyia nodosa* is very similar to *D. tomentosa*

Hendel, *D. pallipes* McAlpine, and *Duomyia* sp. 43. Unlike *D. pallipes* and sp. 43 none of the posteroventral bristles of the fore femur is black and spinescent. Unlike *D. tomentosa* each of the lateral pruinescent zones on abdominal sternite 1 is very narrow (each at least one quarter of width of sternite in *D. tomentosa*). The male, like that of *D. pallipes* and sp. 43, has a large posterodorsal gibbosity on the hind basitarsus, which is absent in *D. tomentosa*. *Duomyia nodosa* also differs from other species in details of the aedeagus, particularly in the shape of the right membranous wing of the preglans (Fig. 2). In Figs 3, 4, and 5 I have shown the apex of a terminal filament at the same scale, so that the remarkable difference between the species can be appreciated. The known distribution of *D. nodosa* is widely separated from that of *D. pallipes* (temperate eastern Australia) and in NT it is apparently separate from that of *D. tomentosa*, but not from that of sp. 43.

Duomyia tomentosa Hendel

Fig. 7

Duomyia tomentosa Hendel, 1914a: 58 (nomen nudum); Hendel, 1914b: 100–101 (described); D. McAlpine, 1973: 83–84, fig. 28.
Duomyia (Duomyza) tomentosa: Malloch, 1929: 507, fig. 2b.

Type material. Holotype.♀, Queensland: Townsville, no date, F.P.D. (BM).

Material from NT (localities only given). Jabiru East (AM); Anbangbang, Kakadu National Park (AM, NTM); South Alligator River crossing, SSW of Cooinda (AM); Ferguson River Crossing, Stuart Highway (AM); Mataranka Hot Springs (ANIC); Horn Islet, Sir Edward Pellew Group (AM, QM).

Description. See D. McAlpine (1973).

Distribution. Northern Territory: mainly N of 17°S. Queensland: northern Cape York Peninsula to south-east of state. New South Wales: inland districts as far south as Gilgandra and Mendooran (few records). Western Australia: extreme north (new state record—Carson [River] escarpment, 14°49'S 126°49'E, ANIC).

Notes. *Duomyia tomentosa* closely resembles other species inhabiting NT with pale-setulose scutellum, pale-pruinescent humeral callus and usually no black bristles on fore and hind femora, but males are distinguished by details of the aedeagus (McAlpine, 1973: fig. 28) and by the armature of the hind leg: no strong gibbosity on tarsal segment 1, but a very high dorsal gibbosity surmounted by a compact rounded tubercle on the tibia (Fig. 7). Females may be difficult to distinguish from those of *D. foliata* and *D. nodosa*. Those of the former may often have darker femora and darker zones with little pruinescence on the abdomen but variation in NT populations is scarcely known. *Duomyia tomentosa* appears to be separable from *D. nodosa* by the distribution of pruinescence on abdominal sternite 1, as indicated under that species, and it seems that these two species may have separate distributions within the NT.

A male specimen clearly belonging to *D. tomentosa* (Jabiru East, AM) is atypical in possessing one black spinescent posteroventral bristle on each fore femur.

Duomyia foliata McAlpine

Fig. 4

Duomyia foliata D. McAlpine, 1973: 85–86, fig. 29.

Type material. Holotype ♂, Queensland: Cannonvale, NE of Proserpine, 1.iv.1967, M.S.U. (ANIC). Paratypes. Queensland. See list by McAlpine (1973).

Material from NT (localities only given). Mudginberri, Kakadu National Park (ANIC); 15 mi (c. 24 km) N of Tennant Creek (ANIC).

Description. See D. McAlpine (1973).

Distribution. Northern Territory: Kakadu and Tennant Creek districts. Queensland: northern Cape York Peninsula to Bundaberg district and Carnarvon Range. Western Australia: as far south as Murchison River (few records). New South Wales: southern districts (Congo, near Moruya; Jerilderie).

Notes. The males of *D. foliata* are readily distinguished from related species (those with pale-setulose scutellum, two pairs of scutellar bristles, and pale-pruinescent humeral callus) by the absence of a dorsal gibbosity on the hind tibia, but this tibia is distally compressed, with a broad shallow concavity occupying c. the distal half of its posterior surface. There are numerous distinctive features of the aedeagus: the pubescent strip on the stipe does not form a prominence at its distal end; the right membranous wing of the preglans is long, narrow, and further narrowed at each extremity, and the left membranous wing is vestigial; the glans is basally narrowed and strongly curved and lacks the sub-basal tubercle; each terminal filament has very coarse annular ridging on its distal part, the more distal ridges forming broken rings, and a distinctive sclerotized subapical lobe (see Fig. 4, and D. McAlpine, 1973: fig. 29). These features distinguish *D. foliata* from the closely related *D. monteithi* McAlpine of Queensland, which has very slender terminal filaments, each with a simple tip and very fine annular ridging (Fig. 5). Females lack such distinctive diagnostic features, but often have darker zones with little pruinescence on the abdominal tergites and brown suffusions on the femora which are usually absent in related species of NT.

Populations in the NT are very little known and need further sampling, but the aedeagal characters given above have been checked for both northern and southern Queensland populations and specimens from Western Australia (Murchison River, ANIC) and southern New South Wales.

In southern Queensland *D. foliata* has been recorded as infesting eggs of marine turtles (Hall & Parmenter, 2006), but the species is not restricted to habitats of these reptiles.

Duomyia sp. 44

Material examined. NT: 1♀, Pularumpi [Garden Point], Melville Island, June-July 1986, P.H. (ANIC); 1♀, Buffalo Creek, near Darwin, March 1996, D.K.M., G.R.B. (AM).

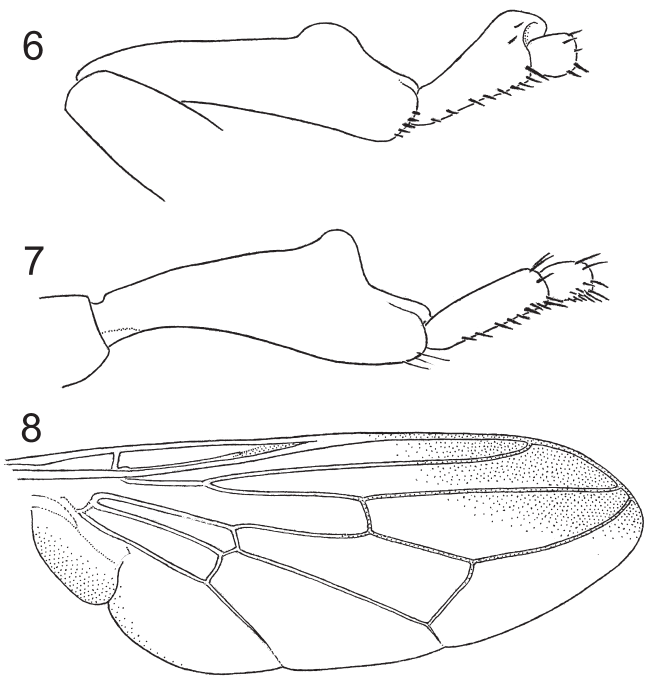
Description. (♀ only,♂ unknown). Resembling *D. nodosa*, *D. tomentosa* etc. in most characters, but the following points are significant.

Coloration. Head, antenna, and palpus predominantly tawny-yellow; frontal setulae mixed yellow and black or predominantly black. Scutellum tawny-yellow to tawny-

brown, with pale pruinescence and mixed yellow and black setulae; humeral callus brown to tawny-yellow with pale pruinescence; rest of thorax brown-black with almost uniform covering of pale grey pruinescence, giving darker general coloration than in *D. nodosa* and *D. tomentosa*; setulae on mesopleuron mixed back and yellowish. Legs tawny-yellow; fore femur with several black dorsal bristles, in Buffalo Creek specimen with one or two brown or yellow-brown posteroventral bristles, in Melville Island specimen with a series of fairly fine black posteroventral bristles. Wing with faint greyish apical cloud. Halter yellow. Abdominal tergites coloured much as thorax, with predominantly black setulae, except on tergite 1.

Distribution. Northern Territory: coastal habitats.

Notes. I am uncertain if the two specimens listed are conspecific, as they differ in a few details and there are no males to check aedeagal characters. However, they agree in characters given in the key to species and in my brief description. I consider this material too meagre to justify a formal name and description.



Figs 6–8. *(6) Duomyia nodosa*, part of left hind leg of male, anterior view. *(7) D. tomentosa*, same part. *(8) D. rapida*, holotype, right wing.

Duomyia rapida n.sp.

Fig. 8

Type material. Holotype.♀ (unique). NT: Arnhem Highway, just W of Mary River, 12°50'S 131°56'E, 60 m, 20.ii.2008, K.H., D.M., M.S.M., C.O., M.H. (AM, K292955).

Description. (♀;♂ unknown). Small, slender predominantly black fly with brownish shading on wing.

Coloration. Postfrons brown, with pale yellow setulae and narrowly silvery-pruinescent lateral margins; parafacial tawny-yellow, with silvery-pruinescent spot at upper extremity; face pale yellow, without darker marks; cheek region orange-tawny with thin silvery pruinescence on posterior part; upper occipital region largely black, with silvery pruinescent orbital margins and broad silvery-pruinescent zone above occipital foramen. Antenna tawny-brown. Palpus brown-black. Thorax largely black, with green-tinted reflections; humeral callus glossy, without pruinescence; scutellum black, with little dark pruinescence; setulae on mesoscutum, scutellum and pleura nearly all yellow. Coxae and femora largely black, latter with narrowly yellowish apices and with all major bristles black; tibiae brownish with yellow bases, fore one darkest, hind one with paler central zone; all basitarsi yellow with darkened apices; more distal segments of fore tarsus brown-black, those of mid and hind tarsi tawny-brown. Wing membrane tinged with yellow basally, elsewhere stained with light brown, the colouring slightly intensified anterodistally. Halter tawny. Abdominal tergite 1 with dense grey-brown pruinescence; tergites 2 to 5 shining black with bluish reflections; tergite 5 with all setulae and bristles black; sternites 1 to 4 and 6 shining black with varying amounts of grey pruinescence, the last with black setulae and little pruinescence.

Head. Postfrons without distinct pitting or central hump, its width c. 0.45 of width of head, with numerous rather coarse, compressed, curved setulae; fronto-orbital bristles absent; ocellar bristle small; facial carina broadly subtriangular, with sharply raised lateral margins on upper part and c. six vertical ridges on flattened central part; parafacial rather broad, pitted and with several curved, compressed setulae towards upper end; height of cheek 0.31 of height of eye. Antenna potentially extending distinctly beyond centre of epistomal margin of face; segment 3 apically rounded; arista almost bare, with two or three minute rays towards base of segment 6. Prelabrum moderately small; palpus rather short and broad.

Thorax. Mesoscutum with very numerous short, curved setulae; scutellum with numerous longer dorsal setulae and some on lateral surface; setulae on pteropleuron rather long, but none bristle-like; pteropleural ridge with several yellow setulae; major thoracic bristles as given for *D. grahami*, except that only two stout, subequal pairs of scutellars present. Fore femur with rather numerous somewhat irregularly placed dorsal bristles on almost entire length and a series of four or five stout, spinescent posteroventral bristles; mid femur with two subapical posterior bristles; hind femur with a series of dorsal bristles, distally with an irregular series of short, spinescent anteroventral bristles. Wing (Fig. 8): vein 3 distally almost straight; vein 4 strongly curved forwards apically to terminate well in front of apex; first section of vein 4 1.05× as long as second section; membrane almost entirely microtrichose.

Abdomen. Sternites 3 and 4 small; sternite 5 apparently absent; sternite 6 well sclerotized, divided; tergite 5 with setulae and bristles on median part of posterior half semi-erect and not medially inclined.

Dimensions. Total length, 6.1 mm; length of thorax, 2.3 mm; length of wing, 4.8 mm.

Distribution. Northern Territory: only known from type locality to east of Kakadu National Park.

Notes. *Duomyia rapida* is the only known species of the genus in Northern Territory that combines a black, setulose scutellum with the possession of thick, spinescent posteroventral bristles

on the fore femur. In the key of McAlpine (1973), *D. rapida* runs to *D. commoni* McAlpine, which is widely distributed in eastern Queensland and is now reasonably well known to me. I now place these two species, together with *D. convallis* McAlpine, also of Queensland, in the *commoni* alliance, characterized as follows: scutellum extensively setulose, with two pairs of bristles; humeral callus glossy, without noticeable pruinescence; femora largely blackish or dark brown; fore femur with thick black posteroventral spines.

As there is a single available specimen of *D. rapida*, the range of variation may not yet be understood. The holotype of *D. rapida* is smaller than any of the 21 available specimens of *D. commoni*, but may be exceptionally small for its own species.

The specific epithet is a Latin adjective, tearing or snatching, as suggested by the armature of the fore femur.

The species of the *commoni* alliance are distinguishable by the following key:

1 Fore femur with a series of black dorsal bristles extending to near base, pale setulae in this region few, short, and inconspicuous; hind femur with a short distal series of short black spinescent anteroventral bristles; wing membrane extensively suffused with light brown, colour intensified anteroapically; setulae on posteromedian part of tergite 5 black, posteriorly inclined but not medially directed, those on lateral margin of tergite 5 all short and black like those above margin, only becoming longer posteriorly ..... *rapida*

—— Fore femur with series of dorsal black bristles restricted to c. distal 0.6 or less of its length and replaced basally with long whitish setulae; hind femur without distal anteroventral black bristles, with only fine pale setulae in this region; wing membrane almost clear except for apical brownish cloud in marginal, submarginal, and first posterior cells and brown zone in subcostal cell; setulae on posteromedian part of tergite 5 mostly pale, decumbent, medially directed, group of setulae on lateral margin also pale and longer than those just above margin 2

2 Postfrons deep yellow, only slightly darker than parafacial; scutellum brown or tawny laterally; posteroventral spines of fore femur much shorter than half diameter of femur; anal crossvein curved on whole length ..... *convallis*

—— Postfrons brown, strongly contrasting with parafacial; scutellum almost entirely black; longer posteroventral spines of fore femur at least as long as half diameter of femur; anal crossvein curved only at anterior extremity ..... *commoni*

Duomyia eremia McAlpine

Fig. 9

Duomyia eremia D. McAlpine, 1973: 89, fig. 34.

Type material. Holotype ♂, NT: 48 miles (c. 77 km) WSW of Alice Springs, 10.ii.1966, E.B.B., M.S.U. (ANIC). Paratype ♂, same data (AM). Both specimens with aedeagus extended and exposed.

Other material. 1♀, South Australia: Anajatra, Mann Range, May 1983, G.A.H. (AM).

Description. (♀). Agreeing in general characters with that of types except as indicated.

Coloration. Fore tibia entirely brown-black; mid tibia almost so; fore femur with mixed black and white dorsal bristles, ventral bristles white.

Head. Height of cheek 0.29 of height of eye.

Dimensions. Total length, 8.1 mm; length of thorax, 3.2 mm; length of wing, 6.5 mm.

Distribution. Northern Territory: Alice Springs district. South Australia: Mann Range, far NW of state (new record for state).

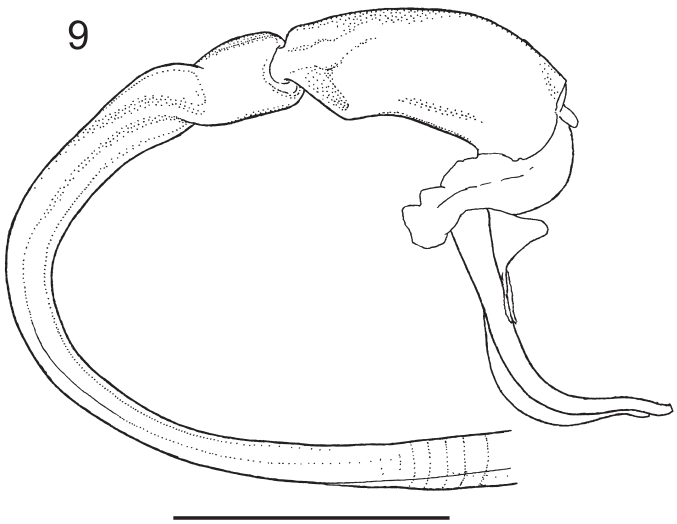
Notes. *Duomyia eremia* is sharply differentiated from related species by the characters given in the key. Also, the complete absence of a greyish apical wing cloud differentiates it from numerous species, except *D. sericea* and *D. chaetostigma*.

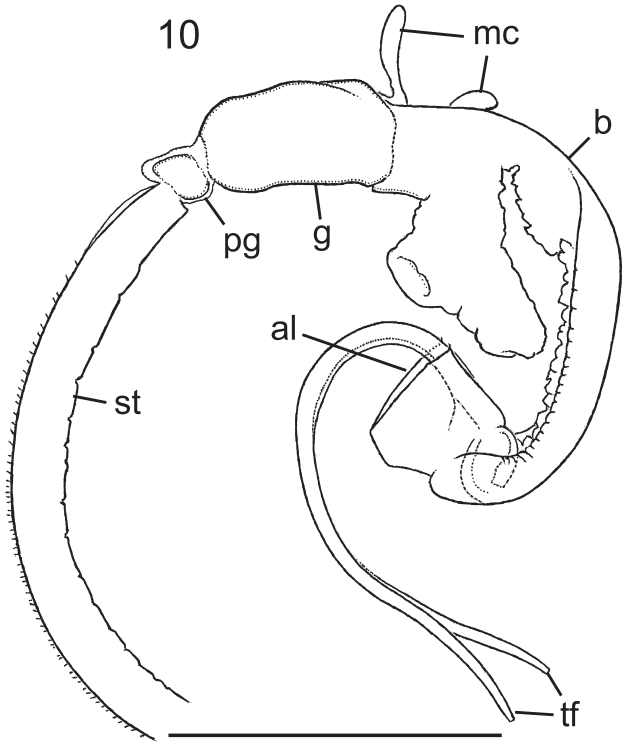
Duomyia sericea Hendel

Fig. 10

Duomyia sericea Hendel, 1914b: 99–100; D. McAlpine, 1973: 87 (redescribed).

Type material. Lectotype.♀ (designated D. McAlpine, 1973). Queensland: Burpengary, 26 mi (c. 42 km) N of Brisbane, no date, T.L.B. (BM). Paralectotype.♀, lower specimen on same pin, same data (BM).





Figs 9, 10. *(9) Duomyia eremia*, holotype, aedeagus. *(10) D. sericea*, Lawn Hill National Park, aedeagus. *al*, amber lobe (paired); *b*, bulb; *g*, glans; *mc*, membranous caeca of bulb; *pg*, preglans; *st*, stipe; *tf*, terminal filaments. Both scales = 0.5 mm.

Additional material (localities only given). NT: 5 km SE of Humpty Doo (AM, ANIC); Wangi Falls, Litchfield National Park (AM); Merl [Mel] Camping Area, near Cahill's Crossing (AM); East Alligator Rangers' Station (ANIC); Marrakai Road, 2 km E of Stuart Highway (AM); Anbangbang, near Nourlangie Rock (AM, NTM); Koolpin Gorge, southern Kakadu National Park (AM); Horn Islet, Sir Edward Pellew Group (QM). Queensland: north-west inland (Musselbrook–Lawn Hill district, AM, QM); north-east coast (Daintree district, ANIC); south-east (Brisbane–Morton Bay district, BM, AM, QM).

Description. See D. McAlpine (1973: 87).

Distribution. Northern Territory: northern districts. Queensland: widely but perhaps discontinuously distributed.

Notes. Among the *Duomyia* species found in the tropics, *D. sericea* is the only species with the mesoscutal transverse suture continued across the middle of the mesoscutum as a distinct groove. Also, it differs from other species having a setulose scutellum with two pairs of bristles and a black, glossy humeral callus in the possession of subtriangular whitish-pruinescent (as distinct from setulose) lateral zones on abdominal tergites 3 to 5. Antennal segment 3 is not dilated distally, as it is in a female specimen from New South Wales (Crescent Head, AM), otherwise resembling *D. sericea*. The aedeagus (Fig. 10) is remarkable for the very short, well defined preglans, long and complex bulb, and pair of partly connected amber lobes, each with mucronate apex, which sheathe the bases of the terminal filaments. However, the details of the aedeagus show some variation, which may be geographic, in the quantity of microtrichia on the stipe, the shape and size of the glans, the form of the complex bulb and its associated caeca, and perhaps the form of the amber lobes. It is difficult to evaluate this variation with so little material from the eastern part of the species' range.

The *Duomyia marginalis–chaetostigma* alliance

I use the above term for a series of little understood species living in northern and eastern Australia, which tend to run to *D. marginalis* McAlpine or *D. chaetostigma* McAlpine in the key by McAlpine (1973) and to this alliance in the above key to species. In the limited available material from NT there are several species of the alliance from the northern parts of the territory, from the Alice Springs district, and from the vicinity of the Gulf of Carpentaria. These and the more extensive collections from eastern states need more thorough sampling and study before an accurate taxonomic review can be published.

I have only seen one male clearly representing the species *D. marginalis*, viz. the holotype, from Stanthorpe, southern Queensland (QM). This specimen has distinctive features of the aedeagus, including a very large membranous lobe on the somewhat elongate preglans and a moderately stout glans (see McAlpine, 1973: fig. 39). A superficially similar male from near Leyburn, to the north of Stanthorpe, has a markedly different aedeagus and is provisionally placed as "*Duomyia* sp. 46" in the AM collection.

Duomyia chaetostigma has become better known since its original description (McAlpine, 1973), but the numerous typical specimens are only from the Binnaway–Mendooran–Dunedoo district of mid-western New South Wales. The males consistently have a narrowly ovoid preglans with broadly rounded scoop-like distal lobe, moderately slender glans, pair of terminal filaments each slightly more than 3× as long as glans and with narrow membranous margin expanded on c. distal third of filament but discontinued shortly before apex (McAlpine, 1973: fig. 40). The presence of setulae on the membrane of the subcostal cell is an aberrant condition of the holotype, not present in other specimens. The few superficially similar males from Queensland and NT disagree in aedeagal characters, and are therefore not regarded as conspecific.

Species of this alliance are not treated further in this review.

Duomyia grahami n.sp.

Figs 11, 12, 16

Type material. Holotype ♂, NT: Jabiru East, 12°40'S 132°53'E, 22–24.ii.1996, G.R.B., D.K.M. (AM, K292956); micro-pinned on double mount, left mid-leg detached, aedeagus extended. Paratypes. NT: 2♂, 3♀, Anbangbang [picnic area], Kakadu National Park [c. 12°51'S 132°47'E], Feb. 1996, G.R.B., D.K.M. (AM, NTM); 2♂, 6♀, Nawurlandja Rock area, Kakadu National Park, 12°51'S 132°47'E, Jan. 1993, G.D., A.D. (AM, ANIC).

Description. (♂, ♀). Moderately large, predominantly tawny-brown fly; wing with light brownish shading distally.

Coloration. Head, including antenna and palpus, orange-tawny; ocellar spot brownish. Thorax largely tawny, with bristles and most setulae black; mesoscutum, humeral callus, and scutellum almost uniformly yellow-pruinescent; pleura with dark brown suffusion, masked by paler grey pruinescence, covering part of mesopleuron, pteropleuron, and sternopleuron. Legs tawny, with some brownish suffusion mainly restricted to hind femur and tibia; each tarsal segment slightly paler basally. Wing membrane mostly tinged with yellow; distal part of subcostal cell deep yellow; apical part of wing beyond end of vein 2 and including distal extremity of discal cell lightly suffused with brown. Halter tawny-yellow. Abdominal tergite 1 tawny-brown; remainder of exposed tergites darker grey-brown; sternites 1 and 2 entirely grey-pruinescent.

Head. Postfrons without distinct pitting or central hump, its width c. 0.36–0.37 of width of head, with numerous short, fine setulae; facial carina not markedly convex centrally, with sharply raised lateral margins and variable number of vertical ridges; parafacial moderately narrow, with few fine setiferous pits near upper extremity only; cheek region not rugose; height of cheek c. 0.24–0.32 of height of eye; fronto-orbital and ocellar bristles very small or absent. Antenna potentially extending c. to centre of epistomal margin in male, shorter in female; arista subplumose on somewhat less than basal half, with numerous rays slightly shorter than width of segment 3. Prelabrum moderately small; palpus narrow.

Thorax without mollisetae; scutellum without setulae; the following bristles present: humeral, 1+1 notopleurals, supra-alar, postalar, posterior intra-alar, posterior dorsocentral, prescutellar acrostichal, three pairs of scutellars; pteropleuron with some upper setulae stouter, bristle-like; pteropleural ridge with few setulae; prosternum with each anterolateral angle much produced so as to meet or almost meet propleural gibbosity. Fore femur with distinct black dorsal and posteroventral bristles; mid femur with distal comb of long posterior bristles. Hind leg of male modified as follows (Fig. 12): trochanter with stout ventral tubercle bearing short brush of mostly blackish setulae; femur stouter than other femora, curved for most of length; tibia almost straight. Hind leg of female without ventral tubercle on trochanter, with femur more slender, only slightly curved, and tibia slender and straight. Wing (Fig. 11): veins 3 and 4 both curved and convergent distally, latter terminating very near wing apex; first basal section of vein 4 0.87–1.03× as long as second section; membrane almost entirely microtrichose, except for distinct basal bare zone in second basal cell.

Abdomen. Sternites 3 and 4 vestigial. Male: spiracle 5 located in pleural membrane near lateral margin of tergite, near or slightly behind mid-length of tergite; distal section of outer surstylus, immediately beyond apex of inner surstylus, convex, with broadly rounded distal outline and slight posterior angular prominence; aedeagus with stipe slender, with extensive longitudinal tract of pubescence, slightly thickened distally where it has a pair of thick longitudinal ridges; preglans elongate, curved, sharply differentiated from stipe by deep constriction and break in sclerotization, with narrow membranous margin extending most of length, distally with obliquely curved sheath-like extension attaching it to glans, its length (including sheath) c. 1.6× length of glans; glans stout, subcylindrical; bulb short, but basally bearing a small membranous caecum; paired terminal filaments of equal size, joined for c. 0.7 of length, but with internal canals separate from near bases, each stout, sclerotized except for very short membranous tip, c. 1.6× as long as glans. Female: tergite 5 nearly twice as long as tergite 4, its posterior margin almost straight and transverse only on short median part, cut off obliquely on each side but retaining distinct but obtuse posterolateral angle; spiracle 5 in membrane close to angle of tergite.

Dimensions. Total length,♂ 8.2–9.5 mm, ♀ 5.8–10.7 mm; length of thorax,♂ 3.6–4.1 mm, ♀ 2.7–4.6 mm; length of wing,♂ 7.2–8.2 mm, ♀ 6.4–8.9 mm; length of glans of aedeagus, 0.68–0.71 mm.

Distribution. Northern Territory: Kakadu National Park—localities near and up to c. 27 km S of Jabiru. The terms Anbangbang and Nawurlandja (or Nourlangie) Rock area probably refer to the same spot locality.

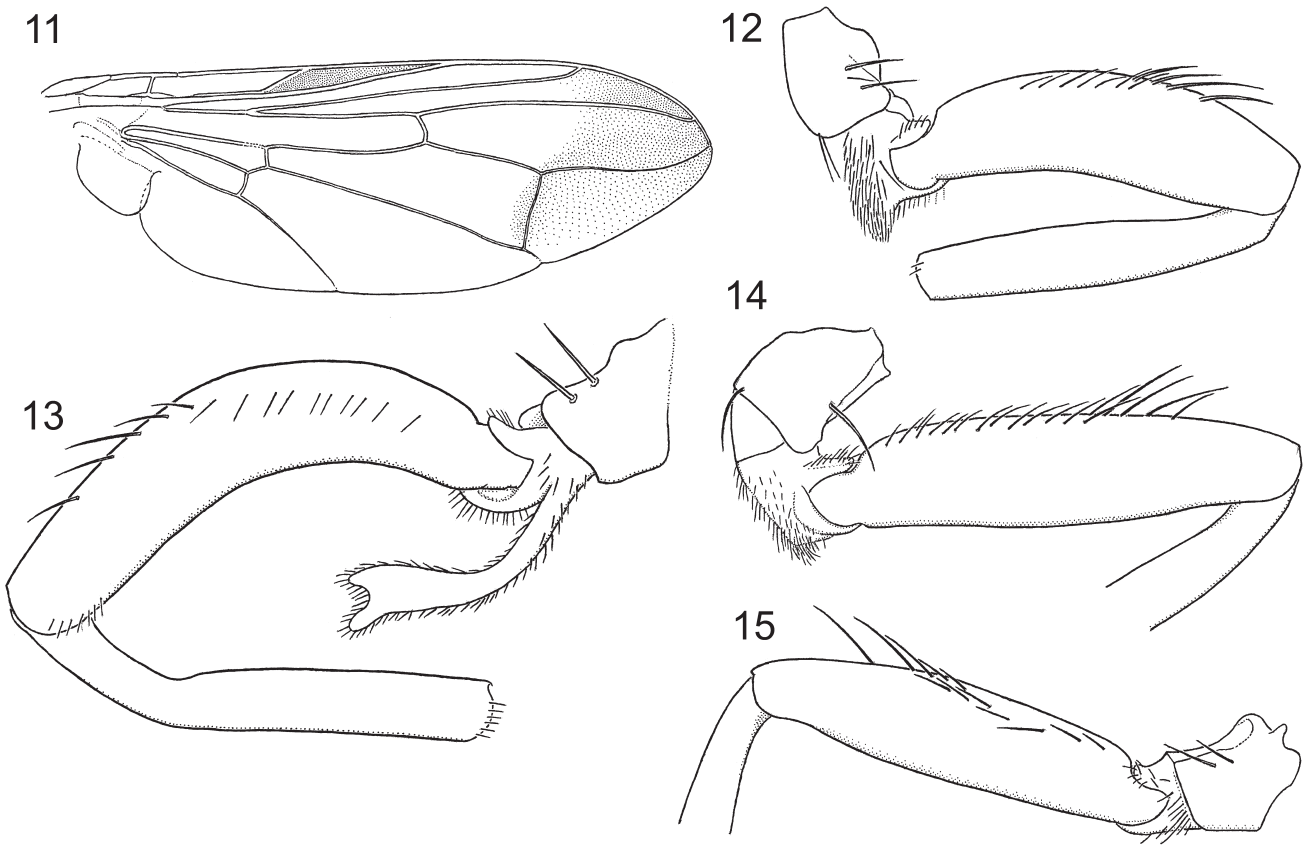
Notes. *Duomyia grahami* typifies a group of four species (including also *D. tricurva*, *D. bucina*, and *D. recta*), known only from Northern Territory and here called the *grahami* alliance. The group is characterized as follows: scutellum without setulae; mesoscutum and scutellum tawny, entirely yellow-pruinescent; antenna rather long; arista with well developed short hairs; fore femur with a series of long black posteroventral bristles; prosternum broad, touching propleuron on each side; abdominal tergite 1 pruinescent on whole width; aedeagus with preglans long and sharply demarcated, and terminal filaments short, stout, joined for at least half of length of each. Within this group it is the only species with a well defined bare zone in the second basal cell, and the male differs from that of the other three species in the modifications of the hind leg (Fig. 12). The female differs from that of *D. recta* and presumably that of *D. bucina* in the slight but distinct curvature of the hind femur. Separation of females of *D. grahami* from those of *D. tricurva* also appears possible from the almost entirely grey-black tergite 5 of the former (without large yellowish tawny posterior zone), large dark brown zones on thoracic pleura, and, in mature specimens only, by the more extensive though faint brownish distal cloud of the wing, which encloses the discal crossvein.

The specific epithet refers to Graham R. Brown, who generously cooperated in the collection of this and other species treated in this paper.

Duomyia tricurva n.sp.

Figs 13, 17

Type material. Holotype ♂, NT: Jabiru East, 12°40'S 132°53'E, 22–24.ii.1996, G.R.B., D.K.M. (AM, K292957); micro-pinned on double mount, aedeagus extended. Paratypes. NT: 1♂, 1♀, same data as holotype (AM, NTM);



Figs 11–15. *(11) Duomyia grahami*, female, right wing. *(12) D. grahami*, holotype male, part of left hind leg. *(13) D. tricurva*, holotype male, part of right hind leg. *(14) D. bucina*, male, Florence Falls, part of left hind leg. *(15) D. recta*, holotype male, part of right hind leg.

1♂, Arnhem Highway, just W of Mary River, 12°50'S 131°56'E, Feb. 2008, K.H., M.S.M. et al. (AM).

Description. (♂, ♀). Very similar to *D. grahami* and related species, agreeing with description of that species, except as indicated.

Coloration. Mesoscutum sometimes with slight brown suffusion; brown suffusions on thoracic pleura less extensive than in *D. grahami*. Tarsal segments often noticeably two-toned. Wing with apical brown suffusion pale and more restricted than in *D. grahami*, not reaching discal crossvein. Abdominal tergite 5 with tawny-yellow posterior zone, extending broadly to mid-dorsal region in female.

Head. Width of postfrons c. 0.38–0.40 of width of head; height of cheek c. 0.27–0.33 of height of eye. Antenna of male extending slightly less than distance to centre of epistomal margin. Prelabrum slightly more prominent on lower margin than in *D. grahami*.

Thorax. Fore femur usually with posteroventral bristles longer, stouter, and fewer than dorsal bristles. Hind leg of male (Fig. 13): trochanter with sub-spatulate, apically notched ventral process c. half as long as femur; femur more slender and more strongly curved than in *D. grahami*; tibia strongly bent beyond base. Hind leg of female: trochanter without process or tubercle; femur and tibia with very slight curvature. Wing: first section of vein 4 c. 0.93–1.05× as long as second section.

Abdomen. Male: surstyli not examined; aedeagus with general features of *D. grahami*; preglans very slightly thickening from base to commencement of distal sheath, c. 1.5× length of glans; terminal filaments joined for c. 0.7 of their length, each c. 1.2–1.4× as long as glans. Female: tergite 5 shaped somewhat as in *D. grahami*, but more broadly convex dorsally, with spiracle 6 inserted into small incision in lateral margin, immediately in front of posterolateral subangular prominence.

Dimensions. Total length,♂ 8.1–8.9 mm, ♀ 9.3 mm; length of thorax,♂ 4.0–4.2 mm, ♀ 4.2 mm; length of wing,♂ 7.8–8.4 mm, ♀ 8.2 mm; length of glans of aedeagus, 0.59–0.63 mm.

Distribution. Northern Territory: vicinity of Kakadu National Park.

Notes. The male of *D. tricurva* is readily distinguished from that of other species of the *D. grahami* alliance (as characterized above under that species), by the remarkably modified hind leg (Fig. 13), including the long sub-spathulate process of the trochanter and the bent tibia. The female differs from that of *D. recta* and possibly the unrecorded female of *D. bucina* in retaining slight curvature of the hind femur, and from that of *D. grahami* by the presence of a conspicuous tawny-yellow posterior zone on tergite 5 and, in well matured specimens, by the less developed apical brown suffusion on the wing.

Male-restricted modifications of the hind trochanter occur in some species of several platystomatid genera, e.g. *Euprosopia* Macquart (see McAlpine, 1973), *Achias* Fabricius (see McAlpine, 1994), and *Lamprophthalma* Portschinsky (see McAlpine, 2001). Three of the species in the *Duomyia grahami* alliance show degrees of trochanteral modification, but the only other case that I have encountered

of such a long spathulate trochanteral process, as in *D. tricurva*, is in the male of an unnamed species of *Achias* of New Guinea (BPB collection).

The specific epithet is a Latin adjective referring to the marked curvature of parts of the hind leg of the male (trochanteral process, femur, and tibia).

Duomyia bucina n.sp.

Figs 14, 18

Type material. Holotype ♂, NT: Florence Falls, Litchfield National Park, "13.06S 130.47E" [error = 13°06'S 130°47'E], 10.iv.1991, M.S.U. (ANIC); impaled on large pin, aedeagus in microvial. Paratypes. NT: 2♂, same data as holotype (AM, ANIC).

Description. (♂, ♀ unknown). Very similar to *D. grahami* and related species, agreeing with description of that species, except as indicated.

Coloration generally very like that of *D. grahami*. Scutellum more yellowish; thoracic pleura with less developed brown zones. Tarsi more uniformly tawny. Wing with faint apical brownish suffusion, not extending near discal crossvein. Abdominal tergite 5 becoming orange-tawny towards posterior margin; sternites 1 and 2 tawny-pruinescent.

Head. Postfrons c. 0.40–0.42 of width of head; parafacial slightly broader than in males of *D. grahami*; height of cheek c. 0.27–0.28 of height of eye. Antenna as in male of *D. grahami*.

Thorax. Scutellar bristles usually three pairs, but additional bristles present on right side of one paratype. Hind leg of male (Fig. 14): trochanter with relatively low, slightly bilaterally compressed tubercle, bearing moderately small, pale setulae, only slightly denser here than on rest of surface of trochanter; femur straight, not noticeably thickened; tibia straight, except for slight basal curvature. Wing: first section of vein 4 c. 1.00–1.07× as long as second section; membrane microtrichose, including that of entire second basal cell.

Abdomen. Spiracle 5 located in pleural membrane near anterior third of length of tergite 5; distal section of outer surstylus narrower than in *D. grahami*, more posteriorly curved, obliquely subtruncate; stipe of aedeagus apparently with little pubescence; preglans curved and slightly more expanding distally than in related species; terminal filaments joined for c. 0.8 of length, each nearly as long as glans.

Dimensions. Total length, 8.1–9.5 mm; length of thorax, 3.7–4.1 mm; length of wing, 7.5–7.8 mm; length of glans of aedeagus, 0.77–0.80 mm.

Distribution. Northern Territory: only known from Litchfield National Park, south of Darwin.

Notes. *Duomyia bucina* is closely similar to other species of the *D. grahami* alliance (see notes under *D. grahami*), having tawny mesoscutum and scutellum, bare scutellum, and subplumose arista. Within this group it resembles only *D. recta* in having the hind femur straight (at least in the male, Fig. 14, and presumably in the female), but differs in having some brown suffusion on the thoracic pleura, the distal wing cloud fainter and not reaching the discal crossvein in mature specimens, the hind trochanter with a distinct but low tubercle (presumably absent in the female as observed in other species), the preglans slightly shorter in relation to the glans and more distally expanded, and the terminal filaments slightly longer.

The specific epithet is a Latin noun meaning a curved trumpet, in reference to the shape of the preglans.

Duomyia recta n.sp.

Figs 15, 19

Type material. Holotype ♂, NT: Jabiru East, c. 12°40'S 132°53'E, 22–24.ii.1996, D.K.M., G.R.B. (AM, K292958); double-mounted on micro-pin, aedeagus extended. Paratype. NT: 1♀, Katherine Gorge National Park, 14°19'S 132°25'E, Dec. 1992, G.D., A.D. (AM).

Description. (♂, ♀). Very similar to *D. grahami* and related species, agreeing with description of that species, except as indicated.

Coloration generally slightly paler than in *D. grahami*. Thoracic pleura and legs without brown suffusion; all tarsal segments uniformly tawny yellow. Wing: subcostal cell quite pale; membrane otherwise with distal pale brown suffusion approximately as in *D. grahami*. Abdominal tergites tawny to tawny-brown; sternites 1 and 2 pruinescent tawny to greyish.

Head. Width of postfrons c. 0.40–0.42 of width of head; height of cheek 0.28–0.31 of height of eye; fronto-orbital bristles minute; ocellar bristle absent. Antenna potentially extending to centre of epistomal margin in male, distinctly shorter in female. Prelabrum with lower margin rather prominent; palpus slightly widened distally.

Thorax generally as described for *D. grahami*. Fore femur with some posteroventral bristles stouter than in *D. grahami*. Hind leg (Fig. 15) not noticeably sexually dimorphic; trochanter without sign of gibbosity or tubercle; femur straight, tibia almost so. Wing: first section of vein 4 0.91–0.96× as long as second section; second basal cell without bare zone.

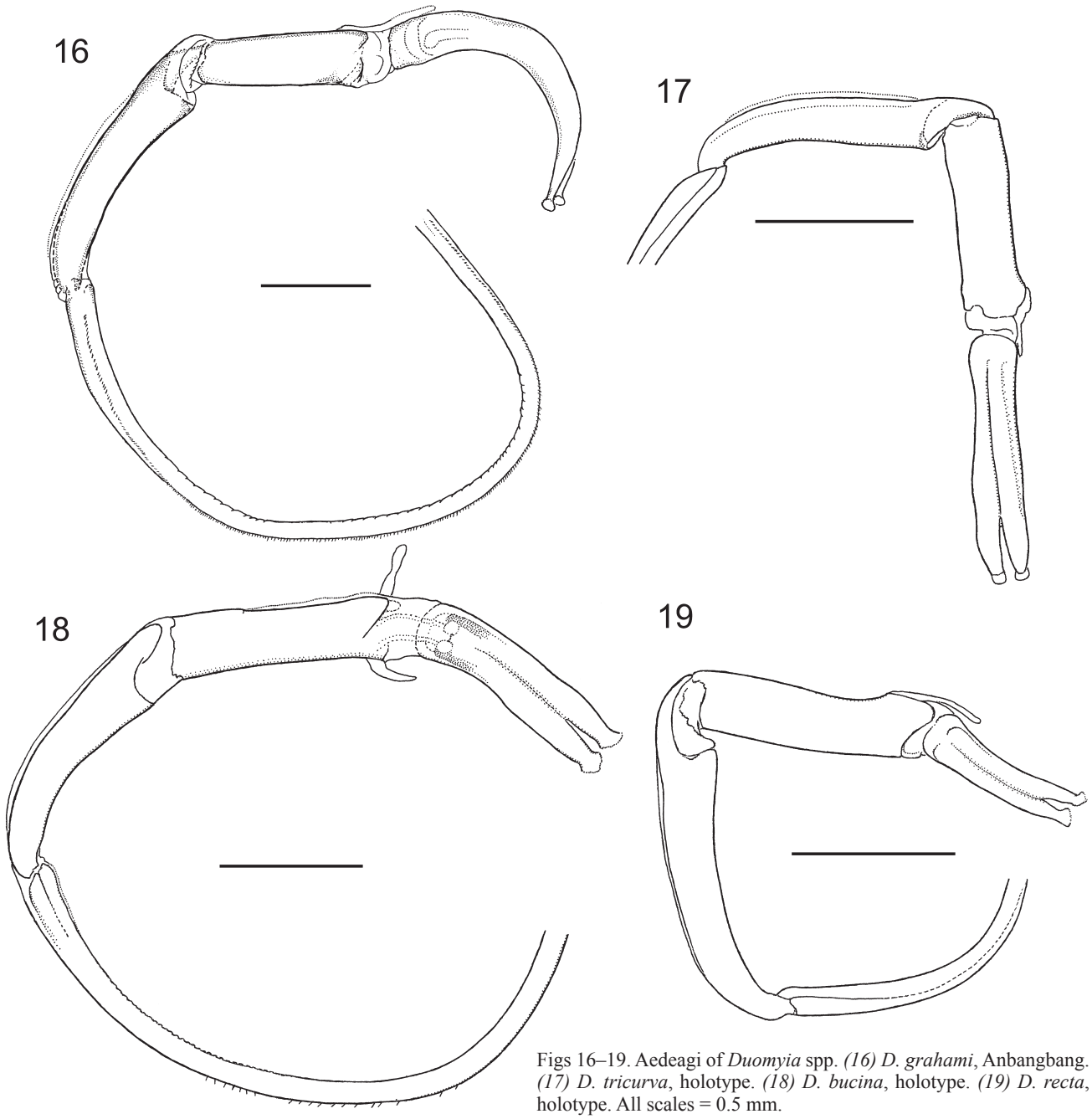
Abdomen. Male: surstyli not visible in holotype; stipe of aedeagus with pubescence apparently little developed or absent (SLM); preglans becoming slightly thicker distally, its length c. 1.4× that of glans; terminal filaments joined for c. 0.8 of length, length of each, excluding basal tunic, c. 0.63 that of glans. Female: tergite 5 with posterior margin extensively transverse and almost straight, not obliquely cut off posterolaterally on each side; spiracle 5 located in pleural membrane slightly behind mid-length of almost straight lateral margin of tergite.

Dimensions. Total length,♂ 6.7 mm, ♀ 6.5 mm; length of thorax,♂ 2.8 mm, ♀ 3.4 mm; length of wing,♂ 6.3 mm, ♀ 6.9 mm; length of glans of aedeagus, 0.72 mm.

Distribution. Northern Territory: Jabiru district to Katherine Gorge.

Notes. *Duomyia recta* belongs with the four species of the *D. grahami* alliance, discussed above under *D. grahami*. It differs from others of this alliance in the absence of brown suffusion on the thoracic pleura, in the male in the absence of any modification of the hind trochanter and femur, and in the female by having the shape of tergite 5 and position of spiracle 5 approximately as for males of the group. The terminal filaments of the aedeagus are shorter in proportion to the length of glans than in the other species of this alliance.

The specific epithet is a Latin adjective, straight, in reference to the hind femur.



Figs 16–19. Aedeagi of *Duomyia* spp. *(16) D. grahami*, Anbangbang. *(17) D. tricurva*, holotype. *(18) D. bucina*, holotype. *(19) D. recta*, holotype. All scales = 0.5 mm.

Duomyia prensans n.sp.

Fig. 20

Type material. Holotype.♀ (unique). NT: Merl [Mel] camping area [near Cahill's Crossing], Kakadu National Park, 12°25'S 132°57'E, 21.i.1993, G.D., A.D. (AM, K292959).

Description. (♀;♂ unknown). Large, stout blackish fly with conspicuous metallic green reflections on thorax and abdomen.

Coloration. Head yellowish-tawny; ocellar spot black; orbital margin of postfrons and, more narrowly, that of parafacial partly silvery-pruinescent; lunule and summit of parafacial without dark markings; facial carina with small brown marks on upper part and slight central tawny-brown suffusion; antennal groove with silvery pruinescence on pale yellow cuticle; occipital region nowhere darkened, with silvery pruinescence except near vertex. Antenna tawny-brown. Prelabrum and palpus tawny. Thorax largely black with conspicuous green reflections; lateral margin of mesoscutum between transverse suture and scutellum reddish brown; humeral callus and scutellum without pale pruinescence or almost so; propleuron extensively grey-pruinescent; mesopleuron largely shining to glossy, greyish-pruinescent on upper margin and on small posterior zone, with setulae mostly black. Legs largely black; fore and hind basitarsi orange-tawny, becoming brown distodorsally, with ventral setulae tawny, dorsal setulae black; segments 2 and 3 of hind tarsus also partly orange-

tawny; mid basitarsus brownish tawny with mainly black setulae. Wing stained with orange at base; second costal cell partly yellow, partly hyaline; subcostal cell dark brown; marginal cell largely paler brown to yellowish brown; submarginal cell brownish distally, paler yellowish basally; basal cells and anal cell partly yellowish, partly hyaline; distal and posterior parts of membrane faintly tinged with yellowish brown. Halter tawny with partly brown capitellum. Abdominal tergites 1 to 5 shining black with green to blue reflections and almost no pruinescence, with setulae mostly black, those on lateral parts of tergites 2 and 3 brown; sternites 1 and 2 shining brown-black, with very little pruinescence.

Head. Vertex prominently carinate between inner vertical bristles; postfrons without median hump, with moderately fine setulae, anterolaterally with small setiferous pits extending on to upper extremity of parafacial; width of postfrons 0.48 of width of head; fronto-orbital bristles vestigial; ocellar bristle absent; parafacial broad, almost smooth, except at upper and lower extremities; height of cheek 0.46 of height of eye. Antenna potentially extending c. 0.8 of distance from basal socket to centre of epistomal margin; arista with rather numerous short hairs on basal part of segment 6, some about as long as or slightly longer than maximum diameter of segment. Prelabrum rather small; palpus moderately slender.

Thorax. Mesoscutum with numerous moderately short setulae, and several longer ones between postalar and intra-alar bristles and immediately anterior to scutellar suture; scutellum very finely, densely and sharply rugose on almost entire surface; pteropleuron with numerous rather long, fine setulae, but no differentiated bristle; pteropleural ridge setulose; major thoracic bristles otherwise as given for *D. grahami*. Fore femur with numerous rather small dorsal bristles and five or six strongly spinescent posteroventral bristles on distal half; mid femur with subapical comb of closely placed posterior bristles and, basad from this, numerous moderately long fine mostly pale setulae; hind femur with the usual dorsal bristles and no ventral bristles; fore and hind basitarsi appearing almost cylindrical or very slightly depressed. Wing: vein 3 apically strongly curved towards vein 4; first (basal) section of vein 4 0.90× as long as second section; second section strongly curved; distal section of vein 4 converging on its whole length with vein 3, with strong sigmoid curvature, terminating well in front of apex; membrane almost entirely densely microtrichose, except for minute zones in second basal and anal cells.

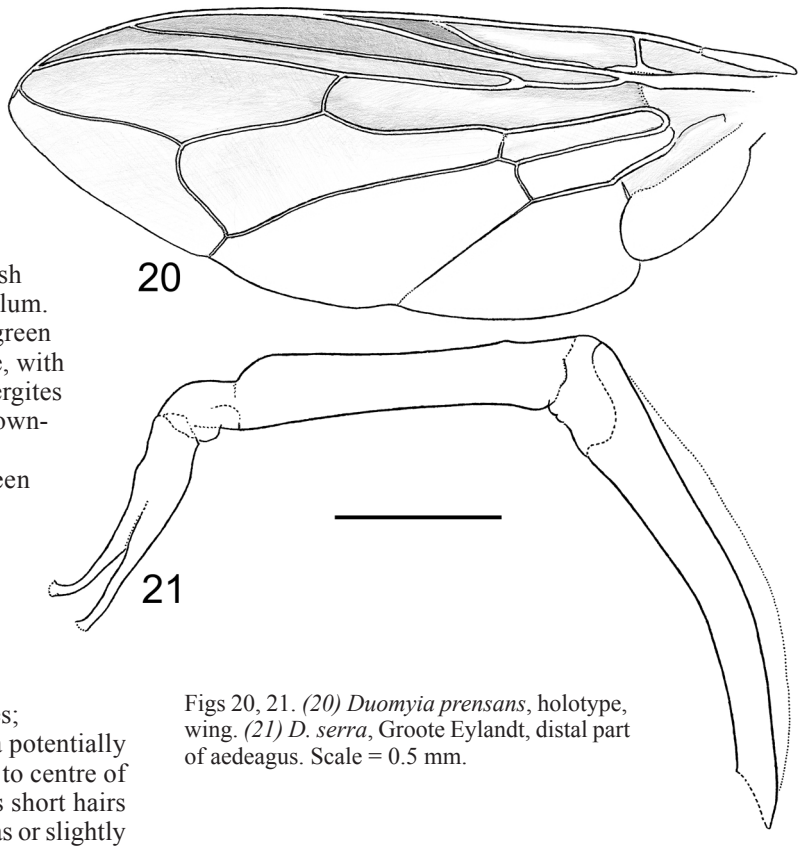
Abdomen. Tergite 5 nearly twice as long as tergite 4; sternite 2 subquadrate, shorter than sternite 1, with posterior margin almost transverse; sternites 3, 4, and probably 5 vestigial.

Dimensions. Total length, 12.0 mm; length of thorax, 5.4 mm; length of wing, 9.5 mm.

Distribution. Northern Territory: vicinity of East Alligator River.

Notes. *Duomyia prensans* belongs in the group of species having no scutellar setulae, with thickened spinescent posteroventral bristles on the fore femur, the antenna relatively long (perhaps longer in the unknown male), the scutellum entirely metallic black, and no pteropleural bristles distinguishable from the setulae or hairs. Among such forms it is differentiated from the little known *D. serra* by the pubescent arista, largely orange-tawny fore and hind basitarsi, and the brown suffusion in the marginal cell. The holotype is the most robust specimen of *Duomyia* that I have seen from NT, but is not as large as individuals of some eastern species of the *D. obscura* alliance (several still undescribed). As with many *Duomyia* spp., considerable size variation is to be expected.

The specific epithet is a Latin participle, clutching, in reference to the modification of the fore leg.



Figs 20, 21. *(20) Duomyia prensans*, holotype, wing. *(21) D. serra*, Groote Eylandt, distal part of aedeagus. Scale = 0.5 mm.

Duomyia serra McAlpine

Fig. 21

Duomyia serra D. McAlpine, 1973: 96.

Type material. Holotype ♂, Queensland: Chester River, Silver Plains, Coen district, xii.1961 (ANIC).

Other material examined. NT:♂ Groote Eylandt, no date, N.B.T. (SAM). According to Musgrave (1932: 321–322), N.B.T. collected at Groote Eylandt within the period 1920–1922.

Description. See D. McAlpine (1973: 96).

Dimensions. (♂, Groote Eylandt). Total length, 9.3 mm; length of thorax, 3.6 mm; length of wing, 6.9 mm; length of glans of aedeagus, 0.96 mm.

Notes. *Duomyia serra* is distinguished from other species of the genus as noted under *D. prensans* and in the key to species.

The only specimen available from NT differs from the holotype, from Queensland, in having the femora and tibiae more extensively dark brown (perhaps nearly black when fresh) and the setulae on the pteropleuron rather stout and black, instead of fine, hair-like, and whitish as in the holotype. On the other hand, the aedeagus (Fig. 21) is essentially similar to that of the holotype. More material is needed to establish the status of this island population.

Duomyia praeflava n.sp.

Figs 22, 23

Type material. Holotype ♂, NT: 16 km E by N of Mount Cahill [Kakadu National Park], 16.xi.1972, D.H.C., at light (ANIC); on micro-pin through polyporus. Paratypes. NT: 1♂, 2♀, same data as holotype (AM, ANIC); 1♀, Cooper Creek, 19 km E by S of Mount Borradaile [N of Oenpelli], Nov. 1972, D.H.C. (ANIC).

Other material. Queensland: 1♂, 3 km ENE of Innot, near Ravenshoe, 17°39'S 145°16'E, Nov. 1981, D.H.C. (ANIC).

Description. (♂, ♀). Small predominantly blackish fly, resembling *D. korneyevi*, agreeing with description given for that species except as indicated below.

Coloration (all specimens slightly faded). Palpus yellow, often brownish basally. Thorax largely black, with green-tinted reflections; humeral callus grey-pruinescent on upper part; scutellum almost entirely rather densely grey-pruinescent, apparently without fine rugosity; sternopleuron with pruinescence often restricted to posterior extremity. Coxae brown or partly yellowish; all tarsi brownish distally, fore ones with only basal part of segment 1 paler. Halter yellow basally, with largely brownish capitellum. Abdominal coloration much as in *D. korneyevi*, but sternites 1 and 2 more extensively smooth, glossy.

Head. Height of cheek 0.35–0.45 of height of eye. Antenna of male potentially extending to centre of epistomal margin, that of female slightly shorter; segment 6 of arista with a little basal pubescence.

Thorax. Pteropleural bristle sometimes duplicated; pteropleural ridge often without setulae (ridge not visible in some specimens). Hind basitarsus shorter and stouter than fore basitarsus in male (0.86 of length of fore tarsus in larger male, 0.89 of length of fore basitarsus in smaller male); hind basitarsus slightly longer than fore basitarsus in females. Wing: veins 3 and 4 both slightly curved distally, less strongly convergent than in *D. korneyevi*, vein 4 terminating distinctly behind wing apex; basal section of vein 4 0.97–1.11× as long as second section. Squama not as large as that of *D. korneyevi* and differently shaped (Fig. 23).

Abdomen. In male, tergite 4 shorter than tergite 5 but variable in length; sternite 2 broadly rounded to almost truncate on posterior margin; sternite 5 sclerotized, rounded anteriorly, each posterolateral angle produced into a convex extension, posterior margin between these extensions broadly excavated. Male postabdomen: surstyli longer than in *D. korneyevi*, apex of outer surstylus narrow, reflexed, only slightly surpassing apex of inner surstylus; stipe of aedeagus with pubescence restricted to longitudinal channel and occupying most of its length; preglans simple, rather slender, shorter than glans; glans subcylindrical, without membranous wing; bulb with prominent projection; tunic containing pair of sclerotized lobes embracing bases of terminal filaments; terminal filaments very elongate, each c. 8× as long as glans, with very oblique terminal gonopore.

Dimensions. Total length,♂ 3.4–4.6 mm, ♀ 3.8–5.3 mm; length of thorax,♂ 1.3–1.9 mm, ♀ 1.6–2.2 mm; length of wing,♂ 2.9–3.7 mm, ♀ 3.5–4.7 mm; length of glans of aedeagus, 0.28–0.35 mm.

Distribution. Northern Territory: Kakadu National Park and northern Arnhem Land. Queensland: near Atherton Tableland.

Notes. Among the species with black non-setulose scutellum and no thick posteroventral spines on the fore femur, *D. praeflava* is distinguished by its long, yellow antenna and extensively grey-pruinescent scutellum (i.e. with rather dense dust-like microtrichia). In the male, the aedeagus differs from that of related species in the long terminal filament and unusual structure of the bulb and tunic (Fig. 22).

The specific epithet is a compound Latin adjective meaning yellow in front, in reference to the yellow head, antenna, and palpus.

Duomyia korneyevi n.sp.

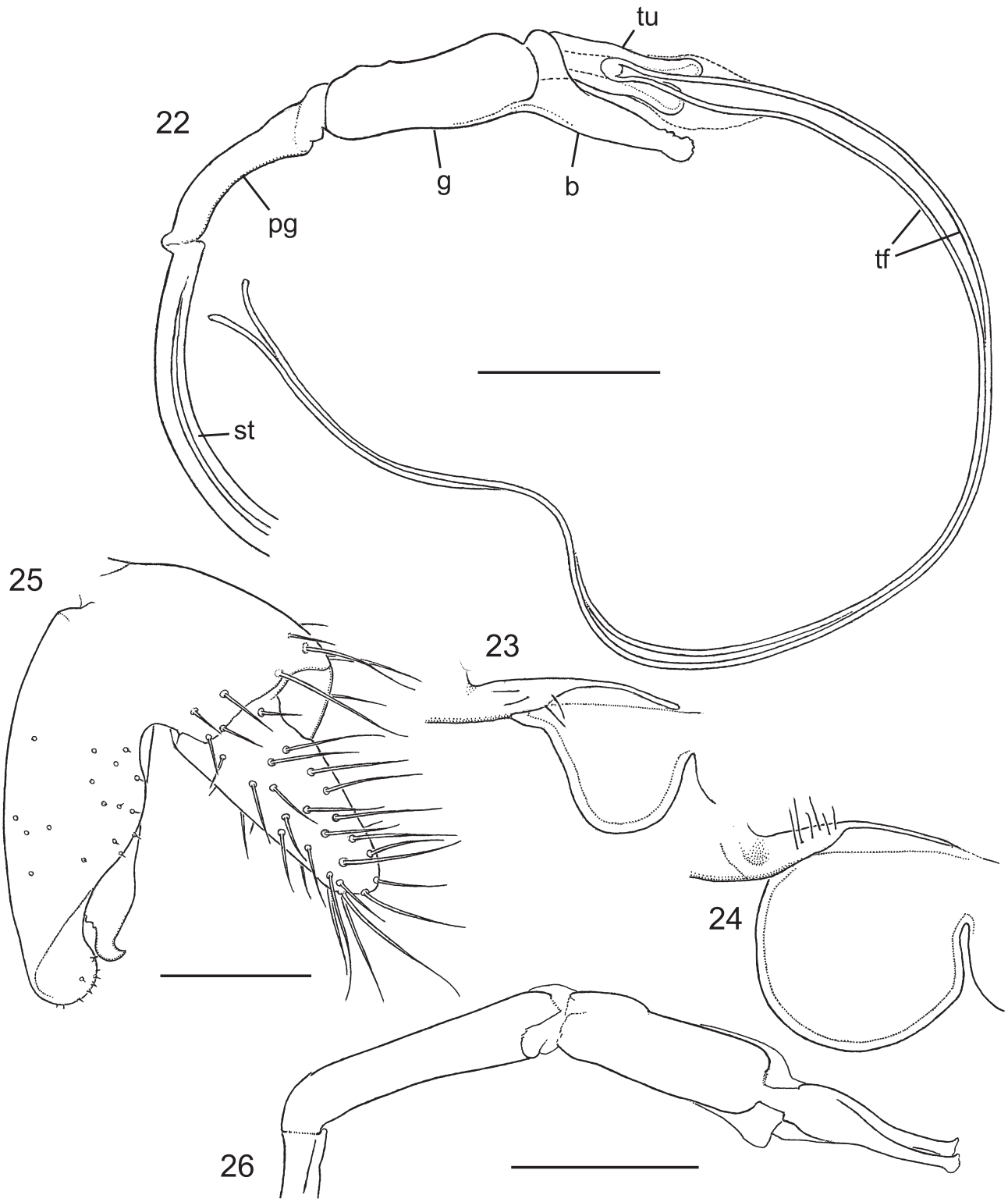
Figs 24–26

Type material. Holotype ♂, NT: Koongarra, 15 km E of Mount Cahill [Kakadu National Park], 6–9.iii.1973, D.H.C., at light (ANIC); double mounted on micro-pin through cube of polyporus. Paratypes. NT: 7♂, 1♀, same data as holotype (ANIC, AM); 1♀, Cooper Creek, 19 km E by S of Mount Borradaile [N of Oenpelli], Nov. 1972, D.H.C. (ANIC).

Other material. Queensland: 1♀, Dulhunty River, northern Cape York Peninsula, May 1992, G.C. (AM).

Description. (♂, ♀). Small to very small (for genus), predominantly blackish fly, with unmarked wing.

Coloration. Head yellow; small ocellar spot brown; no other markings visible in anterior view; upper occiput with extensive dark brown zone, largely covered with grey pruinescence. Antenna deep yellow. Prelabrum and palpus yellow. Thorax largely black; mesoscutum pruinescent mainly towards lateral margins; humeral callus shining, almost devoid of pruinescence; scutellum dorsally densely minutely rugose, without pale pruinescence; mesopleuron with grey pruinescence covering variable extent of upper part; sternopleuron with little pale pruinescence on upper margin and ventromedian part. Coxae dark brown; femora dark brown, fore and mid ones with yellow apices; tibiae tawny, with some brown suffusion; tarsi yellow, fore ones with segments 3 to 5 brown, mid and hind ones with segments 4 and 5 tawny. Wing without dark markings or shading; subcostal cell pale yellow. Halter yellow. Abdominal tergites 1 to 5 shining black or brown-black; tergites 1 and 2 with grey-pruinescent lateral zones, such zones absent on tergites 3 to 5; sternite 1 brown, shining medially and on anterior margin, grey-pruinescent elsewhere; sternite 2 brown, with grey pruinescence except on anterior margin.



Figs 22–26. *(22) Duomyia praeflava*, holotype, aedeagus. *(23) D. praeflava*, right squama, small male. *(24) D. korneyevi*, right squama, small male. *(25) D. korneyevi*, Koongarra, epandrium, left lateral view. *(26) D. korneyevi*, Koongarra, distal part of aedeagus. Scales for Figs 22, 26 = 0.3 mm. Scale for Fig. 25 = 0.1 mm. *b*, bulb; *g*, glans; *pg*, preglans; *st*, stipe; *tf*, terminal filaments; *tu*, tunic.

Head somewhat anteroposteriorly compressed, slightly carinate at vertex; postfrons without distinct pitting and median hump, with fine inconspicuous setulae; width of postfrons 0.39–0.42 of width of head; ocellar and fronto-orbital bristles not differentiated from setulae; facial carina flat to slightly concave, rugose, with sharply raised lateral margins; parafacial of moderate width, without setiferous pits, except sometimes at upper extremity; cheek with variable anterior rugosity; height of cheek 0.34–0.43 of height of eye. Antenna potentially extending to centre of epistomal margin, not noticeably sexually dimorphic; arista with segment 6 apparently bare, or almost so; segment 5

with a little short pubescence. Prelabrum moderately small; palpus slightly broadened and rounded distally.

Thorax. Mesoscutum with many short almost recumbent setulae except near lateral margins; scutellum almost semicircular in outline, convex, without setulae; pteropleuron with one stout black bristle and several mostly pale setulae, including one or few on pteropleural ridge; other thoracic bristles as given for *D. grahami*. Fore femur with an irregular series of numerous dorsal black bristles and a series of fewer posteroventral bristles, some of the latter rather long; mid femur with two to four subapical black posterior bristles; hind femur with dorsal bristles beyond mid-length; all basitarsi subcylindrical, moderately elongate, fore basitarsus shortest (both sexes). Wing: distal section of vein 3 not strongly curved; distal section of vein 4 basally almost parallel with vein 3, distally curved forwards to terminate approximately at apex; basal section of vein 4 1.0–1.2× as long as second section; membrane almost entirely microtrichose. Squama large and broadly rounded (Fig. 24).

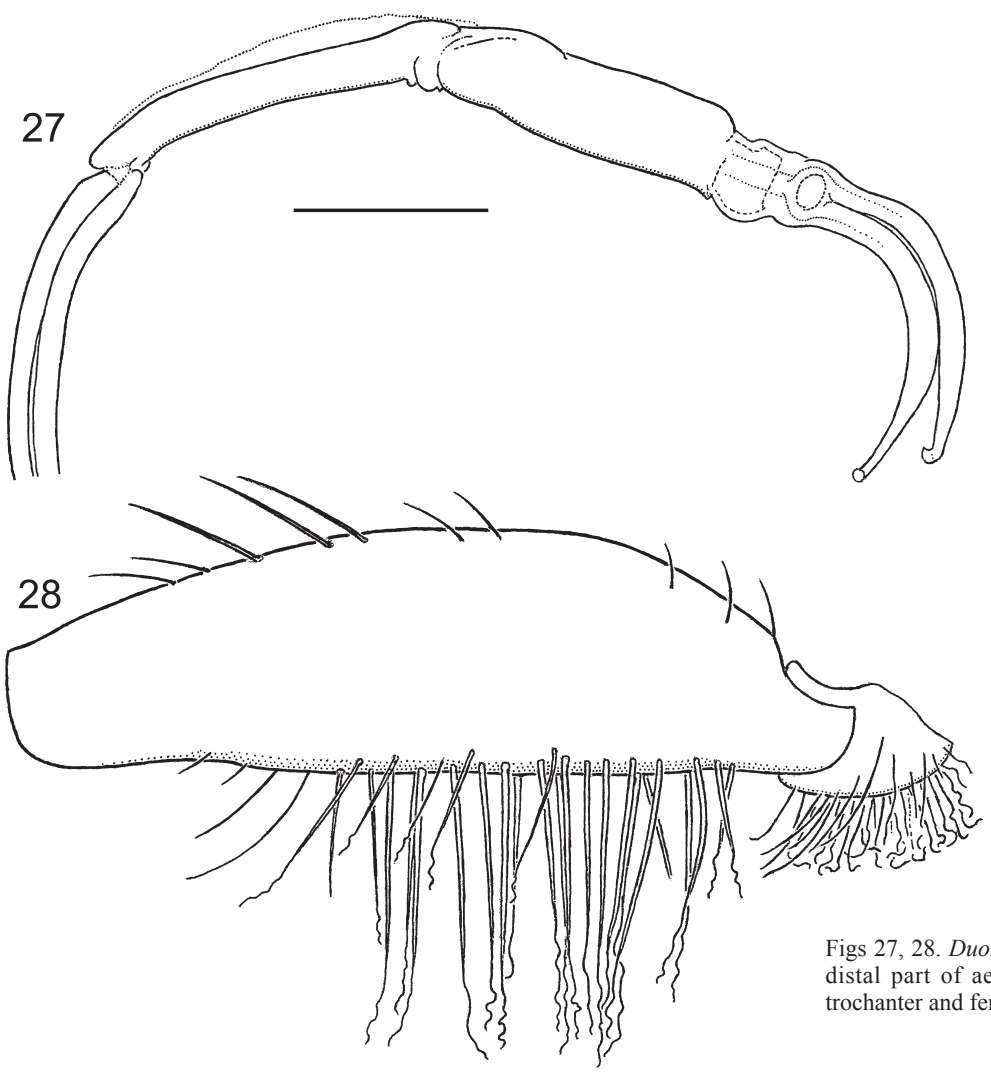
Abdomen. In male, tergite 5 c. 1.4–1.7× as long as tergite 4; sternite 1 quadrate, rather broad; sternite 2 subtriangular, almost as broad; sternites 3 and 4 apparently reduced or absent; sternite 5 well sclerotized, subtriangular, minutely setulose, with two posterolateral angles tumid, bearing slightly larger setulae. In female, tergite 5 nearly as long as in male; sternites 1 and 2 approximately as in male; sternites 3 to 5 apparently all much reduced. Male postabdomen: surstyli rather short; distal section of outer surstylus short and broadly rounded, not flexed; aedeagus with elongate preglans, c. 1.2× as long as glans; glans subcylindrical, without membranous marginal wing; bulb short, apparently without caeca; terminal filaments of equal size, bulbous on c. basal half, joined basally, variably expanded apically, length of each c. 0.72–0.78× length of glans.

Dimensions. Total length,♂ 2.9–4.1 mm, ♀ 4.1–4.2 mm; length of thorax,♂ 1.3–1.7 mm, ♀ 1.6 mm; length of wing,♂ 2.7–3.4 mm, ♀ 3.2–3.5 mm; length of glans of aedeagus, 0.33–0.34 mm.

Distribution. Northern Territory: Kakadu National Park and northern Arnhem Land. Queensland: northern Cape York Peninsula.

Notes. Among the species with black, non-setulose scutellum and no black posteroventral spines on the fore femur, *D. korneyevi* is distinguished by its long, entirely yellow antenna and very finely densely rugose scutellum (fingerprint sculpture, as distinct from the glossy and pruinescent scutellar surface types present in related species). Other significant characters are given in the above description and the key to species.

The specific epithet refers to Valery A. Korneyev, who has made a significant contribution to knowledge of Eurasian platystomatids.



Figs 27, 28. *Duomyia lana*, Burrell's Creek. *(27)* distal part of aedeagus. *(28)* male, right hind trochanter and femur. Scale = 0.3 mm.

Duomyia lana n.sp.

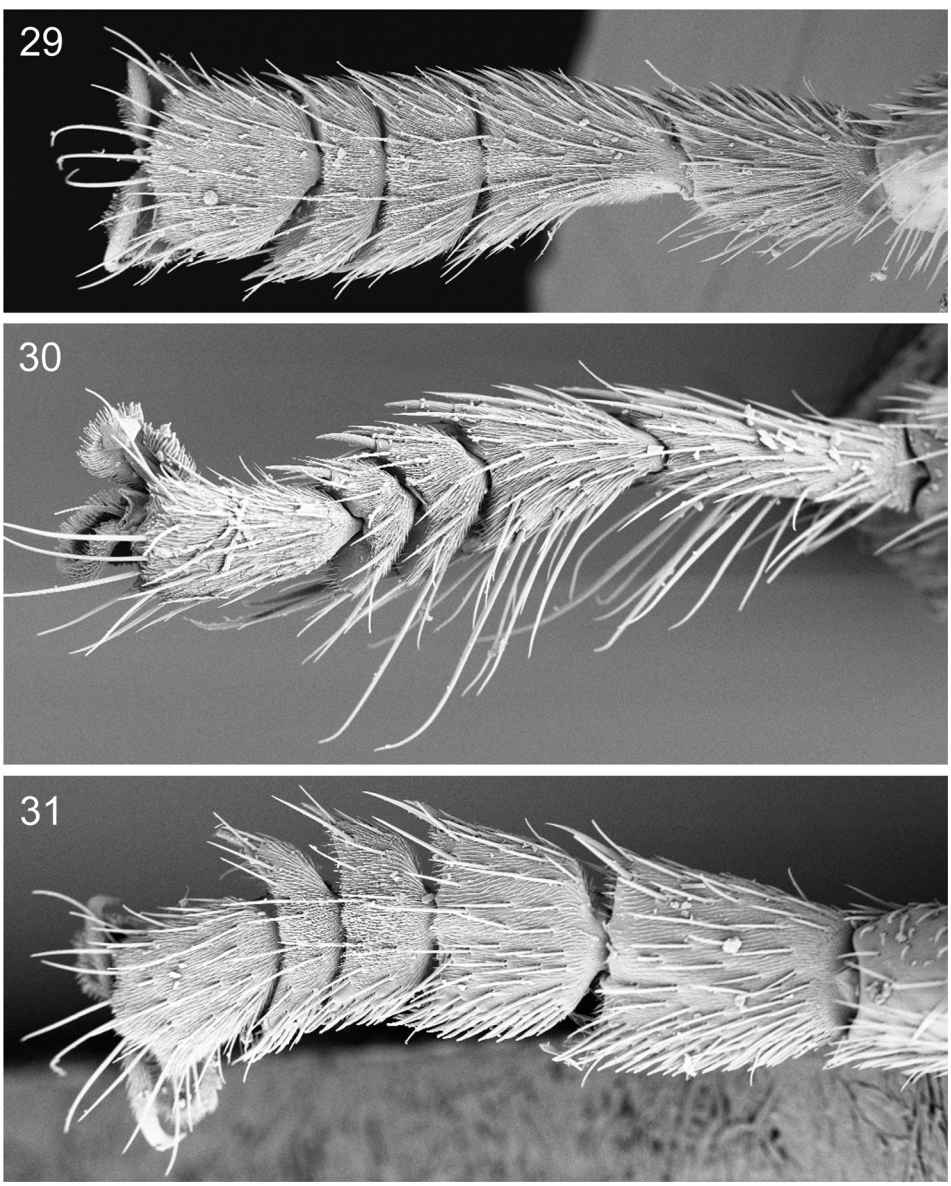
Figs 27–31

Type material. Holotype ♂, NT: Burrell's Creek, [old] Stuart Highway, 24.xi.1972, D.H.C., at light (ANIC); impaled on long pin, aedeagus extended, right mid leg glued to card. Paratypes. NT: 3♂, 2♀, same data as holotype (ANIC, AM). Apparently the old section of the Stuart Highway (termed Dorat Road on a newer map) crossed Burrell's Creek at c. 13°27'S 131°10'E.

Description. (♂, ♀). Medium-sized to small blackish fly, with green reflections and unmarked wing.

Coloration. Head largely tawny-brown to dark brown, generally darker in females; anterior part of postfrons always dark brown; face pale yellowish in male, brown in female. Antenna tawny-brown, much of segment 3 darker brown. Prelabrum blackish; palpus brown, darker distally. Thorax shining black with green reflections; mesoscutum, scutellum, humeral callus, mesopleuron, and sternopleuron almost without pruinescence. Legs largely black; tarsi brown to black; fore and mid tarsi with short paler zone at articulation of segments 1 and 2. Wing without dark markings or shading. Halter tawny with brown capitellum. Abdominal tergites 1 to 5 shining black with green reflections, almost without pruinescent zones; sternite 1 shining blackish, almost without pruinescence.

Head much higher than long, slightly carinate at vertex; postfrons without distinct pitting and median hump, with fine inconspicuous setulae; width of postfrons 0.27–0.29 of width of head in male, 0.33–0.35 in female; ocellar and fronto-orbital bristles not differentiated; facial carina flat-topped, usually shorter and broader in female than in male, with strongly raised lateral margins; parafacial narrowed for short distance near eye, without setulae; cheek without obvious rugosity; height of cheek 0.28–0.33 of height of eye; cheek bristle usually stronger in female than in male. Antenna potentially reaching 0.8 or 0.9 of distance from basal socket to centre of epistomal margin; arista apparently bare except for short pubescence on segment 5. Prelabrum moderately small in female, somewhat smaller in male; palpus moderately short.



Figs 29–31. *Duomyia lana*, male. *(29)* left fore tarsus. *(30)* left mid tarsus. *(31)* left hind tarsus.

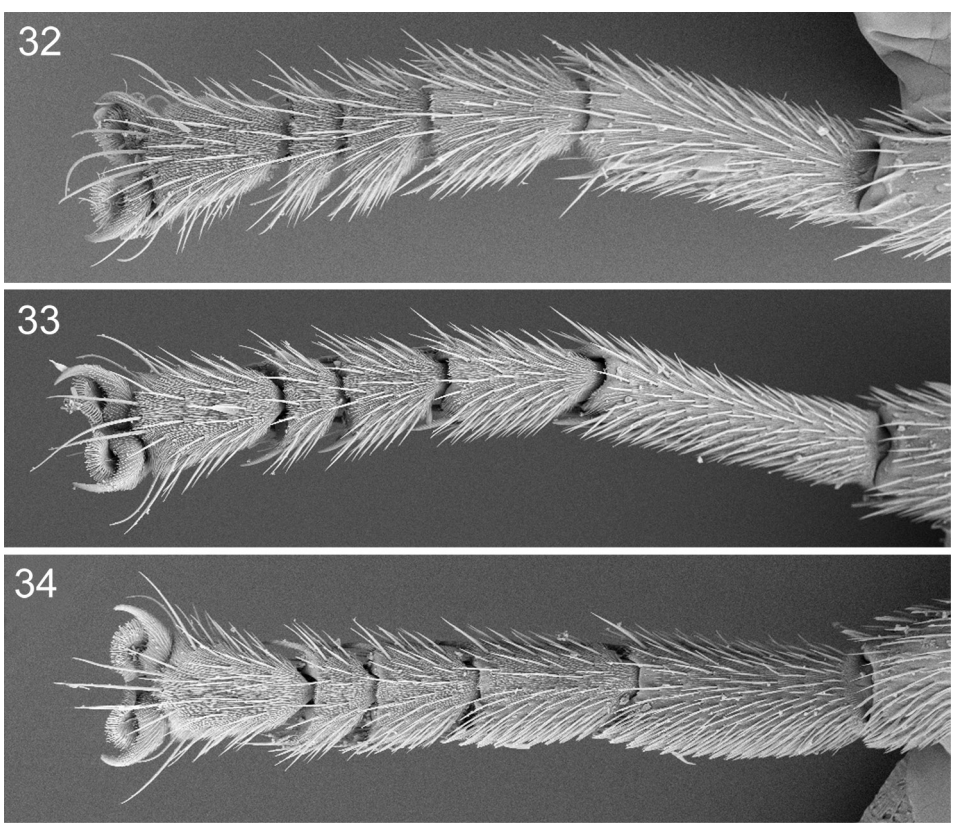
Thorax generally as described for *D. korneyevi*; pteropleuron usually with two black bristles not much longer than the pale hairs, without setulae on pteropleural ridge; mesopleuron with hair-like setulae, longer and finer in male than in female; ventral part of sternopleuron with brush of many fine whitish mollisetae in male, undeveloped in female. Fore coxa of male with large distal brush of fine mollisetae, undeveloped in female; other coxae with shorter, less conspicuous mollisetae in male, undeveloped in female; fore femur with numerous rather fine black dorsal bristles, without posteroventral keel and spinescent bristles, in male with many long fine whitish ventral hairs and mollisetae except on distal quarter, in female only rather short fine ventral setulae present; mid femur with few posterior subapical black bristles, finer in male than in female, and, in male, rather numerous fine whitish posteroventral hair-like setulae; hind femur with numerous long whitish ventral mollisetae, undeveloped in female; all tarsi strongly sexually dimorphic; fore tarsus of male (Fig. 29) with segment 1 unusually short, asymmetrical, segment 2 also asymmetrical, segments 3 to 5 unusually broad; fore tarsus of female moderately elongate, almost symmetrical; mid tarsus of male (Fig. 30) less elongate than in *D. collessi*, *D. korneyevi*, etc., segments 1 to 4 with long posterior bristles, segment 1 asymmetrical distally, segments 2 to 4 shorter and broader than in related species; mid tarsus of female without modifications present in male, only slightly stouter and more depressed than in related species; hind tarsus of male (Fig. 31) much broader and more depressed than in related species, with segment 1 c. 1.3× as long as wide; hind tarsus of female more slender, with segment 1 almost cylindrical. Wing: distal section of vein 3 slightly arched; distal section of vein 4 slightly curved forwards distally to terminate slightly behind apex; basal section of vein 4 0.92–1.2× as long as second section; membrane almost entirely microtrichose. Squama large, slightly less broadly rounded than in *D. korneyevi*.

Abdomen. In male, tergite 5 distinctly longer than tergite 4; sternite 1 quadrate; sternite 2 smaller, broadly rounded posteriorly; sternites 3 and 4 obsolete; sternite 5 large, slightly narrowed towards transverse anterior margin, posteriorly with each posterolateral angle produced into a broad subacute lobe, with very fine setulae only. In female, tergite 2 laterally with variably developed (probably size-correlated) group of long whitish setulae or mollisetae; other tergites without zones of differentiated setulae; tergite 5 slightly longer than tergite 4; sternites 1 and 2 as in male; sternites 3 to 5 obsolete. Male postabdomen: apex of outer surstylus only slightly exceeding that of inner surstylus, not reflexed, slightly broadened, with posterolateral gibbosity; stipe of aedeagus with trace of pubescence only; preglans well defined, slender, slightly longer than glans, with narrow membranous wing on most of length; glans subcylindrical, somewhat elongate; bulb simple, without processes; tunic simple; each terminal filament tapered distally, slightly longer than glans.

Dimensions. Total length,♂ 5.2–6.0 mm, ♀ 5.3–8.0 mm; length of thorax,♂ 2.0–2.7 mm, ♀ 2.2–3.2 mm; length of wing,♂ 4.0–5.1 mm, ♀ 4.5–5.8 mm; length of glans of aedeagus, 0.47–0.48 mm.

Distribution. Northern Territory: only known from type locality to south of Adelaide River town.

Notes. *Duomyia lana* belongs among those species with smooth glossy black scutellum lacking scutellar setulae, and



Figs 32–34. *Duomyia collessi*, male, Magela Creek. *(32)* left fore tarsus. *(33)* left mid tarsus. *(34)* left hind tarsus.

without posteroventral black spines on the fore femur. The male is distinguished from all other species by the brushes of dense whitish mollisetae on the fore coxa, lower part of sternopleuron, and other parts, and by the asymmetrical fore and mid tarsi and broadly depressed hind tarsus (Figs 29–31). The female lacks these modifications but is generally distinguished by having the face brown (pale yellow in male), and the fore tarsus dark brown to its base. The female of *D. maceveyi* is similar in some characters, but has numerous short hairs towards the base of antennal segment 6 and the hind basitarsus yellow.

The specific epithet is a Latin noun meaning wool, in reference to the woolly mollisetae of the male.

Duomyia collessi n.sp.

Figs 32–36

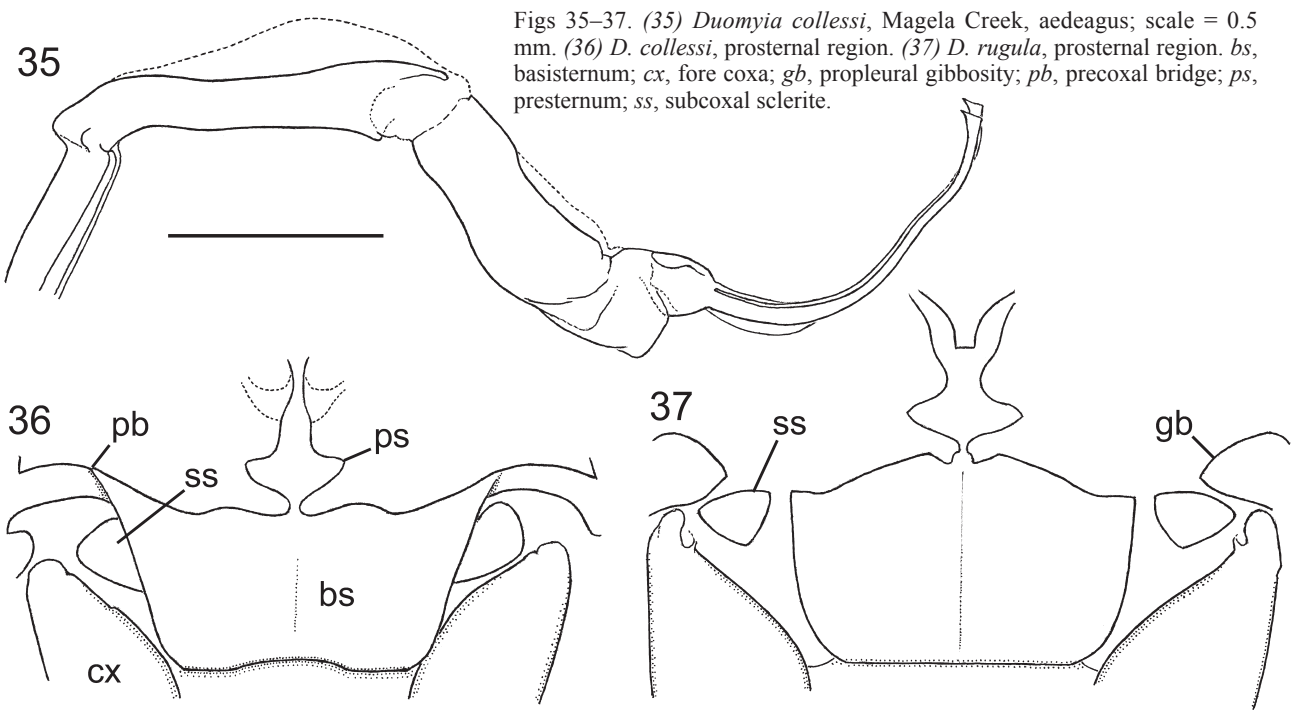
Type material. Holotype ♂, NT: Magela [or Magella] Creek, 9 km SSE of Mudginbarry [or Mudginberri] Homestead [vicinity of Kakadu National Park], 6.xi.1972, D.H.C., at light (ANIC); impaled on long pin, aedeagus extended. Paratypes. NT: 5♂, 9♀, same data as holotype (ANIC, AM); 1♂, Cooper Creek, 11 km S by W of Nimbuwah Rock, Nov. 1972, D.H.C. (ANIC); 2♀, 7 km NW by N of Cahill's Crossing, East Alligator River, Nov. 1972, D.H.C. (ANIC, AM); 1♀, 5 km NNW of Cahill's Crossing, Nov. 1972, D.H.C. (ANIC); 2♂, Baroalba Creek Springs, 19 km NE by E of Mount Cahill [Kakadu National Park], Oct. 1972, D.H.C. (ANIC); 2♀, 16 km E by N of Mount Cahill, Nov. 1972, D.H.C. (ANIC); 2♀, Nourlangie Creek, 8 km N of Mount Cahill, Oct. 1972, D.H.C. (ANIC).

Other material (localities only given). Queensland: Sweers Island Reserve, South Wellesley Islands (AM).

Description. (♂, ♀). Medium-sized to small blackish fly, with green reflections and unmarked wing.

Coloration (most of type series slightly faded). Head largely yellow to ochraceous; postfrons dark brown on substantial but variable anterior section; subgenal margin tawny-brown; occipital region largely tawny. Antenna brown to tawny-brown. Prelabrum tawny to brown, darker on lower margin; palpus dark brown. Thorax largely shining black with green reflections; mesoscutum greyish pruinescent only near lateral margins; humeral callus and scutellum glossy, almost without pruinescence; mesopleuron grey-pruinescent on less than posterodorsal quarter; pteropleuron densely grey-pruinescent centrally, shining on substantial anterior and posterior zones; sternopleuron with little pruinescence towards extremities. Legs largely dark brown to blackish; fore tarsus with segment 1 tawny-yellow, segments 2, 3, and 5 dark brown with pale creamy bases, segment 4 brown; mid and hind tarsi tawny to tawny yellow. Wing hyaline, without dark markings; subcostal cell yellowish; veins basad of humeral crossvein bright yellow, more brownish yellow distally. Halter with tawny scabellum, yellow pedicel, and partly brown capitellum. Abdominal tergites black with greenish reflections, with mostly rather short black setulae, some longer whitish setulae on tergite 2 laterally, more developed in male.

Head resembling that of *D. lana*; width of postfrons 0.29–0.31 of width of head in male, 0.30–0.34 in female; facial carina convex with strong vertical plications and strongly raised lateral margins; parafacial rather narrow (more so in male), without setulae; cheek almost smooth, apparently lacking minute setulae on anterior section except for few on extreme lower margin; height of cheek 0.25–0.35 of height of eye. Antenna generally potentially reaching slightly more than distance from basal socket to centre of epistomal margin in male, slightly less than that distance in female; arista with segment 6 bare. Prelabrum moderately small; palpus moderately short, apically rounded.



Figs 35–37. *(35) Duomyia collessi*, Magela Creek, aedeagus; scale = 0.5 mm. *(36) D. collessi*, prosternal region. *(37) D. rugula*, prosternal region. *bs*, basisternum; *cx*, fore coxa; *gb*, propleural gibbosity; *pb*, precoxal bridge; *ps*, presternum; *ss*, subcoxal sclerite.

Thorax generally as described for *D. korneyevi*; pteropleuron with mostly pale setulae, longer in male, a few setulae on pteropleural ridge; scutellum with three pairs of marginal bristles and no setulae. Fore femur with a series of numerous rather stout black dorsal bristles and a distinct series of fewer fine, mainly yellowish posterodorsal bristles; mid femur with moderately long white hair-like posterior setulae and short series of black subapical posterior bristles; hind femur slightly curved, more distinctly so in male, with dorsal black bristles and numerous fine white hair-like ventral setulae, generally longer in male; hind tibia with only slight basal curvature; fore and mid tarsi not strongly asymmetrical; fore tarsus not strongly sexually dimorphic, segment 1 not strongly depressed, c. 3× as long as wide in male, slightly more elongate in female; mid tarsus without apparent sexual dimorphism; hind tarsus with segment 1 c. 2.0–2.4× as long as wide in male, 3.1–4.1× in female. Wing: distal section of vein 3 slightly curved on c. basal half; distal section of vein 4 with slight sigmoid curvature, terminating very slightly behind wing apex; basal section of vein 4 slightly shorter to slightly longer than second section; membrane almost entirely microtrichose except sometimes for narrow bare zones in second basal and anal cells. Squama large and prominent, but not so broadly rounded as in *D. korneyevi*.

Abdomen. In male, tergite 5 much longer than tergite 4; sternite 2 large and subtriangular; sternites 3 and 4 vestigial or absent; sternite 5 with broad median notch on posterior margin separating pair of broad subangular lobes. In female, sternite 2 usually broadly rounded posteriorly, very small but distinct tergite 3 usually present, sternites 4 and 5 absent; sternite 6, as usual, represented by two separate sclerites. Male postabdomen: surstyli rather short; distal section of outer surstylus not broadened, apically slightly flexed so that sharp edge is directed anteriorly; stipe of aedeagus without pubescence; preglans well defined, slender, longer than glans, with membranous wing on most of length and prominent basal gibbosity; glans stout, irregularly subcylindrical; bulb rather short and stout, of complex shape, but without processes; each terminal filament separate from origin in tunic, with slightly expanded oblique apex, c. 1.7× as long as glans.

Dimensions. Total length,♂ 5.9–7.2 mm, ♀ 3.5–9.0 mm; length of thorax,♂ 2.4–2.9 mm, ♀ 1.6–3.6 mm; length of wing,♂ 4.9–5.6 mm, ♀ 3.4–7.0 mm; length of glans of aedeagus, 0.55 mm.

Distribution. Northern Territory: Kakadu National Park and northern Arnhem Land. Queensland: South Wellesley Islands, Gulf of Carpentaria.

Notes. *Duomyia collessi* belongs among those species with bare glossy black scutellum, long brownish tawny antenna, and no posteroventral armature on the fore femur except for fine bristles. It differs from *D. lana* in the yellow cheek and parafacial and, in the male, the lack of long woolly mollisetae on the fore coxa, sternopleuron, etc., and the relatively unmodified tarsi (Figs 32–34). From some similar undescribed species of eastern Queensland, it can be distinguished by the distribution of grey pruinescence on the mesopleuron and pteropleuron, the latter pruinescent centrally but with substantial shining anterior and posterior zones, and, in the male, by the longer terminal filaments (Fig. 35).

The specific epithet refers to Donald H. Colless, whose collections of *Duomyia* (in ANIC) form a significant basis of this study.

***Duomyia maceveyi* n.sp.**

Figs 38, 39

Type material. Holotype ♂. NT: Arnhem Highway, just W of Mary River, 12°50'S 131°56'E, 20.ii.2008, K.H., D.M., M.S.M., C.O., M.H. (AM, K292960); mounted on large pin through thorax, aedeagus in microvial. Paratypes. NT: 2♂, same data as holotype (AM, ANIC); 2♂, 2♀, South Alligator Motor Inn, Arnhem Highway, Dec. 1986, B.J.M., M.S.M. (AM, NTM); 2♂, 1♀, Nawurlandja (Nourlangie) Rock area, Kakadu National Park, 12°51'S 132°47'E, Jan 1993, G.D., A.D. (AM); 1♀, Strauss Airstrip, 45 km S of Darwin, 12°39'S 131°04'E, Jan 1993, G.D., A.D. (AM).

Other material (localities only given). Queensland: Archer River roadhouse, 13°26'S 142°56'E, (AM, ANIC); 8 km SSW of Coen, 14°00'S 143°11'E (AM); Coleman River, near Musgrave, 14°48'S 143°22'E (AM, QM); 13 km W of Musgrave, 14°48'S 143°23'E (AM); Morehead River Crossing, 15°01'S 143°39'E (AM).

Description. (♂, ♀). Moderate-sized to rather large fly, largely black, with green to blue reflections; wing without dark markings.

Coloration. Postfrons largely dark brown, with small orange-tawny suffusion in front of ocelli and on each anterolateral angle, its orbital margin silvery pruinescent; parafacial, face and cheek region orange-brown, the first with narrow silvery-pruinescent orbital margin; antennal groove with silvery pruinescence not extending on to side of carina; occipital region mostly very dark, with extensive silvery pruinescence except near vertex. Antenna tawny-brown; segment 3 usually darker greyish brown; arista dark brown. Prelabrum tawny-brown; palpus orange-tawny. Thorax largely black, with green to blue or purple reflections; humeral callus glossy, almost without pruinescence; scutellum glossy except at lateral extremities; mesopleuron largely glossy, with pruinescence restricted to upper part and immediate vicinity of fore coxa, with setulae pale. Legs largely dark brown to black; fore tarsus dark brown, with segment 1 becoming tawny-brown basally; mid and hind tarsi tawny-yellow, becoming brownish apically. Wing without distal dark zone; membrane tinged with yellow, particularly basally and anteriorly; subcostal cell yellow. Capitellum of halter variegated, tawny-grey and brown. Abdominal tergites 1 to 5 shining black, with almost no pruinescence, often with bluish reflections; sternite 1 glossy, dark brown, without pruinescence; sternite 2 densely grey-pruinescent.

Head. Postfrons without distinct pitting, with low but distinct median hump in front of ocelli and slight depression between this and convex anterior part, with scattered very fine, nearly straight setulae; width of postfrons 0.42–0.45 of width of head; fronto-orbital and ocellar bristles minute or absent; facial carina distinct, with strongly raised lateral margins and several variably developed vertical ridges; parafacial of moderate width, with variable number of setiferous pits towards upper end; height of cheek 0.28–0.32 of height of eye. Antenna potentially extending well beyond centre of epistomal margin in both sexes; arista with numerous short hairs towards base of segment 6, several of them slightly longer than maximum diameter of segment. Prelabrum of moderate size; palpus moderately narrow, with rather long setulae; prementum very broad.

Thorax. Mesoscutum with very numerous short, curved setulae; scutellum devoid of setulae, convex, almost smooth, normally with three pairs of marginal bristles; pteropleuron with fine setulae and one or two stout black bristles; pteropleural ridge with few fine setulae; major thoracic bristles otherwise as given for *D. grahami*. Fore femur with numerous irregularly placed black dorsal bristles, without posteroventral bristles; mid femur subapically with several long black posterior bristles, and, basad from these an extensive tract of long fine pale setulae; hind femur with dorsal bristles, mainly on distal half; all tarsi subcylindrical, more or less elongate. Wing: veins 3 and 4 both distally curved and convergent, latter terminating at apex; basal section of vein 4 0.88–1.00× as long as second section; membrane almost entirely microtrichose.

Abdomen. Tergite 5 slightly longer than tergite 4 in both sexes; sternite 2 subtriangular; sternites 3 to 5 vestigial in female. Male: spiracle 5 located in pleural membrane near lateral margin of tergite, slightly behind mid-length of tergite; distal section of outer surstylus beyond apex of inner surstylus subtriangular, with apical angle rounded off; aedeagus with stipe moderately slender, apparently without pubescence; preglans well demarcated from stipe, elongate, c. as long as glans, without distinct membranous margin or appendage, its distal end oblique; short but distinct flexible section present between preglans and glans; glans subcylindrical, with membranous bight distally; membranous bulb well developed, with an irregular soft appendage and beyond its base a large shield-like sclerite; terminal filaments subequal, apparently joined for very short distance basally, rather stout, much shorter than glans, arising from distal end of shield-like sclerite.

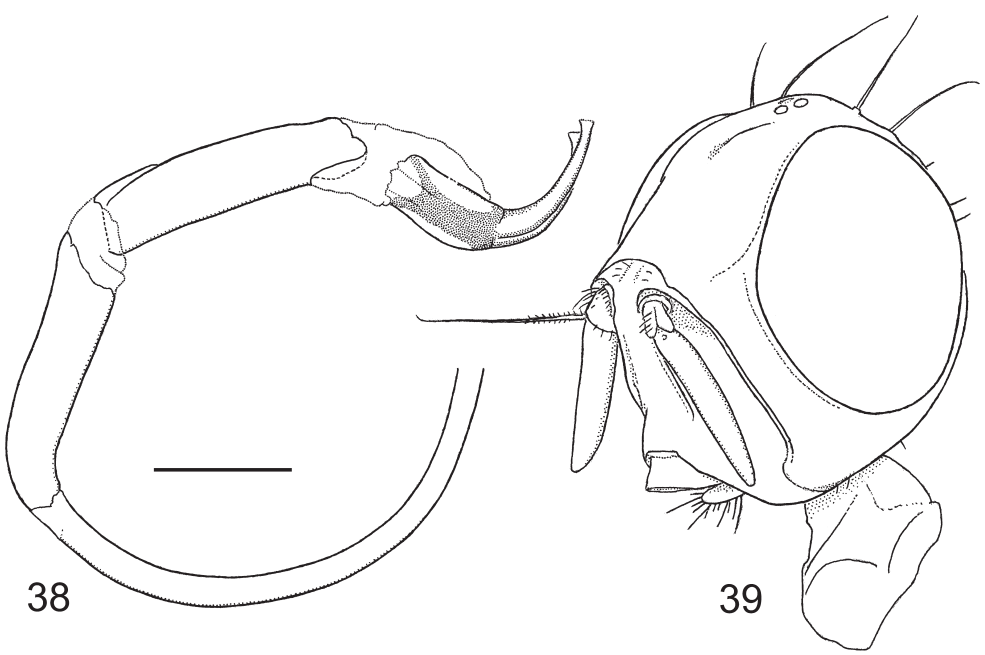
Dimensions. Total length,♂ 10.1 mm, ♀ 9.1–10.0 mm; length of thorax,♂ 4.0–4.1 mm, ♀ 3.9–4.4 mm; length of wing,♂ 7.8–8.1 mm, ♀ 7.5–8.1 mm; length of glans of aedeagus, c. 1.0 mm.

Distribution. Northern Territory: Kakadu National Park and other northern districts. Queensland: Archer River district to Cooktown district.

Notes. *Duomyia maceveyi*, together with the closely similar *D. mithrax* Hendel of northern Queensland, differs from other *Duomyia* species with largely smooth but medially humped postfrons and no scutellar setulae in the better developed basal hairing of the arista, the very broad prementum of the proboscis, and the presence of one or few strongly differentiated black bristles on the pteropleuron. They also differ from the compact, inadequately elucidated group of species, including *D. howensis* McAlpine and *D. obscura* Walker, in the termination of vein 4 at (not in front of) the wing apex and the elongate, subcylindrical hind basitarsus. The smooth, glossy scutellum and, in the females, the absence of pleural sclerotization of the abdomen and the vestigial tergite 6 and sternites 3 to 5 further differentiate *D. maceveyi* and *D. mithrax* from some other related species (not all yet named).

The only reason why *D. maceveyi* does not run to *D. mithrax* in the key of McAlpine (1973) is the consistent absence of any trace of a dark distal wing zone in the former species. Better material of *D. mithrax* is now available, and it is apparent that the aedeagus of *D. maceveyi* differs in having a more elongate preglans and a large shield-like sclerite (tunic) covering one side of the bulb at the base of the terminal filaments. The available Queensland specimens of *D. maceveyi* differ from both the sympatric *D. mithrax* and the Northern Territory specimens of *D. maceveyi* in the generally much darker face and parafacial.

The specific epithet refers to Shane F. McEvey, in appreciation of his unstinting help in several of my projects.



Figs 38, 39. *Duomyia maceveyi*, near Mary River. *(38)* aedeagus; scale = 0.5 mm. *(39)* head of male; sparse minute setulae on postfrons omitted.

Duomyia ameniina McAlpine

Duomyia ameniina McAlpine, 1973: 116–117; McAlpine, 2011: 63–64, figs 1, 2.

Type material. Holotype ♂, Queensland: Morven, 18.i.1963, D.E.H. (ANIC). Paratypes and other material. See D. McAlpine (2011).

Distribution. Northern Territory: higher rainfall areas N from c. 14°S. Western Australia: Ord River district. Queensland: widely distributed (see McAlpine, 2011 for details). New South Wales: NE of state.

Notes. *Duomyia ameniina* is the only species known in the Northern Territory with the vertical area between the supra-alar bristle and wing-base quite smooth, without microtrichia. Among Queensland species, *D. alfredi* McAlpine also has this condition but differs most obviously in having many of the setulae on the mesoscutum long and almost erect, instead of relatively short and decumbent as in *D. ameniina*.

Duomyia rugula McAlpine

Duomyia rugula McAlpine, 2011: 68–70, figs 10–12.

Type material. Holotype ♂. Northern Territory: 12 km NNE of Borroloola, 15°58'S 136°21'E [McArthur River district], 1.xi.1975, M.S.U. (ANIC). Paratype. Queensland: see McAlpine, 2011.

Distribution. Northern Territory: far east. Queensland: Archer River district. Single record for each state or territory.

Notes. *Duomyia rugula* differs from other species in NT by the long rays of the arista in combination with the substantial bare zones of the wing in the marginal, first basal, and discal cells. For further morphological details see McAlpine, 2011.

Duomyia whittingtoni n.sp.

Fig. 40

Type material. Holotype ♂. NT: Anbangbang [Nourlangie Rock, c. 12°51'S 132°47'E], Kakadu National Park, 25.ii.1996, D.K.M., G.R.B. (AM K292961); micro-pinned on double mount, aedeagus extended. Paratypes. NT: 1♂, same data as holotype (NTM); 1♂, Arnhem Highway, just W of Mary River, 12°50'S 131°56'E, 20.ii.2008, K.H., D.M., M.S.M., C.O., M.H. (AM).

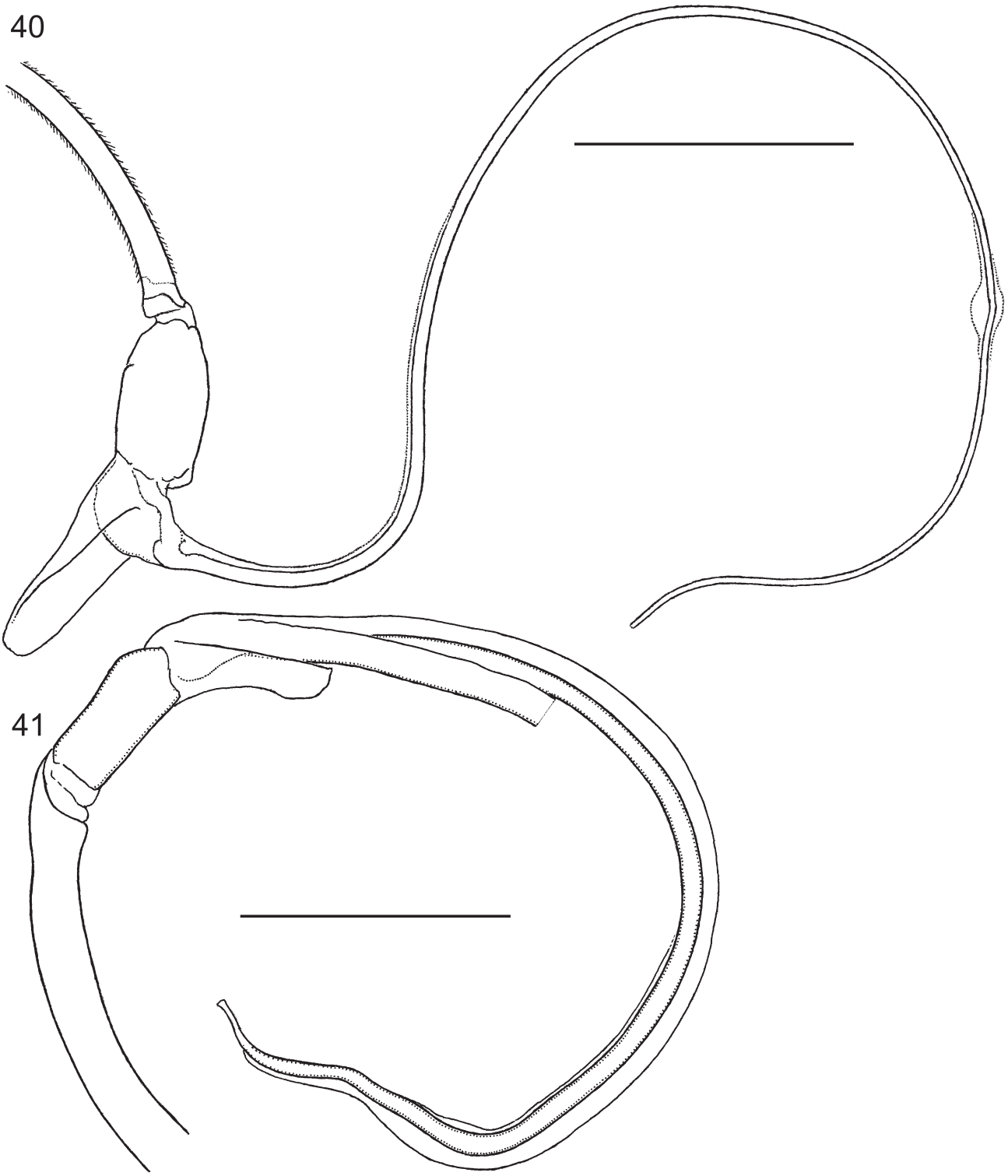
Description. (♂, ♀ unknown). Medium-sized, slender, predominantly blackish fly, with unmarked wing; belonging in same alliance as *D. spinifemorata*, q.v.

Coloration. Head yellow; postfrons with three large transversely aligned black blotches immediately in front of vertex, median one enclosing ocelli; antennal grooves brown-black, partly grey pruinescent; occiput with black ground colour extending right to vertex, but covered with dense whitish pruinescence except on broad shining black upper section. Antenna tawny-brown; segment 3 largely greyish. Prelabrum brown; palpus blackish, with tawny-brown apex. Thorax largely black, with slightly green-tinted reflections; mesoscutum pruinescent mainly towards lateral margins; humeral callus with rather sparse dark pruinescence; scutellum shining, minutely roughened but almost without pruinescence; mesopleuron partly glossy, with pale pruinescence and pale setulae on c. posterodorsal half and narrowly on margin of fore-coxal cavity; sternopleuron with little pale pruinescence on upper margin and posteroventral part. Coxae largely black; fore femur black, very narrowly tawny at apex; other femora largely blackish, or brownish on basal part; tibiae tawny, with darker markings; fore tarsus with segments 1 and 2 yellow, slightly browned distally, segments 3 to 5 brown; other tarsi more extensively yellow, but with at least segments 4 and 5 brown. Wing without dark markings or suffusion; subcostal cell pale yellow. Capitellum of halter pale yellow. Abdominal tergites 1 to 5 shining black, with greenish reflections; vicinity of suture between tergites 1 and 2 grey-pruinescent; sternite 1 largely glossy brown-black, grey-pruinescent on lateral margins; sternite 2 densely grey-pruinescent.

Head somewhat anteroposteriorly compressed. Postfrons without distinct pitting and median hump, with very fine mostly suberect setulae; width of postfrons 0.40–0.43 of width of head; ocellar bristle weakly differentiated; fronto-orbital bristles indistinguishable; facial carina flat, rugose, sharply margined laterally; parafacial moderately narrow, with few setiferous pits near upper extremity; height of cheek 0.36–0.38 of height of eye. Antenna potentially extending c. 0.6–0.7 of distance from basal socket to centre of epistomal margin; arista with numerous short hairs towards base of segment 6, some at least twice as long as basal diameter of segment. Prelabrum moderately small; palpus slightly widened distally.

Thorax. Mesoscutum with dense short, mostly somewhat recumbent setulae; scutellum short, convex, finely and weakly rugose; pteropleuron with fine setulae and no differentiated bristles; major thoracic bristles otherwise as given for *D. grahami*; prosternum with each anterolateral angle not prominently produced, separated from propleural gibbosity by membranous zone. Fore femur with numerous irregularly placed black dorsal bristles on most of length, without posteroventral bristles, but with variably developed elongate pale ventral setulae and a prominent rounded tooth-like posteroventral keel beyond mid-length; mid femur with one to three subapical black posterior bristles and numerous rather long posterior setulae; hind femur with few dorsal bristles beyond mid-length; all basitarsi subcylindrical, moderately elongate. Wing: distal section of vein 3 very slightly curved; distal section of vein 4 basally almost parallel with vein 3, distally curved forwards to terminate near or slightly in front of apex; basal section of vein 4 1.00–1.3× as long as second section; membrane almost entirely microtrichose.

Abdomen. Tergite 5 c. twice as long as tergite 4, but not noticeably broader; sternite 2 subtriangular; sternites 3 and 4 minute. Outer surstylus with free distal section extending far beyond apex of inner surstylus, subtriangular with apical part narrowly produced; stipe slender, very extensively pubescent except towards base; preglans very short, sclerotized, asymmetrical, without pubescence and processes; short flexible section present between preglans and glans; glans compact, irregularly ovoid, with large



Figs 40, 41. *(40) Duomyia whittingtoni*, Anbangbang, aedeagus. *(41) D. spinifemorata*, aedeagus. Scale = 0.5 mm (both figs). Only one of pair of similar terminal filaments shown (both figs).

terminal transparent lobe ensheathing the rather short, rotund bulb; terminal filaments separate approximately from their bases, very elongate, gradually tapered over much of length, slightly unequal in length, each c. 12 or 13× as long as glans, with extensive weak internal circular ridges, with apex simple, truncate, and with terminal, very slightly decurrent gonopore; cercus much shorter than outer surstylus.

Dimensions. Total length, 7.1–7.8 mm; length of thorax, 2.9–3.2 mm; length of wing, 5.2–6.1 mm; length of glans of aedeagus, 0.26 mm.

Distribution. Northern Territory: Kakadu National Park and vicinity.

Notes. Among the species with bare, black scutellum and

short antenna, *D. whittingtoni* is distinguished from *D. ameniina* and *D. alfredi* by the pale creamy halter and presence of dense pruinescence on the vertical surface between the supra-alar bristle and wing base, from *D. rugula* and *D. semiclara* by the entirely microtrichose first basal cell of the wing, much shorter hairs on the arista, and presence of a tooth-like posteroventral keel on the fore femur (at least in the male), from *D. irregularis* by the non-pruinescent scutellum and absence of posteroventral spines on the fore femur, and from *D. spinifemorata* by the presence of the humeral bristle and absence of seriate posteroventral spines on the fore femur.

The specific epithet refers to Andrew E. Whittington, who has made a significant contribution to knowledge of Afrotropical platystomatids.

Duomyia irregularis Malloch

Duomyia irregularis Malloch, 1929: 509–510, fig. 1b; McAlpine, 1973: 95, redescription based partly on holotype.

Type material. Holotype ♂. Northern Territory: Palmerston [former name for Darwin], Dec. 1908 anon. (DEI). Examined by me in 1969.

Other material re-examined. 1♂, "Australia, Brunetti", (AM, transferred from BM 1.ix.2008). Damaged. This bears my determination label dated 1969 and is clearly one of the specimens I previously recorded (McAlpine, 1973) from "Darwin, ii iii 1909," but it no longer bears these collection data.

Distribution. Northern Territory: vicinity of Darwin. The only material known to me was collected in 1908 and 1909, probably by F.P. Dodd. The species is not present in available more modern collections.

Notes. This species belongs in the *Duomyia spinifemorata* alliance, as described under *D. spinifemorata*. Within this alliance it is distinguished by having both tooth-like anteroventral keel and short anteroventral spines on the fore femur and whitish dorsal pruinescence on the scutellum, this pruinescence being dark or little developed in the other species. Tergite 5 is much broader than tergites 3 and 4, as in *D. spinifemorata*, but the hind femur has small black anteroventral spines, generally absent or less developed in other species of this alliance. The male genitalia remain undescribed because of the scarcity of specimens.

Duomyia spinifemorata Malloch

Fig. 41

Duomyia spinifemorata Malloch, 1929: 508–509, figs 1a, 2a; McAlpine, 1973: 94–95, redescription from type material.

Type material. Holotype ♂. Northern Territory: Palmerston [former name for Darwin], Dec. 1908 (DEI, ex Litchwardt collection). Examined by me in 1969.

Additional material (localities only given). Northern Territory: near entrance to Litchfield National Park, via Batchelor (AM); Marrakai Road, 2 km E of Stuart Highway (AM); South Alligator Motor Inn, Arnhem Highway (AM).

Supplementary description. Male abdomen: tergite 5 large, broader than preceding tergites; outer surstylus resembling that of *D. whittingtoni*, but with distal section longer, slightly tapered, with relatively broad, blunt apex; stipe of aedeagus moderately stout, apparently quite without pubescence; preglans not visibly differentiated from stipe, distally produced to overlap short flexible section between preglans and glans; glans compact, subcylindrical, with terminal ensheathing lobe resembling that of *D. whittingtoni*; terminal filaments stouter than in *D. whittingtoni*, of about equal length, each c. 9× as long as glans, attenuated at extreme apex.

Distribution. Northern Territory: northern districts.

Notes. I propose the *Duomyia spinifemorata* alliance as a provisional grouping to include *D. spinifemorata*, *D. irregularis*, and *D. whittingtoni*. This alliance is apparently endemic to the Northern Territory and is characterized by having the scutellum short, broad, dorsally minutely roughened or pruinescent, with black ground-colour and no setulae, the antenna short, the arista with obvious pubescence or short hairs, the vertex of head low and rounded, the prosternum relatively narrow and widely separated from the propleuron on each side; vein 4 terminating very near wing apex. Where known, the aedeagus has the preglans very short and the terminal filaments very long (unknown in *D. irregularis*). The *D. ameniina* alliance resembles the *spinifemorata* alliance but is distinguished by having longer hairs on the arista, vein 4 strongly curved distally to terminate well in front of the apex, and the scutellum more evenly rounded and usually glossy. *Duomyia aliceae* McAlpine also has vein 4 terminating well in front of the apex, and further differs from the *spinifemorata* alliance in the extensively grey-pruinescent mesoscutum and humeral callus, and the distinctive posteroventral armature of the fore femur (McAlpine, 2011).

Within the *D. spinifemorata* alliance, *D. spinifemorata* is distinguished by the lack of a tooth-like posteroventral keel and presence of a posteroventral series of stout black spines on the fore femur. It further differs from *D. irregularis* in the presence of three posterior black blotches on the postfrons and absence of dorsal whitish pruinescence on the scutellum; and from *D. whittingtoni* in the absence of the humeral bristle, less attenuated terminal filaments of the aedeagus (except at their apical extremities), and lack of pubescence on the stipe.

Duomyia serra McAlpine and *D. prensans* n. sp. resemble *D. spinifemorata* among species without scutellar setulae in having posteroventral spines on the fore femur, but these have the vertex prominently transversely carinate, the antenna much longer, and the capitellum of the halter brown.

The male specimen from near Litchfield National Park was taken from blossom of a myrtaceous tree.

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