

X.—*New or little-known Tipulidæ (Diptera).—XLIV. Australasian Species.* By CHARLES P. ALEXANDER, Ph.D., F.E.S., Massachusetts Agricultural College, Amherst, Massachusetts, U.S.A.

THE crane-flies discussed in this paper are from Queensland, New South Wales, Victoria, and West Australia, and were collected by my friends Messrs. Clark, Davidson, Dødd, Ferguson, Heron, Mathews, Perkins, Taylor, and Wilson, to whom my deepest thanks are extended. Where not indicated to the contrary, the types of the novelties are preserved in my collection.

Dolichozeza (Dolichozeza) illingworthi, sp. n.

Thorax almost uniform fulvous-yellow, the pleura paler yellow; legs brown, the genua scarcely brightened; posterior tibiæ broadly white at tips; fore and middle basitarsi brown, the tips white; posterior basitarsi pure white; wings whitish subhyaline, the apex and a narrow seam on anterior cord dark brown; abdominal segments black, ringed at near mid-length with ochreous.

Male.—Length about 7·5 mm.; wing 7–7·5 mm.

Frontal prolongation of head obscure yellow, the palpi dark brown. Antennæ (♂) of moderate length, if bent backward extending to beyond the base of the abdomen; scapal segments obscure yellow, the flagellum dark brown. Head dark brown, the anterior portion more brownish yellow.

Thorax almost uniform fulvous-yellow, the mesonotum immaculate, the pleura clear yellow, palest ventrally. Halteres elongate, pale brown, the knobs dark brown. Legs with the coxæ and trochanters pale brown; femora brown, the bases paler, the genua scarcely brightened; tibiæ dark brown, the distal third of posterior tibiæ snowy white; basitarsi dark brown, the tips and remainder of tarsi snowy white; on posterior legs the tarsi are uniformly whitened. Wings whitish hyaline, the apex narrowly dark brown; stigma and a narrow seam on anterior cord dark brown; veins brownish black. Venation: cells of medial field relatively shallow; *m-cu* nearly its own length before fork of *M*; cell 2nd *A* very narrow on basal half, the outer half more expanded to form a weak anal angle.

Abdomen black, the segments ringed with ochreous at or beyond mid-length; hypopygium chiefly ochreous, relatively large. Male hypopygium with the tergite nearly transverse,

with an acute spine on either side, the space between nearly transverse, in its median portion produced caudad into a low transverse median lobe. Outer dististyle toothed on mesal face shortly before apex.

Hab. North Queensland.

Holotype, ♂, Kuranda, Cairns District, altitude 1100 feet, on window, March 1921 (*A. P. Dodd*).

Paratopotype, ♂.

I take great pleasure in naming this interesting species in honour of Dr. James F. Illingworth, to whom I am indebted for many Tipulidæ from the Cairns District. The species is allied to *D. varipes*, Skuse, differing especially in the details of coloration and structure of the male hypopygium.

Dolichopeza (Dolichopeza) davidsoni, sp. n.

General coloration dark brown; pleura pale yellow, variegated with dark brown; legs brown, the femoral tips, tibial bases and tips, extreme proximal ends of basitarsi, and the outer tarsal segments white; wings greyish, the apex and veins beyond cord conspicuously infumed; abdominal tergites dark brown, the outer sternites ringed with yellow.

Male.—Length about 6.5 mm.; wing 7.2–7.4 mm.

Female.—Length about 8 mm.; wing 7.7 mm.

Frontal prolongation of head brownish yellow, dark brown ventrally; palpi dark brown. Antennæ with the scape and basal segments of flagellum pale yellow, the outer segments dark. Head brown, with a sparse grey pruinosity, the anterior vertex and front restrictedly light yellow.

Pronotum light yellow, the cervical sclerites dark brown. Mesonotal præscutum dark brown, the usual stripes scarcely evident, confluent, the humeral region restrictedly light yellow; scutal lobes dark brown, the median region very restrictedly pale; scutellum and postnotum uniformly brown. Pleura pale yellow, conspicuously variegated with dark brown, this including the anepisternum, together with the dorso-pleural region immediately dorsad of it, the ventral sternopleurite, and the meron. Halteres elongate, pale, the knobs dark brown. Legs with the coxæ and trochanters pale yellow; femora pale basally, deepening into brown outwardly to produce a darker subterminal ring, the tips narrowly whitened; tibiæ dark brown, the bases narrowly whitened, the tips broadly pure white; proximal ends of basitarsi more or less whitened, especially evident on the type, where on the hind legs it includes an area only slightly less than the tibial apex; remainder of basitarsi dark

brown, the tips and tarsal segments 2 to 4 white; terminal segment infuscated. Wings with a greyish tinge, cells *C* and *Sc* a little darker; stigma elongate, dark brown; wing-apex broadly infused, connected by broad seams along the veins with a large seam on the anterior cord; medial veins, *m-cu*, and distal section of *Cu*₁ similarly seamed; whitish areas before and beyond the stigma; veins dark brown, more cream-coloured in the pre-stigmal pale area. Venation: forks of medial field relatively shallow; *m-cu* more than two-thirds its own length before the fork of *M*; cell 2nd *A* narrow.

Abdominal tergites uniformly dark brown; basal sternites pale yellow, narrowly ringed with dark brown; subterminal segments with the caudal margins of the segments yellow, the amount increasing on the outer segments. Ovipositor with the genital shield and basal half of the tergal valves blackened, the tips of the latter and the sternal valves pale yellow.

Hab. South Queensland, New South Wales.

Holotype, ♀, Mt. Tamborine, South Queensland, altitude 2000 feet, November 1928 (*W. H. Davidson*).

Allotype, ♂, Eastern Dorrigo, New South Wales, altitude 2000–3000 feet, February 27, 1929 (*W. Heron*).

Paratypes, ♂ ♀, with the allotype.

The species is named in honour of the collector of the type, Mr. Will H. Davidson. *Dolichozeza davidsoni* is allied to *D. annulipes*, Skuse, differing in the wing-pattern, coloration of the thoracic pleura, and details of the leg-pattern.

Dolichozeza (Dolichozeza) dorrigenis, sp. n.

General coloration dark brown; thoracic pleura with a broad oblique yellow stripe; legs dark brown, the genua, tips of all tibiae, proximal ends of all basitarsi, and outer tarsal segments snowy white; wings greyish subhyaline, virtually unmarked except for the stigma; *m-cu* about one-third its length before the fork of *M*; abdominal tergites dark brown, with whitish-yellow lateral spots; sternites whitish yellow, with a median series of brown spots.

Female.—Length about 8 mm.; wing 7·8 mm.

Frontal prolongation of head pale yellow; palpi brown. Antennæ dark brown, including the scape; flagellar segments elongate-cylindrical, the verticils longer than the segments. Head rich cinnamon-brown, the anterior vertex and front light yellow.

Pronotum yellow laterally, narrowly dark brown behind. Mesonotum brown, the humeral region of the præscutum restrictedly pale yellow, the scutal region a little brightened. Pleura obliquely lined with pale yellow and dark brown, the yellow band extending from the humeral region to the posterior coxæ, margined in front by a narrow brown line, margined posteriorly by a somewhat wider line of the same colour; propleura extensively pale yellow. Halteres dusky, the knobs dark brown. Legs with the coxæ pale yellow, the base of the fore coxa darkened; trochanters yellow; femora dusky at base, passing into dark brown, the genua narrowly but conspicuously white; tibiæ dark brown, the tips of all legs conspicuously snowy white, broadest on the hind legs; proximal ends of basitarsi narrowly but conspicuously white, the major portion dark brown, the tips again white; remainder of tarsi white. Wings greyish subhyaline, the stigma conspicuously dark brown; a vague, scarcely indicated brown seam on anterior cord; pale areas before and beyond the stigma scarcely indicated; wing-margin in cell Sc_2 narrowly infumed; veins dark brown. Wing rather conspicuously petiolate. Venation: Sc_1 distinctly preserved; forks of medial field relatively deep; $m-cu$ at about one-third its length before the fork of M ; cell $2nd\ A$ unusually long and narrow.

Abdominal tergites dark brown, each segment with a conspicuous yellow lateral spot on posterior ring; sternites greenish, the median portion extensively yellow, with a conspicuous series of brown markings distributed the entire length; in certain lights the yellow coloration of the abdomen is conspicuously white pruinose. Ovipositor with the valves chiefly yellow; tips of the short sternal valves broadly and conspicuously blackened.

Hab. New South Wales.

Holotype, ♀, Brooklana, East Dorrigo, altitude about 2000 feet, March 3, 1928 (*W. Heron*).

Dolichopeza dorrigenis is allied to *D. annulipes*, Skuse, differing in the details of coloration of the wings, legs, and abdomen.

Macromastix (Macromastix) clitellaria, sp. n.

General coloration of mesonotal præscutum and scutal lobes polished black (♂), more obscurely darkened (♀); postnotal mediotergite yellowish testaceous, with two black spots on caudal margin; legs long and slender, black, the

femoral bases broadly obscure yellow; wings with a strong dusky suffusion, the prearcular region and cells *C* and *Sc* dark brown; base of abdomen (δ) fulvous-yellow, the terminal portion black.

Male.—Length about 11–12 mm.; wing 15 mm.

Female.—Length about 10·5–11 mm.; wing 13·5 mm.

Frontal prolongation of head of moderate length only, a little more than one-half the remainder of head, dark brown, paler at apex; nasus very long and slender, tufted with conspicuous setæ; palpi black. Antennæ short, only about as long as the head excluding the frontal prolongation, apparently only 11-segmented; first scapal segment obscure yellow, darkened dorsally; second scapal segment light yellow; flagellum black, the base of the first segment paler; first flagellar segment subpyriform, the succeeding segments becoming more slender; verticils short and inconspicuous. Head dark brown, the posterior orbits narrowly and irregularly light grey.

Pronotum black, pollinose. Mesonotal præscutum (δ) with an extensive polished black dorsal shield, the narrow lateral margins yellowish-grey pruinose; scutal lobes similarly polished black; median area of scutum, the scutellum, and most of the postnotal mediotergite yellowish testaceous, the caudal margin of the latter with two paired black spots. In the female the polished areas of the male are dull, being covered with a sparse pollen. Pleura heavily light grey pruinose, including the dorso-pleural region; pleurotergite with the dorsal portion pale, pruinose, the ventral portion clearer grey. In the female the dorsal portion of the pleurotergite is glabrous. Halteres brownish yellow, the knobs infuscated. Legs with the coxæ light grey; trochanters obscure yellow; femora chiefly black, their bases broadly obscure yellow, the amount of the latter somewhat more extensive on the middle and posterior femora; remainder of legs black; legs very long and slender, the posterior basitarsi longer than the tibiæ. Wings with a strong dusky suffusion, the stigma and cell *Sc*₁ more yellowish; prearcular region and cells *C*, *Sc*, and small adjoining cells dark brown; veins black, the obliterative areas relatively restricted; distal end of *R*₁₊₂ entirely pale; *Rs* entirely pale brown, without macrotrichia. Macrotrichia lacking on veins beyond the cord, with the exception of *Sc* and *R*₁. Venation: *R*₃ nearly in alignment with *R*₂₊₃, the latter subequal to *Rs*; cell *M*₁ deep, the petiole subequal to or longer than *m*; cell 2nd *A* very narrow.

Abdomen with the basal segments fulvous-yellow, the distal half or less black, the outermost segments pruinose; sternites similarly coloured; hypopygium entirely dark. In the female the abdominal tergites are very extensively covered with a yellowish-grey pruinosity, only the base of tergite 2 being nitidous; basal sternites more extensively glabrous.

Hab. Victoria.

Holotype, ♂, Bogong High Plains, altitude 5600–6000 feet, January 1928 (*F. E. Wilson*).

Allotopotype, ♀.

Paratopotypes, 2 ♂♂.

Type returned to Mr. Wilson.

Macromastix (Macromastix) mathewsi, sp. n.

Male.—Length 11–14 mm.; wing 13–15 mm.

Female.—Length 8.5–12 mm.; wing 9.5–14 mm.

Allied to *M. constricta*, Skuse (New South Wales), differing especially in the details of coloration and structure.

Frontal prolongation of head a little shorter than in *constricta*, opaque by a conspicuous microscopic yellow pubescence, obscure yellow with a narrow dark brown or black lateral line; nasus shorter; palpi black. Antennæ with the scape yellow, the flagellum entirely black. Head yellowish grey.

Mesonotal præscutum yellowish grey, opaque, with four poorly delimited brownish-grey stripes, the intermediate pair confluent and more greyish behind; scutellum and postnotum with an abundant appressed yellowish pubescence. Pleura conspicuously light grey, including the anepisternum, sternopleurite, and pteropleurite, the pleurotergite abruptly yellowish. Halteres dark brown, the stem paler. Legs with the coxæ greyish, the mid-coxæ more clearly so; trochanters obscure yellow; femora yellow, the tips broadly blackened, this including approximately the distal fourth; tibiæ brownish yellow, the bases very narrowly, the tips broadly blackened; tarsi black; all tarsi relatively short, as in *constricta*. Wings broader than in *constricta*, strongly infumed, the base and costal border darker, but not contrasting so conspicuously with the remainder of the wing. Venation: cell 2nd *A* narrow, but still much wider than in *constricta*.

Abdominal tergites (♂) dark brown, the basal segments yellow on lateral margins, this narrowing behind; sternites yellow, the subterminal segments black, sparsely pollinose;

hypopygium pale. In the female the abdomen is heavily pruinose, the lateral margins and ovipositor fulvous.

Hab. West Australia.

Holotype, ♂, South Perth, October 20, 1927 (*W. H. Mathews*).

Allotopotype, ♀, September 22, 1927.

Paratopotypes, numerous ♂ ♀, September 22, 1927; October 20–30, 1927; *paratypes*, ♂ ♀, Redlands, September 11, 1927 (*W. H. Mathews*).

“All caught in my garden on the side of a small hill.”

I take great pleasure in naming this species in honour of the collector, Mr. Wallace H. Mathews. Although closely allied to *M. constricta*, the present species is clearly distinct. The most conspicuous differences lie in the frontal prolongation of the head, the wings, and coloration of the male hypopygium.

Macromastix (Macromastix) clarkiana, sp. n.

Male.—Length about 12–13 mm.; wing 15–16 mm.

Female.—Length about 13 mm.; wing 15 mm.

Closely allied to *M. constricta*, Skuse (New South Wales), agreeing in the general coloration of the body and wings, differing in the details of pattern and structure.

Frontal prolongation of head slender, as in *constricta*, but slightly less constricted before mid-length, chestnut-brown. Antennæ with the scape bright yellow, the flagellum black; flagellar segments beyond the fourth narrowed and shortened, the terminal seven shorter than the preceding four taken together. Two more or less distinct brown spots between the eyes.

Ground-colour of the præscutum yellowish grey, clearer laterally, with four entirely separated brown stripes; scutellum and postnotal mediotergite conspicuously yellow pollinose. Pleura chiefly clear grey. Legs with the femora and tibiæ fulvous, tips broadly blackened; tarsi relatively short, as in *constricta*. Wings with a strong dusky grey ground-colour, the pattern distinct from *constricta*; pre-arcular region darkened, the costal region rather narrowly of the same colour, the amount decreasing toward the stigma, which is chiefly yellow; in cell *R* only about the basal half of the cell is darkened; no distinct dark seam in cell *M* adjoining vein *Cu*₁, except at base; cell *Cu*₁ and adjoining portions of cells *M* and *Cu* conspicuously light cream-yellow; veins dark. Wings broader than in *constricta*, especially in the anal region. Venation: cell 2nd *A* narrower than in *mastersi*, but broader than in *constricta*.

Abdomen as in the group, the basal segments yellow, the apex, including hypopygium, black. In the female the abdominal tergites are more greyish, with a broad dark brown sublateral stripe on either side; basal segments laterally and the genital segments fulvous-yellow; sternites yellow, the caudal margins of sternites 5 and 6 light grey. Male hypopygium as in *constricta*, but inner dististyle, at base of the elongate rod-like extension, provided only with setæ or weak spines. In *constricta* this region of the style is provided with a small group of short black spines.

Hab. Victoria.

Holotype, ♂, Cann River, November 1928 (*J. Clark*).

Allotopotype, ♀.

Paratopotypes, several ♂ ♀.

Type in the National Museum, Victoria.

I take great pleasure in naming this species in honour of the collector, Mr. John Clark.

Limonia (Geranomyia) bogongicola, sp. n.

General coloration reddish yellow, heavily variegated with black; rostrum moderately elongate; femora brownish yellow, the tips broadly blackened; wings whitish to yellow, with a brown pattern; male hypopygium with the spines of the short rostral prolongation of the ventral dististyle of moderate length, but exceeding the prolongation itself.

Male.—Length (excluding rostrum) about 8–9 mm.; wing 8·5–10 mm.; rostrum about 3 mm.

Female.—Length (excluding rostrum) about 12–13 mm.; wing 10·5–11·5 mm.; rostrum about 4 mm.

Rostrum black, including the maxillary palpi, the latter 3-segmented; rostrum of moderate length only; subequal to the combined head in thorax in male, somewhat longer in the female. Antennæ black throughout, the basal segments weakly pruinose; flagellar segments cylindrical, the outer segments gradually increasing in length. Head black, pruinose.

Pronotum black, pruinose, restrictedly obscure reddish laterally. Mesonotal præscutum deep reddish, with three broad black stripes that restrict the interspaces; scutum brownish black; scutellum abruptly pale yellow, with a dark basal median spot; postnotal mediotergite dark brown, sparsely pruinose, the antero-lateral portions obscure yellow. Pleura chiefly black, sparsely pruinose, with vague indications of paler areas. Halteres yellow, the knobs weakly infumed, the stem fringed with setæ. Legs with the coxæ dark brown, more yellowish apically, the posterior coxæ more extensively

so; trochanters obscure yellow; femora yellow basally, darker outwardly, the tips broadly blackened, in cases with a very indistinct pale apex; tibiæ brown, the tips blackened; tarsi black. Wings whitish subhyaline, more yellowish in female, with a restricted dark pattern, including the stigma, clouds at origin of *Rs*, *Sc*₂, along the cord and outer end of cell 1st *M*₂; additional paler washes in the medial, cubital, and anal cells. In the female the ground-colour is more yellowish and the pattern is heavier, including the broad apex and more distinct cloudings in the cubital and anal cells. Costal fringe relatively long and conspicuous in both sexes. Venation: *Sc*₁ ending opposite two-thirds to three-fourths the length of *Rs*, *Sc*₂ at its tip; *m-cu* close to the fork of *M*.

Abdominal tergites black, the caudal margins of the segments narrowly and indistinctly silvery; sternites more brownish, the caudal and lateral margins dark; hypopygium yellowish brown. Male hypopygium with the ninth tergite transverse, the caudal margin convex with the median area very gently emarginate. Ventral dististyle with the rostral prolongation short and stout, the two spines arising from tubercles that are placed close together, the spines longer than the entire prolongation. *Æ*deagus with the surface set with microscopic tubercles. Gonapophyses with the mesal apical lobe relatively prominent, the outer margin with microscopic denticles.

Hab. Victoria.

Holotype, ♂, Bogong High Plains, altitude 5600–6000 feet, January 1928 (*F. E. Wilson*).

Allotopotype, ♀.

Paratopotypes, 1 ♂, 1 ♀.

Type returned to Mr. Wilson.

The species is most closely allied to *L. (G.) risibilis* (Alexander), differing especially in the diagnostic features listed above.

Limonia (Geranomyia) grampianicola, sp. n.

Male.—Length (excluding rostrum) about 6·5 mm.; wing 7·5 mm.; rostrum about 2 mm.

Female.—Length (excluding rostrum) about 8 mm.; wing 8·5 mm.; rostrum about 2·4 mm.

Closely allied and generally similar to *L. (G.) risibilis* (Alexander), differing in the details of coloration and structure of the male hypopygium.

Rostrum of moderate length only, black, including the

palpi. Antennæ black throughout. Head chiefly grey, the vertex with an extensive velvety-black area on either side of the median line, these areas narrower than the median region.

Mesonotal præscutum with three conspicuous black stripes, the median one broadest and most intense in front, the posterior portion and lateral stripes paler, the lateral areas crossing the suture on to the scutal lobes; median region of scutum and the scutellum extensively pale. Pleura chiefly yellow, the anepisternum and sternopleurite more infuscated, the dorso-pleural region dusky. All femora with black rings, most extensive on the fore femora, where they are nearly apical, there being only a restricted brightening beyond; on the other legs the pale femoral tups are subequal or a little shorter than the dark rings. Wings pale yellow, with a restricted brown pattern, including, besides the stigma, a small spot on Cu_1 near base, a rectangular area at origin of Rs , Sc_2 , seams along cord and outer end of cell 1st M_2 ; a grey marginal wash in cell 1st A ; veins black, C , Sc , R , Cu , and the prearcular veins pale. Venation: Rs strongly arcuated to angulated and short-spurred at origin; R_3 very long, approximately twice cell 1st M_2 ; cell 1st M_2 relatively short and broad, widened outwardly, at distal end about two-thirds as wide as long; $m-cu$ variable in position, from one-fifth to approximately one-half its length before the fork of M .

Male hypopygium with the dorsal dististyle slender, the distal portion sinuous, the slender tip decurved. Rostral prolongation of ventral dististyle stout, the spines blackened, one arising from a low tubercle, the other more nearly sessile. Gonapophyses with the mesal apical lobe long and slender, their margins smooth. In *risibilis* the dorsal dististyle is differently formed, the rostral prolongation is stouter, and the spines are not blackened.

Hab. Victoria.

Holotype, ♂, Grampians, in fern-gully, October 1928 (F. E. Wilson).

Allotopotype, ♀.

Type returned to Mr. Wilson.

L. (G.) annulata (Skuse) has a somewhat similar leg-pattern, but a very different hypopygium.

Limonia (Limonia) clarki, sp. n.

General coloration dark grey, the pleura more or less distinctly striped; legs black, the femoral bases paler; wings with a strong brown suffusion, the oval stigma dark brown;

Sc relatively short, *Sc*₁ ending a short distance beyond the origin of *Rs*.

Male.—Length about 5·5–5·5 mm. ; wing 6 mm.

Female.—Length about 7·5–8 mm. ; wing 7–8 mm.

Rostrum elongate, nearly equal to the remainder of the head, black. Antennæ black throughout. Head grey, the posterior vertex infuscated on either side of the median line.

Pronotum and mesonotum dark brown, pruinose, especially laterally; præscutum with a broad median and narrower lateral brown stripes; median region of scutum, scutellum, and postnotum more heavily pruinose. Pleura grey, the dorso-pleural region darker brownish grey; dorsal portion of the sternopleurite paler. In some paratypes the pale pleural stripe is very evident. Halteres pale, the knobs dark brown. Legs with the coxæ brown; trochanters brownish yellow; femora pale basally, passing into black; tibiæ and tarsi black. Wings with a strong brown suffusion; stigma oval, dark brown; narrow vague dusky seams along cord, outer end of cell 1st *M*₂, vein *Cu*, and the longitudinal veins beyond cord; veins dark brown. Venation: *Sc*₁ ending a short distance beyond the origin of *Rs*, *Sc*₂ at its tip; *Rs* relatively long, angulated near origin; *m-cu* at or close to the fork of *M*.

Abdominal tergites brownish black; sternites more pruinose, the basal sternites paler medially and on caudal margin; hypopygium chiefly dark, the ventral dististyle pale. Male hypopygium with the tergite transverse, the caudal margin gently emarginate. Basistyle with the ventro-mesal lobe low and stout. Ventral dististyle smaller than the basistyle, with a conspicuous cylindrical rostral prolongation that bears two long spines, one slightly more distal in position, a little shorter than the inner; both spines lie in an oval pale depression, the more basal spine from a short enlarged base. Dorsal dististyle a strongly chitinized black hook, the slightly decurved apex acute; margin of curvature of the style with small delicate setulæ. Gonapophyses broad-based, the mesal apical lobe slender.

Hab. West Australia.

Holotype, ♂, Mundaring, August 23, 1926 (*E. W. Ferguson*).

Allotype, ♀, Balingup, August 29, 1926 (*E. W. Ferguson*).

Paratopotypes, 7 ♂ ♀ (*E. W. Ferguson* and *J. Clark*); *paratypes*, 3 ♂ ♀, with the allotype (*E. W. Ferguson*); 4 ♂ ♀, Pemberton, August 28, 1926 (*E. W. Ferguson*); 1 ♂, Donnybrook, August 29, 1926 (*E. W. Ferguson*).

Type in the Macleay Collection.

Limonia clarki is respectfully dedicated to Mr. John Clark, in recognition of his valuable studies on the entomology of West Australia. The species is allied to *L. (L.) incisuralis* (Skuse) and *L. (L.) zonata* (Skuse), but is very distinct.

Limonia (Limonia) tamborina, sp. n.

General coloration yellow, the posterior præscutum and scutum dark brown; scutellum conspicuously whitish; pleura yellow, striped longitudinally with brown; knobs of halteres yellow; femora with a subterminal dark ring, the tips pale; wings cream-coloured, with a sparse dark pattern; *Sc* relatively short, *Sc*₁ ending shortly before mid-length of the angulated *Rs*; abdominal segments bicolorous, the bases obscure yellow, the apices more narrowly dark brown; male hypopygium with the mesal lobe of basistyle very long and slender, narrowed to an acute chitinized point.

Male.—Length about 5 mm.; wing 6 mm.

Rostrum and palpi black. Antennæ black throughout; flagellar segments oval, with a dense white pubescence and relatively inconspicuous setæ. Head dark brownish grey.

Mesonotum chiefly yellow, the præscutum behind with three confluent brownish stripes; scutal lobes dark brown; median area of scutum and the broad scutellum conspicuously whitish; postnotal mediotergite pale whitish yellow. Pleura yellow, with a broad dorso-longitudinal brown stripe that extends from the propleura, passing beneath the wing-root and across the pleurotergite to the abdomen; sternopleurite similarly darkened, producing a short ventral stripe. Halteres dusky, the knobs yellowish. Legs with the fore coxæ dark brown on outer face at base, forming part of the dorsal stripe; remaining coxæ and trochanters pale yellow; legs relatively long and slender, femora obscure yellow, darkened beyond base, gradually deepening to a narrow, dark brown, subterminal ring, the extreme tip again abruptly yellow; tibiæ obscure yellow, brightest at base, the tips darkened; tarsi brown. Wings with a creamy ground-colour, with a sparse dark pattern; stigma oval, brown; the brown clouds include conspicuous seams at *Sc*₂, origin of *Rs*, cord and outer end of cell 1st *M*₂; a broad diffuse seam in cell *M* adjoining vein *Cu*₁, becoming obsolete at mid-length of the cell; veins dark, more yellowish in the costal and prearcular regions. Costal fringe relatively short and inconspicuous. Venation: *Sc*₁ ends just before mid-length of *Rs*, *Sc*₂ longer, ending just beyond this point; *Rs* square at origin, weakly

spurred; R_2 and free tip of Sc_2 in transverse alignment; inner end of cell R_3 lying far proximad of the other cells of cord; cell 1st M_2 large, rectangular, as long as vein M_{1+2} beyond it; $m-cu$ shortly beyond the fork of M , subequal to the distal section of Cu_1 .

Abdomen bicolorous, the bases of the segments obscure yellow, the tips more narrowly dark brown. Male hypopygium with the ventro-mesal lobe of the basistyle very long and slender, gradually narrowed to an acute chitinized point. Dististyle complex, trilobed; what seems to correspond to the usual dorsal dististyle a short, nearly straight, pale rod, the apex narrowed and blackened; main body of ventral dististyle a small fleshy lobe; third branch corresponding to the rostral prolongation, this elongate, feebly chitinized, strongly curved at end, without rostral spines.

Hab. South Queensland.

Holotype, ♂, Mt. Tamborine, altitude 2000 feet, June 17, 1928 (*W. H. Davidson*).

Limonia (Limonia) exosa, sp. n.

General coloration of mesonotal præscutum yellow, with a brown median stripe; posterior sclerites of mesonotum dark brown; anterior vertex silvery; antennæ relatively long, black; wings with a distinct dusky tinge; Sc long; cell M_2 open by the atrophy of the basal section of M_3 ; $m-cu$ at fork of M ; male hypopygium with the dorsal dististyle lacking; ventral dististyle small, produced into a long arcuated chitinized blade.

Male.—Length about 3.6 mm.; wing 4.5 mm.

Rostrum brownish yellow; palpi brown. Antennæ dark brown throughout, of an unusual length for a member of this genus, if bent backward extending at least to the base of the abdomen; flagellar segments long-oval, with a short, dark, glabrous, apical pedicel; segments clothed with a dense white pubescence and short scattered verticils, the longest unilaterally arranged. Anterior vertex light silvery; posterior portion of vertex dark brown, the posterior orbits light grey.

Pronotum brownish black. Mesonotal præscutum yellowish, with a broad brown median stripe that widens behind; posterior sclerites of mesonotum dark brown. Pleura dark brown dorsally, the ventral portion paler. Halteres relatively long, dark brown, the base of the stem narrowly pale. Legs with the coxæ and trochanters yellowish testaceous; femora light brown, the bases narrowly yellowish; tibiæ

pale brown; tarsi somewhat darker brown. Wings with a distinct dusky tinge, the oval stigma barely darker; veins brown, with relatively long, conspicuous, brown macrotrichia. Venation: *Sc* relatively long, *Sc*₁ extending to beyond mid-length of *Rs*, *Sc*₂ close to its tip; *Rs* weakly angulated at origin; free tip of *Sc*₂ and *R*₂ pale, the latter lying slightly more distad than the former; cell *M*₂ open by the atrophy of the basal section of *M*₃; *m-cu* at fork of *M*, a trifle shorter than the distal section of *Cu*₁; vein 2nd *A* relatively elongate.

Abdomen dark brown, the eighth segment and hypopygium paler. Male hypopygium with the tergite strongly narrowed posteriorly, the caudal margin with a very low V-shaped notch. Ventro-mesal lobe of basistyle very large but low, applied to the whole mesal face of the style. Ventral dististyle small, oval, produced into a long arcuated chitinized blade. Dorsal dististyle lacking. *Ædeagus* very short and broad, the apex divided into two obtuse divergent lobes. Gonapophyses broad, the mesal apical angle produced into a long arcuated lobe that is gently widened outwardly, the tip obtuse.

Hab. New South Wales.

Holotype, ♂, Brooklana, Eastern Dorrigo, altitude 2000 feet, November 6, 1927 (*W. Heron*).

Paratopotypes, 6 ♂♂, February 1928 (*W. Heron*).

Limonia exosa is similar to *L. amacula* (Alexander) of North Queensland, differing in the diagnostic features given above.

Limonia (Libnotes) tayloriana, sp. n.

General coloration pale reddish yellow, the mesothorax unmarked with darker; head light grey; halteres and legs pale testaceous-yellow; wings subhyaline, the stigma sub-circular, dark brown; veins pale, the cord and outer end of cell 1st *M*₂ darker; male hypopygium with the spines of the rostral prolongation of the ventral dististyle very unequal in diameter.

Male.—Length about 5.5 mm.; wing 6 mm.

Rostrum moderately elongate, nearly as long as the remainder of head, pale brown; palpi obscure brownish yellow, 4-segmented. Antennæ dark brown; flagellar segments elongate-oval, each with a pair of outstanding verticils that are unilaterally arranged, these exceeding the segments in length. Head entirely light grey; eyes large, contiguous on vertex or virtually so.

Prothorax and mesothorax pale reddish yellow, entirely immaculate with darker; a whitish median line extends from the cephalic portion of the præscutum to the abdomen, widening out behind. Halteres short, pale. Legs pale testaceous-yellow, only the outer tarsal segments slightly darkened. Wings subhyaline, the base and costal region more yellowish; stigma small, nearly circular in outline, dark brown; veins pale yellow, the cord between the forks of *Rs* and *M* darkened; outer end of cell 1st *M*₂ darkened; this dark coloration involves only the veins. Venation: *Sc* very long, *Sc*₁ extending to opposite *m-cu*; free tip of *Sc*₂ and *R*₂ in alignment; *Rs* about three times the basal section of *R*₄₊₅; cell 1st *M*₂ elongate, the elements at outer end about in transverse alignment; *m-cu* at about two-fifths the length of cell 1st *M*₂, subequal to the distal section of *Cu*₁; vein 2nd *A* approaching 1st *A* on the prearcular portion, thence gently sinuous and divergent.

Abdomen reddish yellow, the caudal margins of the segments narrowly and vaguely paler. Male hypopygium with the ninth tergite transversely rectangular, the caudal margin with a broad V-shaped notch, the lateral lobes with coarse conspicuous marginal setæ. Basistyle of moderate size, the mesal lobe low and obtuse. Ventral dististyle very large and fleshy, much larger than the basistyle; rostral prolongation relatively slender, with two spines that are very unequal in size, the outer spine placed just beyond mid-length of the prolongation, powerful and gently curved; inner spine near base of prolongation, very small and weak, setiform. Dorsal dististyle a curved chitinized rod, the apex acute. Ædeagus elongate, the apex with divergent flaps. Gonapophyses with the mesal apical angle long, slender, gently curved, the tip obtuse, the lateral margin with scattered pale spiculæ.

Hab. North Queensland.

Holotype, ♂, Mossman, March 1927 (*F. H. Taylor*).

Type in the Australian Institute of Tropical Medicine.

I take great pleasure in naming this species in honour of Mr. Frank H. Taylor, authority on the biting-flies of Australia. The fly is amply distinct from other regional species of *Libnotes*.

Limonia (Dicranomyia) dicksoniæ, sp. n.

General coloration brownish grey, the pleura clear blue-grey; antennæ black throughout; mesonotal præscutum with brown stripes, the median one more shiny black anteriorly; knobs of halteres infuscated; legs chiefly black;

wings grey, almost unmarked except for the stigma; *Rs* elongate, gently arcuate; male hypopygium with the tergite deeply emarginate medially.

Male.—Length about 6 mm.; wing 7 mm.

Female.—Length about 6.5 mm.; wing 8–8.2 mm.

Rostrum grey; palpi dark brown. Antennæ black throughout; basal flagellar segments subglobular, the outer segments passing to oval. Head light grey, the posterior vertex with a triangular dusky area on either side of a linear ashy median stripe; anterior vertex blue-grey, of moderate width.

Mesonotal præscutum dull yellowish grey, with three brown stripes, the median stripe more shiny black, especially in front; lateral stripes sometimes obsolete; posterior region of præscutum more brownish grey; scutal lobes brownish, the remainder of mesonotum clearer grey. Pleura clear blue-grey. Halteres of moderate length, pale, the knobs infuscated. Legs with the coxæ grey; trochanters brownish yellow; femora brown, the tips passing into dark brown or black; tibiæ and tarsi black. Wings relatively narrow, grey, the stigma oval, pale brown; scarcely indicated darkening on other veins; cord and outer end of cell 1st M_2 with extensive oblitative areas; veins dark brown. Venation: Sc_1 ending shortly before or beyond the origin of *Rs*, Sc_2 some distance before this tip; Sc_1 variable in length, from nearly as long as *m-cu* to considerably longer (σ); *Rs* long, gently arcuated, about twice the basal section of R_{4+5} ; R_2 in approximate alignment with the free tip of Sc_2 ; *m-cu* shortly before the fork of *M*, usually from one-third to one-fourth its length.

Abdomen black, heavily pruinose, the hypopygium chiefly dark or obscure. Male hypopygium with the tergite large, the caudal margin deeply notched, the lateral lobes conspicuous, bordered with conspicuous setæ; a small transverse oval area on mid-length of tergite near caudal margin, this provided with two long and two more delicate setæ. Basistyle relatively large, the ventro-mesal lobe at its base, long and relatively narrow, provided with several stout flattened setæ in addition to smaller ones; at the base of this lobe a small tubercle set with about six long curved setæ. Ventral dististyle relatively small, fleshy, the rostral prolongation of moderate size, blackened, terminating in a small, chitinized, beak-like point; spines two, placed on the face of the prolongation at near mid-length, the inner spine a little longer and straighter than the slightly curved outer spine. Dorsal dististyle a gently curved rod that is narrowed at tip into a

long spine. *Ædeagus* broad, trifid at apex. Ovipositor with the basal shields and valves fulvous-brown; tergal valves slender, gently upcurved, relatively small, but still much larger than in *whitei*.

Hab. Victoria.

Holotype, ♂, Ferntree Gully, April 15, 1928 (*F. E. Wilson*).

Allotopotype, ♀.

Paratype, ♀, Ringwood, May 5, 1928 (*F. E. Wilson*).

Type returned to Mr. Wilson.

Limonia dicksoniæ is generally similar to *L. (D.) whitei* (Alexander) of Victoria and Tasmania, but it is very distinct in the diagnostic features listed above. It likewise resembles *L. (D.) helmsi* (Skuse), but differs in the details of venation, as the long, gently arcuated *Rs*.

Limonia (Dicranomyia) dorrigenis, sp. n.

Belongs to the *liberta (tristis)* group; allied to *illingworthi*; size very small (wing, ♂, about 4 mm.); wings greyish, unmarked except for the stigma; male hypopygium with the gonapophyses very broad.

Male.—Length about 3.2 mm.; wing 4.1 mm.

Rostrum, palpi, and antennæ black; flagellar segments oval. Head dark grey.

Mesonotal præscutum yellowish grey, with three brown stripes; scutal lobes darkened; remainder of mesonotum more brownish grey. Pleura dark greyish brown. Halteres yellow, the knobs infuscated. Legs with the fore and middle coxæ extensively dark brown, the hind coxæ chiefly obscure yellow; trochanters reddish; remainder of legs brown, the tarsal segments passing into dark brown. Wings greyish, the oval stigma a little darker than the ground-colour; veins dark brown. Venation: *Sc*₁ ending about opposite the origin of *Rs*, the latter nearly three times the basal section of *R*₄₊₅; cell 1st *M*₂ elongate, longer than the veins issuing from it; *m-cu* more than one-half its length before the fork of *M*.

Abdominal tergites dark brown, the sternites more yellowish; hypopygium brownish yellow. Male hypopygium with the tergite transverse, the caudal margin evenly and convexly rounded, with a marginal series of setæ, including a median pair that are longer and stouter. Basistyle relatively small, the ventro-mesal lobe very stout, terminating in a dense brush of setæ; on face of style a small finger-like lobe that is tufted with setæ that are considerably longer

than the lobe itself; a small group of three or four strong setæ near the apical mesal portion of the basistyle. Dorsal dististyle a gently curved rod that is slightly expanded on outer half, thence gradually narrowed to a long apical spine. Ventral dististyle fleshy, including the broad rostral prolongation; the two rostral spines placed side by side, subequal in length, arising from low tubercles. Gonapophyses with the mesal apical lobe very broad, the outer margin weakly toothed, the lobe merging gradually with the main body of the apophysis.

Hab. New South Wales.

Holotype, ♂, Brooklana, Eastern Dorrigo, altitude about 2000 feet, February 10, 1929 (*W. Heron*).

Limonia dorrigenensis is allied to *L. (D.) illingworthi* (Alexander), differing most evidently in the small size, wing-pattern, and structure of the male hypopygium, especially of the gonapophyses.

Limonia (Dicranomyia) flavidella, sp. n.

General coloration pale yellow; legs long and slender, the terminal tarsal segments darkened; wings pale yellow, the stigma vaguely darker; costal fringe relatively long and conspicuous; cell M_2 open by the atrophy of m .

Male.—Length about 5 mm.; wing 6 mm.

Rostrum and palpi pale yellow. Antennæ broken. Head ochreous-yellow.

Mesonotum and pleura uniformly reddish yellow, without markings. Halteres of moderate length only, pale yellow throughout. Legs long and slender, pale yellow, only the terminal tarsal segments infuscated; claws simple, except for a basal spine. Wings uniformly pale yellow, the stigma vaguely darker; veins darker yellow. Costal fringe relatively long and conspicuous. Venation: Sc short, Sc_1 ending opposite the origin of R_s , Sc_2 a short distance from its tip, Sc_1 alone about one-half the length of R_s ; R_s about one-third to one-fourth longer than the basal section of R_{4+5} ; cell M_2 open by the atrophy of m ; $m-cu$ at or shortly before the fork of M ; distal section of Cu_1 a little shorter than $m-cu$.

Abdomen uniformly ochreous-yellow. Male hypopygium with the ninth tergite transverse, the caudal margin virtually straight across, each lateral angle with about a dozen setigerous punctures. Basistyle relatively short and stout, the ventro-mesal lobe large, conspicuously setiferous. Ventral dististyle large and fleshy, much larger than the

basistyle, the rostral prolongation relatively slender, with two conspicuous spines; outer spine about three-fourths the length of the inner, placed a little more than one-half its length from the tip of the prolongation; spines placed close together. Dorsal dististyle a strongly curved hook, the long slender apex blackened. Gonapophyses very extensive, pale, the mesal apical angle curved to the obtuse tip. *Ædeagus* bifid at tip.

Hab. Victoria, New South Wales.

Holotype, ♂, Millgrove, Victoria, altitude about 1600–1700 feet, in a deeply shaded fern-gully, April 7, 1928 (*F. E. Wilson*).

Paratype, ♂, Eastern Dorrigo, New South Wales, altitude 2000–3000 feet, February 27, 1929 (*W. Heron*). “Beaten from tree-fern foliage, *Dicksonia antarctica*” (*F. E. Wilson*).

Type returned to Mr. Wilson.

Limonia (Idioglochina) perkinsiana, sp. n.

Allied to *tusitala*, Alexander; general coloration dark brownish grey; mesonotal præscutum brown, with four dark brown stripes; pleura dark brownish grey; legs dark brown, including the coxæ; wings with a strong dusky tinge; male hypopygium with the caudal margin of the ninth tergite bearing a small, deep, V-shaped median notch.

Male.—Length about 6 mm.; wing 7.5 mm.

Rostrum dark brown, nearly as long as the remainder of the head; palpi dark brown. Antennæ dark brown, the first segment more pruinose; flagellar segments strongly produced beneath, as in the *tusitala* group, the apical necks short and stout. Head pale reddish brown, sparsely pruinose, the median region of the vertex more infuscated.

Mesonotal præscutum with the interspaces brown, the disk with four dark brown stripes, the lateral and posterior portions of the sclerite dark greyish plumbeous; pseudo-sutural foveæ punctiform, dark brown; scutum light grey medially, each lobe with two dark brown areas; scutellum and postnotum light grey. Pleura dark brownish grey, the dorso-pleural membrane buffy. Halteres obscure yellow. Legs with the coxæ dark brown, pruinose, the apices restrictedly pale; remainder of legs dark brown, the femoral bases only a trifle brighter; claws with a series of about four teeth, the outermost longest. Wings with a strong dusky tinge, *Rs* and *Cu* more suffused with still darker brown; veins yellowish brown, some darker brown. Venation: *Sc*

relatively long, the distance on costa between Sc_1 and origin of R_s about two-thirds the length of the latter; basal section of R_{4+5} about two-thirds R_s ; R_{2+3} only gently arcuated; $m-cu$ shortly beyond the fork of M .

Abdominal segments dark brown, the tergites vaguely more reddish brown medially at base; caudal margins of the segments very restrictedly pale; sternites obscure brownish yellow, darker laterally, the caudal margins narrowly pale; hypopygium more brightened. Male hypopygium with the caudal margin of the ninth tergite with a small but deep V-shaped median notch. Dorsal dististyle strongly curved, sickle-shaped, narrowed to the subacute apex. Ventral dististyle with the inner beak-like portion stout, the tip obtuse.

Hab. Queensland.

Holotype, ♂, Dunk Is., August 25, 1927 (*F. A. Perkins*).

I name this crane-fly in honour of the collector, Mr. F. A. Perkins.

Type in the University of Queensland.

Limonia perkinsiana is allied to *L. (I.) vile* (Edwards) and *L. (I.) novocaledonica*, Alexander, differing from both in the very dark colour and details of structure of the male hypopygium.

Eurhamphidia invenustipes, sp. n.

General coloration brownish grey; legs uniformly darkened; wings subhyaline, iridescent, the stigma and apex darkened.

Male.—Length about 6–6.3 mm.; wing 6.4–6.8 mm.

Rostrum approximately as long as the remainder of head, dark brown; palpi black. Antennæ short, brownish black, the first segment obscure yellow at base. Head brownish grey.

Pronotum dark brown. Mesonotal præscutum yellowish brown, with a narrow but conspicuous dark brown median stripe that does not extend to the suture; scutum pale brown, the centres of the lobes brownish black; scutellum and postnotum light brown. Pleura pale brown, pruinose, darkened dorsally; dorso-pleural membrane obscure buffy brown; sternopleurite darker brown. Halteres slender, dark brown, the base of the stem restrictedly obscure yellow. Legs long and slender; coxæ obscure yellow, the fore coxæ more infuscated; trochanters obscure yellow; femora brown; remainder of legs brown, without white markings. Wings highly iridescent, subhyaline; stigma elongate, dark

brown; wing-apex narrowly darkened; veins dark brown. Venation: Sc_1 ending nearly opposite $r-m$ or somewhat beyond it, Sc_2 not far from its tip; first section of Rs nearly twice the second; veins R_2 and R_{4+5} divergent apically; $m-cu$ at near mid-length of cell 1st M_2 , in approximate alignment with $r-m$.

Abdomen relatively long and slender, brownish black, the basal sternites obscure yellow.

Hab. West Australia.

Holotype, ♂, Donnybrook, August 29, 1926 (*E. W. Ferguson*).

Paratype, ♂, Pemberton, August 28, 1926 (*E. W. Ferguson*).

Type in the Macleay Collection.

Eurhamphidia invenustipes is entirely different from *E. niveitarsis* (Skuse), the only other described Australian species.

XI.—*Descriptions and Records of Bees.*—CXXII.

By T. D. A. COCKERELL, University of Colorado.

Bombus discrepans, Pendlebury.

3 ♂, Koo Luang, Nakawn Sritamarat, Siam, April 30, 1928 (*Kerr*).

The genitalia, which differ considerably from those of any species known to me, were not described by Pendlebury. Spatha strap-shaped, parallel-sided, acutely pointed at apex; sagitta stout, very obliquely truncate apically, with the lower (outer) corner produced into a sort of short beak; stripes very broad at base, apically broadly truncate, for the attachment of the squama; squama black, somewhat U-shaped, with very thick base, outer arm broadly attached to stipes, but not projecting, inner much shorter, and pointed; volsella extending finger-like far beyond squama, the apex obtuse, somewhat broadened, its inner margin concave; stiff bristles project from beneath the apical portion.

The specimens were taken at an altitude of 1400 to 1600 m.

In its general appearance this bee is exactly like *B. ignitus*, Sm., from Japan.