

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

THE crane-flies discussed herewith are all from Eastern Australia, where they were collected by my colleagues, Messrs. Heron, Illingworth, Tonnoir, and Wilson, to whom I am greatly indebted for this further aid in making known the vastly rich fauna of the Commonwealth. The material collected by Tonnoir is preserved in the Station Collection at Canberra; the Wilson specimens are preserved in the cabinet of the collector; the remaining specimens are retained in my own collection.

*Limonia (Dicranomyia) punctulatella*, sp. n.

Closely allied and generally similar to *L. (D.) punctulata* (de Meijere) of the Greater Sunda Islands, differing especially in the structure of the male hypopygium.

*Male*.—Length about 5 mm.; wing 5.8 mm.

Rostrum, palpi, and antennæ black throughout. Mesonotal præscutum reddish brown, with three darker brown stripes, of which only the median one is broad and distinct. Femora darkened subterminally. Wings with about five or six dark spots in cell *C* between arculus and stigma; a large oval dark spot on vein *M* just beyond one-third the length; remainder of wing-pattern as in the group. Male hypopygium with the caudal margin of tergite broadly emarginate, each lateral lobe with about eighteen to twenty coarse setæ. Ventromesal lobe of basistyle very stout and broad-based. Dorsal dististyle gently curved, a little dilated just

before the short straight apical spine. Ventral dististyle with the rostral prolongation long and stout, with two spines placed on a broad tubercle, the more basal spine placed low on ventral margin of prolongation, the two spines separated by a distance subequal to the length of the outer spine. Gonapophyses with the mesal-apical lobe appearing as a slender, smooth, blackened spine, the acute tip gently curved.

*Hab.* North Queensland.

*Holotype*, ♂, Babinda, Cairns district, October 1920 (*J. F. Illingworth*).

A large number of perfectly valid species of *Dicranomyia* have been confused under the name *punctulata*, including, besides the typical species, *fullowayi* (Alexander), *neopunctulata* Alexander, *punctulatoides* Alexander, and *subpunctulata* Alexander. The included forms range from North India and Western China, eastward into Japan, and southward and eastward throughout all the major Malayan Islands, to North Queensland. Furthermore, *L. (D.) punctipennis* (Skuse) and allied species in New Zealand and in South and West Australia must likewise be held to pertain to this same group of crane-flies. The present fly is entirely distinct from all described members of the group in the presence of two widely separated spines on the rostral prolongation of the ventral dististyle of the male hypopygium.

*Limonia (Dicranomyia) kulin*, sp. n.

Closely allied and generally similar to *L. (D.) punctipennis* (Skuse), differing especially in the broader wings, with a conspicuous costal fringe in the male sex, and in the details of structure of the male hypopygium.

*Male*.—Length 5.5–6 mm. ; wing 6–7 mm.

*Female*.—Length about 7.5 mm. ; wing 8 mm.

General coloration grey, the mesonotum variegated with darker grey. Wings broader than in *punctipennis*, the cells correspondingly widened ; ground-colour more greyish yellow, the characteristic wing-pattern of the group clearly defined. Costal fringe (male) long and conspicuous. Male hypopygium with the tergite transverse, the caudal margin very shallowly and broadly emarginate. Ventral dististyle elongate, its area approximately twice the basistyle ; rostral prolongation decurved,

relatively small, with two short rostral spines that are placed close together low down on cephalic margin of prolongation at about one-third the length; spines nearly equal in size, a little more than one-half the length of the prolongation alone. Gonapophyses with the mesal-apical lobe blackened apically, curved into a horn, the outer margin before apex with more or less distinct small pale spicules.

*Hab.* New South Wales, Victoria.

*Holotype*, ♂, Narooma, New South Wales, November 25, 1930 (*A. L. Tonnoir*).

*Allotype*, ♀, mountains above Millgrove, Victoria, December 22, 1929 (*F. E. Wilson*).

*Paratype*, ♂, with the allotype.

The specific name is that of a native tribe of South-east Australia.

*Limonia (Dicranomyia) canithorax*, sp. n.

General coloration of thorax light grey; antennæ black, the basal flagellar segments nearly globular; mesonotal præscutum with central portion clear grey, on either side with yellowish or golden pollen; knobs of halteres infuscated; legs passing from dark brown to black; wings with a brownish-yellow suffusion, the costal margin more saturated, concolorous with the stigma; cell 1st  $M_2$  closed; male hypopygium with the ventral dististyle smaller than the basistyle; rostral spines two, arising close together.

*Male*.—Length about 8 mm.; wing 8.5 mm.

Rostrum black, grey-pruinose, somewhat produced, if taken with the porrect labial palpi nearly as long as remainder of head; maxillary palpi black. Antennæ black, the scape grey-pruinose, the pedicel somewhat paler; basal two or three flagellar segments nearly globular, with short necks, the outer segments passing into oval; verticils of outer segments becoming small and inconspicuous, shorter than the segments; terminal segment a little larger than the penultimate. Head grey; eyes relatively small; anterior vertex wide, nearly three times the diameter of the scape.

Pronotum grey. Mesonotal præscutum with a clear grey median line, on either side of which the sclerite is slightly yellowish brown to golden, the humeral region remaining grey; posterior sclerites of mesonotum clear

light grey. Pleura clear grey, the dorso-pleural region a trifle more pollinose. Halteres short, obscure yellow, the apices of the knobs infuscated. Legs with the coxæ generally pale, sparsely pruinose, the fore coxæ somewhat darker; trochanters obscure yellow; femora basally brownish yellow, passing through brown to dark brown at tips; tibiæ brown, the tips passing into black; tarsi black; claws with a single basal spine. Wings with a brownish-yellow suffusion, the costal region more saturated, somewhat as in *auripennis*, this colour not passing distad beyond the nearly concolorous stigma; veins pale brown. Costal fringe relatively long and dense. Venation:  $Sc_1$  ending opposite origin of  $R_s$ ,  $Sc_2$  faint,  $Sc_1$  alone nearly equal to  $m-cu$ ;  $R_s$  slightly angulated at origin, about one-third longer than the basal section of  $R_{4+5}$ ; free tip of  $Sc_2$  a little proximad of  $R_2$ ; inner end of cell 1st  $M_2$  slightly arcuated;  $m-cu$  shortly before fork of  $M$ ; cell 2nd  $A$  wide.

Abdominal tergites dark brown, very sparsely pruinose, the sternites more obscure yellow, becoming darker on the outer segments. Male hypopygium with the caudal margin of tergite only gently emarginate. Basistyle with the ventro-mesal lobe large, pale, with long but relatively sparse setæ on mesal face. Ventral dististyle small, not as extensive as the basistyle, the mesal edge sloping steeply to the conspicuous rostral prolongation; two rostral spines, subequal in length, placed close together, arising from small basal tubercles. Dorsal dististyle a flattened blade that narrows into a long acute black point. Gonapophyses with the mesal-apical lobe pale, its lateral margin with two or three microscopic teeth.

*Hab.* New South Wales.

*Holotype*, ♂, Mt. Victoria, Blue Mountains, October 20–30, 1930 (*F. E. Wilson*).

The coloration of the wings is much as in *L. (D.) auripennis* (Skuse), but the clear grey coloration of the head and thorax, in conjunction with the large size and structure of the male hypopygium, readily separate the fly from all similar Australian species.

*Limonia (Dicranomyia) validistyla*, sp. n.

General coloration grey; antennæ black throughout; mesonotal præscutum with three clearly defined brown stripes; halteres pale yellow, the knobs dark brown;

legs black, the femoral bases obscure yellow, narrowest on the fore legs; wings with a strong brown tinge, washed and seamed with still darker brown;  $Sc_1$  relatively short;  $m-cu$  close to fork of  $M$ ; male hypopygium with the caudal margin of tergite convexly rounded; dorsal dististyle a very powerful blackened rod that is bent beyond mid-length at about a right angle.

*Male*.—Length about 7.5 mm.; wing 8.5 mm.

Rostrum dark brown; palpi black. Antennæ black throughout; flagellar segments suboval, the verticils not exceeding the segments. Head dark grey, the centre of posterior vertex a little darker.

Pronotum and mesonotum grey, the præscutum with three clearly defined brown stripes, the median one ending before the suture; scutal lobes extensively infuscated. Pleura dark grey. Halteres pale yellow, the knobs dark brown. Legs with the coxæ dark grey; trochanters obscure yellow; femora yellow basally, passing into black, the pale bases narrowest on the fore legs, more extensive on the posterior legs; remainder of legs black. Wings with a strong brown tinge, the oval stigma dark brown, conspicuous; narrower and less evident brown seams at origin of  $Rs$ , along cord and outer end of cell 1st  $M_2$ ; a dusky streak along vein  $Cu$  in cell  $M$ ; veins brownish black. Venation:  $Sc_1$  ending opposite origin of  $Rs$ ,  $Sc_2$  not far from its tip; free tip of  $Sc_2$  and  $R_2$  in transverse alignment;  $Rs$  weakly angulated at origin; basal section of  $R_{4+5}$  about two-thirds  $Rs$ ;  $m-cu$  close to fork of  $M$ ; anal veins at origin parallel or gently converging.

Abdomen black, sparsely pruinose; hypopygium brownish yellow. Male hypopygium with the caudal margin of tergite convexly rounded. Ventro-mesal lobe of basistyle of moderate size. Dorsal dististyle an unusually powerful chitinized rod, just beyond mid-length bent at a right angle, slightly widened at the angle, apex of style narrowed to an acute black spine. Ventral dististyle about as large as the basistyle, roughly triangular in outline; rostral prolongation stout, with two spines placed on the face of prolongation at near mid-length; spines separate, equal in size and shape, the outer placed a little less than its own length from apex of prolongation. Mesal-apical lobe of gonapophysis long and slender.

*Hab.* Victoria.

*Holotype*, ♂, Mt. Donna Buang, above Warburton, altitude 3000–4000 feet, December 6, 1931 (*F. E. Wilson*).

*Limonia (Dicranomyia) validistyla* is most like *L. (D.) obscura* (Skuse), but is very different from all regional species in the structure of the hypopygium. Through the kindness of Mr. Woodhill and the Trustees of the Macleay Collection, Sydney, I have been furnished with enlarged photomicrographs of the genitalia of the holotype of *obscura*. From these it has become apparent that the species described as *inculta* Alexander is identical with *obscura* and must be placed in the synonymy.

*Limonia (Dicranomyia) octacantha*, sp. n.

General coloration of notum yellowish brown, the præscutum with three brown stripes; antennæ black throughout; halteres pale; wings greyish subhyaline, clouded and streaked with greyish brown;  $Sc_1$  ending opposite one-fifth the length of  $R_s$ ,  $Sc_2$  not far from its tip; *m-cu* some distance before fork of *M*; male hypopygium with the ventral dististyle produced into an elongate rostral prolongation that bears a pair of spines at apex and a second pair at base.

*Male*.—Length about 7 mm.; wings 8.7 mm.

Rostrum black, sparsely pruinose; palpi black. Antennæ black throughout; flagellar segments suboval, the outer segments much narrower at proximal end than at apex; verticils a little shorter than the segments; terminal segment subequal to or a little longer than the penultimate. Head brownish grey; anterior vertex narrow, about one-half the diameter of scape.

Mesonotal præscutum yellowish-brown pollinose, with three conspicuous brown stripes; posterior sclerites of mesonotum more pruinose, the scutal lobes darkened. Pleura grey, clearer light grey on the ventral sclerites, more darkened on the anepisternum and pteropleurite. Halteres elongate, chiefly dirty whitish, the base of knob weakly infumed. Legs with the coxæ dark, pruinose; trochanters obscure yellow; femora obscure brownish yellow basally, broadly blackened at tips; tibiæ and basitarsi dark brown, the tips very narrowly blackened; remainder of tarsi black; claws large, each with a conspicuous basal tooth. Wings greyish subhyaline, clouded and streaked with more greyish brown; stigma pale

brown; pale clouds at origin and fork of *Rs*, fork of *M*, and on *m-cu*; outer end of cell 1st *M*<sub>2</sub>; pale grey streaks along most longitudinal veins and along the centre of cell *R*; veins brown. Venation: *Sc*<sub>1</sub> ending about opposite one-fifth the length of *Rs*, *Sc*<sub>2</sub> close to its tip; free tip of *Sc*<sub>2</sub> lying a little proximad of *R*<sub>2</sub>; inner end of cell *R*<sub>3</sub> about on a level with *m-cu* and lying far before the other cells of the cord; *m-cu* about three-fourths its length before fork of *M*.

Abdomen black, sparsely pruinose; hypopygium yellowish brown. Male hypopygium with the tergite large, transverse, narrowed outwardly, the caudal margin truncated to very insensibly emarginate medially, with about a score of setæ, all of which are marginal in position. Ventro-mesal lobe of basistyle large. Dorsal dististyle a nearly straight blackened rod, the acute tip a little curved. Ventral dististyle fleshy, subequal in area to basistyle, the rostral prolongation produced into a long slender structure that bears four spines, an outer pair placed on a common tubercle far out toward end of prolongation, and an inner pair from slightly unequal tubercles placed at the extreme base of prolongation, the two pairs of spines being separated by a distance equal to more than one-half the length of the dorsal dististyle; outer spines subequal, pale basally; inner spines a little shorter; apex of rostral prolongation truncated, with several setæ. Gonapophyses with the mesal-apical lobe long and narrow, blackened, the outer margin microscopically serrulate. Apex of ædeagus simple.

*Hab.* Victoria.

*Holotype*, ♂, Mt. Donna Buang, above Warburton, altitude 3000–4000 feet, April 1931 (*F. E. Wilson*).

*Limonia (Dicranomyia) octacantha* is a rather remarkable species, the type of male hypopygium being very distinctive. The nearest ally would seem to be *L. (D.) flagellifer* Alexander, of south-eastern Australia, which is readily told by the structure of the hypopygium, the rostral prolongation being long-bispinous.

*Limonia (Dicranomyia) cunninghamensis*, sp. n.

General coloration of mesonotum yellow, the præ-scutum slightly darker medially; scutellum and medio-tergite darker brown; legs chiefly yellow; wings yellow,

the stigma brown;  $Sc_1$  long;  $Rs$  relatively short, only a little longer than, or subequal to, the basal section of  $R_{4+5}$ ; male hypopygium with the rostral spines long, straight, strongly divergent.

*Male*.—Length about 4.5 mm.; wing 6 mm.

*Female*.—Length about 5.5–6 mm.; wing 7.5–8 mm.

Rostrum obscure ochreous; basal segment of maxillary palpus yellow, the remainder black. Antennæ with the basal segment slightly brightened at base, the remainder dark brown; flagellar segments oval, with short verticils. Head brownish yellow, opaque, with a sparse grey pruinosity.

Mesonotum yellow, the præscutum with a slightly darker median line; median region of scutum, scutellum, and mediotergite darker brown. Pleura pale testaceous-yellow. Halteres relatively short, the stem yellow, the knobs infuscated. Legs with the coxæ and trochanters pale yellow; remainder of legs yellow, the outer tarsal segments infuscated. Wings pale yellow, the oval stigma brown; veins brown, those before the cord more yellowish. Venation:  $Sc_1$  ending opposite origin of  $Rs$ ,  $Sc_2$  some distance from its tip,  $Sc_1$  alone being a little shorter than  $Rs$ , the latter in turn being a little longer and more arcuated than the basal section of  $R_{4+5}$ ;  $m-cu$  at fork of  $M$ , subequal to or longer than the distal section of  $Cu_1$ .

Abdominal tergites brown, the sternites more yellowish; hypopygium and subterminal segments yellow. Male hypopygium with the caudal margin of the ninth tergite broadly emarginate. Ventro-mesal lobe of basistyle large, with conspicuous setæ. Dorsal dististyle a curved chitinized rod, narrowed to the long acute tip. Ventral dististyle relatively small, less than the basistyle; rostral prolongation conspicuous, broad-based, narrowed to a very slender apical point; rostral spines long and slender, straight, each subequal to the prolongation itself, conspicuously divergent, arising from small basal tubercles. Gonapophyses with the mesal-apical lobe long and slender.

*Hab.* Victoria.

*Holotype*, ♂, Ben Cairn, near Millgrove, in beech-gully (*Nothofagus Cunninghamii*, H. f.), altitude 2900–3200 feet, February 9, 1929 (*F. E. Wilson*).

*Allotopotype*, ♀.

*Paratopotype*, ♀.



*Limonia* (*Dicranomyia*) *cunninghamensis* requires no comparison with any of the other chiefly yellow species of the subgenus.

*Limonia* (*Dicranomyia*) *kurnai*, sp. n.

General coloration shiny yellow; mesonotum with two black lines on the scutum, scutellum, and mediotergite; pleura narrowly lined and spotted with black; wings with a faint brown tinge, the margin narrowly infuscated; cord, outer end of cell 1st  $M_2$ , and vein *Cu* seamed with brown; abdomen yellow and black, the sternites bright yellow with their lateral margins black.

*Male*.—Length about 5.2–5.5 mm.; wing 6–6.3 mm.

*Female*.—Length about 6 mm.; wing 6.5 mm.

Rostrum brownish yellow, about one-fourth the length of remainder of head; palpi black. Antennæ black throughout; basal flagellar segments subglobular to short-oval, the outer segments passing to elongate-oval; verticils inconspicuous. Head light brown; anterior vertex about one-half wider than diameter of scape.

Pronotum black medially, paling to yellow on sides. Mesonotum shiny obscure yellow, the præscutum with a conspicuous black median stripe that does not reach the suture behind; lateral stripes feebly indicated, sometimes subobsolete, pale brown, crossing the suture and passing into black on the scutal lobes, scutellum, and mediotergite, becoming confluent on caudal margin of latter sclerite, the two stripes enclosing yellow areas. Pleura shiny yellow, lined with black, including longitudinal streaks on suture between anepisternum and sternopleurite, and on ventral sternopleurite; smaller spots on dorsal anepisternum, ventral pleurotergite, and meron. Halteres dusky. Legs with coxæ testaceous-yellow; trochanters more greenish yellow; femora brown, more yellowish basally, passing into black at tips; tibiæ and tarsi brownish black; claws with a long basal spine. Wings with a faint brownish tinge, the entire margin narrowly darker brown; stigma oval, dark brown; cord, outer end of cell 1st  $M_2$ , vein *Cu*, and axilla similarly seamed with brown; veins dark brown. Venation:  $Sc_1$  ending about opposite origin of *Rs*,  $Sc_2$  some distance from its tip,  $Sc_1$  alone subequal to *m-cu*; cell 1st  $M_2$  closed; *m-cu* at or close to fork of *M*; anal veins at base very gently converging.

Abdominal tergites with caudal margins yellow, the basal rings more obscure yellow, at near mid-length of each tergite with brownish black areas, these larger on the outer segments; sternites bright yellow, the lateral margins conspicuously black, on the outer segments the caudal margins similarly darkened; hypopygium chiefly testaceous-yellow. Male hypopygium with the tergite transverse, the caudal margin broadly emarginate, the lateral lobes provided with long coarse setæ. Basistyle with its ventro-mesal lobe large and stout. Dorsal dististyle a strongly curved blackened rod, the distal third narrowed. Ventral dististyle subequal in area to basistyle; rostral prolongation with two long straight spines that exceed the prolongation in length, these spines slightly retrorse. Gonapophyses pale, the mesal-apical lobe of moderate width, the tip obtuse. Ovipositor with the cerci blackened, small, slender, upcurved; hypovalvæ stout, deep horn-colour, more blackened basally.

*Hab.* Victoria.

*Holotype*, ♂, Ringwood, March 1931 (*F. E. Wilson*).

*Allotopotype*, ♀.

*Paratopotypes*, 2 ♂♂; *paratypes*, 2 ♂♂, Warburton, April 1931 (*F. E. Wilson*).

The specific name, *kurnai*, is that of an aboriginal Victorian tribe. The species is very different from any other described Australian member of the subgenus, being most nearly allied, perhaps, to species such as *dorsalis* Skuse and *viridiventris* Skuse.

*Limonia (Dicranomyia) whitei brevispinula*, subsp. n.

*Male*.—Length about 6 mm.; wing 7 mm.

Close to typical *whitei* Alexander (Victoria, Tasmania), differing especially in the structure of the male hypopygium.

Rostrum obscure ochreous; palpi black. Humeral region of præscutum strongly tinged with reddish brown. Male hypopygium with the spines of the rostral prolongation of the ventral dististyle very short, the distance between them about one-half their length. In typical *whitei* the spines are slender, the distance between them at their bases not more than one-fourth to one-fifth their length.

*Hab.* New South Wales.

*Holotype*, ♂, Brooklana, Eastern Dorrigo, altitude about 2000 feet, October–November 1929 (*W. Heron*).

*Limonia (Geranomyia) erasmi*, sp. n.

General coloration of mesonotum reddish brown, the præscutum with three more or less confluent black stripes; rostrum short, less than one-third the length of remainder of body; legs chiefly brownish black, the femoral bases yellow; wings subhyaline, unmarked except for the pale brown stigma; costal fringe (male) long.

*Male*.—Length, excluding rostrum, 6–6.5 mm.; wing 7–7.8 mm.; rostrum, about 1.6–1.7 mm.

*Female*.—Length, excluding rostrum, about 7 mm.; wing 7.5 mm.; rostrum about 1.4–1.5 mm.

Rostrum unusually short, black; palpi 3-segmented. Antennæ brownish black, the outer segments darker; flagellar segments short-oval, the outer segments a little more elongate. Head dark grey, anterior vertex subequal in width to diameter of scape.

Pronotum brownish black. Mesonotal præscutum reddish brown on humeral and lateral portions, the disk chiefly covered by three more or less confluent black stripes; scutal lobes chiefly blackened, their margins and the median area brighter; scutellum yellow, in cases darkened medially; mediotergite brownish yellow, more or less darkened caudally. Pleura blackened, pruinose, the pleurotergite and meron paler; in cases, the anepisternum likewise pale. Halteres pale, the apices of knobs dark brown. Legs with the coxæ testaceous-yellow, the fore coxæ darker; trochanters obscure yellow; femora chiefly brownish black, their bases restrictedly obscure yellow; tibiæ dark brown to brownish black; tarsi black. Wings subhyaline, the oval stigma a little darker; veins yellow to yellowish brown. Costal fringe (male) long and conspicuous. Venation:  $Sc_1$  ending just before mid-length of  $R_s$ ,  $Sc_2$  at its tip;  $m-cu$  at or shortly before fork of  $M$ .

Abdomen dark brown, the hypopygium reddish yellow. Male hypopygium with the tergite transverse, the caudal margin convexly rounded, the median area restrictedly truncated or even feebly notched. Basistyle with the ventro-mesal lobe large. Dorsal dististyle a powerful

rod, the distal half wider than the base, the tip gradually narrowed to a spine. Ventral dististyle fleshy, in area approximately twice the size of basistyle; rostral prolongation relatively short and stout; rostral spines two, about equal in length to the prolongation itself, placed on a low tubercle at near mid-length of the rostrum. Gonapophyses pale throughout.

*Hab.* New South Wales (Blue Mountains).

*Holotype*, ♂, Blackheath, October 1930 (*F. E. Wilson*).

*Allotype*, ♀, Wentworth Falls, October 1930 (*F. E. Wilson*).

*Paratopotype*, ♂; *paratype*, ♂, Mt. Victoria, October 1930 (*F. E. Wilson*).

I take great pleasure in naming this very distinct *Geranomyia* in honour of the collector, my friend, Mr. F. Erasmus Wilson. The fly is readily told from other members of the *Triphana* group by the immaculate wings and long costal fringe of the male sex.

*Limonia (Geranomyia) grus*, sp. n.

General coloration of mesonotal præscutum reddish, with three brownish-black stripes; rostrum slightly less than one-half the length of remainder of body; antennæ black throughout or with the pedicel brightened; flagellar segments subcylindrical, with an abrupt apical pedicel; wings greyish, with a more greyish-brown pattern, the chief areas at origin of *Rs* and stigma; *Sc*<sub>1</sub> ending beyond mid-length of *Rs*; male hypopygium with the rostral prolongation stout, with two rostral spines that are placed close together at about one-third its length.

*Male*.—Length, excluding rostrum, 5–5.5 mm.; wing 7–7.5 mm.; rostrum 2.3–2.5 mm.

Rostrum of moderate length, subequal in length to antenna, black throughout; palpi concolorous, 3-segmented. Antennæ black throughout, in the paratype with pedicel obscure yellow; flagellar segments subcylindrical to oval, with abrupt but short apical pedicels; verticils shorter than the segments; terminal segment about a third longer than the penultimate. Head dark grey; anterior vertex very narrow.

Pronotum dark brown. Mesonotal præscutum obscure reddish, with three brownish-black stripes, in the paratype more extensive and subconfluent; scutum chiefly brownish

black; posterior sclerites of mesonotum chiefly brownish black, sparsely pruinose. Pleura with the ground-colour reddish brown, in cases more variegated on the anepisternum, ventral sternopleurite and pleurotergite with darker brown. Halteres pale, the knobs infuscated. Legs with the coxæ and trochanters testaceous-yellow; femora obscure yellow at bases, the outer half or more passing into dark brown; remainder of legs dark brown. Wings with the ground-colour greyish, with an extensive, slightly darker, more greyish-brown pattern, the chief areas including the origin of *Rs* and the stigma; cord and outer end of cell 1st *M*<sub>2</sub> narrowly darkened; fainter darkened clouds at wing-apex and in Anal field; veins dark brown. Macrotrichia of veins relatively long and conspicuous; costal fringe short. Venation: *Sc*<sub>1</sub> ending just beyond mid-length of *Rs*, *Sc*<sub>2</sub> at its tip; *m-cu* at the for of *M*.

Abdominal tergites and hypopygium chiefly dark brown, pruinose; basal sternites, in cases, a little more variegated with paler. Male hypopygium with the tergite transverse, the caudal margin gently emarginate, the lateral lobes with long coarse setæ. Basistyle with the ventro-mesal lobe with numerous conspicuous setæ. Dorsal dististyle a stout, gently curved rod, the apex suddenly narrowed into a spine. Ventral dististyle relatively small, not exceeding the basistyle in area; rostral prolongation short, obtuse to subtruncated at apex; rostral spines two, shorter than the prolongation, a trifle unequal, placed close together at about the basal third of the rostrum. Gonapophyses with the mesal-apical lobe stout, somewhat narrower in paratype, dark-coloured to blackened, the outer margin microscopically roughened. Ædeagus with the surface set with conspicuous small tubercles.

*Hab.* New South Wales, Victoria.

*Holotype*, ♂, mountains above Warburton, Victoria, April 1931 (*F. E. Wilson*).

*Paratopotypes*, 1 ♂, with type; 1 ♂, altitude 3000–3800 feet, March 2, 1930 (*F. E. Wilson*); 2 ♂♂, altitude 600 feet, March 2, 1930 (*F. E. Wilson*); *paratype*, 1 ♂, Blundell's, Federal Capital Territory, New South Wales, February 18, 1931, bred from a pupa in gelatinous cocoon in running water (*A. L. Tonnoir*).

In its wing-pattern and venation, *Limonia* (*Geranomyia*) *grus* is most similar to *L. (G.) skuseana* Alexander (*fusca* Skuse, preoccupied), differing in the reduced palpi, details of body-coloration, and the structure of the male hypopygium, especially the position of the rostral spines and the nature of the ædeagus.

*Limonia* (*Libnotes*) *zelota*, sp. n.

General coloration ochreous, the præscutum with four narrow brown stripes; knobs of halteres infuscated; femora yellow, with a black subterminal ring, tibiæ and tarsi black; wings whitish, with a restricted brown and grey pattern; *m* short and transverse, only about one-half the basal section of *M*<sub>3</sub>; vein 2nd *A* near origin converging toward vein 1st *A*.

*Female*.—Length about 13 mm.; wing 16.5 mm.

Rostrum buffy, the small palpi pale. Antennæ with the basal segment yellow; flagellar segments weakly bicolorous, the bases a little darker than the apices; flagellar segments oval, the outer segments becoming more elongate; terminal segment long and slender. Head, in unique type, chiefly concealed.

Mesonotum ochreous, the præscutum with four narrow brown stripes, the long intermediate pair approximated or confluent in front, not reaching the suture behind; lateral stripes short and narrow; all interspaces more or less suffused with dusky; lateral margins of præscutum slightly darkened; scutal lobes with brownish-grey centres; postnodal mediotergite with two brownish-grey lines, slightly convergent behind. Pleura chiefly ochreous. Halteres pale, the knobs infuscated. Legs with the coxæ and trochanters pale yellow, the latter slightly greenish; femora yellow, with a black subterminal ring that is about twice as wide as the greenish-yellow apex; tibiæ and tarsi black. Wings relatively broad, whitish, with a restricted brown and grey pattern; brown seams at origin of *Rs*, cord, outer end of cell 1st *M*<sub>2</sub>, *Sc*<sub>2</sub>, and as an oval, oblique, stigmal area at free tip of *Sc*<sub>2</sub>; paler brownish-grey seams along vein 2nd *A*, vein *R*<sub>4+5</sub>, and tips of veins *M*<sub>3</sub> and *M*<sub>4</sub>; pale grey longitudinal streaks in cells *R* and *R*<sub>1</sub>; veins yellow, dark brown in the infuscated areas. Venation: *Sc*<sub>1</sub> ending beyond *r-m*, *Sc*<sub>2</sub> at its tip; *Rs* long, more than

three times the basal section of  $R_{4+5}$ ;  $R_2$  and free tip of  $Sc_2$  in transverse alignment;  $m$  transverse, only about one-half the basal section of  $M_3$ ;  $m-cu$  at near one-third the length of cell 1st  $M_2$ ; vein 2nd  $A$  short, near origin converging strongly toward 1st  $A$ .

Abdomen ochreous, the tergites with conspicuous brown basal areas, the sternites more uniformly pale. Ovipositor with the valves relatively short and stout.

*Hab.* New South Wales.

*Holotype*, ♀, Brooklana, Eastern Dorrigo, altitude about 2000 feet, October–November 1929 (*W. Heron*).

In its large size and general appearance, the present fly suggests *D. (L.) restricta* (Alexander), differing notably in the coloration of the body and legs, and, especially, in the venation. By Edwards's key to the species of *Libnotes* (*Journ. Feder. Malay St. Mus.* xiv. pp. 74–80, 1928), *zelota* runs to beyond couplet 35, where it disagrees with all included forms.

#### *Tonnoiromyia montina*, sp. n.

Generally similar to *tasmaniensis*, differing especially in the shorter antennæ of the male, with longer and more conspicuous verticils, and in the structure of the male hypopygium.

*Male*.—Length about 5 mm.; wing 5.5 mm.; antenna about 2.8 mm.

*Female*.—Length about 6.5 mm.; wing 6.5 mm.; antenna about 1.9 mm.

Antennæ of male relatively short, if bent backward extending about to the end of the second abdominal segment, black throughout; flagellar segments weakly constricted at mid-length; verticils much longer and more conspicuous than in *tasmaniensis*, the longest ones unilaterally arranged and exceeding one-third the length of the segment; terminal (sixteenth) segment a tiny button. Head black, with a yellowish-grey pollen, the orbits more greyish.

Mesonotum black, sparsely pruinose (female) to more polished (male). Halteres black. Male hypopygium as in *tasmaniensis*, differing as follows:—Tergite broadly and evenly emarginate. Outer fleshy lobe of basistyle short. Outer dististyle with the lateral spine short and obtuse, the outer margin of the style with abundant

erect setulæ. Inner dististyle with a conspicuous setiferous lobe on margin beyond base. The powerful structure interpreted as being a gonapophysis in *tasmaniensis* is here replaced by a slender sinuous spine, narrowed to an acute point, the margin quite smooth. Ædeagus elongate, bifid at apex.

*Hab.* New South Wales.

*Holotype*, ♂, Wentworth Falls, Blue Mts., October 20–30, 1930 (*F. E. Wilson*).

*Allotype*, ♀, Mt. Tomah, Blue Mts., October 20–30, 1930 (*F. E. Wilson*).

*Tonnoiromyia montina* is amply distinct from the more southern *T. tasmaniensis* Alexander (Victoria, Tasmania).

*Helius (Helius) mesorhyncha*, sp. n.

General coloration of mesonotum brownish yellow, the præscutum with three darker brown stripes, the posterior sclerites of notum and the pleura grey; knobs of halteres infuscated; rostrum relatively short, less than twice the remainder of head, obscure yellow; wings with a faint brown tinge, the stigma brown; *Rs* in alignment with  $R_{4+5}$ , the basal deflection of the latter lacking; *r-m* opposite fork of *Rs*.

*Female*.—Length, including rostrum, about 8 mm.; wing 6 mm.; rostrum about 0.8 mm.

Rostrum relatively short, a little less than twice the remainder of head, obscure yellow throughout; palpi black. Antennæ about as long as the rostrum, black throughout; flagellar segments oval, gradually decreasing in size outwardly; verticils only a little longer than the segments. Head grey; anterior vertex about one-half wider than the diameter of the scape.

Pronotum dark grey. Mesonotal præscutum with the ground-colour brownish yellow, with three darker brown stripes, the median one weakly divided behind; posterior sclerites of mesonotum grey, the centres of the scutal lobes darker, the posterior margin of scutellum somewhat brighter. Pleura grey. Halteres pale, the knobs infuscated. Legs with the coxæ brownish yellow; trochanters yellow; femora, tibiæ, and basitarsi obscure yellow, the tips narrowly darkened; outer tarsal segments more uniformly brown. Wings relatively narrow, with a faint brown tinge, the prearcular and costal regions clearer yellow; stigma oval, brown; wing-tip in outer



radial field narrowly darkened; a scarcely evident darkening on anterior cord; veins brown, paler in the flavous portions. Venation:  $Sc_1$  ending shortly before fork of  $Rs$ ,  $Sc_2$  near its tip:  $Rs$  in alignment with  $R_{4+5}$ , the basal deflection of the latter lacking; branches of sector diverging, cell  $R_3$  at margin about one-third more extensive than cell  $R_2$ ;  $r-m$  at fork of  $Rs$ ; cell 1st  $M_2$  widest across basal portion;  $m-cu$  close to fork of  $M$ .

Abdominal tergites dark brown, the sternites more yellowish brown; valves of ovipositor elongate.

*Hab.* New South Wales.

*Holotype*, ♀, Blundell's. Federal Capital Territory, January 21, 1931 (*A. L. Tonnoir*).

*Helius (Helius) mesorhyncha* differs from the other described Australian species of the subgenus in the shorter rostrum and in the details of body and wing coloration, and in venation. The nearest described species would seem to be *H. (H.) fulvithorax* (Skuse), which has the rostrum about as long as the entire thorax and with the thoracic dorsum fulvous, without stripes.

*Limnophila buangensis*, sp. n.

Belongs to the *pilosipennis* group, allied to *egena*; general coloration of thorax brownish yellow, the præscutum with three darker stripes; antennæ (male) of moderate length, exceeding one-half the length of body; wings with a brown tinge, the stigma a trifle darker; male hypopygium with the interbase a flattened horn-yellow plate, the mesal edge with a few teeth; gonapophyses oval, blackened, terminating in an acute point.

*Male*.—Length about 5–5.5 mm.; wing 6.5–7 mm.; antenna about 3–3.2 mm.

Rostrum brownish black; palpi black. Antennæ (male) black, elongate, considerably longer than in *egena*, but shorter than in *mitocera* and allies; flagellar segments cylindrical, with a conspicuous erect pubescence; terminal segment about one-third the length of penultimate. Head blackened, grey-pruinose, more heavily to on anterior vertex and orbits; vertex not shiny.

Pronotum dark brown. Mesonotal præscutum almost covered by three confluent brown stripes, the humeral

and lateral portions obscure yellow; posterior sclerites of mesonotum more brownish yellow. Pleura testaceous-yellow to brownish yellow. Halteres elongate, obscure yellow, the knobs infuscated. Legs with the coxæ and trochanters yellowish testaceous; remainder of legs black, the femoral bases very restrictedly yellow. Wings with a brownish tinge, the stigma a trifle darker; veins light brown. Macrotrichia in apices of radial and medial cells relatively sparse, usually confined to outer third or fourth of cell. Venation:  $Sc_1$  elongate, nearly twice  $m-cu$ ;  $R_{2+3+4}$  a trifle longer than basal section of  $R_5$ ; cell  $M_1$  lacking;  $m-cu$  at near mid-length of cell 1st  $M_2$ .

Abdominal tergites brownish black, darker at margins; sternites brownish yellow, darkened laterally, the subterminal segments uniformly blackened; hypopygium obscure yellow. Male hypopygium as in the group. Outer dististyle with a long, blackened, apical spine, the ventral subterminal tooth reduced. Inner dististyle strongly narrowed on distal third. Interbase a powerful, flattened, horn-yellow plate, its mesal edge with a few teeth. Ædeagus bifid at apex, as in group. Gonapophyses appearing as blackened oval structures, each terminating in an acute point.

*Hab.* Victoria.

*Holotype*, ♂, Mt. Donna Buang, above Warburton, altitude 3000–4000 feet, December 6, 1931 (*F. E. Wilson*).

*Paratopotypes*, 3 ♂♂.

*Limnophila buangensis* is quite distinct from the other members of the *egena* subgroup in the length of the antennæ in the male sex, in conjunction with the structure of the male hypopygium. Among the described Australian species, *L. borchi* Alexander, *L. hilli* Alexander, and *L. nocticolor* Alexander have the antennæ (male) short; *L. egena* Alexander has the organ of moderate length (approximately 2 mm. in male), while *L. mitocera* Alexander and two allied species described herewith have the male antenna of quite unusual length (over 4 mm.).

*Limnophila mitoceroïdes*, sp. n.

Belongs to the *pilosipennis* group; allied to *mitocera*; antennæ (male) exceeding the entire body in length; wings with a strong brownish tinge; macrotrichia in

outer ends of cells  $R_3$  to  $M_4$ , inclusive;  $Sc_1$  longer than 1st  $M_2$ ;  $m-cu$  at near mid-length of cell 1st  $M_2$ ; male hypopygium with the outer dististyle having only a microscopic apical notch; gonapophyses with the apical spine short and stout, strongly curved.

*Male*.—Length about 4.5 mm.; wing 4.8 mm.; antenna about 5 mm.

Rostrum short, testaceous; palpi brownish black. Antennæ (male) elongate, exceeding the entire body; scape and pedicel obscure yellow; flagellum dark brown; flagellar segments very long-cylindrical, with conspicuous outspreading setæ that are approximately one-third the length of the segment itself. Head blackish, the surface very sparsely dusted with grey; frons paler; anterior vertex broad, with a median carina.

Mesonotum light brown, the lateral portions of præscutum more yellowish. Pleura chiefly yellow. Halteres pale, the knobs infuscated. Legs with the coxæ and trochanters yellowish testaceous; remainder of legs brownish black, the femoral bases restrictedly paler. Wings with a strong brownish tinge; stigma lacking; veins brown. Macrotrichia in outer ends of cells  $R_3$  to  $M_4$ , inclusive. Venation:  $Sc_1$  ending opposite fork of  $R_s$ ,  $Sc_2$  some distance from its tip,  $Sc_1$  alone being longer than cell 1st  $M_2$ ;  $R_{2+3+4}$  and basal section of  $R_5$  short and subequal;  $R_2$  very faint;  $m-cu$  at near mid-length of the narrow cell 1st  $M_2$ .

Abdomen dark brown, the hypopygium a trifle brighter. Male hypopygium with the outer dististyle having only a microscopic apical notch, the outer spine larger than the inner. Gonapophyses with the main body a dilated plate, the apical spine short and stout, strongly curved.

*Hab.* New South Wales.

*Holotype*, ♂, Dorrigo, East Dorrigo, altitude about 2000 feet, April 20, 1931 (*W. Heron*).

The present fly is most nearly allied to *L. mitocera* Alexander (Victoria), differing in the even more elongate antennæ, the venation and coloration of the wings, and in the structure of the male hypopygium.

*Limnophila tasioceroides*, sp. n.

Belongs to the *pilosipennis* group; allied to *mitocera* and *mitoceroides*; antennæ (male) exceeding the entire body in length; wings with a strong brown tinge;

macrotrichia in outer ends of cells  $R_3$  to  $M_4$ , inclusive;  $Sc_1$  short, both  $Sc_1$  and  $Sc_2$  lying distad of level of fork of  $Rs$ ;  $R_{2+3+4}$  elongate, approximately three times the basal section of  $R_5$ ; male hypopygium with the gonapophyses appearing as pale foot-shaped blades.

*Male*.—Length about 4 mm.; wing 4.5 mm.; antenna about 5 mm.

*Female*.—Length about 6 mm.; wing 5.6 mm.; antenna about 1.8 mm.

Rostrum and palpi brownish black. Antennæ with the scape short, black; pedicel brown; flagellum (male) longer than entire body, the segments very long-cylindrical, with outspreading verticils that are a little longer than one-third the length of the segments. Head dark brown, opaque; anterior vertex broad, without a distinct median carina.

Mesonotum and pleura almost uniformly dark brown. Halteres elongate, dusky, the base of stem paler. Legs with the coxæ and trochanters brownish testaceous; remainder of legs dark brown. Wings with a strong brown tinge, the stigmal region slightly darker brown; veins darker brown. Macrotrichia in outer ends of cells  $R_3$  to  $M_4$ , inclusive. Venation:  $Sc_1$  ending about opposite one-third the length of  $R_{2+3+4}$ ,  $Sc_2$  about its own length from tip, placed just beyond the fork of  $Rs$ ;  $Rs$  angulated to weakly spurred at origin;  $R_{2+3+4}$  long and straight, exceeding  $R_{2+3}$  alone and nearly three times the basal section of  $R_5$ ;  $R_2$  faint, a little more than one-half  $R_{1+2}$ ; cord transverse;  $m-cu$  about two-thirds its length beyond the fork of  $M$ .

Abdomen uniformly dark brown. Male hypopygium with the outer dististyle relatively short and stout, with coarse setæ; apical notch distinct, the outer spine slender and acute, the inner broadly triangular. Gonapophyses appearing as pale foot-shaped blades, the apical portion bent at about a right angle and gradually narrowed to a subacute, gently decurved point. Ædeagus relatively long, feebly sinuous to weakly spiraliform at near mid-length, the apex pale.

The female that I am describing as allotype agrees in most respects, differing from the male as follows:—Antennæ short. Mesonotum, excepting postnotum, more reddish brown. Wings more strongly tinged with brown.

In both wings of this specimen, a minute cell  $M_1$  is present, indicating the possibility of this being a normal condition for the species.

*Hab.* New South Wales.

*Holotype*, ♂, Dorrigo, East Dorrigo, altitude about 2000 feet, June 20, 1931 (*W. Heron*).

*Allotopotype*, ♀, June 1, 1931.

*Limophila tasioceroides* is most nearly allied to *L. mitoceroides*, sp. n., differing chiefly in the venation and structure of the male hypopygium. The two species are quite distinct from the other described members of the group in the very elongate antennæ of the male sex. This latter feature, together with the type of venation, gives to the present species a superficial resemblance to the Eriopterine genus *Tasiocera* Skuse, whence the specific name.

*Limnophila vera*, sp. n.

Allied to *aureola*; general coloration yellow, the mesonotum with a continuous dark brown capillary vitta; halteres infuscated; legs with the tibiæ, tarsi, and tips of femora blackened; wings narrow, the ground-colour very pale yellow, with a restricted brown pattern, including a common area at origin of *Rs* and fork of *Sc*; *Sc* very short,  $Sc_1$  ending about opposite one-sixth the length of *Rs*;  $R_2$  and  $R_{3+4}$  subequal.

*Male*.—Length about 5 mm.; wing  $4.5 \times 1.1$  mm.

Rostrum light brown; palpi black. Antennæ short, if bent backward extending about to anterior portion of pronotum; scape and pedicel obscure yellow, flagellum black; verticils of outer segments a little exceeding the segments in length. Head strongly narrowed behind, brownish yellow, the posterior vertex with a linear brown area.

Pronotum infuscated medially, yellow laterally. Mesonotum obscure yellow, the præscutum more infumed in front, with a capillary brown median line that begins on the cephalic portion of the præscutum, continuing caudad to the abdomen, becoming wider on the scutellum and mediotergite. Pleura and pleurotergite testaceous-yellow. Halteres infuscated. Legs with the coxæ and trochanters pale yellow; femora yellow, the tips narrowly blackened; tibiæ and tarsi black; tibial spurs hairy

on basal two-thirds. Wings narrow, the ground-colour very pale yellowish, sparsely variegated with small brown spots, including a common area at origin of *Rs* and fork of *Sc*; stigma small, quadrate; narrow seams along cord and outer end of cell 1st  $M_2$ ; a small marginal spot at end of vein  $R_3$ ; vein brown, more luteous in the prearcular and costal regions. Venation: *Sc* very short,  $Sc_1$  ending about opposite one-sixth the length of *Rs*,  $Sc_2$  at its tip;  $R_2$  subequal to  $R_{1+2}$  and  $R_{3+4}$ ; cell 1st  $M_2$  relatively narrow; *m-cu* at about one-third the length of cell 1st  $M_2$ ; anterior arculus lacking.

Abdomen obscure yellow, narrowly blackened laterally, the caudal margins of the tergites pale brown; hypopygium chiefly pale. Male hypopygium much as in *aureola*; interbase of different shape, broadest on basal two-thirds, the distal third narrowed into a curved black spine.

*Hab.* Victoria.

*Holotype*, ♂, Dromana, November 3, 1931 (*F. E. Wilson*).

This distinct species is respectfully dedicated to Mrs. F. Erasmus Wilson. The only near relative is *L. aureola* Skuse, which differs conspicuously in the broad bright yellow wings, with small marginal darkenings at ends of all longitudinal veins, and in the different venation, as the loss of element  $R_{3+4}$ ,  $R_2$  being at or beyond the fork of vein  $R_{2+3+4}$  instead of far before it. The conspicuous median vitta on the mesonotum of the present fly together with the darkened halteres and legs furnish additional characters for the separation of the two flies. It would appear that these species may be found to belong to the *Pseudolimnophilaria* rather than to the *Limnophilaria*, where now placed.

*Limnophila dorrigana*, sp. n.

*Male*.—Length about 4 mm.; wing 5 mm.

Belongs to the *jucunda* group, closest to *brunneistigma* Alexander (Victoria).

Antennal flagellum dark brown, not light yellow, as in *brunneistigma*. Anterior sclerites of mesonotum opaque yellow, the median region of præscutum darkened as far caudad as the level of the pseudosutural foveæ; scutellum and postnotum darker brown. Legs testaceous-yellow, the terminal tarsal segments darkened. Wings

greyish yellow, the basal and costal portions clearer light yellow; stigma oval, darker brown; very vague and scarcely indicated dark seams along cord and outer end of cell 1st  $M_2$ , indicated chiefly by the darker veins. In *brunneistigma*, the membrane and veins, except the stigma, are light yellow. Wings widest opposite termination of vein 2nd  $A$ . Venation: as in the *jucunda* group;  $Sc_1$  ending about opposite two-thirds the length of  $Rs$ ,  $Sc_2$  not far from its tip;  $R_{2+3+4}$  relatively long, exceeding three times  $R_{2+3}$  alone the latter a little longer than either  $R_{1+2}$  or  $R_2$ , but all elements in the stigmal area are faintly indicated and difficult to delimit;  $m-cu$  about one-half its length beyond fork of  $M$ . Abdominal segments dimidiate, their caudal margins yellow, the bases brown. Male hypopygium with each gonapophysis terminating in a relatively short, very slender spine that lies close to body of apophysis. Ædeagus very short.

*Hab.* New South Wales.

*Holotype*, ♂, Dorrigo, East Dorrigo, altitude about 2000 feet, September 20, 1931 (*W. Heron*).