

The new genus *Diplegogaster* is proposed to include three well-marked species—*Cyclopterus bimaculatus* Bonnaterre, 1788, which is selected as the genotype, *Lepadogaster microcephalus* Brook, and *L. pellegrini* Chabanaud. A key to these three species has been given by Chabanaud 1925.

The British species may now be listed thus :—

*Diplegogaster bimaculatus* (Bonnaterre).

— *microcephalus* (Brook).

*Mirbelia decandollii* (Risso).

*Lepadogaster lepadogaster* (Bonnaterre).

In passing it may not be out of place to mention here the genus *Gouania* Nardo, based on *Lepadogaster wildenowii* Risso, with several synonyms such as *Rupisuga*, *Apepton*, etc.; it resembles *Lepadogaster* in having the vertical fins united, but differs in lacking the nasal tentacles and in other small characters. It is possible that it might prove subgeneric.

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

I AM here discussing a series of Limoniine crane-flies that were taken in eastern Ecuador by Mr. William Clarke-Macintyre and his native collectors. Most of the species were secured at and near Abitagua, on the Rio Pastaza, at an approximate altitude of 1200 metres. My sincere thanks are extended to Mr. Macintyre for his continued efforts in making known the rich Tipulid fauna of the region. All types are preserved in my private collection of these flies.

*Limonia (Limonia) pastazicola*, sp. n.

Belongs to the *eiseni* group; mesonotum reddish brown, darker behind; legs black; wings with a brownish tinge, restrictedly patterned with darker brown, including areas at origin of *Rs*, fork of *Sc*, stigma, cord and outer end of cell 1st *M*<sub>2</sub>; *Rs* angulated and spurred at origin;

abdominal tergites black, the sternites more bicoloured ; male hypopygium with the two spines of the rostral prolongation of the ventral dististyle widely separated, each acutely pointed ; at base of prolongation a strong tubercle provided with two modified setæ, one from apex, the other from base ; gonapophyses with mesal-apical lobe a slender blackened spine ; ædeagus relatively narrow, parallel-sided.

*Male*.—Length about 8 mm. ; wing 9 mm.

Rostrum and palpi black. Antennæ black throughout ; flagellar segments long-oval, with long, unilaterally distributed verticils. Head black ; anterior vertex narrow.

Pronotum brownish yellow. Mesonotal præscutum reddish brown, restrictedly darkened medially ; posterior sclerites of notum more uniformly darkened. Pleura chiefly dark brown, the dorsal half more intensely so but not forming a well-defined longitudinal stripe. Halteres dark brown, the base of stem restrictedly pale. Legs with the coxæ and trochanters yellowish testaceous ; remainder of legs black, the femoral bases restrictedly brightened. Wings with a brown tinge, restrictedly patterned with darker brown, as follows :—Stigma ; origin of *Rs* ; fork of *Sc* ; cord and outer end of cell 1st  $M_2$  ; veins brown, a little darker in the clouded areas. Venation : *Sc* relatively long,  $Sc_1$  ending about opposite two-thirds to three-fourths *Rs*,  $Sc_2$  close to its tip ; *Rs* angulated and spurred at origin ; *m-cu* oblique, at the fork of *M*.

Abdominal tergites black, the sternites more bicoloured, brownish black, the basal portion of the more proximal segments obscure yellow ; hypopygium black, the ventral dististyles pale yellow. Male hypopygium with the dorsal dististyle long, the tip strongly decurved. Ventral dististyle relatively small, the rostral prolongation conspicuous, very high basally ; two pale acute spines that are widely separated, the distance between their bases nearly equal to the length of the spine ; at base of prolongation a strong tubercle with two modified setæ, one from apex, the other from base of tubercle. Gonapophyses with mesal-apical lobe a slender blackened spine. Ædeagus relatively narrow, parallel-sided, the apical lobes not divergent.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, March 23, 1937 (*Macintyre*).

*Limonia (Limonia) pastazicola* is quite distinct from the other species of the group, the chief distinctions being found in the structure of the male hypopygium.

*Limonia (Limonia) hyperphallus*, sp. n.

Belongs to the *eiseni* group; front silvery; mesonotal præscutum polished black, the posterior sclerites darker; pleura with a broad dorsal black stripe; legs black; wings with a brown tinge, the costal and apical portions more suffused; a restricted but conspicuous dark brown pattern; *Sc* long, *Rs* angulated and spurred at origin; abdominal tergites uniformly brownish black; sternites bicoloured; male hypopygium with the rostral prolongation relatively slender, the pale rostral spines placed close together; a single modified seta at base of prolongation; mesal-apical lobes of gonapophyses broad, each outer angle produced; ædeagus unusually broad, the apical lobes very widely flaring.

*Male*.—Length about 6.5 mm.; wing 7 mm.

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

Rostrum and palpi black. Antennæ black throughout; flagellar segments oval, the long verticils unilaterally arranged. Front silvery, posterior portion of head dark brown; anterior vertex reduced to a narrow strip.

Pronotum brownish yellow above, darker on sides. Mesonotal præscutum chiefly polished brown, the humeral region obscure yellow; posterior sclerites of notum brownish black, the mediotergite a little more brightened. Pleura brown, with a broad dorsal black stripe, extending from the sides of the pronotum to the abdomen, passing through the base of halteres. Halteres dusky. Legs with the coxæ and trochanters obscure yellow; femora dark brown, tibiæ and tarsi black. Wings with a brown tinge, the costal portion and wing-tip in outer radial field more suffused; a conspicuous but restricted darker brown pattern, as follows:—Origin *Rs*; fork of *Sc*; stigma; cord and outer end of cell 1st  $M_2$ ; veins brown. Venation: *Sc* long,  $Sc_1$  ending about opposite three-fourths the length of *Rs*,  $Sc_2$  near its tip; *Rs* square and short-spurred at origin; *m-cu* close to fork of *M*, exceeding the distal section of  $Cu_1$ .

Abdominal tergites uniformly brownish black; sternites bicoloured, the bases yellow, the apices broadly blackened, the amount of the latter increasing on the outer segments; hypopygium black, the ventral dististyle pale. Male hypopygium with the ventral dististyle of moderate size, the rostral prolongation relatively slender; rostral spines pale, placed close together, their punctures less than their own width apart, located at base of prolongation; a single modified seta near base of prolongation, this not arising from a basal tubercle. Gonapophyses with mesal-apical lobe blackened, very broad, the apex subtruncated, with each angle slightly produced into a spinous point. Ædeagus unusually broad, especially the widely flaring apex, which is about one-half as wide as the transverse diameter of the tergite.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, April 7, 1937 (*Macintyre*). *Allotopotype*, ♀, April 5, 1937.

The nearest relative is *Limonia (Limonia) caribæa* Alexander (Cuba), which differs especially in the structure of the male hypopygium, as the ventral dististyle and the unusually broad ædeagus.

*Limonia (Limonia) bimucronata*, sp. n.

Belongs to the *eiseni* group; head black, the vertex with a narrow median grey line; thorax obscure brownish yellow, including the pleura; knobs of halteres dark brown; legs black; wings yellow, beyond the cord with all outer radial cells deeper fulvous brown; a sparse brown pattern, including cord and outer end of cell 1st  $M_2$ ; *Rs* square and spurred at origin; abdominal tergites bicoloured, yellow, the apices brown; male hypopygium with the ventro-mesal lobe of basistyle bearing a lateral tubercle; spines of rostral prolongation of ventral dististyle widely separated; gonapophyses bispinous at tips.

*Male*.—Length about 6.5 mm.; wing 7.2 mm.

Rostrum and palpi black. Antennæ black throughout; flagellar segments oval, passing into long-oval, the more basal segments with very short, glabrous, apical pedicels; terminal segment one-half longer than the penultimate; verticils very long, unilaterally distributed. Head black,

the front, anterior vertex, and a narrow median line on posterior vertex light grey.

Thorax almost uniformly obscure brownish yellow, the surface subnitidous, the posterior sclerites of the mesonotum a trifle darker. Halteres with stem yellow, knob dark brown. Legs with the coxæ and trochanters yellow; femora brownish black, the bases very vaguely paler; tibiæ and tarsi black; claws with a single very long tooth. Wings with the ground-colour yellow, including all cells basad of cord, beyond cord reaching the wing-tip in cells  $R_5$ , 1st  $M_2$ , 2nd  $M_2$ , and  $M_3$ ; beyond cord the ground-colour of remaining cells is more fulvous brown, more saturated in the outer radial field; a sparse dark brown pattern, as follows:—Origin of  $R_s$ , fork of  $Sc$ , cord, outer end of cell 1st  $M_2$ , and a small marginal spot on  $R_3$ ; veins yellow, darker in the infuscated portions. Venation:  $Sc$  moderately long,  $Sc_1$  ending shortly beyond mid-length of  $R_s$ ,  $Sc_2$  at its tip;  $R_s$  square and spurred at origin; free tip of  $Sc_2$  placed shortly distad of level of  $R_2$ ; cell 1st  $M_2$  about equal in length to vein  $M_{1+2}$  beyond it;  $m-cu$  shortly before fork of  $M$ .

Abdominal tergites bicoloured, the bases of segments yellow, the apices brown, on the more basal segments including about one-half the segment, the brown becoming more restricted on outer segments; sternites and hypopygium more uniformly yellow. Male hypopygium with the ventro-mesal lobe of basistyle bearing a conspicuous lateral lobule. Dorsal dististyle nearly straight, the long tip curved at a right angle. Ventral dististyle relatively small, the rostral portion very large and compressed, as in the group; rostral spines blunt, pale, separated on prolongation by a distance subequal to their own length, their bases surrounded by abundant silken setulæ; modified setæ from base of style arising from a low inconspicuous tubercle. Gonapophyses black, the mesal-apical lobe relatively narrow, terminating in two unequal spines. Ædeagus of moderate width.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, August 20, 1937 (*Macintyre*).

*Limonia (Limonia) bimucronata* is quite distinct from the other described species of the group having bispinous

gonapophyses, as *L. (L.) caribæa* Alexander and *L. (L.) hyperphallus*, sp. n.

*Limonia (Limonia) lustralis*, sp. n.

Belongs to the *insularis* group; general coloration of thorax obscure yellow, the notum unpatterned; antennæ and legs black throughout; wings bright brownish yellow, the outer radial field more saturated; a restricted dark brown pattern; *Rs* long, square at origin; cell 1st  $M_2$  subequal in length to vein  $M_{1+2}$  beyond it; *m-cu* at fork of *M*; abdominal tergites dark brown, sternites obscure yellow.

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

Rostrum and palpi black. Antennæ black throughout; basal flagellar segments short-oval to pyriform, with very short apical pedicels; outer segments more elongate, the terminal segment very long, nearly twice the penultimate. Front grey, the posterior parts of head black; anterior vertex narrow, about one-half the diameter of scape.

Pronotum dark brown medially, paling to yellow on sides. Mesonotum and pleura almost uniform obscure yellow, the ventral sternopleurite slightly darkened. Halteres short, weakly infuscated. Legs with the coxæ and trochanters yellow; remainder of legs intensely black. Wings bright brownish yellow, the costal region and outer radial field more saturated; a very restricted dark brown pattern, as follows:—Origin of *Rs*; fork of *Sc*; narrow seams on free tip of  $Sc_2$  and  $R_2$ ; cord and outer end of cell 1st  $M_2$  very narrowly bordered with brown; small marginal clouds at ends of all longitudinal veins, largest on  $R_{4+5}$ ; stigma oval, pale brown, scarcely darker than the ground; veins yellow, darker in the infuscated areas. Venation: *Rs* long, square at origin, longer than vein *R* alone; *Sc* long,  $Sc_1$  ending about opposite five-sixths the length of *Rs*,  $Sc_2$  at tip;  $R_{2+3}$  relatively short, less than twice the basal section of  $R_{4+5}$ ; cell 1st  $M_2$  subequal in length to vein  $M_{1+2}$  beyond it; *m-cu* at fork of *M*.

Abdominal tergites dark brown, sternites obscure yellow; genital segment yellow; cerci slender, upcurved.

*Hab.* Ecuador (Oriente).

*Holotype*, ♀, Abitagua, Rio Pastaza, altitude 1200 metres, November 21, 1937 (*Macintyre*).

The nearest relatives of the present fly seem to be *Limonia* (*Limonia*) *capnora* Alexander, *L. (L.) lutzii* Alexander, and *L. (L.) infucata* Alexander, all of which differ in the coloration of the thorax, legs, and wings.

*Limonia* (*Limonia*) *grossa*, sp. n.

Belongs to the *insularis* group; size large (wing, male, 11 mm.); general coloration brown; legs uniformly yellowish brown; wings tinged with brown, patterned with still darker brown;  $Sc_1$  ending about opposite four-fifths the length of  $R_s$ , the latter nearly square at origin;  $R_2$  greatly reduced; abdomen weakly bicoloured; male hypopygium with the rostral prolongation more constricted at base than at apex.

*Male*.—Length about 9 mm.; wing 11 mm.

Rostrum and palpi black. Antennæ black; flagellar segments cylindrical, with short, glabrous, apical pedicels; terminal segment elongate. Head brownish black, the front more silvery; anterior vertex narrow, about one-half the diameter of the scape.

Thorax almost uniform brown, the posterior pleurites somewhat darker; præscutum without stripes; setæ of interspaces sparse. Halteres with stem dusky, knob more infuscated. Legs with coxæ and trochanters brown; remainder of legs uniform yellowish brown. Wings with a brownish tinge, patterned with still darker brown, including restricted seams at origin of  $R_s$ , fork of  $Sc$ ,  $R_2$  and free tip of  $Sc_2$ , cord, and outer end of cell 1st  $M_2$ ; veins pale brownish yellow, darker in the clouded portions. Wing-tip obtuse. Venation:  $Sc_1$  ending about opposite four-fifths the length of  $R_s$ ,  $Sc_2$  at its tip;  $R_s$  nearly square at origin;  $R_1$  bent strongly caudad on outer portion, greatly reducing vein  $R_2$ ,  $Sc_2$  correspondingly lengthened; basal section of  $R_{4+5}$  short, angulated at near mid-length; *m-cu* just before the fork of  $M$ .

Abdomen weakly bicoloured, obscure yellow, the caudal margins of the individual segments broadly infuscated; hypopygium dark brown. Male hypopygium with the rostral prolongation of the ventral dististyle constricted

at base, thence gently expanded into a head. Dorsal dististyle scabrous, as in the group.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, April 21, 1937 (*Macintyre*).

*Limonia* (*Limonia*) *grossa* is most closely allied to *L. (L.) fumosa* (Alexander), differing in the large size and in the structure of the male hypopygium. There are now numerous Neotropical species referable to this group, several of which have the legs variegated in various patterns.

*Limonia* (*Neolimnobia*) *corallina*, sp. n.

General coloration coral-red; antennal scape and pedicel black, flagellar segments bicoloured, yellow and dark brown; head black; femora brownish yellow, the tips abruptly clearer yellow; wings with the ground-colour pale yellow, with a pale brown reticulated pattern.

*Male*.—Length about 7 mm.; wing 8 mm.

Rostrum and palpi black. Antennæ with the scape and pedicel black; flagellar segments bicoloured, yellow, with a dark brown subbasal ring, terminal segments uniformly dark; flagellar segments oval to long-oval, the incisures well indicated; verticils much exceeding the segments. Head black, the orbits very narrowly grey; anterior vertex a little less than twice as wide as the diameter of the scape.

Thorax uniformly coral-red, without markings. Halteres yellow throughout. Legs with the coxæ and trochanters reddish yellow; femora brownish yellow to pale brown, the tip narrowly and abruptly yellow; tibiæ and tarsi brownish yellow, the terminal tarsal segments darkened; claws conspicuously toothed. Wings with the ground-colour pale yellow, conspicuously marked with a pale brown reticulate pattern; veins pale yellow, a little darkened in the clouded areas. Venation:  $Sc_1$  ending just before origin of  $R_s$ ,  $Sc_2$  at its extreme tip;  $R_s$  arcuated, about twice as long as the more strongly arcuated basal section of  $R_{4+5}$ ; supernumerary cross-vein in cell  $R_3$  at near two-thirds the length of the cell; cell 1st  $M_2$  nearly as long as vein  $M_{1+2}$  beyond it;  $m-cu$  shortly beyond the fork of  $M$ .



Abdomen, including hypopygium, reddish yellow, the caudal margins of the segments vaguely darker; hypopygium, especially the large ventral dististyles, brown.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, April 7, 1937 (*Macintyre*).

*Limonia (Neolimnobia) corallina* is very different from the other species of the subgenus so far described. The specific name has a double significance, referring to the body-coloration and to the wing-pattern.

*Limonia (Peripheroptera) prindlei*, sp. n.

Size very large (wing 10 mm. or over); coloration of body polished black; antennæ, halteres, and legs black; wings deep yellow, restrictedly patterned with black, including the costal border; wing-tip more or less infumed.

*Male*.—Length about 7–8 mm.; wing 11–15 mm.

*Female*.—Length about 8 mm.; wing 10–10.5 mm.

Rostrum and palpi black. Antennæ black throughout; flagellar segments oval. Head polished black; anterior vertex broad, in male nearly four times the diameter of scape.

Thorax entirely polished black. Halteres and legs black throughout. Wings deep yellow, restrictedly patterned with black, including the narrow costal border to beyond wing apex, the latter more extensively infumed in certain specimens; cord very narrowly seamed with brown, not evident in the paratype female; veins clear yellow, brown in the darkened areas. Venation: free tip of  $Sc_2$  some distance basad of level of  $R_2$ ;  $Sc_2$  at near mid-length of vein  $Sc$ ;  $m-cu$  at or shortly beyond fork of  $M$ ; cell *2nd A* relatively long and narrow.

Abdomen, including the male hypopygium, polished black; in female the extreme caudal borders of segments pale.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Pundoa, altitude 2600 metres, August 21, 1937 (*Macintyre*). *Allotopotype*, ♀, August 20, 1937. *Paratopotypes*, 2 ♂♂, 1 broken ♀, with holotype.

This striking species is named in honour of my brother, Professor William Prindle Alexander, Hayes Professor of Natural History, Buffalo Museum of Science. It is

entirely different from all other members of the subgenus so far described. By my key to the species of *Periphleptera* (Ent. News, xxiv. p. 409, 1913) the fly runs to *L. (P.) teucholaboides* (Alexander), of Peru, an entirely different species.

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

General coloration black, including the notum and dorsal half of pleura; rostrum long; halteres black; femora and tibiæ obscure yellow, the tips darkened; basitarsi brownish black, the outer tarsal segments yellow; wings blackened, the costal border broadly whitish;  $Sc_1$  ending opposite origin of  $Rs$ ; abdominal tergites black.

*Female*.—Length, excluding rostrum, about 8 mm.; wing 7 mm.; rostrum about 6 mm.

Rostrum unusually long, black throughout. Antennæ black; flagellar segments cylindrical, with unilaterally arranged verticils that slightly exceed the segments in length. Head brownish black.

Pronotum dark brown medially, obscure yellow on sides. Mesonotal præscutum almost covered by three confluent, polished black stripes, the yellow ground-colour restricted to small humeral triangles; posterior sclerites of notum polished black. Pleura with dorsal half polished black, concolorous with the notum, the ventral half abruptly yellow. Halteres black. Legs with the coxæ and trochanters pale yellow; femora obscure yellow, the tips rather narrowly dark brown; tibiæ yellowish brown, the tips very narrowly and inconspicuously darkened; basitarsi brownish black, the succeeding tarsal segments pale yellow. Wings with the ground-colour strongly blackened, the prearcular field and costal border broadly and abruptly whitened, interrupted by narrow dark extensions at  $h$ , mid-length of vein  $Sc$ , origin of  $Rs$ , and at stigma, the white areas not quite reaching vein  $M$  behind; stigma a trifle darker than the ground; veins dark brown, paler in the whitened costal portions. Venation:  $Sc$  short,  $Sc_1$  ending opposite origin of  $Rs$ ,  $Sc_2$  at its tip; basal section of  $R_{4+5}$  long, shortening  $r-m$ ; cell 1st  $M_2$  subequal to vein  $M_{1+2}$  beyond it;  $m-cu$  at fork of  $M$ .

Abdominal tergites black, sternites obscure yellow, the borders restrictedly darkened. Ovipositor with shield black, valves horn-yellow, straight and slender.

*Hab.* Ecuador (Oriente).

*Holotype*, ♀, Abitagua, Rio Pastaza, altitude 1200 metres, September 21, 1937 (*Macintyre*).

*Limonia* (*Geranomyia*) *luteimana* is closest to *L. (G.) lacteitarsis* (Alexander), of Colombia, which differs in the shorter rostrum, pale antennal scape and pedicel, and in the details of wing-pattern and venation.

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

General coloration greenish yellow; rostrum relatively short; antennæ black throughout, scape elongate; præscutum with a single dark stripe; femora brownish yellow, the tips yellow, preceded by a narrow dark brown ring; wings yellow, heavily patterned with brown, the third costal area involving the origin of *Rs* and the fork of *Sc*; male hypopygium with the rostral spines elongate, from unusually long basal tubercles, placed close together, the outer spine close to apex of prolongation; mesal-apical lobe of gonapophysis long, slender, curved.

*Male*.—Length, excluding rostrum, about 6 mm.; wing 7 mm.; rostrum about 2.3 mm.

Rostrum relatively short, about twice the length of antennæ, black throughout; palpi black. Antennæ black throughout; scape unusually long, nearly as long as the basal four flagellar segments together; flagellar segments oval to subcylindrical; verticils of moderate length. Head grey, darkened behind; anterior vertex reduced to a narrow line.

Pronotum greenish yellow. Mesonotal præscutum greenish yellow, with a single brown median stripe; scutal lobes darkened; scutellum and postnotum testaceous yellow. Pleura testaceous yellow. Halteres broken. Legs with the coxæ and trochanters pale; femora brownish yellow, the tips yellow, preceded by a slightly narrower, dark brown ring; tibiæ pale brown, the tips narrowly dark brown; tarsi brown, the outer segments passing into black. Wings yellow, the costal portion a little more suffused; a brown pattern, distributed as follows;—Five costal areas, the first arcular,

the third a major common area involving the origin of *Rs* and fork of *Sc*; fourth area stigmal; fifth small, at end of vein *R*<sub>3</sub>; cord and outer end of cell 1st *M*<sub>2</sub> seamed with brown; brown marginal clouds at ends of veins *Cu*<sub>1</sub>, 1st *A*, and 2nd *A*, the second largest; veins yellow, darker in the clouded areas. Venation: *Sc* relatively short, *Sc*<sub>1</sub> ending about opposite one-fifth the length of *Rs*, *Sc*<sub>2</sub> a short distance from its tip; *R*<sub>2+3</sub> less than twice the basal section of *R*<sub>4+5</sub>; *r-m* relatively short, obliterative; cell 1st *M*<sub>2</sub> longer than vein *M*<sub>1+2</sub> beyond it; *m-cu* shortly before fork of *M*.

Abdominal tergites weakly bicolored, the segments yellow, with the caudal portions a little darker; hypopygium yellow. Male hypopygium with the caudal margin of the tergite weakly emarginate, the lobes broadly rounded, with numerous setæ. Dorsal dististyle relatively small, gently curved. Ventral dististyle large and fleshy, the prolongation short but conspicuous; two rostral spines placed close together on long conspicuous tubercles, the outer far distad, the apex of prolongation beyond it sloping off precipitously; outer spine about three times its long tubercle, the spine itself straight, exceeding the dorsal dististyle in length; inner spine from a slightly shorter tubercle, gently curved, about two-thirds the length of outer spine. Gonapophyses with mesal-apical lobe unusually long and slender, curved, the tips subacute, weakly darkened.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, April 4, 1937 (*Macintyre*).

*Limonia* (*Geranomyia*) *tumidibasis* is allied to species such as *L. (G.) eurygramma* Alexander and *L. (G.) glauca* (Alexander), differing conspicuously in the structure of the male hypopygium, notably the ventral dististyle.

*Limonia* (*Rhipidia*) *jubilata*, sp. n.

General coloration black, the præscutum and scutum variegated with chestnut-brown; antennæ (male) with ten bipectinate segments, the flagellum bicoloured; halteres pale yellow; femora yellow, with a narrow, brownish black, subterminal ring; tarsi passing into brown; wings handsomely variegated with pale brown washes and darker brown spots on a yellow ground;

*m-cu* at fork of *M*; abdominal segments conspicuously bicoloured, obscure yellow, the caudal margins narrowly black; male hypopygium with three rostral spines, these arising at near mid-length of the rostral prolongation.

*Male*.—Length about 6 mm.; wing 6.4–6.5 mm.; antenna about 2 mm.

Rostrum and palpi black. Antennæ bicoloured; scape black, pedicel brown; flagellar segments with base and branches black, the apical pedicels conspicuously white; first flagellar segment produced into a simple point that is a little shorter than the segment; flagellar segments 2 to 11, inclusive, rather long-bipectinate, the longest branches (at near mid-length of organ) about three times the segment; terminal segment simple, longer than the penultimate segment or its branches. Head dark grey, variegated with brown on occiput; anterior vertex reduced to a narrow strip that is about one-third the diameter of scape.

Pronotum dark brown. Mesonotal præscutum with median portion on cephalic half brownish black, the posterior half expanded, more chestnut-brown; the humeral region obscure yellow, the sublateral portions broadly grey, the lateral margins broadly infuscated; scutum black, the centres of lobes chestnut-brown; scutellum brownish black; mediotergite black, pleurotergite pruinose. Pleura with two narrow black longitudinal stripes, the dorsopleural region and dorsal sternopleurite paler brownish grey. Halteres pale yellow. Legs with the coxæ blackened; trochanters obscure yellow; femora yellow, with a narrow, brownish black ring before the subequal yellow apex; tibiæ and basal segments of tarsi yellow, the outer segments passing into brown. Wings with the ground-colour light yellow, variegated by pale brown washes and conspicuous darker brown spots; the dark areas include the following:—Arculus; mid-distance between arculus and origin of *Rs* in cell *Sc*; origin of *Rs*; fork of *Sc*; cord and outer end of cell 1st *M*<sub>2</sub>; the more conspicuous paler brown washes include the basal third of wing, outer radial field, and outer portions of cells *Cu* and 1st *A*, variegated by yellowish grey areas before arculus, before origin of *Rs*, before and beyond stigma; on both sides of cord in radial and

medial fields, and in outer end of cell 1st *A* adjoining vein 2nd *A*; stigma with yellow centre, the margin brown; veins brown, brighter in the ground areas. Venation: *Sc* ending opposite or just beyond mid-length of *Rs*, *Sc*<sub>2</sub> at tip; *m-cu* at fork of *M*.

Abdominal segments conspicuously bicoloured, obscure yellow, the caudal margins narrowly but very conspicuously blackened; hypopygium brownish yellow. Male hypopygium with the ventro-mesal lobe of basistyle simple. Dorsal dististyle curved, the long tip acute. Ventral dististyle fleshy, the rostral prolongation moderately long, with three rostral spines arising close together at near mid-length of prolongation on outer margin; prolongation beyond insertion of spines shorter than the shortest of latter. Gonapophyses with mesal-apical lobe long and slender, blackened.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, April 21, 1937 (*Macintyre*). *Paratopotype*, ♂, April 3, 1937.

The present fly is entirely different from the numerous Neotropical species of the subgenus so far made known.

*Orimarga (Orimarga) multipunctata*, sp. n.

General coloration of mesonotum greyish yellow, the præscutum with four brown lines; halteres pale yellow; femora brown, the tips more darkened; tibiæ infuscated, the base narrowly white, the apex narrowly darkened; tarsi white; wings pale yellow, heavily spotted with brown; *R*<sub>1+2</sub> entire, very long, subequal to *Rs*; *m-cu* about its own length before the fork of *M*; abdominal tergites weakly bicoloured.

*Male*.—Length about 7 mm.; wing 6.5 mm.

*Female*.—Length about 7.5 mm.; wing 6.7 mm.

Rostrum pale, palpi black. Antennæ black; flagellar segments oval. Front light grey; vertex darker grey.

Mesonotal præscutum greyish yellow, with four brown lines, the intermediate pair narrower, incomplete in front and behind; posterior sclerites of notum pale brownish yellow. Pleura brownish yellow, with a conspicuous dorsal black stripe; ventral sternopleurite less conspicuously infuscated. Halteres pale yellow. Legs with the

fore coxæ darkened, remaining coxæ obscure yellow; trochanters yellow; femora brown, the tips slightly more darkened; tibiæ infuscated, the base narrowly white, the apex narrowly blackened; tarsi white, the terminal segment darkened. Wings pale yellow, the costal portion somewhat deeper yellow; a conspicuous brown spotted pattern, as follows:—Arculus; origin of  $R_s$ ; fork of  $Sc$ ;  $R_2$ ; anterior cord and  $m-cu$ ; fork of  $M_{3+4}$ ; large marginal areas on veins  $R_{1+2}$  and 2nd  $A$ ; smaller clouds on  $M_3$ ,  $M_4$ ,  $Cu_1$ , and 1st  $A$ ; a weaker brown wash in base of cell  $Cu$ ; veins yellow, brown in the clouded areas. Venation:  $Sc_1$  ending about opposite five-sixths the length of  $R_s$ ,  $Sc_2$  a short distance from its tip;  $R_s$  weakly angulated at origin; free tip of  $Sc_2$  about its own length before  $R_2$ ;  $R_{1+2}$  entire, very long, subequal in length to  $R_s$ ; cell  $M_3$  subequal to its petiole;  $m-cu$  about its own length before the fork of  $M$ ; cell 2nd  $A$  relatively wide.

Abdominal tergites weakly bicoloured, the basal rings obscure brownish yellow, the apices brown; subterminal segments more uniformly darkened; sternites more uniformly pale yellow.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, September 20, 1937 (*Macintyre*). *Allotopotype*, ♀.

Readily distinguished from other species with very long, entire vein  $R_{1+2}$ , as *Orimarga (Orimarga) excessiva* Alexander and *O. (O.) pallidibasis* Alexander, by the heavily spotted wings.

*Orimarga (Orimarga) parvipuncta*, sp. n.

General coloration of mesonotum brownish grey, posterior sclerites darker; pleura with a broad black dorsal stripe; antennal flagellum yellow; halteres pale; femora brown, passing into brownish black at tips; tibiæ white, in cases more or less infuscated beyond the base, the tips conspicuously blackened; tarsi white, the outer portions of the basitarsi weakly infused; wings greyish yellow, the prearcular field milky white; a restricted brown-spotted pattern on certain veins;  $R_s$  relatively short,  $R_{1+2}$  very long; cell  $M_3$  subequal to its petiole; abdominal segments weakly bicoloured,

black, the caudal margins obscure yellow; hypopygium black.

*Male*.—Length about 7-7.5 mm.; wing 6.5 mm.

*Female*.—Length about 8 mm.; wing 6 mm.

Rostrum and palpi black. Antennæ with the scape black, remainder of organ pale yellow. Head grey.

Mesonotal præscutum uniformly brownish grey, the lateral margin narrowly paler; posterior sclerites darker, pruinose; mediotergite dark. Pleura with a broad black dorsal stripe, the sternopleurite pale brown. Halteres pale. Legs with the coxæ and trochanters testaceous yellow; femora, including the front pair, brown, passing into brownish black at tips; tibiæ white, in cases more or less infuscated beyond the base, especially on fore pair, the tips conspicuously black, the amount subequal on all legs; tarsi white, the distal portion of basitarsi weakly infuscated, forming a more or less evident ring at mid-length of tarsi. Wings tinged with greyish yellow, the præarcular field milky white; a restricted brown pattern, as follows:—Origin of *Rs*; fork of *Sc*; *R*<sub>2</sub>; cord; tips of outer radial veins; veins yellow, whitened in præarcular field, infuscated in the clouded areas. Venation: *Rs* relatively short, subequal to or a little longer than *R*<sub>2+3</sub>, usually shorter than the very long *R*<sub>1+2</sub>; cell *M*<sub>2</sub> subequal to its petiole; *m-cu* close to fork of *M*.

Abdominal segments weakly bicoloured, black, the caudal margins obscure yellow to brownish yellow; hypopygium black.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, September 20, 1937 (*Macintyre*). *Allotopotype*, ♀, September 22, 1937. *Paratopotypes*, 2 ♂♂, September 21, 1937.

The nearest ally is *Orimarga (Orimarga) pallidibasis* Alexander (Amazonian Peru), which differs in the pattern of the legs, thorax, and abdomen, the unspotted wings, and in the details of venation.

*Orimarga (Orimarga) scabriseta*, sp. n.

Allied to *funerula*; general coloration black, the lateral margin of præscutum and the thoracic pleura



striped longitudinally with silvery; halteres and legs black; wings long and slender, strongly suffused with blackish; vein  $R_{1+2}$  long, approximately one-half  $Rs$ ;  $m-cu$  about opposite three-fourths the length of  $Rs$ ; male hypopygium with the setæ of basistyle unusually abundant and placed close together, each with microscopic lateral branches scattered over the length.

*Male*.—Length about 9–10 mm.; wing 6.5–7 mm.

Rostrum black, subequal in length to remainder of head; palpi black. Antennæ black throughout; flagellar segments oval. Head light grey pruinose; anterior vertex a little wider than the diameter of scape.

Thorax black, the lateral border of præscutum narrowly silvery; pleura with a silvery longitudinal stripe, together with a more poorly defined grey-pruinose area extending from beneath the wing-root to above the halteres. Halteres black. Legs with the coxæ black; trochanters dark brown; remainder of legs black. Wings long and narrow, with conspicuous basal petiole; almost the entire surface strongly suffused with brownish black; prearcular area whitened, except for the veins; ill-defined darker brown seams in radial field; entire medial field, excepting vein  $M_3$ , with the veins narrowly bordered by pale; veins dark. Venation: almost as in *funerula*;  $R_1$  between free tip of  $Sc_2$  and  $R_2$  subequal to  $R_{2+3}$ ;  $R_{1+2}$  elongate, approximately one-half the long  $Rs$ ;  $m-cu$  almost in oblique alignment with the free tip of  $Sc_2$ , nearly opposite three-fourths the length of  $Rs$ ; cell 2nd  $A$  narrow.

Abdomen, including hypopygium, black. Male hypopygium much like that of *funerula* but quite distinct. Basistyle with two unusually dense groups of setæ, these placed so close together that the punctures are contiguous; setæ roughened by microscopic lateral branches, almost like the thoracic hairs of a bee. Apical knob of gonapophysis more rounded and set with numerous blunt points.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Baños, Tungurahua, altitude 2000 metres, May 25, 1937 (*Macintyre*). *Paratopotype*, ♂.

*Orimarga (Orimarga) scabriseta* is very similar to *O. (O.) funerula* Alexander (Peru), but differs conspicuously in the peculiar nature of the long abundant setæ of the

basistyle, each of which is roughened by numerous lateral branches. These two species are readily told from other regional members of the genus by the very strongly blackened wings.

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

Thorax pale yellow; rostrum longer than remainder of head, dark brown; antennæ black; legs brown, the outer tarsal segments paling to yellow; wings whitish subhyaline, unpatterned except for the pale brown stigma; *r-m* distinct, cell 1st  $M_2$  wide, shorter than any of the veins beyond it, *m-cu* beyond mid-length; male hypopygium with the outer dististyle bifid near apex, the outer spine very small.

*Male*.—Length about 4.5–5.3 mm.; wing 5–6 mm.

Rostrum longer than the remainder of head, dark brown; palpi black. Antennæ relatively short, black throughout; flagellar segments short-oval, the outer ones more lengthened. Head blackish grey.

Thorax almost uniformly pale yellow; præscutal setæ black, erect. Halteres with stem yellow, knob broken. Legs with coxæ and trochanters yellow; remainder of legs brown, the outer tarsal segments paling to white; claws simple. Wings whitish subhyaline, unpatterned except for the pale brown oval stigma; veins brown, paling to yellow on basal third of wing. Venation:  $Sc_1$  ending about opposite three-fourths to four-fifths  $Rs$ ,  $Sc_2$  near its tip; branches of  $Rs$  gently divergent, cell  $R_3$  at margin about one-fourth more extensive than cell  $R_2$ ; basal section of  $R_{4+5}$  distinct; *r-m* short; cell 1st  $M_2$  wide, much shorter than any of the veins beyond it, *m-cu* beyond mid-length.

Abdominal tergites pale brownish yellow, darker laterally; subterminal segments darker brown; hypopygium more reddish brown. Male hypopygium with the outer dististyle relatively small and slender, bifid near apex by a very small sublateral spine. Inner dististyle much longer, nearly straight. Lateral arms of tergite appearing as relatively narrow blades that gradually narrow to subacute tips. Basistyle without mesal armature.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, September 21, 1937 (*Macintyre*). *Paratopotypes*, 1 ♂, August 20, 1937; 1 ♂, September 20, 1937.

*Helius (Helius) ineptus* is readily told by the pale yellow coloration of the body, in conjunction with the whitish subhyaline, unpatterned wings.

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

Belongs to the *albitarsis* group; general coloration black; terminal tarsal segments whitened; wings with a brown tinge; *m-cu* far distad, at from two-thirds to three-fourths the length of the cell; abdomen black; male hypopygium with the basistyle bearing a slender finger-like lobe on ventro-mesal face; inner dististyle unusually long; interbases appearing as strongly curved flattened blades.

*Male*.—Length about 6.5 mm.; wing 7 mm.

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

Rostrum of moderate length, subequal to remainder of head, black throughout; palpi black. Antennæ black throughout, short; flagellar segments long-oval, the verticils very long. Head black; anterior vertex much reduced.

Thorax uniformly brownish black to black. Halteres dusky, the knobs infumed. Legs with the coxæ dark brown, the posterior pair somewhat paler; trochanters dark; remainder of legs black, the outer tarsal segments restrictedly whitened, involving the four outer segments and the extreme tip of basitarsus. Wings with a brown tinge, the long-oval stigma darker brown; veins dark brown. Venation: *Sc*<sub>1</sub> ending just before fork of *Rs*, *Sc*<sub>2</sub> at its tip; *r-m* reduced to a point by approximation of veins; *m-cu* far distad, at from two-thirds to three-fourths the length of the cell.

Abdomen brownish black; hypopygium black. Male hypopygium with a slender, finger-like lobe on the ventro-mesal face of basistyle at near two-thirds the length. Outer dististyle small, curved, with a small subterminal spine. Inner dististyle unusually long, about twice the length of the outer, the distal half prolonged into a slender pale point. What appear to represent interbases are strongly curved blades, the tips acute.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, April 5, 1937 (*Macintyre*). *Allotopotype*, ♀.

*Helius (Helius) lobuliferus* is readily told from other members of the *albitarsis* group by the structure of the male hypopygium, as the lobed basistyles and the strongly flattened interbases.

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

Size very small (wing, male, under 4 mm.); general coloration brownish black; tarsi, including more than distal half of basitarsi, snowy white; wings with a strong dusky tinge; *r-m* obliterated by punctiform contact of veins  $R_{4+5}$  and  $M_{1+2}$ ; abdomen, including hypopygium, black; male hypopygium with the outer dististyle only a little shorter than the inner style, the latter with apical portion relatively stout; interbases appearing as slender curved spines; ædeagus black.

*Male*.—Length about 3.5 mm.; wing 3.8 mm.

Rostrum and palpi black. Antennæ black throughout, relatively long; flagellar segments oval to long-oval, with coarse erect setæ. Head dark.

Mesonotum brownish black, the pleura somewhat paler. Halteres dark throughout. Legs with the coxæ dark, trochanters paler; femora, tibiæ, and basal two-fifths of basitarsi brownish black, the remainder of tarsi snowy white; claws long, simple. Wings with a strong dusky tinge, the elongate stigma a trifle darker than the ground; veins dark. Venation: *Sc* long,  $Sc_1$  ending opposite the fork of *Rs*, the longer  $Sc_2$  some distance beyond this point; branches of *Rs* rather strongly divergent at outer ends, so cell  $R_3$  is wider at margin than cell  $R_2$ ; *r-m* obliterated by punctiform contact of veins  $R_{4+5}$  and  $M_{1+2}$ ; cell 1st  $M_2$  widest across base; *m-cu* at near mid-length of lower face of cell 1st  $M_2$ , subequal to either section of  $M_{3+4}$ .

Abdomen, including hypopygium, black. Male hypopygium with the basistyle unprovided with lobes. Outer dististyle only a little shorter than the inner, strongly curved near outer end, with a small subterminal spine. Inner dististyle with apex relatively stout. What appear to represent interbases are slender, curved spines. Ædeagus relatively simple but elongate, black, only the tip pale.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, April 18, 1937 (*Macintyre*).

*Helius (Helius) melanophallus* is the smallest species of the *albitarsis* group so far made known. The structure of the male hypopygium readily separates it from all other known species of the group.

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

General coloration black, the præscutum and scutum more reddish brown; halteres yellow; legs black, the outer tarsal segments paler; wings with a weak brown tinge, stigma and a vague seam along cord darker; cell 1st  $M_2$  subrectangular, with *m-cu* at near one-third the length; abdominal tergites weakly bicoloured, black, the apical half brown, the basal sternites more brightened; male hypopygium with the tergite conspicuously produced; basistyle with mesal lobe; outer dististyle a slender simple rod; inner dististyle expanded outwardly, bilobed, the outer lobe flattened, the apex obtusely rounded; aedeagus unusually long and slender.

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

*Female*.—Length about 4.5 mm.; wing 4.8 mm.

Rostrum black, about one-half the length of remainder of head; palpi black. Antennæ black throughout. Head greyish brown.

Pronotum black. Mesonotum with præscutum and scutum variegated with reddish brown, the remainder black. Pleura uniformly black. Halteres yellow. Legs with the coxæ and trochanters black; remainder of legs black, the outer tarsal segments paling to brownish yellow; no brightening at genua. Wings with a weak brown tinge, the prearcular field and costal border slightly more yellow; stigma small, oval, slightly darker brown; a narrow, poorly indicated, dusky seam along cord; veins brown, yellow in the flavous areas. Venation:  $Sc_1$  ending about opposite two-thirds the length of the nearly straight  $R_s$ ; branches of  $R_s$  divergent, cell  $R_3$  a little wider at margin than cell  $R_2$ ; cell 1st  $M_2$  subrectangular, with *m-cu* at near one-third the length.

Abdominal tergites weakly bicoloured, the bases black, the distal half brown; basal sternites more conspicuously bicoloured, the brown apex replaced by yellow; hypo-

pygium black. Male hypopygium of the general type of *myersiellus*; tergite conspicuously produced, the apex a little dilated, truncate. Basistyle slender, the mesal face with a conspicuous dusky lobe. Outer dististyle a slender, nearly straight, simple rod. Inner dististyle expanded outwardly, longer than the outer, bilobed at apex, the inner lobe slender, with setæ to tip; outer lobe flattened, the apex obtusely rounded. Ædeagus unusually long and very slender, hair-like on outer portion, the total length exceeding three times the basistyle.

*Hab.* Ecuador (Oriente).

*Holotype*, ♂, Abitagua, Rio Pastaza, altitude 1200 metres, September 22, 1937 (*Macintyre*). *Allotopotype*, ♀, September 21, 1937.

The nearest relatives are *Helius (Helius) albogeniculatus* Alexander and *H. (H.) myersiellus* Alexander, both of Brazil, which differ in the conspicuously whitened femoral tips, the wing-pattern, and in the details of structure of the male hypopygium.

*Helius (Helius) panamensis lateralis*, subsp. n.

*Female*.—Length about 6.5 mm.; wing 5.8 mm.

Similar to the typical form, differing in details of colour.

Rostrum yellow, a little longer than the remainder of head; palpi pale, the outer segments darker. Antennæ with scape and pedicel pale yellow, flagellum a little darker; basal flagellar segments nearly globular, small and crowded, the outer segments longer, with more conspicuous verticils. Head grey.

Pronotum yellow. Mesonotum pale yellow, the mediotergite black, sending cephalad a narrow lateral line involving the dorsal pleurites, passing beneath the wing-root, nearly if not quite interrupted at the suture and including the broad præscutal margins between the suture and pseudosutural foveæ. Pleura yellow. Halteres pale yellow. Legs yellow, the femoral tips narrowly but conspicuously blackened. Wings yellow, sparsely patterned with brown, as in the typical form; stigma oval, brown; paler clouds at cord, before mid-length of vein *Cu*, and as a seam in the outer medial and cubital fields; veins yellow, a little darker in the clouded areas,

Venation :  $r-m$  at or shortly before fork of  $Rs$  ;  $m-cu$  shortly beyond fork of  $M$ .

Abdominal tergites yellow, vaguely patterned with darker ; sternites uniformly yellow.

*Hab.* Ecuador (Oriente).

*Holotype*, ♀, Abitagua, Rio Pastaza, altitude 1200 metres, September 21, 1937 (*Macintyre*).

LI.—*The Vertical Distribution of some Reptiles and Amphibians in Southern Ecuador.* By H. W. PARKER, B.A., Department of Zoology, British Museum (Natural History).

ALTHOUGH in recent years a certain amount of attention has been devoted to the study of the geographical distribution of reptiles and amphibians in the Neotropical region, particularly in Central America, very little accurate information is at present available as regards the vertical distribution of these animals along the Andean chain. Professor Clodoveo Carrión of the University of Loja has endeavoured to remedy this deficiency over the area in which he works and the following notes are offered as a contribution towards the study of the faunal zones of the Andes. First there is an annotated list of the specimens recently obtained by Professor Carrión at various altitudes both to the east and west of the Andean watershed and then a summary of the species previously collected in the province of Loja. Altitude alone probably has only a minor effect upon the distribution of plants and animals, a more important role being played by the concomitant factors of temperature and humidity which are influenced also by latitude and physiographical conditions. Altitudinal figures are consequently no index of the physical conditions prevailing, and so complex are the various factors involved that no simple physical measurement will provide a satisfactory index. Instead it is more convenient to consider the vegetational zones which are more or less clearly defined, but which naturally are not abruptly marked off one from the other. In southern Ecuador there are three major zones on each side of the central watershed :—(1) A humid tropical zone of limited extent