

# The crane-flies of South Africa in the South African museum (Diptera, Tipulidae). Part I

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5.—*The Crane-flies of South Africa in the South African Museum (Diptera, Tipulidae)*.—By CHARLES P. ALEXANDER, Cornell University, Ithaca, N.Y.

PART I.

(With Plates X–XIV, and 2 Text-figures.)

THE following paper is a consideration of the local crane-flies contained in the collection of the South African Museum, Cape Town, and sent to me for determination through the kindness of the Director, Dr. L. Péringuey. The collection is of especial interest in that it contains the majority of the South African species described by Bergroth in 1888, and the re-examination of this material has been very interesting. As has been done in previous papers, the author has supplied figures of the wings and details of the male hypopygia of species that are still insufficiently known. I am greatly indebted to Dr. Péringuey for his many kindnesses, and also to the various collectors of the material, these being credited throughout the text.

FAMILY PTYCHOPTERIDAE.

GEN. PTYCHOPTERA, Meigen.

1803. Illiger's Magazine, vol. 2, p. 262.

PTYCHOPTERA CAPENSIS, sp. n.

Head black; mesonotum orange without markings; wings light yellowish, a brown seam along the cord and an interrupted seam at the forks of  $R_4 +_5$  and  $M$ ; apical cells of the wings pubescent.

*Male*.—Length about 8 mm.; wing 8.1 mm.

Rostrum and palpi dark brown. Antennae elongated; two basal segments reddish-orange, third segment dark brown, more yellowish basally, remainder of the antennae dark brownish-black. Front dark brown, shiny; vertex and occiput broad, black, with metallic reflections.

Mesonotum and pleura shiny orange without markings. Halteres dark brown. Legs with the coxae and trochanters orange-yellow; femora yellow broadly tipped with black; tibiae yellowish-brown, the apices black; tarsi broken. Wings with the ground-colour light yellowish, most intense in the costal area, the apex and anal cells darker, greyish; a brown seam along the cord; a similar interrupted seam at the tip of  $R_1$ , fork of  $R_4+5$ , the fork of  $M$  and about mid-length of  $Cu_1$  beyond the  $m-cu$  cross-vein. Venation, (Plate X, fig. 1, upper left hand corner),  $Rs$  very short, less than the  $r-m$  cross-vein; deflection of  $R_4+5$  punctiform;  $r-m$  longer than  $m-cu$ ; apical cells of the wings pubescent.

Abdomen yellowish-orange, dark brownish-black along the mid-dorsal line of the tergum; apical segments destroyed excepting the hypopygium, which is orange.

*Habitat*.—South Africa.

Holotype, ♂, M'fongosi, Zululand, February, 1914 (W. E. Jones).

Type in the South African Museum.

This is the first representative of this family of flies to be discovered in Africa and the first species of *Ptychoptera* to be described from the southern hemisphere.

## FAMILY TIPULIDAE.

### SUB-FAMILY LIMNOBIINAE.

#### TRIBE LIMNOBIINI.

GEN. DICRANOMYIA, Stephens.

1829. Cat. Brit. Ins., vol. 2, p. 243.

DICRANOMYIA LIGHTFOOTI, sp. n.

Antennae black; thorax light brown, thoracic stripes dark brown; pleura yellow with two dark brown stripes; wings greyish subhyaline; cell 1st  $M_2$  open; subcosta short.

*Male*.—Length 4.7 mm.; wing 6.8 mm.

Rostrum and palpi dark brownish-black. Antennae black, short, the flagellar segments globular, moniliform. Head brownish-grey.

Mesonotal praescutum light brown with a very broad dark brown median stripe; lateral stripes shorter; scutum with the lobes brown; scutellum brownish-grey; postnotum brown. Pleura dull yellow with two dark brown stripes, the dorsal stripe extending from the cervical sclerites underneath the base of the halter to the abdomen; ventral

stripe short, mesosternal in position. Halteres short, light yellow, the knob very slightly darkened. Legs with the coxae and trochanters dull yellow; femora dull yellow, the tips broadly but indistinctly infuscated; tibiae yellowish-brown; tarsi light brown, the three apical segments dark brown. Wings pale at the extreme bases; membrane pale greyish subhyaline; veins dark brown; no stigma. Venation (Plate X, fig. 2, upper right hand corner), *Sc* short, ending just before the origin of *Rs*; *Sc*<sub>2</sub> not distinct; cross-vein *r* at the tip of *R*<sub>1</sub> much longer than that portion of *R*<sub>1</sub> beyond it; *Rs* elongated, about three times the deflection of *R*<sub>4+5</sub>; cell 1st *M*<sub>2</sub> open by the atrophy of *m*; *M*<sub>3</sub> leaves *Cu*<sub>1</sub> at a right angle, strongly arcuated; basal deflection of *Cu*<sub>1</sub> at the fork of *M*.

Abdominal tergites dark brown; hypopygium pale; sternites dark brown, the segments broadly margined caudally with paler brown.

*Habitat*.—South Africa.

Holotype, ♂, East London, South-east Cape Colony, November, 1915 (Lightfoot).

Type in the South African Museum.

This species is respectfully dedicated to its collector.

#### DICRANOMYIA TIPULIPES, Karsch.

1886. Ent. Nachr., vol. 12, No. 4, pp. 51, 52.

This fly was described from Pungo-Ndongo, Portuguese West Africa, but is now known to be widely distributed over the southern half of the African continent and the adjacent islands. The following material is in the collection:

♂ ♀ Bergroth's specimens (4, 5) from Stellenbosch, Cape Town, 1887 (Peringuey).

♂ Cape Town, 1913 (Péringuey),

♂ Ceres, Cape Colony, April, 1913 (Lightfoot).

♀ Smithfield, Orange River Colony, September, 1910 (Kannemeyer).

♂ Barberton, Transvaal, April, 1911 (H. Edwards).

The position of *Sc*<sub>2</sub> is not as described by Karsch but is far removed from the tip of *Sc*<sub>1</sub>, the distance being about equal to the entire radial sector. The wing has been well shown by Edwards in his Seychelles report and is again figured in Plate X, fig. 3. This insect varies much in the intensity of the wing-pattern, fully-coloured individuals having *C*, *Sc*, and *R* light yellow with four large black marks along *Sc*, the first at the wing base, the second the largest, the third at *Sc*<sub>2</sub>, and the fourth at the margin of the sector. Bergroth (Ann. Mag. Nat. Hist., ser. 8, vol. 91, p. 580, 1913) denies that *D. confinis*, Bergroth (Wien. Entomol. Zeit., vol. 8, p. 116, 1889, n.n. for *D. consimilis*, Bergroth,

Ent. Tidskr., vol. 9, p. 127, 1888, preocc.) is conspecific with *D. tipulipes* as suggested by Edwards (Trans. Linn. Soc. Lond., vol. 15, pt. 2, p. 197, 1912). The material at hand indicates the possibility of a mistaken observation on Bergroth's part in regard to the position of  $Sc_2$ , and it appears that Edwards is right in his assumption. It will require more material to decide this question finally.

DICRANOMYIA MARLEYI, sp. n.

Thorax rich cinnamon-brown; pleura with a broad dark brown stripe; wings subhyaline, stigma distinct, cord seamed with grey; vein  $Sc$  long, cell 1st  $M_2$  closed.

*Male*.—Length 5.8 mm.; wing 5.7 mm.

Rostrum and palpi brownish-black. Antennae broken. Head greyish-brown.

Mesonotal praescutum rich cinnamon-brown, duller laterally, the median area behind darker brown; scutal lobes dark brown; scutellum blackish; postnotum yellowish-brown. Pleura with a broad dark brown stripe extending from the cervical sclerites through the base of the halteres to the abdomen; dorsal sclerites brown, ventral sclerites light yellow. Halteres short, the knobs large, dark brown, the extreme base of the stem more yellowish. Legs with the coxae and trochanters yellowish-brown; femora bright yellow, darkened toward the tips, which are dark brown; tibiae and tarsi brown. Wings subhyaline; stigma spot large, rounded, dark brown; pale brownish-grey seams as follows: Tip of  $Sc_1$ , base of  $Rs$ , broad seams to the cord and outer end of cell 1st  $M_2$ ; veins dark brown. Venation (Plate X, fig. 4),  $Sc$  long, extending to beyond mid-length of the sector;  $Sc_2$  at the tip of  $Sc_1$ ;  $Rs$  elongate, nearly square at its origin;  $r$  at the tip of  $R_1$ ;  $r-m$  a little shorter than the basal deflection of  $R_{4+5}$ ; cell 1st  $M_2$  large, nearly square; basal deflection of  $Cu_1$  at the fork of  $M$ .

Abdominal tergites brownish-yellow, the caudal and lateral margins broadly blackish; sternites pale yellow, the caudal margins brown.

*Habitat*.—South Africa.

Holotype, ♂, Stella Bush, near Durban, April, 1915 (Marley).

Type in the South African Museum.

This interesting new species is dedicated to its discoverer.

DICRANOMYIA PERINGUEYI, sp. n.

Antennal flagellum uniformly dark brown in colour; thorax brownish-yellow without distinct stripes; wings greyish subhyaline, stigma rounded, pale brown; vein  $Sc$  long, cell 1st  $M_2$  closed.

*Male*.—Length 5 mm.; wing 6.4 mm.

Rostrum brown, palpi dark brown. Antennae with the first segment brown beneath, yellow above, the second segment entirely light yellow; flagellar segments dark brown, submoniliform, densely pubescent, the constrictions between the individual segments well defined, the last segment elongated, pointed, slightly darker brown. Eyes closely approximated, but not contiguous; head brown with a grey bloom.

Thoracic dorsum brownish-yellow, somewhat shiny, without distinct stripes; scutellum more yellowish, postnotum more brownish. Pleura dark brown with a very sparse pale bloom. Halteres pale yellow at the extreme base, the remainder of the organ dark brown. Legs with the coxae and trochanters dull yellow; femora elongate, slender, dull yellow, not darkened; tibiae brownish-yellow, the apical segments broken. Wings pale greyish subhyaline, the stigmal spot rounded, pale brown; veins dark brown. Venation, *Sc* long, extending to mid-length of the elongate sector; *Sc*<sub>2</sub> at the tip of *Sc*<sub>1</sub>; *r* at the tip of *R*<sub>1</sub><sup>+</sup>; *Rs* about three times the length of the deflection of *R*<sub>4+5</sub>; inner end of cell 1st *M*<sub>2</sub> a little arcuated; basal deflection of *Cu*<sub>1</sub> at the fork of *M*.

Abdomen more or less discoloured, the tergites yellowish-brown, the sternites more yellowish.

*Habitat*.—South Africa.

Holotype, ♂, South Africa, without more exact data.

Type in the South African Museum.

This fly is named in honour of Director Péringuey of the South African Museum.

GEN. RHIPIDIA, Meigen.

1818. Syst. Besch., vol. 1, p. 153.

RHIPIDIA AFRA, Bergroth.

1888. Entomol. Tidskr., vol. 9, pp. 128, 129.

Two female specimens, one from East London, South-east Cape Colony, July, 1914 (Lightfoot), the other from Krantz Kloof, Natal, June, 1915 (Marley). The specimens measure in length 6.3–8.5 mm., the wing 7.3–8.8 mm., one of the specimens being much larger than the other, but undoubtedly belonging to the same species. The wing is shown on Plate X, fig. 5.

GEN. LIBNOTES, Westwood.

1876. Trans. Ent. Soc. Lond., p. 505.

LIBNOTES CAPENSIS, sp. n.

Basal antennal segments black, intermediate segments light brown, the terminal segment black; thorax yellow with a double black mid-

dorsal stripe; femora with a narrow subterminal black ring; wings light yellowish to hyaline with abundant black, brown and grey dots, spots and clouds on the wing-membrane.

*Male*.—Length 12.5 mm.; wing 20 mm.

*Female*.—Length 12.2 mm.; wing 15.5 mm.; fore leg, femur 11.3 mm., tibia 13.5 mm.; hind leg, femur 13 mm., tibia 13.8 mm.

Rostrum and palpi black. Antennae moderately elongated, the first five segments black, beyond the fifth passing into light brown or brownish-yellow, the terminal segment elongated, black with a grey bloom. Front narrow, buff; remainder of the head buff with a slight greenish tinge; a narrow black mark on the vertex.

Thorax gibbous. Pronotum elongated, yellow, with a green cast. Mesonotal praescutum light yellow with a strong greenish cast on the sides; a well-defined black stripe on each side of the very narrow yellow median vitta, these stripes narrowed anteriorly, considerably broadened at the transverse suture; lateral stripes short, barely indicated, greenish; a quadrate area devoid of pollen just back of the pseudosutural foveae; scutum with the lobes largely black, median area and the remainder of the lobes yellowish; scutellum black with a narrow median yellowish line; postnotum brownish-black, yellow on the sides. Pleura yellow with a strong green cast; two broad, interrupted brown stripes, the dorsal one beginning above the fore coxae, becoming indistinct beneath the wings; the ventral stripe is on the mesosternum, reappearing as a rounded spot just in front of the halteres. Halteres green, the knobs yellowish. Legs with the coxae and trochanters green; femora light brown, more yellowish apically; a narrow subterminal black annulus, subequal to or slightly less in extent than the yellow apex; tibiae light brown, the extreme tip narrowly darker brown; metatarsi similar, the remaining tarsal segments black. Wings light yellowish on the costal area, more hyaline elsewhere; veins light yellow, dark brown where traversed by dark markings; dark markings as follows: A series of small black dots in the costal and subcostal cells; dark brown areas at the base of *M*, base of *Rs*, tip of *Sc*<sub>1</sub>, along the cord and along vein *Cu*; numerous grey clouds and spots in all the cells of the wing, the anterior cells being more free of these markings. Venation (Plate X, fig. 6), *Sc*<sub>2</sub> at the tip of *Sc*<sub>1</sub>; *r* at the tip of *R*<sub>1</sub>; deflection of *R*<sub>4+5</sub> longer than *r* or *r-m*; basal deflection of *Cu*<sub>1</sub> longer than *Cu*<sub>2</sub>, situated at the fork of *M*.

Abdomen with the first tergite brownish, the remainder greenish-yellow, each segment margined caudally with yellowish, these margins broader toward the tip of the abdomen.

The female is similar to the male, but in this latter sex  $Sc_1$  is about three to four times the length of  $Sc_2$ . The whole body in the living insect is undoubtedly strongly greenish, but this colour is lost in specimens that are pinned for many years.

*Habitat.*—South Africa.

Holotype, ♂, Umvoti, Natal (H. Fry).

Allotype, ♀, Stella Bush, near Durban, October 17th, 1915 (Marley)

Type in the South African Museum.

The genus *Libnotes* is Oriental in its distribution, and this is the first African species to be described.

### TRIBE ANTOCHINI.

GEN. RHAMPHIDIA, Meigen.

1830. Syst. Besch., vol. 6, p. 281.

#### RHAMPHIDIA CAPENSIS, sp. n.

Thorax black, the praescutum with a yellowish brown median stripe that is indistinct behind and is split by a narrow black vitta; wings spotted.

*Male.*—Length 9.5 mm.; wing 9.2 mm.

Rostrum slender, elongated, half again as long as the head, black; palpi black. Antennae rather short, first segment dark brown, second segment dark brown basally, bright yellow apically; basal flagellar segments pale at the base, darkened at the tip; terminal flagellar segments uniformly dark brown. Front greyish; vertex comparatively narrow, dark brown; occiput similar.

Thorax gibbous. Pronotum dull yellow. Mesonotal praescutum black; a yellowish-brown median stripe, indistinct behind, split by a narrow black median vitta; lateral stripes yellow, broad, distinct and well-defined; area around the pseudosutural and transverse sutures yellowish; scutum yellow, the lobes black; scutellum and postnotum black or dark brown. Pleura dark brownish black. Halteres light yellow. Legs with the coxae dull yellow, the outer faces infuscated, darkest on the middle coxae; trochanters yellow; femora yellow, passing into brown toward the tip, the apex narrowly blackened; tibiae and tarsi dark brown. Wings light grey, the costal cells and cell 2nd  $R_1$  light yellow; veins dark brown; brown markings as follows: The stigma, base of vein  $M$ , origin of  $Rs$ , mid-distance between the last two, along the cord and outer end of cell 1st  $M_2$



and tip of  $R_2 + 3$ ; apex of wing slightly infumed. Venation (Plate X, fig. 7), *Sc* long, ending opposite the fork of the sector; *Rs* angulated and spurred at its origin; basal deflection of  $R_4 + 5$  longer than *r-m*.

First abdominal tergite blackish, tergites two to six with the basal half blackish, the caudal half dull yellowish; tergites seven and eight black; hypopygium pale yellow; sternites largely dull yellow; the extreme base and sides more blackish.

*Habitat*.—South Africa.

Holotype, ♂, Krantz Kloof, Natal, November, 1915 (Marley).

Type in the South African Museum.

This is the first African *Rhamphidia* to be described.

#### GEN. ELEPHANTOMYIA, Osten Sacken.

1859. Proc. Acad. Nat. Sci. Phila., p. 220.

#### ELEPHANTOMYIA AURANTIACA, sp. n.

Rostrum black; head black with a sparse grey bloom; thorax orange; wings brownish-yellow, the anal angle slightly darkened.

Length uncertain, the abdomen broken; wing 6.7 mm.

Rostrum broken, much longer than the head and thorax together, black; palpi black. Antennae with the scape black, the flagellum broken. Head black with a sparse dark grey bloom.

Mesonotum rich orange without darker markings; metanotum black. Pleura orange with a slight brownish suffusion. Halteres with the stem yellow, the knob broken. Legs with the coxae and trochanters dull yellow; femora rather stout, dull yellow, more brownish toward the tip; tibiae and tarsi brown. Wings with a strong brownish yellow tinge; anal angle and along vein *Cu* slightly darkened; stigma barely indicated, pale brown; costa brownish yellow, remaining veins dark brown. Venation (Plate X, fig. 8), *Sc* long extending beyond mid-length of *Rs*; basal deflection of  $R_4 + 5$  a little longer than *r-m*, basal deflection of  $Cu_1$  before the middle of cell 1st  $M_2$ .

Abdomen broken.

*Habitat*.—South Africa.

Holotype, sex? Ceres, Cape Colony, April, 1913 (Lightfoot).

Type in the South African Museum.

Although the type is injured there can be little question about the generic reference of this fly. It differs from *E. wahlbergi* Bergroth (Caffraria) in its black rostrum, orange thorax without a brown dorso-median stripe, indistinct stigma, etc.

GEN. STYRINGOMYIA, Loew.

1845. Dipterol. Beitr., vol. 1, p. 6.

STYRINGOMYIA VITTATA, Edwards.

1914. Trans. Ent. Soc. Lond., June 25, pp. 217, 218.

Two males, Durban, Natal, 1914 (W. Haygarth).

The ventral aspect of the hypopygium was not described nor figured by Edwards (Plate XIII, figs. 46, 47). The pleurite has a swollen ventral lobe that is armed on the cephalic face with a sharp chitinized tooth. The ninth tergite (Plate XIII, fig. 46) is produced into a rather slender lobe that is squarely truncated at the apex, on each angle with a small papilla bearing a stout spine.

GEN. ATARBA, Osten Sacken.

1869. Mon. Dipt. N. Am., pt. 4, p. 127.

ATARBA CAPENSIS, sp. n.

Antennal flagellum uniformly dark brown; thorax dull yellow without darker markings; wings without a stigmal spot.

*Male*.—Length about 4.4 mm.; wing 5.1 mm.

*Female*.—Length 4.7 mm.; wing 5.5–5.6 mm.

Rostrum and palpi dark brown. Antennae of the female rather elongated for this sex, the scape light brown, the flagellum uniform dark brown; segments of the female flagellum oval, densely white pubescent, the segments gradually decreasing in size to the tip, the last segment not elongated. Head brownish-yellow.

Thorax uniform dull yellow without stripes, the pleura a little lighter coloured. Halteres short, pale, the knob a little darker. Legs with the coxae and trochanters dull light yellow; femora rather stout, dull yellow, passing into brown at the tip; tibiae and the first tarsal segment yellowish-brown, the tips darker; remainder of the tarsi dark brown. Wings with a strong yellowish tinge on the basal and costal portions, the distal and anal areas more greyish; no stigma; veins yellow in the yellowish area, brown in the greyish areas. Venation (Plate X, fig. 10), *Sc* short, ending slightly beyond the origin of *Rs*; *Sc*<sub>1</sub> about three times the length of *Sc*<sub>2</sub>; *Rs* gently arcuated, a little more than half the length of *R*<sub>2+3</sub>; basal deflection of *Cu*<sub>1</sub> at or slightly beyond the fork of *M*.

Abdomen uniform brown, the ovipositor more yellowish; sternal valves of the ovipositor elongate, acute at the tips; tergal valves a

little more than half as long as the lower valves, blunt at the tips ; in the male a black ring before the hypopygium.

*Habitat.*—South Africa.

Holotype, ♂, Hottentot-Hollands Mountains, altitude 4000 ft., Caledon, Cape Colony, 1915 (Barnard).

Allotype, ♀, with the type.

Paratopotypes, 2 ♀ ♀.

Type in the South African Museum.

The present form is the first South African species of the genus to be discovered.

### TRIBE ERIOPTERINI.

#### GEN. ERIOPTERA, Meigen.

1803. Illiger's Magazine, vol. 2, p. 262.

#### SUB-GEN. EMPEDA, Osten Sacken.

1869. Mon. Dipt. N. Am., pt. 4, p. 183.

#### ERIOPTERA (EMPEDA) BONAE SPEI, sp. n.

Light brownish-grey ; hypopygium yellow ; wings light grey with an ill-defined brown stigma.

*Male.*—Length about 3·3·1 mm. ; wing 3·9–4 mm.

Rostrum and palpi brown. Antennae brown, the basal flagellar segments large, globular, the segments gradually decreasing in diameter and becoming more and more elongated to the apex. Head light grey.

Pronotal scutum light yellow. Mesonotum light brown with a dense grey bloom. Pleura concolorous. Halteres pale yellow the knobs only slightly darkened. Legs with the coxae brownish-yellow, sparsely greyish pruinose ; trochanters yellowish-brown ; femora light yellowish-brown, a little darkened at their tips ; tibiae and tarsi dark brown, the latter blackened on the apical segments. Wings with a slight grey suffusion, the costal region a little more yellowish ; stigma brown, ill-defined ; veins dark brown. Venation (Plate X, fig. 11), *Sc* moderately elongated, extending to about mid-length of the sector ; *Sc*<sub>2</sub> not distantly removed from its tip, *Sc*<sub>1</sub> being about equal to the radial cross-vein ; cross-vein *r* about equal in length to that portion of *R*<sub>1</sub> between it and the fork of the sector ; fused portion of *Cu*<sub>1</sub> and *M*<sub>3</sub> shorter than or subequal to the basal deflection of *Cu*<sub>1</sub>.

Abdomen dark brown ; hypopygium reddish-yellow.

*Habitat.*—South Africa.

Holotype, ♂, Cape Town, August, 1909 (Lightfoot).

Allotype, ♀, with the type.

Paratopotypes, 6 ♂ ♀.

ERIOPTERA (ERIOPTERA) PERINGUEYI, Bergroth.

1888. Ent. Tidskr., vol. 9, pp. 129, 130.

The types, bearing Bergroth's label (No. 3), are from Stellenbosch, near Cape Town, November, 1887 (Peringuey). There are a few other specimens in the collection bearing the label "Cape Town, Cape Colony." The wing of this beautiful *Erioptera* is figured on Plate X, fig. 12. The specimens show the following measurements:

*Male*.—Length 7 mm.; wing 5.8 mm.

*Female*.—Length 6.9–7 mm.; wing 7.2 mm.

GEN. TRIMICRA, Osten Sacken.

1861. Proc. Acad. Nat. Sci. Phila., p. 290.

TRIMICRA INCONSPICUA, Loew.

1866. Berlin Entomol. Zeitschr., vol. 10, p. 59 (*Gnophomyia*).

Several specimens of both sexes from Smithfield, Orange River Colony (Kannemeyer); a few from Stellenbosch, near Cape Town. These agree closely with the original description of the species. It is possible that the *Limnobia lanuginipes*, Walker (Ins. Saunders., p. 435, 1856) is the same species, although there is a considerable discrepancy in size. The wing is shown on Plate X, fig. 13.

GEN. PLATYLIMNOBIA, gen. n.

Rostrum and palpi short. Head large, wider than the narrow thorax. Antennae short, 16-segmented; first scapal segment elongated, the second short, subglobular, shorter than the first flagellar segment; flagellar segments cylindrical. Front broad, widely separating the eyes; eyes with coarse ommatidia. Mesothoracic dorsum very flattened, depressed, the praescutum short, not projecting over the pronotum. Halteres small, twisted, with about seven or eight bristles on the elongate knob. Legs slender, the coxae very large, tibiae unspurred. Wings reduced to mere pads without apparent venation; a series of about twenty-five bristles along the costa, about four in the radial field and about five in the median field. Male hypopygium with the pleural pieces short, stout, cylindrical, with rather abundant stout hairs that are larger and more abundant toward the tip; inner faces of the pleurites grooved to receive the appendages when in a position

of rest; pleural appendages two, strong and powerful, directed inward and dorsad, the dorsal appendage a simple curved hook that is strongly chitinised at the apex; ventral appendage flattened, the outer angle produced into a finger-like lobe that bears a few hairs, longest at the apex.

Genotype, *Platylimnobia barnardi*, sp. n. (Southern Ethiopian region).

PLATYLIMNOBIA BARNARDI, sp. n.

Wings rudimentary in both sexes; thoracic dorsum very flattened; coxae enlarged; colouration brownish-yellow, the thorax with a brown dorso-median stripe.

*Male*.—Length 4.6–5.3 mm.

*Female*.—Length 4.5 mm.

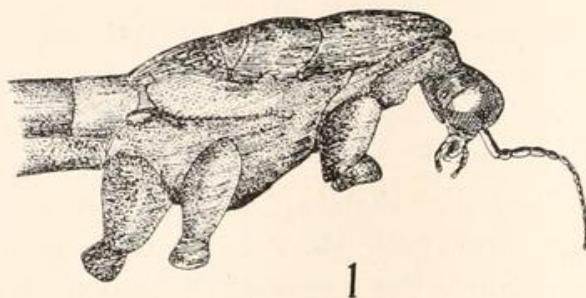


FIG. 1.—*Platylimnobia barnardi*, sp. n. Lateral aspect of the head and thorax, the legs being removed.

Rostrum short, dark brown; palpi dark brown. Antennae with the first segment brown, somewhat darker at the tip; second segment dark brown but not so deeply coloured as the flagellum, the segments of which are provided with numerous pale hairs and a few bristles. Head large, rounded, dark brown with a sparse bloom.

Mesonotal praescutum narrow, small, light brownish-yellow with a broad dark brown median stripe; anterior margin and the pronotal scutellum shiny; scutal lobes indistinct, yellowish; scutellum small, quite indistinct, brownish-yellow; postnotum elongate, similar to the scutellum in colour. Pleura brownish anteriorly, more yellowish behind. Halteres pale. Legs with the fore and middle coxae brownish, the hind coxae yellowish; trochanters yellowish; femora dark brown, a little paler basally; tibiae and tarsi dark brown. Wings dull yellow with an indistinct venation.

Abdomen brown. The hypopygium of the male as described under the generic characterisation (Plate XIII, fig. 45). Ovipositor with the sternal valves powerful, almost straight; tergal valves more slender.

*Habitat*.—South Africa.

Holotype, ♂, Hottentot-Hollands Mountains, altitude 4000 ft., Caledon, Cape Colony, 1915 (Barnard).

Allotype, ♀, with the type.

Paratopotypes, 4 ♂ ♀.

Type in the South African Museum.

This curious insect is named in honour of its collector. The outline of the body is shown in fig. 1.

GEN. PODONEURA, Bergroth.

1888. Ent. Tidskrift, vol. 9, p. 133.

PODONEURA ANTHRACOGRAMMA, Bergroth.

1888. Ent. Tidskrift, vol. 9, pp. 133, 134.

The type-material is from Cape Town (Peringuey) and bears Bergroth's label No. 7; a ♂ from Cape Town (Lightfoot); a ♂, S. W. District, Cape Colony. The wing of this remarkable insect is shown on Plate X, fig. 14.

GEN. GNOPHOMYIA, Osten Sacken.

1859. Proc. Acad. Nat. Sci. Phila., p. 223.

GNOPHOMYIA ELEGANS, Wiedemann.

1830. Aussereur. Zweifl. Ins., vol. 2, p. 617 (*Limnobia*).

The material at hand includes one of Bergroth's specimens (Caffraria, Wahlberg, No. 6) and a female from Durban, Natal, April, 1915 (Marley). The female offers the following measurements, length about 9.5 mm.; wing, 9.5 mm. This beautiful fly bears a striking resemblance to certain of the Neotropical species of *Eriocera* Macquart, and it is not strange that Dr. Schiner (Reise Novara) referred it to this genus. The wing is shown on Plate XI, fig. 15.

GEN. GONOMYIA, Meigen.

SUB-GEN. GONOMYIA, Meigen.

1818. Syst. Besch., vol. 1, p. 146.

GONOMYIA (GONOMYIA) SPURIA, Bergroth.

1888. Ent. Tidskrift, vol. 9, pp. 134, 135.

One female specimen from Lourenço Marquez, Portuguese East Africa (C. W. Howard), in the collection of the United States National Museum. The wing is shown on Plate XI, fig. 16.

This delicate species bears a certain resemblance to species in many widely separated regions of the world, especially as regards the arrangement of media and its branches—the *blanda* group (Holarctic), *Gonomyia proxima*, Brunetti (Oriental), and even to *Ptilostena*, Bergroth (Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 575–578, 1913). The last-named group is separated from *Gonomyia* because of its arrow petiolate wings, the long  $Sc_1$  and the peculiar shape of cell  $R_2$  of the wings; *G. spuria* shows all of these characters except the last, and it seems doubtful whether *Ptilostena* should receive more than sub-generic rank. Edward's *Thaumastoptera aldabrensis* (Trans. Linn. Soc. Lond., vol. 15, pt. 2, p. 205, pl. 10, fig. 10, 1912) is also a *Gonomyia* that shows many characters in common with *Ptilostena*. It may here be mentioned that the *Teucholabis flavonotata*, Edwards (*loc. cit.*, pp. 205, 206, pl. X, fig. 11), from the Seychelles Islands is a *Gonomyia*, closely resembling *G. sulphurella*, Osten Sacken (E. Nearctic).

SUB-GEN. GONOMYELLA, sub-gen. n.

Differs from *Gonomyia*, s.s., as follows: Wings with the subcosta elongate, cell  $R_2$  very large; radial cross-vein present; cell 1st  $M_2$  open by the atrophy of  $m$  or the outer deflection of  $M_3$ .

Type of the sub-genus.—*Gonomyia slossonae*, Alexander (Neotropical).

Besides the two Ethiopian species described in this paper, *Gonomyia velutina*, Alexander (Peru) also belongs to this group.

GONOMYIA (GONOMYELLA) NATALENSIS, sp. n.

Head light grey; thorax grey with three brown stripes; pleura striped grey and pale yellow; abdominal tergites uniformly dark brown; wings with subcosta elongate, cross-vein  $r$  present and connected with  $R_2 +_3$ , cell 1st  $M_2$  open by the atrophy of the outer deflection of  $M_3$ .

*Female*.—Length about 6.6 mm.; wing 6.2 mm.

Rostrum short, black, with a sparse greyish bloom; palpi black. Antennae rather elongated for this sex, black, the first segment about as long as the two following combined; flagellar segments elongate-oval with an abundant white pubescence. Head clear light grey, the vertex with a faint suffusion of brown; space between the eyes very broad.

Pronotum prominent, light grey, broadly darker medially, the scutellum more pallid, brownish-yellow. Mesonotal praescutum light grey with three dark brown stripes, the median stripe broadest, ending just before the transverse suture; pseudosutural foveae prominent, elongate, subtriangular, shiny black; tuberculate pits

prominent, shiny black, rounded, situated near the anterior margin of the sclerite, the distance between them a little greater than the diameter of one; scutum dark grey; scutellum pale brown to brownish-yellow; postnotum black with a sparse grey bloom. Pleura with the propleural sclerites yellowish; mesopleura pale whitish-yellow, with two broad blackish-grey stripes, the dorsal one beginning on the pronotal scutellum continuing caudad to the mesonotal postnotum; ventral stripe including the coxae and the mesosternum; mesosternum yellowish medially. Halteres pale brown, the knobs darker brown. Legs with the coxae yellow, the outer faces dark with a dense grey bloom; trochanters dark brown; remainder of the legs black. Wings with a pale grey tinge, vein *Cu* suffused with brown; stigma distinct, rounded-oval, brown; veins dark brown. Venation (Plate XI, fig. 17), *Sc* very long, extending to beyond mid-length of the long sector; *Sc*<sub>1</sub> rather long, longer than the radial cross-vein but shorter than vein *R*<sub>2</sub> alone; *Rs* long, somewhat angulated at its origin; *R*<sub>2+3</sub> short; cross-vein *r* connecting *R*<sub>1</sub> with *R*<sub>2+3</sub>; basal deflection of *R*<sub>4+5</sub> long, not on a line with *r-m*; cell 1st *M*<sub>2</sub> open by the atrophy of the outer deflection of *M*<sub>3</sub>; fork of *M*<sub>1+2</sub> longer than its petiole; basal deflection of *Cu*<sub>1</sub> beyond the fork of *M*.

Abdominal tergites dark brownish-black, unmarked, the ovipositor light yellowish-brown; sternites black, the segments broadly margined caudally and laterally with yellowish; lateral integument bright yellow.

*Habitat.*—South Africa.

Holotype, ♀, Gillets, Natal, September, 1915 (Marley).

Paratype, ♀, Krantz Kloof, Natal, September 26th, 1915 (Marley).

Type in the South African Museum.

GONOMYIA (GONOMYELLA) BREVIFURCA, sp. n.

Black; thorax and abdomen striped and banded with bright yellow; wings with the radial cross-vein present; cell 1st *M*<sub>2</sub> open by the atrophy of the medial cross-vein; fusion of *Cu*<sub>1</sub> and *M*<sub>3</sub> very extensive, the remaining fork being very short.

*Male.*—Length 4 mm.; wing 3.3 mm.

Rostrum and palpi black. Antennae black, the flagellar segments rounded-oval. Head black; eyes small with coarse ommatidia; front and vertex extensive.

Pronotum black, the scutellum bright yellow. Mesonotum black with a small yellow blotch on the outer caudal angle of the scutum inside the wing-base. Pleura bright yellow with two broad black stripes, the dorsal stripe extending from the pronotum to the mesonotal post-



notum; ventral stripe near the sternum and including all the coxae; prosternum beneath yellow; mesosternum with a large oval yellow spot beneath. Halteres brown, the knobs darker. Legs with the coxae and trochanters black; femora dark brown, the tips black; tibiae and tarsi black. Wings with a pale yellowish-brown tinge; no stigma; veins brown. Venation (Plate XI, fig. 18),  $Sc$  long extending about one-third to one-quarter the length of the long sector;  $Sc_2$  indistinct;  $Rs$  very long;  $R_2+3$  short, less than  $R_2$ ; cross-vein  $r$  present but indistinct, connecting with  $R_2$ ; basal deflection of  $R_4+5$  and  $r-m$  about on a line; basal deflection of  $M_1+2$  obliterated; cross-vein  $m$  lacking so that cell  $M_2$  is undivided; fusion of  $M_3$  with  $Cu_1$  very extensive,  $Cu_1$  alone being about as long as the  $r-m$  cross-vein.

Abdomen banded black and yellow, tigrine in appearance, the segments black with broad caudal margins of bright yellow; hypopygium black.

*Habitat*.—South Africa.

Holotype, ♂, Hottentot-Hollands Mountains, altitude 4000 ft., Caledon, Cape Colony, 1915 (Barnard).

Type in the South African Museum.

This interesting little fly is not like the typical members of the sub-genus in the manner that cell 1st  $M_2$  is open. The very short fork of  $Cu_1$  and  $M_3$  is strongly suggestive of the possibility of the loss of one of these veins by complete fusion to the wing-margin, a very rare condition in this family of flies, the only other comparable case known to the author being certain species of the Neotropical genus *Polymera*.

#### GEN. MONGOMA, Westwood.

1881. Trans. Ent. Soc. Lond., p. 364.

#### MONGOMA EXORNATA, Bergroth.

1888. Ent. Tidskrift, vol. 9, pp. 135, 136 (*Trentepohlia*).

This interesting fly has a rather extensive range in Eastern and South-Eastern Africa, as given by the author in an earlier paper (Can. Ent., vol. 44, p. 204, 1912); a specimen in the collection from the Bluff, Durban, Natal, August, 1915 (Marley).

#### GEN. CONOSIA, van der Wulp.

1880. Tijd. v. Entomol., vol. 23, p. 159.

#### CONOSIA IRRORATA, Wiedemann.

This is a very widely distributed species that is found practically throughout the tropics of the Old World. Five ♂, ♀, M'fongosi, Zululand, February, 1914 (W. E. Jones).

TRIBE LIMNOPHILINI.

GEN. LIMNOPHILA, Macquart.

1834. Suit. à Buffon, vol. 1, p. 95.

LIMNOPHILA TRANSVAALICA, sp. n.

Antennae elongate; head dark grey; thorax and abdomen orange-yellow; wings yellowish without markings.

*Female*.—Length 10·6 mm.; wing 11·3 mm.

Rostrum and palpi brown. Antennae with the first segment elongated, light brown with a pale bloom; second segment brown; flagellar segments elongate-cylindrical, black, with sparse pale hairs and strong bristles near mid-length of the segments. Head prominent, subtriangular, the eyes being large and semiprotuberent; space between the eyes rather narrowed; anterior portion of the vertex with a pale grey bloom, remainder of the head dark grey, passing into brownish on the occiput; several prominent bristles on the vertex along the inner margin of the eye and another group on the sides of the occiput.

Thorax dull brownish-yellow to orange without distinct darker markings. Pleura more yellowish. Halteres light yellow at the base passing into brown toward and on the knob. Legs with the coxae and trochanters light yellow; femora brown, brighter basally; tibiae dark brown basally, the remainder broken. Wings with a strong yellowish tinge, the stigma indistinct, pale brown; costa dark brown; remaining veins yellowish-brown. Venation (Plate XI, fig. 19), *Sc* long ending beyond the fork of *Rs*; cross-vein *r* at the tip of *R*<sub>1</sub>; basal deflection of *Cu*<sub>1</sub> beyond the middle of cell 1st *M*<sub>2</sub>.

Abdominal tergites brownish-yellow, the eighth and ninth segments black; sternites reddish-yellow; ovipositor yellowish, the elongate acicular tergal valves directed strongly upward at the tip.

*Habitat*.—South Africa.

Holotype, ♀, Barberton, Transvaal, November, 1911 (H. Edwards).

Type in the South African Museum.

The structure of the female antennae indicates an elongate organ in the male sex.

LIMNOPHILA FRUGI, Bergroth.

1888. Ent. Tidskrift, vol. 9, pp. 137, 138.

Two specimens from Natal, a male, Gillets, September, 1915 (Marley), and a specimen of uncertain sex from Krantz Kloof, February, 1915 (Marley).

This is a well-defined species and, as indicated by Bergroth, related to the Nearctic *L. luteipennis*, et al.; the bright yellow colour of the first flagellar segment of the antennae is a conspicuous character. The male specimen offers the following measurements: Length 8.5 mm.; wing 8-8.4 mm. The venation is shown on Plate XI, fig. 20.

? *LIMNOPHILA DUBIOSA*, sp. n.

Antennae of the male elongated, the flagellum bicolorous; wings with a heavy brown pattern, with about seven larger blotches along the costal margin; cell  $M_1$  absent; a strong supernumerary cross-vein in cell  $M$ .

*Male*.—Length 6.5 mm.; wing 7.4 mm.

Rostrum and palpi black. Antennae very elongate, but six flagellar segments remain and the entire organ must be nearly as long as the wing; scape dark brown; flagellar segments with the basal half brownish-black, the apical half dull yellow; scapal segments large, the first segment elongate, the second segment very short, much broader than long; flagellar segments abruptly narrower than the scape, elongate-cylindrical, without bristles, but with abundant elongate pale outstretched hairs. Eyes small with coarse ommatidia; space between the eyes very broad. Head discoloured, dark brown.

Thorax dull dark brown, any bloom destroyed by discoloration of the type. Pleura dark brown. Halteres elongate, dull brownish-yellow, the knobs brownish. Legs with the coxae and trochanters dark brown; remainder of the legs broken. Wings pale yellowish-white with a heavy brown pattern, consisting of about seven larger dark brown blotches along the costa, the first at the wing-base, the third at the origin of the sector, the fourth at the tip of  $Sc_1$ , the fifth, largest, at the tip of  $R_1$ , the sixth at the tip of  $R_2$ ; the remainder of the wing is densely spotted and clouded with a paler shade of brown; veins dark brown, in the paler areas more yellowish. Venation,  $Sc$  rather short, ending just before the fork of  $Rs$ ;  $Sc_2$  at the tip of  $Sc_1$ ;  $Rs$  elongate, arcuated at its origin;  $R_2+3$  rather long, almost in a line with  $Rs$ ;  $R_2$  and  $R_3$  divergent, widely separated at the wing-margin; basal deflection of  $R_4+5$  nearer the base of the wings than the  $r-m$  cross-vein; cell  $M_1$  absent; basal deflection of  $Cu_1$  under the middle of cell 1st  $M_2$ ; a strong supernumerary cross-vein in cell  $M$ , this vein slightly subsinuate in its course.

Abdomen dark brown, discoloured.

*Habitat*.—South Africa.

Holotype, ♂, Stellenbosch, near Cape Town, Cape Colony.

Type in the South African Museum.

This very interesting fly is, unfortunately, not in good condition, but the well-marked diagnostic characters are such that it will be easily recognised. If the generic reference as given above is correct, then the fly would fall in the sub-genus *Idioptera*, Macquart (Suit. à Buffon, vol. 1, p. 94, 1834), the described species of which are Holarctic in their distribution.

SUB-FAMILY TIPULINAE.

TRIBE DOLICHOPEZINI.

GEN. DOLICHOPEZA, Curtis.

1825. Brit. Entomol., p. 62.

SUB-GEN. TRICHODOLICHOPEZA, sub-gen. n.

Differs from *Dolichopeza* s.s., as follows: Wings with a black pubescence in all the apical cells from  $R_1$  to  $Cu_1$ .

Type of the sub-genus.—*Dolichopeza* (*Trichodolichopeza*) *hirtipennis*, sp. n.

DOLICHOPEZA (TRICHODOLICHOPEZA) HIRTIPENNIS, sp. n.

Head dark brownish-black with a greyish bloom; thorax buff with three dark brown stripes; wings pale grey with a prominent stigma; numerous short hairs in all the apical cells of the wings; tarsi brown.

*Male*.—Length 9·8 mm.; wing 12·3 mm.

*Female*.—Length 9·1 mm.; wing 10·4 mm.

*Male*.—Frontal prolongation of the head light yellow, the dorso-median line, including the nasus, dark brown. Antennae of moderate length, the first segment dull yellow, a little darkened toward the tip; second segment bright yellow; flagellum black; first flagellar segment elongated, cylindrical, with numerous scattered bristles: remaining segments of the flagellum with a sub-basal verticil of stout black bristles. Eyes with fine ommatidia, rather widely separated; vertex with a low protuberance, the latter with the front orange-yellow, remainder of the head dark brownish-black with a brownish-grey bloom.

Pronotum buff with a broad dark brown median line. Mesonotal praescutum pale yellowish-buff with three dark brown stripes, the median one broadest in front, more narrowed behind; lateral stripes short, narrowed in front; pseudosutural fovea deep, surrounded by a brown blotch and with another brown mark from the fovea to the lateral margin of the sclerite; about a dozen scattered black hairs in the area just in front of the fovea; scutum buff medially, the lobes

dark brown, especially inwardly; scutellum and postnotum yellowish-buff, the latter sparsely pale pollinose. Pleura pale whitish with brown spots. Halteres slender, pale yellow, darkened toward the knob, which is yellowish at the tip. Legs with the coxae pale with a sparse whitish bloom: trochanters yellow; femora dull brownish-yellow, darkened towards the tips; tibiae and tarsi dark brown. Wings with a pale grey tinge, more whitish subhyaline on the apical half; costal cell pale brownish-yellow; stigma prominent, rectangular, dark brown; tip of the wing infuscated; brown seams along the cord and the veins excepting *M* and 1st *A*; a large white blotch before and beyond the stigma and the whole area distad of the basal deflection of *Cu*<sub>1</sub> whitish subhyaline; veins dark brown, excepting *Rs*, *R*<sub>1</sub> between the origin of the sector and the stigma and the fork of *M* which are light yellowish-orange; numerous hairs in all the apical cells of the wings. Venation (Plate XI, fig. 21), *Rs* short, oblique, tip of *R*<sub>2</sub> atrophied; fused portion of *Cu*<sub>1</sub> and *M*, that portion of *M* between *r-m* and the first fork, and the petiole of *M*<sub>1+2</sub> all subequal or the second a little longer.

Abdomen yellowish-orange, the tergites with the caudal half of each segment brownish-black; sternites more uniformly yellow.

*Female*.—Similar to the male, but the antennae shorter and the frontal prolongation of the head without the distinct, narrow, median brown line.

*Habitat*.—South Africa.

Holotype, ♂, Hottentot-Hollands Mountains, altitude 4000 ft., Caledon, Cape Colony, 1915 (Barnard).

Allotype, ♀, Winterhoek Mountains, Tulbagh, Cape Colony, altitude 3600 ft., April, 1916 (R. M. L.).

Type in the South African Museum.

GEN. MEGISTOCERA, Wiedemann.

1828. *Aussereur. Zweifl. Ins.*, vol. 1, p. 55.

MEGISTOCERA BICAUDA, Speiser.

1909. *Dem Kilimand., dem Meru Exped., Dipt.* 10, *Orthorr.* 4, pp. 53, 54.

One female, Dunbrody, Blue Cliff, Cape Colony, April 2nd, 1912, agrees well with Speiser's description of the species, but the general coloration of the fly is much darker than stated by Dr. Speiser, the chestnut-brown shades, as described, being very dark brown. In spite of these slight differences I believe it to be the same species; the cloudings on the wings are also a little more extensive than indicated

for typical *bicauda*; the second pair of "tails" described by Dr. Speiser are presumably the sternal valves of the ovipositor.

The female specimen offers the following measurements: Length 13.3 mm.; wing 20.2 mm.; fore femur 9.7 mm.; hind femur 15 mm. The abdomen in the specimen at hand is greatly shortened, the intermediate segments being crowded and telescoped together, the terminal segment (Plate XIII, fig. 42) elongate, cylindrical-tubular, the tergal valves rather short, curved gently upwards, the apices acute; sternal valves shorter, straight, and high, the apices rounded to subacute; along the dorsal margin a groove containing tufts of long pale hairs; viewed from above the tergal valves are strongly divergent apically, the sternal valves nearly parallel. The wing venation is shown in Plate XI, fig. 23; the colour of the membrane is the peculiar whitish tinge characteristic of the genus; the apex and the margin around to the first anal vein is indistinctly and very faintly tinged with dusky, small pale brown clouds as follows: origin of the sector; *r-m* cross-vein; apex of *Cu*<sub>2</sub> and second anal.

#### MEGISTOCERA HIRSUTA, sp. n.

Thoracic praescutum greyish-yellow with four brownish-grey stripes; thorax with a dense covering of long, pale hairs; wings without dark markings.

*Male*.—Length 15 mm.; wing 20 mm.

Frontal prolongation of the head moderately long, shiny, shorter than the first antennal segment in this sex, brownish-yellow, nasus distinct; palpi yellowish, darkened towards their tips. Antennae with the scapal segments brownish-yellow, the first segment greatly enlarged, the flagellum broken. Head greyish-yellow with a broad median chestnut area.

Thoracic dorsum greyish-yellow, the praescutum with four brownish-grey stripes of which the median pair are the longest; the thoracic interspaces are reddish; remainder of the thorax pale whitish, the scutellum and postnotum with a delicate reddish median line. Thorax with a dense covering of long, pale, erect hairs. Pleura pale with a greyish-white bloom. Halteres slender, brown, yellowish at the extreme base. Legs with the coxae very small, whitish; trochanters dull yellow; femora dull yellow, the extreme tip narrowly dark brown; tibiae similar, the apices brown; tarsi brownish-yellow. Wings with the peculiar whitish tinge characteristic of the genus, without seams or darker markings on the veins or at the wing-tip. Venation as in Plate XI, fig. 24; the stigma is of a much paler shade of brown than in *bicauda*, the second anal cell much larger, vein *Cu*<sub>1</sub> more sprawly, etc.

Abdominal tergites chestnut-brown, sublaterally much paler, light greyish-buff; segment one and most of segment two with a narrow dark brown lateral line; segments three to eight with a pale greyish-buff triangular spot at the base of each segment, the apex of the triangle directed caudad.

*Habitat*.—Portuguese East Africa.

Holotype, ♂, Quelimane, Lourenço Marquez, December 20th, 1908 (C. W. Howard).

Type in the collection of the United States National Museum, the species being added here to complete the data.

This fly differs from all of the described African species in the conspicuous erect hairs on the thorax.

#### GEN. LEPTOTIPULA, gen. n.

Frontal prolongation of the head moderately prominent, nasus distinct. Antennae of the male elongate, 12-segmented, the first and third segments subequal in length; flagellar segments very elongated, cylindrical, the first flagellar segment shortest, thence gradually increasing in length to the fifth, and then shortened to the tip. Tibiae with short spurs. Wings with  $R_2$  oblique; cross-vein  $r$  short; a long fusion of  $Cu_1$  and  $M_3$ , this distance equal to the length of cell 1st  $M_2$ ; second anal vein short.

Genotype, *Leptotipula limnophiloides*, sp. n. (Southern Ethiopian region).

The long fusion of  $Cu_1$  and  $M_3$  is a Limnobiine character and quite unexpected in this sub-family. In *Dolichozeza* and *Nephrotoma* long fusions may occur, but they are between  $Cu_1$  and  $M$ .

#### LEPTOTIPULA LIMNOPHILOIDES, sp. n.

Antennae elongated; femora black at the tip with a yellow sub-terminal annulus; wings with a distinct brown stigma; veins  $Cu_1$  and  $M_3$  fused for the length of cell 1st  $M_2$ .

*Male*.—Length 7.6 mm.; wing 8.2 mm.; antennae about 4.8 mm.

Frontal prolongation of the head rather prominent, brown, the entire dorsal half abruptly light yellow; a distinct nasus with numerous pale yellow hairs; palpi dark brown. Antennae elongated, the three basal segments brownish-yellow, the remainder dark brown; first flagellar segment short, about as long as the first scapal segment; remaining segments of the flagellum exceedingly elongated, slender, with abundant pale outstretched hairs and scattered black bristles. Head broad, the eyes large with fine ommatidia; a low tubercle on the

vertex, this with a deep median furrow; head yellowish-brown with an indistinct narrow darker median line.

Thorax dull brownish-yellow with three rather indistinct brown stripes on the praescutum; scutum and postnotum brown, the scutellum more yellowish. Pleura yellow, the mesopleura largely brown with a sparse pale bloom. Halteres elongated, pale yellowish, the bases of the knobs dark brown, the apices brighter. Legs with the coxae small, greyish-yellow with a bloom; trochanters yellow suffused with brown; femora brown, paler at the extreme base, the tip black, a subequal pale yellow ring just before the tip; tibiae dark brown, the tips narrowly darker; tarsi dark brown; tibial spurs very short. Wings with the basal half pale greyish, the apical half more hyaline; stigma prominent, rectangular, dark brown; pale brown marks at the base of *M*, origin and fork of *Rs* and along the basal deflection of *Cu*<sub>1</sub>; tip of the wing in cell *R*<sub>2</sub> a little darkened; a narrow hyaline streak in cell *R* just before the bend in the sector; base of the wing more hyaline. Venation (Plate XI, fig. 22), *Sc*<sub>2</sub> entering *R*<sub>1</sub> just beyond the fork of *Rs*; *Rs* rather long, angulated and spurred at its origin; cell *R*<sub>2</sub> large, vein *R*<sub>2</sub> oblique, the radial cross-vein somewhat indistinct; vein *M* strongly arcuated just before its fork; basal deflection of *Cu*<sub>1</sub> at the fork of *M* and fused with *M*<sub>3</sub> for a distance about equal to the deflection of *Cu*<sub>1</sub> alone; second anal rather short and straight.

Abdomen with the basal tergites pale yellow, the second segment with the intermediate portion dark brown; third to sixth tergites blackish basally, the apices broadly silvery; a large yellowish sub-apical area; seventh segment largely yellow; eighth and ninth segments black; sternites dark brown, the caudal margins broadly silvery; third to sixth sternites with a narrow linear yellow mark on the mid-line and a yellowish subterminal area; eighth and ninth segments dark brown. Male hypopygium with the ninth tergite black, the sclerite arched so that the caudal margin (Plate XIV, fig. 54) appears to be very broadly V-shaped; the dorsal surface with numerous black semi-appressed hairs. Ninth pleuro-sternite extensive, profoundly incised beneath on the mid-ventral line, projecting beyond the caudal margin of the ninth tergite, the surface with numerous long hairs; pleural appendages two (Plate XIII, fig. 43), the outer one slender, the extreme base narrowed, the knob elongate with a very few scattered hairs; inner appendage compressed, ending in a slender, finger-like lobe that projects into the notch of the tergite, the outer margin of the sclerite with numerous outstretched black hairs giving a hystericiform appearance to the appendage.



*Habitat.*—South Africa.

Holotype, ♂, Clairmont, Natal, August, 1915 (Marley).

Type in the South African Museum.

### TRIBE TIPULINI.

GEN. LONGURIO, Loew.

1869. Berlin. Entomol. Zeitschr., vol. 13, p. 3.

LONGURIO MINUSCULUS, sp. n.

Head black with a greyish-brown bloom; thorax orange-yellow, unmarked; abdomen brownish, the basal segments and the hypopygium yellowish.

*Male.*—Length 8.2–9.6 mm.; wing 8.8–10.3 mm.

Frontal prolongation of the head moderate in length, yellowish-brown, the mid-dorsal region darker, the nasus present, with elongate hairs; palpi dark brown. Antennae short, the scape yellowish, the flagellum dark brownish-black; first segment as long as the succeeding two together; second segment pyriform; first flagellar segment enlarged, elongate-pyriform, the remaining segments gradually narrowed and more slender; hairs on the flagellum very short. Head black with a greyish-brown bloom, the front yellowish, this colour continued on to the vertex along the inner margin of the eyes; ventral sclerites of the head yellowish; sometimes the occiput is dull yellow.

Thorax orange-yellow without markings, the pleura more yellowish. Halteres long and slender, brown, the knob darker. Legs with the coxae and trochanters yellow; femora and tibiae yellow, darkened towards their tips; tarsi dark brown. Wings light grey, the costal region yellowish; stigma small, greyish-yellow; veins brown. Venation (Plate XI, fig. 26), petiole of cell  $M_1$  about one-half the length of vein  $M_1$  alone.

Abdomen with the basal tergites yellowish, more brown medially; on segments three to eight dark brown, more yellowish sublaterally; sternites dull yellow, the eighth segment brown; hypopygium dull yellow. Male hypopygium (Plate XIII, fig. 51) of the typical *Longurio* structure, the ninth tergite (Plate XIV, fig. 56) small, deeply incised by a U-shaped notch, the lateral lobes slender, subacute at their tips; the ninth sterno-pleurite moderately elongated, bearing at its apex the pleural appendages that are beset by numbers of short black spicules; these appendages in a position of rest lie in the dorsal concavity of the ninth sterno-pleurite.

*Habitat*.—South Africa.

Holotype, ♂, Hottentot-Hollands Mountains, altitude 4000 ft., Caledon, Cape Colony, 1915 (Barnard).

Paratopotypes, 3 ♂ ♂ ♂.

Type in the South African Museum.

LONGURIO BONAE SPEI, Bergroth.

1888. Ent. Tidskrift, vol. 9, pp. 138, 139 (*Tipula*).

A male specimen, without locality, but Bergroth's original description gives Stellenbosch, near Cape Town. The fly gives the following measurements: Length 10.2 mm.; wing 12.3 mm.; middle leg, femur 7.6 mm.; tibia 8.6 mm.; hind leg, femur 9.1 mm.; tibia 11.4 mm. The male hypopygium (Plate XIII, fig. 48) has the ninth tergite (Plate XIV, fig. 55) rather short with a deep U-shaped median notch, dark brown, the margin more yellowish; the lobes with appressed black hairs that are directed cephalad; lateral lobes broad at their apices. Ninth sterno-pleurite elongated, about two times the length of the tergite, conical in lateral aspect, profoundly incised on the median line beneath; pleural appendages elongated, lying in the dorsal concavity of the sclerite, bearing along the dorsal edge a series of about five or six sharp black spines that are directed strongly cephalad; these spines are situated on the sharp edge of the appendage and in alignment.

Bergroth, in his original description of this species, discussed in general terms the peculiar structure of the hypopygium without giving any intimation that it agreed with that of *Longurio*. The general appearance of the fly is very similar to certain Nearctic species of *Tipula* of the *tricolor* group (especially *eluta*, Loew), but the structure of the male hypopygium as described above seems to indicate that the present generic reference is more nearly correct. The genotype, *Longurio testaceus*, Loew (North-Eastern Nearctic region), has a hypopygium of the same structure, the short notched tergite and the greatly produced ninth sterno-pleurite bearing the compressed pleural appendages on their dorsal face and jutting into the tergal notch, together with the profound incision of the sterno-pleurite beneath, so that the sclerite is completely bisected.

GEN. CTENACROSCELIS, Enderlein.

1912. Zool. Jahrb., vol. 32, pt. 1, pp. 1, 2.

CTENACROSCELIS ALBOVITTATUS, Macquart.

1838. Diptères Exotiq., vol. 1, pt. 1, p. 53 (*Tipula*).

This handsome crane-fly has an extensive range throughout the southern half of Africa and the adjacent islands—Mauritius (Mac-

quart); Reunion (Loew); Madagascar (Bigot); Caffraria (Bergroth); Kilimandjaro (Speiser).

The following records are contained in the material at hand:

♀, Natal, Krantz Kloof, February, 1916 (Marley), bearing the number 852.

♂, Zululand, M'fongosi, February, 1912 (W. E. Jones).

♀, Southern Rhodesia, Que Que (Bultitude); ♀, Salisbury, May 12th, 1914.

The specimens give the following measurements:

*Male*.—Length 17 mm.; wing 20.5 mm.; middle leg, femur 13.3 mm.; tibia 13.8 mm.; hind leg, femur 13.8 mm.; tibia 15 mm.

*Female*.—Length 24 mm.; wing 21 mm.

The wing is shown on Plate XI, fig. 27.

The male hypopygium has the ninth tergite (Plate XIV, fig. 57) elongate, slightly narrowed toward the tip, deeply split by a narrow V-shaped notch, the adjacent lobes slender, rounded at their tips; the dorsal surface with an abundance of delicate appressed hairs.

#### GEN. TIPULA, Linnaeus.

1758. Syst. Nat., ed. 10, p. 585.

#### TIPULA CHIONOIDES, sp. n.

Subapterous, at least in the female sex; nasus bifid at the apex; coloration dark brown; legs short.

*Female*.—Length 15 mm.; wing .9 mm.; fore legs, femur 3.7 mm.; tibia 4.2 mm.; tarsus 4.6 mm.; hind legs, femur 5.5 mm.; tibia 6.1 mm.; tarsus about 6.5 mm.

Frontal prolongation of the head rather elongate, dark brown, the apex deeply bifid by a U-shaped notch (Plate XIII, fig. 44), producing two nasiiform projections, each of which is armed with numerous strong bristles; palpi short, dark brown, the terminal segment not elongated. Antennae with the two basal segments dark brown, the flagellar segments dull yellowish; first scapal segment elongate-cylindrical; the second short-globular; flagellar segments short-cylindrical. Head dark brown with a strong median tubercle on the vertex just behind the antennal bases.

Thorax dark brown with a sparse yellowish pollen, but without distinct stripes; pleura dark brown with a sparse yellowish-brown bloom. Halteres with the knob elongated, dark brown throughout. Legs with the coxae powerful, elongate, dark brown; trochanters similar in colour; femora very short, especially the anterior pair, incrassate, dark brown; tibiae and tarsi dark brown. Wings very

reduced, less than a millimetre in length and not exceeding the halteres, extending to the base of the abdomen; they are somewhat curved, dark brown basally, more yellowish apically, venation indistinct.

Abdominal tergites rather dark brown with numerous large black blotches, and with abundant scattered yellowish appressed hairs, and black rectangular areas of close-set impressed punctures lying transversely across the sclerites; on segment two they are about mid-length of the segment and interrupted medially and two small areas on either side near the caudal margin; segments three to seven with the broad transverse bands sub-basal in position, interrupted

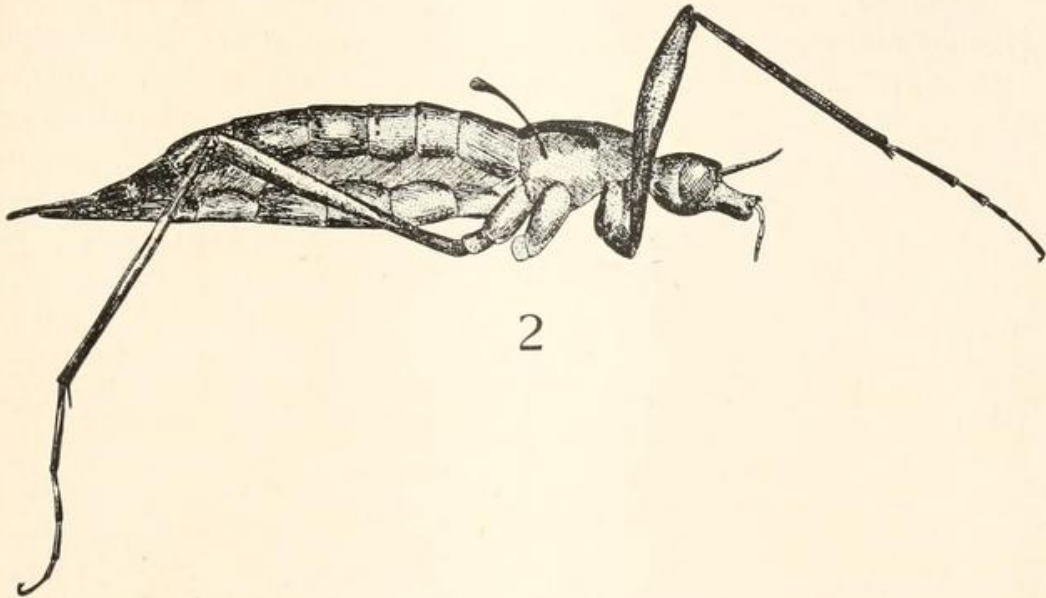


FIG. 2.—*Tipula chionoides*, sp. n. Lateral aspect, with the middle leg removed.

medially and with two small areas on either side of the median line and near the caudal margin of the sclerite; sternites brown with darker brownish-black blotches and with impressed punctured areas arranged about as on the tergites; ovipositor with the tergal valves elongate, obtuse at their tips; sternal valves much shorter, more acute at the tips.

*Habitat.*—South Africa.

Holotype, ♀, South Africa, the exact station unknown.

Type in the South African Museum.

The general habit of the insect is shown in fig. 2.

The genus *Icriomastax*, Enderlein (*Zool. Jahrb.*, vol. 32, pt. 1, p. 9, 1912), established for the Brazilian *I. ocellata*, Enderlein, is the only other crane-fly known to me in which the nasus is bifid.

## TIPULA SOROR, Wiedemann.

1821. *Diptera Exotica*, vol. 1, p. 24.1828. *Aussereur. Zweifl. Ins.*, vol. 1, p. 46.

There are two specimens in the collection, a male without exact locality, and Bergroth's specimen (No. 2), a female from Cape Town. The specimens give the following measurements :

*Male*.—Length 18·6 mm.; wing 19·1 mm.

*Female*.—Length 23·5 mm.; wing 19·2 mm.; fore leg of female, femur 8·5 mm.; tibia 10 mm.; middle leg, femur 10 mm.; tibia 10·2 mm.; hind leg, femur 12 mm.; tibia 14·1 mm.

The antennae are short, light yellow, the basal enlargement of the flagellar segments with four black verticils. The wings are shown on Plate XII, fig. 28. Male hypopygium (Plate XIII, fig. 49) with the sclerites of the ninth segment fused into a ring, continuous except on the mid-ventral line of the sternite, where the edges are contiguous and carinate; pleural suture short, almost straight, slightly upcurved at the end. Ninth tergite (Plate XIV, fig. 58) moderate in size, the caudal margin concave with a very broad median lobe, whose caudal margin is squarely truncated and bifid for a short distance by a deep line; the caudal dorsal margin with numerous small black spicules; a shallow semicircular depression at the base of the median lobe. Outer pleural appendage very broad and flat, pale, almost white, the apex somewhat obliquely truncated, the outer face with short, appressed hairs that are most numerous at the cephalic dorsal angle of the lobe; inner pleural appendage showing through the translucent outer appendage as figured, complex, flattened, the apex produced into a slender darkened tip; a small tuft of yellowish hairs on the margin of the sternite just ventrad of the pleural suture.

## TIPULA ZAMBEZIENSIS, sp. n.

Coloration orange-yellow; wings yellowish-grey, the costal region more saturated; male hypopygium with the sclerites of the ninth segment fused into a ring, the tergite with two divergent flattened horns on the caudal margin.

*Male*.—Length about 14 mm.; wing 14·4 mm.

*Female*.—Length about 21 mm.; wing 15·8 mm.

Frontal prolongation of the head yellowish-orange, the nasus elongate, slender; palpi dark brown. Antennae with the scape dull orange; flagellum brown, the basal swellings of the segments darker brown; flagellar segments elongate-cylindrical, very slender, with long

verticils. Head deep brownish-orange without distinct darker markings.

Mesonotal praescutum dull orange-yellow with four stripes that are mottled orange and dark brown, the elongate middle pair almost continuous along the median line, the lateral stripes lying very close to the central pair; scutum light yellow with a greenish tinge, each lobe with two dark marks, the larger one lying caudally and nearer the median line; scutellum and postnotum dull yellow, the latter with a strong greenish tinge. Pleura clear light yellow, unmarked. Halteres dark brown. Legs with the coxae and trochanters light yellow; femora yellowish-brown, the tips darker brown; tibiae light brown, the tips narrowly darker brown; tarsi dark brown. Wings with a yellowish-grey tinge, the costal region and the stigma yellowish; veins dark brown. Venation (Plate XII, fig. 29), *Rs* short, straight, oblique; cells *R*<sub>3</sub> very small.

Abdomen with the basal segments light yellow, sub-basal segments dull yellow, indistinctly and narrowly trivittate with dark brown, the segments soon passing into a more uniform brownish. Male hypopygium (Plate XIII, fig. 53) with the sclerites of the ninth segment fused into a continuous ring except on the mid-ventral line of the sternite. Region of the ninth tergite (Plate XIV, fig. 59) with the median area slightly projecting caudad and bearing on either side of the median line a flattened subacute lobe, the space between these horns U-shaped and a little less than the diameter of a single horn; the horns divergent. Outer pleural appendage a broad flattened pale lobe that is obliquely truncated at the apex, and the outer face with rather sparse sub-appressed black bristles; inner pleural appendage more complex, consisting of a long finger-like lobe that projects cephalad, the caudal edge with a fringe of long yellow bristles. Region of the ninth sternite extensive, carinate on the mid-ventral line, the edges closely approximated. Eighth sternite unarmed.

The female has the thoracic stripes indistinct, the abdominal segments yellowish-brown, indistinctly and narrowly trivittate with darker brown; ovipositor with the tergal valves very long and slender, the apices slightly expanded; sternal valves short, deep, the tips somewhat rounded to subacute.

*Habitat.*—South Africa.

Holotype, ♂, Victoria Falls, Rhodesia, July, 1911 (L. Péringuey).

Allotype, ♀, Kafue River, Northern Rhodesia, 1906 (J. Drury).

Paratype, ♀, Krantz Kloof, Natal, January, 1915 (Marley).

Type in the South African Museum.

## TIPULA POMPOSA, Bergroth.

1888. Ent. Tidskrift., vol. 9, p. 139, fig. 4.

A male from Barberton, Transvaal, March, 1911 (H. Edwards); a female from the same station, December, 1911; a female from M'fongosi, Zululand, March, 1911 (W. E. Jones); Bergroth's type was from Caffraria.

The wing is shown on Plate XII, fig. 30.

The specimens offer the following measurements:

*Male*.—Length 19.5 mm.; wing 21.8 mm.

*Female*.—Length about 27 mm.; wing 23.8–28.2 mm.; fore legs, femur, 12.8 mm.; tibia 15.4 mm.; hind legs, femur, 14.4 mm.; tibia 18 mm.

Male hypopygium (Plate XIII, fig. 52) with the sclerites of the ninth segment fused into a ring that is continuous except on the mid-ventral line beneath; pleural suture distinct but incomplete, slightly curved at the end. Ninth tergite (Plate XIV, fig. 60) broad, the caudal margin produced medially into a slender lobe whose tip is truncated with a U-shaped notch; this lobe is concave dorsally, the lateral margins being slightly elevated, the caudal margin with numerous chitinised points which continue back on the dorsal surface of the lobe for about half its length: Pleural appendages two, the outer appendage slightly elongate-oval, the inner appendage more rounded-oval with cephalad-projecting arms. Sternal region profoundly incised on the mid-ventral line, the adjacent edges barely contiguous.

## TIPULA JOCOSA, sp. n.

Flagellum of the antennae black; head chestnut-brown with a median black stripe; thoracic stripes dull yellow, narrowly margined with dark brown; wings greyish subhyaline with sparse brownish spots and seams; cell 1st  $M_2$  large and ample.

*Female*.—Length about 25 mm.; wing 19.8 mm.

Frontal prolongation of the head reddish-brown with black dorsal and lateral lines, elongated, the nasus long and slender; palpi black, the bases and apices of the first two segments dull yellow, the remaining segments broken. Antennae short, the first scapal segment dull yellow, blackened above toward the tip; second segment brownish-black, globular; flagellar segments elongated, black, with elongated bristles. Head chestnut-brown with a well-defined median black stripe, the occiput more brownish.

Mesonotal praescutum dull yellow with four dull yellow stripes that are narrowly margined with dark brown; middle pair of stripes

narrowly separated behind, but confluent in front, where the yellow of the stripes is darkened, more greyish; lateral margin of the sclerites black, narrowed out in front and not continuous over the mid-line; scutum dull yellow, the median area and posterior portions of the lobes blackish; scutellum dull brownish-yellow, darkened behind; postnotum yellow, broadly dark brown medially. Pleura discoloured, apparently dull yellow with blackish markings. Halteres dark brown, the knob light yellow. Legs with the coxae and trochanters pale; femora brownish-yellow, the tips broadly black, a little brightened just before the tips; tibiae yellowish-brown, the tips indistinctly and narrowly brown; tarsi dark brown. Wings greyish subhyaline, the costal cell light yellow; apex of the wing greyish in cells  $R_2$ ,  $R_3$ , and base of  $R_5$ ; stigma dark brown; dark brown seams along the cord and the veins surrounding cell 1st  $M_2$ ; a brown spot at the base of the wing and a brown seam along the base of vein  $Cu$  and along the forks of this vein; a large hyaline area in cell  $M$  along vein  $Cu$ ; veins dark brown; a yellow area at the base of  $M$  and  $Cu$  and a smaller area just before the stigma. Venation (Plate XII, fig. 31),  $R_s$  very short,  $R_3$  not arcuated, as in *Ctenocroscelis*; cells 1st  $M_2$  and  $M_1$  large and full; petiole of cell  $M_1$  not as long as the basal deflection of  $Cu_1$ ; fusion of  $Cu_1$  with  $M_3$  subequal to the  $r-m$  cross-vein.

Abdominal tergites pale yellowish-brown, the basal third of the intermediate segments yellow; sternites paler basally, the apical sclerites darker.

*Habitat.*—South Africa.

Holotype, ♀, Cape Town, Cape of Good Hope (P. C. Keytel).

Type in the South African Museum.

#### TIPULA CORONATA, sp. n.

Antennae with the basal four or five flagellar segments much larger than the slender apical segments; coloration dark grey with a sparse yellowish pollen; wings brownish-grey with the stigma brown; male hypopygium with the ninth tergite having the caudal margin with an acute median notch.

*Male.*—Length 8–8.7 mm.; wing 9.5–11.4 mm.

Frontal prolongation of the head dark brown, the dorsal half abruptly yellowish, nasus prominent; palpi short, dark brown. Antennae dark brown, the scape a little paler and with a sparse greyish bloom; first four segments of the flagellum enlarged, but gradually smaller than one another, the terminal seven segments of the flagellum cylindrical, slender, approximately subequal in length and more yellowish than the basal flagellar segments. Head clear



light grey, the front more yellowish; tubercle on the vertex low with a shallow median groove and a broad V-shaped notch in front.

Thoracic dorsum blackish with a yellowish-brown bloom; two dorso-median dark brown lines on the praescutum; scutum clear grey, the lobes more brownish laterally; postnotum clear light grey with an indistinct blackish median line. Pleura light grey. Halteres elongate, dull yellow, the knobs brownish. Legs with the coxae dull yellow with a sparse whitish bloom; trochanters yellow with a blackish mark on the lower side; femora light brown, a little darkened at the tips; tibiae and tarsi brown. Wings brownish-grey, the costal cell a little more suffused; stigma distinct, but ill-defined, dark brown; a vitreous band along the cord and crossing cell 1st  $M_2$ ; veins dark brown, the veins in the path of the vitreous band and the tips of  $R_1$  and  $R_2$  pale. Venation (Plate XII, fig. 32),  $R_s$  weak, rather short; second anal short.

Abdominal tergites grey, the sternites more reddish-grey. Male hypopygium (Plate XIII, fig. 50) with the ninth tergite (Plate XIV, fig. 61) subquadrate, the caudal margin with a very deep median re-entrant angle; caudal margin densely beset with powerful black bristles; margin of the U-shaped notch pale, the inner ventral angle of each of the lateral lobes produced beneath into a blunt lobule that is armed at the tip on the outer face with three stout black teeth and several powerful bristles. Ninth pleurite small, triangular, bearing at its outer ventral angle the pleural appendages; pleural appendages consisting of a rounded knob that is densely beset with powerful short spines and numerous bristles; a flattened lobe lying distad of this knob, whose margin is armed with a crown of six or seven stout spines that are subequal in size and equidistantly spaced; a stout hair on the underside near the tip. Ninth sternite very extensive, profoundly incised on the mid-ventral line, each division powerful, bearing at the apex a small pale triangular lobe that seems to be the ninth pleurite.

In a paratype the fifth flagellar segment is a little larger than those which follow, and apparently belongs to the same series, with the four basal flagellar segments; the frontal prolongation of the head not so pale dorsally. In the two paratypes from the Winterhoek Mountains the size is very small, the smallest measurements given.

*Habitat.*—South Africa.

Holotype, ♂, South-west District, Cape Colony.

Paratopotype, ♂; paratypes, 2 ♂♂, Winterhoek Mountains, Tulbagh, Cape Colony, altitude 3600 ft., April, 1916 (R. M. Lightfoot).

Type in the South African Museum.

TIPULA CAFFRA, sp. n.

Antennae with the flagellar segments uniformly elongate-cylindrical; coloration blackish with a yellowish pollen; wings brownish-grey, the stigma and costal cell yellowish-brown; male hypopygium of simple structure, the ninth tergite extensive, profoundly incised medially by a V-shaped notch that extends about to the eighth tergite.

*Male*.—Length about 10 mm.; wing 10.6 mm.

Frontal prolongation of the head narrowed basally, dark brownish-black with a sparse greyish bloom; nasus not distinct, but the whole apex of the prolongation with an abundance of stout black bristles; palpi short, black. Antennae black with sparse tiny grey hairs; flagellar segments elongate-cylindrical, even more narrowed toward the tip of the organ. Head with the frontal tubercle not very prominent; head black with a heavy greyish-golden pollen; a blackish area on either side of the median line.

Thoracic praescutum dark with a heavy yellowish pollen and with four brown stripes, the median pair confluent in front; scutellum dull yellowish; postnotum yellow, darkened behind. Pleura with the mesopleurites dark brown with a greyish pruinosity, the metapleurites light brown, conspicuously and abruptly lighter coloured than the anterior sclerites. Halteres brownish-yellow, the knobs darker. Legs with the anterior and middle coxae dark brown, the posterior coxae brownish-yellow; trochanters brownish-yellow; femora light yellowish-brown, the tips broadly dark brown; tibiae brown, darker at the tips; tarsi dark brown. Wings brownish-grey, the costal cell and stigma light yellowish-brown; a yellowish tinge along *Cu*; a vitreous band before the cord crossing cell 1st  $M_2$  and a smaller vitreous spot beyond the stigma; veins dark brown, paler in the vitreous areas. Venation (Plate XII, fig. 33), *Rs* rather elongate, strongly angulated at its origin; second anal vein short and straight.

Abdomen with the basal segment light reddish-yellow; remaining segments black with a sparse greyish bloom. Male hypopygium of simple structure. Ninth tergite dark brown, extensive, profoundly incised medially by a V-shaped notch, this cut extending about to the eighth segment, so that the ninth tergite, viewed from above, is completely divided into two lobes, each lobe triangular, the apex subacute. Ninth sterno-pleurite smaller than the tergite, dark brown, the pleural region yellowish; appendages yellow, simple in structure; pleural suture deep, black and almost straight; sternal region profoundly incised on the mid-ventral line, the adjacent edges not contiguous.

*Habitat.*—South Africa.

Holotype, ♂, Winterhoek Mountains, Tulbagh, Cape Colony, altitude 3600 ft., 1916 (R. M. L.).

Type in the South African Museum.

GEN. NEPHROTOMA, Meigen.

1803. Illiger's Mag., vol. 2, p. 262.

1834. Macquart, Hist. Nat. des Insect.; Dipt., vol. 1, p. 88  
(*Pachyrrhina*).

The South African species of this difficult genus are still not well understood. There are eleven described species that may be considered regional, five of which (*aurantiaca*, Macquart, *petiolata*, Macquart, *delegorguei*, Macquart, *crocea*, Loew, and *capensis*, Rondani) are apparently very closely related, and I have been unable to distinguish them satisfactorily; they belong to the group of species with black thoracic stripes and the intermediate abdominal tergites with black markings of various shapes and greater or less extent. To determine these species accurately it will be necessary to have an abundance of material and to study the type-specimens where they are in existence. Unfortunately most of the species were described from female specimens, which sex shows very few of the necessary specific characters.

NEPHROTOMA UMBRIPENNIS, sp. n.

Antennal flagellum dark brown; head orange-yellow; thoracic praescutum with the median stripe chestnut margined with black; scutellum and postnotum pale; pleura spotted yellow and pale reddish; abdomen with the basal tergites unmarked medially; wings suffused with brownish; *m-cu* cross-vein beyond the fork of *M*; *Rs* somewhat elongated; cell *M*<sub>1</sub> sessile.

*Male.*—Length 14.4 mm.; wing 15.3 mm.

Frontal prolongation of the head short, pale yellow; palpi brown. Antennae moderate in length, the scape yellow, the second segment a little darker; first flagellar segment pale basally, passing into dark brown at the tip; remaining segments dark brownish-black on the basal swelling, the pedicels dark brown; first flagellar segment elongated, longer than the combined scape; remaining flagellar segments deeply incised beyond the basal swelling. Head orange, the occipital mark dark brown, very large, sending its anterior angle far up on to the frontal tubercle.

Pronotum dull yellow medially. Mesonotal praescutum dull yellow with three stripes; median stripe rich chestnut-brown, broadly

margined on each side with black, becoming indistinct before the transverse suture; lateral stripes shiny black, slightly out-curved at their anterior ends; scutum dull yellow, the lobes with the proximal half black, being caudal prolongations of the lateral praescutal stripes; scutellum and postnotum dull yellow. Pleura light yellow with pale reddish blotches, these arranged as two indistinct bands, the ventral band occupying the sternum and suffusing all the coxae; propleura brownish; sides of the postnotum largely brownish-red. Halteres brown, stem paler at the base. Legs with the coxae as described above; trochanters and femora dull yellow, the latter with the tips dark brownish-black; tibiae dark brown; tarsi broken. Wings with a strong brown or yellowish-brown suffusion, the costal cell rich yellowish; stigma pale brown, indistinct; a brown seam along *Cu*; a pale vitreous area before the stigma and at the base of cell 1st *M*<sub>2</sub>. Venation (Plate XII, fig. 34), with the point of contact between *Cu*<sub>1</sub> and *M*<sub>3</sub> underneath cell 1st *M*<sub>2</sub> as in the genus *Tipula*; *Rs* elongated, also as in *Tipula*; cell *M*<sub>1</sub> sessile as in *Nephrotoma*.

Abdomen rich orange-yellow without dorsal markings, except on the fifth to eighth tergite, where there is a rounded blackish median mark; lateral margins of the sclerites darkened; sternites with a sublinear black median mark on segment five to eight. Male hypopygium (Plate XIV, fig. 62) with the caudal margin of the ninth tergite almost straight, produced laterally into a subacute shiny tooth, medially with an obscure notch; caudal margin shiny, heavily chitinised, with about two small black teeth on each side of this notch; ninth pleurite nearly complete, the pleural suture being very long and straight, running back to the eighth segment; outer pleural appendage elongate, pale, rounded at the apex; ninth sternite profoundly incised medially, the lateral angles contiguous.

*Habitat*.—South Africa.

Holotype, ♂, South Africa, without exact locality.

Type in the South African Museum.

In the venation and the male hypopygium this form closely approaches *Tipula* and shows the close relationship between this genus and *Tipula*.

#### NEPHROTOMA EDWARDSI, sp. n.

Head orange without a distinct occipital mark; thorax dusky brown with darker stripes; abdomen orange-yellow, the apical segments, including the hypopygium, blackish; legs black except at the extreme bases of the femora.

*Male*.—Length 14.5 mm.; wing 14.7 mm.

Frontal prolongation of the head short, orange; palpi brown. Antennae with the first scapal segment orange, second segment dull yellow; first flagellar segment dull yellow, pale with a dense pale pubescence; remainder of the antennae broken. Head bright orange, the frontal tubercle large and high; occipital mark not apparent.

Pronotum brown. Mesonotal praescutum brown with three ill-defined dark brown stripes that are not conspicuous on this dark background; anterior ends of the lateral stripes capped by a velvety-black mark; scutum pale brown with the lobes dark brown, at the outer cephalic angle with a velvety-black spot; scutellum and postnotum pale brown. Pleura brown with scattered darker brown markings. Halteres short, dark brown, the extreme bases paler. Legs with the coxae brown; trochanters dull yellow; femora black, the extreme bases a little brighter; tibiae and tarsi black. Wings with a pale grey tinge, the costal cell rather dark brown; stigma dark brown; a brownish seam along *Cu*, *Rs*, *R*<sub>2</sub>, *R*<sub>3</sub> and *R*<sub>4+5</sub>; veins black. Venation (Plate XII, fig. 35), *Rs* rather elongate for this genus of flies; *m-cu* at the fork of *M*; cell *M* rather broadly to merely sessile.

Abdominal tergites dull orange-yellow, brightest at the base, on the sixth segment passing into brownish-black; apical segments, including the hypopygium, blackish; lateral margins of the tergites narrowly black; sternites colored about as on the tergites. Male hypopygium with the ninth tergite black, the caudal margin with a deep U-shaped notch. Abdomen with numerous appressed hairs, more elongate and prominent toward the end of the organ.

*Habitat*.—South Africa.

Holotype, ♂, Barberton, Transvaal, October, 1911 (H. Edwards).

Type in the South African Museum.

This interesting *Nephrotoma* is dedicated to its discoverer.

#### NEPHROTOMA STRENUA, sp. n.

Head orange without a dark occipital mark; antennae elongated, flagellum bicolorous; thorax with black stripes; abdomen dull brownish-yellow, toward the apex with an indistinct blackish annulus; hypopygium yellowish.

*Male*.—Length 14.5 mm.; wing 16 mm.; antennae about 9 mm.

Frontal prolongation of the head short, yellow; palpi brown, the extreme tip of the last segment yellowish. Antennae with the first scapal segment orange; flagellar segments with the basal enlargement light brown, the pedicels brownish-yellow; flagellar segments elongated, rather deeply incised beneath. Head yellow on the front and

genae, more saturated, orange-yellow, on the vertex and occiput; occipital mark not apparent.

Pronotum brownish-orange. Mesonotal praescutum brownish-yellow with three shiny black or brownish-black stripes that are nearly confluent; middle stripe broadest in front, narrowed to an indistinct point behind, indistinctly split by a reddish line; anterior ends of the lateral stripes capped by an opaque black mark; scutum brown with the lobes darker; scutellum and postnotum brownish-yellow, the latter more brightened. Pleura marked with yellow and reddish-brown. Halteres light brown, the knobs darker brown. Legs with the coxae yellowish-brown provided with numerous long yellow hairs; trochanters dull yellow; femora dull brownish-yellow, narrowly tipped with dark brown; tibiae yellowish-brown, darkened at their apices; tarsi broken. Wings with a strong brownish-yellow tinge, the costal cell very little brighter; stigma oval, dark brown; apex of the wings and vein *Cu* a little infuscated; a broad seam along the basal deflection of  $R_4 +_5$  and *r-m*. Venation (Plate XII, fig. 36), *Rs* short, oblique; cell  $M_1$  sessile; fusion of  $Cu_1$  with *M* before the fork of the latter vein.

Abdominal tergites dull brownish-yellow, the lateral margins of the segments broadly blackish; on the sixth to eighth segments broader and including the caudal margins of the segments; hypopygium yellowish; sternites six and seven and the lateral portions of eight black, the remainder orange-yellow. Male hypopygium (Plate XIV, fig. 63) with the ninth tergite dull yellow, with the caudal margin deeply rounded by a U-shaped notch, the caudal margin chitinised; pleural suture elongate, curved slightly dorsad at its tip; outer pleural appendage not large, the apex not produced, rather blunt. Abdomen with rather dense yellow hairs, on the basal segments short and appressed, longer toward the tip of the organ, on the eighth sternite very conspicuous.

Habitat.—South Africa.

Holotype, ♂, St. Matthew's, King William's Town District, South-east Cape Colony, 1894 (R. Lightfoot).

Type in the South African Museum.

*NEPHROTOMA UNICINGULATA*, sp. n.

Antennal flagellum dark brown; head light yellow; thorax with black stripes, scutellum and postnotum pale; abdomen unmarked on the mid-dorsal line, but with a black subterminal ring; wings pale yellowish with a slight suffusion at the apex and a seam on the basal deflection of  $R_4 +_5$ ; extreme apices of cells  $R_5$  and  $M_1$  sparsely pubescent.

*Male*.—Length 13·7 mm. ; wing 15 mm.

*Female*.—Length 21 mm. ; wing 16·5 mm.

Frontal prolongation of the head very short, light yellow, the nasus elongate ; palpi pale brown. Antennae moderately elongated ; scape yellow ; flagellar segments dark brown toward the tip of the organ ; basal swelling of the individual segments a little darker than the pedicels ; segments of the flagellum a little constricted beyond the base. Head light yellow ; frontal tubercle low, entire, at its base along the inner margin of the eyes a small brown spot ; occipital blotch elongate-triangular, dark brown.

Pronotum clear, light yellow dorsally, unmarked. Mesonotal praescutum dull yellow with three black shiny stripes ; lateral stripes curved outwards at their anterior ends ; scutal lobes shiny black ; scutellum and postnotum dull yellow, brownish black on the sides, slightly darkened caudally. Pleura pale with a whitish cast, indistinctly marked with yellow ; an elongate dark brown mark on the propleura. Halteres yellow, the knobs brown with the apices paler. Legs with the coxae pale yellow ; trochanters and femora dull yellow, the latter broadly dark brown at their tips ; tibiae and tarsi dark brown. Wings with a yellowish or greyish-yellow tinge, the costal cell a little brighter ; stigma distinct, oval, dark brown ; a brown seam along the basal deflection of  $R_4+5$  and at the tip of the wing in cells  $R_3$  and  $R_5$  ; a sparse short pubescence in the apices of cells  $R_5$  and  $M_1$  and on the stigma. Venation as on Plate XII, fig. 37.

Abdomen light yellow, the basal third of the first tergite brownish ; a black band near the tip of the abdomen, including all of segment seven, the apex of the sixth tergite, the extreme base of the eighth tergite and the eighth sternite ; an indistinct brownish spot on the extreme lateral margins of the basal segments ; hypopygium yellow. Male hypopygium with the ninth tergite (Plate XIV, fig. 65) rather short, broad ; caudal margin with a U-shaped notch, lateral angles beneath produced into blunt darkened lobes that are roughened and carunculated ; caudal margin of the incision beneath is darkened, provided with numerous small acute teeth ; a small rounded median notch ; pleural suture prominent, curved strongly dorsad at its tip ; outer pleural appendage pale, elongated, the tip attenuated.

In the female the black abdominal band occupies the seventh and the apical two-thirds of the sixth tergites, and the lateral margins of the tergites are broadly dark brown, folded over the sternites ; valves of the ovipositor slender.

*Habitat*.—South Africa.

Holotype, ♂, Malvern, Natal, 1901 (C. N. Barker).

Allotype, ♀, Overbeck, Mossel Bay, Cape Colony, 1897.

Paratypes, ♂, with the allotype; ♀, Barberton, Transvaal, April, 1911 (H. Edwards).

Type in the South African Museum.

NEPHROTOMA ANTENNATA, Wiedemann.

1821. Wiedemann, *Diptera Exotica*, vol. 1, p. 53 (*Tipula*).

1828. Wiedemann, *Aussereur. Zweifl. Ins.*, vol. 1, p. 53 (*Tipula*).

1888. Bergroth, *Ent. Tidskrift*, vol. 9, p. 140 (*Pachyrrhina*).

Bergroth's specimen (No. 1), without locality, but in the paper cited above given as "Cape Town." The specimen is a male measuring 12.4 mm. in length, and the wing 13.5 mm.

The wing is shown on Plate XII, fig. 38.

The coloration of the thorax, well described by Bergroth, offers a very good specific character; the middle thoracic stripe is not as dark in colour as the lateral stripes and is narrowed toward the caudal end, not attaining the transverse suture; the opaque black line surrounds the lateral stripe except a small portion on the outside; the same intense marking occupies the lateral portions of the transverse suture and runs caudad as a small spot above the wing-root; postnotum with a distinct brown median mark. Hypopygium with the ninth tergite (Plate XIV, fig. 64) short, broad, the caudal margin with a very broad and deep U-shaped notch with a low, obtuse, median tooth; outer pleural appendage pale, large, very conspicuous.

NEPHROTOMA TIGRINA, sp. n.

Head orange, occipital mark distinct; thorax yellow with black stripes, the median stripe paler centrally; abdomen with the tergites banded; hypopygium yellowish and black.

*Male*.—Length 13.6 mm.; wing 12.4 mm.; antennae about 6 mm.

*Female*.—Length 16 mm.

Frontal prolongation of the head short, nasus slender; palpi yellowish-brown, darker toward the tip. Antennae moderately elongated; first segment orange; second segment brown; flagellum black, the base of the first segment a little paler; flagellar segments rather feebly incised beyond the basal swelling. Head orange, more yellowish on the genae; a large rounded blackish spot near the base of the frontal tubercle and adjoining the inner margin of the eye; occipital triangle prominent, shiny, dark brown.

Pronotum obscure yellowish dorsally. Mesonotal praescutum shiny yellow with three black stripes, the median stripe with the central



portions paler, brownish or brownish-yellow; lateral stripes very broad, especially anteriorly; scutum obscure yellowish medially, the lobes largely shiny black; scutellum obscure yellowish-brown, almost black caudally; postnotum with the dorsal median portions conspicuous light yellow, the caudal third almost black; lateral portions of the postnotum black with a conspicuous oval, light yellow mark just before the base of the halteres. Pleura with the lateral margins of the propleura brownish; remainder of the pleura brownish-red with conspicuous light yellow marks as follows: On the dorsal half of the mesosternum, interrupted above the middle coxae; on the mesepimeron and metaepisternum, and a more obscure blotch on the dorsal portions of the mesepimeron underneath the wing-root. Halteres brown, the tips of the knobs a little brighter. Legs with the coxae and trochanters brownish-red; anterior femora black, the basal quarter brighter, reddish-brown; posterior femora yellowish-brown, broadly tipped with blackish; tibiae brown, narrowly darkened at their tips; tarsi brown. Wings with a strong yellowish tinge, the costal cell a little suffused; stigma conspicuous, dark brown; a broad, light brown seam along the basal deflection of  $R_4+5$  and the  $r-m$  cross-vein; apex of the wing broadly suffused with brown. Venation (Plate XII, fig. 39), cell  $M_1$  short-petiolate.

Abdominal segments brownish-yellow, the basal tergite black; segments two and three with a broad, black, caudal margin that is continued back up the sides of the segments for a short distance; segments six to eight largely black; hypopygium black with the outer pleural appendage conspicuously brownish-yellow. Hypopygium (Plate XIV, fig. 67) with the ninth tergite large, the caudal margin with a prominent U-shaped notch, the lateral lobes shiny, smooth; caudal margin blackened, medially with a deep, rounded incision and with abundant black spicules that are most numerous at the opening of the lesser incision, more sparse and scattered on the dorsal portions of the sclerite; outer pleural appendage large, conspicuous, the tip drawn out in a long point; ninth pleurite not complete, the pleural suture rather long, curved dorsad at its cephalic end.

The female is similar to the male, differing as follows: antennae shorter; black bands on the abdomen broadest on segments one to three, successively narrower on four and five, complete and very intense on six and seven; segments eight and nine, including the ovipositor, yellowish; lateral margins of the tergites black excepting the basal half of segment two; sternites dull yellow except on segment seven, which is largely black.

*Habitat.*—Portuguese East Africa.

Holotype, ♂, Lourenço Marquez, Portuguese East Africa, February 13th, 1909 (C. W. Howard).

Allotype, ♀, topotypic, 1911 (J. B. Paulus).

Paratopotypes, 2 ♂♂.

The type is in the collection of the United States National Museum, the allotype in the South African Museum.

In the structure of the hypopygium it most closely resembles *N. umbripennis*, sp. n., and *N. tincta*, Walker, as described below.

#### NEPHROTOMA TINCTA, Walker.

1856. Ins. Saunders., vol. 1, Dipt., p. 444 (*Tipula*).

One male and one female, Barberton, Transvaal, April, 1911 (H. Edwards); a female from the same locality, November, 1911.

The specimens offer the following measurements:

*Male.*—Length 11 mm.; wing 10·3 mm.

*Female.*—Length 15·8 mm.; wing 12·4 mm.

This beautiful species much resembles *N. tigrina*, sp. n., but is a much darker species in all respects; the praescutal stripes are very broad, further restricting the ground-colour; pleura and coxae black, excepting a bright yellowish-white mark on the lateral portions of the postnotum, and more yellowish spots on the mesepimeron. The legs are black, excepting the basal quarter of the femora and the trochanters, which are yellowish; wings strongly suffused with blackish, the venation as shown on Plate XII, fig. 40. Abdomen with the subterminal black ring occupying all of segments six to eight and the caudal portion of the fifth tergite; ninth tergite dark yellowish-brown, the outer pleural appendages conspicuously bright yellow. Hypopygium with the ninth tergite (Plate XIV, fig. 66) of the same general structure as in *N. tigrina*, but the lateral lobes much broader and stouter, so that the caudal notch is more V-shaped, the median incision large, rounded; caudal margin with an abundant pale pubescence that conceals the chitinised teeth beneath; outer pleural appendage elongate, the tip drawn out into a long point.

#### NEPHROTOMA PETIOLATA, Macquart.

1838. Macquart, Dipt. Exotiq., vol. 1, pt. 1, p. 49 (*Pachyrrhina*).

1888. Bergroth, Ent. Tidskrift, vol. 9, p. 140 (*Pachyrrhina*).

The following specimens in the collection:

♀, Hex River Mountains, Worcester, Cape Colony, 1886 (L. Péringuey), bearing Bergroth's number 8.

Two ♀ ♀, Natal.

♂, Pilgrim's Rest, Transvaal (Miss Schunke).

♂, Machike, Rhodesia, August, 1913.

The specimens measure as follows :

*Male*.—Length 11 mm. ; wing 11 mm.

*Female*.—Length 17 mm. ; wing 13 mm.

The occipital mark sends a narrow line forward almost to the tip of the frontal tubercle. Hypopygium with the ninth tergite nearly as in *N. tincta*, the median notch small, the caudal margin with numerous black spicules.

The wing is shown on Plate XII, fig. 41.

EXPLANATION OF THE PLATES.

PLATE X.

FIG.

- 1.—Wing of *Ptychoptera capensis* sp. n. (Upper left-hand corner.)
- 2.—Wing of *Dicranomyia lightfooti* sp. n. (Upper right-hand corner.)
- 3.—Wing of *D. tipulipes* Karsch.
- 4.—Wing of *D. marleyi* sp. n.
- 5.—Wing of *Rhipidia afra* Bergroth.
- 6.—Wing of *Libnotes capensis* sp. n.
- 7.—Wing of *Rhamphidia capensis* sp. n.
- 8.—Wing of *Elephantomyia aurantiava* sp. n.
- 9.—Wing of *Styringomyia vittata* Edwards.
- 10.—Wing of *Atarba capensis* sp. n.
- 11.—Wing of *Erioptera (Empeda) bonae spei* sp. n.
- 12.—Wing of *E. (Erioptera) peringueyi* Bergroth.
- 13.—Wing of *Trimicra inconspicua* Loew.
- 14.—Wing of *Podoneura anthracogramma* Bergroth.

PLATE XI.

FIG.

- 15.—Wing of *Gnophomyia elegans* Wiedemann.
- 16.—Wing of *Gonomyia (Gonomyia) spuria* Bergroth.
- 17.—Wing of *G. (Gonomyella) natalensis* sp. n.
- 18.—Wing of *G. (G.) brevifurca* sp. n.
- 19.—Wing of *Limnophila transvaalica* sp. n.
- 20.—Wing of *L. frugi* Bergroth.
- 21.—Wing of *Dolichozeza (Trichodolichozeza) hirtipennis* sp. n.
- 22.—Wing of *Leptotipula limnophiloides* sp. n.
- 23.—Wing of *Megistocera bicauda* Speiser.
- 24.—Wing of *M. hirsuta* sp. n.
- 25.—Wing of *Longurio bonae spei* Bergroth.
- 26.—Wing of *L. minusculus* sp. n.
- 27.—Wing of *Ctenacroscelis alborittatus* Macquart.

PLATE XII.

FIG.

- 28.—Wing of *Tipula soror* Wiedemann.
- 29.—Wing of *T. zambeziensis* sp. n.
- 30.—Wing of *T. pomposa* Bergroth.
- 31.—Wing of *T. jocosa* sp. n.
- 32.—Wing of *T. coronata* sp. n.

- 33.—Wing of *T. caffra* sp. n.  
 34.—Wing of *Nephrotoma umbripennis* sp. n.  
 35.—Wing of *N. edwardsi* sp. n.  
 36.—Wing of *N. strenua* sp. n.  
 37.—Wing of *N. unicingulata* sp. n.  
 38.—Wing of *N. antennata* Wiedemann.  
 39.—Wing of *N. tigrina* sp. n.  
 40.—Wing of *N. tincta* Walker.  
 41.—Wing of *N. petiolata* Macquart.

## PLATE XIII.

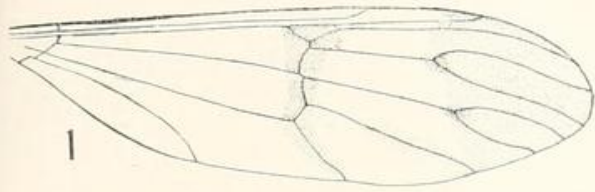
FIG.

- 42.—Ovipositor of *Megistocera bicauda* Speiser; lateral aspect.  
 43.—Hypopygium of *Leptotipula limnophiloides*; lateral aspect; 8 *t*, 9 *t* = tergites; 9 *pl. st.* = pleuro-sternite.  
 44.—End of nasus of *Tipula chionoides*; dorsal aspect.  
 45.—Hypopygium of *Platylinobia barnardi* sp. n.; dorsal aspect of the pleurite.  
 46.—Hypopygium of *Styringomyia vittata*; dorsal aspect.  
 47.—Hypopygium of *S. vittata*; ventral aspect.  
 48.—Hypopygium of *Longurio bonae spei*; lateral aspect. Lettering as in fig. 43.  
 49.—Hypopygium of *Tipula soror*; lateral aspect. Lettering as in fig. 43.  
 50.—Hypopygium of *T. coronata*; dorsal aspect of the pleural appendages.  
 51.—Hypopygium of *Longurio minusculus*; lateral aspect. Lettering as in fig. 43.  
 52.—Hypopygium of *Tipula pomposa*; lateral aspect.  
 53.—Hypopygium of *T. zambeziensis*; lateral aspect.

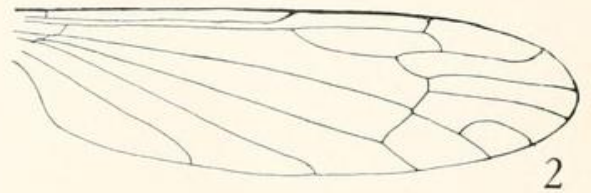
## PLATE XIV.

FIG.

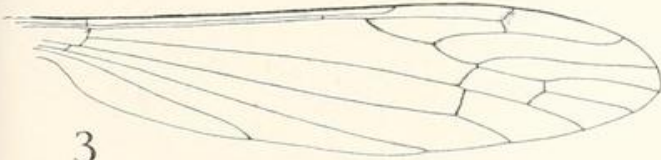
- 54.—Hypopygium of *Leptotipula limnophiloides*; ninth tergite, dorsal aspect.  
 55.—Hypopygium of *Longurio bonae spei*; ninth tergite, dorsal aspect.  
 56.—Hypopygium of *L. minusculus*; ninth tergite, dorsal aspect.  
 57.—Hypopygium of *Ctenacroscelis albovittatus*; ninth tergite, dorsal aspect.  
 58.—Hypopygium of *Tipula soror*; ninth tergite, dorsal aspect.  
 59.—Hypopygium of *T. zambeziensis* ninth tergite, dorsal aspect.  
 60.—Hypopygium of *T. pomposa*; ninth tergite, dorsal aspect.  
 61.—Hypopygium of *T. coronata*; ninth tergite, dorsal aspect.  
 62.—Hypopygium of *Nephrotoma umbripennis*; ninth tergite, dorsal aspect.  
 63.—Hypopygium of *N. strenua*; ninth tergite, dorsal aspect.  
 64.—Hypopygium of *N. antennata*; ninth tergite, dorsal aspect.  
 65.—Hypopygium of *N. unicingulata*; ninth tergite, dorsal aspect.  
 66.—Hypopygium of *N. tincta*; ninth tergite, dorsal aspect.  
 67.—Hypopygium of *N. tigrina*; ninth tergite, dorsal aspect.



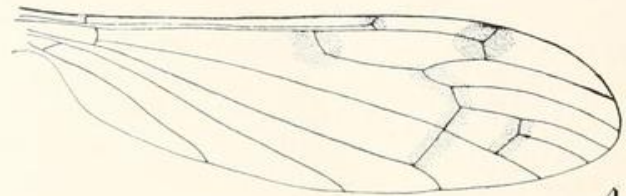
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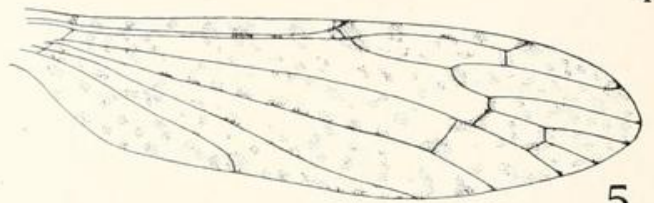
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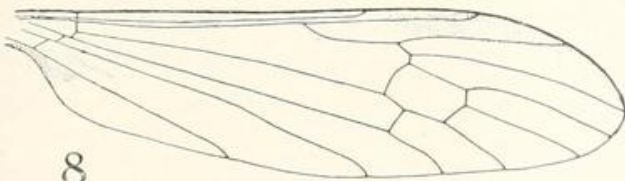
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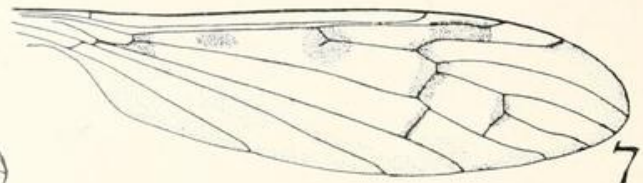
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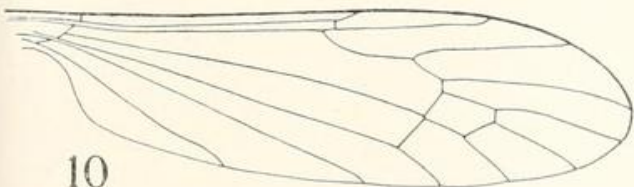
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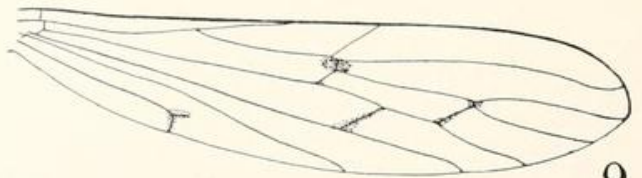
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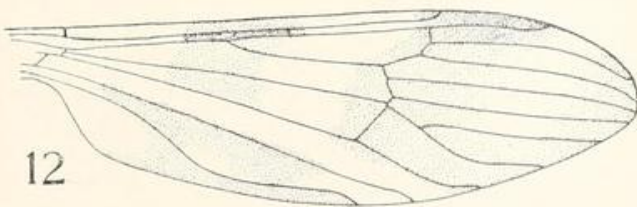
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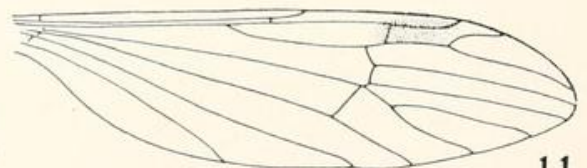
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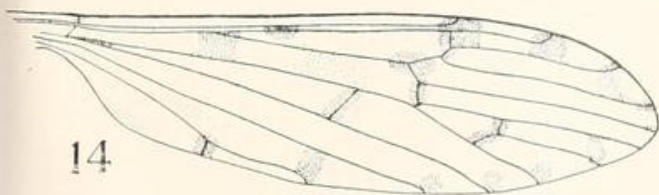
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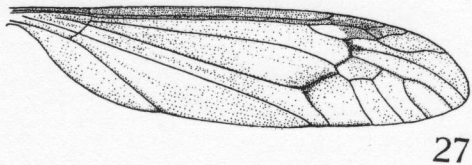
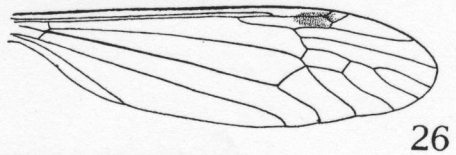
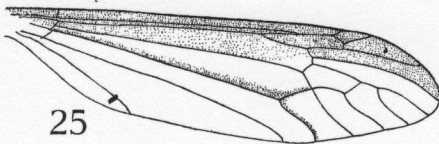
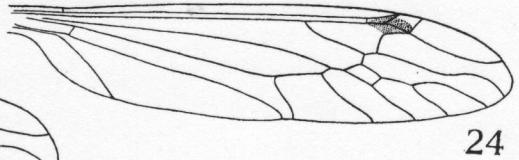
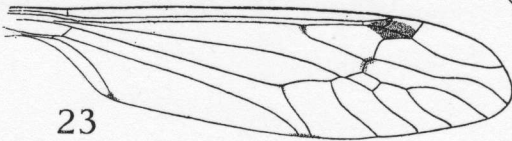
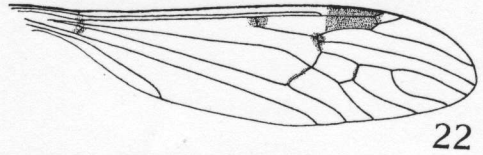
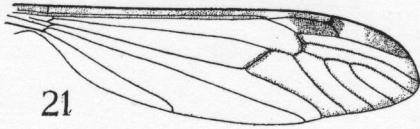
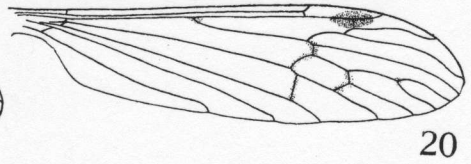
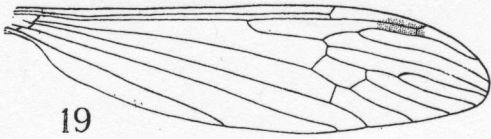
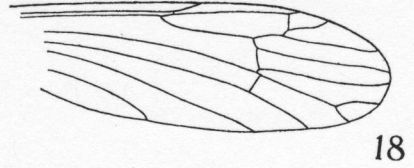
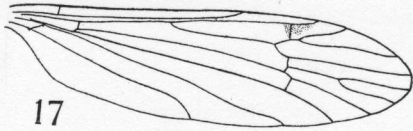
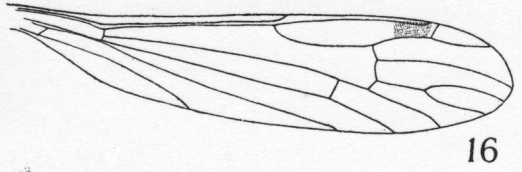
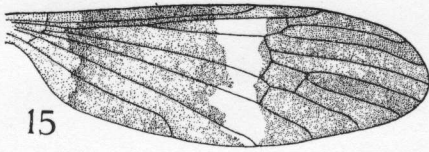
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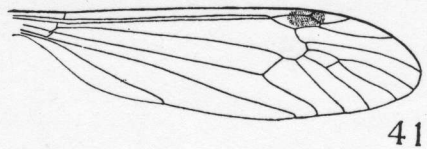
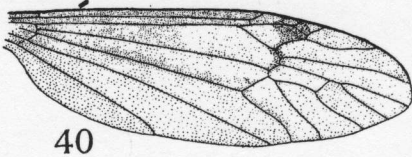
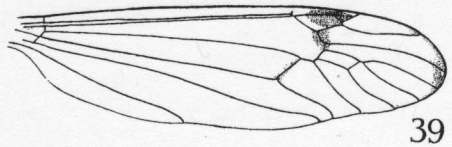
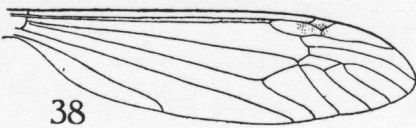
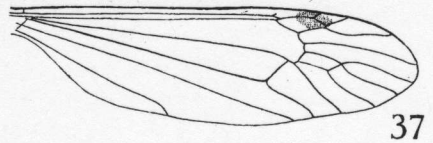
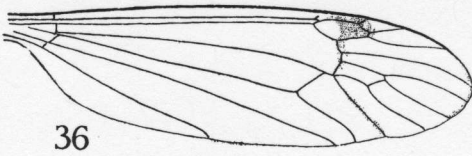
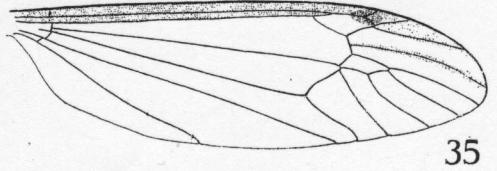
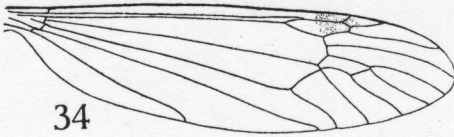
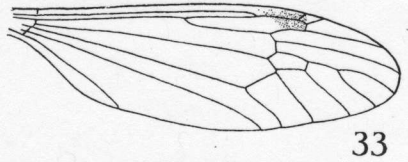
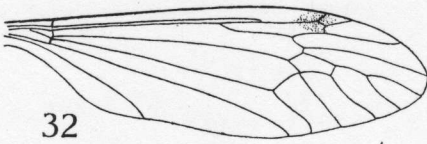
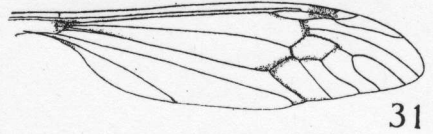
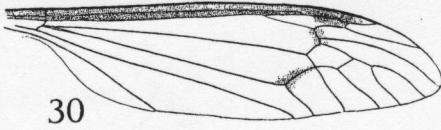
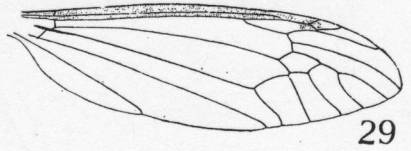


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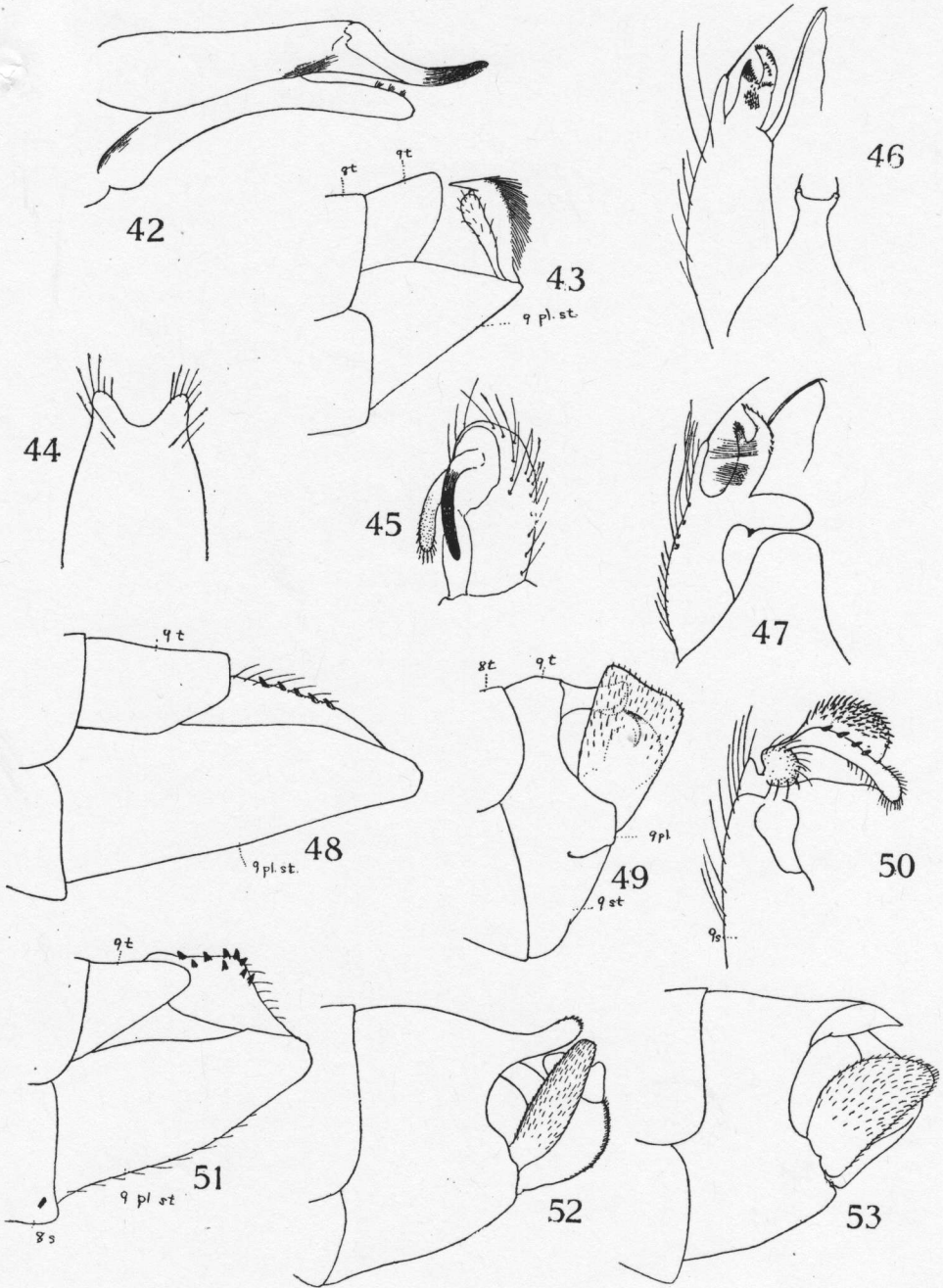


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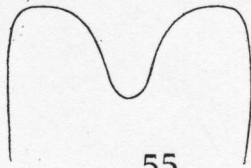




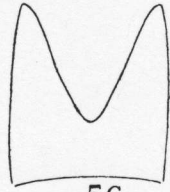




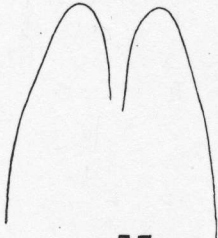
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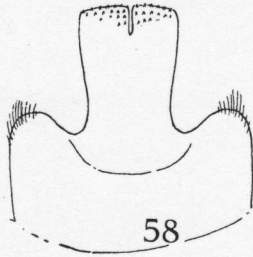
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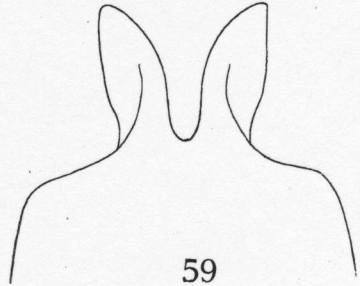
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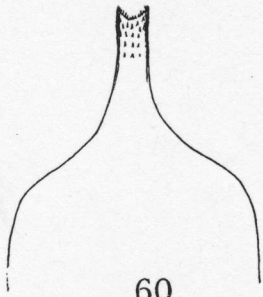
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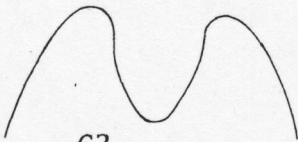
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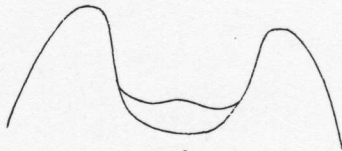
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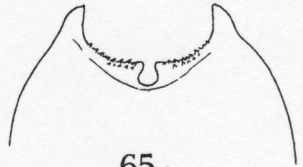
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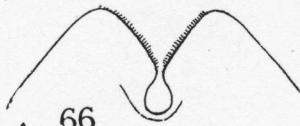
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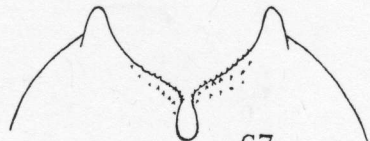
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