

NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN  
ASIA (DIPTERA), LVII

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# NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN ASIA (DIPTERA), LVII

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## FIVE PLATES

Now I am continuing the study of the great collections of crane flies that were made in many parts of Pakistan, India and Ceylon, by Dr. Fernand Schmid. In this report I am considering species in two important genera belonging to the Limoniini, *Limonia* Meigen and *Orimarga* Osten Sacken.

The materials that were taken by Schmid in Sikkim in 1959, totalling about 10,000 specimens, nearly 20 per cent had been damaged to some extent by the work of a fungus that had destroyed the internal soft parts causing the heads and genitalia to drop off. Many of such damaged specimens have been mounted on microscope slides and so preserved but others, including evident new species, were in such condition that they could not be saved.

### Genus LIMONIA Meigen

*Limonia* MEIGEN, Illiger's Mag. 2 (1803) 262.

*Limonia* is the largest genus in the family as presently known, with more than 1,500 species. In an earlier part of the present series of papers [Asia, LV (1965)] I had reviewed the status of the genus and listed the subgeneric groups as recognized. Since that date a few additions have been proposed and are given here in order to bring the record of date:

*Neolimonia* Alexander, 1964—(type *eiseni* Alexander) Neotropical.

Bull. Inst. Jamaica, Science Ser. 14 (1964) 28-29.

*Cænoglochina* Alexander, 1964—(type *apicata* Alexander) Neotropical, southern Nearctic. Bull. Inst. Jamaica Ser. 14 (1964) 31.

*Achyrolimonia* Alexander, 1965—(type *trigonia* Edwards) Holarctic, Ethiopian, Oriental. Trans. Amer. Ent. Soc. 91 (1965) in press.

*Afrolimonia* Alexander, 1965—(type *rhizosema* Speiser) Ethiopian. Trans. Amer. Ent. Soc. 91 (1965) in press.

*Tricholimonia* Alexander, 1965—(type *congoensis* Alexander) Ethiopian. Trans. Amer. Ent. Soc. 91 (1965) in press.

*Eurhiphidiia* Alexander, 1965—(type *productiva* Alexander, 1942, as *rostrifera* Edwards, preoccupied) Eastern Palaearctic, Ethiopian, Oriental. Trans. Amer. Ent. Soc. 91 (1965) in press.

*Hesperolimonia* Alexander, 1966—(type, *infuscata* Doane) Western Nearctic. Trans. Amer. Ent. Soc. 92 (1966) in press.

LIMONIA (DICRANOMYIA) KALKI sp. nov.

Plate 1, figs. 1, 15.

Size large (wing of male 11 millimeters or more); general coloration of præscutum dark brown; antennæ short, flagellar segments bicolored, bases obscure yellow, tips more broadly dark brown; wing obscure yellow, with an extensive brown pattern; male hypopygium with tergal setæ relatively sparse and weak; basistyle with ventromesal lobe small, directed cephalad; dorsal dististyle broad on basal half, the outer end a long straight rod; rostral prolongation of ventral dististyle terminating in four flattened chisel-like spinoid setæ; surface of ædeagus with abundant setulæ.

*Male*.—Length, about 9.5 to 10 millimeters; wing, 11 to 11.5; antenna, about 1.5.

*Female*.—Length, about 9.5 millimeters; wing, 12.

Rostrum dark brown, palpi black. Antennæ with scape and pedicel brown, flagellar segments bicolored, obscure yellow basally, with slightly more than the outer half dark brown; segments oval, slightly longer than their verticils; terminal segment longer than the penultimate. Head brownish gray; anterior vertex narrow.

Pronotum light brown. Mesonotal præscutum almost uniformly dark brown, the three præscutal stripes being virtually confluent; scutal lobes darkened, median region and scutellum testaceous yellow; mediotergite dark brown, pleurotergite paler. Pleura buffy yellow to darker brown. Halteres with stem whitened, the large knob infuscated. Legs with coxæ testaceous, fore pair darker; trochanters obscure yellow; remainder of legs pale brown, femoral bases narrowly more yellowed, outer tarsal segments darker; claws with a major outer spine and about four crowded basal denticles. Wings (Plate 1, fig. 1) obscure yellow with an extensive brown pattern, including four larger costal areas that are subequal in extent to the interspaces, the third including tip of  $Sc_1$  and origin of  $Rs$ , the fourth being the stigma, its center slightly paler, confluent with a major area at fork of  $Rs$ ; similar but narrower brown seams over cord, outer end of cell 1st  $M_2$ , vein  $Cu$  and the axillary angle; outer veins very narrowly bordered by darker, including about the distal third of  $M$ ; veins yellow in the ground areas, brown in the clouded parts. Venation:  $Sc_1$  ending a short distance beyond origin of  $Rs$ ,  $Sc_2$  far retracted, lying in the

second darkened costal area  $Sc_1$ : about one-half longer than  $Rs$ ; m-cu variable in position, before the fork of  $M$  in the type, shortly beyond in the paratype.

Abdomen dark brown, styli of hypopygium slightly brightened. Male hypopygium (Plate 1, fig. 15) with the tergite,  $t$ , relatively long but transverse, broadest across base; posterior border with a broad V-shaped emargination; lobes low, with relatively sparse weak setæ. Basistyle,  $b$ , with ventromesal lobe small, directed cephalad, as figured. Dorsal dististyle,  $d$ , broad on basal half, outer end bent at a right angle, narrowed very gradually to the obtuse and slightly recurved tip; ventral style large and fleshy, its area not quite twice that of the basistyle; rostral prolongation terminating in four flattened chisel-like spinoid setæ; rostral spines placed close together on face of prolongation below midwidth. Gonapophysis,  $g$ , with mesal-apical lobe slender, curved gently to the acute tip.  $\text{\AA}$ edeagus relatively stout, apex bilobed, surface with very abundant delicate setulæ.

*Habitat*.—Sikkim.

Holotype, male, Thomphyak, 12,800 feet, in *Rhododendron* association, May 29, 1959 (*Schmid*). Allotopotype, female, pinned with type. Paratopotype, 1 male, pinned with type.

The closest relative of the present fly is the smaller *Limonia* (*Dicranomyia*) *nakula* Alexander which has the wings unpatterned or virtually so. The somewhat peculiar ventromesal lobe of the basistyle and the armature of the rostral prolongation are much the same but other structures are distinct, including the tergite, dorsal dististyle, the small ventral style and the  $\text{\AA}$ edeagus.

LIMONIA (DICRANOMYIA) VACCHA sp. nov

Plate 1, figs. 2, 16.

General coloration of thoracic notum yellowish, pattered with brown including three præscutal stripes, pleura dark brown; wings pale yellow, patterned with brown, including four large costal areas,  $Sc_2$  far retracted; male hypopygium with posterior border of tergite with a deep V-shaped emargination; basistyle with ventromesal lobe suboval, with numerous short spinoid setæ; dorsal dististyle with tip recurved, ventral style with rostral prolongation very small, spines placed close together;  $\text{\AA}$ edeagus distinctive, before apex dilated into a burl-like enlargement with conspicuous setæ.

*Male*.—Length, about 9.5 millimeters; wing, 10; antenna, about 1.3.

Rostrum relatively long, dark brown; palpi small, black. Antennæ black throughout; flagellar segments oval, longer

than their verticils. Head dark brownish gray behind, lighter gray in front; anterior vertex elevated, the condition presumably caused by drying, its width about twice the diameter of scape.

Pronotal scutum dark brown, obscure brownish yellow on sides, scutellum light yellow. Mesonotal præscutum with the ground restrictedly yellowish gray, with three broad brown stripes, the median one darker in front, sides of sclerite brown; scutal lobes brown, median region and scutellum more yellowed; mediotergite yellowish brown, pleuroterite darkened ventrally. Pleura dark brown, dorsopleural membrane buffy. Legs with fore coxæ dark brown, remaining coxæ obscure yellow; trochanters pale green; femora light brown, tibiæ and tarsi brownish yellow, outer tarsal segments darker; claws relatively small, nearly straight, basal spine long. Wing (Plate 1, fig. 2) pale yellow, conspicuously patterned with brown, including four large costal areas that are subequal to their interspaces, the first darkening at base, third over  $Sc_1$  and origin of Rs, the fourth at stigma, confluent with a major area at fork of Rs; further broad darkened seams over cord, outer end of cell 1st  $M_2$  and along vein Cu in cell M; wing tip suffused, veins  $M_1$  to 2nd A at margin with darkened seams, largest on the Anal veins, including also the axillary angle; veins yellow, light brown in the patterned parts. Venation;  $Sc_1$  ending shortly beyond origin of Rs,  $Sc_2$  very far retracted; m-cu about four-fifths its length before fork of M.

Abdomen dark brown, ventral dististyles of hypopygium more yellowed. Male hypopygium (Plate 1, fig. 16) with the tergite, *t*, long, about as broad as the greatest length; posterior border with a deep V-shaped emargination forming relatively narrow darkened lobes that are fringed with abundant long yellow setæ, those near base of notch shorter. Basistyle, *b*, in area a little smaller than the ventral dististyle; ventromesal region conspicuously produced, terminating in a suboval darkened structure that is provided with numerous short spinoid setæ, toward base of knob longer and more normally setoid. Dorsal dististyle, *d*, a yellow sickle, apex very strongly recurved; ventral style with rostral prolongation very small, its apex with two or three upturned modified flattened setæ; rostral spines two, longer than the prolongation, placed close together at near midlength of upper margin of prolongation. Gonapophysis, *g*, with mesal-apical lobe flattened, the decurved tip short.  $\mathcal{A}$ Edeagus, *a*, distinctive, relatively long, before apex

dilated into a burl-like enlargement that is provided with conspicuous setæ.

*Habitat*.—Sikkim.

Holotype, male, Thomphyak, 12,800 feet, in *Rhododendron* association, May 29, 1959 (*Schmid*).

*Limonia* (*Dicranomyia*) *vaccha* suggests various other regional species, including *L. (D.) mecogastra* Alexander and *L. (D.) nakula* Alexander, being readily distinguished by the hypopygium, including the tergite, basistyle, both dististyles and, especially, the ædeagus.

LIMONIA (DICRANOMYIA) VEDA sp. nov.

Plate 1, fig. 3; Plate 2, fig. 17.

Size medium (wing of male 8.5 millimeters); thorax yellow, præscutum with a conspicuous brown central stripe; legs brownish yellow; wings yellowish subhyaline, virtually unpatterned; male hypopygium large and very complex in structure, including the basistyle and ventral dististyle; rostral prolongation large, sclerotized, the broad apex truncated to slightly emarginate.

*Male*.—Length, about 7.5 to 7.6 millimeters; wing, 8.5 to 8.7; antenna, about 1.1 to 1.2.

*Female*.—Length, about 8 millimeters; wing, 10.

Rostrum obscure yellow; palpi brownish black. Antennæ relatively short, dark brown, incisures of intermediate flagellar segments pale; segments oval, subequal to their verticils. Head light gray; anterior vertex relatively broad, about one and one-half times the diameter of scape.

Pronotum dark brown, more yellowed on sides. Mesonotum yellow, præscutum with a conspicuous brown central stripe, broader and more intense in front, narrowed behind, becoming obsolete far before suture. Pleura yellow. Halteres broken. Legs with coxæ and trochanters yellow; remainder of legs brownish yellow, outer tarsal segments darker; claws with a single major spine. Wings (Plate 1, fig. 3) yellowish subhyaline, virtually unpatterned, only the stigma barely indicated, very pale brown; veins pale brown. Longitudinal veins beyond general level of origin of Rs with macrotrichia, including also the outer fourth of 2nd A. Venation: Sc<sub>1</sub> ending about opposite origin of Rs, Sc<sub>2</sub> faint, far retracted; m-cu shortly before fork of M.

Abdominal tergites dark brown, sternites pale, the large hypopygium chiefly dark brown. Male hypopygium (Plate 2, fig. 17) with the tergite, *t*, long-transverse, posterior border gently emarginate, lobes very low with numerous very long

pale setæ. Basistyle, *b*, with mesal lobe very large and conspicuous, black and flattened, with abundant delicate setæ and fewer bristles, in the outer angle with a smaller lobe that is provided with abundant dense long yellow setæ and a long pale arm on outer margin with about 20 long pale extensions or filaments (detail figured separately). Dorsal dististyle, *d*, a conspicuous flattened blade, the tip narrowed into an acute spine; ventral style smaller in area than the basistyle, body pale and relatively small; rostral prolongation large, sclerotized, flattened, beak very broad, apex truncate to slightly emarginate; face of prolongation back from tip with two long setæ; outer margin before apex with a conspicuous more slender lobe tipped with long yellow setæ; two short rostral spines, placed close together at near midlength of face of prolongation; cephalic angle of the beak, near the basistyle, produced into a stout lobe with several coarse setæ and a long slender lobule that bears an apical brush of long dense yellow setæ. Gonapophysis, *g*, with mesal-apical lobe a short gently curved hook. Ædeagus, *a*, with two small apical lobes; surface with abundant microscopic pale setulæ so small and inconspicuous as to be scarcely evident.

*Habitat*.—Sikkim.

Holotype, male, Yagtang, 11,650 feet, in *Rhododendron* association, June 17, 1959 (*Schmid*). Allotype, female. Paratopotype, 1 male, pinned with the allotype.

Other regional species of *Dicranomyia* with complex male hypopygia and unpatterned wings include *Limonia* (*Dicranomyia*) *chandra* Alexander and *L. (D.) dactylophora* Alexander, with a few others, all differing conspicuously among themselves in the structure of the hypopygium which in the present fly is unusually large and complex. The most nearly related species probably are to be found in the *sternolobata* group of the subgenus.

**LIMONIA (GERANOMYIA) MULTICOLOR** sp. nov.

Plate 2, fig. 18.

Belongs to the *argentifera* group; mesonotal præscutum yellow, the interspaces more fulvous yellow, the lateral stripes and anterior end of the median one black, scutal lobes solidly darkened; legs yellow; wings subhyaline, stigma small, pale brown,  $Sc_1$  long, about twice r-m; male hypopygium with the two rostral spines placed together on a small common tubercle, gonapophyses setuliferous.

*Male*.—Length, excluding rostrum, about 5 millimeters; wing, 5.3; rostrum, about 2.2.

Rostrum of moderate length, less than one-half the wing, black, the base obscure yellow; maxillary palpi black. Antennæ with scape light brown, the remainder brownish black; flagellar segments oval, the outer ones more elongate. Head with the broad anterior vertex silvery, the posterior parts black.

Pronotum brownish black, paler laterally. Mesonotal præscutum yellow, the interspaces more fulvous yellow, strikingly patterned with black, including the anterior third of the median stripe and large circular lateral spots behind the humeri; posterior part of median stripe much paler and not contrasting strongly with the ground; scutal lobes solidly dark brown, the margins and restricted central area yellow; scutellum testaceous yellow; mediotergite dark brown, pruinose, anapleurotergite darkened, the katapleurotergite yellow. Pleura yellow. Halteres uniformly pale yellow. Legs with coxæ and trochanters pale yellow; remainder of legs yellow, the outer three tarsal segments black. Wings subhyaline, with a small pale brown stigma; veins medium brown; costal fringe short, Venation:  $Sc_1$  ending shortly before fork of the oblique Rs,  $Sc_2$  some distance from tip,  $Sc_1$  alone about twice r-m; supernumerary crossvein in cell Sc distinct; Rs and basal section of  $R_{4+5}$  in oblique alignment, the former about one-half longer than the latter;  $R_2$  arcuated; cell 1st  $M_2$  subrectangular, subequal in length to distal section of vein  $M_3$ ; m-cu shortly beyond fork of M, subequal to distal section of  $Cu_1$ ; anal veins slightly convergent near bases.

Abdominal tergites brown, sternites yellowed, hypopygium yellowish brown. Male hypopygium (Plate 2, fig. 18) with the tergite, *t*, transverse, posterior lobes low, with long conspicuous setæ; sternite with relatively few but longer submarginal setæ. Basistyle, *b*, relatively small, its area less than that of the ventral dististyle; ventromesal lobe small. Dorsal dististyle, *d*, a very strongly curved hook, the acute tip gently up-curved; ventral style with the rostral prolongation small, the two spines placed close together at summit of a low tubercle at near midlength of prolongation. Gonapophysis, *g*, with mesal-apical lobe nearly straight, gradually narrowed into an acute black spine surface of apophysis with microscopic setulæ. Apical lobes of ædeagus, *a*, obtuse.

*Habitat*.—Pakistan.

Holotype male, Balakot, Northwest Frontier Province, 3,226 feet, October 12, 1953 (*Schmid*).



The most similar species is *Limonia* (*Geranomyia*) *nigronotata* (Brunetti), of South India and Ceylon, which differs in details of body coloration and structure of the male hypopygium. All species of this group have the apical lobe of the gonapophysis conspicuously setuliferous.

**LIMONIA (MELANOLIMONIA) PRIAPULA** sp. nov. Plate 1, fig. 4; Plate 2, fig. 19.

Close to *pseudomorio*; wings strongly darkened, with evident darker seams over the cord and outer end of cell 1st  $M_2$ ; male hypopygium with tergite divided medially by a furrow; setæ of ninth sternite relatively sparse.

*Male*.—Length, about 8.5 millimeters; wing, 8; antenna, about 1.4.

Rostrum and palpi brownish black. Antennæ black, the extreme bases of proximal flagellar segments oblique, pale; flagellar segments long-oval, subequal to their verticils, terminal segment about one-half longer than the penultimate. Head black, the broad anterior vertex silvery, as in the subgenus.

Thoracic notum black; surface subnitidous by a sparse pruinosity. Pleura heavily silvery pruinose by dense microscopic appressed pubescence. Halteres brownish black, base of stem yellowed. Legs with fore coxæ dark brown, midcoxæ light brown, posterior coxæ obscure yellow; trochanters yellowed; remainder of legs brownish black, femoral bases yellowed, very narrowly on fore legs, extensively so on posterior pair; claws with basal spine elongate. Wings (Plate 1, fig. 4) narrow, basal petiole long, strongly darkened, the costal border slightly paler; stigma dark brown; narrow brown seams over cord, outer end of cell 1st  $M_2$  and along vein Cu; veins brown. Venation:  $Sc_1$  ending a short distance beyond origin of Rs,  $Sc_2$  not apparent; cell 1st  $M_2$  long, exceeding any of the veins beyond it.

Abdominal tergites and hypopygium black, posterior ends of the more proximal sternites broadly obscure yellow. Male hypopygium (Plate 2, fig. 19) with the tergite, *t*, narrowly transverse, posterior border truncate, on either side produced into a long straight fingerlike lobe the intervening space about equal to the length of a lobe; disk of tergite a conspicuous median depression that isolates a small triangular part on posterior border, this with two setæ. Ninth sternite short-obcordate in outline, broadest at base, each side with about seven bristles, the outer pair largest. Basistyle, *b*, with ventromesal lobe large, foot-shaped, the pendant toe directed ce-

phalad, provided with long delicate setæ, at the heel portion with two more powerful bristles; cephalad of this lobe with a rounded tubercle provided with about six or seven long straight bristles, caudad of it near base of the dorsal dististyle a smaller similar lobe with shorter setæ. Outer dististyle, *d*, a strong curved rod, the apex dilated, lower angle acute; ventral style relatively large, its area subequal to that of the basistyle; rostral prolongation slender, the spine from a low darkened tubercle surrounded by hyaline membrane. Gonapophysis, *g*, with mesal-apical lobe slender, blackened. Ædeagus, *a*, narrowed beyond base, outwardly much expanded, the margins infolded, sides provided with abundant setæ and microscopic scabrous points, as in the subgenus.

*Habitat*.—India (Kumaon).

Holotype, male, Dogalbeta, Pauri Garhwal, 7,000 to 8,300 feet, May 30, 1958 (*Schmid*).

*Limonia (Malanolimonia) priapula* is closely allied to *L. (M.) pseudomorio* (Alexander), of Japan, and to *L. (M.) subaurita* Alexander, of Corea and eastern China, differing in the hypopygial characters described.

**LIMONIA (MELANOLIMONIA) TERGOTRUNCATA** sp. nov. Plate 1, fig. 5; Plate 2, fig. 20.

General coloration of thorax brown, pleura more yellowed, silvery pruinose; wings pale brown, stigma slightly darker; male hypopygium with the tergite transverse, posterior border virtually truncate, the lobes scarcely developed; ventral dististyle small, with a single rostral spine; ædeagus broad, on either side before apex produced into a triangular point.

*Male*.—Length, about 4.5 millimeters; wing, 5.2; antenna, about 1.

Rostrum buffy, silvery pruinose; palpi black. Antennæ relatively long, black; flagellar segments long-oval, with short glabrous apical pedicels, verticils exceeding the segments. Head dark brown, the broad anterior vertex more silvery.

Pronotum brown. Mesonotum almost uniformly light brown to fulvous brown, pleura yellowish brown, conspicuously silvery, as in the subgenus, the ventral pleurites more yellowed. Halteres relatively long, infuscated, base of stem paler. Legs with coxæ and trochanters light yellow, remainder of legs pale brown. Wings (Plate 1, fig. 5) pale brown, stigma slightly darker brown; veins pale brown. Macrotrichia on longitudinal veins beyond general level of origin of Rs, lacking on Cu and

the anals. Venation:  $Sc_1$  ending opposite origin of the long Rs; m-cu shortly before fork of M, longer than distal section of  $Cu_1$ .

Abdomen, including hypopygium, brown. Male hypopygium (Plate 2, fig. 20) with the tergite, *t*, transverse, the posterior border virtually truncate, the usual lobes not or scarcely developed; posterior half of tergite with abundant long setæ. Basistyle, *b*, with ventromesal lobe low and rounded. Dorsal dististyle, *d*, a strongly curved flattened black blade, widened before the long acute tip; ventral style relatively small, its area about one-half that of the basistyle; rostral prolongation long, with a single strong stout spine near base. Gonapophysis, *g*, with mesal-apical lobe nearly straight, apex obtuse. Ædeagus, *a*, broad, before the simple apex on either side produced into a triangular cuplike projection into which the genital tube opens; sides of outer half with abundant delicate setæ, as in the subgenus.

*Habitat*.—Pakistan.

Holotype, male, Kaghan, Northwest Frontier Province, 6,688 feet, June 27, 1953 (*Schmid*).

*Limonia* (*Melanolimonia*) *tergotruncata* is generally similar to some other brown species of the subgenus, as *L. (M.) fulvonigrina* Alexander, differing from all in the structure of the male hypopygium, particularly the tergite and ædeagus. The virtual lack of tergal lobes is particularly distinctive.

**LIMONIA (ATYPOPTHALMUS) KURMA** sp. nov. Plate 1, fig. 6; Plate 2, fig. 21.

Size relatively large (wing of male 7.5 millimeters); head holoptic; mesonotum chiefly obscure yellow, patterned with pale brown, pleura with a dorsal longitudinal brown stripe; legs yellow, scarcely patterned; wings faintly tinged with brownish yellow, stigma pale brown,  $Sc_1$  ending opposite fork of Rs; abdominal tergites bicolored; male hypopygium complex, especially the ventromesal lobe of basistyle and the small dististyle.

*Male*.—Length, about 7 millimeters; wing, 7.5; antenna, about 2.

Rostrum yellowish brown; palpi brownish black. Antennæ brown; flagellar segments subcylindrical, with short abrupt apical pedicels; verticils coarse, the longest subequal to the segments, with further dense setulæ. Head dark gray; anterior vertex eliminated by the enlarged eyes.

Pronotum light brown. Mesonotal præscutum obscure yellow, with a very broad pale brown central stripe, lateral

margins similarly pale brown, the space between these areas clear yellow; posterior sclerites of notum yellow, scutal lobes pale brown; mediotergite weakly darkened on central portion. Pleura light yellow with a conspicuous brown dorsal longitudinal stripe, broadest in front, narrowed behind. Halteres with stem pale, knob infuscated. Legs with coxæ and trochanters yellow; remainder of legs yellow, outer ends of femora vaguely darker, outer tarsal segments brown; claws of male with a single very long basal spine. Wings (Plate 1, fig. 6) faintly tinged with brownish yellow, prearcular and costal regions clearer yellow; stigma short-oval, pale brown; veins brown, more yellowish brown in the brightened areas. Longitudinal veins beyond general level of origin of Rs with trichia, including the outer two-thirds of Sc and outer end of 2nd A. Venation: Sc long, Sc<sub>1</sub> ending opposite fork of Rs, Sc<sub>2</sub> at its tip; free tip of Sc<sub>2</sub> and R<sub>2</sub> subequal and in transverse alignment; cell 1st M<sub>2</sub> subequal to distal section of M<sub>3</sub>; m-cu close to fork of M.

Abdominal tergites bicolored, yellowed basally, apices broadly brown, sternites obscure yellow, hypopygium chiefly yellow. Male hypopygium (Plate 2, fig. 21) with the tergite, *t*, very large, posterior border convex, cephalic margin more strongly produced, sclerotized; numerous setæ near posterior margin. Ninth sternite (not figured) likewise very large, setæ abundant, longer than the tergal bristles. Basistyle, *b*, large, especially the ventromesal appendage, the total area fully three times that of the dististyle; appendage only a little smaller than the body of style, its outline very irregular; apex a rounded cap that bears a brush or pencil of very long curved yellow setæ directed basad, on posterior margin with eight additional long setæ in a single row, directed outwardly; on outer margin of appendage with a similar compact lobe with numerous shorter yellow setæ; opposite margin of appendage with a large rounded lobe that is provided with abundant small tubercles. Dististyle, *d*, irregular in outline; body small, with long setæ, rostral portion smaller than the body, near apex with two small tubercles. Gonapophysis, *g*, an extensive plate, mesal-apical lobe broad, apex pointed, directed laterad. Ædeagus, *a*, large, surface with extremely abundant very delicate setulæ, apex blackened, irregular in outline.

*Habitat*.—India (Kumaon).

Holotype, male, Koti, Pauri Garhwal, 4,200 feet, August 23, 1958 (*Schmid*).

The present conception of the subgenus *Atypophthalmus* Brunetti has been reviewed by the writer in recent papers and need not be repeated here. Besides the subgenotype, *umbrata* (de Meijere), described almost at the same time as *holoptica* by Brunetti, two further species were described in 1918 by Brunetti from the Garo Hills, Assam, as *quinque-notata* (Brunetti) and *nigrescens* (Brunetti). Edwards studied the types of these latter species and despite their more simple type of male hypopygium considered them as being related to *holoptica* and therefore in the present subgenus. Both of these are quite distinct from the present fly in the coloration of the body and wings.

**LIMONIA (EURHIPIDIA) PERSCITULA** sp. nov.

Plate 1, fig. 7; Plate 2, fig. 22.

General coloration black; antennæ of male with all flagellar segments long-bipectinate, pedicel large, pale yellow; halteres with stem yellow, knob black; legs obscure yellow, femora with a broad pale brown subterminal ring; wings white with major brown areas on anterior half but not involving the yellowed cells C and Sc; cells of posterior half of wing much paler brown; vein Sc<sub>1</sub> ending about opposite one-fourth the length of Rs; abdomen brownish black the posterior lateral angles of both tergites and sternites with a light silvery spot.

*Male*.—Length, about 5 millimeters; wing, 5.5; antenna, about 1.3.

Rostrum elongate, black, subequal to remainder of head; palpi black. Antennæ with scape black, pedicel large, light yellow; flagellar segments with base and branches black, apical pedicels light yellow, outer segments uniformly darkened; all flagellar segments with two branches, shortest on basal segment, on other segments very long, about two and one-half times the segment. Head brown.

Cervical region and pronotum dull black. Mesonotal præscutum brownish black with gray pollen on the interspaces isolating three stripes; posterior sclerites of notum dull brownish black, parascutellum pale. Pleura black, with a broad silvery longitudinal stripe on the dorsal sternopleurite, meron and metapleura; dorsopleural membrane dusky. Halteres with stem light yellow, the large knob black. Legs with coxæ brownish black; trochanters yellow; femora obscure yellow with a broad pale brown nearly terminal ring; tibiæ and tarsi brownish yellow, outer tarsal segments darker. Wings (Plate 1, fig. 7) conspicuously patterned with brown and white in

the radial field, the ground color white, with major brown areas at origin of  $R_s$ , stigma and anterior cord, and the wing tip in cell  $R_3$ , with a smaller postarcular area in base of cell  $R$ ; cells of posterior half of wing much paler brown, especially cells  $M$ ,  $Cu$  and the anals, beyond the cord the outer medial cells extensively pale brown; cells  $C$ ,  $Sc$  and  $Sc_1$  yellowed, interrupted by small brown clouds at arculus,  $Sc_2$  and tip of  $Sc_1$ ; veins pale brown, more yellowed in the costal region. Venation:  $Sc$  relatively long,  $Sc_1$  ending about opposite one-fourth to one-fifth  $R_s$ ; vein  $R_3$  bent strongly caudad at near midlength, slightly narrowing cell  $R_3$ ; cell  $M_3$  shorter than  $M_{3+4}$ .

Abdomen brownish black, the posterior lateral angles of both the tergites and sternites with a light silvery spot; hypopygium blackened.

*Habitat*.—India (Sikkim).

Holotype, male, Tashigang, 3,120 feet, September 29, 1959 (*Schmid*).

*Limonia* (*Eurhipidia*) *perscitula* is readily distinguished from other Asiatic members of the subgenus by the wing pattern, including the chiefly yellowed costal field. *L. (E.) hariola* Alexander, of Assam, similarly has this area of the wing yellowed but with the remainder entirely distinct in pattern. Other Asiatic species, as *L. (E.) pictipennis* (Edwards) and *L. (E.) productina* Alexander (*rostrifera* Edwards, preoccupied), have a somewhat comparable heavy pattern but with the darkened areas involving cells  $C$  and  $Sc$ . The male hypopygium of *L. (E.) coheriana* Alexander is shown (Plate 2, fig. 22).

LIMONIA (EURHIPIDIA) SIMPLICIS sp. nov.

Plate 1, fig. 8.

General coloration of thorax dark brown, opaque; antennæ black, the flagellar segments of male unbranched; legs brown, tarsi extensively creamy white; wings subhyaline, stigma conspicuous, brown;  $Sc$  relatively long,  $Sc_1$  ending nearly opposite midlength of the unusually long  $R_s$ , cell  $M_3$  subequal in length to vein  $M_{3+4}$ , cell 2nd  $A$  relative long and narrow.

*Male*.—Length, about 5 millimeters; wing, 5.4; antenna, about 0.9.

Rostrum about one-half the remainder of head, brownish black; palpi black. Antennæ black throughout; flagellar segments simple, oval, with very short apical pedicels; verticils shorter than the segments; terminal segment about one-third longer than the penultimate. Head dark brown.

Pronotum brown. Mesonotum almost uniformly dark brown, surface opaque, humeral region of præscutum and the pretergites restrictedly testaceous yellow. Pleura brown, more gray pruinose ventrally. Halteres with stem obscure yellow, knob broken. Legs with coxæ and trochanters obscure yellow, fore coxæ slightly darker; remainder of legs brown, apical fourth of basitarsi, tarsal segment two and all but the narrow tip of three creamy white; claws (male) long and slender with a few basal spines. Wings (Plate 1, fig. 8) subhyaline; stigma conspicuous, small, short-oval, brown; veins brown. Veins beyond general level of cord with macrotrichia, lacking on  $M_{3+4}$  and distal section of  $Cu_1$ , present on Rs. Venation: Sc relatively long,  $Sc_1$  ending nearly opposite midlength of the unusually long Rs;  $R_2$  and free tip of  $Sc_2$  in transverse alignment; cell  $M_3$  subequal in length to its petiole ( $M_{3+4}$ ); **m-cu close** to fork of M; cell 2nd A relatively long and narrow.

Abdominal tergites brown sternites more testaceous; abdomen broken beyond fourth segment (when first mounted this was intact but was lost through action of fungi).

*Habitat*.—India (Sikkim).

Holotype, male, Chateng, 8,700 feet, June 12, 1959 (*Schmid*).

*Limonia (Eurhipidia) simplicis* differs from all previously defined members of the subgenus in the simple flagellar segments of the male sex. From other regional species with the wings unpatterned, including *L. (E.) coheriana* Alexander, it differs not only in the antennal structure but in the details of wing pattern and venation.

LIMONIA (RHIPIDIA) TENUIRAMA sp. nov.

Plate 1, fig. 9; Plate 3, fig. 23.

General coloration of thorax brownish gray, median præscutal stripe broad; antennæ of male with seven bipectinate flagellar segments; wings whitened, with a very heavy brown spotted pattern, the costal areas larger, vein Sc long,  $Sc_1$  nearly opposite midlength of Rs; male hypopygium with rostral prolongation of the ventral dististyle long, with five unusually long spines placed at about two-thirds their length from the end of the prolongation.

*Male*.—Length, about 7 to 7.5 millimeters; wing, 7.5 to 9; antenna, about 1.8 to 2.

*Female*.—Length, about 7 millimeters; wing, 8.

Rostrum brownish black; palpi black. Antennæ black, the apical pedicels of the flagellar segments paler; branches longer than the segments, bulbous outwardly; a single branch on first

segment, two each on segments two to eight, a single one on segment nine, remaining segments simple or virtually so; terminal segment elongate, outer half enlarged. Head brownish black.

Pronotum dark brown, paler laterally. Mesonotal præscutum light brown, gray pruinose, with three darker stripes, the median one broad; posterior sclerites of notum testaceous gray, scutal lobes brown. Pleura light brown, variegated with darker. Halteres pale yellow. Legs with coxæ brown; trochanters testaceous yellow; remainder of legs brown, tips of femora and outer tarsal segments darker; claws with two larger outer spines and smaller more basal points. Wings (Plate 1, fig. 9) with the ground whitened, with a very heavy pale brown spotted pattern, the darkened areas exceeding the pale ground, mostly confluent; costal markings larger, reducing the interspaces; veins brown, Sc and R yellow in the interspaces. Venation: Sc long, Sc<sub>1</sub> ending nearly opposite midlength of Rs or slightly before; m-cu at or before the fork of M, in cases (including the holotype) to more than one-half its length.

Abdomen, including hypopygium, brown, still darker in fully colored specimens. Male hypopygium (Plate 3, fig. 23) with the posterior border of tergite, *t*, gently emarginate, cephalic margin truncate or feebly emarginate. Basistyle, *b*, with ventromesal lobe large and rounded, with abundant setæ. Dorsal dististyle, *d*, stout, ventral style with both the rostral prolongation and its five spines unusually long, the rostrum beyond the spines about two-thirds their length or more. Gonapophysis, *g*, with mesal-apical lobe stout.

*Habitat*.—India (Kumaon, Sikkim).

Holotype, male, Yumtang, Sikkim, 12,140 feet, in *Rhododendron* association, June 27, 1959 (*Schmid*). Allotopotype, female, with type. Paratopotypes, 2 males pinned with type. Paratypes, males, Yedang, Sikkim, 10,600 feet, in *Rhododendron* association, June 9, 1959; male, Dakwani, Pauri Garhwal, Kumaon, 9,300 to 11,000 feet, August 5, 1958 (*Schmid*).

The closest ally appears to be *Limonia* (*Rhipidia*) *javanensis* (de Meijere) of southeastern Asia, which has the venation and wing pattern, with the hypopygium, generally the same, differing especially in the details of the latter. Other generally similar regional species include *L. (R.) subtesselata* (Brunetti) and *L. (R.) duplicata* (Doane), both with vein Sc much shorter, ending just beyond the origin of Rs and with the darkened



costal areas more restricted. It should be noted that the name *duplicata* apparently is the earliest available name for the preoccupied *maculata* (Meigen).

**LIMONIA (LIMONIA) ANGULOSA** sp. nov.

Plate 1, fig. 10; Plate 3, fig. 24.

General coloration of mesonotum dark brown, including a broad præscutal stripe, pleura extensively brownish black; legs with fore coxæ black, the others yellowed, femora black, the base, narrow apex and a subterminal ring yellow; wings pale yellow, conspicuously patterned with brown, including a V-shaped area that virtually crosses the wing at near one-third the length; Sc long, Sc<sub>2</sub> opposite midlength of Rs, m-cu before fork of M; basal abdominal segments yellowed, posterior borders brown, outer segments brownish black; male hypopygium with lateral tergal lobes conspicuous, ventromesal lobe of basistyle very large; gonapophysis with mesal-apical lobe a long slender black spine.

*Male*.—Length, about 8 millimeters; wing, 8.5 to 8.6; antenna, about 1.2 to 1.3.

Rostrum black, elongate, with the long labial palpi subequal to remainder of head; maxillary palpi black. Antennæ black; flagellar segments exceeding their verticils. Head dark brown; anterior vertex narrowed to a strip.

Cervical region and the long pronotum brownish black. Mesonotal præscutum with a broad dark brown central stripe, the sides, including the region of the usual lateral stripes, paler, humeral region and lateral border conspicuously light yellow; posterior sclerites chiefly dark brown, median region of scutum, base of scutellum and postnotal suture paler. Pleura chiefly brownish black, the ventral pteropleurite, meron and metapleura yellowed. Halteres with stem obscure yellow, light yellow at base, knob brownish black. Legs with fore coxæ black, remaining coxæ and all trochanters yellowed; femora blackened, the base, narrower apex and a broader subterminal ring yellow, the last subequal to or wider than the outer darkened ring; tibiæ brownish black, extreme base yellowed, tarsi black; claws of male long, outer spine conspicuous. Wings (Plate 1, fig. 10) pale yellow, conspicuously patterned with brown, costal border brighter yellow; the amount of dark color subequal to the yellow ground, including the broad apex and major areas in all cells except Sc; basad of cord a continuous V-shaped band extending from R to the posterior border in cell 1st A; bases of cells R and M and an area at midlength of cell 2nd

A darkened; veins light brown, yellowed in the brightened fields. Venation:  $Sc$  moderately long,  $Sc_2$  ending opposite midlength of  $Rs$ ;  $R_{1+2}$  from about one and one-half to twice  $R_2$ ; cell 1st  $M_2$  varying from short to longer rectangular; m-cu before fork of  $M$ .

Abdomen elongate; basal segments yellow, their posterior borders narrowly but conspicuously brown, lateral membrane more narrowly darkened; fifth and succeeding segments brownish black, basistyles yellowed. Male hypopygium (Plate 3, fig. 24) generally as in *festiva*, differing in the details; tergite, *t*, transverse, the posterior border gently emarginate, forming low lateral lobes that are provided with long setæ, the broad median area with similar setæ. Basistyle, *b*, with ventromesal lobe very large, semioval, with numerous very long setæ. Dististyle, *d*, dilated on basal half, provided with long setæ, outer end blackened, terminating in a blunt knob. Gonapophysis, *g*, with mesal-apical lobe a long slender black spine, outwardly curved to the acute tip.  $\mathcal{A}$ Edeagus broad.

*Habitat.*—India (Sikkim).

Holotype, male, Tsomgo, 12,500 feet, in *Rhododendron* association, August 26, 1959 (*Schmid*). Paratypes, 2 males, She-rabtang, 13,200 feet, in *Rhododendron* association, August 27, 1959 (*Schmid*); 1 male, Chamiteng, 9,900 feet, August 24, 1959 (*Schmid*).

The most similar regional species is *Limonia* (*Limonia*) *festiva* (Brunetti), which is distinguished by the small size and different pattern of the wings and legs. Edwards [Rec. Indian Mus. 26 (1924) 297] saw the type of *festiva* and thought that it might belong to the subgenus *Dicranomyia* Stephens rather than in typical *Limonia* but undoubtedly it is correctly placed in the latter subgenus. In a series of *festiva* there is a slight variation in the relative length of vein  $Sc$  in some specimens, this ending exactly opposite the origin of  $Rs$  while in others it extends slightly beyond.

LIMONIA (LIMONIA) AYODHYA sp. nov.

Plate 1, fig. 11; Plate 3, fig. 25.

Size small (wing of male to 6 millimeters); thorax chiefly yellowed, præscutum with a central brown stripe, scutal lobes and a dorsopleural stripe brown; legs light brown; wings weakly tinged with brown, stigma darker brown; costal fringe long, cell 1st  $M_2$  long, widened outwardly, m-cu far beyond the fork of  $M$ ; male hypopygium with ventromesal lobe of basistyle slender, body of dististyle produced, the beak very long.

*Male*.—Length, about 5 to 5.5 millimeters; wing, 5.6 to 6; antenna, about 1.7 to 1.8.

Rostrum slender, pale brown, palpi concolorous. Antennæ relatively long; scape brown, remainder brownish black; proximal flagellar segments suboval, the outer ones gradually lengthened, all with short inconspicuous apical pedicels, segments subequal in length to their longest verticils; terminal segment about one-third longer than the penultimate. Head dark gray, holoptic in male, eyes broadly contiguous.

Pronotum light brown. Mesonotal præscutum yellow with a central pale brown stripe that widens behind; scutum yellow, lobes brown; scutellum yellow, mediotergite brown, pleurotergite brown, pleurotergite yellow, its lower end brown, this being the posterior end of a brown dorsopleural stripe, more intense on anepisternum; vertral pleurites light yellow. Halteres with stem obscure yellow, knob brown. Legs with coxæ and trochanters pale yellow, fore coxæ a trifle suffused; remainder of legs light brown, femoral bases somewhat more yellowed, outwardly with indications of a narrow more darkened subterminal ring. Wings (Plate 1, fig. 11) weakly tinged with brown, stigma oval, darker brown; cell Sc slightly infumed, especially at base; a very vague darkening in cell M adjoining vein Cu; veins brown. Costal fringe of male conspicuous, especially at near midlength of wing. Venation: Sc long, Sc<sub>1</sub> ending shortly before fork of Rs, Sc<sub>2</sub> at its tip; cell 1st M<sub>2</sub> long, widened outwardly, subequal to distal section of M<sub>1+2</sub>; m-cu about its own length beyond fork of M, just beyond one-third the length of M<sub>3+4</sub>.

Abdominal tergites, including hypopygium, brown, sternites paler brown, the more proximal segments with almost the proximal half light yellow. Male hypopygium (Plate 3, fig. 25) with the tergite, *t*, extensive, posterior border convexly rounded, apex nearly truncate; cephalic border even more strongly convex; setæ of moderate length in a gently arcuated row paralleling the posterior border. Basistyle, *b*, in area more than twice the dististyle; ventromesal lobe elongate, slender, narrowed outwardly to an obtuse knob, near base with a low lobe that bears smaller setæ. Dististyle, *d*, with body small, outwardly produced caudad into an oval to subtriangular lobe; beak very long, broad-based, narrowed very gradually into a long slender rod that terminates in an acute spine; lower margin at base of style with about five strong setæ. Gonapophysis, *g*, with mesal-apical

lobe slender, gently curved. *Ædeagus*, *a*, broad, terminating in two small oval lobes.

*Habitat*.—Ceylon.

Holotype, male, Ratnapura, 100 feet, February 3, 1954 (*Schmid*). Paratype, male, Nuwara Eliya, 6,000 feet, February 21, 1954 (*Schmid*).

*Limonia* (*Limonia*) *ayodhya* is told from other generally similar small members of the subgenus by the unusually far distad position of *m-cu* which is almost as in *Libnotes*. The structure of the rostral prolongation of the dististyle is much as in *L. (L.) acinacus* Alexander, which has the body of the style small and unproduced and with all other hypopygial features distinct.

LIMONIA (METALIMNOBIA) EUSEBEIA sp. nov. Plate 1, fig. 12; Plate 3, fig. 26.

Size large (wing about 15 millimeters); mesonotal præscutum dark brown to black with four brownish yellow to dull orange stripes, pleura chiefly brownish black; knobs of halteres black; femora brownish yellow, on outer fourth with two narrow black and two yellow rings, the apex being black; wings light brown, variegated with brown and more yellowed areas; abdomen chiefly brownish yellow; male hypopygium with the dististyle complex.

*Male*.—Length, about 12 to 13 millimeters; wing, 14 to 16; antenna, about 3 to 3.1.

*Female*.—Length, about 10 millimeters; wing, 14.

Rostrum and palpi brownish black. Antennæ black, pedicel yellow; outer flagellar segments more elongate, with very long verticils. Head dark brown, slightly paler on anterior vertex, posteriorly with conspicuous black porrect setæ.

Pronotum elongate, brownish black. Mesonotal præscutum with the ground dark brown to black, with four brownish yellow to dull orange stripes that are virtually confluent behind; scutum with a light silvery central stripe that extends onto base of scutellum, lobes brown, narrowly more darkened along mesal edge; posterior sclerites of notum dull yellow. Pleura chiefly brownish black, ventral sternopleurite and posterior sclerites more yellowed. Halteres with stem light yellow, knob black. Legs with fore coxæ blackened, midcoxæ brownish yellow, posterior coxæ clearer yellow; trochanters obscure yellow; femora brownish yellow, becoming darker at near midlength, on outer fourth with two black and two yellow rings, the black including the tip and a subequal subterminal ring; tibiæ and

tarsi brown. Wings (Plate 1, fig. 12) with the ground light brown, including the costal and outer radial fields; a darker brown pattern in cells, including postarcular marks in both cells R and M; other major dark areas at stigma with a confluent seam over the anterior cord and with a more or less complete ring or solid darkening at origin of Rs; narrower dark brown seams over cord and outer end of cell 1st  $M_2$ , with paler brown spots at ends of veins  $M_{1+2}$  to 2nd A, alternating with yellow marginal spots; extensive paler darkenings in cells M, Cu and anals, conspicuously variegated with yellow along vein Cu and in anal cells; veins brown, paler in the costal field. Venation: Rs long, exceeding three times  $R_{2+3}$ ; m-cu before the fork of M.

Abdomen brownish yellow, the lateral margins of the sternites narrowly blackened, hypopygium yellowed. Male hypopygium (Plate 3, fig. 26) with the tergal lobes, *t*, obtuse, with long setæ, the median emargination small and shallow. Basis-tyle, *b*, with ventromesal lobe bearing very long setæ. Dististyle, *d*, complex, generally as in *improvisa*, the beak bilobed, outer arm slender. Gonapophysis, *g*, with mesal-apical lobe slender, apex extended into a strong blackened spine.

*Habitat*.—India (Sikkim). Holotype, male, Chumzomoi Choka, 11,800 feet, in *Rhododendron* association, July 8, 1959 (Schmid). Allotopotype, female, pinned with type. Paratopotypes, 1 male, 2 females, with the types.

There are numerous Asiatic species in the subgenus, including *Limonia* (*Metalimnobia*) *bifasciata* (Schrank), *L. (M.) brahma* Alexander, *L. (M.) hedone* Alexander, *L. (M.) improvisa* Alexander, *L. (M.) jactator* Alexander, *L. (M.) quadrimaculata* (Linné);, *L. (M.) xanthopteroides* (Riedel), *L. (M.) yunnanica* (Edwards) and some others, all quite different from the present fly in coloration of the wings and legs and in hypopygial structure. This is generally similar to that found in *improvisa* of western China which differs in details of structure and in the distinct pattern of the legs.

**LIMONIA LATIORFLAVA** sp. nov.

Plate 1, fig. 13.

Size small (wing of female 5.4 millimeters); mesonotal præscutum fulvous orange, posterior sclerites of the notum chiefly darkened, pleura with a broad brownish black dorsal stripe, the ventral pleura abruptly light yellow; halteres dark brown; legs brownish black, all tarsi and tips of tibiæ light yellow; wings very strongly infuscated, stigma darker, vein Sc long, m

longer than basal section of  $M_3$ , m-cu more than one-half its length beyond fork of M; abdominal tergites dark brown, sternites and the eighth tergite yellow.

*Female*.—Length, about 5.2 millimeters; wing, 5.4.

Rostrum and palpi brownish black. Antennæ relatively long, dark brown; flagellar segments oval, verticils short. Head dark gray; anterior vertex narrow.

Pronotum brownish black. Mesonotal præscutum fulvous orange with a light brown central stripe that is very faint anteriorly, darker behind; median region of scutum and base of scutellum yellow, scutal lobes and most of scutellum dark brown, the latter paler behind; mediotergite brown, pleurotergite yellowed dorsally, brownish black beneath, this being the posterior end of a broad and conspicuous brownish black dorso-pleural stripe, the ventral pleura abruptly light yellow. Halteres dark brown, base of stem vaguely brightened. Legs with coxæ and trochanters pale yellow; femora obscure yellow basally, passing into brownish black; all tibiæ brownish black, the outer fifth and all tarsi pale yellow. Wings (Plate 1, fig. 13) long-petiolate basally, very strongly infuscated; stigma oval, slightly darker than the ground; cell Cu and bases of R and M somewhat more whitened; veins brown. Longitudinal veins beyond general level of origin of Rs with long conspicuous macrotrichia, with a few on m and other outer end of 2nd A. Venation: Sc long,  $Sc_1$  ending shortly before fork of Rs,  $Sc_2$  close to its tip; free tip of  $Sc_2$  immediately before level of  $R_{\frac{1}{2}}$ ; cell 1st  $M_2$  subrectangular, subequal to distal section of  $M_3$ ; m unusually long, arcuated, nearly twice the basal section of  $M_3$ ; m-cu unusually far distad, more than one-half its length beyond the fork of M, subequal to distal section of  $Cu_1$ .

Abdominal tergites dark brown, eighth tergite and all sternites yellow. Ovipositor with cerci small, slender, gently up-curved to the acute tips.

*Habitat*.—Ceylon.

Holotype, female, Parawatta, 1,000 feet, January 17, 1954 (Schmid).

*Limonia latiorflava* is readily told from other regional species of the genus having whitened or pale yellow tarsi by the extent of this pattern which includes all legs and involves not only the tarsi but the broad apices of the tibiæ. The Philippine

*Limonia latiflava* Alexander is more similar, differing especially in the details of venation. In the light of our present knowledge I hesitate to refer these flies to any particular subgenus.

*LIMONIA NEBULINERVIS* sp. nov.

Plate 1, fig. 14; Plate 3, figs. 27, 28.

Allied to *decurvans*; general coloration of head and thorax black; legs light brown; wings yellowish brown, prearcular and costal fields clear yellow; a relatively conspicuous pale brown pattern over the cord, outer end of cell 1st  $M_2$  and elsewhere; Rs long, fully twice  $R_{2+3}$ , vein 2nd A long.

*Male*.—Length, about 6 millimeters; wing, 6.5.

Mouthparts so reduced as to be virtually lacking. Antennæ black, broken beyond the fourth segment, the remaining flagellar segments oval with apical pedicels. Head intensely polished black; anterior vertex very broad.

Prothorax and mesothorax brownish black, præscutal interspaces with erect black setæ, with a single similar bristle on each scutal lobe. Pleura dark brown, meral region paler. Halteres obscure brownish yellow. Legs with fore coxæ dark brown, midcoxæ somewhat paler brown, hind coxæ and all trochanters obscure yellow; remainder of legs light brown; claws of male with a very long basal spine. Wings (Plate 1, fig. 14) yellowish brown, prearcular and costal field clear yellow; a relatively conspicuous pale brown pattern, including areas at origin of Rs, fork of Sc, cord and outer end of cell 1st  $M_2$ , and the transversely oval stigma at  $R_2$ ; extreme border of wing from radial field to vein 1st A less evidently darkened; veins brownish yellow, clearer yellow in the brightened fields. Longitudinal veins beyond cord with long trichia, basad of cord on ends of Rs, M, basal section of  $Cu_1$  and 2nd A. Venation: Sc long,  $Sc_1$  ending about opposite three-fourths Rs,  $Sc_2$  near its tip; Rs long, fully twice  $R_{2+3}$ ; m-cu at fork of M, subequal to distal section of  $Cu_1$ ; vein 2nd A long, gently sinuous.

Abdominal tergites and the hypopygium dark brown, basal sternites more yellowed. Male hypopygium (Plate 3, fig. 27) generally as in *decurvans*, differing only in slight details.

*Habitat*.—India (Sikkim).

Holotype, male, Lachung, 8,610 feet, July 10, 1959 (*Schmid*).

*Limonia nebulinervis* is closely allied to *L. decurvans* Alexander, described from Nepal, differing evidently in the color of the body and wings. The male hypopygium of *decurvans* is shown for comparison (Plate 3, fig. 28). I am not attempt-

ing to place these two flies in any subgenus until more is known of those species in the genus where the mouthparts are so reduced as to virtually be lacking except for the oral opening.

**Genus ORIMARGA Osten Sacken**

*Orimarga* OSTEN SACKEN, Mon. Diptera No. Amer. 4 (1869) 120.

*Orimarga* is a relatively small genus with species occurring in all biotic regions, including Madagascar but excluding New Zealand, best represented in number of species in the Neotropical and Oriental regions.

The following subgenera are presently recognized:

*Orimarga* OSTEN SACKEN, Mon. Diptera No. Amer. 4 (1869) 120.

Type, *alpina* Zetterstedt—Palæarctic, Ethiopian, Oriental, Australasian, Nearctic and Neotropical.

*Diotrepha* OSTEN SACKEN, Cat. Diptera No. Amer., Ed. 2 (1878) 219–220. Type, *mirabilis* Osten Sacken—Neotropical, southeastern Nearctic.

*Protorimarga* ALEXANDER, Rept. Harvard Afr. Exped. 2 (1930) 1010–1011. Type, *bequaertiana* Alexander—Ethiopian.

add - *Orimarga (Orimarga) asura* sp. nov. Plate 4, figs. 29, 34

General coloration of thorax dark grayish brown; rostrum elongate; antennæ black; legs light brown; wings of male broad, brownish yellow, prearcular and costal regions brighter yellow; Sc<sub>1</sub> ending opposite fork of Rs, R<sub>2</sub> and R<sub>1+2</sub> subequal; basal section of R<sub>4+5</sub> and R<sub>2+3</sub> long; m-cu opposite base of Rs; male hypopygium with apex of the outer dististyle unusually glabrous, extended into a long spine; appendage of ninth sternite including a flattened disklike plate.

*Male*.—Length, about 6 to 6.5 millimeters; wing, 5.3 to 5.5.

Rostrum black, elongate, nearly as long as remainder of head; palpi black. Antennæ black; flagellar segments oval, gradually decreasing in size outwardly, terminal segment smaller than the penultimate; verticils shorter than the segments. Head dark gray; anterior vertex relatively narrow, about one and one-half times the diameter of the scape.

Cervical sclerites and pronotum dark brown. Mesonotum dark grayish brown, humeral region of præscutum slightly brightened. Pleura grayish brown, the ventral anepisternum and sternopleurite slightly darker. Halteres broken. Legs with coxæ and trochanters obscure yellow; remainder of legs light brown. Wings (Plate 4, fig. 29) of male broad, brownish yellow, prearcular and costal regions brighter yellow; veins pale



brownish yellow. Macrotrichia of veins sparse, with very few near outer end of  $R_3$ , more numerous on outer half of  $R_{4+5}$ ,  $M_3$  and outer third of  $M_{1+2}$ . Venation: Sc long,  $Sc_1$  ending opposite fork of Rs,  $Sc_2$  slightly retracted;  $R_2$  from about one-half to nearly equal to  $R_{1+2}$ ,  $R_{2+3}$  longer than Rs; basal section of  $R_{4+5}$  unusually long, about three-fourths Rs and having the same general course;  $M_{3+4}$  subequal to or longer than  $M_4$ ; m-cu far retracted, opposite base of Rs; vein 2nd A long.

Abdomen dark brown. Male hypopygium (Plate 4, fig. 34) with the basistyle, *b*, relatively short, along the mesal face only a little longer than the outer dististyle. Dististyles, *d*, terminal; outer style sclerotized, giabrous, outer end more darkened, apical spine with a further microscopic denticle; inner style with apical half slender, with scattered setæ, more numerous at base. Appendage of ninth sternite, *9s*, including a flattened disklike plate, in the paratype showing a group of small setæ, immediately distad of this with a short spine from a dilated base.

*Habitat*.—India (Sikkim).

Holotype, male, Singhik, 3,700 feet, August 7, 1959 (*Schmid*).

Paratopotype, male, pinned with type.

*Orimarga (Orimarga) asura* is most similar to *O. (O.) basalis* Alexander and *O. (O.) subbasalis* Alexander, differing from the former in the entirely different hypopygium. The latter species still is known only from the female, differing from the present fly in coloration and especially in the very abundant trichiation of the wing veins.

**ORIMARGA (ORIMARGA) BREVISTYLATA** sp. nov.

Plate 4, figs. 30, 35

General coloration of head and thorax light gray, thoracic pleura patterned with brown; antennæ black; halteres yellow; fomera yellow with a virtually terminal dark brown ring; wings light yellow, outer ends of cells  $R_2$  and  $R_3$  weakly darkened, veins pale yellow, inconspicuous; macrotrichia of wing veins very reduced, m-cu opposite base of Rs; male hypopygium large and massive, especially the fused ninth segment and basistyle; both dististyles very short; mesal face of basistyle with three groups of setiferous lobes.

*Male*.—Length, about 6.5 millimeters; wing, 7.

Rostrum brownish gray, palpi black. Antennæ black; flagellar segments elongate-oval, verticils small. Head light gray; anterior vertex broad.

Thoracic dorsum almost uniformly light gray, præscutum with vague indications of four narrow darker stripes; scutal lobes similarly indistinctly more darkened. Pleura gray, more darkened on ventral anepisternum and ventral sternopleurite. Halteres pale yellow. Legs with coxæ and trochanters yellow; femora yellow with a narrow dark brown ring virtually at tip, involving only about one-fifteenth of the segment; tibiæ yellow, tips narrowly darkened; basitarsi brownish yellow, tips and remainder of tarsi brownish black; claws of male with a small basal spine. Wings (Plate 4, fig. 30) light yellow, prearcular and costal regions more saturated yellow, outer ends of cells  $R_2$  and  $R_3$  weakly darkened; veins yellow, only a little darker than the ground. Macrotrichia of veins very sparse, including about two or three trichia near outer ends of  $R_2$  and  $M_{1+2}$ , on  $R_{4+5}$  with about a dozen scattered over nearly the outer half; costal setæ short: trichia lacking on other veins excepting a few on vein  $Sc_2 + R_1$ . Venation:  $Sc_1$  ending about opposite one-third  $Rs$ ,  $Sc_2$  not far removed, free tip of  $Sc_2$  not or scarcely evident;  $R_{1+2}$  about two and one-half times  $R_2$ ; m-cu oblique, opposite the base of  $Rs$ .

Abdomen, including hypopygium, dark brown. Male hypopygium (Plate 4, fig. 35) very large and massive, especially the fused tergite-sternite and basistyles, as shown; what appears to represent the sternite (as shown on microscope slide) truncate, with a pair of small hairy lobules at the midline, separated by a U-shaped emargination. Basistyle, *b*, with three groups of lobes on mesal face at base, provided with dense yellow setæ; body of style with setæ much reduced in size and numbers. Dististyles, *d*, distinctly fused basally, subequal in length; outer style a short broad blackened blade, apex obtuse, inner style constricted before the small oval head, the latter provided with numerous short yellow setæ. Phallosome, *p*, including two short slender spines; ædeagus slender, divided into two hairlike extensions.

*Habitat*.—India (Sikkim).

Holotype, male, Zema, 8,400 feet, May 24, 1959 (*Schmid*).

*Orimarga (Orimarga) brevistylata* is entirely different from the other previously described species in the unusually large and distinctive male hypopygium. The marked reduction in number of macrotrichia of the wing veins should be emphasized. In its venation, the species is generally similar to *O. (O.) basalis* Alexander, of Kashmir, a very different fly.

ORIMARGA (ORIMARGA) FUSCICOSTA sp. nov.

Plate 4, figs. 31, 36.

General coloration of head and thorax gray; halteres pale yellow; femora yellow with a nearly terminal brown ring; wings cream colored, conspicuously patterned with brown, including most of cells C and Sc; veins very pale except in the darkened costal field; male hypopygium with outer dististyle simple, narrowed gradually to an acute blackened spine, inner style narrowly obtuse at tip.

*Male*.—Length, about 6.5 millimeters; wing, 5.8.

*Female*.—Length, about 7 millimeters; wing, 6.8.

Rostrum dark brown; palpi black. Antennæ black, the elongate scape pruinose; flagellar segments elongate-oval to subcylindrical, the verticils short. Head light gray, the central part of anterior vertex narrowly infuscated.

Pronotum gray. Mesonotum gray, if any pattern is normally present it has been destroyed by discoloration. Pleura light gray. Halteres pale yellow. Legs with coxæ dark gray; trochanters brownish yellow; femora yellow with a nearly terminal brown ring, the extreme tip yellowed; remainder of legs obscure yellow. Wings (Plate 4, fig. 31) cream-colored, conspicuously patterned with brown, including cells C and Sc except at wing base and in the clear yellow stigmal region; outer radial cells darkened,  $R_2$  almost entirely so, cell  $R_3$  at the tip only, cell  $R_5$  clear; small darkened marginal clouds in outer medial field with still paler brown washes in cell  $R_1$  behind the stigma and along the posterior border in the anal field; veins very pale yellow, difficult to see clearly in balsam mounts, veins C, Sc and R darker. Macrotrichia of veins sparse, on  $R_3$ , distal third of  $R_{4+5}$  and on outer ends of  $M_{1+2}$ ,  $M_3$  and  $M_4$ . Venation: Sc short,  $Sc_1$  ending nearly opposite midlength of Rs,  $Sc_2$  near its tip; free tip of  $Sc_2$  not apparent;  $R_{1+2}$  and  $R_2$  in transverse alignment; m-cu opposite the base of Rs.

Abdomen, including hypopygium, dark brown. Male hypopygium (Plate 4, fig. 36) with the basistyle, *b*, relatively slender, longer than the dististyles. Outer dististyle, *d*, long and slender, narrowed gradually to a decurved blackened spine; inner style nearly as long, dilated on proximal half, outer end narrowly obtuse; setæ of basal half of style conspicuous. Phallosome, *p*, including the two long acute spines of the ædeagus and inner extensions of the ninth sternite, the latter a more cephalic flat-

tened club and a more distal shorter triangular blade that narrows into an acute spine.

*Habitat*.—India (Kumaon).

Holotype, male, Khumyara, Pauri Garhwal, 4,300 to 5,000 feet, May 3, 1958 (*Schmid*). Allotype, female, Akhrotkoti, Pauri Garhwal, 5,700 to 6,500 feet, May 18, 1958 (*Schmid*).

The only other regional species of the genus having the wings conspicuously patterned is *Orimarga (Orimarga) platystyla* sp. nov., which differs from the present fly in the nature of the wing pattern, including the pale costal border, and in the structure of the hypopygium, particularly the inner dististyle.

**ORIMARGA (ORIMARGA) LACTIPENNIS** sp. nov.

Plate 4, figs. 32, 37.

General coloration of head and thorax light gray; antennæ black; halteres yellow; legs with femora and tibiæ yellow, tips dark brown; wings milky white, veins pale yellow; male hypopygium with the phallosome including two powerful gently curved sclerotized rods, at tip bent at a right angle into a point.

*Male*.—Length, about 7 to 7.5 millimeters; wing, 6.5 to 7.5; antenna, about 1.

*Female*.—Length, about 7 to 7.5 millimeters; wing, 7.5 to 8.

Rostrum brown, relatively long, more than one-half the remainder of head; palpi black. Antennæ black; flagellar segments oval. Head light gray.

Cervical region brown. Pronotum and mesonotum almost uniformly light gray, præscutal stripes not or scarcely indicated. Pleura gray. Halteres pale yellow. Legs with coxæ and trochanters yellowed; femora yellow, tips broadly and conspicuously dark brown; tibiæ whitened, tips somewhat more narrowly darkened; tarsi pale, outer segments brownish black. Wings (Plate 4, fig. 32) milky white, unpatterned; veins pale yellow, difficult to see against the ground. Venation:  $Sc_1$  ending shortly before fork of Rs,  $Sc_2$  near its tip;  $R_{2+3}$  about three-fourths Rs;  $R_{1+2}$  from about one and one-half to nearly twice  $R_2$ ; basal section of  $R_{4+5}$  long, only a little shorter than  $R_{2+3}$ ; m-cu about opposite one-third the length of Rs; vein 2nd A arched basally, widening the cell.

Abdomen, including hypopygium, brown. Male hypopygium (Plate 4, fig. 37) with mesal face of basistyle, *b*, at proximal end with dense delicate setæ. Dististyles, *d*, terminal, united basally, the blackened outer style narrowed very gradually to a slender point; inner style subequal in length, stouter, with a

low setiferous lobe on margin at base. Phallosome, *p*, including two powerful gently curved sclerotized rods, the tip bent at a right angle into a point.

*Habitat*.—India (Sikkim).

Holotype, male, Namnasa, 10,000 feet, July 1, 1959 (*Schmid*). Allotopotype, female. Paratopotypes, several males and females, with the types. Paratypes, 1 male Bichu, 8,000 to 8,500 feet, July 14, 1959; 1 male, Chumzomoi Choka, 11,800 feet, in *Rhododendron* association, July 8, 1959; males, Lachung, 8,610 feet, July 2, 1959 (*Schmid*).

The present fly is generally similar to species such as *Orimarga* (*Orimarga*) *basalis* Alexander but with the wing veins even paler and more difficult to see, and with the hypopygium, especially the dististyles and phallosome, entirely distinct.

ORIMARGA (ORIMARGA) PANDU sp. nov.

Plate 4, figs. 37, 38.

General coloration gray; antennæ black; wings of male broad, grayish yellow, prearcular and costal fields clearer yellow, especially the veins; macrotrichia of veins sparse;  $Sc_1$  ending opposite fork of  $R_s$ ,  $R_{1+2}$  and  $R_2$  subequal, m-cu opposite base of  $R_s$ ; male hypopygium with outer dististyle blackened outwardly, terminating in a long spine with several appressed spicules near its base; gonapophysis terminating in a crown of microscopic fibrations.

*Male*.—Length, about 6.5 millimeters; wing, 5.5.

Rostrum dark brown, elongate, nearly as long as remainder of head, terminal parts appearing at blackened stylets; palpi black. Antennæ black; flagellar segments oval, with short verticils. Head gray; anterior vertex subequal in width to greatest diameter of the scape.

Cervical region black. Pronotum brownish gray. Mesonotum almost uniformly plumbeous gray, humeral region of præscutum more infuscated. Pleura chiefly plumbeous gray, the dorsal sternopleurite vaguely paler. Halteres with stem pale, knobs broken. Legs with coxæ brownish testaceous; trochanters yellowed; remainder of legs broken. Wings (Plate 4, fig. 33) of male broad, grayish yellow, prearcular and costal fields clearer yellow; veins light brown, those in the costal region more yellowed, especially C. Macrotrichia of veins very sparse, on veins  $R_3$  to  $M_4$  inclusive. Venation:  $Sc$  long,  $Sc_1$  ending opposite fork of  $R_s$ ;  $R_{1+2}$  and  $R_2$  subequal; free tip of  $Sc_2$  evident, basal section of  $R_{4+5}$  long;  $M_{3+4}$  about two-thirds  $M_3$ ; m-cu far retracted, about opposite the base of  $R_s$ .

Abdomen dark brown. Male hypopygium (Plate 4, fig. 38) with the outer dististyle, *d*, dilated at base, constricted at mid-length, the blackened apex extended into a terminal spine, with several microscopic appressed spicules near its base; inner style relatively broad, subequal in diameter to the outer style. Phallosome, *p*, with the details distinctive; gonapophysis at apex slightly dilated, with a crown of microscopic points or fimbriations, as in several Neotropical species of the genus.

*Habitat*.—India (Sikkim).

Holotype, male, Singhik, 3,700 feet, August 7, 1959 (*Schmid*).

Although it is generally similar to *Orimarga* (*Orimarga*) *asura* sp. nov., the present fly is amply distinct in the hypopygial structure, including especially the outer dististyle and the phallosome.

**ORIMARGA (ORIMARGA) PLATYSTYLA** sp. nov.

Plate 5, figs. 39, 44.

General coloration of head and thorax gray; halteres yellowish white; legs yellow; wings yellowed, restrictedly patterned with brown, including the outer ends of cells  $R_2$  and  $R_3$ ; male hypopygium with inner dististyle stout, the apex broadly truncate, with numerous short setæ.

*Male*.—Length, about 6 to 7 millimeters; wing, 5 to 6.

Rostrum dark brown; palpi black. Antennæ dark brown; flagellar segments long-oval to elongate. Head light gray.

Thoracic dorsum gray, any pattern normally present destroyed in the type material. Pleura gray, the sternopleurite more yellowed in the paratype. Halteres yellowish white. Legs with coxæ and trochanters yellow; remainder of legs yellow, the femora very vaguely more darkened before tips, outer tarsal segments brownish black. Wings (Plate 5, fig. 39) yellowed, including the costal region; a restricted brown pattern, including a cloud above origin of  $R_s$ , involving the outer fifth of vein  $Sc$ , with larger and more conspicuous darkenings in outer ends of cells  $R_2$  and  $R_3$ ; a less evident suffusion over  $R_2$  and adjoining veins; veins of the yellowed disk very pale yellow, difficult to see, darkened in the patterned areas. Sparse macrotrichia at outer ends of veins  $R_3$ ,  $R_{4+5}$ ,  $M_{1+2}$  and  $M_3$ . Venation:  $Sc_1$  ending shortly before fork of  $R_s$ ,  $Sc_2$  slightly retracted, free tip of  $Sc_2$  immediately before level of  $R_2$ ; m-cu opposite base of  $R_s$ .

Abdomen, including hypopygium, dark brown. Male hypopygium (Plate 5, fig. 44) with the basistyle, *b*, short and stout, the mesal face of proximal end with a dense concentration of:

abundant long yellow setæ, elsewhere the setæ relatively sparse and small. Dististyle, *d*, slightly longer than the basistyle; outer style smooth, gradually narrowed to the acute tip; inner style unusually stout, its apex broadly truncate, with numerous short setæ, those elsewhere on style long and conspicuous. Phallosome, *p*, with inner apophyses slender, apices only slightly dilated; ædeagus with filaments long and slender.

*Habitat*.—India (Kumaon).

Holotype, male, Gangrea, Pauri Garhwal, 7,500 to 10,000 feet, June 15, 1958 (*Schmid*). Paratype, male, Binaik Chatti, Pauri Garhwal, 7,000 to 7,500 feet, June 16, 1958 (*Schmid*).

The only other described regional species with patterned wings is *Orimarga (Orimarga) fuscicosta* sp. nov., which is readily told by the darkened costa and the hypopygial structure, the latter most evident in the inner dististyle which here is distinct from that of all other known species.

**ORIMARGA (ORIMARGA) RESUPINA** sp. nov.

Plate 5, figs. 40, 45.

Size relatively small (wing of male 4.5 millimeters); general coloration gray; rostrum brownish yellow; legs brownish yellow; wings whitened, veins very pale brown, *Sc*<sub>1</sub> ending shortly before fork of *Rs*, vein 2nd *A* ending before level of *m-cu*; male hypopygium with the outer dististyle distinctive, slender, narrowed to the decurved acute apex, on outer margin before tip with a long straight spinelike extension directed backward.

*Male*.—Length, about 5.5 millimeters; wing, 4.5.

Rostrum brownish yellow, palpi darker. Antennæ black. Head gray.

Thoracic dorsum almost uniformly gray, restrictedly more yellowed on posterior parts of scutal lobes, parascutella and pleurotergite. Pleura chiefly dark brown, the posterior sclerites more yellowed. Halteres with stem white, knob brown. Legs with fore coxæ brownish black, remainder yellowed; trochanters yellow; remainder of legs brownish yellow, outer tarsal segments black. Wings (Plate 5, fig. 40) whitened, prearcular and costal regions slightly more yellowed; veins very pale brown. Macrotrichia on longitudinal veins beyond cord, including *R*<sub>3</sub>, distal section of *R*<sub>4+5</sub> and more than outer half of *M*<sub>1+2</sub> and *M*<sub>3</sub>. Venation; *Sc*<sub>1</sub> ending shortly before fork of *Rs*, *Sc*<sub>2</sub> shortly retracted; *R*<sub>1+2</sub> about one-half longer than *R*<sub>2</sub>; basal section of *R*<sub>4+5</sub> arcuated, about two-thirds *R*<sub>2+3</sub>; *m-cu* about opposite one-fifth *Rs*; vein 2nd *A* ending before level of *m-cu*.

Abdomen dark brown, hypopygium yellow. Male hypopygium (Plate 5, fig. 45) with the basistyle, *b*, relatively stout, on mesal face of proximal end with a concentration of long setæ. Outer dististyle, *d*, unique, appearing as a flattened rod, the tip slender, blackened, decurved to the acute apex, on outer margin before tip with a long straight spinelike extension directed backwards; inner style subequal in length, with a fleshy setiferous lobe at base. Phallosome, *p*, transverse, massive, all elements terminating about on a level, including outer hornlike plates with broader inner blades, their tips truncate; central mass with abundant microscopic points.

*Habitat*.—India (Kumaon).

Holotype, male, Rishikesh, Dehra Dun, 1,200 feet, March 31, 1958 (*Schmid*).

*Orimarga (Orimarga) resupina* is told readily from all other regional species where the male sex is known, by the structure of the hypopygium, especially the outer dististyle. The only other species having a style approximately similar to that in the present fly is *O. (O.) basalis* Alexander where all structures are distinct. The still unrecognized *O. (O.) peregrina* Brunetti is described as being a generally yellowish species, including the thoracic pleura and abdomen. Bagchi's figure of this species shows vein 2nd A as being very long, ending beyond the level of m-cu; the length of vein Sc is erroneous as figured but is stated correctly by Brunetti in the description and in his later 1918 paper on the Tipulidæ.

**ORIMARGA (ORIMARGA) TAPROBANICA** sp. nov.

Plate 5, figs. 41, 46.

General coloration of head and thorax gray, the mesonotum unpatterned; halteres yellow; legs yellowish brown; wings narrow, faintly brownish yellow, clearer yellow at base, veins very light brown, basal section of  $R_{4+5}$  long; male hypopygium with outer dististyle a flattened straight blade, the tip abruptly narrowed; phallosome including outer lateral spines of the gonapophyses and a pair of smaller inner points.

*Male*.—Length, about 7 to 9 millimeters; wing, 5 to 6.

*Female*.—Length, about 7.5 millimeters; wing, 6.

Rostrum light gray, palpi black. Antennæ brownish black; flagellar segments oval, terminal segment shorter than the penultimate. Head light gray; anterior vertex broad.

Thoracic notum uniformly gray, pleura slightly more reddened, the anepisternum and ventral sternopleurite striped longitudinally with darker. Halteres light yellow. Legs with



fore coxæ plumbeous, remaining coxæ obscure yellow; trochanters testaceous yellow; remainder of legs yellowish brown. Wings (Plate 5, fig. 41) narrow, faintly tinged with brownish yellow, clearer yellow at base; veins very light brown, inconspicuous. Macrotrichia on most longitudinal veins beyond cord, including  $R_3$ , both sections of  $R_{4+5}$ ,  $M_3$  and outer half of  $M_{1+2}$ ;  $R_{1+2}$  with four or five trichia. Venation: Sc relatively long,  $Sc_1$  ending opposite four-fifths Rs,  $Sc_2$  near its  $R_{1+2}$  approximately equal to twice  $R_2$ ; free tip of  $Sc_2$  faint, some distance before  $R_2$ ; basal section of  $R_{4+5}$  in holotype very long, only a little shorter than Rs, shorter in paratypes; m-cu about opposite one-third Rs.

Abdomen, including hypopygium, brownish black. Male hypopygium (Plate 5, fig. 46) with the basistyle, *b*, longer than the dististyles. Outer dististyle, *d*, a flattened straight blade, gradually narrowed outwardly, the tip a short spine; inner style broad basally, outer half narrowed, setæ of the expanded base long and conspicuous. Phallosome, *p*, with outer spines of gonapophyses slender, inner plate broad, margined with low tubercles to appear more or less crenulate; inner armature of phallosome including two slender spines and a pair of flattened blades. A paratype from Kitulgala has the outer dististyle more slender but appears to be conspecific.

*Habitat*.—Ceylon.

Holotype, male, Nuwara Eliya, 6,000 feet, February 26, 1954 (*Schmid*). Paratopotype, male, pinned with type. Paratypes, 1 male, Carney, 900 feet, February 2, 1954; 2 males, Kitulgala, 800 feet, March 2, 1954; 1 female, Le Vallon, 2,700 feet, January 27, 1954; 1 male, Ulapane, 1,700 feet, January 24, 1954 (*Schmid*).

*Orimarga (Orimarga) taprobanica* is quite distinct from *O. (O.) assignata* Senior White, the only other described regional species, in the uniformly gray coloration of the thorax and the brownish black abdomen. Both *assignata* and *peregrina* Brunetti have the general coloration of both thorax and abdomen brownish yellow, with the wings shorter and broader, the venational details distinct, including the short arcuated basal section of vein  $R_{4+5}$ .

ORIMARGA (ORIMARGA) TENUISTYLA sp. nov.

Plate 4, figs. 42, 47.

Size relatively large (wing of male 5.8 millimeters); general coloration gray, pleura paler, striped longitudinally with brownish black; halteres yellow; legs light brown; wings faintly

grayish yellow;  $R_2$  longer than  $R_{1+2}$ , basal section of  $R_{4+5}$  square and spurred, vein and cell 2nd A long.

*Male*.—Length, about 8.5 millimeters; wing, 5.8.

Rostrum long, nearly equal to remainder of head, dark brown, pruinose above, obscure yellow beneath; palpi black. Antennæ black throughout; basal flagellar segments oval, the outer ones progressively more lengthened, terminal segment shorter than the penultimate; verticils shorter than the segments. Head gray, anterior vertex lighter gray, about one-half wider than the antennal scape.

Pronotum plumbeous gray. Mesonotum almost uniformly plumbeous gray, præscutum with three scarcely differentiated stripes, scutal lobes similarly darkened; pleurotergite chiefly pale, darkened ventrally. Pleura light brown, heavily pruinose, more brightened at the wing root, with a narrow brownish black dorsal stripe passing above the root of the halteres. Halteres pale yellow. Legs with coxæ testaceous yellow, fore pair slightly darker; trochanters obscure yellow; remainder of legs very light brown. Wings (Plate 5, fig. 42) moderately broad in male, faintly grayish yellow, clearer yellow in the prearcular and costal fields; veins very pale brown, poorly differentiated against the ground. Longitudinal veins beyond cord with sparse macrotrichia, on veins  $R_3$ , distal section of  $R_{4+5}$ ,  $M_{1+2}$  and  $M_3$ , with very few on  $M_4$ . Venation: Sc relatively long,  $Sc_1$  ending about opposite four-fifths to five-sixths Rs,  $Sc_2$  faint;  $R_2$  longer than the pale  $R_{1+2}$ ; free tip of  $Sc_2$  faintly indicated, far before  $R_2$ ; basal section of  $M_{4+5}$  rectangular and spurred;  $M_{3+4}$  and  $M_4$  subequal; m-cu about opposite one-fifth the long Rs; vein and cell 2nd A long, ending beyond level of m-cu.

Abdomen, including hypopygium, dark brown. Male hypopygium (Plate 3, fig. 47) with the setæ of basistyle, *b*, sparse and inconspicuous, including those of the mesal face. Outer dististyle, *d*, narrowed very gradually to the long-extended apex; inner style nearly as long, very pale and unusually slender, apex with five setæ. Phallosome, *p*, including small lateral hornlike apophyses and very broad subcircular inner plates, the tips of the latter very obtuse; central armature including a distinctive sclerotized plate, the caudal end bilobed.

*Habitat*.—India (Assam).

Holotype, male, Mynso, Khasi-Jaintia, 3,500 feet, April 20, 1960 (*Schmid*).

*Orimarga (Orimarga) tenuistyla* is best distinguished from other generally similar regional species by the venation, including the short Sc, very short  $R_{1+2}$  and spurred basal section of  $R_{4+5}$ , and by the hypopygium, particularly the dististyles and central armature of the phallosome. Somewhat similar species include *O. (O.) sherpa* Alexander and *O. (O.) subbasalis* Alexander.

ORIMARGA (ORIMARGA) VARUNA sp. nov.

Plate 5, figs. 43, 48.

General coloration gray, rostrum orange yellow; antennæ black; halteres yellow; legs brownish yellow; wings brownish yellow with light brown veins, macrotrichia of the latter sparse; veins  $R_2$  and  $R_{1+2}$  subequal,  $R_{2+3}$  and  $R_{4+5}$  long, m-cu shortly beyond level of base of Rs; male hypopygium with outer dististyle darkened, sinuous, inner style with a small setiferous lobule at its base; phallosome symmetrical, the hornlike gonapophyses large, narrowed outwardly.

*Male*.—Length, about 6 to 6.5 millimeters; wing, 5.4 to 6.8.

*Female*.—Length, about 6 to 6.5 millimeters; wing, 6 to 7.

Rostrum of type obscure orange yellow, not elongated; palpi black. Antennæ black; basal flagellar segments oval, the outer ones more elongate. Head light gray.

Thoracic notum gray, with slight pattern. Pleura brownish yellow, gray pruinose. Halteres yellow. Legs with fore coxæ darkened, remaining coxæ and all trochanters light yellow; remainder of legs brownish yellow, the posterior pair somewhat darker. Wings (Plate 5, fig. 43) relatively narrow, brownish yellow; veins light brown, those of outer costal region more yellowed and incrassated. Veins beyond level of cord with abundant macrotrichia, including both sections of  $R_{4+5}$ . **Venation:** Sc relatively long,  $Sc_1$  ending about opposite five-sixths Rs,  $Sc_2$  near its tip, the free tip of  $Sc_2$  not or scarcely indicated;  $R_{1+2}$  and  $R_2$  subequal;  $R_{2+3}$  long, subequal to Rs; basal section of  $R_{4+5}$  about four-fifths as long, arcuated at origin;  $M_{3+4}$  subequal to vein  $M_4$ ; m-cu shortly beyond the level of origin of Rs.

Abdomen light brown, darker outwardly, hypopygium yellowed. Male hypopygium (Plate 5, fig. 48) with the outer dististyle, *d*, darkened, sinuous, narrowed to the slightly obtuse tip; inner style pale, subequal in length, on mesal face with a small lobule that bears numerous long marginal setæ. Phallosome, *P*, symmetrical, including larger darkened hornlike gonapophyses and inner slender rods, their tips acute.

*Habitat*.—India (Kumaon).

Holotype, male, Pagna Malla, Pauri Garhwal, 5,955 feet, August 11, 1958 (*Schmid*). Allotype, female, Wan, Pauri Garhwal, 7,880 feet, August 20, 1958, Paratypes, male, Ampata, Teri Garhwal, 2,500 to 3,500 feet, April 9, 1958; male, Ghona Tal, Pauri Garhwal, 5,580 feet, August 12, 1958; 3 males, Katkor, Teri Garhwal, 3,500 feet, April 7, 1958 (*Schmid*).

*Orimarga (Orimarga) varuna* is most readily told from other similar regional species by the distinctive hypopygium, particularly the dististyles and phallosome. Other species with narrow wings in the male and with veins  $R_{2+3}$  and  $R_{4+5}$  elongate, include *O. (O.) basalis* Alexander and *O. (O.) subbasalis* Alexander.

## ILLUSTRATIONS

[Symbols: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *dd*, dorsal dististyle; *g*, gonapophysis; *p*, phallosome; *s*, sternite; *t*, tergite; *vd*, ventral dististyle.]

### PLATE 1

- FIG. 1. *Limonia* (*Dicranomyia*) *kalki* sp.nov.; venation.  
2. *Limonia* (*Dicranomyia*) *vaccha* sp.nov.; venation.  
3. *Limonia* (*Dicranomyia*) *veda* sp.nov.; venation.  
4. *Limonia* (*Melanolimonia*) *priapula* sp.nov.; venation.  
5. *Limonia* (*Melanolimonia*) *tergotruncata* sp.nov.; venation.  
6. *Limonia* (*Atypophthalmus*) *kurma* sp.nov.; venation.  
7. *Limonia* (*Eurhipidia*) *perscitula* sp.nov.; venation.  
8. *Limonia* (*Eurhipidia*) *simplicis* sp.nov.; venation.  
9. *Limonia* (*Rhipidia*) *tenuirama* sp.nov.; venation.  
10. *Limonia* (*Limonia*) *angulosa* sp.nov.; venation.  
11. *Limonia* (*Limonia*) *ayodhya* sp.nov.; venation.  
12. *Limonia* (*Metalimnobia*) *eusebeia* sp.nov.; venation.  
13. *Limonia* *latiorflava* sp.nov.; venation.  
14. *Limonia* *nebulinervis* sp.nov.; venation.  
15. *Limonia* (*Dicranomyia*) *kalki* sp.nov.; male hypopygium.  
16. *Limonia* (*Dicranomyia*) *vaccha* sp.nov.; male hypopygium.

### PLATE 2

- FIG. 17. *Limonia* (*Dicranomyia*) *veda* sp.nov.; male hypopygium.  
18. *Limonia* (*Geranomyia*) *multicolor* sp.nov.; male hypopygium.  
19. *Limonia* (*Melanolimonia*) *priapula* sp.nov.; male hypopygium.  
20. *Limonia* (*Melanolimonia*) *tergotruncata* sp.nov.; male hypopygium.  
21. *Limonia* (*Atypophthalmus*) *kurma* sp.nov.; male hypopygium.  
22. *Limonia* (*Eurhipidia*) *coheriana* Alexander; male hypopygium.

### PLATE 3

- FIG. 23. *Limonia* (*Rhipidia*) *tenuirama* sp.nov.; male hypopygium.  
24. *Limonia* (*Limonia*) *angulosa* sp.nov.; male hypopygium.  
25. *Limonia* (*Limonia*) *ayodhya* sp.nov.; male hypopygium.  
26. *Limonia* (*Metalimnobia*) *eusebeia* sp.nov.; male hypopygium.

27. *Limonia nebulinervis* sp.nov.; male hypopygium.  
28. *Limonia decurvans* Alexander; male hypopygium.

## PLATE 4

- FIG. 29. *Orimarga (Orimarga) asura* sp.nov.; venation.  
30. *Orimarga (Orimarga) brevistylata* sp.nov.; venation.  
31. *Orimarga (Orimarga) fuscicosta* sp.nov.; venation.  
32. *Orimarga (Orimarga) lactipennis* sp.nov.; venation.  
33. *Orimarga (Orimarga) pandu* sp.nov.; venation.  
34. *Orimarga (Orimarga) asura* sp.nov.; male hypopygium.  
35. *Orimarga (Orimarga) brevistylata* sp.nov.; male hypopygium.  
36. *Orimarga (Orimarga) fuscicosta* sp.nov.; male hypopygium.  
37. *Orimarga (Orimarga) lactipennis* sp.nov.; male hypopygium.  
38. *Orimarga (Orimarga) pandu* sp.nov.; male hypopygium.

## PLATE 5

- FIG. 39. *Orimarga (Orimarga) platystyla* sp.nov.; venation.  
40. *Orimarga (Orimarga) resupina* sp.nov.; venation.  
41. *Orimarga (Orimarga) taprobanica* sp.nov.; venation.  
42. *Orimarga (Orimarga) tenuistyla* sp.nov.; venation.  
43. *Orimarga (Orimarga) varuna* sp.nov.; venation.  
44. *Orimarga (Orimarga) platystyla* sp.nov.; male hypopygium.  
45. *Orimarga (Orimarga) resupina* sp.nov.; male hypopygium.  
46. *Orimarga (Orimarga) taprobanica* sp.nov.; male hypopygium.  
47. *Orimarga (Orimarga) tenuistyla* sp.nov.; male hypopygium.  
48. *Orimarga (Orimarga) varuna* sp.nov.; male hypopygium.



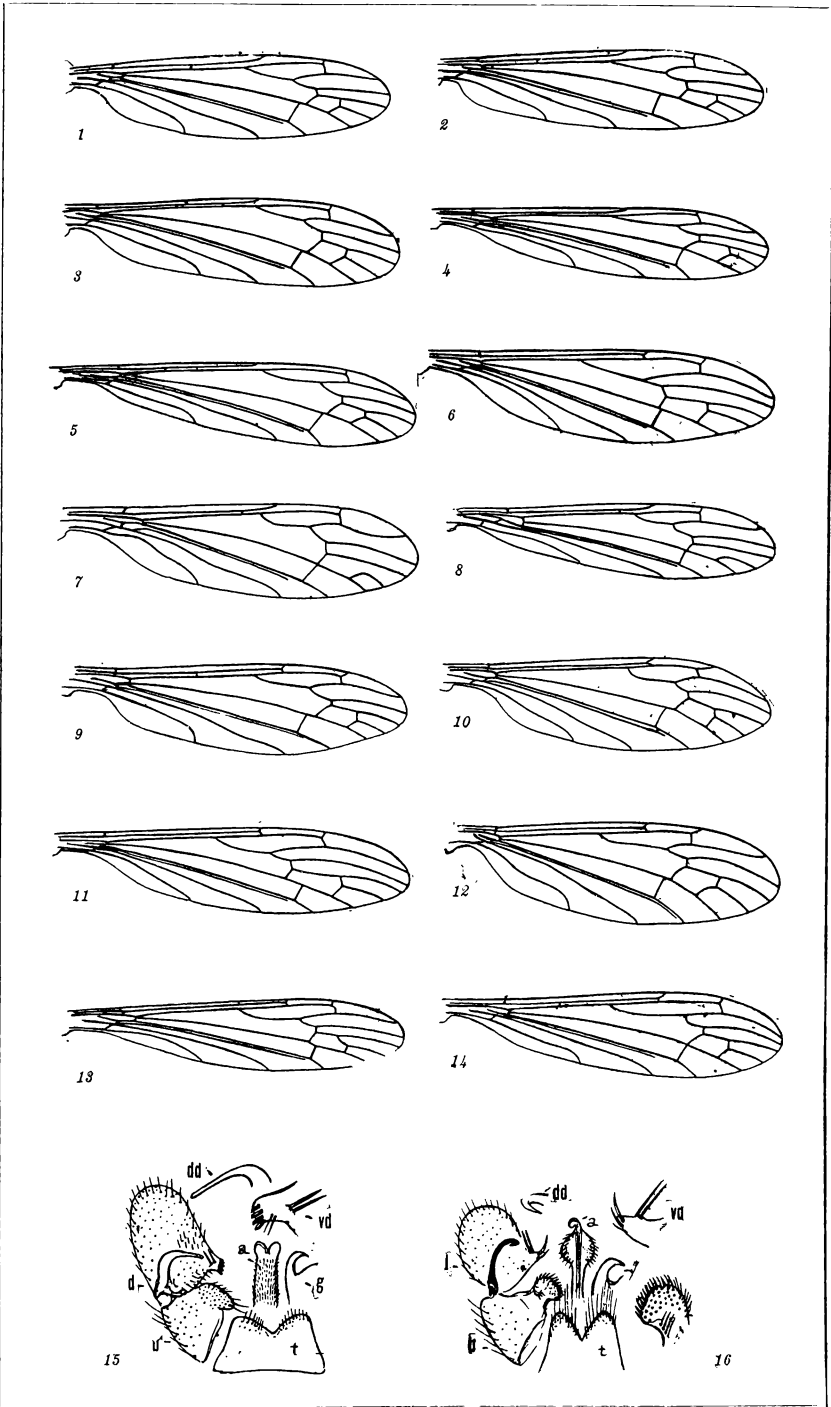
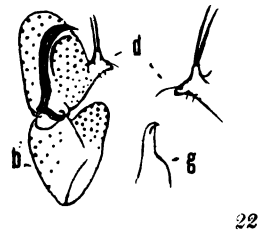
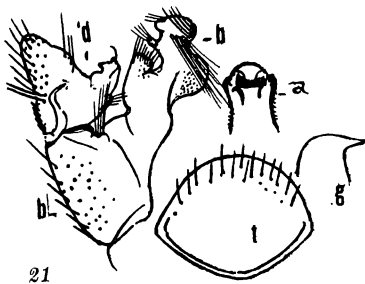
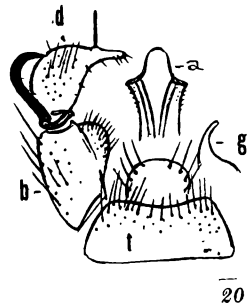
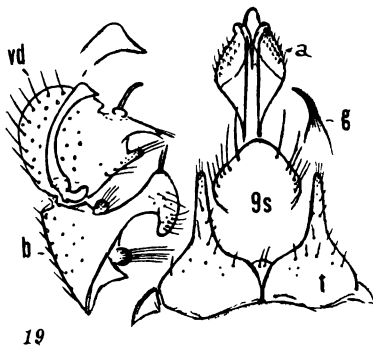
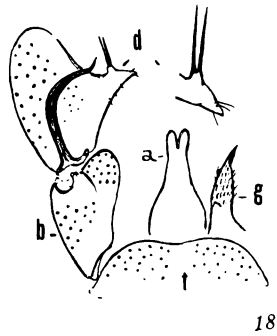
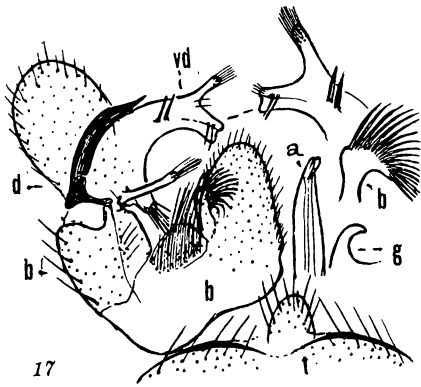


PLATE 1.





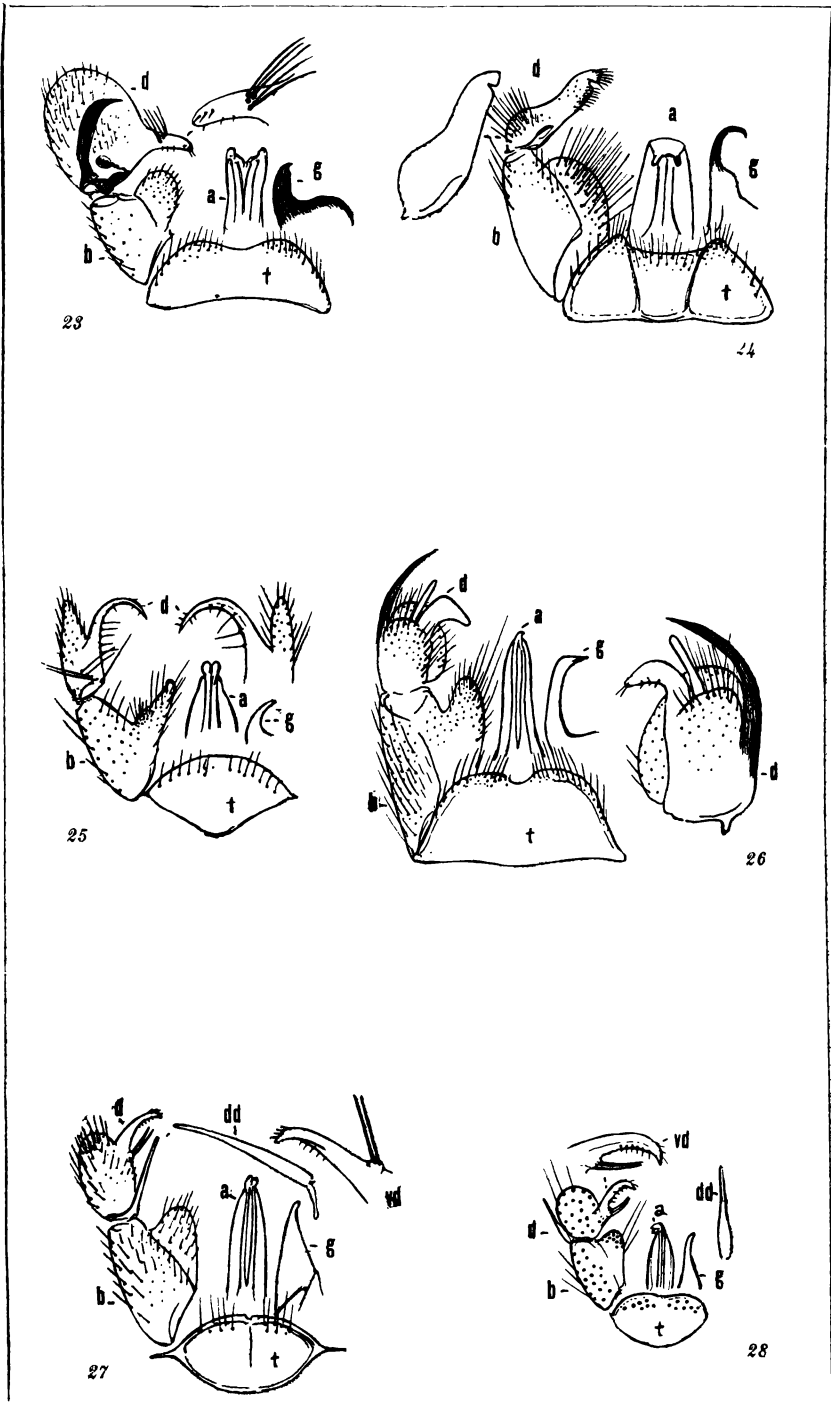


PLATE 3.

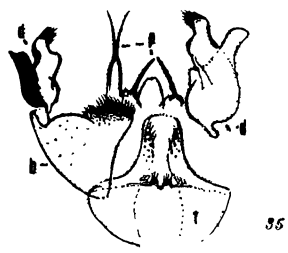
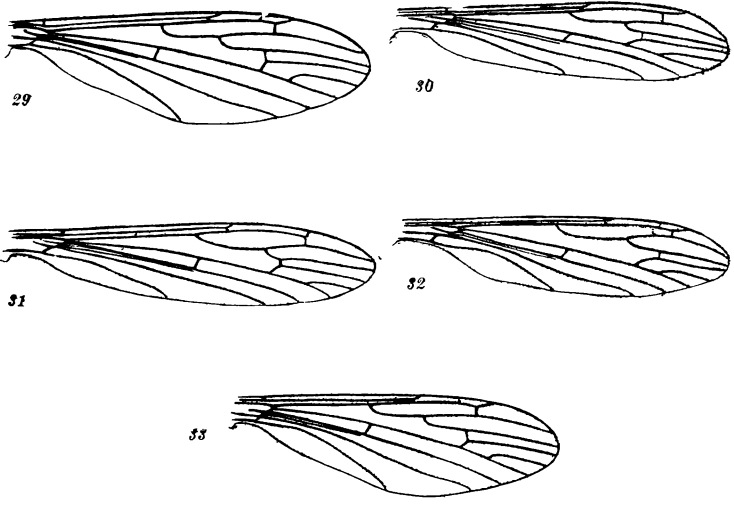


PLATE 4.

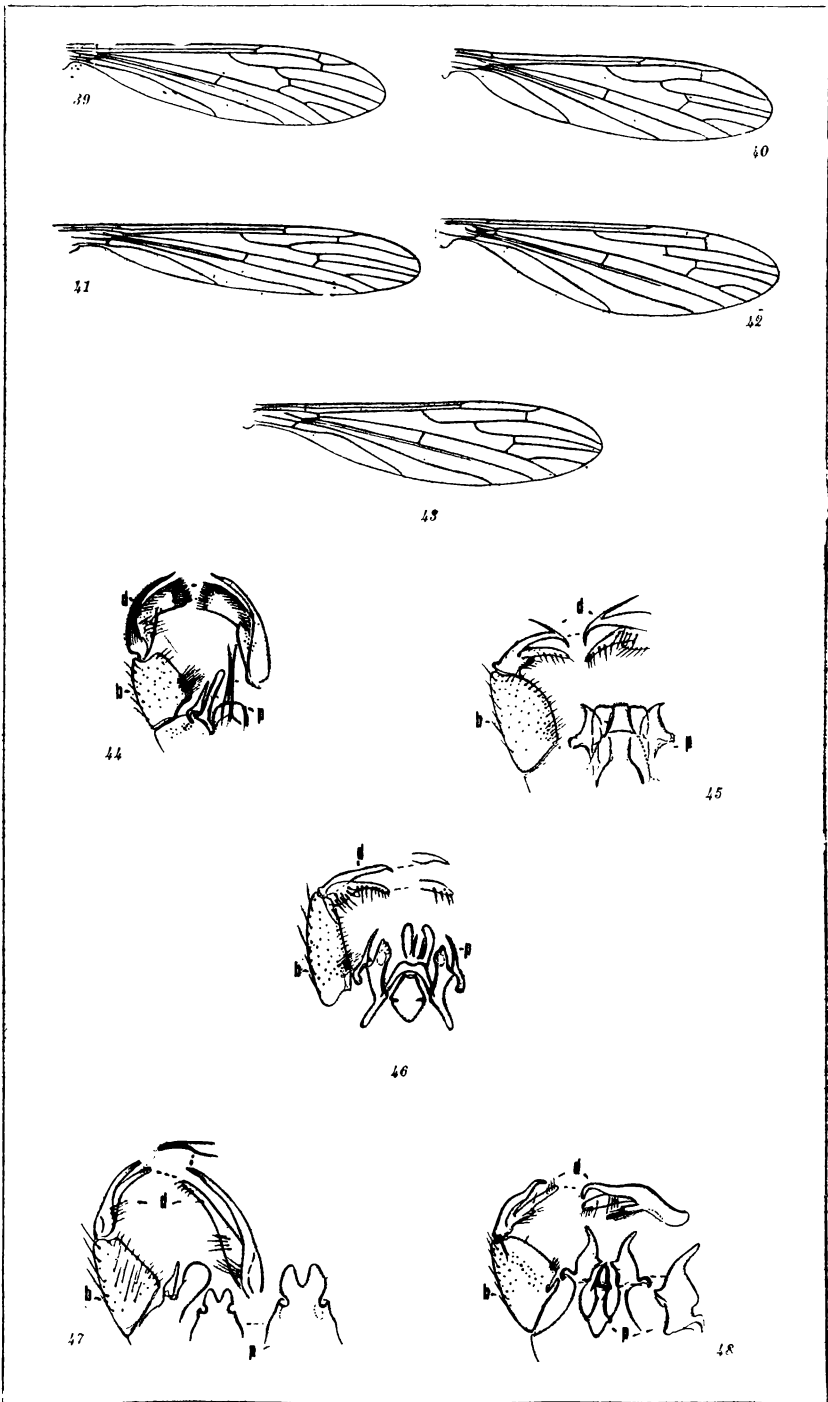


PLATE 5.