

NEW OR LITTLE-KNOWN TIPULIDAE (DIPTERA).
XCIII. ORIENTAL-AUSTRALASIAN SPECIES.

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THE crane-flies considered at this time are available from two chief sources, the first being from the Nilgiri Hills, South India, taken by Mr. P. Susai Nathan, with the types preserved in my collection, the second being based on extensive series in the British Museum (Natural History), kindly loaned me for study by Mr. Paul Freeman. The latter include various species from the Kingdon Ward-Lord Cranbrook expedition to the Adung Valley, north-east Burma, in 1931, as discussed by me in an earlier part of the present series of papers.* A few further species from Kashmir, taken by Dr. T. B. Fletcher, and from Tibet, captured in 1933 by Kingdon Ward and Kaulback, are included in the British Museum materials.

Dolichopeza (Nesopeza) compressior, sp. n.

General coloration brown, the præscutum with three darker brown stripes; antennæ with scape and pedicel yellow, flagellum black; legs brown, the tarsi, together with the extreme tips of the tibiæ, snowy white; wings with a strong blackish tinge, stigma still darker brown; abdominal tergites brown, the basal sternites brownish yellow, with brown incisures; male hypopygium with the tergite produced caudad into a deep compressed median blade; phallosome large and complex in structure.

Male.—Length about 8–9 mm.; wing 9–10.5 mm.; antenna about 3.3–3.5 mm.

Frontal prolongation of head brownish yellow; palpi dark brown. Antennæ with scape and pedicel obscure yellow, flagellum black; flagellar segments cylindrical, much exceeding the verticils. Head with the front yellow, the posterior portion of vertex rich brown, patterned on the orbits and behind with darker areas, the latter slightly pruinose.

Pronotum infuscated, more yellow on sides. Mesonotal præscutum chiefly occupied by three dark brown stripes that are vaguely delimited by slightly darker borders; interspaces a trifle paler, especially in front; scutal lobes dark brown, the median area narrowly obscure yellow; scutellum, with the parascutella, yellow, the posterior border narrowly darkened; mediotergite brownish grey. Pleura and pleurotergite obscure yellow, the dorsopleural region clearer yellow; ventral sternopleurite and meron vaguely more darkened. Halteres dark brown, the base of stem narrowly yellow. Legs with the coxæ and trochanters

* Ann. & Mag. Nat. Hist. ser. 12, vol. iv. pp. 1072–1074 (1951).

brownish yellow; femora and tibiæ brown, the extreme tips of the latter snowy white; tarsi of this same colour, the terminal segment infuscated; claws (male) simple. Wings with a strong blackish tinge, cells *C* and *Sc* a trifle darker; stigma relatively small, oval, still darker brown; obliterative area before cord poorly indicated; veins dark brown. Venation: *Rs* of moderate length, gently arcuated, approximately twice R_{2+3} ; medial forks relatively shallow, cell M_1 being about twice its petiole; *m-cu* approximately one-half its length before the fork of *M*.

Abdominal tergites brown; basal sternites weakly bicoloured, brownish yellow, the incisures more narrowly brown, including the narrow apices and slightly broader bases of the segments; hypopygium yellowish brown. Male hypopygium relatively large and complex. Ninth tergite with caudal portion extended into a deep compressed median blade, comprised of two halves that are capable of being flattened into a broad depressed central plate; on either side of this with a more sclerotized blackened bilobed structure, the outermost lobe obtusely rounded. Outer dististyle a simple dusky lobe. Inner dististyle shorter, its apex truncated. Phallosome large and complex, pale horn-coloured. Eighth sternite not produced or armed.

Hab. South India (Nilgiri Hills).

Holotype, ♂, Naduvatam, altitude 6,000 feet, September 20, 1950 (*P. Susai Nathan*). *Paratopotypes*, 3 ♂♂, September 20–21, 1950.

Dolichopeza (Nesopeza) compressior is allied and generally similar to *D. (N.) himalayae* Alexander and *D. (N.) orientalis* Brunetti, of the eastern Himalayas, differing in relatively slight details of coloration of the body and wings and in the venation. I have both of the latter species before me but unfortunately have no males for comparison. *D. (N.) himalayae* is a re-naming of *D. (N.) obscura* Brunetti, Fauna British India, Diptera Nematocera, pp. 355, 565, 1912; nec *D. (Oropeza) obscura* Johnson, Proc. Boston Soc. Nat. Hist., xxxiv. 122. 1909.

Dolichopeza (Nesopeza) laetipes, sp. n.

General coloration pale brownish ochreous, the præscutum with four pale brown stripes; pleura bicoloured, brown, the posterior sclerites abruptly whitened; tibiæ brown, the tips snowy white, basitarsi brown, the broad tips and remainder of tarsi snowy white; wings subhyaline, the oval stigma dark brown, distinct; forks of medial cells shallow; abdominal tergites brown, vaguely patterned at near mid-length with pale.

Male.—Length about 8.5 mm.; wing 9 mm.; antenna about 4.3 mm.

Frontal prolongation of head obscure yellow, restrictedly darker above, with a tuft of black setæ; palpi brownish black. Antennæ approximately one-half as long as the body; scape and pedicel obscure brownish yellow, flagellum black; flagellar segments elongate-cylindrical, approximately four times as long as the sparse scattered verticils, the latter in

turn fully three times as long as the short dense white pubescence. Head fulvous brown, the region of the low vertical tubercle more darkened.

Pronotum pale brownish ochreous. Mesonotum similar, the præscutum with four pale brown stripes that are a little darker than the ground; each scutal lobe with two pale brown areas; scutellum and mediotergite pale brown, the latter with a narrow yellow central line; pleurotergite weakly darkened. Pleura bicoloured, the mesepisternum and ventral meron brown, the pteropleurite and metapleura abruptly whitened. Halteres elongate, stem whitened, knob dark brown. Legs with the coxæ and trochanters pale, the middle coxæ weakly darkened basally; femora brown, obscure yellow at bases; tibiæ brown, the tips rather narrowly but conspicuously snowy-white, on the fore legs including about the outer eighth, on the posterior pair nearly the outer fourth; basitarsi brown, the broad tips and remainder of tarsi snowy white; claws (male) small, simple. Wings subhyaline; stigma oval, dark brown, distinct; veins brown. Venation: Sc_2 ending opposite two-thirds the length of Rs , the latter about twice $m-cu$; outer medial cells relatively shallow, M_1 being about one-fifth longer than its petiole; $m-cu$ approximately one-half its length before the fork of M ; cell 2nd A narrow.

Abdominal tergites brown, vaguely patterned at near mid-length with pale; sternites more yellowed, the tips narrowly darkened; outer segments more uniformly infuscated. Male hypopygium relatively small; eighth sternite short, unmodified; region of ninth sternite pale, submembranous, near its dorsal portion on either side of the mid-line with a slender finger-like lobe that is tufted with a few very long bristles, subequal in length to the lobes themselves. Caudal border of ninth tergite with a flattened central blackened plate, more or less rectangular in outline, the outer angles produced into points, the slightly concave margin with a row of setæ; lateral tergal lobes appearing as conspicuous blackened plates, provided with several spinulæ, the plates produced backward on the ventral margin of the tergite. Outer dististyle of moderate length, clavate, its length from four to four and one-half times the greatest width. Inner dististyle with the beak elongate. What appear to represent gonapophyses jut from the genital chamber as curved blackened rods.

Hab. South India (Nilgiri Hills).

Holotype, ♂, Cherambadi, altitude 3,300 feet, November 9, 1950 (*P. Susai Nathan*).

Readily distinguished from other regional members of the subgenus, including *Dolichozepea* (*Nesopeza*) *compressior*, sp. n., *D. (N.) himalayae* Alexander, and *D. (N.) orientalis* Brunetti, by the pattern of the legs, and where the male sex is known, by the structure of the male hypopygium.

Dolichozepea (*Mitopeza*) *kanagaraji*, sp. n.

Thorax uniformly light yellow; head darkened, pruinose; knobs of halteres and the legs brown; wings with a dusky tinge, the costal region

somewhat more brownish yellow; Rs short, oblique; R_{1+2} entirely atrophied; cell M_1 broadly sessile; $m-cu$ shortly before the fork of M_4 .

Female.—Length about 9 mm.; wing 12 mm.

Frontal prolongation of head dark brown, without nasus; palpi elongate, dark brown. Antennæ with the scape and pedicel light yellow; flagellum broken. Head darkened, heavily grey pruinose; anterior vertex broad, approximately five times the diameter of the scape, without a tubercle.

Thorax uniformly light yellow. Halteres with stem brownish yellow, knob infuscated. Legs with the coxæ and trochanters yellow, remainder of legs brown. Wings with a dusky tinge, the prearcular and costal fields somewhat more brownish yellow; stigma oval, pale brown, inconspicuous against the ground; veins dark brown, paler in the costal region. A few macrotrichia in extreme outer end of cell R_5 . Venation: Sc_2 ending a short distance before origin of Rs , the latter pale, oblique in position, only a trifle longer than the basal section of R_{4+5} ; free tip of Sc_2 about one-half vein R_1 beyond it, the latter angularly bent at point of union with the vertical R_2 ; R_{1+2} atrophied; cell M_1 broadly sessile, the basal section of vein M_2 being only a little shorter than m ; $m-cu$ shortly before fork of vein M_4 ; cell 2nd A narrow, especially at outer end.

Abdomen brownish yellow, the tergites more darkened posteriorly. All valves of ovipositor short and blunt.

Hab. South India (Nilgiri Hills).

Holotype, ♀, Naduvatam, altitude 6,000 feet, September 27, 1950 (*P. Susai Nathan*).

This interesting fly is named for Captain A. Kanagaraj of the Indian Medical Service, nephew of Mr. P. Susai Nathan. The most similar described species is *Dolichozepea* (*Mitopeza*) *flavicans* (Edwards), of Ceylon, which differs especially in the venation, particularly the petiolate cell M_1 . The broadly sessile cell M_1 and arrangement of the veins at the fork of M give the present fly an appearance very much like species of the genus *Nephrotoma* Meigen.

Nephrotoma fletcheriana, sp. n.

Allied to *kodaikanalensis*; antennæ (male) long, exceeding one-half the length of the wing, basal flagellar segments strongly serrate; mesonotal præscutum yellow with three polished stripes, the median one pale brown, the laterals black; pleura yellow, vaguely patterned with more reddish areas; halteres infuscated; fore femora chiefly blackened; wings with a brownish tinge, cells C and Sc even more suffused, darker than the stigma; cell M_1 short-petiolate; abdomen chiefly yellow, the tergites conspicuously darkened laterally; male hypopygium with the tergite and dististyles of the general type of *kodaikanalensis*, gonapophyses appearing as very slender rods, narrowed at their tips.

Male.—Length about 12 mm.; wing 10 mm.; antenna about 5.5 mm.

Female.—Length about 14 mm.; wing 11 mm.

Frontal prolongation of head short. orange yellow, the outer half of the dorsum, including the nasus, pale brown; palpi dark brown. Antennæ (male) long, exceeding one-half the wing; scape and pedicel yellow, flagellum black, the first segment a trifle paler at base; flagellar segments two to four strongly and conspicuously serrate, the succeeding ones becoming more elongate, with the outer swellings less and less conspicuous. Head with the vertical tubercle high, very weakly notched at summit; head orange; occipital brand very reduced to scarcely evident, brown, sending a narrow brown vitta cephalad to the summit of the vertical tubercle; in the allotype female this line is very delicate to subobsolete.

Pronotum orange-yellow medially, the sides, with the propleura and fore coxæ, conspicuously dark brown, the last especially so. Mesonotal præscutum yellow with three polished stripes, the central one pale brown, very narrowly to scarcely bordered by darker brown; lateral stripes black, straight, but with a small lateral suffusion opposite the anterior end, this not reaching the margin; scutum yellow, the lobes with two dark brown areas, the lateral end of the suture opaque black; scutellum and postnotum yellow, the former a trifle more darkened, the medio-tergite vaguely darkened at posterior end. Pleura and pleurotergite yellow, variegated by vague reddish areas, especially on the ventral anepisternum, ventral sternopleurite, meron and less evidently on the dorsal pleurotergite. Halteres infuscated. Legs with the coxæ weakly infuscated, the fore pair more heavily so, as described; trochanters yellow; fore femora blackened, with about the proximal fourth yellow; remaining femora brownish yellow with the tips very narrowly blackened; tibiæ dark brown, the narrow tips and the tarsi black; claws (male) elongate, toothed. Wings with a brownish tinge, particularly the prearcular field, with cells *C* and *Sc*, the latter darker than the stigma; vague dusky seams over certain of the veins, especially R_{4+5} and *Cu*; veins brown. Stigmal trichia reduced to one or two, or lacking. Venation: *Rs* short and straight, subequal to the basal section of R_{4+5} ; cell M_1 short-petiolate, the petiole about one-third *m*; *m-cu* on vein M_4 shortly beyond its base.

Abdomen chiefly yellow, including the small hypopygium, the tergites conspicuously darkened laterally. Male hypopygium with the ninth tergite transverse, the caudal margin produced into flattened compressed blades that lie vertically side by side at the mid-line, the surface with black setæ, the lower margin with blackened spicules; at base on either side the blade subtended by a strong acute spine. Region of ninth sternite very short, without a lobe. Outer dististyle relatively short and broad, the lower margin at near mid-length produced into a rectangular lobe, somewhat as in *kodaikanalensis* but less accentuated. Inner dististyle with the beak slender, passing abruptly into the more elevated sclerotized dorsal crest; no posterior crest; lower beak blackened, narrowed to an acute point. Phallosome with the gonapophysis appearing as a very slender rod, gradually narrowed and paling to membrane at apex. Eighth sternite small, not sheathing, the apex emarginate and filled with pale

membrane; centre of disk with unusually abundant long yellow setæ, much more numerous than in *kodaikanalensis*.

Hab. Burma, Bihar, North Bengal.

Holotype, ♂, Mayuyo, Burma, March 22, 1918 (*Boy Coll.*) *Allotype*, ♀, Katihar, Purneah District, North Bengal, August 7-31, 1910 (*C. Paiva*), determined by Brunetti as *bombayensis*. *Paratype*, a broken ♂, Pusa, Bihar, March 17, 1914.

A label by Edwards accompanying this material states: "*lineaticeps*, sp. n.; close to *gamma* Brunetti but prothorax yellow above and mid-præscutal stripe brown in all four males; 2 males returned Kathgodam, U.P., December 11, 1918, *Y. R. Rao*; Pusa, October 1921, *Bose*".

The species is named for Mr. T. Bainbrigg Fletcher. While quite different in its general appearance from *Nephrotoma kodaikanalensis* Alexander, including the length and structure of the male antennæ and the pattern of the head and præscutum, the nature of the male hypopygium, particularly the tergite, both dististyles and the eighth sternite, indicates a close affinity with this species, the differences in the parts mentioned being chiefly of degree only. However, the gonapophyses of the two species are quite different.

Nephrotoma multesarensis, sp. n.

General coloration yellow; mesonotal præscutum with three polished black stripes, the lateral pair stright, with an opaque velvety spot opposite the anterior end; head above yellow with a brown cross-band between the eyes; antennal scape yellow, basal flagellar segments weakly bicoloured, very strongly incised; pronotum light yellow medially, weakly infuscated on sides; legs obscure brownish yellow, the outer tarsal segments black; wings pale yellow, stigma a trifle darker but inconspicuous; abdomen yellow, the basal tergites with three narrow dark brown stripes; male hypopygium with the tergite produced caudad into two triangular spiculate lobes lying close to the mid-line; inner dististyle with a conspicuous posterior crest; both the eighth and the ninth sternites with a fingerlike setuliferous lobe, the former directed strongly cephalad.

Male.—Length about 12-13 mm.; wing 11.5-12 mm.; antenna about 4.2-4.3 mm.

Female.—Length about 14-15 mm.; wing 12-13 mm.

Frontal prolongation of head yellow, more reddened above, nasus black, conspicuous; palpi brownish yellow, the elongate terminal segment yellow in male, a little darker in female. Antennæ (male) with the scape yellow, pedicel and first flagellar segment more brownish yellow; succeeding segments vaguely bicoloured, the basal enlargement brownish black, the remainder brown, outer segments more uniformly brownish black; basal flagellar segments very strongly incised, much as in *serricornis*, the outer enlargement almost as deep as the basal one; segments a little exceeding the verticils. Head light yellow, with a conspicuous brown band across the anterior vertex between the eyes,

most intense at the orbits; vertical tubercle weakly bifid in front; occipital brand relatively small, semicircular, abruptly narrowed in front, reaching the darkened vertical band.

Pronotum light yellow medially, weakly infuscated on sides. Mesonotal præscutum light yellow with three polished black stripes that are very narrowly bordered by more velvety black; lateral stripes straight but with a large opaque dark brown to black spot opposite its anterior end to appear outcurved; scutum yellow, each lobe with a major black area involving the ends of the suture and continued ventrad onto the wing root; median stripe produced behind to the suture, ending in the angle of the latter; scutellum light brown, parascutella yellow; mediotergite light yellow, the posterior border in cases with a pair of inconspicuous more reddish spots. Pleura and pleurotergite pale yellow, the anepisternum, ventral sternopleurite and ventral meron inconspicuously more reddened. Halteres with stem brownish yellow, knob brownish black, in cases obscure yellow at tips. Legs with the coxæ and trochanters yellow; remainder of legs obscure brownish yellow, the tarsi passing into black; claws (male) toothed. Wings pale yellow, the prearcular and costal fields, including cell *Sc*, a trifle darker yellow; stigma pale brown, with numerous trichia; veins brown. Venation: *Rs* straight, about one-third longer than the basal section of R_{4+5} ; cell M_1 narrowly sessile; in the type, veins M_{1+2} , M_3 and M_4 all arising at a common point or virtually so, *m-cu* close to the base of M_4 ; in other specimens, M_4 some distance before the remaining veins.

Abdomen chiefly yellow, the more basal tergites with three narrow dark brown stripes that are interrupted on the basal rings, the lateral pair more nearly continuous; sternites and outer segments, including the hypopygium, more uniformly yellow. Male hypopygium with the ninth tergite transverse, its posterior border truncate, with the lateral shoulders rounded; median area with a pale membranous part that is produced into two obtusely triangular spiculate lobes that are separated by a small V-shaped notch. Ninth sternite with an erect fingerlike setuliferous lobe at base of an elongate-oval central emargination. Outer dististyle relatively long and narrow, the basal half more dilated, thence, narrowed to the tip. Inner dististyle subquadrate in general outline, the beak relatively slender; lower beak obtusely rounded; dorsal crest lacking; posterior crest conspicuously produced into a flattened blade, its tip truncate. Gonapophysis appearing as a small pale blade, the tip obtuse. Eighth sternite large and sheathing, the posterior border conspicuously emarginate, with pale membrane, the lobes obtuse, provided with coarse black setæ that are directed inward; in the notch lies a stout fingerlike lobe directed strongly cephalad, this provided with long yellow setæ.

Hab. India (United Provinces).

Holotype, ♂, Muktesar, Kumaon, altitude 7,500 feet, August 10–12, 1923 (*Sen*); British Museum. *Allotopotype*, ♀, July 26, 1924 (*Sen*). *Paratopotypes*, 1 ♂, July 28, 1924 (*Sen*), Alexander Collection, by exchange with Edwards; 1 ♀, September 11, 1924 (*Sen*).

In its general appearance, the present fly is most like *Nephrotoma serricornis* (Brunetti) and allies, differing very conspicuously in the structure of the male hypopygium, particularly the tergite, inner dististyle and eighth sternite.

Nephrotoma seniana, sp. n.

General coloration yellow, patterned with darker; flagellar segments bicoloured, the bases black, stems obscure yellow; a small brown spot before the antennal bases; sides of prothorax with a dark brown transverse stripe extending onto the fore coxæ; mediotergite yellow, the posterior border more reddened; fore femora broadly yellow at base and tip, the intermediate half blackened; wings with a weak brownish tinge, stigma ill-defined; cell M_1 petiolate; abdomen chiefly orange-yellow, the tergites with a series of broken spots, hypopygium chiefly yellow; caudal border of ninth tergite virtually trilobed; inner dististyle without dorsal or posterior crests.

Male.—Length about 10 mm.; wing 11 mm.; antenna about 4.3 mm.

Frontal prolongation of head yellow, narrowly darkened above for its full length, including the nasus; palpi yellow. Antennæ with basal three segments yellow, the succeeding ones conspicuously bicoloured, the basal enlargements black, the remainder obscure yellow, the outer segments uniformly darkened; flagellar segments rather conspicuously incised, longer than the verticils. Front pale yellow, with a small brown spot just before the level of the antennal bases; vertical tubercle large and protuberant, entire, pale yellow; dorsum of head orange, with vaguely darkened areas at the narrowest part of the broad anterior vertex; occipital brand conspicuous, rectangular, the short anterior point sending a capillary line forward for a short distance.

Pronotum broadly pale yellow medially, the sides dark brown, the colour continued as a narrow line over the propleura onto the anterior face of the fore coxa. Mesonotal præscutum polished light yellow, with three polished dark castaneous stripes, the anterior ends of the lateral pair outcurved, not at all opaque; an isolated dark spot below margin of præscutum in front of the suture; each scutal lobe with two confluent castaneous areas; lateral end of suture intensely blackened; scutellum polished brown, parascutella yellow; mediotergite polished yellow, the posterior border a trifle more reddened; pleurotergite reddish, enclosing a pale yellow central area. Pleura pale yellow, variegated with reddish areas on the ventral anepisternum, ventral sternopleurite and meron. Halteres with stem obscure yellow, knob infuscated. Legs with the coxæ yellow, excepting the fore pair, as described; trochanters yellow; a single (fore) leg remains; femora broadly yellow at base and tip, with about the central half dark brown, the extreme tip again infuscated; tibiæ light brown; tarsi black (outer segments broken). Wings with a weak brownish tinge, cells *C* and *Sc*, with the stigma, a trifle more yellowed; a few stigmal trichia; veins brown. Venation: *Rs* nearly twice the basal section of R_{4+5} ; cell M_1 petiolate, the stem being nearly

as long as $r-m$; cell 1st M_2 gently widened outwardly; $m-cu$ at fork of M , M_{1+2+3} subequal to $r-m$.

Abdomen chiefly orange-yellow, the tergites with a series of spots beginning on the basal ring of the second segment, widely interrupted at both base and apex of the segment, the individual areas more or less constricted, especially on the intermediate segments; small isolated spots on ventral edge of tergites near base, most distinct on the second segment where it lies at near mid-length; sternites yellow; hypopygium chiefly yellow. Male hypopygium with the ninth tergite transverse, its caudal margin virtually trilobed, including lateral sclerotized blades, obtuse at tips, each with three or four blackened spicules on face; central lobe microscopically notched at tip but appearing virtually entire and with a triangular outline, its whole surface with abundant spicules. Outer dististyle about three and one-half times as long as the greatest width, this just before mid-length, thence rather suddenly narrowed to the obtuse tip. Inner dististyle with the beak relatively slender; no dorsal or posterior crests; setae of outer margin long but sparse, yellow; lower beak viewed from the side appearing long and slender, gently curved, viewed from above appearing more spatulate, broadcast before the subobtuse apex. Phallosome with the aedeagus very short, subtended by the subequal pale gonapophyses, the latter unequally bilobed, the outer lobe a flattened compressed blade. Eighth sternite transverse, the membrane beneath the posterior border with a small fleshy lobe, directed caudad, its surface with dense microscopic setulae.

Hab. India (United Provinces).

Holotype, ♂, Muktesar, Kumaon, altitude 7,500 feet, July 24, 1924 (*Sen*); British Museum, through T. B. Fletcher.

This species is named for the collector. It is quite distinct from other regional species of somewhat similar coloration by the structure of the male hypopygium, particularly the tergite, inner dististyle and gonapophysis.

Nephrotoma subopaca, sp. n.

General coloration yellow, the praescutum with three subopaque black stripes, the lateral pair straight or virtually so, the areas not margined with darker; occipital brand very large and conspicuous; antenna with scape and pedicel blackened; thoracic pleura conspicuously patterned with black; fore femora chiefly blackened, the others yellow with narrowly infuscated tips; wings with a weak brownish tinge, the stigma very inconspicuous; abdomen yellow, the tergites conspicuously trivittate with brownish black, the sternites with a broad central stripe; hypopygium orange-yellow, ninth tergite terminating in two broad spiculate lobes, inner dististyle with the outer crest glabrous.

Male.—Length about 12 mm.; wing 12.5 mm.; antenna about 4.5 mm.

Female.—Length about 15 mm.; wing 13.5 mm.

Frontal prolongation of head light yellow, broadly blackened medially above, including the nasus, the darkened area continued backward over

the central part of front to the anterior base of the vertical tubercle; palpi brownish black. Antennae (male) elongate, black, the scape vaguely variegated with yellow at base and again at tip; flagellar segments moderately incised, longer than the verticils. Head above orange-yellow adjoining the unusually large occipital brand, more yellowed elsewhere; brand broad, plumbeous black, vaguely margined with more opaque black, the narrow anterior point almost reaching the entire summit of the vertical tubercle; a conspicuous black spot on either side of the anterior vertex adjoining the eye.

Pronotum yellow, vaguely infuscated medially, the sides and propleura extensively blackened, the colour extended onto more than the basal half of the fore coxa. Mesonotal praescutum pale yellow, more whitened laterally, with three subopaque black stripes, the lateral pair virtually straight, with a small weak darkened suffusion opposite the anterior end of lateral stripe; a small isolated darkening in the humeral region; scutum pale yellow, each lobe with a single subopaque black area; posterior sclerites of notum pale yellow, the scutellum weakly darkened, medio-tergite with a pair of confluent black areas at posterior border and with a narrow central darkened vitta. Pleura and pleurotergite yellowish white, conspicuously patterned with subopaque black, most evident on the ventral sternopleurite, meron and lower edge of the pleurotergite; smaller but similar areas along posterior border of the mesepisternum and on the lower pteropleurite and metapleura; an extensive paler area on the ventral anepisternum. Halteres obscure yellow, including the knobs. Legs with the fore coxae darkened, as described, the hind pair less evidently so, the middle coxae yellow; trochanters yellow; fore femora chiefly blackened with about the proximal third yellow, the remaining femora yellow with the tips narrowly infuscated; tibiae yellowish brown to brown, the tips, with the tarsi, blackened; all legs of type broken excepting a single detached broken one. Wings with a weak brownish tinge, somewhat more intense along the veins; stigma and cell *Sc* a trifle darker, the former very inconspicuous; stigma in male with a few trichia, in female glabrous or virtually so; veins brown. Venation: *Rs* about one-third to one-fourth longer than the basal section of R_{4+5} ; cell M_1 narrowly sessile; $m-cu$ on M shortly before the fork.

Abdomen yellow, the tergites very conspicuously trivittate with brownish black, the mid-dorsal stripe virtually continuous except for the pale apex of the basal segment, the area ending abruptly on tergite seven, there being only a small basal spot on the eighth segment; lateral stripes similarly broad, becoming less intense behind; sternites yellow with a broken central stripe, this becoming fainter behind, beginning on sternite two, very distinct on segments three and four; hypopygium orange-yellow. Male hypopygium with the ninth tergite transverse, slightly narrowed behind, each lobe broad and low, separated by a narrow U-shaped notch, the lobes provided with abundant blackened spicules, the more mesal end of the lobe a little more produced. Ninth sternite

short. Outer dististyle relatively short, its length about two-and-one-half times the greatest width which is just beyond mid-length. Inner dististyle with the beak relatively slender; dorsal and posterior crests glabrous; outer basal lobe produced to form an outline almost like that of the posterior crest. Gonapophysis very small, only about one-half as long as the ædeagus, at apex a trifle dilated into a weak head. Eighth sternite unarmed, the posterior border truncate or virtually so.

In the female, coloration virtually as in the male. Scutellum with a capillary dark vitta; mediotergite with a broad central darkening extending to the posterior border to produce a T-shaped area.

Hab. Kashmir.

Holotype, ♂, Yusimarg, altitude 7,500 feet, August 6-15, 1923 (*T. B. Fletcher*). *Allotype*, ♀, Killarmarg, altitude 10,000 feet, July 19, 1923 (*T. B. Fletcher*).

The most similar described species is *Nephrotoma trilobulata* Alexander, likewise from Kashmir which also has the occipital brand large and conspicuous. The present fly differs in the coloration of the antennæ, body, legs and wings, and in the structure of the male hypopygium, especially the tergite, inner dististyle, gonapophysis and eighth sternite.

Tipula (Acutipula) deva, sp. n.

Size medium (wing, male, 20 mm.); mesonotal præscutum brownish yellow, with four poorly defined darker stripes, the intermediate pair separated by a yellow line; antennæ brownish yellow, the three proximal segments clearer yellow; femora and tibiæ yellow, the tips narrowly and weakly darkened; wings fulvous brown, patterned with cream-coloured areas, including a major one at and before the cord and a broken band beyond the cord, chiefly in the medial field; basal four segments of abdomen orange-yellow, with brown lateral tergal stripes; outer segments, including the hypopygium, brownish black; male hypopygium with the median tergal lobe entire, relatively narrow, compressed-flattened; eighth sternite with a broader depressed-flattened lobe, its lower surface with a brush of long yellow setæ.

Male.—Length about 15 mm.; wing 20 mm.; antenna about 4 mm.

Frontal prolongation of head buffy yellow, including the long nasus; palpi with proximal three segments light brown, the terminal one darker. Antennæ with proximal three segments yellow, the remainder a trifle darker, brownish yellow, finally passing into dark brown; basal enlargements of segments relatively small; longest verticils subequal to the segments. Head above chiefly fulvous, more pruinose on centre of posterior vertex; anterior vertex narrow, as in *yunnanica*, about equal to one-half the visible diameter of the eye.

Pronotum brownish yellow, somewhat clearer medially above. Mesonotal præscutum brownish yellow with four poorly defined darker stripes, the intermediate pair light brown, the laterals more greyish; central stripes separated by a rather broad yellowed vitta, the lateral interspaces wider, more greyish; internal borders of the central stripes together

with the lateral pair very narrowly and insensibly margined with pale brown; extreme cephalic ends of central stripes darkened; posterior sclerites of notum with the ground yellow pollinose, centres of scutal lobes vaguely darkened; scutellum with a scarcely indicated capillary median vitta; mediotergite with the ground areas showing through the pollen. Pleura yellow, the mesopleura slightly pruinose, the posterior sclerites more yellow pollinose. Halteres obscure yellow. Legs with the coxæ and trochanters yellow; femora and tibiæ yellow, the tips narrowly and weakly darkened; tarsi passing into dark brown; claws (male) strongly toothed. Wings with a strong light brown to fulvous brown ground, patterned with cream-coloured areas, as follows: At near two-thirds the length of cell *M*; a zigzag band at and before cord, beginning before stigma, including the outer end of cell *R*, nearly the basal half of 1st *M*₂, narrow base of cell *M*₃ and a very extensive area in cell *M*₄, virtually reaching the posterior wing border along vein *Cu*; major pale areas before and beyond a smaller darkened spot before mid-length of cell *Cu*; a relatively indistinct pale band beyond cord, beginning at near mid-length of cell *R*₅ and with subbasal spots in cells *M*₁ and 2nd *M*₂, the last smallest; stigma slightly darker than the ground; veins brown. Venation: *R*₁₊₂ entire; *R*s relatively short, about one-fifth longer than *m-cu*, the latter on *M*₃₊₄ just before the fork.

Abdomen with proximal four segments and base of the fifth orange-yellow, poorly patterned, including a brown sublateral stripe on the tergites beginning at near mid-length of segment two; outer segments, including hypopygium, brownish black. Male hypopygium with the median lobe of tergite simple, relatively narrow, compressed-flattened, densely set with black spiculate points. Outer dististyle white, relatively short and broad, the tip obliquely truncated, broadest across the basal half. Inner dististyle with the outer lobe large and erect, its summit with about thirty strong setæ, those nearest the apical lobe shorter; subterminal lobe or beak broken at tip, its length and outline thus unknown. Eighth sternite with a depressed flattened lobe that is somewhat like that of the tergite but broader, its apex with spicules, the more basal part beneath with long yellow setæ, the outer ones longest.

Hab. North-east Burma.

Holotype, ♂, Adung Valley, altitude 9,000 feet, June 6, 1931 (*Kingdon Ward and Lord Cranbrook*).

Most similar to *Tipula (Acutipula) atuntzuensis* Edwards, of Yunnan, differing in the coloration of the antennæ, body, legs and wings. The male hypopygium is most like that of *T. (A.) yunnanica* Edwards, differing in the details as described. The type bears a note in Edwards's writing "Compare *atuntzuensis*, but antennæ different, etc."

Tipula (Acutipula) epicaste, sp. n.

Size medium (wing, male, 17 mm.); general coloration light grey, the præscutum with four light brown stripes; femora obscure yellow, the tips dark brown; wings with a weak brownish tinge, very vaguely

variegated with paler; abdomen with the proximal four segments yellow, the remainder brownish black; male hypopygium with the ninth tergite produced into a slender median lobe; outer dististyle pointed at tip; inner dististyle with apex of rostrum of outer lobe very broad and obtuse.

Male.—Length about 15 mm.; wing 17 mm.; antenna about 4 mm.

Frontal prolongation of head uniformly brown, nasus distinct; palpi dark brown to brownish black. Antennae (male) of moderate length, if bent backward extending to shortly beyond the wing-root, scape brownish yellow, pedicel clearer yellow, flagellum black; basal enlargements of segments small and inconspicuous; segments a little exceeding the longest verticils. Head light grey, vaguely patterned medially with very pale brown; vertical tubercle virtually lacking.

Pronotum narrow, brown, grey pruinose, the scutellum more yellowed. Mesonotal præscutum with the ground-colour light grey, with four light brown stripes, the inner margins of the intermediate pair narrowly but conspicuously dark brown, contiguous at front, becoming obsolete beyond mid-length; cephalic border of præscutum extensively blackened; scutum light grey, the lobes variegated with light brown areas; posterior sclerites of notum dark brown, heavily silvery pruinose, the central part remaining dark, possibly denuded; pleurotergite with the katepaleurotergite light brown, its anterior end silvery. Pleura grey, more whitened behind; dorsopleural region infuscated. Halteres dark brown. Legs with the coxæ grey pruinose; trochanters yellow; femora obscure yellow, the tips dark brown, more extensive on the fore legs; tibiæ yellowish brown, the tips narrowly darkened; tarsi passing into dark brown; claws with a conspicuous tooth. Wings with a weak brownish ground, very lightly and indistinctly variegated with paler, the most evident area being the oblitative band across the cord; scarcely apparent brightenings in outer half of cell *M* and again in cell *Cu* on either side of a scarcely differentiated darkening before mid-length of the cell; stigma medium brown; veins brown. Venation: *Rs* shorter than *m-cu*; petiole of cell *M*₁ less than *m*.

Abdomen with the proximal four segments yellow, the remainder brownish black; sides of basal tergite broadly dark brown, the central part grey pruinose; a scarcely indicated sublateral darkening on the basal tergites. Male hypopygium with the ninth tergite produced into a slender median lobe, its apex simple, spiculose. Outer dististyle broadest about opposite mid-length, the width exceeding one-half the length, apex narrowly obtuse. Inner dististyle with the apex of rostrum of outer lobe very broad and obtuse, with strong setæ; summit of lobe obtuse, with a smaller group of more delicate setæ placed back of the exact summit; beak slender. Eighth sternite broad, with weak brushes of yellow setæ back from the border.

Hab. North-east Burma.

Holotype, ♂, Adung Valley, vicinity of Lung Sa, altitude 12,000 feet, August 1, 1931 (*Kingdon Ward and Lord Cranbrook*).

The present fly is most similar to *Tipula (Acutipula) radha*, sp. n., differing in coloration and in details of structure of the male hypopygium, especially both dististyles.

Tipula (Acutipula) radha, sp. n.

Size large (wing, male, over 20 mm.); head above light grey; antennal flagellum weakly bicoloured; præscutum light grey with four poorly indicated grey stripes that are best delimited by darker internal borders; legs dark brown; wings moderately tinged with brown, restrictedly patterned with pale areas, most conspicuous in cell *Cu* and along the cord; no pale areas beyond the cord; abdomen with basal four segments yellow with a darkened sublateral stripe, the remaining segments, including hypopygium, black; male hypopygium large and conspicuous; ninth tergite narrowed into a simple slender spiculose lobe; outer dististyle obtuse at apex; inner dististyle with summit of outer lobe bearing a small brush of erect setæ; eighth sternite broad, with a weak brush of setæ along the mid-line.

Male.—Length about 19 mm.; wing 22 mm.; antenna about 4.7 mm.

Frontal prolongation of head relatively long, yellowish brown, the nasus and lower surface darker brown; palpi brown, the more proximal segments a little darker. Antennae with the scape and pedicel yellow, flagellum brownish yellow to pale brown, the small basal enlargements darker to produce a weak bicolorous appearance; verticils longer than the segments. Head light grey, the occiput more reddened; vertical tubercle scarcely indicated.

Pronotum pale medially, sparsely pruinose, more heavily so on the sides. Mesonotal præscutum light grey, with four poorly indicated stripes, the intermediate pair brownish grey, their inner margins clearly defined by a capillary brown darkening; lateral stripes grey, their inner border delimited by brown; scutum grey, each lobe with two barely differentiated grey areas that are encircled by pale brown, posterior sclerites of notum grey pruinose, the posterior border of scutellum protuberant, with a pair of vague brown spots. Pleura and pleurotergite yellowish grey. Halteres pale brown, the base of knob a little darker. Legs with the coxæ and trochanters yellow; remainder of legs dark brown, the femoral bases very narrowly yellowed; claws (male) conspicuously toothed. Wings moderately suffused with brown, costal border and especially the stigma somewhat darker brown; a dark spot in cell *Cu*, preceded and followed by more extensive whitened areas; a similar whitened spot at near three-fourths the length of cell *R* adjoining vein *M*; oblitative streak even more conspicuously whitened, extending from before stigma into the base of cell *M*₃; no other pale areas beyond cord; veins brown. Venation: petiole of cell *M*₁ shorter than *m*; *m-cu* at fork of *M*₃₊₄.

Abdomen with basal four segments orange-yellow, with a relatively indistinct brown sublateral stripe, the margins broadly pale; no median darkening; remaining segments, including hypopygium, black. Male

hypopygium large and conspicuous; suture between tergite and sternite complete; between basistyle and sternite represented only beneath. Ninth tergite produced far beyond the level of the eighth sternite into a simple lobe, at apex very slender, terete, provided with small microscopic points; more basad, on sides of tergite, with abundant long coarse setae. Outer dististyle relatively long, obtuse at tip, broadest on basal half. Inner dististyle with the outer lobe yellowed, the summit obtuse, provided with a small brush of erect setae; the produced beak-like portion tipped with shorter and stouter spinuous setae; beak of style slender, on outer margin back from the blackened part with a low crest; sensory pores abundant. Eighth sternite broad, only moderately sheathing, the apex truncate; mid-line just back of margin with a small brush of relatively short setae, directed ventrad and slightly caudad.

Hab. South-east Tibet.

Holotype, ♂, Zayul, Atakawg, Kawg La, altitude 10,000 feet. July 16, 1933 (Kingdon Ward and R. J. H. Kaulback).

The most similar species are *Tipula (Acutipula) atuntzuensis* Edwards and *T. (A.) deva*, sp. n., both of which differ in all details of coloration and in the structure of the male hypopygium.

Limonia (Limonia) shushna, sp. n.

General coloration of mesonotum dark cinnamon brown, the pleura brownish black, its dorsal portion yellow; femora obscure yellow basally, the tips broadly brownish black; tibiae brown, the outer half, with the tarsi, paling to yellow; wings with a strong dusky tinge, with a conspicuous darker brown pattern; *Sc* long, *Rs* square at origin, vein 2nd *A* bent strongly into the margin; abdomen black.

Female.—Length about 6.5 mm.; wing 7.8 mm.

Rostrum brownish ochreous, very short; palpi dark brown. Antennae with the scape dark brown; remainder broken. Head above dull orange-brown, darker in front; anterior vertex broad.

Pronotum above cinnamon-brown, paler on sides; pretergites yellow. Disk of mesonotum dark cinnamon-brown, the praescutum darker sublaterally, the extreme border in front yellow; posterior sclerites of notum medium brown. Pleura brownish black, contrasting with the paler pleurotergite; dorsopleural membrane yellow. Halteres with stem yellow, knob infuscated. Legs with the fore and middle coxae more or less infuscated, especially the middle pair; posterior coxae and all trochanters pale yellow; femora obscure yellow basally, the tips broadly brownish black; tibiae brown on about the proximal half, paling to obscure yellow; basal tarsal segments similarly yellow, the outer ones broken. Wings with a strong dusky tinge, the base narrowly yellow; a conspicuous darker brown pattern, including areas at origin and fork of *Rs*, fork of *Sc*, stigma, cord and outer end of cell 1st *M*₂ and as marginal seams on veins *M*₁₊₂ to 2nd *A*, inclusive; wing-tip in outer radial field darkened; veins brown, paler brown in the basal part of the costal field. Venation: *Sc* long, *Sc*₁ ending about opposite two-thirds *Rs*, *Sc*₂ at its

tip; *Rs* square at origin; free tip of *Sc*₂ beyond *R*₂ and about twice as long; cell 1st *M*₂ rectangular, subequal to *M*₄; *m-cu* just beyond fork of *M*, a little longer than the distal section of vein *Cu*₁; vein 2nd *A* bent strongly into the wing-margin.

Abdomen black, the genital segment dark brown. Ovipositor with the cerci slender, upcurved to the acute tips; hypovalvae longer and more powerful, blackened at bases.

Hab. South India (Nilgiri Hills).

Holotype, ♀, Naduvatam, altitude 6,000 feet, September 1950 (*P. Susai Nathan*).

There is no very similar regional species. The Papuan *Limonia (Limonia) brunneilata* Alexander bears a general resemblance but does not seem to be closely allied.

Limonia (Rhipidia) monophora, sp. n.

General coloration of mesonotum dark grey, the praescutum with a conspicuous brown median stripe; antennae (male) with six unipectinate segments, the branches shorter than the segments; femora yellow, the tips broadly and conspicuously blackened; wings whitish, with very numerous pale grey spots and clouds and four larger costal areas; male hypopygium with four long rostral spines.

Male.—Length about 5 mm.; wing 6 mm.; antenna about 1.1 mm.

Rostrum black, grey pruinose; palpi brownish black. Antennae (male) with the scape and pedicel dark brown, flagellar segments weakly bicoloured, the central part of each segment, with the branch, dark brown, the incisures broadly paler; terminal segment more uniformly blackened; flagellar segments two to seven with a single branch, the longest about two-thirds of the segment; flagellar segments one and eight with a low blunt protuberance; first flagellar segment with a short, very abrupt apical pedicel, the remainder with this stouter and less abrupt; terminal segment nearly twice the penultimate, narrowed outwardly. Head dark grey, the vertex more or less darkened; anterior vertex reduced.

Pronotum grey, narrowly brown medially above. Mesonotal praescutum dark grey, with a conspicuous brown median stripe and less distinct lateral ones; posterior sclerites of notum grey, each scutal lobe patterned with brown. Pleura and pleurotergite grey, narrowly and inconspicuously lined longitudinally with brown, the ventral sternopleurite clearer grey. Halteres pale, knob weakly darkened. Legs with the coxae yellow, infuscated basally; trochanters yellow; femora yellow, the tips broadly and conspicuously blackened; tibiae and first two tarsal segments obscure yellow, the tips very narrowly brownish black; outer tarsal segments blackened. Wings with the ground-colour whitish, the surface with very numerous pale grey spots and clouds and four larger and darker costal areas, the third being a common one at fork of *Sc* and origin of *Rs*; fourth area (stigmatal) no larger than the others, ill-defined; vague seams over cord and outer end of cell 1st *M*₂; the pale grey clouds elsewhere on disk somewhat more extensive than the ground; veins dark

brown, more brightened in the prearcular field, in the costal interspaces and vein *M*. Venation: *Sc* relatively short, *Sc*₁ ending about opposite one-third to one-fourth the length of *Rs*, *Sc*₂ near its stip; *m-cu* more than one-third its length before the fork of *M*.

Abdomen with the tergites dark brown; sternites obscure brownish yellow, the posterior margins of the segments narrowly yellow. Male hypopygium with the tergite transverse, the caudal margin gently emarginate medially, each low lobe with about a dozen long setæ. Dorsal dististyle relatively short, gently curved, the tip abruptly narrowed into a straight spine. Ventral dististyle relatively small, its rostral prolongation long, with four long spines placed at near two-thirds to three-fourths the length of the prolongation, or less than their own length from the tip.

Hab. South India (Nilgiri Hills).

Holotype, ♂, Cherangode, altitude 3,500 feet, November 1950 (*P. Susai Nathan*).

Other generally similar species of the subgenus, including *Limonia* (*Rhipidia*) *antennata* (Brunetti), *L. (R.) demarcata* (Brunetti) and *L. (R.) subtesselata* (Brunetti), fall in the typical group of species, with the flagellar segments bipectinate.

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

General coloration of mesonotum reddish brown; antennæ (male) with seven bipectinate segments, the branches of moderate length; legs obscure yellow, the femoral tips not or scarcely darkened; wings subhyaline, unpatterned or virtually so; male hypopygium with the rostral spines eight in number, long and conspicuous.

Male.—Length about 7.5 mm.; wing 8.5 mm.; antenna about 1.4 mm.

Rostrum dark brown; palpi black. Antennæ (male) brownish black, the apical pedicels of the more basal flagellar segments more whitened; first and tenth flagellar segments simply produced; segments two to eight, inclusive, each with two branches, the longest (on segments four and five) about one-half longer than the segment; segment nine with a single branch that is nearly as long as the segment; penultimate segment with a slender apical pedicel, terminal segment more than one-half longer, simple. Head above grey, vaguely more infuscated medially; anterior vertex narrow, a trifle wider than the diameter of scape.

Pronotum light brown medially, darker on sides. Mesonotal præscutum reddish brown, with indications of slightly darker brown stripes, the surface pruinose; posterior sclerites of notum similarly pruinose. Pleura light brown, sparsely pruinose, with vague indications of a dorsal darkening. Halteres with stem whitened, knob infuscated. Legs with the coxæ brown, sparsely pruinose; trochanters yellow; remainder of legs obscure yellow, the tips of the femora and tibiæ not or scarcely darkened; terminal tarsal segments weakly infuscated; claws (male) with a strong basal tooth. Wings subhyaline, unpatterned or virtually so, there

being scarcely any indications of darkened clouds anywhere on the surface; veins brown. Venation: *Sc* short, *Sc*₁ ending about opposite one-third *Rs*, *Sc*₂ near its tip; *m-cu* close to fork of *M*.

Abdominal tergites brown, the sternites a trifle paler; a vaguely indicated black lateral line. Male hypopygium with the tergite strongly narrowed outwardly, the caudal margin notched. Dorsal dististyle stout, widened outwardly, suddenly narrowed into a long straight spine. Ventral dististyle of moderate size, its area approximately twice that of the basistyle; rostral spines eight in number, long and conspicuous, the longest subequal in length to the prolongation itself. Gonapophysis with mesal-apical lobe blackened, the slightly curved tip acute, the concave inner margin with a few scattered microscopic points.

Hab. North-east Burma.

Holotype, ♂, Adung Valley, vicinity of Lung Sa, altitude 12,000 feet, August 5, 1931 (*Kingdon Ward* and *Lord Cranbrook*).

Readily told from other allied regional species of the subgenus, including *Limonia* (*Rhipidia*) *antennata* (Brunetti) and *L. (R.) subtesselata* (Brunetti) by the virtually unpatterned wings, nature of the antennal branching, and details of structure of the male hypopygium.

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

Mesonotum with a handsome pattern, the præscutum with a broad yellow central stripe that is narrowly bordered by brown. The interspaces silvery; rostrum relatively long, black throughout; head above black, with a narrow silvery median stripe; femora dark brown, the narrow tip and a subterminal ring yellow; wings yellow, heavily patterned with dark brown costal areas and paler brown clouds and washes; *Sc* long; *m-cu* some distance before the fork of *M*.

Female.—Length, excluding rostrum, about 6–6.5 mm.; wing 6.8–7.2 mm.; rostrum about 3.4–3.6 mm.

Rostrum relatively long, approximately one-half the wing, black throughout; palpi black. Antennæ black; flagellar segments suboval, longer than the verticils. Head above black with a narrow silvery central vitta, narrowest on the anterior vertex which is only about as wide as two rows of ommatidia.

Pronotum greenish white, slightly darker at the mid-dorsal line, the sides infuscated. Mesonotal præscutum handsomely patterned, having a broad obscure yellow central stripe that is bordered laterally by narrow brown interspaces, darkest behind; outside of this, extending from the humeri backwards, conspicuously whitish silvery; lateral præscutal borders less evidently darkened; scutal lobes chiefly dark brown, the median region yellow; scutellum obscure yellow; medio-tergite dark brown, yellow on the sides, the pleurotergite pale. Pleura yellow, whitish pruinose, somewhat darker on dorsal portion. Halteres with stem pale, knob dark brown. Legs with the coxæ and trochanters pale; femora obscure yellow basally, passing into dark brown, the extreme tip and a much broader subterminal ring yellow; tibiæ and tarsi

brownish black, the former with greenish tints. Wings handsomely patterned, the restricted ground yellow, most evident in the radial field; a heavy dark brown pattern, including about seven costal areas, the third and fourth at origin of *Rs* and fork of *Sc*, respectively, in cases almost contiguous; fifth and succeeding dark areas with somewhat paler centres, the former including the stigma and over the cord; other brown clouds at outer end of cell 1st *M*₂ and at ends of anal veins, that at 2nd *A* largest; outer medial cells conspicuously clouded with paler brown; still paler brown washes in the cubital and anal cells and as vague interspaces between the darkened costal areas; prearcular and postarcular region extensively darkened, constituting the first costal area; veins brown, yellow in the clearer areas. Venation: *Sc* long, *Sc*₁ ending opposite or beyond two-thirds the length of *Rs*, the latter angulated and short-spurred at origin; free tip of *Sc*₂ far beyond *R*₂, at apex of the setiferous extension of vein *R*₁₊₂; cell 1st *M*₂ about as long as vein *M*₁₊₂ beyond it; *m-cu* from one-half to two-thirds its length before the fork of *M*; vein 2nd *A* gently sinuous.

Abdominal tergites chiefly infuscated; sternites yellow, with more or less distinct greenish tinges.

Hab. South India (Nilgiri Hills).

Holotype, ♀, Naduvatam, altitude 6,000 feet, September 21, 1950 (*P. Susai Nathan*). *Paratopotypes*, 2 ♀♀.

This handsome fly is quite distinct from all other regional members of the subgenus, being most similar to *Limonia* (*Geranomyia*) *meracula* Alexander and *L. (G.) semifasciata* (Brunetti) yet quite different in all details of coloration and venation.

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

General coloration light brown, the præscutum with three darker brown stripes; pleura yellow, whitish pruinose; legs brown; wings with a weak brownish tinge, the stigma scarcely darker; male hypopygium of the type of *halterella*, very complicated in structure, especially the basistyle and its ventromesal lobe.

Male.—Length about 7–7.2 mm.; wing 7.2–7.5 mm.

Rostrum brownish black; palpi black. Antennæ with the scape and pedicel black; flagellum broken. Head brownish grey, more infuscated medially, especially on the anterior vertex, the latter about three times as wide as the diameter of the scape.

Pronotum dark brown medially. Mesonotum chiefly light brown, the præscutum with three darker brown stripes, the lateral pair narrow and much paler, poorly indicated; scutal lobes patterned with dark brown; scutellum and mediotergite heavily light grey pruinose, parascutella yellow, pleurotergite yellow, whitish pruinose. Pleura yellow, whitish pruinose, the ventral sternopleurite slightly darker. Halteres elongate, stem light brown, its base narrowly yellow, knob brownish black. Legs with the coxæ and trochanters yellow, the fore coxæ a trifle darker; femora brown, the bases narrowly yellow; tibiæ and tarsi

dark brown; claws (male) weakly toothed. Wings with a weak brownish tinge, stigma scarcely darker; veins brown. Venation: *Sc* short, *Sc*₁ ending nearly opposite origin of *Rs*, long, about two-thirds *Rs*; basal section of *R*₄₊₅ about two-thirds *Rs*; cell 1st *M*₂ relatively small, shorter than any of the veins beyond it; *m-cu* at fork of *M*.

Abdominal tergites dark brown, sternites yellow; hypopygium chiefly darkened. Male hypopygium of the *halterella* type, the basistyle very complicated by outgrowths. Ninth tergite transverse, the outer margin evenly convex, the posterior border more nearly transverse, with a deep median split, on either side of which with about ten long setæ. Basistyle relatively small, its ventromesal lobe very complicated by outgrowths, the most caudal being a geniculate darkened lobe; outermost lobe gradually narrowed to a tongue-like pale lobe, before the ligulate portion with two differentiated setiferous areas, one consisting of a dense collar of relatively short setæ; at base of the ventromesal lobe on the lower margin with a bilobed appendage that is provided with very long erect setæ. Dorsal dististyle only slightly curved. Ventral dististyle in total area somewhat less than the basistyle, the slender rostral prolongation nearly cut off from the oval outer lobe; rostral spines two, placed on face of prolongation at near mid-length, opposite a tuft of setæ on the lower face. *Ædeagus* slender, with abundant long pale setæ.

Hab. South India (Nilgiri Hills).

Holotype, ♂, Ootacamund, altitude 7,500 feet, September 18, 1950 (*P. Susai Nathan*). *Paratype*, ♂, Naduvatam, altitude 6,000 feet, October 1950 (*P. Susai Nathan*).

Limonia (*Dicranomyia*) *vamana* is quite distinct from the various Indian species of the subgenus hitherto made known. It is allied to *L. (D.) halterella* Edwards, of Europe and northern North America, and to numerous other species in North and South America. The structure of the male hypopygium is distinctive.

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

General coloration ochreous, the pronotum and anterior part of præscutum with a dark brown line; legs long and slender; wings very reduced, only a little longer than the halteres; male hypopygium normal for the subgenus, excepting the structure of the basistyles.

Male.—Length about 6.5 mm.; wing about 0.7 mm.

Rostrum yellow; palpi yellow basally, the outer segments dark brown. Antennæ broken beyond the fifth segment, dark brown; basal flagellar segments oval, longer than the verticils. Head strongly produced and very gradually narrowed behind, obscure yellow, with a transverse brown area behind the eyes; anterior vertex broad, the eyes correspondingly small.

General coloration of thorax ochreous, dusted with whitish, heaviest on the pleura; a dark brown median line on pronotum and anterior part of præscutum. Halteres with stem pale, knob dark brown. Legs

unusually long and slender; coxæ yellow, the fore pair darker; remainder of legs dark brown to brownish black, the femoral bases restrictedly obscure yellow; claws toothed as in the subgenus, the outer denticle largest. Wings very reduced, only a little longer than the halteres, whitish, the venation inconspicuous and entirely distorted.

Abdomen with the basal segments ochreous, soon passing into brown. Male hypopygium with the tergite transverse, the caudal border gently emarginate, the obtuse lobes provided with unusually abundant long pale setæ. Basistyle short, the main body with only about four to six strong setæ, arranged in a transverse row near outer end; ventromesal lobe, narrowed outwardly, provided with relatively few setæ; besides this latter lobe, two smaller lobes lying still farther distad at extreme outer end, one a small oval lobule, the other appearing as a long slender pale lobe, narrowed gradually to the obtuse tip. Dorsal dististyle a strongly curved darkened sickle, widened at the bend, thence narrowed to the long acute terminal spine. Ventral dististyle long and fleshy, its area more than twice the total area of the basistyle; rostral prolongation stout, the tip narrowly blackened, subacute; rostral spines placed on outer margin near base of prolongation, close together, without evident basal tubercles. Gonapophysis with mesal-apical lobe stout, blackened, bent laterad into an acute point.

Hab. East Tibet.

Holotype, ♂, Poshö, Kyari Dzong, 12,000 feet, August 28, 1936 (R. J. H. Kaulback).

This fly is entirely distinct from all other regional members of the subgenus. The only other members of the genus with somewhat similarly reduced wings fall in other subgenera (*Alexandriaria phalangoides* Alexander; *Zalusia falklandica* Enderlein). The male hypopygium of this insect is very ordinary with the exception of the somewhat peculiar lobing of the basistyle.

Limonia (Alexandriaria) nigroephippiata, sp. n.

General coloration of mesonotal præscutum and scutum polished black, the lateral portion, with the pleura, yellow; antennæ black throughout; femora yellow, the tips passing into brown; wings subhyaline, the base broadly light yellow, stigma oval, medium brown; *Sc* short, *Sc*₁ ending some distance before origin of *Rs*; abdomen dark brown, the lateral borders narrowly yellow.

Female.—Length about 5.5 mm.; wing 5.5 mm.

Rostrum brown; palpi black. Antennæ black throughout; basal flagellar segments short-oval, the outer ones more elongate; terminal segment about one-fourth longer than the penultimate; intermediate segments subequal in length to their verticils. Head behind dull dark brown, the centre of the posterior vertex more blackened, leaving an isolated black spot on the anterior vertex, the latter otherwise grey pruinose; anterior vertex nearly four times as broad as the diameter of the scape.

Pronotum narrowly blackened medially, the sides broadly yellow. Mesonotal præscutum nearly covered by three virtually confluent polished black stripes, the interspaces not or scarcely paler, the lateral borders broadly chestnut-yellow; scutal lobes polished dark brown or brownish black, the median region behind yellowed; scutellum obscure yellow; mediotergite chiefly dark brown, somewhat paler on anterior part. Pleura and pleurotergite polished yellow, the mesepisternum somewhat more infuscated. Halteres with stem yellow, clearest basally, knob infuscated. Legs with the coxæ yellow, the fore pair a trifle darker; trochanters yellow; femora yellow, the tips passing into brown; tibiæ and tarsi yellowish brown to brown. Wings subhyaline, the base broadly light yellow, the colour continued distad onto veins *Sc* and *Cu*; stigma oval, medium brown; veins brown, yellow in the flavous portions. Venation: *Sc* short, *Sc*₁ elongate, subequal to *Rs*, the latter again about equal to the distance between its origin and tip of *Sc*₁; *Rs* shorter than basal section of *R*₄₊₅; *m-cu* at or close to fork of *M*, a trifle exceeding the distal section of *Cu*₁.

Abdomen dark brown, including the genital shield, the lateral borders narrowly paler. Ovipositor with the cerci straight, slender, the tips obtusely rounded.

Hab. South India (Nilgiri Hills).

Holotype, ♀, Naduvatam, altitude 6,000 feet, September 1950 (*P. Susai Nathan*).

The only other regional species is *Limonia (Alexandriaria) prominens* (Brunetti), of Goa, which is entirely different in the coloration of the body, wings and appendages. The fly much more resembles *L. (A.) simplissima* (Alexander), from the highest mountains of Java, a larger species with the details of coloration and venation distinct. Both of these flies are still known only from the female sex.