

New or little-known Tipulidæ (Diptera).—XCI. Oriental-Australasian Species. By CHARLES P. ALEXANDER. Ph.D., F.R.E.S., University of Massachusetts, Amherst, Massachusetts, U.S.A.

THE crane-flies discussed herewith are from two chief sources, an important series from the Nilgiri Hills, South India, taken by Mr. P. Susai Nathan, preserved in my collection, and the very important and rich materials of the Kingdon Ward-Lord Cranbrook expedition to north-east Burma in 1931, the types in the British Museum (Natural History). A very few species from still other sources are included, as acknowledged in the text.

The very extensive collections of Tipulidæ made by Kingdon Ward and Lord Cranbrook were provisionally arranged by Edwards about 1932 and 1933 and manuscript

names were placed on certain of the species. Paratypes of several of the species described herewith and in succeeding parts under this general title were placed in my personal collection through extensive exchanges of crane-flies between Edwards and myself. No descriptions of the species had been provided by Edwards before his death on November 15, 1940, and it is desirable that this exceptionally interesting and valuable material be published. The entire series was made available to me through the kind interest of Mr. Paul Freeman and other officers of the British Museum, to whom I express my deep appreciation.

The material secured by Ward and Cranbrook were taken for the most part in the Adung Valley, north-east Burma, between June and August 1931. The conditions under which the collection was made have been detailed by Ward in his delightful book, 'Plant Hunter's Paradise'* and it is interesting to note two quotations from the work that directly concern these flies.

"We had better luck with a 'daddy-long-legs', which occurred in great numbers and extraordinary diversity, varying from gigantic insects with a wing span of six inches, to a queer alpine insect, found in the scrub rhododendron at 14,000 feet, one sex of which flies, while its mate, having only rudimentary wings, has to crawl. We caught many of these Tipulidæ, nearly all of which proved to be previously unknown. They came into the hut after dark, attracted by the light, especially on rainy nights, which suggested a certain wisdom. It must have been miserable flitting about in the Adung valley at night when the air was thick with fine mist, as it so often was", *l. c.*, pp. 239-240.

"Many new species of 'daddy-long-legs' were obtained. According to Dr. F. W. Edwards, they are related some to western Chinese, others to European forms. They show no affinities with Oriental species", *l. c.*, p. 342.

Concerning the first quotation, the gigantic specimens mentioned undoubtedly referred to the genus *Ctenacrosceles*, which includes the largest known Tipulidæ. Only one specimen of the genus was included in the collection and this represents a medium-sized form. It may be observed that the largest species of the genus so far made

* Ward, F. Kingdon. 'Plant Hunter's Paradise', pp. 347, 13 pls. 2 maps; 1937 (Jonathan Cape, London).

known have a wing expanse of slightly over four inches and that a crane-fly with a spread of half a foot, as mentioned, would be most noteworthy. The fly mentioned as having nearly apterous females and fully winged males presumably refers to *Tipula (Vestiplex) halteroptera*, sp. n., or to *T. (Oreomyza) sharva* Alexander.

Ward (*l. c.*, pp. 331-336) provides details of the itinerary and weather conditions of the expedition. As it pertains to the present materials, collections made between June 1st and 7th, were taken at Camp I, 8000 feet; between June 8th and early September, in the vicinity of Lung Sa, in Alpine Burma, at 12,000 feet and over.

Tipula (Bellardina) cranbrookii, sp. n.

Allied to *gracilirostris*; frontal prolongation of head long, without nasus; vertical tubercle low and rounded; mesonotal præscutum reddish brown, with four more fulvous stripes; a group of yellow setæ on sternopleurite; femora and tibiæ uniformly brownish yellow; wings brown, with a yellow pattern to produce a marbled appearance, the prearcular and costal fields yellow; abdomen reddish brown, the fifth and succeeding segments darker; tergites with broad yellowish grey lateral borders; male hypopygium with the tergite produced medially on ventral face into a small bilobed appendage; outer dististyle very irregular in outline; inner dististyle produced into a slender black rod that is directed caudad; a pair of small sclerotized rods lie in the notch of the ninth sternite.

Male.—Length about 24-25 mm.; wing 26-27 mm.; antenna about 4 mm.

Female.—Length about 30 mm.; wing 29 mm.

Frontal prolongation of head long and slender, subequal in length to remainder of head, without nasus, brown, darkest dorsally, more yellowed below at base; palpi dark brown, the outer half of terminal segment black. Antennæ relatively short; scape yellowish brown, pedicel yellow, flagellum dark brown to black; flagellar segments with weak basal swellings, subequal to or a trifle shorter than the segments. Head with the front, anterior slope of vertical tubercle and orbits yellow, the remainder of dorsum brownish grey, clearer grey on the obtusely rounded vertical tubercle.

Pronotum brown medially, paler on sides, the latter with a brush of setæ. Mesonotal præscutum with the lateral borders and interspaces reddish brown, the four stripes more fulvous, the posterior interspaces paling to the same colour; mid-region of scutum grey pruinose, the lobes fulvous brown; posterior sclerites of notum darker, with conspicuous setæ, the mediotergite pruinose. Pleura and pleurotergite chiefly brown, with a more or less distinct brownish grey longitudinal stripe extending from the fore coxæ across the dorsal sternopleurite and ventral pteropleurite onto the metapleura; sternopleurite with conspicuous yellow setæ; propleura and cervical region more intensely blackened; dorsopleural membrane buffy yellow. Halteres with stem yellow, knob dark brown. Legs with the coxæ brown, grey pruinose; trochanters brownish yellow; femora and tibiæ brownish yellow, the tips undarkened; basitarsi brownish yellow, the outer tarsal segments passing into black; claws (male) conspicuously toothed. Wings with the ground colour brown, deeper on outer half; prearcular and costal fields yellow, especially cell *Sc*; stigma and spots at origin of *Rs* and over anterior cord darker brown than the ground; a somewhat restricted yellow pattern, including narrow, chiefly transverse lines across cells *M* and *Cu*, and more basad in the cubital and anal fields; conspicuous yellow prestigmal and poststigmal brightenings; a series of yellow marginal spots in cells *R*₃ to 2nd *A*, including two in cell 1st *A*; veins light brown, yellow in the more brightened fields. Venation: *Rs* about twice *R*₂₊₃; *R*₂ at or close to the fork of the latter; *m-cu* at or just before fork of *M*₃₊₄.

Basal abdominal segments reddish brown, the fifth and succeeding segments darker brown; tergites with broad yellowish grey lateral borders on their posterior rings, the posterior margins narrowly pale; hypopygium large, a trifle darker coloured. Ovipositor with the cerci slender, long and virtually straight, the margins smooth. Male hypopygium with the ninth tergite, on ventral surface near posterior border with a small bilobed appendage. Ninth sternite with two narrow sclerotized rods from the U-shaped ventral notch. Outer dististyle very irregular in outline, including an outer arm that is expanded apically and is unequally bilobed. Inner dististyle

much smaller, extended caudad as a slender black rod that is encased in pale membrane.

Hab. North-east Burma.

Holotype, ♂, Lung Sa, Adung Valley, altitude 12,000 feet, July 11, 1931 (*Kingdon Ward and Lord Cranbrook*). *Allotopotype*, ♀, August 12, 1931. *Paratopotypes*, 2 ♂♂, July 1-30, 1931.

I am very pleased to name this striking fly for Lord Cranbrook, vertebrate zoologist and hunter of the expedition. The nearest ally seems unquestionably to be *Tipula* (*Bellardina*) *gracilirostris* Alexander, of Szechwan, western China, which is similar in the peculiar head structure, differing in all details of coloration and, especially, the quite distinct male hypopygium. I had earlier* proposed the subgeneric name *Sinotipula* for this group of striking crane-flies which occur in rather numerous species in the mountains of central Asia and again in western North America. It now seems questionable to me whether the group can be maintained as distinct from the earlier proposed *Bellardina* Edwards, chiefly Tropical American forms, and for the time being, at least, I am using this prior name. It is possible that future studies will justify the retention of both names.

Tipula (*Vestiplex*) *gandharva*, sp. n.

Allied to *inæquidentata*; præscutum yellow, with four dark stripes; femora black, with a very vague yellow subterminal ring; claws (male) toothed; wings with a brownish tinge, variegated by rather restricted yellow areas; abdomen with basal four segments reddish yellow, the tergites with a broad brown central stripe, the fifth and succeeding segments black; male hypopygium with the posterior border of tergite produced into two pairs of lobes or blades; appendage of ninth sternite a slender simple rod, its basal third more dilated.

Male.—Length about 15 mm.; wing 18.5 mm.

Frontal prolongation of head yellow, including the conspicuous nasus; palpi brownish black, the terminal segment still darker. Antennæ (male) broken beyond the seventh segment, when entire evidently short, not or scarcely reaching the wing root; scape and pedicel pale yellow, first flagellar segment brownish yellow, succeeding segments dark brown to black, the basal swellings only feebly indicated; longest verticils subequal to the

* Philippine Journ. Sci. lvii. pp. 94-100, 1935.

segments. Head fulvous brown with a sparse bloom, especially behind; vertical tubercle very low and obtuse, with a narrow central darkened vitta.

Pronotum brownish yellow, pollinose. Mesonotal præscutum with the ground colour light yellow to whitish, clearest on sides, the interspaces more fulvous; four dark stripes, the intermediate pair brown, then anterior ends paling to dark grey; lateral stripes dark grey, their internal border deepening to brown; scutum light yellow, each lobe with dark grey areas that are narrowly to vaguely bordered with brown, most distinct along the inner margins; scutellum yellow, with a narrow light brown median line; postnotum yellow pollinose. Pleura and pleurotergite yellow, vaguely patterned with slightly darker, more reddish areas, especially on the ventral anepisternum, ventral sternopleurite and meron; dorso-pleural membrane yellow. Halteres with stem yellow, knob dark brown, obscure yellow at apex. Legs with the coxæ and trochanters light yellow; femora black, narrowly yellow basally and with a very vague to scarcely evident subterminal yellow ring; tibiæ and tarsi black; claws (male) small, with an erect subbasal tooth. Wings with a brownish tinge, variegated by rather restricted yellow areas to form a weak pattern, the chief of these markings before and beyond the origin of *Rs*; a band beyond stigma, including the proximal parts of the radial cells; an area across base of cell 1st *M*₂; basal and subapical marks in cell *M*, and extensive brightenings in cells *Cu*, 1st *A* and 2nd *A*; stigma brown; veins brown. Venation: *R*₁₊₂ entire; *Rs* relatively long, a little exceeding vein *R*₃; cell *M*₁ deep, its petiole subequal to *m*; *m-cu* at fork of *M*₃₊₄.

Abdomen with basal four segments chiefly reddish yellow, the tergites with a conspicuous mid-dorsal brown stripe, broadest on the outer segments; fifth and succeeding segments black. Male hypopygium with the caudal margin of the ninth tergite bearing two pairs of lobes, an outer slender pair and a pair of blackened blades lying closer together and at a lower level. Basistyle terminating in a short stout spine. Appendage of ninth sternite a long simple rod, the basal third more dilated. Inner dististyle massive, the lower surface of beak conspicuously blackened.

Hab. North-east Burma.

Holotype, ♂, Adung Valley, Camp I, altitude 8000 feet, June 4, 1931 (*Kingdon Ward and Lord Cranbrook*).

Based on the structure of the male hypopygium, the most similar described species is *Tipula (Vestiplex) inaequidentata* Alexander, of the eastern Himalayas, differing in the length of the antennæ, details of coloration, and structure of the male hypopygium.

Tipula (Vestiplex) halteroptera, sp. n.

Male fully winged, female with wings greatly reduced, only a little longer than the haltere; general coloration of præscutum grey, with four dark grey stripes that are narrowly margined with dark brown; antennæ black, the flagellar segments barely incised; claws (male) simple; wings (male) strongly tinged with brown, with a restricted oblitative area across the base of cell 1st M_2 ; abdominal tergites grey, conspicuously trivittate with brown; male hypopygium with the tergite simple; basistyle small, unarmed; appendage of ninth sternite a small yellow blade; ovipositor with margins of cerci smooth.

Male.—Length about 11 mm.; wing 10 mm.; antenna about 4 mm.

Female.—Length about 17–18 mm.; wing 2.5 mm.; antenna about 2.4 mm.

Male.—Frontal prolongation of head grey; nasus short but distinct; palpi brownish black. Antennæ black, scape sparsely pruinose, pedicel narrowly reddened at apex; reaching to shortly beyond the wing root; basal swellings of flagellar segments poorly developed; verticils shorter than the segments. Right antenna of type with some of the segments deformed. Head dark grey, the antennal fossæ behind tinged with red; anterior vertex broad, the very low vertical tubercle very weakly subcarinate; eyes relatively small.

Pronotum black, pruinose. Mesonotal præscutum with four dark grey stripes that are narrowly margined with dark brown, the median vitta broad, formed by the common border of the intermediate stripes; remainder of præscutum and the posterior sclerites grey, the scutal lobes vaguely patterned with brown; scutellum and mediotergite with a vague capillary dusky line, parascutella dark brown; katapleurotergite obscure brownish yellow. Pleura grey; dorsopleural membrane more

buffy brown. Halteres brownish black. Legs with all coxæ dark, heavily light grey pruinose; trochanters black; femora abruptly reddish yellow, the tips blackened, the amount subequal on all legs and including about the outer eighth of the posterior pair; tibiæ yellowish brown, the tips blackened; tarsi black; claws simple; spur formula 1–2–2. Wings fully developed, strongly tinged with brown, the prearcular and costal fields somewhat more yellowed; a restricted oblitative area across the base of cell 1st M_2 ; a vague yellow brightening near outer end of cell M ; veins pale brown. Venation: R_{1+2} entire; vein R_1 united with R_{2+3} at the fork; R_s about one-third longer than $m-cu$; wings of type with venation of outer medial field deformed by atrophy of veins.

Abdomen grey, the tergites broadly and conspicuously trivittate with brown; outer segments, including hypopygium, more uniformly darkened, pruinose. Male hypopygium with the tergite with a deep V-shaped notch, the mid-area with pale membrane; a blackened flange or beak on ventral face of each lobe. Basistyle unarmed. Appendage of ninth sternite a flattened yellow blade that bears two setæ at near three-fourths the length, the blade about five times as long as broad.

Female.—Differing from the male in important characters, particularly the very reduced wings which are only a trifle longer than the halteres, strongly infuscated, and with the venation so distorted as to be barely recognizable. Nasus lacking or reduced to a tiny tubercle. Antennæ short; flagellar segments simple, the longest about twice as long as thick, a trifle exceeding the verticils. Legs short and stout, with about the distal third of the femora blackened. Ground colour of abdominal tergites buffy grey, the three brown stripes even broader; sternites with vague indications of a broken central line. Ovipositor as in the subgenus; cerci relatively narrow, the margins not serrate.

Hab. North-east Burma.

Holotype, ♂, Adung Valley, date and altitude unspecified (*Kingdon Ward and Lord Cranbrook*). *Allotopotype*, ♀, altitude 13,000 feet, July 1, 1931. *Paratopotype*, ♀, in poor condition, taken with the allotype; Alexander Collection, through exchange with Edwards.

The most similar described species is *Tipula (Vestiplex) tardigrada* Edwards, from the high mountains of Yunnan.

This is a larger fly, with the wings of the female much larger than in the present insect, and with distinct colorational and structural differences in the male.

Tipula (Vestiplex) bisentis, sp. n.

Size small (wing, male, under 14 mm.); mesonotal præscutum grey, with four darker grey stripes that are narrowly margined with brown; antennal pedicel pale yellow, femora yellow, the tips conspicuously blackened; claws simple; wings with a strong brownish tinge, very vaguely to scarcely patterned; wings of female slightly atrophied; abdomen with basal segments reddish orange, the tergites trivittate with dark brown, the outer segments, including hypopygium, black; male hypopygium with the basistyle entire, its apex bispinous.

Male.—Length about 10–11 mm.; wing 13–13.5 mm.; antenna about 4.3–4.4 mm.

Female.—Length about 13 mm.; wing 8.5 mm.; antenna about 2 mm.

Male.—Frontal prolongation of head obscure yellow, narrowly lined with brown on sides of dorsal face, nasus dark; palpi dark brown. Antennæ moderately long; scape obscure fulvous yellow, its apex a little darker; pedicel pale yellow; first flagellar segment brownish black, the remaining segments black; flagellar segments only slightly incised, approximately twice as long as the longest verticils. Head grey, more heavily so on the genæ, the vertex with three brown spots; vertical tubercle low, very weakly bilobed at summit; head, including the tubercle, with microscopic pittings.

Pronotum grey, vaguely patterned with brown. Mesonotal præscutum light grey on sides, the interspaces yellowish grey, the median one more infuscated; four still darker grey stripes that are narrowly, but conspicuously margined with brown; scutum yellowish grey, each lobe with two separate dark grey areas that are very narrowly and insensibly bordered by brown; scutellum and mediotergite light grey, with a brown central vitta that is narrower behind; pleurotergite almost whitened. Pleura grey, lighter on ventral half, the anepisternum dark grey; dorsopleural membrane obscure fulvous. Halteres with stem reddish yellow, brighter at base, knob dark brown. Legs with the coxæ

light grey; trochanters reddish yellow, pruinose; femora yellow, the tips narrowly but conspicuously black, the amount subequal on all legs; tibiæ yellow, the tips more narrowly infuscated; basitarsi brownish yellow, the outer tarsal segments passing into brownish black; claws simple; spur formula 1–2–2. Wings with a strong brownish tinge, the prearcular field and cell *Sc* more yellowed; stigma trifle darker than the ground; obliterative areas before stigma and especially across cell 1st *M*₂ conspicuous; very vague and inconspicuous brightenings in cell *R*₁, near base of *R*₃ and near outer end of cell *M* adjoining vein *Cu*; base of cell 1st *A* somewhat brightened; veins brown, *Sc* and the prearcular veins more yellowed. Squama naked. Venation: *R*₁₊₂ preserved; *Rs* subequal to vein *R*₃; petiole of cell *M*₁ about one-half longer than *m*; *m-cu* close to the fork of *M*₃₊₄.

Abdomen with first tergite grey pruinose; succeeding segments reddish orange, the tergites trivittate with dark brown; lateral stripes most distinct on basal segments, paler and more diffuse behind; outer segments, including six to nine, with the posterior border of five, uniformly blackened. Male hypopygium with the caudal border of ninth tergite broadly emarginate, the lateral lobes obtuse; at base of notch and lying more ventral with two smaller blackened knobs with spiculate tips. Basistyle bispinous, the more dorsal spine longer. Appendage of ninth sternite bearing a small finger-like lobe with three long setæ.

Female.—Generally similar to male but differing in several regards. Antennæ and legs short. Wings slightly atrophied but showing the venation and pattern of the male. Præscutal stripes more uniformly darkened. Abdomen with mid-dorsal stripe broader, the sternites more uniformly infuscated. Cerci flattened, the margins serrate.

Hab. North-east Burma.

Holotype, ♂, Lung Sa, Adung Valley, altitude 12,000 feet, July 19, 1931 (Kingdon Ward and Lord Cranbrook). *Allotopotype*, ♀, altitude 11,000 feet, August 24, 1931. *Paratopotype*, ♂, July 4, 1931.

This small *Vestiplex* is readily told from all other regional species, with the exception of *Tipula (Vestiplex) subtinctoria* Brunetti, by the bispinous basistyle of the male hypopygium. The latter fly is much larger and otherwise

quite distinct in coloration and details of structure of the male hypopygium.

Tipula (Oreomyza) wardiana, sp. n.

General coloration of thorax yellow in male, more pruinose in female, with poorly indicated præscutal stripes; nasus very reduced; antennal flagellum beyond the elongate basal segment black; halteres yellow; legs black, the femora with the narrow bases and a vague subapical ring yellow; claws (male) toothed; wings pale yellow, with a conspicuous brown pattern to produce a checkered appearance; R_{1+2} present; abdomen of male with proximal four segments orange, the remainder, including the hypopygium, black; male hypopygium with the caudal border of the ninth tergite doubly emarginate; outer dististyle long and narrow, virtually parallel-sided; inner dististyle massive, its lower beak elongate, expanded at apex into an obtusely rounded head.

Male.—Length about 15 mm.; wing 15 mm.; antenna about 4.5 mm.

Female.—Length about 21 mm.; wing 18 mm.; antenna about 3.1 mm.

Frontal prolongation of head brownish yellow, darker on sides; nasus very reduced; palpi brown, the terminal segment black. Antennæ (male) with scape and pedicel yellow; first flagellar segment brownish yellow, darker on the outer half, remainder of flagellum black; first flagellar segment unusually long, exceeding the next two combined; flagellar segments only moderately incised, longer than the verticils. In female, antennæ shorter, the first flagellar segment elongate, as in male. Head above grey, more whitened in front; vertical tubercle low.

Pronotum yellow, sparsely pruinose. Mesonotal præscutum yellow pollinose laterally, the disk with four poorly indicated stripes, the intermediate pair more yellowish grey, the laterals brownish grey; posterior sclerites of notum more uniformly grey. In female, the notum is more uniformly grey, the præscutal stripes brown, the intermediate pair confluent in front. Pleura yellow pollinose in male, more pruinose in female; dorsopleural region yellow. Halteres with stem yellow, knob obscure orange. Legs with coxæ yellow pollinose, somewhat more pruinose in female; trochanters yellow; legs blackened, the

femoral bases narrowly yellow; femora with a very vague to scarcely evident obscure yellow ring before the broader tips; claws (male) toothed. Wings pale yellow, the prearcular field and cell *Sc* deeper yellow, cell *C* more brownish yellow; a conspicuous brown pattern to produce a checkered appearance; dark areas irregular, especially before cord where they are subequal in extent to the pale markings; beyond the cord the darkenings more restricted, including the narrow margin, seams over all the veins excepting the base of the outer radial field, and a narrow oblique darkening at near mid-length of the radial field, extending from the outer end of cell R_2 to the outer end of cell 1st M_2 ; cell 2nd *A* almost uniformly pale; veins brown, yellow in the prearcular and costal fields, excepting costa itself. No squamal setæ. Venation: R_{1+2} preserved; *Rs* about two and one-half times *m-cu*; cell 1st M_2 relatively large, irregularly pentagonal; *m* and petiole of cell M_1 subequal; *m-cu* at or close to fork of M_{3+4} .

Abdomen of male with the proximal four segments orange, virtually unpatterned, the remaining segments, including hypopygium, abruptly black. In female the integument is much discoloured by eggs within but apparently conforms well with the pattern of the male; lateral borders of both tergites and sternites light ashy grey, much more evidently so than in male. Ovipositor with cerci very long and straight, the margins smooth. Male hypopygium with the caudal border of the ninth tergite bi-emarginate, there being a major outer shallow notch, with a small circular one at its base. Outer dististyle long and narrow, only slightly wider near base than near apex. Inner dististyle massive, lower beak elongate, dilated at apex into an obtusely rounded head.

Hab. North-east Burma.

Holotype, ♂, Adung Valley, Camp I, altitude 8000 feet, June 5, 1931 (Kingdon Ward and Lord Cranbrook). *Allotopotype*, ♀, pinned with type.

I am most pleased to name this attractive crane-fly for the collector, Mr. F. Kingdon Ward, distinguished botanist and plant hunter extraordinary. The fly is most similar to species such as *Tipula (Oreomyza) tetragramma* Edwards, of Yunnan, differing in all details of coloration, the toothed claws, and the quite distinct male hypopygium.

Tipula (Oreomyza) letifera, sp. n.

Belongs to the *marmorata (fragilis)* group; mesonotal præscutum grey, with four brown stripes; wings greyish subhyaline, with a very poorly indicated pale brown pattern; abdomen brownish yellow, the outer segments darker and more pruinose; male hypopygium with the ninth tergite transverse, the caudal margin with a V-shaped median notch, the sides of which are produced into slender spiculose arms; upper margin of outer dististyle narrowly blackened and crenulate; eighth sternite with caudal border produced into a low rounded lobe that is fringed with about a dozen black setæ.

Male.—Length about 12 mm.; wing 14 mm.; antenna about 4.3 mm.

Frontal prolongation of head brownish grey; nasus distinct; palpi brown, the terminal segment black. Antennæ with scape brownish yellow, pedicel clear light yellow, flagellum dark brown; flagellar segments very slightly incised, longer than the verticils. Head above chiefly light grey; vertical tubercle rounded.

Pronotum brownish yellow, vaguely patterned with brown, most distinct medially and on sides. Mesonotal præscutum greyish yellow, clearer grey on humeral portions; four brown stripes, additional to a more diffuse lateral darkening before the suture; anterior ends of intermediate stripes paling to grey, narrowed and clear-cut behind; posterior sclerites of notum grey, the mediotergite clear light grey; each scutal lobe with two separate pale brown areas; scutellum and mediotergite with a capillary brown median vitta. Pleura and pleurotergite light grey. Halteres with stem pale, knob infuscated. Legs with the coxæ light grey; trochanters brownish yellow; femora yellow, the tips slightly more infuscated; tibiæ brownish yellow, the tips gradually darkened; tarsi dark brown; claws (male) toothed. Wings greyish subhyaline, with a very poorly indicated pale brown pattern arranged as in the group, the chief dark clouds being at cord and across midlength of cell R_3 ; veins brown. Venation: R_s relatively long, about one-half longer than $m-cu$.

Abdomen brownish yellow basally, the outer segments darker and pruinose. Male hypopygium with the ninth tergite transverse, its posterior border truncate, with a V-shaped median notch, the margins of the latter narrowly

blackened, produced outward as slender lobes. Outer dististyle broad, its dorsal margin narrowly blackened and crenulate. Inner dististyle with the main body a flattened blade that narrows to the acute beak, the outer margin evenly convex. Eighth sternite slightly sheathing, the central part of caudal border produced into a low rounded lobe that is fringed with about a dozen black setæ.

Hab. South-east Tibet.

Holotype, ♂, Shugden Gompä, altitude 13,000 feet, August 18, 1935 (*R. J. H. Kauback*); British Museum (Natural History).

The most similar European species appears to be *Tipula (Oreomyza) obsoleta* Meigen, which has the male hypopygium, particularly the inner dististyle and eighth sternite, quite distinct. The eastern Nearctic species *T. (O.) fragilis* Loew and *T. (O.) nebulipennis* Alexander, have the upper margin of the outer dististyle blackened and toothed but quite different from the condition in the present fly.

Tipula pullimargo, sp. n.

General coloration of head and thorax uniformly dull orange-yellow; antennæ (male) elongate, approximately three-fourths the length of body; wings strongly tinged with brownish yellow, the stigma and narrow costal border abruptly dark brown; abdominal tergites reddish yellow, trilineate with black, outer four segments black; ovipositor with short valves; male hypopygium with the outer dististyle a short compact club with the head spinous; inner style a large flattened structure, the beak and posterior crest subequal in form and size.

Male.—Length about 11–12 mm.; wing 13–14 mm.; antenna about 8–9 mm.

Female.—Length about 8–9 mm.; wing 11–12 mm.; antenna about 3 mm.

Frontal prolongation of head orange, including the nasus, the latter variable in length; palpi testaceous to light brown. Antennæ (male) elongate; scape, pedicel and proximal half or more of first flagellar segment obscure yellow, the tip and remainder of organ black; flagellar segments elongate-subcylindrical, with barely indicated basal enlargements; verticils a little more than half as long as the longest segments; besides the verticils, segments with abundant erect shorter white

pubescence. In female, antennæ much shorter, simple; basal two segments yellow, the remainder passing into dark brown. Head obscure yellow, without vertical tubercle.

Thorax uniformly dull orange-yellow, without pattern; præscutal setæ very short and sparse, those of the posterior sclerites longer and conspicuous, yellow. Halteres with stem yellow, knob dark brown. Legs with the coxæ and trochanters orange yellow; remainder of legs black, the femoral bases yellow, narrowest on the fore pair, on the posterior femora including more than one-half the segment; claws (male) with a weak pale basal spur, otherwise simple; spur formula 1-1-2. Wings with a strong brownish yellow tinge, clearer yellow basally; cells *C* and *Sc*, with the stigma, abruptly dark brown; restricted whitish oblitative areas before stigma and across base of cell 1st M_2 ; veins brownish yellow, somewhat darker in the costal field. Venation: R_{1+2} preserved; petiole of cell M_1 nearly twice m ; M_{3+4} subequal to or shorter than basal section of M_{1+2} .

Abdomen reddish yellow, the basal tergites narrowly trilineate with black; in male, tergites six to nine and sternites seven to nine uniformly blackened; in female, ground-colour of abdomen obscure brownish yellow to brown, the black pattern approximately as in the male but the stripes apparently broader. Ovipositor with the valves very short, especially the yellow oval cerci which are covered with delicate setulæ; hypovalvæ subequal in length, appearing as subhyaline blades, their tips obliquely truncate. Male hypopygium with the ninth tergite narrowed outwardly, the caudal margin with a broad shallow median notch, the lateral lobes slender. Outer dististyle a short compact club, the head set with numerous strong black spinous setæ. Inner dististyle a larger flattened structure, dilated outwardly to form two subequal blades, the beak and posterior crest, both being of approximately equal size and outline, the former more obtuse at tip; beak with more abundant punctures than the crest.

Hab. North-east Burma.

Holotype, ♂, Adung Valley, Camp I, altitude 8000 feet, June 4, 1931 (*Kingdon Ward* and *Lord Cranbrook*). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, several ♂♂, 2 ♀♀, May 30-June 13, 1931.

A very distinct and isolated species, readily told from all other medium-sized members of the genus that have the body colour yellow, including *Tipula flavithorax* Brunetti, by the elongate male antennæ, striking pattern of the wing, and, especially, the peculiar male hypopygium, particularly the dististyles. In an earlier paper (Philippine Journ. Sci. lvii. p. 85, 1935) I had provisionally assigned the species to the vicinity of *T. filicornis* Brunetti, but better knowledge of the Oriental fauna now renders this placement less probable.

Nephrotoma globata, sp. n.

Allied to *toda*; general coloration yellow, the præscutum with three polished black stripes, straight or only vaguely outcurved; pleura and pleurotergite patterned with red; femora chiefly blackened, their bases restrictedly obscure yellow; wings weakly darkened, stigma and a cloud over the anterior cord dark brown; cell 1st M_2 very small, less than one-fourth vein M_1 ; *m-cu* on M_4 at base of cell 1st M_2 ; male hypopygium large, subglobular, obscure orange; caudal border of ninth tergite four-lobed; inner dististyle long and slender, especially the slightly decurved beak, lower beak a slender blackened rod; eighth sternite conspicuously produced medially.

Male.—Length about 11-12 mm.; wing 12-12.5 mm.; antenna about 4.1-4.2 mm.

Female.—Length about 14-15 mm.; wing 13-13.5 mm.

Male.—Frontal prolongation of head yellow, darkened above at outer end; nasus dark brown; palpi brownish black. Antennæ with scape yellow, pedicel brownish yellow, flagellum black; flagellar segments moderately incised, longer than the verticils. Head light yellow; vertical tubercle low, entire; anterior vertex at narrowest point with a dark spot on either side; occipital brand relatively large, triangular, but pale and inconspicuous, with paired darkened spots within its borders.

Pronotum almost uniformly yellow, slightly more reddened on sides. Mesonotal præscutum yellow, with three polished black stripes, the lateral pair straight, confluent behind with even larger areas on the scutal lobes, this pattern involving the suture; scutellum testaceous yellow; mediotergite light yellow on central part, vaguely more darkened on sides, the posterior border

with a pair of darker spots. Pleura and pleurotergite yellow, vaguely patterned with red, most evident on the ventral sternopleurite, ventral anepisternum, meron and dorsal pleurotergite. Halteres obscure brownish yellow, the apices of the knobs a little clearer yellow. Legs with coxæ yellow, the fore pair a trifle darker basally; trochanters yellow; femora chiefly blackened, the bases restrictedly obscure yellow; claws (male) toothed. Wings weakly darkened; stigma dark brown, conspicuous, glabrous or with only one or two trichia; cells *C* and *Sc* a little more yellowed; a conspicuous brown spot at the anterior cord, confluent with the stigma; veins brown. Venation: *Rs* only a trifle longer than the basal section of *R*₄₊₅, cell 1st *M*₂ small, less than one-fourth vein *M*₁ beyond it; cell *M*₁ broadly sessile; veins *M*₁₊₂, *M*₃ and *M*₄ all leaving at base of cell 1st *M*₂, with *m-cu* shortly beyond the base of the last vein.

Abdomen of holotype above chiefly obscure orange, only vaguely darkened medially above; hypopygium very large, subglobular, obscure orange. Male hypopygium with the caudal border of ninth tergite produced into two pairs of lobes, including a larger pair on either side of a deep and narrow median incision, the mesal edge of these blades extended into an acute glabrous point; lateral marginal arms slender, each tipped with two or three spicules. Outer dististyle long and slender. Inner dististyle long and narrow, the beak especially so, lower beak a slender blackened rod. Phallosome complex, consisting of two sets of structures subtending a microscopic pair of arms. Eighth sternite large and sheathing, the caudal border trilobed; lateral lobes widely separated, with a brush of long setæ; median lobe large, appearing as a flattened semicircular plate.

Female.—Much as in male. Dark spots on vertex large and conspicuous; occipital brand smaller, subtended on either side by dark markings that lie outside the brand. Lateral præscutal stripes a trifle outcurved. Abdominal tergites more heavily patterned, appearing as large vague darkenings on the individual segments.

Hab. South India (Palni Hills).

Holotype, ♂, Kodaikanal, altitude 7000 feet, August 15, 1921 (*T. B. Fletcher*); British Museum (Natural History). *Allotopotype*, ♀, August 11, 1921. *Paratopotypes*, 1 ♂, 1 ♀, August 15–17, 1921.

Among the regional forms that have the male hypopygium unusually large and complex, the present fly seems undoubtedly to come closest to *Nephrotoma toda* Alexander, differing in all details of the male hypopygium, including the ninth tergite, both dististyles, the phallosome and the eighth sternite. The name used, *globata*, was a manuscript designation of Edwards and specimens were returned to India under this name.

Nephrotoma kodaikanalensis, sp. n.

General coloration orange-yellow, the præscutum with three polished nacreous to blackened stripes that are narrowly bordered by velvety black, the lateral pair straight; head orange-yellow, with no occipital brand; pleura light yellow, variegated by more reddish areas; femora chiefly blackened, the basal fourth obscure yellow; claws (male) toothed; wings with a weak brownish tinge, stigma pale brown, without trichia; basal section of vein *M*₄ elongate; abdomen orange-yellow, the tergites trivittate with brown, the outer segments uniformly orange; male hypopygium with the tergite narrowed outwardly, terminating in two flattened black plates; outer dististyle broad, with a strong lobe on upper margin; beak of inner dististyle abruptly slender, lower beak with a blackened bidentate point; eighth sternite with a pencil of setæ at near mid-centre, these directed strongly ventrad and backward.

Male.—Length about 11–12 mm.; wing 11–12 mm.; antenna about 3.9–4 mm.

Female.—Length about 15–16 mm.; wing 13–14 mm.

Frontal prolongation of head orange-yellow, nasus distinct; palpi brownish yellow. Antennæ (male) with scape and pedicel yellow, flagellum black, the first segment paler basally; flagellar segments rather strongly incised, longer than the verticils. Head orange-yellow; vertical tubercle low and broad; occipital brand lacking or indicated by a small vague darkening only.

Pronotum orange-yellow. Mesonotal præscutum orange-yellow, with three polished nacreous to blackened stripes that are narrowly bordered by velvety black, the lateral stripes straight, without a subtending darkened area; scutum yellow, each lobe with two confluent areas, blackened at and near the suture, paler behind, bordered by velvety black except on the posterior part;

posterior sclerites of notum yellow, scutellum more testaceous; mediotergite with a pair of slightly darker posterior spots; pleurotergite uniformly yellow. Pleura variegated with light yellow and more reddened areas. Halteres with stem weakly infuscated, brighter at base; knob infuscated, its apex yellowed. Legs with the coxæ and trochanters orange; femora chiefly blackened, with about the basal fourth obscure yellow; tibiæ brown, the apex darker; tarsi dark brown; claws (male) strongly toothed. Wings with a weak brownish tinge; stigma pale brown, inconspicuous, without trichia; cell *Sc* a trifle darkened; veins brown. Venation: *Sc*₂ ending opposite origin of *Rs*, the latter a little longer than the basal section of *R*₄₊₅; *m-cu* some distance from origin of vein *M*₄, the first section of the latter subequal to *r-m*; cell *M*₁ narrowly sessile.

Abdomen orange-yellow, the tergites trivittate with brown, the mid-dorsal line most conspicuous, beginning on the second segment, ending on the seventh, broadly interrupted at the incisures, including both the base and apex; lateral stripes much narrower but more continuous, beginning near the posterior end of the second segment, ending on the fifth; sternites and outer segments uniformly orange. Male hypopygium with the ninth tergite relatively small, the posterior end produced into two flattened black blades that lie vertically, their surface with blackened spicules. Outer dististyle bearing a strong pointed lobe on outer or upper margin. Inner dististyle with the beak narrowed abruptly into a slender point; posterior crest large. Gonapophyses appearing as flattened blades, expanded outwardly.

Hab. South India (Palni Hills).

Holotype, ♂, Kodaikanal, altitude 7000 feet, October 8, 1921 (*T. B. Fletcher*) British Museum (Natural History). *Allotopotype*, ♀, August 13, 1921. *Paratopotypes*, 1 ♂, 1 ♀, August 15, 1921.

The present insect is superficially most similar to *Nephrotoma dorsopunctata* (Brunetti), among the described regional species. It differs from all of these in the distinctive male hypopygium, particularly the ninth tergite, outer dististyle, gonapophysis, and eighth sternite. Like the last, the specific name, *kodaikanalensis*, was one of Edwards' manuscript designations and material had been distributed under the name.

Nephrotoma rajah, sp. n.

General coloration yellow, including the head and prothorax; mesonotal præscutum with three straight polished black stripes; scutellum pale; postnotum and pleura yellow; knob of halteres infuscated; femora brownish yellow, the tarsi blackened; wings greyish subhyaline, cells *C* and *Sc* concolorous; stigma brown, with trichia; cell *M*₁ broadly sessile; abdomen orange, with a broken central tergal stripe; subterminal segments darkened to form a narrow ring; male hypopygium with the tergite unequally trilobed; inner dististyle with the beak prolonged, the lower beak very obtuse; on face of style with a flattened black plate, its apex produced into two strong spines; gonapophyses appearing as flattened blades, broadest on outer half.

Male.—Length about 10.5 mm.; wing 12 mm.; antenna about 3.2 mm.

Female.—Length about 12 mm.; wing 12.5 mm.

Frontal prolongation of head yellow, restrictedly infuscated above at apex, including the nasus; palpi with first segment brown, the outer segments black. Antennæ (male) relatively short; scape and pedicel yellow, flagellum black; flagellar segments very weakly incised, the basal swellings feebly indicated; verticils shorter than the segments. Head yellowish orange, unpatterned, the colour more intense across the vertex; occipital brand not developed.

Prothorax uniformly yellow, including the sides. Mesonotal præscutum yellow, with three straight polished black stripes that are very insensibly bordered by more velvety black; lateral stripes crossing the suture and covering much of each scutal lobe, the remainder of the latter yellow; lateral ends of suture darkened; scutellum testaceous to weakly infuscated, parascutella and postnotum uniformly yellow. Pleura yellow, the ventral sternopleurite deepening to orange. Halteres with stem obscure yellow, knob infuscated. Legs with the coxæ and trochanters yellow; femora brownish yellow, the tibiæ and tarsi progressively more darkened, the latter black. Wings greyish subhyaline, cells *C* and *Sc* concolorous; stigma oval, moderately deep brown; a small paler brown cloud over the anterior cord; veins brown. Stigma with about a dozen trichia. Venation: *Sc*₂ ending opposite the origin of *Rs*, the latter a little longer

than the basal section of R_{4+5} ; cell M_1 broadly sessile, the basal section of vein M_2 being subequal to or longer than $r-m$; cell 2nd A relatively broad.

Abdomen orange, the tergites with a broken central brown stripe; subterminal segments of both sexes restrictedly darkened to form a narrow ring; hypopygium orange. Male hypopygium with the tergite transverse, the caudal margin unequally trilobed, including a pair of lateral lobes that are tipped with blackened spicules and a smaller median triangular point, the sides of which bear a few similar spicules; margin of the incision thickened; no development of sclerotized armature on ventral surface of plate. Outer dististyle of moderate length, its greatest width approximately one-fifth the length. Inner dististyle with the beak much prolonged, the outer margin subtended by pale membrane to form a crest; lower beak very low and obtuse, blackened; on face of style with a flattened black plate, its apex produced into two strong spines, with one or two further tiny points. Gonapophyses appearing as flattened blades, gently widened outwardly broadest across the outer half; inner margin of blade nearly straight, the outer margin strongly convex, particularly the outer half. Ninth sternite incised medially, with protruding membrane at base of notch. Eighth sternite transverse, only moderately sheathing; posterior border with a small median incision, the margin with long conspicuous setæ.

Hab. South India (Nilgiri Hills).

Holotype, ♂, Glen Morgan, altitude 6500 feet, May 22, 1948 (*P. Susai Nathan*). *Allotopotype*, ♀, pinned with type.

By Brunetti's key (1912), the present fly runs to *N. dorsopunctata* (Brunetti), an entirely different fly which is well distinguished by the coloration of the body, halteres and wings, including the uniformly darkened cell Sc , and in the venation. I do not have the male sex available for comparison with the present insect.

Nephrotoma libra, sp. n.

General coloration of præscutum yellow, with three subnitidous black stripes, the lateral pair straight; suture pale; a narrow black line on margin of præscutum before suture; posterior border of mediotergite with a pair of black spots; pleura yellow, conspicuously patterned with darker; femora brownish yellow, the tips narrowly but

conspicuously brownish black, the amount subequal on all legs; claws (male) simple; wings weakly tinged with brown, the stigma darker, without trichia; abdomen yellow, the tergites with three narrow black stripes, the sternites with a similar median one; male hypopygium with the caudal margin of tergite thickened and blackened, spiculose, the outer lateral angle on ventral surface with a decurved spine; inner dististyle with an unusually high dorsal crest; gonapophyses appearing as flattened yellow blades; caudal border of eighth sternite truncate to very slightly emarginate.

Male.—Length about 12 mm.; wing 11 mm.; antenna about 4.1 mm.

Frontal prolongation of head yellow, with a narrow brown mark on either side of the mid-line above; nasus dark; palpi brown, the terminal segment black. Antennæ (male) about one-third as long as body; scape reddish brown, pedicel brownish black, flagellum black; flagellar segments only slightly incised, the basal enlargements small; verticils shorter than the segments. Head yellow, with a small brown orbital spot and a faint darkening on the simple vertical tubercle; occipital brand large, broad, only slightly narrowed on anterior half.

Pronotum yellow, the scutellum extensively blackened on sides. Mesonotal præscutum yellow, with three subnitidous black stripes, the lateral pair straight; a narrow black line on border before the suture, the latter pale; scutum pale yellow medially, each lobe with two entirely confluent black areas; scutellum and postnotum yellow, posterior border of mediotergite with a pair of brownish black spots; pleurotergite with lower half of the katapleurotergite blackened. Pleura yellow, conspicuously patterned with darker, including a diffuse brown area on the anepisternum and solid blackened marks on the ventral sternopleurite and meron; a narrow blackened line on suture between the mesepisternum and mesepimeron. Halteres pale brown, the base of stem obscure orange, the knob, weakly darkened. Legs with coxæ obscure yellow, the outer faces of the fore and hind pairs a trifle darkened; trochanters brownish yellow; femora brownish yellow, the tips narrowly but conspicuously brownish black, the amount subequal on all legs; tibiæ brownish yellow, the tips more broadly but gradually infuscated; tarsi dark brown; claws (male)

small, simple. Wings with a weak brown tinge, cell *Sc* concolorous; stigma medium brown, without trichia; veins brown. Venation: *Rs* arcuated, subequal to the basal section of *R*₄₊₅; cell *M*₁ narrowly to more broadly sessile; vein *M*₁₊₂₊₃ very short to punctiform so *m-cu* is close to the inner end of cell 1st *M*₂.

Abdomen yellow, the tergites with three narrow black stripes, the median one most distinct on segments two to four, becoming very faint behind; lateral stripe darker and more conspicuous; sternites with a very delicate black central stripe; hypopygium brownish yellow. Male hypopygium with the caudal margin of tergite thick and blackened, the outer lateral angle produced into a decurved spine. Basistyle with a smooth blackened plate on mesal face. Inner dististyle with an unusually high and conspicuous glabrous dorsal crest. Gonapophysis appearing as a flattened yellow blade, the slender apex bent at a right angle, gradually narrowed to the slightly decurved tip.

Hab. Tibet.

Holotype, ♂, Gyantse, altitude 13,000 feet, July 19, 1928 (*Lt. Col. F. M. Bailey*) British Museum (Natural History).

Somewhat similar to *Nephrotoma nigrohalterata* Edwards likewise from high altitudes in Tibet. The latter seems to be well distinguished from other similar regional forms by the blackened scutellum, uniformly black halteres, and the strong pruinose coxæ. It should be noted that at the time of describing *nigrohalterata*, Edwards mentioned a female specimen from the type locality of the present fly and it seems probable that this second specimen likewise belongs to *libra*.

Nephrotoma kaulbacki, sp. n.

General coloration of notum yellow, the præscutum with three polished black stripes, the lateral pair appearing outcurved; vertex with a narrow dark line from the summit of the vertical tubercle to the occiput; prothorax, scutellum and postnotum uniformly yellow; fore femora chiefly blackened; claws (male) toothed; wings weakly tinged with grey, stigma medium brown, *Sc* relatively long; male hypopygium with the caudal margin of tergite deeply notched, the lobes conspicuously thickened and blackened; gonapophyses appearing as flattened

yellow blades; eighth sternite extensive, sheathing, its posterior border with a very deep and narrow notch; ninth sternite with a small finger-like lobule.

Male.—Length about 11 mm.; wing 12 mm.; antenna about 3.9 mm.

Female.—Length about 12.5 mm.; wing 13 mm.

Frontal prolongation of head, including nasus, brownish black above, with a narrow yellow central line, the sides yellow; palpi black. Antennæ (male) moderately long, about one-third the wing; scape and pedicel pale yellow, flagellum black, the proximal segments a trifle more brightened at bases; flagellar segments sub-cylindrical to weakly incised, the basal enlargements small and insignificant; verticils a trifle shorter than the segments. Front pale yellow; dorsum of head orange, with a continuous narrow dark brown vitta from the summit of the narrow entire vertical tubercle, behind merging with the elongate-triangular occipital brand.

Prothorax uniformly yellow. Mesonotal præscutum yellow laterally, the interspaces orange; three polished black stripes, the median one with a reddened central vitta on anterior third; lateral stripes appearing outcurved by a small velvety black spot opposite their cephalic end, the latter not reaching the margin; scutum broadly yellow medially, the lobes with two confluent black areas, the posterior one paling to brown on outer edge, suture pale; scutellum and postnotum uniformly yellow. Pleura yellow, the anepisternum and ventral sternopleurite with poorly indicated more reddened areas. Halteres with stem reddish yellow; knob infuscated. Legs with the coxæ and trochanters yellow; fore femora chiefly black, the proximal third yellow; remaining femora yellow, with about the outer eighth darkened; tibiæ brownish yellow, the tips darker; tarsi passing through brown to black; claws (male) toothed. Wings weakly greyish subhyaline; prearcular and costal fields very pale yellow, cell *Sc* somewhat brighter; stigma oval, medium brown, with at most a single trichia; a vague darkened cloud over the anterior cord in cell *R*₃. Venation: *Sc* relatively long, *Sc*₂ ending about opposite one-fourth the length of the nearly straight *Rs*; cell *M*₁ broadly sessile.

Abdominal tergites of male yellow, narrowly trivittate with brownish black, beginning at the second segment;

sternites yellow, with a virtually entire median line; darkened areas more extensive on the subterminal segments but not forming an unbroken dark ring; hypopygium brownish yellow. In female, the median tergal stripe is very broad and uninterrupted, fully as wide as the sublateral yellow lines; extreme lateral margins of both the tergites and sternites narrowly darkened; eighth segment more uniformly darkened to form a narrow ring. Male hypopygium with the outer half of the ninth tergite slightly narrowed, with a deep median notch; lateral lobes thickened and blackened, spiculate. Inner dististyle with beak slender; posterior crest produced backward as pale membrane. Eighth sternite large, strongly sheathing, the posterior border with a very deep and narrow notch.

Hab. East Tibet.

Holotype, ♂, Poshö, Kyari Dzong, altitude 12,500 feet (Natural History).

I am very pleased to name this fly for the collector, Mr. R. J. H. Kaulback, who collected several interesting Tipulidæ in Tibet in 1933, 1936 and 1937. The pattern of the head of the fly is somewhat as in the otherwise quite different *Nephrotoma angustistria* Alexander and *N. fletcheriana* Alexander. The tergite of the male hypopygium is somewhat suggestive of *N. nigricauda* Alexander, but all other details of the organ are distinct.

Nephrotoma inorata, sp. n.

Female.—Length about 13–14 mm.; wing 13–14 mm.

Very similar in its general appearance to *Nephrotoma kaulbacki*, sp. n., differing in details of structure and coloration. The conformation of the vertical tubercle and the abundant stigmal trichia should be noted. Antennal pedicel weakly infuscated. Vertical tubercle weakly trilobed, including two lower lobules and a more elevated median one, with the broader darkened vitta beginning close to the base of the latter; a brown orbital darkening at the narrowest point of the vertex. Anterior end of the central præscutal stripe reddened; lateral stripes virtually straight, with a very faint brown cloud opposite their anterior end; central stripe reaching the suture behind and darkening this as a V-shaped area, with a further delicate brown median line over the scutum and scutellum; posterior border of mediotergite weakly

darkened. Knobs of halteres vaguely brightened. Fore femora not evidently blackened, merely infuscated apically, as with the other legs. Wing coloration much the same, stigma a little larger, with abundant trichia; darkened cloud over the anterior cord distinct, lying on both sides of the veins. Venation: *Sc* short, *Sc*₂ ending opposite origin of *Rs*, the latter shorter and more oblique, in alignment with the remainder of the anterior cord, distinctly shorter than in *kaulbacki*; cell *M*₁ more narrowly sessile; cell *2nd A* narrow. Abdomen orange, the tergites with a broad conspicuous dorso-median stripe, beginning on the basal segment, barely interrupted at the posterior borders of the segments, the individual areas slightly widened posteriorly; segments seven and eight uniformly black to form a conspicuous ring; genital segment fulvous.

Hab. South-east Tibet.

Holotype, ♀, Eong Tö Valley, altitude 6500 feet, May 21, 1933 (*Kingdon Ward* and *R. J. H. Kaulback*) British Museum (Natural History). *Allotopotype*, ♀.

Limonia (Euglochima) dravidica, sp. n.

Mesonotal præscutum dark reddish brown, the posterior sclerites and the pleura paler; legs brownish black, the tarsi, including more than the distal half of the basitarsus, snowy white; wings with a weak brownish tinge, stigma darker brown; male hypopygium with the ventral dististyle relatively small.

Male.—Length about 8–8.5 mm.; wing 7.5–8 mm.

Female.—Length about 7–7.5 mm.; wing 7.5–8 mm.

Rostrum very small, brown; palpi black. Antennæ black, the scape somewhat paler; flagellar segments relatively long, narrowed and glabrous at both ends; longest verticils unilaterally distributed. Head dark grey, paler on genæ.

Mesonotal præscutum dark reddish brown, the posterior sclerites and the pleura much paler, more yellowed. Halteres very long, blackened. Legs with the coxæ and trochanters testaceous yellow; femora and tibiae brownish black; basitarsi blackened on less than the proximal half, the remainder of tarsi snowy white. Wings with a weak brownish tinge, the oval stigma darker brown; veins dark brown. Venation: *Sc* short, *Sc*₁ ending distinctly before the level of the end of vein *2nd A*,

Sc_2 at its extreme tip; Rs short to very short, less than the basal section of R_{4+5} ; cell 1st M_2 normally closed, rectangular, longer than the veins beyond it; $m-cu$ variable in position, in cases just beyond the fork of M , in others fully half its length beyond the fork.

Abdomen dark brown, the basal segments more obscure yellow. Male hypopygium with the posterior border of the tergite gently rounded, the setæ mostly marginal in position. Dorsal dististyle strongly curved, narrowed to the acute apex. Ventral dististyle less than one-half more extensive than the total area of the basistyle; rostral prolongation short and stout, terminating in a single strong seta; two rostral spines on basal half of outer face, the more proximal one a trifle longer and rising from a low tubercle. Gonapophyses with mesal-apical lobe pale, curved to the subacute tip.

Hab. South India (Anamalai Hills).

Holotype, ♂, Cinchona, altitude 4000–5000 feet, August 29, 1946 (*P. Susai Nathan*). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, 7 ♂♀, August 29–September 25, 1946.

The present fly differs from the Indonesian *Limonia* (*Euglochina*) *cuneiformis* (de Meijere) in slight details of coloration and especially in the structure of the male hypopygium. In *cuneiformis*, the ventral dististyle is unusually long, its total area being nearly three times that of the basistyle, including the ventromesal lobe. Brunetti (1912) recorded this latter fly from the Dawna Hills but the identification must be considered doubtful until the male sex becomes available.

Antocha (*Antocha*) *studiosa*, sp. n.

Body uniformly pale yellow; antennæ, halteres and legs yellow; wings whitish subhyaline, the small oval stigma brown, relatively conspicuous; $m-cu$ at about two-thirds its length before the fork of M ; male hypopygium with the outer dististyle sclerotized, its apex unequally bidentate; longest gonapophyses expanded basally, the outer half abruptly narrowed.

Male.—Length about 3.5–3.7 mm.; wing 4–4.4 mm.; antenna about 0.7–0.8 mm.

Female.—Length about 5 mm.; wing 5.4 mm.

Rostrum, palpi and antennæ pale yellow, the latter short; flagellar segments oval, shorter than the verticils. Head pale yellow.

Thorax uniformly pale yellow. Halteres yellow. Legs yellow throughout. Wings whitish subhyaline, the prearcular and costal fields pale yellow; stigma small, oval, brown, relatively conspicuous; veins brown, more yellowed in the flavous areas. Venation: R_{2+3} , R_2 and R_{1+2} all short and subequal; $m-cu$ from about one-half to virtually its own length before the fork of M , usually at about two-thirds this length.

Abdomen uniformly yellow. Male hypopygium with the tergite narrowly transverse, the caudal margin very shallowly emarginate, the surface with abundant setæ. Outer dististyle sclerotized, gently curved, at apex unequally bidentate, the outer tooth an obtuse blade, the lower or axial one a more slender, gently curved spine. Inner dististyle subequal in length, narrowed to the obtuse tip. Longest gonapophysis expanded on about the basal half, thence abruptly narrowed, at apex curved to the acute tip. Ædeagus angularly bent at near mid-length.

Hab. South India (Nilgiri Hills).

Holotype, ♂, Singara, altitude 3400 feet, May 3, 1948 (*P. Susai Nathan*). *Allotopotype*, ♀, May 14, 1948. *Paratopotypes*, 12 ♂♀, mostly in poor condition, May 1–29, 1948.

The most similar described species is *Antocha* (*Antocha*) *basivena* Alexander, of the Khasi Hills, Assam, which differs in coloration and, especially, the structure of the male hypopygium, including the inner dististyle and the gonapophyses. In the original description of the latter species, the inner dististyle was erroneously termed the outer style.

Hexatoma (*Eriocera*) *walayarensis*, sp. n.

Mesonotal præscutum reddish brown, with three darker brown stripes, the median one divided behind; antennæ (female) 7-segmented; head with a large globular vertical tubercle, highly polished and entire; knobs of halteres infuscated; wings with a strong brownish tinge, the costal border narrowly darker brown; Sc_1 ending opposite the fork of Rs ; R_{1+2} and R_2 subequal; R_2 before the fork of cell R_3 , vein R_3 variable, in cases as long as vein R_2 ; Rs long, considerably exceeding vein R_5 , the basal section of the latter very reduced; cell R at outer

end unusually wide, approximately twice cell M ; $m-cu$ just beyond the fork of M .

Female.—Length about 11 mm.; wing 10.5 mm.; antenna about 1.3 mm.

Rostrum and palpi much reduced, brown; front vertical dark brown. Antennæ (female) 7-segmented, dark brown; first flagellar segment stout, exceeding the next two taken together in length. Head above obscure brownish yellow, the large globular vertical tubercle highly polished, entire, the summit more darkened; posterior part of head light grey pruinose.

Pronotum brown. Mesonotal præscutum reddish brown, with three darker brown stripes, the central one divided behind; lateral stripes broader and more conspicuous; sides of præscutum more pollinose; posterior sclerites of notum obscure brownish yellow, pollinose, the scutal lobes with darker areas; notum virtually glabrous. Pleura and pleurotergite obscure yellow, the anepisternum and ventral sternopleurite slightly more darkened; small isolated darkened areas on pleurotergite before the root of the halteres and on the lateral edge of the tergal region before the suture. Halteres with stem brownish yellow, the base clearer yellow, knob infuscated. Legs with the coxæ and trochanters reddish yellow; femora and tibiæ obscure brownish yellow, the tips weakly darkened; tarsi passing into darker brown. Wings narrow, with a strong brownish tinge, the prearcular and costal fields still darker brown; no stigmal darkening; veins brown. Veins of outer medial field delicate to subevanescent; veins beyond cord virtually glabrous, with the exception of R_5 . Venation: Sc_1 ending opposite fork of R_s , Sc_2 a short distance from its tip, Sc_1 alone about two-thirds R_2 ; R_{1+2} and R_2 subequal; R_2 before fork of cell R_3 , vein R_3 variable, from one-third to nearly as long as vein R_2 ; R_{2+3+4} subequal in length to vein R_3 ; basal section of vein R_5 virtually lacking, so the vein is nearly in longitudinal alignment with R_s , the latter very long, considerably exceeding vein R_5 ; cell R at outer end unusually wide, approximately twice cell M ; elements of cord virtually in transverse alignment; cell M_1 lacking; cell 1st M_2 rectangular, about equal to the distal section of vein M_3 ; $m-cu$ just beyond the fork of M , subequal to the distal section of Cu_1 ; vein 2nd A gently sinuous.

Abdomen dull brown, the segments without shiny rings. Genital shield fulvous; cerci very long, gently upcurved.

Hab. South India.

Holotype, ♀, Walayar Forests, South Malabar, altitude 2000 feet, October 18, 1947 (*P. Susai Nathan*).

In its general appearance the present fly is most like *Hexatoma (Eriocera) fusca* (Edwards) and *H. (E.) yerburyi* (Edwards), both of Ceylon, differing in details of coloration and the narrow wings, with the venation quite distinct.

Cryptolabis (Bæoura) nilgiriana, sp. n.

General coloration of thorax and abdomen dull black, the head and pleura more pruinose; halteres brownish black; legs brownish yellow; head, thoracic dorsum and legs with long erect setæ; wing greyish subhyaline; $m-cu$ before mid-length of M_{3+4} ; male hypopygium with the tergite narrowed posteriorly and produced into a conspicuous rectangular lobe, the tip of which is truncated; dististyle a strongly curved simple blade, shaped somewhat like a boomerang.

Male.—Length about 3.8 mm.; wing 4.6 mm.

Female.—Length about 4 mm.; wing 5 mm.

Rostrum and palpi brown. Antennæ dark brown throughout; flagellar segments passing through oval to elongate, the verticils long and conspicuous. Head brown, grey pruinose, with conspicuous erect setæ.

Thoracic notum almost uniformly dull black, the pretergites obscure yellow; dorsum with long erect setæ. Pleura and pleurotergite black, pruinose. Halteres brownish black, the base of stem restrictedly paler. Legs with the coxæ brownish testaceous, the fore pair darker; trochanters testaceous; remainder of legs obscure brownish yellow, the tips of the tibiæ narrowly and vaguely darkened; outer tarsal segments a little darker; segments of legs with very long erect setæ. Wings greyish subhyaline, with a barely indicated darker suffusion in the anal field and over the cord; stigma weakly darkened; veins and macrotrichia brown. Venation: $m-cu$ at from one-third to two-fifths the length of M_{3+4} ; cell 2nd A narrow.

Abdomen, including hypopygium, brownish black. Male hypopygium with the tergite narrowed posteriorly, terminating in a conspicuous rectangular lobe, its tip truncate. Dististyle a strongly curved simple rod or

blade, broadest on more than the proximal half, the distal end narrowed to the subacute tip.

Hab. South India (Nilgiri Hills).

Holotype, ♂, Cherangode, altitude 3500 feet, May 24, 1950 (*P. Susai Nathan*). *Allotopotype*, ♀. *Paratopotypes*, two broken specimens.

Readily told from the described regional members of the subgenus, *Cryptolabis* (*Bæoura*) *distans* (Brunetti) and *C. (B.) funebris* Alexander, by the coloration, venation, and, where known, the quite distinct male hypopygium. The latter structure is still unknown for *distans*.