

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

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THREE PLATES

The present report continues the consideration of the crane-flies that were taken in the Himalayas of northern India by Dr. Fernand Schmid, together with the description of two further species from South India, taken by Mr. P. Susai Nathan. I wish to extend my deep thanks to the collectors for the privilege of studying these unusually interesting flies. All species discussed at this time belong to the genus *Tipula*, exceptionally well developed in India and particularly throughout the extent of the Himalayas.

TIPULINÆ

TIPULA (BELLARDINA) SAVTSHENKOI sp. nov.

Plate 1, fig. 5.

Allied to *thibetana*; mesonotal præscutum with four light brown stripes, the intermediate pair widely separated by a more yellowed central area; frontal prolongation of head chestnut brown, without nasus; thoracic pleura brownish yellow, variegated with darker brown; legs yellowish brown, outer tarsal segments darker; wings brownish gray, restrictedly patterned with darker brown, delicately reticulated with yellow, especially in the basal cells, these lines in cells M and 1st A nearly transverse; wing margin conspicuously darkened, interrupted by a central whitened spot in each cell from M₁ to 2nd A; outer radial field with a complete Y-shaped mark; male hypopygium without blackened spinules on tergite, the latter produced medially into a sclerotized structure; outer dististyle with apex elongate, provided with abundant small black setæ; inner dististyle small, its base without dense hair.

Male.—Length, about 23 millimeters; wing, 22; antenna, about 4.2.

Frontal prolongation of head elongate, dark chestnut brown, without nasus; palpi with first and last segments brownish black, intermediate segments brown. Antennæ with scape brown, pedicel yellow, flagellum brownish black; basal enlargements of flagellar segments small; verticils very long, much

exceeding the segments. Head dark brown above, the anterior orbits narrowly brightened; vertical tubercle conspicuous, narrowly compressed.

Pronotum brown medially, the sides of the scutum light pruinose. Mesonotal præscutum with disk chiefly occupied by four light brown stripes, the intermediate pair widely separated by a more yellowed central vitta that narrows behind; interspaces narrow, virtually concolorous; humeral and lateral borders dark brown; scutal lobes dark brown, vaguely freckled with small orange spots, margins and central area gray; scutellum brownish gray, with a light gray central line; mediotergite light gray, with a large brown area on either side of midline, posterior border more yellowed; vestiture of præscutum, scutum and mediotergite long and conspicuous; pleurotergite light brown, the katapleurotergite dark brown, narrowly lined above with silvery, the lower third brownish yellow. Pleura brownish yellow, variegated with darker brown on the propleura, dorsal anepisternum and sternopleurite, as well as the dorsal pteropleurite and metapleura. Halteres with stem yellow, knob infuscated. Legs with coxæ light brown, posterior pair more grayish brown; trochanters yellow, lower face patterned with black; remainder of legs light yellowish brown, the outer tarsal segments passing into black; tooth of claws triangular, the breadth at base subequal to the length. Wings with the ground brownish gray, restrictedly patterned with darker brown, delicately reticulated with yellow lines; the darker areas include marks at origin of R_s , two in cell M adjoining vein Cu_1 ; at midlength of cell Cu and a smaller mark immediately behind in cell 1st A; the entire margin is similarly darkened but interrupted by conspicuous whitened spots in centers of cells M_1 to M_4 , two in 1st A and one in 2nd A; a conspicuous Y-shaped area in cells R_3 and R_5 , the arms reaching the margin; stigma dark brown, its center obscure yellow along vein R_1 , preceded by a narrow white prestigmal spot; yellow areas in basal cells more nearly straight and transverse than in *thibetana*, especially in cells M and 1st A; pale areas beyond cord and stigma and caudad of cell 1st M_2 , more conspicuous in bases of cells M_3 and M_4 ; pale obliterative areas in outer end of cell R and across cell 1st M_2 ; veins yellow, very narrowly and insensibly bordered by the same color. Macrotrichia on most longitudinal veins beyond cord, becoming sparse and scattered on basal parts, Sc, M and 1st A with trichia virtually over their whole length; base of Cu_1 glabrous, with a

series of five punctures beyond arculus; prearcular anal vein with abundant trichia. Venation: Rs about one-half longer than m-cu.

Abdomen reddish brown, the basal rings of the more proximal tergites with a dark brown lateral spot, margins of posterior rings yellowish gray. Male hypopygium (Plate 1, fig. 5) with the tergite, *t*, semioval in outline, the posterior border convexly rounded, with long black setæ, the central part produced into a sclerotized structure, as figured. Outer dististyle, *d*, long, boomerang-shaped, strongly bent beyond midlength, the slender outer part with abundant small black setæ, at the point of bending with two flattened flanges, one more slender, the broader flange with several blackened points at apex; inner style much smaller, strongly arcuated, the apex with pale membrane, outer surface at near midlength with black setæ.

Habitat.—Sikkim.

Holotype, male, Namnasa, altitude 9,500 feet, July 12, 1959 (*Schmid*).

I am pleased to dedicate this fly to Dr. E. N. Savtshenko, outstanding student of the Eurasian Tipulidæ. The species agrees most closely with *Tipula (Bellardina) thibetana* de Meijere, disagreeing in important features of coloration and structure of the male hypopygium. The type of *thibetana* was re-examined and discussed by Edwards (Ann. Mag. Nat. Hist. (10) 1 (1928) 686, fig. 3 (wing)).

TIPULA (SCHUMMELIA) APPENDIFERA Alexander.

Plate 1, fig. 6.

Tipula (Schummelia) appendifera ALEXANDER, Ann. Mag. Nat. Hist. (12) 8 (1955) 661-663.

The types were from Nuristan, East Afghanistan, collected by Klapperich. Additional material from Pakistan and Sikkim indicates a wide range in the Himalayas; Chatorkhand, Pakistan, altitude 6,850 feet, July 31, 1954 (*Schmid*); Kai Gah, Kashmir, altitude 8,000 feet, July 7, 1953 (*Schmid*); Lachung, Sikkim, altitude 8,610 feet, July 9, 1959 (*Schmid*).

The distinctive male hypopygium is re-described and figured (Plate 1, fig. 6). Posterior end of tergite, *t*, rounded, on either side with a large subcircular plate, nearly glabrous, margins blackened; median area in cases slightly produced (as shown), in others retracted. Outer dististyle, *d*, long and slender, tapering to the narrow obtuse tip; inner style massive, beak stout, lower beak lacking; on face of style at base with a large lobe

that presumably represents the outer basal lobe, its surface microscopically roughened. Phallosome, *p*, with a conspicuous blackened apophysis on either side, subtending the broad membranous *ædeagus*. Eighth sternite with posterior border gently convexly rounded, unmodified except for abundant setæ over about the posterior third.

TIPULA (SCHUMMELIA) ARGENTACEA sp. nov.

Plate 1, fig. 7.

Size relatively large (wing of male 13.5 millimeters); mesonatal præscutum obscure yellow with four olive-brown stripes; scutum and scutellum with a capillary brown median line; katepipleurotergite tumid, silvery; antennæ with basal three segments yellow, succeeding segments weakly bicolored; wings broad, brownish yellow, weakly patterned with darker brown and cream colored areas, the former including a major cloud over *m-cu*, prearcular and costal fields yellow; cell M_1 sessile, cell 1st M_2 small; male hypopygium with the posterior border of tergite broadly emarginate, unmodified; no hair pencils on ninth sternite; inner dististyle with beak slender, basal lobe with microscopic spinules.

Male.—Length, about 13 millimeters; wing, 13.5; antenna, about 3.5.

Frontal prolongation about two-thirds the remainder of head, orange yellow above, narrowly darkened on sides, light yellow beneath; nasus distinct, palpi with proximal two segments obscure yellow, remainder black. Antennæ with proximal three segments yellow, the second flagellar black at base, apex obscure yellow, succeeding segments vaguely bicolored, base black, apex dark brown, fifth and remaining segments black; segments subequal in length to the unilaterally arranged elongate verticils, basal enlargements moderate. Head brownish yellow, vertical tubercle chestnut brown, the area narrowed posteriorly, reaching the occiput as a slender line.

Pronotum obscure yellow, variegated by three large more olive brown areas. Mesonotal præscutum obscure yellow, clearer on the posterior interspaces, disk virtually covered by four olive brown stripes, the intermediate pair and mesal margins of the laterals darker brown; scutum broadly light yellow medially, the lateral two-thirds of each lobe more darkened, central line dark brown; scutellum yellow with a central brown vitta, parascutella infuscated; mediotergite yellow, with sparse black setæ laterally on posterior half; anapleurotergite yellow with

a small brown spot at posterior end, katapleurotergite tumid, the anterior half conspicuously light silvery, posterior part more darkened. Pleura olive yellow, more darkened in front, posterior edge of pteropleurite slightly suffused; dorsopleural membrane brown. Halteres with stem obscure yellow, base and knob clearer yellow. Legs with all coxæ and trochanters yellow; femora obscure yellow, tips broadly brownish black; tibiæ dark brown, tips slightly more intense; tarsi brownish back; claws with an acute spine. Wings broad, brownish yellow, prearcular and costal fields conspicuously light yellow; stigma long-oval, dark brown; major brown clouds over m-cu and outer end of cell 1st M_2 , with smaller marginal clouds on Cu_1 and 2nd A; small oblitative areas before and beyond stigma and across cell 1st M_2 into cell M_3 ; cells R and 2nd A slightly darker than remainder of ground; cream colored spots before outer end of cell M and in outer ends of both anal cells; veins brown, conspicuously yellowed in the brightened fields. Macrotrichia of veins long and abundant, on all longitudinal veins beyond cord, including the free tip of Sc_2 ; basal of cord with trichia on all veins basad to the general level of arculus and on the prearcular anal vein. Venation: Rs shorter than the gently arcuated m-cu; cell M_1 sessile or with its petiole punctiform; cell 1st M_2 small, its outer end pointed; M_{3+4} long, subequal to basal section of M_{1+2} .

Abdomen obscure yellow basally, intermediate segments brown, yellowed basally, hypopygium blackened. Male hypopygium (Plate 1, fig. 7) with the tergite, *t*, transverse, posterior margin broadly and shallowly emarginate, forming broad lateral lobes; border unmodified, narrowly darkened, with sparse inconspicuous setæ. Ninth sternite with scattered setæ of normal length, not forming groups or pencils. Outer dististyle, *d*, relatively long, the length approximately six times the width; inner style flattened, beak slender, base of style with a small suboval lobe that is provided with numerous microscopic spinulæ. Eighth sternite unmodified.

Habitat.—Sikkim.

Holotype, male, Lachung, altitude 8,610 feet, July 9, 1959 (*Schmid*).

Tipula (*Schummelia*) *argentacea* resembles some other regional species in the conspicuous silvery area on the thoracic katapleurotergite, these including *T. (S.) argentosigna* sp. nov., *T. (S.) atrosetosa* sp. nov., and *T. (S.) tanyrhina* sp. nov. All are

readily told among themselves by the coloration of the body and wings and the structure of the head and male hypopygia.

TIPULA (SCHUMMELIA) ARGENTOSIGNA sp. nov.

Plate 1, fig. 8.

Size medium (wing of male about 13 millimeters); frontal prolongation of head normal; mesonotal præscutum with disk virtually covered by four brown stripes, katapleurotergite light silvery; wings light brown, variegated by dark brown and pale areas; basal abdominal segments brownish yellow, lateral borders infuscated, outer segments more uniformly dark brown; male hypopygium with a conspicuous pencil of long black setæ on ninth sternite; inner dististyle with beak and lower beak slender spinelike.

Male.—Length, about 10.8 to 11 millimeters; wing, 13 to 13.5; antenna, about 4.2 to 4.3.

Female.—Length, about 15 millimeters; wing, 16; antenna, about 3.

Frontal prolongation of head normal for the subgenus (compare *tanyrhina*), yellow, sides slightly more obscured, dorsum with few setæ, nasus distinct; basal segment of palpus yellow, second segment yellow, tip broadly brownish black, outer segments darker, terminal one black. Antennæ with scape and pedicel yellow, the latter clearer; flagellum with proximal segments very weakly bicolored, bases brownish black, remainder paler, outer segments more uniformly darkened; segments longer than their verticils. Head brown, slightly more yellowed on orbits; vertical tubercle low, with a capillary blackened central vitta.

Cervical region weakly darkened, sides obscure orange. Pronotum clear light yellow above, weakly more darkened on sides. Mesonotal præscutum with disk virtually covered by four brown stripes, posteriorly with slightly paler centers, interspaces similarly darkened, leaving a small yellow spot before suture, lateral border broadly light yellow; scutum brownish yellow, lobes weakly darkened, more intensely so at lateral ends of suture; scutellum brownish yellow, parascutella darker brown; medio-tergite obscure orange yellow, with a weak brown darkening on basal half on either side of the broad central area; anapleurotergite obscure orange yellow, katapleurotergite tumid, strikingly white silvery, with a brown spot at either end, the anterior one being on the ventral pteropleurite. Pleura infuscated, slightly variegated with paler; meron and ventral sternopleurite more

yellowed. Halteres with stem infuscated, knob yellowed. Legs with fore coxæ light brown, mid-coxæ yellow, anterior face darkened, posterior coxæ light yellow; trochanters yellow, fore pair darker; femora brown, narrowly blackened at outer end, genua pale; tibiæ dark brown, tarsi passing into black; claws of male toothed. Wings with ground light yellow, with a conspicuous darker brown and pale pattern, prearcular and costal regions yellowed; stigma dark brown; conspicuous paler brown areas at m-cu, outer end of cell 1st M_2 , extended to beyond fork of M_{1+2} , and at near midlength of cell M; oblitative area across cell 1st M_2 conspicuously whitened; remaining pale areas slightly more yellowed, placed at origin of Rs, before and beyond stigma, center of cell M_1 , and two in cell M, passing into cell Cu behind; a circular marginal spot in cell 1st A adjoining vein 1st A, the latter narrowly seamed with dark brown over its entire length; veins dark brown, more yellowed in the brightened fields. Macrotrichia on most longitudinal veins beyond arculus, lacking on 1st A; prearcular anal vein with sparse trichia. Venation: Rs a trifle longer than the very oblique m-cu; petiole of cell M_1 about twice m; M_{3+4} subequal to m.

Basal abdominal segments brownish yellow, brightest near base, lateral borders infuscated, becoming more extensive on outer segments; basal sternites yellow, outer segments, including the hypopygium, dark brown. Male hypopygium (Plate 1, fig. 8) with the tergite, *t*, brownish black, convexly rounded, posterior border with a deep V-shaped incision, on slide mounts becoming flattened as illustrated, with a low median projection not apparent from above; margin blackened, outer lateral angles farther produced. Ninth sternite, *9s*, with a narrow but conspicuous brush or pencil of long black setæ, directed ventrad. Outer dististyle, *d*, relatively narrow, its length above five or six times the width; inner style with beak slender, lower beak a broad-based spine; outer crest intensely blackened, produced; at base of style with a small triangular blade or lobe. Eighth sternite narrow, posterior border gently convex, unmodified, with moderately long marginal setæ.

Habitat.—Sikkim.

Holotype, male, Chumzomoi Choka, in *Rhododendron* association, altitude 11,800 feet, July 8, 1959 (*Schmid*). Allotopotype, female; paratopotype, male.

Tipula (*Schummelia*) *argentosigna* is still another of the members of the subgenus having a conspicuous silvery mark

on the thoracic katapleurotergite, others being *T. (S.) argentacea* sp. nov., *T. (S.) atrosetosa* sp. nov., and *T. (S.) tanyrhina* sp. nov. The present fly has the head normal, as in *argentacea*, differing in the wing pattern and especially in the male hypopygium, including the tergite, sternite and inner dististyle.

TIPULA (SCHUMMELIA) ATROSETOSA sp. nov.

Plate 1, fig. 9.

General coloration of mesonotal præscutum yellow, disk with four brown stripes that are more or less bordered by darker; central line of scutum and scutellum brown, katapleurotergite silvery; pleura yellow below, with a broad dark brown dorsal longitudinal stripe; legs black; wings whitish, prearcular and costal fields conspicuously yellow, a restricted darker pattern; cell M_1 deep, 1st M_2 small; male hypopygium with posterior border of tergite narrowly blackened, tridentate; basistyle with abundant long black setæ; outer dististyle dilated on proximal third; gonapophysis pale, with abundant tubercles that bear very long yellow setæ.

Male.—Length, about 10.5 to 11 millimeters; wing, 11 to 12; antenna, about 3.3 to 3.5.

Frontal prolongation of head dull orange above, more yellowed beneath; nasus distinct, palpi black. Antennæ relatively short; scape and pedicel light yellow, the former elongate; first flagellar segment brownish yellow, second black at base, its pedicel obscure yellow; succeeding flagellar segments black, basal enlargements conspicuous, segments weakly incised above, subequal to their longest verticils. Head brownish yellow, orbits clearer yellow; center of vertex medium brown, on the low vertical tubercle with a capillary black line.

Pronotum brown, paler brown laterally, with restricted obscure yellow sublateral markings. Mesonotal præscutum obscure yellow laterally and on posterior interspaces, disk with four brown stripes, the intermediate pair narrowly bordered by slightly darker brown, the stripes confluent in front, isolating the posterior interspaces, humeral region obscure yellow, lateral borders clearer; scutum with lobes brown, central area obscure yellow with a darker brown median line that is continued back onto the scutellum, the remainder of the latter brownish yellow, parascutella darker; mediotergite obscure orange on central part, more infuscated laterally; pleurotergite brownish yellow, the katapleurotergite brilliantly silvery; mesonotum with relatively long erect setæ. Pleura yellow below, with a broad

and conspicuous dark brown longitudinal stripe extending from the cervical sclerites across the propleura and anepisternum, thence more ventrally onto the abdomen, passing beneath the katapleurotergite. Halteres with base and knob yellow, stem more obscured, especially outwardly. Legs with coxæ and trochanters light yellow; remainder of legs black, femoral bases obscure yellow; claws relatively long, toothed. Wings with the ground whitish, prearcular and costal fields strongly yellowed; stigma long-oval, dark brown; paler brown areas in cell M adjoining vein Cu, over m-cu, and at ends of veins Cu and 2nd A; more evident whitened areas before and beyond stigma and across cell 1st M₂, before outer end of cell M, two marginal areas in cell 1st A, a single one in 2nd A; veins dark brown, more yellowed in the brightened parts. Macrotrichia of veins abundant, extending basad virtually to arculus, including abundant trichia on m-cu, m and the prearcular anal vein. Venation: Rs straight, much shorter than m-cu; petiole of cell M₁ very short to nearly punctiform, the longest about one-half m; cell 1st M₂ small; m-cu at fork at M₃₊₄ or just beyond on M₄.

Basal abdominal tergites yellow, outer ones more obscure, sides of first segment with a brown spot; basal sternites yellow, outer segments passing into black. Male hypopygium (Plate 1, fig. 9) with the tergite, *t*, transverse, posterior border with central area narrowly blackened, tridentate, the lateral teeth more acute; lateral tergal lobes broader, pale. Basistyle, *b*, with abundant long black setæ that do not form brushes. Outer dististyle, *d*, pale, relatively short, conspicuously expanded on basal third; vestiture of black setæ, on outer margin with a few exceedingly long yellow setæ, the longest exceeding one-half the length of the style (not figured); inner style long but broad, beak slender, blackened, lower beak blunt, triangular; region of outer basal lobe reflexed, its margin microscopically denticulate. Gonapophysis, *g*, small, yellow, with abundant tubercles that bear yellow setæ of unusual length. Ædeagus broad, sclerotized on sides. Eighth sternite large, posterior border truncate; abundant long black setæ on about the outer two-thirds of the plate.

Habitat.—Sikkim.

Holotype, male, Nanga, altitude 5,000 feet, August 4, 1959 (*Schmid*). Paratopotype, 1 male, August 3, 1959; paratypes, male, Manu, altitude 4,920 feet, May 10, 1959 (*Schmid*); male, Teng, altitude 4,600 feet, August 1, 1959 (*Schmid*).

Tiplua (*Schummelia*) *atrosetosa* is still another species having the thoracic katapleurotergite brilliantly silvery, others being *T. (S.) argentacea* sp. nov. and *T. (S.) argentosigna* sp. nov., together with the more isolated *T. (S.) tanyrhina* sp. nov. All of these species differ among themselves in the details of coloration and structure of the male hypopygium.

TIPULA (SCHUMMELIA) DRAVIDIANA sp. nov.

Plate 1, figs. 1, 10.

Size small (wing of male about 10 to 11 millimeters); mesonotal præscutum brownish yellow, with two intermediate brown stripes, scutellum pale, pleura unpatterned; femora obscure yellow, with a narrow brown subterminal ring, tibiæ and tarsi black, claws simple; wings weakly tinged with brown, stigma oval, darker brown, conspicuous obliterative areas before and beyond stigma; cell M_1 deep, m-cu long, at or close to the fork of M; abdominal tergites conspicuously patterned yellow and brown; male hypopygium with the tergite produced medially.

Male.—Length, about 10.5 millimeters; wing, 10.8.

Female.—Length, 12 to 13 millimeters; wing, 10 to 11.5.

Frontal prolongation of head buffy yellow with conspicuous black setæ; nasus elongate; palpi dark brown. Antennæ with basal three segments yellow, succeeding segments bicolored, the basal enlargements black, the more extensive pedicels yellow (antennæ of type male broken beyond the eighth segment), segments a trifle longer than the single modified verticil; antennæ of female shorter but comparably colored, the outer flagellar segments uniformly darkened. Head light yellow in front, including the sides of the low vertical tubercle; posterior vertex brownish gray medially, clearer brown on sides and here with conspicuous black setæ.

Pronotum buffy. Mesonotal præscutum with the ground brownish yellow, with two brown intermediate stripes that are narrowly separated by a ground vitta, sides of præscutum slightly darker; scutum with central area whitened, lobes, brown; scutellum whitened, with a dark depressed area on either side at base; mediotergite whitened, darker behind and on sides; pleurotergite brownish yellow, the posterior end brown. Pleura pale yellow, with a small darkened area beneath the wing root. Halteres with stem yellow, knob dark brown, its apex yellowed. Legs with coxæ and trochanters yellow; femora obscure yellow with a narrow brown subterminal ring; tibiæ and tarsi black; claws of male very small, simple. Wings (Plate 1, fig. 1) weakly

tinged with brown, stigma oval, dark brown; narrow dark seams over m-cu and less evidently on distal section of Cu_1 and petiole of cell M_1 ; whitened obliterative areas before and beyond stigma and across base of cell 1st M_2 ; elsewhere on disk with vague brightenings in certain of the cells; veins brown, yellow in the obliterative parts. Macrotrichia on veins almost to wing base. Venation: R_{1+2} entire but pale, without trichia; Rs short and nearly straight, about two-thirds R_{2+3} ; cell M_1 deep from four to five times its petiole; cell 1st M_2 small, irregularly pentagonal, m being distinct; m-cu long, oblique, at or near the fork of M.

Abdomen yellow, tergites margined posteriorly and laterally with brown, more extensively so on the eighth segment; sternites yellow; hypopygium brownish yellow. Male hypopygium (Plate 1, fig. 10) with the tergite, *t*, transverse, the posterior margin produced into a median lobe, pointed at tip, carinate above, the sides with numerous small pale setulæ, lateral lobes lower, broadly rounded. Outer dististyle, *d*, short and broad, the apex very obtuse; inner style oval, beak blackened, long-produced; disk with numerous setæ, including a modified group of five or six at posterior end, in the same region with about eight large pale circular sensory pores. Phallosome with the apophyses appearing as pale flattened blades, longer than the dark colored ædeagus. Eighth sternite with the margin generally unmodified but with a very low lobe on either side, bearing scattered elongate black setæ.

Habitat.—South India.

Holotype, male, Cherangode, Nilgiri Hills, altitude 3,300 feet, November 9, 1950 (*Susai Nathan*). Allotype, female, Cinchona, Anamalai Hills, altitude 3,500 feet, May 1956 (*Susai Nathan*). Paratypes, 3 females, with the allotype.

The most similar species in the Oriental fauna include *Tipula* (*Schummelia*) *modica* Alexander, *T. (S.) picticornis* (Brunetti), *T. (S.) turea* Alexander, and *T. (S.) vocator* Alexander, all differing in details of coloration and, especially, in the structure of the male hypopygium.

TIPULA (SCHUMMELIA) FUSCOCELLULA sp. nov.

Plate 1, fig. 11.

Size medium (wing about 12 millimeters); mesonotal præscutum yellow with three brown stripes; front of head with a brown median line extending almost to base of prolongation; basal flagellar segments weakly bicolored; femora obscure yel-

low, tips blackened; wings pale brown, weakly patterned with darker brown and white, cell Sc uniformly darkened; call M_1 deep; male hypopygium with posterior border of tergite broadly emarginate, with a low blackened central lobe, lateral lobes beneath with a blackened tooth; outer dististyle long and narrow; inner style with beak very slender, on disk with an area of blackened setæ.

Male.—Length, about 11 millimeters; wing, 12.5; antenna, about 4.

Frontal prolongation yellow above, including the long nasus, sides more infuscated; palpi black. Antennæ with scape and pedicel yellow, flagellar segments weakly bicolored, the small basal enlargements dark brown, outer ends paler brown, the bicolorous pattern persisting almost throughout; segments slightly exceeding their longest verticils. Head with front and anterior vertex yellow, the posterior part of head infuscated, sending a median line forward between the antennal bases, expanded in front and reaching almost to base of prolongation, becoming a capillary line on the very low vertical tubercle.

Pronotal scutum chiefly brown, scutellum yellow, dark brown on sides. Mesonotal præscutum yellow laterally, more brownish yellow on the interspaces, with three brown stripes that are vaguely bordered by still darker, the broad central stripe entire; scutum obscure yellow, each lobe with two confluent dark brown areas; scutellum obscure yellow with a broad central darkened stripe, parascutella brown; mediotergite yellow with a broad brown stripe on either side of the narrower pale center; pleurotergite brownish yellow, the tumid katapleurotergite vaguely silvery. Pleura yellow, conspicuously patterned with dark brown, appearing as two broken stripes, the dorsal one including the cervical region, propleura, most of the anepisternum and the dorsal pteropleurite; ventral stripe involving the ventral sternopleurite and meron; setæ of notum pale. Halteres with stem yellowish brown, darker outwardly, base of stem and apex of knob obscure orange yellow. Legs with coxæ yellow, fore pair narrowly darkened basally; trochanters yellow; femora obscure yellow, tips rather narrowly blackened; tibiæ and basitarsi yellowish brown, outer tarsal segments black; claws toothed. Wings pale brown, with a weak pattern of darker brown and whitened spots; cell Sc almost uniformly dark brown, the extreme outer end yellowed; stigma dark brown; the darkest clouds occur at outer end of cell M and in outer radial

field, the chief whitened areas being poststigmal, across cell 1st M_2 , near outer end of cell M and in outer end of cell 1st A; no brightening in cell 2nd A; veins brown. Macrotrichia on longitudinal veins beyond cord, including a few on m; before the cord extending basad virtually to the arculus on Sc, R, M and both anals, extensively so but more scattered on Cu_1 ; squama naked. Venation: Cell 1st M_2 relatively large; cell M_1 deep, its petiole shorter than m; Rs a trifle longer than m-cu.

Abdominal tergites brownish yellow, the basal segments clearer yellow, lateral borders broadly brownish black, interrupted by pale posterior borders; basal sternites yellow, vaguely patterned with darker; outer two segments, including base of hypopygium, black, the appendages yellowed. Male hypopygium (Plate 2, fig. 11) with the tergite, *t*, transverse, posterior border broadly emarginate, with a low central blackened projection and rounded lateral lobes, the latter with a slender blackened tooth on ventral surface. Outer dististyle, *d*, long and slender, pale, tapering gradually to the narrowly obtuse tip; inner style with the beak very slender, dorsal crest virtually lacking; outer basal lobe large and flattened; disk of style with a linear area of strong blackened setæ. Gonapophysis, *g*, large, obtuse, with long yellow setæ from inconspicuous punctures. Eighth sternite narrow, its posterior border truncate, unmodified, with setæ restricted to about the posterior fourth.

Habitat.—Pakistan.

Holotype, male, Surgun Sur, Northwest Frontier Province, altitude 6,875 feet, July 29, 1953 (*Schmid*).

Tipula (*Schummelia*) *fuscocellula* agrees with *T. (S.) nigrocellula* Alexander in the uniformly darkened subcostal cell, differing in details of coloration of the body and wings and, especially, in the structure of the male hypopygium. In *nigrocellula*, the outer dististyle is small and weak and the inner style is differently constructed.

TIPULA (SCHUMMELIA) NANNARIS sp. nov.

Plate 1, fig. 12.

General coloration of mesonotum brown, mediotergite uniformly darkened; pleura yellow, patterned with brown; knobs of halteres brownish black; tibiæ and tarsi brownish black; wings almost uniformly infuscated, very restrictedly patterned with paler; cell 1st M_2 small, hexagonal; male hypopygium with the ninth tergite shallowly emarginate, the lobes broadly rounded and thickened; outer dististyle long and slender, inner style with

beak slender, lower beak much larger, heavily blackened, basal lobe small, darkened.

Male.—Length, about 10 millimeters; wing, 11; antenna, about 4.

Frontal prolongation of head yellow, the angle with remainder of head acute; nasus elongate, yellow; palpi dark brown, terminal segment elongate, subequal to the combined remaining segments. Head cinnamon brown behind, narrowly darkened on occiput, front and anterior vertex yellow, without a vertical tubercle.

Cervical region above and the pronotal scutum dark brown, the latter variegated with obscure yellow; scutellum yellow medially, lateral angles narrowly blackened. Disk of mesonotal præscutum with four brown stripes that are narrowly bordered by darker brown, the intermediate pair confluent behind; posterior interspaces and anterior ends of intermediate stripes brownish yellow, lateral borders and humeri broadly yellow; scutum almost uniformly brown, including the central region; scutellum yellowish brown with a narrow dark brown central line, parascutella dark brown; mediotergite uniformly medium brown, with scattered erect yellow setæ; pleurotergite medium brown above, the summit of the tumid katapleurotergite more yellowed, not silvery. Pleura yellow, the propleura, anepisternum and dorsal sternopleurite infuscated; dorsopleural membrane variegated yellow and brown. Halteres with stem obscure yellow, knob brownish black. Legs with all coxæ and trochanters yellow; femora brownish yellow, tips narrowly black; tibiæ and tarsi brownish black; claws toothed. Wings with the ground almost uniformly infuscated, very restrictedly variegated by small pale areas before and beyond stigma, across cell 1st M_2 , and very vaguely at and near outer ends of cells M and 1st A; no brightening in cell 2nd A; stigma dark brown; veins dark brown. Macrotrichia on most longitudinal veins beyond arculus and on preanal vein, lacking on m-cu. Venation: Rs gently arcuated, subequal to m-cu; cell M_1 deep, its petiole and m subequal; cell 1st M_2 small, hexagonal; m-cu on M_{3+4} at near two-thirds the length.

Abdominal tergites dark brown, the more proximal segments slightly more brownish yellow basally; proximal sternites obscure yellow; outer segments, including hypopygium, brownish black. Male hypopygium (Plate 1, fig. 12) with the tergite, *t*, large, blackened, posterior border emarginate forming broad

rounded lobes with thickened margins, each produced beneath into a small tooth. Outer dististyle, *d*, long and slender, pale throughout; inner style yellow, beak slender, lower beak much broader, blackened; a small dark basal lobe; disk with inconspicuous yellow setæ. Sternal cushions densely provided with short yellow setæ, with fewer very long yellow bristles.

Habitat.—Sikkim.

Holotype, male, Manu, altitude 4,920 feet, August 5, 1959 (*Schmid*).

Tipula (*Schummelia*) *nannaris* is readily told from all regional members of the subgenus by the blackened knobs of the halteres and the almost uniformly darkened wings, with very restricted pale pattern. The structure of the hypopygium, especially the tergite, sternite and inner dististyle, provide distinctive characters.

TIPULA (SCHUMMELIA) TANYRHINA sp. nov.

Plate 1, fig. 13.

Size medium (wing about 13 millimeters); frontal prolongation of head elongate, exceeding the remainder of head; mesonotal præscutum with four brown stripes that are broadly margined with darker brown, mediotergite obscure orange, katepipleurotergite conspicuously silvery; pleura brown; knobs of halteres orange; legs with femora obscure yellow, tips narrowly blackened; wings cream yellow with a very heavy darker pattern; basal abdominal tergites brown, outer segments black; male hypopygium with the tergite transverse, its posterior border shallowly emarginate.

Male.—Length, about 11.5 to 12 millimeters; wing, 13 to 13.5; antenna, about 4.5 to 4.8; frontal prolongation alone, about 1.3 to 1.4.

Frontal prolongation of head of unusual length, slightly exceeding the remainder of head, yellowed above, on sides yellowish brown to light brown, without nasus; palpi with proximal three segments brown, terminal segment black; head above, including the prolongation, flattened, without an angle or emargination at base of the latter, as usual in the genus. Antennæ with scape light to dark brown, pedicel yellow, flagellum black; flagellar segments with small basal enlargements, basal segment unusually long, nearly equal to the second and third combined, verticils shorter than the segments. Head above chiefly brown, including a central area, the front and broad orbits yellow, in

cases the posterior vertex more extensively darkened; a small dark spot immediately behind each antennal fossa.

Pronotum yellow medially, broadly more darkened on sides. Mesonotal præscutum chiefly covered by four brown stripes that are broadly margined with darker brown, posterior interspaces obscured, humeral and lateral borders broadly light yellow; scutal lobes infuscated, especially anteriorly, central region obscure yellow; scutellum light brown, obscure yellow medially, parascutella testaceous; mediotergite obscure orange, pleurotergite orange, the katapleurotergite bright silvery. Pleura brown, more yellowed behind; dorsopleural membrane yellow. Halteres with stem weakly infuscated, obscure yellow at base, apex of knob orange. Legs with coxæ yellow, basal half of fore pair darkened; trochanters brownish yellow; femora obscure yellow, tips narrowly blackened; tibiæ brownish yellow, tips very narrowly infuscated; basitarsi brownish yellow, outer segments passing into black; claws with a slender subbasal tooth. Wings with the restricted ground cream yellow, with a very heavy grayish brown pattern, including still darker brown areas beyond arculus, at midlength and in outer end of cell M, outer end of cell 1st M_2 , and tip of vein 2nd A; stigma darker brown; the chief ground areas are before and beyond the stigma, bases of cells M_1 and 2nd M_2 , and more extensively in cell M and near outer end of the anal cells; oblitative area at base of cell 1st M_2 more whitened, extensive, invading cells M and M_3 ; cell C pale brown, Sc light yellow; veins brown, Sc and R yellow. Macrotrichia on most veins beyond cord, including also Sc and, in cases, Rs; on M sparse and scattered, lacking on basal section of Cu_1 ; sparse and scattered on anal veins, especially 1st A; a nearly complete series on the prearcular anal vein. Venation: Rs long, from about one and one-half to nearly twice R_{2+3} and slightly exceeding m-cu; petiole of cell M_1 subequal to or shorter than m.

Abdominal tergites brown, posterior borders narrowly paler, basal sternites more yellowed, outer segments black; appendages of hypopygium obscure yellow. Male hypopygium (Plate 1, fig. 13) with the tergite, *t*, transverse, posterior border very shallowly emarginate, blackened, ventral surface on either side with low denticles. Ninth sternite a small darkened cushion with relatively few long scattered setæ. Outer dististyle, *d*, of moderate length, the greatest width about one-fourth to one-fifth the length; inner style with lower margin of beak blackened, the paler base

of style disconnected by a constriction; apex of beak obtusely rounded. Eighth sternite unarmed.

Habitat.—Sikkim.

Holotype, male, Chumzomoi Choka, altitude 11,800 feet, in *Rhododendron* association, July 8, 1959 (*Schmid*). Paratopotypes, males, July 8, 1959.

Tipula (*Schummelia*) *tanyrhina* is readily told from other known species by the elongated frontal prolongation of the head, in conjunction with a marked flattening of the vertex. In life it was associated with *T. (S.) argentosigna* sp. nov., having the structure of the head normal and unmodified.

TIPULA (YAMATOTIPULA) BHOTEANA sp. nov.

Plate 2, fig. 14.

Size small (wing of male about 11 millimeters); general coloration gray, præscutum with four more blackened stripes; antennæ long, black, pedicel yellow; legs black, bases of fore femora narrowly yellow, claws small, simple; wings cream yellow, bright yellow at base, restrictedly patterned with darker; male hypopygium with tergite emarginate; outer dististyle darkened, inner style simple, its beak powerful, cleaverlike, with few modifications; gonapophyses paddlelike.

Male.—Length, about 9.8 to 10 millimeters; wing, 11 to 11.2; antenna, about 6.

Frontal prolongation of head relatively long, somewhat shorter than the remainder, black, including the nasus; palpi black throughout. Antennæ of male of unusual length, exceeding one-half the body or wing; black, pedicel obscure yellow; flagellar segments subcylindrical, with very small basal enlargements; segments with a dense white pubescence and slightly longer verticils, the longest of the latter about one-third the length of the segment. Head brownish gray, clearer gray in front and on orbits; vertical tubercle low, rounded; eyes small, anterior vertex very broad; genæ prominent, with long coarse setæ.

Pronotum blackened, sparsely pruinose. Mesonotum gray, disk of præscutum with four more blackened stripes, lateral borders dull black, setæ pale and appressed; posterior sclerites dull black, gray pruinose, mediotergite with a vague more blackened capillary central line, pleurotergite blackened; scutellum with long pale setæ, postnotum glabrous. Pleura dull black, variegated by gray areas, including a more or less distinct longitudinal stripe across the propleura, dorsal sternopleurite, ventral pteropleurite and metapleura; dorsopleural region dark brown.

Halteres with stem brown, obscurely brightened at base, knob brownish black. Legs with coxæ gray pruinose; trochanters brownish black; remainder of legs black, bases of fore femora narrowly and indistinctly obscure yellow; tibial spurs long, formula 1—2—2; claws small, simple. Wings with the ground cream yellow, prearcular field bright yellow, costal field, especially cell Sc, less brightly so; a vague brown pattern, including the stigma and clouds over the anterior cord, at midlength and near outer end of cell M, less evident on posterior cord and as washes in cells R and anal; veins beyond cord narrowly seamed with darker; a whitened spot before stigma, obliterative areas less evident; veins dark brown, yellowed in the brightened parts. Most longitudinal veins beyond cord with long macrotrichia, lacking on Rs, 1st A and all but outer ends of M and Cu; vein 2nd A with several trichia on all but base and apex; a single bristle on the prearcular anal vein. Venation: Rs about one-third longer than m-cu; R_{1+2} preserved; cell M_1 about twice its petiole; cell 1st M_2 long, narrower at outer end; M_{3+4} very short.

Abdomen black, including the hypopygium. Male hypopygium (Plate 2, fig. 14) with the tergite, *t*, transverse, posterior border with a large V-shaped emargination, lobes broad, with very few punctures. Ninth sternite extensive, with numerous punctures, including small marginal tubercles tipped with small setæ, the mesal angle prolonged into a slender rod. Outer dististyle, *d*, a dark colored blade, narrowed gradually to the obtuse tip, surface with moderately long black setæ; inner style simple, prolonged into a powerful cleaverlike beak; no developed lower beak or outer crest excepting a low darkened flange on posterior border; outer margin with very abundant pale setæ. Gonapophysis, *g*, appearing as a paddlelike blade. Eighth sternite unmodified.

Habitat.—Sikkim.

Holotype, male, Lakchmi Pokri, altitude 14,000 feet, in *Rhododendron* association, October 11, 1959 (*Schmid*). Paratopotype, male.

The reference of this unusually interesting fly to *Yamatotipula* is somewhat provisional but appears to be indicated by the venation and structure of the male gonapophyses. In its general appearance it is more like species of *Oreomyza* but the structure of the hypopygium, particularly the gonapophyses, would seem to bar it from this assignment. The fly is quite distinct from other regional small-sized species of *Tipula* in the

elongate antennæ of the male and in the general pattern of the legs and wings.

TIPULA (YAMATOTIPULA) HEXACANTHA sp. nov.

Plate 2, fig. 15.

Size medium (wing of male 17 millimeters); general coloration of head and thorax light gray; frontal prolongation of head light yellow; antennæ short, outer flagellar segments blackened; femora and tibiæ yellow, tips narrowly blackened, claws of male bidentate; wings brownish yellow, restrictedly patterned; obliterative area before cord conspicuous; abdominal tergites brownish gray, lateral borders broadly light yellow; male hypopygium with posterior border of tergite blackened, produced into six small spinous points; inner dististyle complex, the outer basal lobe with an outer blade that bears about nine long curved reddish bristles.

Male.—Length, about 15 millimeters; wing, 17; antenna, about 2.4.

Frontal prolongation of head yellow, including the long nasus; palpi dark brown, terminal segment short, about twice as long as the penultimate. Antennæ short; scape brownish yellow, pedicel dark brown, proximal two flagellar segments black, their bases narrowly yellowed, outer segments uniformly blackened; basal swellings small, segments slightly exceeding the longest verticils. Head light gray, with indications of a capillary darker central vitta, more whitened on front; no vertical tubercle.

Pronotal scutum obscure yellow, narrowly darkened medially, gray on sides; scutellum and pretergites clear light yellow. Mesonotal præscutum light gray with four poorly indicated darker gray stripes, the central pair narrowly divided on anterior half by a darker line, humeral region yellow; scutum gray, each lobe with scarcely indicated darker gray areas, the oval anterior one more clearly indicated, posterior angles of lobes yellow; scutellum gray at base, the posterior half and the mediotergite more pinkish gray with a capillary darkened vitta, mediotergite laterally and the pleurotergite yellow, the katapleurotergite clearer yellow. Pleura light gray on anepisternum and sternopleurite, the remainder light yellow, including the dorsopleural membrane. Halteres infuscated. Legs with coxæ and trochanters yellow; femora and tibiæ yellow, tips narrowly brownish black, the amount subequal on all legs; tarsi black, proximal ends of basitarsi paler; claws bidentate, basal tooth small. Wings brownish yellow, cells C and Sc more saturated yellow; stigma pale

brown, inconspicuous, preceded by a more yellowed area in cell C; narrow dark seams on anterior cord and m-cu; a conspicuous continuous whitened obliterative area from before the stigma in cell R_1 extending into cell M_3 , including also the outer ends of cells R and M; vague whitenings in bases of cells M_1 and 2nd M_2 , cell R_5 not clearly brightened; veins dark brown, pale in the obliterative areas. Macrotrichia on longitudinal veins beyond the general level of origin of Rs, lacking on Rs, R_{1+2} , R_{2+3} , the veins comprising cell 1st M_2 , and the broad bases of veins Cu_1 , M_1 and M_3 , virtually lacking on 1st A; 2nd A with strong trichia on more than outer half; trichia on prearcular anal vein and sparsely on m-cu. Venation: Petiole of cell M_1 subequal to or about two-thirds m; M_{3+4} from about one-third to one-half the basal section of M_{1+2} .

Abdominal tergites brownish gray, the lateral margins very broadly light yellow, basal rings restrictedly orange; posterior borders narrowly yellow, more evident on tergites four and five; sternites brown, yellowed laterally and at the incisures, more extensively so on outer segments; hypopygium chiefly obscure yellow. Male hypopygium (Plate 2, fig. 15) with the tergite, *t*, long, posterior border produced medially into a smooth blackened plate that bears two small teeth on either side of a small median lobe, together with a broader lateral tooth, a total of six acute points. Outer dististyle, *d*, pale, upper edge gently emarginate; inner style complex, both the beak and lower beak pale, the former cleaverlike, its dorsal crest low, fringed with setæ; outer basal lobe very large, modified about as illustrated; near outer end with a triangular blade that bears about nine long curved reddish bristles; sensory pits about seven in number in a single slightly broken row. Gonapophysis, *g*, appearing as a broad pale blade, broadest just beyond midlength. Ædeagus slender, intensely blackened.

Habitat.—Pakistan.

Holotype, male, Urak, May 28, 1954 (*Schmid*). Paratopotype, male, pinned with the type.

Tipula (*Yamatotipula*) *hexacantha* is quite distinct from the relatively few known regional members of the subgenus, including the widespread *T. (Y.) nova* Walker, which likewise has the outer basal lobe of the inner dististyle modified but in a quite different manner.

TIPULA (NOBILITIPULA) SPECULARIS sp. nov.

Plate 2, fig. 16.

General coloration of thorax yellow, præscutum with three blue-gray stripes that are clearly delimited by black borders, each scutal lobe with a similar blue-gray area that is margined with black; antennal flagellum black; wings yellow, prearcular and costal fields brighter yellow; a restricted brown pattern, including the stigma, a broad seam over the cord and a cloud in the outer radial field; basal abdominal segments yellow, tergites trivittate with dark brown, outer segments black, more or less pruinose; male hypopygium with the tergite emarginate, the lobes with dense black setæ; outer dististyle arising from margin of the larger inner style; outer gonapophyses appearing as broad yellow blades with long conspicuous setæ.

Male.—Length, about 13 millimeters; wing, 13.5; antenna, about 4.3.

Frontal prolongation of head yellow, relatively short, about two-thirds the remainder of head; nasus short and stout, with black setæ; palpi with basal two segments brown, third paler brown, terminal segment brownish yellow, nearly equal in length to the remainder. Antennæ relatively long; scape light yellow, pedicel yellowish brown, flagellum black; flagellar segments with basal swellings very reduced, longest verticils unilaterally arranged on ventral face of segments, the longest slightly exceeding the segment. Head yellow, posterior vertex on either side behind the tumid vertical tubercle extensively pale brown; tubercles and median region of posterior vertex without setæ.

Pronotum yellow. Mesonotum light yellow, præscutum with three blue gray stripes that are clearly delimited by black borders, the lateral margins of the central stripe very broad on anterior half; scutum yellow, each lobe with a blue gray area that is almost encircled by black, broadest along mesal edge, at apex paling to brown; posterior sclerites of notum, including the pleurotergite, yellow, the katapleurotergite elevated into a spinoid tubercle; setæ of notum relatively sparse but very long, pale. Pleura light yellow, including the dorsopleural membrane; a small pale brown spot at dorsal angle of anepisternum. Halteres yellow, knob weakly lined with darker, including rows of black setæ. Legs with coxæ orange yellow, with very long yellow setæ; trochanters yellow; remainder of legs broken. Wings with the ground yellow, the prearcular field, with cells C and Sc, brighter yellow; stigma oval, brown; a broad paler

brown seam over the cord, with a similar brown wash in outer ends of cells R_2 and R_3 ; veins dark brown, yellowed in the brightened fields. Veins unusually glabrous, as in the subgenus, lacking on veins beyond cord, even on R_{4+5} where normally they are most persistent; a few trichia on base of vein R_{1+2} ; basad of cord with trichia on C, Sc and R; squama naked. Venation: Rs arcuated; cell M_1 with petiole about two-thirds m; M_{3+4} subequal to basal section of M_{1+2} .

Basal five abdominal segments yellow, tergites trivittate with dark brown, central vitta lacking on basal tergite, interrupted at the incisures of the others, lateral stripe continuous; outer segments black, in places with a more or less evident light gray bloom. Male hypopygium (Plate 2, fig. 16) with the tergite, *t*, transverse, outer half narrowed into two broad subtriangular yellow lobes, separated by a V-shaped notch, the lobes with very abundant black setæ that are smaller and more numerous near the margins; cephalic half of sclerite glabrous. Outer dististyle, *d*, small, inserted at near midlength of lower margin of the larger inner style, broadest on outer half and here with relatively few but long black setæ, those at the base pale and more delicate; inner style with beak slender, lower beak broadly obtuse, both heavily blackened, outer margin of style with very long setæ; outer basal lobe large, subrectangular in outline, the angles, especially the outer one, more or less produced into points. Phallosome, *p*, with gonapophyses appearing as slender blackened spines and broadly flattened yellow blades, the latter at apex and along mesal margin provided with conspicuous yellow setæ, longer outwardly, shorter but very dense near base. Eighth sternite with margin truncate or very slightly convex, entire, with setæ over the outer three-fourths of plate, about evenly spaced throughout.

Habitat.—Sikkim.

Holotype, male, Namnasa, altitude 9,500 feet, July 12, 1959 (*Schmid*).

The present is the first record of occurrence of the subgenus *Nobilitipula* Alexander in India, the only other described Asiatic species being *T. (N.) fuiana* Alexander, of eastern China. The remaining species, including the subgenotype, occur in eastern North America. The present fly has the wing veins even more glabrous than in the other species.

TIPULA (ACUTIPULA) ECHO sp. nov.

Plate 2, fig. 17.

Size relatively large (wing of male about 18 millimeters); mesonotal præscutum anteriorly and on sides broadly orange yellow, posterior part with four brown stripes, pleura grayish yellow; legs black; wings brown, conspicuously patterned with white and more restrictedly with darker brown; basal abdominal segments orange, tergites trivittate with dark brown, outer segments brownish black; male hypopygium with the tergal lobe yellow, virtually entire, the apex indistinctly trilobulate, with abundant black spicules; inner dististyle with a slender blackened blade immediately beyond the beak, the outer lobe large, margined with strong setæ; eighth sternite with sparse short setæ.

Male.—Length, about 15 to 16 millimeters; wing, 17.5 to 18; antenna, about 4.6 to 5.

Frontal prolongation of head chestnut brown to darker brown, still darker medially above, including the nasus; palpi black. Antennæ with scape and pedicel light yellow, proximal three or four flagellar segments vaguely bicolored, black at base, dark brown outwardly, the distal segments uniformly blackened; verticils subequal to or slightly longer than the segments. Head dark gray, anterior vertex and front more infuscated.

Pronotum uniformly orange. Mesonotal præscutum handsomely patterned, broadly orange yellow anteriorly and on sides, the posterior part of disk with four brown stripes, lateral interspaces gray, central vitta yellow; scutum light gray, each lobe with two darker gray areas; scutellum brownish orange, gray basally, parascutella brownish yellow; mediotergite blackish gray in front, light gray laterally and behind, pleurotergite obscure yellow, heavily gray pruinose, especially on the katableurotergite. Pleura grayish yellow, dorsopleural region broadly orange yellow. Halteres blackened, base of stem narrowly reddish. Legs with coxæ and trochanters obscure yellow; remainder of legs black, femoral bases very narrowly yellow; claws of male bidentate. Wings with the ground brown, paler on basal third, prearcular field and cell Sc yellow; the darker brown areas include the stigma and a small mark in cell Cu; clearly defined white areas in cell M, becoming more yellowed behind; two areas in cell Cu and a narrow band beyond cord, including the bases of cells M₁, 2nd M₂, M₃ and M₄, together with outer end of R₅; a narrow entire obliterative area before cord, extending from before the stigma across the base of cell 1st M₂;

veins brown, yellowed in the prearcular field, whitened in the obliterative area. Veins very glabrous, including the outer medial branches; restricted trichia on R_{4+5} , M , M_{3+4} , and 2nd A; prearcular anal vein with numerous trichia. Venation: Petiole of cell M_1 subequal to m .

Abdomen with proximal five tergites orange, trivittate with dark brown, sublateral dark stripes narrower, lateral borders broadly buffy, sternites more yellowed, outer segments blackened, the pale tergal borders becoming narrower and finally obsolete on the eighth segment. Male hypopygium (Plate 2, fig. 17) with the tergite, t , darkened, the central area produced posteriorly into a broad depressed yellow lobe, gently widened outwardly, apex indistinctly trilobulate, the central lobule more pointed, all with small black spicules; lateral margins of sclerite with long setæ. Ninth sternite with a dense brush of setæ, as in *indra*. Outer dististyle, d , pale, about twice as long as broad, apex truncate; inner style distinctive, including a basal section and a loosely attached outer blade that includes the beak, an extensive outer lobe provided with stout setæ, and a slender blackened blade above the beak, the sensory area between the latter two; the smaller basal section apically with strong yellow setæ, including an outer lobe. Eighth sternite with apex shallowly emarginate, the low lobes with short sparse yellow setæ.

Habitat.—Sikkim.

Holotype, male, Shingba, altitude 10,400 feet, June 30, 1959 (*Schmid*). Paratopotypes, 2 males; paratype, 1 male, Lachung, altitude 8,610 feet, July 10, 1959 (*Schmid*); 2 males, Chachu, altitude 9,500 feet, in *Rhododendron* association, May 21, 1959 (*Schmid*).

This attractive species is quite distinct from other regional members of the subgenus. In its essentially entire lobe of the tergite of the hypopygium it is most like *Tipula* (*Acutipula*) *interrupta* Brunetti and *T. (A.) indra* Alexander, entirely different flies in other regards.

TIPULA (ACUTIPULA) HEMMINGSENIANA sp. nov.

Plate 2, fig. 18.

Size small (wing of male about 13 millimeters); mesonotum chiefly darkened, pronotum and pleura yellow; mediotergite darkened basally, the broad posterior margins orange yellow; femora yellow, tips broadly black; wings light brown, prearcular field and cell Sc light yellow; cream colored areas in cell Cu and in bases of all outer medial cells; obliterative areas before

stigma and at cord whitened, very conspicuous; basal abdominal segments brownish yellow, tergites bordered laterally with brownish black, outer segments blackened; male hypopygium with the inner dististyle unusually simple, the outer lobe reduced to a small subcircular disk; eighth sternite trilobed.

Male.—Length, about 11 to 12 millimeters; wing, 12.5 to 13.5; antenna, about 3.3 to 3.5.

Frontal prolongation of head black above, including the short stout nasus, sides yellowish brown variegated with darker; palpi black. Antennæ with scape brownish black, pedicel light yellow, flagellum black, the extreme base of first segment yellow; basal enlargements of segments very small, verticils short, not quite one-half the segments. Head dark grayish brown, without a vertical tubercle.

Pronotum brownish yellow. Mesonotal præscutum with the disk virtually covered by four dark brown stripes that are vaguely bordered by blackish, the median lines darkened, lateral borders of præscutum yellow and orange; scutum dark brown, scutellum black, parascutella paler; mediotergite with central area chestnut brown, sides and posterior border broadly orange, light yellow pollinose; pleurotergite brownish gray above, katepleurotergite orange. Pleura testaceous yellow, propleura and dorsopleural membrane orange. Halteres with stem brown, knob brownish black. Legs with all coxæ light yellow, trochanters slightly darker; femora yellow, tips broadly black, more extensive on fore femora, slightly narrower on fore pair; tibiæ brown, tips slightly darker; basitarsi brown, succeeding segments black, terminal segment slightly paler; claws with a relatively short and broad tooth. Wings strongly suffused with light brown, prearcular field and cell Sc light yellow; stigma pale brown, inconspicuous; a brown cloud before midlength of cell Cu, preceded and followed by larger cream-colored areas, with similar pale spots in bases of all outer median cells; conspicuous more whitened obliterative areas before stigma, in outer end of cell R, and as a large spot in cell 1st M_2 ; veins brown, prearcular veins, with Sc and R, more yellowed. Macrotrichia on most longitudinal veins virtually back to the arculus, lacking on base of Cu_1 ; prearcular anal setæ abundant; squama with setæ. Venation: Rs a little longer than m-cu; petiole of cell M_1 subequal to m; M_{3+4} a little longer than basal section of M_{1+2} .

Basal five abdominal segments brownish yellow, tergites conspicuously bordered laterally with brownish black, outer four segments black, the outer dististyle white. Male hypopygium (Plate 2, fig. 18) with the tergite, *t*, strongly narrowed posteriorly, terminating in a median lobe that is shallowly divided at apex into two lobules, the apex with strong black spicules, more crowded outwardly; base of lobe produced into low shoulders. Outer dististyle, *d*, obtuse at tip, the length slightly less than three times the greatest width; inner style unusually simple, appearing as a compact blackened structure, its beak stout; outer apical angle with a small subcircular disk; face of style with a slender black spine, sensory pits conspicuous, lying distad of the spine. Gonapophysis, *g*, a flattened blade, dilated outwardly, tip oblique, outer apical angle obtuse. Eighth sternite, *8s*, large, posterior half narrowed, apex trilobed, including a broad low central lobe provided with relatively few long setæ, and smaller lateral humps with fewer setæ; viewed from the side the median lobe is relatively prominent.

Habitat.—Sikkim.

Holotype, male, Namnasa, altitude 9,500 feet, July 12, 1959 (*Schmid*). Paratopotype, 1 male; paratypes, 5 males, Chachu, altitude 11,500 feet, June 29, 1959 (*Schmid*).

This unusually distinct fly is named for Dr. Axel M. Hemmingsen, distinguished student of crane-fly biology and ecology. The species is readily told from all other regional members of *Acutipula* by the small size, body coloration, and especially by the structure of the male hypopygium, including the inner dististyle and eighth sternite.

TIPULA (INDOTIPULA) MELACANTHA sp. nov.

Plate 1, fig. 2; Plate 2, fig. 19.

Size unusually small (wing 11 millimeters or less); general coloration of thorax polished orange yellow, the pleura clearer yellow; antennal flagellum black, verticils short; femora brownish yellow, tips blackened; wings tinged with brown, stigma darker, *Rs* arcuated, a little longer than *m-cu*; abdominal tergites conspicuously patterned black and yellow, with a narrow black subterminal ring; male hypopygium with posterior border of tergite produced into two acute black spines, gonapophyses conspicuously setiferous.

Male.—Length, about 9 millimeters; wing, 10 to 10.5; antenna, about 3.1 to 3.5.

Female.—Length, about 12 millimeters; wing, 10.5 to 11; antenna, about 2.

Frontal prolongation of head yellow, nasus distinct; palpi brownish yellow. Antennæ with scape and pedicel yellow, first flagellar segment brownish yellow, remainder black; in male, segments moderately incised, verticils short, the longest scarcely one-half the segment; in female, antennal segments short. Head polished yellow, more or less darkened across the broad anterior vertex.

Pronotum light brown medially, paling to yellow on the sides. Mesonotum almost uniformly polished orange yellow, posterior sclerites and pleura clearer yellow. Halteres with stem obscure yellow, brighter basally, knob dark brown. Legs with coxæ and trochanters light yellow; femora brownish yellow, tips blackened; tibiæ and tarsi darker brown to black; claws of male with a single long tooth. Wings (Plate 1, fig. 2) tinged with brown, costal region slightly darker; stigma oval, darker brown; veins brown. Veins beyond general level of origin of Rs with long conspicuous trichia. Venation: Rs arcuated, a little longer than m-cu; R_{1+2} preserved; cell M_1 variable in depth, from about one and one-half to nearly three times its petiole; cell 2nd A narrow.

Abdominal segments bicolored, in male the tergites obscure yellow, posterior borders narrowly black, more expanded on posterior lateral angles; second segment with a black central spot; eighth segment blackened to form a narrow subterminal ring; sternites and hypopygium yellow; second segment very long; in female, the darkened tergal pattern more extensive, including a nearly complete central stripe and broader darkened subterminal ring. Ovipositor with cerci elongate, straight and slender. Male hypopygium (Plate 2, fig. 19) with posterior border of tergite, *t*, produced into two stout lobes, each terminating in a powerful black spine; ventral tergal armature about as figured, including paired outer blades, near base of each with a gently curved rod that bears a few blackened spicules at tip. Outer dististyle, *d*, simple, relatively narrow, broadest at base, the lower margin with strong black setæ; inner style unusually simple, the main body appearing as a simple flattened blade, the outer expanded head without major setæ but with a transverse flange; outer basal lobe about as long but narrower, the outer surface with strong erect yellow setæ, lower margin pale and membranous. Phallosome, *p*, including the short

ædeagus that is produced into a slender spine, gonapophyses appearing as broadly flattened oval blades with abundant setulæ and fewer long pale setæ, with further sclerotized infolding on lateral parts. Eighth sternite simple.

Habitat.—South India.

Holotype, male, Cherangode, Nilgiri Hills, altitude 3,500 feet, November 1950 (*Susai Nathan*). Allotopotype, female, pinned with types. Paratopotypes, males and females.

Tipula (*Indotipula*) *melacantha* is the smallest regional member of the subgenus so far discovered, in its hypopygial structure being entirely distinct from other species, such as *T. (I.) brachycantha* Alexander, *T. (I.) flavithorax* Brunetti, and *T. (I.) palmica* Edwards.

TIPULA (INDOTIPULA) PANDAVA sp. nov.

Plate 2, fig. 20.

Size relatively large (wing of male about 15 millimeters); mesonotum chiefly reddish brown, more yellowed behind; wings yellowish brown, stigma darker, cell M_1 very deep, its petiole shorter than m ; outer medial veins with macrotrichia; male hypopygium with tergal lobes black, rounded, widely separated; outer dististyle conspicuously dilated on basal half, inner style heavily blackened, the body very compact, outer basal lobe a powerful blackened rod.

Male.—Length, about 12.5 to 13.5 millimeters; wing, 14 to 15; antenna, about 3.8 to 4.

Frontal prolongation of head above light yellow, the sides brown; nasus elongate; palpi brown, terminal segment brownish black. Antennæ with scape obscure yellow, pedicel light yellow, flagellum black; flagellar segments slender, slightly exceeding the longest verticils. Head with front light yellow, more obscure yellow surrounding the antennal bases; posterior part of head brownish gray, with a \perp -shaped darker pattern an anterior vertex, the stem extended cephalad between the antennal bases, terminating in two small dark brown spots on the front.

Cervical region and pronotum weakly infuscated above, yellow on sides. Mesonotal præscutum with disk chiefly covered by four stripes, the narrow intermediate pair obscure yellow, bordered by reddish brown, the sublateral stripes more solidly darkened, lateral margins broadly light yellow; posterior sclerites of notum obscure orange, clearer behind, parascutella a little darker; postnotum glabrous. Pleura brownish yellow in front, becoming clearer orange yellow behind. Halteres with

stem pale brown, knob darker, tip narrowly pale. Legs with coxæ yellow, fore pair weakly darkened in front; trochanters yellow; femora obscure yellow basally, passing into brown, tips brownish black; tibiæ and tarsi brownish black; claws of male bidentate, basal tooth shorter and stouter. Wings yellowish brown, base and costal region more yellowed, stigma darker brown; obliterative areas before stigma and across cell 1st M_2 small; veins dark brown. Macrotrichia of veins beyond cord conspicuous, on outer medial veins including complete series on M_1 , M_2 and all but the base of M_3 , on M_4 , on outer third; 1st A with a few trichia near arculus, 2nd A glabrous; abundant trichia on prearcular anal vein. Venation: Cell M_1 deep to very deep, its petiole about one-third to one-half m.

Abdomen at base brownish yellow, outer segments darkened, hypopygium brownish black. Male hypopygium (Plate 2, fig. 20) with the tergite, *t*, transverse, broadest across base, narrowed outwardly, terminating in two blackened lobes separated by a broad shallow emargination, fringed with long setæ, with a further small median lobule; major lobes obtusely rounded at tips, smooth at summit, the bases and inner faces with small black spicules. Ninth sternite, *9s*, with an oval lobe covered with very long setæ. Basistyle, *b*, on outer face near apex with conspicuous long yellow setæ. Outer dististyle, *d*, yellow, elongate, broadest on basal half before midlength, distal end very slender, outer margin fringed with long setæ; inner style distinctive, the body a subrectangular blackened mass, beak very obtuse, lower beak small, pointed; outer basal lobe almost separated from body of style, appearing as a slender gently curved blackened rod from a more dilated base, apex of rod slightly expanded, its outer angle produced into a spine. Gonapophysis, *g*, appearing as a flattened paddlelike blade. Eighth sternite with margin convexly rounded.

Habitat.—Sikkim.

Holotype, male, Lathong, altitude 6,560 feet, July 26, 1959 (*Schmid*). Paratopotype, 1 male; paratype, male, Selep, altitude 7,000 feet, July 27, 1959 (*Schmid*).

Tipula (*Indotipula*) *pandava* agrees rather closely with Edwards, redescription of the type of *T. (I.) divisa* Brunetti,¹ but disagrees entirely with Brunetti's original description of the hypopygial dististyles, and in other features that make it im-

¹ *Stylops* 1 (1932) 236-237.

possible to reconcile the two flies. The inner dististyle of the present fly is entirely different from that of other generally similar described species.

TIPULA (INDOTIPULA) PROLATA sp. nov.

Plate 2, fig. 21.

General coloration buffy yellow, præscutum with four pale brown stripes that are narrowly bordered by cinnamon brown; wings weakly tinged with brownish yellow, base and costal field clearer yellow, stigma medium brown; outer abdominal segments infuscated; male hypopygium with tergal lobes spiculate; outer dististyle broad, terminating in a small lobule; beak of inner style long and straight, outer crest with a compact group of five strong reddish bristles, outer basal lobe large and complex; eighth sternite large, central part pale membranous, with sparse setæ.

Male.—Length, about 11 millimeters; wing, 12.5.

Frontal prolongation of head brownish yellow; nasus distinct; first segment of palpus brownish yellow, the remainder darker. Antennæ with scape and pedicel obscure yellow; flagellum broken. Head black, sparsely pruinose, paler on occipital region; anterior vertex very broad, without a tubercle.

Cervical region and pronotum buffy yellow, scutum weakly infuscated medially. Mesonotal præscutum buffy laterally, disk with four pale brown stripes that are delimited by narrow more cinnamon-brown borders, posterior interspaces obscure yellow; posterior sclerites of notum brownish yellow, mediotergite broadly more reddened behind; mesonotum unusually glabrous, with very sparse pale setæ on the præscutal interspaces. Pleura buffy yellow, dorsopleural membrane yellow. Halteres with stem brownish yellow, base clearer yellow, knob dark brown. Legs with coxæ buffy yellow, trochanters clearer yellow; remainder of legs broken. Wings weakly tinged with brownish yellow, prearcular and costal fields, together with the narrow cell Cu_1 , clear yellow; stigma oval, medium brown; restricted more whitened obliterative areas before stigma and across cell 1st M_2 ; veins pale brown, more yellowed in the brightened fields. Macrotrichia on veins R_{2+3} , R_2 , R_3 , R_{4+5} , M_1 and M_2 , more sparse on outer end of M_3 ; virtually lacking or very few on M_4 and distal section of Cu_1 ; very sparse and scattered trichia on Rs , M and Cu , lacking on anal veins; proximal end of 1st A and prearcular anal vein with trichia; squama naked. Venation: Petiole of cell M_1 nearly twice m ; M_{3+4} subequal to basal

section of M_{1+2} ; m-cu just beyond base of M_4 ; cell 2nd A moderately wide, broadest just beyond midlength.

Basal abdominal tergites infuscated, lateral borders yellow, broadest on basal two segments; proximal sternites yellow; outer segments chiefly darkened, especially the tergites; eighth sternite with about six obscure yellow spots. Male hypopygium (Plate 3, fig. 21) with the tergite, *t*, long, narrowed posteriorly, terminating in two triangular lobes that are separated by a deep U-shaped notch, the lobes with abundant blackened spicules, those at apex and on inner margin larger. Outer dististyle, *d*, broad, its length about two and one-half times the greatest breadth which is beyond midlength, apex constricted to form a small oval lobule clothed with delicate setæ; inner style with the beak unusually long and straight, glabrous, lower beak short and broad, darkened, surface microscopically tuberculate; outer crest of style with a compact group of five strong reddish bristles that are produced into hairlike points; outer basal lobe large and complex, its area only a little less than the remainder of style. *Æ*deagus simple, produced into a slender blackened point. Eighth sternite very large, narrowed posteriorly, the central part with pale membrane, the setæ only on sides of the membranous part, apex truncate.

Habitat.—Pakistan.

Holotype, male, Kawai, altitude 4,800 feet, June 24, 1953 (*Schmid*).

The nearest ally is *Tipula (Indotipula) simlensis* Edwards, which is quite distinct in the hypopygial structure, including especially both dististyles and the eighth sternite. The present fly lacks the remarkable setal adornment of the eighth sternite found in *simlensis*.

TIPULA (VESTIPLEX) EURYDICE sp. nov.

Plate 3, fig. 23.

Allied to *inæquidentata*; mesonotal præscutum light gray with four brownish gray stripes that are partly bordered by brown; pleura gray, posterior sclerites clear yellow; antennæ black, basal three segments light yellow; legs black, femora with a very conspicuous yellow subterminal ring; wings creamy yellow with a pale brown pattern, the prearcular and costal fields bright saturated yellow; basal four abdominal segments orange yellow, outer segments black; male hypopygium with the dorsal tergal rods slender, ventral armature black, bispinous; appendage of ninth sternite long, dilated outwardly; basistyle with a black-

ened lobe; inner dististyle with beak slender, blackened, both the dorsal and posterior lobes conspicuous; ædeagus without a lateral shoulder.

Male.—Length, about 13 to 14 millimeters; wing, 15 to 17; antenna, about 4.8 to 5.

Frontal prolongation of head above light yellow, including the nasus, weakly infuscated on sides and beneath; palpi black, incisures paler. Antennæ relatively long; basal three segments light yellow, fourth light brown, its base darker, outer segments black, longer than their verticils; basal enlargements of segments very small. Head reddish, heavily light yellow pollinose, with a capillary pale brown central line from the small entire vertical tubercle.

Pronotum gray, vaguely patterned with pale brown. Mesonotal præscutum light gray, with four clearly differentiated dark brownish gray stripes that are margined with darker brown, most distinct on outer margins of intermediate stripes and inner borders of the lateral pair, humeral region restrictedly dark brown; scutum light gray, each lobe with two almost confluent brown areas; scutellum brownish gray, parascutella paler; mediotergite yellow, vaguely darkened at base and on central part, pleurotergite brownish yellow above, more yellow pollinose on the katapleurotergite. Pleura gray, patterned with grayish yellow on the dorsal sternopleurite, posterior sclerites clear yellow; dorsopleural membrane buffy yellow. Halteres with stem yellow, knob dark brown basally, apex broadly obscure yellow. Legs with coxæ and trochanters yellowed; femora black, bases narrowly yellow, with a broader very distinct yellow subterminal ring; tibiæ and tarsi black; claws of male toothed. Wings with the ground creamy yellow, the prearcular and costal fields bright saturated yellow; a pale brown pattern, subequal in extent to the ground areas except on basal third of wing where the yellow bands are broad; obliterative areas before stigma and across cell 1st M_2 more whitened; distal half of cell R_5 yellowed; veins brownish yellow, clear yellow in the brightened fields. Outer longitudinal veins with macrotrichia, lacking on R_s , more than the basal half of M , most of Cu_1 and 1st A ; 2nd A with trichia on outer two-thirds; no prearcular anal trichia. Venation: Vein R_3 gently arcuated; R_s about one-half longer than $m-cu$.

Basal four abdominal segments orange yellow, tergites slightly patterned, most evident as vague sublateral lines and a cen-

tral darkening at base of abdomen; remainder of abdomen black, lateral tergal borders of segments five and six narrowly pale. Male hypopygium (Plate 3, fig. 23) with the tergite, *t*, distinctive, including a paler brownish black dorsal plate, each lobe extended into a slender parallel-sided blade; ventral armature heavily blackened, bifid, including an acute black mesal spine and a stouter lateral black rod, its tip microscopically toothed or bidentate. Appendage of ninth sternite, *9s*, a strong rod, beyond base gradually dilated, apex obliquely truncate, base of blade with a sparse fringe of long yellow setæ, apex with fewer scattered bristles. Basistyle, *b*, produced into a blackened blade, its apex obtuse. Outer dististyle, *d*, relatively narrow, darkened, with long black setæ; inner style with beak black, slender, widened basally into a broad plate; dorsal crest short but unusually high, with long erect setæ; posterior lobe broadly rounded. Ædeagus, *a*, pointed at apex, shaped about as figured, lacking the lateral shoulders found in *inæquidentata*.

Habitat.—Sikkim.

Holotype, male, Chateng, altitude 8,700 feet, May 22, 1959 (*Schmid*). Paratopotype, male.

The most similar described species is *Tipula (Vestiplex) inæquidentata* Alexander, of the eastern Himalayas, which differs especially in details of the male hypopygium, particularly the tergite, appendage of the ninth sternite, the inner dististyle and the ædeagus.

TIPULA (VESTIPLEX) KUMAONENSIS sp. nov.

Closely allied to *avicularia*, differing in the large size and in details of structure of the hypopygium, particularly the inner dististyle and appendage of the ninth sternite.

Male.—Length, about 15 to 17 millimeters; wing, 19 to 21; antenna, about 3.8 to 4.

Frontal prolongation of head brownish yellow, gray above, nasus distinct; palpi brownish black, outer segments black. Antennæ relatively short; scape and pedicel yellow, flagellum black. Head buffy yellow, more infuscated medially.

Pronotum gray, patterned with brown. Mesonotal præscutum light gray laterally, disk chiefly covered by three brownish gray stripes that are narrowly bordered by darker, especially the lateral margins of the central vitta and inner edge of the laterals; central vitta vaguely divided by a darkened line, posterior interspaces brownish gray; scutal lobes dark gray, inner part

more infuscated; central region of scutum and scutellum light gray; mediotergite more yellowish gray, the latter two areas with a distinct dark brown central line; pleurotergite gray, katepaleurotergite whitened. Pleura gray, dorsopleural region brown. Halteres with stem reddish brown at base, darker outwardly, knob dark brown. Legs with coxæ brown, gray pruinose, posterior pair paler; trochanters obscure yellow; femora black with a conspicuous subterminal yellow ring; tibiæ and tarsi black; claws of male toothed. Wings broad, light brown, patterned with creamy yellow areas; stigma and a large cloud over anterior cord darker brown; the pale marks include a narrow poststigmatal band extending backward into the base of cell M_3 ; basad of cord the dark and pale areas zigzag and are approximately equal in area.

Abdomen with proximal four segments orange, outer segments, including the hypopygium, black; a broad black central tergal stripe, scarcely interrupted at posterior borders of segments. Male hypopygium much as in *avicularia*, differing in details, especially of the dististyles and appendage of the ninth sternite. Ninth tergite with a shallow but conspicuous V-shaped notch, the margin with abundant recurved black setæ; no ventral armature. Appendage of ninth sternite nearly parallel-sided, outwardly narrowed to the acute tip, with unusually long and abundant yellow setæ, the appendage not dilated outwardly and not appearing like a bird's head, as in *avicularia*, the structure united with the appendage of the basistyle. Basistyle with the apical lobe broadly rounded at tip, with a small lateral point. Outer dististyle elongate, widened outwardly; outer margin of inner style with very long and conspicuous yellow setæ.

Habitat.—India (Kumaon).

Holotype, male, Gangrea, Pauri Garhwal, altitude 7,500 to 10,000 feet, June 12, 1958 (*Schmid*). Paratopotypes, 3 males, June 12 to 14, 1958.

I have a paratype of *Tipula (Vestiplex) avicularia* Edwards and consider the present fly as being distinct though very closely allied.

TIPULA (VESTIPLEX) RHIMMA sp. nov.

Plate 3, fig. 22.

Size medium (wing of male 14.5 millimeters); mesonotum yellow pollinose, præscutum with four brown stripes, posterior sclerites and pleura patterned with brown; basal antennal segments yellow, flagellum black; wings narrow, light brown, ex-

tensively variegated with creamy yellow areas; basal abdominal tergites yellow, trivittate with brown, outer segments darkened; male hypopygium with lower lobes of tergite very large; appendage of ninth sternite a broad yellow blade with many setæ; outer dististyle boomerang-shaped, apex triangularly dilated, inner style with beak slender, blackened.

Male.—Length, about 12 millimeters; wing, 14.5; antenna, about 3.5.

Frontal prolongation of head yellow, including the long nasus, sides with a narrow brown line; palpi with basal segment yellow, remainder dark brown, terminal segment about equal in length to the preceding two combined. Antennæ with scape and pedicel light yellow, first flagellar segment light brown, remainder black; flagellar segments with small basal enlargements, verticils long, subequal to the segments. Head yellow, darker behind on the posterior vertex; a narrow light brown central vitta on vertex, extending from center of the low entire tubercle to the occiput.

Pronotum obscure yellow, with three brown stripes. Mesonotal præscutum light yellow with four brown stripes, the intermediate pair separated by a capillary ground line, more evident behind; scutal lobes yellow, restrictedly patterned with brown; scutellum and mediotergite yellow with an indistinct brown central line; vestiture of notum, especially of the mediotergite, yellow, conspicuous. Pleura and pleurotergite yellow, propleura, anepisternum, ventral sternopleurite, ventral pteropleurite, and meron more darkened. Halteres with stem reddish brown, knob darker brown, apex paler. Legs with coxæ and trochanters yellow; femora dark brown, base and a broader subterminal ring light yellow; tibiæ and tarsi dark brown; claws of male toothed. Wings narrow, light brown, extensively patterned with yellow, prearcular and costal fields deeper yellow; stigma brownish yellow; basad of the cord the yellow areas very extensive, including much of cells R, M, Cu, and base of 1st A; cell 2nd A with two yellow areas; beyond cord a conspicuous brightening extending from costa backward, barely entering cell R₅; obliterative areas before stigma and across cell 1st M₂ a trifle more whitened; veins brown, yellowed in the brightened fields. Macrotrichia on veins beyond cord, lacking on the pale outer half of R₁₊₂; sparse trichia on outer ends of M, basal section of Cu₁ and 1st A, more extensive on 2nd A, lacking on Rs; no prearcular anal trichia. Venation: Rs about two and one-half times

m-cu, the latter before the fork of M_{3+4} ; petiole of cell M_1 slightly longer than m.

Basal abdominal tergites yellowed, trivittate with brown, outer segments more extensively darkened; basal sternites reddish yellow, outer segments dark brown. Male hypopygium (Plate 3, fig. 22) with the tergite, *t*, distinctive; dorsal lobes relatively small, pale, tips rounded, separated by a broad U-shaped notch; lower blades much larger, arising far laterad, the narrowed beaklike part slightly upturned, almost meeting at the midline. Appendage of ninth sternite, *9s*, a broad yellow blade, the slightly constricted apex obtuse, with many setæ, with further larger marginal bristles. Outer dististyle, *d*, yellow throughout, shaped like a narrow boomerang, the apex triangularly dilated, the setæ abundant, short and pale; inner style with beak slender, blackened, lower beak dilated into an oval yellow blade. Ædeagus, *a*, small, the apex subtruncate, the angles slightly produced.

Habitat.—Sikkim.

Holotype, male, Mangalbarey, altitude 2,800 feet, April 30, 1959 (*Schmid*).

Tipula (Vestiplex) rhinna is still another of the small to medium-sized members of the subgenus that are allied to *T. (V.) ravana* Alexander. It is entirely distinct in the structure of the male hypopygium, including especially the tergite, appendage of the ninth sternite, and outer dististyle.

TIPULA (VESTIPLEX) SIDDARTHA sp. nov.

Plate 3, fig. 24.

Size small (wing of male 14.5 millimeters); general coloration of thorax yellow, præscutum with four light brown stripes, scutellum and mediotergite with a central dark line, dorsal pleurites darkened; antennæ black, scape and pedicel yellow; femora brown with an obscure yellow subterminal ring, claws of male toothed; wings brown, variegated by darker brown and cream colored areas; basal abdominal segments brownish yellow, tergites with three darker stripes, outer segments uniformly darkened; male hypopygium with upper tergal lobes flattened, obtuse, lower lobes narrow, blackened; appendage of ninth sternite a flattened yellow blade, the obtuse tip with about seven long yellow setæ; basistyle unarmed; inner dististyle with beak slender, blackened, lower beak yellow, scooplike; apex of ædeagus bidentate.

Male.—Length, about 13.5 millimeters; wing, 14.5; antenna, about 4.4.

Frontal prolongation of head above light yellow, including the long nasus, sides darker; palpi yellowish brown. Antennæ relatively long; scape and pedicel yellow, flagellum black, the first segment a little paler; basal enlargements of segments scarcely developed, longest verticils subequal to the segments. Head buffy yellow; vertical tubercle entire, clearer yellow; a faint capillary brown central line from behind the tubercle almost reaching the occipital border.

Pronotum buffy yellow, patterned with brown. Mesonotal præscutum yellow pollinose, with four light brown stripes, the intermediate pair darkened on internal margins to form a dusky central line; scutum yellow, each lobe with two separate light brown stripes; scutellum and mediotergite yellow with a conspicuous central dark brown line, interrupted posteriorly. Pleura yellow, cervical region, propleura and anterior part of anepisternum patterned with dark brown. Halteres with stem yellow, knob brownish black, the apex paling to obscure yellow. Legs with coxæ and trochanters yellow; femora brown, tips blackened, preceded by a narrow obscure yellow subterminal ring; tibiæ and tarsi black; claws of male setiferous, with an acute basal spine, outer half blackened. Wings with the ground brown, variegated by darker brown and cream-colored areas, prearcular field yellow; costal cell yellow on central part, base more darkened; large dark areas additional to the stigma include a postarcular mark, origin of Rs and anterior cord; the pale pattern includes a broad postarcular brightening in cells R and M, with smaller outer areas, marks before and beyond stigma, the latter a short band extending from costa to cell 1st M₂; cells Cu and anals variegated, including two pale areas in cell 2nd A; no marginal brightenings in outer radial or medial fields; veins dark brown, more yellowed in the brightened fields. Veins beyond general level of origin of Rs with abundant trichia, lacking basally on Rs and M; an almost complete series on 2nd A, 1st A with two or three near tip. Venation: Rs long, straight, nearly twice m-cu; petiole of cell M₁ not quite twice m; m-cu shortly before fork of M₃₊₄.

Abdomen brownish yellow basally, the tergites darker medially and sublaterally, outer segments darker, especially the blackened eighth and ninth; appendages yellow. Male hypopygium (Plate 3, fig. 24) with upper lobes of tergite, *t*, flattened,

obtusely rounded, separated by a deep median split; lower lobes slender, their blackened tips weakly emarginate or lobed, the inner lobule scabrous. Appendage of ninth sternite, *9s*, a flattened yellow blade, slightly dilated at outer end, apex obtuse, on lower margin below tip with about seven long yellow setæ. Basistyle unarmed. Outer dististyle, *d*, narrow, broadest at near two-thirds the length, narrowed outwardly; inner style with the beak slender, blackened, lower beak yellow, scooplike; dorsal crest long and low, glabrous, along its base with a linear series of eight circular punctures, each with a short stout pale spine. *Ædeagus*, *a*, yellow, broad at base, apex with two acute spines separated by a shallow emargination.

Habitat.—Sikkim.

Holotype, male, Rapham, altitude 5,250 feet, April 2, 1959 (*Schmid*).

The most similar regional species are *Tipula (Vestiplex) halteroptera* Alexander and *T. (V.) ravana* Alexander, readily told from the present fly by the structural characters, including the simple claws of the first named species. All structures of the hypopygium of *ravana* are quite distinct. The circular spine-bearing punctures on the inner dististyle, as described for the present fly, are likewise found in *ravana* but are only three in number, lying far back.

TIPULA (OREOMYZA) LAETABUNDA sp. nov.

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

Size medium (wing of male over 10 millimeters); general coloration of mesonotum yellow, præscutum with four more brownish stripes, the intermediate pair confluent in front; antennæ black, the scape, pedicel and base of first flagellar segment yellow; legs black, claws of male simple; wings yellowish white, extensively patterned with brown, arcular area and cell *Sc* light yellow; R_{1+2} atrophied, m-cu near outer end of M_{3+4} ; basal abdominal segments yellow, beyond the fifth brownish black; male hypopygium with the tergal lobes rounded, median notch small; outer basal lobe of inner dististyle rounded.

Male.—Length, about 9.5 millimeters; wing, 10.6; antenna, about 3.5.

Frontal prolongation of head heavily yellow pollinose, especially above; nasus conspicuous; palpi black. Antennæ with scape, pedicel and more than the proximal half of first flagellar segment yellow, remainder of organ black; flagellar segments not incised, slightly stouter at base, exceeding the verticils,

terminal segment very small. Head olive, slightly more grayish behind; vertex with a very delicate darker line; vertical tubercle low.

Pronotum yellow, slightly variegated with darker. Mesonotal præscutum with the ground yellow pollinose, with four inconspicuous more brownish stripes, the intermediate pair confluent in front, lateral stripes broader; posterior sclerites of notum olive yellow, scutal lobes with two brown areas, the posterior one larger; central part of mediotergite slightly darker. Pleura olive yellow, variegated with large gray areas on anepisternum, ventral sternopleurite and meron; dorsopleural membrane brownish yellow. Halteres with stem yellowed, knob dark brown. Legs with coxæ olive yellow; trochanters yellow; remainder of legs black, femoral bases very narrowly yellowed; claws simple. Wings (Plate 1, fig. 3) with the ground yellowish white, with an extensive brown pattern that exceeds the ground areas, cell Sc and region of arculus clear light yellow; the major ground areas include two in cells R and 1st A, one in M, most of Cu and an extensive band beyond cord, extending from C subbasally across cells R₃ and R₅, widened posteriorly in cells 1st M₂, 2nd M₂ and M₃; veins brown, yellowed in the brightened areas. Macrotrichia on most longitudinal veins beyond cord, lacking on Rs and 2nd A, present on outer ends of M, Cu₁ and 1st A. Venation: Rs long, about three times m-cu, at fork shirred or deflected downward; R₁₊₂ atrophied; cell M₁ about twice its petiole; cell 1st M₂ small, pentagonal; M₃₊₄ long, with m-cu shortly before its fork; cell M₄ widest at margin.

Abdomen with basal five segments yellow, remainder dark brown to brownish black. Male hypopygium (Plate 4, fig. 25) with the tergite, *t*, large, posterior border with two broad yellow rounded lobes, median area with a microscopic emargination, cephalad of this with a dorsal furrow; setæ of lobes relatively small, especially outwardly, those of the disk larger. Outer dististyle, *d*, flattened, apex obtuse; inner style with beak relatively narrow, tip obtuse, lower beak much broader, surface with parallel darkened lines; outer basal lobe a flattened blade, its margin obtuse. Phallosome, *p*, broad, including four short sclerotized points, the outer pair directed caudad, the lower ones cephalad. Margin of eighth sternite unmodified.

Habitat.—Sikkim.

Holotype, male, Namnasa, altitude 9,500 feet, July 13, 1959 (*Schmid*).

The nearest regional ally is *Tipula* (*Oreomyza*) *camillerii* Alexander, of the eastern Himalayas, which differs in the still smaller size, pattern of the wings, and in details of the male hypopygium.

TIPULA (OREOMYZA) GUTTULIFERA sp. nov.

Plate 3, fig. 26.

Belongs to the *marmorata* (*fragilis*) group; mesonotal præscutum gray with four brownish black stripes, pleura patterned gray and brownish black; antennæ of male long, approximately one-half the body, basal segments yellow, flagellum black; legs brownish black, femoral bases narrowly yellowed; wings brown, conspicuously patterned with white and creamy spots and droplets; abdomen brownish black; male hypopygium with tergal lobes very slender, each with two setæ; basistyle not blackened on mesal face; outer dististyle slightly dilated but not blackened at base; inner style broad, beak small; eighth sternite entirely unmodified.

Male.—Length, about 12.5 to 13 millimeters; wings, 14 to 14.5; antenna, about 6.8 to 7.

Frontal prolongation of head black, faintly pruinose near base, nasus distinct; palpi black. Antennæ of male elongate, approximately one-half the body; scape yellow, restrictedly darkened at base, pedicel light yellow, flagellum black; flagellar segments beyond the first with small oval basal enlargements, verticils much shorter than the segments. Head above brown, slightly more darkened medially; front and anterior vertex on sides of the low vertical tubercle light gray.

Pronotal scutum variegated gray and black, central region of scutellum testaceous. Mesonotal præscutum with the ground gray, with four brownish black stripes, the intermediate pair narrowly separated by an obscure central line, anterior and lateral borders more narrowly darkened; scutum brownish gray, each lobe with two conspicuous dark brown areas; scutellum brown, paler laterally, parascutella testaceous brown; mediotergite brownish gray. Pleura gray, variegated with brownish black on anepisternum, ventral sternopleurite and meron, clearer gray behind; dorsopleural membrane dark brown. Halteres long, stem yellow, knob brownish black. Legs with coxæ gray; trochanters yellow; femora brownish black, bases narrowly yellowed; tibiæ brownish black, tarsi black; claws small, simple. Wings with the ground brown, conspicuously patterned with white and creamy spots and droplets; stigma and area over an-

terior cord slightly darker brown; whitened spots in outer end of cell R, base of 1st M_2 , two marginal areas in cell 1st A, one in 2nd A; more diffuse whitened marks in bases of cells R, M and anals; cream-colored spots present in most cells both before and beyond the cord, including prestigmal and poststigmal brightenings; all outer cells with creamy central spots; basad of cord the areas include one in cell R, two in each of cells M and Cu, and one at basal third of 1st A; prearcular field chiefly pale yellow; cells C and Sc uniformly brown; veins brown, anterior prearcular veins yellow. Veins beyond general level of origin of Rs with strong trichia, including virtually all of R and M and outer end of 1st A; lacking on 2nd A, including the prearcular sections, and in cases, the basal section of Cu_1 . Venation: Petiole of cell M_1 longer than m ; M_{3+4} short to very short, less than $r-m$.

Abdomen brownish black, basal tergites slightly pruinose, posterior borders of segments very narrowly pale. Male hypopygium (Plate 3, fig. 26) with the tergal lobes, t , very slender, lying almost parallel to one another, each with two widely separated setæ on inner edge. Basistyle with mesal margin only weakly darkened. Outer dististyle, d , stout, base dilated but not blackened, obtuse; setæ sparse, longer near base, marginal and outer setæ small and weak; inner style unusually broad, beak small, blackened; dorsal crest high; region of outer basal lobe a low darkened flange with several strong setæ; longer but pale setæ on disk at base of dorsal crest. Eighth sternite with posterior border truncate, entirely unmodified, with only a few relatively short setæ.

Habitat.—Sikkim.

Holotype, male, Gopetam, altitude 12,200 feet, in *Rhododendron* association, October 10, 1959 (Schmid). Paratopotype, male, pinned with type.

Tipula (Oreomyza) guttulifera is entirely distinct from all other regional members of the group that have the wings more or less patterned with light and dark, including *T. (O.) baltistanica* Alexander and *T. (O.) letifera* Alexander. The long antennæ and conspicuous pattern of the wings provide noteworthy characters.

TIPULA (OREOMYZA) SORDIDIPES sp. nov.

Plate 3, fig. 27.

Belongs to the *marmorata (fragilis)* group; general coloration of thorax gray, præscutum with four dark brown stripes;

legs black, femoral bases narrowly yellow; wings weakly tinged with brown, vaguely patterned with darker; abdomen dark brown, sparsely pruinose, the central tergites more or less yellowed, sternites uniformly darkened.

Male.—Length, about 9.5 to 11 millimeters; wing, 11 to 12; antenna, about 3.8 to 4.

Female.—Length, about 11 millimeters; wing, 8.5.

Frontal prolongation of head brownish gray, nasus elongate, with yellow setæ; palpi black. Antennæ moderately long, as shown by the measurements; scape and pedicel obscure yellow, flagellum black; flagellar segments slightly incised, basal enlargements conspicuous; segments exceeding the verticils, with a further dense white pubescence. Head gray, center of vertex extensively light brown.

Pronotum gray, scutum vaguely patterned with brown. Mesosotal præscutum gray, with four dark-brown stripes, the intermediate pair separated behind, confluent anteriorly, their anterior ends with gray centers, lateral stripes solidly darkened; pseudosutural foveæ black, punctiform; scutum gray, each lobe with two confluent dark-brown areas; posterior sclerites clear light gray. Pleura light-gray, slightly patterned on ventral anepisternum and ventral sternopleurite with darker gray. Halteres with stem dirty yellow, knob dark-brown. Legs with coxæ light-gray; trochanters brown; remainder of legs black, bases of fore femora, and in cases the middle pair, narrowly obscure yellow; claws simple. Wings weakly tinged with brownish yellow, stigma and a vague wash in cells R_2 and R_3 pale brown; veins light brown. Macrotrichia of veins beyond level of origin of R_s abundant, lacking on about the basal fourth of M , approximately the basal half of Cu_1 and 1st A , and basal two-thirds of 2nd A ; no trichia on prearcular anal vein. Venation: R_s approximately one-third to one-half longer than $m-cu$, the latter on M_4 leaving a basal section that is a little shorter than M_{3+4} .

Abdomen dark brown, sparsely gray pruinose, central part of tergites two to four more yellowed, especially the posterior border of the last, in cases even more extensive, reaching the seventh tergite or extreme base of the eighth; appendages of hypopygium reddened. Male hypopygium (Plate 3, fig. 27) with the tergite, t , shallowly emarginate, the border with small black spicules. Blackened lobe on mesal face of basistyle with abundant microscopic tubercles. Outer dististyle, d , widened across basal half,

the dilated margin narrowly blackened; inner style with outer part relatively narrow, tapering to the narrowly obtuse apex. Eighth sternite with posterior margin gently convex, with a few relatively long black setæ.

Habitat.—Kashmir.

Holotype, male, Chotta Deosai, altitude 12,675 feet, in marsh, September 12, 1953 (*Schmid*). Allotopotype, female, pinned with type. Paratopotypes, males and females.

The closest regional ally is *Tipula* (*Oreomyza*) *venerabilis* Alexander, likewise from Kashmir, which is well distinguished by the coloration of the body and legs. In this latter fly the fore femora are chiefly blackened but the other legs are brownish yellow, the femoral tips narrowly blackened, while the abdomen, including both tergites and sternites, are extensively yellowed.

TIPULA (LUNATIPULA) STYLOSTENA sp. nov.

Plate 3, fig. 28.

Allied to *marmoratipennis*; mesonotum gray, præscutum with four conspicuous brownish gray stripes that are narrowly bordered by dark brown; wings yellow, conspicuously tessellated with brown; macrotrichia of veins relatively sparse; abdomen orange, outer segments blackened, in male the terminal segments telescoped within the preceding ones; outer dististyle very narrow, terminating in about four blackened spinoid setæ; beak of inner style slender.

Male.—Length, about 15 to 16 millimeters; wing, 18.5 to 21; antenna, about 3.5 to 3.8.

Female.—Length, about 20 to 21 millimeters; wing, 21 to 22.

Frontal prolongation of head above grayish yellow, including the nasus, sides dark brown; palpi brown, terminal segment yellowed. Antennæ relatively short; scape and pedicel yellow, flagellum dark-brown, in some specimens (*Badrinath* paratype) more bicolored, the tips of the flagellar segments yellowed; segments weakly incised, shorter than their verticils. Head yellowish brown, clearer yellow in front, including the very low vertical tubercle; posterior vertex with a narrow dark-brown central line.

Pronotal scutum light-gray, with three brown areas; scutellum light-yellow, with a brown lateral spot. Mesonotal præscutum gray with four conspicuous brownish gray stripes that are narrowly bordered by dark brown, humeri dusky; scutum light-gray, each lobe with two confluent brownish gray areas

that are bordered by dark brown; scutellum and mediotergite gray with a very conspicuous brownish black central vitta; pleurotergite gray dorsally, the katapleurotergite more yellowed; vestiture of thorax long and conspicuous, yellow, especially long on sides of mediotergite. Propleura dark brown; mesepisternum gray, mesepimeron and metapleura more yellowed; ventral meral area darker. Halteres with stem obscure yellow, knob dark brown. Legs with coxæ and trochanters yellow; in male, femora black, narrowly yellowed basally, with a vague obscure yellow subterminal ring, tibiæ and tarsi black; claws simple; in female, femora more uniformly brownish yellow, tips broadly blackened. Wings yellow, conspicuously patterned with pale brown and darker brown in a tessellated or zigzag pattern; stigma chiefly yellow, outer end dark brown; somewhat darker clouds at outer end of cell 1st M_2 and at mid-length of vein Cu; beyond the cord the yellow ground includes a narrow band beyond stigma and clear marginal spots in centers of cells R_2 to M_4 , the last small, in the anal cells these spots much larger; basad of cord the principal ground areas occupy the bases of cells R to 2nd A; a very irregular band beyond level of origin of R_s , completely crossing the wing, in cell M forming a V-shaped area with the point directed basad; veins brown. Veins unusually glabrous, beyond cord lacking on R_{1+2} except at base, R_{2+3} , R_3 , M_4 and Cu_1 ; R_{4+5} and M_1 with trichia on about the outer two-thirds, much fewer on M_2 ; lacking on veins before cord except the outer end of 2nd A. Venation: R_{1+2} entire; R_s about two and one-half times m-cu; petiole of cell M_1 shorter than m; m-cu at or shortly before fork of M.

Abdominal tergites orange, proximal five segments with a brown middorsal stripe, very broad on first segment, much narrowed or lacking on the intermediate segments; lateral margins gray, bordered internally by a darkened line; tergites six and seven black, posterior borders narrowly yellow, remaining segments brown, telescoped within the preceding segments, the eighth visible only on sides; sternites light yellow, outer segments light brown. Ovipositor with cerci fleshy, orange, long-triangular, tips pointed, hypovalvæ black. Male hypopygium (Plate 3, fig. 28) with the tregite, *t*, transverse, posterior border with broad lateral sections, the margins with long coarse black setæ; central area normally protruding but in slide mounts forced backward so as to appear sunken, as shown; apex bilobed, each lobe tipped with short black spinoid setæ. Ninth sternite a very

low cushion, provided outwardly with a few coarse black setæ. Outer dististyle, *d*, unusually narrow, as compared with *marmoratipennis*; gently curved, apex with four or five blackened spinoid setæ, the outermost larger; inner style blackened outwardly, including the slender slightly upcurved beak; lower beak a rounded paler cushion, densely covered with appressed reddish setæ directed outwardly. Phallosome, *p*, a broad subtriangular yellowish shield. Eighth sternite broad, posterior border on either side with a rounded lobe provided with abundant long yellow setæ; intermediate pale area with more delicate setæ, the outer ones becoming very small and finally appearing as microscopic blackened points near the margin.

Habitat.—Pakistan; India (Kumaon).

Holotype, male, Ukhal, Pauri Garhwal, Kumaon, altitude 9,000 to 9,800 feet, May 12, 1958 (*Schmid*). Allotopotype, female, pinned with type. Paratypes, 1 male, Badrinath, Pauri Garhwal, altitude 10,160 to 11,000 feet, June 18, 1958; 1 male, Tarsali, Pauri Garhwal, altitude 6,000 to 7,000 feet, May 7, 1958; 1 female, Barasu, Pauri Garhwal, altitude 5,000 to 6,000 feet, May 5, 1958; 1 male, Khoghozi, Chitral, Pakistan, altitude 5,180 feet, October 5, 1954 (*Schmid*).

Tipula (Lunatipula) stylostena is generally similar to *T. (L.) marmoratipennis* Brunetti, of the Himalayan region, differing evidently in the coloration of the wings but especially in the structure of the male hypopygium. In the latter species the outer dististyle is very broad, especially outwardly, and the inner style is quite different in conformation. I have re-described the types of *marmoratipennis* in another paper [Rec. Indian Mus. 44 (1942) 49–50, fig. 9].

TIPULA OCTACANTHA sp. nov.

Plate 1, fig. 4; Plate 3, fig. 29.

Size medium (wing of male 15 millimeters); general coloration of thorax ferruginous or orange, pleura more yellowed; antennæ relatively short, flagellar segments bicolored; femora and tibiæ yellowish brown, tips narrowly darkened, claws toothed; wings weakly darkened, unmarked except for the stigma, squama naked, vein R_{1+2} entire; abdomen brownish yellow, subterminal segments blackened to form a ring; male hypopygium with the tergite deeply emarginate, lobes subacute; a single dististyle, strongly armed with spines, including one on disk and a tri-spinous outer basal lobe.

Male.—Length, about 14 millimeters; wing, 15; antenna, about 3.3.

Frontal prolongation of head brownish yellow; nasus elongate, with long black setæ; palpi yellowish brown, terminal segment elongate, light brown. Antennæ relatively short; yellow, flagellar segments beyond the first bicolored, light yellow, the basal enlargements dark brown; segments weakly incised, longer than the verticils; terminal segment yellow, about twice as long as broad, tipped with a few long black setæ. Head light gray; vertical tubercle deeply divided by a median impression, the lobes thus formed yellow, the color extended forward between the antennal bases and laterad to the eye.

Pronotum darkened medially, light yellow on sides. Mesonotum almost uniformly ferruginous or orange, præscutum almost glabrous, the setæ short and very sparse. Pleura and pleurotergite more yellowed, unpatterned. Halteres with stem yellow, knob dark brown. Legs with coxæ orange yellow; trochanters yellow; femora and tibiæ yellowish brown, brighter basally, tips narrowly darkened; tarsi dark brown, passing into black; legs long and slender, especially the basitarsi which exceed the tibiæ (posterior legs, tibia 14 millimeters, basitarsus 15.5); claws of male toothed. Wings (Plate 1, fig. 4) very weakly suffused, prearcular and costal fields more yellowed, cell Sc slightly darker; stigma oval, brown; oblitative areas restricted in size; veins brown, more yellowed in the brightened fields. Macrotrichia on most longitudinal veins beyond cord, lacking on R_{1+2} , sparse on M_4 ; basad of cord with complete series on Sc, lacking on both anal veins, sparse and widely scattered over the whole length of M, a few near outer end of main stem of Cu_1 ; squama naked. Venation: R_{1+2} entire; Rs slightly angulated at base, only a little longer than m-cu; cell 1st M_2 short-pentagonal; petiole of cell M_1 more than one-third the cell and more than twice m; m-cu just beyond fork of M_{3+4} on M_4 ; cell 2nd M_2 relatively narrow.

Basal abdominal segment fulvous yellow, on the second and succeeding segments more brownish yellow, darker sublaterally, margins yellowed; sternites yellow; segments seven and eight uniformly blackened, hypopygium brownish yellow. Male hypopygium (Plate 3, fig. 29) with the tergite, *t*, transverse, narrow, posterior border with a deep U-shaped notch with a low triangular lobe or tooth at its base, lateral lobes narrowly obtuse at tips; setæ small and sparse, especially near the outer margins.

Ninth sternite a rounded lobe with long yellow setæ. Basistyle with outer angle slightly produced, provided with long yellow setæ. Dististyle, *d*, single, much larger than the basistyle, the body flattened, unusually glabrous, especially the dorsal crest; beak and lower beak obtuse, the latter blackened, just below it on margin with a narrower yellow lobe provided with long yellow setæ, this latter structure presumably representing the almost fused outer style; outer basal lobe very large and complex, stout basally, forking into an acute spine and a stouter arm that again divides into two unequal spines, the shorter outer one with two very small appressed spinules on lateral face; apex of outer basal lobe with sparse very long yellow setæ on bases of all spines; on disk of style near base of outer basal lobe with a further still larger slender spine, making a total of four major spines on each dististyle. Ædeagus simple, surrounded by pale membrane but without distinct gonapophyses. Eighth sternite, *8s*, damaged on posterior margin, with a flattened fingerlike lobe provided with very long yellow setæ, much longer on outer margin.

Habitat.—Sikkim.

Holotype, male, Teng, altitude 4,600 feet, May 12, 1959 (*Schmid*).

Tipula octacantha is readily told by the somewhat peculiar structure of the male hypopygium, particularly the strongly armed dististyle. In its general appearance it suggests *T. brunnicosta* Brunetti, but is quite distinct. At the present time I do not think it advisable to try to place the species in a subgeneric group.

ILLUSTRATIONS

[Legend: *a*, ædeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *p*, phallosome; *s*, sternites, *t*, tergites.]

PLATE 1

- FIG. 1. *Tipula* (*Schummelia*) *dravidiana* sp. nov.; venation.
2. *Tipula* (*Indotipula*) *melacantha* sp. nov.; venation.
3. *Tipula* (*Oreomyza*) *lætabunda* sp. nov.; venation.
4. *Tipula* *octacantha* sp. nov.; venation.
5. *Tipula* (*Bellardina*) *savtshenkoi* sp. nov.; male hypopygium.
6. *Tipula* (*Schummelia*) *appendifera* Alexander; male hypopygium.
7. *Tipula* (*Schummelia*) *argentacea* sp. nov.; male hypopygium.
8. *Tipula* (*Schummelia*) *argentosigna* sp. nov.; male hypopygium.
9. *Tipula* (*Schummelia*) *atrosetosa* sp. nov.; male hypopygium.
10. *Tipula* (*Schummelia*) *dravidiana* sp. nov.; male hypopygium.
11. *Tipula* (*Schummelia*) *fuscocellula* sp. nov.; male hypopygium.
12. *Tipula* (*Schummelia*) *nannaris* sp. nov.; male hypopygium.
13. *Tipula* (*Schummelia*) *tanyrhina* sp. nov.; male hypopygium.

PLATE 2

- FIG. 14. *Tipula* (*Yamatotipula*) *bhoteana* sp. nov.; male hypopygium.
15. *Tipula* (*Yamatotipula*) *hexacantha* sp. nov.; male hypopygium.
16. *Tipula* (*Nobilitipula*) *specularis* sp. nov.; male hypopygium.
17. *Tipula* (*Acutipula*) *echo* sp. nov.; male hypopygium.
18. *Tipula* (*Acutipula*) *hemmingseniana* sp. nov.; male hypopygium.
19. *Tipula* (*Indotipula*) *melacantha* sp. nov.; male hypopygium.
20. *Tipula* (*Indotipula*) *pandava* sp. nov.; male hypopygium.
21. *Tipula* (*Indotipula*) *prolata* sp. nov.; male hypopygium.

PLATE 3

- FIG. 22. *Tipula* (*Vestiplex*) *rhinna* sp. nov.; male hypopygium.
23. *Tipula* (*Vestiplex*) *eurydice* sp. nov.; male hypopygium.
24. *Tipula* (*Vestiplex*) *siddartha* sp. nov.; male hypopygium.
25. *Tipula* (*Oreomyza*) *lætabunda* sp. nov.; male hypopygium.
26. *Tipula* (*Oreomyza*) *guttulifera* sp. nov.; male hypopygium.
27. *Tipula* (*Oreomyza*) *sordidipes* sp. nov.; male hypopygium.
28. *Tipula* (*Lunatipula*) *stylostena* sp. nov.; male hypopygium.
29. *Tipula* *octacantha* sp. nov.; male hypopygium.

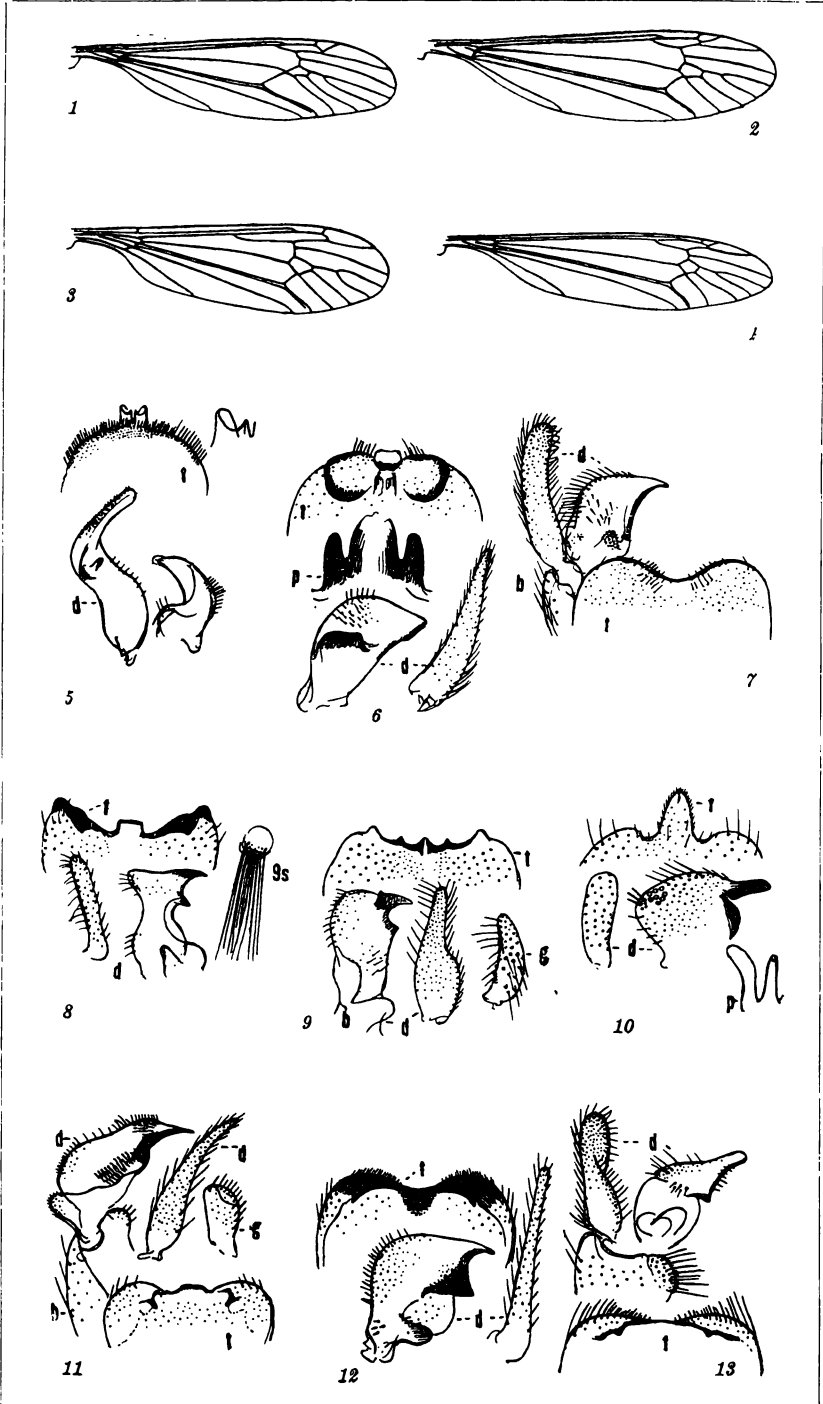
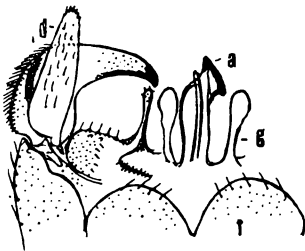
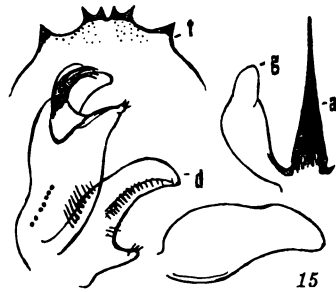


PLATE 1.



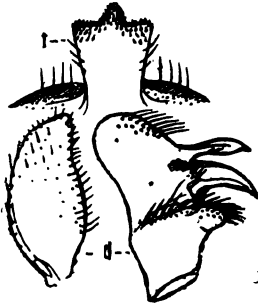
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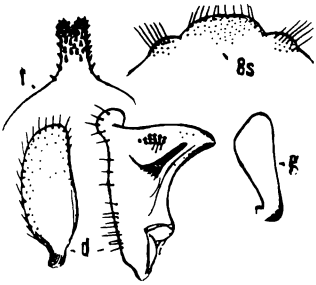
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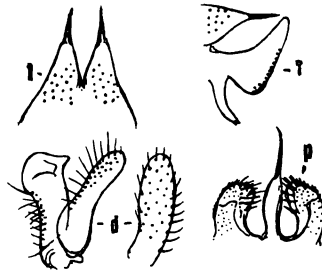
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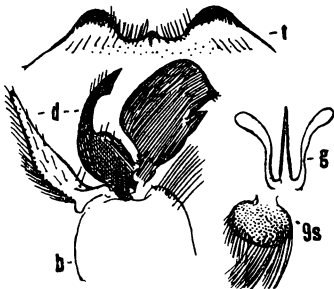
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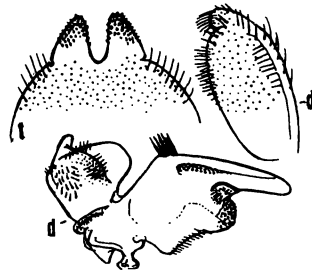
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