

NEW AND LITTLE-KNOWN INDIAN CRANEFLIES  
(DIPTERA : TIPULIDAE)-IV

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## NEW AND LITTLE-KNOWN INDIAN CRANEFLIES (DIPTERA : TIPULIDAE)-IV

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ABSTRACT. Five new species of Indian Tipulidae are described, these being *Limonia (Rhipidia) josephi* from Uttar Pradesh, and *Limonia (Limonia) lateroflava*, *L.(L.) talungensis*, *Elephantomyia (Elephantomyodes) fulvithorax* and *E.(E.) suffusa*, all from Assam. In addition, figures of the male hypopygia of various species of the genus *Tipula* from India and Thailand, not previously illustrated, are provided.

The preceding part under this general title was published in *Oriental Ins.*, 4 : 77-87, March 1970. In addition to various new species here described, figures of the male hypopygia of certain species of the genus *Tipula* not shown in earlier papers are provided.

### SUBFAMILY TIPULINAE

#### 1. *Tipula (Acutipula) epularis* Alexander (Fig. 1)

*Tipula (Acutipula) epularis* Alexander, 1953, *Ann. Mag. Nat. Hist.*, (12) 6 : 745-746.

Type ♂, Foot of Mount Japvo, Naga Hills, Assam, 1524 m, v. 1952, Coll. S. Sircar. Male hypopygium (Fig. 1).

#### 2. *Tipula (Acutipula) mannheimsiana* Alexander (Fig. 2)

*Tipula (Acutipula) mannheimsiana* Alexander, 1953, *Ann. Mag. Nat. Hist.*, (12) 6 : 746-747.

Type ♂, Foot of Mount Japvo, Naga Hills, Assam, 1524 m, v. 1952, Coll. S. Sircar. Male hypopygium (Fig. 2).

#### 3. *Tipula (Acutipula) sircari* Alexander (Fig. 3)

*Tipula (Acutipula) sircari* Alexander, 1953, *Ann. Mag. Nat. Hist.*, (12) 6 : 900-902.

Type ♂, Foot of Mount Japvo, Naga Hills, Assam, 1524 m, v. 1952, Coll. S. Sircar. Male hypopygium (Fig. 3).

#### 4. *Tipula (Formotipula) dikchuensis* Edwards (Fig. 4)

*Tipula (Formotipula) dikchuensis* Edwards, 1932, *Stylops*, 1 : 238.

Type ♂, Dikchu, Sikkim, India. Male hypopygium (Fig. 4).

5. **Tipula (Formotipula) ishana** Alexander (Fig. 5)

*Tipula (Formotipula) ishana* Alexander, 1953, *Ann. Mag. Nat. Hist.*, (12) 6 : 899-900.

Type ♂, Foot of Mount Japvo, Naga Hills, Assam, 1524 m, v. 1952, Coll. S. Sircar. Male hypopygium (Fig. 5).

6. **Tipula (Sivatipula) alhena** Alexander (Fig. 6)

*Tipula alhena* Alexander, 1953, *Ann. Mag. Nat. Hist.*, (12) 6 : 748.

Type ♂, Doi Chom Cheng, near Doi Sutep, Chiangmai, Thailand. Male hypopygium (Fig. 6).

### SUBFAMILY LIMONIINAE

#### TRIBE LIMONIINI

7. **Limonia (Atypophthalmus) kurma** Alexander (Figs. 7, 12)

*Limonia (Atypophthalmus) kurma* Alexander, 1965, *Philippine J. Sci.*, 94 : 406-408.

Type ♂, Koti, Pauri Garhwal, Uttar Pradesh, 1210 m, 23.viii.1958. Venation (Fig.7), male hypopygium (Fig. 12).

8. **Limonia (Goniodineura) siva**, nom. nov.

*Limnobia trimaculata* Brunetti, 1912, *Fauna British India, Diptera, Nematocera*, p. 402, pl. 7 fig. 16 (wing); nec *Limnobia trimaculata* Zetterstedt, 1838, *Ins. Lapponica Diptera*, p. 833.

The necessity of renaming this preoccupied species has been indicated in the account covering the Tipulidae in the *Catalogue of Oriental Diptera* by Alexander and Alexander (in press).

A common and widespread species throughout the Himalaya.

*Additional Records* : INDIA : UTTAR PRADESH : Pauri Garhwal, Gery, 2090 m, 16.viii.1958 (Schmid), Pagna Malla, 1815 m, 11. viii. 1958 (Schmid). WEST BENGAL : Kurseong, 1524m, 3-5.vii.1908, 18-29, vi. 1909 (Annandale). NEPAL : Amlekhgang, 26.viii.1956 (Coher).

9. **Limonia (Limonia) lateroflava**, sp.nov.

Thorax chiefly yellow, prescutum with a narrow, brown central stripe, posterior sclerites patterned with darker, pleura uniformly yellow; legs black, femora with a conspicuous yellow subterminal ring; wings yellow, patterned with brown, *Sc* short, *Sc*<sub>2</sub> ending about opposite one-fourth *Rs*, *m-cu* about four-fifths its length before fork of *M*, proximal six abdominal tergites chiefly dark brown,

their bases narrowly yellow, seventh and eighth tergites and all sternites orange yellow.

*Female* : Rostrum black, about one-half the remainder of head ; palpi black. Antennae with scape and pedicel black, flagellar segments vaguely bicolored, pale brown basally, outer half more yellowed (outer seven segments of type broken). Head with front silvery gray, posterior vertex dark brown ; anterior vertex narrow, about one-half the diameter of the scape.

Pronotum elongate, yellow, narrowly brownish black on central part. Mesonotal prescutum with sides broadly yellow, median area with two narrow light brown stripes, slightly more widened before suture; scutal lobes brownish yellow, their medial borders dark brown, central area conspicuously whitened, this continued caudad across the scutellum, the remainder of the latter dark brown, parascutella yellow ; mediotergite with central part broadly brown, sides and pleurotergite yellow. Pleura uniformly yellow. Halteres with stem brownish yellow, knob dark brown. Legs with all coxae and trochanters yellow ; fore legs with femora black, extreme base obscure brownish yellow, with a subterminal yellow ring that is subequal to the blackened tip ; remainder of legs black. Wings light yellow, prearcular and costal fields darker yellow ; a conspicuous brown pattern that includes the stigma and a confluent area over anterior cord, these slightly darker than other markings that include the broad apex, seams over cord and outer end of cell *1st M*<sub>2</sub>, and the entire length of vein *Cu* in cell *M* ; other extensive brown pattern beyond arculus, at midlength of cell *R*, this confluent with a slightly more basal mark in cell *M* ; darkened seams at outer end of vein *M*, posterior half of cell *M*<sub>3</sub>, and extensive clouds in cubital and anal fields, the largest at midlength of cell *Cu* and outer end of cell *1st A*, involving also more than the outer half of cell *2nd A* ; veins yellow in the ground, brown in the patterned areas, darkest on *Rs* and adjoining veins. Venation : *Sc* unusually short, *Sc*<sub>2</sub> slightly exceeding *Sc*<sub>1</sub>, ending about opposite one-fourth *Rs* ; *R*<sub>2</sub> faint; slightly oblique, about two-fifths *R*<sub>1+2</sub> ; *Rs* relatively short, arcuated ; *m-cu* about four-fifths its length before fork of *M*.

Abdominal tergites chiefly dark brown, with narrow yellow basal rings that become narrower on outer segments, being scarcely indicated on fifth segment, obsolete on sixth ; seventh and eighth tergites yellow ; sternites conspicuously orange yellow.

*Length* : ♀, 11 mm, wing 10 mm.

*Holotype* ♀, INDIA : ASSAM : Bomdi La, Kameng, North-East Frontier Agency, 2682 m, 15.vii.1961, Coll. Schmid.

The most similar regional species is *Limonia (Limonia) angulosa* Alexander, which differs in the details of coloration, including the brownish black pronotum, broad darkened central area of the praescutum, brownish black pleura, and distinctive abdominal pattern. In this species vein *Sc* is longer and the tips of the femora narrowly yellowed.

**10. *Limonia (Limonia) talungensis*, sp.nov.**

General coloration of thorax almost uniformly yellow, scutal lobes and pleura patterned with darker ; legs pale brown, femora unpatterned ; wings pale yellow, with a conspicuous pale brown pattern on posterior half, the darkened color subequal in extent to the ground interspaces, cells *C* and *Sc* yellow, virtually unpatterned, vein *Sc* long, ending just beyond origin of *Rs*, *m-cu* at fork of *M* ; male hypopygium with dististyle oval, narrowed into a long slender point, on outer margin of body of style with a compact group of about five long spinoid setae ; aedeagus terminating in two large triangular pale blades, the genital openings at their bases.

*Male* : Rostrum and palpi dark brown. Antennae brown ; proximal flagellar segments suboval, the outer ones gradually longer, terminal segment slightly longer than the penultimate. Head dark brown.

Thorax almost uniformly yellow, mesoscutal lobes darker ; pleura with a very vague pale brown stripe from behind the fore coxae to the postnotum. Halteres with stem yellow, knob vaguely more darkened. Legs with coxae and trochanters yellow ; remainder of legs pale brown, femora without pattern ; claws long and slender, only slightly curved, at near midlength with a long spine, more basally with two smaller black points. Wings with ground pale yellow, costal field darker yellow ; posterior half of wing with a conspicuous pale brown pattern, subequal in extent to the interspaces ; more darkened areas at cord, fork of *Sc* and stigma ; cells of anterior half of wing chiefly pale yellow, *C* and *Sc* virtually unpatterned ; veins yellow. Venation : *Sc* long, *Sc*<sub>2</sub> exceeding *Sc*<sub>1</sub>, ending shortly beyond fork of *Rs* ; *R*<sub>2</sub> faint, about one-half *R*<sub>1+2</sub> ; basal section of *R*<sub>4+5</sub> very strongly arcuated ; *m-cu* at fork of *M*.

Abdominal tergites brown, sternites and hypopygium somewhat paler. Male hypopygium with dististyle oval, narrowed gradually into a long slender point ; at near one-third the length of style on outer margin with a compact group apparently of five long spinoid setae ; on side mount a single style remains, showing what appears to be a long pale seta, near base of the beak, directed outwardly. Basistyle slightly larger than the dististyle ; ventromesal lobe hemispherical. Gonapophysis with mesal-apical lobe a straight darkened blade, the tip acute. Aedeagus distinctive, broad, apex divided into two large triangular pale blades, the genital tubes approximated, their openings near the midline.

*Length* : ♂, about 7 mm, wing 7.9 mm.

*Holotype* ♂, INDIA : ASSAM : Talung Dzong, Kameng, North-East Frontier Agency, 2377 m, 6.vi.1961, Coll. Schmid.

*Limonia (Limonia) talungensis* is most similar to *L. (L.) flavoterminalis* Alexander, of Formosa, and *L. (L.) sannionis* Alexander, of northern Thailand, the general appearance and hypopygial structure being much the same, including the arrangement of the spinoid setae on the dististyle. All three species differ

among themselves in details of hypopygial structure, especially the dististyle and aedeagus.

**11. *Limonia (Pseudoglochina) eurymelania* Alexander (Figs. 8, 13)**

*Limonia (Pseudoglochina) eurymelania* Alexander, 1964, *Philippine J. Sci.*, 93 : 474-475.

Type ♀, Phaileng, Lushai Hills, Mizo District, Assam, 1067 m, 14.ix.1960, Coll. Schmid. Venation (Fig. 8), male hypopygium (Fig. 13).

**12. *Limonia (Rhipidia) josephi*, sp.nov. (Fig. 11)**

Allied to *choprai*, differing especially in the structure of the ventromesal lobe of the basistyle of the male hypopygium, this being a single enlarged structure that is approximately one-third the size of the body of style.

*Male* : Rostrum and palpi dark brown. Antennae with scape and pedicel brown, flagellar segments with base and branches brown, the narrowed outer ends of all but the terminal segment whitened ; first flagellar segment simple, segments 2 to 9 bipectinate, segments 10 and 11 each with a single branch, terminal segment simple ; longest branches at near midlength of antenna, nearly twice the segments, other branches shorter. Head dark brown.

Pronotum brown. Mesonotal prescutum brownish gray with poorly differentiated brown stripes, the humeral region and broad lateral borders more yellowed ; posterior sclerites of notum grayish brown, discolored in type. Pleura brownish gray, with a narrow very distinct brownish black longitudinal stripe extending from cervical region to the abdomen, including the extreme bases of halteres, with a further paler brown line on sternopleurite. Halteres with stem pale yellow, knob light brown. Legs with fore and middle coxae pale brown, posterior pair and all trochanters light yellow ; remainder of legs brownish yellow, femoral bases clearer yellow, outer tarsal segments medium to dark brown. Wings with ground pale yellow, extensively patterned with very pale brown, this more extensive than the ground interspaces ; in costal field slightly darker, the interspaces very restricted ; veins brown. Venation :  $Sc_1$  ending nearly opposite midlength of  $Rs$  ; cell  $1st\ M_2$  small,  $M_{3+4}$  slightly shorter than  $M_4$ .

Abdominal tergites dark brown, sternites more yellowed, hypopygium brownish yellow. Male hypopygium (Fig. 11) with tergite,  $t$ , transverse, posterior border very shallowly emarginate, the lobes correspondingly low. Basistyle,  $b$ , slightly smaller than the ventral dististyle ; ventromesal lobe entirely different from that of *choprai*, appearing as a large single structure that is about one-third the area of remainder of style, the apical angle with about three enlarged setae. Dorsal dististyle,  $d$ , very long and slender, at outer fourth strongly bent, terminating abruptly in an acute spine ; ventral style with rostral prolongation unusually long and slender, nearly straight ; spines three, small, slightly

more than one-half the length of prolongation beyond, placed on face of prolongation, their dilated bases contiguous. Gonapophysis, *g*, with mesal-apical lobe darkened, erect. Aedeagus, *a*, relatively broad, especially the basal half.

*Length* : ♂, about 6 mm, wing 7 mm, antenna about 2.8mm.

*Holotype* ♂, INDIA : UTTAR PRADESH : Gwaldam, Pauri Garhwal, Kumaon, 1829m, 27.ix.1958, Coll. Schmid.

The species is named for Dr. A.N.T. Joseph, in charge of the collections of Diptera in the Indian Museum.

The generally similar *Limonia (Rhipidia) choprai* (Alexander), described in *Rec. Indian Museum*, **29** : 184-186, fig. 4 (venation, ♂ hypopygium), 1927, was described from Simla, in the western Himalaya. The species presently is known to me from various stations in Almora and Pauri Garhwal, Kumaon. As will be seen from the figure of *choprai* above cited the basistyle of the hypopygium is entirely different from that of the present fly whereas other features in the two flies are generally similar. It may be noted that in the original description of the type the three rostral spines of the hypopygium are somewhat longer and more oblique in position than in the present fly but this character appears to be variable. One male of what seems certainly to represent this species (Phurkia, Almora, 2593m, 13.ix.1958) has the rostral prolongation even longer and more slender than in the present fly but with the three rostral spines unusually short and erect. Despite these differences I consider the identification as being correct because of the structure of the basistyle that agrees closely with that of the type of *choprai*. Also in this species there is marked variation in the wing pattern, the males having the wings more nearly unicolorous than in the females where the dotted brown pattern is even more accentuated than in the male of *josephi*.

#### TRIBE HEXATOMINI

### 13. *Elephantomyia (Elephantomyodes) fulvithorax*, sp.nov. (Fig. 9)

Thoracic dorsum fulvous anteriorly, more orange behind, pleura chiefly dark brown ; antennae with long setae; legs black, tarsal segments two and three, with the narrow apex of the basitarsus, white ; wings weakly infuscated, with a darker pattern that includes the conspicuously darkened costal region and broad seams over cord and outer end of cell *1st M*<sub>2</sub>.

*Male* : Rostrum nearly one-half the remainder of body, dark brown, with abundant long appressed setae. Antennae 15-segmented, terminal segment a microscopic thimble-shaped structure ; first flagellar segment without major setae or verticils, the others, through the penultimate, with long setae, the extreme exceeding three times the segment. In *affluens* the verticils are still longer, the extreme exceeding four times the segments, the terminal one even

more reduced, the first flagellar segment elongate, nearly twice the second. Head dark brown.

Prothorax, including the dorsopleural membrane, brown. Mesonotal prescutum with four dark fulvous stripes that are scarcely differentiated from the interspaces, the central vitta darker on anterior half, becoming obsolete before suture; posterior sclerites of notum, including the pleurotergite, clear light orange. Pleura dark brown, including the propleura and mesepisternum, the posterior sclerites, including the pteropleurite and meron, obscure orange. Halteres with stem light brown, knob black. Legs with fore and middle coxae and trochanters dark brown, posterior coxae and trochanters yellow; femora, tibiae and most of basitarsi black, the apical tenth of latter and all of segments two and three whitened, four and five black. Wings (Fig. 9) very similar to *affluens*, the ground slightly darker, costal darkening virtually identical, darkened seams over cord and outer end of cell *Ist M*<sub>2</sub> broader. Macrotrichia restricted to veins beyond cord behind vein *R*; in *affluens* with trichia on outer ends of all basal veins, including both Anals. Venation: Cell *Ist M*<sub>2</sub> longer than in *affluens*, subequal to distal section of vein *M*<sub>3</sub>; *m-cu* at near midlength of *M*<sub>3+4</sub>.

Abdominal tergites black, bases of intermediate segments vaguely reddish yellow, broader and conspicuous on basal sternites; subterminal segments uniformly blackened, hypopygium brown.

*Length*: ♂, excluding rostrum, about 9.5 mm, wing 9.5 mm, rostrum alone 4.3 mm, antenna about 1.4 mm.

*Holotype* ♂, INDIA: ASSAM: Nakhu, Kameng, North-East Frontier Agency, 1455 m. 3.vii.1961, Coll. Schmid.

The most similar regional species is *Elephantomyia* (*Elephantomyodes*) *affluens* Alexander of South India, which has the wing and leg patterns generally the same, differing evidently in the coloration of the thorax which is dark plumbeous gray, the prescutum with four dark brown stripes. Some further distinctions have been indicated in the above description.

#### 14. *Elephantomyia* (*Elephantomyodes*) *suffusa*, sp.nov. (Fig. 10)

Mesonotal prescutum light brown, darker medially in front, posterior sclerites of notum brownish yellow, pleura yellowed posteriorly, brown in front; rostrum subequal in length to remainder of body; legs yellowish brown, basitarsi with proximal two-thirds brown, the remainder, together with segments two and three, white; wings weakly tinged with brown, costal border, including cells *C*, *Sc* and the stigma, darker brown, cell *Ist M*<sub>2</sub> short-rectangular, less than vein *M*<sub>4</sub>; abdominal tergites brownish black, outer segments black.

*Male*: Rostrum nearly as long as remainder of body, dark brown. Antenna black; flagellar segments elongate, the setae or verticils very long, the longest



more than two and one-half times the segment. Head gray; eyes of male very large.

Pronotum brown. Mesonotal prescutum light brown laterally and behind, the anterior half of central area darker brown, posterior sclerites of notum brownish yellow. Pleura brown anteriorly, including the propleura and mesepisternum, posterior sclerites, including the pteropleurite, meron and metapleura, yellowed, clearer yellow behind. Halteres with stem brown, base narrowly light yellow, knob dark brown. Legs with fore and middle coxae infuscated anteriorly, yellowed behind, posterior coxae and all trochanters clear yellow; femora and tibiae yellowish brown; basitarsi with proximal two-thirds brown, remainder, with segments two and three, snowy white, outer segments brown. Wings (Fig. 10) weakly tinged with brown, cells *C*, *Sc*, and the stigma, slightly darker brown; veins very delicate, brown. Venation: *Sc*<sub>1</sub> ending shortly before fork of *Rs*, *Sc*<sub>2</sub> close to its tip; anterior branch of *Rs* nearly perpendicular at origin; cell *1st M*<sub>2</sub> relatively short-rectangular, less than vein *M*<sub>4</sub>; *m-cu* at near one-third *M*<sub>3+4</sub>; cell *2nd A* narrow, longer than in *aurantia*.

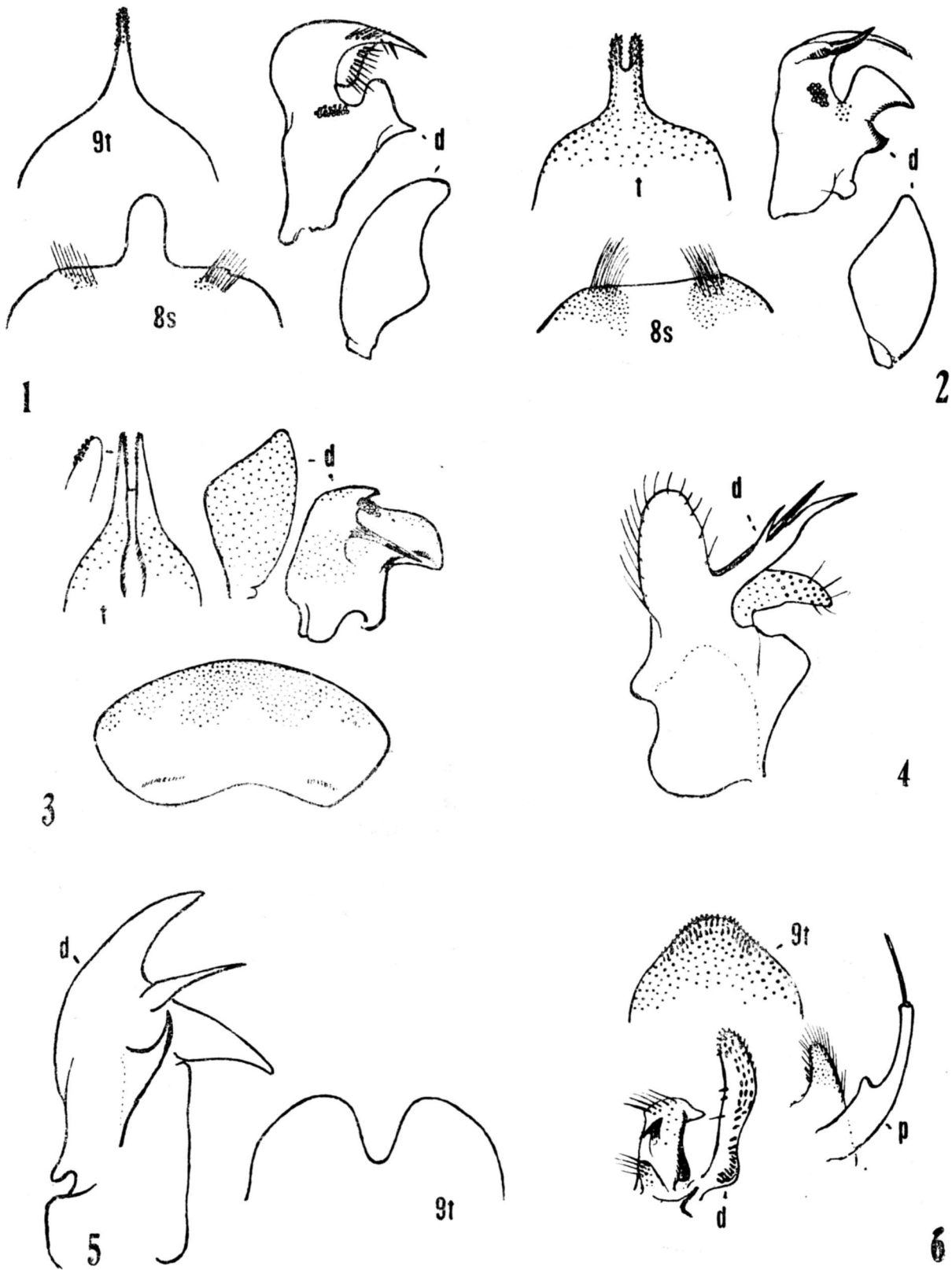
Abdominal tergites brownish black, the basal rings of the more proximal segments slightly paler, outer segments, including hypopygium, black; proximal sternites obscure brownish yellow.

*Length*: ♂, excluding rostrum, about 7 mm, wing 6.5 mm, rostrum alone about 6.8 mm, antenna about 1.7 mm.

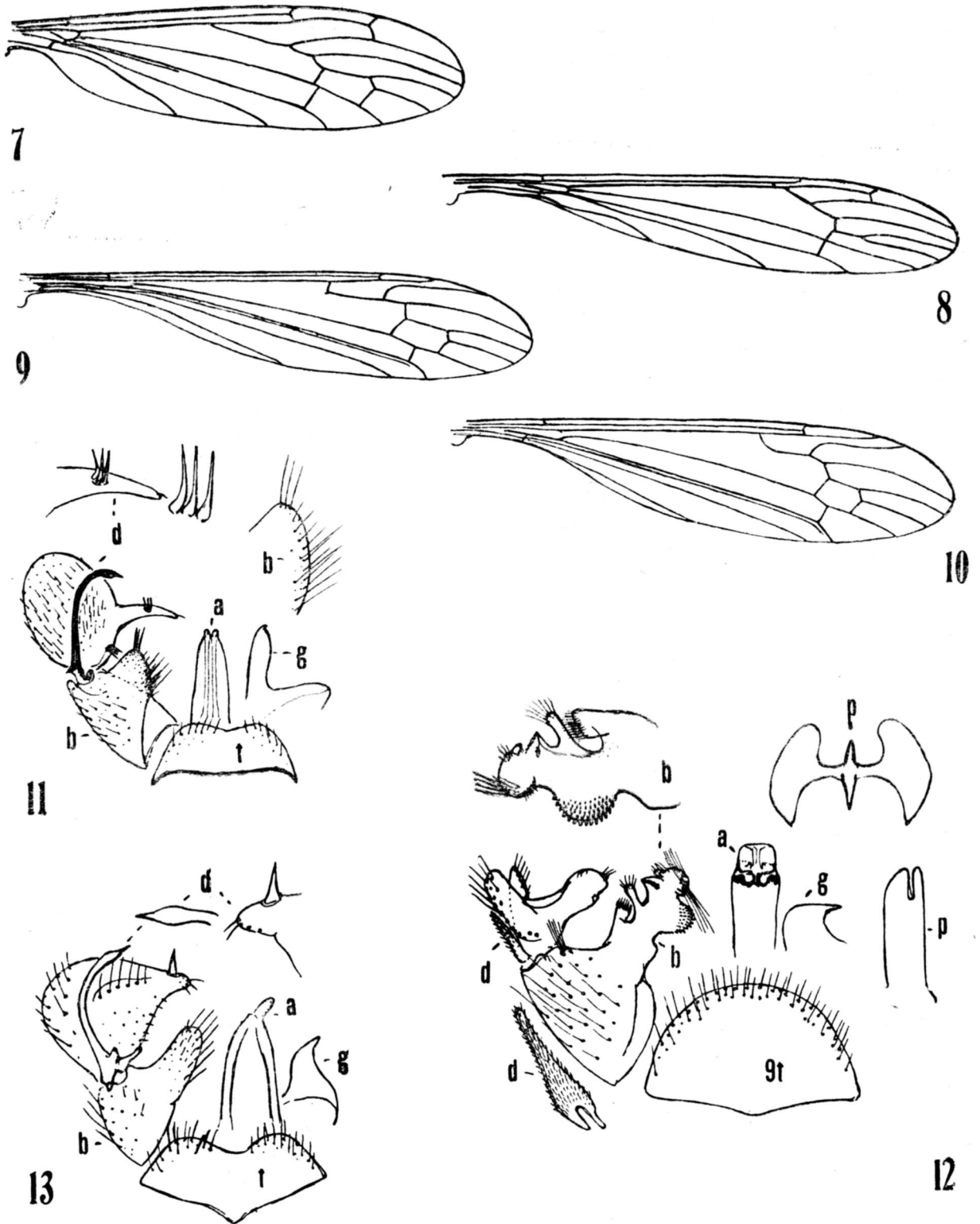
*Holotype* ♂, INDIA: ASSAM: Amatulla, Kameng, North-East Frontier Agency, 396m, 23.v.1961, Coll. Schmid.

In its unpatterned wings the present fly is most similar to *Elephantomyia* (*Elephantomyodes*) *aurantia* (Brunetti) which differs evidently in the almost uniformly orange color of the body, including most of the body, and in the clear wings.

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Figs. 1-6. Male hypopygium of 1, *Tipula (Acutipula) epularis* Alexander ; 2, *Tipula (Acutipula) mannheimsiana* Alexander ; 3, *Tipula (Acutipula) sircari* Alexander ; 4, *Tipula (Formotipula) dikchuensis* Edwards ; 5, *Tipula (Formotipula) ishana* Alexander ; 6, *Tipula (Sivatipula) alhena* Alexander, (Symbols : d, dististyle ; p, phallosome ; s, 8th sternite ; t, 9th tergite).



Figs. 7-10. Venation of 7, *Limonia (Atypophthalmus) kurma* Alexander ; 8, *Limonia (Pseudoglochina) eurymelania* Alexander ; 9, *Elephantomyia (Elephantomyodes) fulvithorax*, sp.nov. ; 10, *Elephantomyia (Elephantomyodes) suffusa*, sp.nov. Figs. 11-13. Male hypopygium of 11, *Limonia (Rhipidia) josephi*, sp.nov. ; 12, *Limonia (Atypophthalmus) kurma* Alexander ; 13, *Limonia (Pseudoglochina) eurymelania* Alexander. (Symbols a, aedeagus ; b, basistyle ; d, dististyle ; g, gonapophysis ; p, phallosome ; t, 9th tergite).