

# DIPTERA OF THE SIJU CAVE, GARO HILLS, ASSAM.

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## I. TIPULIDAE, TABANIDAE, ANTHOMYIDAE, ACALYPTRATE MUSCIDAE AND PHORIDAE.

By *E. BRUNETTI.*

The few diptera from the Siju Cave, Garo Hills, Assam, submitted to me for examination by Dr. Annandale comprise species of Tipulidae, Tabanidae, Anthomyidae, Acalyptrate Muscidae and Phoridae. The most interesting are the two tipulid forms and the tabanid *Haematopota annandalei* Ric., a single ♂, this sex not having previously been noted.

It is curious that these three species were captured at a much greater distance from the entrance of the cave than the others. Tipulidae are unusual occupants of caves, yet the two species here noted were taken at approximately half and three-quarters of a mile respectively from the entrance, to which distance of course no light could possibly penetrate. It also seems too far in for accidental occurrences, the natural inference being that they are regular inhabitants of the cave.<sup>1</sup> Prof. Bezzi notes five genera of this family as having been captured in caves, *Pachyrhina*, *Limnobia*, *Dicranomyia*, *Trichocera* and *Ulomorpha*, his records being mostly from localities in Italy and South France, and he states that tipulid larvæ have been found there as well as adults.

Prof. Bezzi's two short papers on cave diptera<sup>2</sup> may be recommended to students of this subject but it may be noted that many of the species therein recorded are from "grottos."

### TIPULIDAE.

#### **Rhamphidia** sp.

A single ♀ in indifferent condition very near my *R. inconspicua* and of the same size, but differing in the antennæ not becoming setiform towards the tip. Taken 2,000 feet from the entrance of the cave.

#### **Troglophila**,<sup>3</sup> sub-gen. nov.

A new subgenus of *Limnophila*. Antennæ very long, filiform, shortly pubescent throughout. Wings with four posterior cells, veins in

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<sup>1</sup> This, however, seems to us unlikely, see note on p. 14. [*S.K. and B.C.*]

<sup>2</sup> *Revis. Ital. di Speleologia* I (1903); and *Atti Soc. Ital. Sci. Nat.* XLVI (1907).

<sup>3</sup> I have to thank Mr. Edwards for suggesting this name.

apical part of wing each with a row of fine hairs ; subcostal and marginal cross-veins present ; arculus complete (*i.e.*, the small cross-vein forming basal sides of both basal cells), posterior cross-vein some distance before base of discal cell.

***Limnophila (Trogliphila) cavernicola*, sp. nov.**

♂. *Head* pale brownish grey ; a short row of long fine hairs on frons towards eye-margins. Antennal scape pale yellowish, 1st joint short, cylindrical, 2nd considerably rounded, almost globular ; flagellum of 12 extremely long and slender joints, blackish, with fine, close grey pubescence ; whole antennæ distinctly longer than whole body ; palpi black, 1st joint yellowish. Back of head yellowish.

*Thorax* pale brown yellowish, the hinder part of the dorsum forming two large swellings ; scutellum comparatively large, hind margin with short, stiff black hairs ; metanotum with a slight brownish tinge.

*Abdomen* dull ochraceous brown, a little blackish basally (tip missing) ; pubescence soft, whitish. Belly yellowish.

*Legs.* Coxæ, trochanters and base of femora pale yellowish, changing to dull brownish, the tibiae, perhaps, rather darker than tarsi. One very minute tibial spur.

*Wings.* Auxiliary vein ending almost exactly in middle of costa with subcostal cross-vein immediately before its tip : 1st vein ending at three-fourths of the wing, 2nd vein beginning some distance before tip of auxiliary, forking well beyond origin of 3rd vein, the branches nearly parallel ; marginal cross-vein just beyond base of upper branch, joining 1st vein some distance before the tip ; 3rd vein beginning a little beyond half-way between base of prae-furca and forking of 2nd vein, running, after its basal flexure, absolutely straight to wing-tip. Anterior cross-vein almost in a line with basal section of 3rd vein, the three branches of 4th vein practically parallel with 3rd and equidistant from each other. Discal cell rather small, 5-sided. Posterior cross-vein much before discal cell, 5th vein nearly straight, 6th slightly sinuate, ending opposite base of discal cell ; 7th straight, ending opposite base of 2nd vein : hinder angle of wing moderately developed. All the veins with a row of conspicuous, fine long hairs on upper and lower sides of wing : halteres dirty brown.

One ♂ taken 3,600 feet from the entrance of the cave. Long. about 3-3½ mm.

The venation of this species is very much like that of my *Limnophila glabra* except that the upper branch of the 4th vein is not forked, and the posterior cross-vein is situated some distance before the discal cell. The hairy veins are of course also distinctive.

TABANIDAE.

***Haematopota annandalei* Ric.**

One ♂. Antennal 3rd joint dull yellow brown ; the extensive larger front facets of eyes red brown ; frontal triangle whitish-grey dusted ; lower part of frons and upper part of face jet-black ; rest of face whitish, with white pubescence ; palpi pale cream yellow ; proboscis black.

*Thorax* black, a pair of faint, median greyish stripes on anterior margin; hind margin of dorsum and base of scutellum narrowly and irregularly grey.

*Abdomen* black, hind margins of segments narrowly orange yellow; 2nd and 3rd segments more or less similarly coloured on extreme side margins. Pubescence of abdomen black on dorsum, intermixed with whitish hairs at sides of segments.

*Legs* black; the pale rings very weak though obviously present; fore tibiae rather broadly pale at base, two rings on the middle tibiae, the traces of the same on the hind pair much weaker than on middle pair.

Pubescence of legs black, rather coarse and conspicuous, very short on inner side of fore femora, inner and hinder side of fore tibiae, upper side of middle femora and on basal third of upper side of hind femora.

*Wings* a trifle darker than in ♀, pattern practically exactly similar.

*Described* from a single ♂ in good condition in the Indian Museum. Taken 1,200 feet from the entrance of the cave. Long. 9 mm.

An uncommon species, of which the ♂ apparently has not been seen before. Its appearance in a cave at such a distance from the entrance is interesting, and must surely have been accidental.

## ANTHOMYIDAE.

### *Pegomyia kempi*, sp. nov.

♂ ♀. *Head*. In ♂ eyes absolutely contiguous for several facets, in some specimens just perceptibly separated; vertical triangle very elongate, black above but light grey below ocellar triangle: latter with a pair of long bristles and a few additional stiff hairs; vertex with several long bristles of varying length. Frons triangular, mainly whitish grey, central part yellowish; 4 pairs of fronto-orbital bristles quite obvious though, of course, almost contiguous. Antennæ black, 2nd joint with usual short black bristly hairs and a single long erect bristle; 3rd joint black, dark grey dusted, arista microscopically plumulose. Face moderately light grey dusted; proboscis blackish, nearly bare; labella brownish yellow, with a few pale hairs; palpi of moderate size, black, almost cylindrical but slightly widening to tip, bearing a few stiff hairs. Oral vibrissae strong, about six additional bristles on cheeks. Occiput dark grey, with very short black bristles, slightly concave and not projecting behind eyes in profile on upper half but narrowly so on lower half. A row of short black bristles on upper occipital margin.

In ♀, frons slightly wider below than above, nearly one-third of width of head just above level of antennæ; frons and face wholly whitish-grey dusted, the broad centre of face yellowish, the side-margins dull. One pair of strong and one pair of weak ocellar bristles; two pairs of vertical, inner pair divergent, outer pair convergent; one pair of divergent post-vertical; one pair of weak ones in middle of frons; five pairs of fronto-orbital. Almost all these bristles can be found in the ♂.

*Thorax* moderately dark whitish grey to yellowish grey, varying in intensity, with four equidistant, narrow longitudinal blackish stripes from anterior to posterior margin, the outer ones placed on side-margins

of dorsum and more or less continued along sides of scutellum. Pleura moderately dark grey, with whitish grey reflections; scutellum concolorous with thorax, with sides and central basal part more or less blackish: metanotum wholly ash-grey dusted. 1 humeral bristle, rather weak, 1 presutural strong, 1 strong supra-alar, 1 strong and 1 weak post-alar; 5 dorso-central (two before and three behind suture); 1 pair of additional comparatively weak bristles between (but slightly in advance of) 2nd pair of dorso-central. One pair<sup>1</sup> of intra-alar, rather long but fine (the 2nd in a line with the 2nd dorso-central behind suture). A row of 4 fine, moderately long pre-scutellar, rather weak but obviously longer than the general pubescence. 2 pronotal, 2 notopleural; a perpendicular row of about 6 strong ones on mesopleura; 1 strong one on anterior upper corner of sternopleura, 2 strong ones (one above the other) on its hind upper corner, with one or two long fine ones below them; lower part of sternopleura with dense long bristles. 1 long, strong scutellar bristle on each side-margin a little beyond base, a strong, decussate, apical pair and a very much weaker, sub-apical reclinate pair. Whole thorax with fine moderately long bristly hairs standing up above the general, somewhat sparse pubescence of short stiff hairs.

*Abdomen* mainly dark grey, lighter on 2nd segment but apparently more or less blackish towards tip in individuals. Fine, rather long bristly black pubescence; 2 or 3 long bristles about the basal corners of 2nd segment, and a row of several similar ones towards hind margins of each segment. Belly dark grey, with short, black bristly pubescence which is longer on the genital region.

*Legs.* Coxae ash grey to dark grey, more or less orange towards tips; femora and tibiae all orange; tarsi dull yellowish grey, fore coxae with a row of long black bristles on front side, posterior pairs with similar bristles on outer side. Fore femora with considerable black bristly pubescence varying in length, on outer side. Middle pair with very short black, minute stiff hairs and about three long bristles on basal half of under side; also three on hinder side at tip. Hind pair with several very long bristles above towards tip and about 3 to 6 on outer (almost on upper) side, equidistant, on apical half. Fore tibiae with rows of microscopic bristles, 1 strong one at middle and 1 at tip on outer side: middle pair with a row of 4 or 5 on hinder side, tip with a circlet of several (about 5 or 6): hind pair with 1 below middle on front side; a row of 4 on middle half of outer side, placed a little towards hinder side; 1 at middle and 1 at three-fourths on hinder side; tips with a circlet of 3 moderately strong ones, placed approximately on front, outer and hinder sides.

*Wings* clear, barely yellowish basally; halteres whitish yellow; squamae very pale yellowish grey with pale orange margins and fine short pale fringes. Long. about 6 mm.

*Described* from 5 ♂♂ and 2 ♀♀ taken 450 to 800 feet from the entrance to the cave. Types in Indian Museum, cotype ♂ and ♀ in British Museum.

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<sup>1</sup> In some specimens three intra-alar bristles are present, in which case it is the 3rd (the hindermost) which is in a line with the 2nd dorso-central behind suture,

## MUSCIDAE ACALYPTRATAE.

**Limosina ornata** de Meijere.

Several specimens taken 450 to 500 feet from the entrance of the cave agree exactly with de Meijere's description, some paler ones being obviously immature.

**Limosina notatipennis**, sp. nov.

♂ *Head* dull yellowish. Frons rather bright yellow; antennæ dull brownish yellow, 3rd joint rounded, shortly pubescent, arista three times as long as antenna, finely plumose. A pair of ocellar bristles, a pair of convergent vertical ones with a rather diverging pair just behind them. Two fronto-orbital each side at about middle of eyes; four medium sized facial bristles. Oral vibrissæ long; lower part of head dull yellowish brown, proboscis black.

*Thorax* dull nut-brown, with rather sparse, very short pale hairs. One strong post-humeral, placed well backwards and inwards on dorsum; suture not traceable; hinder pair of dorso-central bristles present, also some marginal bristles in neighbourhood of base of wing. Scutellum slightly paler; a pair of apical and of marginal bristles, all well separated.

*Abdomen* blackish, with fine soft pubescence.

*Legs* dull brownish yellow; femora with a row of fine stiff, moderate-sized bristles. Middle tibiae with three or four moderately strong bristles on outer side, situated from after the base to beyond the middle; also two strong, diverging preapical ones; a conspicuous row of shorter stiff bristles on about apical half on inner side. Hind tibiae with a row of fine, long bristly hairs on outer side.

Hind tarsi with 1st joint distinctly dilated, rather short; 2nd slightly wider than remainder.

*Wings* grey, a little darker anteriorly down to 3rd vein; costa with short, fine bristles to tip of 3rd vein. A transverse band composed of three nearly clear spots in a line, separated by 3rd and 4th veins, the lower spot just clear of the abbreviated 5th vein. An outer more distal pale band leaving wing tip broadly grey. A pale spot in costal cell just before tip of 1st vein, which latter ends at one-third of the wing; 2nd vein ending fractionally beyond middle of wing, 3rd ending a little before tip, 4th ending (or becoming suddenly faint) a little beyond half-way from end of discal cell to wing margin; 5th ending (or weakened) a little sooner; 6th weak but nearly reaching wing-margin. Halteres whitish. Long. 1 mm.

Described from a single specimen, apparently a ♂, taken 400 feet from the entrance to the cave. In the Indian Museum.

**Limosina tenebrosa**, sp. nov.

Sex uncertain. *Head* blackish brown; sides of frons paler dusted about the middle. Antennæ blackish brown, 2nd joint with two or three, very long, fine bristles above and below; arista about  $3\frac{1}{2}$  times as long as antennæ, shortly and closely plumulose. Ocellar bristles of moderate size; inner pair of strong vertical ones widely separated, con-

vergent : outer vertical pair nearly on eye-margins ; a post-vertical convergent pair close to and almost just behind latter ; two pairs of fronto-orbital at about middle of eye and nearly on a level with the four pairs of frontal bristles. Oral vibrissa strong, a smaller one below it, one strong genal and several smaller ones in an irregular row behind it. Isolated bristly hairs on face and cheeks.

*Thorax* cinereous grey, with very short pale yellowish hairs ; pleura whitish-grey dusted. One humeral bristle, one pre-alar, two post-alar ; some stronger bristly hairs or fine, weak bristles along sides of dorsum and above bases of wings. Scutellum very large, nearly half as long as thorax, distinctly paler in colour, practically bare ; a bristle on each side-margin before middle and a wide-apart apical pair, all the bristles long.

*Abdomen* uniformly blackish brown, pubescence short, inconspicuous ; 2nd segment fully as long as 3rd and 4th together.

*Legs* mainly rather dark brown ; fore coxæ on inner side, and some parts of all the tarsi considerably yellowish, hind metatarsi slightly widened on inner side, less than half as long as 2nd joint. Middle tibiae with two bristles on outer side ; the first well beyond base, the other well before tip.

*Wings* pale grey ; costa finely ciliate to tip of 3rd vein ; ambient vein with usual microscopic fringe ; 4th and 5th veins faintly traceable to wing-margin, halteres blackish. Long.  $1\frac{1}{2}$  mm.

Three specimens, taken 200 feet from the entrance of the cave. Type and other specimens in Indian Museum.

### **Phyllomyza tenebrosa, sp. nov.**

♀. *Head* black, in certain lights frontal triangle and side margins of frons rather broadly shining : ocelli shining brown. Antennæ black, narrowly orange at base ; 2nd joint subtriangular with very long bristles, above and below ; 3rd joint large, sub-quadrate with rounded angles, orange, but broadly black above and at tip. Proboscis blackish brown, apparently of coarse texture, pointed, as long as height of head ; palpi large, subspatulate, black, pubescent. Face dull yellowish brown ; foveae very broad, moderately deep ; the median partition low. Cheeks in profile extending downwards about one-third to one-fourth height of eyes. Occiput nowhere extending beyond hind margin of eyes, slightly concave, practically bare of conspicuous hairs. One pair of ocellar bristles ; 2 pairs of vertical, well separated (inner pair behind ocellar triangle, outer pair towards sides of vertex), both converging ; 1 pair of post-vertical, diverging ; 3 pairs of fronto-orbital, two lower, smaller converging pairs (? cruciate). Oral vibrissae rather strong, a 2nd bristle less strong and a row of small genal setæ ; 2 or 3 strong bristles each side on hind corners of jowls.

*Thorax* dull black, microscopically punctate, and with minute yellow pubescence, rather closely beset with minute black bristles. 1 humeral bristle, 2 post-humeral (the lower one near extreme side margin of dorsum) ; 1 pre-sutural ; 2 supra-alar ; 2 post-alar. The last two pairs of dorso-central bristles present and some longer bristles towards hinder part of dorsum. Pleura dark grey-black ; sternopleura with one long bristle

Scutellum blackish, microscopically punctate, a long bristle at middle of each side-margin and a pair of convergent bristles at tip.

*Abdomen* black with fine short rather sparse pubescence; hind margins of segments almost imperceptibly pale; fine black, very short bristly pubescence and longer bristly hairs towards, but well clear of hind margins of hinder segments. Ovipositor telescopic, moderately elongate, terminal lamellæ dull orange, pubescent. Belly dark grey, with a little black pubescence.

*Legs* mainly black; knees, fore tibiae narrowly and posterior pairs broadly at tips, also all tarsi wholly yellowish.

*Wings* nearly clear, microscopically setulose, causing considerable iridescence: several rather strong bristles varying in length at base, including one long one well before humeral cross-vein. Auxiliary and 1st longitudinal veins united; costa finely and shortly setose to tip of 1st vein, beyond this point only microscopically so to tip of costa; 2nd and 3rd veins parallel, latter vein ending exactly at wing-tip, 4th vein practically parallel with 3rd. 2nd basal cell rather small but distinct; anterior cross-vein just before middle of discal cell, latter with its outer side perpendicular; 6th vein indistinct. Halteres blackish. Long. about  $2\frac{1}{2}$  mm.

Described from a single specimen taken 450-500 feet from the entrance of the cave. In the Indian Museum.

#### ***Idypaspistomyia latipes* Mg., var.**

♀. *Head*. Frons fully one-third width of head with approximately parallel sides, very dark brown, with vertex, ocellar triangle, broad side-margins and a rather wide median linear space whitish grey. Antennae with 1st joint very small, 2nd sub-triangular, 3rd large, thick, oval; arista dorsal, black, practically bare. Face small, yellowish; mouth-opening much produced; proboscis rather long, somewhat chitinized, cylindrical, tapering, nearly bare; apparently geniculate near base and well before tip. Palpi large, distinctly clavate, yellowish, with some black bristles. Head below eyes moderately produced along its whole width, rather angular in front and behind (in profile) with a row of marginal moderate-sized bristles, which is continued up the lower margin of the face without any definite stronger oral bristle. Occiput moderately produced behind eyes only on its lower half, with a definite marginal fringe of bristles on its outer edge. A pair of small ocellar bristles with a pair of cruciate, rather small vertical ones just behind ocellar triangle; a fairly strong divergent post-vertical bristle at each inner corner of each eye; 4 fronto-orbital bristles.

*Thorax* yellowish-grey dusted; dorsum wholly uniformly covered with very short black bristly hairs; pleura blackish. 1 humeral, 1 notopleural, 2 post-alar towards hind corners of dorsum. Scutellum concolorous with thoracic dorsum, with a long bristle at each basal corner and an apical pair.

*Abdomen* conical, darker than thorax, or blackish with a little sparse black pubescence: ovipositor cylindrical, concolorous, moderate-sized; belly blackish.

*Legs* blackish; posterior tarsi, except tips, dull yellowish.

*Wings* clear ; humeral cross-vein faint but obvious ; costa weakened but not fractured there and bearing, to this point, a definite row of fine black bristles ; auxiliary and 1st veins united, costa distinctly fractured immediately before tip of 1st vein ; bearing from this point to its tip the usual fringe of minute bristly hairs. 2nd, 3rd and 4th veins practically parallel, all distinct to wing-margin, 4th not obviously less distinct. 2nd basal and discal cells very clearly united, anterior cross-vein just beyond middle of latter ; the two cross-veins slightly nearer together than distance of posterior one to wing margin. Anal cell apparently absent<sup>1</sup> ; halteres whitish.

Described from a single ♀ taken 400 feet from the entrance of the cave. The species is included in the Kertész Palaeartic Catalogue under *Desmometopa*. I have to thank Mr. J. E. Collin for the identification of the species. The specimen differs from the typical form of the species in the unstriped thorax, the rather darker anterior part of the frons and the face, and in the dark front coxae.

## PHORIDAE.

### *Conicera kempī*, sp. nov.

♀. *Head* wholly dull black ; mouth-region brownish yellow ; 3rd antennal joint very large, almost pear-shaped, with pointed tip, microscopically setulose ; arista three times as long as joint, apical, absolutely bare. 1 pair ocellar bristles, 1 vertical pair near eye-margins ; an upper frontal row of four bristles, the middle two much larger than the others ; a lower frontal row of middle pair only.

*Thorax* dull black, with uniform microscopic recumbent dark brown bristly hairs ; side-margins of dorsum with several bristly hairs from humeri to posterior calli. The hinder pair of dorso-central bristles present, long, fine, converging. Scutellum with one pair of apical, converging bristles.

*Abdomen* dull black, tip of last segment and the (mostly hidden) genitalia pale brownish yellow.

*Legs* pale brownish yellow. Fore tibiae on front side with a row of fine bristles on apical three-fourths, and a longer one well after the base : middle tibiae with a long strong one on front side after the base, also one pre-apical, one on outer side at first third of the length, a long apical one and a smaller one : hind tibiae with a fairly strong one beyond the base on outer side or almost intermediate between outer and hinder sides ; hinder side with one at first third of the length and another at two-thirds ; one long and one shorter apical bristle. Hind metatarsi about two-thirds as long as tibiae and nearly as long as rest of tarsi.

*Wings*. Costa with fine short bristly hairs to tip of 3rd vein, extremely inconspicuous ; 1st and 3rd veins very distinct, not parallel with costa ; tip of 1st meeting latter beyond half-way between humeral cross-vein and tip of costa. The four weak veins on disc of wing distinct, approximately equidistant. Halteres black, clubs large. Long. 2 mm.

Six ♀♀. Taken 400 to 500 feet from the entrance of the cave. Type in Indian Museum, cotype in British Museum.

<sup>1</sup> Difficult to ascertain with certainty, both wings being partially folded at this spot.