

Undescribed Species of Crane Flies from the Himalaya Mountains (Diptera: Tipulidae), XV¹

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Abstract: Six new species of Eriopterine crane flies are described, these being *Gnophomyia* (*Gnophomyia*) **diacaena** n. sp., from Assam; *Gonomyia* (*Lipophleps*) **pentacantha** n. sp., Kumaon; *Toxorhina* (*Ceratocheilus*) **bistyla** n. sp., Assam; *T.* (C.) **fulvicolor** n. sp., Assam; *T.* (C.) **fuscolimbata** n. sp., Assam; and *T.* (C.) **simplicistyla** n. sp., Assam.

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Gnophomyia (*Gnophomyia*) **diacaena** n. sp.

Allied to *eupetes*; head and thorax brownish black, sparsely pruinose; antennae of male elongate, about one-half the wing; femora obscure yellow, tips blackened; wings very weakly darkened, R_{2+3+4} subequal to R_{1+2} or a little longer than R_{2+3} , *m-cu* about its own length beyond fork of *M*; male hypopygium with two small acute spines at near midlength of the gonapophyses.

MALE: Length about 5 mm; wing 5.8 mm; antenna about 3 mm.

Rostrum and palpi black. Antennae elongate, about one-half the wing, black throughout; flagellar segments elongate, nearly cylindrical, longest verticils unilaterally arranged, slightly shorter than the segments, with other smaller verticils and abundant still shorter setae; terminal segment about three-fourths the penultimate. Head brownish black.

Thoracic dorsum almost uniform dull black, sparsely pruinose, lateral angles of pronotal scutum yellowed. Pleura dull leaden black, dorsopleural region, posterior pleurites and extreme dorsal pleurotergite vaguely yellowed. Halteres blackened, base of stem narrowly yellow. Legs with fore coxae brownish black, remaining coxae yellowed, base of middle pair darkened; trochanters yellow; femora obscure yellow, slightly darker on upper surface, tips blackened; tibiae and basitarsi brownish yellow, tips narrowly darkened, outer tarsal segments dark brown. Wings very weakly darkened, without stigma, base more yellowed; veins brown. Macrotrichia on longitudinal veins beyond general level of origin of *Rs*, lacking on *M*, present on outer ends of *Cu*₁, 2nd *A*, and more than the outer half of 1st *A*. Venation: *Sc*₁ ending shortly before level of vein *R*₂; *Rs* in direct longitudinal alignment with *R*₅, *r-m* at its fork; R_{2+3} a little shorter than R_{1+2} ; cell 1st *M*₂ long and narrow, subequal to distal section of *M*₃; *m-cu* its own length beyond fork of *M*.

Abdomen brown, hypopygium brownish black. Male hypopygium with the outer dististyle a yellow broad-based spine, inner style at apex expanded into a small oval blade, setae subterminal. Aedeagus relatively short, gonapophyses longer, each appearing as a long slender rod that narrows very gradually into a spine, inner margin at near midlength with two small acute points.

¹ Contribution from the Entomological Laboratory, University of Massachusetts.

HOLOTYPE: ♂, Luanglong Khunou, Manipur, Assam, 2,500 feet, May 28, 1960 (Schmid).

The most similar described species is *Gnophomyia* (*Gnophomyia*) *eupetes* Alexander, of Sikkim, differing most evidently in hypopygial structures, as the bispinous gonapophyses.

Gonomyia (*Lipophleps*) **pentacantha** n. sp.

MALE: Length about 2.8 mm; wing 3.3 mm.

Characters as in *nissoriana*, differing in the hypopygial structure. Inner dististyles of the two sides asymmetrical, one with the elongate rod about as in *nissoriana*, terminating in a short blackened spine and with a very long nearly apical seta; style of the opposite side with the rod much shorter, entirely pale, without the elongate seta. Phallosome distinctive, stout, broadened outwardly, on either side with a strong curved arm or rod, directed cephalad and then laterad, at apex more expanded and bearing five strong pale spines, with interpolated much longer yellow setae. In *nissoriana* the arms are more evenly curved and more slender, with long setae but lacking the five major spines, as described.

Closely related to *Gonomyia* (*Lipophleps*) *nissoriana* Alexander (Philippine Jour. Sci. 61: 142-143, pl. 1, fig. 21 (venation), pl. 2, fig. 32 (♂ hypopygium); (1936), described from the Khasi Hills, Assam, now known from Kumaon, Nepal, Kameng, and South India. I earlier had considered the present material as representing *nissoriana* but from the hypopygial structure it evidently is distinct.

HOLOTYPE: ♂, Tapoban, Pauri Garhwal, Kumaon, 7,300 feet, July 28, 1958 (Schmid).

Toxorhina (*Ceratocheilus*) **bistyla** n. sp.

General coloration of thorax dark brown to black, praescutum with three stripes, pleura with a major light gray area; wings light brown, unpatterned; male hypopygium with two dististyles or profound branches.

MALE: Length, excluding rostrum, about 5.5-6 mm; wing 5.2-6 mm; rostrum about 4-4.5 mm.

Rostrum elongate, black. Antennae black throughout. Head gray, posterior vertex more infuscated medially; no corniculus.

Cervical region brownish black; pronotum dull orange brown. Mesonotal praescutum dull gray with three stripes, the lateral pair darker, borders clearer gray; posterior sclerites of notum brownish black, sparsely pruinose, parascutella and posterior callosities of scutal lobes obscure yellow. Pleura black, ventrally with a large light gray area that includes most of the sternopleurite, metapleura and meron more obscure gray; dorsopleural membrane light brown. Halteres light yellow. Legs with fore coxae brown, remaining pairs orange yellow; trochanters dark brown; remainder of legs brown. Wings light brown, prearcular and costal fields a trifle more yellowed; veins pale brown, brownish yellow in the brightened areas; no darkened pattern. Venation: R_5 deflected strongly caudad, especially in the holotype, terminating at wing tip; M_{3+4} shorter than M_4 . No supernumerary crossvein in cell R_5 as occurs in some specimens of **fuscolimbata**.

Abdomen dark brown, ninth segment paler. Male hypopygium generally as in **fuscolimbata**, differing in details. Basistyle without a modified tubercle, as found in various species. Two dististyles or profound branches; beak of outer branch narrow, inner branch only moderately curved, at extreme outer lateral area with an elongate-oval blade or style, its tip obtuse.

HOLOTYPE: ♂, Bilo La, Kameng, North East Frontier Agency, Assam, 6,000 feet, June 10, 1961 (Schmid). Paratopotype, ♂, pinned with type.

The most similar species is *Toxorhina* (*Ceratocheilus*) **fuscolimbata** n. sp., from the high mountains of Manipur, Assam, which is most readily separated by the patterned wings. The hypopygia of the two species are generally similar but differ in details, especially of the dististyles.

Toxorhina (*Ceratocheilus*) **fulvicolor** n. sp.

General coloration of thorax fulvous cinnamon, pleura obscure yellow; rostrum about one-fourth longer than the body or wing; wings weakly tinged with brown, prearcular and costal fields light yellow; abdomen fulvous, posterior borders of tergites narrowly brown; interbase large, irregular in outline; dististyle single, terminal, large, on outer margin before midlength with a darkened knob, the long beak yellow, slender; arms of phallosome long.

MALE: Length, excluding rostrum, about 5 mm; wing 4.8 mm; rostrum about 6.5 mm.

Rostrum dark brown, longer than the wing or remainder of body. Antennae with scape and pedicel light yellow, flagellum brownish black. Head grayish white, including the posterior orbits, posterior vertex narrowly brown; anterior vertex subequal in width to the diameter of the antennal pedicel.

Cervical region and pronotum brownish yellow. Mesonotal praescutum and scutum fulvous cinnamon without well-defined pattern; scutellum pale brown, posterior border and parascutella yellow; postnotum fulvous yellow, central part of mediotergite vaguely darkened. Pleura obscure yellow. Halteres yellow. Legs with coxae and trochanters yellow; remainder of legs obscure yellow, appearing brownish yellow from the abundant brown bifid setae. Wings weakly tinged with brown, prearcular and costal fields light yellow; veins pale brown. Macrotrichia on both sections of R_5 and sparsely on R_s , lacking on anterior branch of R_s ; trichia on distal section of M_{1+2} and sparsely on M_3 . Venation: Sc_1 ending shortly beyond origin of R_s , anterior branch of the latter long, exceeding R_s ; vein R_5 deflected strongly caudad, ending at wing tip; $m-cu$ at fork of M .

Abdomen fulvous, the posterior borders of tergites narrowly brown, hypopygium yellowed. Male hypopygium with basistyle provided with long black setae, especially along mesal face and as a loose pencil on margin, this not on a basal tubercle as in *mesorhyncha* and some others. Interbase large, its outline irregular. Dististyle single, terminal, outer margin before midlength with an obtuse darkened slightly corrugated knob; slightly more than outer half of style a long straight yellow blade, the sides parallel, tip obtuse. Arms of phallosome long, sinuous.

HOLOTYPE: ♂, Khaorum, Manipur, Assam, 3,750 feet, August 28, 1960 (Schmid).

Various other regional species, including *Toxorhina* (*Ceratocheilus*) *luteibasis* Alexander, *T. (C.) mesorhyncha* Alexander, *T. (C.) monostyla* Alexander, and *T. (C.) tuberifera* Alexander, are generally similar to the present fly, differing evidently in details of coloration and in hypopygial structure, including the basistyle, interbase and dististyle.

Toxorhina (*Ceratocheilus*) **fuscolimbata** n. sp.

Size medium (wing over 5 mm); mesonotal praescutum light brown medially, the sides broadly darker brown, the color continued caudad onto the scutal lobes, pleura striped

black and yellow; halteres light yellow; legs brownish yellow, appearing darker because of abundant black setae; wings pale brown with darkened seams over several of the veins, anterior branch of *Rs* long; male hypopygium with outer dististyle a strongly curved hook; arms of aedeagus short.

MALE: Length, excluding rostrum, about 5 mm; wing 5.4 mm; rostrum about 4 mm.

FEMALE: Length, excluding rostrum, about 6.5–7 mm; wing 5.2–5.6 mm; rostrum about 3.5–3.8 mm.

Rostrum brownish black. Antennae black; pedicel very large, flagellum short. Head in front brownish gray, more infuscated behind; anterior vertex broad, about two and one-half times the diameter of scape.

Cervical region brownish black, pronotum brown. Mesonotal praescutum with central region light brown, more laterally dark brown, this pattern continued caudad across the suture over the scutal lobes, lateral praescutal borders obscure yellow; scutellum and postnotum brownish black. Pleura with a broad black dorsal stripe, more ventrally whitish yellow, including the dorsal sternopleurite and posterior pleurites, ventral sternopleurite grayish brown. Halteres light yellow. Legs with fore coxae dark brown basally, tips yellowed, mid-coxae less darkened basally, hind coxae yellow; trochanters brownish black; remainder of legs brownish yellow but appearing darker from the abundant vestiture. Wings tinged with brown, base more yellowed; costal border and seams over various veins slightly darker than the ground, the centers of the cells on either side of the cord paler; veins brown, the more basal ones yellowed. Macrotrichia on *Rs* and both branches, very abundant on *R*₅, with fewer on *M*₃ and outer two sections of *M*₁₊₂. Venation: *Sc*₁ ending opposite origin of *Rs*, in cases to near midlength; anterior branch of *Rs* long, from two and one-half to three times *Rs*; cell 1st *M*₂ large, subequal in length to distal section of *M*₁₊₂; *m-cu* shortly beyond fork of *M*, in cases to about one-third its length. In the paratype an adventitious crossvein in cell *R*₅; in the holotype with such a vein in the left wing only, in the allotype lacking such veins.

Abdomen dark brown, including the male hypopygium, genital segment of female more yellowed. Male hypopygium with two dististyles, the large outer style very strongly curved into a semicircle, narrowed very gradually to the acute tips; inner style extended into a paddlelike blade, its outer margin bearing a slender lobe. Arms of aedeagus short, slender, divergent.

HOLOTYPE: ♂, Hkayam Boum, Manipur, Assam, 7,500 feet, June 20, 1960 (Schmid). Allotype, ♀, Chingsao, Manipur, 3,800 feet, June 13, 1960 (Schmid). Paratype, ♀, Sirhoi Kashong, Manipur, 7,500 feet, June 10, 1960 (Schmid).

Toxorhina (*Ceratocheilus*) **fuscolimbata** differs from all other regional species in the conspicuously patterned wings. It is more like *T. (C.) capnitis* Alexander, of Thailand, which differs in the coloration of the body and in the details of venation, as the short anterior branch of *Rs* which is less than twice *Rs* itself.

Toxorhina (*Ceratocheilus*) **simplicistyla** n. sp.

General coloration of head gray; thorax blackened, heavily pruinose; halteres yellow; wings subhyaline, unpatterned, cell *M*₂ open by atrophy of *m*; male hypopygium with mesal face of basistyle produced into a lobe that bears eight powerful black bristles; dististyle single, a narrow yellow blade, curved gently to the obtuse tip, outer margin with a small erect spur; arms of phallosome very short, slightly divergent.

MALE: Length, excluding rostrum, about 6 mm; wing 4.8 mm.

Rostrum broken. Antennae black, scape pruinose. Head above light gray, center of posterior vertex broadly brownish gray.

Cervical region brownish black, prothorax paler. Mesonotum with praescutal disk blackish, sides broadly light gray; scutal lobes similarly blackened, posterior callosities yellowed; remainder of notum light gray, posterior part of mediotergite vaguely darkened. Pleura blackened, sparsely pruinose; dorospleural membrane dark brown, paler anteriorly. Halteres yellow. Legs with coxae dark brown, tips narrowly yellowed; trochanters brown; remainder of legs medium brown, outer tarsal segments darker. Wings subhyaline, unpatterned; veins brown. Distal sections of veins R_5 and M_{1+2} with sparse trichia, more crowded outwardly. Venation: Sc_1 ending shortly beyond origin of R_s ; anterior branch of R_s relatively long, a little shorter than basal section of R_5 , one-half longer than R_s ; cell M_2 open by atrophy of m ; $m-cu$ before fork of M .

Abdomen brownish black, pruinose. Male hypopygium with posterior tergal border convexly rounded. Mesal face of basistyle with a conspicuous lobe provided with eight powerful black setae, with three similar bristles more distally on face of style. Blade of interbase very narrow, simple. Dististyle single, subterminal, appearing as a very gently curved yellow blade that narrows gradually to the obtuse tip, on outer margin at near two-fifths the length with a small erect to slightly reclinate spur. Phallosome with central mass protruding caudad, arms of aedeagus very short, slightly divergent.

HOLOTYPE: ♂, Nakhu, Kameng, North East Frontier Agency, Assam, 4,800 feet, July 3, 1961 (Schmid).

Other regional species that have the dististyle single and with the same general conformation as in the present fly include *Toxorhina* (*Ceratocheilus*) *mesorhyncha* Alexander, *T. (C.) tuberifera* Alexander, and some others, having cell 1st M_2 of the wings closed and with the hypopygial details distinct. *T. (C.) monostyla* Alexander has cell M_2 of the wings open, as in the present species, but with the hypopygial structure quite distinct.

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