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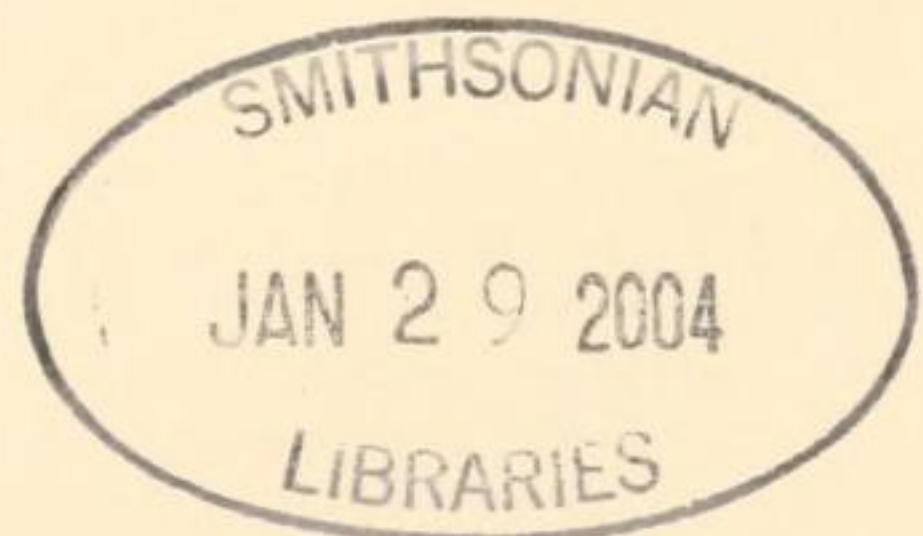
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New Exotic Crane-Flies (Tipulidae: Diptera). Part XV

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The preceding part under this general title was published in ENTOMOLOGICAL NEWS, Vol. 78 (7): 189-195. At this time I am discussing further species of Hexatomine crane-flies that were taken in Kameng, North East Frontier Agency, Assam, India, by Dr. Fernand Schmid, to whom I again express my thanks for the opportunity of studying this particularly interesting series of specimens.

Epiphragma (Epiphragma) retrorsa, new species

General coloration of thorax brownish black, variegated by paler areas, rostrum light yellow; antennae black, the fusion-segment light yellow; femora obscure yellow basally, outer half dark brown, dorsal surface of apex yellowed, tibiae and tarsi light yellow; wings whitened, with a solidly darkened irregular pattern that forms conspicuous open ocelli on anterior half, with four major darkened areas, the largest beyond the cord, extending from end of cell *Cu* outwardly to wing tip in cell *R*₅, *m-cu* far distad; abdomen brownish black, tergites restrictedly patterned with silvery on sides of outer third; male hypopygium with tergal lobes conspicuous, light yellow, interbase with outer end narrowed into a slender spinelike retrorse blade.

♂. Length about 10 mm; wing 10.5 mm.

Rostrum light yellow, palpi black. Antennae black except for the light yellow flagellar segment that is weakly darkened at tip; flagellar segments long-cylindrical, with still longer verticils; antennae broken beyond the tenth segment and the number of segments in the basal fusion in doubt but evidently not exceeding two. Head above broadly dark brown, with broad obscure yellow orbits; anterior vertex still darker on central part and as a transverse bar between the eyes to form a T-shaped figure; front gray pruinose.

¹ Contribution from the Entomological Laboratory, University of Massachusetts.

Pronotum dark brown. Mesonotal praescutum chiefly dark brown on anterior half, including broad humeral areas and a slightly paler central stripe, posterior half gray with four brown marks in a transverse row before suture; scutum light brown, anterior fourth pruinose, lobes darker, being posterior extensions of the lateral praescutal areas; posterior sclerites of notum brownish black, postnotum sparsely yellow pollinose. Pleura brownish black, with sparse gray pruinose areas, dorso-pleural membrane light brown. Halteres brown, base of stem restrictedly paler. Legs with coxae dark brown, patterned with gray, including apices of fore coxae and broad central areas of remaining pairs; trochanters dark brown; femora obscure yellow on about the proximal half, thence broadly dark brown, the apex of all obscure yellow on dorsal surface; tibiae and tarsi clear light yellow. Wings whitened, with a solidly darkened irregular pattern that forms conspicuous open ocelli on anterior half; major darkened areas in bases of cells *R* and *M*, including the prearcular field, before the small yellow stigma, and an area beyond midlength of cells *Cu* and *1st A*, attaining the margin at end of vein *2nd A*; a still larger oblique band extending from wing tip in cell *R*₅ basad and thence caudad across outer end of cell *1st M*₂ and *m-cu* into the apices of cells *Cu* and *1st A*; veins of costal and subcostal interspaces light yellow, remaining veins light brown, darker in the patterned parts. Venation: *m-cu* far distad, about its own length before fork of *M*₃₊₄.

Abdominal tergites brownish black, with silvery areas on extreme posterior borders and more broadly on margins of outer third of the intermediate segments; sternites uniformly blackened. Male hypopygium with tergal lobes conspicuous, nearly glabrous, suboval in outline, separated by a narrow V-shaped emargination. Outer dististyle with the curved apical spine very slender. Interbase with proximal half stout, the slender apex directed caudad at a right angle, beyond midlength strongly narrowed and retrorse, appearing as a slender spine-like blade.

Habitat. ASSAM. Holotype: ♂, Lifakpo, Kameng, North East Frontier Agency, 3,100 feet, May 29, 1961 (Fernand Schmid).

Epiphragma (*Epiphragma*) *retrorsa* is quite distinct from other regional members of the genus, especially in the distinctive structure of the hypopygial interbases. The amount of black color on the femora likewise separates the species from *E.* (*E.*) *klossi* Brunetti, of the Malay States, which has the femora entirely black, and *E.* (*E.*) *caligata* Alexander, of northern Thailand, with more than the outer fourth of the segment blackened. Both of these species have the brown areas of the wing narrowly bordered by still darker brown, quite different from the condition in the present fly.

***Epiphragma* (*Epiphragma*) *schmiederi*, new species**

Size small (wing of male 8.2 mm); antennae with 15 segments, there being two in the flagellar fusion; mesonotal praescutum brown, with three confluent obscure yellow stripes, pleura with a conspicuous brown dorsal stripe; femora yellowed, tips broadly dark brown; wings dark brown with five pale yellow costal areas and with small isolated whitened spots in all cells; male hypopygium with the tergal lobes scarcely developed, separated by a broad shallow emargination.

♂. Length about 8 mm; wing 8.2 mm; antenna about 2.2 mm.

Rostrum yellow, palpi brown. Antennae 15-segmented, relatively short, dark brown, the fusion segment more yellowed; proximal two segments of flagellum incompletely fused, the suture more or less distinct; flagellar segments with very abundant microscopic setulae and sparse scattered verticils that are about one-third as long as the segments. Head yellowed, center of vertex infuscated.

Pronotum yellow, posterior part of scutum transversely banded with brown. Mesonotal praescutum brown with three confluent obscure yellow stripes that are more infuscated before the suture, posterior sclerites of notum brown, parascutella paler, mediotergite with a basal more yellowed triangular area. Pleura yellow, with a broad brown dorsal stripe extending from cervical region to the pleurotergite, ventral sternopleurite paler brown; dorsopleural membrane more orange. Halteres elongate, stem brownish yellow, base clearer yellow, knob dark brown; stem near base with a few long erect setae. Legs with

coxae and trochanters yellowed; femora yellow, tips broadly dark brown, preceded by a vague much narrower clearer yellow ring; tibiae and tarsi yellowed, outer tarsal segments and narrow tips of tibiae darker. Wings dark brown, conspicuously patterned with five pale yellow costal areas and with small isolated whitened spots in all cells; yellow costal markings include both cells *C* and *Sc*, widest at costa, the second area barely entering cell *R*; third marking larger, reaching *Rs* behind, outer yellow areas smaller; the white spots are completely isolated from one another, except in cell *1st M*₂ and the adjoining part of *R*₅, cell *2nd A* with two widely separated such spots; basal half of cell *1st A* uniformly paler than the ground; veins brown, light yellow in the costal interspaces. Venation: *Rs* nearly square at origin; *R*₂₊₃₊₄ more than twice the basal section of *R*₅; *m-cu* at near two-fifths *M*₃₊₄.

Abdominal tergites brown, slightly paler medially, the posterior borders narrowly black, on either side before apex with a conspicuous silvery yellow area; basal sternites yellowed, darkened laterally except at apex, posterior borders very narrowly brownish black; subterminal segments more uniformly dark brown, hypopygium brownish yellow. Male hypopygium with the lobes of the tergite very low to scarcely evident, separated by a broad very shallow emargination. Outer dististyle narrower than the inner style, tip decurved into an acute spine. Interbase with the long outer spine more yellowed than the base which is about one-half as long.

Habitat. ASSAM. Holotype: ♂, Bomdi La, Kameng, North East Frontier Agency, 8,800 feet, June 21, 1961 (Fernand Schmid).

This particularly distinct and attractive species is named for Rudolf Gustav Schmieder, Emeritus Associate Professor of Biology of the University of Pennsylvania and most capable editor of ENTOMOLOGICAL NEWS, to whom I am indebted for many appreciated favors over the years. I had listed the known Indian species of the genus in an earlier Part of the present series of papers (ENTOMOLOGICAL NEWS, 77: 69-70; 1966). *Epiphragma (Epiphragma) schmiederi* is entirely different

from all of these species in its distinctive wing pattern. In its 15-segmented antennae, with two flagellar segments included in the basal fusion, it agrees with *E. (E.) commoptera* Alexander, *E. (E.) dysommata* Alexander, *E. (E.) kempi* Brunetti, and *E. (E.) vicina* Brunetti, all differing in their larger size and distinctive patterns of the legs and wings.

Austrolimnophila (Austrolimnophila) septifera, new species

Size medium (wing of male about 9 mm); general coloration of praescutum brownish gray with three brownish black stripes, the central one more or less divided behind; wings very pale brown, prearcular field clear yellow, certain of the veins with restricted darker brown clouds; a supernumerary crossvein at near midlength of cell R_3 ; *m-cu* at near two-thirds M_{3+4} .

♂. Length about 7.5–7.8 mm; wing 9–10 mm; antenna about 1.2–1.4 mm.

♀. Length about 8 mm; wing 9 mm.

Rostrum and palpi dark brown, remaining mouthparts paler brown. Antennae dark brown to brownish black, scape more pruinose; flagellar segments subequal to their longest verticils. Head gray; anterior vertex broad, about three times the diameter of the scape, central area broadly depressed.

Pronotum gray, pretergites brown. Mesonotal praescutum dull brownish gray with three brownish black stripes, the central one deeply divided behind; pseudosutural foveae black, tuberculate pits lacking; posterior sclerites of notum brownish black, sparsely pruinose. Pleura black, gray pruinose, dorso-pleural membrane yellowish brown. Halteres pale yellow. Legs with coxae brown; trochanters yellow; remainder of legs brown to brownish yellow, femoral tips slightly darkened; outer tarsal segments blackened. Wings very pale brown, prearcular field clear yellow; restricted brown clouds at origin of R_s , cord, outer end of cell 1st M_2 , supernumerary crossvein in cell R_3 , fork of M_{1+2} , and along vein *Cu*; veins slightly darker brown. Macrotrichia on longitudinal veins beyond general level of origin of R_s , on the Anals, especially 2nd *A*, virtually back to their bases. Venation: R_2 longer than R_{1+2} ; R_{2+3+4} from three

to four times the basal section of R_5 ; a supernumerary crossvein at near midlength of cell R_3 ; petiole of cell M_1 longer than m ; $m-cu$ at near two-thirds M_{3+4} ; anterior arculus apparently lacking. In one wing of the holotype an adventitious crossvein at near midlength of cell R_5 , connecting with M_1 beyond its origin.

Abdomen elongate; tergites dark brown, sternites paler brown, hypopygium black. Male hypopygium with tergal lobes very broad, separated by a conspicuous U-shaped emargination. Outer dististyle terminating in an acute black spine; inner style subequal in length, its outer half relatively narrow. Each gonapophysis appearing as a single simple curved spine.

Habitat. ASSAM. Holotype: ♂, Bomdi La, Kameng, North East Frontier Agency, 8,800 feet, April 29, 1961 (Fernand Schmid). Allotype: ♀, Jhum La, Kameng, 7,800 feet, May 14, 1961. Paratopotype: ♂, pinned with type; paratype: ♂, with the allotype, May 13, 1961.

Austrolimnophila (Austrolimnophila) septifera is distinguished from all other Asiatic members of the genus by the supernumerary crossvein in cell R_3 of the wings.

Limnophila (Adelphomyia) basilobula, new species

General coloration of the entire body polished black; antennae brownish black; halteres yellowed; femora obscure yellow, tips broadly brownish black, more extensively so on fore pair, remainder of legs brownish black; wings unfuscated, the base broadly clear light yellow; a few macrotrichia in extreme outer ends of apical cells; male hypopygium with the outer dististyle a slender blackened rod, tip unequally bispinous, inner style unequally bilobed, the basal lobe short; phallosome with blackened spikelike apophyses subtending the slender aedeagus.

♂. Length about 6–7 mm; wing 7–8 mm; antenna about 1.8–2 mm.

♀. Length about 8 mm; wing 7.5 mm.

Rostrum very short, black; palpi dark brown. Antennae brownish black; proximal flagellar segments shorter than their verticils, the outer ones much longer than the weak normal

vestiture. Head black, sparsely pruinose, especially in front; setae of vertex black, porrect.

Pronotum black, subopaque, with erect pale setae. Mesonotum polished black; praescutal interspaces and the scutellum with long setae. Pleura black. Halteres with stem pale yellow, knob orange. Legs with coxae black; trochanters obscure yellow; femora obscure yellow, tips broadly brownish black, on fore legs including about the outer two-thirds, on hind legs less than the outer half; tibiae and tarsi brownish black. Wings infuscated, base broadly clear light yellow, including the veins; a restricted pale brown pattern that includes the stigma, origin of *Rs*, cord and outer end of cell *1st M*₂, with fainter indications elsewhere. Very sparse macrotrichia in extreme outer ends of cells *R*₄ to *M*₃. Venation: *Sc*₁ ending nearly opposite the fork of the long *Rs*, *Sc*₂ removed from the tip; *R*₁₊₂ subequal to or longer than *R*₂₊₃; *r-m* arcuated; cell *M*₁ present, variable in length, from about subequal to nearly two and one-half times its petiole; *m-cu* at near one-fourth to two-fifths *M*₃₊₄.

Abdomen, including hypopygium, black. Male hypopygium with posterior border of tergite very low convex, with long white setae. Basistyle unmodified, the setae near apex of outer face exceedingly long, subequal to the outer dististyle. Dististyles terminal; outer style a slender black rod from a more expanded base, at apex with two acute spines, the axial one longer and stouter; inner style unequally bilobed, the long arm about two-thirds the length of the outer style, narrow, its inner margin fringed with numerous yellow setae, the more basal ones from small tubercles; basal lobe or arm more than one-third as long, flattened. Phallosome with conspicuous blackened spikelike apophyses that subtend the short slender aedeagus.

Habitat. ASSAM. Holotype: ♂, Jhum La, Kameng, North East Frontier Agency, 7,800 feet, May 14, 1961 (Fernand Schmid). Allotopotype: ♀, pinned with type. Paratopotypes: 6 ♂♂, 1 ♀, with the types, May 13-14, 1961.

About 18 species of the subgenus *Adelphomyia* Bergroth (*Tricholimnophila* Alexander) presently are known in Asia, occurring chiefly in Japan, with fewer representatives in eastern

Siberia, China and Formosa, with one in Szechwan, western China. Three species now are known from the Indian sub-region, including besides the present fly, *Limnophila* (*Adelphomyia*) *otiosa*, new species, and *L. (A.) kingdonwardi* Alexander, 1963, of northeastern Burma, the latter formerly assigned to the subgenus *Prionolabis* Osten Sacken but evidently belonging to the present group. The three species are readily told by coloration and by hypopygial differences, particularly the dististyles and phallosome.

***Limnophila* (*Adelphomyia*) *otiosa*, new species**

General coloration of thorax black, sparsely pruinose; wings brownish yellow, prearcular field light yellow, disk restrictedly patterned with light brown; no macrotrichia in wing cells; male hypopygium with tergite not produced; apical sixth of outer dististyle suddenly narrowed, tip shallowly bidentate, inner style short and stout, very unequally bilobed; phallosome with apex of aedeagus dilated.

♂. Length about 6–6.5 mm; wing 7.5–8.5 mm; antenna about 1.6–1.8 mm.

Rostrum dark brown, palpi black. Antennae relatively short; scape dark brown, sparsely pruinose, pedicel paler; flagellum brownish yellow, the segments long-oval, the verticils still longer. Head brownish gray; anterior vertex broad, about three times the diameter of the scape.

Pronotum brownish black, sparsely pruinose. Mesonotum black, sparsely gray pruinose, praescutal pseudosutural foveae black. Pleura black, pruinose, more blackened ventrally; dorso-pleural membrane buffy. Halteres light yellow. Legs with fore and middle coxae dark brown, apices paler, posterior coxae more castaneous; trochanters yellow; femora yellow, tips broadly blackened, on fore legs including the outer third, middle legs the outer fourth, posterior legs about the outer sixth; tibiae brownish yellow, tips narrowly darker; tarsi brownish black to black. Wings brownish yellow, prearcular and costal fields light yellow; stigma and narrow seams at origin of *Rs*, cord, and outer end of cell *1st M*₂ light brown; veins pale brown,

light yellow in the prearcular field. Longitudinal veins beyond origin of R_s with long macrotrichia, including also both Anal veins back to the level of the arculus; no trichia in the wing cells excepting two or three at extreme outer margin of cell R_5 . Venation: R_{2+3+4} subequal to or slightly longer than basal section of R_5 ; inner ends of cells R_4 , R_5 and 1st M_2 nearly in transverse alignment; cell M_1 about one and one-half to two times its petiole; $m-cu$ at near one-third to one-fourth M_{3+4} .

Abdominal tergites and hypopygium brownish black, basal sternites light brown. Male hypopygium with posterior border of tergite truncate, not produced. Outer dististyle relatively narrow, the apical sixth suddenly narrowed, heavily blackened, tip shallowly bidentate, surface of the dilated blade with abundant parallel corrugations; inner style short and stout, the bilobed condition only slightly indicated by a very small lobule on lower margin near base. Phallosome with gonapophyses broad-based, each narrowed into a long gently sinuous spine; apex of aedeagus obtusely dilated.

Habitat. ASSAM. Holotype: ♂, Rahung, Kameng, North East Frontier Agency, 5,200 feet, April 8, 1961 (Fernand Schmid). Paratopotype: ♂. Paratype: one ♂, Nyukmadong, Kameng, 8,000 feet, April 20, 1961 (Fernand Schmid).

Limnophila (Adelphomyia) otiosa is readily told from the two other regional species by the coloration, lack of macrotrichia in the wing cells, and details of the male hypopygium.
