

[3.0060]

NEW EXOTIC CRANE-FLIES (TIPULIDAE: DIPTERA)
PART XX¹

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The preceding part under this general title was published in Entomological News, vol. 81 (4): 79-84. At this time I am considering further Hexatomine crane-flies that were collected by Dr. Fernand Schmid in various parts of India. Additional to the new species herein described and figured I am including drawings of four others that had been described in earlier parts of this series of papers but not previously illustrated. All species discussed at this time belong to the genus *Limnophila* Macquart. Types of the new species are preserved in the Alexander Collection.

Limnophila (*Afrolimnophila*) *euglena*, NEW SPECIES

Size relatively large (wing of female to 10 mm); head and thorax olive gray, praescutum with scarcely evident more yellowed stripes; halteres yellow; legs yellow, femora with a faintly indicated darker subterminal ring, tips of tibiae narrowly darkened; wings light yellow with scattered pale brown dots and large open ocelli at origin and fork of *Rs* and at near midlength of vein *R*₅.

Female.—Length about 11 mm; wing 9.5-10 mm.

Head, including rostrum, olive gray, mouthparts and palpi black, the latter with long conspicuous setae. Antennae brown, flagellar segments oval.

Thorax almost uniformly olive gray, praescutum with scarcely evident more yellowed stripes; dorsopleural membrane yellow. Halteres yellow. Legs with coxae and trochanters yellow; remainder of legs yellow, femora with a scarcely evident subterminal darkening, tips of tibiae and basitarsi narrowly darkened, remainder of tarsi brownish black. Wings (Fig. 1) light yellow, including the slightly darker veins; an abundant pale brown pattern that includes dots in all cells, and larger ocelliform rings, the largest and most

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evident of these at origin and fork of R_s and in outer radial field, the center of the last just beyond midlength of vein R_5 ; ocelli large, the darkened borders much narrower than the enclosed yellow rings; dots in cells small and scattered, less conspicuous than in *pterosticta*. Venation: Cell M_1 about one-half longer than its petiole; $m-cu$ shortly beyond midlength of M_{3+4} .

Abdomen light brown, genital shield and bases of valves of ovipositor dark orange.

Habitat.—Sikkim. Holotype: ♀, Namnasa, 9,500 feet, July 13, 1959 (Schmid). Paratopotype, broken, sex doubtful.

The most similar species is *Limnophila* (*Afrolimnophila*) *pterosticta* Alexander, of Manipur, which shows slight distinctions in the leg pattern and marked differences in wing pattern, the darkened dots being more abundant, equalling or exceeding the yellow ground, and with the borders of the ocelliform areas broader, subequal to the enclosed yellow ring.

Limnophila (*Indolimnophila*) *adicia* Alexander

Limnophila (*Indolimnophila*) *adicia* Alexander; Ent. News, 75: 62; 1964.

Type from Leimatak, Manipur, Assam. Fig. 2 (venation), Fig. 6 (male hypopygium).

Limnophila (*Indolimnophila*) *dravidica*, NEW SPECIES

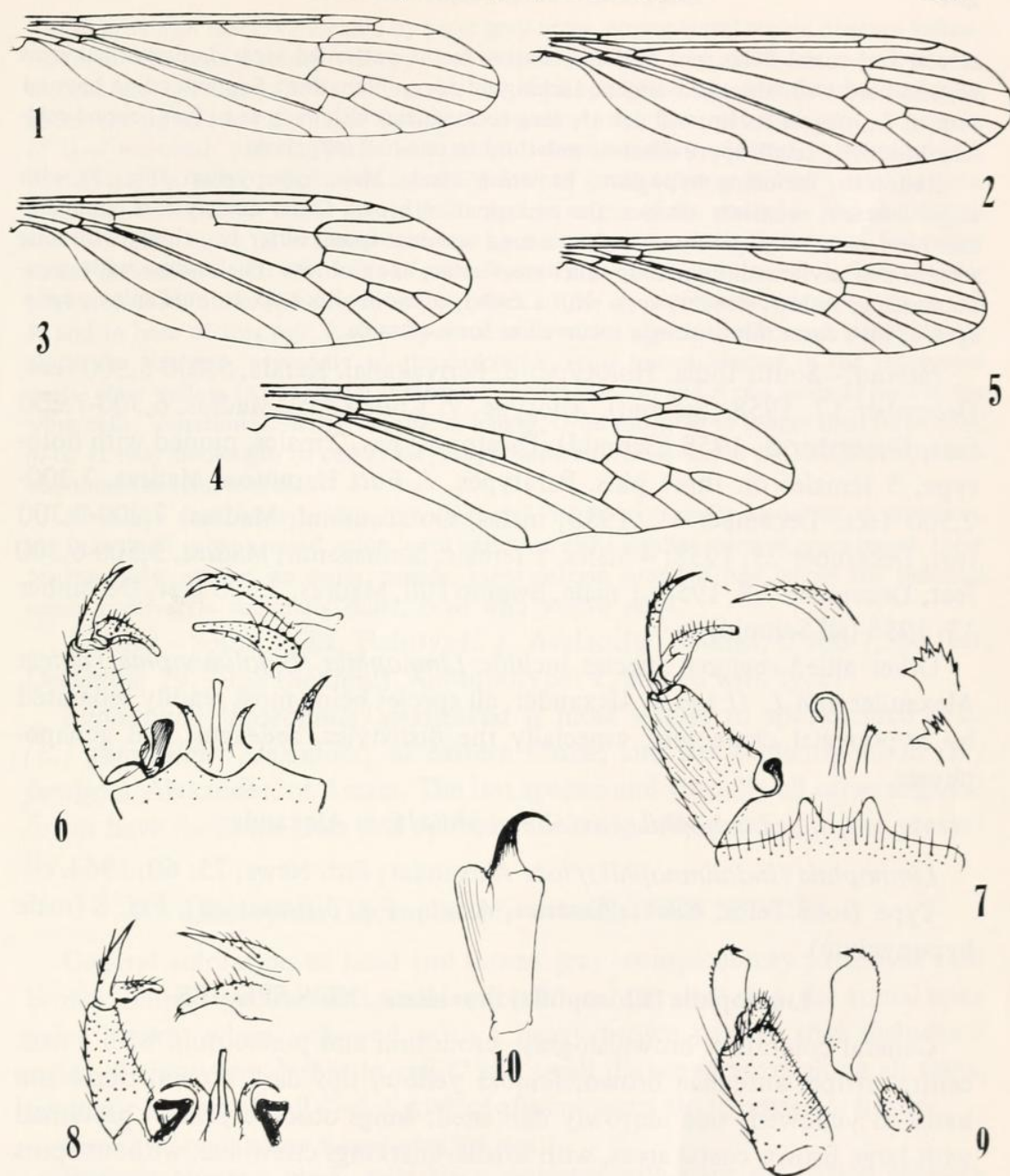
General coloration of mesonotum gray, praescutum irregularly patterned with brown; halteres light yellow; femora and tibiae yellow, tips conspicuously blackened; wings light yellow with abundant brown dots in all cells; male hypopygium with outer dististyle terminating in a long spine; gonapophysis slender, yellow, with a crown of from about six to nine spines at apex; outer end of aedeagus strongly recurved.

Male.—Length about 6-7 mm; wing 6.5-7.5 mm; antenna about 1.1-1.3 mm.

Female.—Length about 8.5-9 mm; wing 8-8.5 mm.

Rostrum brownish black, palpi black. Antennae with scape dark brown, remaining segments paler brown, oval, progressively smaller outwardly; in male outer segments longer. Head brownish gray, vertex with a narrow brown central line.

Pronotum large, brownish gray, patterned with darker. Mesonotal praescutum light gray, patterned irregularly with brown, central darkening very narrow in front, widened posteriorly, at near midlength subtended by a short lateral streak on either side, lateral stripes broader and more conspicuous. Pseudosutural area darkened; posterior sclerites of notum dark gray, scutal lobes dark brown; a continuous brown central line on scutum and scutellum, mediotergite darkened posteriorly. Pleura dark gray, variegated by darker. Halteres light yellow. Legs with coxae dark gray, trochanters obscure yellow; femora yellow, tips conspicuously blackened, on fore pair including about the outer seventh; tibiae and basitarsi yellow, tips more narrowly blackened, outer tarsal segments brownish black. Wings light yellow, with abundant brown dots in all cells, largest areas at tip of Sc and in stigmal region, united posteriorly to form a major spot over the anterior cord, in some specimens solidly darkened at costa; veins brownish yellow, clearer yellow in pre-



Figures 1-10.—Fig. 1, *Limnophila* (*Afrolimnophila*) *euglena*, new species; venation. Fig. 2, *Limnophila* (*Indolimnophila*) *adicia* Alexander; venation. Fig. 3, *Limnophila* (*Indolimnophila*) *iota* Alexander; venation. Fig. 4, *Limnophila* (*Eloeophila*) *perdilata* Alexander; venation. Fig. 5, *Limnophila* *pectinifera* Alexander; venation. Fig. 6, *Limnophila* (*Indolimnophila*) *adicia* Alexander; male hypopygium. Fig. 7, *Limnophila* (*Indolimnophila*) *dravidica*, n. sp.; male hypopygium. Fig. 8, *Limnophila* (*Indolimnophila*) *iota* Alexander; male hypopygium. Fig. 9, *Limnophila* (*Eloeophila*) *dravidiana*, new species; male hypopygium. Fig. 10, *Limnophila* (*Eloeophila*) *perdilata* Alexander; male hypopygium.

(Symbols: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *p*, phallosome; *t*, 9th tergite.)

arcular and costal fields, not evidently darker in the patterned areas. Longitudinal veins beyond cord with abundant trichia, lacking on M_{3+4} . Venation: Sc_1 extending beyond fork of Rs , Sc_2 at its tip; cell 1st M_2 long-rectangular, with $m-cu$ at or just beyond mid-length; cell M_1 small, approximately one-third to one-half its petiole.

Abdomen, including hypogium, brownish black. Male hypopygium (Fig. 7) with tergal lobes, t , relatively slender, the emargination broad. Outer dististyle, d , gradually narrowed outwardly, gently curved to a long terminal spine, outer two-thirds with long setae; inner style with numerous short erect setae, apex obtuse. Phallosome with gonapophysis, g , yellow, slender, apex with a crown of from about six to nine spines; aedeagus, a , with outer third strongly recurved to form a crook.

Habitat.—South India. Holotype: ♂, Periyakanal, Kerala, 5,000-5,500 feet, December 17, 1958 (Schmid). Allotype, ♀, Kodaikanal, Madras, 6,500-7,200 feet, December 5, 1958 (Schmid). Paratopotypes, 2 males, pinned with holotype, 5 females on three pins. Paratypes, ♂, Fort Hamilton, Madras, 7,200-7,500 feet, December 12, 1958; males, Ootacamund, Madras, 7,200-7,300 feet, December 25, 1958; 4 males, 1 female, Senbaganur, Madras, 5,500-6,500 feet, December 7-8, 1958; 1 male, Swamp Hill, Madras, 7,500 feet, December 13, 1958 (all Schmid).

Other allied regional species include *Limnophila* (*Indolimnophila*) *adicia* Alexander and *L. (I.) iota* Alexander, all species being most readily separated by hypopygial characters, especially the dististyles, aedeagus, and gonapophyses.

Limnophila (*Indolimnophila*) *iota* Alexander

Limnophila (*Indolimnophila*) *iota* Alexander; Ent. News, 75: 60; 1964.

Type from Telca, Cachar District, Assam. Fig. 3 (venation), Fig. 8 (male hypopygium).

***Limnophila* (*Eloeophila*) *dravidiana*, NEW SPECIES**

General coloration brownish gray, pronotum and praescutum with a dark central stripe; antennae brown; femora yellow, tips dark brown, tibiae and basitarsi yellowed, tips narrowly darkened; wings obscure yellow, patterned with large brown costal areas, with smaller markings elsewhere, without spots or dots in the cells; male hypopygium with outer dististyle terminating in a small subappressed spine, with relatively few smaller spicules on outer margin, inner style oval, with yellow setae.

Male.—Length about 6.5 mm; wing 6.8 mm.

Female.—Length about 7 mm; wing 8 mm.

Rostrum dark brown, palpi black. Antennae with scape dark brown, pedicel paler, proximal flagellar segments light brown, the outer ones brownish black, elongate. Head dark brown, laterally yellowish pollinose; anterior vertex broad.

Pronotal scutum brownish gray with a darker central stripe, scutellum light yellow. Mesonotal praescutum brownish gray, the interspaces clearer yellow, anterior fourth of sclerite with a more blackened central streak; posterior sclerites of notum brownish gray.

Pleura brownish black, variegated by paler gray areas, dorsopleural region obscure yellow. Halteres with stem obscure yellow, knob brownish black. Legs with coxae dark brown, trochanters obscure yellow; femora yellow, tips conspicuously dark brown, including about the outer seventh; tibiae and basitarsi yellow, tips narrowly darkened, remainder of tarsi brownish yellow. Wings with ground obscure yellow, clearest on anterior half, posterior cells more infuscated, especially before cord; a heavy brown costal pattern, including about seven major areas, the largest at origin of *Rs*, end of *Sc* and the stigma, the two latter more or less interconnected posteriorly over the anterior cord, last major costal darkening near outer ends of cells *R*₃ and *R*₄; other conspicuous darkenings over posterior cord, outer end of cell 1st *M*₂, fork of *M*₁₊₂, supernumerary crossvein in cell *M* and in base of this cell; further spots at ends of longitudinal veins and less evidently along the margins, especially in the holotype; veins brown, darker in the infuscated parts, clear yellow in the costal interspaces of veins *C*, *Sc* and *R*; no spots or dots in the wing cells. Venation: Cell *M*₁ variable in length, from subequal to longer than its petiole; *m-cu* at near midlength of cell 1st *M*₂; supernumerary crossvein in cell *M* about opposite one-third the length of *Rs*.

Abdomen dark brown. Male hypopygium (Fig. 9) with outer dististyle, *d*, terminating in a small subappressed spine, with seven or eight smaller spicules more basad, these progressively smaller on outer margin, inner margin rounded just below the terminal spine; inner style unusually short, oval, with yellow setae.

Habitat.—South India. Holotype: ♂, Avalanche, Madras, 6,900-7,500 feet, December 29, 1958 (Schmid). Allotopotype: ♀, pinned with type.

Limnophila (Eloeophila) dravidiana is most similar to species such as *L. (E.) paraprilinea* Alexander, of eastern China, and less evidently to *L. (E.) fumigata* Alexander, of Assam. The last species and virtually all other regional forms have darkened dots and spots in the wing cells, lacking in the present fly.

Limnophila (Eloeophila) fuscoanalis, NEW SPECIES

General coloration of head and thorax gray, conspicuously patterned with brown; femora yellow with a narrow brown subterminal ring, the actual apex paler brown; wings yellowed, with a heavy brown pattern that includes a series of transverse dashes in cell *C* and small darkened areas along all veins, posterior border of cell 2nd *A* with confluent spots along posterior border.

Female.—Length about 9 mm; wing 9.3 mm.

Rostrum brownish black, palpi black. Antennae with scape and pedicel brownish black, pruinose; proximal flagellar segments obscure yellow, outer segments more bicolored, darkened beyond bases. Head yellowish gray, vertex extensively dark brown.

Pronotal scutum yellowish gray, with a narrow dark brown central stripe, lobes of scutellum more yellowed. Mesonotal praescutum yellowish gray, conspicuously patterned with brown, including three stripes on anterior half, with paler brown marks at posterior ends of the intermediate areas; margins and sublateral stripes paler brown, interspaces with about five brown setigerous punctures, pseudosutural foveae black; posterior sclerites of notum yellowish gray, each scutal lobe with three brown areas, the innermost larger. Pleura variegated gray and brown, dorsopleural membrane more

yellowed. Halteres with stem obscure yellow, knob brown. Legs with coxae dark brown, pruinose; trochanters brownish yellow; femora yellow with a narrow brown subterminal ring, the actual tip paler brown; remainder of legs yellow, outer tarsal segments brown. Wings yellowed, with a heavy brown pattern, involving all cells excepting 1st M_2 ; major darkenings in radial and medial fields, including origin of R_s and the supernumerary crossvein in cell M ; other large marks in stigmal area, continued caudad to $r-m$ and a subterminal blotch with center over cell M_1 ; small darkened spots along all veins, including a series of transverse dashes in cell C ; veins M , Cu and the Anals with series of brown marks on their cephalic margins; posterior border of cell 2nd A almost continuously darkened by confluent brown spots; veins in the very restricted interspaces yellow, brown in the patterned areas. Venation: R_s square at origin; supernumerary crossvein in cell M oblique, its posterior end more distal; apex of vein 2nd A conspicuously arched.

Abdomen dark brown; genital shield and valves of ovipositor brownish yellow. Cerci long and very slender.

Habitat.—India. Holotype: ♀, Jhum La, Kameng, North East Frontier Agency, Assam, 7,800 feet, June 2, 1961 (Schmid).

7,800 feet, June 2, 1961 (Schmid).

The most similar regional species is *Limnophila (Eloeophila) perdilata* Alexander, which is virtually of the same large size, in the female sex differing especially in the wing pattern, including the distribution of dark pattern in the Anal cells.

Limnophila (Eloeophila) oxyacantha, NEW SPECIES

General coloration of thorax gray, patterned with brown; antennae relatively long, proximal flagellar segments weakly bicolored; legs yellow, femora with a pale brown subterminal ring; wings yellowed, with a heavy brown costal pattern, posterior two-thirds with smaller brown clouds in all cells; male hypopygium with outer dististyle long-oval, apex produced into a long slender spine.

Male.—Length about 5.5 mm; wing 5.2 mm; antenna about 1.4 mm.

Rostrum brownish gray, palpi brownish black. Antennae of male relatively long; scape and pedicel brownish black, proximal flagellar segments weakly bicolored, brown basally, outer third or less obscure yellow, distal five or six segments uniformly darkened; segments subequal in length to their longest verticils. Head grayish brown.

Pronotum gray. Mesonotal praescutum gray, with four dark brown discal stripes, the intermediate pair narrow, subequal in width to the median interspace more confluent posteriorly; lateral borders behind the humeral region more broadly darkened, pseudosutural foveae and adjacent margin blackened; posterior sclerites of notum brownish gray, scutal lobes with darker centers, parascutella and pleurotergite darkened. Pleura dark brown. Halteres with stem yellow, knob brownish black. Legs with coxae dark brown, trochanters yellowed; femora brownish yellow with a narrow pale brown subterminal ring; tibiae and tarsi clearer yellow, especially the latter. Wings with the restricted ground yellowed, with a heavy brown pattern that includes seven larger costal areas, the fourth at tip of Sc_1 , fifth at stigma, the two broadly confluent posteriorly in cell R_1 ; posterior two-thirds of wing with relatively sparse smaller and slightly paler brown marks

and clouds in all cells, the total amount subequal to the ground areas; veins brown. Venation: Cell M_1 slightly longer than its petiole.

Abdomen brownish yellow, segments with lateral and posterior borders brown, sub-terminal segments more uniformly darker brown. Male hypopygium with outer dististyle long-oval, apex extended into a long slender spine; outer margin without projections, lower margin at base of spine microscopically tuberculate, inner style gently arcuated.

Habitat.—India. Holotype: ♂, Amatulla, Kameng, North East Frontier Agency, Assam, 1,250-2,000 feet, March 11, 1961 (Schmid).

Limnophila (Eloeophila) oxyacantha is most readily distinguished from other generally similar regional species by the conformation of the outer dististyle of the hypopygium. Other regional species, including *L. (E.) fascipennis* Brunetti, with numerous brown markings in the wing cells have these smaller and more numerous.

Limnophila (Eloeophila) perdilata Alexander

Limnophila (Eloeophila) perdilata Alexander; Ent. News, 77: 221; 1966.

Type from Yagtang, Sikkim. Fig. 4 (venation), Fig. 10 (male hypopygium).

Limnophila (subgenus uncertain) *pectinifera* Alexander

Limnophila pectinifera Alexander; Ent. News, 75: 59; 1964.

Type from Tairenpokpi, Manipur, Assam. Fig. 5 (venation).

2.0060 New exotic crane-flies (Tipulidae: Diptera) Part XX. Abstract.—Further Hexatomines were collected in various parts of India. Additional to the new species described and figured drawings of four others described in earlier parts of this series are illustrated. Types of the new species are preserved in the Alexander Collection.

Limnophila (Afrolimnophila) euglena, NEW SPECIES: Size relatively large (wing of female to 10 mm); head and thorax olive gray, praescutum with scarcely evident more yellowed stripes; halteres yellow; legs yellow, femora with a faintly indicated darker sub-terminal ring, tips of tibiae narrowly darkened; wings light yellow with scattered pale brown dots and large open ocelli at origin and fork of R_s and at near midlength of vein R_5 . Type locality: Sikkim, Namnasa, 9,500 feet.

Limnophila (Indolimnophila) adicia Alexander: venation and male hypopygium illustrated; type locality, Leimatak, Manipur, Assam.

Limnophila (Indolimnophila) dravidica, NEW SPECIES: General coloration of mesonotum gray, praescutum irregularly patterned with brown; halteres light yellow; femora and tibiae yellow, tips conspicuously blackened; wings light yellow with abundant brown dots in all cells; male hypopygium with outer dististyle terminating in a long spine; gonapophysis slender, yellow, with a crown of from about six to nine spines at apex; outer end of aedeagus strongly recurved. Type locality: South India, Periyakanal, Kerala, 5,000-5,500 feet.

Limnophila (Indolimnophila) iota Alexander: venation and male hypopygium illustrated. Type locality: Telca, Cachar District, Assam.

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Limnophila (Eloeophila) perdilata Alexander: venation and male hypopygium illustrated. Type locality: Yagtang, Sikkim.

Limnophila (subgenus uncertain) *pectinifera* Alexander: venation illustrated. Type locality: Tairenpokpi, Manipur, Assam.—**Charles P. Alexander**, *Entomological Laboratory, University of Massachusetts, Amherst, MA 01002*.

Descriptors: Diptera; Tipulidae; Crane-flies; India; *Limnophila (Afrolimnophila) euglena*; *Limnophila (Indolimnophila) adicia*; *Limnophila (Indolimnophila) dravidica*; *Limnophila (Indolimnophila) iota*; *Limnophila (Eloeophila) dravidiana*; *Limnophila (Eloeophila) fuscoanalis*; *Limnophila (Eloeophila) oxyacantha*; *Limnophila (Eloeophila) perdilata*; *Limnophila* (subgenus uncertain) *pectinifera*.