Undescribed Species of Crane Flies from the Himalaya Mountains (Diptera: Tipulidae), XXI[1,2]

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Abstract: Six new species of crane flies are described, two from the western Himalayas, *Paradelphomyia* (*Oxyrhiza*) **pugilis**, and *Limnophila* (*Brachylimnophila*) **garhwalensis**, from Kumaon; four from the eastern Himalayas, Kameng, Assam, *Dolichopeza* (*Sinoropeza*) **fasciventris**, *Orimarga* (*Orimarga*) **suspensa**, *Hexatoma* (*Eriocera*) **paragnava**, and *H.* (*E.*) **perhirsuta**.

Dolichopeza (*Sinoropeza*) **fasciventris**, n.sp.

General coloration of thoracic dorsum polished ferruginous, pleura brownish yellow; antennae 13-segmented, about one-third as long as wing, terminal segment microscopic, flagellar segments slightly sinuous, with setae on outer face at base; wings strongly darkened, stigma darker brown; basal section of vein M_3 lacking, the posterior branch of M appearing branched, as in the subgenus; abdomen black, bases of intermediate five segments conspicuously yellow; male hypopygium with posterior border of tergite trilobed, with two more basal lobes on disk; outer dististyle expanded outwardly, the lateral angle more produced, inner style large and complex, with two enlarged flattened lateral lobes, the cephalic one conspicuously hairy, at apex narrowed into a needlelike spine.

Male: Length about 9 mm.; wing 11 mm.; antenna about 4.1 mm. Frontal prolongation of head yellow, palpi dark brown. Antennae 13-segmented, of moderate length, nearly one-half the body or slightly exceeding one-third the length of wing; scape and pedicel yellow, first flagellar segment brownish yellow, outer third darker, remaining segments black; first flagellar segment long-cylindrical, about twice the second, succeeding segments progressively shorter, the terminal one microscopic; each flagellar segment after the first slightly sinuous beyond its base, this with setae on upper side only; *Dolichopeza* (*Sinoropeza*) *postica* has twelve or in cases thirteen antennal segments, the terminal one microscopic, all segments cylindrical throughout, the setae very small and not restricted to base, terminal segment elongate, about two-thirds the penultimate. Head brownish yellow, orbits darker; sides of anterior vertex with a concentration of longer setae.

Pronotum brownish yellow. Mesonotal praescutum with three polished ferruginous stripes, interspaces slightly differentiated, sides uniformly medium brown, with dense virtually contiguous microscopic pits; posterior sclerites brownish yellow. Pleura brownish yellow, dorsopleural membrane brown. Halteres with stem yellowish brown, clearer basally, knob dark brown. Legs with coxae brownish yellow, trochanters yellow; remainder of legs light brown, tips of femora narrowly darker. Wings (Fig. 1) strongly darkened, prearcular and costal fields slightly more yellowed; stigma dark brown, preceded and followed by small pale yellow brightenings; veins before cord brownish yellow, darker brown beyond cord. Sparse microscopic trichia in outer end of cell R_3, with fewer in R_5. Venation: Sc_2 entering

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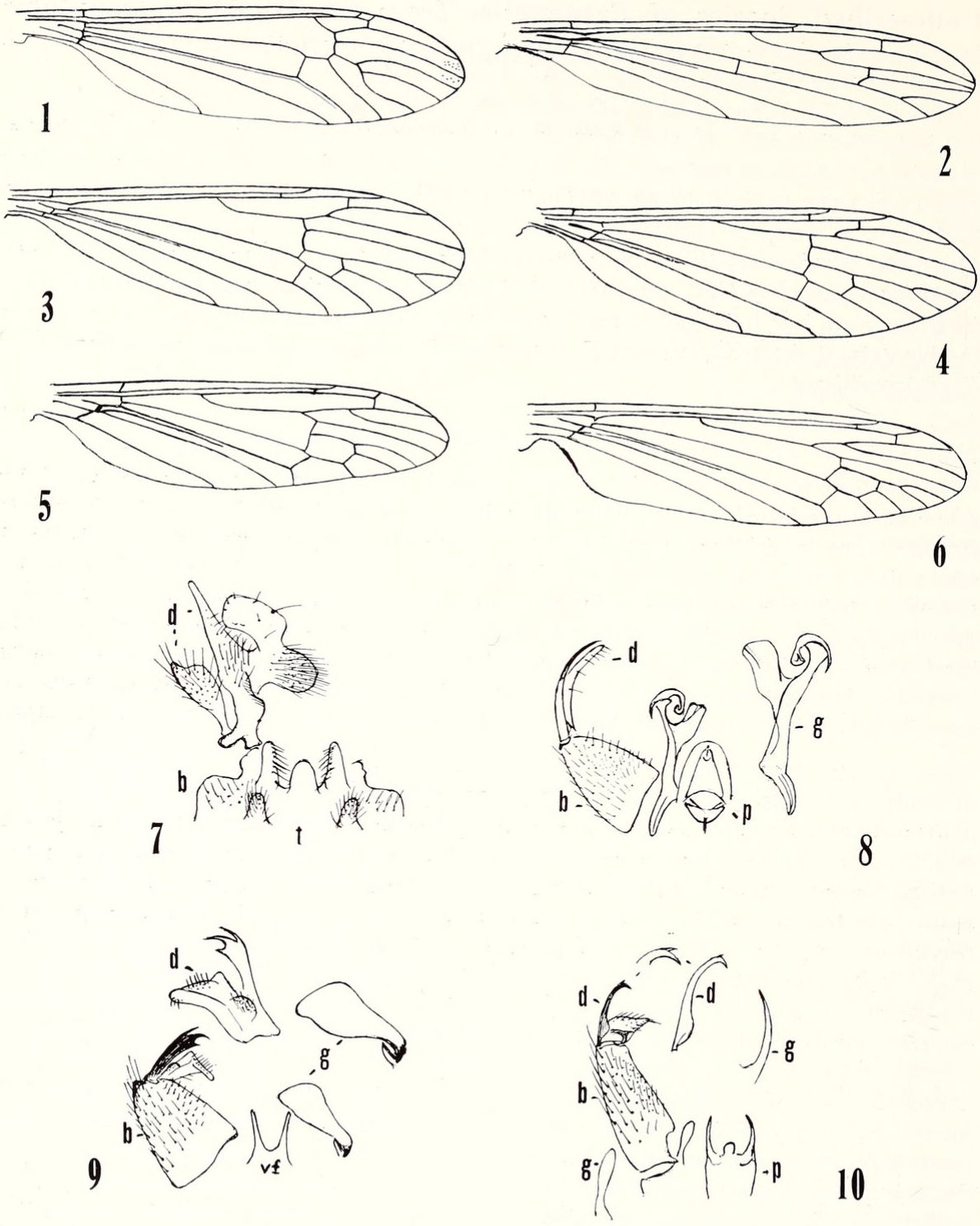
[2] Part XX of this series of papers was published in the Journal of the New York Entomological Society, **80**: 7–11, March 1972.



FIGS. 1–6, venation; 7–10, male hypopygium.

FIG. 1. *Dolichopeza* (*Sinoropeza*) *fasciventris*, n.sp.
FIG. 2. *Orimarga* (*Orimarga*) *suspensa*, n.sp.
FIG. 3. *Paradelphomyia* (*Oxyrhiza*) *pugilis*, n.sp.
FIG. 4. *Limnophila* (*Brachylimnophila*) *garhwalensis*, n.sp.
FIG. 5. *Hexatoma* (*Eriocera*) *paragnava*, n.sp.
FIG. 6. *Hexatoma* (*Eriocera*) *perhirsuta*, n.sp.
FIG. 7. *Dolichopeza* (*Sinoropeza*) *fasciventris*, n.sp.

R opposite fork of R_5; R_{1+2} entirely pale, erect, nearly in alignment with R_2; outer medial branches as in the subgenus, basal section of M_3 lacking, posterior branch of *M* appearing branched; *m-cu* about two-thirds its length before fork of *M*.

Abdomen with basal tergite brown, remaining segments black, the bases of third through seventh segments conspicuously yellow. Male hypopygium (Fig. 7) with posterior border of tergite, *t*, trilobed, central lobe shorter, glabrous, apex rounded, lateral lobes nearly twice as long, narrowed outwardly, tips blunt, inner margin with a row of long black setae; disk of tergite laterally with a conspicuous lobe with long black setae. Outer dististyle, *d*, relatively small, expanded outwardly, outer angle slightly more produced; inner style large, complex in structure, with three principal lobes, the axial one narrowed into a straight slender rod, laterally produced into two broad flattened lobes, the outer one darkened, nearly glabrous, apex broadly obtuse, cephalic lobe densely setiferous, the apex narrowed into a needlelike spine.

HOLOTYPE: ♂, Chug, Northeast Frontier Agency, Kameng, Assam, India, 6,800–7,300 feet, July 30, 1961 (Fernand Schmid).

The only other regional member of the subgenus is *Dolichopeza* (*Sinoropeza*) *postica* Brunetti, of the eastern Himalayas, which differs in the longer simple antennae, apparently with only twelve segments, with the vestiture small and reduced, and with the abdomen uniformly blackened. I possess a paratype male of this species but the abdomen is lacking. Brunetti's description of the male hypopygium indicates that it is quite distinct from that of the present fly. The two Chinese members of the subgenus are entirely distinct, these being *D.* (*S.*) *multiseta* Alexander, of Fukien, and *D.* (*S.*) *paucisetosa* Alexander, of Kiangsi. Edwards (*Rec. Indian Mus.*, **26:** 304; 1924) mentions a specimen of *postica* from the Brunetti series but not type material that has the male antennae longer and apparently represents a still further species.

Orimarga (*Orimarga*) **suspensa**, n.sp.

General coloration light gray, the thorax slightly patterned with light brown; legs medium brown; wings whitened, unpatterned, veins light brown, trichia of outer medial veins sparse, vein M_{3+4} about one-third longer than M_4; male hypopygium with outer dististyle narrowed into a long slender blackened spine; gonapophysis bifurcate, outer arm at apex bearing a semicircular structure, its outer end a strong curved spine.

Male: Length about 7 mm.; wing 6–6.2 mm.; antenna about 1.5 mm.

Female: Length about 7–7.5 mm.; wing 7–7.5 mm.

Rostrum and palpi dark brown. Antennae black; flagellar segments long-oval, their ends truncate, terminal segment short-oval. Head light gray.

Thorax light gray, praescutum with four slightly darker brownish gray stripes, the intermediate pair narrowly and vaguely separated; centers of scutal lobes less evidently darkened. Pleura light gray, sternopleurite variegated by darker gray, more extensive ventrally. Halteres whitened. Legs with fore coxae light brown, remaining pairs and all trochanters yellow; remainder of legs medium brown. Wings (Fig. 2) whitened, unpatterned, prearcular and

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FIG. 8. *Orimarga* (*Orimarga*) *suspensa*, n.sp.

FIG. 9. *Paradelphomyia* (*Oxyrhiza*) *pugilis*, n.sp.

FIG. 10. *Limnophila* (*Brachylimnophila*) *garhwalensis*, n.sp.

(Hypopygial symbols: *b*, basistyle; *d*, dististyles; *g*, gonapophysis; *p*, phallosome; *vf*, ventral fork).

costal fields slightly more yellowed; veins light brown, yellow in the brightened fields. Macrotrichia of outer medial veins relatively sparse, M_4 with only two or three, in cases lacking. Venation: R_{1+2} about one and one-half to twice R_{2+3}; M_{3+4} about one-third longer than M_4; *m-cu* nearly opposite to shortly beyond the origin of *Rs*.

Abdomen dark brown. Male hypopygium (Fig. 8) with both dististyles, *d*, elongate, outer style very gradually narrowed into a slender blackened spine. Phallosome with gonapophyses, *g*, distinctive, bifurcated at near midlength, the inner arm a broad flattened blade, outer arm slender, at apex with a suspended central semicircular chitinized structure, its outer end narrowed into a strong curved spine, the opposite end with apex obtuse or truncated.

HOLOTYPE: ♂, Chug, Northeast Frontier Agency, Kameng, Assam, India, 6,800–7,300 feet, July 30, 1961 (Fernand Schmid). Allotopotype, ♀, pinned with type. Paratopoytpes: 5 ♂ ♀.

The most similar regional species are *Orimarga* (*Orimarga*) *subbasalis* Alexander and *O.* (*O.*) *tenuistyla* Alexander, both from Assam. The hypopygium, especially the gonapophyses, are quite different in the two species. The male sex of *subbasalis* still is unknown but the details of venation and vein trichiation provide distinctive characters for the separation of the flies.

Paradelphomyia (*Oxyrhiza*) **pugilis**, n.sp.

General coloration of thorax polished orange, head gray; legs obscure yellow; wings brownish yellow, stigma very slightly paler; male hypopygium with outer dististyle terminating in three spines; gonapophyses clavate, basal half narrowed, outer half mitten-shaped; ventral fork with spines variable, in cases apparently lacking.

Male: Length about 5–6 mm.; wing 5–6.5 mm.; antenna about 1.0–1.2 mm.

Female: Length about 5.5 mm.; wing about 6 mm.

Rostrum dark brown, palpi black. Antennae dark brown to brownish black; flagellar segments elongate, subequal to or slightly shorter than their verticils. Head gray.

Thorax almost uniformly polished orange. Halteres with stem whitened, knob more yellowed. Legs with coxae and trochanters yellow; remainder of legs obscure yellow, outer tarsal segments light brown, claws long and slender, gently curved. Wings (Fig. 3) faintly brownish yellow, stigma very faintly darker, entirely distad of vein R_2; veins light brown. Sparse trichia in outer ends of cells R_2 to *1st A*; on veins beyond general level of origin of *Rs*, including nearly the outer two-thirds of both anal veins. Venation: R_{2+3+4} varying in length from shorter than R_{2+3} to nearly twice this length; cell M_1 about one-third its petiole; *m-cu* less than its own length beyond fork of *M*.

Abdominal tergites brownish yellow, sternites paler, in male segments seven and eight darker brown to form a ring. Male hypopygium (Fig. 9) with apex of basistyle, *b*, produced into a microscopic point. Outer dististyle, *d*, expanded outwardly, terminating in three spines, the outer two approximated, lower spine more separated, in the paratypes the intervening margin with three or four small points, lacking in the holotype; inner style with basal half stout, outer end narrowed, apex rounded. Gonapophysis, *g*, of distinctive conformation, appearing clavate, basal half slender, outer end more expanded to appear mitten-shaped, wider across base; ventral fork, *vf*, of aedeagus present in holotype, apparently lacking in the two paratypes studied, the fork including two slender gently divergent spines.

HOLOTYPE: ♂, Dwali, Almora, India, 8,410 feet, September 12, 1958 (Schmid). Allotype: ♀, Khati, Almora, 7,700–8,000 feet, September 10, 1958. Paratypes: 6 ♂ ♀, with the allotype, September 10–11, 1958; one ♂, Rata, Almora, 11,000 feet, September 14, 1958 (all Schmid).

Among the regional species the present fly most resembles *Paradelphomyia* (*Oxyrhiza*) *angustistyla* Alexander, *P.* (*O.*) *bigladia* Alexander, *P.* (*O.*) *distivena* Alexander, *P.* (*O.*) *flavescens* (Brunetti), and *P.* (*O.*) *ruficolor* Alexander, differing evidently in hypopygial structure.

Limnophila (*Brachylimnophila*) **garhwalensis**, n.sp.

Mesonotum brownish gray, praescutum with four very indistinct light brown stripes, pleura yellow; halteres light yellow; wings faintly brownish yellow, prearcular and costal fields clearer yellow, stigma small, pale brown, cell M_1 variable in size, approximately one-half its petiole; abdominal tergites brown, sternites more yellowed, especially in female; male hypopygium with outer dististyle slender, bifid near apex, inner gonapophyses very narrow.

Male: Length about 5–5.5 mm.; wing 7–7.5 mm.; antenna about 1.2–1.3 mm.

Female: Length about 8–8.5 mm.; wing 8–9 mm.

Rostrum and palpi black. Antennae with scape and pedicel yellowed, flagellum slightly darker; proximal flagellar segments large, especially the first, progressively smaller outwardly, outer segments long-cylindrical, somewhat shorter than their longest verticils. Head brownish gray; anterior vertex broad.

Pronotal scutum light brownish gray, scutellum and pretergites yellowed. Mesonotal praescutum light brownish gray, with four very indistinct light brown stripes, tuberculate pits blackened, darker than the pseudosutural foveae; posterior sclerites of notum more yellowed. Pleura chiefly yellowed, ventrally clearer yellow to more reddened. Halteres light yellow. Legs with coxae and trochanters light yellow, remainder of legs slightly darker yellow, outer tarsal segments infuscated to blackened. Wings (Fig. 4) faintly brownish yellow, prearcular and costal fields clearer yellow, including the veins; stigma small, pale brown, inconspicuous; veins pale brown. Longitudinal veins beyond general level of origin of *Rs* with long trichia. Venation: Sc_1 ending shortly beyond fork of R_{2+3+4}. Sc_1 alone longer than the gently arcuated *r-m*; R_{1+2} about three times R_2; cell M_1 variable in size, usually small, about one-half its petiole or less, in cases larger.

Abdominal tergites brown, sternites yellowish brown in male, clear yellow in females. Ovipositor with cerci very long, only slightly upcurved. Male hypopygium (Fig. 10) with outer dististyle, *d*, slender, gently curved to the acute tip, with a smaller subapical spine on outer margin. Phallosome with gonapophyses, *g*, very slender, lateral apophyses (or interbases) paddle-shaped.

HOLOTYPE: ♂, Dakwani, Pauri Garhwal, Kumaon, India, 9,300–11,000 feet, August 5, 1958 (Fernand Schmid). Allotopotype: ♀, with type. Paratopotype: 1 ♂. Paratypes: 2 ♀♀, on one pin, Kulara, Pauri Garhwal, 12,000 feet, August 3, 1958.

The most similar members of the subgenus include *Limnophila* (*Brachylimnophila*) *nemoralis* (Meigen) and *L.* (*B.*) *adjuncta* (Walker), Western Palaearctic; *L.* (*B.*) *inaequalis* Alexander and *L.* (*B.*) *nesonemoralis* Alexander, Eastern Palaearctic, and *L.* (*B.*) *occidens* Alexander, Western Nearctic, all differing among themselves in details of coloration of the body, legs and halteres, in venational details, and in hypopygial structure, especially the outer dististyles and gonapophyses.

Hexatoma (*Eriocera*) **paragnava**, n.sp.

Size large (wing 15 mm.); antennae of male very long, approximately three times the wing, flagellar segments with very sparse small spinoid setae; halteres light yellow; wings whitened, prearcular and costal fields yellowed, including the veins, remaining veins dark brown to

brownish black; cell *1st* M_2 long, M_{3+4} about one-half longer than M_4; abdominal tergites brownish gray, lateral margins yellowed, sternites yellowish orange.

Male: Length about 11 mm.; wing 15 mm.; antenna about 47 mm.

Front and mouthparts very reduced, brown, palpi black. Antennae of male very long, approximately three times the wing; proximal segments brownish yellow, remainder black; scape much enlarged, flagellar segments very long, with dense erect white setae and very sparse black spinoid setae, on first segment these shorter than the normal setae, on second and third segments longer and more erect, microscopic on outer segment. Head light gray, vertical tubercle more brownish gray, very large, bulbous, on posterior aspect with long setae.

Pronotum brownish yellow. Mesonotal praescutum light gray with four darker stripes, intermediate pair nearly confluent, lateral stripes darker, vestiture long and conspicuous on sides, shorter on disk, occurring on both the stripes and the interspaces; scutal lobes more darkened, vestiture sparse to lacking; scutellum gray, with sparse paler setae; postnotum more brownish gray, more yellow laterally, without vestiture. Pleura pale yellowish brown, vaguely patterned with darker, ventrally light gray pruinose. Halteres small, light yellow. Legs with coxae yellowed, vestiture short and sparse; trochanters obscure yellow; femora yellow, tips narrowly blackened; tibiae and tarsi brownish yellow, terminal segment darker. Wings (Fig. 5) whitened, prearcular and costal fields yellowed, including the veins; stigma small, pale brown; narrow inconspicuous pale brown seams over cord and certain longitudinal veins, most evident on R_{4+5} and *Cu* in cell *M*; veins of disk dark brown to brownish black, conspicuous. Veins behind costa nearly glabrous, with sparse scattered trichia on R_1 and distal section of R_5. Venation: R_{1+2} and R_2 short, subequal; *Rs* long, exceeding the anterior branch of *Rs*; cell M_1 lacking; cell *1st* M_2 long, M_{3+4} about one-half longer than M_4; distal section of Cu_1 nearly in transverse alignment with cord, cell M_4 at margin very extensive.

Abdominal tergites brownish gray, posterior borders narrowly darker, lateral margins of intermediate segments more yellowed; sternites yellowish orange, hypopygium dark brown.

HOLOTYPE: ♂, Chug, Northeast Frontier Agency, Kameng, Assam, India, 6,800–7,300 feet, July 30, 1961 (Fernand Schmid).

The most similar regional species include *Hexatoma* (*Eriocera*) *gnava* Alexander and *H.* (*E.*) *neognava* Alexander, which differ from the present fly in their smaller size, vestiture, and in details of coloration of the body and wings.

Hexatoma (*Eriocera*) **perhirsuta**, n.sp.

Belongs to the *spinosa* group; size large (wing about 19 mm.); general coloration of head and thorax light brown, these with abundant very long and conspicuous erect brownish yellow setae; wings pale yellowish brown, veins yellowed, appearing inconspicuous against the ground, cell M_1 present; abdominal tergites and pleural membrane dark brown, sternites more orange, the color clearest midventrally.

Male: Length about 16 mm.; wing 19 mm.; antenna about 46 mm.

Rostrum very short, brownish yellow; palpi obscure yellow, terminal segment blackened. Antennae of male very long, exceeding twice the length of wing, dark brown, the enlarged scape slightly paler; flagellar segments very long, all with scattered small stout setae, more delicate on outer segment. Head light brown, with abundant very long brownish yellow setae, vertical tubercle conspicuous.

Mesonotum chiefly light brown, lateral praescutal borders broadly paler, posterior sclerites more whitened. Thoracic dorsum excepting the postnotum with very long erect brownish

yellow to pale brown setae, V-shaped suture dark brown. Pleura brownish yellow anteriorly, dorsal sternopleurite and posterior sclerites more whitened, with long white setae. Halteres with stem dull orange yellow, knob dark brown. Legs with coxae light gray, with long white setae, trochanters yellow; femora brownish yellow, remainder of legs darker brown. Wings (Fig. 6) very pale yellowish brown, stigma small, slightly darker brown; veins yellowed, very inconspicuous against the ground. Veins behind costa with sparse scattered trichia on R, very few on distal section of R_5. Venation: R_{2+3+4} about two-thirds the basal section of R_5; cell M_1 slightly longer than its petiole; *m-cu* about one-third longer than distal section of Cu_1.

Abdominal tergites and pleural membrane dark brown, sternites more orange, clearest midventrally.

HOLOTYPE: Chug, Northeast Frontier Agency, Kameng, Assam, India, 6,800–7,300 feet, July 30, 1961 (Fernand Schmid).

Generally similar to the Japanese *Hexatoma* (*Eriocera*) *jozana* Alexander and *H.* (*E.*) *stricklandi* (Edwards), differing from these and other regional species by the unusually long vestiture of the head and thorax. There are no closely allied Oriental species known to me.