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FOUR UNDESCRIBED SPECIES OF LIMNOBIA  
FROM THE ORIENTAL REGION

(*Diptera, Tipulidæ*)

By CHARLES P. ALEXANDER

The high mountains of the Oriental Region support a rich fauna of crane-flies of the tribe Limnobiini. The four undescribed species of *Limnobia* (*Limonia*) were included in material sent to me by Mr. J. B. Corporaal, collected in Sumatra, and by Mr. Teiso Esaki, collected in Formosa or Taiwan. The author's thanks are extended to the collectors of this material for the privilege of retaining the types.

*Limnobia megastigma*, new species.

General coloration yellow; antennal scape yellow, the flagellum black; mesonotal praescutum with four brown stripes; femora brown with an obscure yellow subterminal ring, the tips black; wings yellow, the stigma very large, brownish black; *r* at tip of  $R_1$ .

*Male*.—Length, 9 mm.; wing, 11.2 mm.

Rostrum and palpi black. Antennae with the scape obscure yellow; flagellum black. Head discolored in the type, apparently obscure yellow.

Mesonothorax unusually gibbous. Mesonotal praescutum shiny yellow with four conspicuous black stripes, the intermediate pair narrowly connected before the suture; scutal lobes darkened laterally; remainder of mesonotum obscure yellow. Pleura obscure yellow. Halteres with the basal two-thirds of the stem obscure yellow, the remainder brownish black. Legs with the coxae and trochanters yellow; femora brown, the tips broadly black; a conspicuous, obscure yellow subterminal ring, slightly more extensive than the black femoral tip; tibiae black, the base a little paler; tarsi black. Wings with the apex obtuse; general coloration yellow, the base and costal region bright yellow; stigma very large, brownish black, occupying the entire area between the end of  $R_s$  and  $r$ ; a small brown spot at origin of  $R_s$ ; indistinct brown seams along the cord and outer end of cell  $1st\ M_2$ ; a more conspicuous brown seam along  $R_{2+3}$  beyond the stigma; all longitudinal veins very faintly seamed with brown; veins brownish black. Venation:  $Sc_2$  at the extreme tip of  $Sc_1$  and exactly opposite the end of  $R_s$ ;  $R_s$  strongly angulated at origin;  $r$  at extreme tip of  $R_1$ , strongly arcuate; veins  $R_{2+3}$  and  $R_{4+5}$  bent strongly caudad beyond midlength; basal deflection of  $Cu_1$  immediately before the fork of  $M$ .

Abdominal tergites orange-yellow, each with a broad, brown median triangle; sternites obscure brownish yellow. Hypopygium bright yellow.

*Habitat*.—Sumatra.

Holotype, ♂, Brastagi, altitude 4,250 feet, May 15, 1921 (J. B. Corporaal).

***Limnobia flavoterminalis*, new species.**

General coloration yellow; praescutum without distinct markings; scutal lobes infuscated; knobs of halteres yellow; femora yellow with a conspicuous dark brown ring, the tips broadly yellow; wings yellow, marbled with brown;  $Sc$  long; abdominal tergites dark brown, the sternites obscure yellow.

*Male*.—Length, 7 mm.; wing, 8 mm.

Rostrum and palpi black. Antennae with the first segment of the scape black; remainder of antenna broken. Head dark brown.

Pronotum yellow. Mesonotal praescutum yellow without distinct darker markings, near the suture with a faint infuscation in the region occupied by the usual interspaces; scutum yellow, the centers of the lobes dark brown; scutellum yellow, margined with dark brown; postnotum with the median sclerite brown in center, fading into obscure yellow laterally. Pleura yellow with a very ill-defined, longitudinal, brown stripe. Halteres pale, the knobs light yellow. Legs with the coxae and trochanters greenish yellow; femora brownish yellow with a narrow but conspicuous, dark brown ring that is a little more than one-half as wide as the yellow tips; tibiae dark brown, the bases very narrowly obscure yellow; tarsi dark brown. Wings yellow, the costal region more saturated; wing-membrane extensively marbled with brown, this appearing as five ill-defined fasciae; the first fascia lies in the bases of cells  $R$  and  $M$ ; second fascia near mid-length of cell  $R$ , extending across cells  $R$ ,  $M$  and less clearly in  $Cu$  and the anal cells; third fascia broad, extending from the origin of  $R_s$ , along the sector to the end of  $Sc_1$ , continued caudad along the cord and less distinctly across the distal third of cells  $R$ ,  $M$  and the end of cell  $Cu$ ; the fourth fascia includes the small stigma at  $r$  and a broad seam along the outer end of cell  $1st\ M_2$ ; the terminal fascia occupies the wing-tip; anal cells pale brown with cream-colored spots; anal angle pale; veins brown, more yellowish in the pale areas. Venation:  $Sc$  very long,  $Sc_1$  ending just before the end of  $R_s$ ,  $Sc_2$  about five times as long as  $Sc_1$ , ending some distance beyond the end of  $R_s$ ;  $R_s$  arcuated;  $r$  a little less than twice its length from the tip of  $R_1$ ; cell  $1st\ M_2$  elongate, widened distally;  $m$  arcuated, about three-fourths the outer deflection of  $M_3$ ; basal deflection of  $Cu_1$  at the fork of  $M$ .

Abdominal tergites dark brown, the sternites obscure yellow; hypopygium obscure brownish yellow.

*Habitat*.—Formosa.

Holotype, ♂, Tattaka, altitude about 7,400 feet, August 17, 1921 (T. Esaki).

*Limnobia esakii*, new species.

General coloration yellow; mesonotal praescutum with a single dark brown stripe; femora black with a conspicuous, subterminal yellow ring; wings yellow, spotted and clouded with brown; *Sc* short, ending a short distance beyond the origin of *Rs*; abdominal tergites brown, the sternites yellow, ringed caudally with brown.

*Female*.—Length, 8 mm.; wing, 7.2 mm.

Rostrum and palpi black. Antennae black, the apex of the second scapal and base of the first flagellar segment indistinctly paler; antennae longer than usual in this genus. Head dark brown, the anterior part of the vertex with an appressed gray pubescence.

Pronotum dark brown. Mesonotal praescutum yellow with a broad, brown, median stripe that widens at the suture; scutum dark brown, the median area pale; scutellum dark brown, the anterior margin with a pale median spot; postnotum dark brown. Pleura yellow. Halteres brown, the base of the stem obscure yellow. Legs with the coxae and trochanters yellow; femora brownish black, very indistinctly paler at base; a conspicuous, subterminal yellow ring that is a little wider than the black apex; tibiae black, the extreme base indistinctly pale; tarsi black. Wings tinged with yellow, more saturated basally and on the cephalic portion; a conspicuous, pale brown pattern, arranged as follows: A large blotch near midlength of cell *R*; a conspicuous blotch at the fork of *Rs*, connected along *R*<sub>2</sub>+<sub>3</sub> with the stigmal blotch; cord and outer end of cell 1st *M*<sub>2</sub> narrowly seamed with brown; stigma large, brown; small but darker brown spots at tip of *Sc* and origin of *Rs*; wing-apex faintly infuscated, this including the distal half of cell 2nd *R*<sub>1</sub>, *R*<sub>2</sub>, the distal two-thirds of *R*<sub>3</sub> and most of cells 2nd *M*<sub>2</sub> and *M*<sub>3</sub>; a brown cloud along vein *Cu*; veins brown, *Sc* more yellowish. Venation: *Sc* short, *Sc*<sub>1</sub> ending just beyond the origin of *Rs*, *Sc*<sub>2</sub> at the tip of *Sc*<sub>1</sub>; *Rs* short, strongly

angulated at origin; *r* more than twice its length from the tip of *R*<sub>1</sub>; deflection of *R*<sub>4</sub>+<sub>5</sub> arcuated; cell 1st *M*<sub>2</sub> closed, relatively small; basal deflection of *Cu*<sub>1</sub> before the fork of *M*.

Abdominal tergites dark brown; sternites yellow, the segments narrowly ringed caudally with dark brown. Ovipositor with the tergal valves very long and slender, straight.

*Habitat*.—Formosa.

Holotype, ♀, Tattaka, altitude about 7,400 feet, August 17, 1921 (T. Esaki).

This interesting *Limnobia* is dedicated to the collector who has secured many undescribed species of Tipulidae in the mountains of Formosa.

*Limnobia viridula*, new species.

General coloration light green; antennal scape dark brown, the flagellum pale brownish testaceous; vertex between the eyes silvery white; pronotum and anterior margin of praescutum with a narrow brown, median stripe; legs brown; wings subhyaline, stigma small.

*Male*.—Length, 6.8 mm.; wing, 8.6 mm.

Rostrum and palpi dark brown. Antennae with the scape dark brown, the flagellum conspicuously pale brownish testaceous. Head dark brown, the vertex between the eyes conspicuous silvery white.

Pronotum light green with a narrow brown median stripe. Mesonotum light green, the cephalic portion of the praescutum with indications of a brown median stripe. Pleura light green. Halteres pale, the knobs infuscated. Legs with the coxae and trochanters pale green; remainder of the legs brown, the femoral bases a little paler. Wings subhyaline; stigma small, circular, pale brown; veins brown. Venation: *Sc*<sub>1</sub> ending nearly opposite *r-m*; *Rs* arcuated; *r* at tip of *R*<sub>1</sub>; cell 1st *M*<sub>2</sub> rectangular; veins beyond the cord long and parallel as in the genus *Libnotes*; basal deflection of *Cu*<sub>1</sub> just before the fork of *M*.

Abdomen light green, including the hypopygium; pleural membrane faintly infuscated. Male hypopygium with the

dorsal pleural appendage small; ventral pleural appendage large, the rostriform lobes bearing a single acute spine.

*Habitat*.—Formosa.

Holotype, ♂, Urai, altitude about 1,500 feet, October 2, 1921 (T. Esaki).