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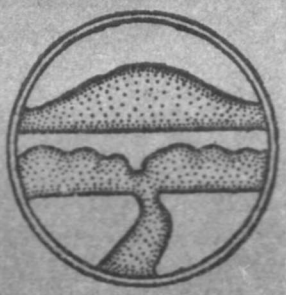

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STUDIES ON THE TIPULIDAE OF CHINA (DIPTERA)
III. New or little-known Crane-flies from Tien-mu-shan, Chekiang

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The preceding part under this general title was published in the Lingnan Science Journal, Vol. 17 : 337-356, 14 fig., July 1938. In the present part I wish to consider the first half of an important collection of these flies that was taken between mid-May and early July 1937 by my good friend Mr. E. Suenson, of Shanghai, to whom I am greatly indebted for many kind favors in the past. This series of flies was taken at various altitudes on Tien-mu-shan, in northwestern Chekiang, a mountain from which numerous new and rare species of crane-flies have been taken in recent years. Since this particular locality is becoming so important to many entomologists, I have requested of Mr. Suenson a brief account of the area and of his itinerary in 1937. The very interesting account is as follows:

"Regarding the locality 'Tien-mu-shan' (meaning *heaven-eye mountain*), in Chekiang, this is very different from what I had formerly seen in Chekiang. A newly constructed road runs almost due west from Hangchow, this passing through country that presents much the same type of landscape as the main part of southern Chekiang,—well-watered valleys with cultivation of rice and other crops between low hills that are covered with brushwood and bamboo. In some parts the hills appear drier, covered with tall grass and small oak bushes, in the spring with many azaleas and other flowers. In still other places the hills are wetter and the brushwood is very dense, with a great proportion of evergreen bushes and trees. It is a beautiful and varied landscape. The road runs through such country past Lin-an. Shortly before it reaches the border of Anhwei there is a road extending for a short distance north to the foot of Tien-mu-shan. This is a solitary mountain rising much higher than the surrounding hills, its summit reaching 1500 meters. I had bad weather and very few days without rain, and stayed most of the time in a big monastery at the foot of the mountain at an elevation of 350 meters. All was covered with fine woods with some large to very large trees. Just behind the monastery there were some very large Cryptomerias, the largest I had seen. A mountain stream flows down the hillside, fed from several tributaries. The woods

consists mainly of deciduous trees, with a good deal of bamboo. A path leads from the monastery to the top of the hill, first over a more gradual slope and then over a very steep wall. Here the woods change into an almost pure stand of Cryptomerias, which become larger and larger the higher one ascends until at the upper end of the steep wall they become very fine specimens, much finer than those immediately behind the monastery at the foot. Where the path reaches the upper edge of the steep portion there is a small temple, at an elevation of 1050 meters. From here the woods again change character. There are no more Cryptomerias but a great variety of deciduous trees. The path goes over a gentle slope to the summit and all is covered with very fine woods, the trees becoming smaller towards the top.

I arrived at Tien-mu-shan on the 14th of May and collected around the monastery at the foot. On the 22nd of June I went up to the temple at the 1050 meter level and collected there until the 3rd of July. On the 4th of July I returned to Shanghai. I found the fauna so interesting that I should like very much to collect there again, especially around the summit. I found some similarity to the fauna of southern Japan and would like very much to know the results of your studies, as a friend of mine, a butterfly collector, has found a similarity to the fauna of western China."—E. Suenson.

When the study of the entire collection is completed it is expected that some interesting conclusions regarding the affinities of the Tipulidae of Tien-mu-shan may be reached. It is planned to include the second half of this study in a further paper under this general title. It may be noted that co-incidentally with the above I am studying a still further extensive series of Tipulidae from Tien-mu-shan taken by the Reverend Dr. Octave Piel, of the Musée Heude, and this second series contains so many additional species that it is quite evident that the complete fauna of the mountain must be very extensive. I am greatly indebted to Mr. Suenson for the privilege of retaining the types of the material here discussed in my extensive collection of the World Tipulidae.

Tipulinae

1. **Longurio (Longurio) fulvus** Edwards

   1916. *Longurio fulvus* Edwards, Ann. Mag. Nat. Hist., (8)18 :262.

   Tien-mu-shan, June 1-21, 1937 (Suenson).

2. **Tipula (Oreomyza) opinata** n.sp. (fig. 1, 10)

General coloration of thorax yellow, the disk of praescutum and the scutal lobes reddish brown; antennae with basal two segments yellow, flagellum black; legs brownish yellow, the tips of femora and tibiae restrictedly darkened; wings with a brown tinge, the costal region and stigma slightly darker brown; R_{1+2} almost entirely atrophied; basal abdominal segments obscure yellow, the intermediate segments brownish yellow, the terminal four segments black;

male hypopygium with the caudal border of tergite bearing two unusually slender lobes separated by a shallow U-shaped emargination; inner dististyle with the beak very obtuse; notch of ninth sternite with two conspicuous subglobular lobes provided with long conspicuous setae.

Male.—Length, about 9.5-10 mm.; wing, 12-13 mm.; antenna, about 3.4-3.5 mm.

Frontal prolongation of head yellow to brownish yellow; nasus long and slender, concolorous; basal segments of palpi obscure yellow, the outer segments infuscated. Antennae of moderate length; scape and pedicel light yellow, flagellum uniformly black; flagellar segments with small basal swellings; longest verticils subequal in length to the segments. Front and anterior vertex orange-yellow, the posterior vertex and occiput abruptly grayish brown, with

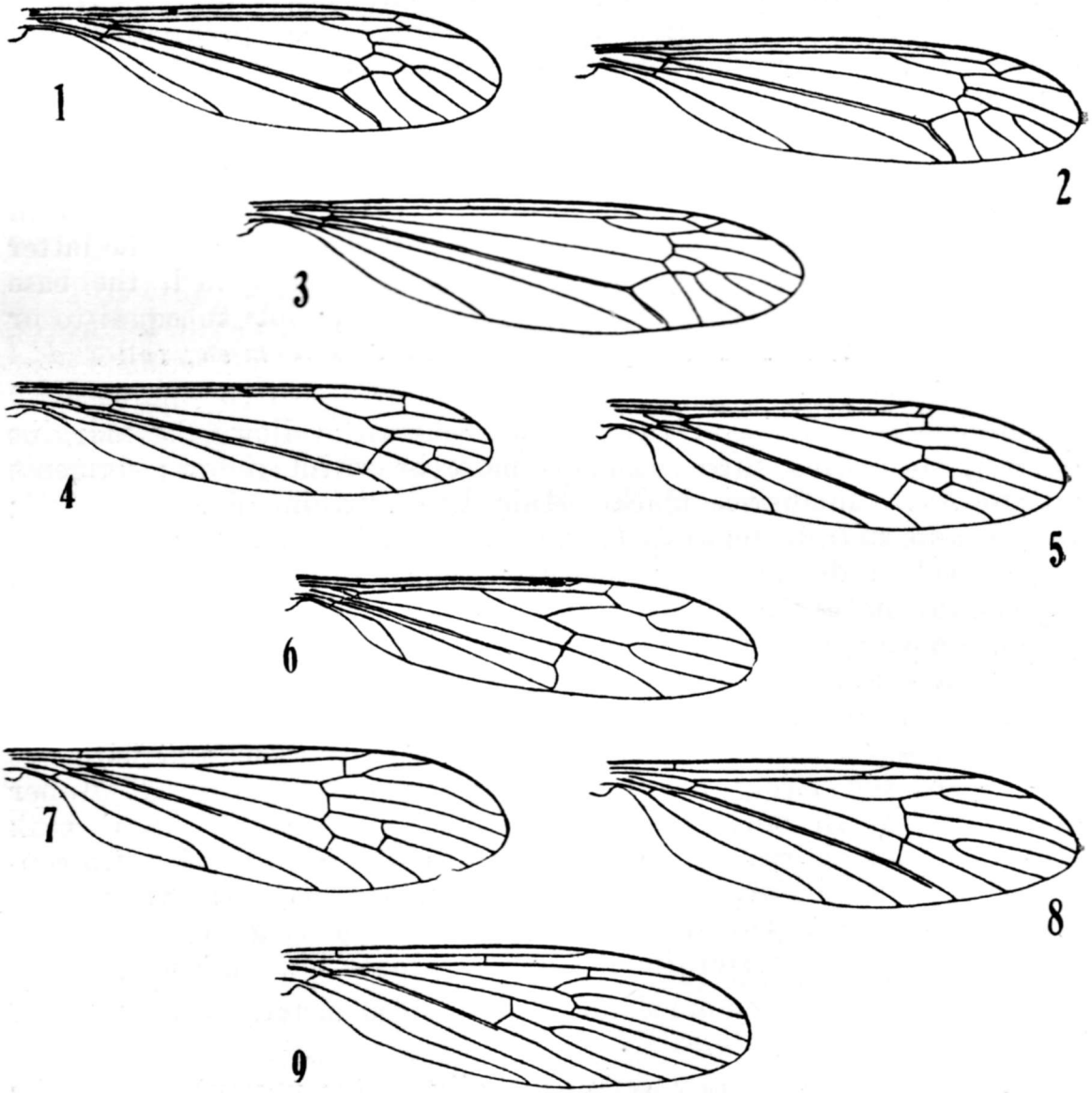

Fig. 1, *Tipula* (*Oreomyza*) *opinata* n.sp., venation; fig. 2, *Tipula* (*Oreomyza*) *repugnans* n.sp., venation; fig. 3, *Tipula suensoniana* n.sp., venation; fig. 4, *Limonia* (*Dicranomyia*) *sordidipennis* n.sp., venation; fig. 5, *Protohelius nigricolor*, n.sp., venation; fig. 6, *Trentepohlia* (*Trentepohlia*) *bifuscigera* n.sp., venation; fig. 7, *Dasymallomyia clausa* n.sp., venation; fig. 8, *Gonomyia* (*Protogonomyia*) *tienmuensis*, venation; fig. 9, *Molophilus* (*Molophilus*) *duplicatus* n.sp., venation.

indications of a slightly darker median vitta; anterior vertex unusually wide, approximately four times the diameter of scape.

Pronotum brownish yellow. General coloration of mesonotal praescutum light yellow, this color including the broad humeral and lateral portions, the disk occupied by virtually confluent reddish brown stripes that cross the suture and include the scutal lobes; median region of scutum obscure yellow, the scutellum brighter yellow, the posterior border and the parascutella darker; mediotergite yellow. Pleura, pleurotergite and dorso-pleural membrane yellow. Halteres brown, the knob darker, the base of stem restrictedly obscure yellow. Legs with the coxae and trochanters yellow; femora brownish yellow, the tips narrowly darker brown, the bases clearer yellow; tibiae brownish yellow, the tips very narrowly darker; basitarsi pale brown, the tips darker; outer tarsal segments dark brown; each claw (male) with two widely separated teeth. Wings (fig. 1) with a brownish tinge, the prearcular and costal fields more yellowish brown; stigma slightly darker brown, its proximal end before the free tip of Sc_2 more yellowish; relatively conspicuous obliterative areas before stigma and across base of cell *1st* M_2; veins brown. Squama naked; veins beyond cord with abundant trichia, lacking or very sparse on basal half of M_3 and on M_4. Venation: Sc_2 ending shortly beyond midlength of Rs, the latter about one-half longer than *m-cu;* tip of R_{1+2} atrophied, the base represented by a naked spur; cell M_1 deep, its petiole subequal to or shorter than *m;* cell M_4 deep, vein M_4 about twice *m-cu;* cell *2nd A* relatively narrow.

Abdomen with basal two tergites obscure yellow, the margins darker; succeeding three segments more brownish yellow; segments six to nine, inclusive, black. Male hypopygium (fig. 10) small; tergite and sternite separated by suture and pale membrane; suture of basistyle indicated only beneath. Ninth tergite, *9t*, transverse, the caudal margin produced into two very slender, spiniform lobes, widely separated by a shallow U-shaped emargination, the lobes with blackened spinulae, the margin of the notch with fewer such points, including a somewhat more conspicuous submedian pair. Outer dististyle, *od*, a clavate lobe, the stem unusually stout and with but few setae, the feebly dilated blade with numerous setae. Inner dististyle, *id*, in outline somewhat mitten-shaped, the usual beak pale and very obtuse. Notch of the ninth sternite, *9s*, with two conspicuous subglobular lobes that are provided with very long conspicuous setae. Gonapophyses, *g*, appearing as glabrous paddle-like blades. Eighth sternite feebly emarginate but unarmed.

Holotype, ♂, Tien-mu-shan, altitude 1050 meters, June 25, 1937 (*Suenson*). *Paratopotype*, ♂.

I cannot indicate any very close ally of the present fly. In its general appearance it more closely resembles species of the subgenus *Lunatipula* Edwards but the naked squama induces me to refer it to *Oreomyza* Pokorny though with much question in my mind. The

pattern of the mesonotum and the structure of the gonapophysis is suggestive of the condition found in the subgenus *Yamatotipula* Matsumura.

3. **Tipula (Oreomyza) repugnans** n.sp. (fig. 2)

General coloration of thorax yellow, the praescutum on cephalic half with two brown lines representing the mesal edges of the usual intermediate stripes; frontal prolongation of head brownish black, nasus distinct; wings with a grayish tinge, the prearcular and costal fields more brownish yellow; stigma pale brown; veins beyond cord with abundant trichia; *Rs* about twice *m-cu; R_{1+2}* entire; *m-cu* some distance before fork of M_{3+4}; abdomen yellow with a terminal black ring; tergites with a median brownish black stripe; genital shield black.

Female.—Length, about 15 mm.; wing, 16 mm.

Frontal prolongation of head brownish black; nasus distinct; palpi black, the apex of terminal segment paling to obscure orange. Antennae with scape and pedicel brownish yellow, flagellum brown, the segments with long conspicuous verticils that exceed the segments in length. Head with the simple vertical tubercle buffy yellow; posterior portion of head brownish gray.

Pronotum dark brown medially, the sides obscure yellow. Mesonotal praescutum yellow, the four usual stripes concolorous, barely indicated by slightly darker borders, the mesal edges of the intermediate stripes on the cephalic half of sclerite dark brown, conspicuous, and at first sight appearing to be the only praescutal markings; posterior sclerites of notum yellow. Pleura yellow. Halteres relatively long, stem brownish yellow, knob dark brown. Legs with the coxae and trochanters yellow; femora obscure yellow, the tips narrowly and rather weakly infuscated; tibiae obscure yellow, the tips very narrowly darkened; tarsi dark brown; tibial spur formula 1—2—2. Wings (fig. 2) with a grayish tinge, the prearcular and costal fields more brownish yellow; stigma pale brown, not conspicuous; veins pale brown, stout. Squama small, without major setae; veins beyond cord, as far caudad as M_3, with abundant trichia; M_4 glabrous. Venation: *Rs* long, approximately twice *m-cu; R_{1+2}* entire; cell *1st* M_2 relatively small, its outer end pointed; *m-cu* a distance before fork of M_{3+4} about equal to *r-m;* cell *2nd A* relatively narrow.

Abdominal tergites yellow, the surface subnitidous; a brownish black median stripe beginning on the second segment, on the sixth and succeeding segments including the entire tergite; pleural membrane and lateral tergal borders darkened; sternites obscure brownish yellow, the posterior borders of the segments pale; subterminal ring and genital shield black; valves of ovipositor horn-yellow; cerci slender, straight, the margins smooth; hypovalvae a little deeper, the tips narrowly obtuse.

Holotype, ♀, Tien-mu-shan, altitude 1050 meters, June 25, 1937 (*Suenson*).

I am somewhat uncertain of the subgeneric position of the present fly but believe that the assignment to *Oreomyza* is correct. It can scarcely be placed in *Acutipula* Alexander which is apparently the only other possibility. The fly is readily told by the uniformly brownish black frontal prolongation of the head, peculiar pattern of the mesonotum, and by the position of *m-cu* some distance before the fork of M_{3+4}, a character found in the subgenus *Nippotipula* Matsumura but very uncommon elsewhere in the genus.

4. **Tipula suensoniana** n.sp. (fig. 3, 11)

Belongs to the *filicornis* group; general coloration of mesonotum obscure brownish yellow, the praescutum with four gray stripes that are narrowly bordered by brown; scutellum, postnotum and pleura yellow, with a sparse whitish bloom; wings with a brownish tinge, the costal border and stigma darker brown; abdomen brownish yellow with a conspicuous brownish black subterminal ring; male hypopygium with the tergite unarmed above except for long conspicuous yellow setae; outer dististyle unusually long and narrow, with a broad-based spiniferous flange.

Male.—Length, about 21 mm.; wing, 22 mm.; antenna, about 19.5 mm.

Frontal prolongation of head brownish yellow on sides, light gray above; nasus distinct; palpi pale brown. Antennae (male) elongate, as shown by the measurements; scape, pedicel and base of first flagellar segment yellow, remainder of flagellum light brown; segments with abundant white pubescence and scattered elongate black verticils; flagellar segments long-cylindrical, with poorly indicated basal tubercles. Head with front, anterior vertex and restricted orbits buffy, the center of vertex gray with the median area more infuscated.

Mesonotal praescutum with the ground color obscure brownish yellow, with four gray stripes that are narrowly bordered by brown, the mesal edges of the intermediate stripes confluent to form a distinct brown median vitta; scutum brownish gray, each lobe with a more brownish ring; scutellum and mediotergite yellow, with golden setae; praescutum without setae. Pleura yellow with a sparse whitish bloom. Halteres with stem brown, the knob darker brown. Legs with the coxae whitish yellow; trochanters yellow; femora brownish yellow, the tips narrowly and weakly infuscated; tibiae yellowish brown, the tips narrowly dark brown; tarsi passing into black. Wings (fig. 3) with a brownish tinge, the costal border darker brown, this latter area involving the prearcular field, cells *C* and *Sc*, and the extreme cephalic border of cell *R*; stigma conspicuous, slightly darker than the costal border; a very restricted to scarcely evident dark seam on anterior cord; obliterative areas before stigma and across base of cell *1st* M_2 somewhat restricted; veins

brown. Wing-petiole relatively long and slender; squama naked; veins beyond cord with abundant trichia. Venation: *Rs* about one-third longer than *m-cu; R_{1+2}* entire, without trichia except at base; *m-cu* and petiole of cell *1st* M_2 subequal; *m-cu* just before fork of M_{3+4}.

Basal abdominal tergites yellow, the outer segments more infuscated; sternites yellow; a conspicuous brownish black subterminal ring involving the sixth and seventh segments; hypopygium yellow. Male hypopygium with the tergite unarmed except for long conspicuous yellow setae and low ventro-apical lobes set with spinous setae. Dististyles (fig. 11) shaped as illustrated, the outer long-attenuate, its spiniferous flange broad-based.

Holotype, ♂, Tien-mu-shan, June 7, 1937 (*Suenson*).

I take unusual pleasure in naming this interesting species in honor of the collector, Mr. E. Suenson, to whom I much indebted for numerous Tipulidae from Japan and eastern China taken during the past fifteen years. The nearest ally is *Tipula lackschewitziana* Alexander, from the high mountains of Formosa. This latter fly differs conspicuously in size, coloration and structure of the male hypopygium. A third species of the group in eastern Asia is *T. parvauricula* Alexander, from the highest mountains of western Fukien in eastern China; this is entirely different from either of the two species listed above.

Limoniinae

5. **Limonia (Dicranomyia) pammelas** (Alexander)

1924. *Dicranomyia pammelas* Alexander, Ann. Ent. Soc. America 17: 433-434.

Tien-mu-shan, May 30, 1937 (*Suenson*); 1 female. Hitherto from Japan (Honshiu, Kiushiu).

6. **Limonia (Dicranomyia) sordidipennis** n.sp. (fig. 4, 12)

Belongs to the *tristis* group; general coloration gray, the praescutum with three more blackish stripes; terminal segment of antennae elongate; wings narrow, with a strong brownish tinge, restrictedly patterned with still darker brown; male hypopygium with the tergite transverse, the caudal margin straight or very feebly emarginate medially; basistyle with the tubercles and secondary armature very reduced; rostral spines of the ventral dististyle entirely separated, arising from small basal tubercles.

Male.—Length, about 6 mm.; wing, 7 mm.

Rostrum and palpi black. Antennae with scape brown, pedicel and flagellum black; flagellar segments passing from short-oval to elongate, the terminal segment very long, approximately one-half longer than the penultimate. Head dark gray; anterior vertex narrow, with a median carina (the latter possibly an abnormality of the unique type).

Mesonotal praescutum gray with three more blackish stripes, the median one weakly constricted before midlength; posterior sclerites of notum brownish black, pruinose. Pleura gray pruinose. Halteres relatively long, stem yellow, knob infuscated. Legs with the coxae black, sparsely pruinose; trochanters testaceous yellow; femora obscure brownish yellow, passing into darker; remainder of legs brown. Wings narrow, with a strong brown tinge, the oval stigma darker brown; very faint darkenings at origin and fork of *Rs*, fork

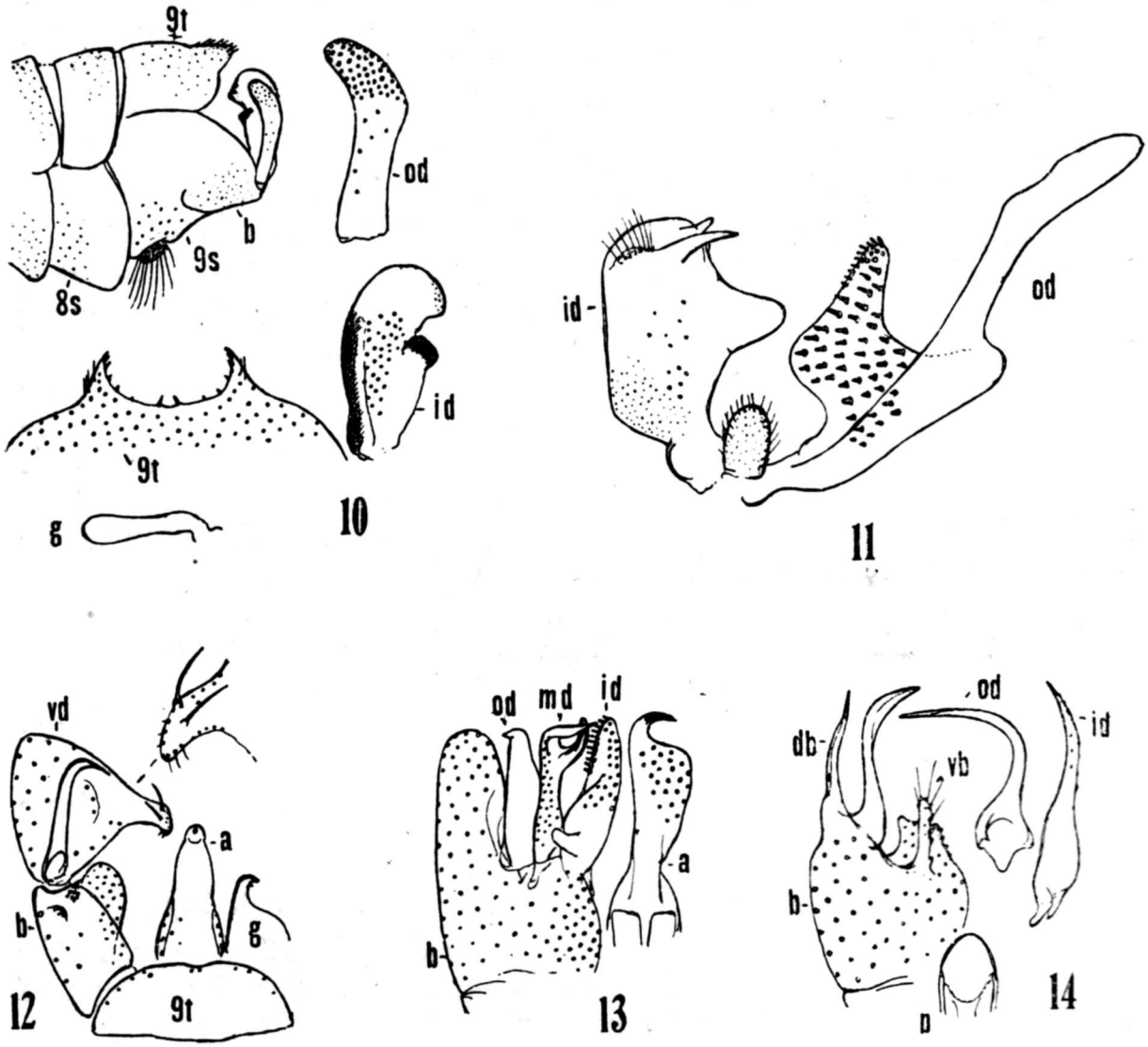

Fig. 10, *Tipula* (*Oreomyza*) *opinata* n.sp., details of male hypopygium; fig. 11, *Tipula suensoniana* n.sp., male hypopygium, dististyles; fig. 12, *Limonia* (*Dicranomyia*) *sordidipennis* n.sp., male hypopygium; fig. 13, *Gonomyia* (*Protogonomyia*) *tienmuensis* n.sp., male hypopygium; fig. 14, *Molophilus* (*Molophilus*) *duplicatus* n.sp., male hypopygium.

(Explanation: *a*, aedeagus; *b*, basistyle; *db*, dorsal lobe of basistyle; *g*, gonapophsis; *id*, inner dististyle; *md*, intermediate dististyle; *od*, outer dististyle; *p*, phallosomic plate; *s*, sternite; *t*, tergite, *vb*, ventral lobe of basistyle; *vd*, ventral dististyle.)

of *M* and at arculus; veins brown. Venation: Sc_1 ending just before origin of *Rs*, Sc_2 at its tip; free tip of Sc_2 and R_2 almost in transverse alignment; *m-cu* at fork of *M*.

Abdomen dark brown, the basal sternites more obscure yellow. Male hypopygium (fig. 12) with the tergite, *9t*, transverse, the caudal margin straight or very feebly emarginate medially; tergal setae weak, arranged along the cephalic margin, including an intermediate

pair. Basistyle, *b*, without conspicuous armature, besides the simple ventromesal lobe, this consisting of an outer, very low tubercle provided with five or six long setae and a close group of about eight setae on opposite face of style. Dorsal dististyle with the apex a long acute spine. Ventral dististyle, *vd*, of moderate size; rostral prolongation with the two spines entirely separated, both arising from small basal tubercles. Gonapophyses, *g*, with mesal-apical lobe blackened, its apex directed laterad or even slightly decurved, the margin with one or two smaller denticles.

Holotype, ♂, Tien-mu-shan, May 28, 1937 (*Suenson*).

Limonia (*Dicranomyia*) *sordidipennis* is most nearly allied to *L.* (*D.*) *sordida* (Brunetti) and *L.* (*D.*) *variispina* (Alexander), from both of which it differs conspicuously in the narrow wings and in the structure of the male hypopygium. It is closest to *variispina* in the transverse tergite but differs in all details of hypopygial structure.

7. **Limonia (Limonia) xanthopteroides** (Riedel)

1917. *Limnobia xanthopteroides* Riedel, Arch. für Naturgesch. 82 : Abt. A, Heft 5 :110-111.

Tien-mu-shan, May 30-June 4, 1937 (*Suenson*). I have also seen it from the hills south of Ningpo, Chekiang, halfway to Nimrod Sound, May 1, 1925 (*Suenson*). Described from Formosa; also occurs in western China. There is a considerable range in size in the present series of specimens (*male* wing, 8.5-12 mm.). In the male hypopygium, the mesal-apical lobe of the gonapophysis is very slender and bears a tuft of short setae at tip.

8. **Protohelius nigricolor** n.sp. (fig. 5)

General coloration black, the surface subnitidous; antennae 15-segmented, the terminal two segments subequal in length; fore femora black, the bases restrictedly brightened; middle and hind femora yellow with the tips narrowly blackened; tibiae yellow, the fore pair darker; wings with a dusky tinge, the prearcular field yellow; stigma short-oval, dark brown, conspicuous; *m-cu* usually beyond origin of *Rs;* abdomen black, genital segment (female) orange.

Male.—Length, about 7 mm.; wing, 7.5 mm.; antenna, about 2.5 mm.

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

Rostrum black, very sparsely pruinose. Antennae 15-segmented, black throughout; flagellar segments elongate, exceeding the verticils in length; terminal segment subequal in length to the penultimate. Head brownish gray, somewhat darker brown behind; anterior vertex (male) relatively narrow, a little more than the diameter of the scape, the eyes correspondingly large, with delicate ommatidia.

Thorax black, the surface subnitidous or very feebly dusted with gray. Halteres with stem dirty white, knob dark brown. Legs with

coxae black, very sparsely pruinose; trochanters yellow; fore femora black, only the bases restrictedly brightened; middle and hind femora yellow with the tips narrowly blackened; tibiae yellow, the tips narrowly darkened, the fore pair darker; tarsi passing through brown to black. Wings (fig. 5) with a dusky tinge, the prearcular field yellow; stigma short-oval, dark brown, conspicuous; veins dark brown, bright-colored in the prearcular field. Venation: Free tip of Sc_2 distinctly preserved, a little nearer R_{1+2} than to Sc_1; *m-cu* at or, in most cases, a short distance beyond fork of *M*.

Abdomen black; basistyli of male hypopygium slightly paler; genital segment of female orange; bases of cerci yellowish horn color, their apices darkened.

Holotype, ♂, Tien-mu-shan, June 7, 1937 (*Suenson*). *Allotopotype*, ♀, with the type. *Paratopotypes*, 2 ♀♀, June 7-9, 1937.

In its uniformly black coloration, *Protohelius nigricolor* differs very strikingly from the two species previously made known from eastern Asia.

9. **Antocha (Antocha) indica** Brunetti

1912. *Antocha indica* Brunetti, Fauna Brit. India, Diptera Nematocera, p. 426.

Tien-mu-shan, June 3, 1937 (*Suenson*); 1 male. Hitherto known from the Himalayan Region and western China.

10. **Elliptera jacoti** Alexander

1925. *Elliptera jacoti* Alexander, Ann. Mag. Nat. Hist., (9)15 : 388.

Tien-mu-shan, May 31, 1937 (*Suenson*); 1 female.

11. **Dicranota (Amalopina) fumicostata** Alexander

1935. *Dicranota* (*Amalopina*) *fumicostata* Alexander, Philippine Jour. Sci. 56 : 357-358.

Tien-mu-shan, altitude 1050 meters, June 25, 1937 (*Suenson*); 4 males. Known hitherto only from northern Formosa.

12. **Trentepohlia (Trentepohlia) bifascigera** n.sp. (fig. 6)

General coloration black; halteres infuscated; legs yellow; wings whitish hyaline, the base and two broad outer bands brown, the more distal of the latter including the broad tip; valves of ovipositor intense horn-yellow.

Female.—Length, about 7 mm.; wing, 5.3 mm.

Rostrum and palpi black. Antennae with the scape and pedicel black, the flagellum pale brown, the outer segments darker brown; flagellum relatively long, the segments long-oval to elongate. Head dark gray; anterior vertex narrow.

Thorax uniformly black, the surface subnitidous. Halteres infuscated, the base of stem narrowly yellow. Legs with the coxae

brownish black, the posterior pair somewhat brightened apically; remainder of legs pale yellow, only the terminal two tarsal segments pale brown. Wings (fig. 6) with the ground color whitish subhyaline, the prearcular and costal portions a trifle more yellowish; two conspicuous brown bands, the outer one apical, its inner margin crossing the exact bases of the two outer forks; inner band broad, its outer margin clearly delimited, extending from the apex of Sc_1 and passing the bases of cells M_3 and M_4; inner edge of this band more diffuse, including the origin of *Rs*, narrowed behind; a more restricted basal darkening, including the bases of cells *Cu* and *A*, interconnected with the central dark area by a broad seam along vein *Cu*, embracing most of cell *M*; veins brown in the darkened portions, pale yellow in the ground areas, in the subterminal pale band very pale to scarcely evident. Venation: *Rs* a little less than twice the basal section of R_5; R_{2+3+4} long and sinuous; R_2 subequal to R_{3+4}; R_4 strongly upcurved; m-cu close to the fork of *M*; apical fusion of Cu_1 and *1st A* punctiform.

Abdomen black, the valves of the ovipositor intense horn-yellow.

Holotype, ♀, Tien-mu-shan, June 11, 1937 (*Suenson*).

Generally similar to species such as *Trentepohlia* (*Trentepohlia*) *pictipennis* Bezzi, *T.* (*T.*) *proba* Alexander and *T.* (*T.*) *pulchripennis* Alexander, differing conspicuously in the pattern and venation of the wings.

13. **Gymnastes (Paragymnastes) flavitibia apicata** n.subsp.

Male.—Length, about 4-4.5 mm.; wing, 4.5-5 mm.

Female.—Length, about 5-5.5 mm.; wing, 5.5-6 mm.

Agreeing with typical *flavitibia* Alexander (Japan) in the extensive to complete basal dark band of the wing, differing in the very extensive and virtually terminal black ring of the posterior femora. Fore femora uniformly black; middle femora black with a very narrow, obscure yellow ring at near one-third the length; posterior femora elongate and strongly clavate, almost the entire swollen portion occupied by the outer black ring, only the apex remaining very narrowly pale; posterior tibiae yellow with a vague darkening on basal fifth, with the outer fourth slightly incrassated and intensely black.

Holotype, ♂, Tien-mu-shan, May 20, 1937 (*Suenson*). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, 4 ♂♀, May 19-June 10, 1937.

14. **Dasymallomyia clausa** n.sp. (fig. 7)

General coloration reddish yellow, extensively patterned with polished black, the latter color chiefly covering the mesonotum; flagellar segments weakly bicolored, brown, with the incisures yellow; legs yellow, the femora with a very narrow subterminal brown ring; terminal tarsal segments black; wings yellowish sub-

hyaline, clearer yellow in the prearcular and costal regions; a conspicuous brown pattern at stigma, along cord and on outer end of cell *1st* M_2; cell *1st* M_2 closed; abdominal tergites black, narrowly ringed caudally with yellow; sternites yellow with brown lateral triangles.

Female.—Length, about 6-7 mm.; wing, 6-7 mm.

Rostrum dark brown; palpi paler brown. Antennae with scape and pedicel obscure yellow; flagellar segments weakly bicolored, narrowly yellow at the incisures, the remainder dark brown, the outer segments more uniformly darkened; basal flagellar segments with the lower face produced, the outer segments passing into long-oval; terminal segment a little shorter than the penultimate; verticils conspicuous, much exceeding the segments. Head light gray.

Pronotum light yellow above, black on the sides. Mesonotal praescutum with the restricted ground obscure reddish yellow, in cases the interspaces almost obliterated by the three very extensive, polished black stripes, the lateral pair reaching the lateral margins of the sclerite; humeral region restrictedly yellow; scutum similarly blackened, the median area and posterior portions of the lobes yellow; scutellum and postnotum polished black. In some specimens the praescutal stripes are narrower and with more evident ground interspaces. Pleura chiefly black, the dorsopleural, ventral pteropleural and meral regions yellow. Halteres short, pale yellow, the stem a little darkened. Legs with the fore coxae black, the remaining coxae and all trochanters yellow; femora yellow with a narrow brown subterminal ring; tibiae and basitarsi yellow, the terminal tarsal segments black; legs very conspicuously hairy, as in the genus. Wings (fig. 7) yellowish subhyaline, the prearcular and costal fields slightly brighter yellow; stigma and conspicuous seams at cord and outer end of cell *1st* M_2 brown; narrow dark seams at arculus, origin of *Rs* and Sc_2; veins brown, clear yellow in the flavous costal portions. Venation: Sc_1 ending a short distance before fork of *Rs*, Sc_2 some distance from its tip; R_{2+3+4} nearly in longitudinal alignment with *Rs;* cell R_2 of normal width; vein R_2 subequal to or longer than R_{3+4}; cell *1st* M_2 closed; *m-cu* at near one-fourth the length of cell.

Abdominal tergites black, narrowly ringed caudally with yellow; sternites more dimidiate, with brown triangles on sides at base, in some cases extending across the segment as a basal band. Ovipositor with the very elongate cerci horn-yellow.

Holotype, ♀, Tien-mu-shan, June 16, 1937 (*Suenson*). *Paratopotypes*, 4 ♀♀, May 16-25, 1937.

Dasymallomyia clausa differs conspicuously from the two species hitherto described in the closed cell *1st* M_2 of the wings. It differs further in several details of coloration and venation.

15. **Gonomyia (Protogonomyia) tienmuensis** n.sp. (fig. 8, 13)

Size large (wing, male, 7 mm. or more); general coloration black; R_3 very long, exceeding twice R_{2+3+4}; male hypopygium with three dististyles, all subequal in length; intermediate style bifid at apex, the branches short; apical spine of aedeagus a short curved pale hook.

Male.—Length, about 5.5-6 mm.; wing, 7-7.5 mm.; antenna, about 2-2.2 mm.

Rostrum and palpi black. Antennae of moderate length; scape black, remainder of organ dark brown; flagellar segments long-oval, verticils conspicuous. Head black, very sparsely pruinose; vertex wide.

Prothorax and mesothorax dull black, the mesonotal scutellum a little more pruinose. Halteres black throughout. Legs black. Wings (fig. 8) with a strong blackish suffusion, the long narrow stigma darker brown; veins and trichia dark brown. Venation: Sc_1 ending about opposite the fork of *Rs*, Sc_2 at near two-thirds the length of this vein; R_3 very long, exceeding twice the length of R_{2+3+4}; *m-cu* at or some distance beyond fork of *M*, the distance variable.

Abdomen dark brown, the posterior margins of the segments narrowly more blackened; hypopygium black. Male hypopygium (fig. 13) with the outer lobe of basistyle, *b*, stout, with long conspicuous setae. Three dististyles, all subequal in length, extending about to distal end of lobe of basistyle; outer style, *od*, a flattened glabrous blade that narrows gradually to the subtruncated apex, this more or less produced laterad into a short point; intermediate style, *md*, bifid at apex, the branches short, subequal in length, the outer one produced into a long spine, the inner branch more blade-like, its apex obtuse; stem and main axis of style with long coarse setae; inner dististyle, *id*, at base bearing a conspicuous finger-like glabrous lobe; distal two-thirds of style with conspicuous setae, at apex on inner edge arranged as a comb. Apex of aedeagus, *a*, a short curved pale hook; surface of aedeagus with relatively sparse, very long setae.

Holotype, ♂, Tien-mu-shan, May 23, 1937 (*Suenson*). *Paratopotype*, ♂.

The nearest allied species are the Formosan *Gonomyia* (*Protogonomyia*) *confluenta* (Alexander) and *G.* (*P.*) *scutellum-album* Alexander, and the western Chinese *G.* (*P.*) *perturbata* Alexander, all of which differ conspicuously in the structure of the male hypopygium. Of these species, *scutellum-album* is the most distinct as regards hypopygial structure. What has been described as being a third or inner dististyle certainly appears to be such rather than an inner lobe of the basistyle.

16. **Molophilus (Molophilus) duplicatus** n.sp. (fig. 9, 14)

Belongs to the *gracilis* group and subgroup; general coloration dark brown; legs brownish black; wings broad, weakly tinged with dusky, the unusually long and abundant macrotrichia dark brown; vein *2nd A* long; male hypopygium with the dorsal lobe of basistyle produced into two elongate sclerotized rods; ventral lobe of basistyle very small and slender; both dististyles simple, the outer a long slender curved rod that narrows to an acute tip; phallosomic plate obtusely rounded at apex.

Male.—Length, about 4 mm.; wing, 4.5 mm.; antenna, about 1.2 mm.

Rostrum and palpi black. Antennae of moderate length, dark brown; flagellar segments oval, the basal segments more crowded, with truncate ends; verticils conspicuous. Head dark grayish brown.

Thorax almost uniformly dark brown, the lateral pretergites obscure yellow. Halteres clothed with silken yellow setae. Legs with the fore coxae darkened, middle and posterior coxae paler; trochanters yellow; remainder of legs brownish black, the posterior pair brighter at bases. Wings (fig. 9) broad, subhyaline, or weakly tinged with dusky; veins and the very long, abundant macrotrichia dark brown; costal fringe long and dense. Venation: R_2 lying distad of level of *r-m;* petiole of cell M_3 about twice *m-cu;* vein *2nd A* long, ending almost opposite outer end of petiole of cell M_3.

Abdomen, including hypopygium, brownish black. Male hypopygium (fig. 14) with the dorsal lobe of basistyle, *db*, produced into two elongate sclerotized rods, the outer slightly more slender and sinuous, from a dilated base, the inner subequal in length, sinuous, its apex a compressed blade; ventral lobe of basistyle, *vb*, very small and slender. Outer dististyle, *od*, a long, slender, strongly curved rod, narrowed to the long-extended acute tip. Inner dististyle, *id*, shorter, subequal in length to the dorsal blades of the basistyle, a simple rod with the base slightly expanded, the tip acute; phallosomic plate, *p*, obtusely rounded at apex. In order to avoid confusion, in the figure the dististyles are shown as separate items.

Holotype, ♂, Tien-mu-shan, altitude 1050 meters, June 25, 1937 (*Suenson*).

Molophilus (Molophilus) duplicatus is allied to *M. (M.) avidus* Alexander (northern Korea) and *M. (M.) tseni* Alexander (western China) in that all three species have the dorsal lobe of the basistyle of the male hypopygium produced into two spinous points instead of the usual single lobe, and further in having the ventral lobe of the basistyle unusually small and slender. The present fly differs in the coloration and in the details of structure of the male hypopygium.

中國大蚊科之研究(雙翅目)

III. 浙江天蕞山之新大蚊及其鮮經研究之品種

亞力山大著

美國士得色米沙麻大學

(摘要)

文中詳述天蕞山之大蚊十六種。各標本乃由 Suenson 氏採自該山高低不同之高度。計屬新種者有：*Tipula* (*Oreomyza*) *opinata*, *T.* (*O.*) *repugnans*, *T. suensoniana*, *Limonia* (*Dicranomyia*) *sordidipennis*, *Protohelius nigricolor*, *Trentepohlia* (*T.*) *bifascigera*, *Gymnastes* (*Paragymnastes*) *flavitibia apicata*, *Dasymallomyia clausa*, *Gonomyia* (*Protogonomyia*) *tienmuensis*, 及 *Molophilus* (*M.*) *duplicatus*.