

## THREE NEW CRANE-FLIES FROM JAPAN\*

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ONE PLATE AND SIX TEXTFIGURES

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Here I intend to report a marine and two mountain crane-flies. The former species was collected on the coral reef at the Loochoo Islands by Prof. Dr. Teiso Esaki and represents the eleventh marine crane-fly. The latter species are subapterous peculiar insects and were collected by Mr. K. Imanishi from the Japanese Alps.

I am very greatly indebted to the above-mentioned entomologists for the privilege of retaining the invaluable specimens in our laboratory.

### *Limonia (Idioglochina) pacifica* sp. nov.

This species was collected from the coral reef between the tide marks. Females were laying eggs among algæ during the ebb-tide and it is highly probable that the larvae of this fly will be found to occur on the tidal zone.

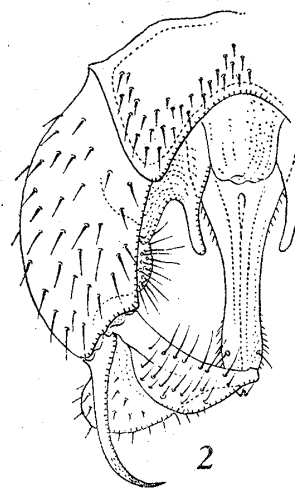
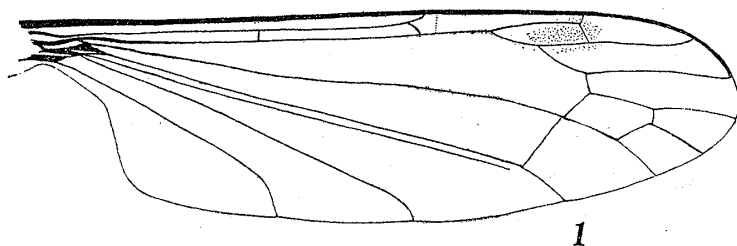
*Male*.—Body about 5.5 mm in length; wing length about 6 mm; coloration of the dry specimen as follows: general appearance yellowish brown; head dark brown, slightly pruinose; antennæ and mouth-parts brown; thorax slightly pruinose in yellow; tergum dark brown in ground color and yellowish along the sutures and furrows; præscutum with three dark brown stripes, of which the median stripe is twice as long as the lateral pair; legs and halteres yellowish brown; wing veins yellow; abdomen dark brown; male hypopygium dark brown with yellowish harpes.

Head setigerous with small setae. Antennae 15-segmented; scape and pedicel setigerous; intermediate ten flagellar segments strongly produced ventrad, each provided with three slender setæ on the dorsal side and four strong but short setæ on the ventral side; first flagellar segment with five dorsal and four ventral setæ; penultimate seg-

\* Contribution from the entomological laboratory of Kyoto Imperial University, No. 45.

ment somewhat spindle-shaped, with three dorsal and three ventral setæ; ultimate segment very small, oval in shape, with three small preapical setæ; intermediate flagellar segments often abnormally fused with an adjacent segment completely. Maxillary palpi short, 4-segmented, but sometimes the two distal segments incompletely separated. Proportional lengths of the segments of the legs, excepting the two proximal segments, as follows: 48:55:30:10:5:3.5:3.5 in the fore leg, 55:55:29:11:6:4:4 in the middle and 62:62:29:11:6:4:4 in the hind leg; claws long, slender, each with a slender basal tooth; empodium small, slender, far shorter than the claws hardly reaching the tip of the basal tooth. Wing membrane almost hyaline, very slightly yellow along the veins; stigma yellow but very much obscure. Venation (Fig. 1): a supernumerary crossvein at the middle of the cell  $Sc$ ;  $Sc_2$  present but rarely absent being replaced by a small veinlet which is found just beyond the tip of  $Sc_1$  as shown by a dotted line in the figure; crossvein is straight, very short;  $R_s$  shorter than the first section of  $R_{4+5}$ ; median cell closed;  $m-cu$  at or slightly before the fork of  $M$ .

Abdomen not highly setigerous. Hypopygium (Fig. 2) setigerous; ninth tergum deeply and widely incised in U-shape on its caudal margin; coxite with a highly setigerous large ventral lobe; harpe large, bilobate, without apical tooth-like spines; styles slender, sharply pointed; ædeagus elongated, slender, slightly narrowed at middle, setigerous with small setæ on its ventral side; ectogonapophyses very small, not extended beyond the middle of the ædeagus.



*Limonia (Idioglochina) pacifica* sp. nov.

Fig. 1. Female wing. Fig. 2. Dorsal aspect of male hypopygium.

*Female*.—Body length about 7 mm; wing length about 6.3 mm; coloration as in the male. Proportional lengths of the segments of the legs as follows: 47:55:35:12:6:3.5:3.5 in the fore, 59:55:35:14:7:4:4 in the middle and 68:68:40:18:8:4:4 in the hind leg. Hypopygium yellowish brown; octavalvae comparatively broad, short, not extended

beyond the middle of the cerci. Ovarian eggs brown, short, oval in shape, with roughly sculptured zone near the apex. Other structures largely as in the male sex.

*Habitat*.—Seashore between the tide marks; Japan.

*Holotype*.—Male; Miyara, Ishigakijima, Okinawa Prefecture; July 12, 1934.

*Allotopotype*.—Female; July 12, 1934.

*Type specimens*.—Alcoholic; deposited in the entomological laboratory, Kyoto Imperial University; collected by Prof. Dr. T. Esaki.

This crane-fly is closely allied to the marine species, *Limonia* (*Idioglochina*) *tokunagai* Alexander. But these two species may be easily distinguishable by the following structures besides the difference of coloration: in the present species, the serration of the antennal flagellum is less developed, the empodium of the legs is larger, the vein *Rs* is shorter, the octavalvae of the female hypopygium is shorter and wider, the caudomesal incision of the ninth abdominal tergum of the male is far larger, the ædeagus is more slender and setigerous, the projection of the ectogonapophysis is very small and without dot-like depressions on its tip, the style is sharply pointed, the tip of the harpe is not provided with spines. According to Dr. Alexander (Philip. Jour. Sci., 1932), in the related species, the style is figured to be pointed and the harpe is said to be provided with two apical spines but in my observation the style is always bluntly ended being slightly spatulate at tip and the harpe in many cases is provided with three spines rarely varying from two to four.

*Limnophila nigrilunae* sp. nov.

This subapterous tipulid fly was collected at night at Kamikochi, Japanese Alps.

*Female* (Fig. 1, Plate 14).—Body about 9.5 mm in length, dark brown, highly setigerous with brown erect setæ. Head dark brown. Maxillary palpi brown, short; distal three segments subequal in length to each other; ultimate segment oval in shape. Antennæ uniformly brown, 16-segmented; flagellum moniliform; first antennal segment twice as long as the second; flagellar segments short-oval, gradually reduced in size distad; ultimate two oval, longer than the penultimate but shorter than the preceding segments taken together.

Thorax dark brown. Mesopræscutum with a distinct dark lunate pattern on its caudal region, setigerous with brown erect setæ along the pseudosutural foveæ; shoulder regions of the thorax black. Scutellum

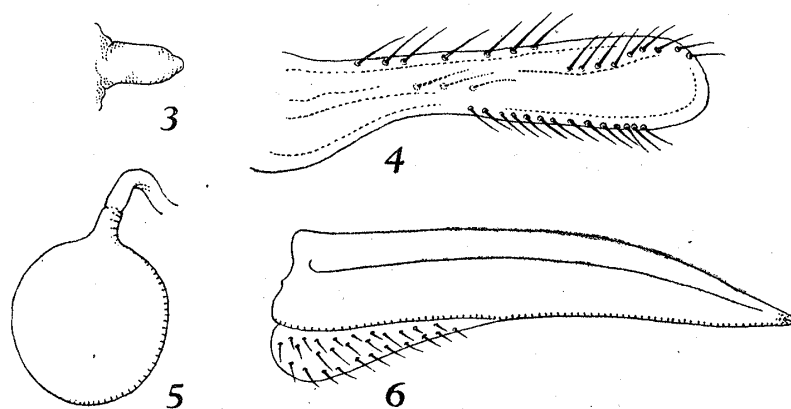
pale brown, highly setigerous with brown setae. Legs highly setigerous with long brown erect setae; coxae and trochanters dark brown; other segments uniformly brown. Proportional lengths of the segments of the legs, excepting the two proximal segments, as follows: 57:63:28:9:7:5:5 in the fore leg, 59:57:27:9:6:5:5 in the middle and 72:72:30:10.5:7.5:5:5 in the hind leg. Fore legs without tibial spurs; spurs of the other legs distinct, pubescent basally, subequal in length to the diameter of the tibial end but the caudal spur of the hind leg slightly shorter than the other. Claws simple, basally pubescent; empodium very large. Wings subatrophied, pale brown, brown on the dorsodistal surface, with many small setae on the costal margin. Halteres pale brown, not clavate, about half as long as the wings.

Abdomen uniformly dark brown; tenth tergum and eighth sternum pale brown; octavalvae compressed, pale brown; cerci elongate, slender, dark brown, gently upcurved. Mature egg found in the ovipositor oval, elongate, yellow uniformly, about 0.7 mm in length and thrice as long as its width.

*Habitat*.—Japanese Alps, Japan.

*Holotype*.—Alcoholic female; Kamikochi (about 1500 meters in altitude), Nagano Prefecture; October 20, 1934; deposited in the entomological laboratory, Kyoto Imperial University; collected by Mr. K. Imanishi.

This subapterous *Limnophila* closely resembles *L. imanishii* Alexander (Japanese Alps) but distinctly differs in the number of the antennal segments: 16-segmented in the present species while in the related species but 13-segmented. Other related subapterous species may be *L. aspidoptera* Coquillett (New Mexico) and *L. subaptera* Alex-



*Alfredia imanishii* sp. nov. Fig. 3. Haltere. Fig. 4. Wing.  
Fig. 5. Spermatheca. Fig. 6. Ovipositor.

ander (California) but they are all provided with 15-segmented antennae differing from the present species and the relative lengths of the wings to the halteres are characteristic for each species: 2:1 in the present species, 2:3 in *L. aspidoptera* and 3:2 in *L. subaptera*.

*Alfredia imanishii* sp. nov.

This subapterous trichocerid fly was collected from the snow surface in the Japanese Alps.

*Female* (Fig. 2, Plate 14).—Body about 5.7 mm in length, entirely yellowish brown. Ocellar tubercle very low. Maxillary palpi 5-segmented (2.4:9:10:7:10). Antennae 16-segmented excepting large antennaria; relative lengths of the six proximal segments as follows: 5:14:11:12:12:11; second segment slender about five times as long as its width (14:3); ultimate flagellar segment small, oval in shape, shorter than one-third of the penultimate segment (3:11). Halteres (Fig. 3) papilliform, minute, about one-fifth of the wing length. Wings (Fig. 4) highly reduced, without definite venation, with several (6) setae on the costal margin, about 14 setae on the anal margin, about 9 setae on the dorsodistal part and with about 3 setae on the ventral side. Hypopygium (Fig. 6) yellow, large, gently curved ventrad; spermathecae (Fig. 5) three in number, spherical, each with a minute chitinized duct.

*Habitat*.—Japanese Alps; Japan.

*Holotype*.—Female; Sasagamine (about 1300 meters in altitude), Niigata Prefecture; March 17, 1932.

*Paratopotypes*.—Two females; March 17, 1932.

*Type specimens*.—Alcoholic; deposited in the entomological laboratory, Kyoto Imperial University; collected by Mr. K. Imanishi.

This peculiar insect is named in honor of the collector, Mr. K. Imanishi. The present species is closely related to *A. acrobata* Bezzi (Alpes, Piémont, about 3100 meters in altitude) but easily distinguishable by the paler coloration and more reduced halteres of the present fly (in the related species halteres about one-third as long as the wings).

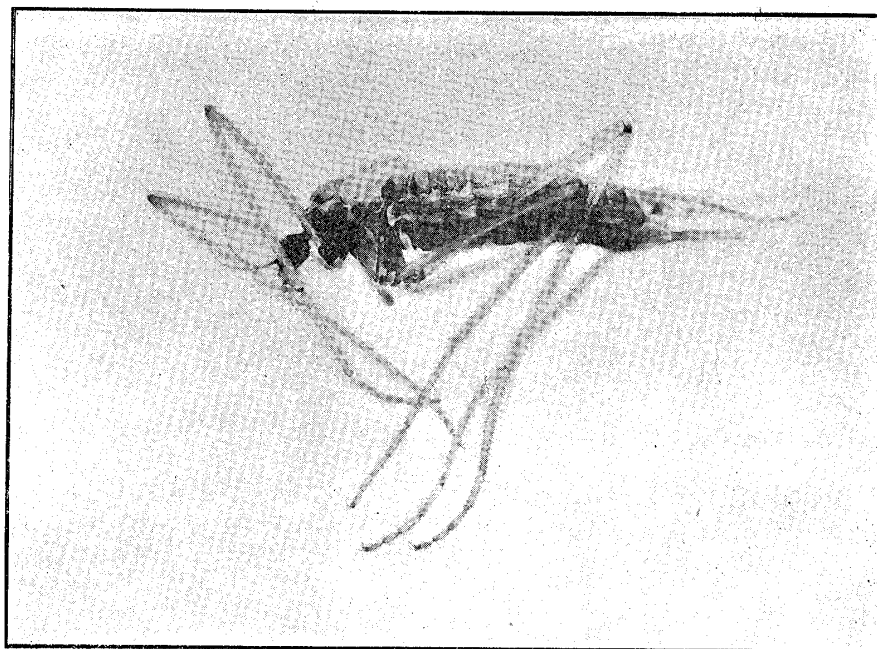
# EXPLANATION OF PLATE 14

Fig. 1. *Limnophila nigrilunae* sp. nov. (female).

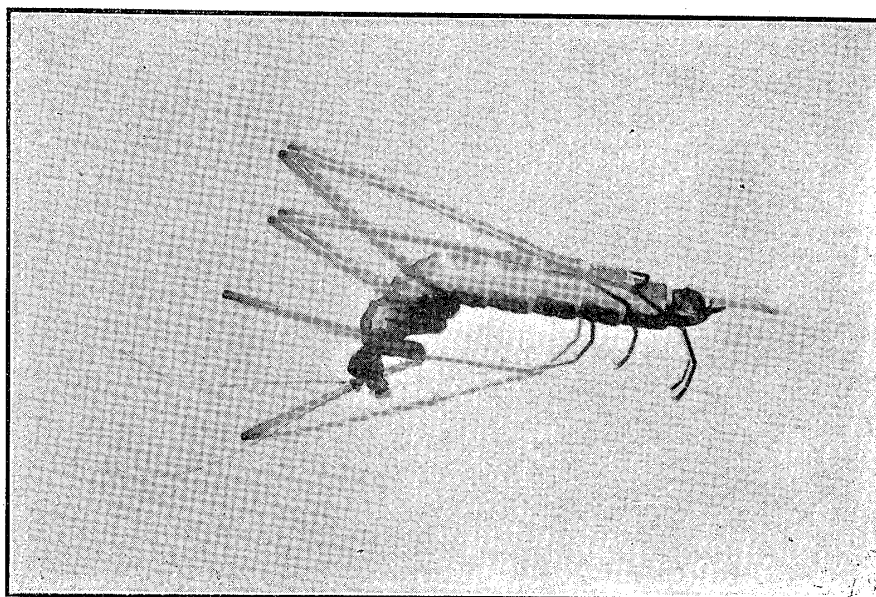
Fig. 2. *Alfredia imanishii* sp. nov. (female).

THREE NEW CRANE-FLIES FROM JAPAN  
MASAAKI TOKUNAGA

PLATE 14



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