

PROCEEDINGS  
OF THE  
CALIFORNIA ACADEMY OF SCIENCES  
FOURTH SERIES

VOL. VIII, No. 3, pp. 35-112, text figures 1-40

JULY 9, 1918

III

SOME JAPANESE APHIDIDÆ<sup>1</sup>

BY

E. O. ESSIG AND S. I. KUWANA<sup>2</sup>

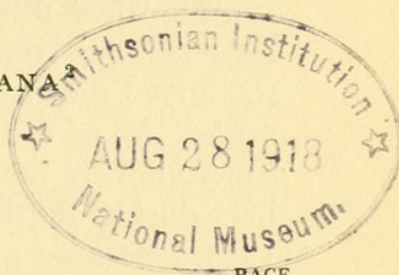


TABLE OF CONTENTS

	PAGE
INTRODUCTION .....	36
ABBREVIATIONS USED IN FIGURES.....	37
HOST INDEX TO THE SPECIES LISTED.....	38
NOTES AND DESCRIPTIONS.....	44

<sup>1</sup> After the submission of this paper to the California Academy of Sciences and before it could be published Prof. S. Matsumura's work entitled "A List of the Aphididæ of Japan, with Descriptions of New Species and Genera" appeared in the Journal of the College of Agriculture, Tohoku Imperial University, Vol. VII, pt. 6, pp. 351-414, Sapporo, July, 1917. In this paper several of the species which were previously described by the authors are named so that some changes are necessary. In all such cases the descriptions are included as originally written. Some uncertainty naturally exists as to other species, but extensive study and more specimens would be necessary for absolute certainty. It is remarkable that so few of our new species were described by Prof. Matsumura. This indicates the great number of Japanese species remaining to be worked up.

E. O. ESSIG.

Berkeley, Cal.,  
Nov. 6, 1917.

<sup>2</sup> The arrangement of the authors' names is alphabetic.

July 9, 1918



## INTRODUCTION

The following paper on "Some Japanese Aphididæ" has been prepared jointly by the authors as a small beginning to the study of this very interesting family in Japan. To the junior author belongs the part of collecting and preserving the material, taking full notes on color, localities, host plants, and dates of collection, as well as the packing and shipping of the material. The senior author is responsible for mounting the specimens on slides, determining the species, writing up the descriptions of new species, and making the drawings. It is to be regretted that distance and lack of time prevented sending the final manuscript to Dr. Kuwana for revision and correction. As the specimens were placed loosely in small vials of alcohol and were subjected to a long journey, many were entirely ruined, while others lost the legs, antennæ, wings, or other body parts. Every original lot, of which there were some 107, was given a collection number and accompanied with full field notes. All of the material was collected at or in the vicinity of Tokyo during the year 1913, and was received in several sendings during the latter part of that year and the first part of 1914. Because of the press of other duties, however, it was impossible to do anything with it until this late date. The Japanese, English and scientific names of the host plants are given wherever possible, the scientific names being revised according to the latest editions of the "Index Kewensis" by Hooker and Jackson and the "Encyclopedia of Horticulture" by Bailey.

Because the material represents such a very small part of the Japanese Aphid fauna, no attempt has been made to work out a scheme of classification and keys, but rather to give simply the notes and descriptions as clearly and briefly as possible. Drawings have been made to illustrate the more important characters and to supplement the descriptions. They are fully labeled so as to avoid lengthy explanations. The use of the camera lucida has made it possible to enlarge all to a common scale and they are so reproduced in the plates. Transferring the drawings by tracing paper has rectified the objects to their actual position on the slides.

In describing a new species it was thought best to set aside, wherever possible, a single representative individual as the type.



The winged viviparous female was selected in all such cases. Many of these types are not perfect but are fairly so. The other specimens of a lot from which a type was selected are designated as paratypes. Where no type could be decided upon the descriptions have been made, as is the usual custom, from a number of individuals, all of which are designated as cotypes. Types bear a red name label and the paratypes and cotypes yellow name labels. The types, representatives of all the cotypes and many of the paratypes, as well as other determined material received from Japan and discussed in this paper, have been presented to the California Academy of Sciences, Golden Gate Park, San Francisco, California, where they are housed in a substantial fireproof museum building accessible to all scientific workers. Duplicate material has also been presented to the Imperial University at Tokyo for the use of Japanese workers. The remainder of the material is in Professor Essig's collection.

#### ABBREVIATIONS USED IN FIGURES

- A — apterous viviparous female  
 A ant.— antenna of apterous viviparous female  
 A ant. iii — article III of antennæ of apterous viviparous female  
 A ant. iv — article IV of antennæ of apterous viviparous female  
 A ant. v — article V of antennæ of apterous viviparous female  
 A ant. vi — “ VI “ “ “ “ “ “  
 A cauda — cauda of the apterous viviparous female  
 A corn. — cornicle of “ “ “  
 A head — head of the “ “ “  
 A hind t. — hind tarsi of the apterous viviparous female  
 A an. pl. — anal plate “ “ “ “ “  
 A pyg. — pygidium of the apterous viviparous female  
 W — winged viviparous female (abbreviations following this letter refer to the same parts as those of the apterous viviparous female already given above)  
 W wax pl. — wax plates of the winged viviparous female  
 Pro. tub. — prothoracic tubercle



## HOST INDEX TO THE SPECIES LISTED

## English, Japanese and Scientific names

- Acer pictum* Thunb. (Enkō Kaede)  
*Chaitophorus japonica*, new species  
*Aegle sepiaria* DC. See *Poncirus trifoliata* Raf.  
*Alnus incana glauca* Ait. (Yama hannoki)  
*Euceraaphis japonica*, new species  
*Angelica polymorpha* Maxim. (Shirane senkiu)  
*Siphocoryne japonica*, new species

## Apple

- Aphis japonica*, new species  
 " *pomi* DeGeer  
 " *somei*, new species  
*Artemisia vulgaris indica* Maxim. (Yomogi)  
*Macrosiphum absinthii* (Linn.)?  
*Asteromæa indica* Bl. (Yomena). See *Boltonia indica* Benth.  
*Astragalus sinicus* Linn. (Genge)  
*Aphis medicaginis* Koch  
*Boltonia indica* Benth. (Yomena)  
*Macrosiphum rudbeckiæ* (Fitch)  
*Rhopalosiphum*, species  
*Brassica campestris* Linn. (Natane-na) Mustard  
*Rhopalosiphum persicæ* (Sulzer)  
*Brassica chinensis* Linn. (Aburana Pak-choi) Cabbage  
*Aphis brassicæ* Linn.  
*Castanea sativa* Mill. (Kuri)  
*Myzocallis kuricola* (Mats.)  
*Castanea vulgaris japonica* A. DC. See *C. sativa* Mill.  
*Castanopsis cuspidata* Schot. (Shii)  
*Eutrichosiphum passaniæ* (Okajima)  
*Nipponaphis cuspidatæ*, new species  
*Pterochlorus tropicalis* Van der Goot  
*Celtis sinensis* Pers. (Enoki)  
*Chromaphis celticolens*, new species  
*Chænomeles japonica* Lindl. (Bake) Japonica or Japanese quince  
*Aphis pomi* DeGeer



## Cherry

*Aphis spinosula*, new species

*Aphis*, species

*Chrysanthemum* (Kiku)

*Aphis gossypii* Glover

*Macrosiphum nishigaharæ*, new species

*Cirsium japonicum* DC. (Noazami). See *Cnicus japonicus* Maxim.

*Citrus trifoliata* Linn. (Karalachi). See *Poncirus trifoliata* Raf.

*Clerodendron trichotomum* Thunb. (Kusagi)

*Aphis gossypii* Glover

*Cnicus japonicus* Maxim. (Noazami)

*Macrosiphum rudbeckiæ* (Fitch)

*Macrosiphum*, species

*Myzus*, species

*Cratægus cuneatus* S. & Z.

*Prociphilus cratægi* Tullgren

*Cucumis sativus* Linn. (Kiuri) Cucumber

*Aphis gossypii* Glover

*Cydonia japonica* Pers. (Bake). See *Chænomeles japonica* Lindl.

*Deutzia scabra* Thunb. (Utsugi)

*Aphis medicaginis* Koch

*Distylium racemosum* S. & Z. (Isu)

*Nipponaphis distylii* Pergande

*Euscaphis japonica* Dipp. (Gonzui)

*Rhopalosiphum indicum* Van der Goot

*Hibiscus syriacus* Linn. (Mukuge) Shrubby Althea or rose of Sharon

*Aphis medicaginis* Koch

*Hordeum sativum vulgare* (Omugi). See *H. vulgare* Linn.

*Hordeum vulgare* Linn.

*Aphis avenæ* Fab.

*Illicium anisatum* Linn. (Skikimi)

*Toxoptera aurantii* Fonsc.

*Ipomæa hederacea* Jacq. (Asagao)

*Rhopalosiphum magnoliæ*, new species

*Iris sanguinea* Donn (Ayame)

*Phorodon*, species



*Iris sibirica orientalis* Thunb. (Ayame). See *I. sanguinea* Donn  
*Lactuca denticulata* Maxim. (?) (Nigana) (*L. dentata*  
Makino?)

*Rhopalosiphum lactuæ* (Kalt.)

*Larix leptolepis* Murr. (Kara-Mastu)

*Lachnus*, species

*Lespedeza bicolor* Turc. (Hagi)

*Macrosiphum hagi*, new species

*Rhopalosiphum lespedezae*, new species

*Ligustrum ibota* Sieb. (Ibota)

*Macrosiphum ibotum*, new species

*Magnolia conspicua* Salisb. (Hakumokuren). See *M. denudata*  
Desr.

*Magnolia denudata* Desr. (Hakumokuren)

*Rhopalosiphum magnoliæ*, new species

*Magnolia hypoleuca* S. & Z. (Hōnoki)

*Myzocallis*, species

*Magnolia kobus* Thunb. (Kobushi)

*Calaphis magnoliæ*, new species

*Mespilus cuneatus* S. & Z. (Sanzashi). See *Cratægus cuneatus*  
S. & Z.

*Nelumbo nucifera* Gaertn. (Hasu) East Indian lotus

*Rhopalosiphum nymphææ* (Linn.)

#### Orange

*Aphis citricola* Van der Goot

“ *gossypii* Glover

“ *somei*, new species

*Rhopalosiphum magnoliæ*, new species

*Osmanthus aguifolium* B. & H. (Hiiragi)

*Prociphilus osmanthæ*, new species

*Pasania cuspidata* Oerst. (Shii). See *Castanopsis cuspidata*  
Schot.

#### Peach (Momo)

*Myzus*, species

*Rhopalosiphum nymphææ* (Linn.)

#### Pear

*Anæcia piri* (Mats.)



## Pear, Japanese or Chinese

*Aphis pomi* DeGeer“ *siphonella*, new species“ *somei*, new species*Prociphilus pyri* (Fitch)*Rhopalosiphum nymphææ* (Linn.)*Toxoptera piricola* Mats.*Petasites japonicus* F. Schmidt (Fuki)*Aphis gossypii* Glover*Pharbitis hederacea* Jacq. (Asagao). See *Ipomœa hederacea* Jacq.*Pinus densiflora* S. & Z. (Aka-matsu) Japanese red pine*Lachnus pinidensifloræ*, new species*Platycodon grandiflorum* DC. (Kikyo) Chinese or Japanese bellflower, Balloon flower.*Macrosiphum rudbeckiæ* (Fitch)

## Plum

*Rhopalosiphum nymphææ* (Linn.)*Podocarpus chinensis* Wall. (Maki). See *P. macrophylla maki* Sieb.*Podocarpus macrophylla maki* Sieb. (Maki)*Phyllaphis*, species?*Poncirus trifoliata* Raf. (Karalcahi) Trifoliate orange*Rhopalosiphum magnoliæ*, new species*Poterium officinale* A. Gray (Waremokau)*Aphis medicaginis* Koch

## Potato

*Aphis gossypii* Glover*Prunus mume* S. & Z. (Ume) Japanese apricot*Rhopalosiphum nymphææ* (Linn.)*Quercus dentata* Thunb. (Kashiwa)*Myzocallis macrotuberculata*, new species*Pterochlorus tropicalis* Van der Goot*Quercus serrata* Thunb. (Kunugi)*Myzocallis*, species“ *capitata*, new species“ *kuricola* (Mats.)*Pterochlorus tropicalis* Van der Goot*Trichosiphum kuwanai* Pergande



*Ranunculus ternatus* Thunb. (Hi Ki-no-Kasa)

*Prociphilus populiconduplifolius* (Cowen)?

*Rhus javanica* Linn. (Nurude)

*Aphis somei*, new species

*Rhus semialata* Murr. (Nurude). See *R. javanica* Linn.

#### Rice

*Macrosiphum granarium* (Kirby)

*Rosa multiflora* Thunb.

*Macrosiphum rosæ* (Linn.)

*Rumex crispus* Linn. (Gishi-gishi)

*Aphis rumicis* Linn.

*Rumex japonicus* Meisn. (Gishi-gishi). See *R. crispus* Linn.

*Sagittaria sagittæfolia* Linn. (Kuwai). Old world arrowhead

*Rhopalosiphum nymphææ* (Linn.)

*Salix*, species (Yanagi)

*Siphocoryne bicaudata*, new species

*Salix multinervis* F. & Sav. (Koriyanagi)

*Chaitophorus salijaponicus*, new species

*Sambucus racemosa* Linn. Elder

*Rhopalosiphum magnoliæ*, new species

*Sanguisorba officinalis* Linn. (Waremokau). See *Poterium officinale* A. Gray

*Smilax china* Linn. (Sarutori-ibara). See *S. walteri* Pursh.

*Smilax walteri* Pursh. (Sarutori-ibara)

*Aphis gossypii* Glover?

*Solanum melongena* Linn. (Nasu)

*Aphis gossypii* Glover

*Sonchus oleraceus* Linn. (Nogeshi). Sow thistle

*Rhopalosiphum lactuæ* (Kalt.)

*Staphylea bumalda* DC. (Mitsuba Utsugi)

*Rhopalosiphum indicum* Van der Goot

#### Strawberry

*Aphis*, species

*Thalictrum minus* Linn. (Aki-Kara-matsu)

*Aphis thalictrii*, new species

*Tsuga sieboldi* Carr. (Tsuga)

*Lachnus*, species



*Viburnum tomentosum* Thunb. (Yabudomari)

*Aphis somei*, new species

*Vicia faba equina* Pers. (Soramame)

*Aphis medicaginis* Koch

Wheat

*Aphis avenæ* Fab.

*Zelkova acuminata* Planch. (Keyaki)

*Aphis medicaginis* Koch

#### NOMENCLATURE OF WING VENATION

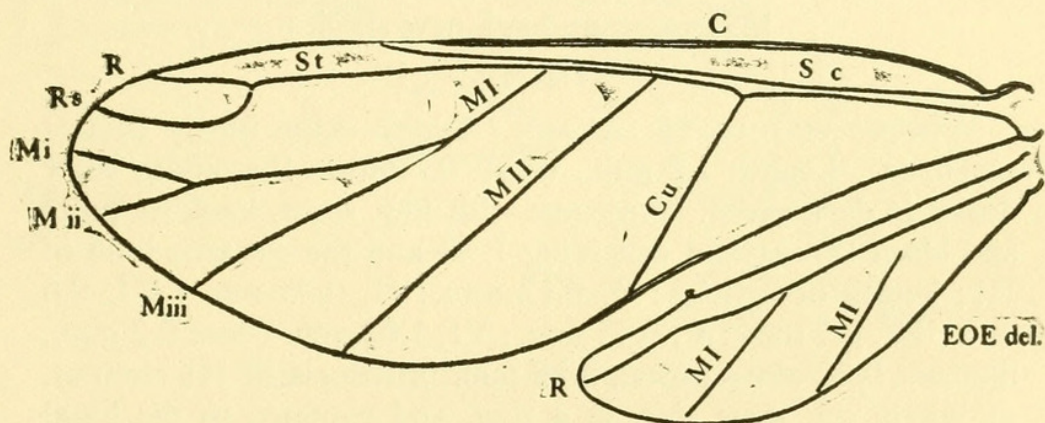


Figure 1.—Nomenclature of wing venation used in the text: C, costal; Cu, cubitus; M, media; R, radius; Rs, radial sector; Sc, subcostal; St, stigma or pterostigma. This form is the system usually used by European writers and by many others. (Original.)



## NOTES AND DESCRIPTIONS

**Macrosiphum absinthii** (Linnæus)

One winged viviparous female and several apterous nymphs of what appears to be this species were taken on Yomogi, *Artemisia vulgaris indica* Maxim., at Nikko, June 19, 1913. Collection number 89. In comparison with determined specimens received from Prof. Theobald, England, there are not quite so many sensoria on article III of the antennæ and the cornicles are somewhat differently shaped, but in other respects they agree very well.

*M. yomogicola* Mats. may prove to be this species.

**Macrosiphum granarium** (Kirby)

A good series of this species was taken on rice plants, Nishigahara, Tokyo, Sept. 11, 1913. Collection number 103.

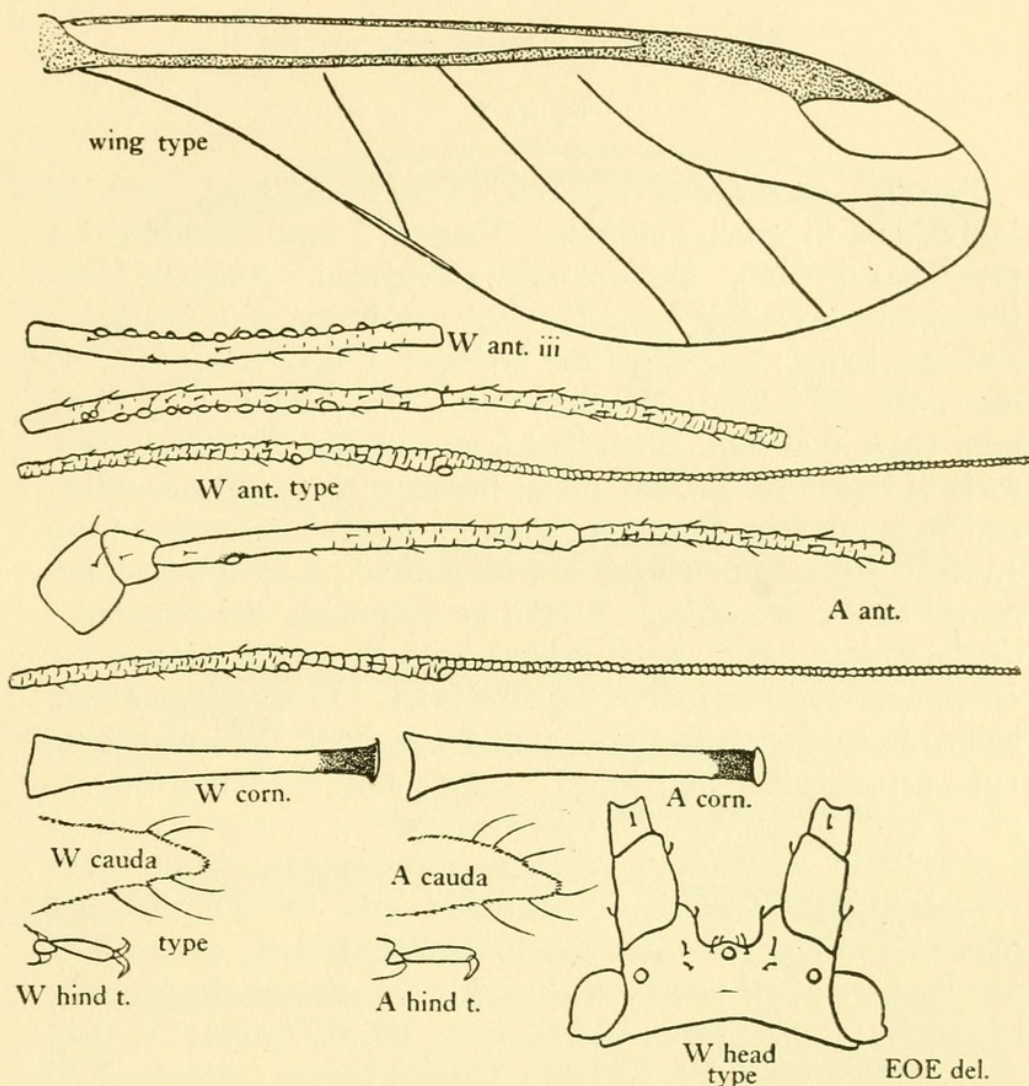
**Macrosiphum hagi**, new species

## Figure 2

WINGED VIVIPAROUS FEMALE (Type)—One nearly perfect specimen. Length 1.2 mm., width 0.7 mm. Prevailing color dusky to dark green. Antennæ with few, short, knobbed hairs and black throughout excepting I, II and the extreme base of III; length of articles: I, 0.12 mm.; II, 0.05 mm.; III, 0.6 mm.; IV, 0.5 mm.; V, 0.43 mm.; VI, 1.02 mm. (base 0.2 mm., filament 0.82 mm.); total, 2.72 mm. Sensoria of III circular, of nearly the same size, in a row, and confined to the basal fifth. There are 12 on this article of each antenna; the normal number occurs on V and VI. Rostrum reaching to the 3rd coxæ. Prothorax yellowish green, meso- and metathorax lemon-yellow; coxæ, trochanters and bases of the femora and tibiæ pale, the remainder of the legs being black. Wings with dark veins; primaries 3.2 mm. in length. Cornicles faintly imbricated, pale with black tips, 0.5 mm. long. Cauda pale green, 0.25 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Three good specimens. Average length 1.1 mm., width 0.7 mm. General color green. Antennæ black, except I, II and most of III, which are pale green, imbricated and with few short thick or knobbed hairs; lengths of articles: I, 0.1 mm.; II, 0.05 mm.;



Figure 2.—*Macrosiphum hagi*, new species

III, 0.6 mm.; IV, 0.45 mm.; V, 0.42 mm.; VI, 1 mm. (base 0.2 mm., filament 0.8 mm.); total 2.62 mm. Article III of each specimen with a single large sensorium near the base; sensoria on other articles normal. Rostrum extending to the base of the abdomen. Cornicles dusky with black tips, faintly imbricated, 0.5 mm. long. Cauda pale green, 0.23 mm. long.

NYMPHS—pale green throughout.

HOST PLANT—Hagi, *Lespedeza bicolor* Turc.

LOCALITY—Tokyo.

DATE OF COLLECTION—May 14, 1913.

COLLECTION NUMBER—32.

Note—This may possibly be *M. hagicola* Mats., but the descriptions differ considerably.



**Macrosiphum ibotum**, new species

Figure 3

WINGED VIVIPAROUS FEMALE (Type)—Selected from 12 individuals in good condition. Length 2 mm., width (of a paratype) 0.9 mm. General color pale green. Antennæ black throughout excepting I and II which are dusky, with few hairs, and imbricated; lengths of the articles: I, 0.12 mm.; II, 0.09 mm.; III, 0.71 mm.; IV, 0.58 mm.; V, 0.51 mm.; VI, 1.67 mm. (base 0.17 mm., filament 1.5 mm.); total 3.68 mm. Sensoria of article III circular, about the same size, almost in a row and 16 in number. Paratypes show a variation in number from 13 to 16. Sensoria on other articles normal. Rostrum reaching nearly to the 3rd coxæ. Prothorax yellowish, the remainder of the thorax dark. Legs yellow, with the distal ends of the femora and tibiæ and all of the tarsi black. Front wings 3 mm. long. Cornicles dark, imbricated throughout, 0.42 mm. long (of a paratype 0.52 mm. long). Cauda dark, 0.23 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Seven individuals in good condition. Average length 1.8 mm., width 1 mm. Prevailing color pale green. Antennæ dark, except I, II and the base of III; imbricated, with a few short hairs; lengths of articles: I, 0.15 mm.; II, 0.07 mm.; III, 0.77 mm.; IV, 0.61 mm.; V, 0.51 mm.; VI, 1.45 mm. (base 0.15 mm., filament 1.30 mm.); total 3.56 mm. Sensoria small, circular, normal on V and VI; varying from none to 3 on III, and confined to the base. Rostrum pale, reaching nearly to the third coxæ. Abdomen pale, with darker green spots on the dorsum. Cornicles black, finely imbricated throughout, 0.53 mm. long. Cauda pale, 0.32 mm. long.

NYMPHS—Paler in color than the adults with the wing-pads dusky.

HOST PLANT—On the undersides of the leaves of *Ibota*, *Ligustrum ibota* Sieb.

LOCALITY—Nakano, Tokyo.

DATE OF COLLECTION—May 25, 1913.

COLLECTION NUMBER—59.



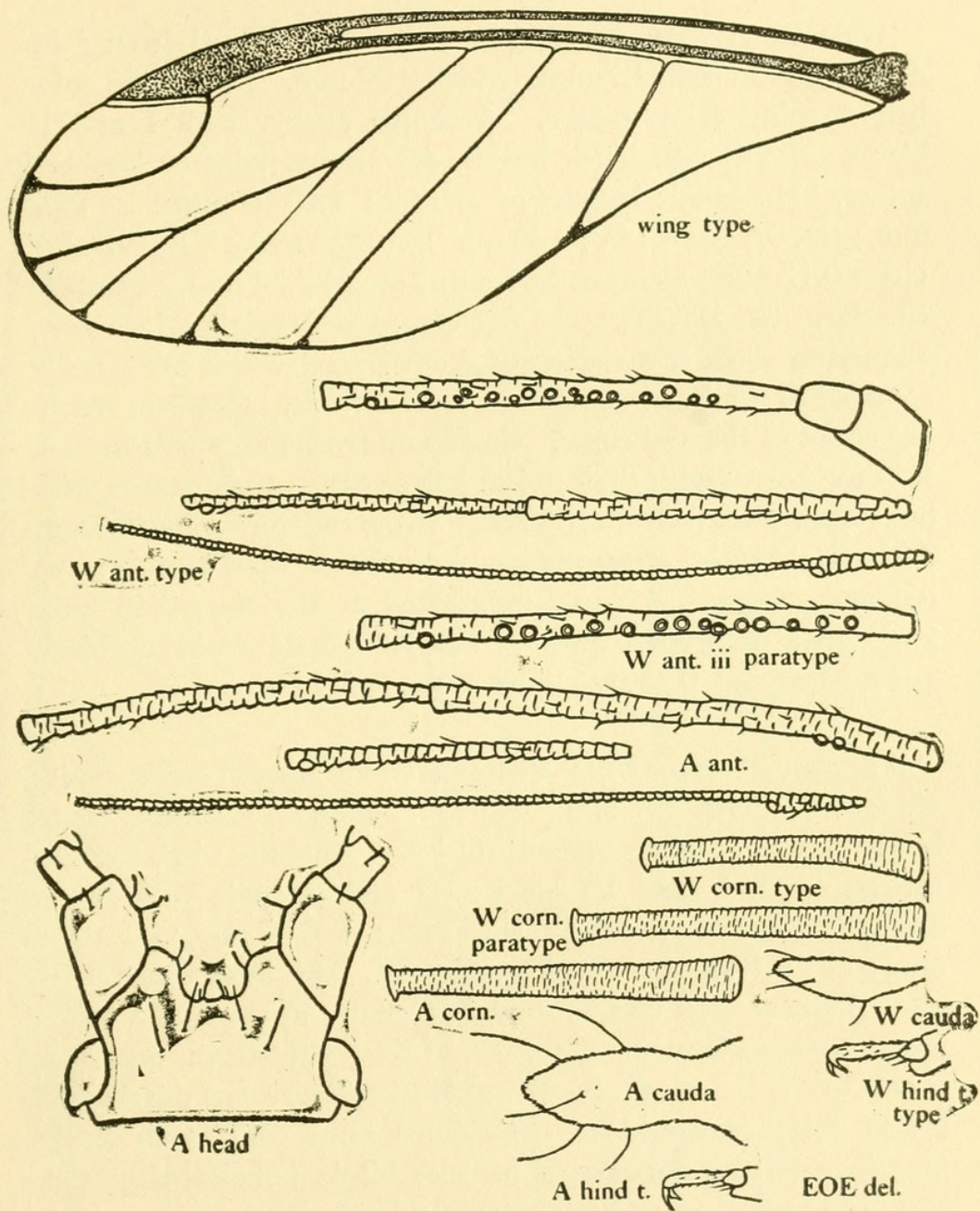


Figure 3.—*Macrosiphum ibotum*, new species



**Macrosiphum nipponicum**, new species

Figure 4

WINGED VIVIPAROUS FEMALE (Type)—Selected from 5 individuals. Length 1.7 mm., width 0.09 mm. Prevailing color bright shiny crimson-lake. Antennæ dusky, with I and II black, III-VI with black apices, few short hairs or knobbed spines, imbricated; lengths of articles: I, 0.10 mm.; II, 0.07 mm.; III, 0.62 mm.; IV, 0.48 mm.; V, 0.50 mm.; VI, 0.97 mm. (base 0.17 mm., filament 0.80 mm.); total 2.74 mm. Sensoria circular. On III there are 8 (left) and 7 (right) in a row. Paratypes show a variation of from 7 to 9 which are usually confined to the basal two-thirds of the article. Rostrum reaching about to the 2nd coxæ. Coxæ and trochanters pale-brown, femora brown, with their apical halves black, tibiæ amber with both ends black, tarsi all black. Front wings 3.7 mm. long. Abdomen bright crimson-lake with black markings on the dorsum. Cornicles black, imbricated at the tips, 0.48 mm. long (of a paratype 0.55 mm. long). Cauda dusky or black (of a paratype) 0.23 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Six individuals. Length 1.8 mm., width 1.2 mm. Prevailing color bright crimson-lake. Head dusky. Antennæ imbricated; articles I, II, V and VI black; III and IV pale with black apices; lengths of articles: I, 0.15 mm.; II, 0.09 mm.; III, 0.65 mm.; IV, 0.49 mm.; V, 0.41 mm.; VI, 0.85 mm. (base 0.16 mm., filament 0.69 mm.); total 2.68 mm. From 1 to 3 large circular sensoria near the base of III. Rostrum reaching nearly to the 3rd coxæ. Prothorax dusky, the rest of the thorax bright shiny crimson-lake. Abdomen same color with black markings on the dorsum. Cornicles black, imbricated at the tips, 0.63 mm. long. Cauda dark, 0.24 mm. long.

HOST PLANT—Not given.

LOCALITY—Kurayamizaka, Nishigahara, Tokyo.

DATE OF COLLECTION—May, 1913.

COLLECTION NUMBER—24.



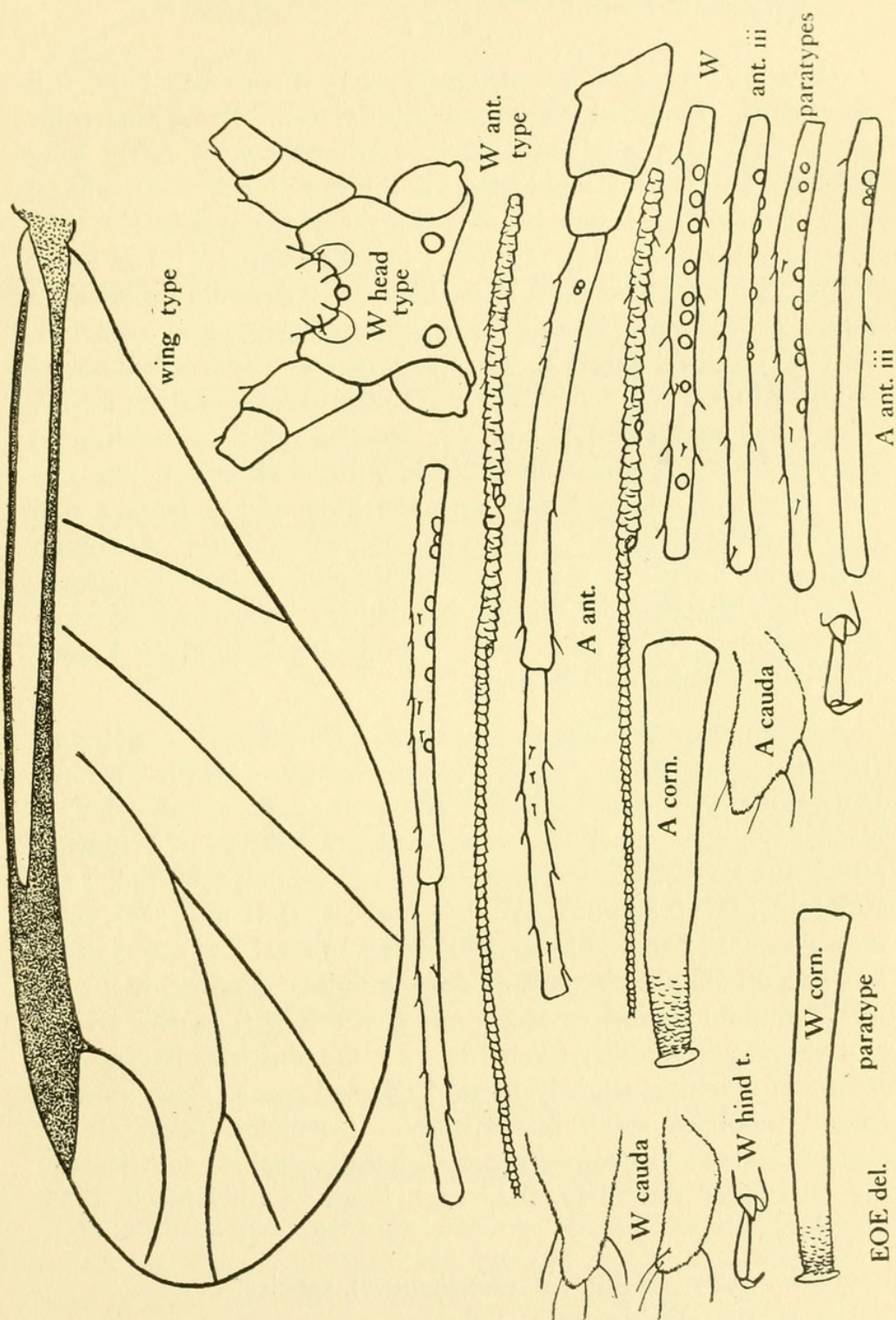


Figure 4.—*Macrosiphum nipponicum*, new species



**Macrosiphum nishigaharæ**, new species

Figure 5

WINGED VIVIPAROUS FEMALE (Type)—From four imperfect specimens. Length 1.75 mm., width 0.8 mm. Prevailing color shiny dark purple-lake to black. Antennæ with fairly long knobbed hairs, imbricated towards the tips; black, except basal half of III which is pale brown; lengths of the articles: I, 0.11 mm.; II, 0.08 mm.; III, 0.6 mm.; IV, 0.38 mm.; V, 0.35 mm.; VI, 0.73 mm. (base 0.13 mm., filament 0.6 mm.); total 2.25 mm. Sensoria on III circular, of different sizes and scattered, 26 (left) and 28 (right). On the paratypes the number varies from 29 to 32. On IV 8 (left). On the paratypes from 3 to 9. The usual number on V and VI. Rostrum dark, extending to the 3rd coxæ. Thorax shiny black, with small lateral prothoracic tubercles. Legs black with the base of the femora and middle of the tibiæ pale. Front wings 2.6 mm. long. Abdomen dark shiny purple or black. Cornicles short, black, somewhat constricted beyond the middle, basal third imbricated, remainder reticulate, 0.26 mm. long. Cauda black, slightly longer than the cornicles or 0.29 mm.

APTEROUS VIVIPAROUS FEMALES (Paratypes) — Selected from ten specimens. Average length 1.6 mm., width 0.8 mm. Prevailing color from shiny carmine to dark purple-lake or black. Antennæ black except the basal two-thirds of III, with numerous knobbed hairs; lengths of articles: I, 0.08 mm.; II, 0.08 mm.; III, 0.58 mm.; IV, 0.41 mm.; V, 0.31 mm.; VI, 0.61 mm. (base 0.12 mm., filament 0.49 mm.); total 2.07 mm. The sensoria on III are circular, of different sizes, confined in a row to the middle region or along the entire length of the article and varying in number from 12 to 21, the majority having 16. Rostrum reaching slightly beyond the 3rd coxæ. Prothoracic lateral tubercles small but distinct. Cornicles black, short, slightly constricted before the end, basal one-third imbricated, the remainder reticulate, 0.27 mm. long. Cauda black, 0.35 mm. long.

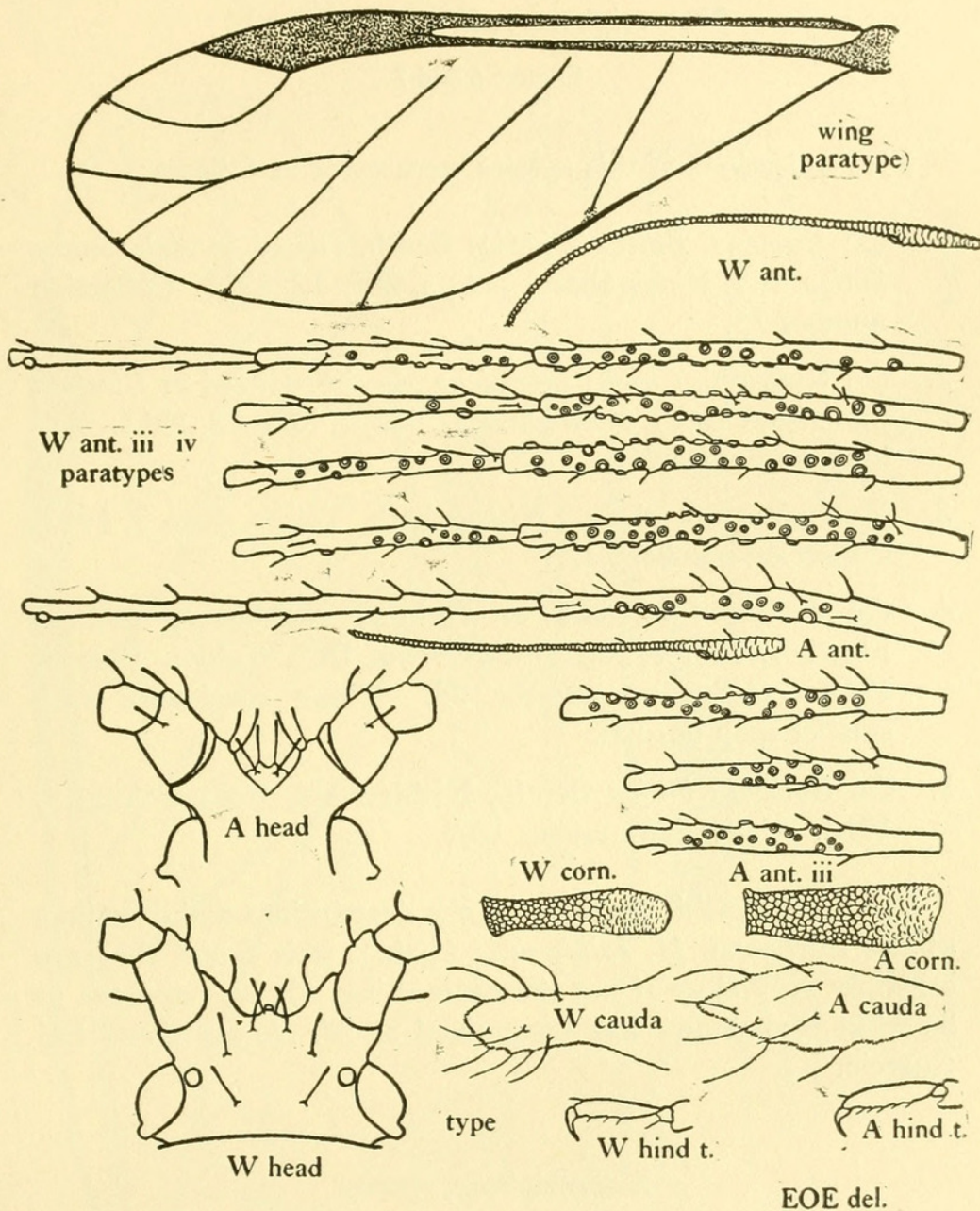
HOST PLANT—Kiku, *Chrysanthemum*, species.

LOCALITY—Nishigahara, Tokyo.

DATE OF COLLECTION—May 9, 1913.

COLLECTION NUMBER—10.



Figure 5.—*Macrosiphum nishigaharæ*, new species***Macrosiphum rosæ* (Linn.)**

The alcoholic specimens do not show the typical black markings on the legs of all, but check up well in all other respects. Taken on *Rosa multiflora* Thunb., Tokyo, May 14, 1913. Collection number 34. A slide of specimens labeled *M. rosæformis* Das, taken at Lahore, India, Jan. 7, 1914, by Mr. Das appears to be small individuals of this species.



**Macrosiphum rudbeckiæ (Fitch)**

Figures 6 and 7

Five collections of this species were made as follows:

1. On Yomena, *Boltonia indica* Benth. (listed as *Asteromæa indica* Bl.), Nishigahara, Tokyo, May 12, 1913. Collection number 25.
2. On Noazami, *Cnicus japonicus* Maxim. (listed as *Cirsium japonicum* DC.), Nishigahara, Tokyo, May 12, 1913. Collection number 26.
3. Host plant not given. Nishigahara, Tokyo, June 5, 1913. Collection number 73.
4. On Kikyo (Japanese or Chinese Bellflower, Balloon Flower), *Platycodon grandiflorum* DC., Tokyo, June 5, 1913. Collection number 75. These specimens were smaller than normal.
5. On *Boltonia indica* Benth., Nishigahara, Tokyo, Aug. 4, 1913. Collection number 102.

In comparing this species with the descriptions and drawings of the European, *M. solidaginis* (Fab.), it is found they are certainly very close if not the same thing. It also appears to be what Matsumura has determined as *M. chrysanthemi* Del Guercio.

**Macrosiphum, species**

Apterous viviparous examples only of this species were taken. The color is given as cobalt-lemon. The antennæ are very long, dusky or black with from 5 to 6 sensoria near the base of article III. The basal third of the cornicles is yellow, the remainder black. The length is about twice that of the cauda, which is pale. The length of the body is 2.5 mm., the width 1.5 mm. Collected on Noazami, *Cnicus japonicus* Maxim. (listed as *Cirsium japonicum* DC.), Nishigahara, Tokyo, June 5, 1913. Collection number 72.



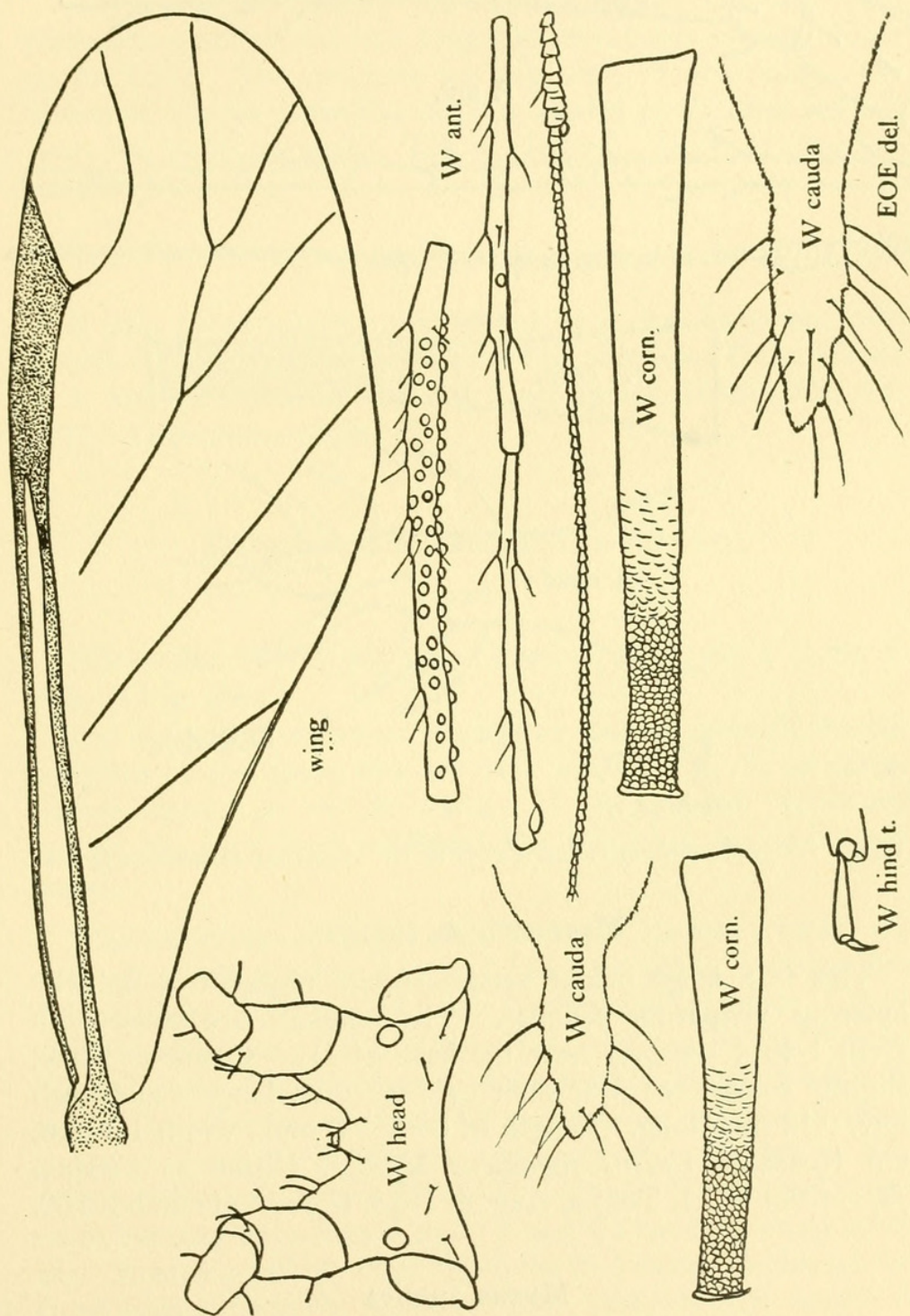


Figure 6.—*Macrosiphum rudbeckiae* (Fitch). Winged viviparous female



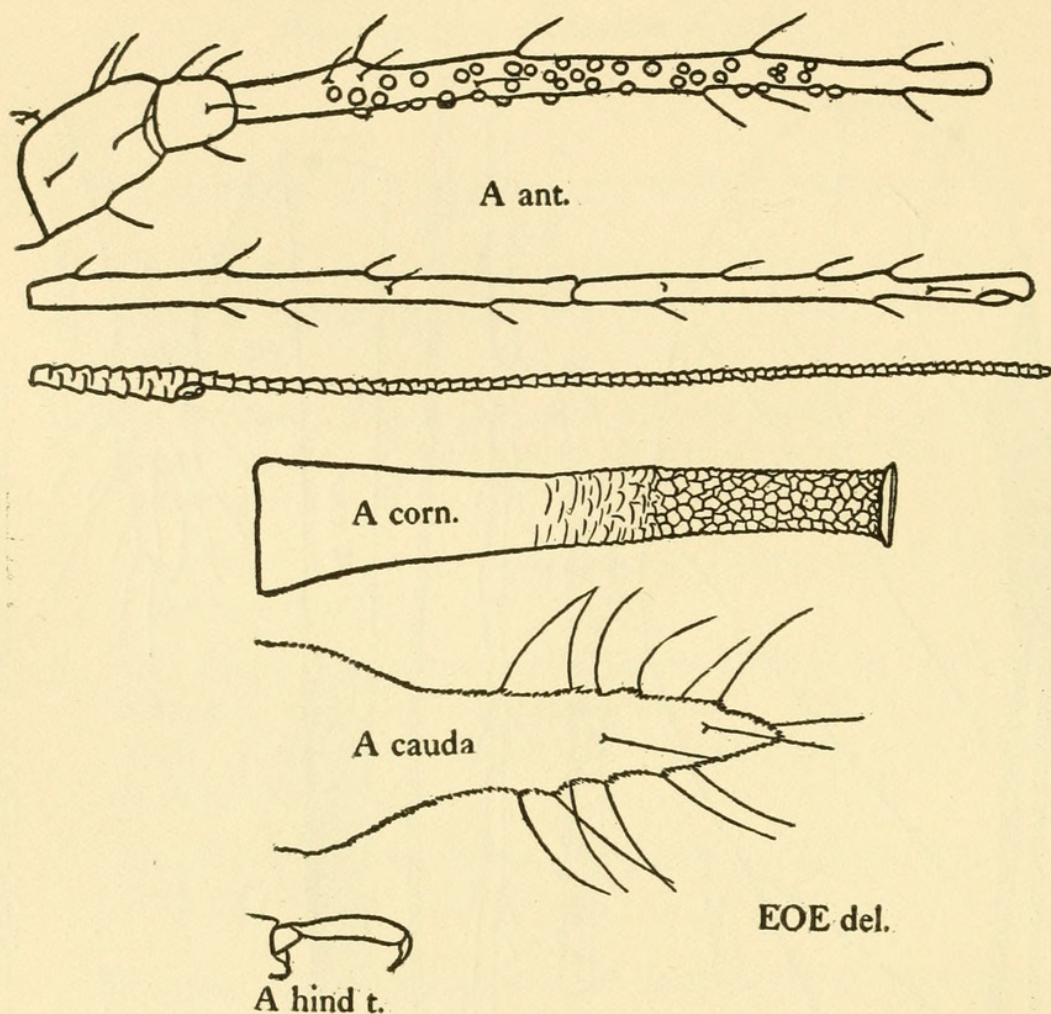


Figure 7.—*Macrosiphum rudbeckiae* (Fitch). Apterous viviparous female.

#### **Macrosiphum, species**

This is a large bright yellow species represented only by apterous viviparous females. The antennæ are black with from 1 to 4 sensoria near the base of III. Cornicles black, slightly constricted near their tips, 0.2 mm. long. Cauda yellow, 0.12 mm. long. Length of body 2.2 mm., width 1.3 mm. On Noazami, *Cnicus japonicus* Maxim. (listed as *Cirsium japonicum* DC.), Tokyo, Aug. 4, 1913. Collection number 100.

#### **Myzus, species**

A few apterous viviparous females of a green species were taken on Momo (peach tree), Nishigahara, Tokyo, May 15, 1913. Collection number 43.



**Myzus, species**

Only apterous females were taken. They are very pale transparent-yellow, 1.1 mm. long and with many knobbed hairs on the body. The cornicles are pale and 0.5 mm. long. On Noazami, *Cnicus japonicus* Maxim. (listed as *Cirsium japonicum* DC.), Nishigahara, Tokyo, June 5, 1913. Collection number 74.

**Phorodon, species**

A pale green species represented by a few apterous viviparous females. Taken on Ayame, *Iris sanguinea* Donn (listed as *I. sibirica orientalis* Thunb.), Komagome, Tokyo, May 11, 1913. Collection number 23.

**Rhopalosiphum indicum Van der Goot**

## Figure 8

1916—Rec. Ind. Mus., vol. 12, pt. 1, no. 1, pp. 1-3, fig. 1. Feb. (Orig. desc.)

The apterous viviparous females agree so well with the description of the above that we have no hesitancy in so designating them. As no description of the winged viviparous female has ever been published the following has been prepared:

WINGED VIVIPAROUS FEMALE—Length 3.2 mm., width 1.5 mm. Prevailing color orange. Antennæ black, with articles I, II and base of III dusky-yellow; lengths of articles: I, 0.19 mm.; II, 0.09 mm.; III, 1.04 mm.; IV, 0.82 mm.; V, 0.54 mm.; VI, 0.71 mm. (base 0.15 mm., filament 0.56 mm.); total 3.39 mm. The sensoria on article III are circular, of various sizes, scattered along the full length, and varying in number on different individuals from 50 to 70. Article IV normally has none, but may have from 1 to 3; V and VI have the usual number. Rostrum yellow, reaching to the 2nd coxæ. Veins of the front wings narrowly bordered with dusky brown, length 6 mm. Coxæ, trochanters and bases of the femora lemon-yellow, the remainder of the legs black. Cornicles black, widest near the middle and narrow at both ends, the apical end being



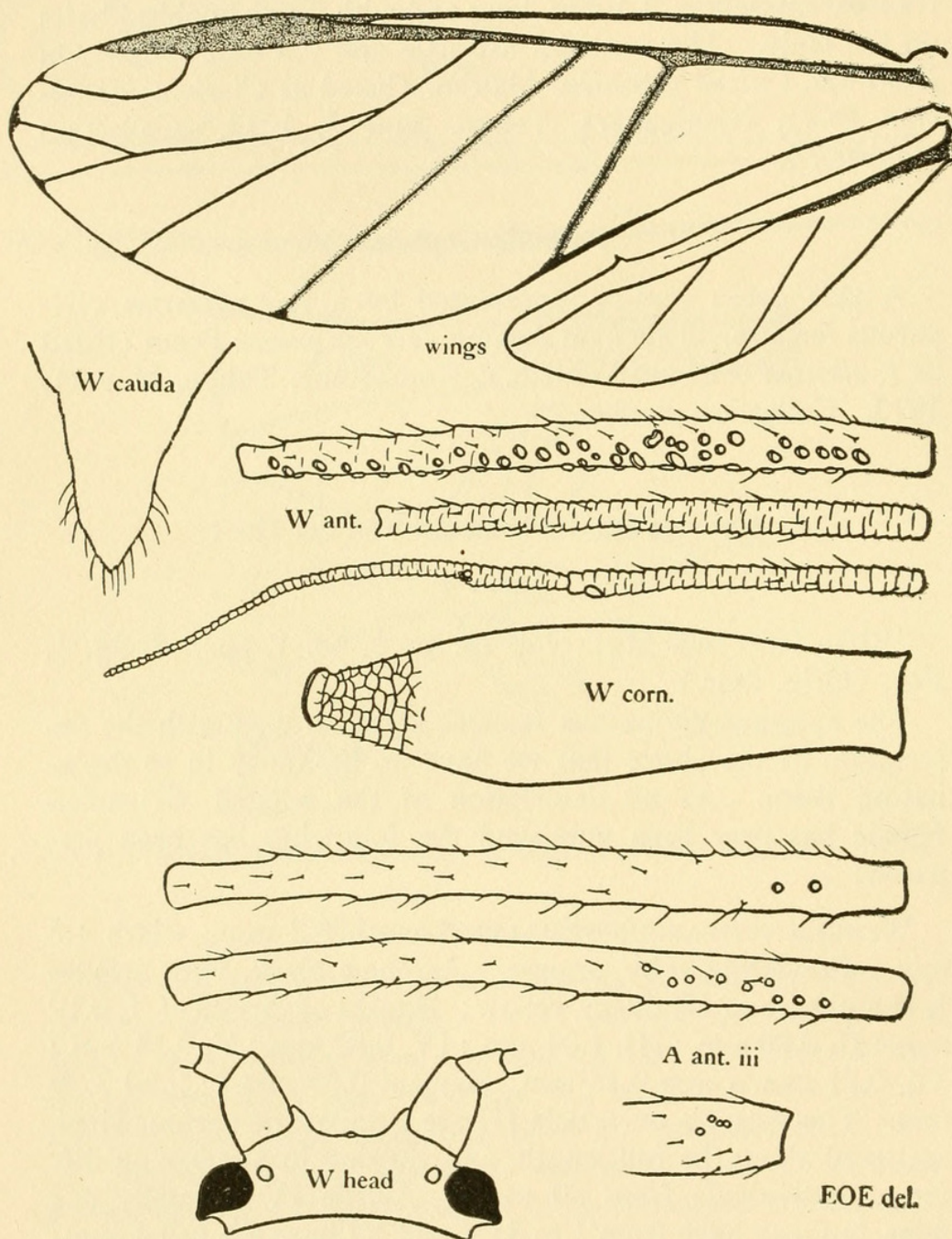


Figure 8.—*Rhopalosiphum indicum* Van der Goot



smallest and reticulate for a short distance as shown in the accompanying drawing. Cauda dusky orange, 0.4 mm. long.

This material, which comprises a good series, was taken in two lots as follows:

1. On Gonzui, *Euscaphis japonica* Dipp., Somei, Tokyo, May 7, 1913. Collection number 1.
2. On Mitsuba Utsugi, *Staphylea bumalda* DC., Nikko, June 9, 1913. Collection number 81. These specimens average larger in size than those of the first lot and were the ones from which the measurements were taken.

### ***Rhopalosiphum lactucæ* (Kalt.)**

Two lots of apterous viviparous females which check up very well with this species were taken as follows:

1. On Nigana, *Lactuca denticulata* Maxim.? (listed as *L. dentata* Makino), Tokyo, May 17, 1913. Collection number 37.
2. On Nogeshi (sow thistle), *Sonchus oleraceus* Linn., Nakano, Tokyo, May 26, 1913. Collection number 62.

### ***Rhopalosiphum lespedezae*, new species**

Figure 9

WINGED VIVIPAROUS FEMALE (Type)—Selected from four imperfect individuals. Length 1.28 mm., width 0.68 mm. Prevailing color green. Head brownish or dusky. Antennæ dusky or black throughout, imbricated, with a few short clubbed or thick hairs; lengths of articles: I, 0.11 mm.; II, 0.09 mm.; III, 0.53 mm.; IV, 0.51 mm.; V, 0.43 mm.; VI, 0.74 mm. (base 0.14 mm., filament 0.6 mm.); total 2.41 mm. The sensoria vary somewhat in size, there being 12 on article III of the left antenna and the usual number on V and VI. Paratypes show a variation in number from 11 to 15 on III and from 0 to 4 on IV. Those which do occur on IV are mostly small. Rostrum reaching to the 3rd coxæ. Apical portion of the femora and tibiæ and all of the tarsi black, the remainder of the legs pale. Primary wings 2.66 mm. long, with the base of the radial sec-



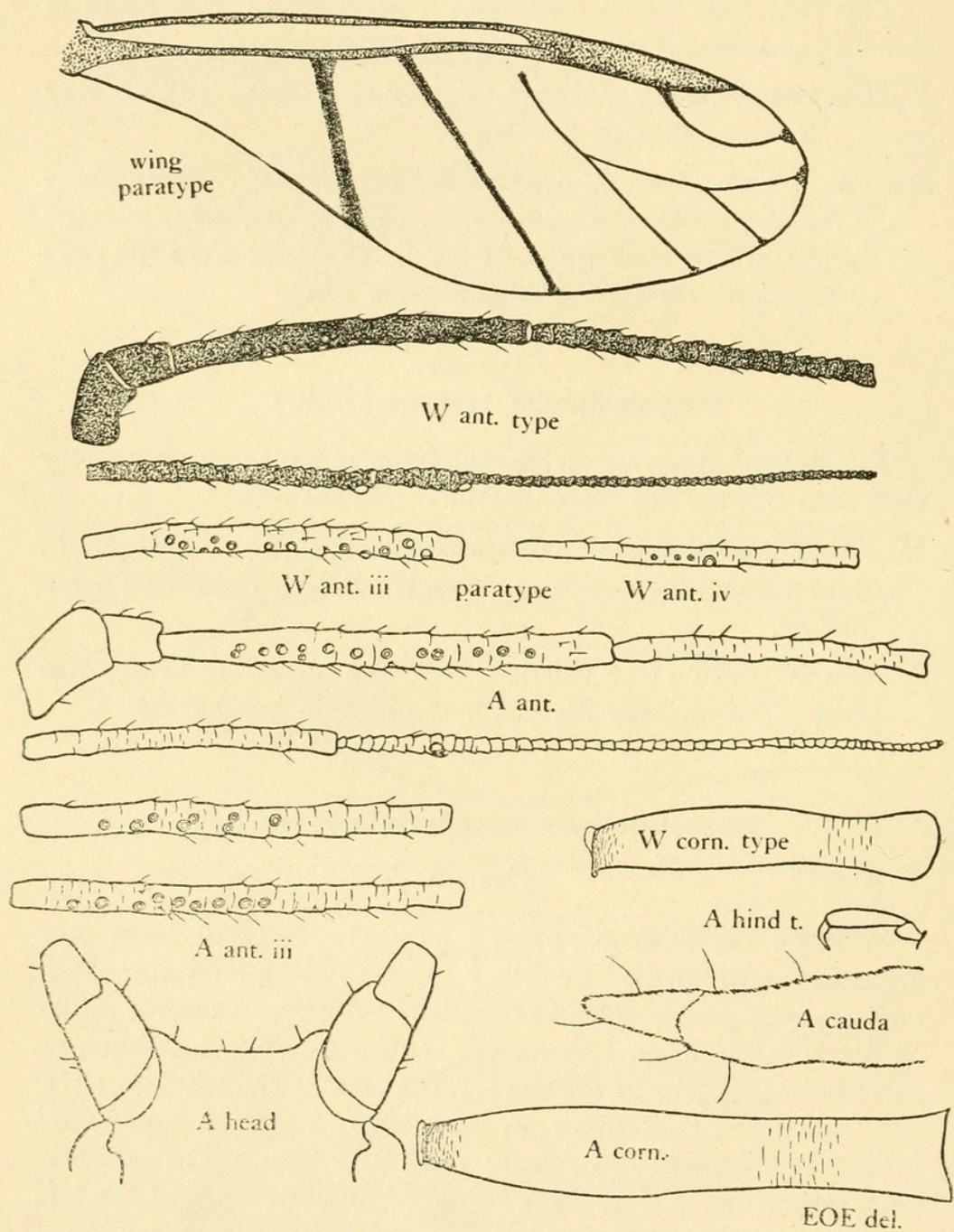


Figure 9.—*Rhopalosiphum lespedezae*, new species



tor and all of the cubitus and media veins distinctly clouded as shown in the illustration. Abdomen green with dusky transverse markings on the dorsum, and several pairs of lateral tubercles. Cornicles black, somewhat constricted near the base and largest beyond the middle, with a small mouth; imbricated at the basal constrictions and near the tips; length 0.51 mm. Cauda green and slightly shorter than the cornicles.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Some thirty good specimens. Average length 1.7 mm., width 1.2 mm. Prevailing color green. Head brownish green or pale brown. Antennæ dark to black throughout and imbricated; lengths of articles: I, 0.14 mm.; II, 0.07 mm.; III, 0.67 mm.; IV, 0.41 mm.; VI, 0.9 mm. (base 0.17 mm., filament 0.73 mm.); total 2.6 mm. Article III has from 8 to 15 (majority with 10) large and small sensoria throughout the length or confined to the basal two-thirds. Rostrum extending to, or nearly to, the 3rd coxæ. Thorax and abdomen green, the red eyes of the unborn young showing through the latter and giving the appearance of red spots on the dorsum; sides of the abdomen with several pairs of lateral tubercles. Cornicles black, faintly imbricated and constricted, 0.78 mm. long. Cauda paler than the abdomen and with a dusky tip, 0.5 mm. long.

HOST PLANT—Hagi, *Lespedeza bicolor* Turc.

LOCALITY—Komagome, Tokyo.

DATE OF COLLECTION—May 8, 1913.

COLLECTION NUMBER—5.

### ***Rhopalosiphum magnoliæ*, new species**

Figures 10 and 11

WINGED VIVIPAROUS FEMALES (Cotypes)—A large number of winged specimens were received, but so many had missing appendages, chiefly antennæ, that no type was selected; hence all are designated as cotypes. Average length 2.2 mm., width 1.05 mm. Prevailing color green. Head pale to bright red. Antennæ black throughout, imbricated, with few short hairs; lengths of articles: I, 0.15 mm.; II, 0.10 mm.; III, 0.92 mm.; IV, 0.71 mm.; V, 0.59 mm.; VI, 1.02 mm. (base 0.24 mm., filament 0.78 mm.); total 3.49 mm. Sensoria on III scattered



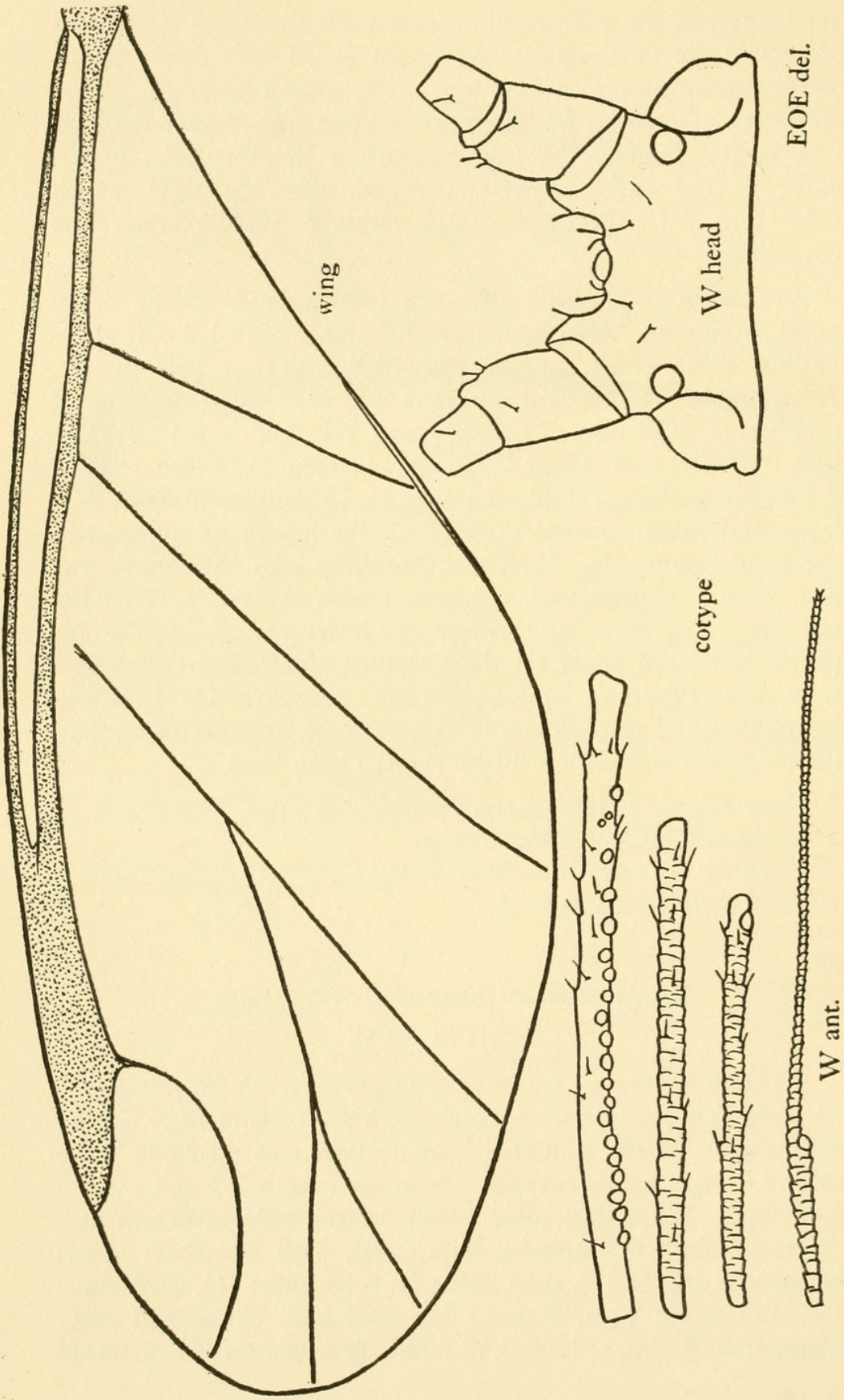
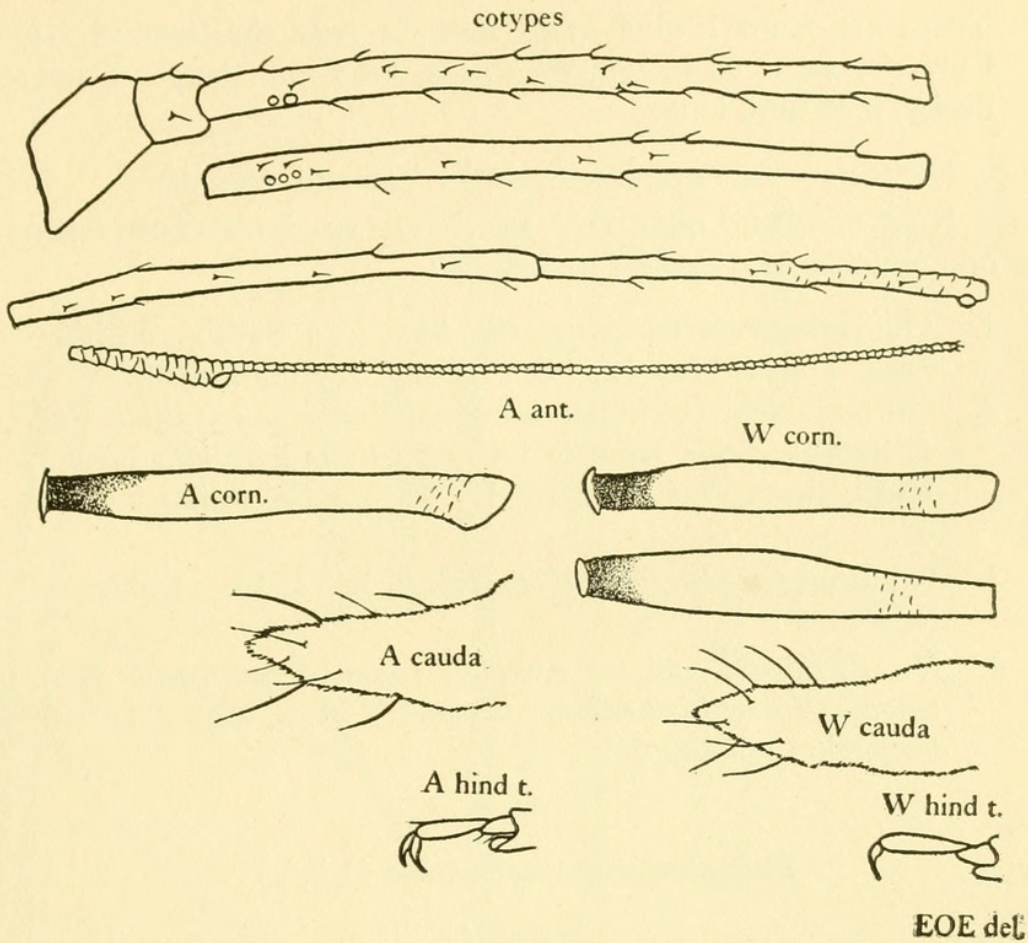


Figure 10.—*Rhopalosiphum magnoliae*, new species



Figure 11.—*Rhopalosiphum magnoliæ*, new species

or almost in a row, varying from 14 to 24 in number. Rostrum dark, extending nearly to the 2nd coxæ. Prothorax pale reddish, remainder of thorax brownish-green. Coxæ, trochanters and bases of the femora pale green; all other parts of the legs black. Veins of the wings pale brown; length of the front wings 4.6 mm. Abdomen green. Cornicles pale green with dusky or black tips, faintly imbricated near bases and tips, 0.56 mm. long. Cauda dusky, 0.4 mm. long.

**APTEROUS VIVIPAROUS FEMALES (Cotypes)**—A large number of individuals. Average length 1.8 mm., width 1 mm. Prevailing color green with the head and thorax reddish brown or amber. Antennæ dark or black throughout, imbricated, with few short hairs; lengths of articles: I, 0.16 mm.; II, 0.08 mm.; III, 0.99 mm.; IV, 0.71 mm.; V, 0.6 mm.; VI, 1.21 mm. (base 0.22 mm., filament 0.99 mm.); total 3.75 mm.



There are from 1 to 3 small sensoria near the base of III. Cornicles same as in winged forms, 0.63 mm. long. Cauda dusky, 0.36 mm. long.

NYMPHS—Pale green with dusky legs and antennæ.

HOST PLANTS, LOCALITIES, ETC.—The species has been taken on a number of occasions as follows:

1. On Habumokuren, *Magnolia conspicua* Salisb., Nishigahara, Tokyo, May 12, 1913. Collection number 30.
2. On Karalachi (trifoliolate orange), *Poncirus trifoliata* Raf. (listed as *Aegle sepiaria* DC. or *Citrus trifoliata* Linn.), Nishigahara, Tokyo, May 15, 1913. Collection number 42.
3. On orange, Shizuoka-Ken, May 18, 1913. Collection number 50.
4. On Karalachi and on Asagao, *Ipomæa hederacea* Jacq. (listed as *Pharbitis hederacea* Jacq.), Tokyo, May 22, 1913. Collection number 51.

### *Rhopalosiphum nymphææ* (Linn.)

Figure 12

This species is apparently quite common in the vicinity of Tokyo, having been taken on a number of host plants as follows:

1. On Ume (Japanese apricot), *Prunus mume* S. & Z., Komagome, Tokyo, May 9, 1913. Collection number 8.
2. On Ume, Nishigahara, Tokyo, May 11, 1913. Collection number 17.
3. On plum, Nishigahara, Tokyo, May 11, 1913. Collection number 18.
4. On Japanese pear, Nishigahara, Tokyo, May 11, 1913. Collection number 19.
5. On peach, Nishigahara, Tokyo, May 11, 1913. Collection number 21.
6. On Kuwai (old world arrowroot), *Sagittaria sagittæfolia* Linn., and on Hasu (East Indian lotus), *Nelumbo nucifera* Gaertn., Tokyo, June 23, 1913. Collection number 91.



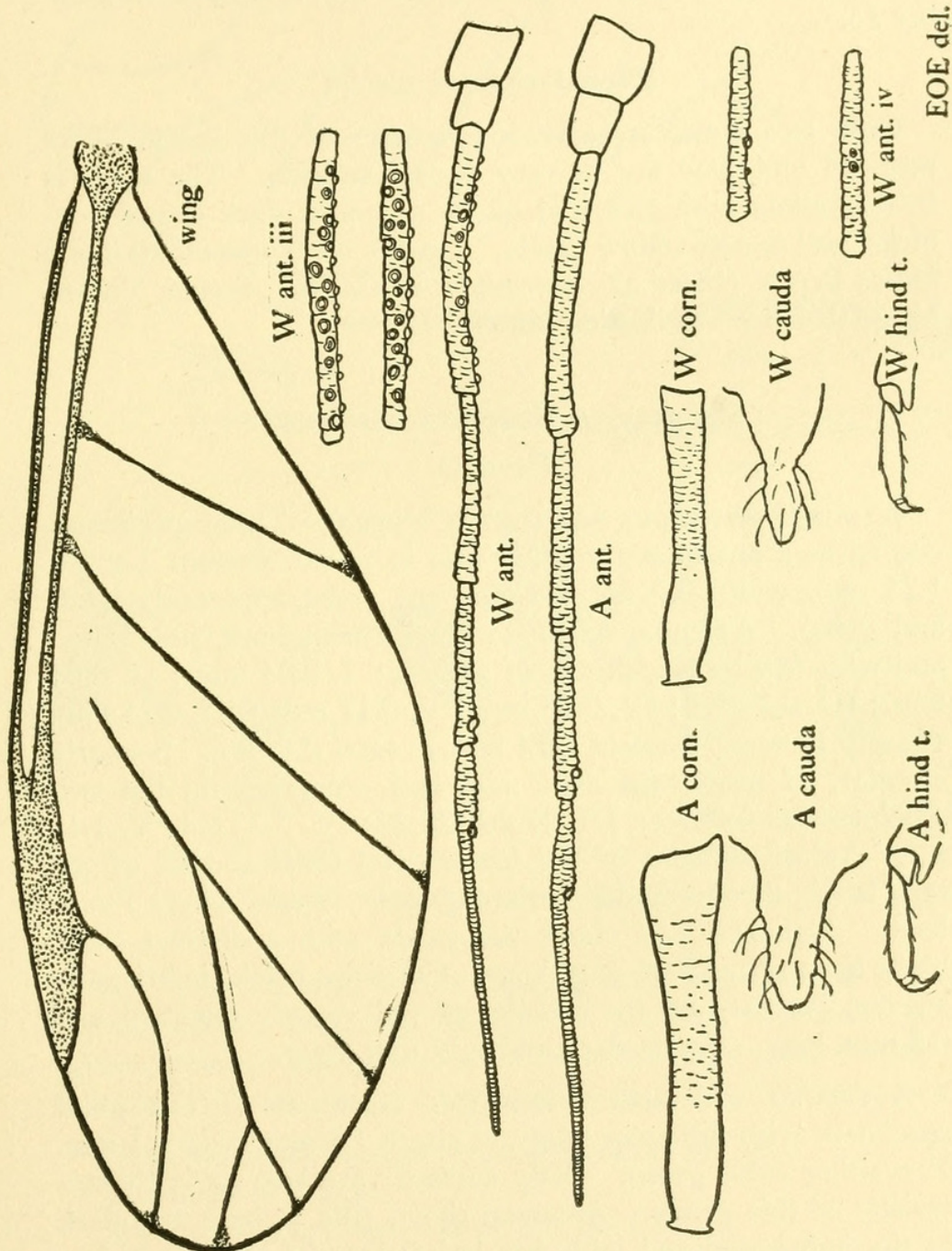


Figure 12.—*Rhopalosiphum nymphæ* (Linnaeus)

EOE del.



**Rhopalosiphum persicæ (Sulzer)**

This species was taken on Natane-na (mustard), *Brassica campestris* Linn., Shiga-Ken, May 23, 1913. Collection number 55.

**Rhopalosiphum, species**

Only two immature apterous females of this species were received and they are in very poor condition. The color is lemon-yellow with pale and dusky antennæ, dark brown cornicles and lemon-yellow cauda. Occurs on Yomena, *Boltonia indica* Benth. (listed as *Asteromæa indica* Bl.), Somei, Tokyo, May 10, 1913. Collection number 12.

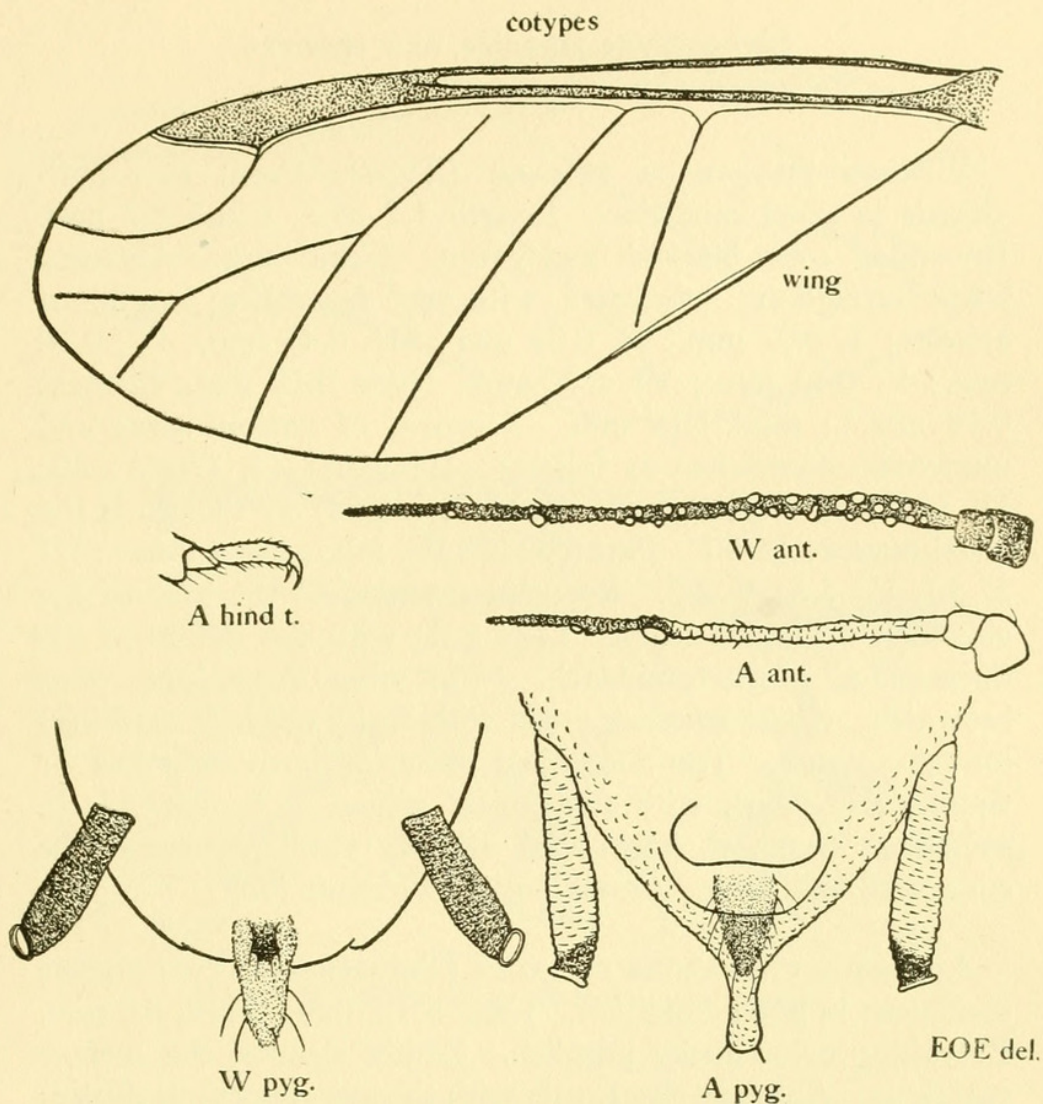
**Siphocoryne bicaudata, new species**

## Figure 13

WINGED VIVIPAROUS FEMALES (Cotypes)—Three specimens, one without antennæ, the other two in fair condition. Length 1.25 mm., width 0.7 mm. Color not given, apparently black and green. Antennæ dusky to black throughout, imbricated and with few hairs; lengths of articles: I, 0.05 mm.; II, 0.04 mm.; III, 0.3 mm.; IV, 0.15 mm.; V, 0.11 mm.; VI, 0.25 mm. (base 0.11 mm., filament 0.14 mm.); total 0.9 mm. Sensoria circular, of nearly the same size and occurring on the two specimens as follows: III, 17,20: 23,24; IV, 5,3: 6,4; V, 1,1: 2,2. Apical portions of the femora and tibiæ and all of the tarsi black, the remainder of the legs pale. Front wings 3 mm. long. Abdomen just above the cauda with a distinct short black horn about 0.04 mm. long. Cornicles black, imbricated, swollen just beyond the middle, curved slightly outward and 0.2 mm. long. Cauda dark and 0.17 mm. long.

APTEROUS VIVIPAROUS FEMALES (Cotypes) — Ten good specimens with full color notes. Length 1.8 mm., width 1 mm. Prevailing color green. Body surface variolous as is characteristic of this genus. Antennæ short, pale at base and dark at tip, imbricated and with few hairs; lengths of the articles: I, 0.06 mm.; II, 0.04 mm.; III, 0.22 mm.; IV, 0.10 mm.; V, 0.08 mm.; VI, 0.2 mm. (base 0.09 mm., filament 0.11 mm.); total 0.7 mm. The sensorium near tip of V is noticeably large. Rostrum reaching to the 2nd coxæ. Abdomen terminating in



Figure 13.—*Siphocoryne bicaudata*, new species

a very long, reflexed horn extending back over the full length of the cauda, with two spines near the tip. Cornicles pale green with tips dusky, somewhat recurved, imbricated throughout and 0.3 mm. long. Cauda dusky to black, 0.13 mm. long.

HOST PLANT—Yanagi (willow), *Salix*, species.

LOCALITY—Tokyo.

DATE OF COLLECTION—May 13, 1913.

COLLECTION NUMBER—53.

Note—This species is close to *Nipposiphum salicicola* Mats., but differs in having sensoria on articles IV and V of the antennæ of the winged forms.



**Siphocoryne japonica**, new species

Figure 14

WINGED VIVIPAROUS FEMALE (Type)—From two individuals in good condition. Length 1.2 mm., width 0.7 mm. Prevailing color blackish and green. Head dark. Antennæ black throughout, imbricated, with very few hairs; lengths of articles: I, 0.07 mm.; II, 0.05 mm.; III, 0.45 mm.; IV, 0.18 mm.; V, 0.13 mm.; VI, 0.30 mm. (base 0.12 mm., filament 0.18 mm.); total 1.18 mm. Sensoria of various sizes and numerous, distributed as follows: III (left) 43, (right) 49; IV (left) 8, (right) 8; V (left) 3, (right) 2. There is the usual number on VI. Paratype has the following number: III 27,32; IV 5,5; V 2,2. Rostrum reaching to the base of the abdomen. Thorax black. Legs pale with the apices of the tibiæ and all of the tarsi black. Front wings 3mm. long, veins brownish. Abdomen dark green with dusky or black markings on the dorsum. The abdominal posterior horn indistinct or rudimentary, dark with two apical spines. Cornicles black, somewhat recurved, imbricated, slightly swollen towards the ends, 0.28 mm. long. Cauda dusky, 0.15 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Two mature specimens in good condition. Length 1.7 mm., width 0.9 mm. Prevailing color dusky purplish. Bodies slender, the surface variolous. Antennæ short, pale with the apical portions dusky; lengths of the articles: I, 0.06 mm.; II, 0.05 mm.; III, 0.24 mm.; IV, 0.09 mm.; V, 0.09 mm.; VI, 0.21 mm. (base 0.09 mm., filament 0.12 mm.); total 0.74 mm. The sensoria normal. Abdominal horn short or rudimentary with two terminal hairs. Cornicles imbricated, somewhat swollen beyond the middle, recurved, pale, with the tips or apical halves dusky, 0.3 mm. long. Cauda dark, 0.12 mm. long.

NYMPHS—Somewhat pale rosy in color, with dusky antennæ, legs and cornicles.

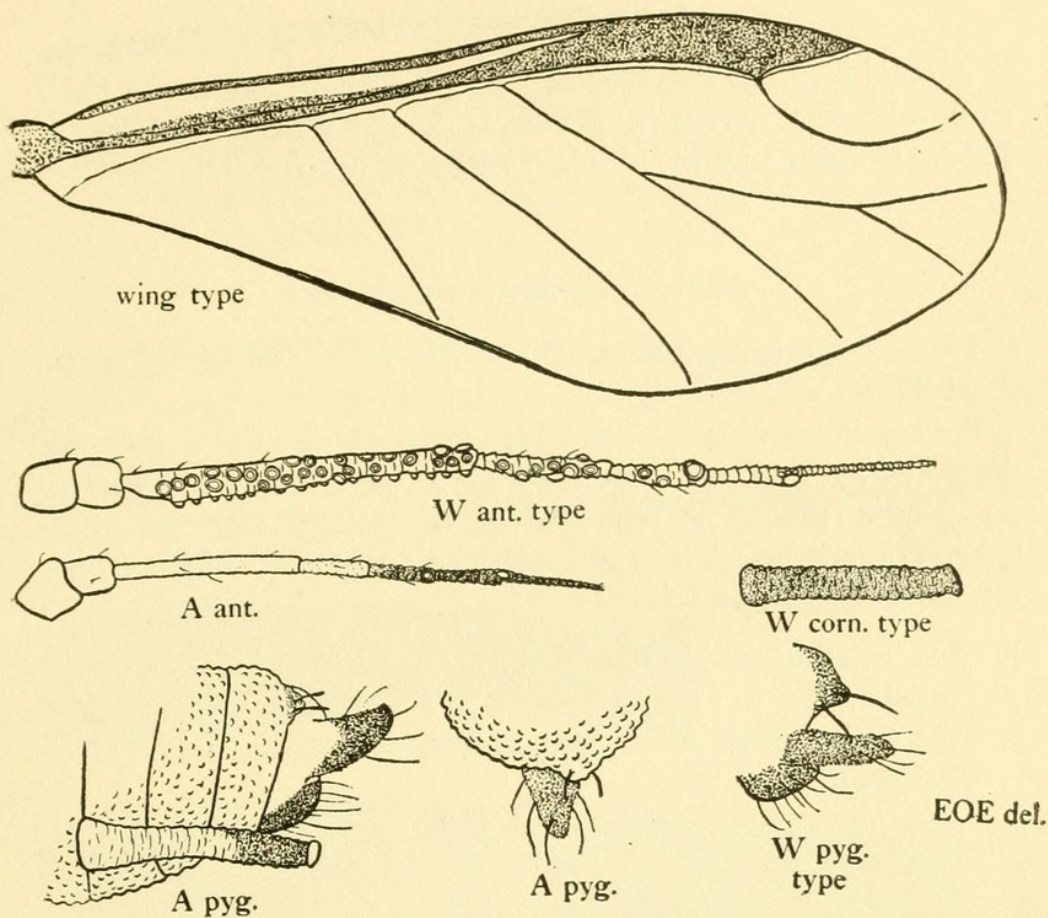
HOST PLANT—Shirane seniku, *Angelica polymorpha* Maxim.

LOCALITY—Nikko.

DATE OF COLLECTION—June 10, 1913.

COLLECTION NUMBER—85.



Figure 14.—*Siphocoryne japonica*, new species

REMARKS—This species is very close to *Siphocoryne bicaudata*, but has a very much smaller abdominal horn in winged and apterous forms and many more sensoria (about twice as many) on the antennæ of the winged forms.

### *Aphis avenæ* Fab.

Two lots taken as follows:

1. Winged and apterous viviparous females on Omugi, *Hordeum vulgare* Linn. (listed as *H. sativum vulgare*), Nishigahara, Tokyo, May 28, 1913.
2. Apterous viviparous females on wheat, Nishigahara, Tokyo, May 28, 1913. Collection number 66.



***Aphis brassicae* Linn.**

A good series of this species was collected on Aburana (Pak-choi cabbage), *Brassica chinensis* Linn., Fuknoka, June 7, 1913. Collected by M. Mori. Collection number 77.

***Aphis citricola* Van der Goot**

1912—Mittel. Nat. Mus. 29, 2 Bieh. Jahrb. Hamb. Wissen. Aust 29, pp. 273-273, fig. 1. (Original description).

A very interesting species which agrees so well with the one described by Van der Goot from Chile, where it was collected on orange, that it is regarded as specifically identical until proven otherwise. There are minor variations in color. Good series were taken as follows:

1. On orange, Shidzuoka-Ken, May 19, 1913. Collection number 48.
2. On young shoot of citrus tree, Tokyo, Aug. 1, 1913. Collection number 97.

***Aphis gossypii* Glover**

## Figure 15

This species is apparently abundant from the number of times it was collected as will be seen from the following records:

1. On Kusagi, *Clerodendron trichotomum* Thunb., Somei, Tokyo, May 7, 1913. Collection number 2.
2. On unknown plant, Somei, Tokyo, May 10, 1913. Collection number 13.
3. On *Petasites japonicus* F. Schmidt (listed as *P. japonica* Mig.), Nishigahara, Tokyo, May 17, 1913. Collection number 44.
4. On orange, Shidzuoka-Ken, May 19, 1913. Collection number 49.
5. On Kiku, *Chrysanthemum*, species, Nishigahara, Tokyo, May 22, 1913. Collection number 52. These are very small specimens.



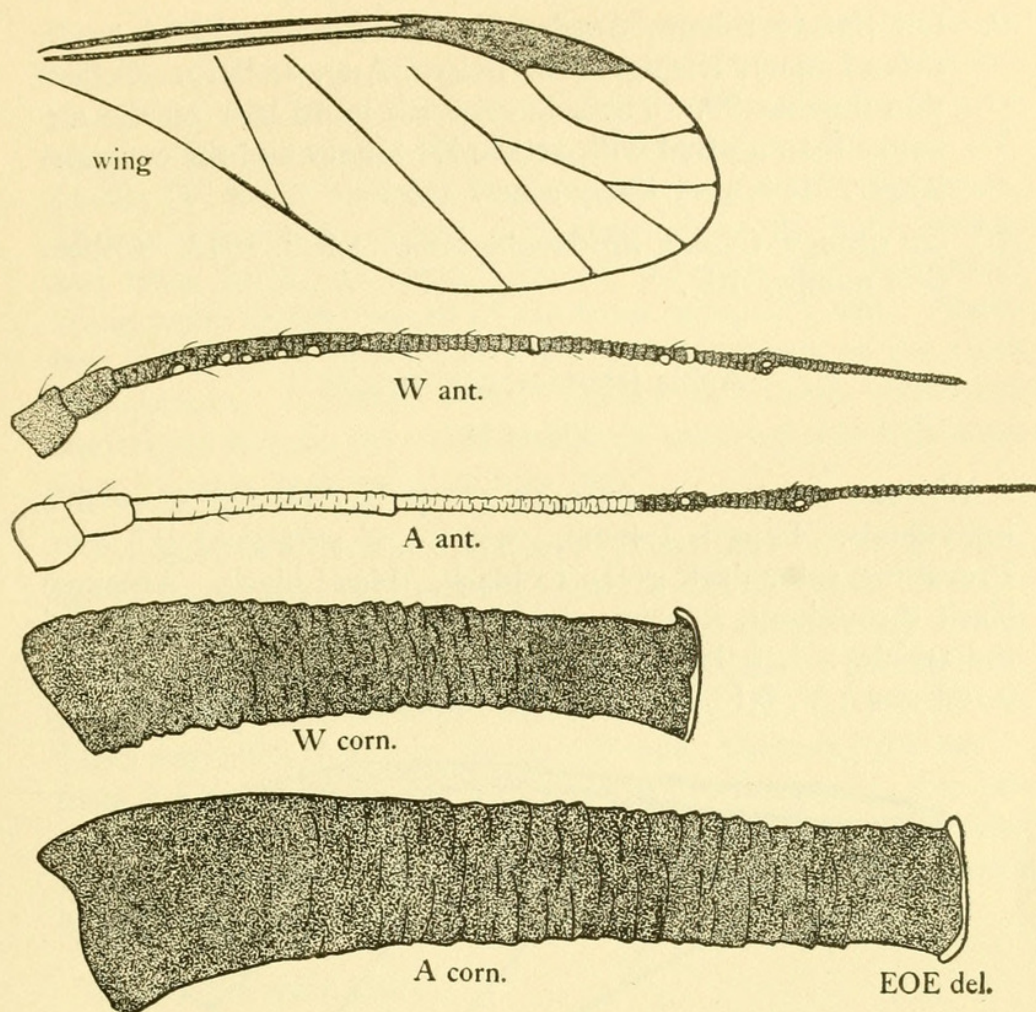


Figure 15.—*Aphis gossypii* Glover. Cornicles greatly enlarged

6. On Nasu, *Solanum melongena* Linn., and on Kiuri (cucumber), *Cucumis sativus* Linn., Tokyo, June 20, 1913. Collection number 90. Occasionally very injurious to these hosts. On some of the winged females there are one or two sensoria on article IV of the antennæ, which is not at all normal.
7. On Kiuri (cucumber), *Cucumis sativus* Linn., Nishigahara, Tokyo, June 28, 1913. Collection number 92. These are mostly typical, but cornicles are long and some have one or two sensoria on antennal article IV.
8. On potato, Nishigahara, Tokyo, June 28, 1913. Collection number 93.

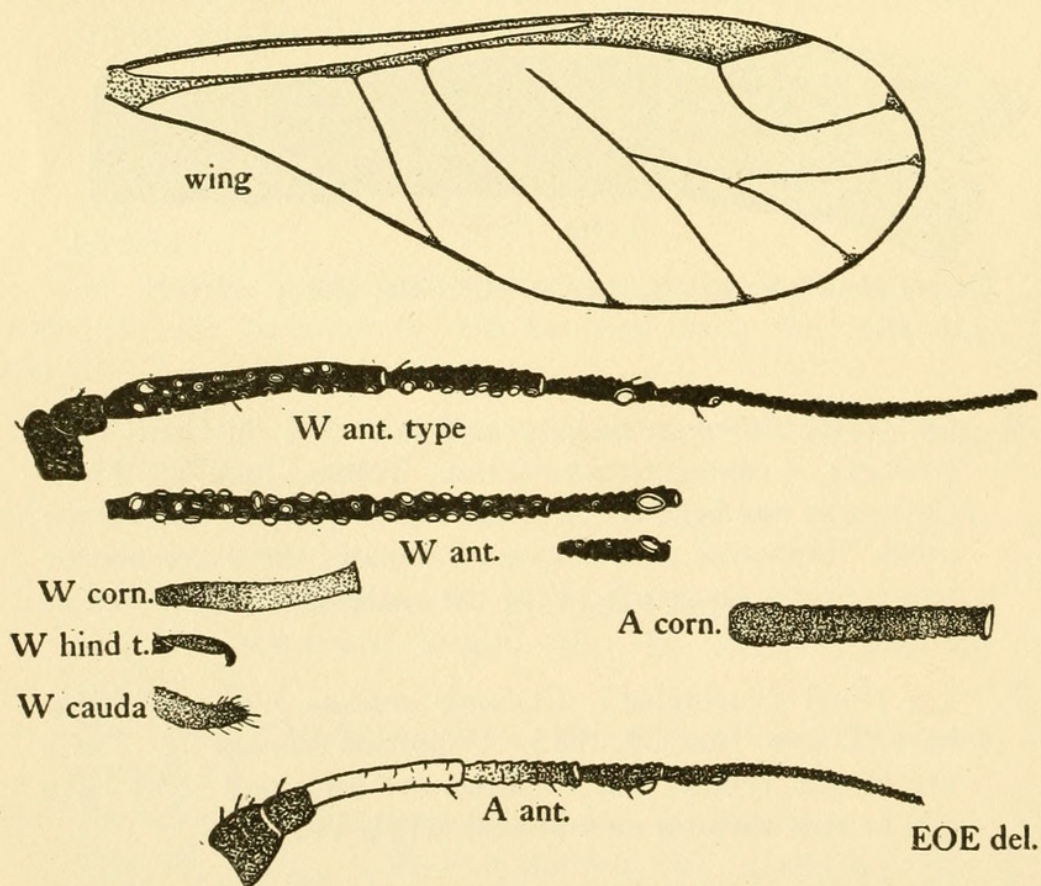


9. On Sarutori-ibara, *Smilax walteri* Pursh. (listed as *S. china* Linn.), Nishigahara, Tokyo, Aug. 4, 1913. Collection number 99. These have much more hair on the antennæ than normal with article III longer and the cornicles larger. It is very likely a new species.
10. On orange, Okiku, Sgidzuoka-Ken, Oct. 5, 1913. Collection number 107.

### *Aphis japonica*, new species

Figure 16

WINGED VIVIPAROUS FEMALE (Type)—Selected from five individuals. Length 1.4 mm., width (of paratype) 0.5 mm. Prevailing color dark green to black. Head black. Antennæ black throughout, imbricated and with few hairs; lengths of the articles: I, 0.06 mm.; II, 0.06 mm.; III, 0.33 mm.; IV, 0.185 mm.; V, 0.13 mm.; VI, 0.445 mm. (base 0.07 mm., fila-

Figure 16.—*Aphis japonica*, new species



ment 0.375 mm.) ; total 1.21 mm. Sensoria of various sizes and distributed over III and IV in large numbers as follows: (left) III, 23; IV, 8; V, the usual normal one which is very large. The paratypes show the following variations: III, 21-28; IV, 9-12; V, 1-3. Rostrum reaching to the 2nd coxæ. Thorax shiny black. Coxæ, tarsi and apical ends of the femora and tibiæ black, the remainder of the legs pale brownish. Wing veins dusky; length of the front wings 2.1 mm. Abdomen yellowish or dark green with dark markings on the sides and dorsum. Cornicles dusky, faintly imbricated, somewhat constricted beyond the middle, slightly recurved and 0.26 mm. long. Cauda dark and 0.06 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—A large number of specimens. Length 1.27 mm., width 0.7 mm. Prevailing color dark green. Head dark green. Antennæ dark except III and the base of IV which are pale; lengths of the articles: I, 0.07 mm.; II, 0.05 mm.; III, 0.17 mm.; IV, 0.14 mm.; V, 0.095 mm.; VI, 0.30 mm. (base 0.07 mm., filament 0.23 mm.); total 0.825 mm. Thorax and abdomen dark-green. The latter with a pair of tubercles just behind the cornicles. Cornicles black, imbricated, almost straight, 0.33 mm. long. Cauda black, wide at base and 0.09 mm. long.

NYMPHS—pale green.

HOST PLANT—apple.

DATE OF COLLECTION—May 7, 1913.

COLLECTION NUMBER—4.

### ***Aphis medicaginis* Koch**

Figure 17

Recorded from a number of host plants as follows:

1. On Soramame, *Vicia faba equina* Pers., Nishigahara, Tokyo, May 8, 1913. Collection number 6.
2. On Utsugi, *Deutzia scabra* Thunb., Somei, Tokyo, May 10, 1913. Collection number 14.
3. On unknown plant, Somei, Tokyo, May 10, 1913. Collection number 15.



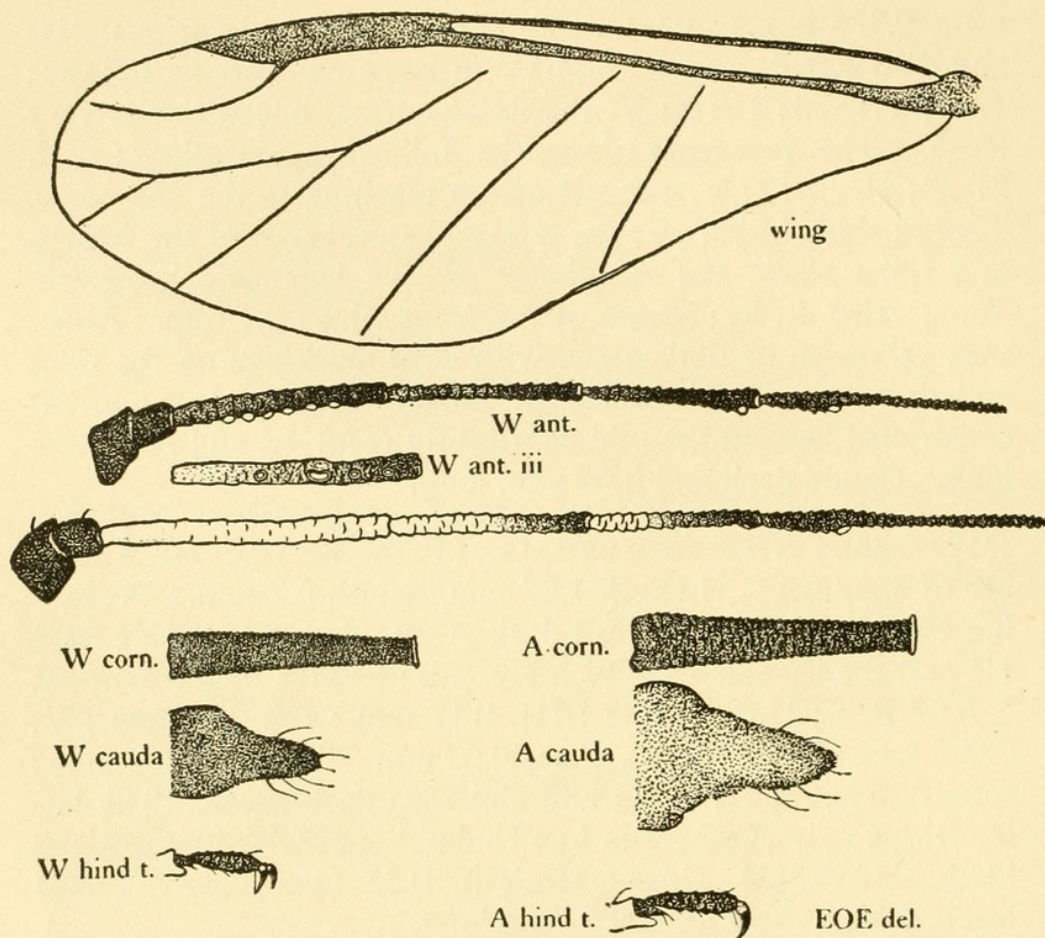


Figure 17.—*Aphis medicaginis* Koch

4. On Soramame, *Vicia faba equina* Pers., Tokyo, May 14, 1913. Collection number 33.
5. On Mukuge (shrubby althea or rose of Sharon), *Hibiscus syriacus* Linn., and on Keyaki, *Zelkova acuminata* Planch., Nishigahara, Tokyo, May 15, 1913. Collection number 38.
6. On Genge, *Astragalus sinicus* Linn., Shiga-Ken, May 23, 1913. Collection number 56.
7. On Waremokau, *Poterium officinale* A. Gray (listed as *Sanguisorba officinalis* Linn.), Nikko, June 10, 1913. Collection number 87. Only apterous viviparous females present.



***Aphis pomi* DeGeer**

Collected in two lots as follows:

1. On Bake (Japan quince or Japonica), *Chænomeles japonica* Lindl., (listed as *Cydonia japonica* Pers.), Nakano, Tokyo, May 25, 1913. Collection number 60.
2. On apple and Japanese pear, Tokyo, June 2, 1913. Collection number 69.

***Aphis rumicis* Linn.**

The material taken checks up with this species very well. It was collected as follows:

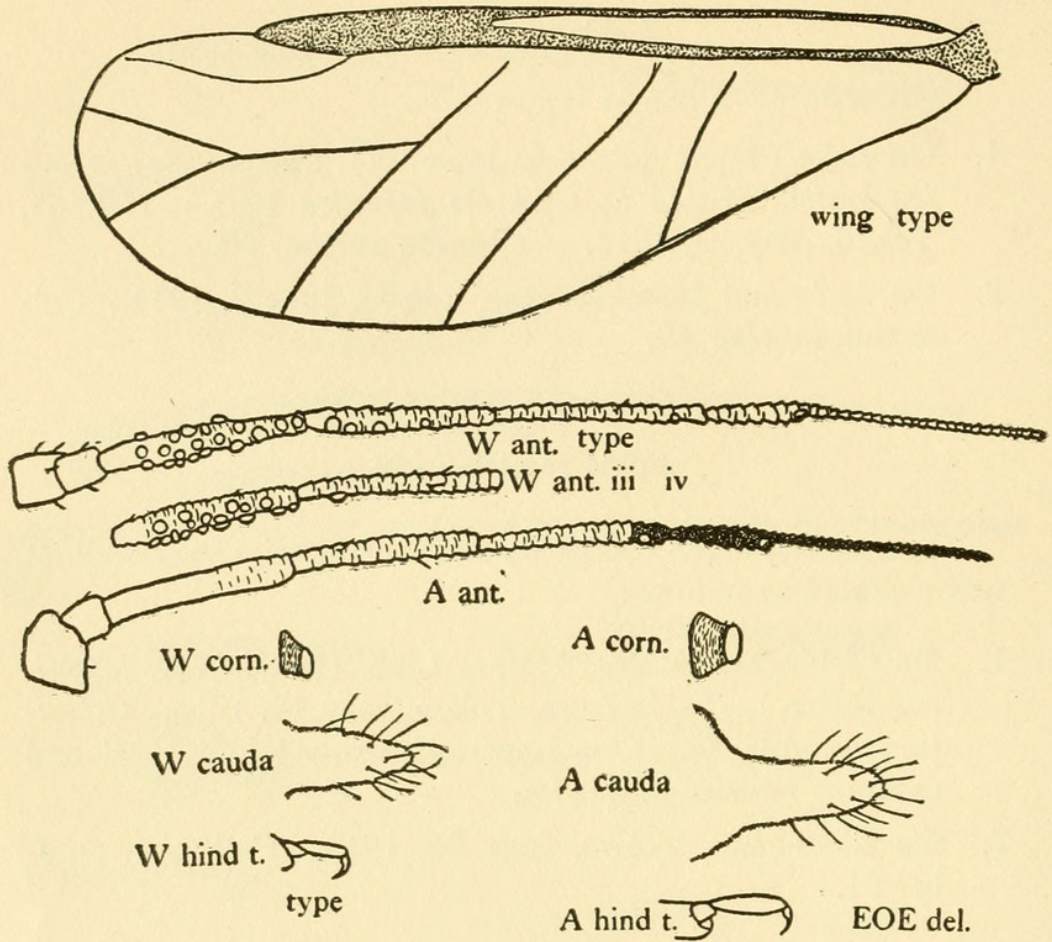
1. On Gishi-gishi, *Rumex crispus* Linn. (listed as *R. japonicus* Meisn.), Nishigahara, Tokyo, May 14, 1913. Collection number 35. One imperfect winged individual and apterous females in this lot.
2. On Gishi-gishi, Tokyo, May 26, 1913. Collection number 61.

***Aphis siphonella*, new species**

Figure 18

WINGED VIVIPAROUS FEMALE (Type)—Selected from six specimens. Length 1.2 mm., width 0.6 mm. Head dark. Antennæ black throughout, imbricated and with few hairs; lengths of articles: I, 0.05 mm.; II, 0.05 mm.; III, 0.26 mm.; IV, 0.23 mm.; V, 0.26 mm.; VI, 0.42 mm. (base 0.12 mm., filament 0.30 mm.); total 1.27 mm. Sensoria numerous on III, a few on IV, and normal on V and VI. On the left antenna (right member missing) there are on III, 20; on IV, 4. The single normal one on V is quite a distance from the tip. On the paratypes the number varies as follows: III, 7-20; IV, 0-1. Rostrum (paratype) reaching to the 2nd coxæ. Prothorax dark green, the remainder of the thorax black; distinct lateral prothoracic tubercles evident on some of the paratypes as are also several pairs of marginal abdominal tubercles. Coxæ, tarsi and the apices of the femora and tibiæ black, the



Figure 18.—*Aphis siphonella*, new species

remainder of the legs pale. Primary wings 2.7 mm. long. Cornicles very short, black, 0.025 mm. long; the cauda dark, 0.16 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Ten specimens. Length 1.4 mm., width 1 mm. Prevailing color dark brown, the body being slightly covered with a white pulverulence. Antennæ with articles I and II dusky; III, IV and most of V pale, and the tip of V and all of VI black; lengths of the articles: I, 0.07 mm.; II, 0.05 mm.; III, 0.24 mm.; IV, 0.22 mm.; V, 0.24 mm.; VI, 0.39 mm. (base 0.12 mm., filament 0.27 mm.); total 1.21 mm. There is a pair of short but distinct lateral prothoracic tubercles. Abdomen dark brown with black markings on the dorsum and with four or more



pairs of lateral tubercles. Cornicles black, imbricated and very short, 0.05 mm. long. Cauda black, 0.25 mm. long.

NYMPHS—pale with dark wing pads.

HOST PLANT—Japanese pear.

LOCALITY—Ōmori, Tokyo.

DATE OF COLLECTION—May 12, 1913.

COLLECTION NUMBER—29.

REMARKS—Named from its very short cornicles.

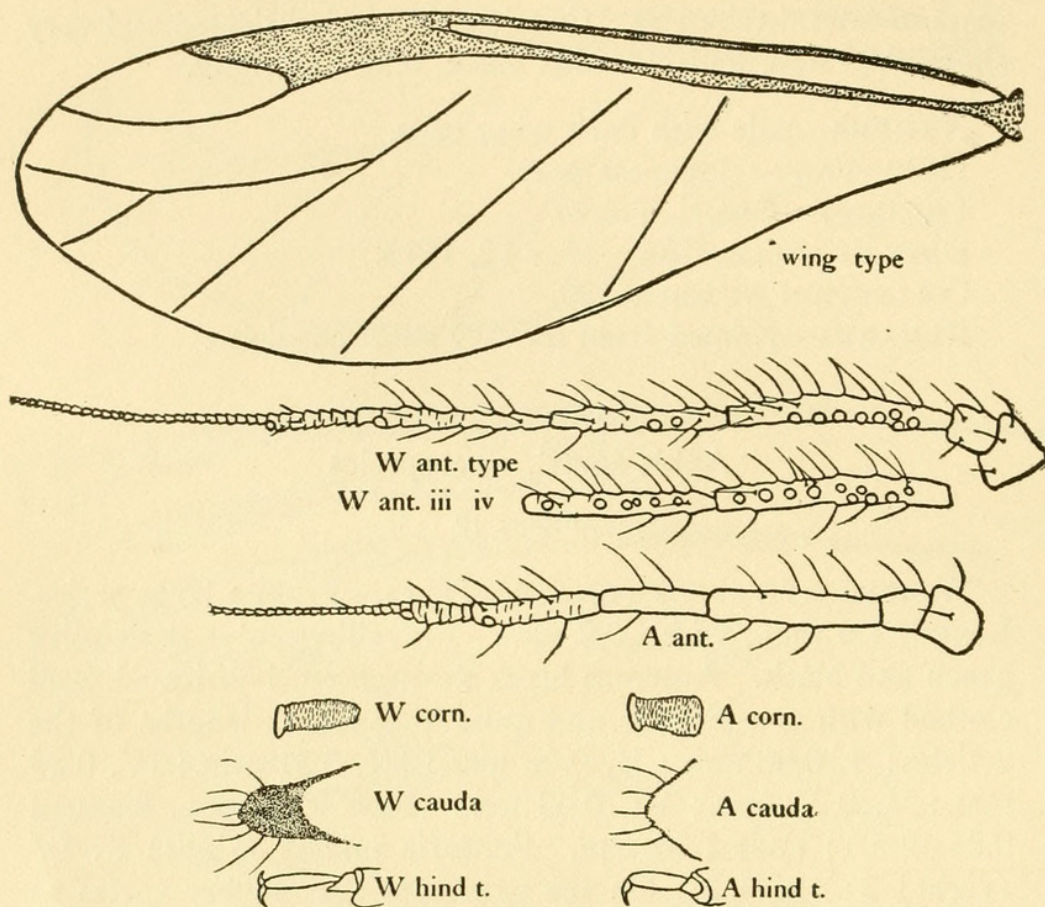
### ***Aphis somei*, new species**

Figure 19

WINGED VIVIPAROUS FEMALE (Type)—From a large series. Length 1.6 mm., width 0.7 mm. Prevailing color dark olive green and black. Antennæ black throughout, imbricated, well clothed with conspicuous and quite long hairs; lengths of the articles: I, 0.06 mm.; II, 0.06 mm.; III, 0.31 mm.; IV, 0.25 mm.; V, 0.27 mm.; VI, 0.43 mm. (base 0.12 mm., filament 0.31 mm.); total 1.38 mm. Sensoria on III (right) 8; IV (right) 2; (left) 3. On the paratypes the number varies as follows: III, 8-14; IV, 1-5; V and VI have the normal ones. Rostrum reaching nearly to the 3rd coxæ. Thorax shiny black with large blunt prothoracic tubercles on the sides. Front wings 3.2 mm. long. Abdomen dark green with black transverse markings on the dorsum. Cornicles very short, black, imbricated, slightly swollen at the base or middle with flaring mouth, length 0.12 mm. Cauda dark, 0.14 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—A large series of specimens. Average length 1.9 mm., width 1.3 mm. Prevailing color brown or purplish, often slightly covered with whitish powder. Antennæ dark with the bases of III, IV and sometimes V pale; lengths of the articles: I, 0.09 mm.; II, 0.07 mm.; III, 0.38 mm.; IV, 0.26 mm.; V, 0.25 mm.; VI, 0.42 mm. (base 0.13 mm., filament 0.29 mm.); total 1.47 mm. Lateral prothoracic tubercles present and at least one pair of tubercles on the abdomen. Cornicles short, usually widest at base with flaring mouth, imbricated, 1.51 mm. long. Cauda greenish to dark, wide at base, pointed, 0.09 mm. long.



Figure 19.—*Aphis somei*, new species

HOST PLANTS, LOCALITIES, ETC.—This species was taken as follows:

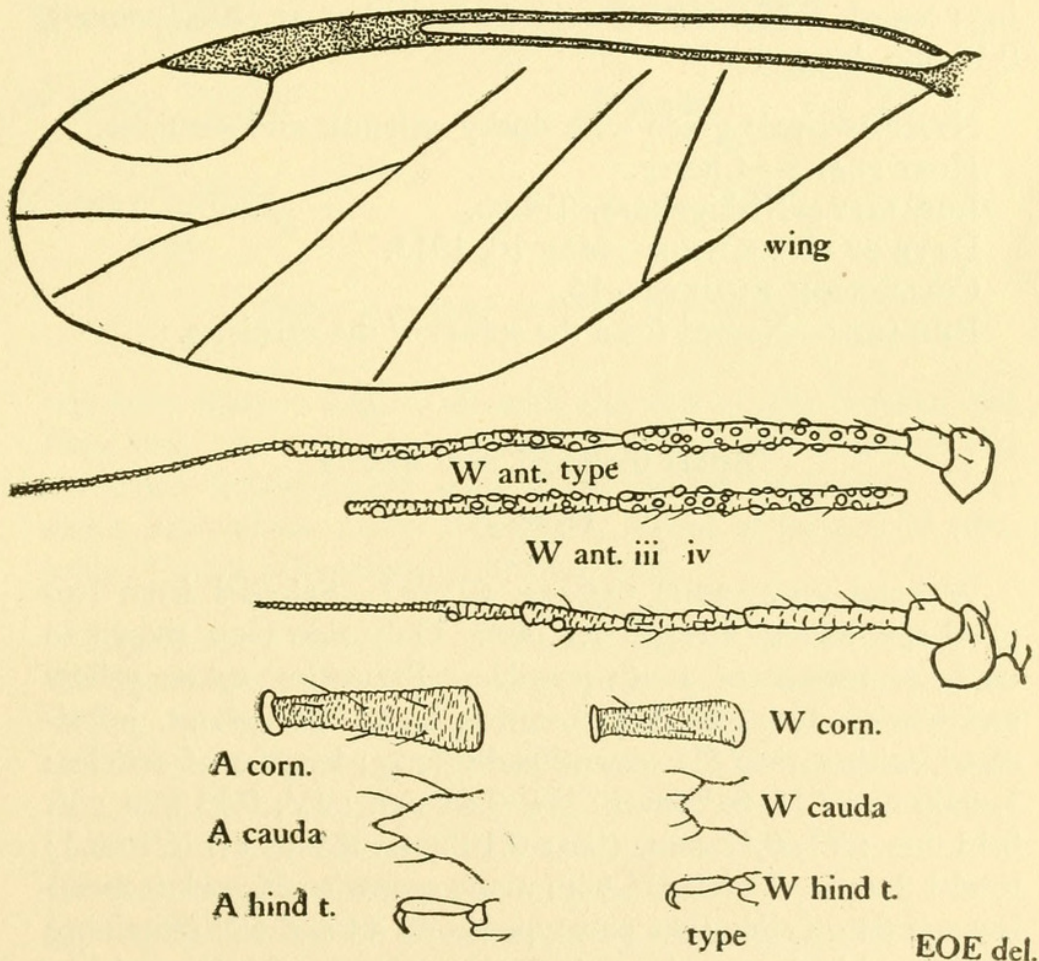
1. On Nurude, *Rhus javanica* Linn. (listed as *R. semialata* Murr.), Nishigahara, Tokyo, May 7, 1913. Collection number 3.
2. On Yabudomari, *Viburnum tomentosum* Thunb., Somei, Tokyo, May 9, 1913. Collection number 11.
3. On apple, Nishigahara, Tokyo, May 11, 1913. Collection number 20.
4. On orange, Nishigahara, Tokyo, May 31, 1913. Collection number 68.
5. On Japanese pear, Tokyo, June 2, 1913. Collection number 70.



***Aphis spinosula*, new species**

Figure 20

WINGED VIVIPAROUS FEMALE (Type)—From four individuals in rather poor condition. Length 1.1 mm., width 0.45 mm. Prevailing colors green and black. Head shiny black. Antennæ black except the base of III which is slightly pale; lengths of articles: I, 0.04 mm.; II, 0.05 mm.; III, 0.34 mm.; IV, 0.17 mm.; V, 0.13 mm.; VI, 0.44 mm. (base 0.10 mm., filament 0.34 mm.); total 1.17 mm. Sensoria numerous; 25 on III (right), 6 on IV, 2 on V. Paratypes have from 25-27 on III, 9-11 on IV and 1-3 on V. Rostrum extending to the 3rd coxæ. Thorax shiny black. Legs pale green with the distal ends of the femora and tibiæ and the entire tarsi black.

Figure 20.—*Aphis spinosula*, new species



Front wings 2.7 mm. long. Abdomen pale-green with indistinct rough wart-like marginal tubercles. Cornicles dusky, straight, widest at the base, slightly flaring at the mouth, imbricated with several spine-like hairs and 0.18 mm. long. Cauda pale green, short, bluntly pointed, 0.07 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—A good series of specimens. Length 1.5 mm., width 1.1 mm. Prevailing colors pale and dark green. Antennæ dark with the base of III pale, imbricated; lengths of articles: I, 0.05 mm.; II, 0.06 mm.; III, 0.19 mm.; IV, 0.14 mm.; V, 0.12 mm.; VI, 0.32 mm. (base 0.09 mm., filament 0.23 mm.); total 0.88 mm. Prothoracic tubercles in the form of large rough basal projections. Abdomen pale-green, with short, wart-like marginal tubercles. Cornicles black, imbricated, same shape as in the winged form, and with several spines as shown in the accompanying drawing; length 0.25 mm. Cauda dark, widest at base, pointed, 0.13 mm. long.

NYMPHS—pale-green with dusky antennæ and cornicles.

HOST PLANT—Cherry.

LOCALITY—Nishigahara, Tokyo.

DATE OF COLLECTION—May 10, 1913.

COLLECTION NUMBER—16.

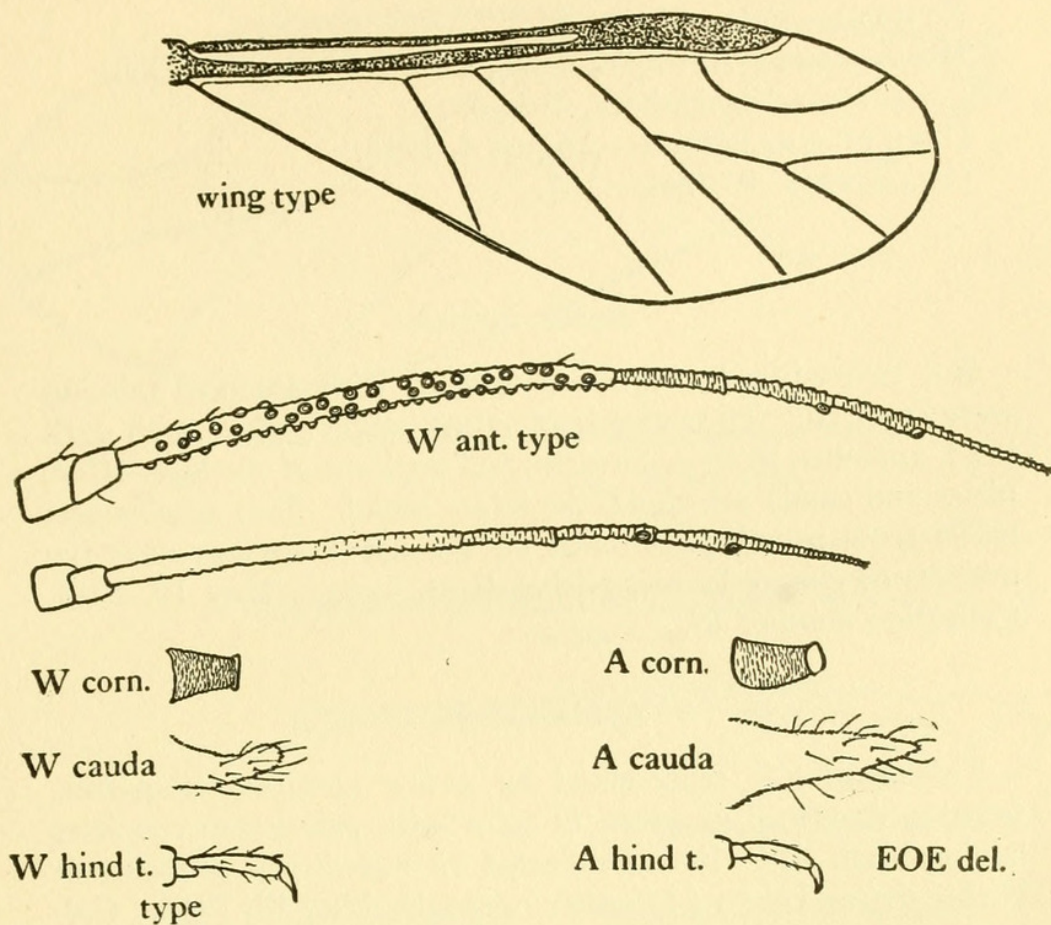
REMARKS—Named from the spines of the cornicles.

### ***Aphis thalictrii*, new species**

Figure 21

WINGED VIVIPAROUS FEMALE (Type)—Selected from two good specimens. Length 1.2 mm. Only side view shown so no measurement of width possible. Prevailing colors yellow and black. Head black. Antennæ black throughout, imbricated, with article III exceptionally long; lengths of articles: I, 0.06 mm.; II, 0.05 mm.; III, 0.58 mm.; IV, 0.13 mm.; V, 0.13 mm.; VI, 0.25 mm. (base 0.10 mm., filament 0.15 mm.); total 1.2 mm. Article III with many sensoria; 56 on left member and 64 on right; the paratype shows 44 and 52; remaining articles with the usual number. Rostrum reaching nearly to the 2nd coxæ. Prothorax dusky yellow, remaining thoracic



Figure 21.—*Aphis thalictrii*, new species

segments black. Legs pale with the tips of the femora, the tibiae and the entire tarsi black. Front wings 2 mm. long. Abdomen lemon-yellow with dusky dorsal markings. Cornicles pale-yellow, finely imbricated, widest at base, 0.07 mm. long. Cauda pale-yellow, 0.12 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Three or four good specimens. Length 1.1 mm., width 0.65 mm. Prevailing color pale lemon-yellow. Antennæ pale throughout and finely imbricated; lengths of articles: I, 0.03 mm.; II, 0.04 mm.; III, 0.41 mm.; IV, 0.10 mm.; V, 0.12 mm.; VI, 0.25 mm. (base 0.10 mm., filament 0.15 mm.); total 0.95 mm. Article III very long as will be seen from the above. Rostrum reaching to the 2nd coxæ. Cornicles pale, short, finely imbricated, widest at the base and gradually tapering towards the mouth, 0.08 mm. long. Cauda pale, noticeably long, being 0.21 mm.



NYMPHS—Pale-yellow.

HOST PLANT—Aki-Karamatsu, *Thalictrum minus* Linn.

LOCALITY—Nishigahara, Tokyo.

DATE OF COLLECTION—August 4, 1913.

COLLECTION NUMBER—101.

### **Aphis, species**

But two winged viviparous females with antennæ missing were received. The color is given as bright yellow with dark head, antennæ, thorax, cornicles and portions of the legs. Cornicles and cauda are short, the latter broad. This species was taken from pseudogalls made on the upper surface near the midribs of cherry leaves, Nishigahara, Tokyo, May 19, 1913. Collection number 46.

### **Aphis, species**

This species is represented by a few apterous viviparous females, described as green in color with pale green cornicles having black tips. It was collected on strawberry, probably at Nishigahara, Tokyo (? locality omitted), May 13, 1913. Collection number 31.

### **Toxoptera aurantii Fonsc.<sup>3</sup>**

This species was collected on Skikimi, *Illicium anisatum* Linn., at Nishigahara, Tokyo, May 17, 1913. Collection number 45.

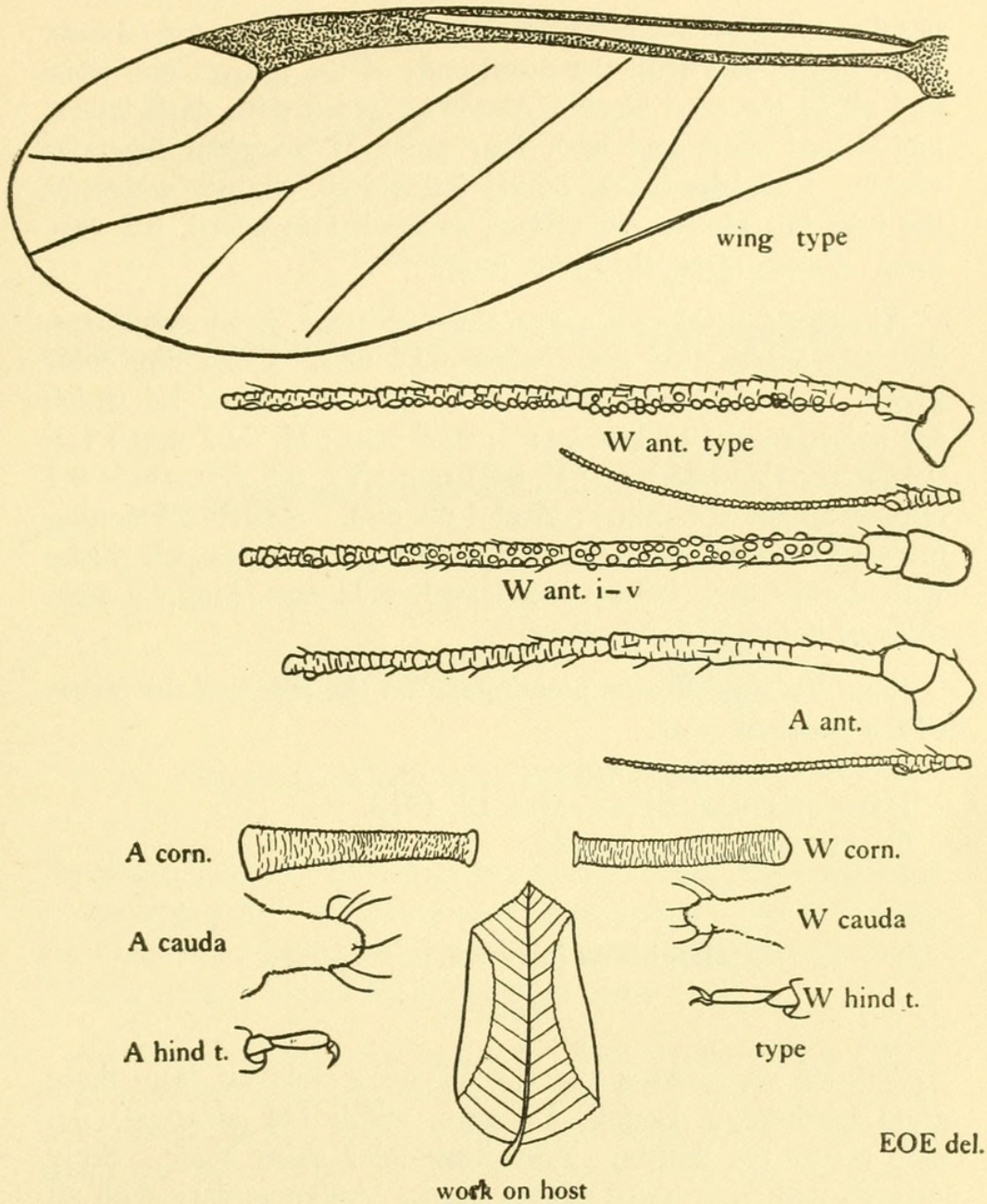
### **Toxoptera piricola Mats.**

#### Figure 22

WINGED VIVIPAROUS FEMALE—From two good specimens. Length 1.6 mm., width 0.65 mm. Prevailing colors black and dark green. Head black. Antennæ black with articles I, II and the extreme base of III dusky or pale, imbricated, with few hairs and many sensoria; lengths of the articles: I, 0.05 mm.; II, 0.07 mm.; III, 0.41 mm.; IV, 0.27 mm.; V, 0.21 mm.; VI,

<sup>3</sup> *T. aurantiæ* Koch is a synonym of this species. See W. P. Phillips and J. J. Davis, Tech. Ser. no. 25, pt. 1, Bur. Ent. U. S. Dept. Agric., p. 8, May 4, 1912.



Figure 22.—*Toxoptera piricola* Mats.

0.56 mm. (base 0.10 mm., filament 0.46 mm.) ; total 1.57 mm. Sensoria circular of various sizes and distributed as follows: III (left) 29, (right) 26; IV (left) 14, (right) 15; V (left) 5, (right) 6. One individual shows the following: III (left) 32, (right) 24; IV (left) 16, (right) 16; V (left) 4, (right) 5 (some of these are difficult to make out). Rostrum reaching



nearly to the 3rd coxæ. Thorax black. Primary wings 3 mm. long. Legs pale with the distal ends of the femora and tibiæ and all of the tarsi black. Abdomen green with dark lateral and dorsal spots and with four pairs of marginal tubercles visible. Cornicles black, faintly imbricated, slightly widest at the base but almost cylindrical, somewhat incurved, 0.3 mm. long. Cauda black, 0.15 mm. long.

APTEROUS VIVIPAROUS FEMALES—Fifteen good specimens. Average length 1.35 mm., width 0.85 mm. Prevailing color green. Antennæ dark except I, II and the base of III which are pale; lengths of articles: I, 0.05 mm.; II, 0.07 mm.; III, 0.32 mm.; IV, 0.23 mm.; V, 0.21 mm.; VI, 0.5 mm. (base 0.1 mm., filament 0.4 mm.); total 1.38 mm. Rostrum reaching midway between the 2nd and 3rd coxæ. Cornicles pale dusky with darker tips, faintly imbricated, 0.33 mm. long. Cauda color of body, 0.17 mm. long.

HOST PLANT—Forms pseudogalls on the edges of the leaves of the Japanese pear.

LOCALITY—Ōmori, Tokyo.

DATE OF COLLECTION—May 12, 1913.

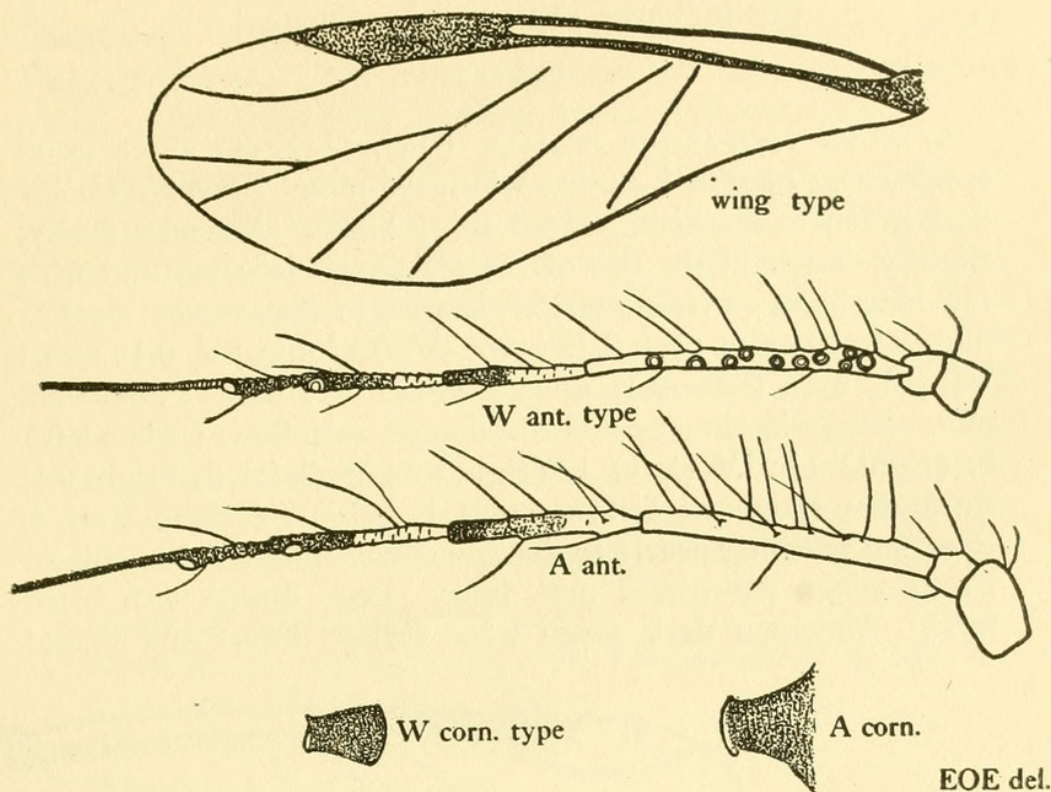
COLLECTION NUMBER—28.

### ***Chaitophorus japonica*, new species**

Figure 23

WINGED VIVIPAROUS FEMALE (Type)—Selected from three good specimens. Length 1.4 mm., width (of paratype) 0.6 mm. across the thorax. Prevailing color shiny black. Body covered with long hairs. Head black. Antennæ dark with all of III and the bases of IV and V pale, with numerous conspicuous long hairs along the upper margin; lengths of articles: I, 0.05 mm.; II, 0.04 mm.; III, 0.43 mm.; IV, 0.19 mm.; V, 0.19 mm.; VI, 0.33 mm. (base 0.10 mm., filament 0.23 mm.); total 1.23 mm. Sensoria large, circular and distributed along the full length of III, there being 10 on the left member (right missing). Paratypes show a variation of 8, 6, 14 on III; the other articles have the usual number. Rostrum extending slightly beyond the 2nd coxæ. Front wings 2.4 mm. long.



Figure 23.—*Chaitophorus japonica*, new species

Tarsi and apices of the tibiae and femora black, the remainder of the legs pale. Abdomen dark with yellow patches around the cornicles. Cornicles dark, imbricated, widest at the base, 0.1 mm. long. Cauda dark, inconspicuous.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Two rather poor specimens. Length 1.3 mm., width 0.9 mm. Prevailing color shiny black. Body covered with long hairs. Antennæ about the same color as in the winged form and as hairy; lengths of articles: I, 0.10 mm.; II, 0.05 mm.; III, 0.4 mm.; IV, 0.25 mm.; V, 0.24 mm.; VI, 0.33 mm. (base 0.12 mm., filament 0.21 mm.); total 1.37 mm. Cornicles dark, imbricated, somewhat constricted near the middle, 0.13 mm. long and 0.16 mm. diameter at base.

HOST PLANT—Enkō-Kaede, *Acer pictum* Thunb.

LOCALITY—Nikko.

DATE OF COLLECTION—June 9, 1913.

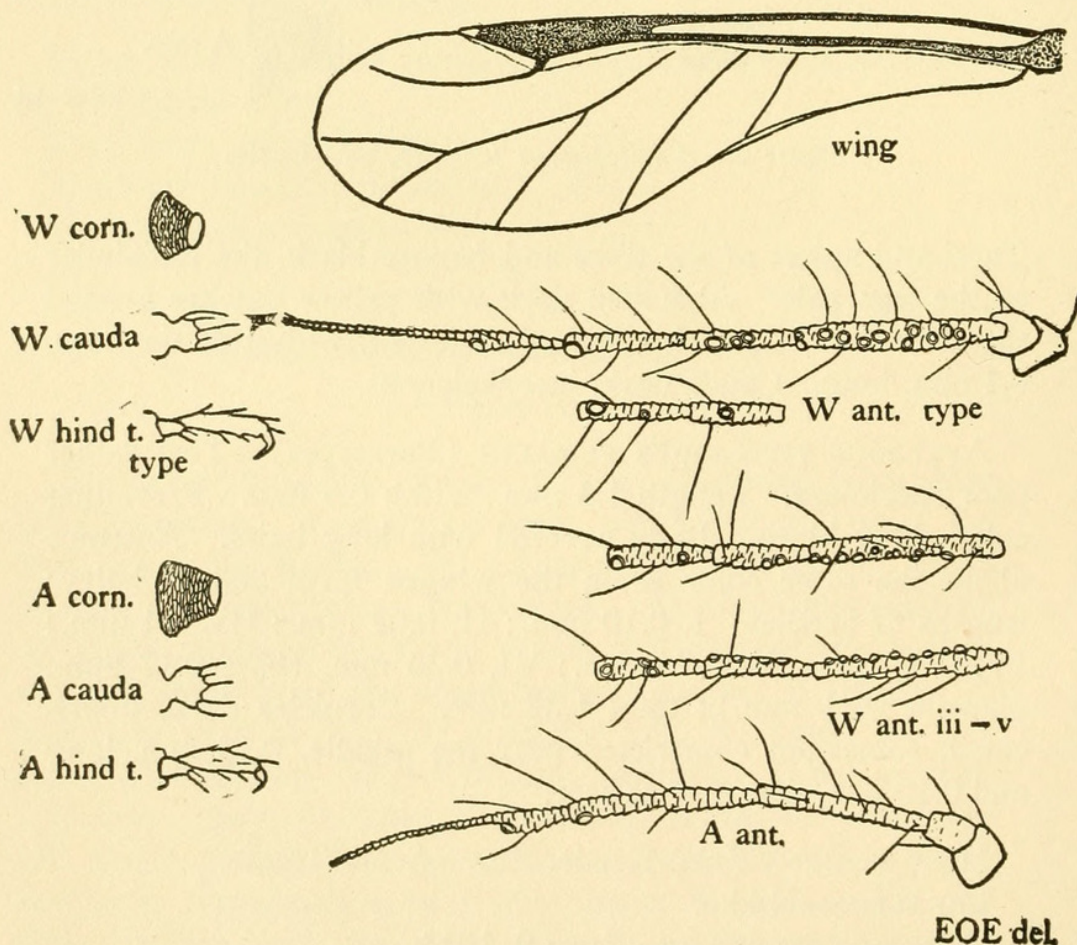
COLLECTION NUMBER—86.



***Chaitophorus salijaponica*, new species**

Figure 24

WINGED VIVIPAROUS FEMALE (Type)—From three good specimens. Length 1.2 mm., width 0.5 mm. Prevailing color dark-green to blackish. Head shiny black. Antennæ dusky, slightly darker at the tips of the articles, imbricated and with few long hairs on front margin; lengths of the articles: I, 0.05 mm.; II, 0.04 mm.; III, 0.25 mm.; IV, 0.13 mm.; V, 0.14 mm.; VI, 0.32 mm. (base 0.11 mm., filament 0.21 mm.); total 0.91 mm. Sensoria circular and distributed as follows: III (left) 8, (right) 11; IV (left) 1, (right) 3; V (left) 2, (right) 1. Paratypes show the following: III, 8-10; IV, 2-4; V, 1-4. Rostrum reaching nearly to the 2nd coxæ. Thorax shiny black. Front wings narrow, 2 mm. long. Legs dusky with black tarsi. Abdomen dark green with darker dorsal and lateral



EOE del.

Figure 24.—*Chaitophorus salijaponicus*, new species



markings. Cornicles imbricated or faintly reticulate, short, wide at the base, 0.05 mm. long and 0.07 mm. diameter at the base. Cauda distinctly knobbed, small, 0.05 mm. long.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Three or four good specimens. Length averages 1 mm., width 0.6 mm. Prevailing color dark. Body covered with long hairs. Antennæ pale with the apical half dusky to black, imbricated, with few long hairs; lengths of the articles: I, 0.04 mm.; II, 0.05 mm.; III, 0.20 mm.; IV, 0.11 mm.; V, 0.12 mm.; VI, 0.28 mm. (base 0.08 mm., filament 0.20 mm.); total 0.8 mm. Rostrum extending slightly beyond the 2nd coxæ. Cornicles short, finely imbricated or reticulate, 0.06 mm. long and 0.09 mm. diameter at the base. Cauda dark, knobbed, 0.06 mm. long.

NYMPHS—Dark with pale thorax.

HOST PLANT—Koriyanagi, *Salix multinervis* F. & Sav.

LOCALITY—Nishigahara, Tokyo.

DATE OF COLLECTION—May 14, 1913.

COLLECTION NUMBER—36.

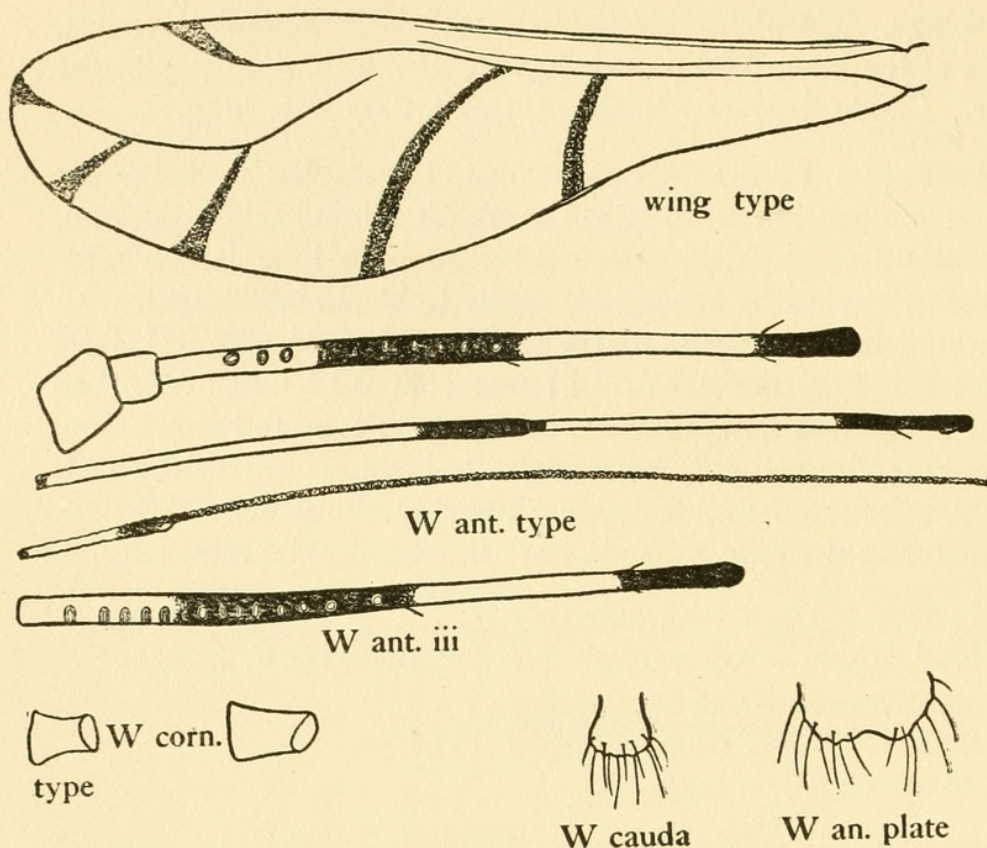
Note—Close to *C. salicicolus* Mats., but differs in antennal structure, especially the relative lengths of base and spur of article VI.

### ***Calaphis magnoliæ*, new species**

Figure 25

WINGED VIVIPAROUS FEMALE (Type)—Selected from seventeen good specimens. Length 1.4 mm., width 0.5 mm. This beautiful species is pale straw-yellow with black markings on the body and wings. The hairs on the head and thorax are quite long, somewhat shorter on the abdomen. Antennæ arising from inconspicuous frontal tubercles, very long, pale or transparently white with conspicuous black areas near the middle and apex of article III and with the extreme bases and apices of IV and V black, and all of VI black or dusky except the base; lengths of the articles: I, 0.09 mm.; II, 0.05 mm.; III, 0.81 mm.; IV, 0.58 mm.; V, 0.52 mm.; VI, 1.14 mm. (base 0.18 mm., filament 0.96 mm.); total 3.19 mm. Sensoria on III circular or oval, arranged in a row and mostly





EOE del.

Figure 25.—*Calaphis magnoliæ*, new species

confined to the dark area near the middle with 3 or 4 in the pale basal region; there are 10 on each member. On the paratypes the number varies from 10 to 14 with a majority having 11 or 12. The usual number occurs on V and VI. Rostrum short, extending slightly beyond the first coxæ. Legs pale with the extreme apex of the femora dusky above; the bases of the tibiæ conspicuously black with the adjacent region pale yellow, and the apical half and the tarsi dusky. Front wings conspicuously marked with black as shown in the accompanying drawing; long and narrow, measuring in length 2.5 mm.; stigma very pale with black tip, the radial sector vein wanting. Hind wings pale throughout. Abdomen apparently with five pairs of inconspicuous tubercles which are very difficult to distinguish as they are small and concolorous with the body. Cornicles pale, slightly constricted in the middle and widest at the base, 0.06



mm. long (paratype 0.08 mm. long). Cauda pale and distinctly knobbed. Anal plate pale with small median constriction or incision.

NYMPHS—Pale-yellow and covered with numerous long capitate hairs or spines.

HOST PLANT—On the leaves of Kobushi, *Magnolia kobus* Thunb.

LOCALITY—Akabane, near Tokyo.

DATE OF COLLECTION—August 1, 1913.

COLLECTION NUMBER—96.

### ***Euceraphis japonica*, new species**

Figure 26

WINGED VIVIPAROUS FEMALE (Type)—A single fine specimen and several nearly mature nymphs. Length 2.1 mm., width 0.7 mm. Prevailing color dark reddish brown with black dorsal markings. Body thickly beset with rather long fine hairs. Antennæ dark throughout with many long fine hairs; lengths of articles: I, 0.11 mm.; II, 0.12 mm.; III, 1.10 mm.; IV, 0.6 mm.; V, 0.46 mm.; VI, 0.35 mm. (base 0.20 mm., filament 0.15 mm.); total 2.74 mm. All of article III except the extreme ends thickly covered with many transversely oval sensoria as shown in the accompanying drawing. There are the usual number on V and VI. Rostrum (of nymph) reaching nearly to the 2nd coxæ. Front wings narrow, 4.2 mm. long. Tarsi, apices of the tibiæ and the femora black, the remainder of the legs pale brown. Abdomen dark reddish brown with black dorsal markings. Cornicles black, shorter than wide, those on the type indistinguishable because of the opaque body. On a nearly mature nymph they are 0.03 mm. long and 0.04 mm. in diameter at the base. Cauda black and rounded. Anal plate black, with a very small middle constriction.

APTEROUS VIVIPAROUS FEMALE (Paratype)—A single good specimen. Length 2.3 mm., width 1 mm. Color about the same as in the winged form. Body hairy. Antennæ dark, hairy; lengths of the articles: I, 0.13 mm.; II, 0.09 mm.; III,



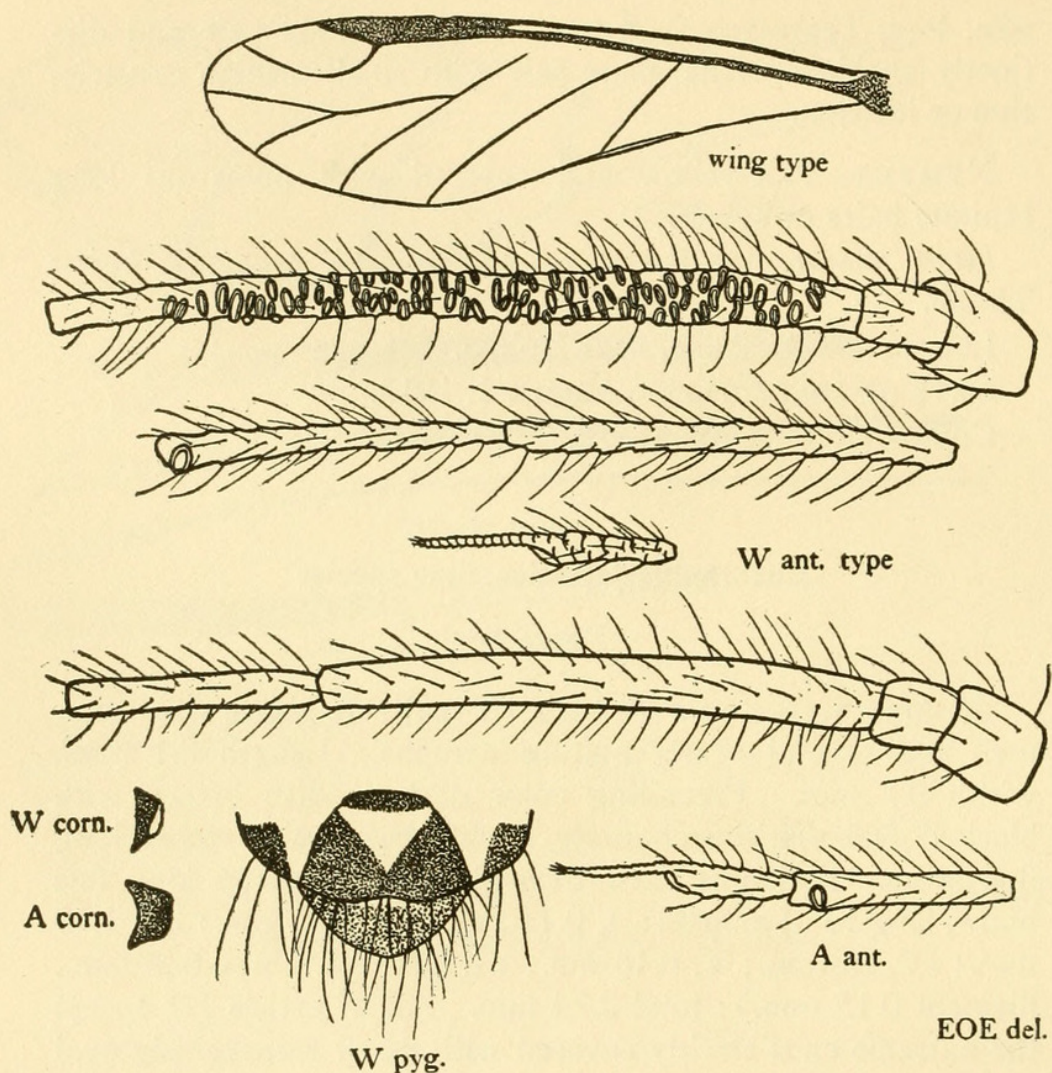


Figure 26.—*Euceraphis japonica*, new species. Wing much reduced from scale.

0.75 mm.; IV, 0.34 mm.; V, 0.29 mm.; VI, 0.31 mm. (base 0.17 mm., filament 0.14 mm.); total 1.91 mm. Rostrum reaching to the 2nd coxæ. Cornicles black, short, 0.04 mm. long and 0.08 mm. diameter at the base. Cauda black, rounded or nearly truncate.

NYMPHS—Only a little lighter in color than the adults.

HOST PLANT—Yama hannoki, *Alnus indica glauca* Ait.

LOCALITY—Nikko.

DATE OF COLLECTION—June 11, 1913.

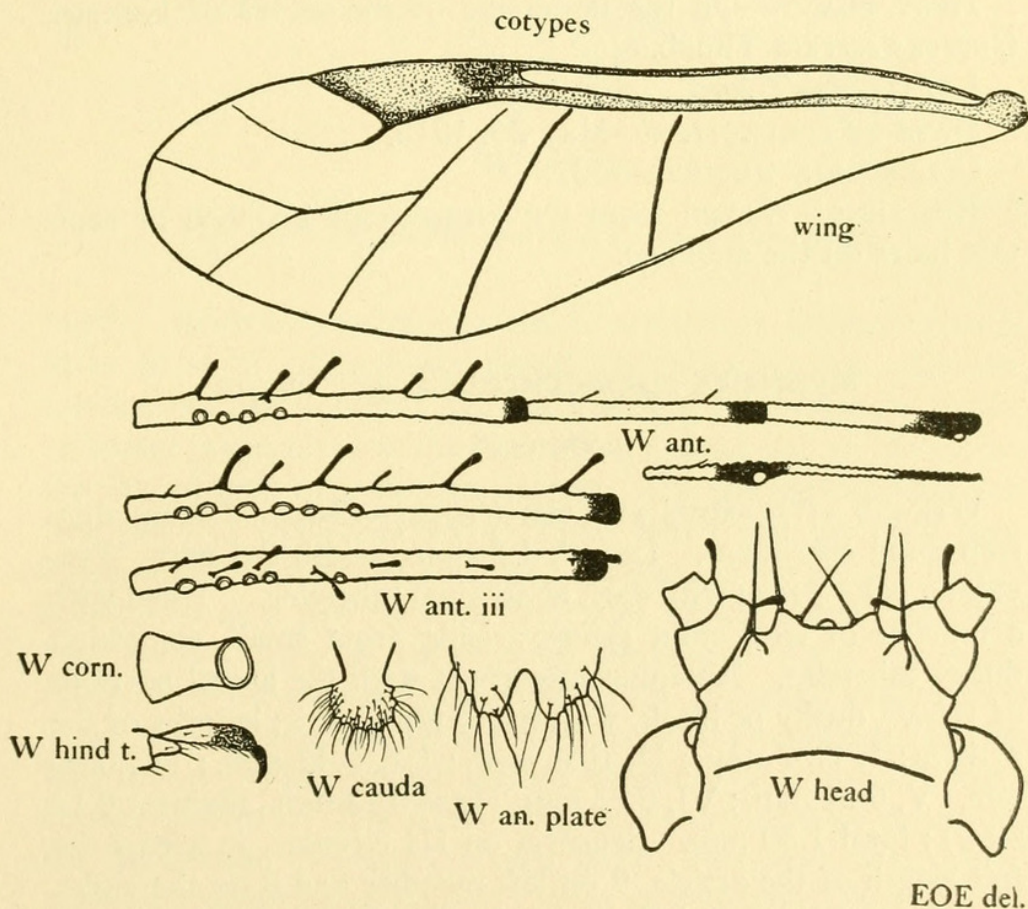
COLLECTION NUMBER—84.



**Myzocallis capitata**, new species

Figure 27

WINGED VIVIPAROUS FEMALES (Cotypes)—There are fourteen specimens of winged females but none perfect enough to be designated as type. Length 1.8 mm., width 0.5 mm. Prevailing color pale yellowish green. Body covered with large and small spines. Head whitish with a number of long stiff spines arising from short tubercles. Antennæ pale green with the apices of III, IV and V and the middle and tip of VI black; articles I and II each with one, and III with 4 to 6 large, curved, knobbed, black spines which are very conspicuous; lengths of articles: I, 0.05 mm.; II, 0.05 mm.; III, 0.50 mm.; IV, 0.30 mm.; V, 0.27 mm.; VI, 0.43 mm. (base 0.16 mm., filament 0.27 mm.); total 1.6 mm. Sensoria on III, large, circular, in a row, confined to the basal half and from two to six in number, the majority having four.

Figure 27.—*Myzocallis capitata*, new species



Rostrum reaching to the 2nd coxæ. Prothorax with two pairs of large dorsal finger-like tubercles and one pair of large lateral ones, all supporting a number of spines; mesothorax with many small tubercles supporting each a spine, those on the metathorax, if present, very obscure. Front wings 2.6 mm. long with venation and markings as shown in the accompanying drawing. Legs pale green with the tips of the tarsi dusky or black. Abdomen with three pairs of large finger-like tubercles on the dorsum near the base, two pairs of small ones just behind these and three or four pairs of large somewhat truncate ones along the sides. All of these tubercles are pale dusky and each has a number of spines. Cornicles pale, widest at base, somewhat constricted in the middle and 0.1 mm. long. Cauda green, distinctly knobbed, with quite a long stipe, 0.1 mm. in length. Anal plate pale and deeply constricted in the middle.

NYMPHS—Pale-yellow and green with the bodies covered with long capitate hairs.

HOST PLANT—On the underside of the leaves of Kunugi, *Quercus serrata* Thunb.

LOCALITY—Tokyo.

DATE OF COLLECTION—May 26, 1913.

COLLECTION NUMBER—63.

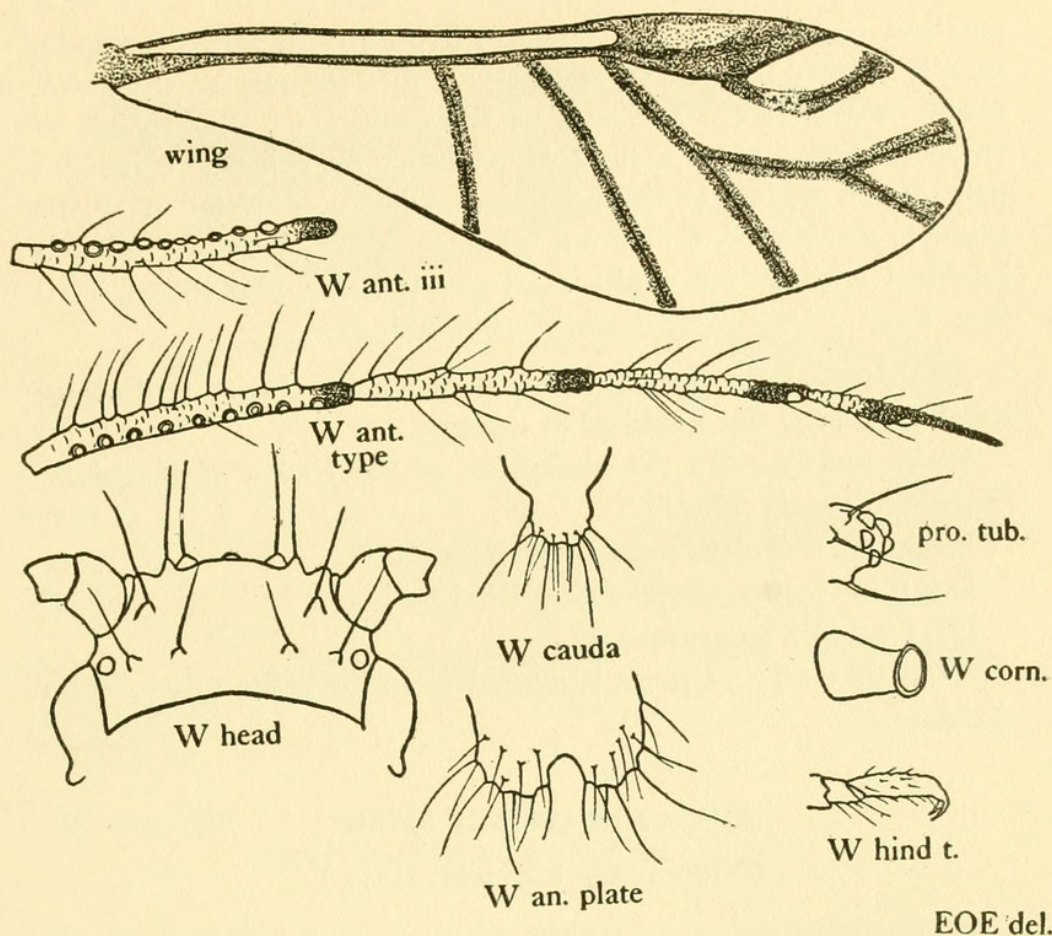
REMARKS—Named from the conspicuous knobbed or capitate hairs on the antennæ.

### ***Myzocallis macrotuberculata*, new species**

Figure 28

WINGED VIVIPAROUS FEMALE (Type)—Selected from thirteen good specimens. Length 1.5 mm., width 0.6 mm. Prevailing color green with dark abdominal tubercles. Head with a number of long stout spines arising from small, somewhat dusky tubercles. Antennæ pale-green with the apical portions of III-VI dusky or black, with many long hairs; lengths of the articles: I, 0.07 mm.; II, 0.05 mm.; III, 0.42 mm.; IV, 0.30 mm.; V, 0.21 mm.; VI, 0.25 mm. (base 0.13 mm., filament 0.12 mm.); total 1.30 mm. Sensoria on III circular, in a row the full length of the article, 9 on left member and 8 on the right. Paratypes show a variation of from 7 to 11, the majority hav-





EOE del.

Figure 28.—*Myzocallis macrotuberculata*, new species

ing 8. Rostrum reaching to base of abdomen; prothorax with three pairs of large, dusky finger-like tubercles, two pairs on the dorsum and a lateral pair with several small smooth hemispherical projections at the top, which appear not unlike ocelli, the lateral pair of tubercles largest. On the mesothorax are two pairs of tubercles, the first pair small and the hind pair large, finger-like and located near the base of the wings. There appears to be a pair of small tubercles on the metathorax but they are not plain on the mounted specimens. From the large tubercles arise several spines and from the small ones but a single one. Coxæ and trochanters green, the remainder of the legs dusky. Wings rather slender, the veins of both pairs with clouded borders. The front wings have venation as shown in the illustration and are 2.5 mm. long. Abdomen pale green with dark tubercles as follows: three pair of large black finger-like ones on the middle base of the dorsum, the first pair the



smallest and the last pair largest; five pairs of large truncate, mostly faintly bilobed yellow or pale dusky ones, on the sides, many of which are as large as the cornicles. From each of these tubercles arise a number of hairs or spines. Cornicles pale green, widest at the base, somewhat constricted near the middle; the length, 0.10 mm., greater than the width. Cauda knobbed with only a slight basal constriction, pale green, 0.10 mm. long. Anal plate distinctly bilobed.

NYMPHS—Pale green, the bodies thickly beset with long hairs which are not knobbed at the tips.

HOST PLANT—On the underside of the leaves of Kashiwa, *Quercus dentata* Thunb.

LOCALITY—Tokyo? (not given).

DATE OF COLLECTION—May 19, 1913.

COLLECTION NUMBER—47.

REMARKS—The species is named from the large tubercles on the dorsum.

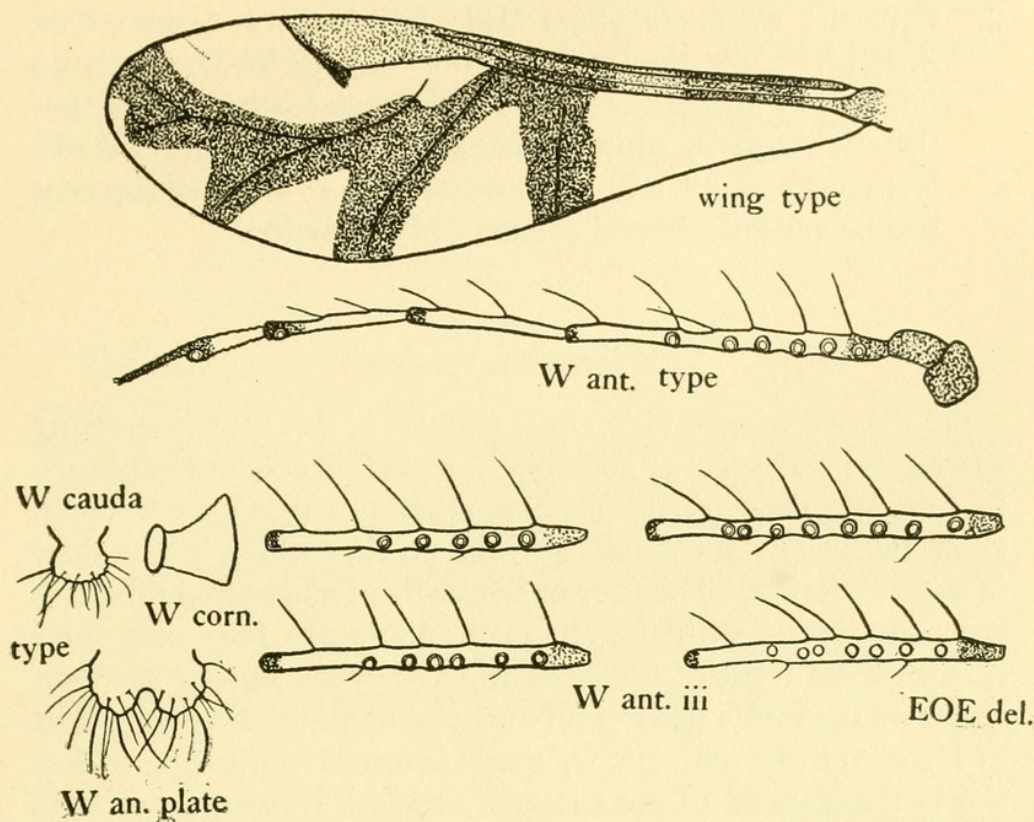
***Myzocallis kuricola* (Mats.)**

**(*Nippocallis kuricola* Mats.)**

Figure 29

WINGED VIVIPAROUS FEMALE—Thirty-two good specimens. Length 1.2 mm., width 0.55 mm. Prevailing color pale green, the body covered with a whitish powder. Head pale green to amber with several pairs of small tubercles from each of which arises a single long straight spine. Antennæ pale, furnished with a few long hairs, with the articles I, II and the extreme base of III and the apices of III-VI dusky or brownish; lengths of the articles: I, 0.05 mm.; II, 0.06 mm.; III, 0.39 mm.; IV, 0.18 mm.; V, 0.17 mm.; VI, 0.18 mm. (base 0.09 mm., filament 0.09 mm.); total 1.03 mm. Sensoria large, circular and in a row. On III there are 6 on each member, the paratypes showing a variation of from 5 to 8; articles V and VI have the usual ones. Rostrum reaching to the second coxæ. Tubercles on the thorax small, with single spines arising from each. Legs pale green with the distal ends of the tibiæ and the tarsi faintly dusky. The veins of the wings are heavily clouded, the borders being specially wide in the front wings as shown in the



Figure 29.—*Myzocallis kuricola* (Mats.)

drawing; radial sector vein so very faint as to appear entirely absent; length of the front wings 2 mm. Abdomen pale green with three or four pairs of large black tubercles on the sides in front of the cornicles (the number is difficult to make out on the mounted specimens on hand); these tubercles bearing several spines. Cornicles dusky, widest at the base, somewhat constricted before the mouth which is slightly flared, 0.08 mm. long and 0.10 mm. in diameter at base. The paratypes also show that the diameter of the base is usually as great or slightly greater than the length. Cauda distinctly knobbed, dusky, 0.06 mm. long. Anal plate normal.

**NYMPHS**—Pale green, the bodies covered with long hairs some of which have small knobs at the ends.

**HOST PLANTS, LOCALITIES, ETC.**—The material was collected in two lots as follows:

1. On Kuri, *Castanea sativa* Mill. (listed as *C. vulgaris japonica* A. DC.), and on Kunugi, *Quercus serrata* Thunb., Nishigahara, Tokyo, June 5, 1913. Collection number 76.



2. On Kuri, *Castanea sativa* Mill., Nishigahara, Tokyo, Oct. 2, 1913. Collection number 106. In this lot were a large number of specimens which were apparently mature, but their wing pads, while almost perfect in structural details, were very small and rudimentary as if the development had been suddenly and permanently retarded.

### **Myzocallis, species**

Of the five winged viviparous females of this very interesting species not a single one possessed a complete antenna necessary to complete determination. The species is pale green, small, about the size of *Myzocallis quercus* (Kalt.) which it resembles in wing venation. The four or five pairs of abdominal tubercles are concolorous with the abdomen; there are four very long spines on the front of the head and five or six shorter knobbed spines on the inside margins of antennal articles I-III; basal half of III with three sensoria. A single apterous viviparous female shows the filament of the antennal article VI to be about twice as long as the base. The body is covered with long knobbed spines.

HOST PLANT—Taken on the undersides of the leaves of Kunugi, *Quercus serrata* Thunb.

LOCALITY—Nishigahara, Tokyo.

DATE OF COLLECTION—May 15, 1913.

COLLECTION NUMBER—41.

### **Myzocallis, species<sup>4</sup>**

A single winged viviparous female with parts of both antennæ missing. The color is pale green with the antennæ pale, the legs green with the tips of the tibiæ and the entire tarsi dusky. The antennæ of a nearly matured winged nymph has the base of VI 0.10 mm. and the filament 0.4 mm. long; article III, though partly missing, has 11 sensoria on the full length. Wings pale with a noticeably short radial sector.

<sup>4</sup> The species on bamboo described as *Takecallis bambusæ* Mats. appears to be the species described as *Myzocallis arundicolens* (Clarke). It is common at Berkeley, Cal.



Cornicles pale dusky, with wide mouth, 0.06 mm. long and about the same basal diameter. Taken on Hōnoki, *Magnolia hypoleuca* S. & Z., Nikko, June 9, 1913. Collection number 83.

***Chromaphis celticolens*, new species**

Figure 30

WINGED VIVIPAROUS FEMALE (Type)—Selected from 7 good specimens. Length 1.6 mm., width (paratype) 0.65 mm. Prevailing color yellow; antennæ pale with dusky area near the middle of III and black on the tips of III-VI. These black areas, when examined closely under high magnification, have pale irregular areas mosaic-like or not unlike conventional

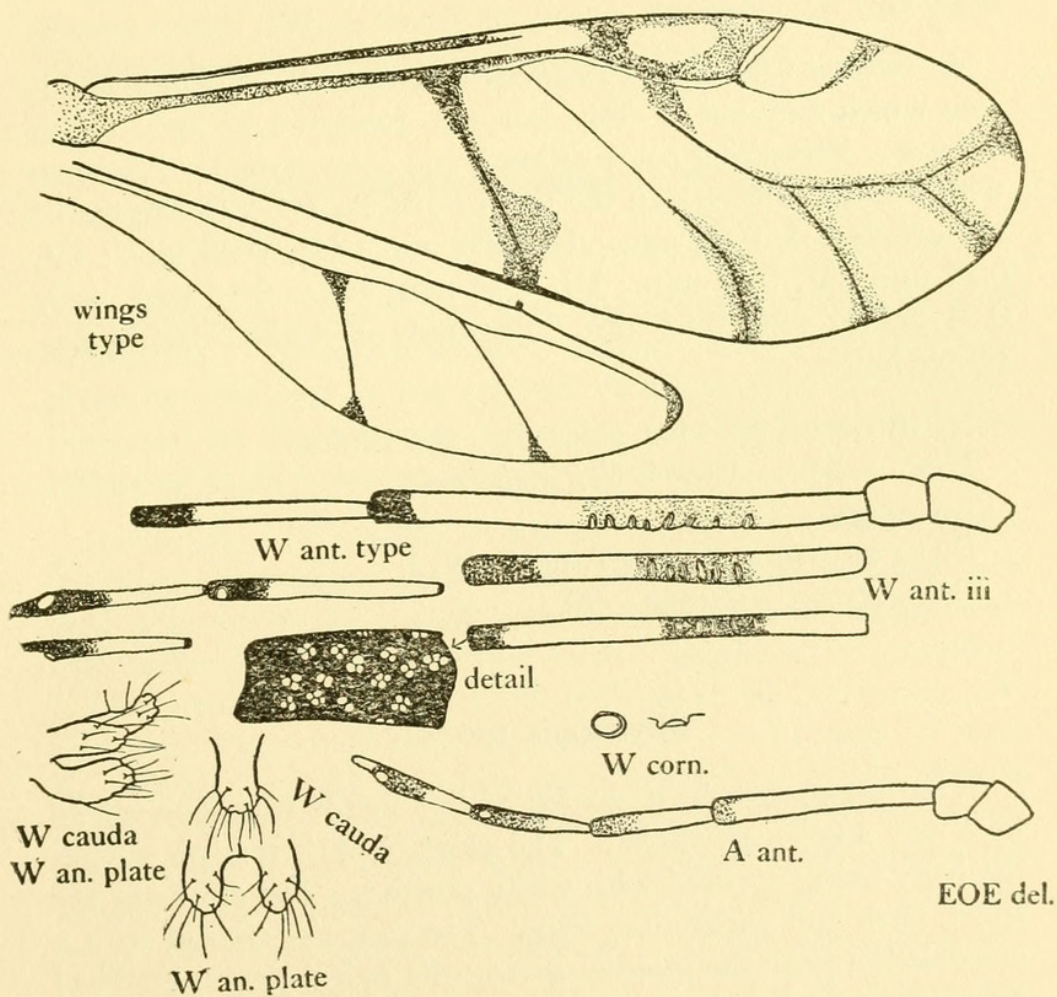


Figure 30.—*Myzocallis celticolens*, new species



flowers; lengths of the articles: I, 0.10 mm.; II, 0.07 mm.; III, 0.62 mm.; IV, 0.30 mm.; V, 0.29 mm.; VI, 0.25 mm. (base 0.21 mm., spur 0.04 mm.); total 1.63 mm. Sensoria on III transversely oval and occurring in a row near the middle or slightly toward the base from the middle, the number being 7 on the right and 8 on the left member. Paratypes have from 5 to 8, a majority having 6. Articles V and VI have the usual number. Rostrum extending to the 2nd coxæ. Thorax dark-yellow or amber. Legs pale with the apices of the femora and the tarsi dusky. Wings having venation and markings as shown in the accompanying illustration, length of the primary wings 2.9 mm. Abdomen yellow or greenish with dusky dorsal spots. Cornicles pale dusky, little more than pores, about 0.025 mm. diameter at the mouth. Cauda pale, faintly knobbed, 0.09 mm. long. Anal plate deeply constricted at the middle.

APTEROUS VIVIPAROUS FEMALE (Paratype)—A single specimen which may not be fully mature. Length 1.85 mm., width 0.7 mm. Prevailing color yellow? (no color notes). Antennæ with dusky markings on the tips of articles III-VI; lengths of the articles: I, 0.05 mm.; II, 0.06 mm.; III, 0.28 mm.; IV, 0.15 mm.; V, 0.15 mm.; VI, 0.14 mm. (base 0.13 mm., spur 0.04 mm.); total 0.83 mm. The body is clothed with a few simple hairs.

NYMPHS—Somewhat paler than the adults.

HOST PLANT—Enoki, *Celtis sinensis* Pers. (listed as *Cetis*).

LOCALITY—Tokyo.

DATE OF COLLECTION—Aug. 1, 1913.

COLLECTION NUMBER—98.

### **Phyllaphis, species?**

What appears to be a species of this genus was represented by a few apterous females. The color is dark reddish purple, the body being covered with white powder. The cornicles are short, dark and wider than long. The cauda is conical with a constriction near the middle, giving the apical part a knobbed appearance, and with a conical base. The anal plate is bilobed.



Taken on Maki, *Podocarpus macrophylla maki* Sieb. (listed as *P. chinensis* Wall.), Nishigahara, Tokyo, May 24, 1913. Collection number 57.

***Trichosiphum kuwanai* Pergande**

Only apterous viviparous females were taken on Kunugi, *Quercus serrata* Thunb., Nishigahara, Tokyo, May 15, 1913. Collection number 40.

**Eutrichosiphum, new genus**

Type: *Trichosiphum pasanix* Okajima

This new genus has been erected to embrace the type named above, which differs from the other members of the genus *Trichosiphum* in having but 5-articled antennæ.

***Eutrichosiphum pasanix* (Okajima)**

Figure 31

A number of winged and apterous viviparous females were in this lot. All of the winged females have five articles as given by Okajima in his original description of the species<sup>5</sup>. Inasmuch as the apterous form has not been described, the following brief notes may be of interest:

APTEROUS VIVIPAROUS FEMALES—Length 1.3 mm., width 0.8 mm. Prevailing color shiny black. Body entirely covered with rather long stiff hairs. Antennæ pale dusky with tips darker and with few long hairs; lengths of the articles: I, 0.05 mm.; II, 0.05 mm.; III, 0.25 mm.; IV, 0.11 mm.; V, 0.24 mm. (base 0.09 mm., filament 0.15 mm.); total 0.7 mm. As will be seen the antennæ are 5-articled as in the winged form. Rostrum long, reaching beyond the base of the abdomen. Legs short, dusky, hairy. Cornicles black, somewhat swollen in the middle with both ends small, recurved, 0.35 mm. long, their entire surface closely beset with very short, scale-like

<sup>5</sup> Bul. Col. Agric., Tokyo Imp. Univ., vol. 8, no. 1, pp. 23-26, pls. iv and v, Sept. 1908.



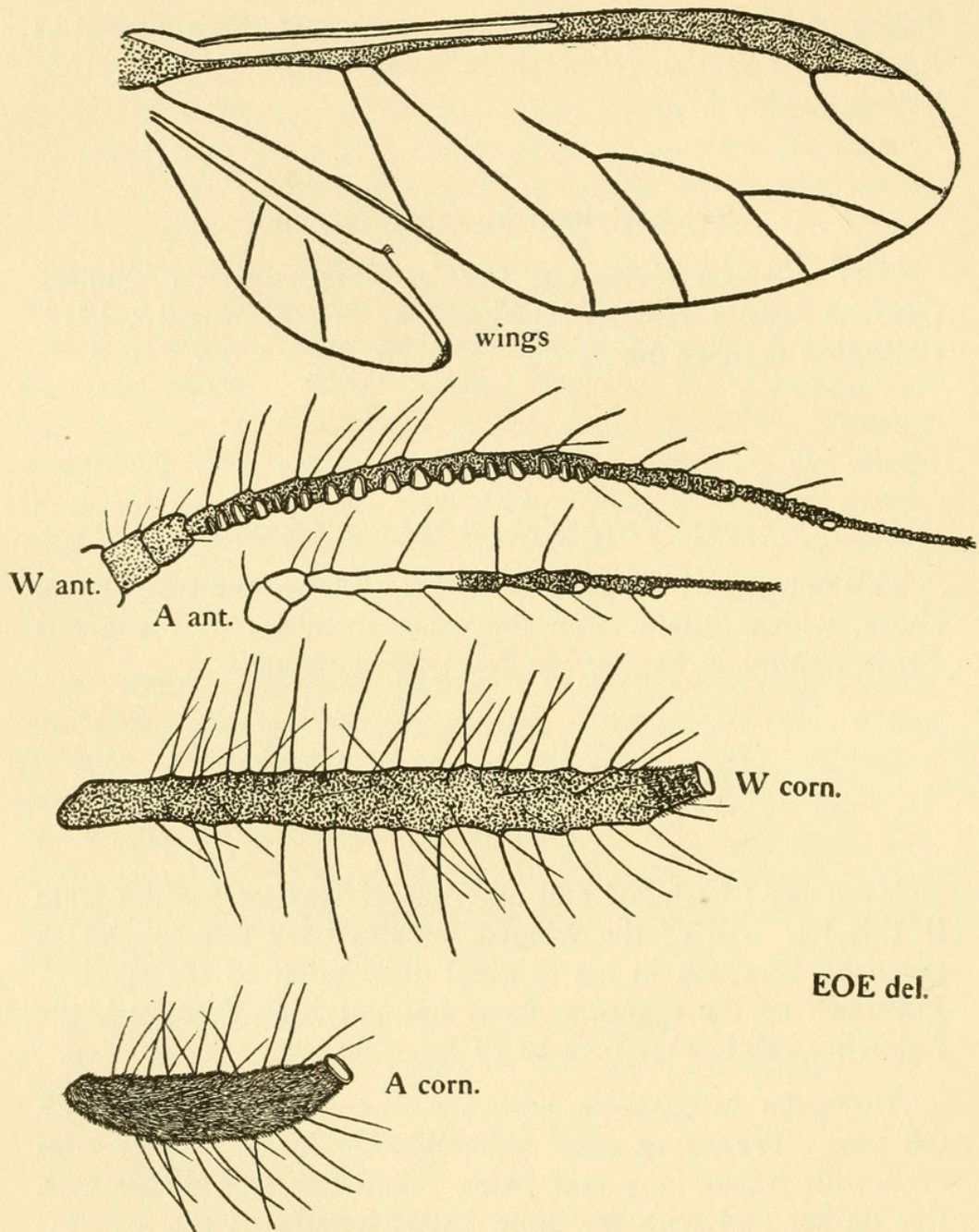


Figure 31.—*Eutrichosiphum pasaniæ* (Okajima)

hairs and with many long hairs. Cauda and anal plate dark, hairy and broadly rounded.

HOST PLANT—Shii, *Castanopsis cuspidata* Schot. (listed as *Pasania cuspidata* Oerst.).

LOCALITY—Nishigahara, Tokyo.

DATE OF COLLECTION—Sept. 14, 1913.

COLLECTION NUMBER—104.



***Lachnus pinidensifloræ*, new species**

Figure 32

WINGED VIVIPAROUS FEMALE (Type)—Selected from four individuals. Length 2 mm., width 0.7 mm. Prevailing color dark-brown to black. Body hairy; head black. Antennæ dusky throughout with the apical portions of III-VI black, covered with long hairs; lengths of articles: I, 0.07 mm.; II,

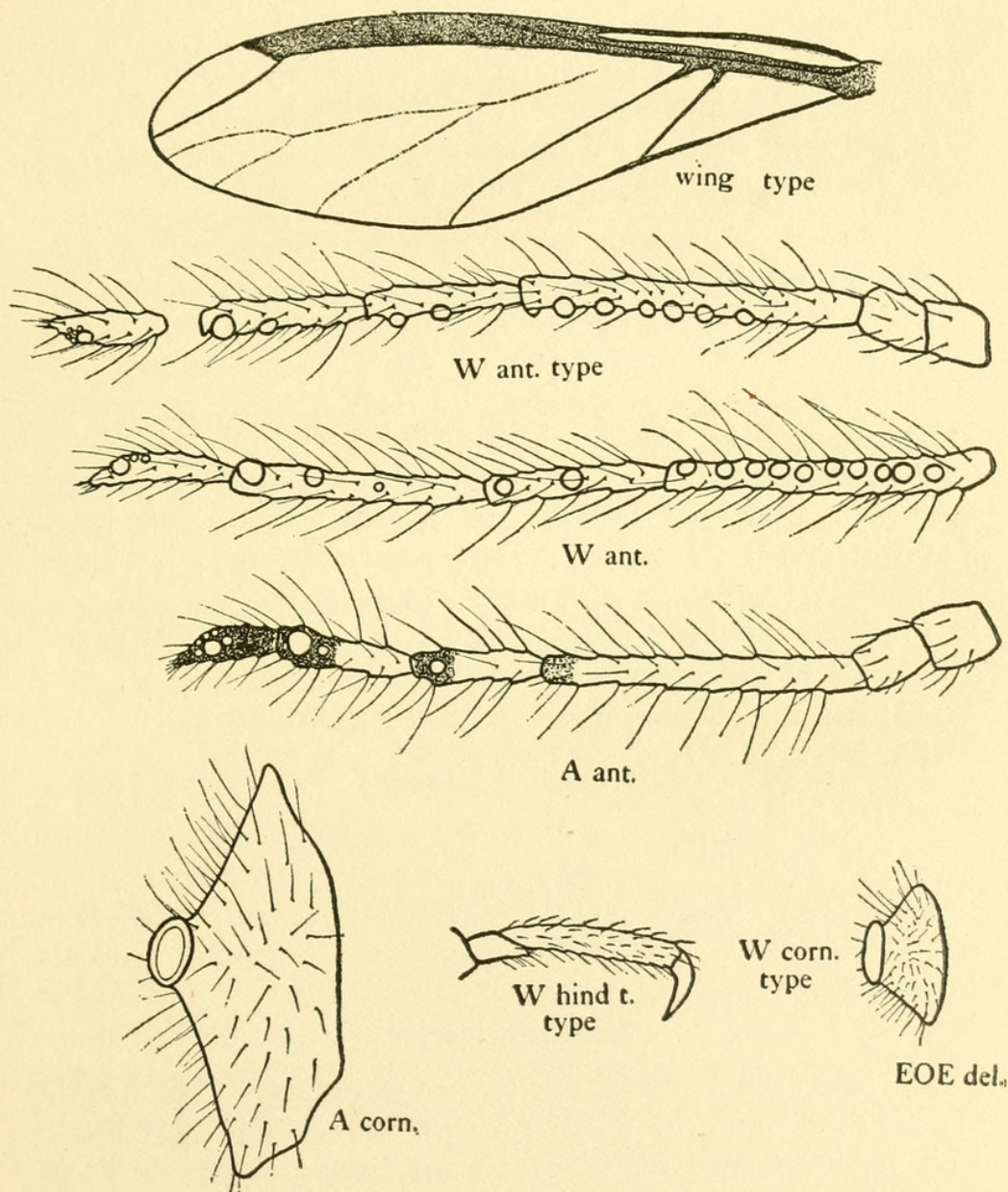


Figure 32.—*Lachnus pinidensifloræ*, new species. Wing reduced from scale.



0.09 mm.; III, 0.46 mm.; IV, 0.21 mm.; V, 0.22 mm.; VI, 0.15 mm. (base 0.12 mm., spur 0.03 mm.); total 1.20 mm. Sensoria large and circular, distributed on the left member as follows: III, 7 in a row; IV, 2; V, 2; VI with the usual number. Paratypes have on III, 10-12; IV, 0-3; V, 0-3. Rostrum long, reaching to the middle of the abdomen. Thorax black. Coxæ, trochanters and tarsi black, femora pale with black tips, tibiæ pale in middle with both ends black. Wings narrow, venation as shown in drawing; length of front wings 4.3 mm. The alcoholic specimens have the wings stained a deep-wine color. Abdomen dark reddish-brown with black markings. Cornicles black, hairy, wide at base and with slightly flaring mouth, 0.09 mm. long and 0.19 mm. diameter at the base. Cauda black.

APTEROUS VIVIPAROUS FEMALES (Paratypes)—Four mature and several immature specimens. Length 3.5 mm., width 2 mm. Prevailing color dark reddish brown with silvery markings on the dorsum due to white wax. Body hairy. Antennæ dusky with the apices of III-VI black; all articles hairy; lengths of articles: I, 0.09 mm.; II, 0.10 mm.; III, 0.43 mm.; IV, 0.17 mm.; V, 0.18 mm.; VI, 0.13 mm. (base 0.10 mm., spur 0.03 mm.); total 1.10 mm. Sensoria large and distributed as follows: III, none; IV, 0-1; VI, 1-2; VI normal. Abdomen with many small black spots, especially at the bases of the numerous hairs. Cornicles black, hairy, very wide at base and small at the mouth which is slightly flared; length 0.2 mm., diameter at the base 0.57 mm.

HOST PLANT—Ahu-matsu (Japanese red pine), *Pinus densiflora* S. & Z.

LOCALITY—Nikko.

DATE OF COLLECTION—June 10, 1913.

COLLECTION NUMBER—80.

### **Lachnus, species**

Only apterous forms of this species were taken. The length averages 3.8 mm., the width 2.3 mm. Prevailing color black with reddish-brown markings on the back. Antennæ black and pale brown, about one-third as long as the body; the large circular sensoria distributed as follows: III, none; IV,



0-1; V, 2-3; VI, 1-3 (not counting the usual ones in the process). Cornicles black. On *Kara-matsu*, *Larix leptolepis* Murr., Nikko, June 9, 1913. Collection number 78. (The color notes were given under number 82?).

#### **Lachnus, species**

Represented only by apterous specimens. Length 5 mm., width 3 mm. Prevailing color shiny black with white dorsal markings. Antennæ pale-brown and black, hairy, half as long as the body, with the large circular sensoria distributed as follows: III, none; IV, 1-3; V, 2-3; VI with the usual ones. Cornicles black, hairy and very wide at base. On *Tsuga*, *Tsuga sieboldi* Carr., Nikko, June 12, 1913. Collection number 79.

#### **Pterochlorus tropicalis** Van der Goot

(**Pterochlorus japonicus** Mats.)

Figures 33 and 34

WINGED VIVIPAROUS FEMALE—Selected from nine good specimens. Length 2.8 mm., width 1 mm. Prevailing color shiny black throughout. Body very hairy. Antennæ black, covered with short hairs; lengths of the articles: (another specimen) I, 0.13 mm.; II, 0.10 mm.; III, 0.78 mm.; IV, 0.34 mm.; V, 0.34 mm.; VI, 0.20 mm. (base 0.13 mm., spur 0.07 mm.); total 1.89 mm. The sensoria are circular and distributed in a row as follows: (selected specimen) III (right) 11, (left) 8; IV (right) 3, (left) 3; V (right) 1, (left) 2; VI with usual number; others have the following: III 13-20, IV 5-9, V 2-4. Rostrum long, reaching beyond the middle of the abdomen. Wings infusate with light areas in the front pair as shown in the accompanying drawing. Hind wings with a white line just below radius vein; a decided network of small lines on the front wings. Length of front wings 4.5 mm. Cornicles wide at base, hairy, black, length (one example) 0.25 mm., diameter at the base 0.58 mm. Cauda black, rounded and very hairy.

APTEROUS VIVIPAROUS FEMALES—Five good specimens. Length 4.2 mm., width 2.5 mm. Prevailing color shiny



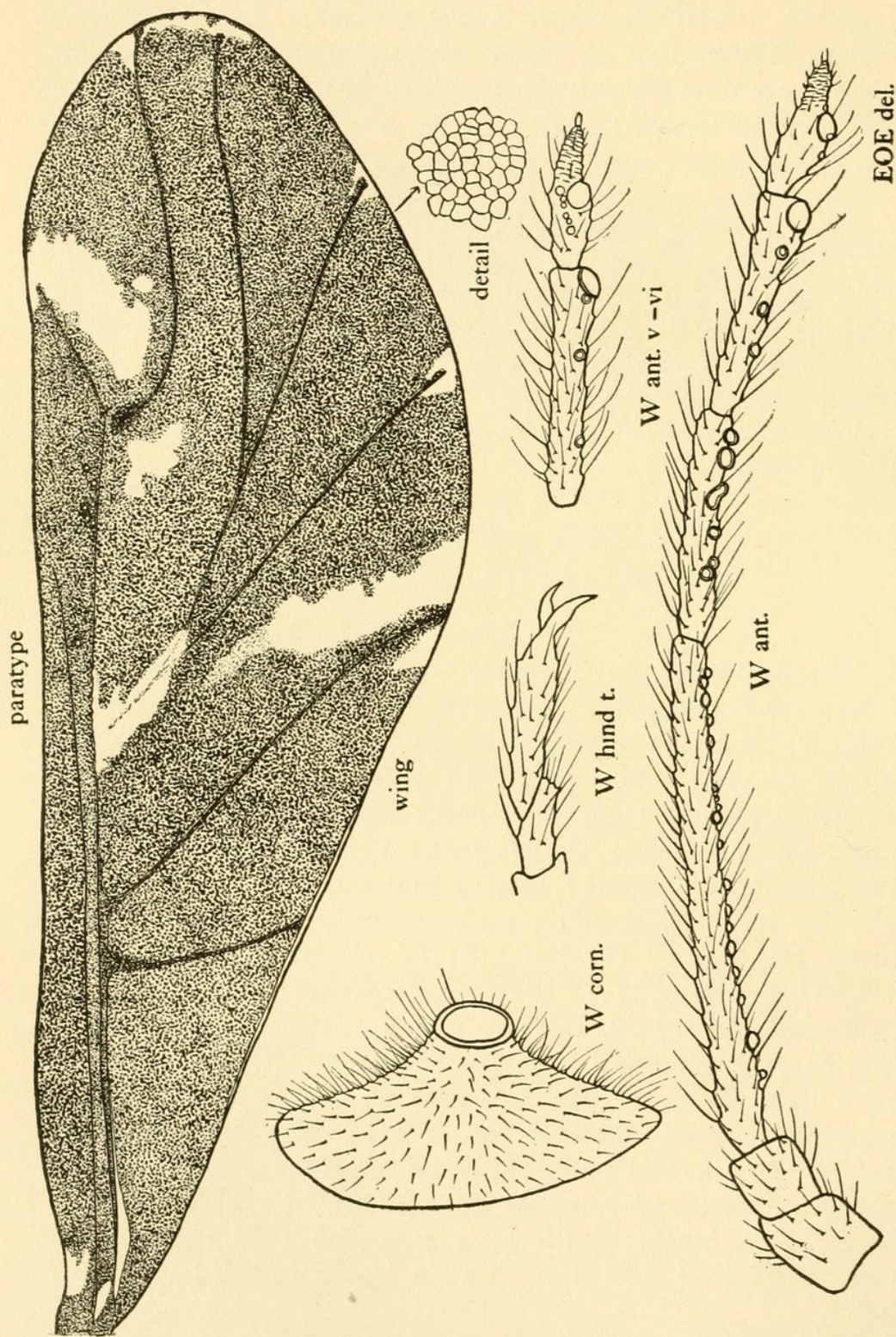


Figure 33.—*Pterochlorus tropicalis* Van d. Goot. Winged viviparous female



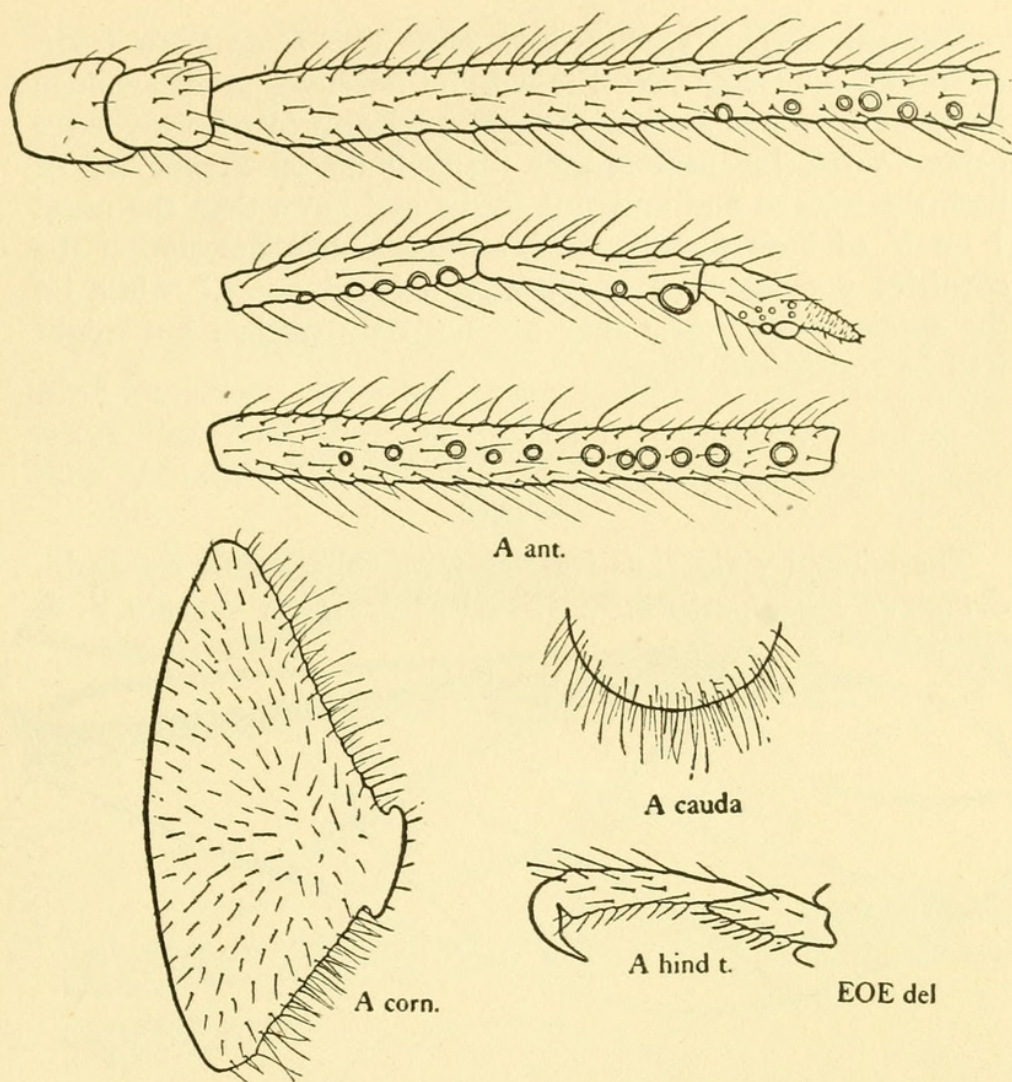


Figure 34.—*Pterochlorus tropicalis* Van d. Goot. Apterous viviparous female

black. Body hairy. Antennæ black, hairy; lengths of articles: I, 0.13 mm.; II, 0.15 mm.; III, 1.10 mm.; IV, 0.36 mm.; V, 0.32 mm.; VI, 0.24 mm. (base 0.15 mm., spur 0.09 mm.); total 2.30 mm. Sensoria large, circular and arranged as follows: III, 1-15; IV, 2-5; V, 1-2; VI with usual number. Cornicles black, hairy, 0.36 mm. long and 0.74 mm. wide at the base. Cauda black, hairy and rounded.

HOST PLANTS—On Kunugi, *Quercus serrata* Thunb., Kashiwa, *Quercus dentata* Thunb. and Shii, *Castanopsis cuspidata* Schot. (listed as *Pasania cuspidata* Oerst.).

LOCALITY—Tokyo.

DATE OF COLLECTION—May 15, 1913.

COLLECTION NUMBER—39.



REMARKS—This species is so close to *Pterochlorus tropicalis* Van der Goot<sup>6</sup> that it is without hesitancy so determined here. The sensoria show a slight variation in number, there being in the Japanese species many more on article III of both the winged and apterous forms and more than the usual 1 on V of both forms. In Van der Goot's description the cornicles are described as "nearly reduced pores," while on the species from Japan they are not only distinct but might well be considered large.

### *Prociphilus cratægi* Tullgren

Figure 35

The winged viviparous females were collected on Sanzashi, *Cratægus cuneatus* S. & Z. (listed as *Mespilus cuneata* S. &

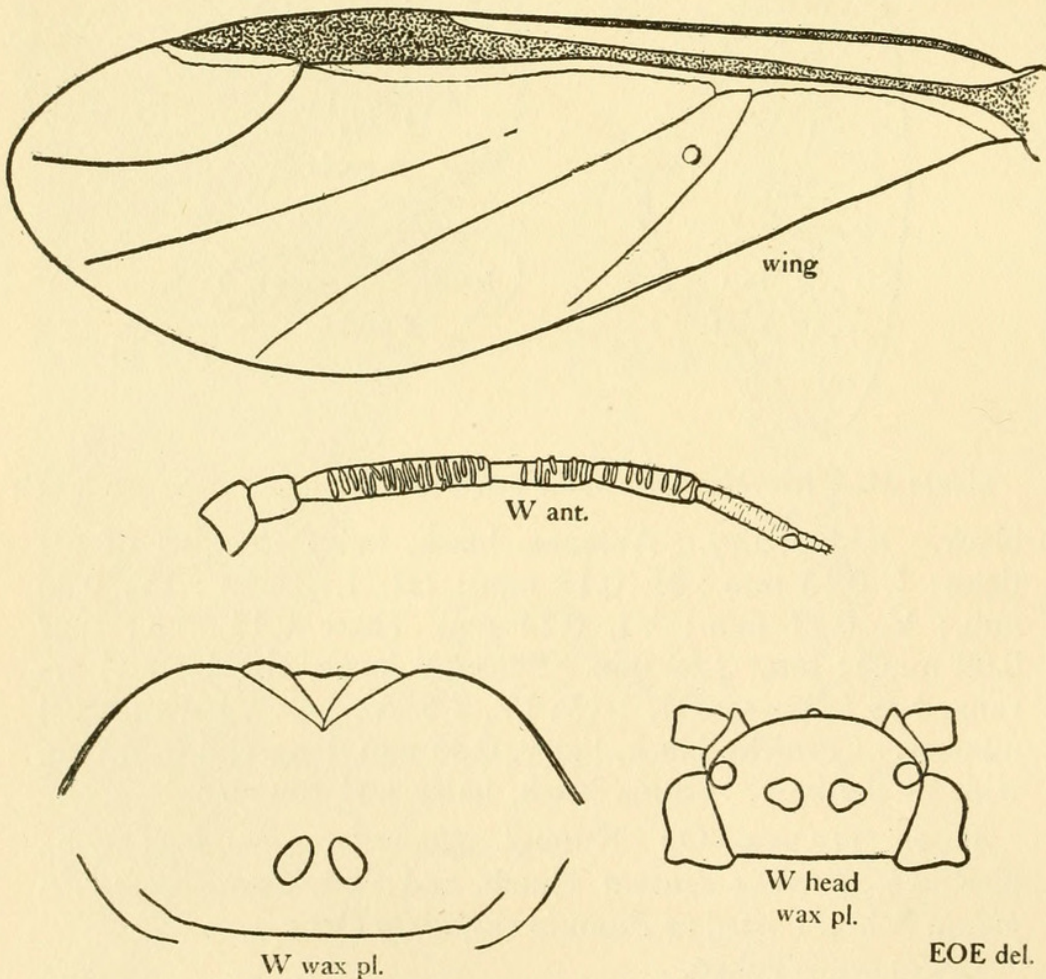


Figure 35.—*Prociphilus cratægi* Tullgren

<sup>6</sup> Rec. Ind. Mus., vol. 12, pt. 1, no. 1, pp. 3-4, fig. 2, Feb. 1916. (Orig. desc.).



Z.), Tokyo ? (locality not given), June 10, 1913. Collection number 88. This material was checked up with specimens received from P. Van der Goot (through John J. Davis), taken in Holland, and from Prof. F. V. Theobald, England.

***Prociphilus osmanthæ*, new species**

Figure 36

WINGED VIVIPAROUS FEMALE (Type)—Selected from nine good specimens. Length 3.3 mm., width 1.6 mm. Prevailing colors black and dark olive-green. Head dark. Antennæ black with the bases of III-VI pale; lengths of articles: I, 0.07 type

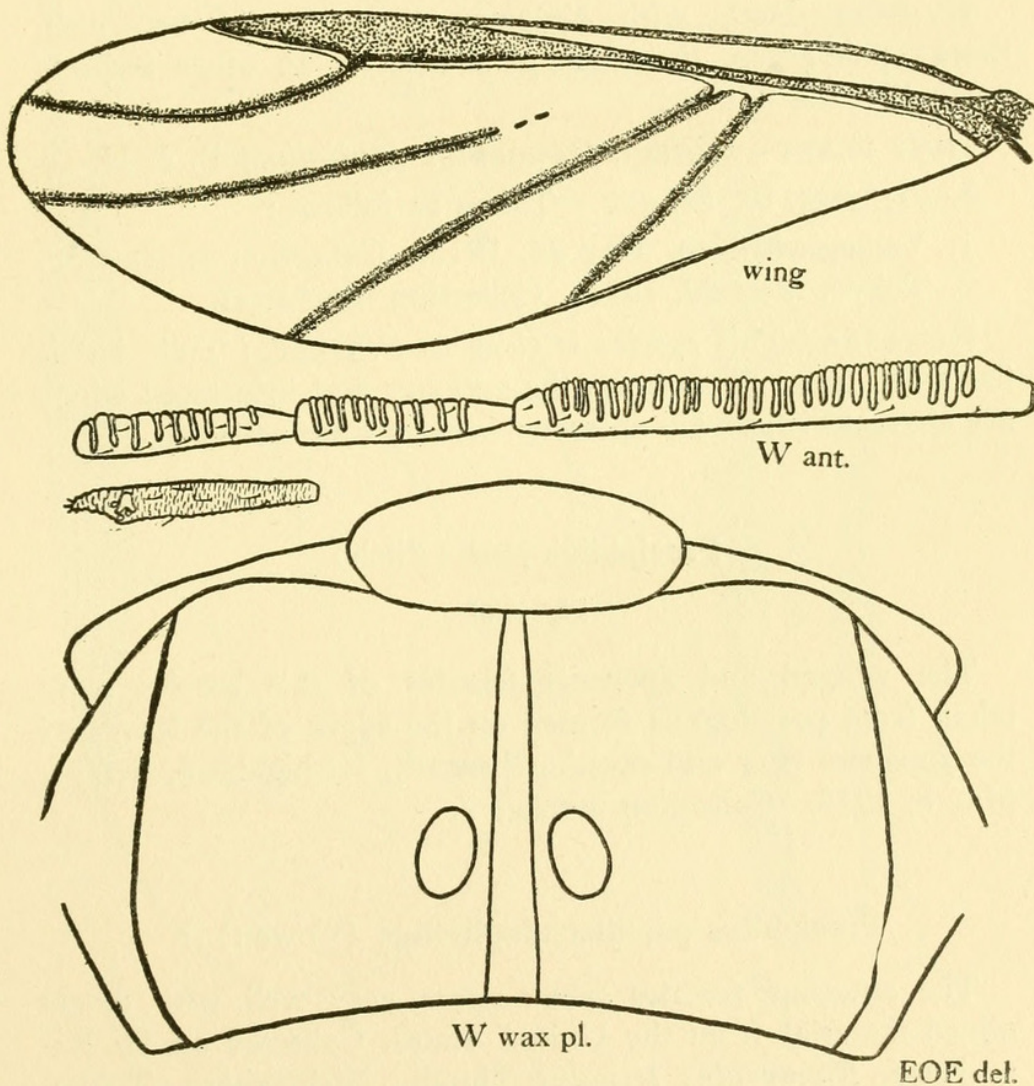


Figure 36.—*Prociphilus osmanthæ*, new species. Wing greatly reduced from scale



mm.; II, 0.10 mm.; III, 0.64 mm.; IV, 0.265 mm.; V, 0.265 mm.; VI, 0.30 mm. (base 0.25 mm., spur 0.05 mm.); total 1.64 mm. Sensoria transversely narrow and distributed as follows on the left member: III, 29; IV, 10; V, 9; VI with the usual number. Paratypes show the following variation: III, 27-31; IV, 9-12; V, 8-12. Rostrum reaching to the base of the abdomen. Wax plates of the mesothorax oval and located just back of the middle. Legs black with the bases of the femora pale. Wings infusate along the costal margin and at base; veins narrowly border with darker; length of the front wings 6 mm. Abdomen dark, with the ventral surface olive-green. Mounted specimens appear pale.

NYMPHS—Dark with abdomen transparently brownish, thorax pale-green, the wing pads dusky. In other respects much like the adults.

HOST PLANT—Hiiragi, *Osmanthus aguifolium* B. & H.

LOCALITIES, DATES, ETC.—Taken as follows:

1. Yamaguchi-Ken, May 24, 1913. Collection number 58.
2. Tokyo, May 29, 1913. Collection number 67.

REMARKS—This species is close to *P. cratægi* Tull., but it has many more sensoria on the antennæ and infuscated wings are characteristic. No apterous females were collected.

### ***Prociphilus pyri* (Fitch)**

Figure 37

The winged and apterous females of this species were taken from pseudogalls formed on the edges of the leaves of the Japanese pear and opening beneath, Nishigahara, Tokyo, May 8, 1913. Collection number 7.

### ***Prociphilus populiconduplifolius* (Cowen) ?**

The apterous females taken agree very well with determined material from the United States. Collected on Hi Ki-no-Kasa, *Ranunculus ternatus* Thunb., Nishigahara, Tokyo, May 13, 1913. Collection number 54.



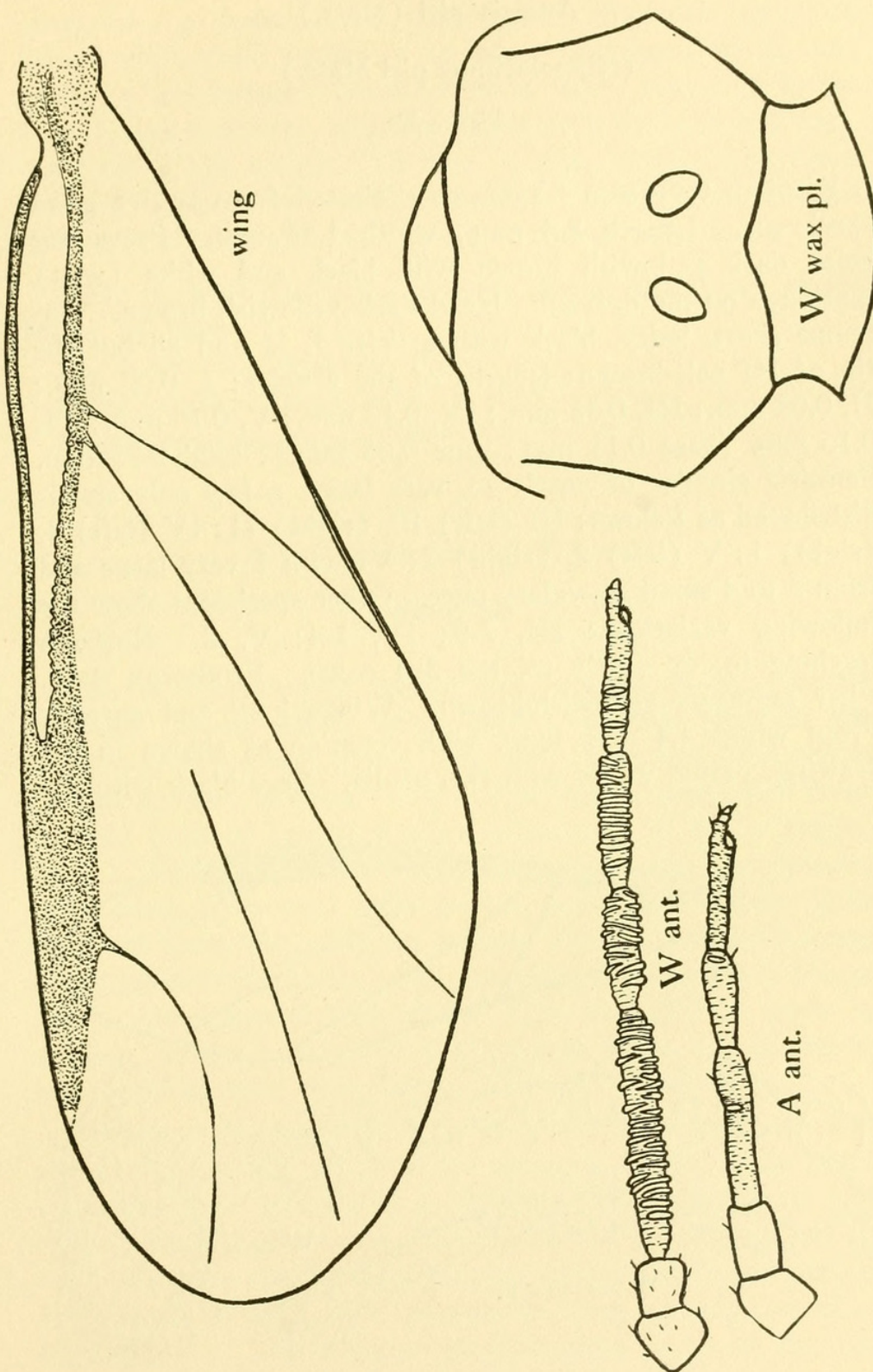


Figure 37.—*Prociphilus pyri* (Fitch)



*Anæcia piri* (Mats.)  
(*Nippolachnus piri* Mats.)

Figure 38

WINGED VIVIPAROUS FEMALE—Selected from twelve good specimens. Length 2.8 mm., width 1.35 mm. Prevailing color dark yellowish brown with black and white (wax) markings on the dorsum. Head dark yellowish brown. Antennæ short, hairy, black with articles I, II and all but the tip of III pale-brown; lengths of the articles: I, 0.07 mm.; II, 0.08 mm.; III, 0.35 mm.; IV, 0.13 mm.; V, 0.16 mm.; VI, 0.16 mm. (base 0.11 mm., spur 0.05 mm.); total 0.95 mm. Sensoria circular or nearly so, very large, a few only small; distributed as follows: III (left) 10, (right) 11; IV (left) 4, (right) 1; V (left) 2, (right) 2; VI with 1 very large and from 3 to 4 small secondary ones. Other specimens show the following variations: III, 7-9; IV, 1-4; V, 2. Rostrum reaching to, or nearly to, the 3rd coxæ. Prothorax dark, other segments yellowish-brown. Wings long and narrow. Front wings 4.4 mm. long, with venation as shown in the drawing. Hind wings with two media. Legs black with the

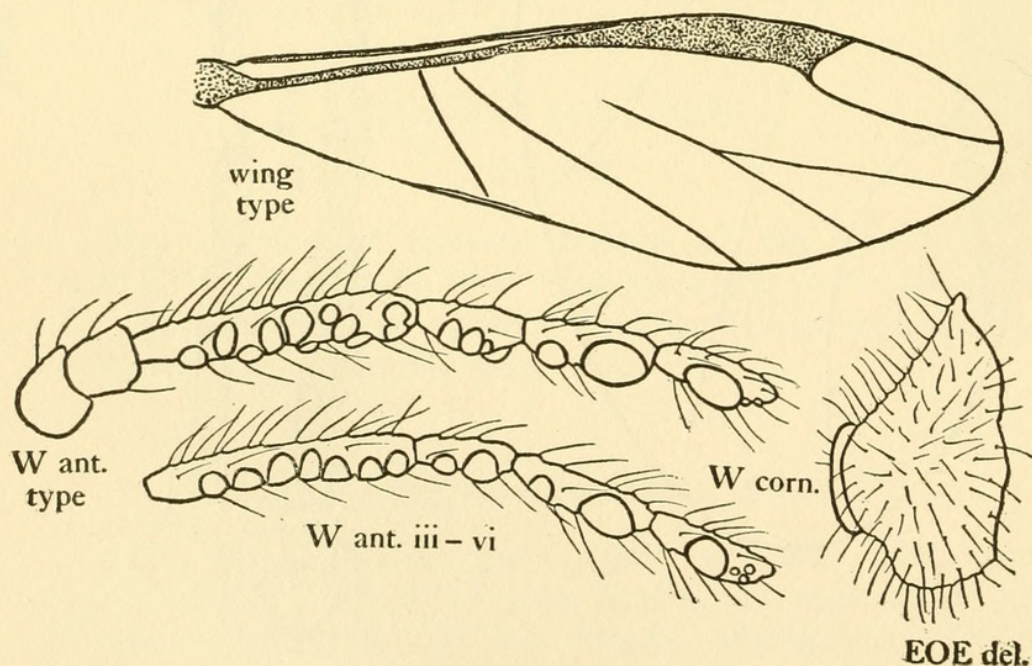


Figure 38.—*Anæcia piri* (Mats.). Wing reduced from common scale



bases of the femora and tibiæ pale. Abdomen yellowish brown with black markings and two prominent white wax bands on the dorsum. Cornicles black, hairy, very wide at the base, length 0.20 mm., width or diameter at the base 0.35 mm., diameter at the mouth 0.12 mm. Cauda, yellow with black margin; rounded and faintly constricted at base, hairy. Anal plate pale at base with black margin; rounded and hairy.

HOST PLANT—Along the midribs on the undersides of the leaves of pear.

LOCALITY—Nishigahara, Tokyo.

DATE OF COLLECTION—Oct. 2, 1913.

COLLECTION NUMBER—105.

### *Nipponaphis distylii* Pergande

Figure 39

This very interesting species was received in considerable numbers, among which were several apterous females; the latter oval in shape, 0.8 mm. long, with 5-articled (sometimes appearing as 4) antennæ. The winged forms were taken from the leaf galls of Isu, *Distylium racemosum* S. & Z., Tokyo, June 2, 1913. Collection number 71. The apterous females were taken from oval galls on the same plant at the same time and given the collection number 71a. The specific name given by Mr. Pergande<sup>7</sup> was *distychii*, derived from *Disty-chium*, the supposed host plant. This is clearly an error in spelling, as the host plant is *Distylium*. The specific name has therefore been corrected to *distylii*.

The genus *Nipponaphis* is, indeed, very close to *Cerataphis*, and except for the horns on the apterous forms of the latter could hardly be considered as separate. The absence of cornicles is usually given as a characteristic of *Cerataphis*, but all of the author's specimens of a large series of the type species, *C. lataniæ* (Boisd.), have cornicles as large as those found in *Nipponaphis*. The peculiar aleyrodid-like form of the apterous female is lacking in *N. distylii* Perg.

---

<sup>7</sup> Entomological News, vol. 17, p. 205, June, 1906.



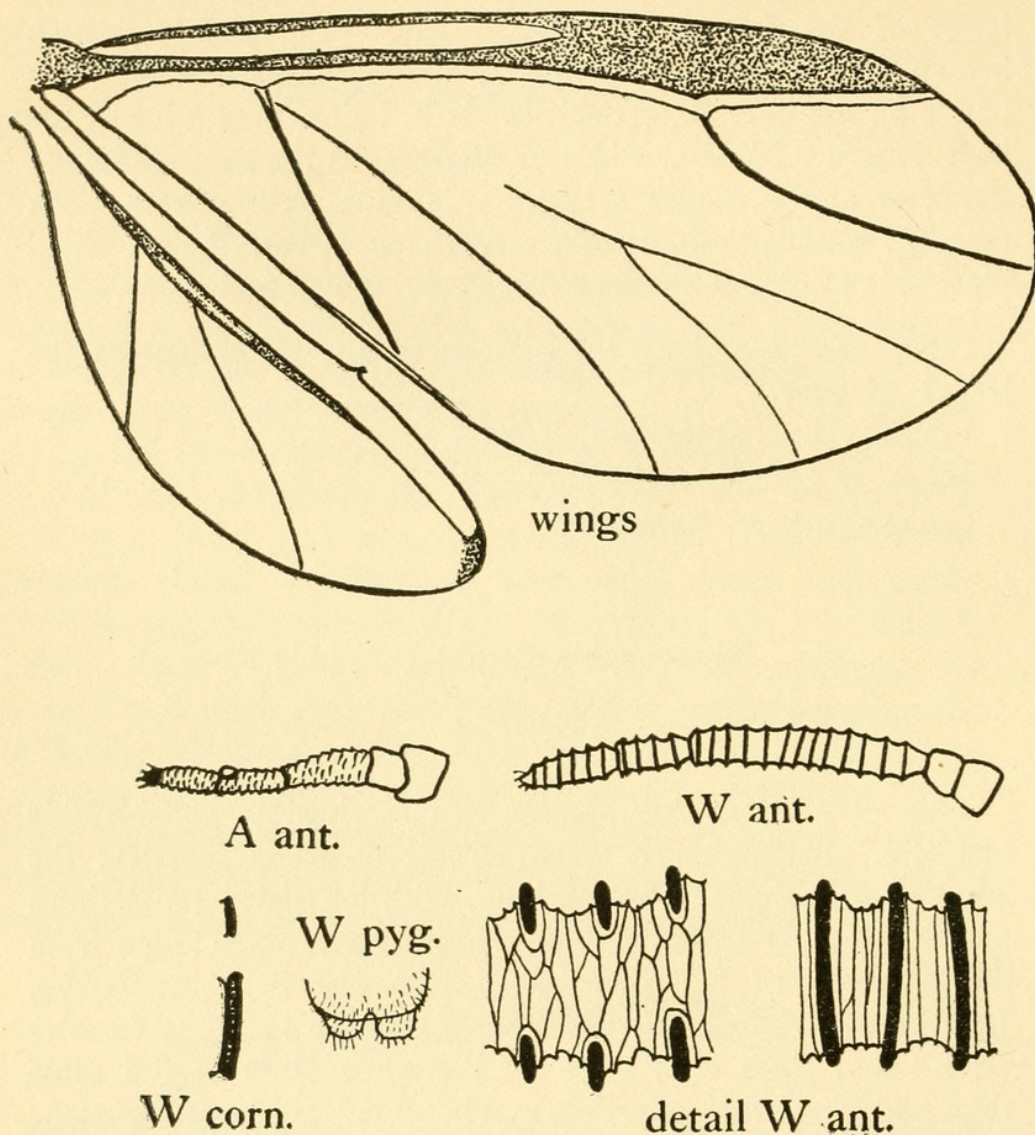
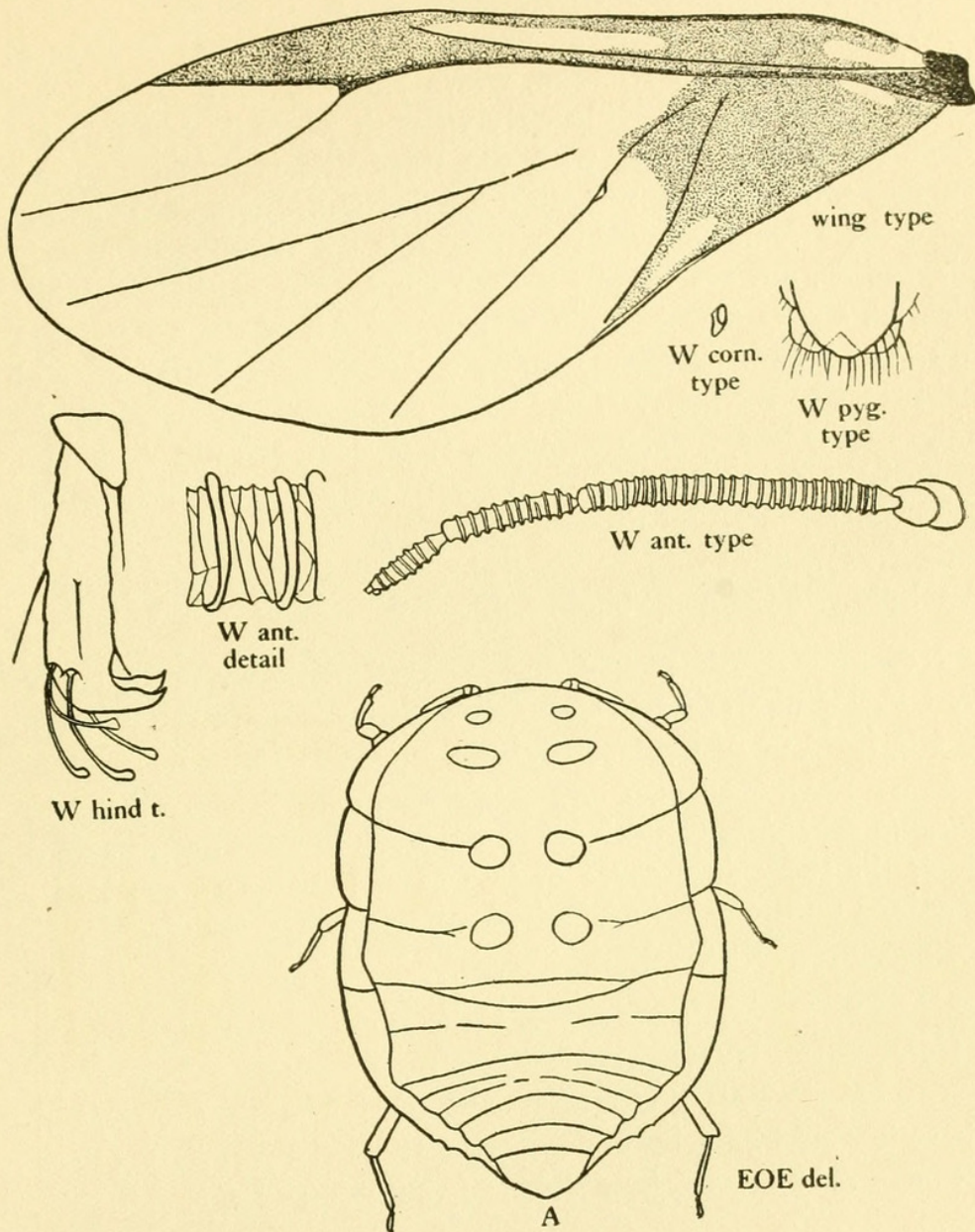
Figure 39.—*Nipponaphis distylii* Pergande***Nipponaphis cuspidatæ*, new species**

Figure 40

WINGED VIVIPAROUS FEMALE (Type)—Selected from thirteen specimens. Length 1.35 mm., width 0.9 mm. Prevailing colors from black to dark-purple. Head very dark. Antennæ, short, 5-articled, as shown in the drawing; lengths of articles: I, 0.04 mm.; II, 0.05 mm.; III, 0.46 mm.; IV, 0.19 mm.; V, 0.15 mm. (base 0.13 mm., spur 0.02 mm.); total 0.89 mm. Sensoria narrow ring-like, nearly equidistant from each other and numerous on all articles except the first two. Rostrum



Figure 40.—*Nipponaphis cuspidatæ*, new species

reaching just beyond the 3rd coxæ. Thorax dark-purple and shiny black. Front wings as shown in the drawing, with the costal border and base infuscate and 3.1 mm. long. The hind wings are also somewhat infuscate, especially along the veins. There are 2 media veins. Legs dusky throughout, the tarsi with four large knobbed digitules. Abdomen very dark purple. Cornicles indistinct, little more than pores. Cauda hairy, blunt at tip, 0.11 mm. long and 0.15 mm. wide at base. Anal plate hairy and distinctly bilobed.



APTEROUS VIVIPAROUS FEMALES (Paratypes) — Several specimens. Length 1.7 mm., width 1.3 mm. Prevailing color dark-purple; body slightly covered with white powder; nearly hemispherical in shape with the sides perpendicular and the surface somewhat depressed on the dorsum. In general appearance these females somewhat resemble the nymphs of certain aleyrodids, but are usually more robust. The epidermis, when cleared, shows a mosaic-like structure. All of the appendages are very small. Antennæ minute, indistinctly 3-articled and held close to the body. Legs small and appear attached to the sides of the body. The cornicles, if present, are not visible on any of the specimens although many were thoroughly cleared (in clearing in KOH the bodies literally went to pieces so that only fragments could be studied). Cauda broadly rounded. Anal plate indistinctly bilobed.

NYMPHS—Dark purple and covered with white powdery wax (color notes do not specify whether these are the nymphs of one form or of both winged and apterous forms).

HOST PLANT—Shii, *Castanopsis cuspidata* Schot. (listed as *Pasania cuspidata* Oerst.). The apterous females are clustered along the twigs in a more or less fixed position as specimens remained on the twigs after the long trip across the Pacific.

LOCALITY—Nishigahara, Tokyo.

DATE OF COLLECTION—May 12, 1913.

COLLECTION NUMBER—27.

REMARKS—This species is certainly close to *Cerataphis*, where it would have been placed except for the fact that it does not have the characteristic horns of that genus.





Essig, E. O. and Kuwana, Shinkai Inokichi. 1918. "Some Japanese Aphididae." *Proceedings of the California Academy of Sciences, 4th series* 8, 35–112.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/85251>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/64285>

**Holding Institution**

Smithsonian Libraries and Archives

**Sponsored by**

Smithsonian

**Copyright & Reuse**

Copyright Status: NOT\_IN\_COPYRIGHT

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.