SOME NEW AND LITTLE-KNOWN APHIDIDAE FROM JAPAN

(HOMOPTERA)

By the late RYOICHI TAKAHASHI

Acyrthosiphon kondoi Shinji

Kontyu, XII, p. 65 (1938).

Apterous viviparous female: Antennae pale, brownish on 6th segment when cleared. Cornicles pale, brownish on distal part. Cauda pale. Legs pale, darker on apices of tibiae. Body about 1.7 times as long as wide when cleared and mounted in balsam, reticulated on dorsum of thorax and abdomen. Head without spinules, a little wrinkled on dorsum except on anterior median area; dorsal setae blunt or a little narrowed to base, posterior ones about one-third as long as middle diameter of 3rd antennal segment; median tubercle of front very short; ventral setae short, an additional one present. Antennal tubercles with a ventral minute seta. Frontal tubercles well developed, diverging, a little rough on lower side, with 2 very short setae, without spinules. Clypeus with 2 pairs of anterior setae, mandibular laminae with 2 or 3 setae; ultimate segment of rostrum reaching beyond middle caxae, nearly as long as penultimate; 0.85 times as long as 2nd segment of hind tarsus, with 2 pairs of secondary setae, distinctly shorter than basal part of 6th segment of antenna. Antennae about 1.3 times as long as body excluding cauda; 1st segment imbricated on distal part of mesal side, with 6–7 setae; 2nd imbricated, with 4 setae; 3rd imbricated, with over 20 setae and a sensorium near base; the setae about one-fourth length of middle diameter of the segment; relative length of segments about as follows: III–21–24, IV–15–17, V–14–16, VI–4–5+24–25. Cornicles long, slender, cylindrical, expanded at base, as long as 3rd antennal segment, much longer than width of head across eyes, about 18 times as long as wide at middle, about 1.8–1.9 times as long as cauda, distinctly imbricated, with a distinct flange, with a few striates at apex, at middle part nearly as wide as, or very slightly wider than middle part of hind tibia, somewhat wider than middle part of 3rd antennal segment. Cauda about thrice as long as wide at base, constricted near basal part, rounded at apex, with 7 setae, one-third distal ones of which are shorter and blunt at tip, shorter than 5th antennal segment. Genital plate with 6 short setae along each side of hind margin, and a pair of longer anterior setae. Legs: Femora imbricated, with minute blunt setae which are about, or less than, one-sixth of middle diameter of femur; tibiae smooth, tibial setae slightly or distinctly shorter than middle diameter of hind tibia; tarsi with 3 setae on basal segment, lateral 2 of which are a little longer; 2nd segment of hind tarsus with 5–7 secondary setae on lower side, and a pair on upper side. Abdomen with about 10–12 minute dorsal setae on basal 5 segments, 2 or 3 dorsal setae between cornicles except on those on pale sclerites behind cornicles on 6th segment; these setae

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about one-fourth as long as middle diameter of 3rd antennal segment; 7th segment with 7–8 setae including marginal ones, 8th with 4 or 5 setae which are about, or somewhat more than, half as long as middle diameter of 3rd antennal segment. Abdomen without dark sclerites, a little sclerotic and pale on 7th and 8th tergites. Basal 2 abdominal spiracles a little apart, distance between 6th and 7th spiracles as long as that between 5th and 6th. Mesosternal furca with a rather slender basal stem. Body 2.5–2.7 mm. in length.

Alate viviparous female: Abdomen with faint pale marginal sclerites, without dark bands. Third antennal segment with 7 or 8 sensoria in a row mostly on basal half; relative length of segments about as follows: III–19, IV–16, V–15.5, VI–5+24. Cornicles slightly shorter than 3rd antennal segment, about 1.8 times as long as cauda, at middle, as wide as middle part of 3rd antennal segment and as middle part of hind tibia. Cauda not constricted, with 7 pointed setae. Body 2.5 mm. in length.

Host plant: *Medicago sativa.*

Specimens examined: An alata and 5 apterae taken at Chiba (28. IV. 1959, S. Sekiguchi leg.); and collected on clover at Chiba by T. Tanaka (V. 1962).

Comes close to, differs from *A. caraganae* Cholodkovsky:

(Aptera) Eighth tergite with fewer (5) setae which are much shorter than diameter of 3rd antennal segment. Cornicles more slender. Body smaller. Distinguished from *A. loti* Theobald by the longer and more slender cornicles.

Differs from *A. pisum* Harris as follows:

(Aptera) Eighth tergite with fewer setae. Cornicles nearly twice as long as cauda. Cauda shorter, rounded at apex, with 7 setae. Clypeus with fewer setae. First antennal segment with fewer setae; 4th segment distinctly shorter than 3rd. Body smaller.

(Alata) Sensoria fewer on 3rd antennal segment.

Acyrthosiphon pisi brevicaudatus, n. subsp.

Different from the main species as follows:

Apterous viviparous female: Cauda shorter, about 0.6–0.66 times as long as cornicle, 2.5–2.7 times as long as wide at base, with 9–11 setae, at least 5 distal onse are shorter and blunt. Antennae: First segment very slightly imbricated on distal part of mesal side, with about 9 setae; relative length of segments about as follows: III–28, IV–21, V–18, VI–7+26; 4th much shorter than 3rd. A pair of minute rounded tubercles are present on the posterior part of head, which are widely apart from each other and not distinct in some individuals and like the main species and *Microlophium*, the clypeus with 5–6 anterior setae, and the cauda with short blunt setae on distal half. Cornicles at middle part as wide as, or a little broader than middle part of 3rd antennal segment, as wide as middle part of hind tibia.

Host plants: *Pisum*, white clover.

Described from cotypes taken on *Pisum* (3. IV. 1958, Osaka, R. Takahashi leg.); an aptera on white clover (21. V. 1960, Osaka, R. Takahashi leg.); an alata (25. VII. 1960, Tsumagoi, Gumma Prefecture, K. Shibata leg.).

Many specimens which are regarded to be the typical *A. pisum* Harris, with longer cauda, were collected on *Vicia sativa* at Kuroyama, Osaka (4. V. 1960, M. Sorin leg.), in which the cauda of the aptera is 3.2 times as long as wide at base.

Differs from the description of *Macrocaudus phaseolii* Shinji in the colour of body,

and in the cornicles not reticulated and much longer than cauda.

Acyrthosiphon* (*Microlophium*) *rubiformosanus (Takahashi)

Macrosiphum rubiformosanum Takahashi, Dept. Agr. Govt. Res. Inst. Formosa, Aphid. Formosa, Pt. 5, p. 3 (1923); Ibid., Pt. 6, p. 60 (1931).

Apterous viviparous female: Green in life; in cleared specimens, antennae pale yellowish brown, paler at base of 3rd segment, blackish at apex of 3rd, distal part of 4th, and on 5th and 6th; cornicles blackish, but paler at base; cauda pale; legs pale, but femora and tibiae dark brownish on distal parts. Body nearly twice as long as wide in cleared specimens mounted in balsam, membranous on dorsum, without dark sclerites and tubercles. Head smooth, not convex, and with some very minute, conical, very short spines in a cluster on median area of front between 2 frontal setae; dorsal setae stiff, pointed, slightly shorter than middle diameter of 3rd antennal segment; venter without additional setae. Antennal tubercles well developed, with 1 or 2 ventral setae; frontal tubercles diverging, distinctly rounded at apex of mesal side, with 2 or 3 setae; space between frontal tubercles narrower than antennal tubercle. Antennae a little longer than

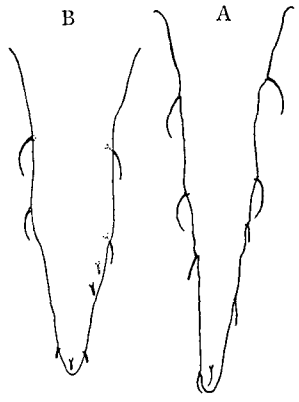

Fig. 1. Caudas (Aptera):

A. *Acyrthosiphon pisum* Harris

B. *A. pisi brevicaudatus*, n. subsp.

body, (about 1.3 times as long as body excluding cauda), 1st segment longer than wide, almost smooth, with 8 setae; 2nd a little imbricated, with 4 setae; 3rd smooth except on slightly imbricated base, not narrowed on basal part, with about 30 blunt setae which are about 0.6 times as long as diameter of the segment; sensoria flat, small, 6–14 in an irregular row or cluster near base, wanting on 4th segment; 4th somewhat imbricated; relative length of segments about as follows: III–29–30, IV–21–22, V–20, VI–4–5+25–32. Clypeus with 4–6 anterior setae, mandibular laminae with 3 setae; rostrum reaching beyond middle coxae; ultimate segment as long as basal part of 6th antennal segment, longer than ultimate, about 1.3 times as long as 2nd segment of hind tarsus, with 4 pairs of secondary setae. Cornicles long, narrow, broadened on basal part, narrowest near apical part, distinctly longer than width of head across eyes, about 14–15 times as long as wide at middle, a little shorter than 3rd antennal segment, thrice or a little over twice as long as cauda, imbricated, with a few large indistinct reticulations at apex in some specimens, with a well developed flange, at apex excluding flange nearly as wide as middle part of hind tibia. Cauda slightly constricted at base, tapering, pointed, slightly

over twice as long as wide, with 6–8 setae. Genital plate pale, with about 7–9 setae along hind margin on each side, and with about 6 anterior setae behind a pair of usual longer setae. Femora long, with many stiff setae distinctly shorter than half diameter of femur; hind femora with imbrications on distal part; tibiae almost smooth, with stiff setae shorter than middle diameter of hind tibia; tarsi with 4 or 5 setae on 1st segment in fore pair, but with 3–4 setae on it in middle and hind pairs; 2nd segment of tarsus with 2 pairs of setae on upper side and 3–4 pairs on lower side. Marginal sclerites of abdomen pale, with 2 or 3 setae, longer on 5th segment. Abdomen with 8–10 stiff pointed setae including marginal ones on 4th and 5th segments, 4 setae between cornicles, 4 or 5 setae on 7th segment; 6 dorsal blunt setae and 2 marginal ones on each side on 8th, which are as long as or slightly longer than diameter of 3rd antennal segment, about twice as long as dorsal setae on basal part of abdomen. Basal 2 abdominal spiracles distinctly separated. Distance between 6th and 7th spiracles as long as, or somewhat shorter than that between 5th and 6th. Mesosternal furca with a distinct basal stem. Fifth sternite with about 20 scattered setae. Body 3.5 mm. in length.

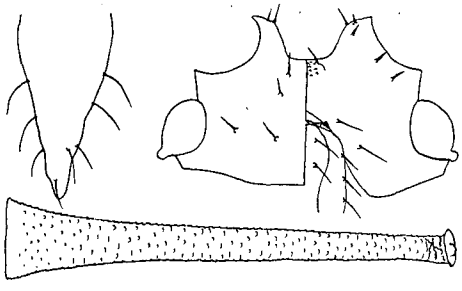

Fig. 2. *Acyrthosiphon* (*Microlophium*) *rubiformosanus* Takahashi.
Aptera: Head, cauda and cornicle.

Alate viviparous female: Green in life, without dark patches on abdomen; mesothorax pale brownish; head darker around ocelli, antennae dark brown on 3rd–6th, pale at base of 3rd segment; cornicles blackish at apex only, fore wings slightly clouded along veins, stigma pale in cleared specimens. Head with minute spinules on anterior part of venter, dorsal setae short, blunt, about 0.6–0.75 times as long as middle diameter of 3rd antennal segment, shorter than diameter of ocellus; ventral setae longer. Antennae 1.5 times as long as body, 1st segment imbricated; 3rd not narrowed at base, with 14–16 flat sensoria in a row along whole length, setae about or a little over one-fourth as long as middle diameter of the segment; relative length of segments about as follows: III–45, IV–40, V–35, VI–14+61. Dorsal ocelli separated from eyes. Clypeus with 4 anterior setae; mandibular laminae with 2 setae; ultimate segment of rostrum shorter than basal part of 6th antennal segment. Cornicles twice as long as cauda, a little longer than width of head across eyes. Cauda broadened on basal part, twice as long as wide at base. Genital plate with 4 setae along hind margin on each side and a pair of anterior setae. Femora imbricated on distal part, tibial setae as long as middle diameter of hind tibia; tarsi with 3 setae on 1st segment in all pairs, with a pair of secondary setae on upper side and 2 pairs on lower side of 2nd segment. Eighth segment of abdomen with 4–6 setae, which are nearly as long as, or a little shorter than middle diameter of 3rd antennal segment. Body 2.5 mm. in length. Other characters as in aptera.

Host plant: *Rubus*.

Specimens examined: Some apterae and alatae collected at Chihaya, and Kawachi-Nagano, Osaka Prefecture (1. VI. 1958, R. Takahashi and M. Sorin leg.).

Related to *M. evansi* Theobald, but can be distinguished by the shorter setae on the body and antennae, and by the 2nd segment of hind tarsus, distinctly shorter than ultimate segment of rostrum.

Different from the original account of *Macrosiphum rubiformosanum* Takahashi, chiefly as follows:

Aptera: Cauda shorter, distinctly tapering.

Alata: Cornicles pale, with blackish apex. Antennae with much fewer sensoria on 3rd segment.

Different from *Microlophium carnosum* Bucton as follows:

Aptera: Body not sclerotic and not wrinkled on dorsum. Head with shorter setae. Front not convex at middle. Antennae with fewer sensoria. Processus terminalis shorter. Tarsi with more setae on 1st segment.

Microlophium is different from *Acyrthosiphon* sens. str. in the tarsi with 3–5 setae on 1st segments, as well as in the 3rd antennal segment smooth except on basal part in aptera.

Impatientinum impatiens Shinji

Tuberosiphum impatiens Shinji, Zool. Mag. Tokyo, XXXIV, p. 789 (1922).

Macrosiphum impatiensae Shinji, Monogr. Japan. Aphid., p. 864 (1941).

Macrosiphum smilaceti Takahashi, Govt. Res. Inst., Dept. Agr., Rept. no. 10 (Aphididae of Formosa, Pt. 3), p. 101 (1924); Philippine Jl. Sc., LXIII, p. 6 (1937). **Syn. nov.**

Different from *I. balsamines* Kaltenbach as follows:

Apterous viviparous female: Body larger, measuring 3.0–3.5 mm. in length on *Impatiens textori.* Third antennal segment with fewer (2–7) sensoria on basal half or one-third; 4th and 5th without secondary sensoria, Ultimate segment of rostrum longer, nearly as long as, or 0.9 times as long as, 2nd segment of hind tarsus. Dorsal setae of body a little longer, those on head as long as, or 1.3 times as long as middle diameter of 3rd antennal segment (in *I. balsamines* distinctly shorter than that diameter); those on 8th tergite about 1.5–1.6 times as long as that diameter (in *I. balsamines* slightly longer than that diameter); setae on 3rd antennal segment longer, distinctly longer than half diameter at middle part of the segment (in *I. balsamines* nearly, or a little less than, half as long as that diameter). Cornicles longer, nearly as long as width of head across eyes about 6.1–6.8 times as long as wide at middle. Cauda a little longer, with 7–12 setae. Abdomen without marginal tubercles.

Alate viviparous female on *Smilax*: Secondary sensoria 13–22 in a row along whole length of 3rd antennal segment, absent on 4th and 5th segments. Other chracters as in aptera.

Host plant: *Impatiens textori.*

Specimens examined: Many apterae taken at Kobuka, Kawachi-Nagano, Osaka Prefecture (23. X. 1960, R. Takahashi leg).

Host plant: *Smilax china.*

Specimens examined: Many apterae and alatae taken at Hirao, Osaka Prefecture (29. IV. 1954); at Toyama (3. V. 1957, S. Takagi leg.); at Kawachi-Nagano, Osaka Prefecture (3. V. 1959); in Mt. Iwawaki, Osaka Prefecture (28. VI. 1959); and at Tsumagoi,

Gumma Prefecture (25. VII. 1960, K. Shibata leg.).

This species was synonymized with *I. balsamines* Kaltenbach in error by me (Kontyu, 28, p. 229, 1960).

In apterae on *Smilax china* body smaller, 2.5–2.8 mm. in length, with dorsal setae usually a little shorter than in those on *Impatiens textori.*

An aptera was collected on *Impatiens noli-tangere* in Mt. Yahiko near Niigata (27. VII. 1960), which is much smaller in body size, measuring about 2.1 mm. in length.

Known from Formosa and Corea besides Japan.

Macrosiphum smilacifoliae Takahashi also occurs on *Smilax china* in Japan and Formosa, and *M. smilacicola* Takahashi on *Smilax* in Formosa, which are remote from *Impatientinum.*

Impatientinum balsamines Kaltenbach

Hille Ris Lambers, Temminckia, VII, p. 305 (1947).

Host plant: *Impatiens noli-tangere.*

Specimens examined: Many apterae and a few alatae taken at Hirayu, Hida, Gifu Prefecture (12. VIII. 1959); in Mt. Yahiko near Niigata (27. VII. 1960); and in Mt. Moiwa, Sapporo, Hokkaido (31. VII. 1960); all collected by R. Takahashi.

New to Japan.

Rhodobium porosum Sanderson

Rhodobium porosum Sanderson, Hille Ris Lambers, Trans. Roy. Ent. Soc. Lond., 99, p. 285 (1948); Eastop, Entom. Mth. Mag., XCII, p. 273 (1956).

Rhodobium rosaefolium, Hille Ris Lambers, Temminckia, VII, p. 301 (1947).

Metopolophium rosaefolium, Börner.

Rhodobium porosum Eastop, A study of Aphid. of E. Africa, p. 63 (1958).

Apterous viviparous female: Frontal median tubercle with a pair of minute blunt setae; venter of head with 2 pairs of usual setae (middle and posterior pairs) and 1 or 2 pairs of additional setae; no ventral setae close to frontal median area; 2 or 3 minute setae on venter of antennal tubercle excluding frontal tubercle. Mandibular laminae with 3 setae. Tarsi with a pair of middle upper setae and 2 pairs of middle lower setae. Tibial setae shorter than narrowest width of tibia. Sixth sternite with about 16 setae. Other characters are given by Hille Ris Lambers.

Host plant: Rose.

Specimens examined: Some apterae taken at Osaka (II and X. 1958, R. Takahashi leg.).

Eumyzus clinopodii, n. sp.

Apterous viviparous female: Pale, antennae and legs pale brownish; cornicles dusky, paler basally; cauda dusky (in cleared specimens). Body broadly oval, without sclerites and tubercles. Head with rough glanules on dorsum and over venter except on median narrow area and lateral areas of dorsum; setae long, blunt, 2 or 3 times as long as basal diameter of 3rd antennal segment, stout, a little tapering; ventral setae 2 or 3 on each side. Antennal tubercles short, with one or 2 long setae on venter. Frontal tubercles short, imbricated, diverging, with a long seta. Antennae a little longer than one-third of body length, 5 or 6-segmented, roughly imbricated; basal segment wider than long,

with 4 setae, 2nd with 4 setae; 3rd gradually narrowed at basal part, much shorter than width of head across eyes, without sensoria, with a few blunt setae which are one half or three-fourths of basal diameter of the segment; primary sensoria small, without cilia, that on penultimate segment removed from apex of the segment about one-third of the length of the segment; relative length of segments about as follows: III–38, IV–15, V–14+13, in 6-segmented antennae, III–41, IV–18, V–17, VI–14+32. Eyes large. Clypeus almost smooth, with 2 pairs of setae, mandibular laminae almost smooth, with 2 setae; rostrum reaching middle coxae, ultimate segment a little longer than penultimate, pale brown, 2.5 times as long as wide at middle, with 2 pairs of secondary setae, about 1.6–1.7 times as long as secondary segment of hind tarsus, much longer than basal part of last antennal segment. Cornicles short, broadened to base, with a large flange, constricted at base, roughly imbricated, with a few spinules, about 3 times as long as wide at middle, about 1.7 times as long as cauda, shorter than 3rd antennal segment, apical part excluding flange slightly broader than middle diameter of hind tibia, as long as distance between 6th and 7th abdominal spiracles. Cauda nearly as long as wide, narrowed posteriorly, blunt at apex, with 4 setae, broader than cornicle, constricted at base. Genital plate short, much broader than anal plate, pale brown, with 4–6 setae along

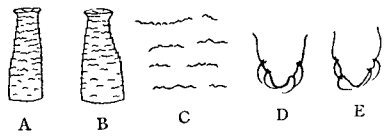

Fig. 3. *Eumyzus clinopodii*, n. sp.
Aptera: A and B. Cornicles.
C. Rough glanules on dorsum of head.
D. and E. Caudas.

each side of hind margin, and a pair of long anterior setae. Legs rather short, trochanters faintly defined from femora on one side, though femora constricted at base; femora smooth, with setae shorter than half diameter at middle of femur; fore femora over thrice as long as wide at middle; tibiae smooth, broadened at apical part, with setae shorter than middle diameter of tibia; hind tibiae no spinules in larvae; tarsi almost smooth, with 3, 3, 2 setae on 1st segment, 2nd segment short, 2.5 times as long as wide, nearly as long as basal part of last antennal segment, with a pair of setae on upper side; apical lower setae much removed from apex, almost at midlength. Pronotum with 6 setae; abdomen with 12–15 long setae in a row on anterior 5 segments, 4 dorsal setae between cornicles, 6 setae on 7th segment, 4 on 8th, these setae about 3–4 times as long as basal diameter of 3rd antennal segment on anterior part of abdomen, about 3.5–4 times as long as that diameter on 8th tergite, as long as, or longer than basal diameter of cornicle. Basal 2 abdominal spiracles closely placed, spiracular plates faint; distance between 6th and 7th abdominal spiracles longer than that between 6th and 5th. Mesosternal furca without stem. Body 1.1 mm. in length.

Host plant; *Clinopodium gracile* (Labiatae).

Described from some apterae (cotypes) taken at Mie Prefecture (14. VIII. 1955, M. Sorin leg.).

Different from *Eumyzus impatiensae* Shinji and *E. gallicola* Takahashi as follows: Head not with granules on lateral areas of dorsum. Body setae longer, blunt at tip, not arising from tubercles. Antennae 5 or 6-segmented. Clypeus with 2 pairs of setae, ultimate segment of rostrum with 2 pairs of secondary setae. Legs shorter; tarsi with lower apical setae much removed from apex; trochanters not distinctly defined.

This species is not a true member of *Eumyzus* but seems to be best included here rather than in other genera.

Galiaphis japonica, n. sp.

Apterous viviparous female: Green in life. When cleared, antennae pale brownish; legs pale, a little darker on apices of tibiae and on tarsi; cornicles and cauda pale. Body oval, about 1.7 times as long as wide in cleared specimens in balsam. Head with spinules except on posterior part of dorsum; dorsal setae minute, blunt at tip; 3 pairs of longer setae on venter. Antennal tubercles well developed, convex and with 2 or 3 minute setae on venter; frontal tubercles converging on basal halves of mesal sides, but diverging on distal halves, with a minute seta. Antennae 1.5 times of body length, roughly imbricated; 1st segment not longer than wide, with about 6 minute setae, 2nd with 4; 3rd somewhat broadened near basal part, gradually narrowed slightly on basal part, as long as, or longer than width of head across eyes, slightly longer than fore femur, with 1–4 flat sensoria near base, and a few minute setae which are less than one-fourth of middle or basal diameter of the segment; relative length of segments about as follows: III–27, IV–21, V–15, VI–8+45. Clypeus with a few spinules and 2 pairs of anterior setae, mandibular laminae with spinules and 2–3 short setae; ultimate segment

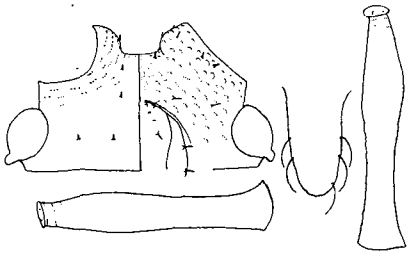

Fig. 4. *Galiaphis japonica*, n. sp.
Aptera: Head, cauda and cornicles.

of rostrum reaching middle coxae, as long as penultimate, shorter than basal part of 6th antennal segment, 1.1–1.2 times as long as 2nd segment of hind tarsus, with a pair of secondary setae. Cornicles about one-fourth of body length excluding cauda, distinctly swollen on distal half, at base a little broader than or as wide as distal swollen part, narrowest at apex below flange, slightly imbricated, about twice as long as cauda, somewhat shorter than width of head across eyes, about 5 times as long as distal swollen part, at apex excluding flange nearly as wide as middle part of hind tibia. Cauda stout, twice as long as wide at base, slightly or scarcely tapering, blunt at apex, scarcely constricted, with 4–5 setae, nearly as wide as base of cornicle, a little longer than basal part of 6th antennal segment. Genital plate with 3–4 short setae on each side of posterior margin, and a pair of anterior setae. Femora imbricated on distal part, with a few minute setae; tibiae smooth, with setae a little shorter than middle diameter of hind tibia; tarsi with 3 setae on 1st segment in all legs; hind tarsi on 2nd segment with 2 secondary setae on each surface. Thorax and abdomen pale, membranous on dorsum, without sclerites and markings; with spinules behind cornicles, 4 minute setae (spinal and pleural) on anterior segments, marginal setae duplicated; 2 or 3 setae between cornicles, 4 (including marginal 2) on 7th; 8th pale, with 4 short setae which are about one-third of middle diameter of 3rd antennal segment. Basal 2 abdominal spiracles closely placed, distance between 6th and 7th spiracles nearly as long as that between

5th and 6th. Mesosternal furca with short rather broad base. Body 1.5 mm. in length.

Host plant: *Anemone* ?

Described from a few apterae (cotypes) taken at Kawachi-Nagano, Osaka Prefecture (20. X. 1957, M. Sorin leg.).

This species may be referable to *Galiaphis* Ossiannilsson rather than to other proposed genera, and differs from *G. annae* Ossiannilsson in the shorter cauda, the processus terminalis over 5 times as long as basal part, and the ultimate segment of rostrum slightly longer than 2nd segment of hind tarsus. Alata is not known.

Different from *Aulacorthum* Mordvilko in the cornicles much expanded on distal half.

Different from *Arthromyzus* Börner and *Pseudorhopalosiphoninus* Heinze chiefly in the cornicles not so swollen abruptly, the minute setae on the body and antennae, the sensoria fewer on 3rd antennal segment, the pale dorsum of abdomen, etc.

Galiaphis cryptotaeniae, n. sp.

Apterous viviparous female: Pale in life. Antennae pale brownish or dusky, paler on basal 2 segments; cornicles pale brownish, slightly darker at tip, cauda pale brownish; and legs pale, when cleared. Body about 1.7–1.8 times as long as wide when mounted in balsam, minutely corrugated, not reticulated, on dorsum of thorax and abdomen. Head covered with spinules, with minute setae, which are a little narrowed towards base; anterior pair of dorsal setae longer, about one-third or half of basal diameter of 3rd antennal segment; 3 pairs of ventral setae a little longer, blunt at tip, no additional setae. Antennal tubercles prominent, convex and with 2–5 minute blunt setae on venter. Frontal tubercles slightly converging or almost parallel on basal halves of mesal sides, but diverging on distal halves, with 1–2 minute setae. Frontal concavity broader than deep. Antennae imbricated, over 1.5 times as long as body; 1st segment as long as wide, not angulated on mesal side, with 7–9 minute setae, 2nd with 4 setae; 3rd a little broadened near basal part, gradually narrowed on basal part, evenly imbricated, with a few minute blunt setae which are about one-sixth of basal width of the segment, with 1 or 2 flat sensoria near basal part, slightly longer than width of head across eyes, longer than cornicle; relative length of segments about as follows: III–27, IV–22, V–15, VI–9+41. Primary sensoria without ciliary ring. Clypeus with spinules, with 2 pairs of setae; mandibular laminae with many spinules and 2–3 longer setae; rostrum long, reaching much beyond hind coxae, reaching middle of abdomen; ultimate segment a little longer than 3rd segment, about 1.6 times as long as 2nd segment of hind tarsus, with a pair of secondary setae, pale brownish, about 4 times as long as wide at midlength, a little shorter than basal part of 6th antennal segment. Cornicles distinctly swollen on distal half, about 5.2–6 times as long as wide at swollen part, broadest at base imbricated, with distinct flange, reach caudal apex, a little shorter than width of head across eyes, narrowest at apex below flange, about one-fourth of body length, at apical part excluding flange nearly as wide as middle width of hind tibia, at base nearly as wide as basal part of cauda, 3 times as long as cauda. Cauda stout, about 1.3–1.4 times as long as wide at base, bluntly pointed or rounded at apex, with 2 pairs of setae, distinctly shorter than basal part of last antennal segment, shorter than ultimate segment of rostrum. Anal plate pale brownish, bluntly produced at apex. Genital plate large, with 5–6 short blunt setae on each side of hind margin and a longer pair anteriorly.

Legs: Femora imbricated, with some very short blunt setae; fore femora 6 times as long as wide, tibiae a little imbricated on distal part, without spinules, tibial setae somewhat shorter than middle diameter; tarsi striate, without spinules; basal segment with 3 setae; 2nd segment with a pair of secondary setae on upper and lower sides; 4 times as long as wide in hind tarsus. Abdomen without sclerites, with spinules behind cornicles, with an indistinct faint marginal sclerite on 5th segment anterior to base of each cornicle; 8–10 minute blunt setae including marginal ones on anterior segments, 6–8 setae on 5th segment, 2–4 between cornicles, 4 on 7th (including marginal ones); 8th pale, with 4 setae which are longer, about one-third of basal width of 3rd antennal segment. Basal 2 abdominal spiracles closely placed, distance between 6th and 7th spiracles nearly as long as that between 5th and 6th, a little shorter than that between 4th and 5th. Mesosternal apodemes with no distinct stem at base. Body 1.0–1.3 mm. in length. Hind tibiae without spinules in larva.

Host plant: *Cryptotaenia japonica.*

Described from a few apterae (cotypes) taken at Mt. Ikoma, Nara Prefecture (29. VI. 1958, M. Sorin leg.).

Different from *G. japonica* in the longer rostrum reaching beyond hind legs, the anal plate produced at apex, and the ultimate segment of rostrum 1.6 times as long as 2nd segment of hind tarsus.

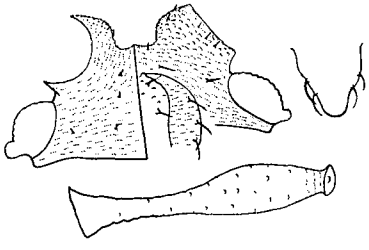

Fig. 5. *Galiaphis cryptotaeniae*, n. sp. Aptera: Head, cauda and cornicle.

Micromyzus weigelae, n. sp.

Apterous viviparous female: Green in life. Antennae pale, brownish on 6th segment; cornicles pale, slightly pale brownish at tip; cauda and legs pale, but darker at apices of tibiae and on tarsi, when cleared. Body about 1.8 times as long as wide when cleared and mounted in balsam. Head with spinules over dorsum and venter, somewhat convex at middle of front; dorsal setae very short, posterior ones at most one-third middle diameter of 3rd antennal segment; venter with none or one additional seta. Antennal tubercles developed, with 3 or 4 minute ventral setae besides those on frontal tubercles; frontal tubercles diverging, rounded anteriorly at end of mesal side, with 2 or 3 minute setae. Antennae nearly as long as body, imbricated; 1st segment broader than long, with 5 setae, 2nd with 3 setae; 3rd slightly narrowed on basal part, without sensoria, with a few minute setae which are less than one-fourth middle diameter of the segment, a little longer than width of head across eyes; primary sensorium of 5th not much removed from tip of the segment; relative length of segments about as follows: III–35, IV–24, V–23, VI–12+24. Clypeus with a few spinules and with 2 or 3 anterior setae; mandibular laminae with a seta; ultimate segment of rostrum about 1.4 times as long as 2nd segment of hind tarsus, much shorter than basal part of 6th

antennal segment, with 2 or 3 pairs of secondary setae. Femora imbricated, with minute setae which are shorter than one-sixth of middle diameter of femur; hind tibiae almost smooth, with a few indistinct striates on distal part, with setae distinctly shorter than middle diameter of tibia; tarsi with 4, but sometimes 3, setae on 1st segment on all legs; 2nd segment of hind tarsi with a pair of secondary setae on upper side and a secondary seta on lower side (hind tibiae with a few spinules in larvae). Cornicles long, slender, slightly longer than 3rd antennal segment, a little shorter than one-third of body length, about 15 times as long as wide at middle, much expanded at base, never swollen, at apex including flange a little narrower than middle part of hind tibia, or of 3rd antennal segment, well imbricated, thrice as long as cauda, as long as hind femora. Cauda broadened on basal part, but a little constricted just at base, blunt at apex, with 8 setae, nearly as long as basal part of 6th antennal segment. Genital plate with 3 or 4 short setae on each side of hind marginal area. Abdomen without sclerites and reticulations, with 4 dorsal setae (spinal and pleural) on 5th and 7th segments, but 3 setae on 8th; anterior dorsal setae minute, at most one-sixth of middle diameter of 3rd antennal segment, but those on 8th about or a little over one-third that diameter. Basal 2 abdominal spiracles apart; distance between 6th and 7th spiracles much shorter than that between

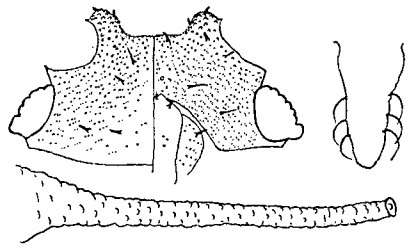

Fig. 6. *Micromyzus weigelae*, n. sp.
Aptera: Head, cauda and cornicle.

5th and 6th. Mesosternal furca with a broad base, without basal stem. Body 1.9 mm. in length.

Host plant: *Weigela hortensis* Sieb. et Zucc.

Described from paratypes (2 aptera) collected at Kobuka, Kawachi-Nagano, Osaka Prefecture (7. V. 1961, R. Takahashi leg.).

Alate viviparous female: Body generally green in life. Head dark, antennae blackish, paler on basal part of 3rd segment; thorax dark; cornicles pale, slightly pale brownish at apex and on basal part, cornicles dark brown, when cleared; abdomen with dorsal dark bands and marginal sclerites. Wings narrowly, but distinctly dark along veins, stigma pale. Head slightly convex at median part of front, with spinules over venter and on dorsum excluding median area except on anterior part; setae minute, blunt, posterior dorsal setae shorter than one-fourth of middle diameter of 3rd antennal segment, anterior dorsal setae shorter than half of that diameter; venter without additional setae (3 pairs of setae including a frontal pair). Antennal tubercles with 2 or 3 ventral minute setae; frontal tubercles with 3 setae and a rounded tubercle at apex, parallel or converging on mesal sides (due to conditions of specimens), the tubercle directed forward, broader than long, imbricated. Antennae well imbricated on all segments, 1.3–1.4 times as long as body; 1st segment not shorter than wide, with about 6 minute setae, 2nd with 4 setae; 3rd distinctly longer than width of head across eyes, gradually narrowed a little at base, with 6–13 rather small sensoria mostly in an irregular row on basal half

to four-fifths, and some minute setae which are one-fourth of middle diameter of the segment; 4th without sensoria; primary sensorium of 5th removed from apex of the segment by its diameter; relative length of segments about as follows: III-30, IV-25, V-23. VI-10+30. Clypeus with 2 pairs of short anterior setae, mandibular laminae with spinules and a seta; rostrum reaching middle coxae, ultimate segment slightly longer than penultimate, about 1.4 times as long as 2nd segment of hind tarsus, much shorter than basal part of 6th antennal segment, with 3 (or 1 or 2) pairs of short secondary setae. Cornicles long, slender, expanded at base, cylindrical or slightly broadened gradually on apical part, slightly shorter than width of head across eyes, over 12 times as long as wide, at middle, about 2.3-2.4 times as long as cauda, shorter than one-fourth body length, imbricated, with minute spinules, without distinct flange (flange small, indistinct), at apex nearly as wide as middle part of hind tibia. Cauda slightly constricted at middle, much longer than wide, blunt at apex, with 4 setae. Genital plate brown, with 3-4 short blunt setae on each side of hind margin and 4 anterior longer blunt setae. Femora long, imbricated, narrowed on basal half, with some minute blunt setae which are shorter

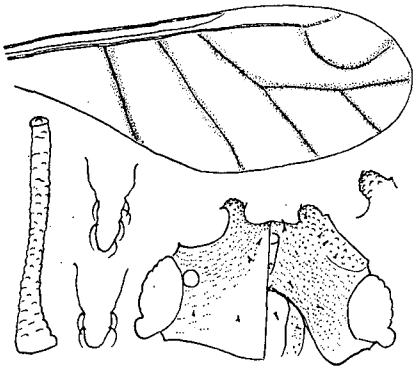

Fig. 7. *Micromyzus weigelae*, n. sp.

Alata: Head, frontal tubercle caudas, cornicle and fore wing.

than one-fourth middle diameter of femur; fore femora as long as 3rd antennal segment; tibiae slender, slightly widened on apical part, smooth; hind tibiae at middle as wide as middle part of 3rd antennal segment, with short pointed setae which are shorter than middle diameter of tibia; tarsi with 4 setae on 1st segment in all legs, median 2 of these setae much larger than short lateral 2; 2nd segment of hind tarsus with a few or some rows of minute spinules, and 2 secondary setae on each surface. Abdomen with a pair of small dark bands on 1st and 2nd segments, a larger pair on 3rd, a band on 4th-8th each, those on 4th and 5th larger, fused together, forming a large irregular patch with a pale part at center, distinctly separated from marginal sclerites; dorsal bands not reaching cornicles on 6th, reaching spiracles and partly broken on 7th; reduced in size and partly broken on 8th; marginal sclerites smaller on 5th, with a marginal tubercle on 2nd-4th, fused with spiracles on 6th, dorsal setae minute, blunt at tip, and 5-7 on 4th and 5th segments excluding marginal ones, 2 between cornicles; 4 on 7th, the lateral one of which is much mesad of spiracle; 2 on 8th, blunt or slightly capitate, slightly shorter than middle diameter of 3rd antennal segment; distance between 6th and 7th spiracles a little shorter than that between 5th and 6th. Media of fore wing twice branched, radial sector strongly curved, hind wings with 2 obliques. Body 1.5-1.7 mm. in length.

Host plant: *Weigela coraeensis* Thunb.

Some alatae taken at Mt. Rokko near Kobe (11. VI. 1961).

Different from *Neotoxoptera abeliae*, n. sp., as follows:

Alate viviparous female: Body smaller, with smaller dorsal patches on abdomen. Wings more narrowly dark along veins, stigma pale. Cauda with fewer setae. Cornicles slender, not distinctly swollen, imbricated, without distinct flange. Tarsi with 4 setae on 1st segment. Two setae on 8th tergite. Hind tibiae with numerous spinules on distal part in larvae.

Different from the description of *Micromyzus nigrum* van der Goot in the shorter processus terminalis, the absence of sensoria on 4th antennal segment and the pale pterostigma.

Differs from *Micromyzus* van der Goot sens. str. (after Eastop, 1958) in the dorsal bands fused on 4th and 5th abdominal segments and in wanting sensoria on 4th antennal segment in alatae, and a subgenus may be necessary for this species.

Genus ***Hydronaphis*** Shinji

Zool. Mag. Tokyo, 34, p. 790 (1922).

Related to *Eumyzus* Shinji, but differs as follows:

Apterous viviparous female: Body strongly sclerotized over dorsum of thorax and abdomen including 7th and 8th abdominal segments, without tubercles, with minute spinules in rows over dorsum. Antennae with a few sensoria on 3rd segment near base, which are sometimes unilaterally not discernible. Legs with many long flagellate setae, which are distinctly longer than middle diameter of tibia. Head with about 5 long setae on each side of venter besides those on frontal tubercle. Clypeus with 2 pairs of long setae on anterior part. Pronotum with 3–5 setae on each latero-anterior area besides a spinal pair. Mesosternal furca with a distinct stem which is nearly as long as wide. Cornicles much longer.

Alate viviparous female: Similar to aptera in chaetotaxy, in long setae on legs, and in longer cornicles. Secondary sensoria present on 4th and 5th antennal segments. Anal and cubitus not so stouter than media. Marginal sclerites very large on 6th abdominal segment, which are partly fused with sclerite of 7th segment. A submarginal sclerite present on venter on 6th and 7th abdominal segments.

Type: *Hydronaphis impatiens* Shinji.

Differs from *Allomyzus*, n. g. (MS), as follows:

Dorsum strongly sclerotized in aptera. Antennae shorter than body with a few sensoria on 3rd segment in aptera. Pronotum with more setae. Mesosternal furca with distinct, but short stem. Legs with many long flagellate setae. Cauda shorter, not constricted. Processus terminalis shorter. Head with additional setae on venter. Wings not distinctly infuscated along veins.

Different from *Eomyzus* (Type-species: *Myzus nipponicus* Moritsu) in the shorter black cauda, the presence of sensoria on 3rd antennal segment in aptera, and in the chaetotaxy of pronotum and in possessing a large dorsal sclerite on the abdomen in alata.

Hydronaphis impatiens Shinji

Zool. Mag., Tokyo, 34, 790 (1922).

Apterous viviparous female: Black; antennae, cornicles and cauda black; femora

black, pale at base; tibiae black at base and on distal part. Body strongly sclerotized and black over dorsum including 7th and 8th abdominal segments, with many minute spinules in rows forming more or less indistinct reticulations over dorsum of abdomen; with minute spinules in rows on dorsum of thorax and abdomen, which are forming indistinct reticulations, without tubercles, but pale widely on marginal area of 5th abdominal segment at base of cornicle, with a small marginal sclerite with a seta in front of cornicle in the pale area. Head over twice as wide as long, not convex at median part of front, with minute spinules over dorsum and venter; dorsal setae in 4 pairs blunt, posterior dorsal setae as long as or shorter than basal diameter of 3rd antennal segment, but anterior pair much longer, 1.7 times to twice as long as that diameter; ventral setae much longer, pointed, about 5 on each side, posterior ones 3 times as long as that diameter. Antennal tubercles well developed, with about 4 long setae on anterior half of venter. Frontal tubercles diverging, with a long marginal setae. Antennae a little shorter than body, imbricated; basal 2 segments with spinules, 1st segment as long as wide, with 6 long setae, 2nd with 4 setae; 3rd gradually narrowed on basal part with 1–3 small sensoria near base, which are not discernible unilaterally, with over 15 setae which are blunt at tip, as long as, or slightly longer than basal diameter of the segment, a little shorter than middle diameter of the segment, shorter than width of head across eyes, nearly as long as cornicle; primary sensoria with ciliary rings; relative length of segments about as follows: III–28, IV–17, V–13, VI–7+36. Clypeus with granules, with 2 pairs of long pointed setae; mandibular laminae with granules and 3 similar setae; rostrum reaching middle coxae, ultimate segment pale brownish, as long as penultimate, about 2.7 times as long as wide at middle, about 1.2–1.3 times as long as 2nd segment of hind tarsus, with a pair of secondary setae, distinctly longer than basal part of 6th antennal segment. Cornicles cylindrical, rather stout, slightly tapering, about 6.6–7 times as long as wide at middle, imbricated, with spinules, with large flange, not constricted at apex, apical part excluding flange nearly as wide as middle part of hind tibia. Cauda short, stout, with 8 setae. Anal plate black, with about 19 long setae. Genital plate dark brown, with about 20 setae along hind margin and 9 setae behind anterior pair of usual setae, much longer than anal plate. Legs: Femora long, partly imbricated, without spinules, with many long pointed setae which are distinctly shorter than middle diameter of femora; fore femora as long as width of head across eyes, over 6 times as long as wide at middle; tibiae smooth, without spinules in adult and in larva, with many long setae which are fine on distal part, as long as, or much longer than middle diameter of hind tibia; tarsi a little striate, 1st segment with 3 setae, 2nd segment with 0–2 setae on lower side, 2nd segment of hind tarsus about 4 times as long as wide, nearly as long as basal part of 6th antennal segment. Pronotum with a pair of spinal setae and 3–5 setae on latero-anterior corner; mesonotum with 17–18 setae; metanotum and anterior 6 abdominal segments fused together; 9–13 setae including marginal ones in irregular row on anterior 5 segments, these setae blunt, a little shorter than basal diameter of 3rd antennal segment; 4 similar dorsal setae on 6th segment between cornicles; 4 dorsal and 3–4 marginal ones of each side on 7th segment which are 2.5 times as long as basal diameter of 3rd antennal segment, 2 longer pointed setae on 8th tergite. Mesosternal furca with a short, but distinct stem which is nearly as long as wide. Abdominal spiracles: basal 2 fused, distance between 6th and 7th longer than that between 6th and 5th. Body 2 mm. in length.

Alate viviparous female: Head, thorax, antennae, cornicles and cauda black; legs as in aptera, stigma pale. Head with spinules except on posterior marginal areas on dorsum and venter, dorsal setae blunt, as long as or a little longer than basal diameter of 3rd antennal segment; ventral setae 3–4 on each side, longer. Antennal tubercles with 2–4 long setae on anterior part of venter. Frontal tubercles as in aptera. Antennae nearly as long as body, imbricated; 3rd segment with over 10 long blunt setae which are nearly as long as middle diameter of the segment, longer than cornicle, but shorter than width of head across eyes; secondary sensoria broadly rounded at apex, scattered and 19–21 on 3rd segment, 2–4 on 4th, 1–5 on 5th; relative length of segments about as follows: III–27, IV–16, V–13, VI–6+38. Ultimate segment of rostrum 3 times as long as wide at middle, about 1.4 times as long as 2nd segment of hind tarsus, with a pair of secondary setae. Cornicles cylindrical, 6 times as long as wide at middle, with large flange, imbricated, with a few large cells on apical part, over thrice or 4 times as long as cauda. Cauda as long as, or a little shorter than wide, rounded or pointed at apex, not constricted, with 7–8 setae. Genital plate with 22–24 setae along margin and about 12 setae behind anterior usual pair of longer setae. Femora with many long fine setae which are a little longer than middle diameter of femur; tibiae smooth, with many

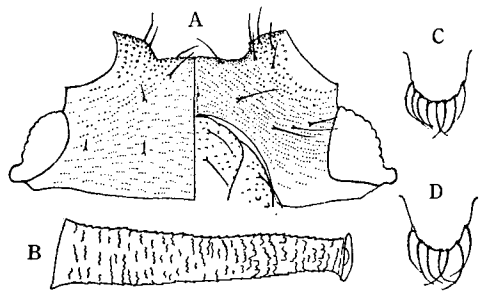

Fig. 8. *Hydronaphis impatiens* Shinji
Aptera: A. Head, B. Cornicle.
Alata: C and D. Caudas.

long fine setae; all tarsi with 3 setae on 1st segment; 2nd segment of hind tarsus slightly shorter than basal part of 6th antennal segment. Pronotum with a pair of spinal setae and 3 setae on latero-anterior area; abdomen with 3 large blackish marginal sclerites anterior to cornicle, which are with spinules and 4–5 setae, a small marginal sclerite with a seta in front of cornicle, a large dorsal black sclerite extending from 3rd to 6th abdominal segment, which is with traces of segmentation, especially between 5th and 6th segments; 7th and 8th segments sclerotized over dorsum, a very large marginal sclerite behind cornicle on 6th segment, which is partly fused with dorsal sclerite and with marginal part of sclerite of 7th segment; 4 blunt dorsal setae on 1st and 2nd abdominal segments, which are as long as, or shorter than basal diameter of 3rd antennal segment, 3–6 similar dorsal setae on 3rd–6th; 6 dorsal and 4 marginal pointed setae on 7th which are 1.7–2.3 times as long as basal diameter of 3rd antennal segment, 8th with 4 longer pointed setae which are over 3 times as long as that diameter. A transverse blackish submarginal sclerite present on venter on 6th and 7th abdominal segments, which is with 2–3 long setae. Basal 2 spiracles of abdomen fused. Distance between 6th and 7th abdominal spiracles about 1.5 times as long as that between 5th and 6th, 6th and 7th spiracles in sclerites. Anal and cubitus very slightly stouter than (almost subequal in thickness to) media; radial sector rather strongly curved. Body 2 mm. in

length.

Nymphs white.

Host plant: *Impatiens noli-tangere*, attacking the subterranean part, not causing galls.

Specimens examined: Some apterae and alatae collected at Mt. Takao, Tokyo (24. VII. 1959, R. Takahashi leg.).

Netoxoptera abeliae, n. sp.

Apterous viviparous female (fundatrix ?): Green in life. Antennae pale on basal 2 segments and basal part of 3rd segment, brown on remaining part; cornicles pale, brownish on apical part; cauda pale brown, legs pale, but brownish on apical parts of tibiae, when cleared. Body about 1.7 times as long as wide in cleared specimens in balsam. Head broadly rounded on median part of front, with spinules on anterior part of dorsum and over venter; dorsal setae minute, posterior ones about one-fourth middle diameter of 3rd antennal segment; venter with 2 pairs of longer setae besides a pair on front. Antennal tubercles distinct, without ventral setae; frontal tubercles much diverging, with 2 setae. Antennae well imbricated, over half length of body; 1st segment with 5 setae, 2nd with 3 setae, 3rd wanting sensoria, nearly as long as width of head across eyes, somewhat narrowed at base, with a few minute blunt setae which are at most about one-fourth middle diameter of the segment; processus terminalis shorter than basal part of 6th; relative length of segments about as follows: III–28, IV–15, V–16, VI–11+7.5. Rostrum reaching middle coxae, ultimate segments slightly longer than 2nd segment of hind tarsus, with about 3–4 pairs of secondary setae, shorter than basal part of 6th antennal segment, nearly as long as processus terminalis. Cornicles usually slightly swollen on distal half, much broadened at base, about 10 times as long as wide at middle, nearly as long as 3rd antennal segment, over twice as long as cauda, imbricated, but almost smooth on distal part, with a distinct flange, at apex including flange slightly narrower than middle part of hind tibia, about one-fifth of body length. Cauda gradually tapering on distal half, blunt at apex, with 6–8 setae, longer than basal part of 6th antennal segment. Genital plate with about 14 short setae along hind margin and a pair of anterior setae. Femora imbricated on distal part, with some very short setae, which are at most one-fifth middle diameter of femur; hind tibiae a little imbricated on subapical part, with setae shorter than middle diameter of tibia (in larvae hind tibiae smooth or with a few spinules on subapical part); tarsi with 3, 3, 2 setae on 1st segment; 2nd segment of hind tarsus with a pair of secondary setae on only upper side. Abdomen without dark bands and sclerites, with 2 minute spinal setae between cornicles, 4 dorsal setae on 7th, and on 8th; those on 8th longer than those on anterior segments, a little over half diameter of middle part of 3rd antennal segment. Basal 2 abdominal spiracles closely placed or a little apart; distance between 6th and 7th spiracles shorter than that between 5th and 6th. Mesosternal furca separated. Body 2.3 mm. in length.

Alate viviparous female: Head, thorax, antennae and cauda black; cornicles pale dusky, paler on swollen part; legs brownish, dark on apical parts of femora and of tibiae, when cleared. Wings broadly clouded along veins; stigma dark. Head with spinules over venter and on anterior and lateral areas of dorsum, dorsal setae blunt, minute, posterior ones about one-eighth of middle diameter of 3rd antennal segment. Antennal tubercles well developed, with 2–3 very short ventral setae, frontal tubercles

converging, with a distinct rounded tubercle on apex of mesal side, which is directed antero-mesad, much wider than long, with 3–4 short setae. Antennae distinctly longer than body, well imbricated, 1st segment with 9–10 minute setae, 2nd with 4 setae; 3rd much longer than width of head across eyes, with some minute setae which are somewhat broadened to apex, and at most about one-fourth of middle diameter of the segment, with 6–13 secondary sensoria in a row or scattered on basal half to two-fifths; 4th without sensoria; processus terminalis 3 times as long as base, not longer than 3rd segment; relative length of segments about as follows: III–40, IV–29, V–24, VI–12+37. Clypeus with some spinules and 2 pairs of anterior setae, mandibular laminae with 1 or 2 setae; rostrum reaching middle coxae, ultimate segment about 1.2–1.3 times as long as 2nd segment of hind tarsus. Cornicles swollen gradually on distal half, shorter than width of head across eyes, and than 5th antennal segment about 9 times as long as wide at middle, slightly over twice as long as cauda, smooth on swollen part, at apex including flange a little wider than middle part of hind tibia, about one-sixth of body length. Cauda with 6 setae. Femora well imbricated, tibiae as in aptera, with setae at most as long as middle diameter of tibia; hind tarsi with a pair of secondary setae on upper side and 2 or 3 setae on lower side. Abdomen with well developed dark bands, which

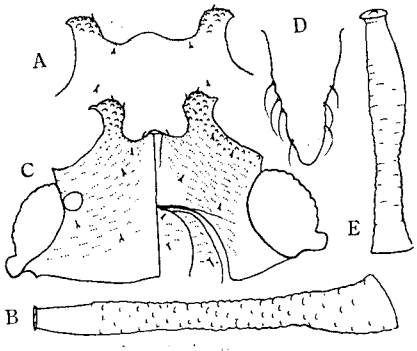

Fig. 9. *Neotoxoptera abeliae*, n. sp.

Aptera: A. Frontal tubercle, B. cornicle.

Alata: C. Head, D. Cauda, E. Cornicle.

are sometimes divided on 1st and 2nd segments, and sometimes fused unilaterally with marginal sclerites on 2nd and 3rd, dorsal band of 2nd at lateral part fused with that of 3rd; those on 3rd–6th fused together, with perforations at base of 6th; marginal sclerites smaller on 5th, not enlarged and not completely fused with dorsal sclerite on 6th, not separated from dorsal one on 7th; dorsal setae as in aptera. Small marginal tubercles sometimes present on 3rd–5th abdominal segments. Media of fore wing twice branched, radial sector strongly curved; hind wings not reduced in size, with 2 oblique veins. Body 2 mm. in length.

Host plant: *Deutzia gracilis* Sieb. et Zucc.

Described from cotypes taken in Mt. Kongo, Osaka Prefecture (30. IV. 1961, R. Takahashi leg.).

Differs from *Neotoxoptera formosana* Takahashi in the following characters:

(Alata) Sensoria fewer, absent on 4th antennal segment. Dorsal sclerites more developed on abdomen. Primary sensorium on 5th segment not protruding apically, smaller. Frontal tubercles with a tubercle. Head with spinules on anterior and lateral areas.

(Aptera) Processus terminalis shorter.

Micromyzus (?) ***lonicericola*** (Takahashi)

Amphorophora lonicericola Takahashi, Japanese Aphididae (published by the author), I, p. 20 and p. 29 (1921); Hori, Insecta Matsumurana, XII, p. 161 (1938).

Alate viviparous female: Head, antennae and thorax black; cornicles pale, pale brownish at base and apex; cauda pale; femora black on distal half, tibiae black at base and on apical part (in uncleared specimens). Head smooth on dorsum, with spinules on frontal tubercles only, with minute dorsal setae. Frontal tubercles well developed, slightly diverging, with a few minute setae. Antennae longer than body, imbricated; 1st segment nearly as long as, or slightly longer than, wide, with about 6 minute setae; 3rd not narrowed on basal part, longer than width of head across eyes, with a few minute setae, with 11–18 circular sensoria in a row or scattered on basal two-thirds or five-sixths, which are broadly rounded at apex; 4th without sensoria; primary sensorium of 5th small, much apart from apex of the segment; processus terminalis 3.5 times as long as basal part; relative length of segments about as follows: III–40, IV–32, V–30, VI–12+42. Ultimate segment of rostrum about 1.3 times as long as 2nd segment of hind tarsus, shorter than basal part of 6th antennal segment, with a pair of secondary setae; a pair of subapical primary setae a little removed anteriorly. Cornicles stout, gradually swollen on ditsal two-thirds, 4.5–4.7 times as long as maximum width at swollen part, not or a little expanded at base, narrowest at apex below flange, imbricated on basal and apical

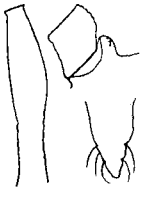

Fig. 10. *Micromyzus*(?) *lonicericola* (Takahashi).
Alata: Frontal tubercle and 1st antennal segment, cornicle and cauda.

parts, with small flange, at tip broader than middle part of hind tibia, a little shorter than width of head across eyes, about or over 2.5 times as long as cauda, flange about half in diameter as maximum width of swollen part. Cauda over 1.5 times as long as wide at base, tapering on distal half, pointed, with 6 setae. Femora with a few very short setae; tibiae with setae shorter than middle diameter of tibia; hind tibiae a little convex at outside of base; in larvae, tibiae without spinules and hind tarsi with 2 setae on 1st segment. Abdomen with dorsal bands at least on 3rd, 4th and 7th segments; marginal sclerites of 6th segment not fused with band of 7th. Eighth abdominal tergite not dark, with 4 setae which are as long as diameter of 3rd antennal segment at most. Wings a little infuscated along veins, with normal veins and pale stigma; stigmatic vein rather strongly curved. Distance between 6th and 7th abdominal spiracles as long as that between 5th and 6th. Body 2mm. in length.

Host plant: *Lonicera morrowii.*

Some cleared and uncleared specimens in bad conditions, collected at Sapporo (16. VI. 1922, M. Hori leg.) in the collection of Hokkaido Agr. Expt. St., Sapporo.

Near *M. stellariae* Strand, but differs in the stouter cornicles, the cauda pointed, with more setae, the antennae with fewer sensoria and shorter processus terminalis, and the larva without spinules on hind tibia.

Acanthulipes (?) ***lonicerae*** (Hori)

Aulacorthum lonicerae Hori, Insecta Matsumurana, XII, p. 161 (1938).

Apterous viviparous female: Head brown, short, nearly thrice as wide as long (including eyes, length at median line), slightly convex at median part of front, with spinules over dorsum, with minute blunt dorsal setae. Frontal tubercles almost parallel on mesal sides, frontal concavity about thrice as wide as deep. Antennae brown, yellowish on basal part of 3rd segment, imbricated; 1st segment as long as wide; 3rd not narrowed basally, with a few minute setae, slightly shorter than width of head across eyes, wanting sensoria; primary sensorium of 5th small, much apart from apex of the segment; relative length of segments about as follows: III-38, IV-21, V-15, VI-7+over 30 (broken at apex). Ultimate segment of rostrum about 1.3 times as long as 2nd segment of hind tarsus and with 2 or 3 pairs of secondary setae in grown larvae (not visible in adult). Femora dark brown, pale at base, with a few minute setae; tibiae yellowish, brown at apex, with setae much shorter than diameter of tibia; larvae with many spinules on hind tibiae. Cornicles brownish, darker at tip, long, narrow, expanded and broadest at base, scarcely or very slightly swollen near apex, imbricated, with small indistinct flange, about 14.5 times as long as wide at middle, longer than width of head across eyes, a little over thrice as long as cauda, slightly shorter than one-third body

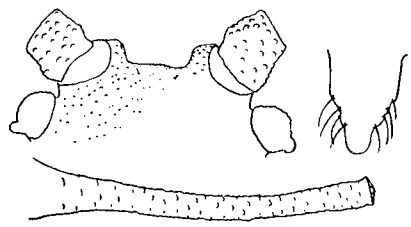

Fig. 11. *Acanthulipes* (?) *lonicerae* (Hori), Aptera: Outline of head and cauda and cornicle.

length excluding cauda, at tip sightly wider than middle diameter of hind tibia, at base about twice as wide as tip. Cauda yellowish brown; conical, with 10 setae. Dorsum of abdomen not sclerotized, corrugated. Body 2.5 mm. in length.

Host plant: *Lonicera morrowii.*

Specimens examined: An uncleared aptera in bad condition, collected at Sapporo (8. VI. 1922, M. Hori leg.) in the collection of Hokkaido Agr. Expt. St., Sapporo.

According to Hori, alata with 30–33 sensoria on 3rd antennal segment, 4 or 5 on 4th and none secondary ones on 5th; processus terminalis 10 times as long as the basal part; and the intermediate host is *Polygonum blumei.*

Myzus lonicerae Shinji (Insect galls and gall insects, Tokyo, 1944, p. 534), according to the description of alata, differs from the present species in the much shorter processus terminalis, and in the cornicles similar to those of *M. persicae* Sulzer.

The cornicles resembles *Aphorodon* Takahashi in shape, but are wanting setae, and the alata with sensoria on 4th antennal segment. Resembles *Acanthulipes* Börner, but the cornicles are swollen near tip, and the frontal tubercles are well developed.

Metaphorodon isodonis, n. sp.

Apterous viviparous female: Yellow in life, antennae and legs pale yellow, cornicles and cauda yellow. Body about twice as long as wide when mounted in balsam. Head

with prominent granules over venter and on dorsum excepting central area, not convex at middle of front, with 4 pairs of minute blunt dorsal setae, and a few ventral similar setae; these setae as long as, or much shorter than, one-third of middle diameter of 3rd antennal segment. Antennal tubercles well developed, with about 3 minute ventral setae; frontal tubercles a little converging, rounded at apex, with 2 or 3 minute setae, space between frontal tubercles much narrower than antennal tubercles, narrower than deep. Antennae longer than two-thirds of body length, roughly imbricated, with minute blunt setae; 1st segment convex on distal half of mesal side, with about 7 setae, 2nd with 4 setae; 3rd gradually narrowed at base, without sensoria, shorter than width of head across eyes, with 7–9 setae; primary sensorium of 5th without ciliae, processus terminalis more or less pointed; relative length of segments about as follows: III–14, IV–11, V–8.5, VI–6+12. Clypeus smooth, convex anterioly, with 2 pairs of minute anterior setae; mandibular laminae with some granules, with 1 or 2 setae; ultimate segment of rostrum longer than penultimate, reaching beyond middle coxae, about 1.4–1.5 times as long as 2nd segment of hind tarsus, with a pair of secondary setae, slightly longer than basal part of 6th antennal segment. Femora imbricated on distal part, with a few minute blunt setae which are as long as dorsal setae of head; hind tibiae crenate along outside except on distal part, with sparse setae, and a few minute spinules on distal part, the setae shorter than middle diameter of tibia; larvae with minute spinules on hind tibiae;

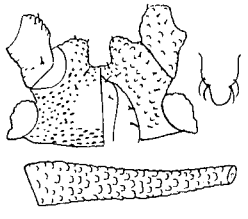

Fig. 12. *Metaphorodon isodonis*, n. sp.
Aptera: Head, cauda and cornicle.

tarsi almost smooth, 1st segment with 3, 3, 2 setae; 2nd segment of hind tarsus with a pair of short secondary setae on upper side and one or none on lower side. Cornicles gradually tapering, rather stout, large, as long as width of head across eyes, or hind femur, over thrice (sometimes nearly 4 times) as long as cauda, about 6 or 7 times as long as wide at middle, roughly imbricated, a little oblique at tip without flange, with apical pore small, about one-fourth of body length. Cauda distinctly constricted rather abruptly on distal one-third, slightly constricted at base, about 1.5 times as long as wide, rounded at apex, with 2 pairs of setae, shorter than ultimate segment of rostrum. Anal plate normal. Genital plate large, with a few minute marginal setae. Abdomen pale, corrugated, without reticulations, without sclerites and markings; a pair of spinal setae and a marginal seta present on 6th segment, 4 setae on 7th between spiracles, 2 setae on 8th, these setae minute, blunt, about or less than, one-fourth as long as middle diameter of 3rd antennal segment. Mesosternal furca with a wide base. Basal 2 abdominal spiracles a little apart, distance between 6th and 7th spiracles much shorter than that between 5th and 6th. Body 1.2 mm. in length.

Host plant: *Isodon* (Labiatae).

Described from a few apterae (cotypes) collected in Mt. Tanzawa, Kanagawa Prefecture (9. VIII. 1961, R. Takahashi leg.).

Differs from *Metaphorodon ishimikawae* (Shinji) chiefly in the absence of setae on

the cornicles, the frontal tubercles more developed, and in the cornicles not so oblique at tip; but the species is here placed as the alata is not known.

Phorodon minutum van der Goot from Labiatae may be a related species, from which the present species differs in the cornicles much broadened to base, the shorter processus terminalis, etc.

Different from *Ovatomyzus* Hille Ris Lambers in the head with spinules and in the imbricated antennae, as well as the hind tibiae with spinules in larvae.

Phorodon humuli japonensis, n. subsp.

Phorodon humuli Matsumura, Jl. Coll. Agr., Sapporo, VII, p. 362 (1917); Shinji, Monogr. Jap. Aphid., p. 987 (1941).

The Formosan aphid recorded by me under this name (Aphididae of Formosa, Pt. I, Agr. Expt. St. Formosa, Rept. 20, p. 27, 1921; Pt. II, Rept. 4, p. 84, 1923; Pt. VI, Rept. 53, p. 71, 1931) may be the same subspecies.

Apterous viviparous female on *Humulus japonicus*: Head without spinules on median area except on anterior part. Projection of frontal tubercle on mesal side nearly as long as 2nd antennal segment, reaching beyond middle of mesal side of 1st antennal segment, but not reaching apex of it, with 3–4 setae. Antennae with minute setae; relative length of segments about as follows: III–21, IV–13, V–12, VI–6+25. Clypeus smooth, mandibular laminae smooth, with 3 long setae; rostrum reaching hind coxae, ultimate segment over 3 times as long as wide at middle, as long as basal part of 6th antennal segment, about 1.6 times as long as 2nd segment of hind tarsus, with a pair of secondary setae, a pair of subapical primary setae removed anteriorly. Cornicles about 1.5 times as long as width of head across eyes, over 10 times as long as wide at middle, about thrice as long as cauda. Cauda with 7–10 setae. Anal plate with 3–4 setae on each side along hind margin. Femora slightly or scarcely imbricated on distal part, setae of femora distinctly shorter than one-third of middle diameter of femur, tibiae smooth in adult, but with some distinct spinules along outer side of distal part of hind tibia in larva, longest seta of hind tibia as long as, or a little shorter than middle diameter of it; tarsi a little imbricated, without spinules; 2nd segment of hind tarsus a little over thrice as long as wide, without setae on upper side, with a pair on lower side; 1st segment of tarsus with 3, 3, 2 setae. Dorsal setae minute and 4–6 besides marginal 2 on anterior 5 abdominal segments, 4 between cornicles and on 7th and 8th tergites; those on 7th segment much longer, about half length of basal diameter of 3rd antennal segment; those on 8th blunt, a little longer than half length of that diameter. Body 1.7 mm. in length.

Described from cotype specimens taken at Tokyo (1. VIII. 1956, R. Takahashi leg.).

Apterous viviparous female (fundatrigenia) on *Prunus mume*: Differs from aptera on *Humulus* as follows: Body larger, 2.4 mm. in length. Projection of frontal tubercle shorter, as long as, or somewhat shorter than, wide. Antennae: Relative length of segments about as follows: III–26, IV–18, V–15, VI–6+30. Cornicles stouter, about 8 times as long as wide at middle. Cauda with 5 or 6 setae on each side. Femora imbricated, tibiae smooth, sometimes with very few minute spinules in hind pair; tibial setae shorter than middle diameter of hind tibia (larvae with many spinules on hind tibiae as in aptera on *Humulus*); 2nd segment of hind tarsus a little over 4 times as long as wide at midlength. Ultimate segment of rostrum about 1.4 times as long as

2nd segment of hind tarsus. Setae on 8th abdominal tergite nearly half length of basal diameter of 3rd antennal segment.

Described from specimens taken at Kibi, Arita-gun, Wakayama Prefecture (5. V. 1958, R. Takahashi leg.).

Alate viviparous female (gynopara): Head smooth, dorsal setae a little shorter than diameter of constricted base of 3rd antennal segment. Projection of frontal tubercles small, short. Antennae: Setae on 3rd segment slightly longer than half diameter of constricted base of the segment. Secondary sensoria about 36–38 on 3rd antennal segment, 6–11 on 4th, 0 on 5th; relative length of segments about as follows: III–44, IV–27, V–22, VI–10+45. Ultimate segment of rostrum about 1.6 times as long as 2nd segment of hind tarsus, with 2 pairs of secondary setae. Hind tibiae somewhat imbricated on distal part, but without spinules. Marginal sclerites large on 2nd–4th and 6th abdominal segments, small on 5th, a large dorsal patch (4th–6th tergites), a large transverse sclerite on 7th reaching spiracle and slightly apart from marginal sclerite on 6th, a narrow sclerite on 8th; large submarginal intersegmental sclerites anterior to cornicles. Setae on 8th tergite longer than diameter of basal constricted part of 3rd antennal

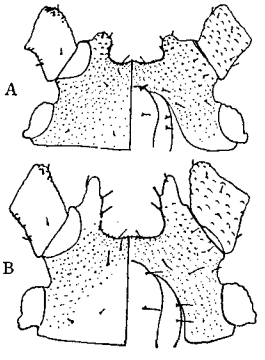

Fig. 13. *Phorodon humuli japonensis*, n. subsp.
A. Fundatrigenia on *Prunus* (Aptera),
B. Aptera on *Humulus*.

segment. Cauda with 7 setae. Cornicles about 7 times as long as wide at middle. Body 2.4 mm. in length.

Described from 2 specimens (Osaka, 11. XI. 1956, M. Sorin leg.).

Different from the main species in the presence of distinct spinules on the hind tibiae in the immature stage, in the shorter projection on the frontal tubercle in the aptera, and in the ultimate segment of rostrum longer as compared with hind tarsi. The presence of distinct spinules on the tibiae of larvae upsets the division between *Phorodontini* and *Myzini* of Börner's classification.

Phorodon umefoliae Shinji, 1924, is a *Myzus* and may be the same species as *M. cerasi* Fabricius.

Phorodon persifoliae Shinji, 1922, seems to be *Hyalopterus pruni* Geoffr.

Capitophorus prunifoliae Shinji, 1924, seems to be a *Phorodon* and may be the present subspecies, but his description is too vague to decide it positively, and his specimens were not preserved.

Phorodon* (*Diphorodon*) *cannabis Passerini

Phorodon (*Diphorodon*) *cannabis* Börner, Arb. phys. angew. Ent. Berlin-Dahlem, VI, p. 79 (1939).

Capitophorus cannabifoliae Shinji, Zool. Mag. Tokyo, 36, p. 357 (1924).
Phorodon asacola Matsumura, Jl. College of Agr., Sapporo, VII, Pt. 6, p. 405 (1917).
Phorodon humuli Hori (nec. Schrank), Hokkaido Agr. Expt. St., Rept. no. 23, p. 78 (1929).
Phorodon (Diphorodon) cannabis Takahashi, Trans. Shikoku Ent. Soc., VII, p. 1 (1961).

Host plant: *Cannabis sativa.*

Specimens examined: Some materials taken at Osaka (5. VI. 1967; 11. X. 1958, M. Sorin leg.). Asakawa, Tokyo district (31. VII. 1958, R. Takahashi leg.).

Differs from *Phorodon* Passerini s. str. as follows:

Apterous viviparous female: Many capitate setae on dorsum of body, some on antennae. Mandibular laminae with spinules. Basal segment of antenna with a distinct blunt tubercle on inner side. Dorsum of body with polygonal mosaic-like markings. Tarsi with a pair of setae on upper side of 2nd segment. Tibiae without spinules in larva.

Genus ***Paraphorodon*** Tseng and Tao

Apterous viviparous female: Oval, with many distinct pustules over dorsum of thorax and abdomen, and capitate setae. Antennae 6-segmented. Projections of frontal tubercles long. First antennal segment with a tubercle. Same with *Diphorodon.*

Trichosiphonaphis polygoniformosanus Takahashi

Myzus polygoniformosanus Takahashi, Aphid. Formosa, Pt. I, p. 18 (1921).
Trichosiphonaphis, Proc. Washington, 24, p. 205 (1922); Aphid. Formosa, Pt. II, p. 19 (in part) (1923); Shinji, Monog. Jap. Aphid., p. 1041 (in part) (1941); Lingnan Sc. Jl., Canton, 16, p. 56 (1937).

Apterous viviparous female: Dirty yellow cornicles and cauda. Thorax and abdomen prominently corrugated over dorsum, without dorsal and marginal sclerites. Meso- and metathorax and basal 6 abdominal segment fused together. Head twice as long as wide across eyes, slightly rounded at median part of front, with prominent spinules over dorsum and venter; chaetotaxy normal, dorsal setae blunt, posterior dorsal setae as long as about one-fourth to half of basal diameter of 3rd antennal segment; anterior 2 pairs of dorsal setae longer, nearly as long as, or a little longer than, that diameter, ventral setae long, pointed, 3–4 on each side. Antennal tubercles convex and with about 4 long blunt setae on venter. Frontal tubercles with a tubercle almost parallel or slightly converging on mesal sides; the tubercle blunt, rounded at apex, short, but distinct, much shorter than 2nd segment of antenna, as long as wide, with about 4 setae which are at most about half length of basal diameter of 3rd antennal segment. Eyes protuberant, a little apart from hind end of head. Antennae a little longer than half length of body, imbricated; 1st segment as long as wide, or broader than long, angulated on mesal side, with about 7 setae; 3rd segment distinctly imbricated along anterior side, not constricted basally, as stout as fore tibia, about half length of width of head across eyes, without sensoria, with some short blunt setae which are at most about one-third as long as basal diameter of the segment, and some of setae somewhat broadened to distal part, primary sensoria without hair ring, processus terminalis about 4 times as long as base. Clypeus produced, with spinules, with 2 long pointed setae; mandibular laminae with spinules, with 4 long pointed setae. Rostrum reaches middle coxae; ultimate segment about thrice as long as wide at middle, with a pair of secondary setae, about 1.4–1.5 times as long as second segment of hind tarsus, longer than basal part of 6th antennal segment. Cornicles converging, reaching beyond apex of cauda, distinctly constricted at base and

at apex below distinct flange, imbricated, with prominent spinules, nearly as long as width of head across eyes, nearly thrice as long as cauda. Cornicles with about 20–29 blunt setae mostly along inner and outer sides almost over whole length, of which 5 or 9 in a row along mesal side, these setae variable in length, longest one about as long as or a little longer than basal diameter of 3rd antennal segment and diameter of apical flange of cornicle, each arising from a distinct wart. Cauda pale, with 4 setae, slightly narrowed at base, rounded at apex, narrowed on distal half. Genital plate large, broadly rounded behind, with about 20 long pointed setae along hind margin and 1–2 pairs of anterior setae. Pronotum with 6 minute blunt setae which are narrowed to base; anterior 5 abdominal segments with 4 dorsal (spinal and pleural) and a marginal similar setae; 6th with 2 setae between cornicles; 7th with many spinules and 4 long stout blunt setae, spinal 2 of which are a little longer than, or nearly twice as long as basal diameter of 3rd antennal segment; 8th with 2 setae which are pointed, nearly as long as, or smaller than spinal ones of 7th. Spiracles semilunar, spiracular sclerites pale, basal 2 of abdomen closely placed, distance between those of 6th and 7th segments less than one-third of that between 5th and 6th. Sternal setae long, many, pointed. Femora imbricated with many long blunt setae, longest one shorter than half diameter at middle of femur; tibiae imbricated, with spinules even on basal part, but almost smooth and parallel-sided on apical part; tibial setae long, pointed, distinctly longer than middle width of tibia; some short blunt setae also present on basal half of outer side. Tarsi scarcely imbricated, without spinules; basal segment with 3 setae, but sometimes with 2 setae in hind legs, these setae subequal in length, 2nd segment with a pair of secondary setae on upper and lower sides; 2nd segment of hind tarsus over 4 times as long as wide at middle. Mesosternal apodemes on a very short broad base. Body 1.8 mm. in length.

Alate viviparous female: Head, thorax and antennae black. Head with minute spinules on dorsum and venter except on posterior parts. Frontal tubercles distinct, slightly diverging, rounded and convex at anterior end, without projection. Antennae as long as body, secondary sensoria small, protuberant, oval, scattered, about 50 on 3rd segment, 20 on 4th, 5–7 on 5th. Cornicles not reaching apex of cauda, dusky, but paler on middle part in cleared specimens, with 6–over 10 pointed setae which are a little shorter than diameter of apical flange. Abdomen without large dorsal patch, with a large marginal sclerite on 2nd–4th segments and a smaller one on 5th; marginal sclerite on 6th fused with a transverse large sclerite on 7th, a band on 1st and 2nd; chaetotaxy as in aptera, dorsal setae on anterior 6 abdominal segments blunt, very short, some of them arising from a minute circular sclerite; 4 setae on 7th pointed, spinal ones nearly twice as long as constricted base of 3rd antennal segment, 8th sclerotic, with 2 pointed setae subequal to those of 7th. Abdominal spiracles on 6th and 7th segments much more closely placed to each other than those on other segments; spiraculer sclerites distinct. Tibiae almost smooth, tibial setae as long as middle diameter of tibia. Wings slightly infuscated along veins; media twice branched, stigma pale; hind wings with media only. Body 2 mm. in length.

Host plant: *Polygonum thunbergii* var. *typicum*.

Specimens examined: Some materials taken at Taishi near Tondabayashi, Osaka Prefecture (3. XI. 1956); Osaka (12. X. 1958, 27. IX. 1959, 11. X. 1959).

Larvae with numerous spinules on hind tibiae.

Aulacorthum lonicerae Hori was recorded by Hori to migrate from *Lonicera* to *Polygonum*, and may be a related species.

Trichosiphonaphis lonicerae Uye

Macrosiphum lonicerae Uye, Insect World, XXVII, p. 4 (1923).

Differs from *T. polygoniformosanus* Takahashi as follows:

Apterous viviparous female: Body blackish brown, more sclerotized over dorsum and dark brownish when cleared, usually larger, 2–2.2 mm. in length. Antennae longer, a little shorter than body; 3rd segment longer, distinctly longer than half width of head across eyes. Rostrum reaching hind coxae, ultimate segment longer, nearly 4 times as long as wide at midlength, about 1.3 times as long as 2nd segment of hind tarsus. Cornicles less constricted (slightly or not constricted) below flange, more slender, with 6–20 setae, which are usually shorter, shorter than diameter of apical flange. Cauda with more setae (6–7 setae on each side). Femora a little imbricated on distal part, with shorter setae, which are less than one-third of middle width of femur; tibiae not imbricated, smooth, with shorter setae, longest seta nearly as long as middle diameter of tibia; tarsi longer; 2nd segment of hind tarsus about 5.5 times as long as wide at middle; 1st segment of tarsus distinctly concave on lower side. Spinal setae of 7th abdominal segment nearly as long as basal diameter of 3rd antennal segment; 8th sclerotic on dorsum, its setae more slender than, but as long as, or much longer than, spinal setae of 7th segment.

Alate viviparous female: Cornicles with 5 setae on basal half, somewhat longer. Cauda with 5–6 setae on each side.

Host plant: *Lonicera japonica.*

Specimens examined: Some materials taken at Osaka (17. V. 1954, 14. VI. 1955, 4 and 25. V. 1958); Kawachi-Nagano, Osaka Prefecture (3. V. 1959); Ichiu-mura, Tokushima (20. VIII. 1958) and Tokyo (19. V. 1949, 27. VII. 1958).

Genus ***Ovatus*** van der Goot

Differs from *Phorodon* Passerini as follows:

Apterous viviparous female: Seventh abdominal segment reduced in length and distance between 6th and 7th abdominal spiracles shorter than that between 5th and 6th. Projections of frontal tubercles never distinctly longer than wide.

Alate viviparous female: Abdomen without large dorsal sclerite on 3rd–6th abdominal segment. In *Phorodon*, 7th abdominal segment not reduced in length, distance between 6th and 7th abdominal spiracles as long as that between 5th and 6th. Projections of frontal tubercles distinctly longer than wide on alienicola; alata with a large dorsal sclerite on abdomen (3rd–6th segments).

Ovatus compositae, n. sp.

Apterous viviparous female: White, all appendages pale, tarsi pale brownish. Body oval, corrugated on dorsum of thorax and abdomen, not sclerotized, without sclerites and markings. Head with spinules except on broad central area of dorsum, straight at middle part of front; transversely corrugated and with a few spinules on median area of posterior marginal area, with usual chaetotaxy, anterior dorsal setae much longer than posterior minute ones, about half to two-thirds of base (or middle) diameter of 3rd

antennal segment; ventral 3 pairs of setae much longer, pointed. Antennal tubercles with 3 short, blunt setae on venter; projections of frontal tubercles converging, stout, as long as wide, with 3–4 setae, somewhat shorter than 2nd antennal segment. Antennae a little shorter than body, imbricated, usually 5-segmented; 1st segment protruding on distal part of mesal side, with 4 blunt setae; 2nd with 4 setae; 3rd imbricated more distinctly along anterior side with a few minute setae which are about one-sixth to one-fifth of basal diameter of the segment, without sensoria, usually fused with 4th segment; relative length of segments about as follows: III–17, IV–11, V–9, VI–6+21, or III–25, IV–14, V–6+20. Clypeus smooth, with pointed setae; mandibular laminae with a few spinules and 2 setae. Rostrum short; ultimate segment of rostrum reaching middle coxae, about 1.1–1.2 times as long as 2nd segment of hind tarsus, with a pair of secondary setae, about 2.7 times as long as wide at middle, shorter than basal part of last antennal segment. Cornicles stout, imbricated, at apex excluding distinct flange broader than middle part of hind tibia, shorter than width of head across eyes, nearly reaching apex of cauda, slightly curved, 5–6 times as long as wide at middle, a little shorter than width of head across eyes, about 2.5–3 times as long as cauda, at base as wide as basal part of cauda, or middle part of hind femur. Cauda sometimes abruptly narrowed on apical

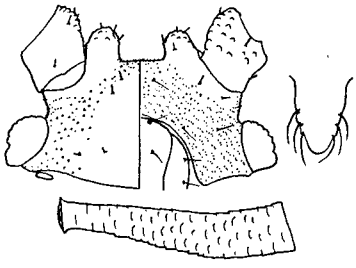

Fig. 14. *Ovatus compositae*, n. sp.
Aptera: Head, cauda and cornicle.

part, with 6 setae. Genital plate large, with 5 or 6 setae on each side of posterior marginal area, and a pair of longer anterior setae. Femora imbricated, with short blunt setae; which are shorter than one-third of middle diameter of femur, hind tibiae a little imbricated, parallel-sided, and sometimes with some spinules on distal part; spinules many in immature stage; tibial setae a little shorter than middle diameter of tibia; tarsi short, without spinules, with 3, 3, 2 setae subequal in length on 1st segment; second segment of hind tarsus a little striate, about thrice as long as wide at middle, shorter than basal part of ultimate antennal segment, without secondary setae*. Dorsal setae very minute, 6 on pronotum, 4 (spinal and pleural) on anterior 6 abdominal segments; marginal setae single; 7th tergite rounded and produced on median area, with a pair of spinal setae and a marginal seta behind spiracle; 8th tergite not sclerotic, with a pair of blunt setae which are about 1.5 times as long as those on 7th, about as long as, or a little longer than, half of basal diameter of 3rd antennal segment. Sclerites of basal 2 abdominal spiracles fused, distance between 5th and 6th abdominal spiracles longer than that between 6th and 7th, but distinctly shorter than that between 4th and 5th. Mesosternal apodemes far apart, connected basally by a transverse one, truncated at end. Body 1.5 mm. in length.

* Three pairs at apex are primary setae.

This species is different from other species of the genus in the antennae usually 5-segmented and the hind tibiae with spinules in larvae.

Host plant: A plant of Compositae.

Described from some apterae (cotypes) taken Taishi near Mt. Nijo, Osaka Prefecture (12. X. 1958, R. Takahashi leg.).

This species is not a member of *Ovatus* according to the classification of Börner, as the hind tibiae are with spinules in the immature stage. Such a character is, however, not always of generic significance, for example the European specimens of *Phorodon humuli* Schrank have not spinules on the hind tibiae, but the Japanese subspecies of it possesses many spinules on them in the immature stage.

Ovatus minutus van der Goot, subsp. ***nipponicus***, n. subsp.

Apterous viviparous female: Yellow in life. When cleared, body pale, antennae pale brownish, paler on basal part of 3rd segment; legs pale brownish, darker on tarsi; cornicles pale brownish, darker at tip; cauda slightly pale brownish. Body oval, 1.6–1.7 times as long as wide when cleared and mounted in balsam. Head with granules on venter and on dorsum except on midregion and on posterior area, slightly corrugated on posterior area of dorsum; head a little convex at middle of front, with a pair of small blunt tubercles on dorsum between anterior ends of eyes, which are smaller than ocular tubercles, rarely absent, and are much apart from eaeh other, each laterad of anterior dorsal setae; dorsal setae minute, blunt, narrowed basally, anterior dorsal setae longer, about half of basal or middle width of 3rd antennal segment; ventral setae slightly longer than basal width of 3rd antennal segment, only 2 on each side, anterior pair being close to front margin. Frontal tubercles converging, with a short rounded tubercle, which is broader than long, with about 3 setae which are as long as anterior dorsal setae, 4–5 similar ventral setae on antennal tubercle. Antennae imbricated; as long as body; 1st segment convex on mesal side, 5 setae; 2nd with 4 setae, 3rd as stout as tibia, without sensoria, nearly as long as width of head across eyes, a little longer than fore femur; relative length of segments about as follows: III–25, IV–18, V–17, VI–7+26. Processus terminalis 3.2–3.5 times as long as basal part in specimens taken near Osaka, but 4.1–4.6 times as long as basal part in specimens from Miyazaki, Kyushu. Rostrum reaches hind coxae; clypeus with setae normal; mandibular laminae with spinules and 2–3 setae; 2nd segment with 5 pairs of setae; 3rd longer than wide, distinctly shorter than 4th plus 5th; distal segment 3 times as long as wide, with a pair of secondary setae, nearly as long as basal part of 6th antennal segment, 1.4–1.5 times as long as 2nd segment of hind tarsus. Cauda about 1.8 times as long as wide, constricted about midlength, tapering, with 6 setae (5 of which are lateral), longer than basal part of last antennal segment, distinctly longer than tarsi. Cornicles often a little curved, cylindrical, stout, pale brownish, darker at tip, imbricated, about 6.5–7 times as long as wide at middle, about twice to 2.5 times as long as cauda, at base broader than femur, slightly shorter than, or as long as width of head across eyes, a little longer than fore femur; a few striates at apex forming indistinct reticulations; flange large, at apex excluding flange slightly broader than middle part of hind tibia. Genital plate pale, as wide as anal plate, with 7–12 short setae along margin and a pair of long anterior setae. Femora a little imbricated distally, with a few setae, longest one is slightly shorter than one-third of middle diameter of femur; tibiae smooth, tibial setae shorter than narrowest

width of tibia; all tarsi with 3 basal setae, a pair of middle upper setae and a pair of middle lower setae. Abdominal spiracles with a distinct sclerite, distance between basal 2 about one-fifth of that between 2nd and 3rd, or basal 2 spiracular sclerites sometimes united, distance between 6th and 7th spiracles very slightly shorter than that between 5th and 6th. Abdomen corrugated over dorsum a little darker and rough behind cornicles, with small marginal and submarginal pale dusky subcircular intersegmental patches, without other sclerites. Fifth tergite with 4 minute dorsal setae and 2 submarginal setae; 2 setae between cornicles, 7th with 2 dorsal and a marginal seta; 8th with 4 setae which are somewhat shorter than basal width of 3rd antennal segment. Apodemes normal, with broad base. Body 1.7–1.9 mm. in length.

Nymphs without spinules on tibiae.

Different from the description of *Phorodon minutum* van der Goot in the longer processus terminalis and the more developed frontal tubercles.

Different from *Ovatus crataegarium* Walker (syn. *O. menthae* Buckton) in the shorter processus terminalis, which is 3.3–3.6 times as long as basal part of the 6th antennal segment; and in the monoecious and holocyclic life on *Mentha*. Also different from *O. insitus* Walker and *O. menthastri* Hille Ris Lambers in the same character of antennae.

Phorodon menthae Buckton described from Hokkaido by M. Hori (Agr. Expt. St., Hokkaido, Rept. 23, p. 80, 1924) seems to be *Ovatus crataegarium* Walker.

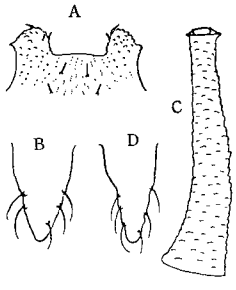

Fig. 15. *Ovatus minutus nipponicus*, n. subsp.
Aptera: A. Frontal tubercles, B. Cauda, C. Cornicle.
Alata: D. Cauda.

Host plant: *Mentha* sp., a plant of Labiatae.

Described from some apterae (cotypes) taken at Hirao near Osaka (22. IX. 1957, 7. X. 1958, 7. XII. 1958—Oviparous female, 29. III. 1959, M. Sorin leg.). Some apterae collected on *Mentha* at Miyakonojo, Kyushu (19. IV. 1962, T. Tanaka leg.).

Close to *O. glechomae* Hille Ris Lambers, but differs, as follows: (1) Antennae as long as body. (2) Dorsum not sclerotic, without spinal tubercles on 7th and 8th tergites. (3) Head not dark, with a smaller central area devoid of granules. (4) Cauda with 6 setae. (*O. glechomae* was placed in *Phorodon* by Börner 1952).

Different from *O. menthae* Walker and *O. menthastri* Hille Ris Lambers in the shorter tubercles on frontal tubercles, basal antennal segment rounded on mesal side, and in shorter cornicles; the presence of small dorsal tubercles on head.

The aphids recorded from Japan as *Phorodon menthae* Buckton by Shinji may be this species.

Alate viviparous female: Secondary sensoria as follows: III–26–35, IV–12–17, V–0–3; relative length of segments about as follows: III–26–29, IV–18–21, V–19, VI–7.5–8.5+31–32. Ultimate segment of rostrum 1.3 times as long as 2nd segment of hind tarsus, with 2 pairs of, or 5, secondary setae. Cornicles straight, 1.5–2 times as long

as dark cauda. Mesosternum with prominent granules on anterior half of midregion. Abdomen without bands, sclerotic on 7th and 8th tergites only. Body 1.8–2 mm. in length.

Described from some alatae (morphotypes) taken at Osaka (7. XII. 1958, 29. III. 1959, M. Sorin leg.), and Miyakonojo, Kyushu (IV. 1962, T. Tanaka leg.).

Oviparous female: Similar to vivipara, with hind tibia not swollen, with many sensoria on hind tibiae. Cauda dark, triangular, 1.5 times as long as wide. Body 1.7 mm. in length.

Vesiculaphis kongoensis, n. sp.

Alate viviparous female: yellow in life. Head and thorax black; antennae black on basal 2 segments, pale brown on the remaining part, legs brownish on apical parts of femora and of tibiae, cauda pale, cornicles dark brown, when cleared. Head smooth on dorsum, but with spinules along frontal margin and over venter; dorsal setae minute, anterior 2 pairs much apart from posterior 2 pairs; frontal median pair of setae usually duplicated, venter with 2 or 3 pairs of setae. Antennal tubercles almost absent, without ventral setae; frontal tubercles almost wanting, with or without a seta. Antennae well

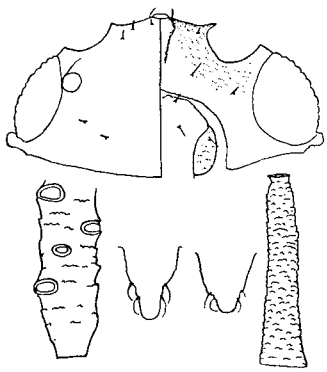

Fig. 16. *Vesiculaphis kongoensis*, n. sp.
Alata: Head, basal parts of 3rd antennal segment, caudas, and cornicle.

imbricated, a little shorter than body; 1st segment with 5 or 6 setae; 3rd shorter than width of head across eyes constricted at basal part, with a few minute setae which are about one-fourth as long as middle diameter of the segment; secondary sensoria 19–23 scattered over 3rd segment, 5 or 6 on 4th, 0–2 on 5th; relative length of segments about as follows: III–24, IV–13, V–13, VI–12+20. Clypeus with 2 pairs of anterior short blunt setae, mandibular laminae with spinules and a seta; ultimate segment of rostrum not reaching middle coxae, about 1.2 times as long as 2nd segment of hind tarsus, with a pair of secondary setae, much shorter than (nearly half as long as) basal part of 6th antennal segment. Cornicles nearly as long as processus terminalis, shorter than 3rd antennal segment, about 6–7 times as long as wide at middle, somewhat rounded on distal one-third, constricted at apex below flange, imbricated, about 2.6 times as long as cauda, at apex including flange about half in diameter as base, slightly wider than middle part of hind tibia. Cauda narrowed rather abruptly on distal half, rounded at apex, with 4 or 5 setae, slightly longer than ultimate rostral segment. Genital plate brownish, with about 12 setae scattered on posterior part, and 2 anterior setae. Femora

imbricated, with some short setae which are less than one-third diameter of middle part of femur; hind tibiae indistinctly a little imbricated on distal part, with setae shorter than, or as long as, middle diameter of tibia; tarsi with 3 setae on 1st segment in fore and middle pair, but 2 setae on it in hind pair; 2nd segment of hind tarsus with a pair of secondary setae on lower side. Hind tibiae with numerous spinules in larvae. Abdomen with a dark band on 3rd–6th and on 8th segments, these bands well separated from each other; marginal sclerites not enlarged on 6th segment, absent on 7th; a pair of small transverse intersegmental sclerites behind 6th; a pair of minute spinal sclerites on 7th; dorsal setae minute, 6 on dorsal band on 3rd, 4 on 5th, 6 between cornicles, lateral 2 of which on each side are close to base of cornicle; 4 setae on 7th; 8th somewhat or scarcely convex at median part of dorsum at hind end, with 4 or 5 setae, which are as long as, or only slightly longer than those on 3rd antennal segment. Wings hyaline, stigma pale, media of fore wing twice branched. Body 1.7–2 mm. in length.

Host plant: *Rhododendron* sp.

Described from some alatae (cotypes) taken in Mt. Kongo, Osaka Prefecture (30. IV. 1961, R. Takahashi leg.).

Differs from *V. caricis* Fullaway in the antennae well imbricated, with fewer sensoria on 5th segment; the dorsal bands distinct on 3rd–5th abdominal segments, the 8th tergite less protuberant, and in the media of fore wing twice branched.

Cavariella nigrocaudata, n. sp.

Apterous viviparous female: Head blackish along anterior margin in some individuals. Antennae blackish on basal 2 segments, dusky on 4th and 5th segments. Rostrum blackish on distal segments. Abdomen dark brownish behind each cornicle. Cornicles when cleared dark brown, blackish on distal swollen part. Cauda blackish. Legs dark brownish when cleared; tibiae blackish in some individuals. Head rounded on front, corrugated over dorsum, with very short dorsal setae which are as long as those on 3rd antennal segment, venter with 3 longer setae on each side. Frontal tubercles very short, without setae. Antennae 5-segmented, imbricated, somewhat shorter than half body length excluding cauda; 1st segment with 5 setae, 2nd with 4; 3rd not constricted basally, with 4–5 setae which are one-third as long as, or shorter than half, middle diameter of the segment; processus terminalis 1.4–1.6 times as basal part; relative length of segments about as follows: III–23, IV–7, V–7+11. Mandibular laminae with a seta; ultimate segment of rostrum reaching slightly beyond hind coxae, about 1.6–1.8 times as long as 2nd segment of hind tarsus, subequal to, or longer than, processus terminalis, with 2 pairs of secondary setae; a pair of subapical primary setae a little anterior to the remaining pairs. Cornicles long, distinctly swollen on distal part, about 8 or 9 times as long as middle width, shorter than width of head across eyes, a little longer than fore femur, slightly longer than 3rd antennal segment, about 2.4–2.6 times as long as cauda, constricted and narrowest proximad of tip; flange small, as wide as middle part of hind tibia. Cauda conical, rounded at tip, a little or distinctly longer than wide at base, with 5 setae. Femora with a few setae which are much shorter than half middle diameter of femur; tibial setae mostly distinctly shorter than middle diameter of tibia, longest one slightly shorter than that diameter; tarsi with 3 setae on 1st segments; 2nd segment of hind tarsus as long as basal part of 5th antennal segment, with 2 secondary setae on upper side only. Abdomen well corrugated over dorsum, 7th

segment not defined from 6th, dorsal setae subequal to, or slightly longer than, half middle diameter of 3rd antennal segment. Dorsal tubercle of 8th tergite well developed, tapering to apex, or nearly parallel on sides on apical one-third, as long as, but sometimes a little shorter than cauda, distinctly longer than wide at middle, with 2 subapical setae. Body 2 mm. in length.

Described from some apterae (syntypes).

Alate viviparous female: Antennae a little longer than half body length excluding cauda, 3rd segment with 18 sensoria mostly in a row along whole length, 4th without secondary sensoria; relative length of segments about as follows: III–27, IV–9, V–7+11. Cornicles with flange indistinct and almost absent. Cauda with 4 setae. Abdomen with well developed dorsal bands, those of 4th and 5th segments slightly fused partly. Dorsal tubercles very short, but distinct, somewhat shorter than wide at base, not broadened to base. Pterostigma grayish dusky. Body 1.8 mm. in length.

Host plant: *Tetrapanax* ("Tsuso").

Described from a morphotype, collected at Fukuoka (11. III. 1962, M. Shiga leg.).

Related to *Cavariella araliae* Takahashi, but differs chiefly as follows: In aptera, cauda blackish; dorsal tubercle shorter, as long as cauda; cornicles blackish distally; ultimate segment of rostrum a little longer, parts of antennae, legs and rostrum dark.

Different from *C. gillibertiae* Takahashi chiefly in the following characters of aptera: (1) Cornicles with small flange. (2) Processus terminalis longer. (3) Ultimate segment of rostrum longer. (4) Dorsal tubercle smaller.

Coloradoa artemisiae Del Guercio, ***artemisicola***, n. subsp.

Apterous viviparous female: Green in life, antennae pale, dusky on 5th and 6th segments; cornicles and cauda pale, tibiae pale. Body about 1.8 times as long as wide when mounted in balsam. Head corrugated, broadly and slightly rounded on front, dorsal setae a little or slightly expanded to apex, about 0.4–0.65 times as long as basal diameter of 3rd antennal segment, ventral setae similar, about 6 on each side. Antennae half length of body, imbricated; 1st segment much broader than long, with 4 setae, 2nd with 4 setae; 3rd not narrowed basally, with about 5 blunt setae which are one-third as long as basal diameter of the segment; relative length of segments about as follows: III–12, IV–7, V–7, VI–8+10. Mandibular laminae with 2 setae, which are similar to those on head in shape; rostrum reaching hind coxae; ultimate segment slightly concave or almost straight on lateral sides, 1.2–1.3 times as long as 2nd segment of hind tarsus, slightly shorter than basal part of 6th antennal segment, with 3 pairs of secondary setae, a pair of which is on upper side. Cornicles slightly swollen on apical part, imbricated, about 8.5–9 times as long as wide at middle, distinctly shorter than width of head across eyes, but longer than 3rd antennal segment, a little less than twice as long as cauda, at apex excluding flange as wide as middle diameter of hind tibia. Cauda stout, but much longer than wide at base, with 5 setae. Anal plate with 3–5 setae on each side. Genital plate with 12 setae variable in size along margin, which are similar to dorsal setae; and a pair of anterior setae. Femora stout, constricted at base, imbricated, fore femora about 2.8 times as long as wide at middle, with some setae similar to dorsal ones, which are much shorter than one-third of middle diameter of femur; tibiae with a few imbrications on apical part, with over 10 capitate setae in a row along outer margin of hind tibia, which are as long as middle diameter of tibia, tarsi without

spinules, 1st segment with 3, 3, 2 setae; 2nd segment with a pair of secondary setae on upper side, one or no seta on lower side. Pronotum with 8 setae, prothorax and 3rd and 5th abdominal segments with a small marginal tubercle. Abdomen with some pale small intersegmental patches, with about 8 dorsal setae besides 2 or 3 marginal ones on each side on 1st–5th segments, 4 setae between cornicles, 4–6 dorsal setae on 7th, 4–5 setae on 8th; these dorsal setae a little broadened towards apex, about 0.4–0.65 times as long as basal diameter of 3rd antennal segment on anterior segments, but 0.8–1.1 times as long as that diameter on 8th; 7th and 8th tergites a little sclerotized, but pale. Abdominal spiracles on subcircular sclerites, distance between 6th and 7th abdominal spiracles as long as that between 5th and 6th. Basal 2 spiracular sclerites fused together. Mesosternal furca with a long basal stem, which is as long as arms, but sometimes much shortened. Body 1.8 mm. in length.

Alate viviparous female: Head, thorax and antennae dusky. Head smooth, with blunt setae equal in length to those of aptera, venter with about 3 setae besides 2 pairs on front. Antennae about two-thirds as long as body; 3rd segment a little narrowed on basal part, with a few blunt setae 0.4–0.5 times as long as basal diameter of the segment; with 13–15 sensoria over whole length, which are flat at apex, in a row on basal half, but scattered on distal half; 4th with 8 sensoria, 5th with 3 secondary ones; relative length of segments about as follows: III–16, IV–10, V–8.5, VI–8+12. Ultimate segment of rostrum slender, about 1.2 times as long as 2nd segment of hind tarsus, with 2 pairs of secondary setae. Cornicles pale, as long as third antennal segment, pale brownish at tip. Cauda broadened to base, with 5 setae. Genital plate with blunt setae equal in number to aptera. Tibiae somewhat imbricated, with setae slightly shorter than middle diameter of hind tibia; 2nd segment of tarsus with no or 1 or 2 setae on upper side, no or 1 seta on lower side. Prothorax and 2nd, 5th and 6th abdominal segments with a small marginal tubercle. Abdomen without dark bands, with blunt setae, which are equal in length to those of aptera. Wings infuscated along veins, veins rather stout. Body 1.5 mm. in length.

Host plant: *Artemisia vulgaris.*

Described from cotypes (an alata, some apterae) taken at Wakayama (3. V. 1958); collected also at Tsubaki, Wakayama Prefecture (28. X. 1959) and near Osaka (27. V. 1956).

Differs from *C. artemisiae* Del Guercio in the narrower cornicles, the fewer and shorter, less expanded setae on 1st–7th abdominal segments, in apterae; in the less expanded setae and the narrower cornicles in alatae.

Close to *C. campestrella* Ossiannilsson, but ultimate segment of rostrum distinctly longer than 2nd segment of hind tarsus.

Easily differentiated from *C. kiku* Hori, which may be identical with *C. lahorensis* Das, in the a little expanded setae.

Key to some Japanese species of *Rhopalosiphum*

(Apterous alienicolae*)

(1) Eighth abdominal segment with 4–10 long setae on dorsum; 3rd antennal segment with setae which are at least twice as long as middle diameter of the segment; hind tibiae with setae

* Aptera is not availabe in *R. donarium* Matsumura.

which are over twice as long as middle diameter of tibiae. Ultimate segment of rostrum much longer than 2nd segment of hind tarsus. . . . . (2)

– Eighth abdominal segment with 2 setae on dorsum; 3rd antennal segment with setae which are short, or at most distinctly less than twice middle diameter of the segment; hind tibiae with setae which are less than twice middle diameter of tibiae; ultimate segment of rostrum and hind tarsi various in length. . . . . (3)

(2) Eighth abdominal segment with 4–6 setae; cornicles usually a little swollen, well imbricated; antennae 5-segmented, marginal tubercles wanting on 2nd–6th abdominal segments; 2nd tarsal segment longer than basal part of 6th antennal segment . . . . . *R. rufiabdominalis* Sasaki.

– Eighth abdominal segment with 10 setae; cornicles long, tapering on distal half, not swollen, sparsely imbricated; marginal tubercles present on 2nd–6th abdominal segments, antennae 6-segmented; 2nd tarsal segment shorter than basal part of 6th antennal segment. . . . . *R. brachytarsus* Takah.

(3) Hind tibiae throughout black, a little narrowed on apical part, with many long setae distinctly longer than middle diameter of tibiae; 3rd antennal segment with setae a little longer than, or as long as, middle diameter of the segment; processus terminalis less than thrice as long as basal part; dorsal reticulations of abdomen without granular markings at center of each cell. . . . . *R. maidis* Fitch.

– Hind tibiae paler on middle part, not narrowed on apical part with setae various in length; 3rd antennal segment with setae distinctly shorter than middle diameter of the segment; processus terminalis over thrice as long as basal part; dorsal reticulations with granular markings at centers of cells. . . . . (4)

(4) Dorsal setae blunt or a little expanded at tip; marginal tubercles absent on 2nd–6th abdominal segments. . . . . *R. padi* L.

– Dorsal setae pointed; marginal tubercles present on 2nd–6th abdominal segments. . . . . *R. nymphaeae* L.

(Alate viviparous female*)

(1) Eighth abdominal segment with 4–6 long setae; antennae 5 or 6-segmented, 3rd segment with setae which are at most about 1.5 times as long as middle diameter of the segment; dorsal sclerite of 7th abdominal segment usually fused with marginal ones; ultimate segment of rostrum much longer than 2nd segment of hind tarsus. . . . . *R. rufiabdominalis* Sasaki.

– Eighth abdominal segment with 2 setae; antennae 6-segmented, 3rd segment with setae distinctly shorter than middle diameter of the segment, other characters various. . . . . (2)

(2) Processus terminalis less than thrice as long as base; hind tibiae black throughout, some of ventral setae of abdomen with small dark sclerites at bases; 5th abdominal segment with one or 2 small median sclerites on dorsum. . . . . *R. maidis* Fitch.

– Processus terminalis distinctly over thrice as long as basal part; hind tibiae paler on middle part; sclerites absent at bases of setae on venter of abdomen; 5th abdominal segment usually without median sclerite on dorsum. . . . . (3)

(3) Fourth antennal segment with one or none sensorium; cornicles strongly swollen on distal part. . . . . *R. nymphaeae* L.

– Fourth antennal segment with over 3 sensoria, cornicles not strongly swollen. . . . . (4)

(4) Cauda with 6–9 setae; dorsal setae of body pointed, though a few spinal ones on anterior abdominal segments blunt or slightly expanded at tip, those of head nearly as long as middle diameter of 3rd antennal segment, those of 8th abdominal segment about 1.3–1.4 times as long as that diameter; 3rd antennal segment with 24–30 sensoria; 4th with 13–15; processus terminalis 3.5–3.8 times as long as basal part; 2nd segment of hind tarsi about 1.2–1.3 times as long as ultimate segment of rostrum; marginal tubercles present on some of 2nd and 6th abdominal

* Alata is not known in *R. brachytarsus* Takah.

segments; dorsal sclerites of 6th and 7th abdominal segments reduced, much apart from marginal sclerites; small median sclerites sometimes present on 2nd-5th segments. . . . . *R. donarium* Matsumura.

– Cauda with 4-6 setae; dorsal setae of body shorter, slightly expanded or blunt at tip, though sometimes pointed on posterior 2 abdominal segments; processus terminalis over 4 times as long as basal part; 2nd segment of hind tarsi nearly as long as ultimate segment of rostrum; marginal tubercles usually absent on 2nd-6th abdominal segments; dorsal sclerite of 7th usually fused with marginal ones; median sclerites usually absent on 2nd-5th segments. . . . . *R. padi* L.

Semiaphis moiwaensis, n. sp.

Apterous viviparous female: White in life, antennae pale; legs pale, brownish on tarsi; cornicles pale or faintly pale brownish when cleared; cauda pale, dark in a specimen. Body about 1.5 times as long as wide when mounted in balsam. Head nearly twice as wide as long, slightly wrinkled, without spinules, a little convex on median part of front; dorsal setae a little expanded distally, minute, longest one about half as long as basal diameter of third antennal segment; venter with about 4 pairs of longer setae besides 2 pairs on front. Frontal tubercles absent. Antennae about 1.5 times as long as width of head across eyes, about one-third length of body, 5-segmented; 1st segment imbricated, as long as wide, with 5 setae; 2nd with 3 setae; 3rd a little narrowed at base, imbricated, with a few setae, which are about 0.4–0.6 times as long as basal diameter of the segment; 4th with a seta and sensorium small; relative length of segments about as follows: III–50, IV–16, V–15+33–38. Clypeus with a pair of setae on anterior part, mandibular laminae with a seta, rostrum rearly reaching middle coxae, ultimate segment about 0.8–0.9 times as long as 2nd segment of hind tarsus, much longer than basal part of 6th antennal segment, with a pair of secondary setae. Cornicles a little imbricated, with minute spinules, rounded on one side, oblique at tip, without flange, 1.5–1.6 times as long as wide at middle, about one-third length of cauda, as long as 4th antennal segment, diameter at middle as long as or, somewhat shorter than, middle diameter of hind tibia. Cauda distinctly broadened to base, with 11–13 setae, distinctly longer than wide at bese, not or scarcely constricted, much longer than ultimate segment of rostrum. Genital plate pale, with about 12 setae along margin and a pair of longer anterior setae. Femora imbricated on distal part, with a few pointed setae which are mostly shorter than one-third diameter at middle part of femur, longest one somewhat shorter than half of that diameter; tibiae smooth, with some pointed setae which are shorter than middle diameter of hind tibia; tarsi striated, without spinules, with 3, 3, 2 or 2, 2, 2 setae on 1st segment, 2nd segment of hind tarsus with a pair of setae on upper and lower sides. Pronotum with 6 setae. Abdomen membranous, without sclerites and marginal tubercles, with 8 blunt setae including marginal ones on anterior segments, which are 0.4 times as long as basal diameter of 3rd antennal segment, 6 setae on 5th segment, 2 between cornicles, 4 on 7th; 8th a little protuberant on median area, with 4 blunt dorsal setae which are as long as, or 0.6 times as long as, basal diameter of 3rd antennal segment, one or none marginal seta on 8th. Basal 2 abdominal spiracles distinctly separated; distance between 6th and 7th spiracles distinctly shorter than that between 5th and 6th. Mesosternal furca separated. Body 2 mm. in length.

Alate viviparous female: Head, antennae, thorax, cornicles and cauda black; femora blackish paler basally, tibiae blackish on both ends. Head smooth, dorsal setae pointed,

a little shorter than basal diameter of 3rd antennal segment. Antennae nearly as long as body, 3rd segment constricted at base, with a few pointed setae which are as long as those on dorsum of head, with 41–46 oval sensoria scattered over whole length; 4th with 9–10, 5th with 3 secondary sensoria; relative length of segments about as follows: III–15–38, IV–5–13, V–4–11, VI–2.5–5.5+12–30. Rostrum not reaching middle coxae, ultimate segment a little longer than basal part of 6th antennal segment. Cornicles with minute spinules in a few rows, rounded on one side or expanded basally, about twice as long as wide at middle, or a little longer than wide at middle, at apex as wide as middle diameter of hind tibia. Cauda as long as 5th antennal segment, with 10–11 setae. Abdomen with a pair of small sclerites on dorsum of 1st segment, one or 2 small sclerites on 6th, and a large dark band on 7th and 8th segments, marginal sclerites distinctly on 2nd–6th segments, with spinules and mostly a seta, smaller on 5th and 6th, with a minute papilla on 5th segment, almost fused with spiracles. Dorsal setae 6 and somewhat shorter than basal diameter of 3rd antennal segment on 1st segment; 4 on 5th, 2 between cornicles, 4 on 7th, 5 on 8th; those on 8th 1.1–1.6 times as long as basal diameter of 3rd antennal segment. Femora imbricated, setae as long as, or longer than one-third of middle diameter of femur; tibiae imbricated on distal part; tarsi with 3, 3, 2 setae on 1st segment, 2nd segment of hind tarsus with a pair of setae on upper side, 2–3 setae on lower side. Distance between 6th and 7th abdominal spiracles a little

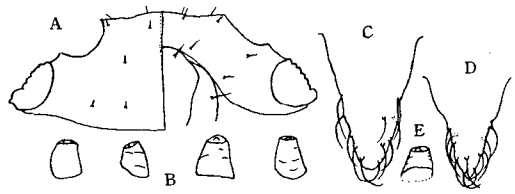

Fig. 17. *Semiaphis moiwaensis*, n. sp.
Aptera: A. Head, B. Cornicle, C. Cauda.
Alata: D. Cauda, E. Cornicle.

shorter than that between 5th and 6th. Wings slightly infuscated along veins, stigma pale brownish gray, veins stout, venation as usual. Body 1.5–1.8 mm. in length.

Host plant: *Impatiens noli-tangere.*

Described from some apterae and alatae (cotypes) taken at Mt. Moiwa, Sapporo (30. VII. 1960).

Differentiated from *Semiaphis nolitangere* Aizenberg in the basal part of the apical segment of antennae longer and nearly as long as the penultimate segment.

Differs from *Semiaphis heraclei* Takahashi (sens. str.) chiefly as follows:

(Aptera): Antennae shorter, 5-segmented, about 1.5 times as long as width of head across eyes. Dorsal setae shorter. Cauda with more setae. Cornicles shorter, about one-third length of cauda, about 1.6–1.7 times as long as wide at middle.

(Alata): Sensoria more in number on 3rd–5th antennal segments. Cauda with more setae.

In *S. heraclei* Takahashi (sens. str.),

(Aptera): Antennae about twice as long as width of head across eyes, 5 or 6-segmented. Dorsal setae of head as long as, or a little shorter than, basal diameter of 3rd antennal segment; dorsal setae of 8th abdominal segment a little longer than that diameter. Cauda with 7–8 setae. Cornicles about half as long as cauda, at least about twice as long as wide at middle.

(Alata): Sensoria 27–38 on 3rd antennal segment, 5–10 on 4th, 0–2 on 5th. Cauda with 7–8 setae.

Hyalopterus albus Monzen (1929) seems to be *S. heraclei* Takahashi.

Brachysiphoniella graminis Takahashi on *Leersia* is a synonym of *Semiaphis montana* ven der Goot, and is distinctive in the long cauda much constricted near basal part and the short ultimate segment of rostrum, which is almost as long as wide, and *Brachysiphoniella* Takahashi may be treated as a subgenus of *Semiaphis* ven der Goot.

Hayhurstia corydalisicola Tao

Pergandeidia corydalisicola Tao, Plant Protection Bulletin (Taiwan), IV, no. 30, p. 102 (1962).

Host plant: *Corydalis platycarpa.*

Specimens examined: Some materiales taken at Mt. Kongo, Osaka Prefecture (22. IX. 1955, M. Sorin leg.; 17. V. 1959, 30. IV. 1961, R. Takahashi leg.).

New to Japan.

In fundatrix, processus terminalis shorter than in females of other generations and about 1.5 times as long as basal part of 6th antennal segment.

Genus ***Neocalaphis*** Shinji

Bull. Morioka Imp. Coll. Agr. and For., XI, p. 28 (1927); Takahashi, Tenthredo, II, p. 10 (1938).

Alate viviparous female: Body without spinal tubercles, and dorsal and marginal pigmented sclerites on abdomen, dorsal setae pointed, fine, short or moderate. Head smooth, not produced at median part of front, with 4 pairs of dorsal setae and a marginal seta on frontal tubercle. Frontal tubercles short. Eyes rather small, distinctly apart from bases of antennae. Dorsal ocelli distinctly apart from eyes. Antennae distinctly longer than body, 6-segmented, with a few short setae, lacking spinules; 1st segment as long as, or somewhat longer than, wide, a little convex on mesal side; secondary sensoria circular or oval, in a row on 3rd segment only, without siliae; primary sensoria circular, accessory ones in a loose cluster near primary one; processus terminalis very long and slender, not narrowed at base. Clypeus with a pair of anterior setae; mandibular laminae with over 2 setae; ultimate segment with 1–3 pairs of secondary setae on each surface. Pronotum as long as head, with 10 setae (in 2 rows), abdomen with 4 dorsal setae and a marginal seta arising from a short blunt tubercle on anterior segments, with about or over 10 setae on 8th tergite. Cornicles truncated, longer than wide at middle, smooth. Cauda constricted at base, globular. Anal plate bilobed, but not deeply indented. Gonochaetae in a single median cluster. Legs slender, fore coxae not enlarged; trochanters distinct, femora narrow; tibiae with spinules, 4 slender, a little or scarcely stouter, apical setae, and many setae longer than width of tibia; tarsi with spinules, 1st segment with a pair on upper side besides 6 setae; 2nd segment with a few pairs of secondary setae on both surfaces; empodial setae broadened, membranous. Fore wings narrowly infuscated or clear along veins, pterostigma not elongated, broadly rounded on hind margin; radial sector absent, media twice branched; hind wings with 2 oblique veins.

Genotype: *Calaphis magnoliae* Essig et Kuwana.

C. magnolicolens Takahashi is another member of the genus. Apterous asexual

female not known. Dorsum with long capitate or blunt setae in nymph much differs from *Calaphis* Walsh in the absence of dorsal sclerites on abdomen, the very long processus terminalis, the tarsi with one upper pair of setae on 1st segment, the constricted cauda, the smooth cornicles, the head not produced above median ocellus, (abdomen with fewer dorsal setae on anterior 7 segments), the anal plate not deeply bilobed. In Japan the true *Calaphis* is represented by a single species, *Calaphis annulata* Koch, which was collected on *Betula* in Mt. Rokko, near Kobe (27. X. 1956, R. Takahashi leg.), Mt. Ikoma (29. VI. 1958, R. Takahashi leg.) near Osaka, at Sapporo (29. VII. 1960), Morioka (4. VIII. 1960) and at Tsumagoi, Gumma Prefecture (30. VII. 1961).

Neocalaphis was first used by Shinji for *Calaphis magnoliae* Essig et Kuwana and *C. magnolicolens* Takahashi, without designating it as new and without diagnosis, and moreover it was corrected to *Chromaphis* in erratum accompanying the paper. These species are, however, very distinctive and Shinji's name is here adopted for the genus.

Neocalaphis magnolicolens Takahashi

Japanese Aphid., no. 1, p. 27 (1921); Aphid. Formosa, Pt. 2, (Rept. 4), p. 125 (1923); Aphid. Formosa, Pt. 3, (Rept. 10), p. 109 (1924).

Shinji, Monog. Jap. Aphid., p. 332 (1941).

Alate viviparous female: Dorsal setae of head mostly as long as, or a little longer than, middle diameter of 3rd antennal segment; venter with 2 pairs of long fine setae, a pair on front. First antennal segment smooth with 6–7 setae, 2nd with 4 setae; 3rd antennal segment dark only on apical part, with a few setae about half as long as middle diameter of the segment, 3rd segment with 9–16 sensoria in a row on basal half or three-fifths, smooth, processus terminalis 6–7 times as long as basal part. Ultimate segment of rostrum 1.1–1.3 times as long as 2nd segment of hind tarsus. Mesoscutum with about 10 setae, 8th abdominal segment with over 20 setae scattered, which are twice as long as middle diameter of 3rd antennal segment. Abdomen with marginal tubercles scarcely developed, without long marginal setae on 5th and 6th segments. Cauda with about 15 setae, a little constricted at base when seen from above, but distinctly so on lower side. Tarsi with 2 pairs of secondary setae on lower side of 2nd segment. Tibiae dark at tip only. Wings hyaline, stigma pale. Body 2.7–3 mm. in length.

Host plant: *Magnolia obovata.*

Common in Mainland (Honshu).

Neocalaphis magnoliae Essig et Kuwana

Calaphis magnoliae Essig et Kuwana, Proc. Calif. Acad. Sc. 4th ser., VII. p. 85 (1918); Shinji, Monogr. Jap. Aphid., p. 328 (1941).

Alate viviparous female: Dorsal setae of head half as long as middle diameter of 3rd antennal segment, venter with 2 pairs of additional setae. Third antennal segment dark near middle part, with a few short setae which are shorter than half diameter at middle of the segment, with 10–12 sensoria on basal half. Ultimate segment of rostrum a little shorter than 2nd segment of hind tarsus. Mesoscutum with about 4 setae, 8th abdominal segment with about 10 setae in a row. Abdomen with small marginal tubercles on anterior segments, marginal tubercles with a much longer apical seta on 5th and 6th segments, these setae a little shorter than cornicle. Cauda with 8–10 setae.

Tarsi with a pair of secondary setae on lower side of 2nd segment. Tibiae dark except near basal part. Wings infuscated along anal, cubitus and distal part of media; stigma dark along hind margin, especially at apex. Body 2.2 mm. in length.

Host plant: *Magnolia kobus.*

Specimens examined: Some materials taken at Tokyo (29. VII. 1956); Nara Prefecture (Oto-mura) (23. VIII. 1957, M. Sorin leg.).

Calaphis annulata Koch

Host plant: *Betula.*

Specimens examined: Some materials taken at Mt. Ikoma, Osaka Prefecture (29. VI. 1958); Mt. Rokko, near Kobe (Sexes, 27. X. 1956).

New to Japan.

Calaphis magnoliae Essig et Kuwana and *C. magnolicolens* Takahashi are not typical of *Calaphis* and are removed to *Neocalaphis* used by Shinji for the former species.

Genus ***Recticallis*** Matsumura

Trans. Sapporo Nat. Hist. Soc., VII, p. 106 (1919).

Alate viviparous female: Body without dorsal sclerites, but with small pigmented marginal sclerites on anterior abdominal segments, with a single median tubercle on pronotum and on anterior abdominal segments; marginal tubercles on abdomen low; dorsal setae short, pointed. Head smooth, a little convex on front above median ocellus, sometimes with additional setae on venter. Frontal tubercles absent. Eyes large, a little apart from bases of antennae. Antennae a little shorter than body, 6-segmented, with a few short pointed setae; 1st segment broader than long, much convex on distal part of mesal side; processus terminalis as long as, or shorter than basal part of 6th segment, narrowed at base; pointed at tip; secondary sensoria circular, in a row, on 3rd segment only, without ciliae; primary sensoria ciliate; some of accessory sensoria scattered near primary one. Clypeus with a pair of anterior setae; mandibular laminae with 1–3 setae; ultimate segment of rostrum with a few pairs of secondary setae on each surface. Pronotum not longer than head, with 6 setae; abdomen with 4 dorsal setae besides those on median tubercle and 2 setae on each marginal sclerite on anterior segments, with 6 setae on 8th segment. Cornicles truncated, smooth, longer than wide at middle. Cauda constricted at base, globular. Anal plate distinctly bilobed, lobes rounded, broader than long. Gonochaetae in a median cluster, which is sometimes divided. Fore coxae enlarged, trochanters distinct, fore trochanters much longer than wide; femora normal; tibiae with spinules, 4 stouter setae at tip, and many pointed setae which are mostly as long as, or a little shorter than, middle diameter of tibia; tarsi with spniules, 1st segment with a pair of upper setae besides 5 setae; 2nd segment with a few secondary setae; empodial setae broadened, membranous. Fore wings infuscated along veins, sometimes with narrow patches on distal part, media twice branched, radial sector obsolete, stigma short, broad; hind wings with 2 oblique veins.

Genotype: *Recticallis alni-japonicae* Matsumura.

Nymph with many long capitate setae on dorsum. Formerly regarded as a synonym of *Myzocallis* Passerini, which is now divided into several distinct genera. Near

Tinocallis Matsumura*, with which *Lutaphis* Shinji and *Neocallis* Matsumura may be synonymous, but different as follows: Secondary sensoria circular, without spinules arranged along margin. First antennal segment much convex on distal part of mesal side. Pronotum and anterior abdominal segments with a single median tubercle. Abdomen with 4 dorsal setae besides those on median tubercle and 2 setae on marginal tubercles on anterior segments. *Myzocallis pseudoalni* Takahashi from Formosa is a member of this genus and 2 Japanese species are now known; *Recticallis alni-japonicae* Matsumura, and *Recticallis nigrostriata* Shinji both feeding on *Alnus*; the latter was originally described as *Tuberculoides*.

Recticallis alni-japonicae Matsumura

Trans. Sapporo Nat. Hist. Soc., VII, p. 106 (1919).

Myzocallis moriokae Shinji, Oyo-Dobuts. Zasshi, VII, p. 282 (1935); Monogr. Japan. Aphid., p. 147 (1941). **Syn. nov.**

Tuberculoides alnifoliae Shinji, Monogr. Japan. Aphid., p. 364 (1941). **Syn. nov.**

Myzocallis alnicola Shinji (Zool. Mag. Tokyo, XXXVI, 1924, p. 345) may be the same thing.

Alate viviparous female; Dorsal setae of head as long as, or a little longer than, middle diameter of 3rd antennal segment. First antennal segment smooth, with 4 setae, 2nd with 2 setae; 3rd imbricated on distal part, with 3–4 sensoria on basal half; setae on 3rd segment a little shorter than middle diameter of the segment. Head sometimes with 2 or 3 additional setae on each side of venter in specimens from Sapporo. Second segment of tarsus with a pair of setae on upper side and a single seta on lower side. Processus terminalis with apical setae distributed over distal small part (4 setae distinctly apart from apex). Mandibular laminae with 1 or 2 setae; ultimate segment of rostrum as long as 2nd segment of hind tarsus. Pronotal median tubercle short, stout, without setae; mesonotum smooth, abdominal median tubercles finger-like, but rather stout, with a single or a pair of short setae; 8th tergite with 6 setae which are a little longer than middle diameter of 3rd antennal segment. Tarsi with a pair of secondary setae on upper side and a single seta on lower side on 2nd segment. Fore wings without patches on distal part. Body 1.5 mm. in length.

Host plant: *Alnus japonica*.

Common in Japan (Honshu, Hokkaido).

Myzocallis pseudoalni Takahashi from Formosa is a member of this genus, and is very close to this species, but differs in the blackish cornicles more constricted at middle.

Recticallis nigrostriata Shinji

Tuberculoides nigrostriata Shinji, Monogr. Japan. Aphid., p. 383 (1941).

Alata viviparous female: Differs from the foregoing species chiefly as follows:

Pronotal median tubercle longer. distinctly longer than wide. Fore wings with 4 parallel dark patches on apical part, 2 of which are along upper branch of media and along obsolete radial sector respectively. Head brownish on dorsum along eyes, 3rd

* *Myzocallis zelkowa* Takahashi, with which *Myzocallis nirecola* Shinji is identical, should be included in *Tinocallis*, and differs from *Myzocallis mushensis* Takahashi from *Zelkowa* in Formosa in the shorter 3rd antennal segment, with fewer sensoria, and in the processus terminalis distinctly shorter than the basal part of 6th segment. *Tinocallis zelkowae* from USSR is a different species.

antennal segment with a dark part near middle part. Thorax brownish on lateral parts, hind femora blackish except on both ends.

Host plants: *Alnus firma, Alnus japonica.*

Common in Honshu.

Takecallis arundinariae Essig.

Univ. Calif. Pub., Tech. Bull. Ent., I, no. 7, p. 302 (1917).

Myzocallis bambusifoliae Takahashi, Aphid. Formosa, Pt. 1, p. 73 (1921); Pt. 2, p. 123 (1923); Pt. 3, p. 63 (1924). **Syn. nov.**

Agrioaphis bambusifoliae Takahashi, Aphid. Formosa, Pt. 6, p. 84 (1931).

Host plant: Bamboo.

Common near Osaka. Hitherto recorded from Shikoku in Japan.

In Japan *Takecallis arundicolens* Clarke (syn. *Takecallis bambusae* Matsmura), and *Takecallis sasae* Matsumura (syn. *Myzocallis taiwanus* Takahashi, **syn. nov.**) are also common on bamboo, and *Myzocallis sasacola* Shinji may be identical with the latter.

Genus ***Dasyaphis*** Takahashi

Tenthredo, II, p. 13 (May, 1938).

Sinocallis Tseng and Tao, Jl. W. China Border Res. Soc., X, p. 213 (1938). (Original not accessible, original specimens of genotype examined).

Tuberocorpus Shinji, Oyo-Dobutsu. Zasshi, IV, p. 120 (1932). Preoccupied by *Tuberocorpus* Shinji (1929).

Genotype *Tuberocorpus onigurumi* Shinji (1932).

Dasyaphis onigurumi (Shinji)

Tuberocorpus onigurumi Shinji, Oyo-Dobutsu. Zasshi, IV, p. 120 (1932); Monogr. Japan. Aphid., p. 702 (1941).

Dasyaphis onigurumi, Takahashi, Tenthredo, II, p. 13 (1938).

Apterous viviparous female: Yellow or white, antennae, legs and all other appendages pale. Body oval, faintly sclerotic and with many subcircular minute irregular concaves among projections on dorsum except on marginal area, with many long dorsal projections, which are subequal in length, nearly as long as, but distinctly stouter than, antenna, somewhat longer on 6th abdominal segment, gradually narrowed towards subapical part, expanded and rounded at apex, rough on surface, with a bluntly pointed seta, which is longer on 6th segment; a pair of these projections between eyes sometimes very short or absent; distribution of these projections as follows: a spinal pair on head, thoracic, and 1st–6th abdominal segments; a pleural pair on thoracic and 1st–4th abdominal segments; a submarginal projection on each side of metanotum and on 3 abdominal segments. All setae on dorsum and margin stiff, pointed, rough on surface, with minute granules. Head broadly rounded at front, fused with prothorax, with 8 dorsal setae besides apical setae of spinal tubercles between eyes, with 3 or 4 pairs of shorter simple setae on venter. Eyes small, with some facets, without ocular tubercles distinct. Antennae somewhat shorter than width of head across eyes, a little longer than distance between, 3-segmented, 1st segment as long as wide, 2nd wider than long, each with 1 or 2 short setae; 3rd almost smooth, but with a few minute spinules and

with a few minute setae and 2 small primary sensoria, which are with a hair-ring, much apart from each other; auxiliary sensoria not discernible, processus terminalis a little longer than wide, with a larger apical seta besides short ones. Clypeus with a pair of simple setae on anterior part, a mandibular seta. Rostrum short, reaching fore coxae; ultimate segment longer than wide, about 1.2–1.25 times as long as 2nd segment of hind tarsus, without secondary setae. Mesothorax, metathorax and basal 7 abdominal tergites fused together, with a faint trace of division on median area between 6th and 7th tergites, this fused part with 18–19 marginal setae in a row on each side. Eighth tergite separated, partly sunken into 7th tergite, produced and pointed at hind end, with 5 marginal setae on each side. Cornicles small almost mere rings, much smaller in diameter than bases

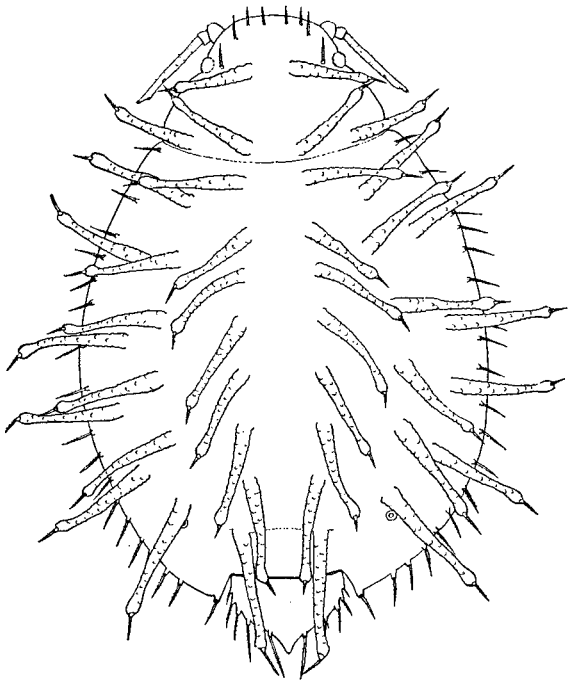

Fig. 18. *Dasyaphis onigurumi* Shinji.
Aptera.

of dorsal tubercles. Cauda a little broader than femur, below 8th tergite, globular, as long as wide, constricted besally, with about 10 setae, a pair at hind end much longer. Anal plate divided, lobes slightly apart from each other, narrowed toward hind end, about 1.3 times as long as wide at base, almost triangular, but rounded at apex, at base as wide as cauda, diverging on mesal margins, reaching midlength of cauda, with 4 setae in a longitudinal row, 2 distal of which are much longer. Genital plate not defined; sternites with about 6–7 setae on median area, with rows of minute spinules. Gonapophyses one, with 6–8 setae in a loose transverse cluster or row. Legs short, femora smooth, with a few short setae; fore trochanter and femur together about 2.8 times as long as wide at middle; trochanters not defined, with a long seta; tibiae with a few

blunt stout setae along outside, which are not smooth and longest one is about half of middle width of tibia; a few short pointed setae present along inner side; stout setae absent at apex; some minute spinules in rows; hind tibiae with a much longer subapical seta; fore tibiae slightly shorter than antenna; tarsi without spinules, basal segment with 2 long setae, one of which is sometimes stouter; distal segment with 2 setae on upper side of middle part, and 3 pairs of short simple apical setae; empodial setae flattened, membranous, broadened; claws short. Abdominal spiracles 7 on each side of abdomen, spiracles semilunar, basal 2 much apart, with a small faint sclerosis; mesosternal apodemes short, much separated from each other, not connected basally, distinctly longer than wide, metasternal apodemes wanting. Body 1.2–1.3 mm. in length.

Alate viviparous female: Head, antennae, thorax black; legs dusky. Cauda and anal plate pale, cornicles brown. Head not divided, without granules and spinules, with 4 setae near hind margin and 2 pairs anteriorly on dorsum, these setae pointed, slightly longer than half of middle width of 3rd antennal segment, about twice as long as width of base of 3rd antennal segment; 3–4 setae on each side of venter. Antennae 5-segmented, about 1.2 times as long as width of head across eyes, slightly longer than fore tibia, with prominent spinules in many rows on 3rd–5th, 3rd stouter distinctly than fore tibia, much constricted abruptly at base, without setae, with about 20 transverse narrow elliptical, rather small sensoria scattered over; 4th a little narrower than 3rd, without setae, 5th a little narrower than 4th, nearly as wide as fore tibia with 4–7 similar sensoria; primary sensoria as in aptera; relative length of segments about as follows: III–12, IV–6–7, V–6. Eyes with small ocular tubercles. Rostrum reaching beyond fore coxae; ultimate segment slightly tapering, as long as 2nd segment of hind tarsus, a little shorter than 5th antennal segment, distal part a little longer than wide, brownish on upper side. Pronotum with a pair of short conical spinal tubercles near hind margin, and 4 setae (2 spinal and 2 marginal) except those on the apices of tubercles. Mesonotum without setae, with a short stout tubercle on each scutum, which is a little broader than long, rounded at apex and smooth, sometimes rudimentary. A very faint trace of division present between trochanter and femur; femora with spinules on distal part; tibiae with spinules in many rows except on basal part, with a few short pointed setae longest one of which is a little longer than half width of middle part of tibia; tarsi with spinules in many rows, setae as in aptera. Cornicles as in aptera, derm faintly sclerotic around cornicle. Cauda a little constricted basally, broader than long, narrower than base of anal lobe, with over 15 setae. Anal lobes almost as in aptera, but a little longer than wide, with 4–5 setae, 2 distal ones much longer. Gonochaetae as in aptera. Abdomen without marginal sclerites, large pairs of spinal sclerites on posterior half of abdomen, dorsal setae not studied. Eighth tergite with a small triangular pointed process at hind end, which is broader than long; 2 pairs of longer pointed stiff setae on 8th tergite hind margin which are not smooth, much longer than the process, as long as middle width of 3rd antennal segment. Marginal setae not on tubercles not smooth, pointed. Fore wings transparent; anal as stout as cubitus much apart from it; media twice branched, not obsolete at base, radial sector wanting; stigma pale, rather large, broadly rounded at post-distal angle; hind wings with media and cubitus present. Body 1.5 mm. in length.

Specimens examined: A female taken at Tokyo (28. X. 1958).

Larvae of alate with many long tubercles on dorsum as in aptera, which are however

much shorter.

Alate male: Similar to alate viviparous female, but differs as follows: Antennae 1.4–1.5 times as long as width of head across eyes, with 1 or 2 short setae on 4th segment. Thoracic tubercles wanting. A pair of setae on dorsal sclerites on 2nd–6th abdominal segments on a pair of short tubercles. Marginal setae of 3rd–5th abdominal segments each on a very short, but distinct blunt tubercle. Cauda with over 20 setae, anal lobes very short, rounded, with a long apical seta and 4 short setae. Penis sheath almost as long as wide. Body 1.5 mm. in length.

Specimens examined: A few male taken at Gifu (26. X. 1957) and Tokyo (28. X. 1958).

Sinocallis Tseng et Tao is a synonym of *Dasyaphis* Takahashi, and *S. mirabilis* Tseng et Tao differs from this species in the much shorter dorsal tubercles and in the more marginal setae (over 20) on each side of body.

SUPPLEMENT TO "LIST OF PAPERS OF DR. RYOICHI TAKAHASHI"

Since the publication of the list of the papers of the late Dr. Ryoichi Takahashi (Mushi 37: 167–190, 1963) several papers have been issued as given below. Furthermore, the real and exact title of the paper listed in the list as "*Macrosiphoniella* of Japan (Aphididae, Homoptera). Mushi 37 : 1–11. (With M. Moritsu) 1963" is as follows:

Key to Japanese species of *Macrosiphoniella*, with descriptions of four species from Japan and Formosa.

Eumyzus, *Paramyzus*, *Macromyzus*, *Sitomyzus*, *Micromyzus*, and *Micromyzodium* of Japan (Homoptera: Aphididae). Insecta Matsumurana 26 : 55–63, 1963.

Eumyzus gallicola, *Micromyzus osmundae*, *Micromyzodium polypodii*, n. spp.; *Paramyzus heraclei similis*, n. subsp.; *Sitomyzus japonicus*, n. n. for *Myzus rhois* Takahashi, with a redescription; *Macromyzus polypodicola* and *Micromyzus montanus* redescribed.

Two new genera and five new or little-known species of Aphididae from Japan (Homoptera). Kontyû 31 : 159–168, 1963.

Megalocallis takagii, *Aphidounguis mali*, n. genn. and n. spp.; *Greenidea carpini*, *Aiceona tanakai*, n. spp.; *Formosaphis micheliae* redescribed.

Macrosiphum of Japan (Aphididae). Kontyû 32 : 353–359, 1964.

Key to Japanese species; *M. rubiphila*, n. sp.; *M. euphorbiae*, *M. clematidis*, *M. yasumatsui*, *M. ibarae*, *M. smilacifoliae* and *M. avenae akebiae* noted or redescribed.

Some species of *Aulacorthum* of Japan (Aphididae, Homoptera). Insecta Matsumurana 27 : 99–113, 1965.

Perillaphis, n. subgen.; *A. glechomae*, *A. asteris*, *A. syringae*, *A. smilacis*, n. spp.; *A. perillae*, *A. taiwanum* and *A. nipponicum* redescribed; key to subgenera and species occurring in Japan.

Some new and little-known Aphididae from Japan (Homoptera). See Insecta Matsumurana 28 : 19–61, 1965.