



Title	On eight Conifer Aphids occurring in Hokkaido
Author(s)	Inoue, Motonori
Citation	Insecta matsumurana, 13(4), 132-142
Issue Date	1939-07
Doc URL	https://hdl.handle.net/2115/9421
Type	departmental bulletin paper
File Information	13(4)_p132-142.pdf



ON EIGHT CONIFER APHIDS OCCURRING IN HOKKAIDO

By

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(With three Textfigures)

This paper deals with eight species of *Aphididae* which are injurious to coniferous trees in Hokkaido. Two of them are new to science and three new to Hokkaido.

The writer is much indebted to Dr. H. KÔNO, Dr. R. TAKAHASHI and Dr. C. WATANABE for their kind advice in many ways.

1. *Neomyzaphis piceana* n. sp.

Wingless viviparous female (*Apterous virgogenia*)

Body bright green. Eyes dark red. Cornicles somewhat yellowish green. Antennae green, somewhat dusky on the distal end of the fifth and sixth joints. Legs green; femora at the tip, tibiae and tarsi dusky.

Body oval, convex. Two longitudinal series of dark brown lateral spots placed on each side of the dorsum of the thorax and abdomen. Eyes large, with prominent ocular tubercles. Head with small lateral processes, from which a hair arises; median cephalic process not prominent, probably absent, with 2 hairs. Antennae slender; first joint a little longer than wide, with about 2 short hairs; second joint shorter than the first, with about 2 hairs; third joint with about 7 very short hairs, wanting sensoria; fourth joint with about 4 hairs, wanting sensoria; fifth joint with about 3 hairs and with a medium-sized circular sensorium near apex; sixth joint with 1 hair at the basal area and about 4 very short hairs at the flagellum, and with some small sensoria near the primary large one.

Legs short; femora thick, with many short hairs. Rostrum reaches to the second coxae. Cornicles with a few striae and large reticulations at the apex, the remainder strongly imbricated, cylindrical, not reaching beyond the cauda, and longer and thicker than the third antennal joint. Cauda long, more than half the length of the cornicles, thick, acuminate, with 3 rather long hairs on each side.

Relative length of the antennal joints and number of sensoria.

Specimen number	Date of collection	Relative length of antennal joints						Number of sensoria			
		I	II	III	IV	V	VI	III	IV	V	VI
No. 1	12. VII. 1938	9	5	21	14	14	37(12-25)	0	0	1	1
		9	5	22	13	13	36(12-24)	0	0	1	1
No. 2	"	9	5	22	11	13	35(10-25)	0	0	1	1
		9	5	22	11	13	35(10-25)	0	0	1	1
No. 3	"	8	5	20	11	13	32(10-22)	0	0	1	1
		8	5	20	11	13	32(10-22)	0	0	1	1
No. 4	"	8	5	22	12	13	37(12-25)	0	0	1	1
		8	5	22	12	13	37(12-25)	0	0	1	1
No. 5	"	8	5	20	11	13	34(10-24)	0	0	1	1
		8	5	20	11	13	34(10-24)	0	0	1	1
No. 6	"	8	5	19	12	13	34(11-23)	0	0	1	1
		8	5	20	13	13	35(11-24)	0	0	1	1
No. 7	"	9	5	25	14	16	40(13-27)	0	0	1	1
		9	5	23	15	16	39(13-26)	0	0	1	1
No. 8	"	9	5	22	13	15	35(11-24)	0	0	1	1
		9	5	22	13	14	37(11-26)	0	0	1	1
No. 9	"	8	5	19	12	15	32(12-20)	0	0	1	1
		8	5	19	13	14	32(12-20)	0	0	1	1
No. 10	"	9	5	22	14	17	34(12-22)	0	0	1	1
		9	5	23	14	16	33(12-21)	0	0	1	1
Average		9	5	21	13	14	35(11-24)	0	0	1	1

Measurements

Body: length, 1.08 mm.; width, 0.63 mm. Length of antenna, 0.84 mm. Length of femora: fore, 0.22 mm.; middle, 0.21 mm.; hind 0.25 mm. Length of tibia: fore, 0.32 mm.; middle, 0.32 mm.; hind, 0.43 mm. Length of tarsi: fore, 0.07 mm.; middle, 0.08 mm.; hind, 0.08 mm. Length of the first joint of hind tarsi, 0.01 mm. on the outer side, 0.03 mm. on the inner side. Length of the second joint of hind tarsi, 0.07 mm. Cornicle: length, 0.27 mm.; diameter at the base, 0.05 mm. Cauda: length, 0.15 mm.; diameter at the base, 0.07 mm. Length of hair: on head, 0.02 mm.; on antenna, 0.05 mm.; on hind tibia, 0.02 mm.; on hind tarsi, 0.01 mm.; on cauda, 0.04 mm.

Described from ten examples collected on the 12th of July, 1938, by the writer at Nopporo.

Host- *Picea jezoensis* CARR.

This species attacks the leaves of the host plant.

Type-locality - Hokkaido (Nopporo).

The type-specimens are preserved in the Entomological Institute of the Hokkaido Imperial University and in the Hokkaido Forestry Experimental Station.

This species is easily distinguished from *Neomyzaphis abietina* (WALKER) by the relative length of the antennal joints, especially by the sixth joint which is much longer than the fourth and fifth joints taken together, and by the basal area of the sixth joint which is about half the length of the flagellum.

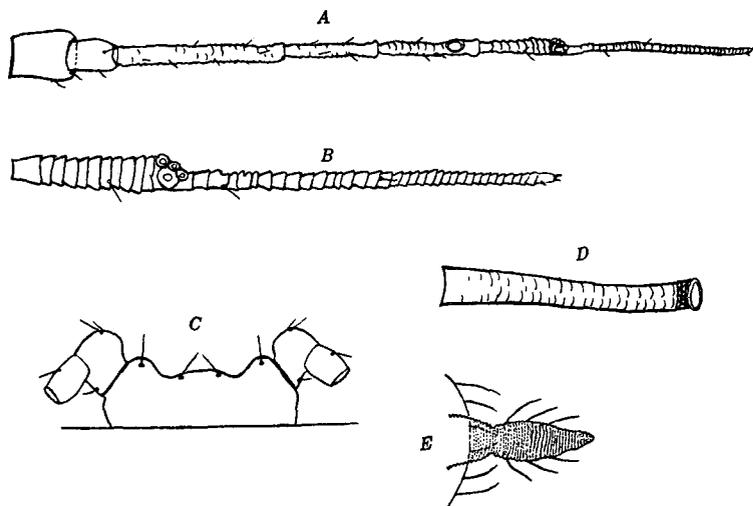


Fig. 1

Neomyzaphis piceana n. sp.

A. Antenna of wingless viviparous female. B. Sixth antennal joint of wingless viviparous female. C. Head of wingless viviparous female. D. Cornicle of wingless viviparous female. E. Cauda of wingless viviparous female.

2. *Eulachnus pumilae* n. sp.

Wingless viviparous female (*Apterous virgogenia*)

Body yellowish-green to green. Eyes dark red. Antennae pale green, somewhat dusky on the distal end of the third, fourth, fifth and sixth joints. Legs pale green; femora at the end and tibiae dusky; tarsi dark. Cornicle dusky.

Body elongate and narrow, with very short setae. Head divided on the dorsum, with about 16 setae which are a little shorter than the first antennal joint. Eyes protruding, without ocular tubercles. Antennae slender, with some very short setae which are much shorter than those on the front; first joint nearly as long as wide, with about 4 stiff setae; second joint as long as the

first, much longer than wide, and with about 4 setae; third joint with about 12 setae, wanting sensoria; fourth joint with about 7 setae, wanting sensoria; fifth joint with about 6 setae and with a large apical sensorium; sixth joint with about 3 setae on the basal part, about 4 very short setae at the tip and with some small or medium-sized sensoria below a large circular sensorium; relative length of joints as follows: I+II—20, III—37, IV—20, V—25, VI—23.

Rostrum reaches nearly to the second coxae, the apex dark, obtuse. Cornicles very small with a narrow cone-shaped base, not hairy. Cauda broadly semi-rounded, with many long hairs which are longer than those on the front and not capitate. Legs very long, with many short stiff setae which are rather short, not quite half as long as those on the front; hind tibiae a little longer than the antennae.

Measurements

Body: Length, 2.40 mm.; width, 0.96 mm. Length of antenna, 1.10 mm. Length of femora: fore, 0.39 mm.; middle, 0.38 mm.; hind, 0.86 mm. Length of tibia: fore, 0.68 mm.; middle, 0.74 mm.; hind, 1.33 mm. Length of tarsi: fore, 0.19 mm.; middle, 0.20 mm.; hind, 0.24 mm. Length of the first joint of hind tarsi, 0.06 mm. on the outer side, 0.08 mm. on the inner side. Length of the second joint of hind tarsi, 0.16 mm. Diameter of cornicle, 0.05 mm. Length of hair: on hind tibia, 0.02 mm.; on tarsi, 0.03 mm.; on head, 0.05 mm.; on body, 0.08 mm.; on antenna, 0.01 mm.

Described from many examples collected on the 11th of July, 1938, by the writer at Kawayu.

Winged viviparous female (*Alate virgogenia*)

Color closely resembles the apterous form. Thorax yellowish green.

Body elongate, narrow, with some very short hairs. Head divided on the dorsum, with some stiff setae which are a little shorter than the first antennal joint and slightly curved. Eyes protruding, without ocular tubercles. Antennae slender, with some short stiff setae which are much shorter than those on the head and a little longer than those in the apterous form; second joint a little shorter than the first, longer than wide, and with about 3 short setae; third joint with 12 setae, wanting sensoria; fourth joint with about 6 setae, wanting sensoria; fifth joint with about 8 stiff setae and a large apical circular sensorium; sixth joint with about 5 short setae on the basal part, about 4 very short stiff setae at the tip, and with some small or medium-sized sensoria below a large circular sensorium; relative length of the joints as follows; I+II—20,

III—45, IV—23, V—26, VI—23.

Rostrum reaches nearly to the second coxae, apex dark, obtuse. Legs very long, slender, with many short stiff setae which are much shorter than those on the head; hind tibiae longer than the antennae.

Wings hyaline; stigma and veins pale yellow; media on the front wings obsolete on the basal part, once branched, faintly indicated; hind wings with two obliques.

Measurements

Body: length, 2.52 mm.; width, 0.90 mm. Length of antenna, 1.20 mm. Length of fore wing, 2.43 mm; width of fore wing, 0.78 mm. Length of hind wing, 1.50 mm.; width of hind wing, 0.36 mm. Length of femora: fore, 0.38 mm.; middle, 0.32 mm.; hind, 0.90 mm. Length of tibia: fore, 0.74 mm.; middle, 0.72 mm.; hind, 1.46 mm. Length of tarsi: fore, 0.18 mm.; middle, 0.19 mm.; hind, 0.22 mm. Length of the first joint of hind tarsi, 0.04 mm. on the outer side, 0.08 mm. on the inner side. Length of the second joint of hind tarsi, 0.16 mm. Diameter of cornicles, 0.04 mm. Length of hair: on head, 0.08 mm.; on body, 0.05 mm.; on antenna, 0.04 mm.; on hind tibia, 0.06 mm.; on hind tarsi, 0.04 mm.

Described from many examples collected by the writer on the 20th of July,

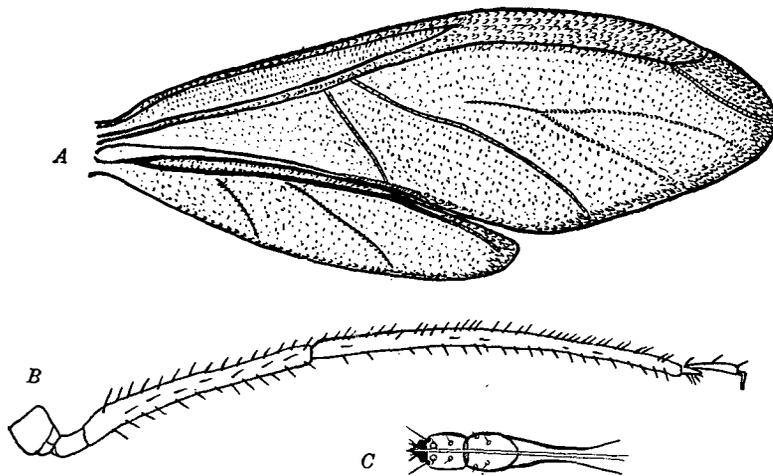


Fig. 2

Eulachnus fumilae n. sp.

A. Wing of winged viviparous female. B. Hind leg of winged viviparous female. C. Rostrum of winged viviparous female.

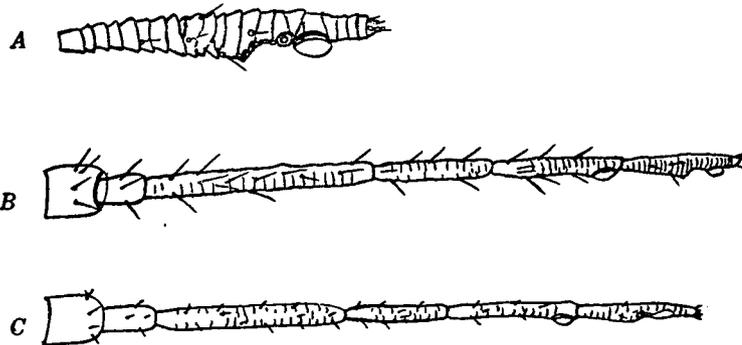


Fig. 3

Eulachnus pumilae n. sp.

- A. Sixth antennal joint of winged viviparous female.
- B. Antennal joint of winged viviparous female.
- C. Antennal joint of wingless viviparous female.

1938 at Kawayu.

Host - *Pinus pumila* REGEL

This species attacks the leaves of the host plant.

Type-locality - Hokkaido (Kawayu).

The type-specimens are preserved in the Entomological Institute of the Hokkaido Imperial University and in the Hokkaido Forestry Experimental Station.

This species is easily distinguished from *Eulachnus agilis* KALTENBACH and *E. piniformosanus* TAKAHASHI by the absence of dusky spots on the 'dorsum of the apterous and alate virgogenia. It is also distinguished from *E. rileyi* WILLIAM by the length of the hairs on the antennae and the dorsum of the abdomen and by the fourth antennal joint without sensoria in the alate form.

3. *Eulachnus piniformosanus* TAKAHASHI

Eulachnus piniformosanus TAKAHASHI, *Aphididae* of Formosa, pt. 1, p. 83 (1921), pt. 2, p. 138 (1923), *ibid.*, *Proc. Ent. Soc. Wash.*, Vol. 34, p. 151 (1932).

Host - *Pinus densiflora* Sieb. et ZUCC.

This species feeds on the needles of the host plant.

Habitat - Hokkaido (Nopporo and Sapporo).

This species is new to Hokkaido. Many examples of the wingless viviparous female were collected by the writer on the 27th of August and 30th of August, 1938 at Nopporo, and 3 examples of the winged viviparous female were collected by Dr. H. KONO on the 3rd of July, 1937 at Sapporo.

Gen. Distr.: Japan (Honshu, Hokkaido and Okinawa), and Formosa.

This species may be identical with *Eulachnus thunbergii* WILSON* from Japan, but the writer is much inclined to the opinion that both species should be kept as distinct species until they are more fully studied: because *thunbergii* has been described only by the sexual form, while *piniformosanus* has been represented only by the viviparous form.

4. *Cinara laricicolus* (MATSUMURA)

Lachnus laricicolus MATSUMURA, Jour. College Agr., Tohoku Imp. Univ., Sapporo, Vol. VII, pt. 6, pp. 380-381 (1917); *ibid.*, Ōyōkonchu-gaku, p. 324 (1917).

Dilachnus laricicolus SHINJI, Konchugaku-kogi, 11, p. 111 (1928).

Host - *Larix Kaempferi* SARG.

This species occurs on the young twigs and lower branches of the host plant.

Habitat - Hokkaido (Nopporo, Sapporo, Nemuro, Tesio and Tomakomai).

Two examples of the wingless viviparous female were collected on the 12th of June, 1936 at Sapporo. Many examples of the winged and wingless viviparous females were collected on the 6th of August, 1937 at Nemuro. Five examples of the wingless viviparous female and three examples of the winged viviparous female were collected on the 8th of August, 1937, at Tesio. Eight examples of the oviparous female and one example of the winged male were collected on the 5th of November, 1937 at Nopporo. Ten examples of the wingless oviparous female and 2 examples of the winged male were collected on 29th of October, 1938 at Tomakomai.

Gen. Distr.: Japan (Honshu and Hokkaido).

This species resembles *Cinara laricis* (WALKER), but differs from the latter remarkably in lacking dark patches on the dorsum of the abdomen of the wingless viviparous female and in the relative length of the antennal joints of the wingless and winged viviparous females.

5. *Cinara kochi* nom nov.

Lachnus laricis KOCH, Die Pflanz., pp. 241-243 (1857) (non *Aphis laricis* WALKER, 1848).

Lachnus laricis SHIMURA et HARADA, Shinrin-byochugai-koyo, pp. 21-23 (1927).

Cinara laricis BRAUN, Z. Angew. Ent., XXIV, pp. 488-491 (1938).

Wingless viviparous female (*Apterous virgogenia*)

Body black, slightly covered with white powder. Venter dark grey, due to white powder. Antennae pale, the third to fifth joints at the distal portion, and the sixth black. Eyes and cornicles black. Rostrum black, the base

* Entom. News, Vol. 30, p. 3 (1919).

pale. Legs black; femora at the base and tibiae near the base pale yellow.

Body oval. Head divided, with short hairs. Eyes large with ocular tubercles. Antennae with many short stout hairs; third joint with 1-2 small sensoria near the apex; fourth joint near the apex with a medium-sized and a small circular sensoria; fifth joint with a medium-sized sensorium below the large apical one; sixth joint with some small sensoria below the large primary one. Relative length of the antennal joints as follows: I+II—32, III—92, IV—44, V—48, VI—27.

Rostrum long and slender, nearly extending to the end of abdomen, acuminate, hairy. Cornicles bearing only one kind of hair. Hind tibiae with many short, stout hairs. Cauda very short, semi-rounded, wider than long, with many long hairs. Anal plate broadly rounded, with many long hairs.

Measurements

Body: length, 5.10 mm.; width, 2.91 mm. Length of antenna, 2.13 mm. Length of femora: fore, 1.44 mm.; middle, 1.44 mm.; hind, 2.13 mm. Width of femora: fore and middle, 0.19 mm.; hind, 0.21 mm. Length of tibia: fore, 1.98 mm.; middle, 2.19 mm.; hind, 3.63 mm. Length of tarsi: fore, 0.39 mm.; middle, 0.42 mm.; hind, 0.45 mm. Length of the first joint of hind tarsi, 0.10 mm. on the outer side, 0.17 mm. on the inner side. Length of the second joint of hind tarsi, 0.35 mm. Diameter of cornicle at the base of cone, 0.37 mm. Length of hair: on head, 0.07 mm.; on antenna, 0.06 mm.; on body, hind tibia and hind tarsi, 0.04 mm.; on cauda, 0.15 mm. Length of rostrum, 4.11 mm.

Described from many examples collected by the writer on the 28th of August, 1938 at Nopporo.

Winged viviparous female (*Apterous virgogenia*)

Body black, slightly covered with white powder. Venter dark grey, due to white powder. Antennae black, the base of the third joint pale. Legs black; femora at the base yellowish brown.

Body oblong. Head divided, with many short stout hairs. Eyes with ocular tubercles. Antennae covered with many short, stout hairs; third joint provided with 6 to 9 medium-sized or small sensoria arranged in a row over the whole length except the basal portion; fourth joint with 2 to 3 medium-sized or small sensoria arranged over the apical half; fifth joint with one medium-sized sensorium below the large apical one; sixth joint with some small sensoria below the large primary one. Relative length of the antennal joint as follows: I+II—35, III—86, IV—45, V—47. VI—27.

Wings hyaline, somewhat dusky; stigma dark; veins dark brown; radial

sector slightly curved; third oblique faintly indicated, twice forked; hind wing with two obliques.

Rostrum very long and slender, nearly extending to the end of abdomen. Cornicles bearing only one kind of hair. Cauda short, semi-rounded, with many long hairs. Anal plate broadly rounded, with many long hairs.

Measurements

Body: length, 4.56 mm.; width, 2.07 mm. Length of antenna, 2.11 mm. Length of fore wing, 4.74 mm.; width of fore wing, 1.56 mm. Length of hind wing, 2.97 mm.; width of hind wing, 0.75 mm. Length of femora: fore, middle and hind, 0.18 mm. Length of tibia: fore, 1.92 mm.; middle, 2.10 mm.; hind, 3.33 mm. Length of tarsi: fore, 0.39 mm.; middle, 0.39 mm.; hind, 0.45 mm. Length of the first joint of hind tarsi, 0.10 mm. on the outer side, 0.15 mm. on the inner side. Length of the second joint of the hind tarsi, 0.32 mm. Diameter of cornicle at the base of cone, 0.28 mm. Length of hair: on head, 0.05 mm.; on body, antenna and hind tibia, 0.04.; on hind tarsi, 0.03 mm.; on cauda, 0.15 mm. Length of rostrum, 3.66 mm.

Described from many specimens collected by the writer on the 28th of August, 1938, at Nopporo, and one example collected on the 28th of October, 1938, at Oiwake.

Oviparous female

Closely allied to the wingless viviparous female in colour and structure.

Antennae covered with many short, stout hairs; third joint provided with 1 to 2 small or medium-sized sensoria near the apex; fourth joint near the apex with one medium-sized and 1 or 2 small sensoria; fifth joint with one medium-sized sensorium below the large apical one; sixth joint with small sensoria below the large primary one. Relative length of the antennal joints as follows: I+II—35, III—92, IV—45, V—50, VI—27.

Length of the hind tibiae shorter than in the wingless viviparous female.

Measurements

Body: length, 5.46 mm.; width, 3.24 mm. Length of antenna, 2.19 mm. Length of femora: fore, 1.47 mm.; middle, 1.44 mm.; hind, 1.98 mm. Length of tibia: fore, 1.95 mm.; middle, 2.25 mm.; hind, 3.27 mm. Length of tarsi: fore, 0.39 mm.; middle, 0.42 mm.; hind, 0.48 mm. Width of femora: fore, 0.24 mm.; middle, 0.26 mm.; hind, 0.27 mm. Length of the first joint of hind tarsi, 0.10 mm. on the outer side, 0.17 mm. on the inner side. Length of the second joint of hind tarsi, 0.39 mm. Diameter of cornicle at the base of cone, 0.25 mm.

Length of hair: on head, hind tibia and hind tarsi, 0.04 mm.; on body, 0.05 mm.; on antenna, 0.04 mm.; on cauda, 0.14 mm. Length of rostrum, 3.09 mm.

Described from five examples collected by the writer on the 13th of November, 1936, at Nopporo.

Host - *Larix Kaempferi* SARG.

This species attacks the stems and branches of the host plant.

Habitat - Hokkaido (Nopporo and Oiwake).

Gen. Distr.: Europe and Japan (Hokkaido).

This species has often been combined with *Cinara laricis* (WALKER), but may be easily distinguished from the latter by the relative length of the antennal joints, by its larger body and by its longer rostrum as Dr. R. BRAUN has pointed out.

6. *Cinara pineti* (KOCH)

Lachnus pineti KOCH, Die Pflanz., pp. 230-232 (1857); CHOLODKOVSKY, Horae Soc. Ent. Ross. XXXI, pp. 635-638 (1898); VAN DER GOOT, Beitr. Kenntn. Holland. Blattl. pp. 405-408 (1915).

Cinara pineti TAKAHASHI, *Aphididae* of Formosa, pt. 6, pp. 22-23 (1931).

Host - *Pinus densiflora* SIEB. et ZUCC.

This species is found attacking the young twig and the branch of the host plant.

Habitat - Hokkaido (Sapporo and Nopporo).

This species is new to Hokkaido. Three examples of the wingless viviparous female and one example of the winged viviparous female were collected by Dr. H. KÔNO on the 10th of July, 1937, at Sapporo. Many examples of the wingless viviparous female were collected by the writer on the 27th of May, 1938, at Nopporo.

Gen. Distr.: Europe (Holland and Russia), Korea, Japan, (Honshu and Hokkaido) and Formosa.

7. *Cinara formosana* (TAKAHASHI)

Dilachnus formosanus TAKAHASHI, *Aphididae* of Formosa, pt. 3, pp. 73-74 (1924), pt. 4, pp. 40-42 (1925).

Panimerus piniformosanus TAKAHASHI, Proc. Nat. Hist. Soc. Fukien Christ. Univ., I, p. 28 (1928).

Dilachnus piniformosanus HORI, Hokkaido Agr. Exp. Stat. Rep. 23, p. 58 (1929).

Neochmosis formosanus TAKAHASHI, Trans. Nat. Hist. Soc. Formosa, 19, p. 325 (1930).

Cinara formosana TAKAHASHI, *Aphididae* of Formosa, pt. 6, p. 23 (1931).

Host - *Pinus densiflora* SIEB. et ZUCC.

This species attacks the shoot of the host plant.

Habitat - Hokkaido (Kotoni).

The writer has received two examples of the winged viviparous female labeled "on the 26th of June" and two examples of the wingless oviparous

female labeled "on the 29th of October", both of which were collected by the late Mr. M. HORI from *Pinus densiflora* at Kotoni near Sapporo.

Gen. Distr.: Formosa, China and Japan (Hokkaido).

Here the writer wishes to express his best thanks to the late Mr. M. HORI for his kindness in sending the valuable material.

8. *Cinara pindensiflorae* (ESSIG et KUWANA)

Lachnus pindensiflorae ESSIG and KUWANA, Proc. Calif. Acad. Sc., 4th ser., VIII, 3, p. 99 (1918).

Dilachnus pindensiflorae TAKAHASHI, APHIDIDAE of Formosa, pt. 1, p. 81 (1921), pt. 2, p. 135 (1923), pt. 6, pp. 23-24 (1931).

Host - *Pinus densiflora* SIEB. et ZUCC.

This species attacks the twigs and branches of the host plant.

Habitat - Hokkaido (Sapporo).

This species is new to Hokkaido. Ten examples of the wingless oviparous female and one example of the winged male were collected by Dr. H. KONO on 23rd of October, 1937, at Sapporo.

Gen. Distr.: Japan (Honshu and Hokkaido), Korea and Formosa.

摘 要

筆者は北海道に於て松栢類に寄生する蚜蟲の研究中今回次の八種を分類學的に整理し得たるを以て茲に公表せり

1. <i>Neomyzaphis piceana</i> INOUE (n. sp.)	エゾマツノハアブラ
2. <i>Eulachnus pumilae</i> INOUE (n. sp.)	ハヒマツノホソオホアブラ
3. <i>Eulachnus piniformosanus</i> TAKAHASHI	マツノホソオホアブラ
4. <i>Cinara laricicola</i> (MATSUMURA)	カラマツオホアブラ
5. <i>Cinara kochi</i> INOUE (nom. nov.)	カラマツミキオホアブラ
6. <i>Cinara pineti</i> (Koch)	マツノオホアブラ
7. <i>Cinara formosana</i> (TAKAHASHI)	タイワンマツノオホアブラ
8. <i>Cinara pindensiflorae</i> (ESSIG et KUWANA)	マツノエダオホアブラ