

Title	日本産カシ類に寄生するアブラムシの2新属
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Two new genera of Aphididae from *Quercus* in Japan (Homoptera)

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The trees of Fagaceae have a very rich aphid fauna and about twenty species of the subfamily Hormaphidinae are now known to occur on these trees in Japan. These aphids are referable to more than ten genera, of which two new ones are here put on record, with descriptions of four species found on the foliage of *Quercus*.

These aphids seem to be primarily associated with *Distylium* or its related plants of Hamamelidaceae, causing galls, and the Fagaceae are secondary hosts. Many species are, however, anholocyclic and monoecious, feeding on the secondary hosts throughout the year, and moreover alate forms do not make appearance in all the generations. The aliencolae or apterae on the Fagaceae are strongly sclerotized, with much reduced antennae, eyes and legs, and are completely sedentary in habit except in the first larval instar, and they seem to be well adapted to aestivation. Many allied forms of this group are distributed in the tropical and subtropical areas of eastern Asia.

The material, upon which the present paper is based, was collected by me unless otherwise mentioned, and is preserved in my collection.

Neothoracaphis new genus.

Aliencola (aptera on secondary host): Body ovate, depressed, flattened, strongly sclerotized and black, without wax-pores. Prosoma (head, thorax and basal abdominal segment consolidated) with polygonal mosaic-like sculptures on dorsum, which are scarcely protuberant, wanting long setae, but with 4 minute submarginal setae on head between eyes; spinal and pleural setae not recognizable on thorax and abdomen except on 8th tergite. Anterior part of abdomen (2nd-7th segments fused together) small, distinctly separated from prosoma, without marginal setae; 8th tergite with 4 setae. Antennae rudimentary, not segmented, on ventral side of head. Eyes with 2 facets only. Rostrum very short, 2-segmented, distal segment longer than wide, tapering from base. Cornicles and abdominal spiracles wanting. Cauda much broader than long, constricted basally. Anal plate bilobed. Genital plate larger than anal plate. Legs smooth, fore and middle legs very short, concealed under body, wanting tarsi; hind legs much longer, exposed, tibiae converging; hind tarsi reduced in size, but longer than wide, not segmented, with some minute conical processes and a pair of capitate setae at tip; claws minute or absent. Venter of body with narrow marginal area defined. Sternal apodemes wanting.

Alata (fundatrigenia and sexupara): Body with short simple setae, dorsal setae few. Head broadly rounded at hind margin. Eyes large, with small tubercle. Front ocellus protuberant, at frontal margin. Antennae much shorter than body, normally 5-segmented,

with annular sensoria, reticulated between sensoria; primary sensoria not distinctly differentiated. Cleypeus without setae, madibular setae absent. Rostrum short, distal segment tapering from base, longer than wide, with 3 pairs of setae; 5th segment not distinct. Cornicles represented by almost mere rings, not surrounded by a sclerotized area. Cauda much broader than long, constricted basally in sexupara, but rounded and not constricted in fundatrigenia. Anal plate bilobed in sexupara, but not in fundatrigenia. Tibiae distinctly imbricated, wanting long setae, but with rather stiff setae which are as long as, or shorter than, diameter of tibia, thin at tip; tarsal basal setae 3 in fore and middle legs, 2 in hind pair, lateral basal setae very long, capitate; a pair of middle upper setae present; apical upper and middle setae long, capitate; empodial setae capitate. Abdominal spiracles

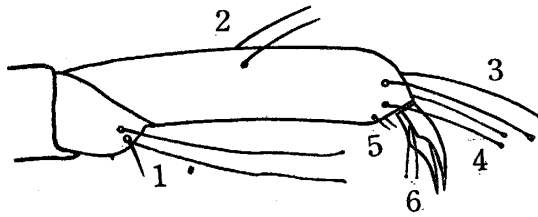


Fig. 1. Tarsus of some Hormaphidinae (diagram). (1) Basal setae. (2) Middle upper setae. (3) Apical upper setae. (4) Apical middle setae. (5) Apical lower setae. (6) Empodial setae.

semilunar, wanting on basal segment, 2 in sexupara, 4 in fundatrigenia on each side. Fore wings rather broad, with pterostigma not elongated, anal and cubitus almost united at base, media once branched, obsolete at base; hind wings with media and cubitus present. Wax-pores absent (wax-pores circular, isolated from each other, protuberant, and present in dorsal and marginal clusters on sclerotized plates in larva).

Genotype: *Nipponaphis yanonis* MATSUMURA.

This new genus is related to *Thoracaphis* VAN DER GOOT, but is different from that genus chiefly in the following characters of aliencola: body wanting distinct dorsal papillae and long setae; cornicles absent; tarsi atrophied or much reduced; anterior part of abdomen without submarginal setae. The genus also differs from *Nipponaphis* PERGANDE chiefly as follows: (aliencola) body strongly sclerotized, depressed, without distinct papillae; cornicles wanting, tarsi atrophied or reduced, anterior part of abdomen without submarginal setae; (alata) tibiae without long fine setae, but with rather stiff setae which are not longer than diameter of tibia. One species is known in Japan.

***Neothoracaphis yanonis* (MATSUMURA)**

Nipponaphis yanonis MATSUMURA, Collection of essays for Nawa, Gifu, p. 56 (1917); MONZEN, Bull. Sc. Res., Alumni Assoc. Morioka Coll. Agric. and Forest., IX, p. 18 (1934); Ann. Rept., Gakugei Facul., Iwate Univ., VII, p. 56 (1954).

Thoracaphis yanonis SHINJI, Monogr. Japan. Aphid., p. 1121 (1941).

Nipponaphis distylii ESSIG and KUWANA (in part), Proc. Calif. Acad. Sc., 4th ser., VIII, p. 109 (1918).

Nipponaphis distyfoliae TAKAHASHI, Bull. Brooklyn Ent. Soc., XV, p. 115 (1920); Zool. Mag. Tokyo, XXXII, p. 195 (1920).

Astegopteryx distyfoliae TAKAHASHI, Dept. Agric., Govt. Res. Inst. Formosa, Rept. no. 4, p. 148 (1923); Rept. no. 10, p. 117 (1924).

Thoracaphis distylifoliae TAKAHASHI, Dept. Agric., Govt. Res. Inst. Formosa, Rept. no. 53, p. 89 (1931).

Thoracaphis quercicola SHINJI (not TAKAHASHI; Monogr. Japan. Aphid., 1941, p. 1131) and *Glyphina saitamaensis* SHINJI (Zool. Mag. Tokyo, XXXV, 1923, p. 302) may be the same species.

Aliencola: Body black, but becoming paler on median area when treated with potash; legs black. Body about 1.3 times as long as wide, scarcely or slightly indented at frontal

margin, sometimes a little asymmetrical. Prosoma (head, thorax and basal abdominal segment fused together) without median ridge, with many rather large polygonal designs which are scarcely protuberant and not distinct on narrow central area. A pair of minute setae present between eyes. Anterior part (2nd-7th segments consolidated) of abdomen without setae, with corrugations and indistinct polygonal designs. Antennae very short, a little longer than wide, nearly as long as, but stouter than, hind tarsus. Cleypeus and mandibular laminae without setae. Rostrum very short, basal segment wider than long, distal segment longer than the basal, slightly shorter than fore tibia, about 1.5 times as long as hind tarsus. Tibiae with a few short setae, shorter than femur in anterior 2 pairs; but a little longer than femur, about 4.5 times as long as wide and expanded on mesal side at apex in hind pair; hind tarsi with 2 minute slender claws at apex, which are sometimes not discernible, and with a pair of short simple setae. Genital plate pale, with about 7 setae along hind margin. Marginal defined area of venter with many very small polygonal markings. Body about 0.55-0.6 mm. in length.

Sexupara: Head with one or 2 minute irregular translucent parts at mid-dorsal line, with 4 short fine setae between eyes, 2 pairs of similar ones between antennae, and a pair on front, these setae about twice as long as diameter of constricted base of 3rd antennal segment; one-3 setae present on venter on each side. Antennae slightly corrugated on basal 2 segments; 3rd segment gradually constricted at base, nearly as long as width of head across eyes and as fore tibia; sensoria about 11-16 on 3rd segment, 5-7 on 4th, 3-5 on 5th; 4th usually longer than 5th; relative length of segments about as follows: III-18, IV-7-8, V-6-7. Rostrum short, distal segment very slightly shorter than hind tarsus, distinctly tapering from base, pointed, about 1.7 times to twice as long as wide, longer than 3rd segment, with 3 pairs of setae. Cauda nearly as wide as lobe of anal plate, a little constricted basally, with 8-10 setae. Anal plate with 5 setae on each lobe. Genital plate brownish, with about 9-11 setae along hind margin and 3-6 setae anteriorly. Abdominal spiracles present on 2nd and 3rd segments. Eighth abdominal segment faintly or scarcely sclerotized on dorsum, with normally 4 setae which are 3 or 4 times as long as basal diameter of 3rd antennal segment; 7th tergite sometimes transversely sclerotized on median area, with 3 or 4 setae; each sternite with 4 setae. Tibiae distinctly imbricated even on basal part, with some rather stiff pointed setae, which are mostly a little shorter than diameter of tibia; hind tarsi shorter than 5th antennal segment, apical upper setae much larger than apical middle setae. Fore wings slightly clouded along anal, which is stouter than other veins. Body 1.5 mm. in length.

The sexupara is different from the fundatrigenia in the 3rd antennal segment being longer than the 4th and 5th taken together, the abdominal spiracles 2 instead of 4 on each side, and in the cauda constricted at base.

Fundatrix: Yellow, with a little wax on posterior marginal area on each side. Body

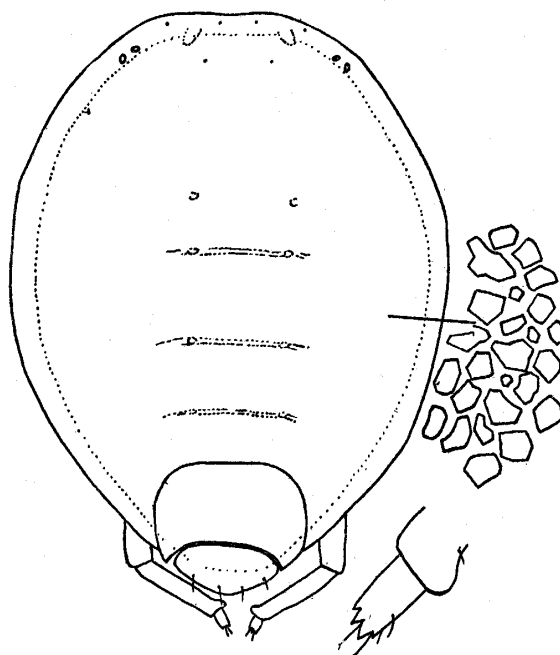


Fig. 2. *Neothoracaphis yanonis* (MATSUMURA).
Aliencola and apical part of hind leg.

almost globular, membranaceous on dorsum. Head with 4 dorsal setae between eyes, 2 pairs of similar ones anteriorly, and a pair on front margin; these setae much longer than basal antennal segment, about twice as long as basal width of 3rd segment; pronotum with a pair of similar ones; 5 marginal setae on thorax and basal part of abdomen on each side as long as, or longer than, dorsal setae of head; 8th tergite with a pair of similar setae and a shorter lateral one, and with spinules in rows. Antennae pale, as long as hind tibia, 3-segmented; 2nd segment short, about twice as broad as long; 3rd broadened gradually towards base, at base as wide as fore tibia, a little imbricated chiefly on distal half, with about 3 setae at tip, and 2 small protuberant sensoria, one of which is subapical and sometimes duplicated, the other removed from apex a little less than one-third length of segment. Eyes with 3 facets. Cornicles and abdominal spiracles absent. Cauda short, rounded, not constricted, with 2 or 3 pairs of long setae. Anal plate not bilobed, with 4 pairs of setae. Genital plate with minute spinules and about 13 long setae. Cleypeus with a pair of setae. Rostrum reaching beyond fore coxae, distal segment stout, but longer than wide, somewhat longer than 3rd segment, nearly as long as hind tarsus, with 3 pairs of setae. Legs short, pale, tibiae with a few flagellate setae on distal part, which are shorter than diameter of tibia, with some imbrications which are not distinct in some individuals; tarsi without basal setae, middle upper setae wanting or one or 2; apical upper setae capitate, distinctly larger than apical middle ones, very long, as long as distal tarsal segment; apical lower setae usually absent; empodial setae not discernible. Body 1.4 mm. in length.

Sexual female: Yellow, antennae and legs yellow. Dorsum membranaceous, reticulated. Antennae rather slender, 5-segmented, imbricated on 3rd-5th segments; 3rd nearly as long as fore tibia; primary sensorium on 4th small, oval; relative length of segments about as follows: III-11, IV-6, V-4. Cornicles represented as mere rings. Hind tibiae not swollen, with over 30 sensoria, and a distinct lanceolate subapical seta which is rather slender, pointed, and much shorter, but distinctly stouter than other flagellate setae; tarsi with chaetotaxy similar to alata, apical middle setae thinner than, but nearly as long as, apical upper setae; hind tarsi slightly longer than distal segment of rostrum, slightly shorter than 5th antennal segment. Body 1.0 mm. in length.

Primary host: *Distylium racemosum*, causing galls on the foliage in spring. Summer hosts: Deciduous trees of *Quercus* including *Q. serrata* and *Q. dentata*. Holocyclic and heteroecious.

Thoracaphis tarokoensis TAKAHASHI described from *Quercus spinosa* in Fromosa is to be included in the genus *Neothoracaphis* and may be differentiated from the present species by the larger body of aliencola, with the frontal margin prominently indented. Eight species of aphids are now known to cause galls on *Distylium racemosum* in Japan, 6 of which belong to *Nipponaphis* PERGANDE and one to *Quadrartus* MONZEN and the present new genus each. Among these species *Neothoracaphis yanonis* (MATSUMURA) is by far the most common, being abundant everywhere the primary host is found in Honshu, and is widely distributed in Kyushu.

Microthoracaphis new genus.

Closely related to *Neothoracaphis*, but differs from the latter in the following structures of aliencola: dorsum of prosoma without polygonal mosaic-like sculptures, with 6 minute setae on submarginal area of head between eyes; fore and middle tarsi present, though reduced in size.

Genotype: *Microthoracaphis elongata* n. sp.

Four species are known in Japan, all of which are anholocyclic and monoecious, being found on the foliage of evergreen trees of *Quercus* all the year round, and alatae are entirely not known.

Key to Japanese species.

(Aliencola)

- (1) Prosoma with many large irregular linear markings or large rough corrugations over dorsum except on marginal narrow area. *M. querciphaga* n. sp.
 — Prosoma without such markings or large rough corrugations distributed over dorsum. (2)
- (2) Body ovate, without distinct median ridge on prosoma. *M. glaucae* n. sp.
 — Body narrow, with a median ridge on prosoma. (3)
- (3) Median ridge of prosoma without prominent constrictions. *M. elongata* n. sp.
 — Median ridge with 4 prominent constrictions. *M. saramaensis* (TAKAHASHI).

***Microthoracaphis elongata* n. sp.**

Aliencola: Body strongly sclerotized, black; hind legs yellow when treated with potash. Body narrow, about 1.7 times to slightly over twice as long as wide, not indented at frontal margin, with a pair of minute setae between eyes; median ridge of prosoma not paler, not prominently constricted, with 4 pairs of indistinct rather large circular paler parts discernible on thorax when cleared with potash, which are not well defined. Prosoma smooth on dorsum, anterior part of abdomen a little corrugated, with one or 2 pairs of indistinct small circular submarginal markings; 8th tergite transversely striate on posterior half, with 2 pairs of setae, and with 2 pairs of minute circular markings on anterior half, these markings with a broad rim. Antennae very short, conical, a little longer than wide, unsegmented, rounded at tip, on venter of body. Eyes with 2 facets. Fore and middle legs very short, concealed under body, dark, femora longer than tibia, tarsi a little shorter than wide, unsegmented, with some minute conical processes and a pair of fine capitate setae at tip; hind legs exposed, tibiae nearly as long as femur, about 4 times as long as wide, over thrice as long as tarsus; hind tarsi a little longer than wide, with about 5 conical processes, a pair of fine capitate setae and sometimes with a short pale claw. Cauda and anal plate pale, as usual. Genital plate brownish, with about 6 long setae along hind margin. Venter with marginal narrow area well defined by a suture. Body 0.7 mm. in length.

Hosts: *Quercus myrsinaefolia*, *Q. paucidentata*.

Described from specimens taken at Fukuoka, Kyushu (23. I. 1953, C. TAKEYA leg.); common at Tokyo, collected also at Hikosan, Kyushu (8. V. 1957, S. TAKAGI leg.), and Ōto-mura, Nara Prefecture (22. VIII. 1957, M. SORIN. leg.). Apteræ taken on *Shiia* at Tokyo (16. VIII. 1949) are narrower in shape, but are regarded as this species.

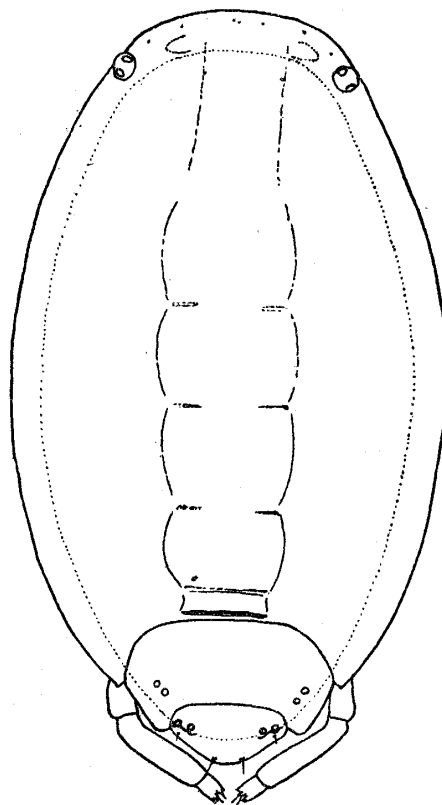


Fig. 3. *Microthoracaphis elongata* n. sp. Aliencola.

Microthoracaphis querciphaga n. sp.

Aliencola: Black, strongly sclerotized, hind legs yellow. Body about 1.5 times as long as wide, slightly indented at frontal margin, without paler parts on median area of prosoma when cleared with potash; median ridge of prosoma very low, not distinct, with constrictions; prosoma with many long irregular branched linear markings or large rough corrugations over dorsum except on marginal narrow area; anterior part of abdomen roughly corrugated, with 2 or 3 pairs of indistinct small circular markings; 8th tergite with one or 2 pairs of small circular blackish markings and with 2 pairs of short setae. Fore and middle legs very short, black; fore tibiae shorter than femur, middle tibiae about 2.2 times as long as tarsus, shorter than, or as long as, femur; hind tibiae about 4 times as long as tarsus and as wide, longer than femur; all tarsi longer than wide, hind tarsi with 2 minute claws. Antennae, eyes, cauda and anal plate as usual. Body 0.8 mm. in length.

Host: *Quercus myrsinaefolia*.

Described from specimens collected at Utsunomiya (2. III. 1955, T. TANAKA leg.). Common near Tokyo, and taken also at Amanosan, Osaka Prefecture (3. V. 1957).

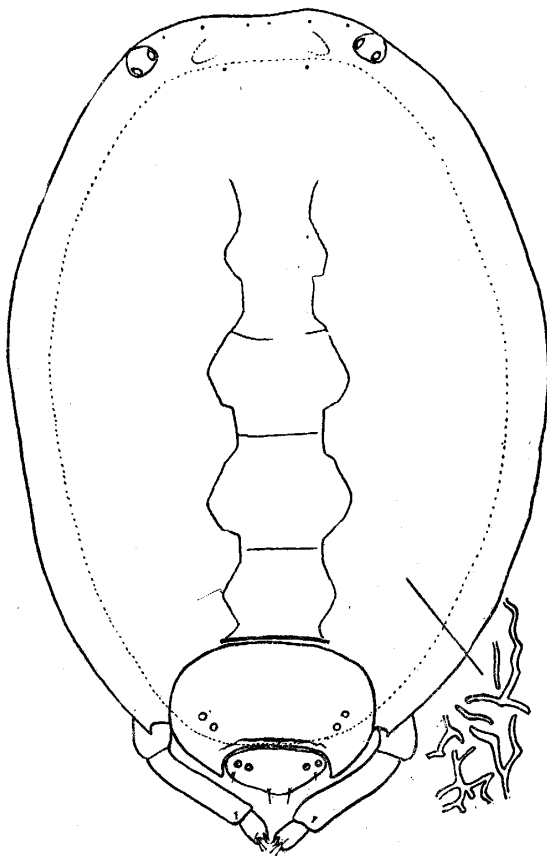


Fig. 4. *Microthoracaphis querciphaga* n. sp.
Aliencola.

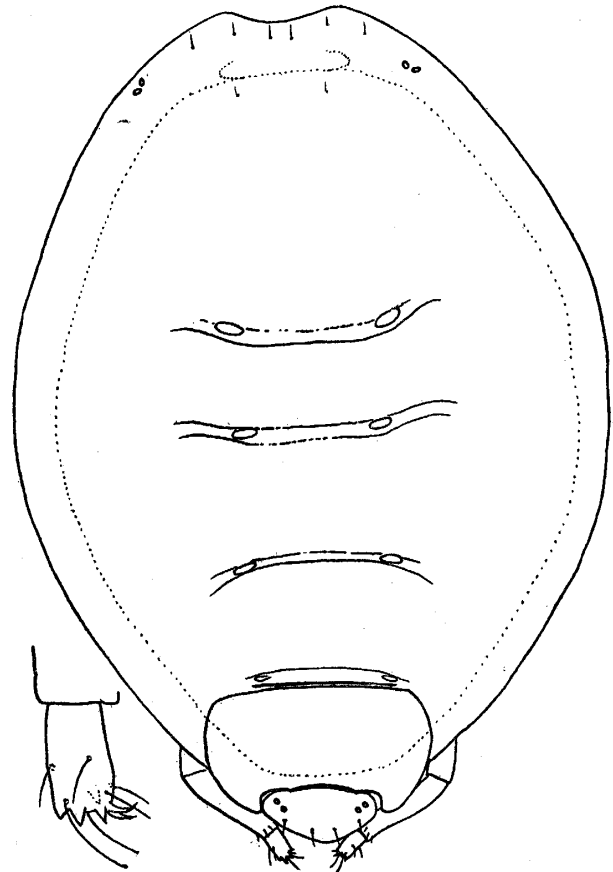


Fig. 5. *Microthoracaphis glaucae* n. sp.
Aliencola.

Microthoracaphis glaucae n. sp.

Aliencola: Black, strongly sclerotized, with much wax at midregion of dorsum; hind legs yellow. Body ovate, about 1.3 times as long as wide, distinctly indented at frontal margin. Prosoma paler on median area when treated with potash, with many small fine

wrinkles over dorsum except on midregion, 3 distinct transverse furrows, and with 3 pairs of depressed markings on dorsum, these depressed markings with many very minute pores which are discernible in well cleared specimens; anterior part of abdomen with some corrugations; 8th tergite striate on posterior part, with 2 pairs of circular markings and 4 setae. Eyes with 2 facets, sometimes absent unilaterally or on both sides. Legs short, fore tibiae shorter than femur, middle tibiae as long as femur; hind tibiae longer than femur, 4 times as long as wide, thrice as long as tarsus, with about 3 short setae on distal part; all tarsi longer than wide, with 2 claws; hind tarsi sometimes about twice as long as wide, with 5 or 6 minute conical processes, a pair of long fine capitate setae and a pair of shorter simple setae on apical part, and a pair of long fine simple setae at midlength. Anal plate with 6 long setae on each lobe. Genital plate with 6 long setae along hind margin. Antennae and cauda as usual. Body 0.8–1.0 mm. in length.

Host: *Quercus glauca*.

Described from material taken at Minoh, Osaka Prefecture (19. II. 1956, M. SORIN leg.). Very common at Asakawa, Tokyo District, and taken also at Miyazaki, Kyushu (24. V. 1957, S. TAKAGI leg.).

This species is closely related to *Thoracaphis sutepensis* TAKAHASHI from Thailand, which is to be assigned to the present genus, but may be readily distinguished from that species chiefly by the pale legs and the tarsi distinctly longer than wide.

***Microthoracaphis saramaoensis* (TAKAHASHI)**

Thoracaphis saramaoensis TAKAHASHI, Stylops, IV, p. 88 (1935).

Host: *Quercus glauca*.

Very common at Asakawa and Mt. Takao, Tokyo District; collected at Miyazaki, Kyushu (24. V. 1957, S. TAKAGI leg.).

Hitherto known from Formosa alone. The Japanese specimens of *aliencola* are somewhat different from the description in the larger body, measuring about 0.7 mm., and in the 8th tergite being striate on the posterior half, as well as in the food plant, but the present name is here adopted with some hesitation, since the Formosan material is not available for comparison now. In the original description circular markings on the 8th tergite were regarded as the bases of stout setae.

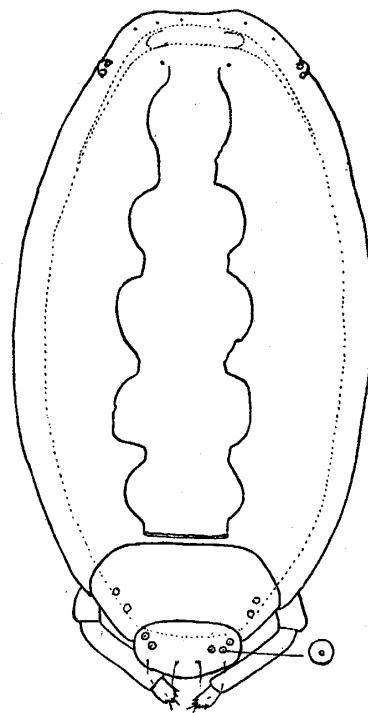


Fig. 6. *Microthoracaphis saramaoensis* (TAKAHASHI). *Aliencola*.