

Kontyû. 47(2): 117-125. June 25, 1979

Some New Species of Aphididae from Japan (Homoptera)

Masato SORIN

Kogakkan University, Ise-shi, Mie 516, Japan

Synopsis Five new species of aphids, *Sitobion isodonis*, *Parachaitophorus yama-shitai*, *Periphyllus montanus*, *Trichaitophorus japonicus* and *Indonipponaphis fulvicola* are described.

Sitobion isodonis sp. nov.

Apterous viviparous female. In life, body yellowish green, with head, lateral large area of body, antennae, legs and cornicles black; cauda pale yellow; compound eyes dark red. In cleared specimens, antennae, femora except basal small part, tibiae and cornicles black; head and lateral large area of body blackish; cauda pale. Head almost smooth on dorsum, somewhat wrinkled on hind submarginal area; venter with some spinules; dorsal setae blunt or bluntly pointed at tip, about 1.7 times as long as basal diameter of 3rd antennal segment; ventral setae nearly as long as dorsal ones; frontal tubercles moderately developed and divergent, with 2 blunt or slightly capitate setae; median tubercle small, with 2 blunt or a little capitate setae; antennal tubercle with 1-2 setae on venter. Antennae 6-segmented, about 1.6 times as long as body; 1st segment smooth, distinctly longer than wide, with 7 setae; 2nd smooth, a little longer than wide, with 4 setae; 3rd smooth, with about 15 setae which are blunt or slightly capitate at tip, the longer ones being a little shorter than basal diameter of the segment, with 3-6 circular sensoria in a row on basal one-third to one-half; 4th slightly imbricated on distal half; primary sensorium on 5th ciliated, a little smaller than apical diameter of the segment; relative length of segments about as follows: III-211, IV-170, V-131, VI-52+295. Clypeus smooth, with some large wax pores and 2 pairs of anterior setae. Mandibular lamina smooth, with 2-3 setae. Rostrum reaching hind coxae; ultimate segment about 1.6 times as long as 2nd segment of hind tarsus, with 10-14 secondary setae. Pronotum sclerotized on anterior and lateral large areas, with 6 setae; metanotum entirely fused with abdomen. Abdomen with 1st to 6th abdominal tergites entirely fused laterally remaining other caudal tergites free; 6th and 7th tergites each with a sclerotic band; central large area of the dorsum, small area just before cornicles and 8th tergite membranous; each anterior segment with 6 dorsal setae which are somewhat capitate at tip and about twice as long as basal diameter of 3rd antennal segment; 6th tergite with 4 setae between cornicles; 7th tergite with 6-7 bluntly pointed setae which are as long as anterior ones; basal 2 spiracles separated, distance between 6th and 7th spiracles nearly as long as that between 5th and 6th. Cornicles imbricated, nearly as long as 3rd antennal segment, about 6 times as long as basal width, reticulated on distal one-fifth, with distinct flange. Cauda about 2.2 times as long as basal width, with 8-9 setae. Genital plate with 15-17 setae along hind margin and 4 setae anteriorly. Femora and tibiae smooth; tibial setae stout, pointed or somewhat spatulate at tip, the longer ones of which are about 1.2 times as long as middle diameter of tibia. First tarsal segment with 3, 3, 3 setae; 2nd segment of hind tarsus with 9 secondary setae; empodial setae shorter than claws. Mesosternal furca with a short stem. Body 2.05 mm. in length.

Alate viviparous female. In life, body deep yellow; head and thorax dark or deep brown; antennae, cornicles and legs black excepting basal small part of femora pale; abdomen with a dark dorsal band on each segment; cauda pale yellow. In cleared specimens, head, antennae, thorax,

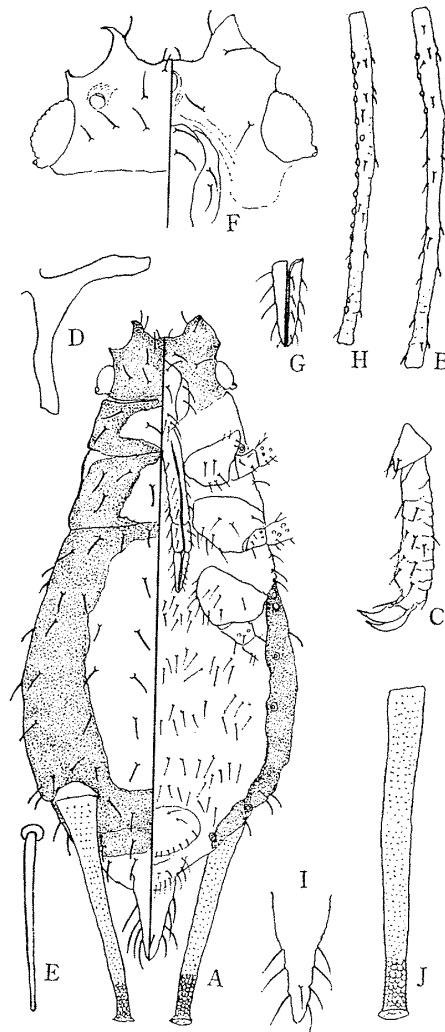


Fig. 1. *Sitobion isodonis* sp. nov.: A-E, Apterous viviparous female; F-J, Alate viviparous female. A: Body; B: Third antennal segment; C: Hind tarsus; D: Mesosternal furca; E: Dorsal setae; F: Head; G: Ultimate rostral segment; H: Third antennal segment; I: Cauda; J: Cornicle.

legs and cornicles blackish brown; abdominal dorsal sclerites brown; cauda pale. Head almost smooth but somewhat wrinkled on dorsum; venter almost smooth, somewhat wrinkled on anterior and lateral small areas; frontal tubercles as in aptera; dorsal setae pointed at tip; hind submarginal setae about 1.3 times as long as basal diameter of 3rd antennal segment; antennal tubercles with a seta on venter. Antennae about 1.6 times as long as body length; 3rd segment almost smooth, slightly imbricated on basal part and distal one-third, with about 17 sensoria in a row on whole length, with about 23 bluntly pointed setae which are about 0.7 as long as basal diameter of the segment; relative length of segments about as follows: III-214, IV-197, V-146, VI-50+314. Mandibular lamina with 2 setae. Abdomen with a faintly sclerotized band on anterior tergites each; 5th and 6th abdominal segments with large dorsal patches which are fused with marginal sclerites; dorsal setae pointed at tip; 6th tergite with 4-5 setae between cornicles; 7th with 6 setae; 8th with 4 setae which are about twice as long as basal diameter of 3rd antennal segment. Cornicles

a little longer than 3rd antennal segment. Cauda rather slender, rounded at apex, with 8 setae. Wing venation normal. Other characters as in apterous viviparous female. Body about 1.35 mm. in length.

Described from syntypes taken at Ise, Mie Prefecture (25. VII. 1970, 15. VI. 1971. M. SORIN leg.).

Host plant. *Isodon japonicus*.

This species differs from other related species in having the thoracic and abdominal terga strongly sclerotized and pigmented marginally leaving pale membranous areas mesially and the conspicuously long setae on the body of apterous viviparous female.

Parachaitophorus yamashitai sp. nov.

Alate viviparous female. In cleared specimens, head, antennae, thorax, dorsal sclerites of abdomen and cornicles dark brown; cauda brown; legs mostly dark brown; basal half of femora, middle part of tibiae and tarsi pale brown. Head almost smooth on dorsum, with some minute spinules near antennal tubercles; with 4 pairs of setae on dorsum and a pair of setae on front and a pair of setae on venter; frontal setae stiff, blunt to bluntly pointed or somewhat dilated at tip, about 4 times as long as basal diameter of 3rd antennal segment; anterior setae similar to, or a little longer than frontal setae; these setae placed on small tubercles; posterior setae fine, pointed; lateral setae about 1.2 times as long as basal diameter of 3rd antennal segment; posterior submedian setae about 2.5 times as long as that diameter; ventral setae stout. Antennae 6-segmented, about 0.76 as long as body length; 1st segment smooth, with 4 pointed setae; 2nd almost smooth with 5 setae; 3rd slightly imbricated at basal constricted part, with about 31 scattered sensoria which are large and protuberant, with some setae, the longer ones of which are about 1.75 times as long as basal diameter of the segment; 4th with 13–16 scattered sensoria; 5th with 7–11 secondary sensoria; primary sensoria large, not ciliated; processus terminalis pale, distinctly imbricated except on distal part which is like onion head in shape, pale, as long as middle diameter of 3rd antennal segment, and without apical setae; relative length of segments about as follows: III–24, IV–13, V–9, VI–3+12. Clypeus with 3 anterior setae; mandibular lamina with a seta. Rostrum not reaching middle coxae; ultimate segment nearly as long as 2nd segment of hind tarsus, about twice as long as basal part of 6th antennal segment, with one or two pairs of secondary setae. Scutum smooth, with 5 setae along inside; postscutellum dark, but paler at middle large area and lateral small parts. Femora almost smooth, faintly imbricated on distal part, with many setae the longer ones of which are nearly as long as middle diameter of the femur; tibiae almost smooth, with many setae which are up to about 1.5 times as long as middle diameter of hind tibia; 1st tarsal segment with 3, 3, 2 setae; 2nd segment of hind tarsus with a pair of secondary setae on upper and lower sides; empodial setae pointed, as long as claws. Wings with twice-branched media, without radial sector but in a specimen with very faint trace of the vein; hind wings with an oblique vein only. Abdomen with pairs of large dorsal sclerites on 1st to 3rd tergites and with broad dorsal bands on 4th to 8th, with 4 long setae on 1st to 5th tergites each, with 2 setae on 6th, 4 on 7th, these setae being slightly stout or bluntly pointed at tip, about twice as long as basal diameter of 3rd antennal segment; 8th tergite with 6 setae which are 4–6 times as long as that diameter; marginal sclerites separated from dorsal sclerites, with 1–3 long setae; ventral setae fine. Cornicles about 2.6 times as long as apical diameter, 0.87 as long as ultimate rostral segment, imbricated on distal half, smooth on basal half, fused with postsiphuncular sclerite. Cauda subequal to or a little shorter than basal width, with a pair of curved setae. Anal plate distinctly bilobed, each of which has a long seta on venter and 3 setae on posterior margin. Genital plate with

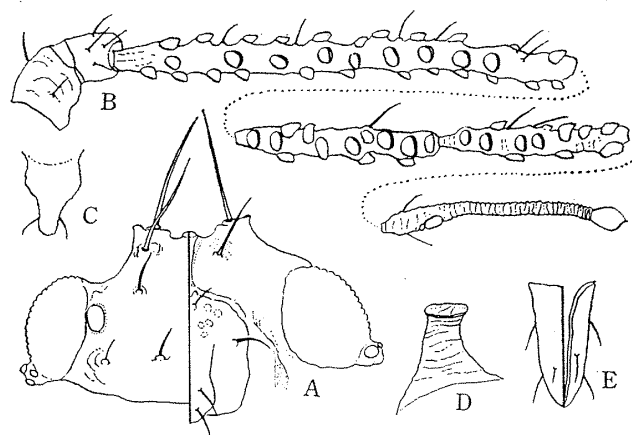


Fig. 2. *Parachaitophorus yamashitai* sp. nov.: Alate viviparous female. A: Head; B: Antenna; C: Cauda; D: Cornicle; E: Ultimate rostral segment.

6 setae along hind margin and 2 setae anteriorly. Body about 1.3 mm. in length.

Male. Similar to alate viviparous female, but differs in the following characters: Frontal and anterior setae of head longer, about 5.6–6 times as long as basal diameter of 3rd antennal segment. Antennae longer, about 0.93 as long as body length, with about 38 secondary sensoria scattered on 3rd, 19 on 4th, 8 on 5th. Cauda longer than basal width. Anal plate with more setae.

Described from syntypes: an alate viviparous female collected at Misugi, Mie prefecture (2. XI. 1965, Z. YAMASHITA leg.) and 3 alate viviparous females and 5 alate males at Hatano, Kanagawa Prefecture (1. XI. 1969, 8. XI. 1969, 15. XI. 1969, 2. XII. 1969, K. NAKAZAWA leg.).

Host plant. Unknown.

This species is closely related to *P. spiraeae* (TAKAHASHI), but differs from the latter in the following characters of alate viviparous female: The dorsum of head and abdomen with shorter setae, the antennae with many short setae and the distal part of processus terminalis onion head-shaped, and the rostrum with shorter ultimate segment.

Periphyllus montanus sp. nov.

Apterous viviparous female. In cleared specimens body pale. Head almost fused with pronotum, with 4 pairs of dorsal setae and a pair of frontal ones, these setae being stout, pointed at tip, about 6 times as long as basal diameter of 3rd antennal segment; venter of head somewhat spinulose, with 3 setae on each side, 2 of which are fine and short, the rest being similar in shape and length to frontal ones. Antennae 6-segmented; 1st segment with 4 setae; 2nd with 2 setae; 3rd to 6th segments imbricated; 3rd not constricted at base, with 4 setae which are about half as long as basal diameter of the segment; primary sensorium ciliated; relative length of segments about as follows; III-60, IV-25, V-28, VI-16+?. Clypeus with a pair of anterior setae; mandibular lamina with a seta. Ultimate rostral segment reaching beyond middle coxae, but not attaining hind coxae, about 0.88 as long as 2nd segment of hind tarsus, with 1–2 secondary setae. Pronotum almost fused with head, with 4 pairs of dorsal setae, and with 3 marginal setae. Femora smooth, with about 10 setae, the longer ones being about 0.58 as long as middle diameter of the femur;

tibiae almost smooth, with some spinules on distal part, with many long setae, which are about 2.5 times as long as middle diameter of hind tibia; 1st tarsal segment with 3, 4, 4 setae, 2nd segment of hind tarsus nearly as long as 5th antennal segment, with about 5 secondary setae; empodial setae a little flattened, as long as claws. Abdomen smooth on dorsum, not sclerotized; dorsal setae stout; 8th tergite with 6 dorsal setae which are about 6.7 times as long as basal diameter of 3rd antennal segment, with 2–3 marginal setae on each side. Cornicles a little imbricated, reticulated on apical small part, nearly as long as basal width. Cauda broadly rounded, with about 12 setae. Genital plate large, with 10 setae on median part and 16 setae along hind margin. Body about 1.57 mm. in length.

Alate viviparous female. In cleared specimens, head, thorax and cornicles blackish brown; antennae and legs pale brown; dorsal bands of abdomen brown. Head almost smooth on dorsum, with 4 pairs of dorsal setae which are fine, pointed at tip, and with a pair of similar setae on frontal margin; dorsal and frontal setae placed on tuberculate bases, up to about 8.3 times as long as basal diameter of 3rd antennal segment; venter with 3 pairs of setae, of which anterior ones are similar to dorsal ones, while the others are about half as long as anterior ones. Antennae about 0.63 as long as body length; 3rd segment with 21–25 sensoria scattered on whole length, with 4 setae which are a little shorter than basal diameter of the segment; 4th with 3–7 sensoria; 5th with 0–1 secondary sensorium; primary sensoria protuberant, not ciliated; relative length of segments about as follows: III-56, IV-25, V-20, VI-14+35. Ultimate rostral segment nearly as long as 2nd segment of hind tarsus, with a pair of secondary setae. Pronotum with 2 pairs of dorsal setae and 2 lateral ones on each side. Femora with many setae, the longer ones being about 1.2 times as long as middle width of the femur; tibiae with many short stouter setae on distal half, and with very long setae about thrice as long as middle diameter of the tibia; 1st tarsal segment with 5 setae in each leg; 2nd segment of hind tarsus with a pair of secondary setae on upper side and 2 pairs of secondary ones on lower side; empodial setae a little flattened, widened towards apex, as long as claws. Abdomen with a broad dorsal band on each segment; marginal sclerites on 1st to 5th tergites free, while those on 6th tergite are fused with cornicle and bear 2–4 setae each; 8th tergite with 8 setae which are about 4.7 times as long as basal diameter of 3rd antennal segment; 5th–7th tergites each with a pair of large dark sclerites, each of which is with 4–7 setae on posterior part. Cornicles about 1.33 times as long as basal width, reticulated on whole length, with small flange. Cauda broadly rounded, with 8–10 setae. Genital plate with 7–8 setae on middle area and 15 setae along hind margin. Body about 1.94 mm. in length.

Described from syntypes taken at Mt. Futatabi, near Kobe (22. X. 1963, M. SORIN leg.) and at Mt. Hakusan, Ishikawa Prefecture (9. X. 1975, M. SORIN leg.).

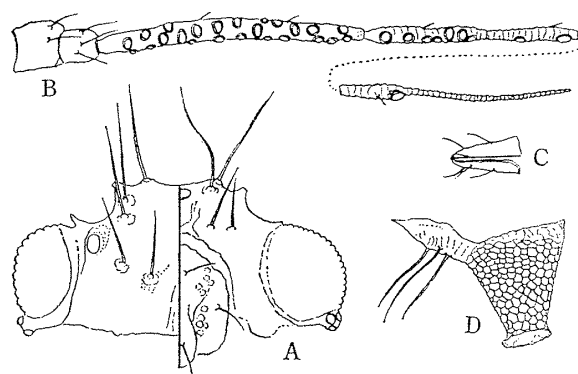


Fig. 3. *Periphyllus montanus* sp. nov.: Alate viviparous female. A: Head; B: Antenna; C: Ultimate rostral segment; D: Cornicle.

Host plant. *Acer rufinerve*.

This species differs from the description of *P. pusillus* QUEDNAU and CHAKRA-BARTI, which it most closely resembles, in the following characters of alate viviparous female: The posterior dorsal setae of head longer; 3rd antennal segment with a little longer setae and more numerous sensoria; and the abdomen with longer dorsal setae and distinct dorsal bands which are not fused with each other.

Trichaitophorus japonicus sp. nov.

Apterous viviparous female. Green in life. Head corrugated on dorsum, with a pair of large tubercles between antennae, each of them bearing 2 long stiff setae which are blunt or a little capitate at tip, about 5.3 times as long as basal diameter of 3rd antennal segment and about half length of that segment; between eyes are 2–3 pairs of minute setae which are blunt at tip and about one-sixth as long as basal diameter of 3rd antennal segment; frontal margin with a pair of stiff setae; venter of head slightly wrinkled, with 2 pairs of long stout setae which are pointed at tip and placed on small tubercle. Antennae 5-segmented, about one-third as long as body length; 1st segment with 2 minute setae and a long fine seta, 2nd with 0–1 minute seta; 3rd without setae, almost smooth on basal half, slightly imbricated on distal half, with a faint segmental trace; primary sensoria not ciliated; relative length of segments about as follows; III-60, IV-18, V-18+21. Clypeus with a pair of anterior setae; mandibular lamina with a seta. Rostrum reaching middle coxae; ultimate segment as long as processus terminalis of 6th antennal segment, about 0.84 as long as 2nd segment of hind tarsus, with 0–1 secondary seta. Pronotum almost fused with head, with 8 setae dorsally and 3–4 marginally on each side; of the pronotal setae the postero-marginal one is long, stiff and a little capitate at tip, while the others are minute. Meso- and metanota almost fused together, but with a faint trace of division at middle area; mesonotum with 8 minute setae on middle part, with some marginal setae, the posterior one of which is long, stiff and blunt at tip; metanotum with 8 minute setae along anterior margin, on each side, and with 2–3 setae marginally, of which one is very long, stiff and blunt at tip. Legs pale except tarsi which are blackish brown;

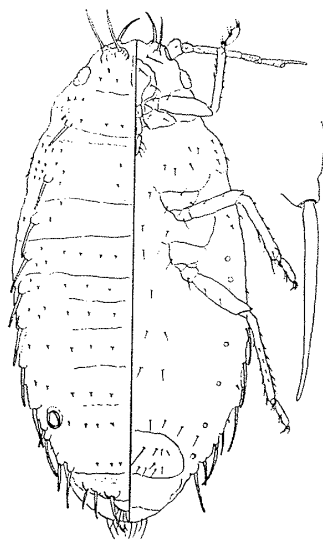


Fig. 4. *Trichaitophorus japonicus* sp. nov.: Apterous viviparous female and marginal seta.

trochanters distinct, with a long seta on underside; femora and tibiae almost smooth; tibiae with long setae, the setae on outside being stout and slightly capitate at tip, the ones on inside pointed, and the apical ones finely pointed; 1st tarsal segment with 3 setae in each leg, the lateral 2 of which are very long and fine; 2nd segment of hind tarsus with 2 pairs of secondary setae, a pair of which on upper side are short, and a pair on lower side very long and fine; empodial setae flattened, widened towards apex, a little shorter than claws. Abdomen divided from metanotum; dorsal setae minute; 1st-7th tergites fused together, but between 1st and 2nd with a faint trace of division, between cornicles with 9 setae; 6th and 7th each with 2 marginal setae; 7th with 5-6 dorsal setae; 8th without dorsal setae, with 3 pairs of marginal setae, the anterior pair of which are pointed and about half as long as posterior ones. Cornicles pale, distinctly shorter than basal width, at apex about 1.5 times as wide as middle part of hind tibia. Cauda pale, rather large, subcircular, not constricted at basal part, with about 10-12 setae. Anal plate broadly rounded, with many long setae. Genital plate large, with 10-18 setae along hind margin, and 4-8 on anterior part. Body about 1.57 mm. in length.

Described from syntypes taken at Midagahara, Toyama Prefecture (16. VIII. 1969, M. SORIN leg.).

Host plant. *Acer Tschonoskii*, feeding on the upper surface of the leaves along the main or lateral veins.

This species differs from the description of *T. aceris* TAKAHASHI in the body color in life, the blunt marginal setae, the presence of faint trace of division between the head and pronotum, the shorter setae on the upper side of 1st and 2nd antennal segments, and in the longer antennae.

Differs from *T. koyaensis* TAKAHASHI chiefly in the body rather large and elongated, the anterior dorsal setae of head placed on large tubercles, and in the shorter marginal setae.

Indonipponaphis fulvicola sp. nov.

Apterous viviparous female. In life, body brown and strongly sclerotized. In cleared specimens, body pale brown with dorsal depressed margins blackish; antennae and legs brown. Body circular, but slightly longer than wide, flattened dorsally and strongly sclerotized, with venter a little expanded outwards. Prosoma fused with abdominal plate (2nd to 7th tergites fused) with indistinct trace of division on median area. Dorsal pustules hemispherical, polygonal on basal part, rounded at apex. Dorsal setae blunt or bluntly pointed at apex, about twice as long as basal diameter of 3rd antennal segment. A pair of small tubercles present on frontal margin of head, and on each thoracic and anterior abdominal segment; some additional tubercles present on submarginal areas of anterior abdominal segments. Antennae 4-segmented; 1st segment with a seta; 2nd with 2 setae; 3rd almost smooth, without setae; 4th imbricated on distal half and with 3 primary setae on apex. Rostrum reaching middle coxae; ultimate rostral segment as long as 3rd antennal segment, about 1.5 times as long as 2nd segment of hind tarsus, without secondary setae. Pro- and mesothorax respectively with 2 pairs of dorsal setae, metathorax with a pair of dorsal setae. Abdominal plate without dorsal setae, with 6 marginal setae on each side, these setae being stout, pointed and nearly as long as dorsal setae of head; 8th tergite with 4 setae on hind submarginal area, longer setae being about 1.2-1.5 times as long as dorsal ones on prosoma. Cornicles small, with marginal area slightly corrugated. Cauda constricted basally, broadly rounded at hind margin, broader than anal lobe, with about 8 long setae. Anal plate bilobed, with some long setae. Tibiae with a few fine setae and 1-2 spine like setae on hind legs. Tarsus 2-segmented;

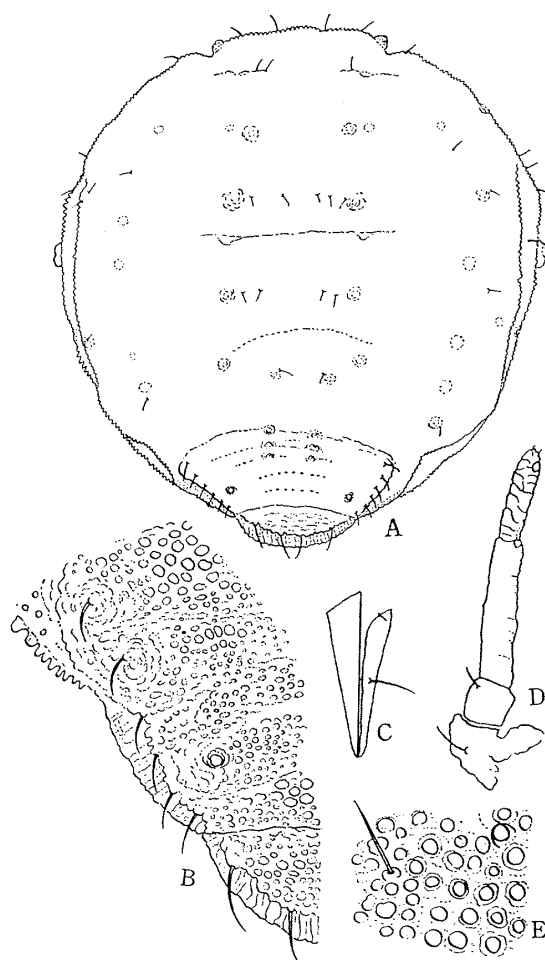


Fig. 5. *Indonipponaphis fulvicola* sp. nov.: Apterous viviparous female. A: Dorsum; B: Lateral part of abdomen; C: Ultimate rostral segment; D: Antenna; E: Dorsal papillae.

1st tarsal segment with 3, 3, 2 setae; 2nd segment of hind tarsus with a pair of secondary setae on upper side. Body about 2.1 mm. in length, about 1.8 mm. in width.

Described from syntypes taken at Ise, Mie Prefecture (14. V. 1966, M. SORIN leg.).

Host plant. *Quercus acuta*, on the branch.

This species is closely related to *I. tuberculata* GHOSH and RAYCHAUDHURI, but can be distinguished from the latter by the following characters of apterous viviparous female: The dorsal and marginal tubercles on the prosoma and abdomen are very small; the setae on the body are long, the longest one is about 3 times as long as the basal diameter of the 3rd antennal segment.

Acknowledgement

I wish to express my cordial thanks to Prof. T. TANAKA, Utsunomiya University and Dr. M. MIYAZAKI, National Grassland Research Institute for their valuable advice and encouragement.

I am also grateful to Mr. Z. YAMASHITA, Tsu, Mie Prefecture and Dr. K. NAKAZAWA, Morioka Tobacco Experiment Station for their kindness supplying me with the materials.

References

- GHOSH, A. K. & D. N. RAYCHAUDHURI, 1973. Studies on the aphids (Homoptera, Aphididae) from Eastern India XV. A study of *Nipponaphis* PERGANDE and related genera with descriptions of a new genus and eight new species from Eastern India. *Kontyû*, **41**: 148-165.
- QUEDNAU, F. W. & S. CHAKRABARTI, 1976. A new genus and three new species of aphids (Homoptera: Aphididae) from North-West India. *Can. Ent.*, **108**: 461-468.
- TAKAHASHI, R., 1937. Some oriental Aphididae (Homoptera) II. *Konowia*, **16**: 90-96.
- 1937. A new genus and species of Aphididae from Formosa (Homoptera). *Annot. Zool. Japon.*, **16**: 17-19.
- 1961. Three new genera and five new and little known species of Aphididae from Japan (Homoptera). *Kontyû*, **29**: 247-254.