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TWO NEW SPECIES OF THE GENUS *AULACORTHUM*
MORDVILKO FROM JAPAN
(HOMOPTERA : APHIDIDAE)

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In 1965 the Japanese species of the genus *Aulacorthum* Mordvilko, 1914, were revised by Takahashi who gave a detailed key to 16 species occurring in Japan. In the course of the present investigation have been found two other species, which are new to science and will be described hereinafter. The type specimens of these species are deposited in the collection of the Entomological Institute, Hokkaido University.

On this occasion I wish to express my sincere gratitude to Prof. C. Watanabe of the Entomological Institute, Hokkaido University, for his continuous kind guidance. I am much indebted to Dr. D. Hille Ris Lambers of Bennekom, Netherlands, for his helpful information in this study. Thanks are also due to Dr. H. Takada of the Entomological Institute, Hokkaido University, for his kindness in offering valuable specimens.

Aulacorthum nepetifolii, n. sp.

Apterous viviparous female: Body blackish brown in life. In mounted specimens tergum sclerotic and brown with head, pro- and mesothorax and 8th abdominal segment free. Antennae pale brownish with 3rd, 4th and 5th segments at apex, and 1st, 2nd and 6th segments wholly black. Legs pale brownish; femora and tibiae on distal part and tarsi black. Siphunculi black. Cauda pale or slightly fuscous. Eyes dark brown. Body 2.5-2.9 mm. in length excluding cauda.

Head smooth dorsally, scabrous with spinules ventrally, with blunt setae, of which the longer ones are 1.5-1.8 times as long as middle breadth of 3rd antennal segment. Antennal tubercles well developed, diverging, spinulose apically and ventrally, usually with 2 apical setae and 1 mid-ventral seta. Median tubercle weakly developed. Antennae 1.1-1.2 times as long as body; 1st segment smooth or a little spinulose on basal part of ventral surface, with 5-7 (mostly 6) setae; 2nd smooth, with 4 setae; 3rd smooth, with 4-14 (mostly 8-12) rhinaria scattered on basal 1/2 or up to basal 4/5 of the segment, and with 16-18 blunt setae, of which the longer ones are 0.9-1.3 times as long as middle breadth of the segment; processus terminalis 4.0-4.6 times as long as basal part of 6th segment; proportions of 3rd-6th segments = 79 : 52 : 46 : 19 + 76. Mandibular laminae with 1 or 2 setae; clypeus with 2 pairs of anterior setae. Rostrum reaching between middle and hind coxae; ultimate segment 1.1-1.3 times as long as 2nd segment of hind tarsus, with 9-12 (mostly 10) secondary setae. Mesosternal furca with long slender stem. Femora almost smooth or with light imbrication on hind legs apically, the longest setae being about half length of middle breadth of hind femur. Tibial

setae up to 1.4 times as long as middle breadth of hind tibia. All tarsi with 1st segment bearing 3 setae and with 2nd segment usually bearing 2 dorsal and 6 ventral setae in addition to apical primary ones. Larvae with tibiae wanting spinules. Abdominal tergum dark with white membranous areas anterior to siphunculi; 2nd-4th segments with a pair of spinal setae respectively, the pleural ones being present or absent, so that each segment bearing 2-4 setae besides marginal ones; 5th and 6th with 2-4 setae between siphunculi; 7th with 6-7 setae including marginal ones; 8th usually with 6-7 setae. Dorsal setae of anterior abdominal segments at most as long as middle breadth of 3rd antennal segment, while those on 8th 1.2-1.7 times so. Genital plate with 10-14 setae along hind margin and a pair of anterior setae. Siphunculi tapering and imbricated, with flange well developed and with a few rows of transverse hexagonal cells at apex, as long as or a little longer than head across eyes, 9-12 times as long as broad at middle, and 1.5-2.0 times as long as cauda. Cauda elongate with a constriction at middle, bearing 6 or 7 setae.

Measurements of a specimen in mm. Body 2.88; head across eyes 0.58; antennal segments (1st-6th): 0.18, 0.10, 0.88, 0.52, 0.50, 0.21+0.85; ultimate rostral segment 0.15; hind femur 1.25; hind tibia 2.31; siphunculus 0.66; cauda 0.35; longest seta 0.06 on head, 0.04 on 3rd antennal segment and on anterior abdominal tergum, and 0.09 on tibiae.

Alate viviparous female: Head and thorax black. Antennae wholly black with 3rd segment pale brownish at extreme base. Otherwise like apterous viviparous female in colouration.

Antennae with 22-24 rhinaria on whole length of 3rd segment, and setae a little shorter than middle breadth of 3rd segment. Ultimate rostral segment 1.2 times as long as 2nd segment of hind tarsus, with 10 secondary setae. Wing venation normal. Marginal sclerites on 2nd-4th abdominal segments well developed, with 2-4 setae, without tubercles; antesiphuncular sclerites well developed; 2nd and 3rd segments with large pleural intersegmental sclerites and small spinal ones; 4th with rather small pleural sclerites; spinal sclerites of 4th and 5th, postsiphuncular sclerites and tergum of 7th fused together forming a large sclerotic patch. Second to 4th abdominal segments with a pair of spinal setae; 5th and 6th with 4 setae between siphunculi; 7th with 8 setae including marginal ones; 8th with 7 setae. Siphunculi as long as head across eyes, 1.8 times as long as cauda, 11 times as long as broad at middle.

Measurements of a specimen in mm. Body 2.80; head across eyes 0.57; antennal segments (1st-6th): 0.15, 0.10, 0.84, 0.54, 0.49, 0.20+0.82; ultimate rostral segment 0.14; hind femur 1.06; hind tibia 2.21; siphunculus 0.56; cauda 0.32; longest seta 0.05 on head, 0.04 on 3rd antennal segment, and 0.05 on tibiae.

Specimens examined: 8 apterous viviparous females and 1 alate viviparous female, Mt. Yûbari, Hokkaido, 10-viii-66, M. Miyazaki leg.

Host plant: *Nepeta subsessilis* var. *yessoensis* Franch. et Savat.

This species closely resembles *A. esakii* (Takahashi, 1924) which has a similar black sclerotic tergum, but it differs from the latter in the following aspects:—Antennae with 1st and 2nd segments rather smooth, and 3rd segment bearing more rhinaria; mandibular laminae smooth; ultimate rostral segment with more setae; mesosternal furca with stem much longer than wide; siphunculi uniformly black.

Aulacorthum phytolaccae, n. sp.

Apterous viviparous female: Body colour in life unknown. In mounted specimens body wholly dark brown with head, pro- and mesothorax and 8th abdominal segment free and with pale membranous areas anterior to siphunculi. Antennae pale yellowish brown with 3rd, 4th and 5th segments at apex and 1st, 2nd and 6th segments dark brown. Legs pale yellowish brown with femora and tibiae at apex and tarsi black. Siphunculi dark brown, more or less paler near apex. Cauda dark brown. Body 2.0-2.7 mm. in length excluding cauda.

Head spinulose except on central area of dorsum, with vertex lightly convex and with setae very long and fine at tip, the longer setae being 2.0-2.8 times as long as middle breadth of 3rd antennal segment. Antennal tubercles diverging, with 2 or 3 apical and 1 or 2 ventral setae. Frontal furrow much broader than deep. Antennae nearly as long as body; 1st segment scabrous, with 5-6 setae; 2nd scabrous; 3rd scabrously imbricated, with 9-13 rhinaria distributed on basal 2/3 to whole length of the segment, with 10-15 setae, of which the longer ones are 1.0-1.4 times as long as middle breadth of the segment; 4th-6th imbricated, without rhinaria; processus terminalis 5.5-6.5 times as long as basal part of 6th segment; proportions of 3rd-6th segments=54:36:26:12+73. Mandibular laminae with 2-4 very long pointed setae; clypeus with 4 similar setae anteriorly. Rostrum reaching hind coxae; ultimate segment 1.3-1.4 times as long as 2nd segment of hind tarsus, mostly with 6 secondary setae. Mesosternal furca with stem not longer than wide. Femora imbricated apically, with setae 0.6-0.9 times as long as middle breadth of hind femur. Tibial setae up to 1.8 times as long as middle breadth of hind tibia. All tarsi with 1st segment bearing 3 setae, and with 2nd segment bearing a pair of dorsal and 2 pairs of ventral setae in addition to 3 pairs of apical ones. Larvae with tibiae wanting spinules. Abdomen with 2nd-4th segments bearing 4 dorsal setae in addition to marginal ones, the spinal ones being up to 1.6 times as long as middle breadth of 3rd antennal segment; 6th with 5-6 setae between siphunculi; 7th with 10-12 setae including marginal ones; 8th with 6-10 setae, of which the longer ones are 1.3-2.6 times as long as middle breadth of 3rd antennal segment. Genital plate with 14-18 setae along hind margin and a pair of anterior setae. Siphunculi cylindrical, broadened at base, imbricated, 2.5-3.5 times as long as cauda, 10-12 times as long as wide at middle, a little shorter than head across eyes, the flange being well developed. Cauda rather short, 1.3-1.5 times as long as wide at base, with a weak constriction at middle, and with 7-9 setae.

Measurements of a specimen in mm. Body 2.30; head across eyes 0.51; antennal segments (1st-6th): 0.13, 0.10, 0.52, 0.35, 0.25, 0.12+0.76; ultimate rostral segment 0.15; hind femur 0.75; hind tibia 1.41; siphunculus 0.50; cauda 0.19; longest seta 0.09 on head, 0.05 on 3rd antennal segment and on anterior abdominal tergum, and 0.08 on tibiae.

Specimens examined: 12 apterous viviparous females, Sendai, Miyagi Pref., 8-x-63, H. Takada leg.

Host plant: *Phytolacca esculenta* Van Houtte.

Of the specimens examined 6 are alate apterae, differing from the normal ones as follows:—Head with 3 small ocelli; 3rd antennal segment with 15-23 rhinaria, 4th with 1-6 rhinaria.

This species resembles the preceding *A. nepetifolii* in general appearance, but it is immediately distinguished by the long, pointed setae, the scabrous antennal segments and the shorter cauda. This species is closely related to *A. perillae* (Shinji, 1924) in having the long setae and the pigmented tergum, but it differs from the latter as follows:—Antennae not wholly black; ultimate rostral segment shorter, with more setae; anterior abdominal segments with fewer setae, without marginal tubercles; cauda much shorter, dark in colour.

Revised and modified couplets of Takahashi's key (Ins. Mats. 27: 108, 1965) are here presented to include the present new species:

- 1. Dorsal setae of anterior part of abdomen at least twice as long as middle breadth of 3rd antennal segment. Antennae wholly black. On *Perilla*. *A. perillae* (Shinji)
- Dorsal setae of anterior part of abdomen less than twice as long as middle breadth of 3rd antennal segment. Antennae pale or black, but if dorsal setae of anterior part of abdomen distinctly longer than middle breadth of 3rd antennal segment, then antennae with 3rd-5th segments pale basally. (2)
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- 8. Third antennal segment with many (4-29) rhinaria distributed on its basal 1/2 or more. (A)
- Third antennal segment with fewer (1-8) rhinaria near base or on about basal 1/3. (9)
- A. Cauda black. Third antennal segment strongly imbricated along whole length. On *Phytolacca*. *A. phytolaccae*, n. sp.
- Cauda pale. Third antennal segment smooth except at base. (B)
- B. Abdominal tergum pale, without ornamentation. Third antennal segment with 17-29 rhinaria, the setae being shorter than half breadth of the segment. On *Aster*. *A. asteris* Takahashi
- Abdominal tergum wholly sclerotized and pigmented. Third antennal segment with 4-14 rhinaria, the setae being longer than half breadth of the segment. On *Nepeta*. *A. nepetifolii*, n. sp.

Explanation of plates

Plate XXVII. *Aulacorthum nepetifolii*, n. sp. Fig. 1-10, apterous viviparous female: 1, general aspect; 2, seta on head; 3, stigma on 3rd abdominal segment; 4, hind tarsus; 5, ultimate rostral segment; 6, head; 7, mesosternal furca; 8, antennal segments III, IV and V; 9, cauda; 10, siphunculus. Fig. 11, alate viviparous female: dorsal view of abdomen.

Plate XXVIII. *Aulacorthum phytolaccae*, n. sp. Figs. 1-10, apterous viviparous female: 1, general aspect; 2, seta on head; 3, stigma on 3rd abdominal segment; 4, ultimate rostral segment; 5, hind tarsus; 6, mesosternal furca; 7, cauda; 8, antennal segments III, IV and V; 9, siphunculus; 10, head.



