

A new Species of the Genus *Eulachnus* (Hemiptera: Aphididae) from Japan

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Eulachnus isensis Sorin, sp. nov.

Apterous viviparous female (Figs. 1a, 2a-2d): In life, body reddish brown, faintly covered with white powder; compound eyes dark red; antennae pale, but the distal parts of segments IV and V, and the middle part of VI dusky to blackish; dorsal spots on the body dark brown; femora and tibiae dusky or blackish, tarsi blackish; dorsal setae on the body dark brown. When cleared, head, thorax, legs, and dorsal spots at the bases of setae brown. Head smooth, divided by a longitudinal suture on the anterior half, frons slightly convex, with 4 long setae; dorsum with 4 setae and the ventral side with 5 setae on each side, those setae on head long, stout, somewhat capitate apices; the longest seta on vertex 0.073mm, about 4 times as long as the basal diameter of antennal segment III. Antennae 6-segmented, about 0.56 times as long as the body length; flagellum imbricated except for the basal half of segment III; setae on the flagellum with slightly capitate apices; the longest seta 0.066mm, about 3.6 times as long as the basal diameter of segment III; primary sensoria rounded, with faint rim and nonciliated, with 5-6 accessory sensoria in a cluster that is a little far apart from the primary sensorium; processus terminalis about 0.26 times as long as the basal part of segment VI; the proportionate lengths of segments

III-VI about as follows: III-100, IV-51, V-73, VI-58 + 15. Clypeus with a pair of setae anteriorly; mandibular lamina with 3 setae. Rostrum short, reaches the hind coxae; the segments III and IV brown, each with a pair of secondary setae; ultimate rostral segment (IV+V) about 1.85 times as long as wide at the base, about 0.6 times as long as the hind tarsus II; the segment V blackish, very short about 0.27 times as long as IV. Pronotum with about 20 setae which are somewhat capitate apices. Abdomen pale, smooth, with numerous small sclerites at the bases of dorsal setae, the sclerites sometimes fused with one another and with 2-3 setae; dorsal setae dark brown, slightly capitate apices; the segments VI and VII each with about 14-16 setae; VIII with a pair of large dorsal sclerites, each with about 5 capitate setae, the longest one about 0.077mm, and about 4.2 times as long as the basal diameter of antennal segment III; 7 spiracles placed on each side, no setae between spiracles. Cornicles ring like, surrounded a small cone which are smooth and no seta. Cauda pale brown, spinulose, rounded hind margin, with about 12 fine setae, 4 of which are stout and much longer, about 4.8 times as long as the basal diameter of antennal segment III. Genital plate dusky on the central part, almost smooth, with about 18 setae which are fine. Gonochaetae in 4 clusters each with about 2-4 setae. Legs dark, almost smooth; femoral setae stout, somewhat capitate apices, the longest one 0.83 times as long as the middle width of hind femur. Hind tibiae somewhat spinulose and imbricated on the distal parts; tibial setae stiff, somewhat capitate apices; distal part of tibiae with some short and pointed setae; the longest seta on hind tibiae about 1.9 times as long as the middle width of tibia. Hind tarsus I a little imbricated, dorsal side about 2.4 times as long as the basal width, with a pair of long capitate setae; ventral side about 4.2 times as long as the basal width, with about 8 setae, one of which is sensory seta; hind tarsus II imbricated, dorsal setae stiff and capitate apices, the longest seta about 1.57 times as long as its maximum width at middle; lateral

and ventral setae fine; empodial setae about 0.34 times as long as the claws.

Measurements of holotype in mm. Body length 1.852, width 0.75; width of head across eyes 0.382; antennae 1.044, antennal segments III-0.299, IV-0.153, V-0.219, VI-0.175 + 0.044; ultimate rostral segment 0.088; hind femur 0.691, hind tibia 1.088, hind tarsus 0.191; cornicle in diameter 0.029; cauda in length 0.074; dorsal setae on head 0.058-0.073, on abdominal tergite III 0.047-0.055, on abdominal tergite VIII 0.058-0.077.

Alate viviparous female (Figs. 1b, 2e-2j): In life, body reddish brown, faintly covered with white powder; antennae pale brown, but blackish on the distal parts of segments III-V and the middle part of VI; compound eyes dark red. When cleared, body pale; head, thorax, antennae, legs and abdominal dorsal spot dark brown. Head divided by a median line on anterior half, with 4 long setae on the frontal margin, 4-5 pairs of dorsal setae; venter of head with 5 pairs of setae which are dark brown and blunt or somewhat capitate apices, the longest one about 4.4 times as long as the basal diameter of antennal segment III. Front ocellus smaller than the dorsal ones. Antennae 6-segmented, about 0.57 times as long as body length; segment III with 4-5 sensoria and 12-19 setae; IV with 1-2 sensoria and 8 setae; primary sensoria large, somewhat protruding; accessory sensoria distinct and a little far apart from the primary sensorium; processus terminalis about 2.75 times as long as its basal width, with 5 setae on the apical part; the proportionate lengths of the segments about as follows: III -100, IV -56, V -72, VI -53 + 12. Clypeus with a pair of setae anteriorly, mandibular lamina with 3-4 setae which are stiff and pointed. Rostrum reaches to the middle coxae; ultimate segment pale brown, about 0.5 times as long as the hind tarsus II, with a pair of secondary setae. Pronotum smooth, with about 12 setae which are stiff and blunt apices. Abdomen pale with many small dark scleroites at the bases of dorsal setae which are stout, somewhat capitate or blunt apices; segments I-III each with 4-7 setae, IV-

VI each with 6-7 setae; VII with 8 setae; tergite VIII with a pair of dusky sclerites, each with 6 pointed setae which are stout, dark brown, about 0.073-0.095mm long, about 4-5.2 times as long as the basal diameter of antennal segment III. Cornicles ring like, about 0.037 mm in diameter. Cauda pale, semicircular, with 8-12 setae. Anal plate with about 23-25 setae. Genital plate dusky, sclerotized, a little larger than anal plate, with about 30 setae. Gonochaetae in 4 clusters, each with 2-5 setae. Wings hyaline; fore wings about 2.556 mm long, 0.828mm wide, pterostigma long, media indistinct and once forked; hind wing veins normal, humuli with 3 setae.

Measurements of one specimen in mm. Body length 1.962, width 0.666; antenna 1.179, III-0.378, IV-0.198, V-0.243, VI-0.189 + 0.054; ultimate rostral segment 0.072; hind femur 0.855, hind tibia 1.404, hind tarsus 0.189; cornicle in diameter 0.036; cauda in length 0.063; fore wing in length 2.556, hind wing 1.62.

Apterous oviparous female (Figs.1c, 2k): Similar to apterous viviparous female, but differs from the latter morph as follows: Antennae a little shorter, about 0.45-0.49 times as long as body length; proportionate lengths of the segments about as follows: III-100, IV-51, V-67, VI-56 + 14. Pronotum with about 13 setae; meso- and metapleura distinctly sclerotized. Hind tibiae darker, swollen, bearing about 50 scent plaques which are indistinct outlines; abdominal dorsal setae blunt or slightly capitate apices and a little shorter, about 0.062-0.077mm on anterior tergites; tergite VIII with about 16 setae which are blunt or pointed apices, the longest one about 0.084 mm and about 4.6 times as long as the basal diameter of antennal segment III. Genital plate rather large, faintly wrinkled, about 1.8 times as wide as long, with about 60 stiff setae. Cauda somewhat spinulose, with about 10 setae.

Measurements of one specimen in mm. Body length 2.16, width 0.882; width of head across eyes 0.432; antenna 0.972, III-0.288, IV-0.162, V-0.216, VI-0.18 + 0.036; ultimate rostral segment 0.09; hind femur 0.666, hind tibia

1.026, hind tarsus 0.216; cornicle in diameter 0.037; cauda in length 0.073; dorsal setae on head 0.084-0.102, on abdominal tergite III 0.077, on abdominal tergite VIII 0.084.

Male (Figs. 1d, 3a-3f): Aptera. Body reddish brown, faintly covered with white powder in life. Head blackish brown, with 4 setae on frontal margin, 4 pairs of dorsal setae, and 5 pairs of ventral setae, those setae are blunt apices, the longest one about 0.099mm and about 4.5 times as long as the basal diameter of antennal segment III. Antennae 6-segmented; segment III almost smooth, but distal part slightly imbricated, with 48-53 small circular sensoria and about 15 setae, longer seta on dorsal side stout, blunt or somewhat capitate apices, the longest one about 2.8 times as long as its basal diameter; segment IV with 22-30 sensoria; V with 19-20 secondary sensoria; basal part of VI with 5-7 secondary sensoria; processus terminalis about 2.3 times as long as the basal width, with 5 apical setae; proportionate lengths of segments: III-100, IV-56, V-72, VI-47 + 12. Clypeus with a pair of setae anteriorly; mandibular lamina with 4-5 fine setae. Rostrum reaches to the hind coxae; ultimate segment about 0.59 times as long as hind tarsus II, with a pair of secondary setae. Meso- and metapleura blackish, distinctly sclerotized; mesoscutum not developed, dorsal setae usually blunt apices. Hind femora almost smooth, with blackish long setae which are somewhat capitate apices, the longest one about 1.24 times as long as the width of femora; hind tibiae almost smooth, but slightly imbricated on distal small part, with many long setae which are somewhat capitate apices on the outer side, but those on inner side with acuminate apices; the longest one about 2.6 times as long as the middle width of tibia; dorsal side of hind tarsus I about 2.4 times as long as the basal width; ventral side of the segment about 3.69 times as long as the basal width, with about 10 setae, one of which is sensory seta; hind tarsus II imbricated, about twice as long as the segment I, with 3 setae on dorsal side, two of which are capitate apices, about 1.54 times as

long as the middle diameter of the segment; empodial setae about 0.416mm long, about 0.26 times as long as the claws. Abdomen with dorsal scleroites, each of which has a long seta, tergite III with 13 setae, the longest one about 0.07 mm; V with 8 setae between cornicles; VI with 11 setae; VII with 12 setae; tergite VIII with a pair of large blackish sclerites, with 10 setae which are blunt or slightly capitate apices, the longest one about 4.8 times as long as the basal width of antennal segment III.

Measurements of one specimen in mm. Body length 1.584, width 0.54; antennae 1.332, III-0.414, IV-0.216, V-0.288, VI-0.198 + 0.036; ultimate rostral segment 0.09; hind femur 0.612, hind tibia 0.954, hind tarsus 0.216; cornicle in diameter 0.029; cauda in length 0.051.

Type series. Holotype: Apterous viviparous female. Mt. Maeyama, Ise-shi, Mie-ken, Japan, 2. VIII. 2003, ex *Pinus densiflora*, M. Sorin leg. 03207. Paratypes: Many apterous and alate viviparous females, 4 males and many oviparous females collected at the same locality as the holotype, 21. XI. 2002, 2. VIII. 2003, 25. X. 2011, 14. XI. 2011, ex *Pinus densiflora*, M. Sorin leg. and Mt. kamiji, Ise-shi, Mie-ken, 21. XI. 2002, ex *Pinus densiflora*, M. Sorin leg. and Kôraibiro, Ise-shi, Mie-ken, 13. I. 2003, ex *Pinus densiflora*, M. Sorin leg.

Host plant. *Pinus densiflora*.

Distribution. Japan (Mie Pref. Honshû).

Etymology: The specific name is derived from the type locality, the forest of the Ise Jingu Shrine.

Remarks. This new species is allied to *Eulachnus agilis* (Kaltenbach, 1843), but is distinguished from the descriptions of the latter by Heie (1995) and Raychaudhuri (1980) in the following characteristics: (Aptera) Body color reddish brown in life (light green or grayish green in the latter); legs dark (pale in the latter); processus terminalis longer, about 0.25 times as long as the basal part of antennal segment VI (0.13-0.18 times in the latter). (Alata) Antennal segment III with sensoria (without sensoria in the latter).

(Male) Apterous; antennae with fewer sensoria; body smaller (Alata, body length 3.6mm in the latter).

Type depositories. The holotype and paratypes are deposited in the collections of the National Institute for Agro-Environmental Sciences, 3-1-3, Kannondai, Tsukuba-shi, Ibaraki-ken, 305-8604, Japan.

Eulachnus thunbergii (Wilson), 1919

Ghosh (1982) gives the detailed descriptions of the apterous and alate viviparous females. On my present specimens, the brief descriptions of the fundatrix, oviparous female and alate male are given below.

Fundatrix: Closely resembles the apterous viviparous female, but it is distinguished by the following aspects: The antennae shorter, about 0.79mm long; the legs shorter, about 0.95 mm long in fore legs and about 1.44mm long in hind legs; the genital palte with fewer, about 16-20 setae and the cauda with 8-9 setae. Body length 2.23-2.35 mm.

Oviparous female: Differs from the apterous viviparous female as following aspects: The antennae shorter, about 1.044mm long; the legs shorter, about 0.98mm long in fore legs and about 1.53mm long in hind legs; the hind tibiae with about 120 scent plaques; the genital plate larger, and with more, about 48 setae and the cauda with fewer, about 10 setae. Body length 2.23 mm.

Male: Alata. Antennae about 0.78 times as long as body length; segment III with about 91-118 secondary sensoria, IV with 39-45, V with 32-36, and the basal part of VI with 6-7; abdominal sternites VI and VII with distinct ventral bands. Body length 2.367 mm.

Specimens examined. 2 apterae and 3 larvae, Cape Shionomisaki, Wakayama Pref. 4. IV. 1958, M. Sorin leg. ex *Pinus thunbergii*; 13 larvae, Kuroyama, Osaka Pref. M. Sorin leg. ex *Pinus thunbergii*; 4 oviparous females, Hirao, Osaka Pref., 1. II. 1959, M. Sorin leg. ex *Pinus thunbergii*; 2

fundatrices, Hirao, Osaka Pref. 15. IV. 1960, M. Sorin leg. ex *Pinus thunbergii*; 3 apterae and 6 larvae, Ise, Mie Pref. 23. XI. 1980, M. Sorin leg. ex *Pinus thunbergii*; 1 aptera and 5 larvae, ditto, 1. V. 2003; 1 alata, ditto, 2. VIII. 2003, ex *Pinus densiflora*; 1 alate male and 5 larvae, Mt. Kamiji, Ise, Mie Pref., 21. XI. 2004, M. Sorin leg. ex *Pinus densiflora*; 1 alata, Mt. Maeyama, Ise, Mie Pref., 25. X. 2011, M. Sorin leg. ex *Pinus densiflora*.

Remarks. Japanese specimens differs from the descriptions of this species by Ghosh (1982) in the following characteristics: (Apterae) The body smaller, 2.23-2.25mm long (2.38-3.10mm long in the latter); the setae on body a little shorter; the processus terminalis a little shorter; and the ultimate rostral segment a little longer, about 0.62 times as long as hind tarsus II ($0.57-0.59 \times$ in the latter). (Alatae) Body smaller, 1.88mm long (2.73-3.18mm long in the latter); antennae shorter, 1.01mm long (1.3-1.66mm long in the latter); the sensoria on antennal segment III fewer, one sensorium (2-5 in the latter); the longest seta on antennal segment III shorter, about 0.088mm (0.115-0.13mm in the latter); the tibial setae much shorter, about 0.099mm long (0.163-0.181mm long in the latter) and the processus terminalis a little shorter, about 0.15 times as long as basal part of antennal segment VI ($0.2-0.22 \times$ in the latter).

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