

Two New Records of the Genus *Arboridia* Zachvatkin (Hemiptera: Auchenorrhyncha: Cicadellidae: Typhlocybinae) from Korea

Sumin Oh, Il-Kwon Kim¹, Ki-Kyeong Kim², Hong-Yul Seo², Joon-Seok Chae³ and Sunghoon Jung*

Laboratory of Systematic Entomology, Department of Applied Biology, College of Agriculture and Life Sciences, Chungnam National University, Daejeon 305-764, Korea.

¹Division of Forest Biodiversity, Korea National Arboretum, Pocheon 487-829, Korea

²National Institute of Biological Resources, Environmental Research Complex, Incheon 404-708, Korea

³Laboratory of Veterinary Internal Medicine, BK21 PLUS Program for Creative Veterinary Science Research, Research Institute for Veterinary Science and Colleague of Veterinary Medicine, Seoul National University, Seoul 151-742, Korea

한국산 두점박이애매미총속 (노린재목: 매미총과: 애매미총아과)의 한국 미기록 2종의 기재

오수민 · 김일권¹ · 김기경² · 서홍렬² · 채준석³ · 정성훈*

대전광역시 충남대학교 농업생명과학대학 농생물학과 곤충분류학실험실, ¹경기도 포천시 국립수목원 산림생물조사과,

²인천광역시 국립생물자원관 동물자원과, ³서울특별시 서울대학교 수의과대학 수의내과학교실

ABSTRACT: Two newly recorded species of the genus *Arboridia* Zachvatkin (Hemiptera: Auchenorrhyncha: Cicadellidae: Typhlocybinae) from Korea are reported, which are *Arboridia lunula* Song & Li, 2013 and *Arboridia agrillacea* (Anufriev, 1969). Photographs of dorsal habitus, illustrations of male genitalia, abdomens and forewings and distributional records are provided. In addition, a key to the Korean *Arboridia* species is also given.

Key words: Hemiptera, Typhlocybinae, *Arboridia*, New records

조 록: *Arboridia*(두점박이애매미총) 속(노린재목: 매미아목: 매미총과: 애매미총아과)의 국내 미기록 2종인 *Arboridia lunula* Song & Li, 2013 와 *Arboridia agrillacea* (Anufriev, 1969)을 기록한다. 성충의 사진과 함께 수컷의 생식기와 복부, 날개의 그림과 채집기록을 기재한다. 또한 국내 *Arboridia* 속의 검색표를 제공한다.

검색어: 노린재목, 애매미총아과, *Arboridia*, 미기록종

The genus *Arboridia* Zachvatkin, 1946 belongs to the tribe Erythroneurini of subfamily Typhlocybinae (Hemiptera: Auchenorrhyncha: Cicadellidae). Some members of the genus *Arboridia* are known as grape pests in the world as well as in Korea, and most of them have been also known as pests on cherry, hawthorn, pear, peach, apple, mulberry, maple, woodbine, dogwood,

and several other plants (Song & Li, 2013). A total of 69 valid species have been described in the Palearctic and Oriental regions (Song & Li, 2013). So far, eight species of this genus have been recorded in the Korean Peninsula (Kwon & Huh 2001).

In this study, two new records of the genus from the Korean Peninsula are reported, and descriptions, genital illustrations and dorsal habitus of the species with a key to the Korean *Arboridia* species are presented. The specimens used for this study are stored at Laboratory of Systematic Entomology, Chungnam National University, Daejeon, Korea. The genital segments

*Corresponding author: jung@cnu.ac.kr

Received October 2 2014; Revised January 30 2015

Accepted February 11 2015

were detached from abdomen and macerated 10% KOH for about 60 min for dissection to examine male genitalia.

Taxonomic accounts

Arboridia Zachvatkin, 1946

Arboridia Zachvatkin, 1946: 153 (Type species: *Typhlocyba parvula* Boheman, 1845)

Khoduma Dworakowska, 1972: 403 (Type species: *Khoduma jacobii* Dworakowska, 1972)

Diagnoses

The genus *Arboridia* can be identified by vertex with one or two pair of dark spots, and style apex with 3 points. Pronotum without conspicuous pits. Abdominal apodemes small and pygofer lobes without thick bristles. Subgenital plates have one group bristles at the middles of outer margin.

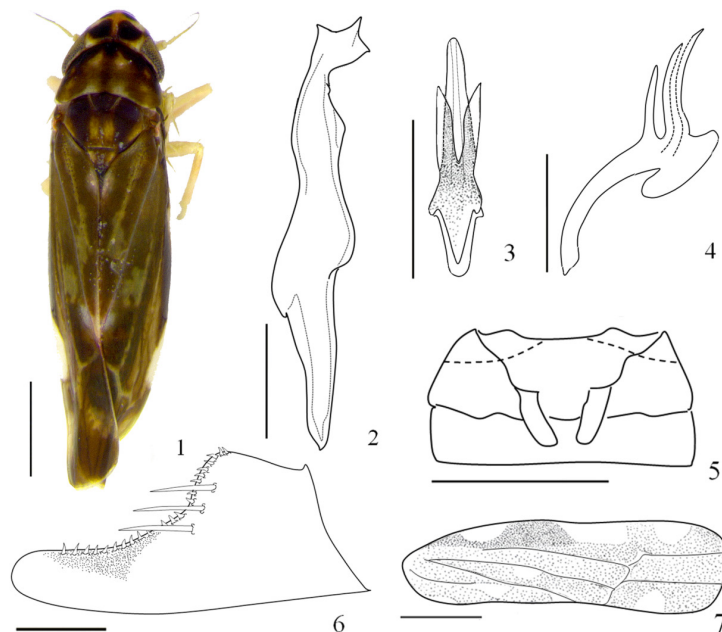
Key to the *Arboridia* species in the Korean Peninsula.

1. Vertex with 4 black spots *A. lumula*
- Vertex without 4 black spots, with 2 black spots 2
2. Forewings with white round patterns. Pronotum anterior margin with one black spot 3

- Forewings without white round patterns. Pronotum anterior margin without one black spot 6
3. Face with one black spot above each antennal pit
..... *A. nigrigena*
- Face without black spot above antennal pit 4
4. Process of pygofer with two points 5
- Process of pygofer with one point *A. koreacola*
5. Vertex of face with black spot *A. maculifrons*
- Vertex of face without black spot *A. okamotonis*
6. Aedeagus with teeth at apex 7
- Aedeagus without teeth at apex 8
7. Aedeagus with process arising from base *A. suzukii*
- Aedeagus without process arising from base *A. silvarum*
8. Process of pygofer lobes long and reaching lower margin of pygofer lobes *A. apicalis*
- Process of pygofer lobes short and not reaching lower margin of pygofer lobes 9
9. Aedeagus apex V - shape *A. kakogawana*
- Aedeagus apex crater - shape *A. agrillacea*

Arboridia (Arboridia) lumula Song & Li, 2013 네눈박이에매미충 (신칭) (Figs. 1-7)

Arboridia lumula Song & Li, 2013: 234



Figs. 1-7. *Arboridia lumula* Song & Li, 2013 1. Habitus. 2. Style. 3. Aedeagus, caudal view. 4. Aedeagus, lateral view. 5. Abdominal apodemes. 6. Subgenital plate. 7. Forewing. Scales: 0.5 mm (1,5,7), 0.1 mm (2-4,6).

Description. Vertex yellow, with 2 pair black spot. One pair small and near anterior margin, another pair large and near posterior margin. Eye grayish black. Pronotum with 4-6 light spots and rest color almost dark brown. Face yellow, with antennal pits and frontoclypeal suture dark brown. Scutellum brown with 2 black triangles. Forewing with several light brown and brown stripes (Figs. 1, 7). Legs yellow without patterns. Abdomen generally dark brown or yellow with dark brown margin. Male abdominal apodemes narrow, extended to half of sternite iv (Fig. 5). **Male genitalia:** Pygofer lobe widely rounded anterior margin and posterior margin flat without macrosetae. Subgenital plate smooth curve from apex to starting point, with 3 macrosetae at the middle of outer margin and row of microsetae under subbase to apex (Fig. 6). Style apex with 3 points (Fig. 2), subequal in size. Aedeagus with pair of long process (Fig. 3). Aedeagus curved dorsally in lateral view (Fig. 4).

Measurements. Body length including forewings male 2.7~2.9 mm, female 2.8 mm.

Specimens examined. [CNU] 1♂, Korea, Osan, Mulhaynggi Arboretum, 01.ix.2009; [CNU] 1♂ 1♀, Korea, Pocheon, KNA, 06.v.2011.

Host plants. Unknown.

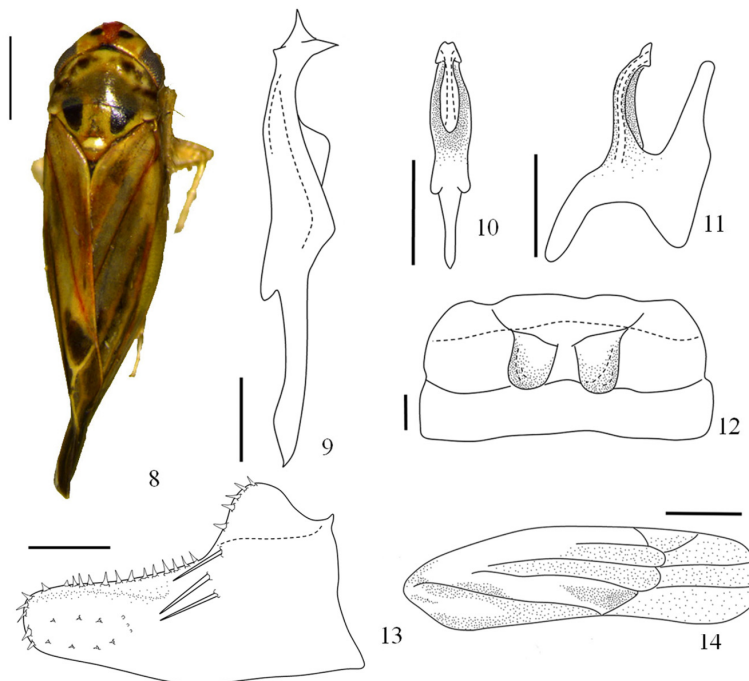
Distributions. China (Guizhou); Korea (Pochen, Osan).

Arboridia agrillacea (Anufriev, 1969) 광릉애매미충 (신칭)
(Figs. 8-14)

Erythroneura agrillacea Anufriev, 1969: 182

Arboridia agrillacea Anufriev, 1978: 87

Description. Vertex light yellow with pair of dark spots medially. Eye bright black. Pronotum anterior margin light brown-yellow, with two small brown spots and scattered small brown spots. Face yellow and postclypeus dark brown, anteclypeus brown-yellow. Vertex of face with pair of light spots. Scutellum yellow with black triangles. Forewing almost brown-yellow with brown stripes (Figs. 8, 14). Leg light yellow without pattern. Abdomen brown with yellow strips. Male abdominal apodemes short and wide. Slightly extended to sternite iv (Fig. 12). **Male genitalia:** Pygofer lobe wide parallel anterior margin and posterior margin without macrosetae. Subgenital plate starting point protruded, with 3 macrosetae at the middle of outer margin and row of microsetae from sub-base to apex. Basal end wide, narrow gradually apex (Fig. 13). Style apex with 3 points (Fig. 9), first and second point large. Aedeagus



Figs. 8-14. *Arboridia agrillacea* (Anufriev, 1969) 8. Habitus. 9. Style. 10. Aedeagus, caudal view. 11. Aedeagus, lateral view. 12. Abdominal apodemes. 13. Subgenital plate. 14. Forewing. Scales: 0.5 mm (8, 14), 0.1 mm (9-13).

with head and apex grooved (Fig. 10). Aedaegus curved askew in lateral view (Fig. 11).

Measurement. Body length including forewings male 2.7 mm, female 2.8 mm.

Specimens examined. [CNU] 1♂ 1♀, Korea, Pocheon, KNA, 05.ix.2011.

Host plants. Unknown.

Distributions. Russia (Maritime Territory); China (Sichua, Henan, Guizhou, Shaanxi); Korea (Pocheon).

Acknowledgements

We thank Prof. S. Kamitani and Prof. T. Hirowatari (Kyushu University, Japan) for allowing us to examine the specimens deposited in the collections of Kyushu University. Additionally, Entomology Lab. members (Dr. N. Ohara and Mr. Kim) of Kyushu University kindly helped us to examine specimens. This work was supported by a grant from the National Institute of Biological Resources (NIBR), funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR No. 2014-02-001).

Literature Cited

- Anufriev, G.A., 1969. New and little known leaf-hoppers of the subfamily Typhlocybinae from the Soviet Maritime Territory (Homopt., Auchenorrhyncha). *Acta Faunistica Entomologica Musei Nationalis Pragae* 13, 163-190.
- Anufriev, G.A., 1978. Les cicadellides de le Territoire Maritime. *Horae Soc. Entomol. Unionis Sovieticae* 60, 1-215.
- Boheman, C.H., 1845. Nya Svenska Homoptera. *Ofversigt af Kongliga Svenska Vetenskaps-Akademiens Förhandlingar* 1, 154-164.
- Dworakowska, I., 1972. On some oriental Erythroneurini (Auchenorrhyncha, Cicadellidae, Typhlocybinae). *Bull. Acad. Polonaise Sci. (Biol.)* 20, 395-405.
- Kwon, Y.J., Huh, E.Y., 2001. HOMOPTERA (Suborder Auchenorrhyncha), National Institute of Agricultural Science and Technology, Suwon.
- Song, Y.H., Li, Z.Z., 2013. Some new species and new record of the genus *Arboridia* Zachvatkin (Homoptera: Cicadellidae: Typhlocybinae) from six provinces of China. *Zootaxa* 3613, 229-244.
- Zachvatkin, A.A., 1946. Studies on the Homoptera of Turkey. I-VII. *Trans. R. Entomol. Soc. London.* 97, 149-176.