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New Genus of the Tribe Deltocephalini (Hemiptera: Cicadellidae: Deltocephalinae) from Japan, with Description of a New Species

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Abstract. A new genus, *Syzygonella* gen. nov., and a new species, *S. esakii* sp. nov., of the tribe Deltocephalini are described and illustrated, based on the material from the Ryukyus, Japan. This new genus is similar to the genus *Alobaldia* in morphology of the aedeagus, connective, and male abdominal segment X.

Key words: Auchenorrhyncha, grassland, Ryukyus, taxonomy.

Introduction

The tribe Deltocephalini in the Palearctic, Oriental, and Afrotropical regions are revised and classified into 16 genera (Webb and Viraktamath 2009). These are characterized by the following four features: aedeagus and connective fused, linear connective, fully membranous male abdominal segment X (Kamitani 1999), and long apodeme of style articulating connective. In this study, we are able to recognize a new genus from Japan, which has unique morphology in the male genitalia. This genus described below is comprising a new species collected from grassland.

Material and method

Material used in this study, including the holotype, is deposited in the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan (ELKU) and the Ryukyu University Museum (Fujukan), University of the Ryukyus, Okinawa, Japan (RUMF). Morphological terminology follows Dietrich (2005). The body length is measured from apex of crown to tip of forewing. For the dissection to examine details, the entire abdomens removed from the specimens were cleared in 10 % KOH solution with chlorazol black E added for staining, heated in water bath for 10 minutes. Cleared material was rinsed in pure water, and then stored in glycerin. Digital

photographs were taken with a Canon Rebel T4i digital SLR camera mounted on Olympus SZX12 and Olympus BX50 stereo microscopes and with a Canon M50 digital SLR camera configured with MP-E65mm F2.8 1–5× lense. Photographs were modified with Adobe Photoshop CS.

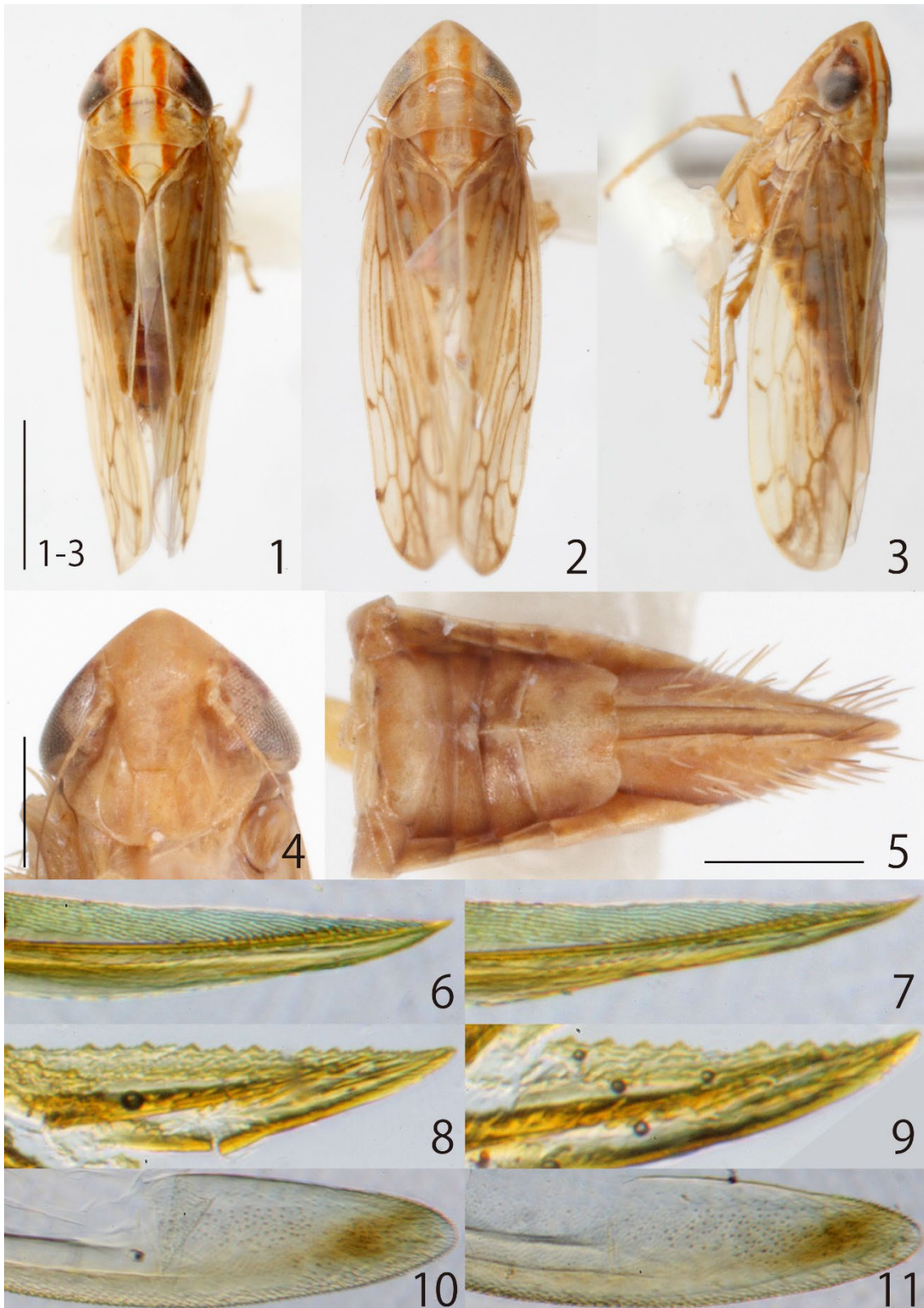
Syzygonella gen. nov.

ZooBank taxon

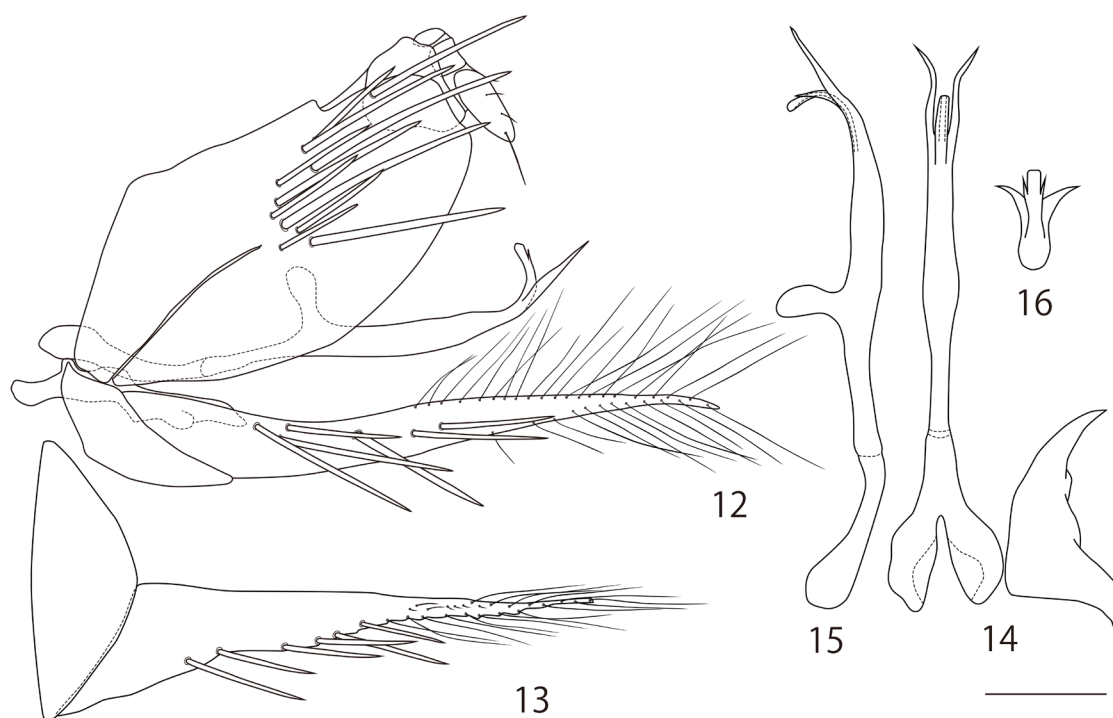
LSID:zoobank.org:act:320AC6CE-6918-4FCD-B364-CB0295DCCE47

Type species: *Syzygonella esakii* sp. nov.

Body robust. Head slightly wider than pronotum; crown depressed; anterior margin angulate in dorsal view; ocellus small, located on anterior margin, apart from eyes shorter than own diameter. Face moderately convex; area between lateral frontal suture and eye not narrowed from antennal pit to crown margin; antenna longer than head width; anteclypeus distinctly tapered at base, but parallel-sided through most of length; lorum long, almost as wide as anteclypeus, expanded very close to margin of face. Pronotum with lateral margin short. Macropterous form in both sexes. Forewing with 3 antepical cells and appendix very narrow. Front femur row AV with 12 short stout setae in basal half; row IC with 11 setae. Front tibia dorsal macrosetae 2. Hind femur macrosetal formula 2 + 2 + 1. Hind tibial rows PD, AD and AV with 9, 9 and 14 macrosetae,



FIGURES 1–11. *Syzygonella esakii* sp. nov. 1, Habitus of male holotype in dorsal view; 2, habitus of female paratype in dorsal view; 3, habitus of holotype in lateral view; 4, face; 5, female abdomen in ventral view; 6–7, valvula I; 8–9, valvula II, 10–11, valvula III; 6, 8, 10, right valvulae; 7, 9, 11, left valvulae. Scales: 1 mm (1–3), 0.5 mm (4–5).



FIGURES 12–16. *Syzygonella esakii* sp. nov. 12, Genital capsule in lateral view; 13, valve and subgenital plate; 14, style, connective and aedeagus in dorsal view; 15, connective and aedeagus in lateral view; 16, aedeagus in posterior view. Scale: 0.1 mm.

respectively; AD with 1–3 short, stout setae between successive macrosetae. Hind tarsomere I with 2 plantar rows of stout setae.

Male genitalia. Pygofer well sclerotized dorsally in basal half; lobe without processes, with 11 long macrosetae on distal half. Abdominal segment X short and weakly sclerotized, with no processes. Valve subtriangular, wider than long, posterior margin bluntly angulate. Subgenital plate slender, ca. 4 times as long as wide, with 6 macrosetae arranged in uniseriate lateral row and numerous hair-like setae in apical half. Style with very short apodeme articulating connective; preapical lobe not distinct; apophysis weakly arched and pointed. Connective Y-shaped, much shorter than aedeagus. Aedeagus with distinct dorsal apodeme on basal 1/4; shaft tubular, strongly curved dorsad near apex, with pair of minute subapical processes and pair of long paraphyses; gonopore apical on ventral surface.

Female. Abdominal sternite VII rectangular, with posterior margin sinuate, weakly produced posteriad at middle and each side (Fig. 5). Valvula I dorsal sculpturing striped (Figs 6, 7). Valvula II attenuated apically, with sclerotized

teeth in distal half, without secondary denticles (Figs 8, 9). Valvula III with very short setae in distal half.

Distribution. Japan.

Diagnosis. This new genus has the fused aedeagus and connective, which is the most important taxonomic feature of the tribe Deltocephalini. Therefore, we classify the new taxon as a genus of Deltocephalini. It is similar to *Alobaldia* Emeljanov, 1972 in having the distinct apical paraphyses of aedeagus, but differs in having the slender subgenital plate, Y-shaped connective, and small subapical processes of aedeagal shaft. Although it is similar to *Scaphoideus* Uhler, 1889 in having the Y-shaped connective and short style arms, it is easily discriminated by the fused aedeagus and connective (Viraktamath and Mohan 2004, Kamitani and Hayashi 2013, Freytag 2017, Wen *et al.* 2017).

Etymology. This genus is feminine in gender. It is referring to the paired long paraphyses of aedeagus and derived from two Greek words: syzygos (paired) + -nella (diminutive suffix).

***Syzygonella esakii* sp. nov.**

(Figs 1–16)

ZooBank taxon

LSID:zoobank.org:pub:840F40FB-6461-4A5B-88E8-C19431D0649C

Head beige to pale brown, with pair of longitudinal vermilion stripes; eyes darkened; face immaculate. Thorax beige to pale brown; pronotum and mesonotum with pair of longitudinal vermilion red stripes. Forewing transparent, with brown veins. Abdomen pale brown; male pygofer pale brown, with subgenital plate yellowish white; ovipositor pale brown.

Head 1.2 times as wide as pronotum; vertex 1.2 times as wide as dorsal mid length, 1.3 times as long as next to eye, 1.1 times as long as pronotum. Pronotum 2.3 times as wide as long. Forewing macropterous, with five apical and three antepical cells; central antepical cell closed basally; appendix narrow.

Body length (holotype, range): ♂ 3.6 mm, 3.5–3.7 mm; ♀ 3.6–3.9 mm.

Male genitalia. Pygofer not truncate caudally. Subgenital plate slender, membranous in apical half with numerous hair-like setae. Style stout, with very short apodeme; apophysis curved laterally. Connective Y-shaped, fused to aedeagus; arms well developed, as long as stem. Aedeagus with tubular shaft strongly curved dorsad, with pair of short subapical processes and pair of long paraphyses; gonopore apical.

Female. Abdominal sternite VII rectangular; posterior margin weakly produced posteriad at middle and each side (Fig. 5). Valvula almost same in right and left; valvula I gradually tapered and pointed; valvula II straight dorsally, with 13 sclerotized teeth in apical half.

Type material. Holotype: ♂, Mt. Kâra-dake / Ishigaki Is. / Ryukyus, Japan / 23. II. 2010 / M. Hayashi *et al.* (ELKU). **Paratypes:** 1♂ 1♀, same data as holotype (ELKU); 1♂, same data except 11. VI. 2008 (ELKU); 2♂ 1♀, same data except 11. XI. 2008 (1♂ in ELKU, 1♂ 1♀ in RUMF); 1♀, Mt. Yarabu-dake / Ishigaki Is. / 25. VI. 2004 (light trap) / M. Hayashi (ELKU).

Distribution. Japan (Ryukyus: Ishigaki Is.)

Remarks. This new species is similar to *Alobaldia tobae* (Matsumura, 1902) in the paired paraphyses of aedeagus, but is easily distinguishable by the elongate subgenital plate, Y-shaped connective, and small apical processes of aedeagal shaft. It is also similar to

Scaphoideus rubrogutattus Matsumura, 1914 in the habitus having vermilion stripes on mesonotum, but differs in the markings on vertex and pronotum and morphology of the male genitalia. *Syzygonella esakii* sp. nov. has been found only from two narrow areas on Ishigaki Is., and it may inhabit poaceous grasslands in Mt. Kâra-dake, northeastern Ishigaki Is.; entire specimens were collected by an engine aspirator (engine vacuum) among herbaceous vegetation near the ground.

Etymology. This species name is dedicated to the late Prof. Teiso Esaki, who is the first professor of the Entomological Laboratory, Faculty of Agriculture, Kyushu University.

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