



<http://dx.doi.org/10.11646/zootaxa.3750.5.5>

<http://zoobank.org/urn:lsid:zoobank.org:pub:68329017-1153-45E5-B3EE-AE8709A5E69B>

Taxonomic study of the genus *Scaphoideus* Uhler (Hemiptera, Cicadellidae, Deltocephalinae) from Japan

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Abstract

The Japanese species of the genus *Scaphoideus* are revised. Eight species are recognized from Japan, including four new species: *S. ryukyuensis* **sp. nov.** from the Ryukyus, *S. pristiophorus* **sp. nov.** from Honshu and Kyushu, *S. aurantius* **sp. nov.** from the Ryukyus and *S. brevistylus* **sp. nov.** from Honshu, Kyushu and the Ryukyus.

Key words: Auchenorrhyncha, new species, taxonomy, morphology

Introduction

The genus *Scaphoideus* Uhler is distributed in the Holarctic, Oriental and Afrotropic Regions, and comprises about 160 species (Kitbamroong & Freytag 1978; Li *et al.* 2011; Li & Wang 2002; Viraktamath & Mohan 2004; Webb & Viraktamath 2007).

The Japanese species of *Scaphoideus* are generally characterized by the presence of a pair of large processes on the connective. Four species have been recorded from Japan: *S. albovittatus* Matsumura, *S. kumamotonis* Matsumura, *S. festivus* Matsumura and *S. rubroguttatus* Matsumura.

In the text, the following abbreviations are used for the repositories of the material examined: Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka (ELKU); Natural Resources Inventory Center, National Institute for Agro-Environmental Sciences, Tsukuba (NIAES); Department of Biology, Faculty of Education, Saitama University, Saitama (SUU).

Scaphoideus albovittatus Matsumura, 1913

(Figs. 1, 9–15)

Scaphoideus albovittatus Matsumura, 1913: 68.

Description. *Coloration & external morphology.* Head slightly narrower than pronotum; vertex roundly prominent, pale yellow without black spot at apex, with pair of small black spots near ocelli and pair of large black spots near ocelli; medial length of vertex 1.2 times as long as length next to eyes and half as long as width of head; frontoclypeus pale yellow with narrow blackish stripe and wide blackish band near anterior margin; clypellus and lorum pale yellow and immaculate; gena pale yellow with small blackish marking below antenna. Pronotum 2.1 times as wide as long, slightly longer than mesonotum, brown with wide longitudinal pale stripe and 2 pairs of blackish spots anteriorly; pale stripe of pronotum with pair of brownish small spots anteriorly; mesonotum brown with longitudinal pale stripe and pair of brownish spots medially. Fore wing pale yellowish semitransparent; ventral surface of thorax, legs and abdominal segments pale yellow. Caudal margin of female 7th abdominal sternite slightly produced caudally and incised medially.

Type material. *Holotype*: ♂, (ELKU No. 3323), Anbô / Yodogô, Yakushima Is., Kagoshima Pref., Kyushu, Japan, 27. VIII. 2004 (light trap), S. Kamitani. *Paratypes*: [Honshu] 1♀, Osugi, Tanabe, Wakayama Pref., 13. IX. 1989, S. Goto (SUU). [Kyushu] 11♂ 20♀, same data as holotype. [Ryukyus] 3♀, Shinmura, Sumiyô, Amami-Oshima Is., 18. VII. 1993 (light trap), M. Hayashi *et al.* (SUU); 1♀, Arangachi, Uken, Amami-Oshima Is., 21. V. 1993 (light trap), M. Hayashi *et al.* (SUU); 1♀, Kominato, Naze, Amami-Oshima Is., 19. V. 1993, M. Hayashi *et al.* (SUU); 2♂, Kinsakubaru, Naze, Amami-Oshima, 18. V. 1993 (light trap), M. Hayashi *et al.* (SUU); 2♀, same locality, 19. V. 1993, M. Hayashi *et al.* (SUU); 1♂, Mt. Nishime-dake, Kunigami, Okinawa Is., 15. V. 1993, M. Hayashi *et al.* (SUU); 33♂, Mt. Terukubi, Kunigami, Okinawa Is., 4. V. 1991, M. Hayashi *et al.* (SUU); 4♂ 1♀, same data except 5. V. 1991; 1♂ 2♀; same data except 18. VI. 1994; 3♂ 3♀, same locality, 15. V. 1993 (light trap), M. Hayashi *et al.* (SUU); 3♀, same data except 4. VII. 1993; 4♀, same data except 1. VII. 1996; 1♀, Hiji, Kunigami, Okinawa Is., 15. V. 1993, M. Hayashi *et al.* (SUU); 1♂, Mt. Oppa-dake, Nakijin, Okinawa Is., 7. IV. 1991, M. Hayashi *et al.* (SUU); 1♂, Mt. Yonaha-dake, Kunigami, Okinawa Is., 28. VI. 1992, M. Hayashi *et al.* (SUU); 4♂ 2♀, same data except 15. V. 1993; 3♂ 2♀, Yona, Kunigami, Okinawa Is., 4. IV. 1991, M. Hayashi *et al.* (SUU); 4♂ 1♀, same data except 5. IV. 1991; 4♂, same locality, 14. IV. 1996, M. Hayashi *et al.* (SUU); 1♂, Mt. Yae-dake, Motobu, Okinawa Is., 1. V. 1991, M. Hayashi *et al.* (SUU); 1♂, Kyoda, Nago, Okinawa Is., 30. IV. 1991 (light trap), M. Hayashi *et al.* (SUU); 1♂, Ôura, Nago, Okinawa Is., 2. V. 1991, M. Hayashi *et al.* (SUU); 1♂ 1♀, Mt. Omoto, Ishigaki Is., 6. V. 1991 (light trap), M. Hayashi *et al.* (SUU); 2♂ 7♀, same locality, 7. V. 1993, M. Hayashi *et al.* (SUU). The holotype is deposited in the Kyushu University, Japan (ELKU).

Distribution. Japan (Honshu, Kyushu, Ryukyus).

Remarks. This widespread species has been confused with *S. festivus* Matsumura, because the coloration is very similar. However, it is easily distinguished by the parallel-sided processes of the connective. The apophysis of the style is distinctly shorter than that of the preceding species, *S. aurantius* sp. nov. The etymology of this species name is based on the small style of the male genitalia.

Key to Japanese species of the genus *Scaphoideus*

1. Vertex pale yellow with pair of blackish spots; pronotum brown with wide longitudinal pale stripe; aedeagal shaft long to rather short. 2
- Vertex orange to brown band between eyes; pronotum brownish orange to brown without longitudinal stripe; aedeagal shaft short. 4
2. Aedeagal shaft rather short and wide, hooked dorsad in lateral view; style with long apodeme *S. albovittatus*
- Aedeagal shaft slender, with pair of apical processes and usually with pair of subapical processes; style with short apodeme . 3
3. Aedeagus with apical processes directed dorsally; style small; connective with processes widest at apical half *S. kumamotonis*
- Aedeagus with apical processes directed ventrally; style large; connective with processes narrow *S. ryukyensis* sp. nov.
4. Pronotum and mesonotum pale yellow, with longitudinal orange stripes. *S. rubroguttatus*
- Pronotum brown uniformly brownish orange to brown 5
5. Processes of connective distinctly widest at apical 1/3. *S. festivus*
- Processes of connective not distinctly widened preapically 6
6. Processes of connective slightly widest at apical 1/4 and serrate at outer margin *S. pristiophorus* sp. nov.
- Processes of connective not widened and without serration on outer margin. 7
7. Apophysis of style long. *S. aurantius* sp. nov.
- Apophysis of style very short *S. brevistylus* sp. nov.

Acknowledgement

We wish to express our cordial thanks to Dr Paul H. Freytag (University of Kentucky) for his valuable information and continuous help.

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