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New synonymy of *Trissolcus halyomorphae* Yang

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Abstract

Trissolcus halyomorphae Yang **syn. n.** is treated as a junior synonym following examination of the holotype of *T. japonicus* (Ashmead).

Keywords

Halyomorpha halys, *Trissolcus japonicus*, *Trissolcus halyomorphae*, brown marmorated stink bug

Introduction

Halyomorpha halys (Stål) (Hemiptera: Pentatomidae), commonly called the brown marmorated stink bug, is a polyphagous invasive pest in the Mid-Atlantic United States and is recorded from 39 of the 48 contiguous states (Carter and Hoebeke 2003, Leskey et al. 2012). It has also become established in Switzerland (Wermelinger et al. 2008) and has been intercepted in New Zealand (Harris 2010). The distribution and abundance of this insect in both North America and Europe are expected to grow (Zhu et al. 2012), drawing increased attention to the need for management strategies, including biological control. Multiple species of egg parasitoid wasps in the genus *Trissolcus* (Hymenoptera: Platygastridae) are currently the subject of a biological control study by the Beneficial Insects & Introduction Unit (Newark, Delaware; USDA-ARS) for use against *H. halys*.

Yang et al. (2009) published a description of a new species, *Trissolcus halyomorphae* (Hymenoptera: Platygastridae), reared from the eggs of *H. halys* in Northeastern China and provided information on its biology. Their diagnosis indicated that *T. halyomorphae* and *T. japonicus* were similar species and that the two could be separated by multiple characters. However, it appears that they did not examine the holotype of *T. japonicus*, and the specimens that formed the basis of their comparison must belong to a species other than *T. japonicus* with characters similar to those of *T. flavipes* (Thomson).

Examination of the holotype of *T. japonicus* revealed that the characters attributed to this species by Yang et al. (2009) are not present, and that *T. japonicus* and *T. halyomorphae* are conspecific. Specifically, in the holotype of *T. japonicus* the femora are not concolorous with the remainder of the legs, the antennal scrobe does not have rugulae that extend to the median ocellus, the posterior ocellus is separate from the inner orbit of the eye by less than one ocellar diameter, the orbits of the eyes (orbital furrows) are expanded ventrally, and the notaulus does not curve outward anteriorly.

Numerous attempts to borrow the holotype of *T. halyomorphae* were unsuccessful but we did procure two paratype females. These specimens, coupled with the images and description of Yang et al., enable us to confidently treat *T. halyomorphae* as a junior synonym of *T. japonicus.* We present this synonymy as a prelude to a full scale taxonomic revision of the Asian species of *Trissolcus* and to minimize confusion by eliminating future use of the name *T. halyomorphae* in literature regarding the biology of this species and its efficacy as a biological control agent.

The contributions of the authors are as follows: E.J. Talamas: species concept development, imaging, manuscript preparation; M. Buffington: manuscript preparation; K. Hoelmer: acquisition of paratype specimens.

Materials and methods

The locality data reported for primary types are not literal transcriptions of the labels: some abbreviations are expanded; additional data from the collectors are also included. The numbers prefixed with "USNM ENT" or "USNM Type No." are unique identifiers for the individual specimens (note the blank space after the acronyms). Details on the data associated with these specimens may be accessed at the following link, purl.oclc.org/NET/hymenoptera/hol, and entering the identifier in the form. The taxonomic synopsis was generated by the Hymenoptera Online Database (hol.osu.edu).

Images were produced using Combine ZP and Cartograph extended-focus software. Full resolution images are archived at the image database at The Ohio State University (purl.oclc.org/NET/hymenoptera/specimage), MorphBank (www.morphbank.net), and Hymenoptera Holotypes of the Smithsonian Institution (usnmhymtypes.com).

Figures 1–3. *Trissolcus japonicus*, holotype female (usnm type no. 7127) **1** Head, anterior view **2** lateral habitus **3** dorsal habitus. Scale bars in millimeters.

Taxonomic part

Trissolcus japonicus (Ashmead)

urn:lsid:biosci.ohio-state.edu:osuc_concepts:3249
http://species-id.net/wiki/Trissolcus_japonicus

Dissolcus japonicus Ashmead, 1904: 73 (original description); Kieffer 1926: 124, 125 (description, keyed).

Asolcus plautiae Watanabe, 1954: 18, 22 (original description, keyed, synonymized by Hirashima and Yamagishi (1981)).

Trissolcus japonicus (Ashmead): Masner and Muesebeck 1968: 72 (type information, generic transfer); Hirashima and Yamagishi 1981: 153 (description, synonymy); Ryu and Hirashima 1984: 37, 43 (description, keyed).

Trissolcus plautiae (Watanabe): Kozlov 1968: 198 (keyed); Kozlov and Lê 1976: 658 (keyed); Kozlov and Lê 1977: 504 (keyed); Kozlov 1978: 629 (description); Hirashima and Yamagishi 1981: 153 (junior synonym of *Trissolcus japonicus*

(Ashmead)); Kozlov and Kononova 1983: 86 (description); Kononova 1995: 92 (keyed).

Trissolcus halyomorphae Yang, 2009: 40 (original description). **syn. n.**

Material examined. Holotype, female, *Dissolcus japonicus*: **JAPAN**: Kanagawa Pref., Ashigarashimo Dist., Hakone Town, Koebele, USNM Type No. 7127 (deposited in USNM). *Other material*: 2 paratype females of *Trissolcus halyomorphae,* **CHINA**: Xiangshan, Beijing 7-VIII-2001, reared from eggs of *Halyomorpha halys*, Yang, Z.-Q. Leg. USNM ENT 00872401-00872402 (USNM)

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Endnotes

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