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Bees of the *Lasioglossum* series (Hymenoptera: Halictidae) in South Korea, with an illustrated keys to species

RYUKI MURAO^{1,3}, HEUNG-SIK LEE² & OSAMU TADAUCHI¹

¹Department of Biological Science, Faculty of Sciences, Kyushu University, Fukuoka, 812–8581 Japan

²Animal and Plant Quarantine Agency, Plant Quarantine Technology Center, Suwon, Gyeonggi-do, Korea

³Corresponding author. E-mail: r.murao@mbr.nifty.com; murao.ryuki@m.kyushu-u.ac.jp

Abstract

The South Korean fauna of the bee genus *Lasioglossum* Curtis (Halictidae: Halictini) belonging to the *Lasioglossum* series (*i.e.*, those with the second submarginal crossvein strong) are reviewed. A total of 12 species are recognized for the country. *Lasioglossum circularum* Fan & Ebmer is recorded for the first time from the Korean Peninsula and the following species are newly recorded from South Korea: *L. denticolle* (Morawitz), *L. formosae* (Strand), *L. kansuense* (Blüthgen), *L. occidentis* (Smith), *L. sutshanicum* Pesenko, and *L. upinense* (Morawitz). Bionomical data as well as illustrated keys to females and males of South Korean species are provided. DNA sequences including a part of barcode region are given for *L. kansuense* and *L. occidentis*.

Key words: Anthophila, Apoidea, Halictini, flower records

Introduction

The bee genus *Lasioglossum* Curtis (Halictidae: Halictinae) is a highly diverse group of bees with approximately 1800 species worldwide (Ascher & Pickering 2015). This genus is mainly differentiated from other halictid bees in having the female fore wing with weakened 2r-m (or 2rs-m *sensu* Engel 2001) and 2m-cu veins and the metasomal terga with or without basal hair bands. *Lasioglossum* is classified into two informal groups (Michener 2007): 1) the *Hemihalictus* Cockerell series (weak-veined *Lasioglossum*), which includes all subgenera with weak second submarginal vein (1rs-m) of the female fore wing; and 2) the *Lasioglossum* series (strong-veined *Lasioglossum*), which includes all subgenera with strong second submarginal vein (1rs-m) of the female fore wing (Fig. 1B). Molecular data support the monophyly of both groups (Danforth & Ji 2001; Gibbs *et al.* 2012). According to the recent systematic studies (Gibbs *et al.* 2012, 2013; Pauly *et al.* 2012, 2013), the *Hemihalictus* series consists of the following subgenera: *Acanthalictus* Cockerell, *Austevylaeus* Michener, *Capalictus* Pauly *et al.*, *Dialictus* Robertson, *Dialictus sensu lato*, *Eickwortia* McGinley, *Evylyaeus* Robertson, *Evylyaeus sensu lato*, *Hemihalictus* Cockerell, *Paradialictus* Pauly, and *Sphecodogastra* Ashmead. The *Lasioglossum* series comprises *Australictus* Michener, *Callalictus* Michener, *Chilalictus* Michener, *Ctenonomia* Cameron, *Glossalictus* Michener, *Homalictus* Cockerell, *Ipomalictus* Pauly, *Lasioglossum*, *Leuchalictus* Warncke, *Paupualictus* Michener, *Parachilalictus* Pauly *et al.*, *Parasphecodes* Smith, *Pseudochilalictus* Michener, *Quasilictus* Walker, *Rubrihalictus* Pauly, and *Urohalictus* Michener.

Various researchers have treated the East Asian fauna of *Lasioglossum* (Ebmer 1995, 1996, 2002, etc.; Murao & Tadauchi 2007; Murao *et al.* 2009, etc.; Pesenko 2006, 2007), and a total of 219 species have been recorded (Murao 2015; Murao *et al.* 2015a). The faunae of both Japan and Russian Far East have been studied recently (Pesenko 2006, 2007; Murao 2014), but those of other countries in eastern Asia are still largely unknown.

Murao *et al.* (2014) provided a list and historical review of the Korean *Lasioglossum*. Six species were added by Murao (2015) and Murao *et al.* (2015a), thus increasing to 46 the total number of species of *Lasioglossum* for the Korean Peninsula. For the *Lasioglossum* series, 12 species of have been listed for the peninsula. Only five species have been recorded from South Korea, but more species are expected to occur in this country.