

New Record of a Hepialid Moth Species, *Korscheltellus lupulina* (Lepidoptera: Hepialidae) from Korea

Jae-Young Lee¹, Bora Shin², Sung-Soo Kim³, Sei-Woong Choi^{1,*}

¹Department of Environmental Education, Mokpo National University, Muan 58554, Korea

²Department of Biology, Mokpo National University, Muan 58554, Korea

³Research Institute for East Asian Environment and Biology, Seoul 05264, Korea

ABSTRACT

The hepialid species, *Korscheltellus lupulina* (Linnaeus) is newly recorded from Korea. A female specimen of *K. lupulina* was collected on Jeju Island, southern Korea. This species can be distinguished by the whitish linear marking on the postmedian and dorsum of the forewing but these markings are often unseen in females. The female genitalia can be diagnosed by the semi-rounded ninth abdominal tergum, a pair of semi-rounded ninth abdominal sternum with weakly produced, semi-rounded central plate-shaped medial region, a pair of narrow band-shaped subanal plates, the short, thin ductus bursae, and the large, ball-shaped corpus bursae without a signum. Currently, there are four genera and five species of the Hepialidae distributed in Korea.

Keywords: Hepialidae, *Korscheltellus lupulina*, Korea, Jeju, new record

INTRODUCTION

The family Hepialidae is one of the most phylogenetically primitive lineages of Lepidoptera and is distinguished by the larger wingspan of up to 250 mm, the lacking of the cloaca, and an entirely separate copulatory orifice and anus/ovipore linked internally by a free ductus seminalis (Nielsen et al., 2000). The members of this family comprise more than 62 genera and 606 species worldwide (van Nieuwerkerken et al., 2011), and three genera and four species in Korea (National Institute of Biological Resources, 2019).

Korscheltellus, a genus of the Hepialidae, comprises three species: *K. lupulina* (Linnaeus, 1758), *K. fusconebulosa* (De Geer, 1878), and *K. gracilis* (Grote, [1865]). This genus can be distinguished by the simple and elongate valva, a horn-like valvellar process, a free processus momenti below the tegumen, a hat-shaped juxta, a curved spatulate or tongue-like mesosome, and a triangular or rounded dorsally projecting acrosternite (Wagner, 1988; Grehan, 2012). The phylogenetic relationship among three species of the genus was suggested based on the male genital characters: ((*K. gracilis*, *K. fusconebulosa*), *K. lupulina*) (Grehan, 2012). The genus

Korscheltellus is similar to *Pharmacis* Hübner, 1820 but can be distinguished by the presence of spatulate mesosome in the male genitalia (Grehan, 2012).

The purpose of the study is to report one of *Korscheltellus*, *K. lupulina*, for the time in Korea. We collected one worn female specimen of Hepialidae and the genitalia examination confirmed that this species is *Korscheltellus lupulina*.

Adult moth was collected at night using a 22-W Circline ultraviolet light bucket trap (BioQuip, USA). The collected adult was mounted for examination and was identified based on the external morphology including the female genitalia. For slide preparation of genitalia, each specimen was prepared by boiling the abdomen in 10% KOH for approximately 20 min. The scales and tissues were removed, stained with Chlorazol Black, and mounted on slides in a Euparal solution.

The material has been deposited in the Insect Collection, Department of Environmental Education, Mokpo National University, South Korea. Abbreviations are as follows: TL, type locality; TS, type species; JJ, Jeju-do.

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***To whom correspondence should be addressed**

Tel: 82-61-450-2783, Fax: 82-61-450-2789
E-mail: choisw@mokpo.ac.kr



Fig. 1. A hepialid moth species, *Korscheltellus lupulina* from Korea. Scale bar = 10 mm.

SYSTEMATIC ACCOUNTS

Order Lepidoptera Linnaeus, 1758

Family Hepialidae Stephens, 1829

Genus *Korscheltellus* Börner, 1920

Korscheltellus Börner, 1920: 341.

Type species: *Phalaena (Noctua) lupulinus* Linnaeus. TL: Europe.

^{1*}*Korscheltellus lupulina* (Linnaeus, 1758) (Figs. 1, 2)
Phalaena (Noctua) lupulina Linnaeus, 1758: 508. TL: Europe.

Phalaena (Hepialus) serraticornis Gmelin, [1790]: 2618.

Hepialus obliquus Fabricius, 1794: 6. TL: Europe.

Hepialus cora Schrank, 1801: 304.

Hepialus fuscus Haworth, 1809: 141. TL: Britain.

Psilothrix incerta Millière, 1886: liii.

Hepialus albomarginata Cockayne, 1955: 5. TL: England.

Korscheltellus espanolide Gregorio, 1981: 55. TL: Spain.

Material examined. 1 female, Korea, JJ: Jeju-si, Haeandong, 33°23'31.6"N, 126°29'13"E, alt. 954 m, 5 Jun 2021, Sei-Woong Choi.

Diagnosis. This species can be distinguished by the whitish linear marking on the postmedian and dorsum of the forewing but these markings are often unseen in females. The genitalia dissection is needed to identify the species correctly.

Description. Wingspan 41 mm. Adult: Female antennae filiform; frons covered with long dark brown hairs; labial palpi absent. Body and legs covered with long brown and light brown hairs. Forewing elongate, ground color dark grayish; costa tinged with black dots; apex strongly projected. Hindwing elongate, ground color dark grayish. **Female genitalia.**

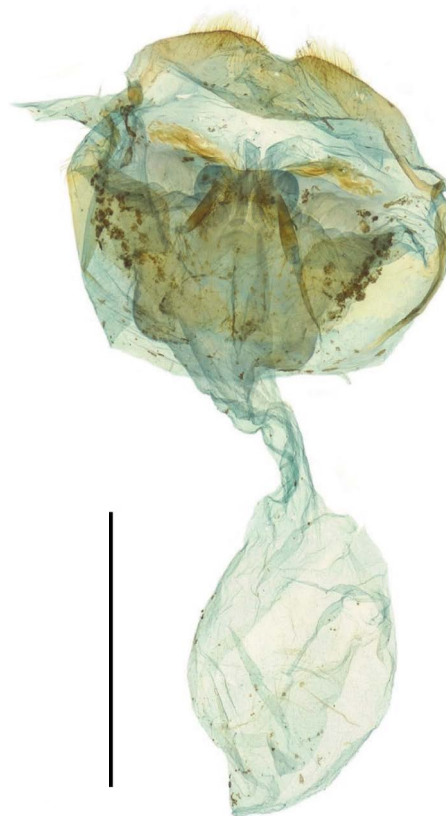


Fig. 2. Female genitalia of *Korscheltellus lupulina* in Korea. Scale bar = 1 mm.

Ninth abdominal tergum semi-rounded, weakly tapered to the middle, and connected at the middle of posterior margin; ninth abdominal sternum with a pair of semi-rounded plates, medial region weakly produced, forming a semi-rounded central plate; a pair of subanal plates narrow band-shaped; ductus bursae short, thin, membranous; corpus bursae large, ball-shaped without a signum.

Distribution. Korea (new record), Europe, and North America.

Remarks. The female genitalia of *K. lupulina* can be distinguished from those of *K. fusconebulosa* by the relatively thick ductus bursae and the large ovate corpus bursae. The species overwinters as a larva and feeds on the roots of a wide range of plants including agricultural products (Waring and Townsend, 2017). Grehan (2012) noted that the eastern boundary of *K. lupulina* was uncertain, while its sister species, *K. fusconebulosa* ranges from Europe to northern Asia, including Japan. Based on this study, it is suggested that *K. lupulina* also has a range extending from Europe to northern Asia.

Korean name: ^{1*}백록박쥐나방 (신칭)

ORCID

Jae-Young Lee: <https://orcid.org/0000-0002-9546-3387>

Bora Shin: <https://orcid.org/0000-0002-0081-0711>

Sung-Soo Kim: <https://orcid.org/0000-0001-5693-4142>

Sei-Woong Choi: <https://orcid.org/0000-0001-6326-399X>

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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