Journal of Species Research 8(3):283-287, 2019

Two newly recorded wolf spiders with one new species (Araneae, Lycosidae) from Korea

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Pardosa pseudolaevitarsis n. sp. and *Hygrolycosa umidicola* Tanaka, 1978 belonging to Lycosidae are described from Korea. To date, fourteen species in the genus *Pardosa* C. L. Koch, 1847 have been described from Korea. *H. umidicola* belongs to *Hygrolycosa* Dahl, 1908 was once described from Korea, but the previous description of this species could not provide adequate scientific evidence for adding *H. umidicola* to the Korean spider fauna. *Pardosa pseudolaevitarsis* n. sp. is similar to *P. laevitarsis* Tanaka & Suwa, 1986 in the shape of its epigyne and palp, but can be distinguished by the followings: epigynal atrium small; spermathecae extending to the end of atrium; shape, location and orientation of fertilization duct in epigyne and internal genitalia; blunt basal spur of median apophysis in palp; number, shape and arrangement cheliceral teeth on both margins. Both species were collected using pitfall traps on a ridge between rice fields and seem to prefer habitats with relatively high humidity.

Keywords: description, *Hygrolycosa umidicola*, Korea, Lycosidae, *Pardosa pseudolaevitarsis* n. sp.

DOI:10.12651/JSR.2019.8.3.283

Introduction

During a survey of rice field spider fauna, *Pardosa pseudolaevitarsis* n. sp. and *Hygrolycosa umidicola* Tanaka, 1978 were collected with pitfall traps on the a ridge between rice fields. To date, fourteen species in the genus *Pardosa* C. L. Koch, 1847 have been described from Korea. *H. umidicola* is only known in Japan, but was once described from Korea (Kim *et al*., 2015). However, Yoo *et al*. (2015) treated this record of *H. umidicola* uncertain species and excluded it from the 'Bibliographic checklist of Korean spiders'. The description of this species could not provide adequate scientific evidence for adding *H. umidicola* to the Korean spider fauna, because of poor description, illustrations and unfocused photos. The National Species List of Korea (NIBR, 2019) also excluded the species from the list. In this paper, *Pardosa pseudolaevitarsis* n. sp. is newly described and *Hygrolycosa umidicola* Tanaka, 1978 is redescribed with measurements and morphological illustrations from Korea.

Materials and Methods

External morphology was examined and illustrated using a stereoscopic dissecting microscope (LEICA, S8APO). Photographs of the body were taken with a CANON 650D with a 60 mm macro-lens. Measurements of body parts were taken with an ocular micrometer scale and recorded in millimeters. Leg and palp measurements are given as leg number, total length (femur, patella + tibia, metatarsus, tarsus). The internal genitalia of female were prepared with 10% of KOH solution for six hours, and after examination, tissue pieces around it were removed with brushes and needles. Abbreviations used are as follows: ALE = anterior lateral eye, AME = anterior median eye, PLE = posterior lateral eye, PME = posterior median eye, AER = anterior eye row in eye region. The examined specimens of this study were deposited in the collection of the National Institute of Biological Resources (NIBR), Korea.

Taxonomic Accounts

Class Arachnida Lamarck, 1801
Order Araneae Clerck, 1757
Family Lycosidae Sundevall, 1833
Genus *Pardosa* C. L. Koch, 1847

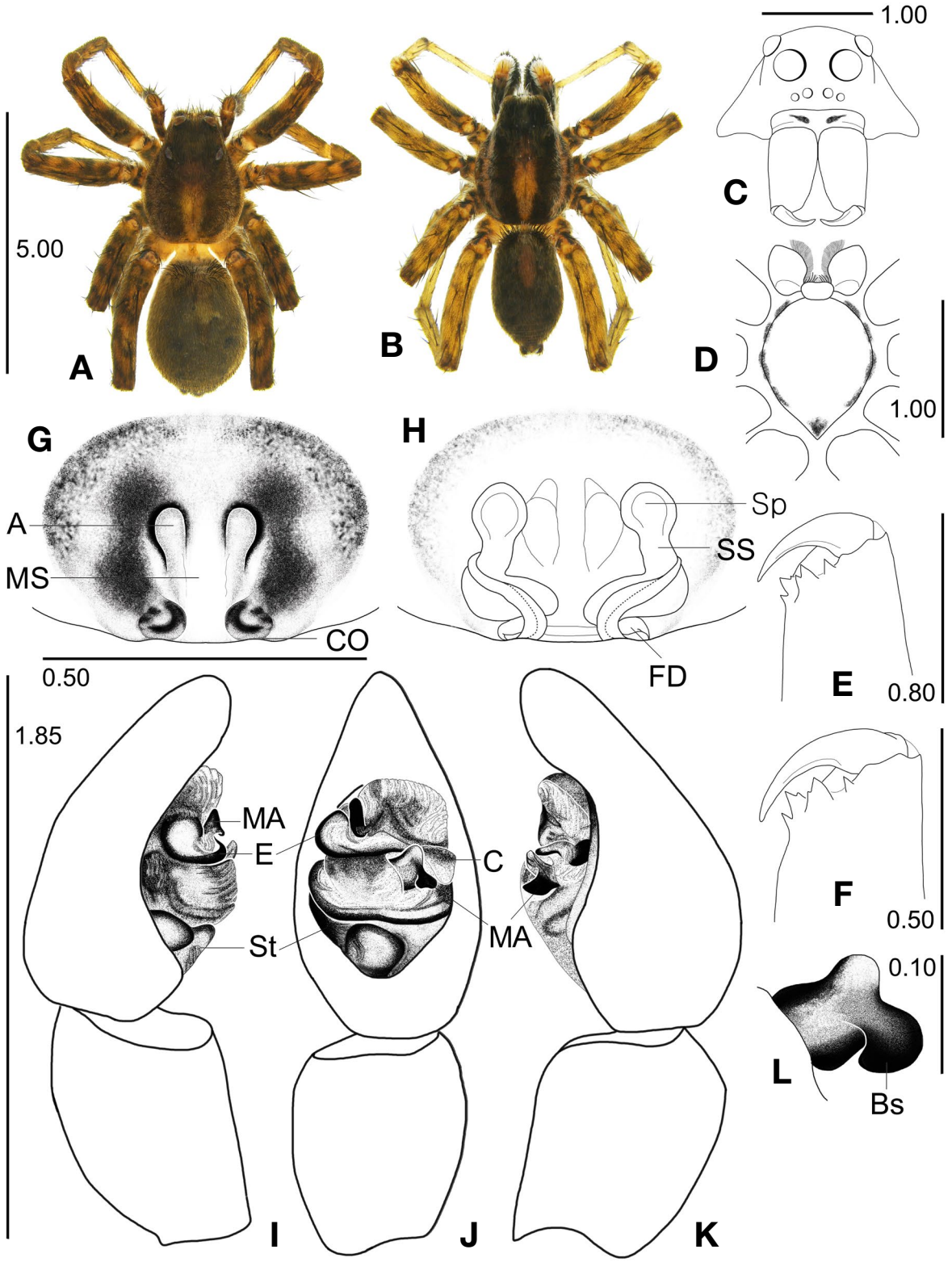

Fig. 1. *Pardosa pseudolaevitarsis* n. sp.: A. Female body, dorsal view (holotype in habitus); B. Male body, dorsal view (allotype in habitus); C. Female eye area, frontal view; D. Female endite, labium and sternum, ventral view; E. Female chelicera; F. Male chelicera; G. Epigyne, ventral view; H. Internal genitalia, ventral view; I. Left palp, prolateral view; J. Same, ventral view; K. Same, retrolateral view; L. Median apophysis. A, atrium. Bs, basal spur. C, conductor. CO, copulatory opening. E, embolus. FD, fertilization duct. MA, median apophysis. MS, median septum. Sp, spermathecae. SS, spermathecal stalk. St, subtegulum. Scale bars in mm.

***Pardosa pseudolaevitarsis* n. sp.**
논가시늑대거미 (신칭) (Fig. 1A–K)

Material examined. Holotype female and allotype male: Daean-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do, Korea (34°54′62″ N, 127°31′52″ E), 06.iv.2019 (S.T. Kim). Paratypes: one female, same collection data as holotype and allotype; 4 females and 4 males, Gagok-ri, Okcheon-myeon, Haenam-gun, Jeollanam-do, Korea (34°36′68″ N, 126°38′93″ E), 06.iv.2019 (S.T. Kim).

Etymology. The specific epithet is a compound word from the Greek prefix *pseudo-* and the specific name of *Pardosa laevitarsis* Tanaka & Suwa, 1986, referring to the similar structure of female internal genitalia.

Diagnosis. The present species is similar to *P. laevitarsis* in the shape of its epigyne and palp, but can be distinguished by the followings: epigynal atrium small; spermathecae extending to the end of atrium; shape, location and orientation of fertilization duct in epigyne and internal genitalia; blunt basal spur of median apophysis in palp; number, shape and arrangement cheliceral teeth on both margins.

Measurements (holotype female/allotype male). Total length 6.15/5.45 (habitus). Carapace 2.90/2.50 long, 2.12/1.83 wide. ALE 0.06/0.05, AME 0.09/0.08, PLE 0.30/0.20, PME 0.35/0.25; ALE-AME 0.05/0.05, AME-AME 0.09/0.08. Chelicera 1.12/0.65 long, 0.40/0.32 wide. Endite 0.60/0.50 long, 0.39/0.30 wide. Labium 0.30/0.19 long, 0.30/0.32 wide. Sternum 1.31/1.20 long, 0.98/0.90 wide. Legs: I, 7.63/6.92 (2.30/2.00, 2.55/2.20, 1.68/1.60, 1.10/1.12); II, 7.25/7.20 (2.10/1.75, 2.40/2.35, 1.60/2.00, 1.15/1.10); III, 7.41/6.65 (2.10/1.85, 2.35/2.00, 1.90/1.80, 1.06/1.00); IV, 10.42/10.56 (2.32/3.40, 3.25/2.75, 3.45/2.93, 1.40/1.48). Palp 2.97/2.65 (0.95/0.80, 1.12/1.00, - , 0.90/0.85). Abdomen 3.45/2.70 long, 2.40/1.25 wide. Epigyne 0.28 long, 0.42 wide.

Description. Holotype female: Carapace blackish brown, oval, longer than wide, a yellowish brown median band and a pair of lateral stripes in thoracic region (Fig. 1A). Longitudinal fovea needle-shaped. AME larger than ALE, AME separated from each other by the diameter of AME, AME separated from ALE by about the diameter of AME, AER slightly recurved from frontal view (Fig. 1C). Clypeus yellowish brown with a pair of blackish brown markings. Chelicerae brown, dorsal and ventral surface infuscate with a black longitudinal band dorsally, 2 promarginal teeth and 2 retromarginal teeth, outer retromargial tooth and inner promarginal tooth larger and bifurcate (Fig. 1E). Endite pale yellowish brown. Labium blackish brown. Sternum round with pointed tip, reddish brown with blackish brown margin, longer than wide (Fig. 1D). Legs stout and strongly developed, yellowish brown, mottled, matatarsi and tarsi lighter. Abdomen ovoid, blackish brown, mottled, anterior part with cardiac pattern, no particular pattern visible, longer than wide (Fig. 1A). Epigyne with a pair of short atrium at middle, a pair of copulatory openings at lower part, median septum thick, spermathecae extend to the upper end of the atrium, spermathecal stalk thick, a pair of fertilization ducts with pointed tip at lower part (Fig. 1G, H).

Allotype male: Similar to female, smaller than female. Carapace black (Fig. 1B). Legs shorter and lighter than female. Chelicerae brown, dorsal and ventral surface infuscate with a black longitudinal band dorsally, 2 promarginal teeth and 2 retromarginal teeth, outer retromargial tooth and inner promarginal tooth larger and bifurcate (Fig. 1F). Palp with sock-shaped median apophysis bearing round basal spur (Fig. 1L), conductor broad, embolus filiform and curved counterclockwise direction, white pubescence on femur and patella, tarsus without prominent claw, palpal tibia shorter than tarsus, palpal tibia and tarsus black (Fig. 1I–K).

Distribution. Korea (endemic).

Remarks. This species was collected using a pitfall trap on a ridge between rice fields and seem to prefer habitats with relatively high humidity.

Genus *Hygrolycosa* Dahl, 1908 습지늑대거미속

Both sexes: Carapace with a pair of narrow dark markings in inner part, sides steeply sloped. Anterior eye row equal to or shorter than second eye row. Anterior eye row straight or procurved. Chelicera with three teeth on posterior margin of fang furrow. The first leg with four spines in a row on the prolateral side of tibia. These spiders are found mainly in wet areas, but sometimes in grassy plains (Tanaka, 1978).

***Hygrolycosa umidicola* Tanaka, 1978**
습지늑대거미 (Fig. 2A–J)

Hygrolycosa umidicola Tanaka, 1978: p. 14, 16, f. 1–6; Yaginuma, 1986: p. 169, f. 92; Tanaka, 1990: p. 123, f. 1–4; Tanaka, 2009: p. 229, f. 40–41; Kim, Ye & Kim, 2015: 29, f. 1–5 [“uncertain” after Yoo *et al*., 2015: 5].

Material examined. 2 females and 3 males: Songjeong-ri, Samsan-myeon, Haenam-gun, Jeollanam-do, Korea (34°31′45″ N, 126°34′10″ E), 07.vi.2015 (S.T. Kim).

Measurements (female/male). Total length 7.95/6.45 (habitus). Carapace 3.20/3.20 long, 2.95/2.37 wide. ALE 0.13/0.12, AME 0.15/0.14, PLE 0.20/0.23, PME 0.25/0.23; ALE-AME almost contiguous/0.03, AME-AME 0.09/0.08. Chelicera 1.32/1.30 long, 0.65/0.50 wide. Endite 0.90/0.70 long, 0.60/0.45 wide. Labium 0.50/0.47 long, 0.42/0.39 wide. Sternum 1.60/1.40 long, 1.30/1.23 wide. Legs: I, 9.41/8.84 (2.50/2.44, 3.52/3.33, 2.11/1.92, 1.28/1.14); II, 9.28/8.68 (2.56/2.44, 3.39/3.22, 2.11/1.87, 1.22/1.14); III, 8.83/8.16 (2.56/2.34, 3.07/2.85, 2.11/1.92,

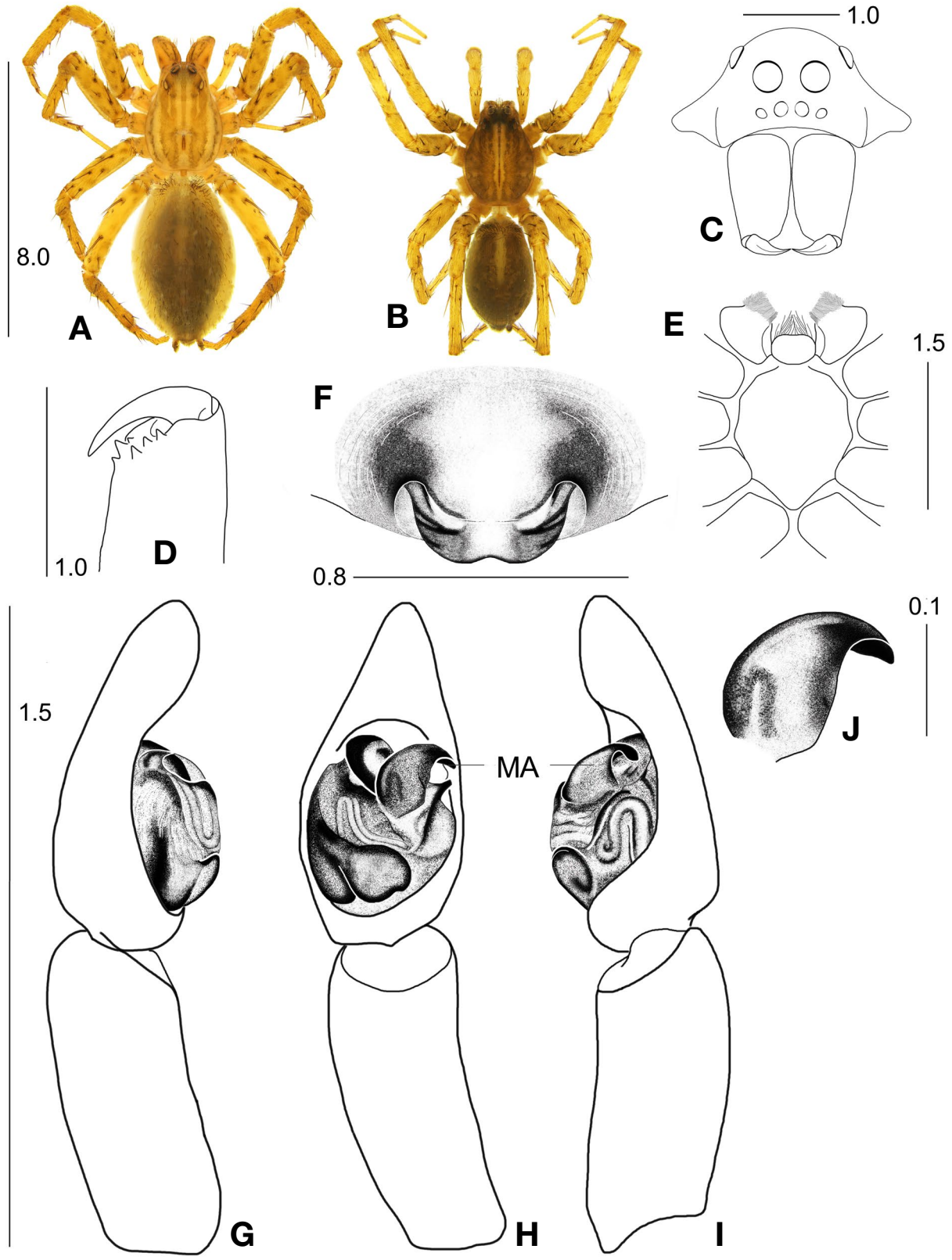

Fig. 2. *Hygrolycosa umidicola* Tanaka, 1978: A. Female body, dorsal view; B. Male body, dorsal view; C. Female eye area, frontal view; D. Female chelicera; E. Female endite, labium and sternum, ventral view; F. Epigyne, ventral view; G. Left palp, prolateral view; H. Same, ventral view; I. Same, retrolateral view; J. Median apophysis. MA, median apophysis. Scale bars in mm.

1.09/1.04); IV, 11.46/10.97 (3.01/2.86, 3.84/3.80, 3.20/3.02, 1.41/1.30). Palp 4.67/3.85 (1.66/1.30, 1.79/1.51, - , 1.22/1.04). Abdomen 4.15/3.10 long, 2.90/2.70 wide. Epigyne 0.78 long, 1.06 wide.

Description. Female: Carapace light yellowish brown, oval, longer than wide, a dark yellowish brown median stripe extended to fovea and a pair of lateral stripes in head region, a pair of dark yellowish brown band extended from PLE to the end of thoracic region, a pair of blackish brown lateral stripes in thoracic region. Longitudinal fovea needle-shaped (Fig. 2A). AME larger than ALE, AME separated from each other by the diameter of AME, AME separated from ALE by about a half diameter of AME, AER slightly recurved from frontal view (Fig. 2C). Clypeus blackish brown without marking. Chelicerae yellowish brown, dorsal base with two short black stripes longitudinally, 3 promarginal teeth and 3 retromarginal teeth (Fig. 2D). Endite dull yellowish brown. Labium dull yellowish brown with blackish brown margin. Sternum shield-shaped with pointed tip, longer than wide (Fig. 2D). Legs stout and strongly developed, yellowish brown, mottled, each segment with conspicuous spines. Abdomen ovoid, blackish brown, anterior part with cardiac pattern, no particular pattern visible, longer than wide (Fig. 2A). Epigyne elliptical and swollen with a transverse 'U-shaped' chitinous plate at lower part, median septum thick, spermathecae visible through integument laterally (Fig. 2F).

Male: Similar to female, smaller and darker than female. Carapace blackish brown (Fig. 2B). Legs shorter and lighter than female. Palp yellowish brown with hook-shaped median apophysis, base of median apophysis (Fig. 2J), palpal tibia longer than tarsus (Fig. 2G–I).

Distribution. Korea (confirmed), Japan.

Remarks. This species was collected using a pitfall trap on a ridge between rice fields and seem to prefer habitats with relatively high humidity.

Acknowledgements

This study was supported by a grant from the Rural Development Administration (RDA) (PJ012285012019) of Ministry of Agriculture, Food and Rural Affairs (MAFRA) and National Institute of Biological Resources (NIBR) of Ministry of Environment (MOE) (NIBR 201701201 and NIBR201902204), the Republic of Korea.

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Submitted: July 17, 2019
Revised: August 2, 2019
Accepted: August 5, 2019