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Seven new species of the genus *Cybaeus* (Araneae, Cybaeidae) from Korea

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Seven new species of the genus *Cybaeus* are described; *C. geumensis*, *C. ilweolensis*, *C. jiriensis*, *C. jogyensis*, *C. odaensis*, *C. seorakensis*, and *C. songniensis*. Detailed descriptions and illustrations of these new species are provided.

Keywords: Araneae, Cybaeidae, *Cybaeus*, Korea, new species

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Introduction

The members of Cybaeidae (Araneae) have few distinctive morphological features except the genitalic characters (Chamberlin and Ivie, 1932; Ihara, 2004; Bennett, 2005; 2006). Most cybaeids usually inhabit the leaf litter on the forest floor in moist woodlands (Copley *et al*., 2009). The family includes 10 genera and 183 species, with 152 species in the genus *Cybaeus*, and has a mainly Holarctic distribution, with species described from Europe, China, Korea and especially Japan and North America (World Spider Catalog, 2016).

Seven *Cybaeus* species have been recorded in Korea (World Spider Catalog, 2016), and seven additional new species, *C. geumensis*, *C. ilweolensis*, *C. jiriensis*, *C. jogyensis*, *C. odaensis*, *C. seorakensis*, and *C. songniensis*, are described with the illustrations.

Materials and Methods

Leg and palp measurements are shown as : total (femur, patella, tibia, metatarsus, tarsus). The following abbreviations are used: c, carapace length; d, p, r and v in leg spination are dorsal, prolateral, retrolateral and ventral side of leg, respectively; Leg I, length of leg I; AER, anterior eye row; ALE, anterior lateral eye; ALE-PLE, distance between ALE and PLE; AME, anterior median eye; AME-ALE, distance between AME and ALE; AME-AME, distance between AMEs; AME-PME, distance between AME and PME; PER, posterior eye row; PLE, posterior lateral eye; PME, posterior median eye; PME-PLE, distance between PME and PLE; PME-PME, distance between PMEs. All measurements are in millimeters. The type specimens are deposited in the National Institute of Biological Resources (NIBR), Ministry of Environment, Korea.

Results and Discussion

Order Araneae Clerck, 1757 거미목
Family Cybaeidae Banks, 1892 굴뚝거미과
Genus *Cybaeus* Koch, 1868 굴뚝거미속

***Cybaeus geumensis* n. sp.**
금산굴뚝거미 (신칭) (Figs. 1A-E, 5A, B, 6A-C, 7A-C)

Material examined. Holotype: ♂, mixed forest (34°44′59″N, 127°59′03″E, alt. 428 m), 300 m south-southeast of Bori Hermitage in Mt. Geum, Sangju-myeon, Namhae-gun, Gyeongsangnam-do, 20 July 2013, B. K. Seo. Paratype: 13♂♂, 3♀♀, same data as holotype; 2♂♂, 7♀♀, mixed forest (34°44′53″N, 127°59′07″E, alt. 343 m), 550 m south-southeast of Bori Hermitage, other data same as holotype.

Etymology. The specific name comes from the type locality, Mt. Geum.

Diagnosis. The new species is similar to *C. jogyensis* n. sp. in the abdominal pattern, the embolus length of male palp, the interval between the embolic base and the conductor of male palp, the round apophysis of male palpal patella, and the size and shape of the vesicles of female spermatheca, but can be distinguished from the latter by

the body length, the teeth number of on the apophysis of male palpal patella, the epigyne, and the coiled copulatory duct connected ventrally with the anterior vesicle of female spermatheca (Figs. 1A-E, 5A, B, 7A-C).

Description. Male (holotype). Total length 9.70. Habitus as in Fig. 5B. Carapace reddish brown, 5.60 long, 4.10 wide; radial grooves and linear fovea distinct. Clypeus height about 3 times of diameter of ALE. AER 1.17, PER 1.46; AER and PER retrocurved slightly in dorsal view. AME 0.17, ALE 0.26, PME 0.23, PLE 0.22, AME-AME 0.09, AME-ALE 0.13, PME-PME 0.29, PME-PLE 0.22, AME-PME 0.27, and ALE-PLE 0.08. Median ocular quadrangle, posterior side > height > anterior side (57 : 49 : 34). Chelicera with three promarginal and nine minute retromarginal teeth. Sternum 2.60 long, 2.30 wide. Labium 0.90 long, 0.90 wide. Leg measurements: I 19.30 (5.00, 1.90, 5.20, 4.60, 2.60), II 16.50 (4.40, 1.70, 4.10, 4.00, 2.30), III 13.30 (3.70, 1.60, 2.70, 3.50, 1.80), IV 16.30 (4.20, 1.60, 3.70, 4.60, 2.20). Palp 6.00 (2.40, 0.80, 0.70, 2.10). Leg I/c 3.45. Fem. I/c 0.89. Tib. I/c 0.93. Met. I/c 0.82. Pat. I + tib. I/c 1.27. Met. I/tar. I 1.77. Met. IV/tar. IV 2.09. Leg spination pattern: Femora; I d1-1, p0-0-0-1; II d1-1-1, p0-0-0-1-1, r0-1-0; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-0-0-1, r0-0-0-1. Tibiae; I, II d1-1, p1-1-1-1, v2-2-1-0-2; III d1-1, p1-1-1, r1-1, v2-2-2; IV d1-1, p1-1-1, r0-1-1, v2-1-2. Metatarsi; I p1-1-1, r1-1-1, v2-0-0-0; II p1-1-1-0-2, r0-1-0-1, v2-2-1; III p1-1-1-2, r1-1-1-2, v2-2-1; IV p1-1-1-2, r1-1-2, v2-2-1. Abdomen oval and dark, with two pairs of pale dots and four chevrons longitudinally, and 4.60 long, 3.60 wide. Palp (Figs. 1A-C, 6A-C): tibia slightly shorter than patella; patella apophysis round with 49 conical teeth; embolus long and slender, its tip reaches end of conductor; interval between embolic base and conductor wide.

Female (paratype). Total length 9.00. Habitus as in Fig. 5A. Carapace 4.80 long, 3.20 wide. Clypeus height 2.3 times of diameter of ALE. AER 1.01, PER 1.24. AME 0.16, ALE 0.22, PME 0.21, PLE 0.22, AME-AME 0.10, AME-ALE 0.08, PME-PME 0.26, PME-PLE 0.16, AME-PME 0.23, and ALE-PLE 0.07. Median ocular quadrangle, posterior side > height > anterior side (51 : 43 : 31). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 2.10 long, 1.90 wide. Labium 0.80 long, 0.80 wide. Leg measurements: I 13.30 (3.70, 1.60, 3.30, 3.00, 1.70), II 12.30 (3.50, 1.50, 2.90, 2.80, 1.60), III 10.40 (3.00, 1.30, 2.10, 2.60, 1.40), IV 13.40 (3.60, 1.40, 3.00, 3.60, 1.80). Palp 5.70 (1.90, 0.80, 1.10, 1.90). Leg I/c 2.77. Fem. I/c 0.77. Tib. I/c 0.69. Met. I/c 0.63. Pat. I + tib. I/c 1.02. Met. I/tar. I 1.76. Met. IV/tar. IV 2.00. Leg spination pattern: Femora; I d1-1-1, p0-0-0-1-1, r0-1-0; II d1-1-1, p0-1-1-1, r0-1-0; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-1-0, r0-0-1. Tibiae; I, II d1-1, p1-1-1, v2-2-1-2; III d1-1, p1-1-1, r1-1, v2-2-0-2; IV d1-1, p1-1-0-1, r0-1-1, v2-1-0-2. Metatarsi; I p1-1, r0-1-1, v2-2-1; II p1-1-1-2, r0-1-1, v2-2-1; III p1-1-1-2, r1-1-1-2, v2-2-1; IV p1-1-1-2, r1-1-2, v2-2-1. Abdomen oval and dark gray, and 5.10 long, 3.70 wide. Epigynum: atrium wide, with a pair of copulatory openings. Internal genitalia: spermatheca with an anterior small pear-like vesicle and a posterior gourd-like vesicle; coiled copulatory duct connected with anterior vesicle ventrally; fertilization duct short (Figs. 1D, E, 7A-C).

Habitat. Mixed forest.

World Distribution. Korea (Gyeongsangnam-do).

***Cybaeus ilweolensis* n. sp.**

일월굴뚝거미 (신칭) (Figs. 1F-J, 5C, D, 6D-F, 7D-F)

Material examined. Holotype: ♂, mixed forest (36°48′30″N, 129°05′19″E, alt. 1012 m), 1.3 km northwest of the summit of Mt. Ilweol, Cheonggi-myeon, Yeongyang-gun, Gyeongsangbuk-do, 23 July 2010, J. C. Lim. Paratype: 9♂♂, same data as holotype; 4♀♀, mixed forest (36°49′00″N, 129°04′53″E, alt. 976 m), 2.4 km northwest of the summit of Mt. Ilweol, 13 November 2009, S. Y. Kim.

Etymology. The specific name comes from the type locality, Mt. Ilweol.

Diagnosis. The new species is similar to *C. seorakensis* n. sp. in the abdominal pattern, and to *C. jogyensis* n. sp. in the embolus length of male palp, the interval between the embolic base and the conductor of male palp, the apophysis teeth number and the apophysis shape of male palpal patella, and the vesicle shape and the position of copulatory duct connected with the anterior vesicle of female spermatheca. However, the new species can be easily distinguished from *C. seorakensis* n. sp. by the longer embolus of male palp, the wider interval between the embolic base and the conductor of male palp, and the round apophysis of male palpal patella, and distinguished from *C. jogyensis* n. sp. by the body length, the abdominal pattern, the epigyne, and the medium-sized well-separated anterior vesicles and the coiled copulatory duct connected with the anterior vesicle of female spermatheca (Figs. 1F-J, 5C, D, 7D-F).

Description. Male (holotype). Total length 7.80. Habitus as in Fig. 5D. Carapace reddish brown, 4.40 long, 3.30 wide; radial grooves and linear fovea distinct. Clypeus height 2.8 times of diameter of ALE. AER 0.96, PER 1.17; AER and PER retrocurved slightly in dorsal view. AME 0.16, ALE 0.25, PME 0.22, PLE 0.25, AME-AME 0.10, AME-ALE 0.05, PME-PME 0.20, PME-PLE 0.16, AME-PME 0.20, and ALE-PLE 0.09. Median ocular quadrangle, posterior side > height > anterior side (47 : 41 : 31). Chelicera with three promarginal and seven minute retromarginal teeth. Sternum 1.90 long, 1.80 wide. Labium 0.60 long, 0.70 wide. Leg measurements: I 16.60 (4.30, 1.50, 4.30, 4.10, 2.40), II 13.90 (3.70, 1.40,

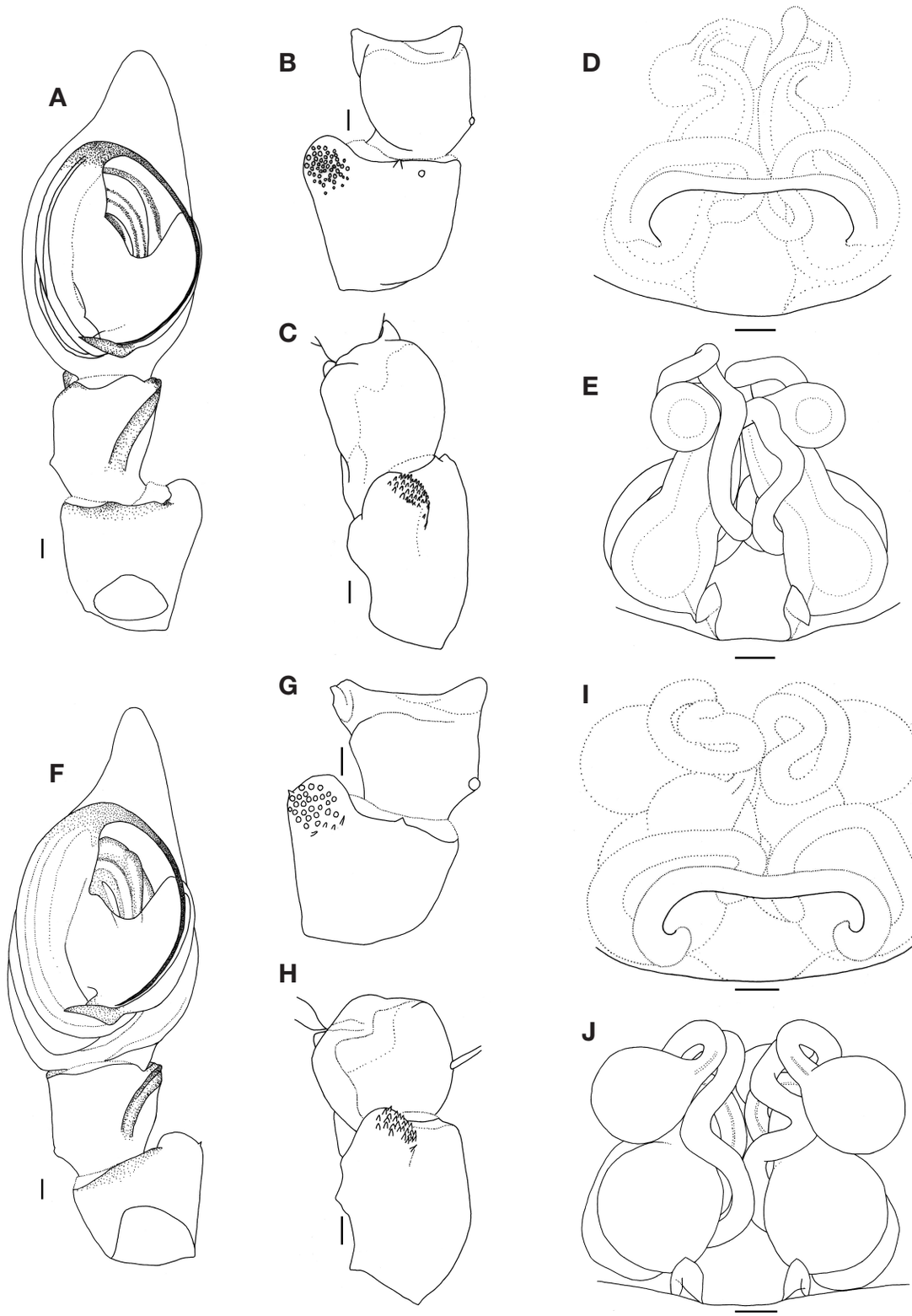


Fig. 1. *Cybaeus geumensis* n. sp. (A-E) and *Cybaeus ilweolensis* n. sp. (F-J): A, F - male left palp, ventral view; B, G - male left palp, tibia and patella, dorsal view; C, H - ditto, retrolateral view; D, I - female internal genitalia, ventral view; E, J - ditto, dorsal view. Scale lines: 0.1 mm.

3.40, 3.40, 2.00), III 11.20 (3.00, 1.20, 2.30, 3.00, 1.70), IV 14.20 (3.70, 1.30, 3.20, 4.00, 2.00). Palp 4.80 (1.90, 0.60, 0.50, 1.80). Leg I/c 3.77. Fem. I/c 0.98. Tib. I/c 0.98. Met. I/c 0.93. Pat. I + tib. I/c 1.32. Met. I/tar. I 1.71. Met. IV/tar. IV 2.00. Leg spination pattern: Femora; I d1-1-1, p0-0-0-1-1, r0-1-0; II d1-1-1, p0-1-1-1, r0-1-0; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-1-1, r0-0-1. Tibiae; I, II d1-1, p1-1-1, v2-2-1-2; III d0-1, p1-1, r1-1, v2-2-2; IV d0-1, p1-1, r1-1, v2-1-1-2. Metatarsi; I p1-1, r1-1, v2-2-0; II p1-1-2, r1-1, v2-2-1; III p1-1-1-2, r1-1-1-2, v2-2-1; IV p1-1-1-2, r1-1-1-2, v2-2-1. Abdomen oval and dark gray, with three pairs of pale dots and three chevrons longitudinally, and 4.00 long, 2.90 wide. Palp (Figs. 1F-H, 6D-F): tibia slightly shorter than patella; patella apophysis round with 31 conical teeth; embolus long and slender, its tip nearly reaches end of conductor; interval between embolic base and conductor wide.

Female (paratype). Total length 7.70. Habitus as in Fig. 5C. Carapace 4.10 long, 2.90 wide. Clypeus height 2.5 times of diameter of ALE. AER 0.91, PER 1.18. AME 0.14, ALE 0.21, PME 0.20, PLE 0.22, AME-AME 0.10, AME-ALE 0.05, PME-PME 0.22, PME-PLE 0.17, AME-PME 0.23, and ALE-PLE 0.09. Median ocular quadrangle, posterior side > height > anterior side (47 : 41 : 29). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 1.76 long, 1.70 wide. Labium 0.57 long, 0.63 wide. Leg measurements: I 11.66 (3.21, 1.32, 2.84, 2.71, 1.58), II 10.95 (3.02, 1.32, 2.52, 2.58, 1.51), III 9.70 (2.71, 1.13, 2.02, 2.39, 1.45), IV 12.03 (3.15, 1.13, 2.71, 3.34, 1.70). Palp 4.60 (1.45, 0.69, 0.82, 1.64). Leg I/c 2.84. Fem. I/c 0.78. Tib. I/c 0.69. Met. I/c 0.66. Pat. I + tib. I/c 1.01. Met. I/tar. I 1.72. Met. IV/tar. IV 1.96. Leg spination pattern: Femora; I d1-1-1, p0-0-0-1-1, r0-1-0; II d1-1-1, p0-1-1-1, r0-1-0; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-1-1, r0-0-1. Tibiae; I, II p1-1-1, v2-2-1-2; III p1-1-1, r1-1, v2-2-2; IV d1-1, p1-1-1, r1-1, v2-1-2. Metatarsi; I p1-1, r1-1, v2-2-0; II p1-1-1, r1-1, v2-2-1; III p1-1-1-2, r1-1-1-2, v2-2-1; IV p1-1-1-0-2, r1-1-1-2, v2-2-1. Abdomen with four pairs of pale dots and two chevrons longitudinally, and 4.41 long, 2.90 wide. Epigynum: atrium wide, with a pair of copulatory openings. Internal genitalia: spermatheca with an anterior medium-sized pear-shaped vesicle and a posterior gourd-like vesicle; coiled copulatory duct connected with anterior vesicle dorsally; fertilization duct short (Figs. 1I, J, 7D-F).

Habitat. Mixed forest.

World Distribution. Korea (Gyeongsangbuk-do).

***Cybaeus jiriensis* n. sp.**

지리굴뚝거미 (신칭) (Figs. 2A-E, 5E, F, 6G-I, 7G-I)

Material examined. Holotype: ♂, mixed forest (35°21′21″N, 127°32′03″E, alt. 957 m), 4.8 km northweat of the Banya Peak in Mt. Jiri, Sannae-myeon, Namweon-si, Jeollanam-do, 30 June 2010, J. C. Lim. Paratype: 4♀♀, same data as holotype.

Etymology. The specific name comes from the type locality, Mt. Jiri.

Diagnosis. The new species is similar to *C. songniensis* n. sp. in the abdominal pattern, the embolus length of male palp, the interval between the embolic base and the conductor of male palp, the apophysis teeth number and the apophysis shape of male palpal patella, and the vesicle shape of female spermatheca, but can be easily distinguished from the latter by the lengthened cymbium tip of male palp, the epygine, the small size and the adjacent position of the anterior vesicles, and the slightly curved copulatory duct connected with the anterior vesicle of female spermatheca (Figs. 2A-E, 5E, F, 7G-I).

Description. Male (holotype). Total length 4.85. Habitus as in Fig. 5F. Carapace yellowish brown, 2.80 long, 2.05 wide; radial grooves and linear fovea distinct. Clypeus height 2 times of diameter of ALE. AER 0.62, PER 0.77; AER and PER retrocurved slightly in dorsal view. AME 0.10, ALE 0.18, PME 0.14, PLE 0.23, AME-AME 0.05, AME-ALE 0.04, PME-PME 0.13, PME-PLE 0.10, AME-PME 0.18, and ALE-PLE 0.04. Median ocular quadrangle, posterior side = height > anterior side (31 : 19). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 1.40 long, 1.55 wide. Labium 0.45 long, 0.50 wide. Leg measurements: I 10.00 (2.60, 1.00, 2.60, 2.45, 1.35), II 8.60 (2.25, 0.90, 2.05, 2.15, 1.25), III 7.40 (1.95, 0.85, 1.50, 1.95, 1.15), IV 9.25 (2.30, 0.85, 2.10, 2.60, 1.40). Palp 3.95 (1.55, 0.65, 0.45, 1.30). Leg I/c 3.57. Fem. I/c 0.93. Tib. I/c 0.93. Met. I/c 0.88. Pat. I + tib. I/c 1.29. Met. I/tar. I 1.81. Met. IV/tar. IV 1.86. Leg spination pattern: Femora; I, IV d1-1-1, p0-1-1; II d1-1-0, p0-0-1, r0-1-0; III d1-1-1, p0-1-1, r0-1-1. Tibiae; I p1-1, v2-2-2-0; II p1-1-1, v2-2-1; III d1-1, p1-1, r1-1, v2-2-2; IV d1-1, p1-1-1, r0-1-1, v2-1-1. Metatarsi; I p1-0-1, r1-0-1, v2-2-0; II p1-1-1-1, r1-1, v2-2-1; III, IV d2-2-2, p1-1, r1-1, v2-2-1. Abdomen oval and dark gray, with two pairs of pale dots and three chevrons longitudinally, and 2.15 long, 1.70 wide. Palp (Figs. 2A-C, 6G-I): tibia shorter than patella; patella apophysis rather pointed with 13 conical teeth; embolus short and slender; interval between embolic base and conductor narrow.

Female (paratype). Total length 4.45. Habitus as in Fig. 5E. Carapace 2.75 long, 1.85 wide. Clypeus height 2 times of diameter of ALE. AER 0.64, PER 0.81. AME 0.12, ALE 0.18, PME 0.16, PLE 0.14, AME-AME 0.05, AME-ALE 0.04, PME-PME 0.13, PME-PLE 0.12, AME-PME 0.17, and ALE-PLE 0.07. Median ocular quadrangle, posterior side > height > anterior side (33 : 31 : 20). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 1.25 long, 1.15 wide. Labium 0.40 long, 0.45 wide. Leg measurements: I 7.80 (2.15,

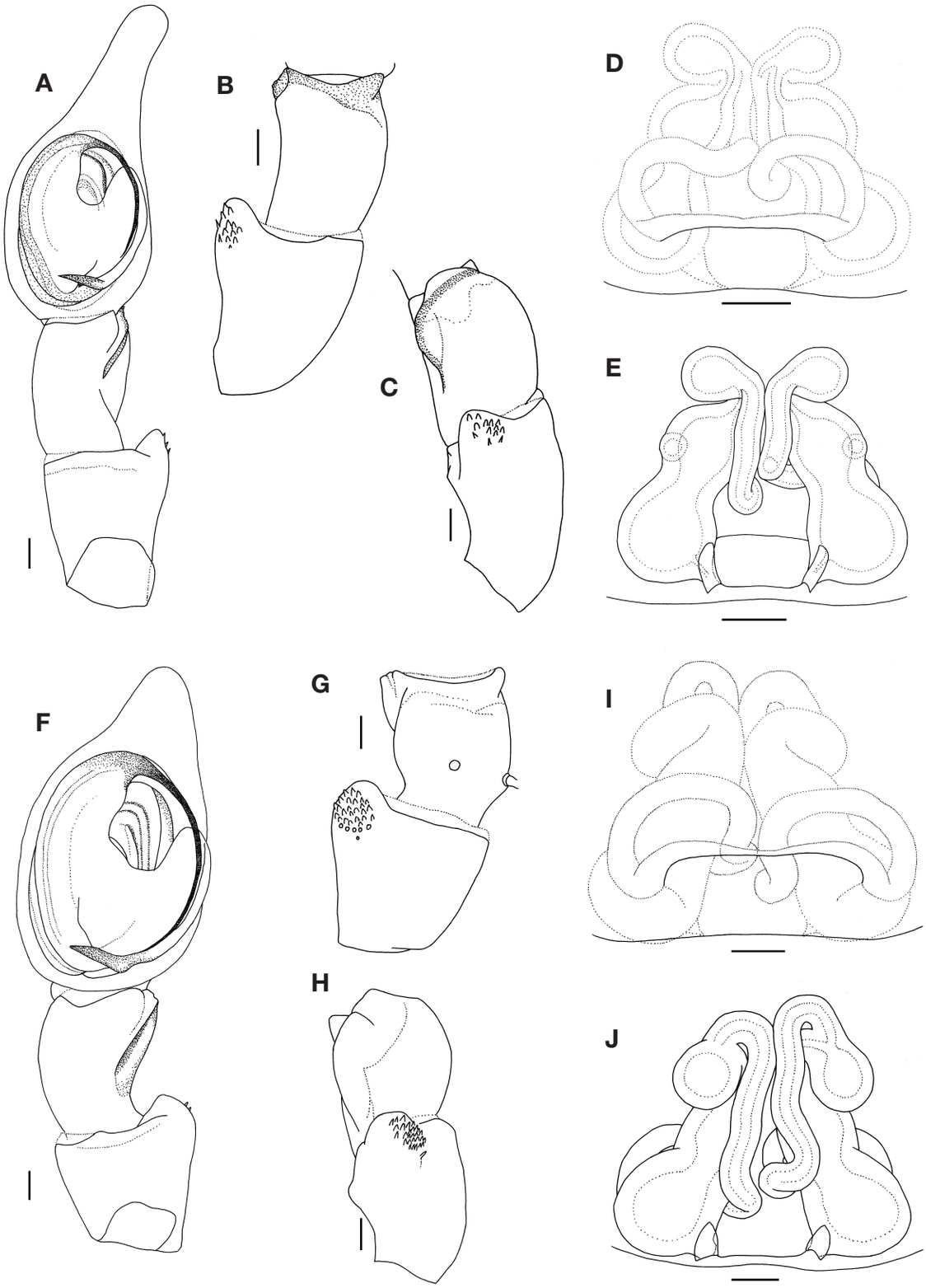


Fig. 2. *Cybaeus jiriensis* n. sp. (A-E) and *Cybaeus jogyensis* n. sp. (F-J): A, F - male left palp, ventral view; B, G - male left palp, tibia and patella, dorsal view; C, H - ditto, retrolateral view; D, I - female internal genitalia, ventral view; E, J - ditto, dorsal view. Scale lines: 0.1 mm.

0.95, 1.90, 1.70, 1.10), II 7.15 (2.00, 0.85, 1.65, 1.60, 1.05), III 6.35 (1.80, 0.80, 1.25, 1.55, 0.95), IV 8.10 (2.15, 0.80, 1.85, 2.15, 1.15). Palp 3.15 (1.05, 0.50, 0.60, 1.00). Leg I/c 2.84. Fem. I/c 0.78. Tib. I/c 0.69. Met. I/c 0.62. Pat. I+tib. I/c 1.04. Met. I/tar. I 1.55. Met. IV/tar. IV 1.87. Leg spination pattern: Femora; I d1-1-1, p0-0-2; II, IV d1-1-1, p0-0-1; III d1-1-1, p0-1-1, r0-1-1. Tibiae; I p1-0, v2-2-2-1; II p1-1-1, v2-2-1; III d1-1, p1-1, r1-1, v2-2; IV d1-1, p1-1-1, r0-1-1, v1-1-2. Metatarsi; I p1-1, r1-1, v2-2-0; II p1-1-1-2, r1-1, v2-2-0; III d2-2-2, p1-1, r1-1, v2-2-1; IV d2-2-2, p1-1, r0-1, v2-2-1. Abdomen 2.00 long, 1.45 wide. Epigynum: atrium wide, with a pair of copulatory openings. Internal genitalia: spermatheca with an anterior small pear-shaped vesicle and a posterior gourd-like vesicle; slightly curved copulatory duct connected with anterior vesicle dorsally; fertilization duct short (Figs. 2D, E, 7G-I).

Habitat. Mixed forest.

World Distribution. Korea (Jeollanam-do).

***Cybaeus jogyensis* n. sp.**

조계굴뚝거미 (신칭) (Figs. 2F-J, 5G-H, 6J-L, 7J-L)

Material examined. Holotype: ♂, mixed forest (34°58′33″N, 127°19′27″E, alt. 420 m), 2 km south of the summit of Mt. Jogye, Nakan-myeon, Suncheon-si, Jeollanam-do, 29 June 2010, J. C. Lim. Paratype: 2♂♂, 2♀♀, same data as holotype; 16♂♂, mixed forest (35°01′44″N, 127°20′13″E, alt. 221 m), 4 km northeast of the summit of Mt. Jogye, Seungju-eup, Suncheon-si, Jeollanam-do, other data same as holotype.

Etymology. The specific name comes from the type locality, Mt. Jogye.

Diagnosis. The new species is similar to *C. geumensis* n. sp. in the abdominal pattern, the embolus length of male palp, the interval between the embolic base and the conductor of male palp, the round apophysis of male palpal patella, and the size and shape of the vesicles of female spermatheca, but can be distinguished from the latter by the body length, the teeth number of on the apophysis of male palpal patella, the epigyne, and the curved copulatory duct connected with the anterior vesicle of female spermatheca (Figs. 2F-J, 5G, H, 7J-L).

Description. Male (holotype). Total length 6.30. Habitus as in Fig. 5H. Carapace reddish brown, 3.91 long, 2.84 wide; radial grooves and linear fovea distinct. Clypeus height 2.7 times of diameter of ALE. AER 0.82, PER 0.98; AER and PER retrocurved slightly in dorsal view. AME 0.13, ALE 0.20, PME 0.18, PLE 0.21, AME-AME 0.08, AME-ALE 0.07, PME-PME 0.18, PME-PLE 0.12, AME-PME 0.18, and ALE-PLE 0.04. Median ocular quadrangle, posterior side = height > anterior side (39 : 35 : 24). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 1.76 long, 1.70 wide. Labium 0.63 long, 0.63 wide. Leg measurements: I 11.72 (3.02, 1.26, 2.84, 2.84, 1.76), II 10.72 (2.84, 1.20, 2.52, 2.52, 1.64), III 8.57 (2.27, 1.07, 1.70, 2.21, 1.32), IV 11.04 (2.84, 1.07, 2.46, 3.09, 1.58). Palp 3.78 (1.32, 0.63, 0.44, 1.39). Leg I/c 3.00. Fem. I/c 0.77. Tib. I/c 0.73. Met. I/c 0.73. Pat. I+tib. I/c 1.05. Met. I/tar. I 1.61. Met. IV/tar. IV 1.96. Leg spination pattern: Femora; I d1-1-1, p0-0-1-1; II d1-1-1, p0-0-1; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-1-1, r0-0-1. Tibiae; I d1-1, p1-0, v2-2-2-1-2; II d1-1, p1-1-1, v2-2-1-2; III d1-1, p1-1-1, r1-1, v2-2-2; IV d1-1, p1-1-1, r0-1-1, v2-1-2. Metatarsi; I p1-1-1-1, r1-1-1-1; II p1-1-1-2, r0-0-1, v2-2-1; III p1-1-2, r1-1-1-2, v2-2-1; IV p1-1-1-2, r1-1-2, v2-2-1. Abdomen oval and dark, with a pair of pale dots and five chevrons longitudinally, and 2.84 long, 2.02 wide. Palp (Figs. 2F-H, 6J-L): tibia shorter than patella; patella apophysis round with 31 conical teeth; embolus long and slender; interval between embolic base and conductor wide.

Female (paratype). Total length 5.04. Habitus as in Fig. 5G. Carapace yellowish brown, 3.09 long, 2.14 wide. Clypeus height 2.4 times of diameter of ALE. AER 0.68, PER 0.86. AME 0.10, ALE 0.18, PME 0.14, PLE 0.16, AME-AME 0.05, AME-ALE 0.05, PME-PME 0.16, PME-PLE 0.13, AME-PME 0.16, and ALE-PLE 0.07. Median ocular quadrangle, posterior side > height > anterior side (33 : 28 : 19). Chelicera with three promarginal and nine minute retromarginal teeth. Sternum 1.45 long, 1.32 wide. Labium 0.44 long, 0.50 wide. Leg measurements: I 8.52 (2.46, 1.01, 2.02, 1.83, 1.20), II 7.81 (2.27, 0.95, 1.76, 1.70, 1.13), III 6.74 (1.95, 0.88, 1.32, 1.58, 1.01), IV 8.82 (2.39, 0.95, 1.95, 2.27, 1.26). Palp 3.65 (1.20, 0.50, 0.69, 1.26). Leg I/c 2.76. Fem. I/c 0.80. Tib. I/c 0.65. Met. I/c 0.59. Pat. I+tib. I/c 0.98. Met. I/tar. I 1.53. Met. IV/tar. IV 1.80. Leg spination pattern: Femora; I, II d1-1-1, p0-0-1; III d1-1-1, p0-0-1, r0-1-1; IV d1-1-1, r0-0-1. Tibiae; I d1-1, p1-1, v2-2-2-2; II d1-1, p1-1-1, v2-2-1-2; III d1-1, p1-1-1, r1-1, v1-2-2; IV d0-1, p1-1-1, r0-1-1, v1-1-2. Metatarsi; I p1-1, r1-1, v2-2-0; II p1-1-1, r0-1-1, v2-2-2; III d1-2-2, p1-1-1, r1-1, v2-2-1; IV d1-2-2, p1-1-1, r0-1, v2-2-1. Abdomen 2.33 long, 1.76 wide. Epigynum: atrium wide, with a pair of copulatory openings. Internal genitalia: spermatheca with an anterior small pear-shaped vesicle and a posterior gourd-like vesicle; curved copulatory duct connected with anterior vesicle dorsally; fertilization duct short (Figs. 2I, J, 7J-L).

Habitat. Mixed forest.

World Distribution. Korea (Jeollanam-do).

***Cybaeus odaensis* n. sp.**

오대굴뚝거미 (신칭) (Figs. 3A-E, 5I, J, 6M-O, 7M-O)

Material examined. Holotype: ♂, mixed forest (37°41′

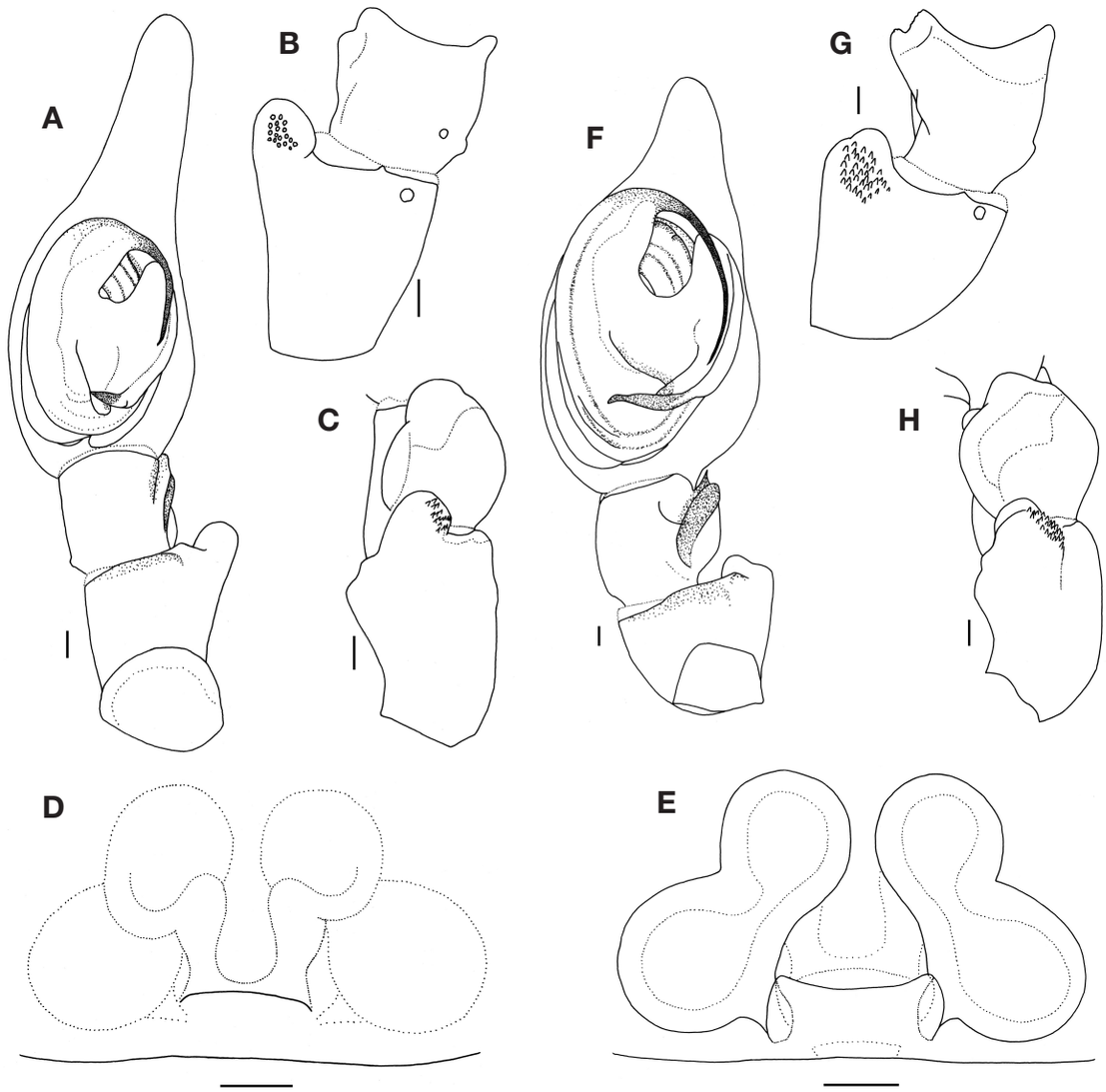


Fig. 3. *Cybaeus odaensis* n. sp. (A-E) and *Cybaeus seorakensis* n. sp. (F-H): A, F - male left palp, ventral view; B, G - male left palp, tibia and patella, dorsal view; C, H - ditto, retrolateral view; D - female internal genitalia, ventral view; E - ditto, dorsal view. Scale lines: 0.1 mm.

12″N, 128°30′14″E, alt. 977 m), 12 km south-southwest of the summit of Mt. Odae, Jinbu-myeon, Pyeonchang-gun, Gangweon-do, 20 July 2010, J. C. Lim. Paratype: 2♀♀, 26♂♂, same data as holotype.

Etymology. The specific name comes from the type locality, Mt. Odae.

Diagnosis. The new species is easily separated from all other *Cybaeus* species by the mottled pattern on the abdomen, the cymbium with lengthened tip, the very short embolus in male palp, the narrow interval between the embolic base and the conductor of male palp, the small number of teeth on the round apophysis of male palpal patella, the narrow atrium, and the small ventral vesicle and the short copulatory duct connected with ventral vesicle of female spermatheca (Figs. 3A-E, 5I, J, 7M-O).

Description. Male (holotype). Total length 7.30. Habitus as in Fig. 5J. Carapace brown, 4.03 long, 2.90 wide; radial grooves and linear fovea distinct. Clypeus height 2.8 times of diameter of ALE. AER 0.85, PER 1.05; AER and PER retrocurved slightly in dorsal view. AME 0.13, ALE 0.23, PME 0.21, PLE 0.21, AME-AME 0.09, AME-ALE 0.04, PME-PME 0.16, PME-PLE 0.14, AME-PME 0.26, and ALE-PLE 0.07. Median ocular quadrangle, height > posterior side > anterior side (42 : 41 : 26). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 1.83 long, 1.76 wide.

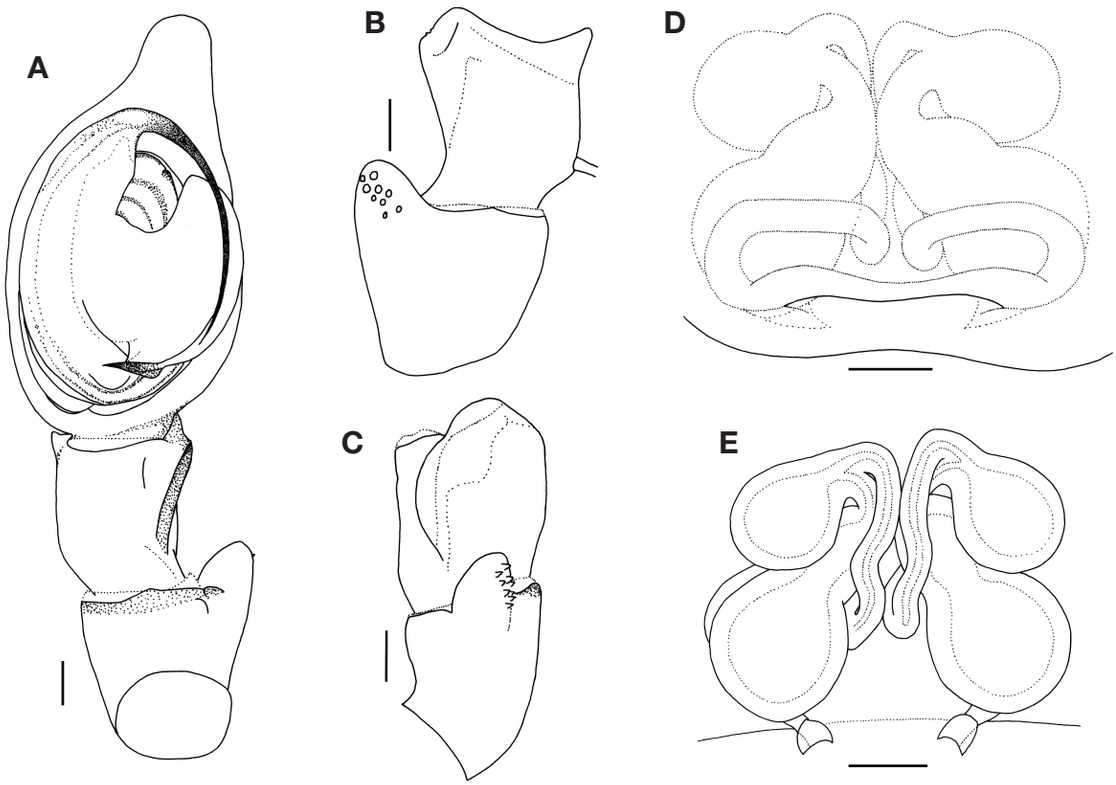


Fig. 4. *Cybaeus songniensis* n. sp. (A-E): A - male left palp, ventral view; B - male left palp, tibia and patella, dorsal view; C - ditto, retrolateral view; D - female internal genitalia, ventral view; E - ditto, dorsal view. Scale lines: 0.1 mm.

Labium 0.63 long, 0.63 wide. Leg measurements: I 23.10 (5.60, 1.70, 6.70, 6.70, 2.40), II 19.70 (4.90, 1.50, 5.40, 5.70, 2.20), III 12.90 (3.50, 1.20, 2.80, 3.70, 1.70), IV 16.40 (4.10, 1.30, 3.70, 5.10, 2.20). Palp 4.80 (1.80, 0.70, 0.50, 1.80). Leg I/c 5.73. Fem. I/c 1.39. Tib. I/c 1.66. Met. I/c 1.66. Pat. I + tib. I/c 2.08. Met. I/tar. I 2.79. Met. IV/tar. IV 2.32. Leg spination pattern: Femora; I d1-1-0, p0-0-1; II d1-1-0, p0-0-1, r0-1-0; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-1-1, r0-0-1. Tibiae; I p1-1-1-1-1-1-1, v2-1-1-1-1; II p1-1-1, v2-2-2-1-2; III p1-1-1, r0-1-1, v2-2-0-2; IV d1-1, p1-1-1, r0-1-1, v2-1-2. Metatarsi; I p1-1-1-1, r1-1-1-1; II p1-1-1-1, r1-0-0, v2-2-2; III d1-1, p1-1-1-1-2, r0-1-2, v2-2-1; IV p1-1-1-2, r1-1-1-1-2, v2-2-1. Abdomen oval and mottled dark gray, with two pairs of pale dots and four chevrons longitudinally, and 3.78 long, 2.39 wide. Palp (Figs. 3A-C, 6M-O): tibia shorter than patella; patella apophysis round with 18 conical teeth; embolus very short and slender; interval between embolic base and conductor narrow.

Female (paratype). Total length 7.40. Habitus as in Fig. 5I. Carapace 3.78 long, 2.84 wide. Clypeus height 2.4 times of diameter of ALE. AER 0.83, PER 1.05. AME 0.12, ALE 0.21, PME 0.20, PLE 0.21, AME-AME 0.12, AME-ALE 0.05, PME-PME 0.16, PME-PLE 0.16, AME-PME 0.25, and ALE-PLE 0.08. Median ocular quadrangle, height > posterior side > anterior side (40 : 39 : 28). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 1.70 long, 1.64 wide. Labium 0.50 long, 0.57 wide. Leg measurements: I 11.22 (2.90, 1.26, 2.96, 2.71, 1.39), II 10.52 (2.90, 1.20, 2.58, 2.52, 1.32), III 9.13 (2.52, 1.13, 1.95, 2.33, 1.20), IV 12.03 (3.21, 1.13, 2.71, 3.34, 1.64). Palp 4.16 (1.32, 0.63, 0.76, 1.45). Leg I/c 2.97. Fem. I/c 0.77. Tib. I/c 0.78. Met. I/c 0.72. Pat. I + tib. I/c 1.12. Met. I/tar. I 1.95. Met. IV/tar. IV 2.04. Leg spination pattern: Femora; I d1-1-0, p0-1; II d1-1-0, p0-0-1, r0-1-0; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-1-1, r0-0-1. Tibiae; I d1-1, p1-1-0-0, v2-2-2-2-2; II d0-0-1, p1-1-1, r0-0-1, v2-2-2-1; III d1-1, p1-1-1, r1-1, v2-2-2; IV d1-1, p1-1-1, r1-1, v2-1-2. Metatarsi; I d1-0-0, p1-1, r1-1, v2-2-0; II d1-0-0, p1-1-1-1, r1-1, v2-2-1; III d1-0-0, p1-1-2, r1-1-1-0-2, v2-2-1; IV p1-1-2, r1-1-1-0-2, v2-2-1. Abdomen 4.41 long, 3.59 wide. Epigynum: atrium narrow, with a pair of copulatory openings. Internal genitalia: spermatheca with an ventral small vesicle and a dorsal gourd-like vesicle; short copulatory duct connected with ventral vesicle; fertilization duct short (Figs. 3D, E, 7M-O).

Habitat. Mixed forest.

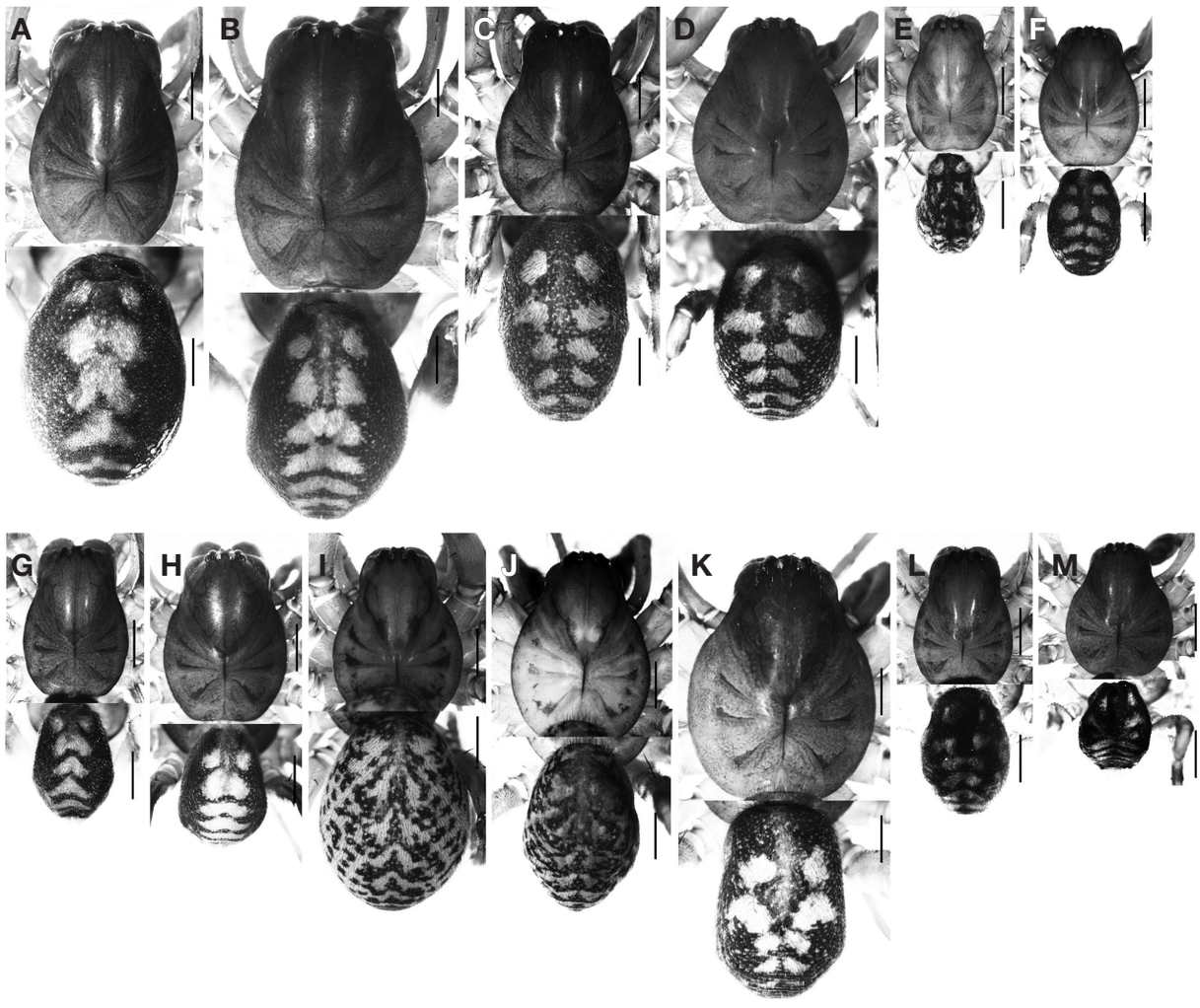


Fig. 5. Carapaces and abdomens: A - *Cybaeus geumensis*, female; B - *C. geumensis*, male; C - *C. ilweolensis*, female; D - *C. ilweolensis*, male; E - *C. jiriensis*, female; F - *C. jiriensis*, male; G - *C. jogyensis*, female; H - *C. jogyensis*, male; I - *C. odaensis*, female; J - *C. odaensis*, male; K - *C. seorakensis*, male; L - *C. songniensis*, female; M - *C. songniensis*, male. Scale lines: 1.0 mm.

World Distribution. Korea (Gangweon-do).

***Cybaeus seorakensis* n. sp.**
설악굴뚝거미 (신칭) (Figs. 3F-H, 5K, 6P-R)

Material examined. Holotype: ♂, mixed forest (38°10′ 32″N, 128°22′18″E, alt. 559 m), 12.5 km north-northwest of Baekdam Temple in Mt. Seorak, Buk-myeon, Inje-gun, Gangweon-do, 19 July 2010, J. C. Lim.

Etymology. The specific name comes from the type locality, Mt. Seorak.

Diagnosis. The new species is similar to *C. ilweolensis* n. sp. in the abdominal pattern, but can be distinguished from the latter by the short embolus of male palp, the narrow interval between the embolic base and the conductor of male palp, and the slightly two-humped apophysis of male palpal patella (Figs. 3F-H, 5K).

Description. Male (holotype). Total length 8.90. Habitus as in Fig. 5K. Carapace reddish brown, 5.20 long, 3.90 wide; radial grooves and linear fovea distinct. Clypeus height 2.3 times of diameter of ALE. AER 1.05, PER 1.25; AER retrocurved slightly and PER straight in dorsal view. AME 0.20, ALE 0.26, PME 0.25, PLE 0.26, AME-AME 0.09, AME-ALE 0.04, PME-PME 0.23, PME-PLE 0.13, AME-PME 0.22, and ALE-PLE 0.05. Median ocular quadrangle, posterior side > height > anterior side (55 : 50 : 36). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 2.30 long, 1.90 wide. Labium 0.70 long, 0.70 wide. Leg measurements: I 21.10 (5.30, 1.90, 5.70, 5.50, 2.70), II 16.80

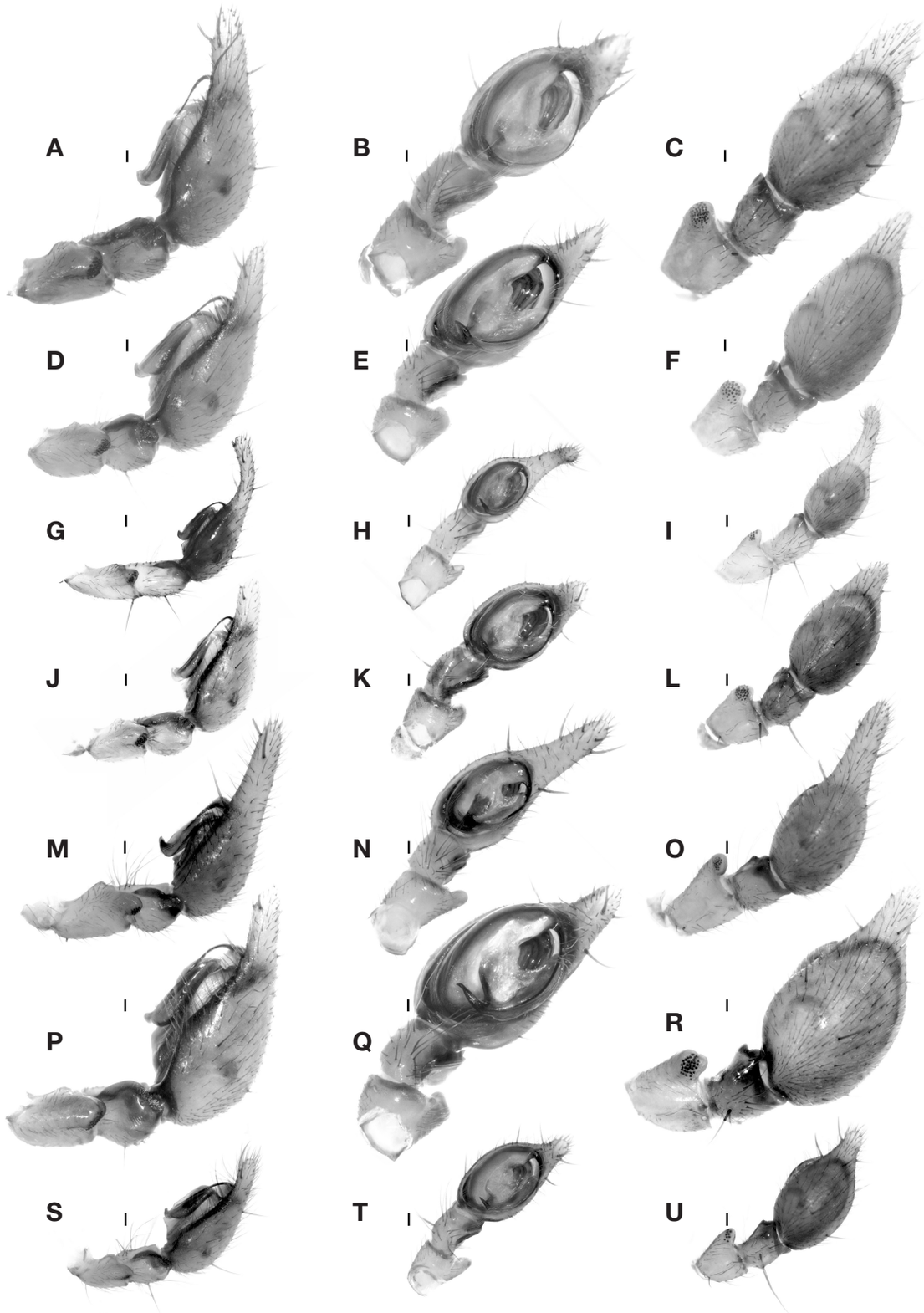


Fig. 6. Male left palps (1st column - retrolateral view, 2nd - ventral view, and 3rd - dorsal view): *Cybaeus geumensis* (A-C); *C. ilweolensis* (D-F); *C. jiriensis* (G-I); *C. jogyensis* (J-L); *C. odaensis* (M-O); *C. seorakensis* (P-R); *C. songniensis* (S-U). Scale lines: 0.1 mm.

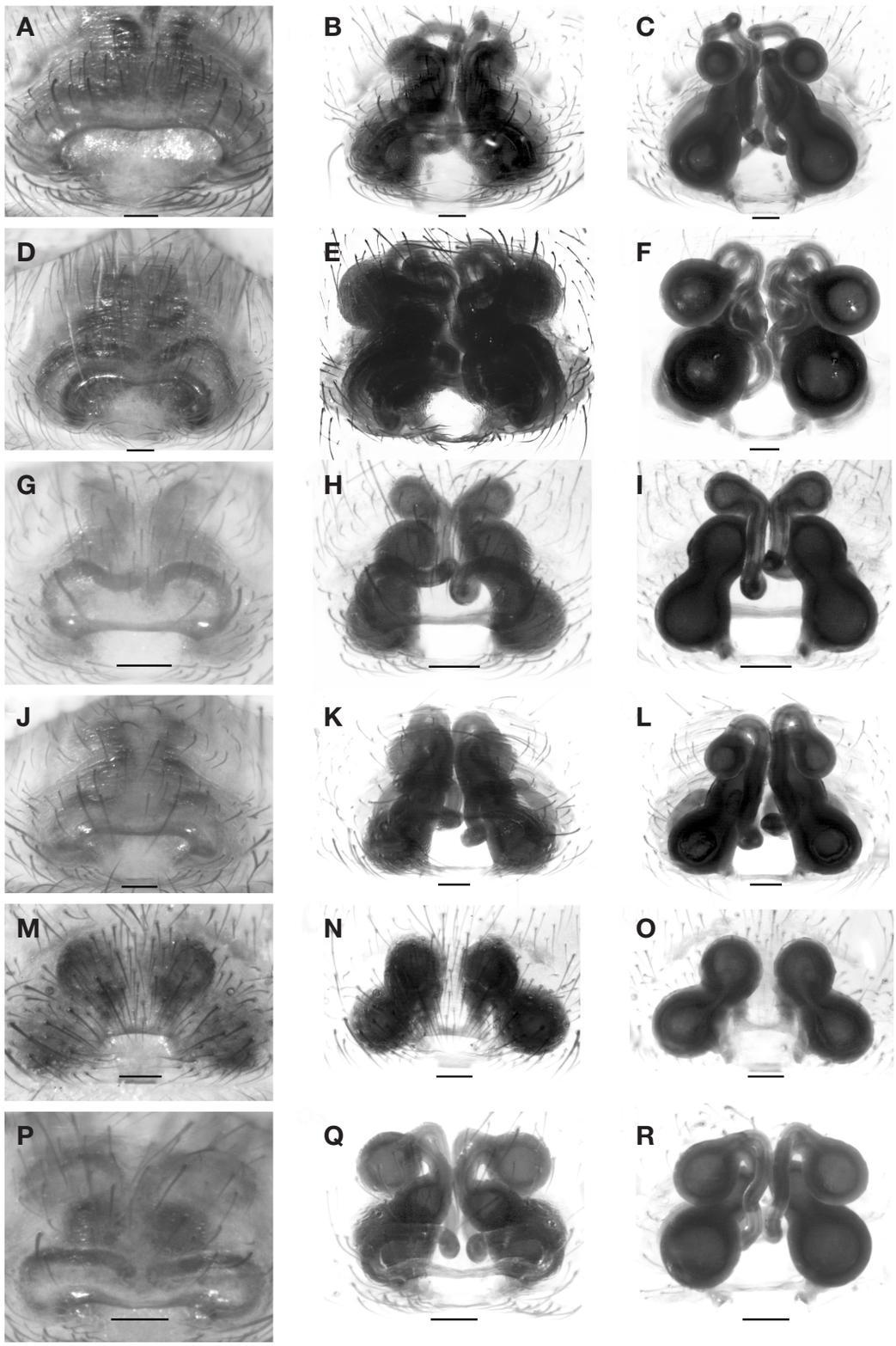


Fig. 7. Female genital organs (1st column - epigynum, 2nd - internal genitalia, ventral view, and 3rd - internal genitalia, dorsal view): *Cybaeus geumensis* (A-C); *C. ilweolensis* (D-F); *C. jiriensis* (G-I); *C. jogyensis* (J-L); *C. odaensis* (M-O); *C. songniensis* (P-R). Scale lines: 0.1 mm.

(4.20, 1.70, 4.20, 4.40, 2.30), III 14.30 (3.80, 1.50, 3.00, 3.90, 2.10), IV 17.30 (4.30, 1.50, 4.00, 5.10, 2.40). Palp 6.10 (2.50, 0.80, 0.60, 2.20). Leg I/c 4.06. Fem. I/c 1.02. Tib. I/c 1.10. Met. I/c 1.06. Pat. I+tib. I/c 1.46. Met. I/tar. I 2.04. Met. IV/tar. IV 2.13. Leg spination pattern: Femora; I d1-1-1, p0-0-0-1-1; II d1-1-1, p0-0-0-1-1, r0-1-1; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-1-1, r0-0-1. Tibiae; I p1-1, v2-2-2-0-2; II p1-1-1, v2-2-1-0-2; III d1-1, p1-1-1, r1-1, v2-2-2; IV d1-1, p1-1-1, r0-1-1, v2-1-2. Metatarsi; I p1-1-1, r0-1-1-1, v2-0-0-0; II p1-1-1-2, r0-1-1-1, v2-0-0-1; III p1-1-1-1-1-2, r1-1-1-2, v2-2-1; IV p1-2-2, r1-1-1-2, v2-2-1. Abdomen oval and dark gray, with two pairs of pale dots and three chevrons longitudinally, and 4.20 long, 2.90 wide. Palp (Figs. 3F-H, 6P-R): tibia shorter than patella; patella apophysis slightly two-humped with 35 conical teeth; embolus short and slender; interval between embolic base and conductor narrow.

Habitat. Mixed forest.

World Distribution. Korea (Gangweon-do).

***Cybaeus songniensis* n. sp.**

속리굴뚝거미 (신칭) (Figs. 4A-E, 5L, M, 6S-U, 7P-R)

Material examined. Holotype: ♂, mixed forest (36°29′35″N, 127°49′36″E, alt. 347 m), 5.3 km south of Beopju Temple in Mt. Songni, Songnisan-myeon, Boeun-gun, Chungcheongbuk-do, 22 August 2011, T. B. Ryu. Paratype: 1♀, same data as holotype.

Etymology. The specific name comes from the type locality, Mt. Songni.

Diagnosis. The new species is similar to *C. jiriensis* n. sp. in the abdominal pattern, the embolus length of male palp, the interval between the embolic base and the conductor of male palp, the apophysis teeth number and the apophysis shape of male palpal patella, and the vesicle shape of female spermatheca, but can be easily distinguished from the latter by the normal cymbium tip of male palp, the epygine, the small size and the separated position of the anterior vesicles, and the curved copulatory duct connected with the anterior vesicle of female spermatheca (Figs. 4A-E, 5L, M, 7P-R).

Description. Male (holotype). Total length 4.35. Habitus as in Fig. 5M. Carapace brown, 2.77 long, 2.08 wide; radial grooves and linear fovea distinct. Clypeus height 3.4 times of diameter of ALE. AER 0.60, PER 0.75; AER and PER retrocurved slightly in dorsal view. AME 0.13, ALE 0.17, PME 0.14, PLE 0.16, AME-AME 0.04, AME-ALE 0.04, PME-PME 0.13, PME-PLE 0.10, AME-PME 0.14, and ALE-PLE 0.05. Median ocular quadrangle, posterior side > height > anterior side (30 : 27 : 17). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 1.32 long, 1.26 wide. Labium 0.38 long, 0.44 wide. Leg measurements: I 9.96 (2.58, 0.95, 2.65, 2.33, 1.45), II 8.25 (2.27, 0.88, 1.95, 1.89, 1.26), III 6.80 (1.89, 0.76, 1.32, 1.70, 1.13), IV 8.83 (2.33, 0.76, 2.02, 2.46, 1.26). Palp 3.08 (1.13, 0.44, 0.38, 1.13). Leg I/c 3.60. Fem. I/c 0.93. Tib. I/c 0.96. Met. I/c 0.83. Pat. I+tib. I/c 1.30. Met. I/tar. I 1.61. Met. IV/tar. IV 1.95. Leg spination pattern: Femora; I d1-1-0, p0-0-1; II d1-1, p0-0-0-1; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-0, p0-0-0-1, r0-0-0-1. Tibiae; I d0-0-0-1, p1-1-1, v2-2-1; II d1-0-1, p1-1-1, v2-2-1; III, IV d1-1, p1-1-1, r1-1, v2-2-2. Metatarsi; I p1-1, r0-0-1, v2-2-0; II p1-1-0-2, r0-0-0-1, v2-2-1; III p1-1-1-2, r1-1-1-2, v2-2-1; IV p1-2-2, r1-1-2, v1-1-2-1. Abdomen oval and dark, with two pairs of pale dots and four chevrons longitudinally, and 1.89 long, 1.51 wide. Palp (Figs. 4A-C, 6S-U): tibia shorter than patella; patella apophysis rather pointed with 9 conical teeth; embolus short and slender; interval between embolic base and conductor narrow.

Female (paratype). Total length 4.98. Habitus as in Fig. 5L. Carapace 2.84 long, 1.95 wide. Clypeus height 2.9 times of diameter of ALE. AER 0.61, PER 0.83. AME 0.09, ALE 0.17, PME 0.14, PLE 0.17, AME-AME 0.07, AME-ALE 0.04, PME-PME 0.14, PME-PLE 0.12, AME-PME 0.17, and ALE-PLE 0.04. Median ocular quadrangle, posterior side > height > anterior side (34 : 30 : 18). Chelicera with three promarginal and eight minute retromarginal teeth. Sternum 1.32 long, 1.26 wide. Labium 0.38 long, 0.44 wide. Leg measurements: I 7.63 (2.21, 0.88, 1.83, 1.64, 1.07), II 7.00 (2.08, 0.82, 1.58, 1.51, 1.01), III 6.25 (1.83, 0.76, 1.20, 1.51, 0.95), IV 8.01 (2.21, 0.76, 1.83, 2.08, 1.13). Palp 3.15 (1.01, 0.50, 0.57, 1.07). Leg I/c 2.69. Fem. I/c 0.78. Tib. I/c 0.64. Met. I/c 0.58. Pat. I+tib. I/c 0.95. Met. I/tar. I 1.53. Met. IV/tar. IV 1.84. Leg spination pattern: Femora; I d1-1, p0-0-1; II d1-1, p0-0-1, r0-1-0; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, r0-0-1. Tibiae; I d1-1, p1-1-1, r0-0-1, v2-2-1-0; II d1-1, p1-1-1, v2-2-1-1; III d1-1, p1-1, r1-1, v2-2-2; IV d1-1, p1-1-1, r0-1-1, v1-1-2. Metatarsi; I p1-1, r1-1, v2-2-0; II p1-1-2, r1-1, v2-2-1; III p1-1-1-2, r1-1-1-2, v2-2-1; IV p1-1-1-0-2, r1-1-2, v2-2-1. Abdomen dark gray, 2.58 long, 1.83 wide. Epigynum: atrium wide, with a pair of copulatory openings. Internal genitalia: spermatheca with an anterior medium-sized pear-shaped vesicle and a posterior gourd-like vesicle; curved copulatory duct connected with anterior vesicle dorsally; fertilization duct short (Figs. 4D, E, 7P-R).

Habitat. Mixed forest.

World Distribution. Korea (Chungcheongbuk-do).

Acknowledgements

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Ministry of Environment (MOE) of the Republic of Korea (NIBR No. 2016-02-001).

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