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Four new species of the genus *Falcileptoneta* (Araneae, Leptonetidae) from Korea

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Four new species of the genus *Falcileptoneta* from Korea, *F. geumdaensis*, *F. geumsanensis*, *F. maewhaensis*, and *F. sunchangensis*, are described and illustrated.

Keywords: Araneae, *Falcileptoneta*, Korea, Leptonetidae, new species

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Introduction

The genus *Falcileptoneta* was erected by Komatsu (1970), and separated from European *Leptoneta*, occurring in the Mediterranean area (Algeria, France, Italy, Portugal and Spain) (World Spider Catalog, 2016), by the difference in the shape of the male palpal tarsus, the absence of the retrolateral mesial appendix, and the presence of the retrolateral tibial apophysis. Sixteen species were described in Korea (Seo, 2015), and four additional new species, *F. geumdaensis*, *F. geumsanensis*, *F. maewhaensis*, and *F. sunchangensis*, are described with the illustrations.

Materials and Methods

Leg measurements are given as: total (femur, patella, tibia, metatarsus, tarsus). The following abbreviations have been 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-PME, distance between ALE and PME; PER, posterior eye row; PLE, posterior lateral eye; PME, posterior median eye; PLE-PME, distance between PLE and PME. All measurements are given in millimeters. The type specimens are preserved in the National Institute of Biological Resources (NIBR), Ministry of Environment, Korea.

Results and Discussion

Order Araneae Clerck, 1757 거미목

Family Leptonetidae Simon, 1890 잔나비거미과
Genus *Falcileptoneta* Komatsu, 1970 왜잔나비거미속

***Falcileptoneta geumdaensis* n. sp.**
금대잔나비거미 (신칭) (Fig. 1A-H)

Material examined. Holotype: ♂, mixed forest around parking area (37°16′48″N, 128°00′55″E, alt. 500 m), 10 km south-southwest of the summit of Mt. Chiak, Geumdae-ri, Panbu-myeon, Weonju-si, Gangweon-do, 21 July 2010, J. C. Lim.
Etymology. The specific name comes from the type locality, Geumdae Rural Village.
Diagnosis. The male palp of *F. geumdaensis* n. sp. is separated from all other *Falcileptoneta* species by the tibia with two retrolateral spur-like apophyses on the distal end, the embolus with transparent membrane anterodorsally, the curved spine-like prolateral sclerite of the palpal bulb, and the presence of some microscopic hairs on the retrolateral sclerite of the palpal bulb (Fig. 1E-H).
Description. Male (holotype). Total length 1.96. Habitus as in Fig. 1A. Carapace yellow, and 0.82 long, 0.76 wide; fovea linear, distinct. Clypeus height 3.3 times of diameter of ALE. AER 0.10, PER 0.13. ALE 0.05, PME 0.03, PLE 0.05, ALE-PME 0.08, PLE-PME 0.03. Chelicera with ten promarginal teeth. Sternum 0.57 long, 0.52 wide. Labium 0.08 long, 0.16 wide. Endite with a nodule, and a little longer than wide (Fig. 1B). Leg measurements: I 5.08 (1.40, 0.28, 1.44, 1.16, 0.80), II 4.26 (1.22, 0.28, 1.12, 0.92, 0.72), III 3.60 (1.02, 0.24, 0.92, 0.84, 0.58), IV - (1.38, 0.24, 1.42, 1.10, -). Palp 1.34 (0.54, 0.20, 0.28, 0.32). Leg I/c 6.20. Fem. I/c 1.71. Tib I/c 1.76.

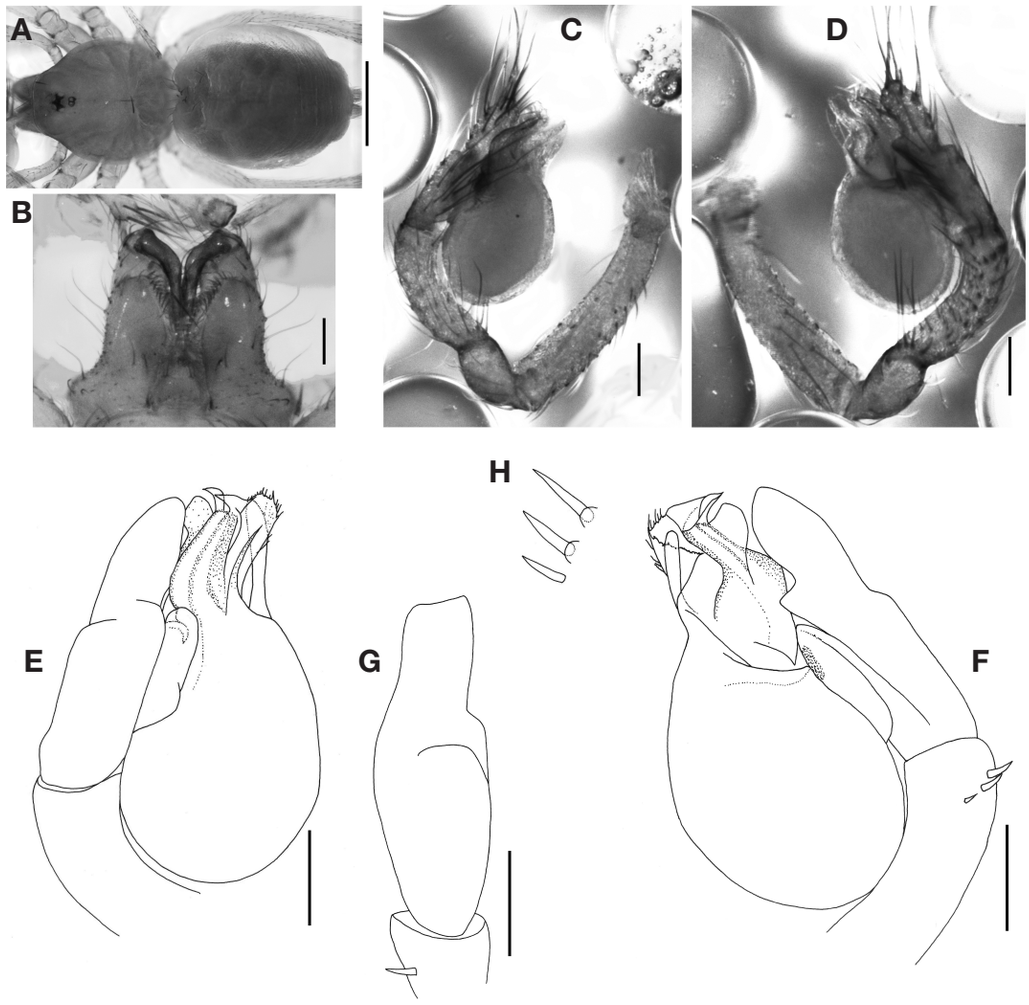

Fig. 1. *Falcileptoneta geumdaensis* n. sp.: A - male, dorsal view; B - male endite; C - male left palp, prolateral view; D - ditto, retrolateral view; E - ditto, bulb and tarsus, prolateral view; F - ditto, bulb and tarsus, retrolateral view; G - ditto, tarsus, dorsal view; H - ditto, tibial apophyses. Scale lines: 0.5 mm (A), 0.1 mm (the rest).

Met I/c 1.41. Pat. I + tib. I/c 2.10. Met. I/tar. I 1.45. Leg spination pattern: Femora; I p0-0-1. Tibiae; I p0-1-1-1, r0-0-1-1, v0-1-0; II p1-1-1, r0-0-1, v0-0-1; III d0-1, p0-0-1, r1-0-1; IV d1-1-0. Metatarsi; I p0-1-0, r0-1-0, 1-1-1; II p0-1-0, r0-1-0, v0-1-1-0; III p0-1-0, r0-1-0, v0-1-1; IV v0-1-0. Abdomen pale yellow and oval, and 1.08 long, 0.88 wide. Palp (Fig. 1C-H): femur without spine; tibia with two retrolateral apophyses on distal end, both apophyses spur-like; tarsus branched slightly, with a transverse depression and a ventral process. Palpal bulb with an embolus and three sclerites: tip of embolus sickle-like, embolus with transparent membrane anterodorsally; prolateral sclerite curved and spine-like; median sclerite shoehorn-like; retrolateral sclerite transparent membrane, with some microscopic hairs.

Habitat. Mixed forest.

World Distribution. Korea (Gangweon-do).

***Falcileptoneta geumsanensis* n. sp.**
금산잔나비거미 (신칭) (Fig. 2A-I)

Material examined. Holotype: ♂, mixed forest (34°44′27″N, 127°59′06″E, alt. 142 m), 1.4 km south of the summit of Mt. Geum, Sangju-myeon, Namhae-gun, Gyeongsangnam-do, 20 April 2013, B. K. Seo. Paratype: 13 ♂♂, 11♀♀, same data as holotype; 2♂♂, 20 July 2013, other data same as holotype; 3♂♂, 2♀♀, mixed forest (34°47′15″N, 127°57′07″E, alt. 103 m), 6.4 km west-northwest of the summit of Mt. Geum, Idong-myeon, Namhae-gun, Gyeongsangnam-do, 19 April 2013, B. K. Seo; 2♂♂, 2♀♀, mixed forest (34°43′18″N, 127°57′44″E, alt. 102 m), 3.9 km.

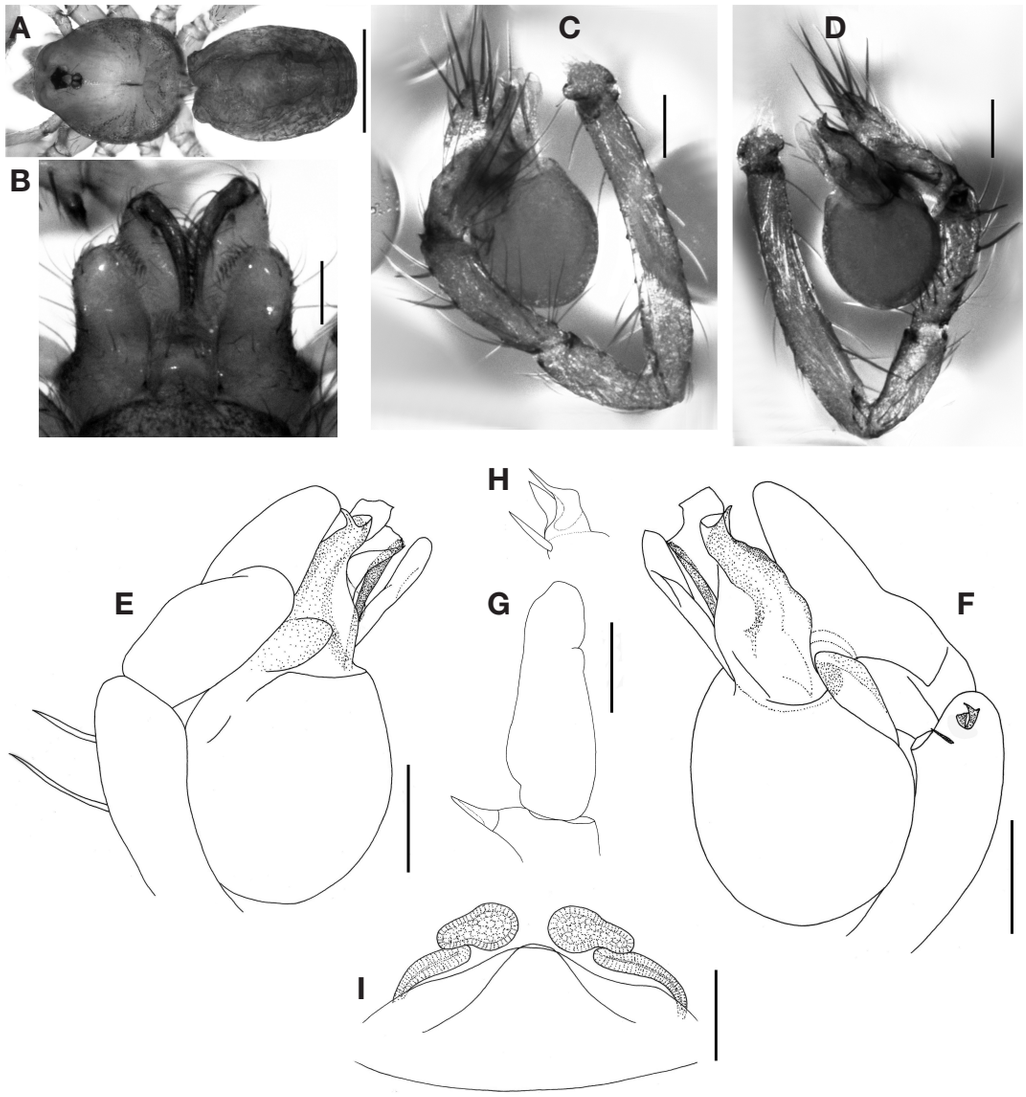

Fig. 2. *Falcileptoneta geumsanensis* n. sp.; A - male, dorsal view; B - male endite; C - male left palp, prolateral view; D - ditto, retrolateral view; E - ditto, bulb and tarsus, prolateral view; F - ditto, bulb and tarsus, retrolateral view; G - ditto, tarsus, dorsal view; H - ditto, tibial apophyses; I - female, internal genitalia. Scale lines: 0.5 mm (A), 0.1 mm (the rest).

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

Diagnosis. The male palp of *F. geumsanensis* n. sp. is very similar to that of *F. digitalis* Seo, 2015 in the shape of tarsus, the tibial dorsal spurs, three retrolateral apophyses on the distal end of the tibia, and the shape of retrolateral sclerite of the bulb, but can be easily distinguished from the latter by the tarsus without a ventral process and a proximal retrolateral spur, the shape of beak-like dorsal apophysis among three retrolateral tibial ones, the sickle-like embolus tip, the narrow undulating membrane at the anterodorsal embolus, and the endite bulged out medially (Fig. 2E-H).

Description. Male (holotype). Total length 1.58. Habitus as in Fig. 2A. Carapace yellowish brown and 0.74 long, 0.62 wide; fovea linear, distinct; radial furrow and margin of thorax covered with brown spots. Clypeus height 2.2 times of diameter of ALE. AER 0.10, PER 0.13. ALE 0.06, PME 0.05, PLE 0.05, ALE-PME 0.08, PLE-PME 0.03. Chelicera with eight promarginal teeth. Sternum 0.48 long, 0.36 wide. Labium 0.10 long, 0.12 wide. Endite bulged out medially, and longer than wide (Fig. 2B). Leg measurements: I 4.12 (1.10, 0.24, 1.18, 0.92, 0.68), II 3.34 (0.92, 0.24, 0.88, 0.70, 0.60), III 0.92 (0.80, 0.20, 0.74, 0.66, 0.52), IV 4.10 (1.10, 0.24, 1.20, 0.92, 0.64). Palp 1.28 (0.54, 0.20, 0.26, 0.28). Leg I/c 5.57. Fem. I/c 1.49. Tib I/c 1.59. Met I/c 1.24. Pat. I + tib. I/c 1.92. Met. I/tar. I 1.35. Met. IV/tar. IV 1.44. Leg spination pattern:

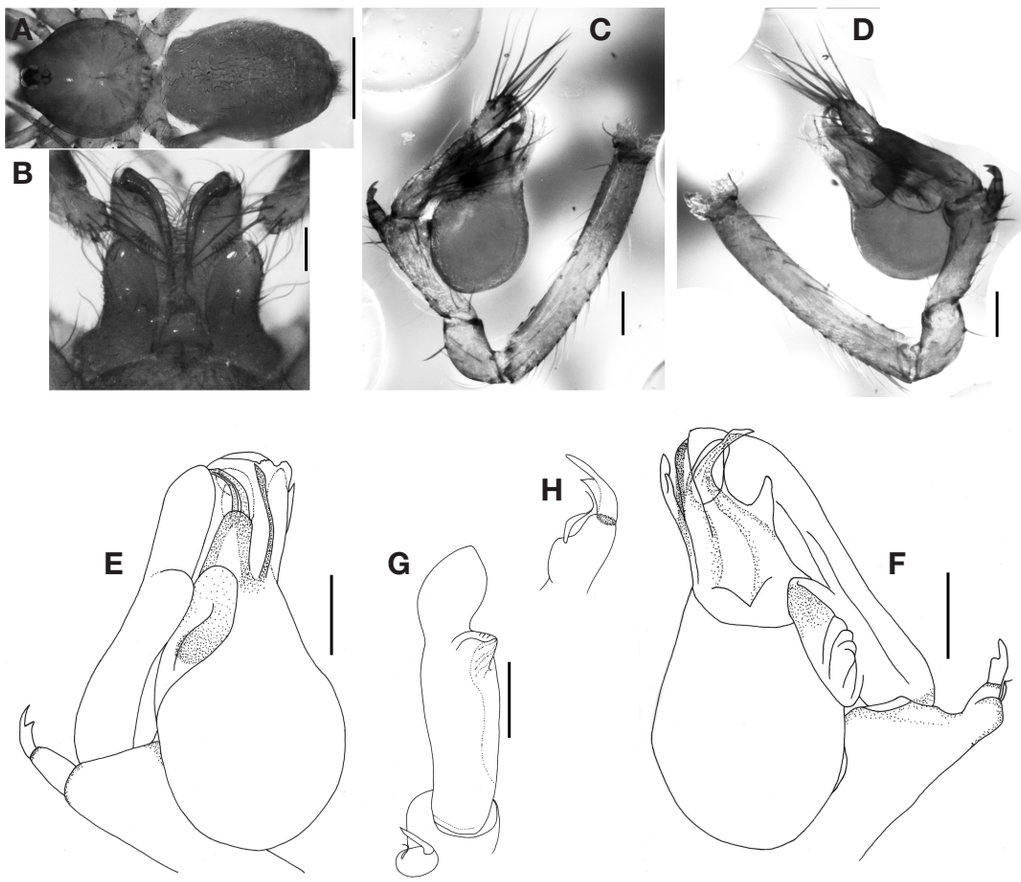

Fig. 3. *Falcileptoneta maewhaensis* n. sp.; A - male, dorsal view; B - male endite; C - male left palp, prolateral view; D - ditto, retrolateral view; E - ditto, bulb and tarsus, prolateral view; F - ditto, bulb and tarsus, retrolateral view; G - ditto, tarsus, dorsal view; H - ditto, tibial apophyses. Scale lines: 0.5 mm (A), 0.1 mm (the rest).

Femora; I p0-0-1. Tibiae; I p0-1-1, r0-1-1, v1-0; II v1-0; III d0-1, p0-0-1, r1-1; IV d1-0, p1-1, r0-0-1. Metatarsi; I v1-1-1; II p0-1-0, v0-0; III p1-0, v0-1-0; IV p0-1-0. Abdomen yellowish brown mottled with brown spots, oval, and 0.74 long, 0.56 wide. Palp (Fig. 2C-H): femur without strong spine; tibia with three retrolateral apophyses on distal end, ventral one spur-like, middle one leaf-like and dorsal one beak-like, and with two dorsal spurs and one dorsoretrolateral one; tarsus unbranched, with a transverse depression. Palpal bulb with an embolus and three sclerites: tip of embolus sickle-like, anterodorsal embolus with narrow undulating membrane; prolateral sclerite narrow leaf-like, with serrated tip; median sclerite shoehorn-like; retrolateral sclerite transparent and membranous.

Female (paratype). Total length 1.66. Carapace 0.68 long, 0.60 wide. Clypeus height 2 times of diameter of ALE. AER 0.12, PER 0.13. ALE 0.07, PME 0.05, PLE 0.05, ALE-PME 0.07, PLE-PME 0.03. Chelicera with eight promarginal teeth. Sternum 0.49 long, 0.35 wide. Labium 0.10 long, 0.14 wide. Leg measurements: I 4.14 (1.06, 0.22, 1.18, 0.90, 0.78), II 3.26 (0.90, 0.22, 0.88, 0.68, 0.58), III 2.88 (0.80, 0.20, 0.74, 0.66, 0.48), IV 4.04 (1.10, 0.22, 1.20, 0.90, 0.62). Palp 1.32 (0.42, 0.16, 0.32, 0.42). Leg I/c 6.09. Fem. I/c 1.56. Tib I/c 1.74. Met I/c 1.32. Pat. I + tib. I/c 2.06. Met. I/tar. I 1.15. Met. IV/tar. IV 1.45. Leg spination pattern: Femora; I p1-0. Tibiae; I p0-0-0-1, r0-1-1-1, v1-0; II v1-0; III d0-1, p0-0-1, r1-1; IV d1-0-0, p0-0-0-1. Metatarsi; I v1-1-1; II, IV p0-1-0, v0-1-0; III p0-1-0, v0-1-0; IV p0-1-0. Abdomen oval, 0.98 long, 0.80 wide. Internal genitalia; spermatheca pear-shaped, genital duct short and loosely coiled (Fig. 2I).
Habitat. Mixed forest.
World Distribution. Korea (Gyeongsangnam-do).

***Falcileptoneta maewhaensis* n. sp.**
매화잔나비거미 (신칭) (Fig. 3A-H)

Material examined. Holotype: ♂, mixed forest (35°45′48″N, 128°07′22″E, alt. 361 m), 2.7 km east-southeast of the summit of Mt. Maewha, Gaya-myeon, Hapcheon-gun, Gyeongsangnam-do, 11 August 2007, B. K. Seo.
Etymology. The specific name comes from the type lo-

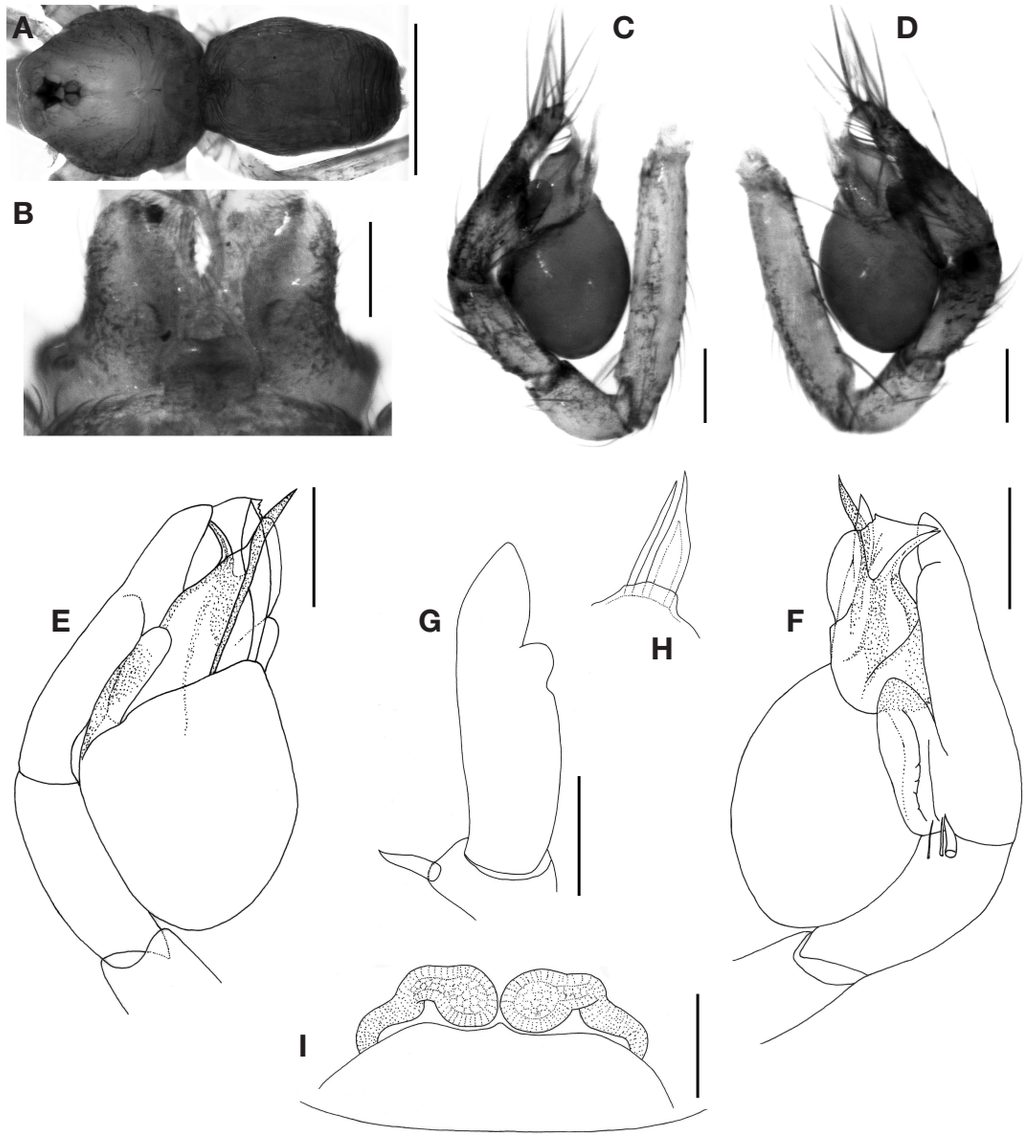

Fig. 4. *Falcileptoneta sunchangensis* n. sp.; A - male, dorsal view; B - male endite; C - male left palp, prolateral view; D - ditto, retrolateral view; E - ditto, bulb and tarsus, prolateral view; F - ditto, bulb and tarsus, retrolateral view; G - ditto, tarsus, dorsal view; H - ditto, tibial apophyses; I - female, internal genitalia. Scale lines: 0.5 mm (A), 0.1 mm (the rest).

cality, Mt. Maewha.

Diagnosis. The male palp of *F. maewhaensis* n. sp. is separated from all other *Falcileptoneta* species by the tibia with a whip-like ventral apophysis and a bifurcated apophysis on the distal part, the embolus with large sickle-like tip, the shoehorn-like median sclerite with bilobed tip, and the transparent, membranous retrolateral sclerite with a triangular process at the dorsal side of embolus (Fig. 3E-H).

Description. Male (holotype). Total length 2.00. Habitus as in Fig. 3A. Carapace yellowish brown and 0.84 long, 0.74 wide; fovea linear, distinct. Clypeus height 2.4 times of diameter of ALE. AER 0.13, PER 0.17. ALE 0.07, PME 0.07, PLE 0.07, ALE-PME 0.09, PLE-PME 0.04. Chelicera with nine promarginal teeth. Sternum 0.55 long, 0.49 wide. Labium 0.14 long, 0.14 wide. Endite with a nodule, and longer than wide (Fig. 3B). Leg measurements: I 7.84 (2.12, 0.30, 2.46, 1.80, 1.16), II 5.54 (1.54, 0.26, 1.64, 1.16, 0.94), III 4.60 (1.20, 0.24, 1.34, 1.06, 0.76), IV 6.16 (1.68, 0.22, 1.90, 1.42, 0.94). Palp 1.56 (0.66, 0.22, 0.28, 0.40). Leg I/c 9.33. Fem. I/c 2.52. Tib I/c 2.93. Met I/c 2.14. Pat. I+tib. I/c 3.29. Met. I/tar. I 1.55. Met. IV/tar. IV 1.51. Leg spination pattern: Femora; I p0-1-0. Tibiae; I p0-0-1, r0-0-1-1, v0-1-1-0; II r0-0-1-1, v0-1-1-0; IV p0-0-0-0-1, r0-0-0-0-1. Metatarsi; I v1-1-0; II, III p1-0; IV p1-0, v1-0. Abdomen pale dark

brown, oval and 1.14 long, 0.78 wide. Palp (Fig. 3C-H): femur without spine; tibia with two retrolateral apophyses on distal end, ventral one whip-like and dorsal one bifurcated; tarsus unbranched, with a transverse depression. Palpal bulb with an embolus and three sclerites: embolus with large sickle-like tip; prolateral sclerite narrow leaf-like; median sclerite large shoehorn-like, with bilobed tip; retrolateral sclerite transparent and membranous, with a triangular process at dorside side of embolus.
Habitat. Mixed forest.
World Distribution. Korea (Gyeongsangnam-do).

***Falcileptoneta sunchangensis* n. sp.**
순창잔나비거미 (신칭) (Fig. 4A-I)

Material examined. Holotype: ♂, mixed forest (35°28′05″N, 126°52′21″E, alt. 427 m), 3.5 km north-northwest of Baekyang Temple in Mt. Baekam, Bokheung-myeon, Sunchang-gun, Jeollabuk-do, 13 May 2006, B. K. Seo. Paratype: 5♂♂, 3♀♀, same data as holotype; 1♂, mixed forest (35°29′04″N, 126°54′55″E, alt. 207 m), 1.3 km east-southeast of Naejang Temple in Mt. Naejang, other data same as holotype.
Etymology. The specific name comes from the type locality, Sunchang County.
Diagnosis. The male palp of *F. sunchangensis* n. sp. resembles those of *F. bifurca* Seo, 2015 and *F. naejangensis* Seo, 2015 in the shape of tarsus, and in having two retrolateral apophyses on the distal end of the tibia, but can be easily distinguished from the latters by the tibia with a simple spine-like ventral apophysis and a thick spur-like apophysis on the distal part, the large sickle-like embolus tip, and the broad retrolateral sclerite of palpal bulb (Fig. 4E-H).
Description. Male (holotype). Total length 1.30. Habitus as in Fig. 4A. Carapace reddish brown and 0.65 long, 0.59 wide; fovea linear and radial furrows distinct. Clypeus height 2 times of diameter of ALE. AER 0.12, PER 0.14. ALE 0.05, PME 0.04, PLE 0.07, ALE-PME 0.07, PLE-PME 0.01. Chelicera with seven promarginal teeth. Sternum 0.42 long, 0.38 wide. Labium 0.07 long, 0.13 wide. Endite bulged out medially, and longer than wide (Fig. 4B). Leg measurements: I 4.40 (1.17, 0.23, 1.25, 1.03, 0.72), II 3.27 (0.88, 0.22, 0.85, 0.73, 0.59), III 2.78 (0.73, 0.20, 0.65, 0.64, 0.56), IV 3.82 (1.01, 0.21, 1.09, 0.86, 0.65). Palp 0.99 (0.39, 0.16, 0.17, 0.27). Leg I/c 6.77. Fem. I/c 1.80. Tib I/c 1.92. Met I/c 1.58. Pat. I+tib. I/c 2.28. Met. I/tar. I 1.43. Met. IV/tar. IV 1.32. Leg spination pattern: Tibiae; II d0-1-1; III d0-1-0. Metatarsi; III, IV p1-0. Abdomen reddish brown, oval and 0.69 long, 0.48 wide. Palp (Fig. C-H): femur without strong spine; tibia with two retrolateral apophyses on distal end, ventral one spine-like and dorsal one thick spur-like; tarsus unbranched, with a transverse depression. Palpal bulb with an embolus and three type sclerite: tip of embolus sickle-like; prolateral sclerite narrrow leaf-like; median sclerite leaf-like; retrolateral sclerite broad, transparent, and membranous.

Female (paratype). Total length 1.29. Carapace 0.65 long, 0.57 wide. Clypeus height 1.8 times of diameter of ALE. AER 0.12, PER 0.14. ALE 0.05, PME 0.07, PLE 0.07, ALE-PME 0.08, PLE-PME 0.03. Chelicera with eight promarginal teeth. Sternum 0.42 long, 0.35 wide. Labium 0.08 long, 0.09 wide. Leg measurements: I 3.97 (1.03, 0.23, 1.11, 0.88, 0.72), II 3.08 (0.83, 0.22, 0.79, 0.65, 0.59), III 2.63 (0.65, 0.22, 0.65, 0.60, 0.51), IV 3.60 (0.98, 0.22, 1.00, 0.79, 0.61). Palp 1.08 (0.34, 0.12, 0.23, 0.39). Leg I/c 6.11. Fem. I/c 1.58. Tib I/c 1.71. Met I/c 1.35. Pat. I+tib. I/c 2.06. Met. I/tar. I 1.22. Met. IV/tar. IV 1.30. Leg spination pattern: Tibiae; I d0-0-0-1; II d0-1-0; III d0-1-1-0; IV r0-0-0-1. Metatarsi; I, II v0-1-0; III, IV p0-1-0, r0-1-0, v0-1-0. Abdomen oval, 0.72 long, 0.56 wide. Internal genitalia; spermatheca pear-shaped, genital duct short and loosely coiled (Fig. 4I).
Habitat. Mixed forest.
World Distribution. Korea (Jeollabuk-do).

Acknowledgements

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