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

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Four new species of the genus *Longileptoneta* from Korea, *L. gachangensis*, *L. gayaensis*, *L. jangseongensis*, and *L. weolakensis*, are described and illustrated.

Keywords: Araneae, Korea, Leptonetidae, Longileptoneta, new species

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Introduction

The spider family Leptonetidae is tiny (1.0-3.0 mm), relatively primitive haplogyne, and characterized by the six-eyed pattern and generally live in caves or in leaf litter (Song *et al*., 1999). Leptonetids include 23 genera and 280 species, and are broadly distributed in the Holarctic region (World Spider Catalog, 2016). The genus *Longileptoneta* was established by Seo (2015) for a new species, *L. songniensis* Seo, 2015, from Korea, and can be easily recognized by the strong spines restricted to the male palpal femur, the prolateral distal spur and the prolateral curvature of the palpal tarsus.

Four additional new species, *L. gachangensis*, *L. gayaensis*, *L. jangseongensis*, and *L. weolakensis*, among the specimens collected during the Korean indigenous species survey were identified, and are described with the illustrations.

Materials and Methods

The sequence of leg segments in measurement data is as follows: total (femur, patella, tibia, metatarsus, tarsus). The abbreviations used in the text: 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 in the text are given 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 Leptonetidae Simon, 1890 잔나비거미과
Genus *Longileptoneta* Seo, 2015 긴잔나비거미속

***Longileptoneta gachangensis* n. sp.**
가창잔나비거미 (신칭) (Fig. 1A-G)

Material examined. Holotype: ♂, grassland around Unheung Temple (35°47′05″N, 128°36′13″E, alt. 205 m), 2.6 km north of the summit of Mt. Choijeong, Gachang-myeon, Dalseong-gun, Daegu, 31 October 2006, B. K. Seo. Paratype: 1♂, same data as holotype.
Etymology. The specific name comes from the type locality, Gachang Township.
Diagnosis. The male palp of *L. gachangensis* n. sp. is similar to that of *L. songniensis* Seo, 2015 in the femur with many strong spines, the tibia without apophysis, and the tarsus without transverse depression, but can be easily distinguished from the latter by the conical embolus, the blade-like prolateral sclerite, the blade-like median sclerite, the skinny triangular retrolateral sclerite with serrated tip, and the tarsus unbranched retrolaterally, with two spurs at tip and much longer proximal prolateral spur (Fig. 1E-G).
Description. Male (holotype). Total length 1.76. Habitus as in Fig. 1A. Carapace brown, and 0.84 long, 0.72 wide; fovea linear, distinct. Clypeus height 3.5 times of

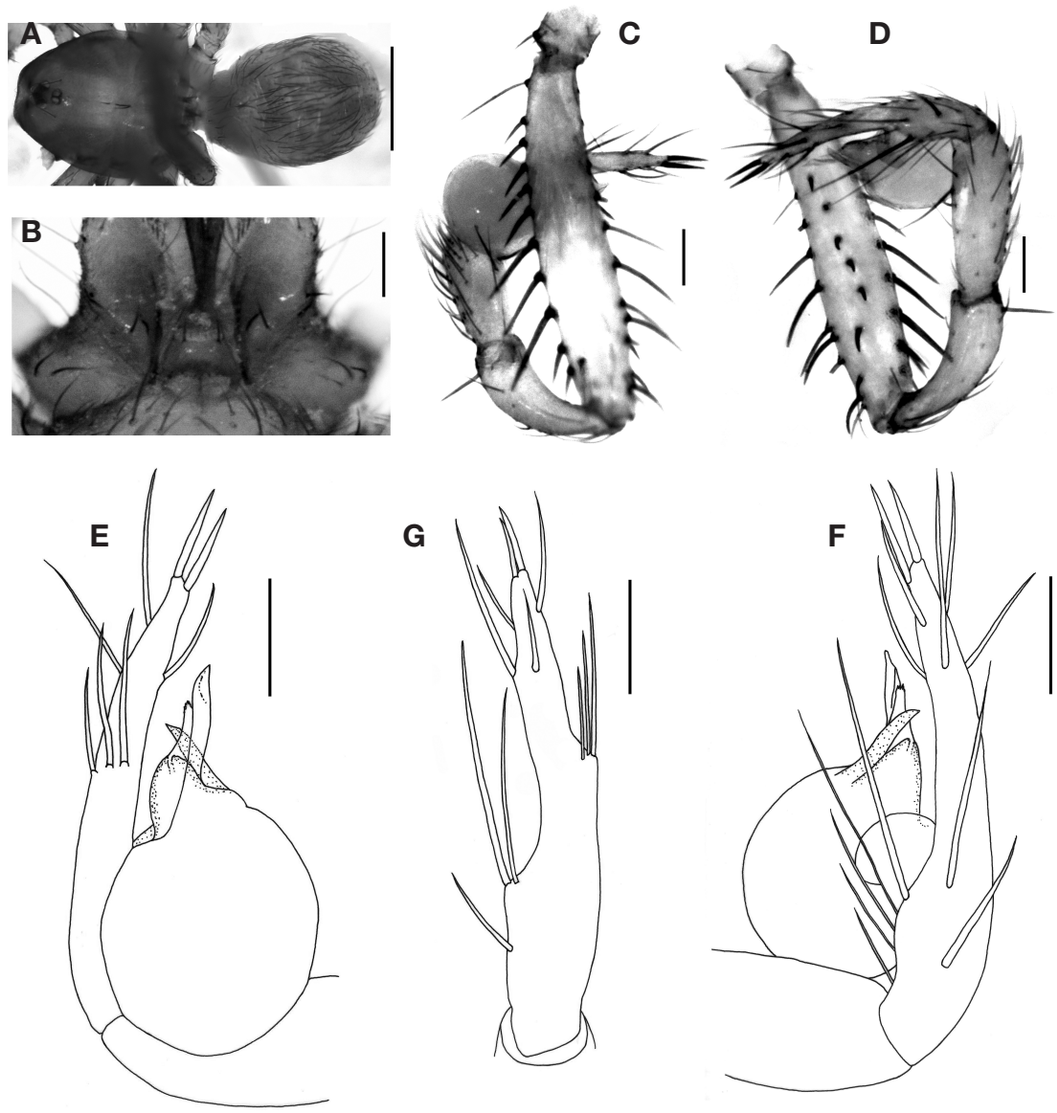

Fig. 1. *Longileptoneta gachangensis* n. sp.: A - male, dorsal view; B - male endite; C - male right palp, retrolateral view; D - ditto, prolateral view; E - ditto, bulb and tarsus, retrolateral view; F - ditto, bulb and tarsus, prolateral view; G - ditto, tarsus, dorsal view. Scale lines: 0.5 mm (A),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

diameter of ALE. AER 0.10, PER 0.14. ALE 0.05, PME 0.05, PLE 0.07, ALE-PME 0.08, PLE-PME 0.03. Chelicera with eight promarginal teeth. Sternum 0.55 long, 0.51 wide. Labium 0.10 long, 0.16 wide. Endite bulged out medially, and longer than wide (Fig. 1B). Leg measurements: I 5.37 (1.45, 0.28, 1.58, 1.28, 0.78), II 4.22 (1.15, 0.28, 1.18, 0.93, 0.68), III 3.41 (0.90, 0.25, 0.88, 0.83, 0.55), IV 4.76 (1.30, 0.25, 1.38, 1.15, 0.68). Palp 1.88 (0.73, 0.35, 0.35, 0.45). Leg I/c 6.39. Fem. I/c 1.73. Tib I/c 1.88. Met I/c 1.52. Pat. I + tib. I/c 2.21. Met. I/tar. I 1.64. Met. IV/tar. IV 1.69. Leg spination pattern: Femora; I d1-1-1-1-1-1-1-1-1-0, p1-0; II d1-1-1-1-1-1-1-1-0. Tibiae; I p0-1-1, r0-1-1, v1-0-0; II p0-0-1, r0-0-1, v1-0-0; III d0-0-1, p0-0-1, r1-1; IV d1-0-0, p0-0-1, r0-0-1. Metatarsi; II p0-1-0, v0-1-0; III p0-1-0, v0-1-1-0; IV p0-1-1, v0-1-0. Abdomen brown, oval, and 0.88 long, 0.60 wide. Palp (Fig. 1C-G): femur with many strong spines; tibia without apophysis; tarsus with two spurs at tip and many strong spines, and with prolateral curvature. Palpal bulb with an embolus and three sclerites: prolateral sclerite blade-like; median sclerite leaf-like; retrolateral sclerite transparent and skinny triangle with serrated tip.

Habitat. Grassland.

World Distribution. Korea (Daegu).

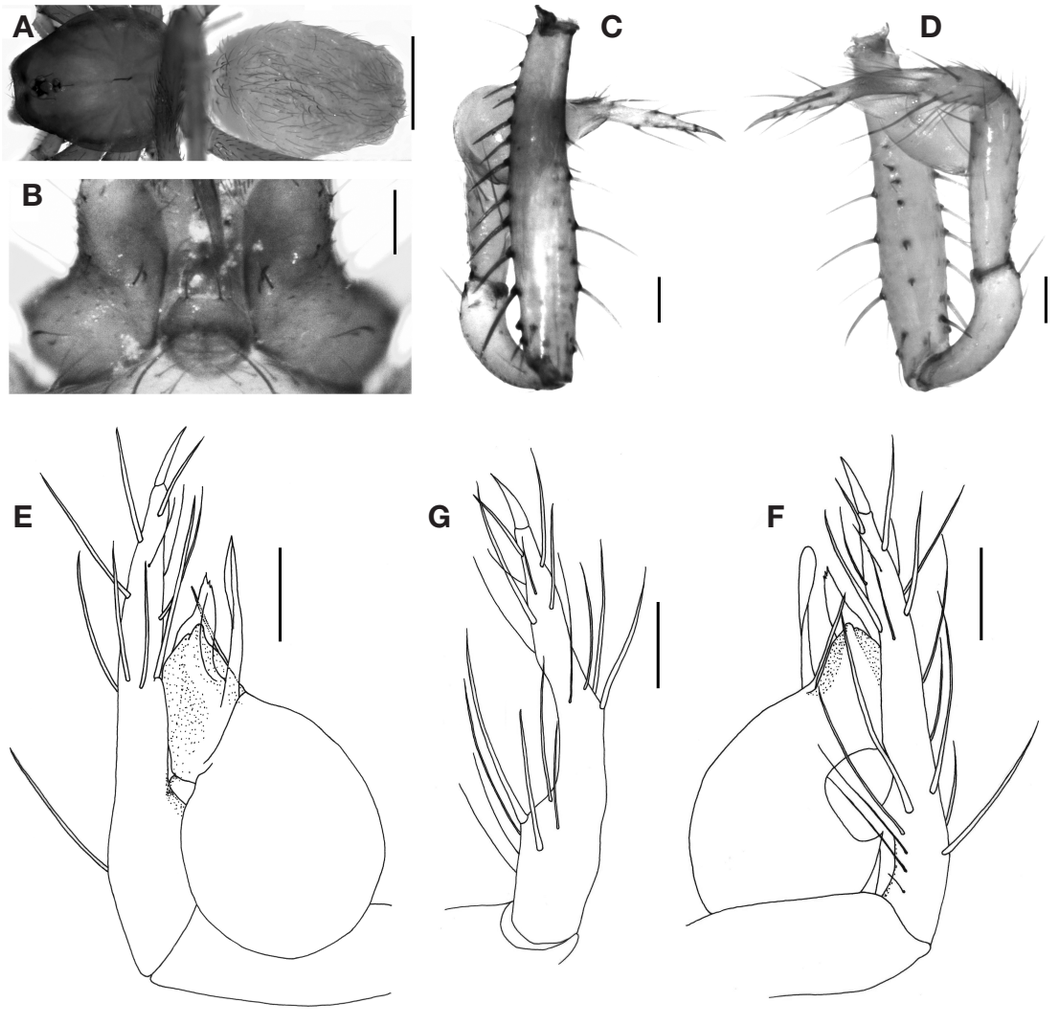

Fig. 2. *Longileptoneta gayaensis* n. sp.; A - male, dorsal view; B - male endite; C - male right palp, retrolateral view; D - ditto, prolateral view; E - ditto, bulb and tarsus, retrolateral view; F - ditto, bulb and tarsus, prolateral view; G - ditto, tarsus, dorsal view. Scale lines: 0.5 mm (A), 0.1 mm (the rest).

***Longileptoneta gayaensis* n. sp.**
가야잔나비거미 (신칭) (Fig. 2A-G)

Material examined. Holotype: ♂, grassland near Sangseonbul Hamlet (35°50′05″N, 128°10′15″E, alt. 475 m), 4.6 km east-northeast of the summit of Mt. Gaya, Suryunmyeon, Seongju-gun, Gyeonsangbuk-do, 25 May 2007, J. Y. Kim.

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

Diagnosis. The male palp of *L. gayaensis* n. sp. is similar to that of *L. songniensis* Seo, 2015 in the femur with many strong spines, the tibia without apophysis, and in the tarsus without transverse depression but with a spur at tip, but it can be easily distinguished from the latter by the conical embolus, the spine-like prolateral sclerite, the shoehorn-like median sclerite, the skinny triangular retrolateral sclerite with serrated tip, and the tarsus unbranched retrolaterally, with much longer proximal prolateral spur (Fig. 2E-G).

Description. Male (holotype). Total length 2.13. Habitus as in Fig. 2A. Carapace brown, and 0.93 long, 0.80 wide; fovea linear, distinct. Clypeus height 3.8 times of diameter of ALE. AER 0.10, PER 0.14. ALE 0.05, PME 0.04, PLE 0.07, ALE-PME 0.09, PLE-PME 0.04. Chelicera with eight promarginal and seven microscopic retromarginal teeth. Sternum 0.59 long, 0.59 wide. Labium 0.14 long, 0.17 wide. Endite bulged out medially, and a little longer than wide (Fig. 2B). Leg measurements: I 5.86 (1.60, 0.28, 1.73, 1.40, 0.85), II 4.77 (1.33, 0.28,

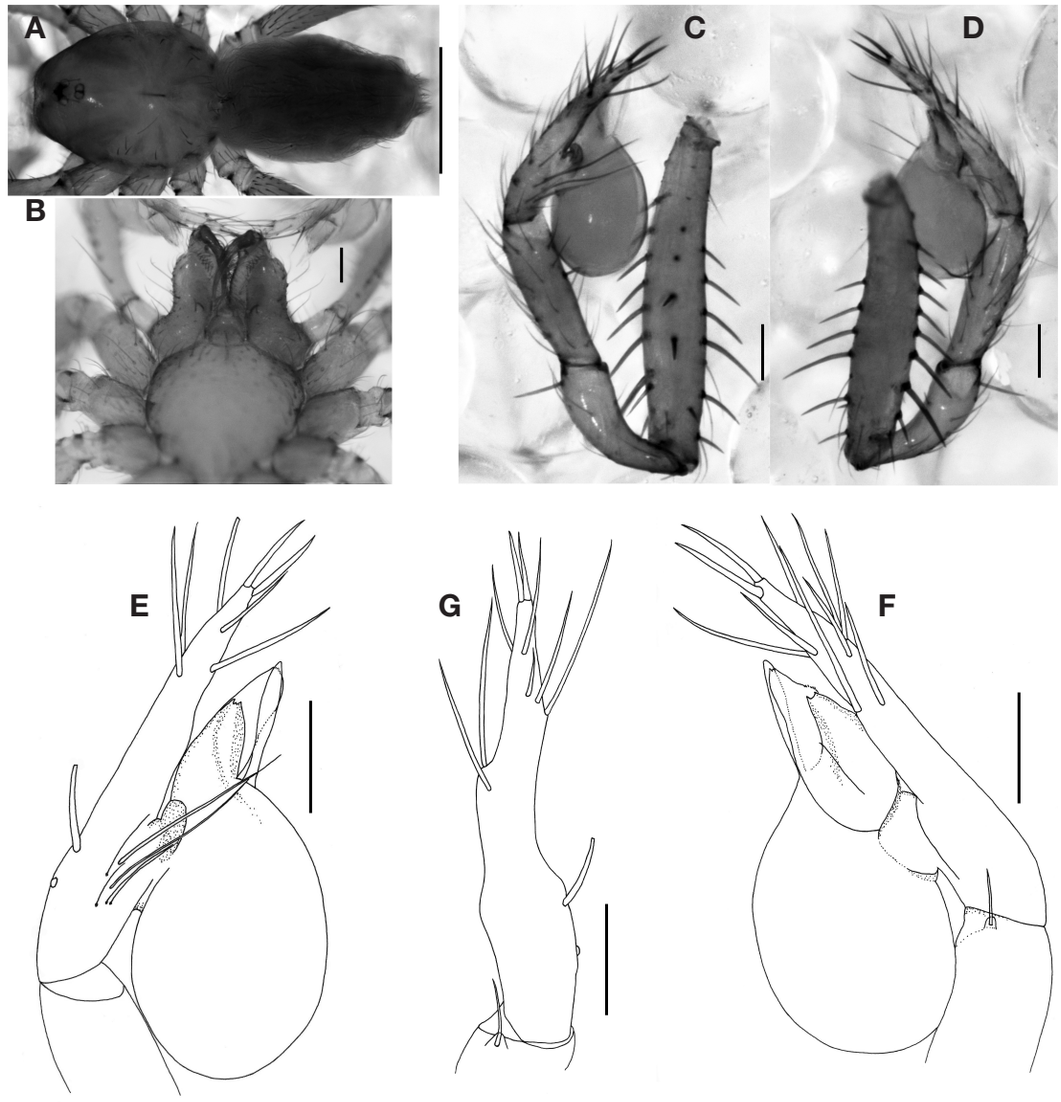

Fig. 3. *Longileptoneta jangseongensis* n. sp.; A - male, dorsal view; B - male endite; C - male left palp, prolateral view; D - ditto, retrolateral view; E - ditto, bulb and tarsus, prolateral view; F - ditto, bulb and tarsus, retrolateral view; G - ditto, tarsus, dorsal view. Scale lines: 0.5 mm (A),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

1.33, 1.08, 0.75), III 3.86 (1.05, 0.28, 0.95, 0.93, 0.65), IV 5.29 (1.48, 0.25, 1.53, 1.25, 0.78). Palp 2.01 (0.78, 0.35, 0.38, 0.50). Leg I/c 6.30. Fem. I/c 1.72. Tib I/c 1.86. Met I/c 1.51. Pat. I + tib. I/c 2.16. Met. I/tar. I 1.65. Met. IV/tar. IV 1.60. Leg spination pattern: Femora; I d1-1-1-1-1-1-1-1-1-0, p1-0; II d1-1-1-1-1-1-1-1-0, p1-0. Tibiae; I p0-1-1-1, r0-1-1-1; II p0-1-1, r0-0-1, v0-1-0; III p0-1-1, r0-1-1, v1-0; IV p0-1-0, r0-1, v1-0. Metatarsi; I p0-1-0, r0-1-0, v0-1-0; II p0-1-0, r0-1-0, v0-1-1; III p0-1-0, r0-1-0, v0-1; IV p0-1-0, 0-1-0, v0-1-1. Abdomen yellowish brown, oval, and 1.05 long, 0.75 wide. Palp (Fig. 2C-G): femur with many strong spines; tibia without apophysis; tarsus with a spur at tip and many strong spines, and with prolateral curvature. Palpal bulb with an embolus and three sclerites: prolateral sclerite needle-like; median sclerite shoehorn-like; retrolateral sclerite transparent and skinny triangle with serrated tip.

Habitat. Grassland.

World Distribution. Korea (Gyeongsangbuk-do).

***Longileptoneta jangseongensis* n. sp.**
장성잔나비거미 (신칭) (Fig. 3A-G)

Material examined. Holotype: ♂, mixed forest (35°26′51″N, 126°50′44″E, alt. 141 m), Jaha-dong, Sinseong-ri, Bukha-myeon, Jangseong-gun, Jeollanam-do, 13 July

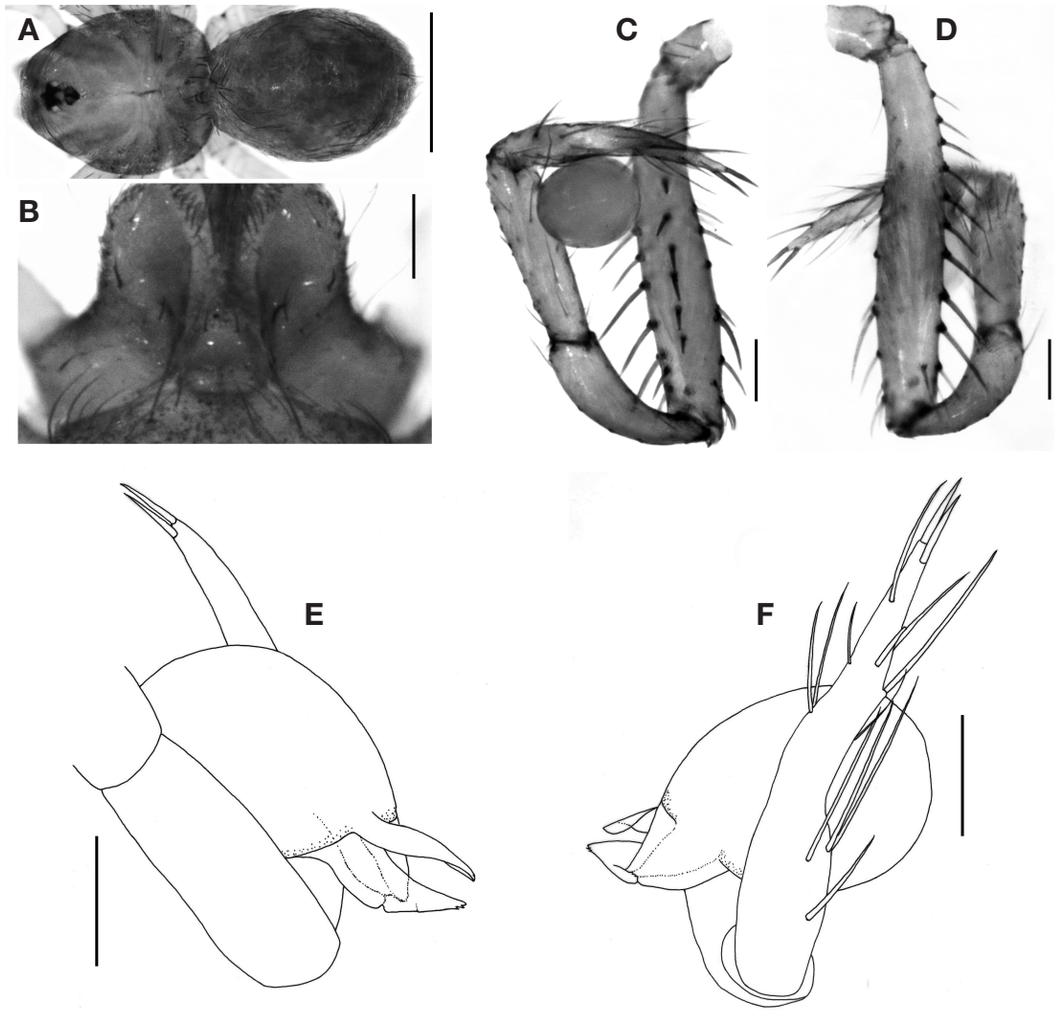

Fig. 4. *Longileptoneta weolakensis* n. sp.; A - male, dorsal view; B - male endite; C - male left palp, prolateral view; D - ditto, retrolateral view; E - ditto, twisted bulb, retrolateral view; F - ditto, twisted bulb, prolateral view, and tarsus, dorsal view. Scale lines: 0.5 mm (A), 0.1 mm (the rest).

2006, B. K. Seo. Paratype: 2♂♂, 12 June 2006, other data same as holotype.

Etymology. The specific name comes from the type locality, Jangseong County.

Diagnosis. The male palp of *L. jangseongensis* n. sp. is similar to that of *L. gachangensis* n. sp. in the femur with many strong spines, the tarsus unbranched retrolaterally, with two spurs at tip and a long proximal prolateral spur but without transverse depression, and the conical embolus, but can be easily distinguished from the latter by the tibial nodule with a spine, the shoehorn-like median sclerite, the triangular retrolateral sclerite with serrated tip, and not having prolateral sclerite (Fig. 3E-G).

Description. Male (holotype). Total length 1.80. Habitus as in Fig. 3A. Carapace yellowish brown, and 0.88 long, 0.76 wide; fovea linear, distinct. Clypeus height 3 times of diameter of ALE. AER 0.10, PER 0.13. ALE 0.07, PME 0.04, PLE 0.05, ALE-PME 0.07, PLE-PME 0.03. Chelicera with nine promarginal teeth. Sternum 0.53 long, 0.53 wide. Labium 0.12 long, 0.16 wide. Endite bulged out medially, and a little longer than wide (Fig. 3B). Leg measurements: I 5.39 (1.43, 0.28, 1.63, 1.25, 0.80), II 4.42 (1.23, 0.28, 1.23, 0.98, 0.70), III 3.54 (0.98, 0.25, 0.85, 0.88, 0.58), IV 4.89 (1.33, 0.25, 1.43, 1.13, 0.75). Palp 2.03 (0.80, 0.40, 0.40, 0.43). Leg I/c 6.13. Fem. I/c 1.63. Tib I/c 1.85. Met I/c 1.42. Pat. I+tib. I/c 2.17. Met. I/tar. I 1.56. Met. IV/tar. IV 1.51. Leg spination pattern: Femora; I d1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-0, p0-1; II d1-1-1-1-1-1-1-1-1-1-1-1-0; III d1-0. Tibiae; I p0-1-1-1, r0-1-1, v1-1; II d0-1, p0-1-1, r0-1-1, v1-1-

0; III d0-1, p1-1, r0-1, v0-1-0; IV p0-1-1, r0-1-0, v0-1. Metatarsi; I~III p0-1-0, r0-1-0, v0-1-0; IV p1-0, r1-0, v1-0. Abdomen yellowish brown, oval, and 1.06 long, 0.68 wide. Palp (Fig. 3C-G): femur with many strong spines; tibia with a small apophysis armed with a spine; tarsus with two spurs at tip and many strong spines, and with prolateral curvature. Palpal bulb with an embolus and two sclerites: median sclerite leaf-like; retrolateral sclerite with serrated tip, transparent and tongue-like.
Habitat. Mixed forest.
World Distribution. Korea (Jeollanam-do).

***Longileptoneta weolakensis* n. sp.**
월악잔나비거미 (신칭) (Fig. 4A-F)

Material examined. Holotype: ♂, dwarf bamboo area around Deokju Temple (36°51′43″N, 128°05′42″E, alt. 267 m), 2.9 km south-southwest of the summit of Mt. Weolak, Hansu-myeon, Jecheon-si, Chungcheongbuk-do, 7 September 2007, S. Y. Kim.
Etymology. The specific name comes from the type locality, Mt. Weolak.
Diagnosis. The male palp of *L. weolakensis* n. sp. is very similar to that of *L. jangseongensis* n. sp. in the femur with many strong spines, the tarsus unbranched retrolaterally, with two spurs at tip and a long proximal prolateral spur but without transverse depression, the conical embolus, the triangular retrolateral sclerite with serrated tip, and not having prolateral sclerite, but can be easily distinguished from the latter by the tibial without nodule with a spine and the long sword-like median sclerite (Fig. 4E-F).
Description. Male (holotype). Total length 1.44. Habitus as in Fig. 4A. Carapace brown, and 0.70 long, 0.60 wide; fovea linear, distinct. Clypeus height 2.8 times of diameter of ALE. AER 0.10, PER 0.13. ALE 0.05, PME 0.04, PLE 0.05, ALE-PME 0.07, PLE-PME 0.03. Chelicera with eight promarginal teeth. Sternum 0.46 long, 0.47 wide. Labium 0.09 long, 0.13 wide. Endite bulged out medially, and a little longer than wide (Fig. 4B). Leg measurements: I 4.46 (1.18, 0.22, 1.30, 1.04, 0.72), II - (0.94, 0.22, 0.92, -, -), III 2.88 (0.78, 0.20, 0.68, 0.68, 0.54), IV - (1.10, -, -, -, -). Palp 1.60 (0.60, 0.30, 0.30, 0.40). Leg I/c 6.37. Fem. I/c 1.69. Tib I/c 1.86. Met I/c 1.49. Pat. I+tib. I/c 2.17. Met. I/tar. I 1.44. Leg spination pattern: Femora; I d1-1-1-1-1-1-1-1-1-1-1-1-1-1-0; II d1-1-1-0. Abdomen brown, oval, and 0.76 long, 0.56 wide. Palp (Fig. 4C-F): femur with many strong spines; tibia without apophysis; tarsus with two spurs at tip and many strong spines, and with prolateral curvature. Palpal bulb with an embolus and two sclerites: median sclerite leaf-like; retrolateral sclerite transparent and triangle with serrated tip.
Habitat. Dwarf bamboo area.
World Distribution. Korea (Chungcheongbuk-do).

Acknowledgements

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