

⟨Original article⟩

Four New Species of the Genus *Alloclubionoides* (Araneae: Agelenidae) from Korea

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Abstract - Four new species of the genus *Alloclubionoides* collected from mountain litter and hillock litter around the agricultural ecosystem of Korea are described in the present work with appropriate body measurements and morphological illustrations; *A. hwaseongensis* sp. nov., *A. imi* sp. nov., *A. namhansanensis* sp. nov. and *A. nasuta* sp. nov. Females of *A. hwaseongensis* sp. nov., *A. namhansanensis* sp. nov. and *A. nasuta* sp. nov. can be distinguished based on the epigyne shape and structure of internal genitalia from previously described species. Males of *A. imi* sp. nov. can also be distinguished based on the shapes of retrolateral tibial apophysis, embolus tip and conductor from previously described species. Also, a key to the Korean *Alloclubionoides* spiders is provided. *Alloclubionoides gajensis* Seo, 2014 is newly synonymized with *Alloclubionoides cochlea* (Kim et al. 2007).

Keywords : Araneae, taxonomy, *Alloclubionoides*, new species, Korea

INTRODUCTION

The genus *Alloclubionoides* Paik, 1992 was described based on the male with sclerotized tegulum, tegular apophysis, tibia length of male palp, interdistance between posterior median eye and posterior lateral eye, spination of legs and length of posterior spinneret from Korea (Paik 1992). A total of thirty-two *Alloclubionoides* species are distributed over a restrictive group of endemic species in Far East areas: seven in China, one in Japan, twenty in Korea and four in Russia (World Spider Catalog 2018).

During a intensive survey of the epigeic spider fauna in various ecosystems, a large number of the spiders in subfamily Coelotinae was collected by pitfall traps. Among them, four new species belonging to the genus *Alloclubionoides* were recognized. In this paper, *A. hwaseongensis* sp. nov., *A. imi* sp. nov., *A. namhansanensis* sp. nov. and *A.*

nasuta sp. nov. are described with measurements and morphological illustrations as new species.

MATERIALS AND METHODS

The external morphology was examined using a stereoscopic dissecting microscope (LEICA, S8APO) and illustrated. Photographs of body were taken with a CANON 650D with 60 mm macro-lens. Measurements of each part of the body were taken with an ocular micrometer scale and are recorded in millimeters. Scale bars in the figures are also recorded in millimeters. Leg and palp (left) measurements are given as “leg number - total length (femur, patella, tibia, metatarsus, tarsus)”. Leg spination was examined with left side. The internal genitalia of females were prepared with 10% of KOH solution for 6 hours and tissue pieces around it were removed with brushes and needles.

The descriptive terminology of male palp and epigyne and internal genitalia in the description follows Wang (2002)

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and Kim and Lee (2006). 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 and PER = posterior eye row in eye region; d = dorsal surface, v = ventral surface, p = pro-lateral surface and r = retrolateral surface in leg spination; AF = atrial hood; AS = atrial septum; CD = copulatory duct; CF = cymbial furrow; Co = conductor; EA = epigynal atrium; EH = epigynal hood; Em = embolus; EmT = embolus tip; FD = fertilization duct; RTA = retrolateral tibial apophysis; Sp = spermatheca; SpH = spermathecal head and Tr = trichobothrium in the figures. The examined specimens of this study were deposited in the collection of National Institute of Biological resources (NIBR), Korea.

TAXONOMY

Order **Araneae** Clerck, 1757

Family **Agelenidae** Koch, 1837

Subfamily **Coelotinae** F.O.P.-Cambridge, 1893

Genus ***Alloclubionoides*** Paik, 1992

Key to the Korean *Alloclubionoides* species

1. Females (those of *A. imi* unknown) 2
 - Males (those of *A. bifidus*, *A. geumensis*, *A. hwaseongensis*, *A. namhansanensis*, *A. nasuta* and *A. yangyangensis* unknown) 24
2. Copulatory duct exposed out of epigyne *A. bifidus*
 - Copulatory duct unexposed out of epigyne 3
3. Atrial hood present 4
 - Atrial hood absent 7
4. A pair of atrial hoods prominent 5
 - A pair of atrial hoods smooth 6
5. Atrial septum triangular *A. lunatus*
 - Atrial septum absent *A. namhansanensis*
6. Upper epigynal margin rimmed *A. coreana*
 - Upper epigynal margin not rimmed *A. hwaseongensis*
7. Epigyne with one atrium 8
 - Epigyne with two atrium *A. yangyangensis*
8. Atrium longer than wide *A. quadrativulvus*
 - Atrium wider than long 9
9. Upper epigynal margin almost straight *A. namhaensis*
 - Upper epigynal margin curved 10
10. Atrium duct and Fertilization duct contiguous *A. naejangensis*
 - Atrium duct and Fertilization duct separated 11
11. Spermathecal head hidden under the copulatory duct
 - *A. terdecimus*
 - Spermathecal head not hidden under the copulatory duct 12
12. Fertilization duct long *A. jirisanensis*
 - Fertilization duct short 13
13. Atrium divided into 3 sections *A. nasuta*
 - Atrium undivided 14
14. Artrium reduced 15
 - Artrium large, unreduced 17
15. Spermathecal head short *A. geumensis*
 - Spermathecal head long 16
16. Atrium round *A. euini*
 - Atrium triangular *A. jaegeri*
17. Spermatheca cylindrical, twisted 18
 - Spermatheca otherwise 21
18. Copulatory duct broadly curved *A. ovatus*
 - Copulatory duct linear 19
19. Spermathecal head located at posterior part of spermathecal stalk *A. dimidiatus*
 - Spermathecal head located at anterior part of spermathecal stalk 20
20. Spermathecal head oriented upward *A. cochlea*
 - Spermathecal head oriented outward *A. kimi*
21. Spermatheca finger-stall-shaped *A. solea*
 - Spermatheca spherical 22
22. Spermathecal head finger-shaped *A. paikwunensis*
 - Spermathecal head cylindrical 23
23. Genital opening located at the middle
 - *A. wolchulsanensis*
 - Genital opening located at the bottom *A. namhaensis*
24. Embolus thick 25
 - embolus slender 35
25. Conductor dorsal apophysis present 26
 - Conductor dorsal apophysis absent *A. imi*
26. Median apophysis present 27
 - Median apophysis absent 31
27. Median apophysis ridge-shaped *A. terdecimus*
 - Median apophysis otherwise 28
28. Embolus tip hidden, penetrating tegulum
 - *A. wolchulsanensis*

- Embolus tip not hidden, not penetrating tegulum 29
- 29. Embolus tip pointed 30
 - Embolus tip with 3 denticles *A. namhaensis*
- 30. Conductor hook-shaped, modified with intermediate tibial apophysis *A. jirisanensis*
 - Conductor saddle-shaped, modified without intermediate tibial apophysis *A. solea*
- 31. Retrolateral tibial apophysis doubly layered
 - *A. coreana*
 - Retrolateral tibial apophysis not layered 32
- 32. Conductor hidden by distal part of embolus
 - *A. cochlea*
 - Conductor not hidden 33
- 33. Cymbium furrow length 1/4 of cymbium 34
 - Cymbium furrow length 1/5 of cymbium *A. lunatus*
- 34. Conductor dorsal apophysis pointed, embolus tip coiled *A. naejangensis*
 - Conductor dorsal apophysis pointed, embolus tip coiled *A. quadrativulvus*
- 35. Median apophysis present 36
 - Median apophysis absent 39
- 36. Median apophysis semicircular 37
 - Median apophysis otherwise 38
- 37. Retrolateral tibial apophysis doubly layered *A. euini*
 - Retrolateral tibial apophysis not layered *A. jaegeri*
- 38. Conductor 'p'-shaped with round tip *A. ovatus*
 - Conductor hook-shaped with round tip *A. paikwunensis*
- 39. Retrolateral tibial apophysis modified with intermediate retrolateral tibial apophysis *A. kimi*
 - Retrolateral tibial apophysis modified without intermediate retrolateral tibial apophysis *A. dimidiatus*

***Alloclubionoides hwaseongensis* sp. nov.** 화성가계거미 (신칭) (Fig. 1)

Type. Holotype female from Yulam-ri, Paltan-myeon, Hwaseong-si, Gyeonggi-do, Korea (126°52'47.36"E, 37°11'15.00"N, 23 m), 09-XI-2016, S.T. Kim and S.Y. Lee.

Etymology. The specific epithet refers to the type locality, Hwaseong-si.

Diagnosis. The female of *A. hwaseongensis* sp. nov. is similar to *A. lunatus* by the shape of epigyne, but can be distinguished by the shallow atrium, almost flat atrial hood,

medially located copulatory ducts, and horizontally extending spermatheca.

Description. Female (holotype). Total length 11.83. Carapace 5.95 long, 3.43 wide. Eye: ALE 0.25, AME 0.15, PLE 0.17, PME 0.17; AME-AME 0.10, AME-ALE 0.05, AME-PME 0.20, PME-PME 0.15, PME-PLA 0.25, ALE-PLA 0.08; AER 1.00, PER 1.34. Chelicera 2.65 long, 1.34 wide. Endite 1.75 long, 1.06 wide. Labium 1.05 long, 0.72 wide. Sternum 2.65 long, 2.10 wide. Legs: I - 12.72 (3.60, 1.65, 3.00, 2.80, 1.67); II - 11.15 (3.30, 1.60, 2.50, 2.58, 1.17); III - 9.33 (2.82, 1.34, 2.00, 2.07, 1.10); IV - 15.00 (4.00, 1.66, 3.32, 4.02, 2.00). Palp 4.98 (1.80, 0.60, 0.95, -, 1.63). Abdomen 4.90 long, 2.78 wide. Epigyne 0.60 long, 0.95 wide.

Carapace: head region blackish brown anteriorly, turbid and light blackish brown posteriorly, margin dark blackish brown and rimmed; thoracic region turbid and light blackish brown with rimmed margin; covered densely with short and long blackish brown hairs around eye region; longer than wide; cervical furrow and radial furrow light blackish brown and distinct; longitudinal fovea blackish brown and needle-shaped (Fig. 1a). Eyes: all eyes encircled with black; AER slightly recurved from above and PER almost straight from above (Fig. 1b); AME smaller than the other eyes. Chelicera: robust, dark blackish brown with numerous long black setae; lateral condyle yellowish brown; three promarginal teeth, middle one largest, two retromarginal teeth (Fig. 1c). Endite: bean-shaped, turbid blackish brown with light anterior tip bearing grayish brown scopula; covered densely with long and short black setae. Labium almost rectangular, turbid blackish brown with pale yellowish white anterior tip bearing grayish brown scopula; covered densely with long and short black setae (Fig. 1d). Sternum: shield-shaped with truncated anterior end, turbid yellowish brown, margin dark yellowish brown and rimmed; covered densely with long and short black setae; protruded slightly between fourth coxae (Fig. 1e). Legs: stout and turbid blackish brown; no annuli; prolateral surface of femur of legs I and II, and retrolateral surface of femur of leg IV without hairs; leg formula 4-1-2-3. Leg spination: I (femur 1-1d, 1-1p; tibia 1p, 2-2-2v; metatarsus 1p, 2-2-2v); II (femur 1-1-1-1d; tibia 1-1p, 1-1-2v; metatarsus 1d, 1-1p, 2-2-2v); III (femur 1-1-1-2-1d; patella 1-1d, 1p, 1r; tibia 1d, 1-1p, 1-1r, 2-2-2v; metatarsus 2-2d, 1-1-1p, 1-1-1r, 2-2-2v; tarsus 1-1p, 1r); IV (femur 1-1-1-2-1d; patella 1d, 1p, 1r; tibia 1-1d, 1-1p, 1-1r,

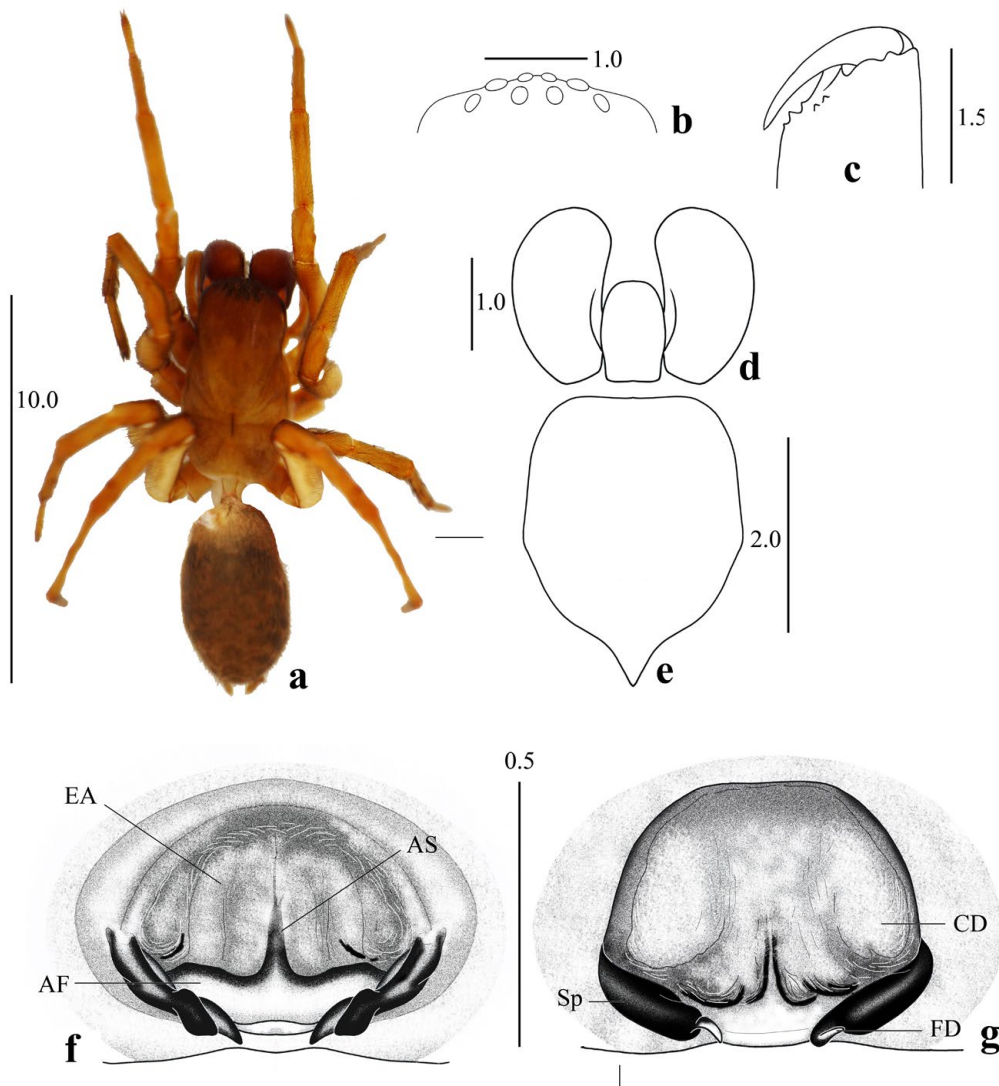


Fig. 1. *Alloclubionoides hwaseongensis* sp. nov. female, holotype. (a) body (specimen in habitus), dorsal view. (b) eye area from above. (c) chelicerae, posterior view. (d) endite and labium, ventral view. (e) sternum, ventral view. (f) epigyne, ventral view. (g) internal genitalia, dorsal view.

2-2-2v; metatarsus 1-1d, 1-1-1p, 1-1-1r, 1-1-1-1-1-2v; tarsus 1-1p, 1-1r). Abdomen: ovoid, turbid and mottled blackish brown; four to five pale blackish brown chevrons on the posterior part; longer than wide (Fig. 1a).

Epigyne: hood indistinct; atrium round and shallow; short and pointed atrial septum over the broad atrial hood at the bottom; wider than long (Fig. 1f); copulatory ducts originating medially and extending posteriolaterally; spermatheca with few knots long and extending horizontally; spermathecal head indistinct between copulatory duct and anterior spermatheca; small and pointed fertilization duct at the bot-

tom arising from posterior spermatheca (Fig. 1g).

Ecological remarks. This species was collected by pitfall traps in the hillock litter around the agricultural ecosystem.

Distribution. Korea (endemic).

Alloclubionoides imi sp. nov. 문순가게거미 (신칭)
(Fig. 2)

Type. Holotype male from Ami-ri, Misan-myeon, Yeoncheon-gun, Gyeonggi-do, Korea (126°55'52.53"E, 38°01'41.88"N, 64m), 12-VIII-2002, S.T. Kim.

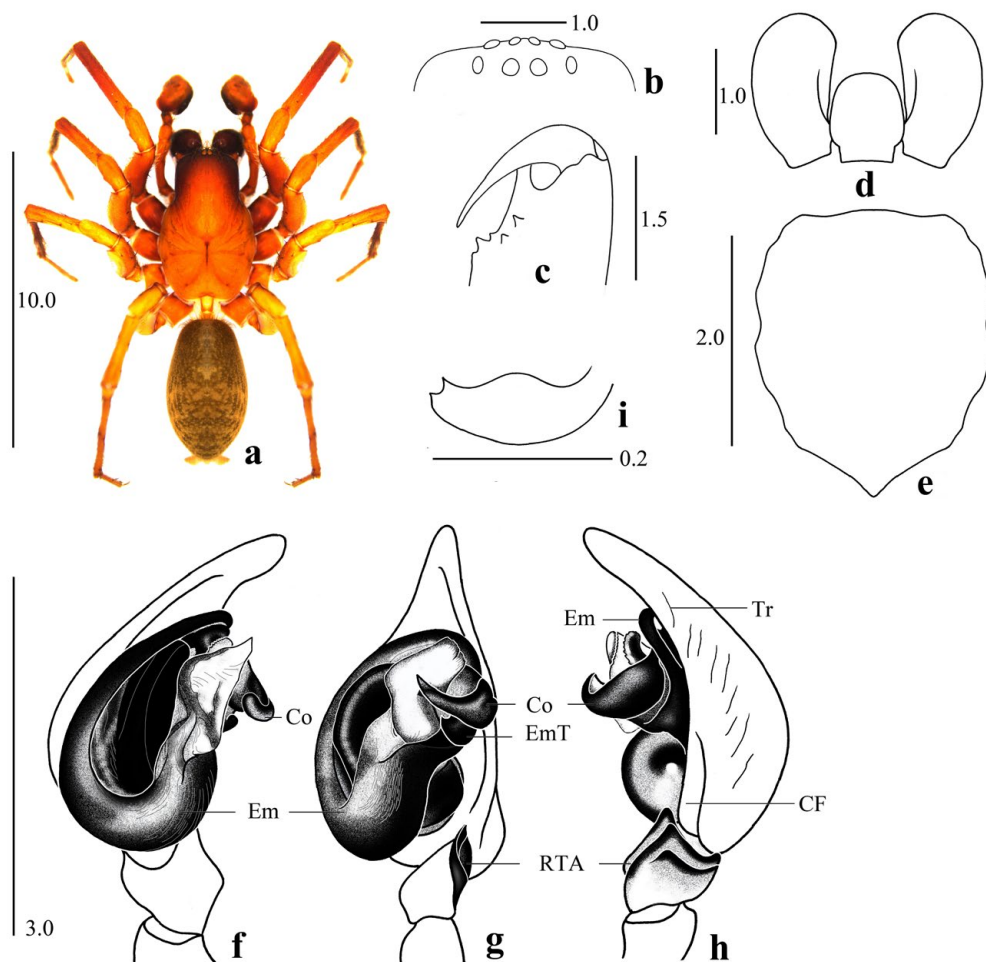


Fig. 2. *Alloclubionoides imi* sp. nov. male, holotype. (a) body (specimen in habitus), dorsal view. (b) eye area from above. (c) chelicerae, posterior view. (d) endite and labium, ventral view. (e) sternum, ventral view. (f) palp (left), prolateral view. (g) same, ventral view. (h) same, retrolateral view. (i) embolus tip, retrolateral view.

Etymology. The specific epithet is a patronym in honor of Dr. Im, Moon Soon, the Korean arachnologist who dedicated his life to spider research.

Diagnosis. The male of *A. imi* sp. nov. is similar to *A. naejangensis* by the palp structure, but can be easily distinguished by three-layered and triangular retrolateral tibial apophysis; bifurcated and slightly swollen embolus tip; hook-shaped long conductor without conductor apophysis.

Description. Male (holotype). Total length 12.72. Carapace 6.27 long, 3.90 wide. Eye: ALE 0.20, AME 0.13, PLE 0.20, PME 0.20; AME-AME 0.06, AME-ALE 0.07, AME-PME 0.20, PME-PME 0.17, PME-PLA 0.20, ALE-PLA 0.08; AER 0.95, PER 1.35. Chelicera 2.62 long, 1.28 wide.

Endite 1.83 long, 0.90 wide. Labium 1.05 long, 0.75 wide. Sternum 2.93 long, 2.25 wide. Legs: I, 15.53 (4.40, 1.85, 3.95, 3.96, 1.37); II, 14.52 (4.00, 1.87, 3.25, 3.20, 2.20); III, 13.06 (3.15, 1.70, 2.80, 3.52, 1.89); IV, 17.63 (4.30, 1.90, 4.00, 4.95, 2.48). Palp 6.39 (2.15, 0.70, 0.82, -, 2.72). Abdomen 6.38 long, 4.05 wide.

Carapace: anterior head region dark reddish brown, lighter posteriorly, margin blackish brown and rimmed; thoracic region yellowish brown; covered densely with short and long blackish brown hairs around eye region; longer than wide; cervical furrow and radial furrow reddish brown and distinct; longitudinal fovea dark reddish brown and needle-shaped (Fig. 2a). Eyes: all eyes encircled with black;

AER slightly recurved and PER almost straight from above (Fig. 2b); AME smaller than the other eyes. Chelicera: robust, dark reddish brown with numerous long black setae; lateral condyle dark yellowish brown; three promarginal teeth, middle one largest, two retromarginal teeth (Fig. 2c). Endite: bean-shaped, dark reddish brown with pale yellowish white anterior tip bearing reddish brown scopula; covered densely with long and short black setae. Labium almost rectangular, dark reddish brown with pale yellowish white anterior tip bearing reddish brown scopula; covered densely with long and short black setae (Fig. 2d). Sternum: shield-shaped, light reddish brown, margin dark reddish brown and rimmed; covered densely with long and short black setae; not protruded between fourth coxae (Fig. 2e). Legs: stout and yellowish brown; no annuli; prolateral surface of femur of legs I and II and retrolateral surface of femur of leg IV without hairs; leg formula 4-1-2-3. Leg spination: I (femur 1d, 1-1p; tibia 2-2-2v; metatarsus 1p, 2-2-3v); II (femur 1-1d, 1p; tibia 1-1p, 1-2-2v; metatarsus 1p, 1r, 2-1v); III (femur 1-1-1-2d; patella 1p, 1r; tibia 1d, 1-1p, 1-1r, 2-2-2v; metatarsus 1-1-1p, 1-1-1r, 2-2-2v; tarsus 1-1p, 1r, 1v); IV (femur 1-1-2d; patella 1r; tibia 1-1p, 1-1r, 1-2-2v; metatarsus 3-1-2d, 1-1p, 1-1r, 2-2-2v; tarsus 1-1p). Abdomen: ovoid and mottled grayish brown; light cardiac pattern and a pair of muscle impressions visible; four to five chevrons posteriorly; longer than wide (Fig. 2a).

Palp (Fig. 2f-i): patellar apophysis absent; three-layered retrolateral tibial apophysis triangular; cymbial furrow short and distinct, about 1/3 of cymbial length; embolus thick and long, wound counterclockwise; bifurcated embolus tip located under the conductor tip broad and slightly swollen; hook-shaped long conductor extending anteriomedially, no conductor dorsal apophysis; nine trichobothria situated on the retrolateral surface of cymbium; no median apophysis.

Ecological remarks. This species was collected by pitfall traps in the hillock litter near the agricultural reservoir.

Distribution. Korea (endemic).

Alloclubionoides namhansanensis sp. nov. 남한산가계거미 (신칭) (Fig. 3)

Type. Holotype female from Mt. Namhansan, Sanseong-ri, Jungbu-myeon, Gwangju-si, Gyeonggi-do, Korea (127° 10'24.90"E, 37°28'00.68"N, 190 m), 31-VII-2015, J.K.

Jung.

Etymology. The specific epithet refers to the type locality, Mt. Namhansan.

Diagnosis. The female of *A. namhansanensis* sp. nov. is also similar to *A. lunatus* by the shape of epigyne, but can be distinguished by the absence of atrial septum, shape of thick spermatheca with few knots extending horizontally; location and finger-shaped spermathecal head; small, curved and pointed fertilization duct.

Description. Female (holotype). Total length 12.32 (habitus). Carapace 5.97 long, 3.70 wide. Eye: ALE 0.30, AME 0.13, PLE 0.20, PME 0.22; AME-AME 0.07, AME-ALE 0.10, AME-PME 0.16, PME-PME 0.15, PME-PLA 0.27, ALE-PLA 0.08; AER 1.15, PER 1.24. Chelicera 3.05 long, 1.30 wide. Endite 1.90 long, 1.05 wide. Labium 1.15 long, 0.90 wide. Sternum 2.90 long, 2.27 wide. Legs: I, 13.49 (3.82, 1.72, 3.20, 2.95, 1.80); II, 11.69 (3.30, 1.70, 2.14, 2.75, 1.80); III, 10.83 (3.00, 1.53, 2.35, 2.90, 1.05); IV, 15.53 (4.00, 1.85, 3.45, 4.30, 1.93). Palp 4.97 (1.90, 0.80, 1.05, -, 1.22). Abdomen 5.93 long, 3.90 wide. Epigyne 1.15 long, 1.60 wide.

Carapace: head region blackish brown; thoracic region light blackish brown with rimmed margin; covered densely with short and long blackish brown hairs around eye region; longer than wide; cervical furrow and radial furrow light blackish brown and distinct; longitudinal fovea blackish brown and needle-shaped (Fig. 3a). Eyes: all eyes encircled with black; AER slightly recurved from above and PER straight from above (Fig. 3b); AME smaller than the other eyes. Chelicera: robust, dark blackish brown with numerous long black setae; lateral condyle dark yellowish brown; three promarginal teeth, middle one largest, two retromarginal teeth (Fig. 3c). Endite: bean-shaped, blackish brown with darker margin and light anterior tip bearing pale blackish brown scopula; covered densely with long and short black setae. Labium almost rectangular, blackish brown with pale yellowish white anterior tip bearing long black setae; covered densely with long and short black setae (Fig. 3d). Sternum: shield-shaped with truncated anterior end, reddish brown with dark reddish brown margin; covered densely with long black setae; not protruded slightly between fourth coxae (Fig. 3e). Legs: stout and light reddish brown; no annuli; prolateral surface of femur of legs I and II, and retrolateral surface of femur of leg IV without hairs;

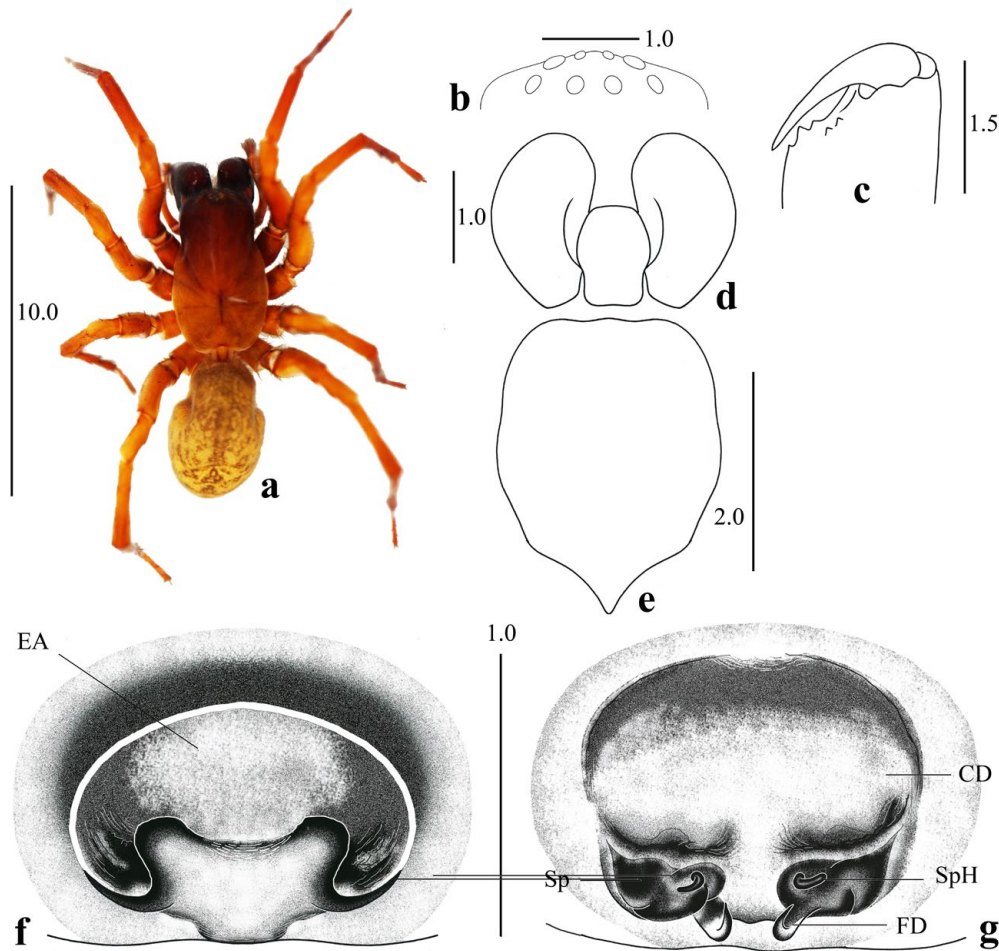


Fig. 3. *Alloclubionoides namhansanensis* sp. nov. female, holotype. (a) body (specimen in habitus), dorsal view. (b) eye area from above. (c) chelicerae, posterior view. (d) endite and labium, ventral view. (e) sternum, ventral view. (f) epigyne, ventral view. (g) internal genitalia, dorsal view.

leg formula 4-1-2-3. Leg spination: I (femur 1-1d, 1-1p; tibia 1p, 2-2-2v; metatarsus 2-2-2v); II (femur 1-1-1-1d; tibia 1p, 2-2-2v; metatarsus 1p, 1r, 2-2-1v); III (femur 2-2-3d; patella 1p, 1r; tibia 1-1p, 1-1r, 2-2-2v; metatarsus 2-2-2d, 1-1p, 1-1r, 2-2-2v; tarsus 1-1p, 1r); IV (femur 1-1-2d; patella 1p, 1r; tibia 1-1p, 1-1r, 2-2-2v; metatarsus 1-1-2d, 1-1-1p, 1-1-1r, 1-1-1-1-2v; tarsus 1-1p, 1r). Abdomen: ovoid, mottled grayish brown; four light grayish brown chevrons on the posterior part; longer than wide (Fig. 3a).

Epigyne: hood indistinct; atrium round and shallow; no atrial septum; wider than long (Fig. 3f); copulatory ducts originating posteriolaterally and extending upwards; spermatheca with few knots broad and extending horizontally; tiny and finger-shaped spermathecal head distinct, located

above fertilization duct; small and pointed fertilization duct bend at the bottom arising from posterior spermatheca (Fig. 3g).

Ecological remarks. This species was collected by pitfall traps in the litter of natural forest in the mountain.

Distribution. Korea (endemic).

Alloclubionoides nasuta sp. nov. 코가계거미 (신칭)
(Fig. 4)

Type. Holotype female from Yeorae-ri, Jinyeong-eup, Gimhae-si, Gyeongsangnam-do, Korea (128°74'01.49"E, 35°30'02.42"N, 43 m), 24-IX-2008, S.T. Kim and S.Y. Lee.

Etymology. The specific epithet (Latin, *nasuta* meaning

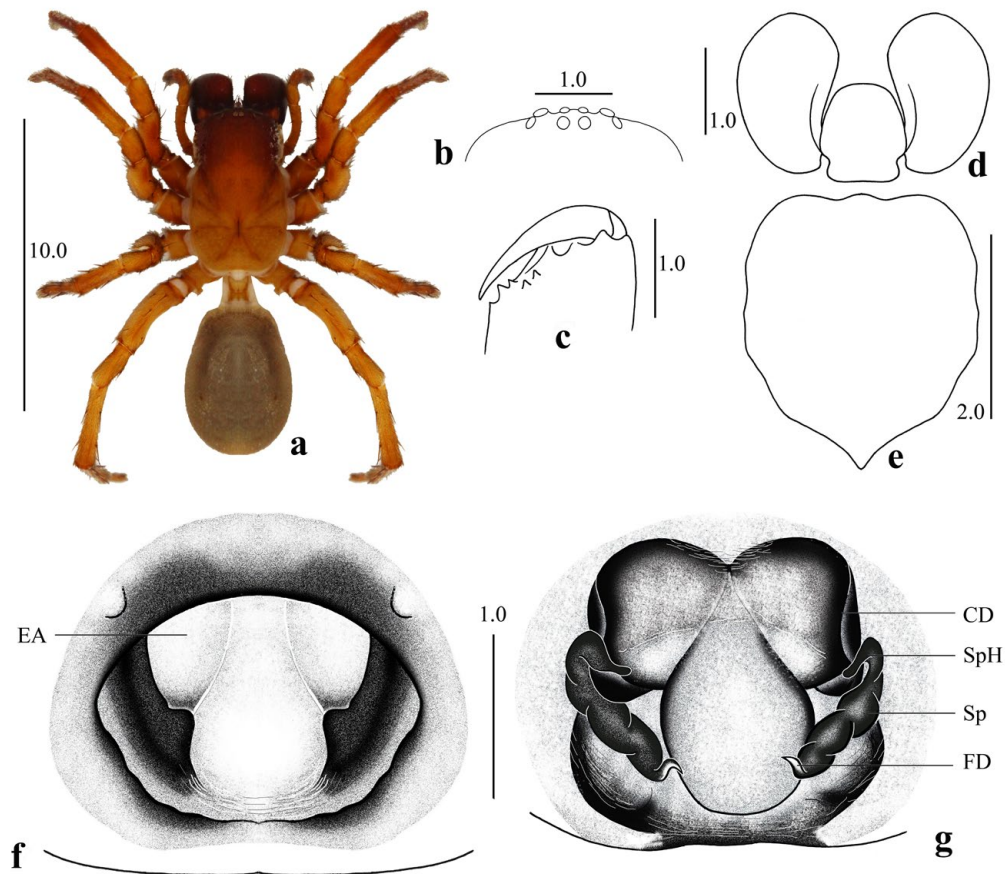


Fig. 4. *Alloclubionoides nasuta* sp. nov. female, holotype. (a) body (specimen in habitus), dorsal view. (b) eye area from above. (c) chelicerae, posterior view. (d) endite and labium, ventral view. (e) sternum, ventral view. (f) epigyne, ventral view. (g) internal genitalia, dorsal view.

big-nosed) refers to the nose-shaped epigynal atrium of female epigyne.

Diagnosis. The female of *A. nasuta* sp. nov. is closely similar to *A. cochlea* by the shape of epigyne, but can be distinguished by the short, curved and finger-shaped spermathecal head, and internal structure of epigynal atrium, abdominal pattern and leg spination.

Description. Female (holotype). Total length 14.21 (habitus). Carapace 6.52 long, 3.95 wide. Eye: ALE 0.27, AME 0.15, PLE 0.20, PME 0.20; AME-AME 0.03, AME-ALE 0.07, AME-PME 0.20, PME-PME 0.14, PME-PLE 0.35, ALE-PLE 0.07; AER 1.25, PER 1.63. Chelicera 3.55 long, 2.05 wide. Endite 2.00 long, 1.18 wide. Labium 1.25 long, 1.00 wide. Sternum 2.94 long, 2.40 wide. Legs: I, 14.15 (3.90, 1.85, 3.30, 3.15, 1.95); II, 12.20 (3.30, 1.67, 2.73, 2.65, 1.85); III, 11.28 (3.05, 1.70, 2.05, 2.93, 1.55); IV, 15.92 (4.15, 1.95, 3.55, 4.27, 2.00). Palp 5.65 (1.97, 0.92,

1.03, – , 1.84). Abdomen 6.48 long, 4.52 wide. Epigyne 1.95 long, 1.40 wide.

Carapace: head region turbid blackish brown, darker anteriorly; thoracic region turbid yellowish brown and rimmed; covered densely with short and long blackish brown hairs around eye region; longer than wide; cervical furrow and radial furrow dark blackish brown and distinct; longitudinal fovea dark reddish brown and needle-shaped (Fig. 4a). Eyes: all eyes encircled with black; AER slightly recurved and PER almost straight from above (Fig. 4b); AME smaller than the other eyes. Chelicera: robust, dark blackish brown with numerous long blackish brown setae; lateral condyle light yellowish brown; three promarginal teeth, middle one largest, two retromarginal teeth (Fig. 4c). Endite: bean-shaped, dark blackish brown with pale yellowish white anterior tip bearing turbid grayish brown scopula; covered densely with long and short black setae. Labium almost

rectangular, dark blackish brown with pale yellowish white anterior tip bearing turbid grayish brown scopula; covered densely with long and short black setae (Fig. 4d). Sternum: shield-shaped, light blackish brown; covered densely with long and short blackish brown setae; not protruded between fourth coxae (Fig. 4e). Legs: stout and light blackish brown; no annuli; prolateral surface of femur of leg I and II and retrolateral surface of femur of leg III and IV without hairs; leg formula 4-1-2-3. Leg spination: I (femur 1-1-1d, 1p; tibia 1p, 2-2-2v; metatarsus 1-1p, 2-2-2v); II (femur 1-1-1-1d; tibia 1p, 2-2-2v; metatarsus 1-1p, 2-2-2v); III (femur 1-1-2-3d; patella 1p, 1r; tibia 1-1p, 1-1r, 2-2-2v; metatarsus 2-2-2d, 1-1p, 1-1r, 2-2-2v; tarsus 1-1p, 1r); IV (femur 1-1-1-1-3d; patella 1r; tibia 1-1p, 1-1r, 2-2-2v; metatarsus 2-2-2d, 1-1p, 1-1r, 2-2-2v; tarsus 1-1p, 1-1r). Abdomen: ovoid and turbid grayish brown; no particular pattern; longer than wide (Fig. 4a).

Epigyne: hood distinct anteriolaterally; atrium divided into three sections and very deep; longer than wide (Fig. 4f); copulatory ducts originating anteriomedially and extending upwards; spermatheca with knots elongated and extending horizontally; short, curved and finger-shaped spermathecal head distinct, located anteriolaterally; small and pointed fertilization duct bend at the bottom arising from posterior spermatheca (Fig. 4g).

Ecological remarks. This species was collected by pitfall traps in the hillock litter around a sweet persimmon orchard.

Distribution. Korea (endemic).

Alloclubionoides cochlea (Kim *et al.* 2007)

Ambanus cochlea Kim, Lee and Kwon, 2007: 120(3): 329, figs. 1–20 [holotype ♂, Cheolma, Gijang-gun, Busan-si, Korea, 16-X-2003].

Alloclubionoides gajiensis Seo 2014: 166, fig. 1A–K, **New**

Synonymy.

Justification of the synonymy. The detailed bibliographic study of the types of *A. cochlea* and *A. gajiensis* showed that *A. gajiensis* has all the diagnostic characters found in types of *A. cochlea* in general appearance, epigyne, internal genitalia and palpal structure.

Distribution. Korea (endemic).

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