

This article was downloaded by: [University of Bath]

On: 13 February 2014, At: 13:08

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Journal of Natural History

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/tnah20>

Two poorly known species of the spider genus *Ambanus* (Arachnida: Araneae: Amaurobiidae) in Korea

Byung-Woo Kim^a & Woncheol Lee^a

^a Department of Life Science, College of Natural Sciences, Hanyang University, Seoul, Korea

Published online: 28 Nov 2010.

To cite this article: Byung-Woo Kim & Woncheol Lee (2006) Two poorly known species of the spider genus *Ambanus* (Arachnida: Araneae: Amaurobiidae) in Korea, *Journal of Natural History*, 40:23-24, 1425-1442, DOI: [10.1080/00222930600916050](https://doi.org/10.1080/00222930600916050)

To link to this article: <http://dx.doi.org/10.1080/00222930600916050>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Two poorly known species of the spider genus *Ambanus* (Arachnida: Araneae: Amaurobiidae) in Korea

BYUNG-WOO KIM & WONCHEOL LEE

Department of Life Science, College of Natural Sciences, Hanyang University, Seoul, Korea

(Accepted 17 July 2006)

Abstract

Two poorly known spider species of the genus *Ambanus* from Korea are revised with detailed illustrations, leg spination, trichobothrium patterns, and SEM photographs. *Ambanus lunatus* (Paik, 1976), previously misidentified in Korea as *Ambanus* spp., is redescribed with the first description of the male. The type species of the monotypic genus *Alloclubionoides* Paik, 1992 (Clubionidae), *Alloclubionoides coreana*, described only from the male holotype, is transferred to *Ambanus* with the first description. Furthermore, the female paratype of *Coelotes paikwunensis* and female specimens described as *A. lunatus* in Korea are in fact the females of *A. coreana*.

Keywords: *Amaurobiidae*, *Ambanus*, *Araneae*, Korea, taxonomy

Introduction

The genus *Ambanus* of the family Amaurobiidae comprises 18 species including the species transferred from the genus *Coelotes* based on the type species *A. mandzhuricus* Ovtchinnikov, 1999. Of these, 10 species are endemic to Korea, four to Russia, three to China, and one to Japan (Wang 2002; Platnick 2006). Wang (2002) revised the subfamily Coelotinae at the generic level based on 31 characters and 22 taxa, including two outgroup taxa (*Tamgrinia*, *Amaurobius*). In his revision, Wang (2002) mentioned 18 species of the genus *Ambanus* but was able to study only the females of two of the 10 Korean species, *A. lunatus* and *A. quadrativulvus*. The remaining eight species have not yet been examined closely for their genitalic characters such as the median apophysis, conductor, embolus, conductor dorsal apophysis, and cymbial apophysis in the male palpal organ, and inner atrial margin, hood, and position of atrium in the female epigynum. Although Namkung (2001, 2003) presented simple illustrations of nine *Ambanus* species [*A. bifidus* (Paik, 1976), *A. dimidiatus* (Paik, 1974), *A. euini* (Paik, 1976), *A. kayasanensis* (Paik, 1972), *A. kimi* (Paik, 1974), *A. lunatus* (Paik, 1976), *A. ovatus* (Paik, 1976), *A. paikwunensis* (Kim and Jung, 1993), and *A. quadrativulvus* (Paik, 1974)], these species cannot be reliably identified from his pictorial book. *Alloclubionoides coreana* Paik, 1992 was originally described on the basis of a single male

Correspondence: Byung-Woo Kim, Department of Life Science, College of Natural Sciences, Hanyang University, Seoul 133-791, Korea. Email: bwkim00@hotmail.com

Published 18 October 2006

ISSN 0022-2933 print/ISSN 1464-5262 online © 2006 Taylor & Francis

DOI: 10.1080/00222930600916050

from the Korean national arboretum of Gwangrung (KNAG), Pocheon-gun, Gyeonggi-do. To date, the only recorded specimens of this species have been males from the same locality.

During a survey of the spider fauna of Korea, spiders of the genus *Ambanus* were collected from pitfall traps near the type locality of *A. paikwunensis* (Mt. Paikwun, Pocheon-gun, Gyeonggi-do) and *Alloclubionoides coreana* (KNAG), and at Mt. Yebong, Namyangju-si, Gyeonggi-do. The male specimens collected at two sites (Mt. Paikwun, KNAG) corresponded well with the description of *A. coreana*, as well as the type species of the monotypic genus *Alloclubionoides* in the family Clubionidae. The specimens are therefore thought to be the male of *Ambanus coreana*, and characterized by having three claws (two in Clubionidae), median apophysis not ear-shaped (or spoon-like), and no patellar apophysis. Females collected at the same locality by pitfall are concluded to be the true females of *A. coreana*, and not to *A. lunatus* as would be suggested by previous taxonomic classifications. The genitalic characters of the latter species are very similar to those of *A. coreana*, with both species having the following characteristics: epigynal teeth absent; atrial septum originating in posterior plate; atrium slit or true copulatory pore, deep, oblique line-shaped on inner retrolateral part of both semicircular hoods; copulatory ducts broadly curved with transparent membranes; spermathecal heads small cylindrical processes; spermathecae short, overlapped, with indistinct stalks and bases; fertilization ducts very small, arising from the posterior margin tip of the spermathecae; patellar apophysis absent; retrolateral tibial apophysis modified with intermediate tibial apophysis; cymbial furrow short, less than half cymbial length; conductor broadly saucer-like with many minute denticles; conductor dorsal apophysis situated on distal embolus; embolus broad and short, wound counterclockwise, distal part cup-shaped.

The main goal of this paper is to provide research data for the future revisional study of the Korean endemic spider genus *Ambanus*.

Materials and methods

Collection sites were located beside a small stream, with vegetation characterized by a mixture of patchy fir plantations and secondary broadleaf woods. Ten pitfall stations were established in several natural forests (KNAG, Mt. Paikwun, Mt. Yebong, Mt. Odae), the central districts of Korea. At each station two pitfall traps (plastic cups, height 6.3 cm, diameter 8 cm) were set 10 m apart and filled with ethylene glycol (Greenslade and Greenslade 1971). Measurements are in mm unless noted otherwise. Specimens examined in this paper will be deposited in the National Biological Resources Center (NBRC) and Arachnological Institute of Korea (AIK).

The descriptive terminology and spination of legs follow that of Ono (1988) and Wang (2002). The following abbreviations are used: a, apical; AER, anterior eye row; AIK, Arachnological Institute of Korea; ALE, anterior lateral eye; ALS, anterior lateral spinneret; AME, anterior median eye; CDA, conductor dorsal apophysis; d, dorsal view; eye ratio, (longest eye row/carapace width) \times 100; ITA, intermediate tibial apophysis; KNAG, the Korean national arboretum of Gwangrung; p, prolateral view; PER, posterior eye row; PLE, posterior lateral eye; PLS, posterior lateral spinneret; PME, posterior median eye; PMS, posterior median spinneret; r, retrolateral view; RTA, retrolateral tibial apophysis.

Taxonomy

Ambanus lunatus (Paik, 1976)

(Figures 1–3, 7, 8A, B, 9C–F)

Coelotes lunatus Paik 1976, p 84, Figures 4, 19–21 (D♀); Paik 1978, p 346, Figure 155 (♀).

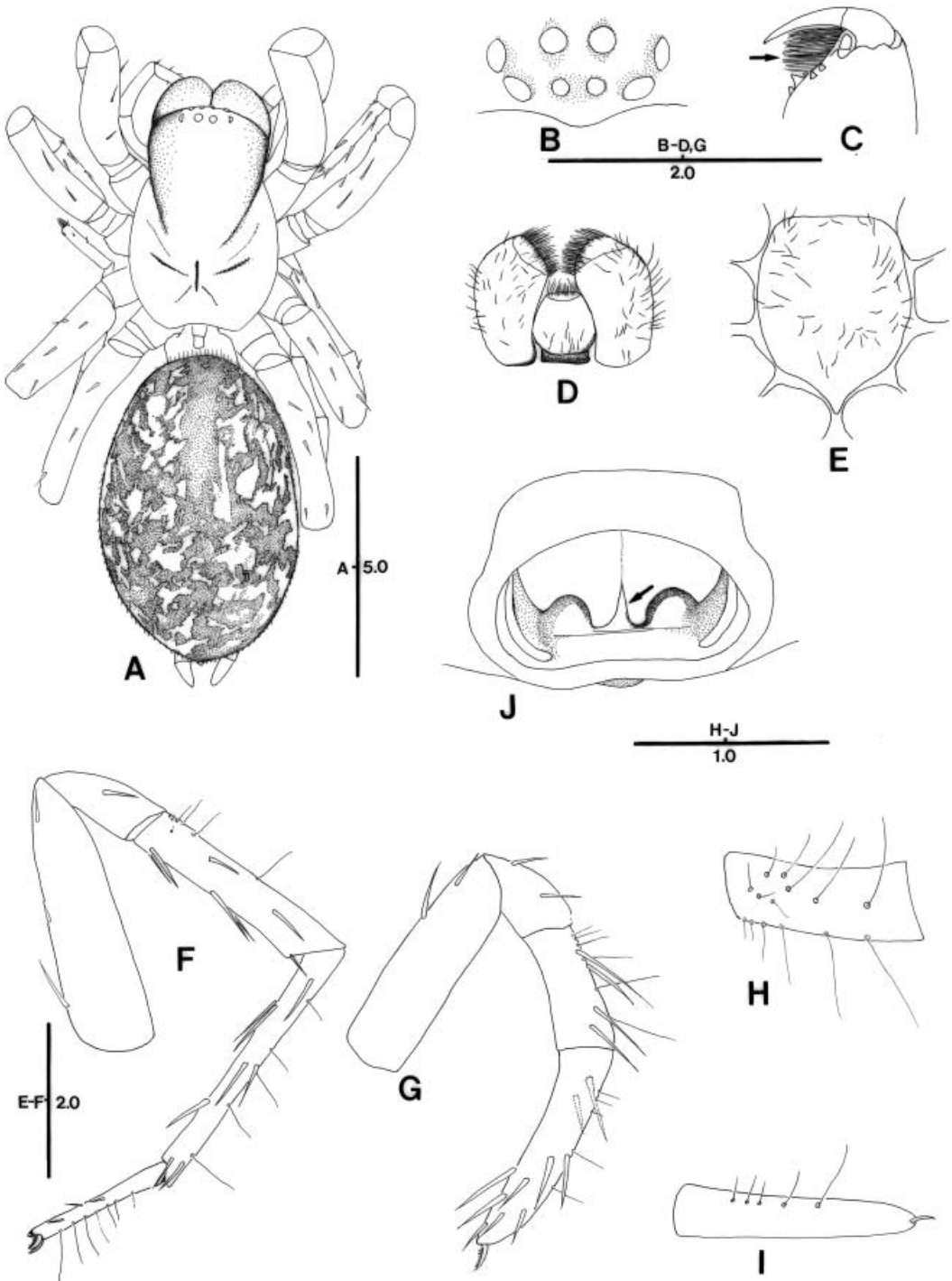


Figure 1. *Ambanus lunatus* (Paik, 1976) from Korea, female. (A) Habitus, dorsal view; (B) eye area and clypeus, front view; (C) chelicerae with long setae (arrow), left part, posterior view; (D) endite and labium, ventral view; (E) sternum, ventral view; (F) fourth leg, left part, prolateral view; (G–I) palp, left part, (H) tibia, dorsal view, (I) tarsus, dorsal view; (J) epigynum with distinct atrial septum (arrow), ventral view.

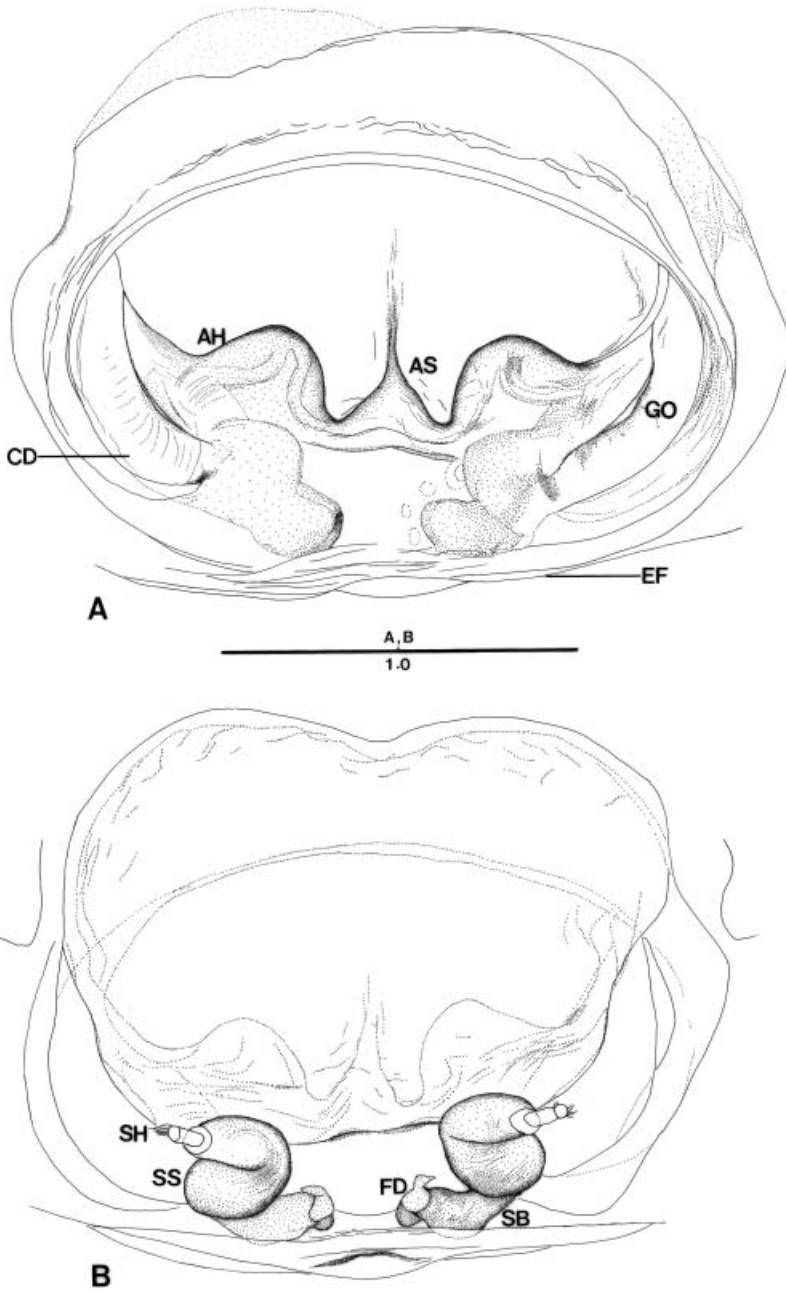


Figure 2. *Ambanus lunatus* (Paik, 1976) from Korea, female. (A) Epigynum, ventral view; (B) genitalia, dorsal view. AH, atrial hood; AS, atrial septum; CD, copulatory duct; EF, epigastric furrow; FD, fertilization duct; GO, genital opening; SB, spermathecal base; SH, spermathecal head; SS, spermathecal stalk.

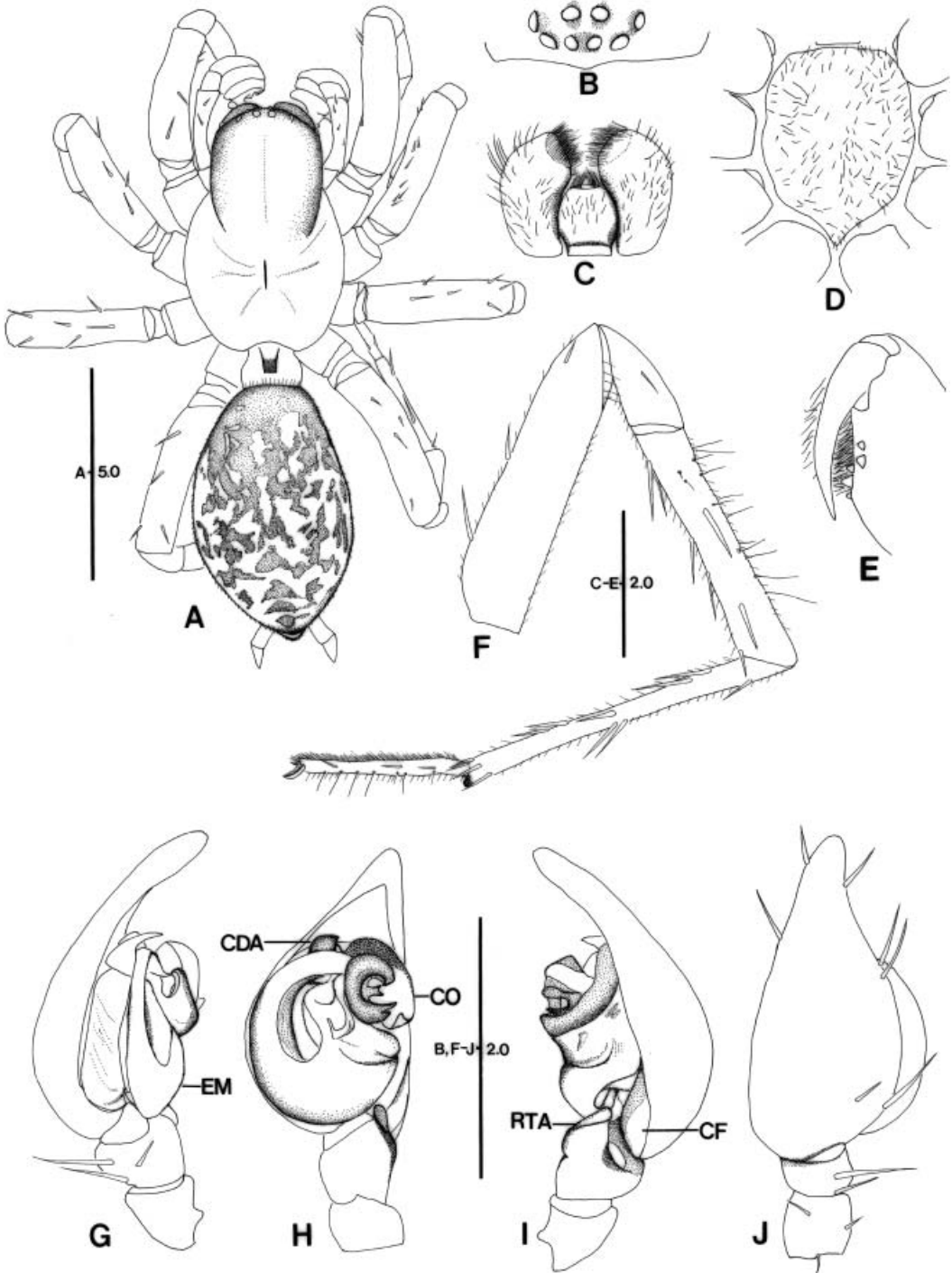


Figure 3. *Ambanus lunatus* (Paik, 1976) from Korea, male. (A) Habitus, dorsal view; (B) eye area and clypeus, front view; (C) endite and labium, ventral view; (D) sternum, ventral view; (E) fourth leg, left part, prolateral view; (F) chelicerae, left part, posterior view; (G–J) palp, left part, (G) prolateral, (H) ventral, (I) retrolateral, and (J) dorsal views. CDA, conductor dorsal apophysis; CF, cymbial furrow; CO, conductor; EM, embolus; RTA, retrolateral tibial apophysis.

Ambanus lunatus: Ovtchinnikov 1999, p 64 (transferred from *Coelotes*); Namkung 2001, p 393, Figure 28.7a (♀); Namkung 2003, p 395, Figure 28.7a (♀).

Diagnosis

This species is similar to *A. coreana*, *A. napolovi* Ovtchinnikov, 1999, *A. paiki* Ovtchinnikov, 1999, and *A. quadrativulvus* (Paik, 1974) in having female epigynum with atrium very broadly oval, situated posteriorly near epigastric furrow; copulatory pore deep, linear on inner lateral part; copulatory ducts broadly curved with transparent membranes in both posterior margins; male palpal organ with cymbial furrow less than one-third cymbial length; large embolus with curved distal part; and conductor saucer-like, with a rounded distal end situated on centre of papal organ. *Ambanus lunatus* female can be distinguished by the presence of a semicircular swollen atrial hood; distinctive atrial septum triangularly expanded, originating in posterior plate; chelicerae with three promarginal teeth; and spermathecal stalk overlapped in the middle; the male by an embolus with two distal parts with cup-shaped processes and another divided into two protrusions facing the retrolateral side; cymbial furrow short, about one-fifth the cymbial length.

Description

Measurements (mm). Female/male: habitus length 12.3/12.6; carapace length 4.8/5.7, carapace width 3.3/3.8, carapace height 3.1/4.1; cheliceral length 2.7/2.7, cheliceral width 1.3/1.2, cheliceral fang length 1.4/1.4; sternum length 2.6/2.4, sternum width 2.0/2.0; endite length 1.7/1.7, endite width 1.0/1.0; labium length 0.9/1.0, labium width 0.8/0.9; clypeal height 0.2/0.2; AER 1.0/0.7, PER 1.3/0.9, AME 0.1/0.1, ALE 0.2/0.2, PME 0.2/0.2, PLE 0.2/0.2. Eye formula ALE=PLE=PME>AME/ALE=PLE=PME>AME. Palp 5.2/5.4 (1.7/1.9, 0.8/0.6, 1.0/0.4, 1.7/2.5). First leg 12.0/15.2 (3.4/4.1, 1.6/1.9, 2.7/3.4, 2.7/3.6, 1.6/2.2), second leg 10.9/13.7 (3.1/3.8, 1.6/1.8, 2.2/2.8, 2.5/3.3, 1.5/2.0), third leg 10.4/12.9 (2.9/3.6, 1.5/1.7, 1.8/2.2, 2.7/3.5, 1.5/1.9), fourth leg 14.0/17.0 (3.8/4.5, 1.7/1.8, 2.9/3.6, 3.9/4.9, 1.7/2.2). Leg formula IV I II III/IV I II III. Abdomen length 6.9/6.0, abdomen width 4.5/3.8, abdomen height 4.7/4.0; ALS 0.5/0.5, PLS 0.9/0.9 (0.4/0.4+0.5/0.5).

Female. Medium-sized spider slightly shorter than male, found under stones and fallen leaves on the ground of the forests. Carapace elongate, 1.2 times longer than width, moderately narrowed in eye area, and distinctly longitudinal fovea on middle (Figure 1A). AER straight and PER slightly procurved in frontal view; AME smaller than other eyes, separated by as much as their diameter (Figure 1B); and eye ratio 24. Clypeal height slightly longer than AME diameter and without chilum. Chelicerae with numerous long setae; lateral condyle yellowish brown; three promarginal teeth, middle one largest; and two retromarginal teeth subequal in size (Figure 1C). Endites reddish brown, widest at mid-part; and labium rectangular, longer than wide (Figure 1D). Sternum shield-shaped, widest at second coxae, and slightly projected between fourth coxae (Figure 1E). Palp (Figure 1G–I) composed of one claw with seven side teeth; tibia with nine trichobothria in three rows (5d-1d-3r), tarsus five in one (5r) and femur with three spines, tibia with five (four, 2-2 on dorsal; one, 0-1 on prolateral), tarsus 14 (five, 2-2-1 on prolateral; five, 0-5 on retrolateral; four, 0-4 on ventral). Legs (Figures 1F, 7) yellowish brown without ring patterns; length of

Table I. Spination of leg segments of *Ambanus lunatus* (Paik, 1976) from Korea (♀/♂).

	Dorsal	Ventral	Prolateral	Retrolateral
First leg				
Femur	1 1/110	0/0	002/002	0/0
Tibia	0/0	222/222	001/001	0/0
Metatarsus	0/0	222/222	1 1/011	0/0
Tarsus	0/0	0/0	0/0	0/0
Second leg				
Femur	1 1/111	0/0	011/1 1	0/0
Tibia	0/0	122a/112a	001(1 1)/011	0/0
Metatarsus	0/0	222/222	1 1/012	0/0
Tarsus	0/0	0/0	0/0	0/0
Third leg				
Femur	111/121	0/0	1 1/1 1	0/0
Tibia	0/1 1	222a/222a	1 1/011	1 1/011
Metatarsus	0/0	222/222	122/122	122/122
Tarsus	0/0	011/010	011/011	0 1/010
Fourth leg				
Femur	111/112	0/0	001/0	0/0
Tibia	101/101	222a/222a	1 1/1 1	1 1/1 1
Metatarsus	0/100	222/222	122/122	122/122
Tarsus	0/0	0 1/0 1	011/111	011/011

a, apical part; values in parentheses refer to the original description by Paik (1976).

first leg (patella+tibia) always shorter than carapace length; trochanters not notched; tibia with 11–17 trichobothria in four rows (4p-5d-4d-4r on first leg, 4p-5d-4d-4r on second, 3p-5d-4d-4r on third, 1p-6d-3d-1r on fourth), metatarsi six to seven in one row (seven on first leg and second, six on third and fourth), tarsi six to seven in one row (seven on first leg, third and fourth, six in second); tarsal organ situated close to distal end of tarsus, slightly anterior of distal trichobothrium; tarsi with three claws, upper claws with 9–12 side teeth (12 on first leg, 11 on second, nine on third and fourth), lower with one to two (one on first leg, two on second, third and fourth). Leg spination (Table I): leg I femur with four spines, tibia seven (one, 0-0-1 on prolateral; six, 2-2-2a on ventral), metatarsus eight (two, 1-1 on prolateral; six, 2-2-2 on ventral), tarsus without spine; leg II femur with four spines, tibia six (one, 0-0-1 on prolateral; five, 1-2-2a on ventral), metatarsus nine (three, 0-1-2 on prolateral; six, 2-2-2 on ventral), tarsus without spine; leg III femur five spines, tibia 10 (four, 1-0-1 on prolateral; retrolateral, six, 2-2-2a on ventral), metatarsus 16 (10, 1-2-2 on prolateral; retrolateral, six, 2-2-2 on ventral), tarsus five (one, 0-1 on retrolateral; four, 0-1-1 on prolateral and ventral); leg IV femur four spines, tibia 12 (two, 1-0-1 on dorsal; four, 1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 16 (10, 1-2-2 on prolateral and retrolateral; six, 2-2-2 on ventral), tarsus five (four, 0-1-1 on prolateral and retrolateral; one, 0-1 on ventral). Abdomen ovoid with scattered brownish yellow spots and chevrons on dorsal side (Figure 1A). Cribellum absent. Spinnerets brown; ALS cylindrical with horizontal apical part; and PLS almost twice as long as other spinnerets and two segments, second segment slightly longer than proximal one.

Female epigynum and genitalia (Figures 1J, 2A, B, 9C, D): epigynal teeth absent; atrial septum distinctive, triangularly expanded, originating in posterior plate; atrial slit or true copulatory pore deep, linear on inner part; atrial hood semicircular and swollen horizontally; copulatory ducts broadly curved with transparent membranes; spermathecal heads small cylindrical processes, situated at anterior of spermathecae; spermathecae short,

overlapped, with indistinct stalks and bases; fertilization ducts very small, arising from the posterior spermathecae.

Male. Medium-sized spiders slightly longer than female. Carapace elongate, 1.6 times as long as width, moderately narrowed in eye area, and distinctly longitudinal fovea on middle (Figure 3A). AER and PER almost straight in frontal view; AME smaller than other eyes, separated by slightly less than their diameter, and eye ratio 26 (Figure 3B). Clypeal height slightly longer than AME diameter and without chilum. Endites reddish brown, widest at mid-part; and labium rectangular, slightly longer than wide (Figure 3C). Sternum shield-shaped, widest at second coxae, and not produced between fourth coxae (Figure 3D). Chelicerae with numerous long setae, lateral condyle yellowish brown, with three promarginal teeth, middle one largest, and two retromarginal teeth subequal in size (Figure 3E). Legs (Figures 3F, 7) yellowish brown; length of first leg (patella+tibia) always shorter than carapace length; trochanters not notched; tibia with 16–24 trichobothria in four rows (5p-7d-4d-6r on first leg, 6p-6d-6d-6r on second, 4p-6d-5d-7r on third, 2p-6d-4d-4r on fourth), metatarsi six to eight in one row (eight on first, third and fourth leg; six on second), tarsi 8–10 in one row (10 on first leg, nine on second and fourth, eight on third); tarsal organ situated close to distal end of tarsus, slightly anterior of distal trichobothrium; tarsi with three claws, upper claws with 9–13 side teeth (13 on first leg, 12 on second, 10 on third, nine on fourth), lower with zero to one (zero on first leg, one on second, third and fourth). Leg spination (Table I): leg I femur with four spines, tibia seven (one, 0-0-1 on prolateral; six, 2-2-2a on ventral), metatarsus eight (two, 0-1-1 on prolateral; six, 2-2-2 on ventral), tarsus without spine; leg II femur with five spines, tibia six (one, 0-1-1 on prolateral; five, 1-1-2a on ventral), metatarsus nine (three, 0-1-2 on prolateral; six, 2-2-2 on ventral), tarsus without spine; leg III femur with six spines, tibia 10 (four, 0-1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 17 (one, 1-0-0 on dorsal; 10, 1-2-2 on prolateral and retrolateral; six, 2-2-2 on ventral), tarsus four (three, 1-1-1 on prolateral; two, 0-1-1 on retrolateral; one, 0-1 on ventral); leg IV femur with four spines, tibia 12 (two, 1-0-1 on dorsal; four, 1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 17 (one, 1-0-0 on dorsal; 10, 1-2-2 on prolateral and retrolateral; six, 2-2-2 on ventral), tarsus six (three, 1-1-1 on prolateral; two, 0-1-1 on retrolateral; one, 0-1 on ventral). Abdomen ovoid, with scattered brownish yellow spots and chevrons on dorsal side (Figure 3A). Cribellum absent. Spinnerets brown, ALS cylindrical, with horizontal apical part and PLS almost twice as long as other spinnerets and with two segments, second segment slightly longer than proximal one.

Male palp (Figures 3G–J, 8A, B): patellar apophysis absent; RTA modified with ITA; cymbial furrow short, about one-fifth cymbial length; tegular sclerite weakly sclerotized and longitudinally situated on tegulum; conductor broadly saucer-like with many minute denticles, rounded distal end situated on centre of papal organ; conductor dorsal apophysis situated on upper embolus; embolus broad and short, wound counterclockwise, two distal parts with cup-shaped processes and another divided into two protrusions facing the retrolateral side.

Specimens examined

Two females, 21 July 1984, two females, 24 July 1984, two females, 22 September 1984, three females, 3 October 1984, five females, five males, 3 November 1984, two females, 11

November 1984, one female, 14 April 1985, two females, 21 April 1985, three females, 3 May 1985, one female, four males, 18 May 1985, Mt. Yebong, Gyonggi-do, K. S. Lee; one male, 6 September 1986, same locality, J. H. Kim; one female, 19 January 2006, Simbong cave, Chungcheongbuk-do, B. W. Kim.

Distribution

Korea (Mt. Yebong, Mt. Songni).

Ambanus coreana (Paik, 1992) nov. comb. (Figures 4–6, 7, 8C–F, 9A, B)

Coelotes sp. (A) Namkung and Yoon 1975, p 39, Figure 3 (♀).

Alloclubionoides coreana Paik 1992, p 9, Figures 1–8 (D♂, in Clubionidae); Namkung 2003, p 448, Figure 34.31a, b (♂). Misidentified male.

Alloclubionoides coreanus: Platinick 1997, p 702 (in Clubionidae).

Coelotes paikwunensis Kim and Jung 1993, p 2, Figures 1, 6, 7 (D♀); Namkung 2001, p 390, Figure 28.4a, b (♀). Misidentified female.

Ambanus paikwunensis: Wang 2002, p 28 (transferred from *Coelotes*); Namkung 2003, p 394, Figure 28.6a, b (♀). Misidentified female.

Ambanus lunatus: Namkung 2001, p 393, Figure 28.7b (♂); Namkung 2003, p 395, Figure 28.7b (♂); Kim and Cho 2002, p 185, Figures 361–366 (♀♂). Misidentified.

Diagnosis

This species is similar to *A. lunatus*, *A. napolovi* Ovtchinnikov, 1999, *A. paiki* Ovtchinnikov, 1999, and *A. quadrativulvus*. The female of *A. coreana* can be distinguished by the presence of an oblique (/ \) shaped atrial hood; atrial septum small and broadly obscure; chelicerae with two promarginal teeth; spermathecal stalk overlapped in lower; and the male by an embolus with distal part with cup-shaped process attached slender embolus tip facing down; cymbial furrow short at about one-quarter the cymbial length.

Description

Measurements (mm). Female/male: Habitus length 12.7/10.3; carapace length 6.7/5.5, carapace width 4.0/3.4, carapace height 3.7/3.6; cheliceral length 3.0/2.5, cheliceral width 1.8/1.3, cheliceral fang length 1.7/1.3; sternum length 3.0/2.5, sternum width 2.4/1.9; endite length 2.1/1.6, endite width 1.1/0.9; labium length 0.9/0.9, labium width 0.8/0.8; clypeal height 0.2/0.2; AER 0.8/0.9, PER 1.1/1.2, AME 0.1/0.1, ALE 0.2/0.2, PME 0.2/0.2, PLE 0.2/0.2. Eye formula ALE=PLE=PME>AME/ALE=PLE=PME>AME. Palp 6.0/5.4 (2.0/1.9, 0.9/0.6, 1.2/0.4, 1.9/2.5). First leg 14.2/14.0 (4.0/3.8, 2.0/1.8, 3.1/3.1, 3.2/3.3, 1.9/2.0), second leg 12.2/12.6 (3.3/3.5, 1.8/1.6, 2.4/2.5, 3.0/3.1, 1.7/1.9), third leg 11.8/12.0 (3.2/3.3, 1.7/1.6, 2.1/2.1, 3.2/3.3, 1.6/1.7), fourth leg 16.1/16.0 (4.1/4.2, 2.0/1.7, 3.4/3.2, 4.5/4.6, 2.1/2.3). Leg formula IV I II III/IV I II III. Abdomen length 8.1/5.8, abdomen width 5.3/3.6, abdomen height 5.0/3.4; ALS 0.5/0.5, PLS 1.1/1.0 (0.5/0.5+0.6/0.5).

Female. Medium-sized spiders distinctly longer than male, found under stones and fallen leaves on the ground of the forests. Carapace elongate, 1.7 times as long as width, moderately narrowed in eye area, and distinctly longitudinal fovea on middle (Figure 4A). AER and PER slightly procurved in frontal view; AME smaller than other eyes, separated

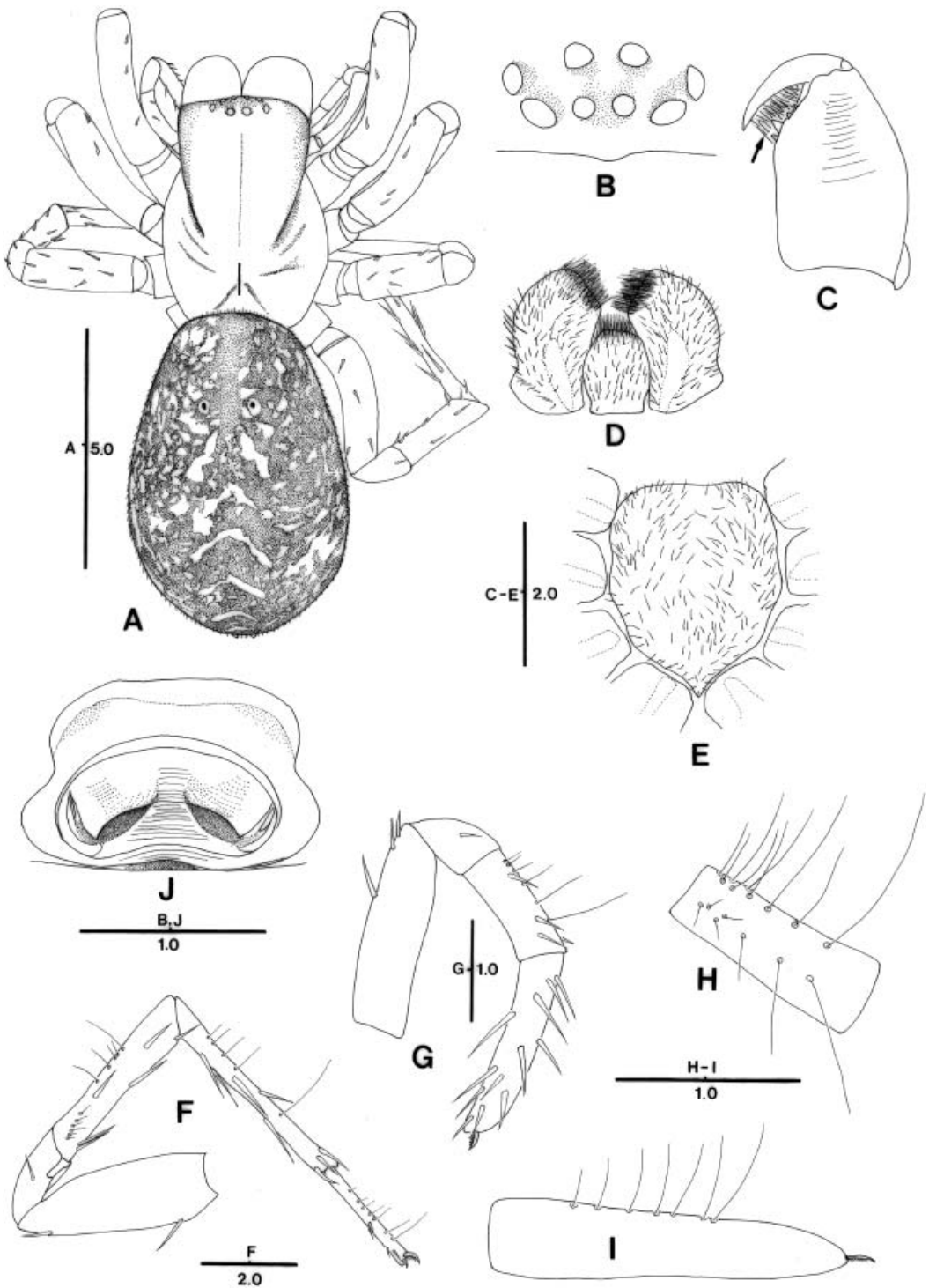


Figure 4. *Ambanus coreana* (Paik, 1992) from Korea, female. (A) Habitus, dorsal view; (B) eye area and clypeus, front view; (C) chelicerae with long setae (arrow), left part, posterior view; (D) endite and labium, ventral view; (E) sternum, ventral view; (F) fourth leg, left part, prolateral view; (G–I) palp, left part, (H) tibia, dorsal view, (I) tarsus, dorsal view; (J) epigynum, ventral view.

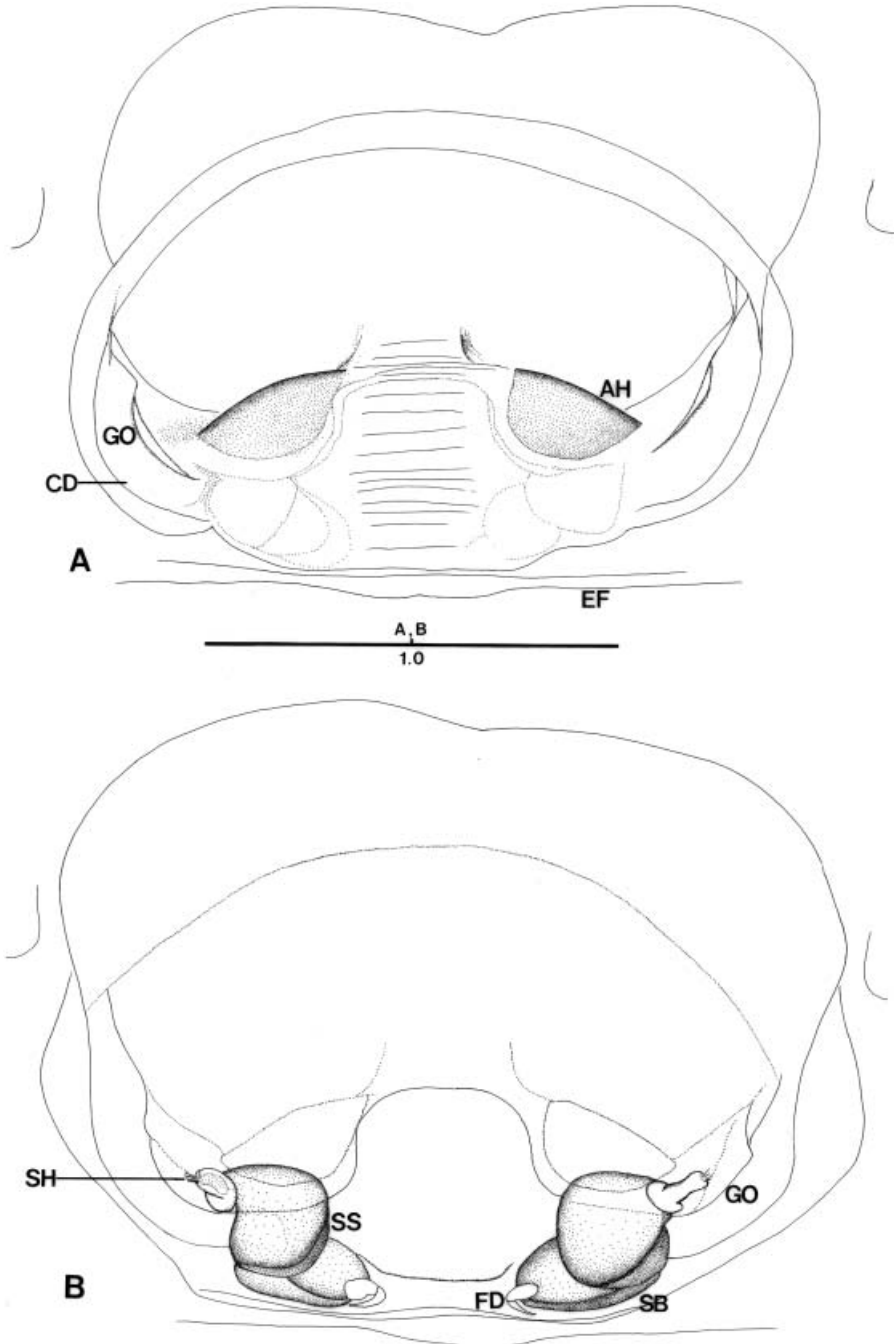


Figure 5. *Ambanus coreana* (Paik, 1992) from Korea, female. (A) Epigynum, ventral view; (B) genitalia, dorsal view. AH, atrial hood; AS, atrial septum; CD, copulatory duct; EF, epigastric furrow; FD, fertilization duct; GO, genital opening; SB, spermathecal base; SH, spermathecal head; SS, spermathecal stalk.

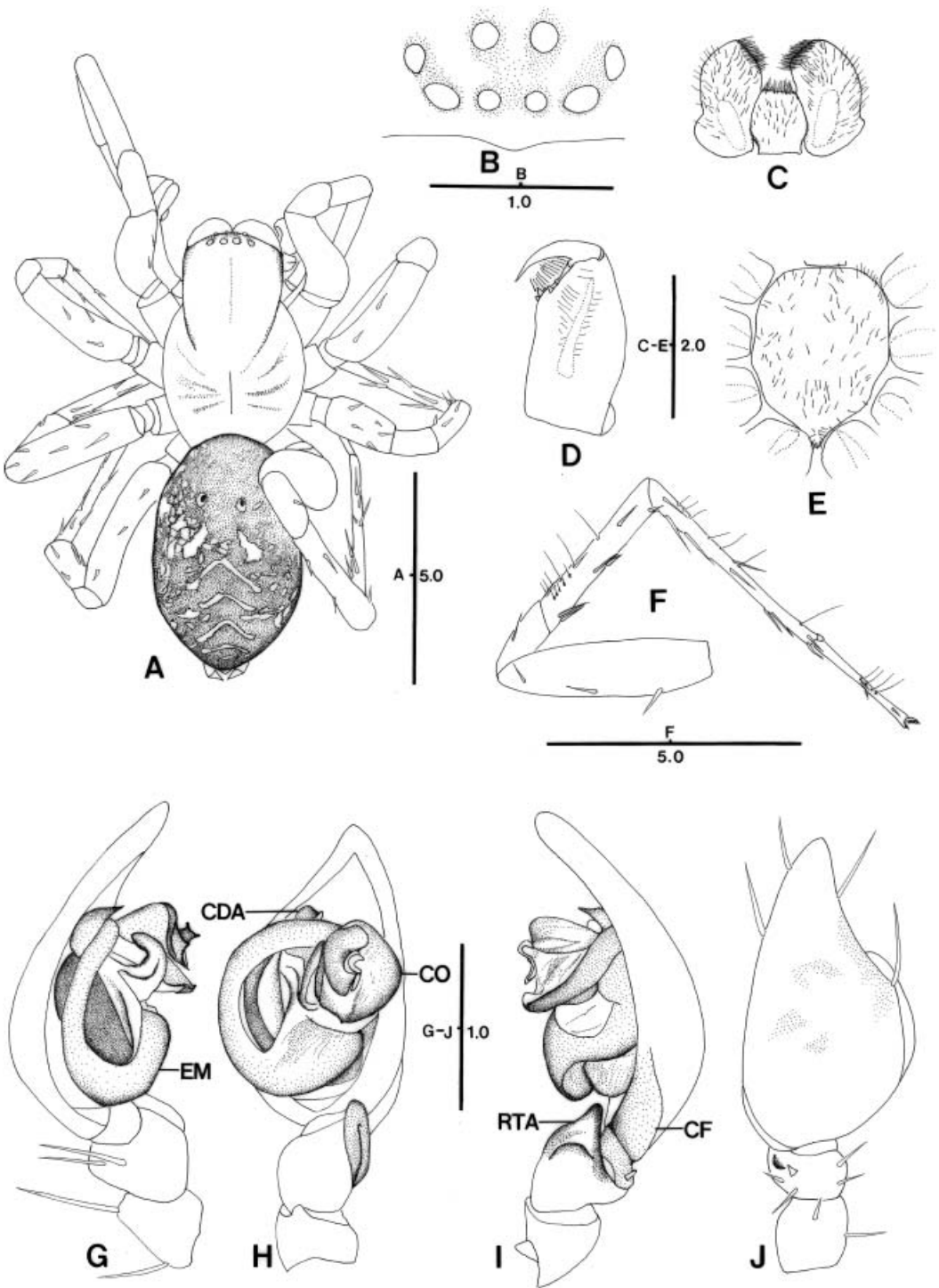


Figure 6. *Ambanus coreana* (Paik, 1992) from Korea, male. (A) Habitus, dorsal view; (B) eye area and clypeus, front view; (C) endite and labium, ventral view; (D) chelicerae, left part, posterior view; (E) sternum, ventral view; (F) fourth leg, left part, prolateral view; (G–J) palp, left part, (G) prolateral, (H) ventral, (I) retrolateral, and (J) dorsal views. CDA, conductor dorsal apophysis; CF, cymbial furrow; CO, conductor; EM, embolus; RTA, retrolateral tibial apophysis.

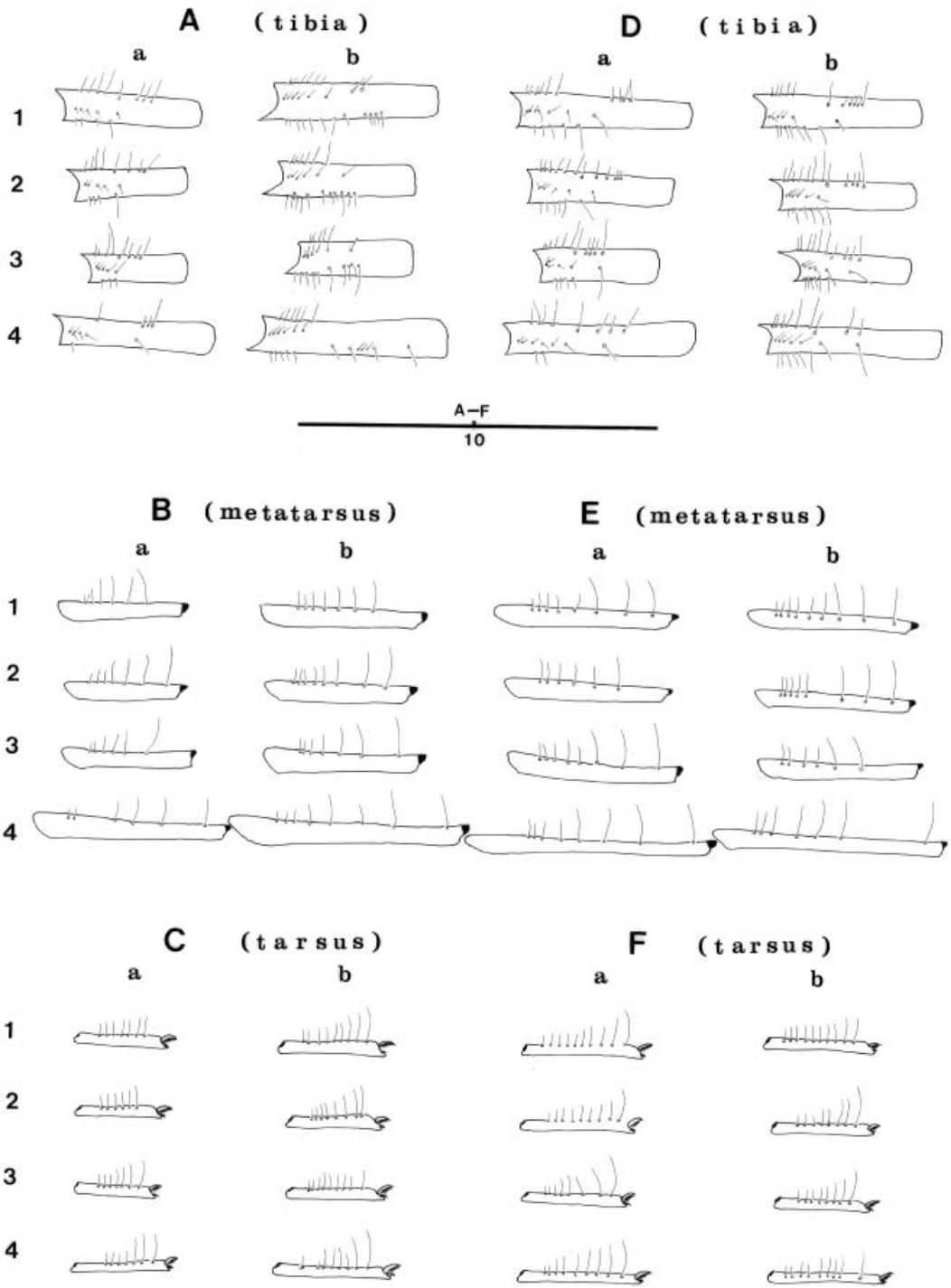


Figure 7. Diagram of trichobothrium patterns on the left legs of *Ambanus* spp. in Korea. (A) Female, tibia, dorsal view; (B) female, metatarsi, retrolateral view; (C) female, tarsi, retrolateral view; (D) male, tibia, dorsal view; (E) male, metatarsi, retrolateral view; (F) male, tarsi, retrolateral view. a, *Ambanus lunatus*; b, *Ambanus coreana*; 1, first leg; 2, second leg; 3, third leg; 4, fourth leg.

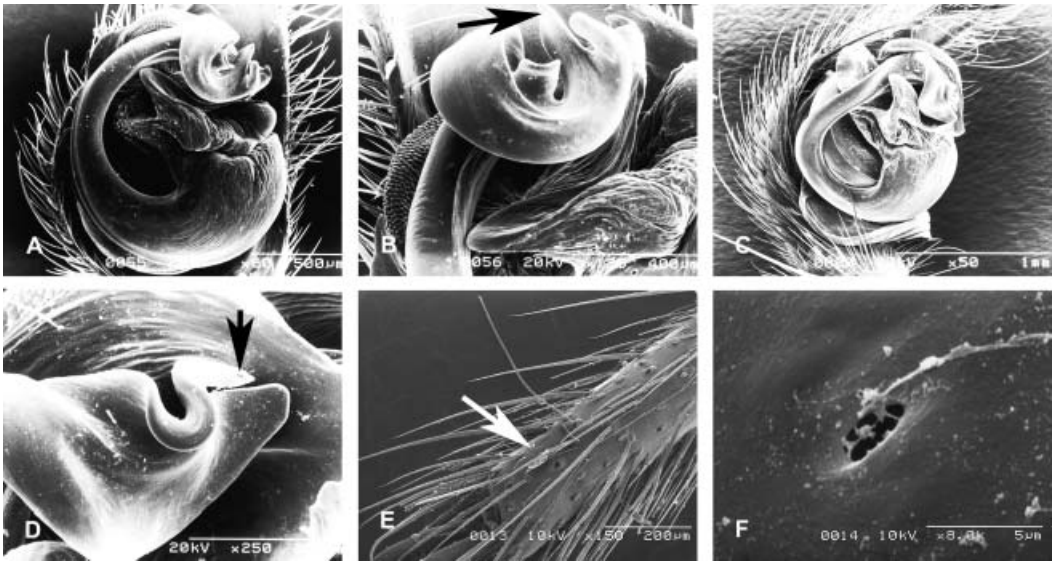


Figure 8. SEM photographs of *Ambanus* spp. in Korea. (A) *Ambanus lunatus*, male palp, left part, ventral view; (B) *Ambanus lunatus*, male palp, left part, distal embolus tip (arrow) and conductor; (C) *Ambanus coreana*, male palp, left part, ventral view; (D) *Ambanus coreana*, male palp, left part, embolus distal tip (arrow); (E) *Ambanus coreana*, female fourth tarsus, distal trichobothrium and tarsal organ (arrow); (F) *Ambanus coreana*, female fourth tarsus, left part, tarsal organ.

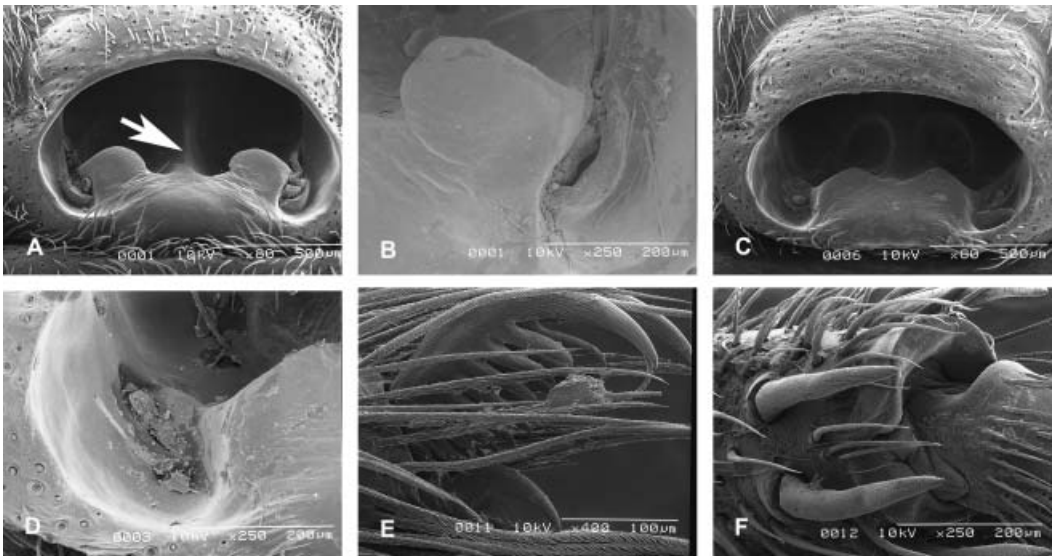


Figure 9. SEM photographs of female *Ambanus* spp. in Korea. (A) *Ambanus lunatus*, epigynum with distinct atrial septum (arrow), ventral view; (B) *Ambanus lunatus*, epigynum, genital opening, ventral view; (C) *Ambanus coreana*, epigynum, ventral view; (D) *Ambanus coreana*, epigynum, genital opening, ventral view; (E) *Ambanus lunatus*, fourth leg, tarsal claws, left part, prolateral view; (F) *Ambanus lunatus*, fourth leg, distal metatarsus and tarsus, left part, prolateral view.

by as much as their diameter; and eye ratio 28 (Figure 4B). Clypeal height twice as long as AME diameter and without chilum. Chelicerae with numerous long setae; lateral condyle yellowish brown; two promarginal teeth, outer larger than inner; and two retromarginal teeth subequal in size (Figure 4C). Endites reddish brown, widest at mid-part; and labium rectangular, longer than wide (Figure 4D). Sternum shield-shaped, widest at second coxae, and slightly projected between fourth coxae (Figure 4E). Palp (Figure 4G–I) composed of one claw with seven side teeth; tibia with nine trichobothria in three rows (5d-1d-3r), tarsus five in one (5r) and femur with four spines, tibia six (three, 1-2 on dorsal and prolateral), tarsus 17 (one, 1-0 on dorsal; six, 3-2-1 on prolateral; five, 2-2-1 on retrolateral; five, 1-0-4 on ventral). Legs (Figures 4F, 7) yellowish brown without ring patterns; length of first leg (patella+tibia) always shorter than carapace length; trochanters not notched; tibia with 22–25 trichobothria in four (five on second leg) rows (6p-7d-5d-7r on first leg, 6p-6d-6d-2r-4r on second, 5p-7d-5d-5r on third, 6p-6d-6d-5r on fourth), metatarsi seven to eight in one row (seven on first, third and fourth leg, eight on second), tarsi eight to nine in one row (nine on first leg, eight on second, third and fourth); tarsal organ situated close to distal end of tarsus, slightly anterior of distal trichobothrium; tarsi with three claws, upper claws with 9–12 side teeth (12 on first leg, 11 on second, nine on third and fourth), lower with two to three (two on first, second and third leg, three on fourth). Leg spination (Table I): leg I femur with four spines, tibia seven (one, 0-0-1 on prolateral; six, 2-2-2a on ventral), metatarsus eight (two, 1-0-1 on prolateral; six, 2-2-2 on ventral), tarsus without spine; leg II femur with four spines, tibia seven (two, 0-1-1 on prolateral, five, 2-1-2a on ventral), metatarsus 11 (three, 1-1-1 on prolateral; two, 0-1-1 on retrolateral; six, 2-1-3 on ventral), tarsus one (1-0-0) on ventral; leg III femur eight spines, tibia 10 (four, 1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 16 (10, 1-2-2 on prolateral and retrolateral; six, 2-2-2 on ventral), tarsus five (two, 0-2 on prolateral; one, 0-1 on retrolateral; two, 0-1-1 on ventral); leg IV femur four spines, tibia 10 (four, 1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 15 (five, 1-2-2 on prolateral; four, 1-1-2 on retrolateral; six, 2-2-2 on ventral), tarsus six (0-1-1 on prolateral, retrolateral and ventral). Abdomen ovoid with scattered brownish yellow spots and chevrons on dorsal side (Figure 4A). Cribellum absent. Spinnerets brown, ALS cylindrical, with horizontal apical part and PLS almost twice as long as other spinnerets and with two segments, second segment slightly longer than proximal one.

Female epigynum and genitalia (Figures 4J, 5A, B, 9A, B): epigynum teeth absent; atrial septum small, broadly obscure, originating in posterior plate; atrial slit or true copulatory pore deep, linear on inner retrolateral part; atrial hood oblique (/ \) shaped; copulatory ducts broadly curved with transparent membranes; spermathecal heads small cylindrical processes, with some slender tentacles on distal part, situated at anterior of spermathecae; spermathecae short, overlapped, with indistinct stalks and bases; fertilization ducts very small, arising from the posterior margin of spermathecae.

Male. Medium-sized spider distinctly shorter than female. Carapace elongate, 1.6 times as long as width, moderately narrowed in eye area, and distinctly longitudinal fovea on middle (Figure 6A). AER straight and PER slightly procurved in frontal view; AME smaller than other eyes, separated by slightly less than their diameter and eye ratio 35 (Figure 6B). Clypeal height slightly longer than AME diameter and without chilum. Endites reddish brown, widest at mid-part; and labium rectangular, slightly longer than wide (Figure 6C). Chelicerae with lateral condyle yellowish brown with three promarginal teeth, middle one largest, and two retromarginal teeth subequal in size (Figure 6D). Sternum shield-shaped,

widest at second coxae, and not projected between fourth coxae (Figure 6E). Legs (Figures 6F, 7) yellowish brown; length of first leg (patella+tibia) always shorter than carapace length; trochanters not notched; tibia with 22–25 trichobothria in four rows (7p-6d-6d-5r on first leg, 7p-6d-5d-6r on second, 6p-6d-4d-6r on third, 6p-7d-3d-6r on fourth), metatarsi 6–13 in one row (13 on first leg, eight on second, six on third, seven on fourth), tarsi eight to nine in one row (nine on first leg, eight on second and third, nine on fourth); tarsal organ situated close to distal end of tarsus, slightly anterior of distal trichobothrium; tarsi with three claws, upper claws with 10–13 side teeth (13 on first leg, 12 on second, 11 on third, 10 on fourth), lower with zero to three (zero on first leg, three on second and fourth, one on third). Leg spination (Table II): leg I femur with four spines, tibia seven (one, 0-0-1 on prolateral; six, 2-2-2a on ventral), metatarsus seven (two, 0-1-1 on prolateral; six, 2-1-2 on ventral), tarsus without spine; leg II femur with four spines, tibia 10 (two, 1-1 on prolateral; five, 1-1-2a on ventral), metatarsus nine (three, 1-2 on prolateral; six, 2-2-2 on ventral), tarsus without spine; leg III femur six spines, tibia 10 (four, 1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 16 (10, 1-2-2 on prolateral and retrolateral; six, 2-2-2 on ventral), tarsus four (two, 0-1-1 on prolateral; two, 0-1-0 on retrolateral and ventral); leg IV femur four spines, tibia 10 (four, 0-1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 17 (10, 1-2-2 on prolateral and retrolateral; seven, 3-2-2 on ventral), tarsus five (four, 0-1-1 on prolateral and retrolateral; one, 0-1 on ventral). Abdomen ovoid with scattered brownish yellow spots and chevrons on dorsal side (Figure 6A). Cribellum absent. Spinnerets brown; ALS cylindrical with horizontal apical part; and PLS almost twice as long as other spinnerets and with two segments, second segment as long as proximal one.

Male palp (Figures 6G–J, 8C, D): patellar apophysis absent; RTA modified with ITA; cymbial furrow short, about one-quarter of cymbial length; tegular sclerite weakly sclerotized and longitudinally situated on tegulum; conductor broadly saucer-like with

Table II. Spination of leg segments of *Ambanus coreana* (Paik, 1992) from Korea (♀/♂).

	Dorsal	Ventral	Prolateral	Retrolateral
First leg				
Femur	110/11	0/0	002/002	0/0
Tibia	0/0	222a/222	001/001(011)	0/0
Metatarsus	0/0	222/212(222)	101/011	0/0
Tarsus	0/0	0/0	0/0	0/0
Second leg				
Femur	21/110	0/0	001/111	0/0
Tibia	0/0	212a/122a	011/001(011)	0/0
Metatarsus	0/0	213/222	111/12(011)	011/0
Tarsus	0/0	100/0	0/0	0/0
Third leg				
Femur	123/112	0/0	11/111	0/0
Tibia	0/0	222a/222a	11/111	11/111
Metatarsus	0/0	222/222	122/122	122/122
Tarsus	0/0	011/010	02/011	01/010
Fourth leg				
Femur	112/111	0/0	0/001	0/0
Tibia	0/0	222a/222a	11/011	11/011
Metatarsus	0/10	222/322(222)	122/122	122/122
Tarsus	0/0	011/010	011/011	011/011

a, apical part; values in parentheses refer to the original description by Paik (1992).

many minute denticles, rounded distal end positioned on centre of papal organ; conductor dorsal apophysis situated on distal embolus; embolus broad and short, wound counter-clockwise, distal part with cup-shaped process attached slender embolus tip facing down.

Specimens examined

One female, 9 October 1973, Mt. Gamak, near the demilitarized zone, Gyeonggi-do, J. Namkung; one female, 4 June 1993, three females, two males, 9 December 1993, Mt. Paikwun, Gyeonggi-do, C. H. Jung; one female, five males, 23 October 2001, two females, five juveniles, 11 August 2004, Korean national arboretum of Gwangrung (KNAG), Gyeonggi-do, T. S. Kwon.

Distribution

Korea (KNAG, Mt. Paikwun, Mt. Gamak).

Discussion

The Holarctic spider subfamily Coelotinae is one of the most common taxa in the area stretching from North America to East Asia, and at least 18 species are listed within the Korean spider fauna (Kim et al. 2005; Platnick 2006). Of these, 10 species among 12 known species of the genus *Ambanus* are endemic in Korea. Many of these are poorly known or have been redescribed as new species after the first reports (Paik 1974, 1976; Kim and Jung 1993). Identification of the two species described in this paper, *A. lunatus* and *A. coreana*, was particularly confused, with both species being misidentified in previous references.

From a re-examination of the type specimen of *Alloclubionoides coreana* we concluded that this species represents the male of *Ambanus coreana* by the following characters: legs with three tarsal claws (two in Clubionidae); leg tarsi with numerous long trichobothria; patellar apophysis absent; cymbial furrow short, less than half cymbial length; PLS two-segmented, twice as long as ALS; and conductor dorsal apophysis present. These character sets correspond well to the genus *Ambanus* of the family Amaurobiidae. Kim and Jung (1993) described *Coelotes paikwunensis* from Mt. Paikwun, 42 km apart from KNAG, the type locality of *A. coreana*. After close examination of the female paratype of *C. paikwunensis*, we found exactly the same characters in the epigynum as in *A. coreana*: epigynal teeth absent; atrial hood oblique (/ \) shaped; atrial septum small, broadly obscure, originating in the posterior plate; chelicerae with two promarginal teeth; and spermathecal stalk overlapped in lower. Therefore, the description of the original *C. paikwunensis* female is reinterpreted as *A. coreana*.

We cannot properly place the holotype of *A. paikwunensis* which has the following characters: one patellar apophysis short with apex straight (absent in *Ambanus*, three in *Robusticoelotes*, sharply curved dorsally in *Spiricoelotes* and *Leptocoelotes*, strongly elongated in *Longicoelotes*); median apophysis simple (spoon-like in *Wadotes*, *Himalcoelotes*, *Asiacoelotes*, *Draconarius*, *Bifidocoelotes*, *Paracoelotes*, *Eurocoelotes*, *Coelotes*, *Urocoras*, *Tonsilla*, and *Coras*); patella about as long as tibia length (strongly elongated in *Tegecoelotes*); intermediate tibial apophysis absent (present in *Platocoelotes*); embolus long linear, slender at end; conductor broadly curved hook-like clockwise; conductor dorsal apophysis present with two branched parts; conductor ventral apophysis present;

intermediate tibial apophysis absent; cymbial furrow less than half cymbial length. This species may be transferred to another genus or new genus by the above characters.

Also, *A. coreana* differs in the spination of legs: first metatarsus with five spines, 2-1-2 on ventral (six, 2-2-2 in the original description); second tibia with one, 0-0-1 (two, 0-1-1); metatarsus with three, 1-2 (two, 0-1-1); fourth metatarsus seven, 3-2-2 (six, 2-2-2). *Ambanus lunatus* collected regularly from Mt. Yebong (1984–1986) differs in having second tibial leg with one spine, 0-0-1 on prolateral (two, 1-1 in original description). Therefore, the systematics and taxonomic characters of the genus *Ambanus* are still in need of a thorough re-examination.

Acknowledgements

The authors wish to express their sincere thanks to Mr J. Namkung and Prof. Dr B. K. Seo of Keimyung University, Daegu, Dr T. S. Kwon of the Korea Forest Research Institute, Seoul, Prof. J. P. Kim of Dongguk University, Seoul, Dr D. X. Song and Dr J. Chen of Hebei University, China, Dr Y. M. Marusik of the Russian Academy of Sciences, and Dr X. P. Wang of the University of Florida, USA for many valuable comments and providing several important papers. Special thanks are also due to Dr P. J. Hayward of the University of Wales Swansea, UK and two anonymous reviewers, who helped improve the current work. This research was supported by grant no. 03-1-05-2-010 from the Korean Institute of Environmental Science and Technology (KIEST).

References

- Greenslade P, Greenslade PJM. 1971. The use of baits and preservatives in pitfall traps. *Journal of the Australian Entomological Society* 10:253–260.
- Kim JP, Cho JH. 2002. Spider: natural enemy and resources. Daejeon: Korean Research Institute of Bioscience and Biotechnology (KRIBB). 424 p.
- Kim JP, Jung CH. 1993. A new species of the genus *Coelotes* (Araneae: Agelenidae) from Korea. *Korean Arachnology* 9:1–6.
- Kim JP, Jung JW, Park YC, Yoo JS. 2005. Check list of Korean Aranea spiders. *Korean Arachnology* 21:75–154.
- Namkung J. 2001. The spiders of Korea. Seoul: Kyo-Hak Publishing Co. 648 p.
- Namkung J. 2003. The spiders of Korea. 2nd ed, Seoul: Kyo-Hak Publishing Co. 648 p.
- Namkung J, Yoon KI. 1975. The spider fauna of Mt. Gamak, Paju-gun, Kyeonggi-do. *Korean Journal of Plant Protection* 14:37–42.
- Ono H. 1988. A revisional study of the spider family Thomisidae (Arachnida, Araneae) of Japan. Tokyo: National Science Museum. 252 p.
- Ovtchinnikov SV. 1999. On the supraspecific systematics of the subfamily Coelotinae (Araneae, Amaurobiidae) in the former USSR fauna. *Tethys Entomological Research* 1:63–80.
- Paik KY. 1974. Three new spiders of genus *Coelotes* (Araneae: Agelenidae). *Research Review of Kyungpook National University* 18:32–43.
- Paik KY. 1976. Five new spiders of genus *Coelotes* (Araneae: Agelenidae). *Educational Journal of Teachers Collection, Kyungpook University* 18:77–88.
- Paik KY. 1978. Illustrated flora and fauna of Korea. Volume 21, Araneae, Seoul: Samwha Press. 546 p.
- Paik KY. 1992. A new genus of the family Clubionidae (Arachnida, Araneae) from Korea. *Korean Arachnology* 8:7–12.
- Platnick NI. 1997. *Advances in spider taxonomy 1992–1995 with redescriptions 1940–1980*. New York: New York Entomological Society. 976 p.
- Platnick NI. 2006. The world spider catalog, version 7.0 [online]. New York: American Museum of Natural History, <http://research.amnh.org/entomology/spiders/catalog/INTRO1.html>.
- Wang XP. 2002. A generic-level revision of the spider subfamily Coelotinae (Araneae, Amaurobiidae). *Bulletin of the American Museum of Natural History* 269:1–150.