

Note on *Drassyllus shaanxiensis* of Ground Gnaphosid Spiders (Arachnida: Araneae: Gnaphosidae) in Korea

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ABSTRACT

A ground gnaphosid spider, *Drassyllus shaanxiensis* Platnick and Song, 1986 is reported for the first time in Korea. This species is described with detailed illustrations, leg spination, trichobothrium patterns, and SEM photographs of male palpal organ and female epigynum.

Key words: taxonomy, morphology, Gnaphosidae, *Drassyllus shaanxiensis*, Korea

INTRODUCTION

The spiders of family Gnaphosidae are predominantly ground-living spiders, which in day time hide in silk retreats under stones, under bark, in walls, sometimes inside rolled-up leaves in the trees. Of these, the genus *Drassyllus* spiders comprise at least 88 species including the 61 currently known New World species (Platnick and Horner, 2007; Platnick, 2008). These taxa are characterized by the presence of a preening comb on metatarsi III and IV, large and almost touching posterior median eyes, and a bifid, medially situated terminal apophysis on the male palpal organs (Platnick and Shadab, 1982; Paik, 1986; Platnick and Song, 1986).

In Korea, Paik (1986, 1992) revised five species of *Drassyllus* including three endemic species and classified into the Zelotine taxon based on the several characters of generic level. Namkung (2001, 2003) presented simple illustrations of five *Drassyllus* species [*D. biglobus* Paik, 1986; *D. sanmenensis* Platnick and Song, 1986; *D. sasakawai* Kamura, 1987; *D. truncates* Paik, 1992; *D. vinealis* (Kulczynski, 1897)], but these species cannot be reliably identified from his pictorial book.

In this paper, *D. shaanxiensis* Platnick and Song, 1986 is described with the characters of male palpal organs and female genital organs. The main goal of this paper is to provide taxonomic data for the future revisional study of the Korean spider genus *Drassyllus*.

MATERIALS AND METHODS

Materials used in this study have been collected by pitfall

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trap (plastic cups: height 6.3 cm, diameter 8 cm) set 10 m apart in two rows and filled with ethylene glycol (Greenslade and Greenslade, 1971). Specimens were preserved with 70% ethanol and were taken the measurements in millimeters unless noted. Specimens examined in this paper will be deposited in the National Institute of Biological Resources (NIBR) and the Laboratory of Biodiversity, Hanyang University (LBHU).

The descriptive terminology and spination of legs follow that of Kim and Lee (2007a, b). Abbreviations used: a, apical; AEM, anterior epigynal margin; AER, anterior eye row; ALE, anterior lateral eye; AME, anterior median eye; CD, copulatory duct; CY, cybium; d, dorsal view; EM, embolus; Eye ratio, longest eye row/carapace width $\times 100$; FE, femur; FD, fertilization duct; GO, genital opening; MA, median apophysis; MP, midpiece; p, prolateral view; PA, patellar; PER, posterior eye row; PLE, posterior lateral eye; PME, posterior median eye; r, retrolateral view; RTA, retrolateral tibial apophysis; SD, sperm duct; SP, spermatheca; ST, subtegulum; STR, subtegular ridge; TA, terminal apophysis; TI, tibia.

SYSTEMATIC ACCOUNTS

Order Araneae Clerck, 1757

Family Gnaphosidae Pocock, 1898

Genus *Drassyllus* Chamberin, 1922

¹**Drassyllus shaanxiensis* Platnick & Song, 1986
(Figs. 1-3)

Drassyllus shaanxiensis Platnick and Song, 1986, p. 17, figs. 69-70 (description of female); Hu and Wu, 1989, p. 121, fig. 15 (description of male); Kamura, 1990, p. 34, figs. 3-6; Song et al., 1999, p. 448, fig. 260F-G; Song et

al., 2004, p. 85, fig. 47A-D.

Zelotes shaanxiensis: Chikuni, 1989, p. 121, fig. 15 (description of male).

Materials examined. Haman, Gyeongsangnam-do, 1 ♂ (NIBR), 5 Jun. 2001 (T.S. Kwon); Yeongwol, Gangwon-do, 1 ♀ (NIBR), 25 Apr. 2002 (B.W. Kim); Jilmae swamp (Mt. Odaesan), Gangwon-do, 1 ♂ 2 ♀ (LBHU), 23 Jul. 2005 (B.W. Kim).

Description. Measurement (mm). Male/Female: Habitus length 4.4/6.8; carapace length 1.8/2.4, carapace width 1.5/1.8, carapace height 0.5/0.8; clypeal height 0.1/0.1; cheliceral length 0.6/0.8, cheliceral width 0.3/0.5, cheliceral fang length 0.4/0.4; endite length 0.5/0.6, endite width 0.3/0.4; labium length 0.3/0.4, labium width 0.3/0.4; sternum length 1.1/1.5, sternum width 1.0/1.2; AER 0.39/0.46, PER 0.46/0.51, AME 0.09/0.09, ALE 0.10/0.12, PME 0.11/0.13, PLE 0.09/0.11. Eye formula PME > ALE > PLE = AME/PME > ALE > PLE > AME. Palp 3.3/1.5 (1.2/0.5, 0.5/0.3, 0.3/0.3, 1.3/0.4). First leg 5.1/4.0 (1.4/1.1, 0.8/0.7, 1.1/0.8, 1.0/0.8, 0.8/0.6), second leg 4.2/3.5 (1.2/0.9, 0.7/0.6, 0.8/0.7, 0.8/0.7, 0.7/0.6), third leg 3.8/3.1 (1.3/0.9, 0.4/0.4, 0.7/0.6, 0.8/0.7, 0.6/0.5), fourth leg 5.9/4.7 (1.5/1.2, 0.9/0.7, 1.2/1.0, 1.5/1.2, 0.8/0.6). Leg formula IV I II III/IV I II III. Abdomen length 2.2/4.0, abdomen width 1.2/1.9, abdomen height 1.3/1.8.

Male. Medium-sized spider smaller than female. Carapace elongate, 1.2 times as long as wide, moderately narrowed in eye area, with distinctly longitudinal fovea at the posterior part (Fig. 1A). AER straight, PER slightly procurved in frontal view; AME smaller than other eyes, separated by slightly less than their diameter, eye ratio 31 (Fig. 1B). Clypeal height the slightly long as AME diameter, without chila (Fig. 1B). Chelicerae with numerous long setae, with four small promarginal teeth and two retromarginal teeth subequal in size and lateral condyle absent (Figs. 1C, 3C). Endites reddish brown, widest at mid part; labium rectangular, rebordered and rounded distally (Fig. 1D). Sternum shield-shaped, widest at second coxae and not projected between fourth coxae (Fig. 1E). Palp (Figs. 1F-I) without claw; tibia with six trichobothria in two rows (3d-3d), femur with three spines (0-1-2). Legs (Figs. 3D-G) yellowish brown; length of leg I (patella+tibia) always longer than carapace length; trochanters not notched; tibiae with 9-12 trichobothria in four rows (3d-3d-3r on leg I, 2p-3d-2d-3r on II, 3p-4d-4d-1r on III, 3p-4d-3d-2r on IV), metatarsi four to six in one row (four on leg I and II, six on III, five on IV), tarsi six in two rows (3d-3d); tarsal organ situated close to distal end of tarsus, slightly anterior of distal trichobothrium; tarsi with two upper claws with three to four side teeth (four on leg I, III and IV, three on II). Leg spination with long hairs and metatarsus III distributed preen comb: leg I

femur with three spines (1-2 on dorsal), other segments absent; leg II femur with three spines (1-2 on dorsal), metatarsus one (1-0-0 on ventral), tibia and tarsus absent; leg III femur with six spines (1-2-1-2 on dorsal), tibia 11 (three, 1-1-1 on prolateral; two, 0-1-1 on retrolateral; six, 2-2-2a on ventral), metatarsus 10 (five, 1-2-2 on prolateral; four, 1-1-2 on retrolateral; one, 1-0 on ventral), tarsus absent; leg IV femur with four spines (1-1-2 on dorsal), tibia 12 (six, 1-1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 12 (four, 1-2-1 on prolateral; five, 1-2-2 on retrolateral; three, 2-1-0 on ventral), tarsus absent. Abdomen ovoid, with brown anterior scutum, without distinct chevrons on dorsal side (Fig. 1A). Cribellum absent.

Male palp (Figs. 1F-I, 3A, B): patellar apophysis and cymbial furrow absent; RTA largely modified, distal half of RTA straight, oblique; distal edge of tegular apophysis sharp and retrolateral edge of tegular apophysis not invaginated; conductor small, almost hidden by large upper part of tegulum; embolus slender, oriented obliquely, with needle-shaped embolus tip; median apophysis hooked, situated in the lower of tegular base.

Female. Medium-sized spider longer than male. Carapace elongate, 1.2 times longer than wide, moderately narrowed in eye area, with distinctly longitudinal fovea at posterior part (Fig. 2A). AER straight, PER slightly procurved in frontal view; AME smaller than other eyes, separated by as much as their diameter, eye ratio 28 (Fig. 2B). Clypeal height 1.3 times as long as AME diameter (Fig. 2B). Chelicerae with numerous long setae; lateral condyle absent; five promarginal teeth, second one largest and five retromarginal teeth (four in right part) subequal in size and lateral condyle absent (Fig. 2C). Endites reddish brown, widest at mid part, 1.5 times as long as wide; labium rectangular, rebordered and rounded distally (Fig. 2D). Sternum shield-shaped, widest at second coxae, 1.3 times as long as wide and not projected between 4th coxae (Fig. 2E). Palp (Figs. 3N, O) bearing one claw without side tooth; tibia with 12 trichobothria in three rows (4d-4d-4r), femur with three spines (0-1-2 on dorsal), tibia four (one, 0-0-1 on dorsal; three, 0-1-2 on prolateral), tarsus seven (one, 1-0-0 on dorsal; three, 2-1 on prolateral; one, 0-1-0 on retrolateral; two, 0-0-2 on ventral). Legs (Figs. 2A, F) yellowish brown without ring patterns; length of leg I (patella+tibia) always shorter than carapace length; trochanters not notched; tibiae with 19-23 trichobothria in four rows (2p-2d-3d-3r on leg I, 2p-2d-2d-3r on II, 5p-4d-4d-4r on III, 4p-5d-3d-4r on IV), metatarsi four to six in one row (four on leg I, five on II and IV, six on III), tarsi six in two rows (3d-3d); tarsal organ situated close to distal end of tarsus, slightly anterior of distal trichobothrium; tarsi with two claws, upper claws with four to five side teeth (five on leg I and II, four on III and IV). Leg

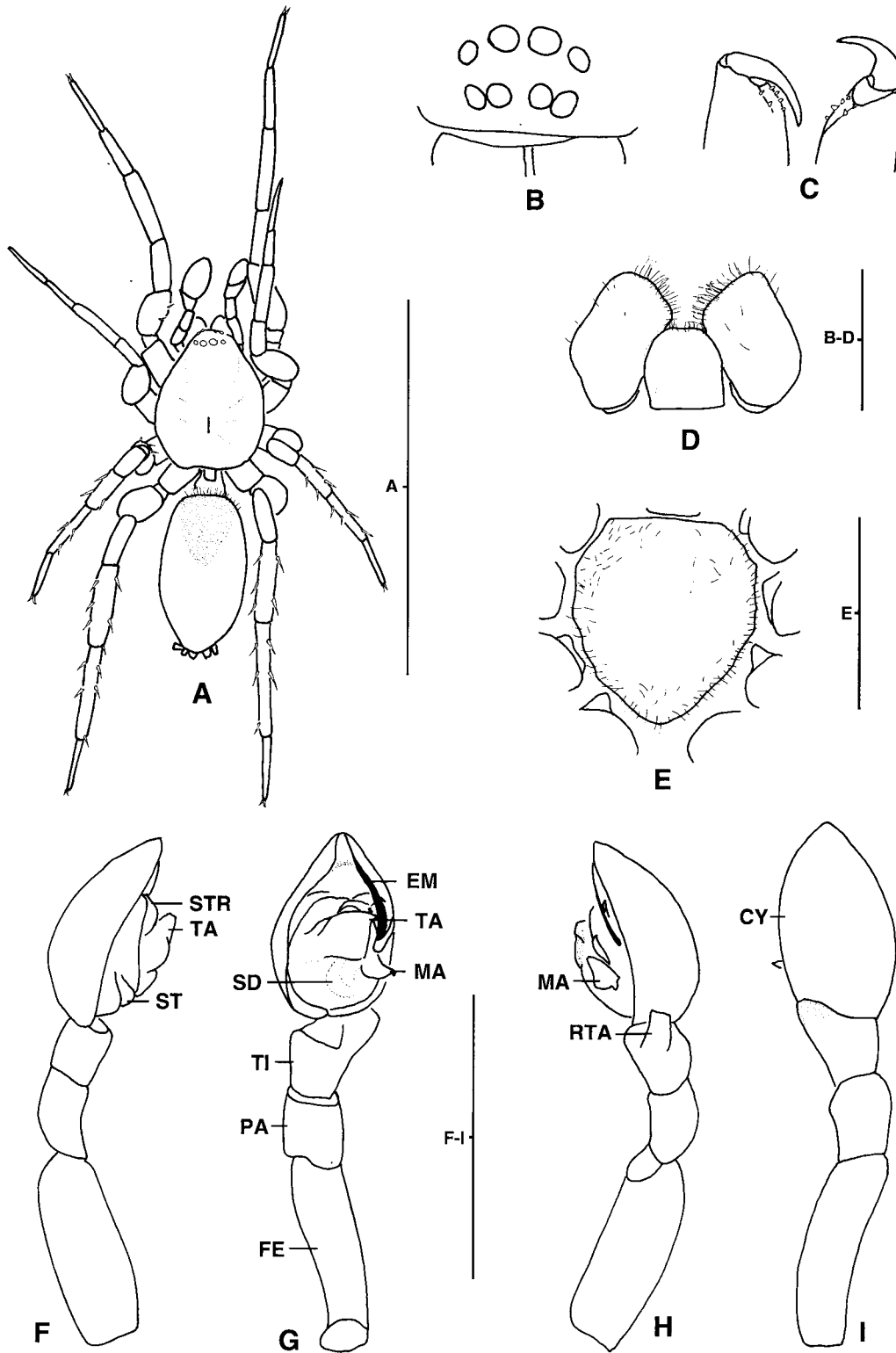


Fig. 1. *Drassyllus shaanxiensis* Platnick and Song, 1986 from Korea, male. A, Habitus, dorsal view; B, Eye area and clypeus, anterior view; C, Chelicerae, posterior view; D, Endites and labium, ventral view; E, Sternum, ventral view; F-I, Palp, left, prolateral (F), ventral (G), retrolateral (H) and dorsal views (I). Note: CY, cymbium; EM, embolus; FE, femur; MA, median apophysis; PA, patellar; RTA, retrolateral tibial apophysis; SD, sperm duct; ST, subtegulum; STR, subtegular ridge; TA, terminal apophysis; TI, tibia. Scale bars=5 mm (A-D), 1 mm (E-I).

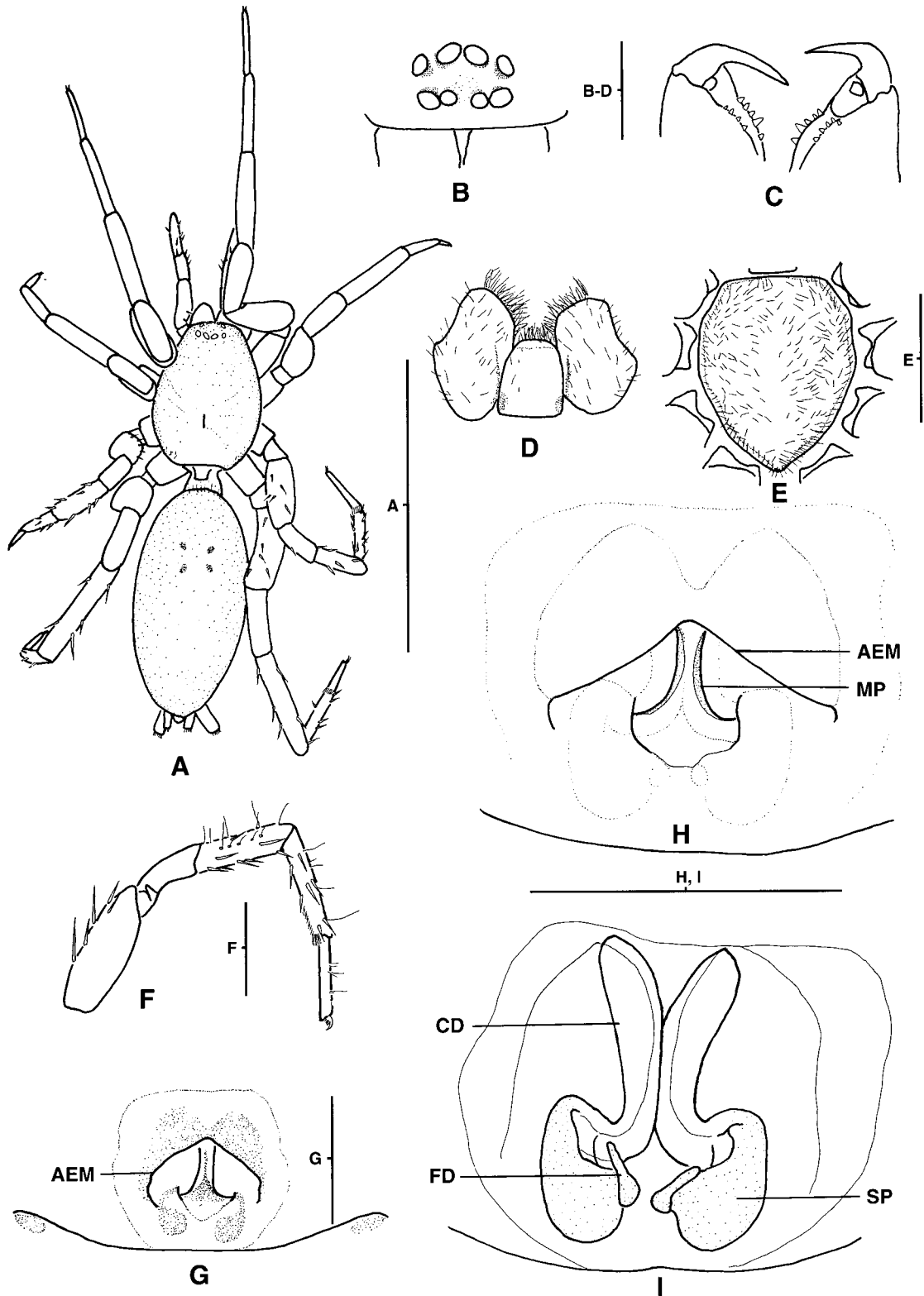


Fig. 2. *Drassyllus shaanxiensis* Platnick and Song, 1986 from Korea, female. A, Habitus, dorsal view; B, Eye area and clypeus, anterior view; C, Chelicerae, posterior view; D, Endites and labium, ventral view; E, Sternum, ventral view; F, 4th leg (left), prolatral view; G, Epigynum, ventral view; H, I, Genitalia, ventral (H) and dorsal views (I); Note: AEM, anterior epigynal margin; CD, copulatory duct; FD, fertilization duct; MP, midpiece; SP, spermatheca. Scale bars=5 mm (A-D, G-I), 1 mm (E, F).

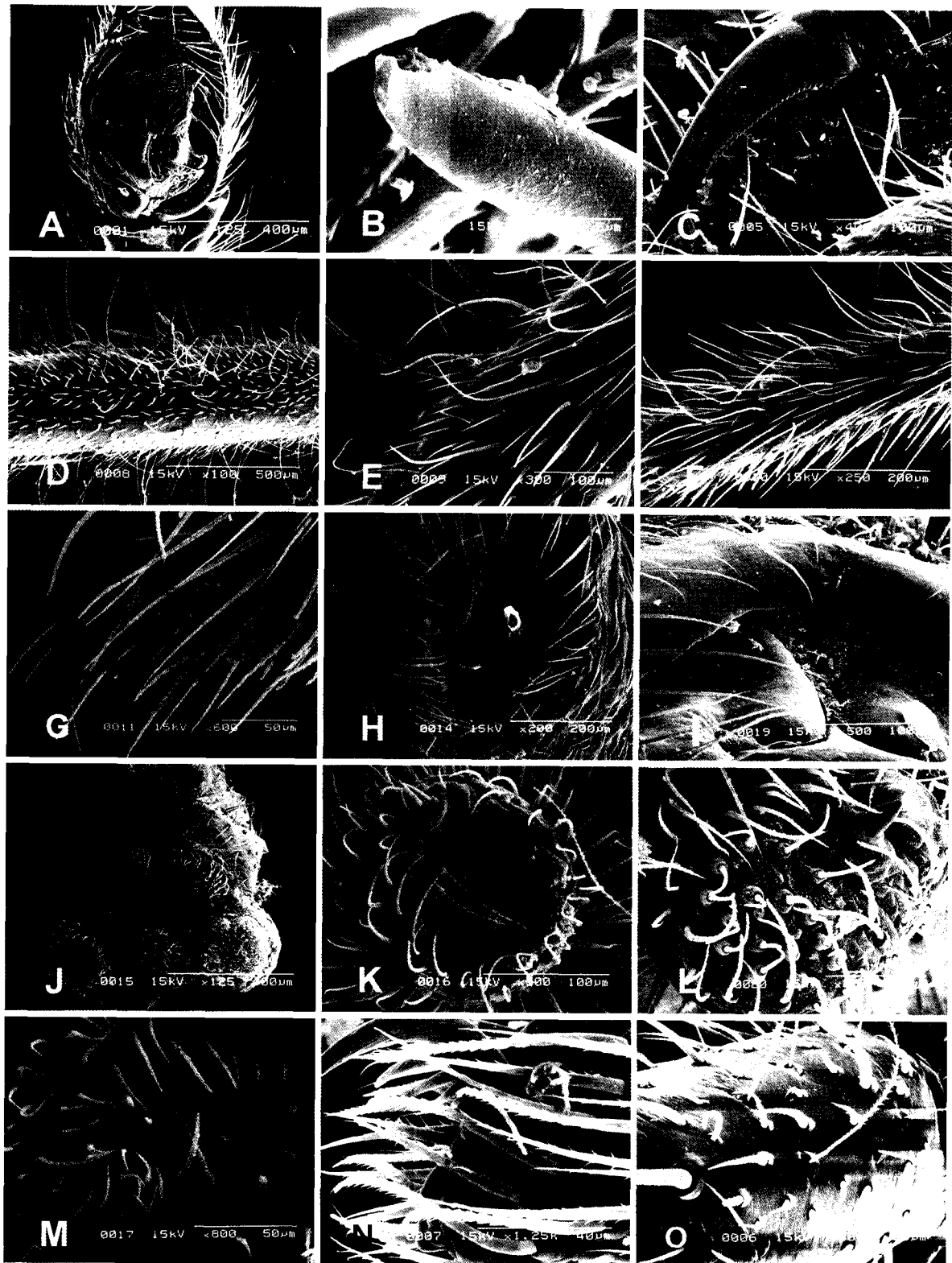


Fig. 3. SEM photographs of *Drassyllus shaanxiensis* from Korea. A, B, Male, left, palpal organ (A) and embolus tip (B); C, Chelicera, left, dorsal view; D-F, Trichobothria at the 4th leg, left, tibia (D), metatarsus (E), tarsus (F), dorsal view; G, Fourth tarsal claws; H, I, Epigynum, ventral view; J-M, Female, 3 pair of spinnerets (J), ALS (K), PMS (L) and PLS (M); N, O, female palp, tarsal claw (N) and tibia (O).

spination with long hairs and metatarsus III distributed preen comb: leg I femur with two (1-1 on dorsal), other segments absent; leg II femur with two spines (1-1 on dorsal), tibia one (0-1-0 on ventral), metatarsus two (2-0 on ventral), tarsus absent; leg III femur with six spines (1-3-2 on dorsal), tibia 12 (six, 1-1-1 on prolateral and retrolateral; six, 2-2-2a on ventral), metatarsus 11 (eight, 1-1-2 on prolateral and retrolateral; three, 2-1-0 on ventral), tarsus absent; leg IV femur with four (1-1-2 on dorsal), tibia 12 (three, 1-1-1 on prolateral; three, 1-2 on retrolateral; six, 2-2-2a on ventral), metatarsus 13 (five, 1-2-2 on prolateral; four, 1-2-1 on retrolateral; four, 2-2-0 on ventral), tarsus absent. Abdomen ovoid without distinctly dorsal scutum and chevrons on dorsal side (Fig. 2A). Spinnerets (Figs. 3J-M) composed of anterior lateral spinnerets (ALS), posterior median spinnerets (PMS) and posterior lateral spinnerets (PLS); ALS cylindrical, separated more longer than their diameter, with characteristic piriform spigots; PMS adjacent at each other, with many aciniform glands and two ampulate spigots on the mesal margin; PLS separated as long as their diameter, with many aciniform glands and four ampulate spigots. Cribellum absent.

Female epigynum (Figs. 2G-I) with expanded anterior epigynal margin (AEM); epigynal teeth absent; genital opening indistinctly hidden by AEM; midpiece recessed between protuberant paramedian lobes; AEM modified broadly, without paramedian protuberances; copulatory ducts curved linear with transparent membranes, attached with each other at the middle; spermathecae large, with indistinctive spermathecal heads and bases; fertilization ducts long cylindrical processes, arising from posterior spermathecae. *Distribution.* Korea (Mt. Odaesan, Haman, Yeongwol), China, Japan, Russia.

Remarks. This species belonging to the *insularis* taxon is similar to *D. pusillus* (C.L. Koch, 1833), *D. vinealis*, *D. excavates* (Schenkel, 1963), *D. yunnanensis* Platnick and Song, 1986 and *D. sanmenensis*, but can be distinguished by the female genital organs having a pair of median extensions on the anterior epigynal ducts and the anterior edges of the epigynal midpiece extending out to sides, slightly overlapped copulatory duct on the middle part and male palp having the tibia without stiff setae dorsally, a sharp protrusion extending from the prolateral side of the terminal apophysis and sperm duct on the base of tegulum.

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