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A PRELIMINARY STUDY OF ERIGONINE SPIDERS (LINYPHIIDAE: ERIGONINAE) FROM VIETNAM

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***ABSTRACT.* –** Nine erigonine spiders from Vietnam are described after examing the collections studied by Simon and additional specimens collected in 2000. *Erigone orientalis* Simon, 1909, and *E. tonkina* Simon, 1909 are junior synonyms of *Hylyphantes graminicola* (Sundevall, 1830); *Trematocephalus acanthochirus* Simon, 1909, is a junior synonym of *Ummeliata insecticeps* (Bösenberg & Strand, 1906); *Trematocephalus bivittatus* Simon, 1909, is a junior synonym of *T. eustylis* Simon, 1909, and is transferred here to the genus *Nasoona* Locket, 1982. *Aprifrontalia quadrialata* Gao, Xing & Zhu, 1996, is a junior synonym of *Gongylidioides onoi* Tazoe, 1994. Four new species are described: *Erigone brevipes* new species, *Erigone grandidens* new species, *Gongylidiellum linguiformis* new species, and *Walckenaeria caobangensis* new species.

***KEY WORDS.* –** Araneae, Linyphiidae, Erigoninae, taxonomy, new species, Vietnam.

INTRODUCTION

Erigonine spiders are very diverse in the temperate regions of the northern hemisphere, but only nine species were reported from Vietnam before, they were *Atypena adelinae* Barrion & Litsinger, 1995, *Ummeliata insecticeps* (Bösenberg & Strand, 1906), *Hylyphantes graminicola* (Sundevall, 1830), *Paranasoona cirrifrons* Heimer, 1984, *Erigone orientalis* Simon, 1909, *E. tonkina* Simon, 1909, *Trematocephalus acanthochirus* Simon, 1909, *T. bivittatus* Simon 1909, and *T. eustylis* Simon, 1909 (Pham, 2000; Tu & Li, 2003; Heimer, 1984; Simon, 1909). Among of them, Simons's species have remained valid since its original description (Platnick, 2004), although the Vietnam collection that he studied has never been reexamined.

Recently, the authors had the chance to exam the five species described by Simon (1909) and have found that both species *Erigone orientalis* and *E. tonkina* are junior synonyms of *Hylyphantes graminicola*; the species *Trematocephalus acanthochirus* is a junior synonym of *Ummeliata insecticeps*; the species *Trematocephalus bivittatus* is a junior synonym of *T. eustylis* and is transformed here to the genus *Nasoona* Locket, 1982. Therefore, only one species described by Simon is valid. The result of the reexamination on the Vietnam collections studied by Simon is given in the present paper.

In addition to collection studied by Simon, material from Vietnam (Ha Jiang, Cao Bang, Lang Son, and Hanoi) collected by the second author in December 2000 is also studied (Li & Liang, 2002; Hou & Li, 2003; Peng & Li, 2003; Tu & Li, 2003). A total of eight species, including four new species, two new records for Vietnam, two widespread species, are found. The species *Aprifrontalia quadrialata* Gao, Xing & Zhu, 1996, is shown to be a junior synonym of *Gongylidioides onoi* Tazoe, 1994, a new record from Vietnam (types of both species are examined). Illustrations of all species except *Hylyphantes graminicola* (see Tu & Li, 2003), are provided.

MATERIALS AND METHODS

Specimens were examined and measured using an SZ11-Olympus stereomicroscope. Further details were studied under an Olympus BX40 compound microscope. All illustrations were made using a drawing tube. Male palps and female epigyna were examined and illustrated after they were dissected from the spider bodies. Vulvae of female epigyna were cleared in boiling KOH solution to dissolve non-chitinous tissues, and the embolic divisions of male palps were excised by breaking the column (the membranous connection between the suprategulum and the radix). For examination of the genital structures under a compound microscope, male palps and epigyna were immersed in 75% alcohol solution, while embolic divisions and vulvae were mounted in Hoyer's Solution.

For each species, only the name that appeared in the original description, new synonyms and new combinations are listed. Synonyms listed in Platnick's spider catalogue (Platnick,

2004) are not presented. Information about the distribution of each species in Vietnam is provided at the provincial level. Materials examined are deposited in the Institute of Zoology, Chinese Academy of Sciences in Beijing, China, excepted otherwise indicated, which include the Jilin University, Changchun, China (JLU), the Museum National d'Histoire Naturelle, Paris, France (MNHNP), and the Department of Zoology, National Science Museum, Tokyo, Japan (NSMT).

The leg measurements are given in the following sequence: Total (femur, patella + tibia, metatarsus, tarsus). All measurements are in millimeters. Terminology for the somatic morphology and genital structures of linyphiids follows Hormiga (2000, 2002). Abbreviations used as followed:

Somatic morphology: AER- anterior eye row; AL- abdomen length; ALE- anterior lateral eye; AME- anterior median eye; AME-ALE- distance between AME and ALE; AME-AME- distance between AMEs; AMEd- diameter of AME; AMEr- radius of AME; AW- abdomen width; CL- carapace length; CW- carapace width; PER- posterior eye row; PLE- posterior lateral eye; PME- posterior median eye; PMEd- diameter of PME; PMEr- radius of PME; PME-PLE- distance between PME and PLE; PME-PME- distance between PMEs; TL- total length.

Male palp: ARP- anterior radical process; DSA- distal suprategular apophysis; DTA- dorsal tibia apophysis; E- embolus; EM- embolic membrane; LC- lamella characteristica; LRP- lateral radical process; LSA- lateral suprategular apophysis; M- membrane; MSA- marginal suprategular apophysis; P- paracymbium; PA- patella apophysis; PL- proximal lobe of terminal apophysis; PRP- posterior radical process; PrTA- prodorsal tibia apophysis; PT- protegulum; R- radix; RTA- retrodorsal tibia apophysis; SPT- suprategulum; T- tegulum; TA- terminal apophysis; TP- tailpiece of radix.

Epigynum: ATP- anterior turning point; CD- copulatory duct; CO- copulatory opening; DP- dorsal plate; FD- fertilization duct; FO- fertilization opening; LP- lateral plate; MP- median plate; S- spermatheca; VP- ventral plate.

TAXONOMY

Erigone brevipes, new species
(Fig. 1)

Material examined. – Holotype - male, Gao Bao Village, Ha Jiang Province, Vietnam (017), 9 Dec.2000.

Paratypes – 6 males, 13 females, same data as holotype; 2 males, 4 females, Gao Bao Village, Ha Jiang Province, Vietnam (015), 9 Dec.2000.

Diagnosis. – This new species can be easily distinguished from other *Erigone* species by the conspicuous short and stout male palp, the small patella, the short tibia, and the large terminal apophysis (TA) of male (Fig. 1D); and by the pentagon atrium, and the triangular, curved dorsal epigynal plate of female.

Description of male. – Total length: 1.33. Carapace: 0.70 long, 0.50 wide. Abdomen: 0.73 long, 0.50 wide. Carapace (Figs. 1A, B) yellowish brown, both sexes are similar in general appearance and without any conspicuous modifications. Eyes subequal, with black surroundings; AER recurved, anterior eyes separated by AMEr; PER straight, intervals of posterior eyes longer than PMEr; ALE and PLE juxtaposed. Chelicerae with tooth on frontal face, fang groove with six promarginal and five small retromarginal teeth (Fig. 1C). Leg pale white, lengths of legs: I 1.88 (0.53+ 0.60+ 0.33+ 0.37), II 1.51 (0.43+ 0.47+ 0.33+ 0.28), III 1.29 (0.33+ 0.43+ 0.25+ 0.28), IV 1.76 (0.53+ 0.60+ 0.33+ 0.30); tibia spines: 2-2-2-1; Tm I: 0.39; Tm IV absent. Sternum grayish brown. Abdomen gray.

Male palp (Figs. 1D- F): Short and stout. Femur with two big teeth from retrolateral view. Patella shorter than tibia, with a small ventral apophysis (PA). Tibia short, widening abruptly without spindle basic portion which usually exists in other *Erigone* species, two dorsal tibia apophyses, with retrolateral one (RTA) round and extending outwards, prolateral one (PrTA) cap-shaped with sclerotic "visor" at tip (Fig. 1H). Tibia trichobothria: one prolateral, two retrolateral. Embolic division (Fig. 1G) prominently characterized by large terminal apophysis (TA) with proximal lobe (PL).

Description of female. – Total length: 1.20. Carapace: 0.58 long, 0.40 wide. Abdomen: 0.73 long, 0.57 wide. Chelicerae without frontal tooth. Lengths of legs: I 1.41 (0.40+ 0.47+ 0.27+ 0.27), II 1.23 (0.37+ 0.40+ 0.23+ 0.23), III 1.13 (0.30+ 0.37+ 0.23+ 0.23), IV 1.40 (0.43+ 0.47+ 0.27+ 0.23); tibia spines: 2-2-2-1; Tm I: 0.39; Tm IV absent. Other somatic characters as in male.

Epigynum (Fig. 1I): Ventral plate slightly chitinized with fine transversal striation, concave in posterior part and with triangular posterior tip slightly turning up. Spermatheca and copulatory ducts can be seen through transparent body wall. Atrium pentagonally shaped in dorsal view (Fig. 1J). Dorsal plate triangular and curved dorsally.

Etymology. – The specific name comes from the Latin *brevipes* (short foot) in reference to the male palp that is distinctly shorter than that of most *Erigone* species.

Distribution. – Known only from the type locality.

Erigone grandidens, new species
(Fig. 2)

Material examined. – Holotype - male, Gao Bao Village, Ha Jiang Province, Vietnam (017), 9 Dec.2000.

Paratypes – 2 females, same data as holotype; 1 male, 1 female, Viet Lann Village, Ha Jiang Province, Vietnam (022), 10 Dec.2000;

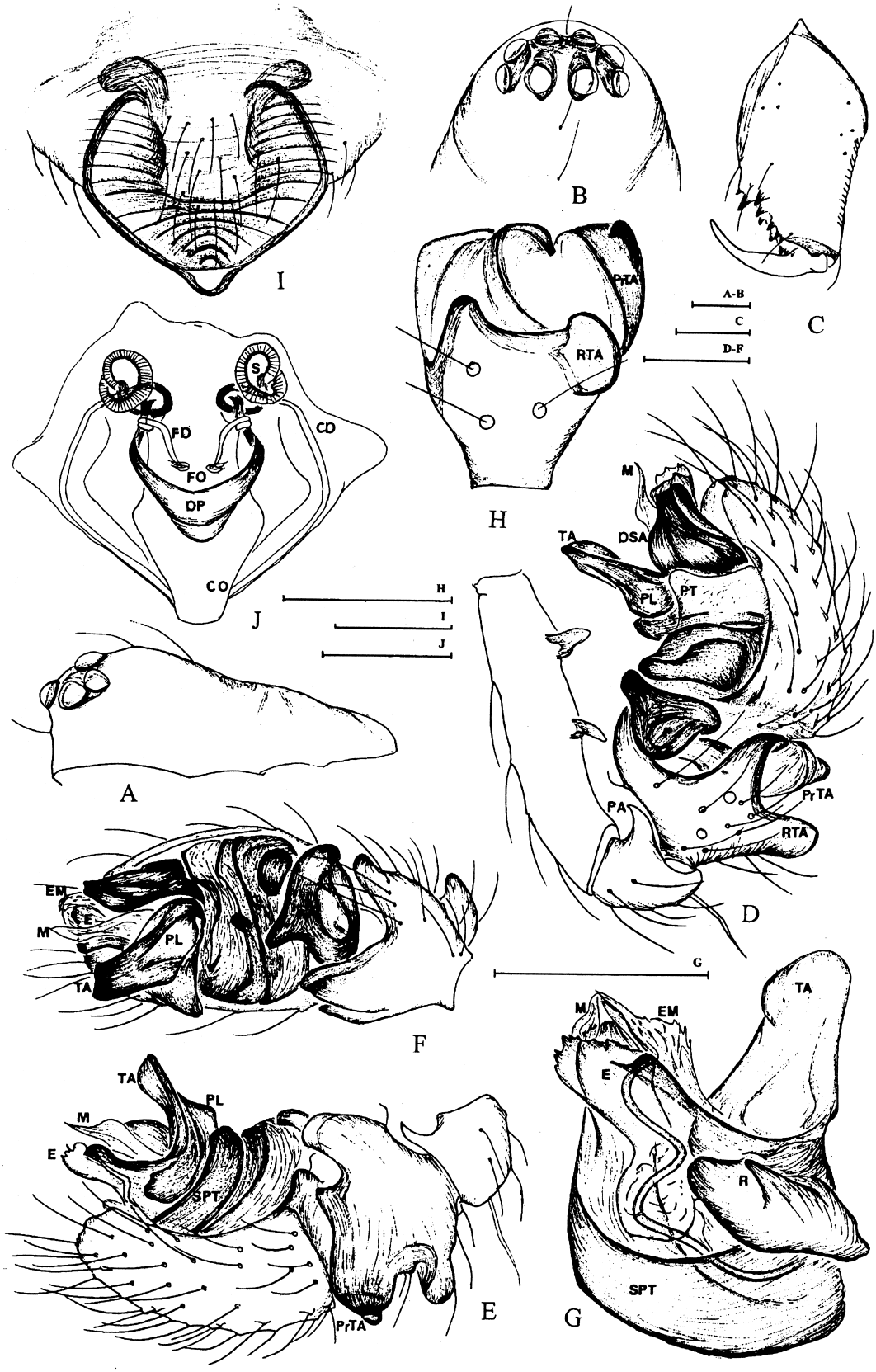

Fig. 1, *Erigone brevipes*, new species. A, carapace, lateral view; B, carapace, dorsal view; C, male left chelicera, frontal view; D, left male palp, retrolateral view; E, left male palp, prolateral view; F, left male palp, ventral view; G, embolic division, ventral view; H, palpal tibia, dorsal view; I, epigynum, ventral view; J, vulva, dorsal view. [Scale bars: 0.1mm].

1 male, 5 females, Viet Lann Village, Ha Jiang Province, Vietnam (023), 10 Dec.2000; 1 male, 2 females, Viet Lann Village, Ha Jiang Province, Vietnam (032), 10 Dec.2000; 1 male, Viet Lann Village, Ha Jiang Province, Vietnam (033), 10 Dec.2000.

Diagnosis. **–** Male of this new species can be distinguished from other similar species by the following combination characters: small patella apophysis (PA), tibia without ventral tooth, terminal apophysis (TA) bending downwards and the blunt posterior radical process (PRP) rolling upwards. Female may be recognized by the diamond shaped atrium.

Description of male. **–** Total length: 1.53. Carapace: 0.83 long, 0.60 wide. Abdomen: 0.73 long, 0.53 wide. Carapace (Fig. 2A): cephalic portion strongly elevated, along median line on posterior slope with three small teeth, each carrying hair. Clypeus straight under ocular area, and then slightly protruding. Thoracic portion with several teeth on each side and fine furrow along lateral margin. Eyes subequal, with black surroundings; AER recurved, intervals of anterior eyes equal to AMEr; PER straight, posterior eyes separated by about PMEd; ALE and PLE close together. Chelicerae (Figs. 2B) anterolaterally furnished with row of eight strongly curved teeth, fang groove with five or six promarginal and four retromarginal teeth. Lengths of legs: I 1.97 (0.60+ 0.67+ 0.40+ 0.30), II 1.84 (0.57+ 0.60+ 0.37+ 0.30), III 1.46 (0.43+ 0.50+ 0.30+ 0.23), IV 1.87 (0.60+ 0.60+ 0.40+ 0.27); tibia spines: 2-2-2-1; Tm I: 0.38; Tm IV absent. Sternum grayish brown. Abdomen gray.

Palp (Figs. 2E-G): Patella short, almost as long as tibia, patella apophysis (PA) small, triangular, shorter than diameter of patella. Tibia without ventral tooth, apical part strongly widened dorsal-ventrally, width (height) of widened part longer than length of tibia, dorsal apophysis (DTA) bifurcate in retrolateral view (Fig. 2C), but seen in dorsal view, translucent sclerite exists between two ends (Fig. 2D). Tibia trichobothria: one prolateral, two retrolateral. Embolic division (Fig. 2H): anterior radical process (ARP) long and curved, with four transversal membranous ridges outside and membranous margin anteriorly; terminal apophysis (TA) well developed and bending downwards; posterior radical process (PRP) large and blunt, rolling upwards.

Description of female. **–** Total length: 1.50. Carapace: 0.70 long, 0.47 wide. Abdomen: 0.90 long, 0.60 wide. Cephalic portion without rising. Chelicerae without anterolateral teeth, fang groove with six promarginal and five small retromarginal teeth. Lengths of legs: I 1.70 (0.50+ 0.57+ 0.33+ 0.30), II 1.60 (0.50+ 0.50+ 0.33+ 0.27), III 1.30 (0.40+ 0.37+ 0.30+ 0.27), IV 1.74 (0.57+ 0.57+ 0.33+ 0.27); tibia spines: 2-2-2-1; Tm I: 0.38; Tm IV absent. Other somatic characters as in male.

Epigynum (Fig. 2I): very simple, slightly chitinized with fine transversal striation, more concave in posterior portion with tip turning up. Vulva seen in dorsal view (Fig. 2J) shows atrium somewhat diamond shaped, anterior portion covered by dorsal plate, posterior margin of dorsal plate curved, the middle part of two copulatory ducts convergent and anterior turning points (ATP) close to each other.

Etymology. **–** The specific name comes from the Latin *grandidens* (large tooth), referring to the chelicerae that are anterolaterally furnished with a row of conspicuous teeth.

Remarks. **–** This new species belongs to Crosby & Bishop's (1928) *psychrophila* group of the genus *Erigone*. Several similar species had been recorded in Asia, include *E. prominens* Bösenberg & Strand, 1906, *E. ourania* Crosby & Bishop, 1928, *E. koshiensis* Oi, 1960 and *E. bifurca* Locket, 1982. As described and illustrated by Holm (1977) and Oi (1960) respectively, the male palp of *E. prominens* and *E. koshiensis* has a longer patella (longer than tibia) and a conspicuous longer patellar apophysis (conspicuously longer than the diameter of the patella), and the tibia has a strong ventral tooth (Fig. 3C) (absent in *E. grandidens*). Both terminal apophysis (TA) and posterior radial process (PRP) of embolic division in *E. prominens* plate-shaped and erected (Fig. 3G), whereas in the new species different as described above. The characters of embolic division in *E. koshiensis* are not clear. *E. ourania* is similar to the new species, with short patella as long as tibia and short patella apophysis almost as long as the diameter of patella, but it has a strong tibia ventral tooth and embolic division with a extremely long and slender anterior radical process (called median tooth by Crosby & Bishop) and a sharp posterior radical process (Crosby & Bishop, 1928: Figs. 63-65). Compared with the illustrations of *E. bifurca* provided by Locket (1982), it differs from the new species in the patella apophysis (longer and narrower), tibia (with a conspicuous ventral tooth), and the most importantly, the anterior radical process (ARP) (with a bifurcate apex, absent in the new species).

The epigynum and vulva of *E. grandidens* is similar to that of *E. prominens*, but differs in: 1) posterior portion of ventral plate narrow and concave in new species (wider and more convex in *E. prominens*); 2) posterior margin of dorsal plate curved (almost straight in *E. prominens*); 3) the middle part of two copulatory ducts convergent and anterior turning points close to each other (in *E. prominens* the middle part of two copulatory ducts are parallel and the anterior turning points separated). The atrium of *E. ourania* as illustrated by Wunderlich (1983) is hexagonal. Female genital structures of *E. koshiensis*, as illustrated by Oi (1960) and of *E. bifurca*, as illustrated by Locket (1982), lack details, but the vulva of *E. koshiensis* as depicted by Saito (1982) is almost same as in *E. grandidens*. While the characters of male palp of *E. koshiensis* provided by Oi (1960) show distinct differences with the new species as compared above, we believe the species described by Saito (1982) may be not *E. koshiensis*.

Distribution. **–** Known only from the type locality.

Erigone prominens Bösenberg & Strand, 1906
(Fig. 3)

Erigone prominens Bösenberg & Strand, 1906: 168, pl. 12, fig. 270.

Material examined. **–** 2 males, 12 females, Tan Linh Village, Son Tay Province, Bavi District, Vietnam (138), 23 Dec.2000; 2 females, Ha Jiang Town, Ha Jiang Province, Vietnam (002), 8 Dec.2000.

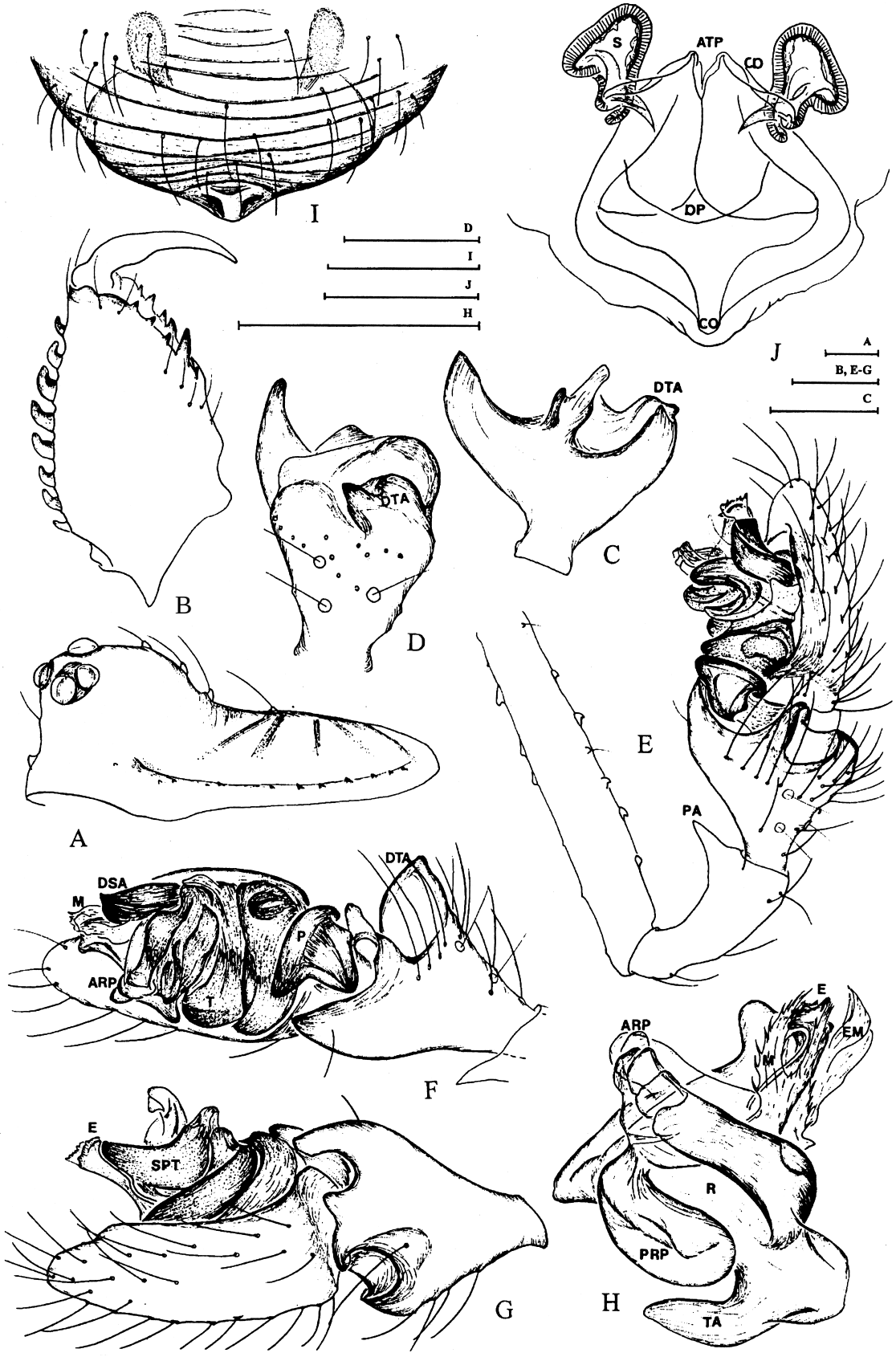

Fig. 2, *Erigone grandidens*, new species. A, carapace, lateral view; B, male left chelicera, frontal view; C, palpal tibia, retrolateral view; D, palpal tibia, dorsal view; E, left male palp, retrolateral view; F, left male palp, ventral view; G, left male palp, prolateral view; H, embolic division, ventral view; I, epigynum, ventral view; J, vulva, dorsal view. [Scale bars: 0.1mm].

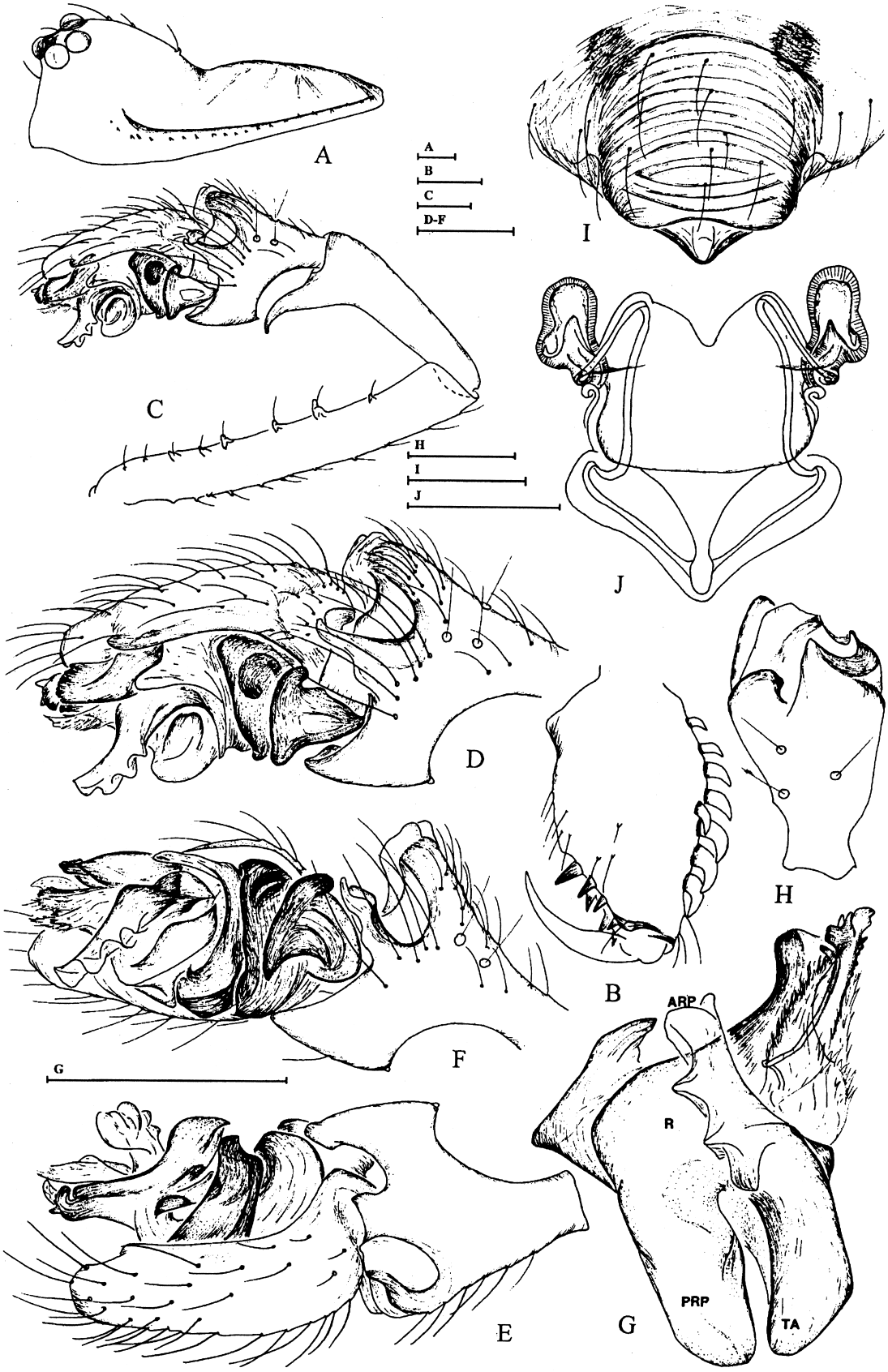

Fig. 3, *Erigone prominens* Bösenberg & Strand, 1906. A, carapace, lateral view; B, male left chelicera, frontal view; C, left male palp, retrolateral view; D, left male palp, retrolateral view; E, left male palp, prolateral view; F, left male palp, ventral view; G, embolic division, ventral view; H, palpal tibia, dorsal view; I, epigynum, ventral view; J, vulva, dorsal view. [Scale bars: 0.1mm].

***Diagnosis.* –** See remarks under *E. grandidens.*

***Description.* –** This species had been well described by Holm (1977).

***Remarks.* –** *Erigone prominens* Bösenberg & Strand, 1906, is a new record for the Vietnamese fauna.

***Distribution.* –** Cameroon to Japan, New Zealand, Vietnam (Son Tay, Ha Jiang).

Gongylidiellum linguiformis, new species
(Fig. 4)

***Material examined.* –** Holotype - female, Gao Bao Village, Ha Jiang Province, Vietnam (017), 9 Dec.2000.

***Diagnosis.* –** Female of the new species can be diagnosed by tongue like ventral plate, as well as the strongly sclerotized posterior portion of epigynum.

***Description of male.* –** Unknown.

***Description of female.* –** Total length: 1.12. Carapace: 0.47 long, 0.38 wide. Abdomen: 0.70 long, 0.50 wide. Carapace pale white with black margin, unmodified (Fig. 4A). Eyes with black surroundings, AMEs smaller, other eyes subequal; AER recurved, eyes separated by AMEr; PER straight, PME-PME longer than PMEr, PME-PLE shorter, ALE and PLE juxtaposed. Chelicerae brown, stridulatory ridges absent on ectal side, fang groove with five promarginal and four retromarginal teeth (Fig. 4B). Sternum whitish gray. Abdomen dark gray, with white and black dapples. Lengths of legs: I 1.08 (0.33+ 0.33+ 0.20+ 0.22), II 0.98 (0.30+ 0.30+ 0.18+ 0.20), III 0.89 (0.27+ 0.27+ 0.17+ 0.18), IV 1.15 (0.38+ 0.40+ 0.17+ 0.20). Tibia spine: 0-0-0-0. Tm I: 0.35. Tm IV absent.

Epigynum (Fig. 4C): Ventral plate extending as tongue like projection. Posterior portion of epigynum shield-like, slightly convex and strongly sclerotized. Copulatory ducts with their openings under base of ventral plate projection, spiraling from ventral side to dorsal side (Figs. 4D-E).

***Etymology.* –** The specific name comes from the Latin *linguiformis* (tongue-shaped) in reference to the shape of ventral plate.

***Remarks.* –** The inner course of vulva shows similar pattern with that of *Gongylidiellum*. Comparison with the illustration of *Gongylidiellum murcidum* Simon, 1884 provided by Wiehle (1960: 489, Fig. 906) shows a striking resemblance to the new species, the sclerotized shield-like structure maybe the unique character of the new species.

Distribution. – Known only from the type locality.

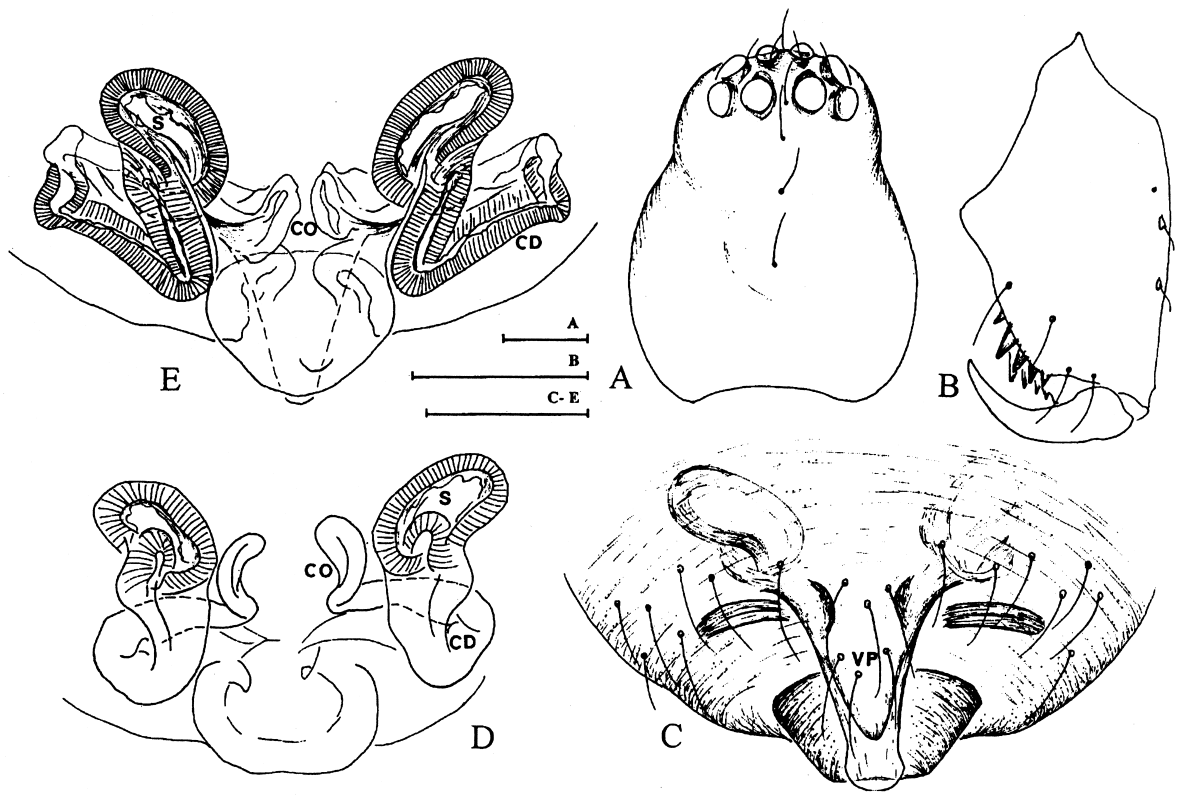

Fig. 4, *Gongylidiellum linguiformis*, new species. A, carapace, dorsal view; B, left chelicera, frontal view; C, epigynum, ventral view; D, vulva, dorsal view (before cleared in boiling KOH solution); E, vulva, dorsal view (after cleared in boiling KOH solution). [Scale bars: 0.05mm].

Gongylidioides onoi Tazoe, 1994
(Fig. 5)

Gongylidioides onoi Tazoe, 1994: 131, Figs. 1-7 (Dmf).
Aprifrontalia quadrialata Gao, Xing & Zhu, 1996: 293, Figs. 2A-E. (New synonymy)

Material examined. – 1 male, 2 females, Tan Linh Village, Son Tay Province, Bavi District, Vietnam (138), 24 Dec.2000; 2 males, 1 female (NSMT, -Ar.3176), paratypes of *Gongylidioides onoi* Tazoe, 1994, Komi, Iriomotejima Is., Okinawa, Pref., Japan, 30 Mar.1989; 2 males, 2 females (JLU), paratypes of *Aprifrontalia quadrialata* Gao, Xing & Zhu, 1996, Putuo Moutain, Zhejiang Province, China, 20-21 Aug.1992.

Diagnosis. – Males of this species can be recognized by the palpal tibia with four apophyses (Fig. 1G) and the combination characters of embolic division. Females are diagnosed by the ventral plates of epigynum, shaped like two closed doors (Fig. 5H).

Description of male. – Total length: 1.93. Carapace: 0.93 long, 0.67 wide. Abdomen: 1.00 long, 0.73 wide. Carapace (Fig. 5A) yellowish brown, cephalic portion slightly elevated behind ocular area and bearing some long hairs. Eyes with black surroundings; AME smaller, others subequal. AER recurved, anterior eyes separated by AMEr; PER straight, intervals of posterior eyes longer than PMEd; ALE and PLE juxtaposed. Chelicerae brown. Fang groove with six promarginal and five small retromarginal teeth (Fig. 5B). Leg pale white, lengths of legs: I 2.59 (0.80+ 0.83+ 0.53+ 0.43), II 2.40 (0.70+ 0.8+ 0.50+ 0.40), III 2.0 (0.57+ 0.63+ 0.47+ 0.33), IV 2.73 (0.73+ 0.90+ 0.70+ 0.40); tibia spines: 2-2-1-1; Tm I: 0.59; Tm IV absent. Sternum dark brown. Abdomen with some grayish spots dorsally.

Male palp (Figs. 5C-G): Tibia short with one prolateral and one retrolateral tibia trichobothria, four tibia apophyses present. Paracymbium U-shaped and covered with long hairs, apical part with distally situated thumb-like process. Protegulum (PT) presents, as less sclerotized extension of tegulum. Suprategulum with triangular marginal apophysis (MSA) in prolateral view and plate-shaped distal apophysis (DSA) in retrolateral view. Embolic membrane (EM) thin and translucent, with apically situated thread-like projections in retrolateral view. Embolic division (Fig. 5F): Radix (R) strongly sclerotized and U-shaped, prolateral arm longer and equipped with many scale-like teeth on outside surface, retrolateral one shorter with three free ends, the outer one pointed and stout, the other two thin and sclerotized. Embolus (E) tubiliform, curved and pointed apically.

Description of female. – Total length: 2.00. Carapace: 0.90 long, 0.60 wide. Abdomen: 1.17 long, 0.73 wide. Lengths of legs: I 2.46 (0.73+ 0.8+ 0.53+ 0.40), II 2.04 (0.67+ 0.73+ 0.47+ 0.37), III 1.97 (0.60+ 0.63+ 0.43+ 0.33), IV 2.67 (0.77+ 0.87+ 0.60+ 0.43); tibia spines: 2-2-1-1; Tm I: 0.61; Tm IV absent. Other somatic characters as in male.

Epigynum (Figs. 5H-I): Ventral plate composed of two parts, (shaped like two closed doors) covering the anterior half of shallow atrium. Copulatory ducts short, turning and opening at the anterior atrium.

Remarks. – *Gongylidioides onoi* Tazoe, 1994 is new for Vietnam fauna.

Distribution. – Japan, China, Vietnam (Son Tay).

Hylyphantes graminicola (Sundevall, 1830)

Linyphia graminicola Sundevall, 1830: 26.
Erigone orientalis Simon, 1909: 100. (New synonymy)
Erigone tonkina Simon, 1909: 101. (New synonymy)

Material examined. – 13 males, 34 females (MNHNP AR 12776), type of *Erigone orientalis* Simon, 1909, Hanoi (Vauloger); Phu-Lang-Thung, Luc-Nam et foret de Mai-Xu (Blaise); 3 males, 3females (MNHNP AR 12772), type of *Erigone tonkina* Simon, 1909, Soug-Luc-Nam (Blaise); 3 females, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 1 female, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 1 female, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 1 female, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 4 females, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 1 female, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 3 females, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 2 males, 2 females, Guang Hoa, Cao Bang Province, Vietnam, 18 Dec.2000; 3 males, 8 females, Sac Ha Village, Cao Bang Province, Vietnam, 16 Dec.2000; 3 females, Sac Ha Village, Cao Bang Province, Vietnam, 16 Dec.2000; 1 female, Sac Ha Village, Cao Bang Province, Vietnam, 17 Dec.2000; 2 males, 2 females, Sac Ha Village, Cao Bang Province, Vietnam, 17 Dec.2000; 1 male, 3 females, Sac Ha Village, Cao Bang Province, Vietnam, 17 Dec.2000; 4 males, 6 females, Guang Hoa, Cao Bang Province, Vietnam, 18 Dec.2000; 1 male, 1 female, Guang Hoa, Cao Bang Province, Vietnam, 19 Dec.2000; 1 female, Tan Linh Village, Son Tay Province, Vietnam, 24 Dec.2000; 3 females , Tan Linh Village, Son Tay Province, Bavi District, Vietnam, 23 Dec.2000; 5 males, 5 females, Tan Linh Village, Son Tay Province, Bavi District, Vietnam, 23 Dec.2000; 3 males, 7 females, Tan Linh Village, Son Tay Province, Bavi District, Vietnam, 23 Dec.2000; 1 male, Van Hoa Village, Son Tay Province, Bavi District, Vietnam, 22 Dec.2000; 1 male, Van Hoa Village, Son Tay Province, Bavi District, Vietnam, 23 Dec.2000; 1 female, Viet Lann Village, Ha Jiang Province, Vietnam (042), 10 Dec.2000; 1 female, Tan Linh Village, Son Tay Province, Vietnam (138), 24 Dec.2000; 1 female, Sac Ha Village, Cao Bang Province, Vietnam, 17 Dec.2000.

Description. – This species has been well described and illustrated recently by Hormiga (2000) and Tu & Li (2003).

Distribution. – Palearctic, Vietnam (Ha Jiang, Cao Bang, Son Tay).

Nasoona eustylis (Simon, 1909)
(Figs. 6, 7)

Trematocephalus eustylis Simon, 1909: 98, Figs. 1, 2. (New combination)
Trematocephalus bivittatus Simon, 1909: 98. (New synonymy)

Material examined. – 1 male (MNHNP AR 11924), type of *Trematocephalus eustylis* Simon, 1909, collected from Luc-Nam

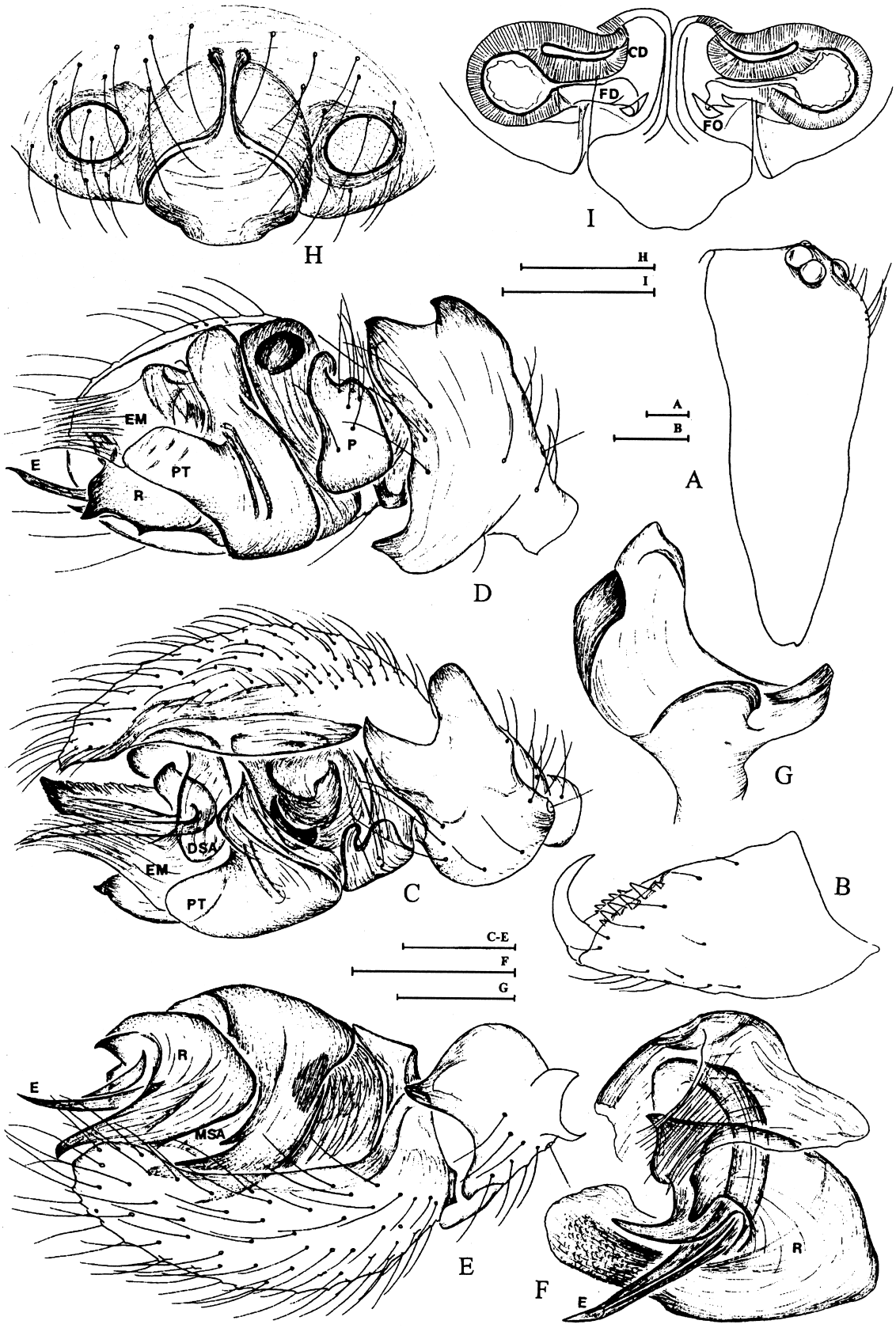

Fig. 5, *Gongylidioides onoi* Tazoe, 1994. A, carapace, lateral view; B, left male chelicera, frontal view; C, left male palp, retrolateral view; D, left male palp, ventral view; E, left male palp, prolateral view; F, embolic division, ventral view; G, palpal tibia, dorsal view; H, epigynum, ventral view; I, vulva, dorsal view. [Scale bars: 0.1mm].

(Blaise); 1 female (MNHNP AR 11928), type of *Trematocephalus bivittatus* Simon, 1909, collected from Song-Luc-Nam (Blaise); 3 males, 2 females, Viet Lann Village, Ha Jiang Province, Vietnam (042), 10 Dec.2000; 1 male, 2 females, Viet Lann Village, Ha Jiang Province, Vietnam (036), 10 Dec.2000; 2 males, Viet Lann Village, Ha Jiang Province, Vietnam (027), 10 Dec.2000. 1 female, Viet Lann Village, Ha Jiang Province, Vietnam (025), 10 Dec.2000; 3 females, Sac Ha Village, Cao Bang Province, Vietnam (072), 17 Dec.2000; 1 male, Sac Ha Village, Cao Bang Province, Vietnam (063), 17 Dec.2000; 1 male, Son Tay Province, Bavi District, Vietnam (113), 23 Dec.2000.

Diagnosis. **–** The male is easily recognized by its cephalic lobe, bearing a prominent forward-directed spine with a hooked tip at top and bending bristles behind (Fig. 6A). The female is diagnosed by the bird mouth-like epigynum in lateral view (Fig.7D).

Description of male. **–** Total length: 2.00. Carapace: 0.88 long, 0.65wide. Abdomen: 1.20 long, 0.70 wide. Carapace (Fig. 6A) brown with black margin, cephalic portion elevated behind ocular area, bearing a prominent forward-directed spine with hooked tip at top, and several bending bristles behind. Clypeus straight. Eyes subequal, with black surroundings; AER recurved, AME-AME equal to AMEd; AME-ALE shorter; PER straight, posterior eyes separated by about PMEd; ALE and PLE juxtaposed. Chelicerae brown as carapace, fang groove with six promarginal and four retromarginal teeth (Fig. 6B). Sternum darker than carapace. Abdomen dark gray, without pattern. Lengths of legs: I 3.15 (0.90+ 1.00+ 0.70+ 0.55), II 2.90 (0.80+ 0.95+ 0.65+ 0.50), III 2.50 (0.70+ 0.75+ 0.60+ 0.45), IV 3.00 (0.80+ 1.00+ 0.70+ 0.50); tibia spines: 2-2-1-1; Tm I: 0.58; Tm IV present.

Male palp (Figs. 6E-G): Tibia about twice wider than long in retrolateral view, anterioral margin between dorsal process and lateral process bulged, with row of spines (Fig. 6C). Tibia trichobothria: one prolateral, two retrolateral. Paracymbium U-shaped (Fig. 6D), in retrolateral view, with thumb-shaped proximal arm, main part rising into lobe, bearing several long hairs. Distal suprategulum apophysis (DSA) wide and truncate, with triangular lateral apophysis (LSA) at base (Figs. 6H-I). Embolic division marked by well-developed radix (Figs. 6H- I): posterior part elongating into tail-piece (TP), anterior part divided into two processes, anterior radix process (ARP) and lateral radix process (LRP), strongly sclerotized, armed with many teeth. The former convex and teeth scattered on the outside surface, the latter subrectangular in prolateral view (Fig. 6F), dorsally concave and teeth interspersed on the dorsal surface. Embolus originated from radix, long and well sclerotized. Terminal apophysis (TA) fist-shaped. Lamella characteristica transparent, with two horn-like tips.

Description of female. **–** Total length: 2.37. Carapace: 0.90 long, 0.75 wide. Abdomen: 1.60 long, 1.10 wide. Carapace brown, without any obvious modification. Chelicerae with six promarginal and five retromarginal teeth. Abdomen gray, with white pattern. Lengths of legs: I 3.11 (0.91+ 1.00+ 0.70+ 0.50), II 2.87 (0.83+ 0.90+ 0.67+ 0.47), III 2.33 (0.70+ 0.70+ 0.50+ 0.43), IV 3.50 (0.93+ 1.33+ 0.87+ 0.37); tibia spines: 2-2-1-1; Tm I: 0.53; Tm IV present. Other somatic characters as in male.

Epigynum (Figs. 7A-F): protruding with well-developed ventral plate and dorsal plate, the former opened and the latter extending to the ventral surface and can be seen in ventral and caudal views. In lateral view (Fig. 7D) epigynum looks like bird mouth.

Remarks. **–** The present species very similar to *Nasoona prominula* Locket, 1982 in the pattern of embolic division and epigynum, and accordingly it should be placed in the genus *Nasoona* Locket, 1982. Males of *N. eustylis* (Simon, 1909) new combination, differ from those of *N. prominula* in: 1). Cephalic portion of *N. prominula* (Locket, 1982: fig. 22) elevated abruptly, the lobe partly above the ocular area, bearing a prominent forward-directed spine frontally and several bending bristles at top, versus that of the former rising slowly and the lobe entirely behind the ocular area, bearing a prominent forward-directed spine at top, and bending bristles behind (Fig. 6A); 2). The prominent forward-directed spine with a hooked tip in the former (Fig. 6A), versus in *N. prominula* not; 3). Clypeus of *N. prominula* backward, but in *N. eustylis* straight; 4). The apical part of distal suprategulum of *N. prominula* figured by Locket (1982: Figs. 27) getting narrowed, versus in *N. eustylis* almost truncate (Figs. 6H-I). 5). Embolic division in retrolateral view compared with that figured by Locket (1982: Fig. 27), anterior part of radix in *N. prominula* with serrated margin, versus in *N. eustylis*, as described above, anterior part of radix strongly sclerotized and armed with many teeth on the suface; in *N. eustylis*, lamella with a biangulate apex, terminal apophysis blunt and fist-shaped, versus in *N. prominula*, lamella with a obtuse tip, terminal apophysis shovel-shaped and truncate, more prominent than lamella.

Distribution. **–** Vietnam (Ha Jiang, Cao Bang, Son Tay).

Ummeliata insecticeps (Bösenberg & Strand, 1906)

(Fig. 8)

Oedothorax insecticeps Bösenberg & Strand, 1906: 163, pl. 12 fig. 257.

Trematocephalus acanthochirus Simon, 1909: 99, Figs. 3, 4. (New synonym)

Material examined. **–** 1 male (MNHNP AR 11929), type of *Trematocephalus acanthochirus* Simon, 1909; 1 female, Gao Bao Village, Ha Jiang Province, Vietnam, 9 Dec.2000; 3 males, 7 females, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 4 females, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 1 female, Viet Lann Village, Ha Jiang Province, Vietnam, 10 Dec.2000; 5 males, 8 females, Sac Ha Village, Cao Bang Province, Vietnam, 17 Dec.2000; 2 males, 1 female, Sac Ha Village, Cao Bang Province, Vietnam, 16 Dec.2000; 4 females, Sac Ha Village, Cao Bang Province, Vietnam, 16 Dec.2000; 1 female, Sac Ha Village, Cao Bang Province, Vietnam, 17 Dec.2000; 1 female, Quang Hoa Village, Cao Bang Province, Vietnam, 18 Dec.2000; 1 female, Van Hoa Village, Son Tay Province, Vietnam, 23 Dec.2000; 2 females, Viet Lann Village, Ha Jiang Province, Vietnam (042), 10 Dec.2000; 1 female, Viet Lann Village, Ha Jiang Province, Vietnam (027), 10 Dec.2000; 1 female, Tan Linh Village, Son Tay Province, Vietnam (138), 23 Dec.2000; 2 females, Viet Lann Village, Ha Jiang Province, Vietnam (022), 10 Dec.2000.

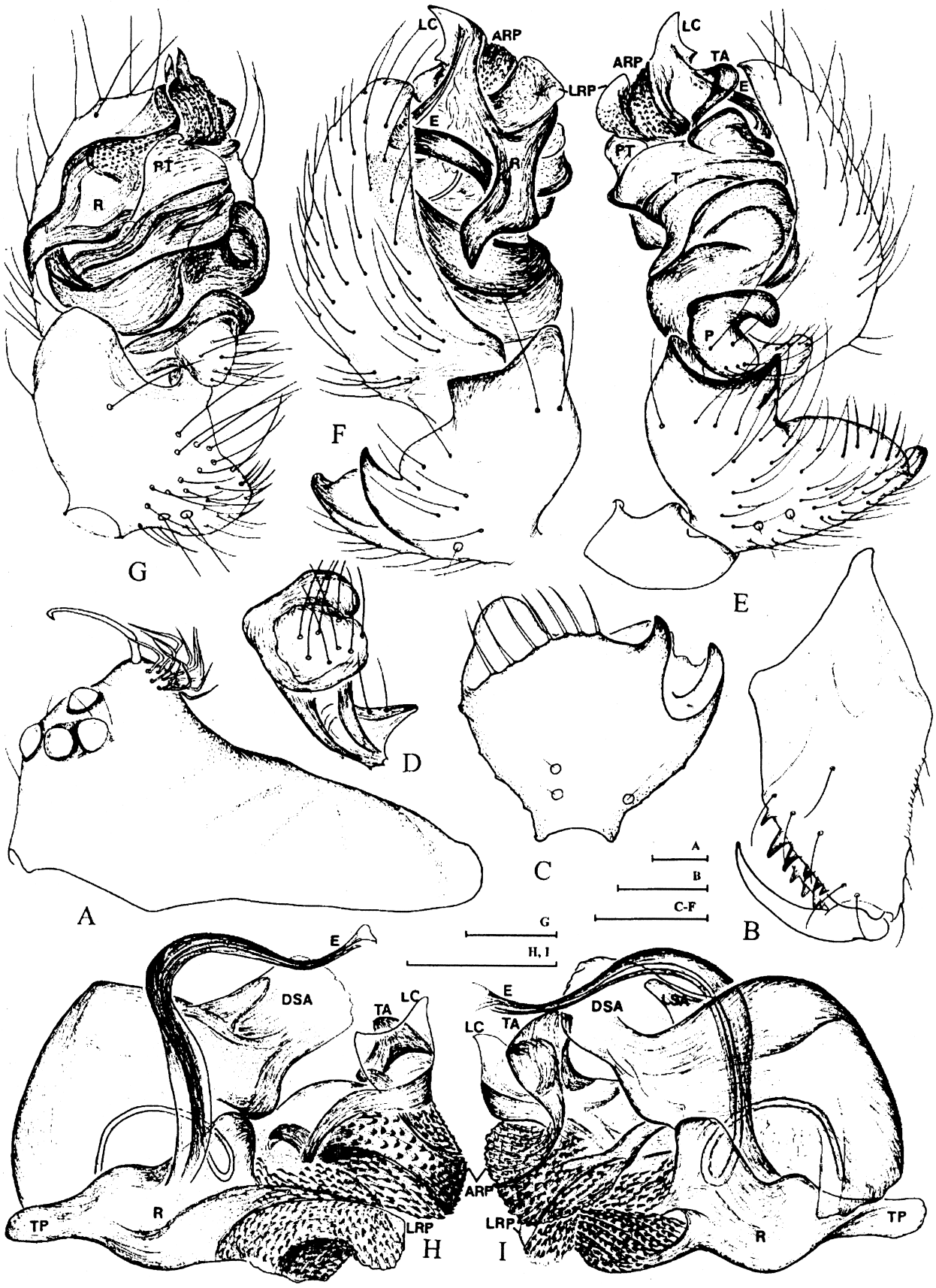

Fig. 6, *Nasoona eustylis* (Simon, 1909). A, carapace, lateral view; B, left chelicera, frontal view; C, palpal tibia, dorsal view; D, paracymbium; E, left male palp, retrolateral view; F, left male palp, prolateral view; G, left male palp, ventral view; H, embolic division, ventral view; I, embolic division, dorsal view. [Scale bars: 0.1mm].

Diagnosis. – The male of this species can be easily distinguished by its spiral embolus and the large sclerotized lamella characteristica; the female by the half round epigynum and the shape of the dorsal median plate exposed outside the ventral plate.

Description of male. – Total length: 2.43. Carapace: 1.23 long, 0.90 wide. Abdomen: 1.40 long, 0.97 wide. Carapace (Fig. 8A) brown, cephalic portion elevated into two lobes behind ocular area, the former bears many hairs, the latter smaller, bears two long bristles pointing forwards, deep groove lying between them, also with many short hairs in it. Clypeus slightly backwards. Eyes with black surroundings; AMEs smaller, others subequal. AER recurved, eyes separated by AMEd; PER straight, intervals between eyes slightly longer than PMEd; ALE and PLE juxtaposed. Chelicerae brown as carapace, fang groove with five promarginal and four retromarginal teeth, an additional tooth-like process on front face (Fig. 8B). Sternum darker than carapace. Abdomen whitish gray, without pattern. Lengths of legs: I 3.23 (0.90+ 1.10+ 0.70+ 0.53), II 3.00 (0.90+ 1.00+ 0.63+ 0.47), III 2.14 (0.67+ 0.60+ 0.50+ 0.37), IV 3.57 (0.97+ 1.33+ 0.80+ 0.47); tibia spines: 2-2-1-1; Tm I: 0.64; Tm IV present.

Male palp (Figs. 8E-G): Tibia short with two small dorsal apophyses. Tibia trichobothria: one prolateral and two retrolateral. Paracymbium U-shaped, distal part with thumb-like process apically. Protegulum (PT) sac-shaped with some small papillae at tip. In ventral and prolateral view, palp dominated by large lamella characteristica, posterior part horn-shaped, anterior part divided into two large sclerotic partly covering spiral embolus. Embolus spiraling more than one circle and then turning back abruptly.

Description of female. – Total length: 2.97. Carapace: 1.33 long, 0.93 wide. Abdomen: 2.0 long, 1.43 wide. Carapace unmodified. Chelicerae without tooth-like process on front face. Lengths of legs: I 3.24 (0.90+ 1.07+ 0.77+ 0.50), II 3.00 (0.87+ 1.00+ 0.70+ 0.43), III 2.47 (0.77+ 0.73+ 0.60+

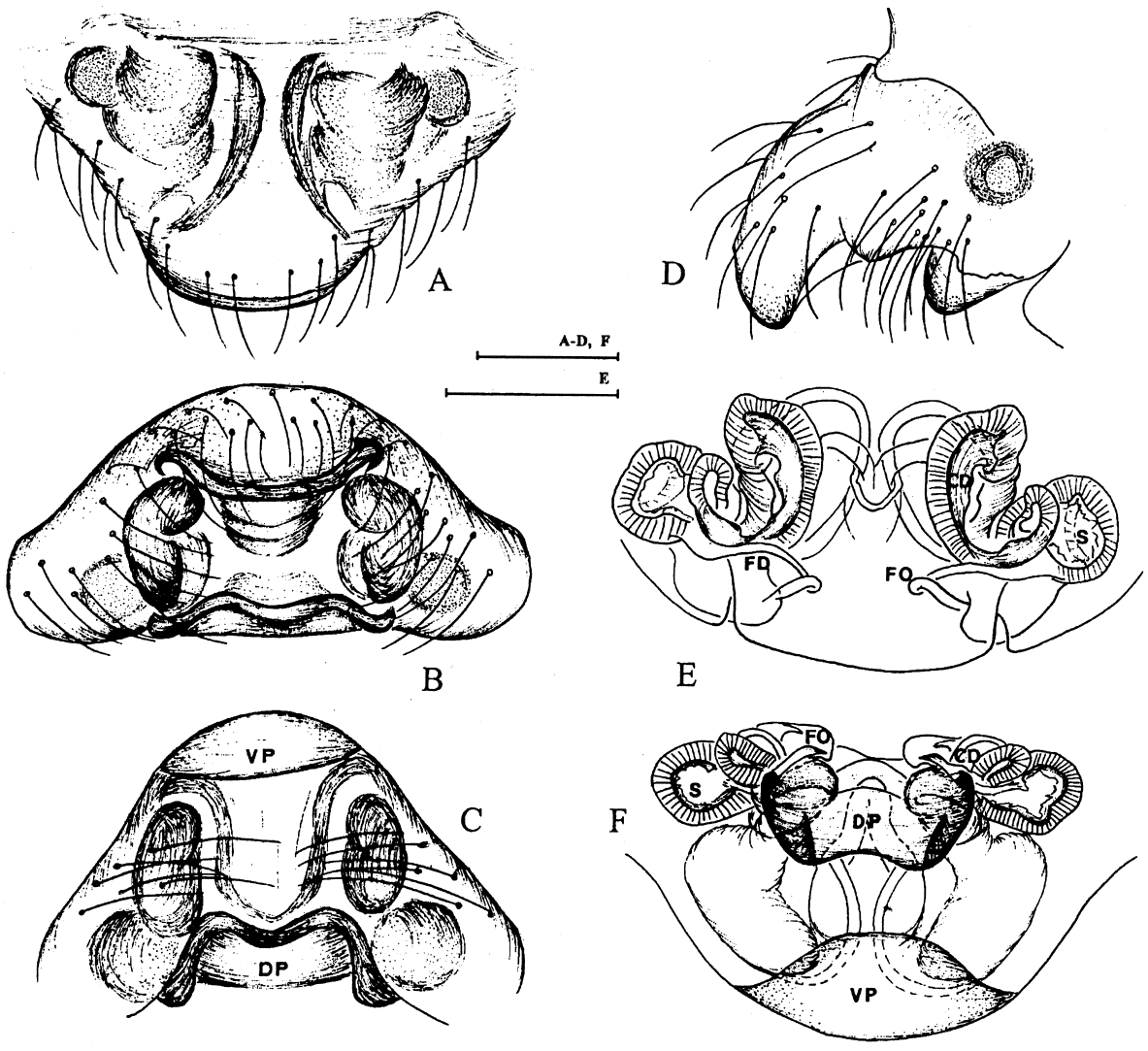

Fig. 7, *Nasoona eustyliis* (Simon, 1909). A, epigynum, frontal view; B, epigynum, ventral view; C, epigynum, caudal view; D, epigynum, lateral view; E, vulva, dorsal view; F, vulva, caudal view. [Scale bars: 0.1mm].

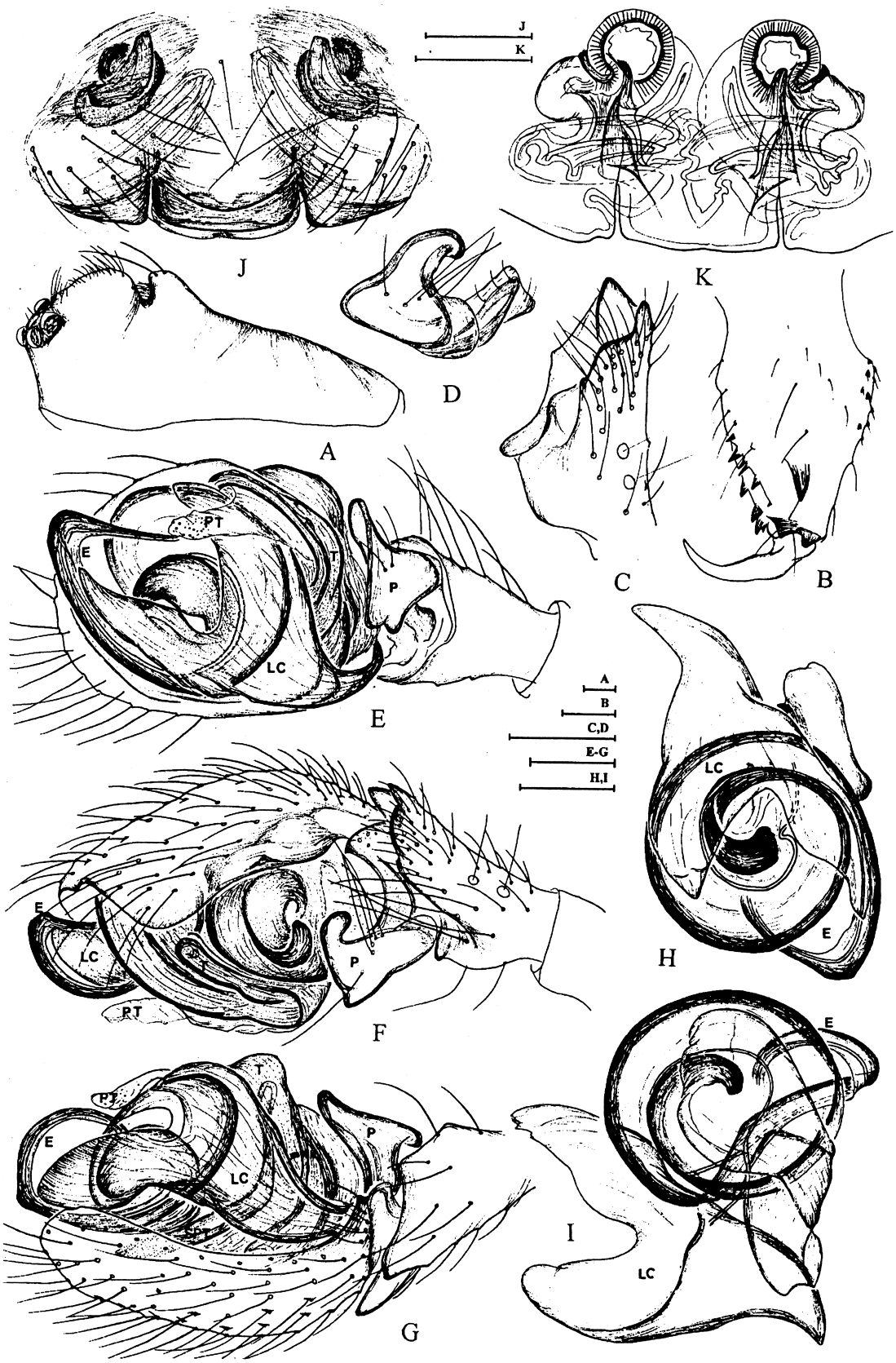

Fig. 8, *Ummeliata insecticeps* (Bösenberg & Strand, 1906). A, carapace, lateral view; B, left chelicera, frontal view; C, palpal tibia, retrolateral view; D, paracymbium, retrolateral view; E, left male palp, ventral view; F, left male palp, retrolateral view; G, left male palp, prolateral view; H, embolic division, dorsal view; I, embolic division, ventral view; J, epigynum, ventral view; K, vulva, dorsal view. [Scale bars: 0.1mm].

0.37), IV 3.33 (0.93+ 1.10+ 0.80+ 0.50); tibia spines: 2-2-1-1; Tm I: 0.69; Tm IV present. Other somatic characters as in male.

Epigynum (Figs. 8J-K): Simple and half round. Ventral plate convex, covering the shallow atrium. Dorsal median plate partly exposed with posterior margin slightly upwards. Inner course as seen in dorsal view (Fig. 8K), complex and difficult to trace.

***Distribution.* –** Russia, China, Korea, Japan and Vietnam (Ha Jiang, Cao Bang and Son Tay).

Walckenaeria caobangensis, new species
(Fig. 9)

***Material examined.* –** Holotype - female, Sac Ha Village, Cao Bang Province, Vietnam (069), 17 Dec.2000.

***Diagnosis.* –** The new species easily distinguished by its wave-shaped margin of ventral plate and S-shaped copulatory ducts.

***Description of male.* –** Unknown.

***Description of female.* –** Total length: 2.23. Carapace: 0.93 long, 0.67 wide. Abdomen: 1.40 long, 1.00 wide. Carapace (Figs. 9A, B): yellowish brown, with black margin, unmodified. Eyes with black surroundings, AME black and smaller, others subequal. AER recurved, eyes separated by AMEd; PER straight, intervals of posterior eyes shorter than PMEd; ALE and PLE juxtaposed. Chelicerae brown, fang groove with six promarginal and four retromarginal teeth (Fig. 9C). Leg pale yellow, lengths of legs: I 3.07 (0.90+ 1.00+ 0.70+ 0.47), II 2.80 (0.87+ 0.90+ 0.60+ 0.43), III 2.34 (0.67+ 0.67+ 0.60+ 0.40), IV 2.57 (0.87+ 1.03+ 0.70+ 0.47). Tibia spines: 2-2-1-1. Tm I: 0.64. Tm IV present. Sternum grayish brown. Abdomen dark gray.

Epigynum (Figs. 9C-D): Ventral plate short and slightly convex, posterior margin waviness, covering shallow atrium. Anterior margin and lateral margin of lateral plate (LP) almost forming a right angle, median plate (MP) subquadrate, slightly concave. Spermatheca at each side, copulatory ducts S-shaped and opened under ventral plate.

***Etymology.* –** The specific name is derived from the type locality.

***Remarks.* –** The pattern of genital structure shows very similar to that of *Walckenaeria unicornis* O. P. -Cambridge, 1861 as illustrated by Wiehle (1960: 143, Figs. 246, 247, illustrations of *Cornicularia unicornis*), but different in wave-shaped margin of ventral plate with two lobes (only one lobe in the latter).

***Distribution.* –** Known only from the type locality.

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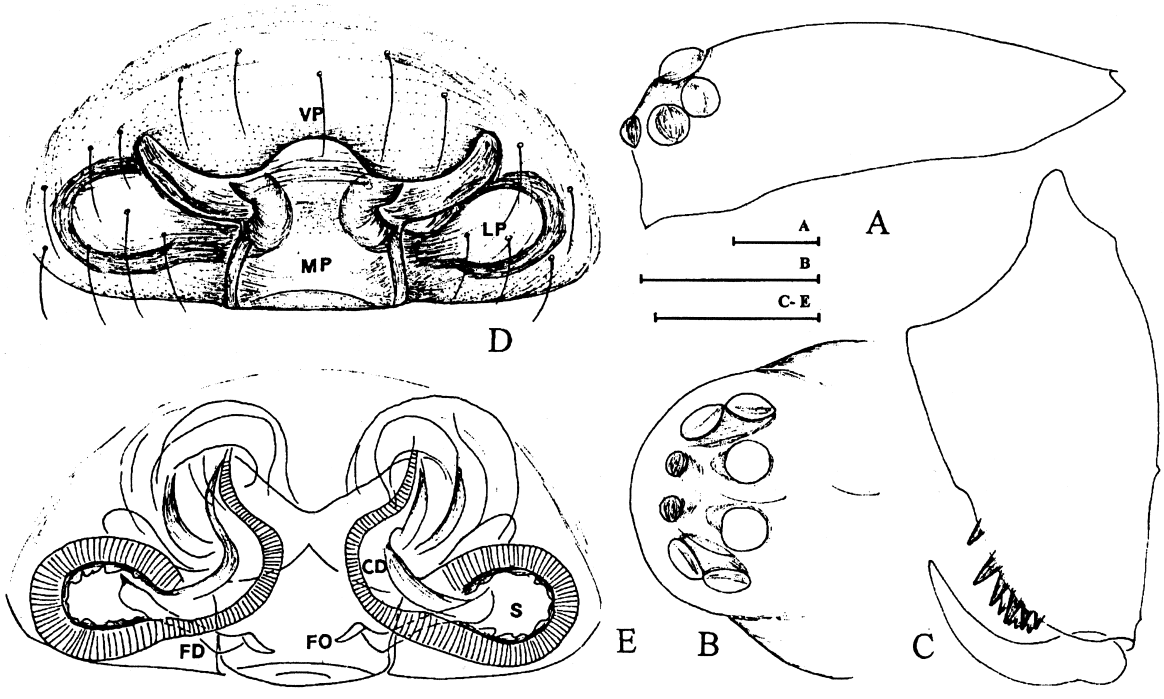

Fig. 9, *Walckenaeria caobangensis*, new species. A, carapace, lateral view; B, carapace, dorsal view; C, left chelicera, frontal view; D, epigynum, ventral view; E, vulva, dorsal view. [Scale bars: 0.05mm].

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