



One new genus and nine new species of Linyphiidae spiders from Yintiaoling Nature Reserve, Chongqing of China

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Abstract

One new genus and nine new species of Linyphiidae are described here from Yintiaoling Nature Reserve (YNR), Chongqing of China as: *Caracladus daguanshanensis* **sp. n.** (both sexes), *Centromerus alatus* **sp. n.** (male only), *Dicristatus modaoxiensis* **sp. n.** (both sexes), *Hypselistes arcus* **sp. n.** (male and female), *Ryojius flosculus* **sp. n.** (male only), *R. latus* **sp. n.** (male only), *Shaanxinus shizhuziense* **sp. n.** (both sexes), *Sinogone caesuma* **gen. & sp. n.** (both sexes), and *Walckenaeria hongqiensis* **sp. n.** (both sexes). Detailed descriptions, photographs of genital characters and somatic features are presented.

Key words: description, Erigoninae, Micronetinae, morphology, taxonomy, sheet-web, south China

Introduction

Linyphiidae is the second largest family of spiders, comprising 4807 species in 632 genera distributed worldwide, including fossil 62 species and 11 genera (WSC 2023). About 512 species in 172 genera have been reported from China (Li 2020; Irfan *et al.* 2021, 2022a, b, 2023; Zhou *et al.* 2021), including 52 species in 30 genera from Hunan Province (Yin *et al.* 2012), about 56 species in 31 genera from Hubei Province, 41 species in 18 genera from Sichuan Province (Li & Lin 2016) and about 140 species in 61 genera from Yunnan Province (Zhao & Li 2014; Irfan *et al.* 2022b). The fauna of Linyphiidae spiders from Chongqing Municipality is understudied and only 32 species in 20 genera have been recorded (Li & Lin, 2016; Irfan *et al.*, 2022a, 2023).

The Yintiaoling Nature Reserve (YNR) is situated in Wuxi County, the northeast edge of Chongqing, adjacent to Hubei Province. Two Linyphiidae species have been described from the YNR (Irfan *et al.*, 2022). While, examining the more samples collected from YNR has revealed one new genus and nine new species, which are described here.

Material and methods

All specimens were preserved in 75% ethanol. Left male palps were examined and photographed after dissection. After dissection, epigynes were cleared in trypsin enzyme solution before examination and photography. The specimens were examined and measured using Leica M205A stereomicroscope equipped with drawing tube and Leica DFC450 camera and LAS software (Ver. 4.6). Except photos of living spider, all other photos of habitus and genitalia were taken with Kuy Nice CCD mounted on an Olympus BX53 compound microscope. Compound focus images were generated using Helicon Focus 6.7.1 software. Eye sizes were measured at the maximum dorsal diameter. Leg measurements are shown as total length (femur, patella and tibia, metatarsus, tarsus). All measurements are given in millimeters.

Specimens are deposited in the School of Life Sciences, Southwest University, Chongqing (SWUC), China. The terminology used in text and figures legend follows Hormiga (2002) and Lin *et al.* (2019). In text “Fig.” and “Figs” refers to figures herein, while “fig.” and “figs” refers to figures published elsewhere. Abbreviations used in the text are as follows.

Somatic morphology: **AER**—anterior eye row; **ALE**—anterior lateral eyes; **AME**—anterior median eyes; **AME–ALE**—the distance between AME and ALE; **AME–AME**—the distance between AMEs; **PER**—posterior eye row; **PLE**—posterior lateral eyes; **PME**—posterior median eyes; **PME–PLE**—distance between PME and PLE; **PME–PME**—distance between PMEs.

Male palp: **APP**—Anterior proximal part of median membrane; **ARP**—Anterior radical process; **ARS**—Anterior radical scaly part; **ATA**—anterior part of terminal apophysis; **AX**—apex of embolus; **DTA**—dorsal tibial apophysis; **DSA**—distal suprategular apophysis; **E**—embolus; **EM**—embolic membrane; **EP**—embolus proper; **LC**—lamella characteristica; **LER**—lateral extension of radix; **MM**—median membrane; **MT**—median tooth of distal suprategular apophysis; **PC**—paracymbium; **PCA**—proximal cymbial apophysis; **PT**—protegulum; **PTA**—prolateral tibial apophysis; **R**—radix; **RA (I-II)**—radical apophyses; **RBP**—cymbial retrobasal process; **RTA**—retrolateral tibial apophysis; **SA**—suprategular apophysis; **ST**—subtegulum; **SPT**—suprategulum; **T**—tegulum; **TP**—tailpiece; **VTA**—ventral tibial apophysis.

Epigyne: **CP**—copulatory pouch; **CO**—copulatory openings; **CD**—copulatory ducts; **DP**—dorsal plate; **FD**—fertilization ducts; **LA**—lateral arm; **S**—spermatheca; **VP**—ventral plate.

Taxonomy

Family Linyphiidae Blackwall, 1859

Genus *Caracladus* Simon, 1884 (支头蛛属)

Type species. *Erigone avicula* L. Koch, 1869; gender masculine

Remark. *Caracladus* comprises five species from China, Europe, and Japan (WSC, 2023). Frick & Muff (2009) revised the genus *Caracladus* and provided the description of all the five species.

Caracladus daguanshanensis sp. n. (大官支头蛛)

Figures 1–4

Type material. Holotype male: CHINA, Chongqing, Wuxi County, YNR, Daguanshan, 31°29′43.91″N, 109°43′44.17″E, elev. 2404 m, 2.IX.2020, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-25-01). **Paratypes (6 females):** 2 females, same data as holotype (SWUC-T-LIN-25-02~03); 1 female, YNR, Guanshan Forest farm, Huajiaya, 31°31′33.83″N, 109°42′17.11″E, elev. 2192 m, 1.IX.2020, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-25-04); 3 females, YNR, Guanshan Forest farm, Huajiaya, Yezhuping, 31°29′43.30″N, 109°43′44.55″E, elev. 2411 m, 9.IV.2022, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-25-05~07).

Etymology. This epithet is derived from the type locality.

Diagnosis. The new species resembles *Caracladus montanus* Sha & Zhu, 1994 and *C. tsurusakii* Saito, 1988 in having similar ventral plate of epigyne with broad atrium and dorsal plate extending anteriorly inside the atrium of epigyne (Fig. 2A, B; Sha & Zhu 1994, fig. 6; Frick & Muff 2009, fig. 40) and male palp with similar embolic division (Fig. 1A–D; Sha & Zhu 1994, fig. 3; Frick & Muff 2009, fig. 41), but can be distinguished by the distal end of cephalic lobe straight in *C. daguanshanensis* sp. n. (Fig. 3B), vs., distally curved both in *C. montanus* (Sha & Zhu 1994, fig. 2) and *C. tsurusakii* (Frick & Muff 2009, figs 44, 45). Moreover, in the male palp of *C. daguanshanensis* sp. nov., the dorsal tibial apophysis with two arms (Fig. 1C), vs., with two apophyses, prolateral tibial apophysis and retrolateral tibial apophysis in *C. montanus* (Sha & Zhu 1994, fig. 5) and *C. tsurusakii* (Frick & Muff 2009, fig. 42); ventral surface of dorsal tibial apophysis with several teeth in *C. daguanshanensis* sp. n. (Fig. 1B), vs., teeth absent in *C. montanus* (Sha & Zhu 1994, fig. 3) and *C. tsurusakii* (Saito 1988, fig. 14). The inner margin of ventral plate of epigyne trapezoid in *C. daguanshanensis* sp. n. (Fig. 2A, B), vs., almost rectangular in *C. montanus* (Sha & Zhu 1994, fig. 6) and oval in *C. tsurusakii* (Frick & Muff 2009, fig. 40).

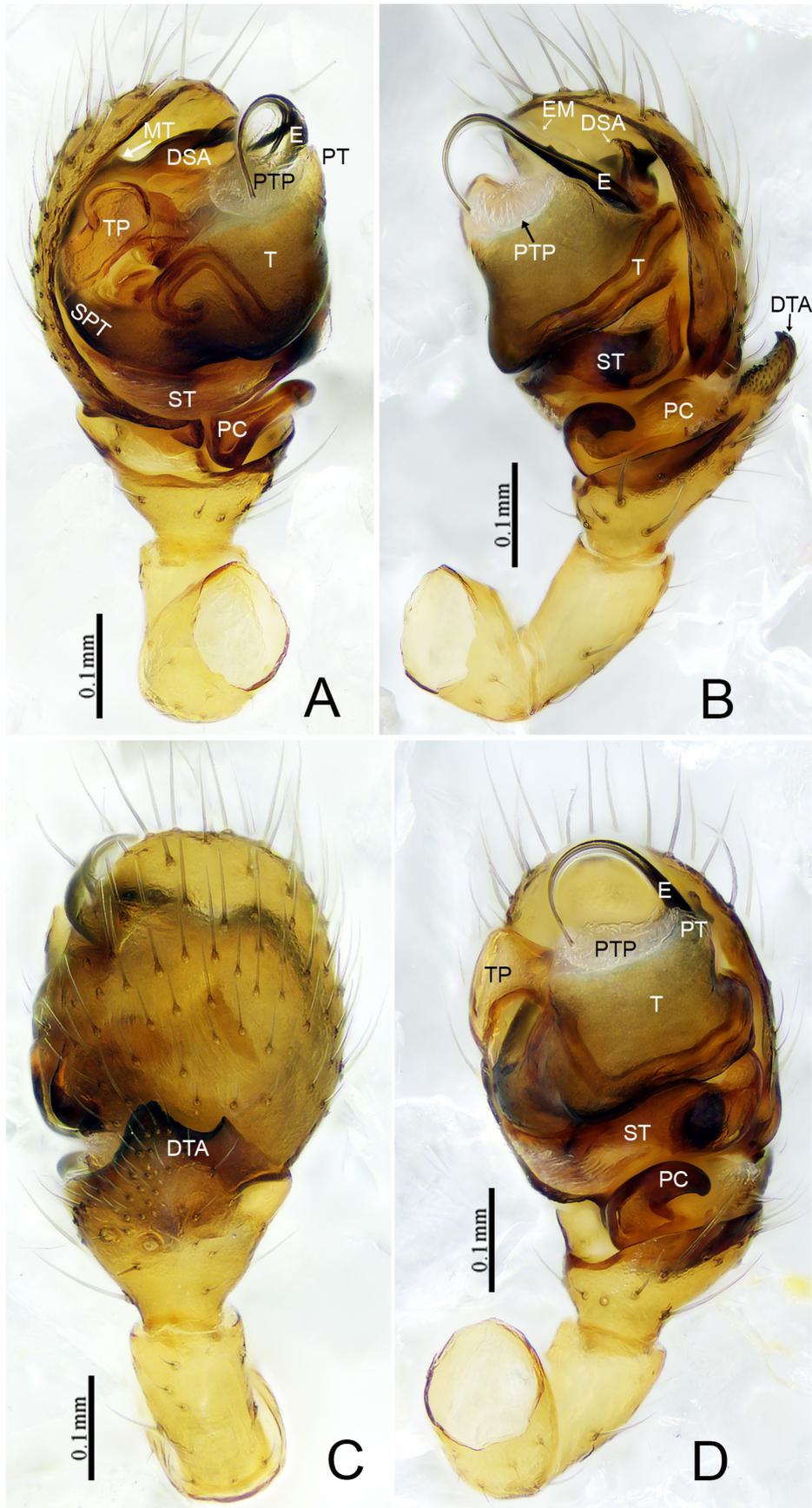


FIGURE 1. *Caracladus daguanshanensis* sp. nov., male holotype, left palp. **A** prolateral view **B** retrolateral view **C** dorsal view **D** ventral view. Arrow in prolateral view indicating the position of median tooth of distal suprategular apophysis on undissected palp.

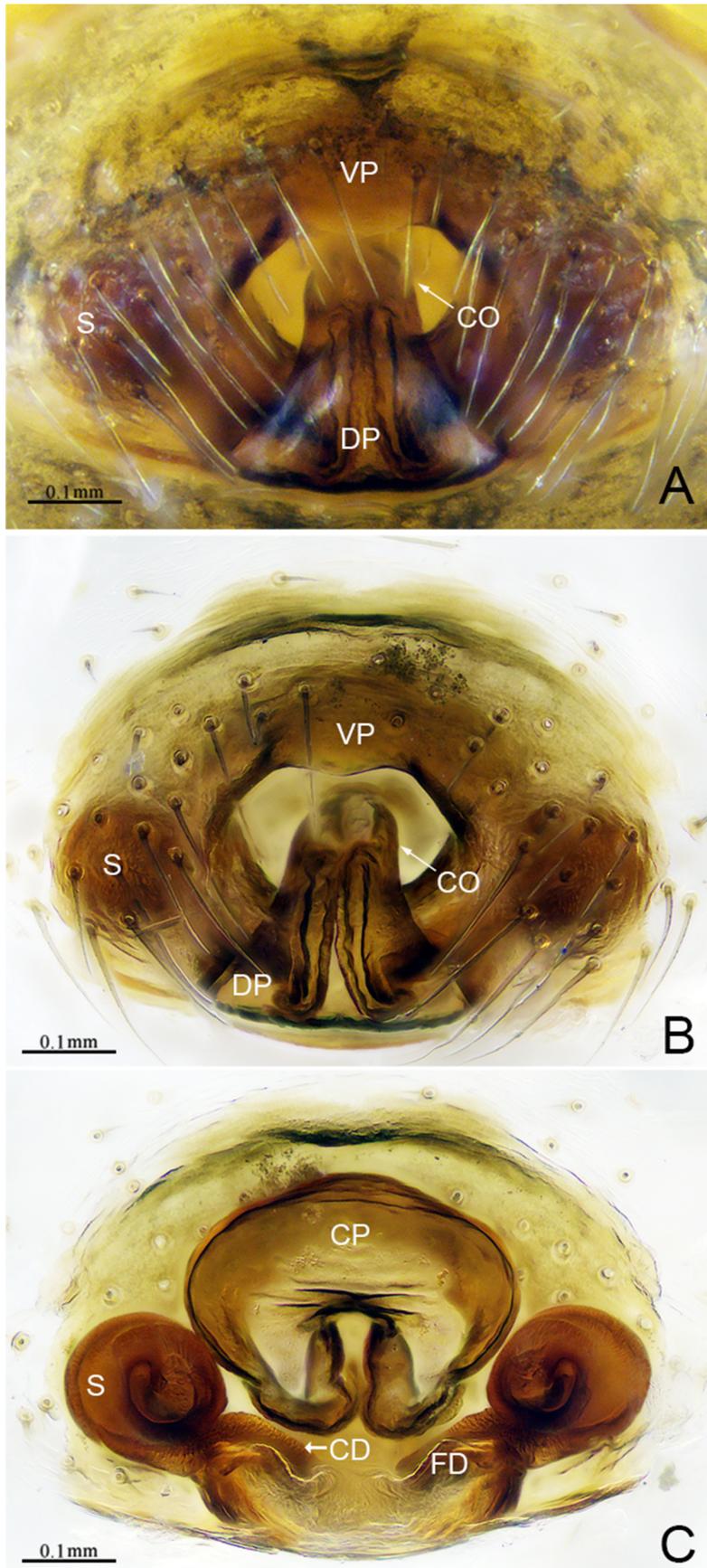


FIGURE 2. *Caracladus daguanshanensis* sp. nov., female (one of paratypes). A, B Epigyne, ventral view, C Vulva, dorsal view.

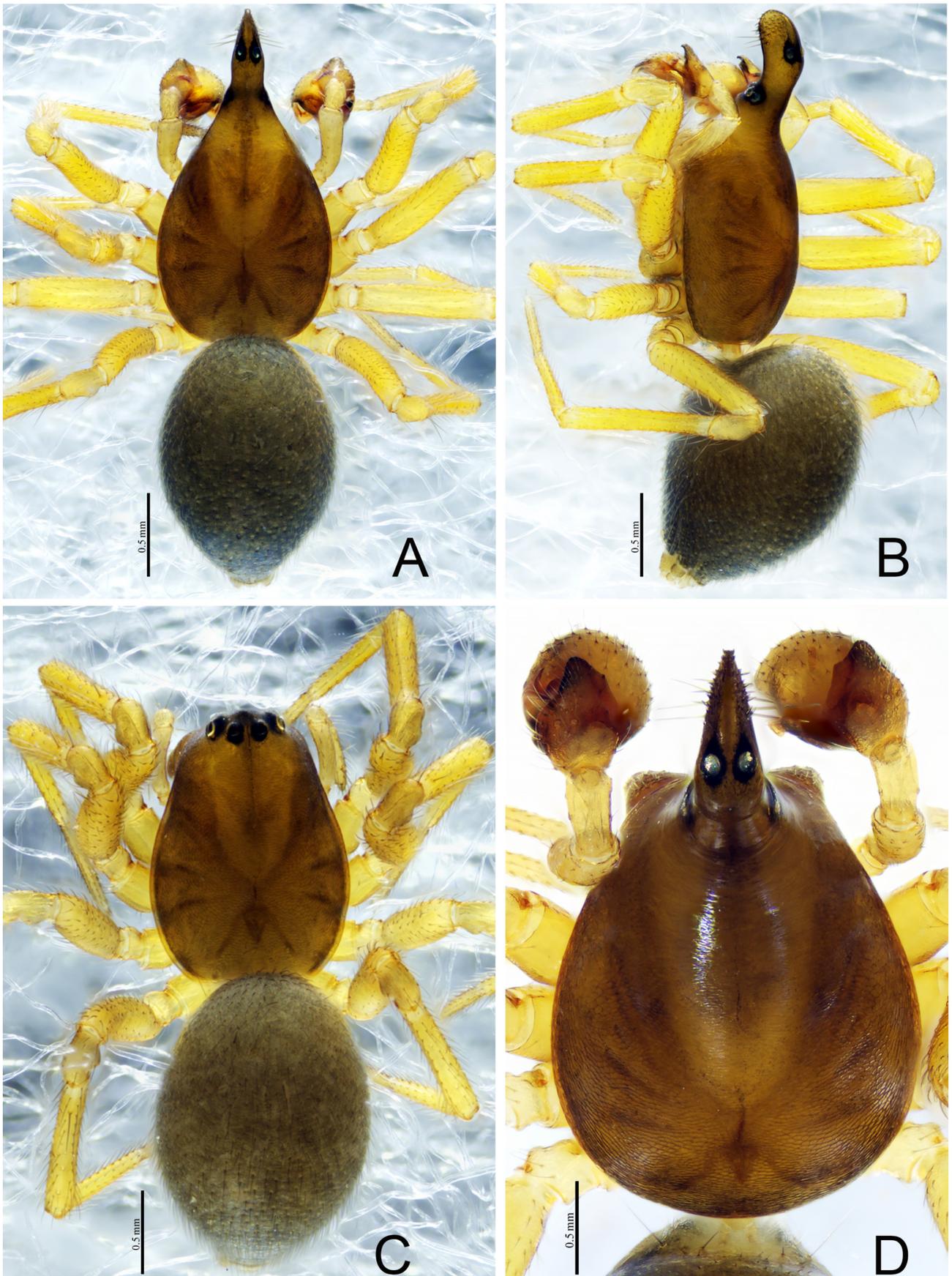


FIGURE 3. *Caracladus daguanshanensis* sp. nov., male holotype (A, B, D), female paratype (C). A, C habitus, dorsal view B habitus, lateral view D habitus, cephalothorax dorsal view.



FIGURE 4. *Caracladus daguanshanensis* sp. nov., male paratype (A, B), female paratype (C). A living habitus, lateral view B, C living habitus, dorsal view.

Description. Male (holotype, Figs 3A, B, D, 4A, B): Total length: 2.38. Carapace 1.37 long, 0.72 wide, yellowish-brown, cephalic lobe 0.49 long, projecting forward, narrowing towards tip with sparse stout setae; cephalic pits absent; thoracic region slightly elevated, fovea, cervical and radial grooves distinct. Clypeus 0.24 high, directed obliquely anteriorly. Chelicerae with 5 promarginal and 5 retromarginal teeth. AER straight, present at the base of cephalic lobe, PME present on the dorsal surface of the cephalic lobe. Eye sizes and interdistances: AME 0.04, ALE 0.05, PME 0.04, PLE 0.05, AME–AME 0.01, PME–PME 0.04, AME–ALE, 0.02, PME–PLE 0.19, ALE–ALE 0.17, PLE–PLE 0.18, ALE–PLE contiguous. Length of legs: I 2.44 (0.74, 0.82, 0.47, 0.41), II 2.19 (0.66, 0.76, 0.43, 0.34), III 1.91 (0.57, 0.63, 0.40, 0.31), IV 2.46 (0.76, 0.85, 0.48, 0.37). TmI 0.57. Tibial spine formula: 1-1-1-1. Abdomen 1.01 long, 0.76 wide, oval, grey, dorsally with two pairs of sigillae, ventral side grey.

Palp (holotype, Fig. 1A–D): Patella two times longer than wide, ventrally slightly curved; tibia with two dorsal trichobothria, dorsal tibial apophysis with two arms; paracymbium simple, J-shaped; tegulum with short and long protegular papillae on protegulum; suprategulum with median tooth, distal suprategular apophysis sclerotized, distal end curved with pointed end; embolic membrane slender, running along the embolus; radix simple, tailpiece foot-shaped in prolateral view; embolus whip-like, gradually narrowing towards tip.

Female (Figs 3C, 4C): Total length: 2.01 mm. Carapace 0.97 long, 0.69 wide, yellowish-brown, cephalic region slightly elevated, fovea, cervical and radial grooves distinct. Clypeus 0.14 high. Chelicerae with 5 promarginal and 5 retromarginal teeth. AER straight, PER procurved, slightly wider than AER. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.06, PLE 0.06, AME–AME 0.02, PME–PME 0.04, AME–ALE, 0.02, PME–PLE 0.05, ALE–ALE 0.24, PLE–PLE 0.28, ALE–PLE contiguous. Length of legs: I 2.44 (0.71, 0.80, 0.47, 0.39), II 2.18 (0.66, 0.73, 0.44, 0.35), III 1.98 (0.61, 0.65, 0.39, 0.33), IV 2.46 (0.74, 0.87, 0.50, 0.35). TmI 0.41. Tibial spine formula: 1-1-1-1. Abdomen 1.01 long, 0.76 wide, oval, grey, dorsally with two pairs of sigillae, ventral side grey.

Epigyne (Fig. 2A–C): Ventral plate wider than long, with broad trapezoid opening at the center; dorsal plate extending anteriorly inside the atrium; copulatory opening at anterior end of trapezoid dorsal plate. Vulva: Copulatory pouch almost round, posteriorly connected with copulatory ducts; copulatory ducts short, relatively sclerotized; spermathecae globular, pointing dorso-laterally, separated by distance one and half times longer than their diameter; fertilization ducts extending mesally.

Distribution. Known only from the type locality.

Genus *Centromerus* Dahl, 1886 (中指蛛属)

Type species. *Bathyphantes brevipalpus* Menge, 1866; gender masculine

Remark. *Centromerus* comprises 90 species distributed across the globe, including five species have been reported from China (WSC 2023). Out of which 16 species described with single sex (13 with females and three with male).

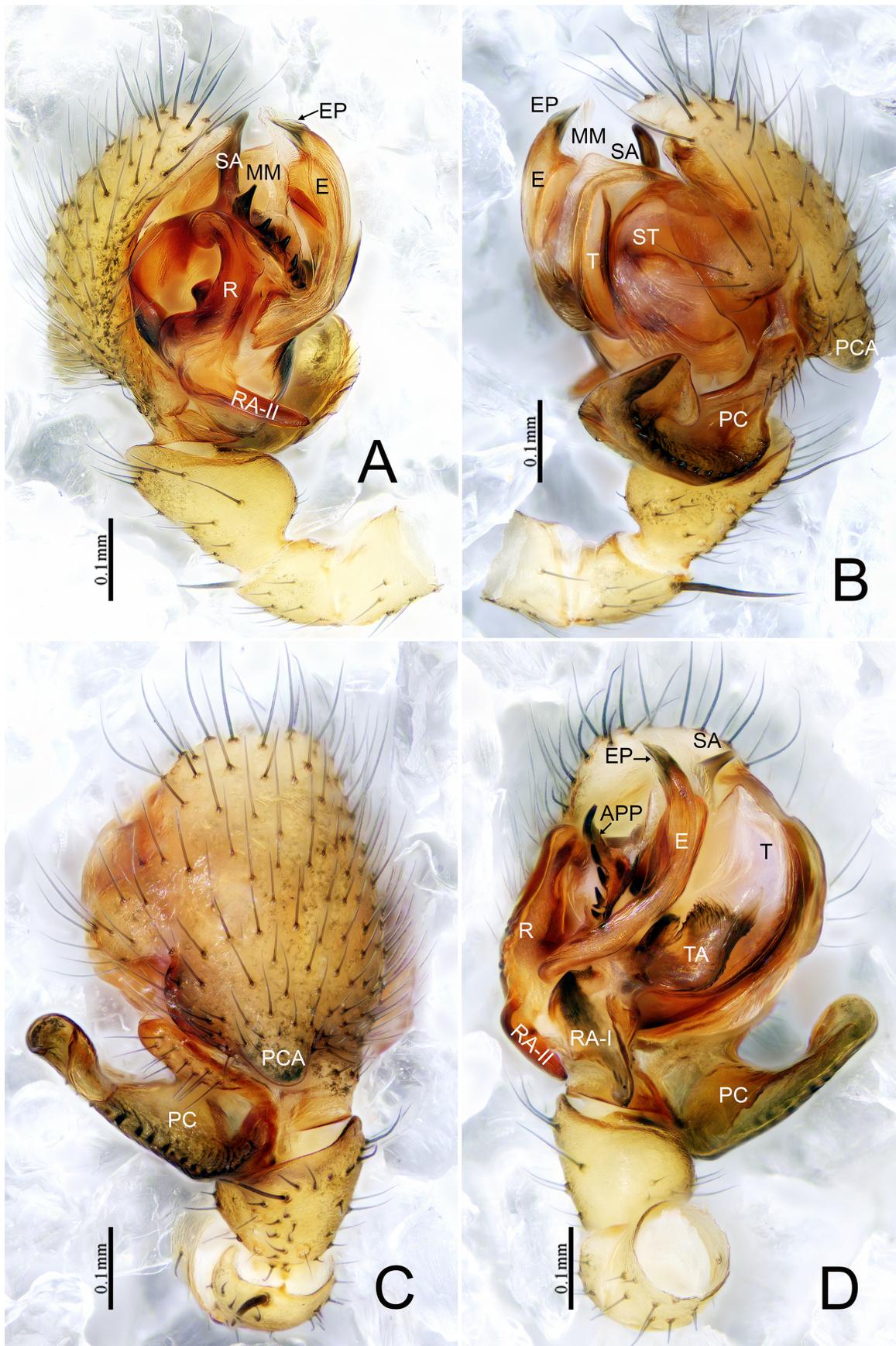


FIGURE 5. *Centromerus alatus* sp. nov., male holotype, left palp. **A** prolateral view **B** retrolateral view **C** dorsal view **D** ventral view.

Centromerus alatus sp. n. (翼中指蛛)

Figures 5, 6

Type material. Holotype male: CHINA: Chongqing, Wuxi County, YNR, Guanshan Forest farm, Modaoxi, 31°31'0.4097"N, 109°44'33.7624"E, elev. 1958 m, 22.IX.2022, L.Y. Wang *et al.* leg. (SWUC-T-LIN-26-01).

Etymology. This epithet derives from the Latin adjective “*alatus*” meaning “wing” and referring to terminal apophysis bird wing-shaped in male palp.

Diagnosis. *Centromerus alatus* sp. n. resembles *C. sylvaticus* (Blackwall, 1841) in having the similar radix with rod-like radical apophysis (Fig. 5A; Gnelitsa 2007, fig. 2c), but can be distinguished by the paracymbium with 18 teeth in *C. alatus* sp. n. (Fig. 5B, C), vs., with 9 teeth in *C. sylvaticus* (Gnelitsa 2007, fig. 2a); distal end of cymbium lacking any outgrowth in *C. alatus* sp. n. (Fig. 5B, C), vs., with small outgrowth at the apex in retrolateral view exists in *C. sylvaticus* (Gnelitsa 2007, fig. 2a); anterior proximal part of median membrane with 6 teeth in *C. alatus* sp. n. (Fig. 5A, D), vs., with 5 teeth in *C. sylvaticus* (Gnelitsa 2007, fig. 2c); terminal apophysis wing-shaped pointing towards the retrolateral margin of cymbium in *C. alatus* sp. n. (Fig. 5D), vs., column-shaped pointing towards the apex of cymbium in *C. sylvaticus* (Gnelitsa 2007, fig. 2b).

Description. Male (holotype, Fig. 6A, B): Total length: 2.91 mm. Carapace 1.48 long, 1.11 wide, brown, cephalic region slightly elevated, fovea, cervical and radial grooves distinct. Clypeus 0.23 high. Chelicerae with 3 promarginal and 5 retromarginal teeth. AER straight, PER slightly procurved. Eye sizes and interdistances: AME 0.06, ALE 0.11, PME 0.09, PLE 0.09, AME–AME 0.04, PME–PME 0.05, AME–ALE, 0.05, PME–PLE 0.0.6, ALE–ALE 0.41, PLE–PLE 0.45, ALE–PLE contiguous. Length of legs: I 4.68 (1.31, 1.59, 1.06, 0.72), II 4.33 (1.27, 1.46, 0.98, 0.62), III 3.69 (1.10, 1.24, 0.82, 0.53), IV 4.95 (1.44, 1.71, 1.14, 0.66). TmI 0.53. Tibial spine formula: 2-2-2-2. Abdomen 1.64 long, 1.05 wide, oval, black.

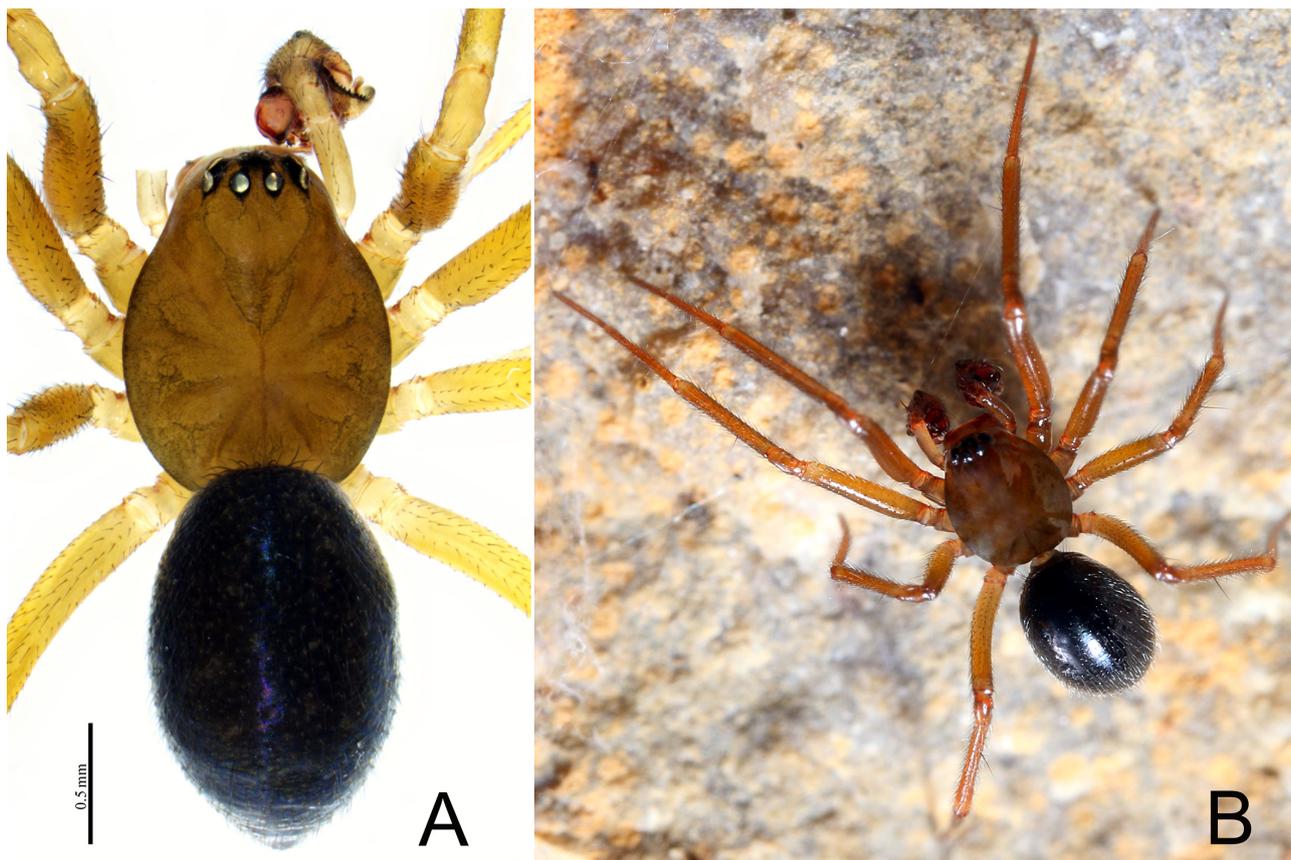


FIGURE 6. *Centromerus alatus* sp. nov., male holotype. A habitus, dorsal view B living habitus, dorsal view.

Palp (Fig. 5A–D): Patella half of the length of tibia, dorsally with thick spine; tibia cone-shaped, with two retrolateral and one dorsal trichobothria; cymbium unmodified, with small basal proximal cymbial apophysis; paracymbium U-shaped, with 18 teeth, distal tip with round lobe. Suprategular apophysis long, slightly curved with

blunt end. Basal part of radix wider than distal end, slightly curved, with two apophyses RA-I robust, with irregular margins, with about 7 small teeth, RA-II rod-like, with blunt end; median membrane as long as the embolus, anterior proximal part of median membrane with 6 strongly sclerotized teeth; terminal apophysis wing-shaped; embolus elongated with sclerotized embolus proper.

Female. Unknown.

Distribution. Known only from the type locality.

Genus *Dicristatus* Irfan, Wang & Zhang, 2023 (二叉蛛属)

Type species. *Dicristatus minutus* Irfan, Wang & Zhang, 2023

Remark. *Dicristatus* Irfan, Wang & Zhang, 2023, a monotypic genus described from Wulipo National Nature Reserve, Wushan County, Chongqing Municipality, China.

Dicristatus modaoxiensis sp. n. (磨刀溪二叉蛛)

Figures 7–10

Type material. Holotype male: CHINA: Chongqing, Wuxi County, YNR, Guanshan Forest Farm, Modaoxi, 31°31'0.4097"N, 109°44'33.7624"E, elev. 1958 m, 22.IX.2022, L.Y. Wang *et al.* leg. (SWUC-T-LIN-27-01).

Paratypes (9 males and 7 females): 8 males and 3 females, same data as holotype (SWUC-T-LIN-36-02~12); 1 male, YNR, Baiguo Forest Farm, Hongqi Management and Protection Station, 31°31'22.19"N, 109°49'36.80"E, elev. 1194 m, 10.IV.2022, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-27-13); 1 female, YNR, Guanshan Forest Farm, Tianchiba, 31°31'12.31"N, 109°47'5.39"E, elev. 1692 m, 10.IV.2022, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-27-14); 1 female, YNR, Dagan Mountain, Pianyanwu Cave, 31°29'43.32"N, 109°44'13.41"E, elev. 2292 m, 02.IX.2020, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-27-15); 1 female, YNR, Baiguo Forest Farm, Hongqi Management and Protection Station, Qinglongtan, 31°30'49.88"N, 109°49'23.60"E, elev. 1155 m, 02.IX.2020, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-27-16~17).

Etymology. This epithet derives from the type locality.

Diagnosis. *Dicristatus modaoxiensis* sp. n. resembles *D. minutus* Irfan, Wang & Zhang in having the similar morphology of male palp and epigyne (Figs 7A–D, 9A–F; Irfan *et al.* 2023, figs 9A–D, 10A–E), but can be distinguished by the lower comb-shaped process of dorsal tibial apophysis with six teeth in *D. modaoxiensis* sp. n. (Fig. 7B), vs., with seven teeth in *D. minutus* (Irfan *et al.* 2023, fig. 9B); the upper comb-shaped process of dorsal tibial apophysis with five teeth in *D. modaoxiensis* sp. n. (Fig. 7B), vs., with seven teeth in *D. minutus* (Irfan *et al.* 2023 fig. 9B); anterior radical process oval in retrolateral view in *D. modaoxiensis* sp. n. (Fig. 7B), vs., comma-shaped in *D. minutus* (Irfan *et al.* 2023, fig. 9B). In epigyne, the anterior margin of dorsal plate round in *D. modaoxiensis* sp. n. (Fig. 9E), vs., V-shaped in *D. minutus* (Irfan *et al.* 2023 fig. 10E).

Description. Male (holotype, Fig. 10A): Total length: 1.65. Carapace 0.77 long, 0.58 wide, yellow, posteriorly lateral margin with grey strip on each side, cephalic region slightly elevated; fovea, cervical and radial grooves distinct, cephalic lobe and pits absent. Clypeus 0.11 high. Chelicerae with 6 promarginal and 5 retromarginal teeth. AER straight, PER slightly recurved. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.07, PLE 0.06, AME–AME 0.02, PME–PME 0.03, AME–PME 0.05, AME–ALE, 0.03, PME–PLE 0.02, ALE–ALE 0.24, PLE–PLE 0.27, ALE–PLE 0.01. Length of legs: I 2.41 (0.69, 0.81, 0.53, 0.38), II 2.13 (0.61, 0.72, 0.45, 0.35), III 1.83 (0.52, 0.61, 0.41, 0.29), IV 2.35 (0.68, 0.82, 0.53, 0.32). TmI 0.28. Tibial spine formula: 2-2-1-1. Abdomen 1.01 long, 0.59 wide, oval, light grey, mid-dorsally with black patch, ventral side light grey.

Palp (holotype, Figs 7A–D, 8A, B): Patella short, medially grooved. Tibia with one retrolateral and one dorsal trichobothrium, retrolateral tibial apophysis absent; dorsal tibial apophysis large, longer than tibia, tongue-shaped in ventral view, retrolateral margin with a row of comb macrosetae, ventrally with a pair of comb-shaped process; lower process with six teeth and upper process with five teeth; cymbial retrobasal process with a small projection, extending retrolaterally, covering basal part of paracymbium, retrolaterally with small triangular projection; paracymbium J-shaped, distal arm tip with an indent; protegulum small; suprategulum with a sharp median tooth on distal suprategular apophysis; distal suprategular apophysis robust, distally bifurcated, completely covering the

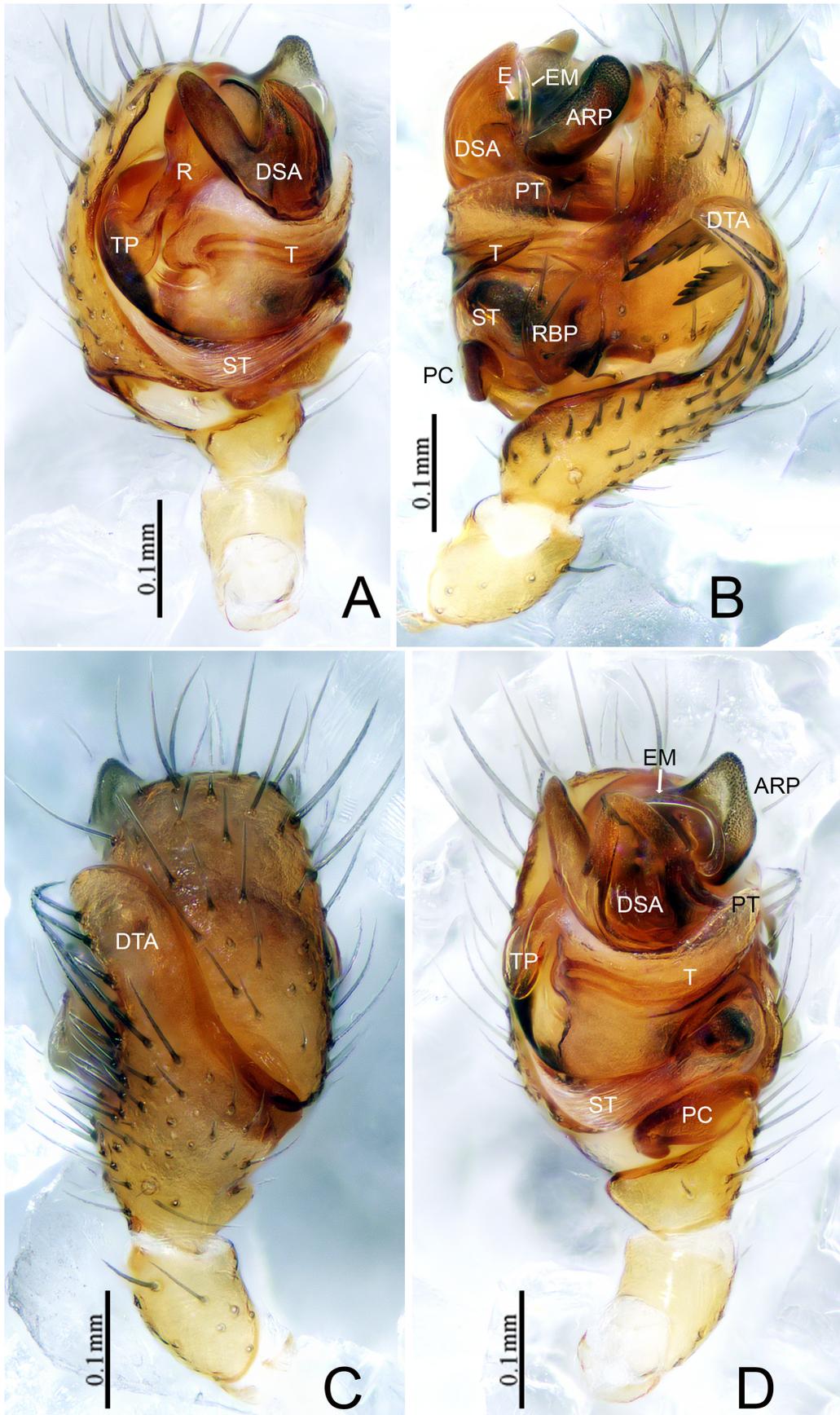


FIGURE 7. *Dicristatus modaoxiensis* sp. nov., male holotype, left palp (). A prolateral view B retrolateral view C dorsal view D ventral view.

embolus. Embolic division: tailpiece horse hoof-shaped; anterior radical process oval in retrolateral view, strongly sclerotized, outer surface serrated; embolic membrane reduced, curved with pointed end; embolus black, strongly sclerotized, minute with pointed end, hardly visible on undissected palp.

Female (Fig. 10B): Total length: 1.47. Carapace 0.69 long, 0.47 wide, yellow, posteriorly lateral margin with grey strip on each side, cephalic region slightly elevated; fovea, cervical and radial grooves distinct. Clypeus 0.10 high. Chelicerae with six promarginal and five retromarginal teeth. AER straight, PER slightly recurved. Eye sizes and interdistances: AME 0.04, ALE 0.05, PME 0.05, PLE 0.06, AME–AME 0.01, PME–PME 0.03, AME–PME 0.06, AME–ALE, 0.02, PME–PLE 0.03, ALE–ALE 0.21, PLE–PLE 0.23, ALE–PLE 0.01. Length of legs: I 2 (0.58, 0.66, 0.41, 0.35), II 1.73 (0.49, 0.57, 0.38, 0.29), III 1.53 (0.45, 0.48, 0.33, 0.27), IV 1.98 (0.58, 0.68, 0.44, 0.30). TmI 0.21. Tibial spine formula: 2-2-1-1. Abdomen 0.85 long, 0.53 wide, oval, light grey, ventral side light grey.

Epigyne (Fig. 9A–F): Epigynal plate wider than long; ventral plate extending posteriorly covering the copulatory ducts, forming broad loop, extending above the epigastric furrow; copulatory openings situated mid-ventrally in inner margin loop of copulatory ducts; dorsal plate heart-shaped, longer than wide, anterior margin round, posterior margin round, with a deep depression at center. Vulva: spermathecae round, antero-laterally positioned, pointing away from each other. Fertilization ducts antero-mesally oriented.

Distribution. Known only from the type locality.

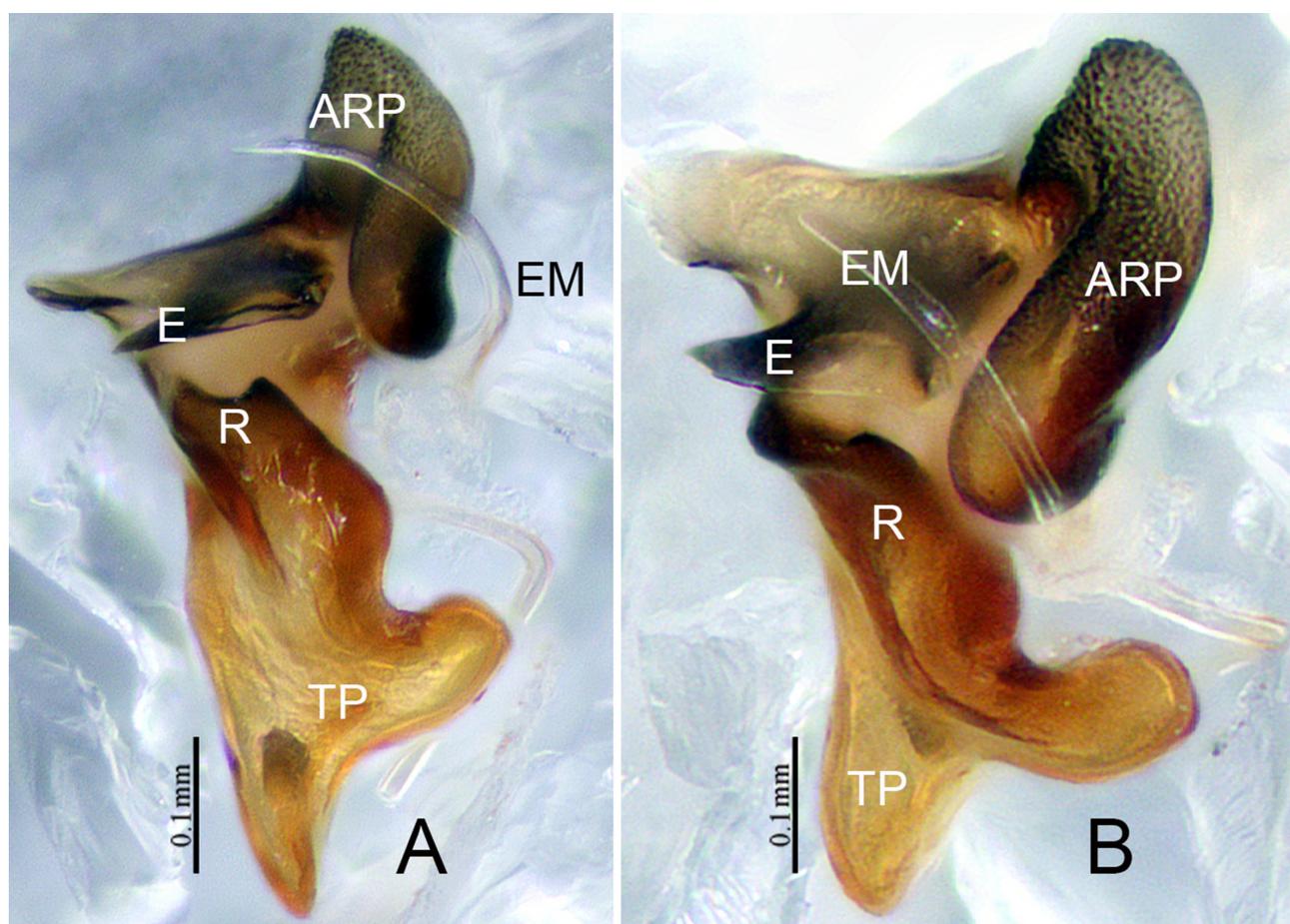


FIGURE 8. *Dicristatus modaoxiensis* sp. nov., male (one of paratypes left palp). **A, B** Embolic division.

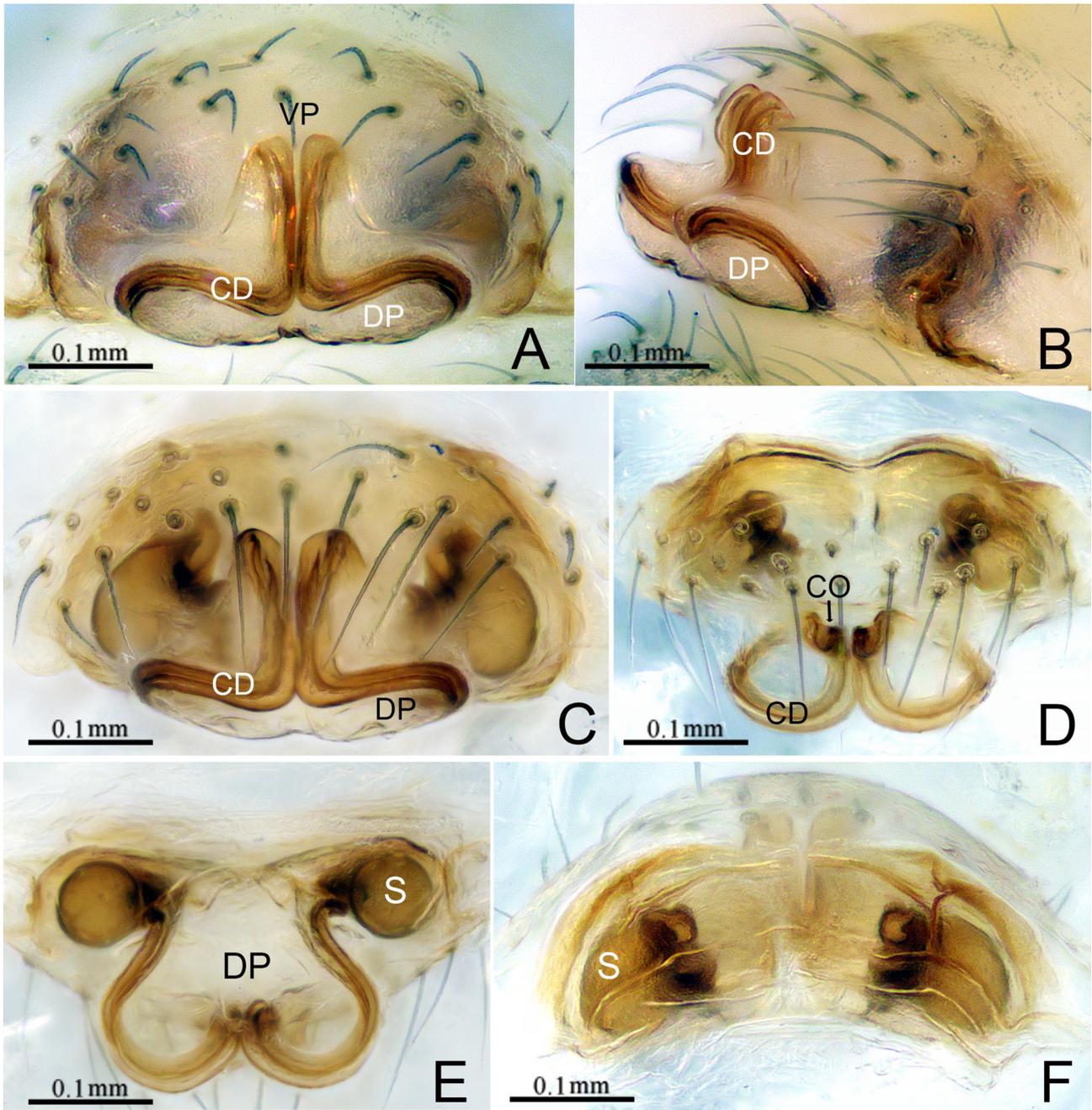


FIGURE 9. *Dicristatus modaoxiensis* sp. nov., female (one of paratypes): A, C, D Epigyne, ventral view, B Epigyne, lateral view, E Vulva, dorsal view F Vulva, anterior view.

Genus *Hypselistes* Simon, 1894 (闪腹蛛属)

Type species. *Erigone florens* O. Pickard-Cambridge, 1875

Remark. *Hypselistes* comprises 10 species distributed across in China, Japan, Kazakhstan, Mongolia, Russia, and USA, including three species reported from China (WSC, 2023).

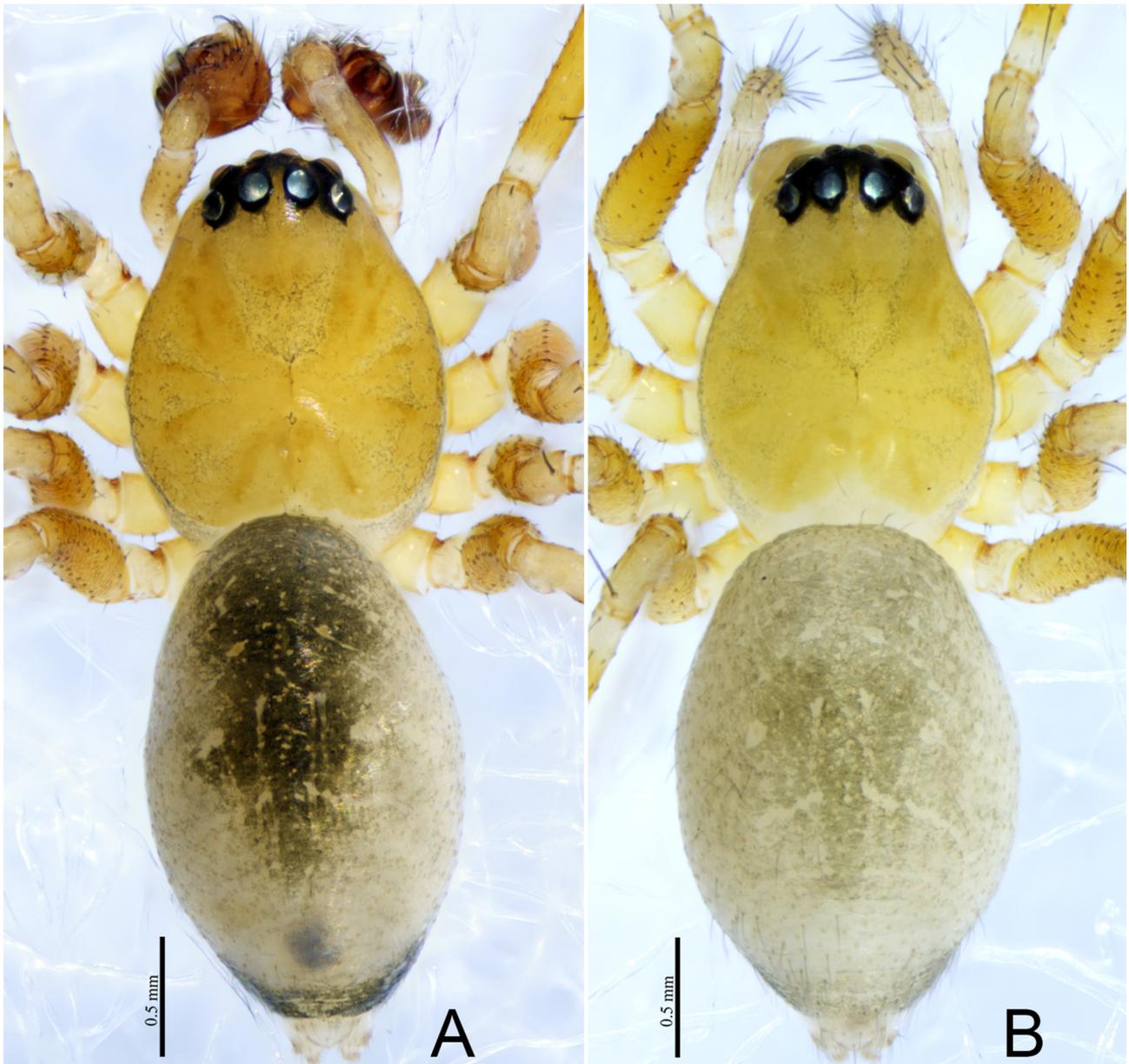


FIGURE 10. *Dicristatus modaoxiensis* sp. nov., male holotype (A), female paratype (SWUC-T-LIN-36-03, B). A, B habitus, dorsal view.

***Hypselistes arcus* sp. n.** (弓闪腹蛛)

Figures 11–13

Type material. Holotype male: CHINA: Chongqing, Wuxi County, YNR, Shuangyang Town, Tianchiba, 31.518383°N, 109.791014°E, elev. 1741m, 25.VI.2022, Tan Bing leg. (SWUC-T-LIN-28-01). **Paratypes (3 females):** 1 female, YNR, Huangcaoping, 31°24'50.13"N, 109°55'40.2"E, elev. 2039 m, 24.VI.2022, Wang Lu-Yu leg. (SWUC-T-LIN-28-02); 2 females, YNR, Huangcaoping, 31°25'52.7952" N, 109°56'41.0028"E, elev. 2254 m, 22.VI.2022, Tan Bing leg. (SWUC-T-LIN-28-03~04).

Etymology. This epithet derives from the Latin noun “*arcus*” meaning “arc” and referring to embolus arc-shaped in male palp.

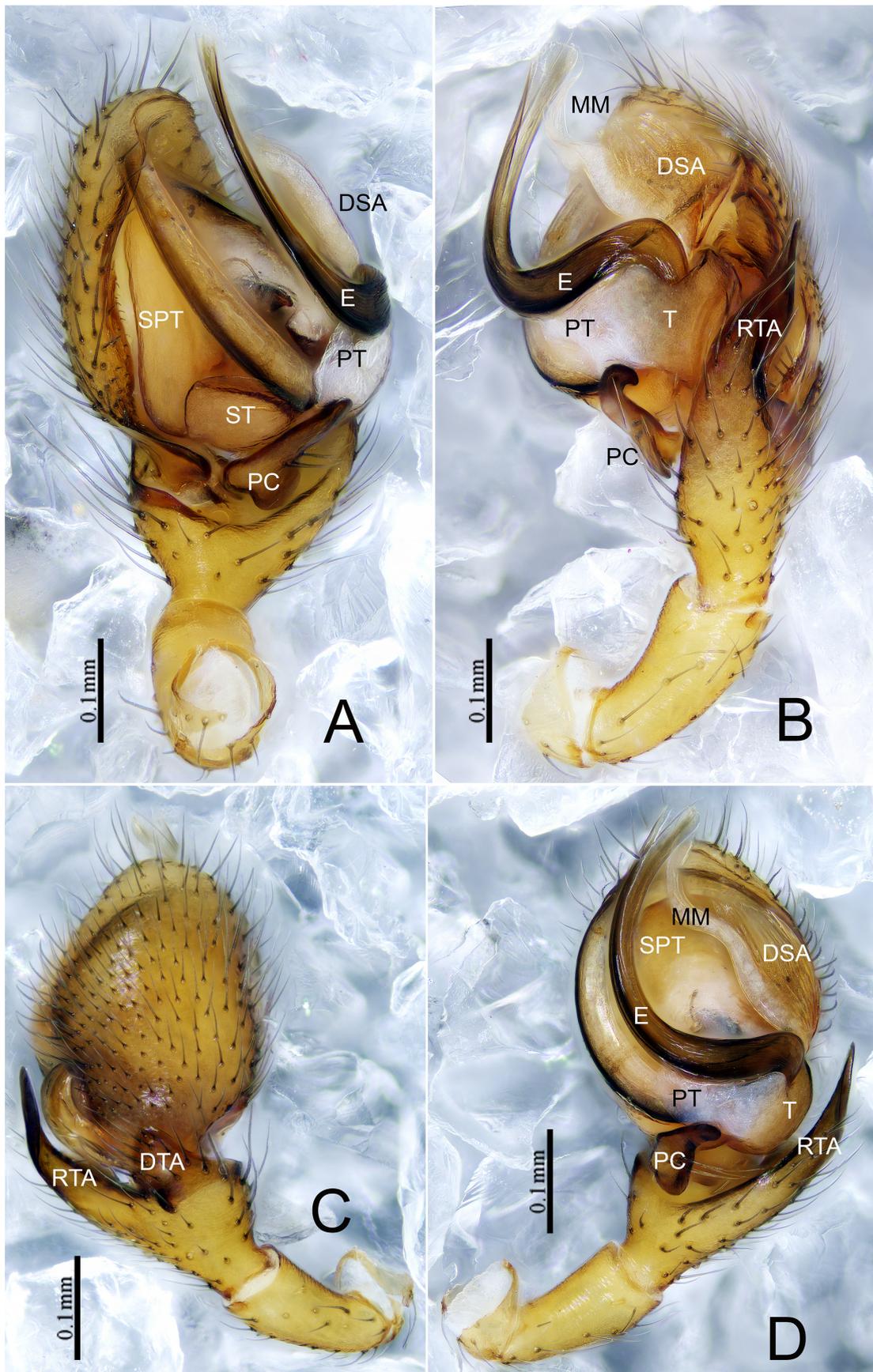


FIGURE 11. *Hypselistes arcus* sp. nov., male holotype left palp. **A** prolateral view **B** retrolateral view **C** dorsal view **D** ventral view.

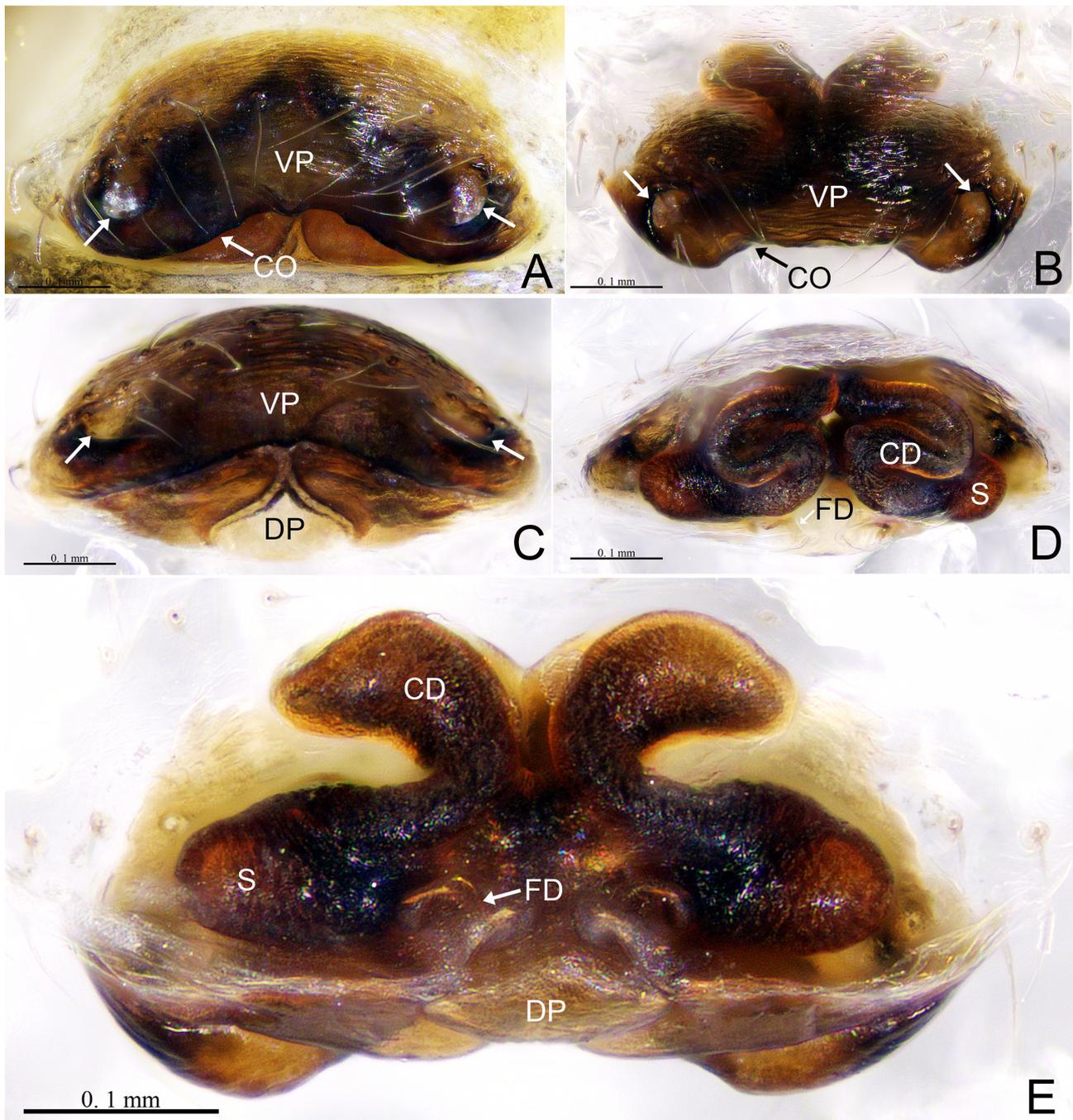


FIGURE 12. *Hypselistes arcus* **sp. nov.**, female (one of paratypes). **A, B** Epigyne, ventral view, **C** Epigyne, posterior view, **D** Vulva, anterior view **E** Vulva, dorsal view. Arrows indicating the depression posteriorly in ventral plate.

Diagnosis. *Hypselistes arcus* **sp. n.** can be distinguished from all other congeners by the male cephalic lobe present in the thoracic of the cephalothorax and PME's not present on the cephalic lobe (Fig. 13A, B), vs., in all other congeners the cephalic lobe is present in the eye region and bears the PME's on it (Wichle 1960, figs 154, 155, 162, 163); cephalic pits present in between the cephalic lobe in *H. arcus* **sp. n.** (Fig. 13A, B), vs., in all other congeners the cephalic pits present at the base of cephalic lobe (Wichle 1960, figs 154, 155, 162, 163). Male palp of *H. arcus* **sp. n.** can be distinguished from all other congeners by the following combination of characters, retrolateral tibial apophysis very long, almost overlapping 2/3 of the cymbium in retrolateral view; distal arm of paracymbium columnar with distal tip hook-shaped (Fig. 11B). The epigyne of *H. arcus* **sp. n.** can be distinguished from all other congeners by the ventral plate laterally with pair of depressions posteriorly (Fig. 12A–C).

Description. Male (holotype, Fig. 13A, B): Total length: 2.23. Carapace 1.13 long, 0.74 wide, yellow, cephalic

lobe 0.26 long, present in the thoracic of the cephalothorax, with parallel sulci containing cephalic pits in it that seem blocked with some sort of secretions (white arrows, Fig. 13A, B); fovea, cervical and radial grooves distinct. Clypeus 0.21 high. Chelicerae with 5 promarginal and 4 retromarginal teeth. AER recurved, PER straight. Eye sizes and interdistances: AME 0.05, ALE 0.05, PME 0.05, PLE 0.06, AME–AME 0.04, PME–PME 0.06, AME–PME 0.08, AME–ALE, 0.05, PME–PLE 0.05, ALE–ALE 0.31, PLE–PLE 0.34, ALE–PLE contiguous. Length of legs: I 3.74 (1.09, 1.20, 0.92, 0.53), II 3.47 (1.01, 1.11, 0.86, 0.49), III 2.76 (0.81, 0.85, 0.71, 0.39), IV 3.68 (1.13, 1.20, 0.89, 0.51). TmI 0.97. Tibial spine formula: 1-1-1-1. Abdomen 1.20 long, 0.72 wide, oval, brownish-black, with pairs of sigillae, ventral side brown.

Palp (holotype, Fig. 11A–D): Patella longer than tibia, ventrally grooved. Tibia cone-shaped in prolateral view, with 2 retrolateral and 1 dorsal trichobothria, retrolateral tibial apophysis long, apical end reaches the mid of cymbium in retrolateral view, dorsal tibial apophysis tongue-shaped; paracymbium J-shaped, distal arm columnar, tip hook-shaped; tegulum with conspicuous prottegulum; distal suprategular apophysis robust, completely covering the median membrane. Embolic division: Embolus with 1.5 coils, extending above cymbial apex.

Female (one of paratypes, Fig. 13C): Total length: 2.25. Carapace 0.85 long, 0.71 wide, yellow, posteriorly lateral margin with grey strip on each side, cephalic region slightly elevated; fovea, cervical and radial grooves distinct. Clypeus 0.21 high. Chelicerae with four promarginal and three retromarginal teeth. AER straight, PER slightly procurved. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.06, PLE 0.06, AME–AME 0.02, PME–PME 0.05, AME–PME 0.06, AME–ALE, 0.04, PME–PLE 0.04, ALE–ALE 0.28, PLE–PLE 0.31, ALE–PLE contiguous. Length of legs: I 2.19 (0.67, 0.76, 0.51, 0.26), II 2.12 (0.64, 0.75, 0.48, 0.25), III 1.79 (0.56, 0.61, 0.41, 0.21), IV 2.28 (0.68, 0.79, 0.55, 0.26). TmI 0.21. Tibial spine formula: 1-1-1-1. Abdomen 1.55 long, 1.09 wide, oval, greyish-black, with pairs of sigillae, ventral side black.

Epigyne (Fig. 12A–E): Ventral plate wider than long, posterior margin with pair of depression laterally; copulatory opening present posteriorly at the junction of dorsal and ventral plate. Dorsal plate reduced, triangular. Vulva: Copulatory ducts sinuous, forming three turns before entering the spermathecae. Spermathecae round, separated by the distance almost equals 2 times of their diameter; fertilization ducts long, extending mesally.

Distribution. Known only from the type locality.

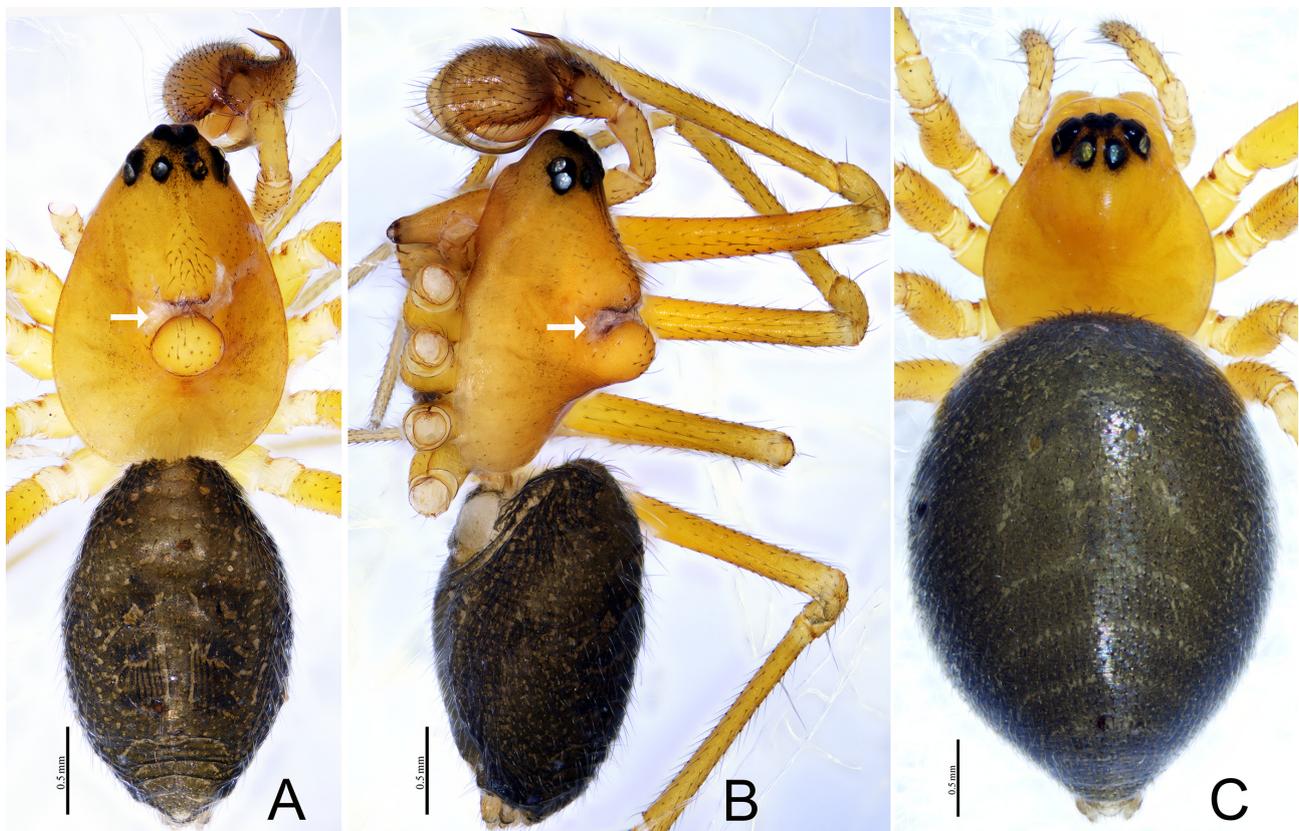


FIGURE 13. *Hypselistes arcus* sp. nov., male holotype (A, B) and female paratype (C). A, C habitus, dorsal view B habitus, lateral view. Arrows indicate the cephalic secretions dried out in the cephalic lobe of holotype male.

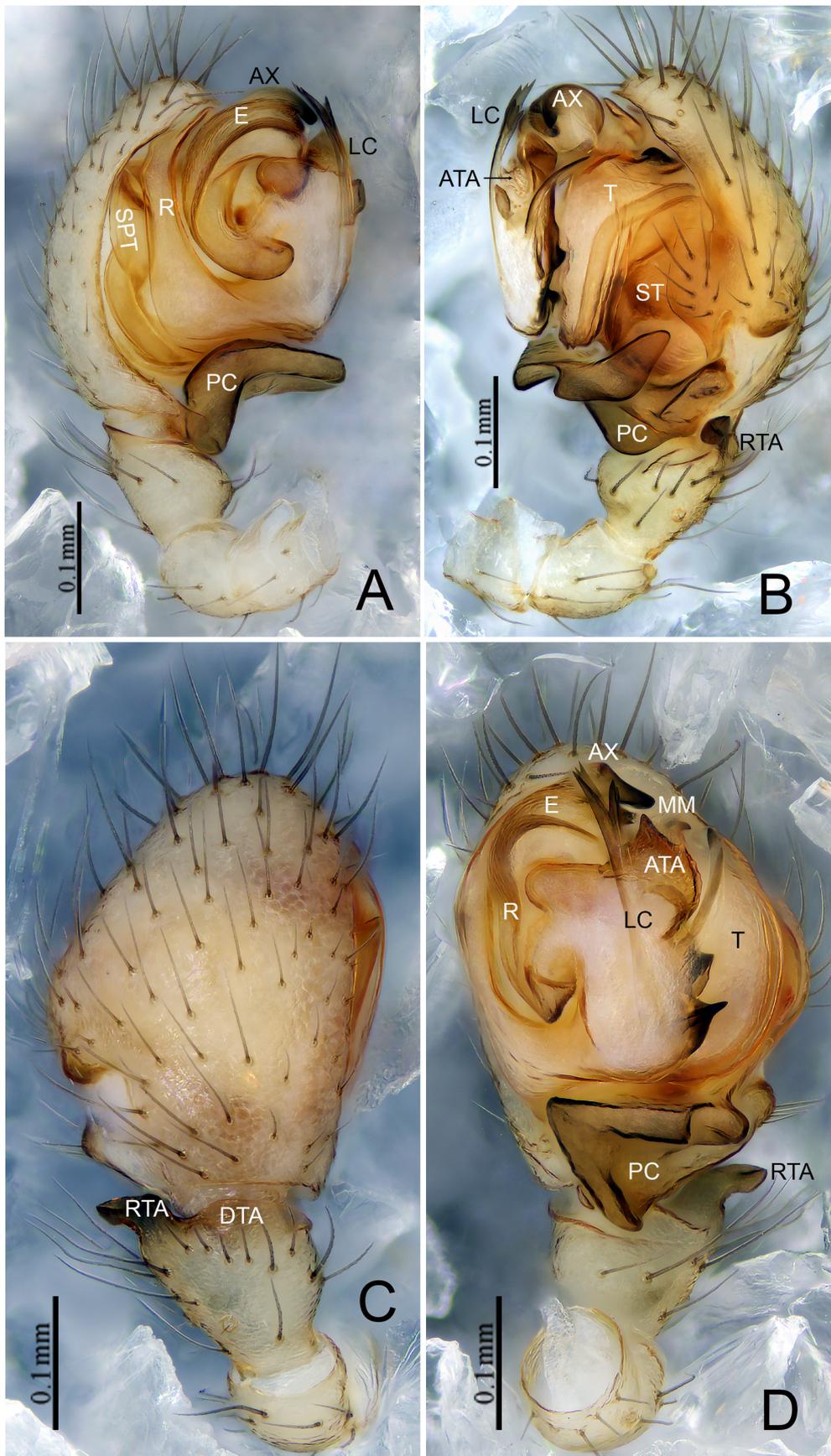


FIGURE 14. *Ryojius flosculus* sp. nov., male holotype, left palp. **A** prolateral view **B** retrolateral view **C** dorsal view **D** ventral view.

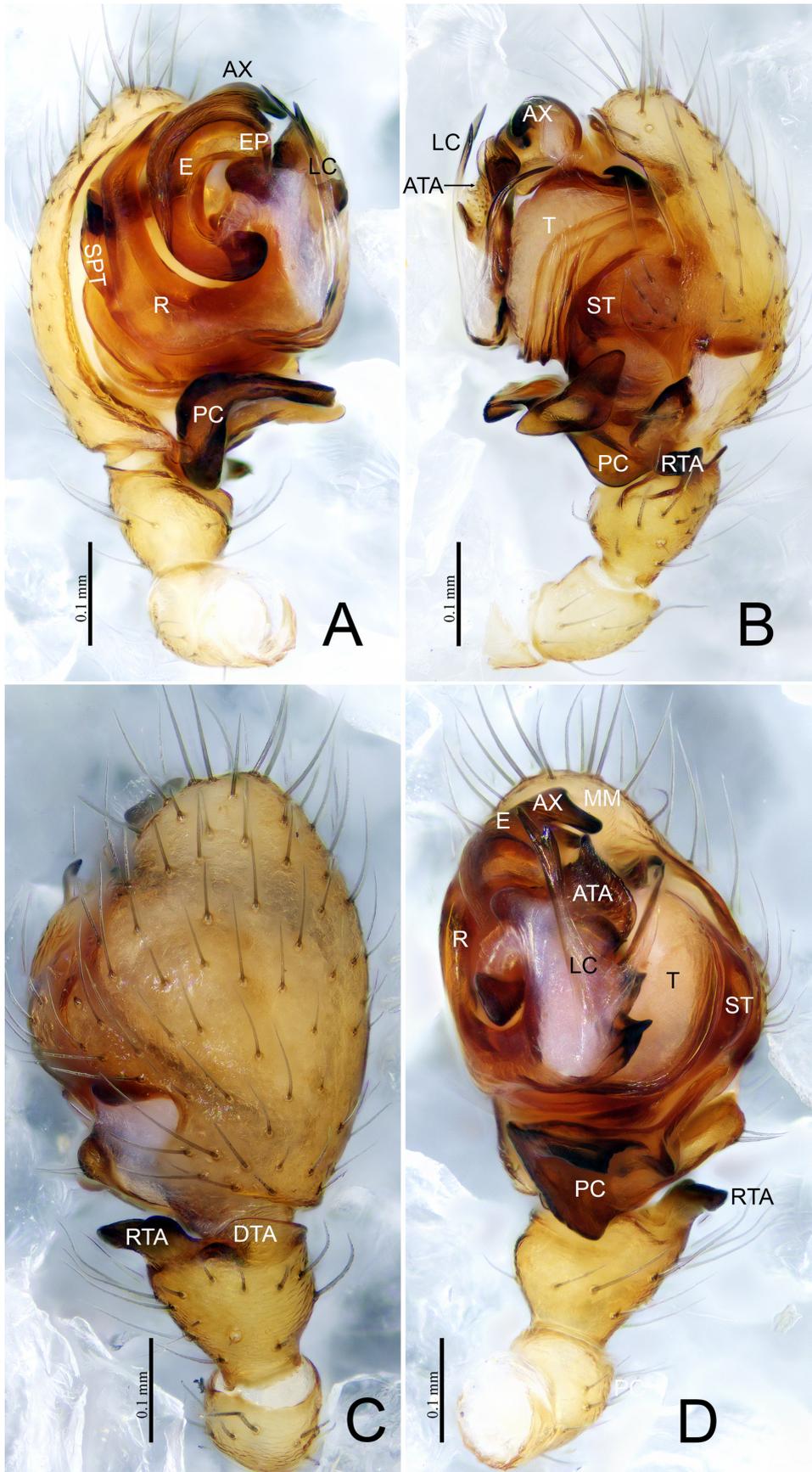


FIGURE 15. *Ryojius latus* sp. nov., male holotype, left palp. **A** prolateral view **B** retrolateral view **C** dorsal view **D** ventral view.

Genus *Ryojius* Saito & Ono, 2001 (良次蛛属)

Type species. *Ryojius japonicus* Saito & Ono, 2001.

Remark. *Ryojius* comprises three species distributed China, Japan, and Korea, including one species reported from China (WSC, 2023).

Ryojius flosculus sp. n. (花良次蛛)

Figures 14, 16

Type material. Holotype: 1♂, CHINA: Chongqing, Wuxi County, YNR, Guanshan Forest farm, Shizhuzi, 31°32'15.29"N, 109°41'49.82"E, elev. 2147 m, 01.IX.2020, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-29-01).

Etymology. This epithet derives from the Latin noun “*flosculus*” meaning “flower” and referring to the longer branch of lamella characteristica apex flower-shaped with several petal-like projections.

Diagnosis. The new species resembles *R. nanyuensis* (Chen & Yin, 2000) in having the similar short arm of lamella characteristica (Fig. 14A–D; Tu *et al.* 2006, figs 15–23), but can be distinguished by the distal tip of long arm of lamella characteristica flower-shaped with each side with 3 teeth in *R. flosculus* sp. n. (Fig. 14B), vs., each side of the tip with 5 teeth in *R. nanyuensis* (Tu *et al.* 2006, figs 15, 16). Distal arm tip of paracymbium triangular in *R. flosculus* sp. n. (Fig. 14B), vs., V-shaped in *R. nanyuensis* (Tu *et al.* 2006, fig. 15).

Description. Male (Fig. 16A): Total length: 2.01. Carapace 0.98 long, 0.74 wide, yellowish-brown; fovea, cervical and radial grooves distinct. Clypeus 0.15 high. Chelicerae with 6 promarginal and 6 retromarginal teeth. AER recurved, PER straight, slightly wider. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.05, PLE 0.05, AME–AME 0.02, PME–PME 0.06, AME–ALE, 0.05, PME–PLE 0.03, AME–PME 0.05, ALE–ALE 0.29, PLE–PLE 0.33, ALE–PLE contiguous. Length of legs: I 2.73 (0.81, 0.96, 0.58, 0.43), II 2.55 (0.79, 0.84, 0.51, 0.41), III 2.03 (0.61, 0.69, 0.41, 0.32), IV 2.65 (0.85, 0.88, 0.54, 0.38). Tm I 0.29 and Tm IV 0.16. Tibial spine formula: 2-2-2-2. Abdomen 1.02 long, 0.62 wide, oval, grey; ventral side grey.

Palp (Fig. 14A–D): Patella as long as tibia; tibia with with one retrolateral and one dorsal trichobothria and two apophyses; retrolateral tibial apophysis strongly sclerotized, wider than long, pointing laterally in dorsal view, dorsal tibial apophysis wider than long, with round tip. Cymbium with shallow depression at base retrolaterally. Paracymbium strongly sclerotized, distal arm tip triangular. Distal suprategular apophysis proximal part covered by tegulum, distal end sclerotized, with narrow hook-shaped tip. Radix C-shaped. Lamella characteristica with 2 branches; posterior horn-shaped and anterior one long, extending towards cymbial apex, tip flower-shaped. Terminal apophysis longer than wide, tip serrated. Embolus conspicuously large, posteriorly curved about half circle, apex strongly sclerotized, finger-shaped with blunt tip; thumb short, covered by the lamella characteristica; embolus proper blunt.

Female. Unknown

Distribution. Known only from the type locality.

Ryojius latus sp. n. (宽良次蛛)

Figures 15, 16

Type material. Holotype male: CHINA: Chongqing, Wuxi County, YNR, Guanshan Forest farm, Shizhuzi, 31°32'15.29"N, 109°41'49.82"E, elev. 2147 m, 30.IX.2020, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-30-01).

Etymology. This epithet derives from the Latin adjective “*latus*” meaning “broad” and referring to the anterior terminal apophysis broad in male palp.

Diagnosis. *Ryojius latus* sp. n. resembles *R. flosculus* sp. n. in having the similar paracymbium (Fig. 15A–D; Fig. 14A–D), but can be distinguished by the distal tip of long arm of lamella characteristica bifurcated in *R. latus* sp. n. (Fig. 15A, B, D), vs., flower-shaped in *R. flosculus* sp. n. (Fig. 14B, D).

Description. Male (Fig. 16B): Total length: 2.13. Carapace 0.99 long, 0.83 wide, brown; fovea, cervical and radial grooves distinct. Clypeus 0.13 high. Chelicerae with 6 promarginal and 5 retromarginal teeth. AER recurved, PER straight, slightly wider. Eye sizes and interdistances: AME 0.04, ALE 0.08, PME 0.07, PLE 0.07, AME–AME

0.02, PME–PME 0.05, AME–ALE, 0.04, PME–PLE 0.05, AME–PME 0.03, ALE–ALE 0.31, PLE–PLE 0.33, ALE–PLE contiguous. Length of legs: I 2.76 (0.79, 0.95, 0.59, 0.43), II 2.52 (0.73, 0.86, 0.54, 0.39), III 2.02 (0.61, 0.64, 0.44, 0.33), IV 2.65 (0.77, 0.91, 0.59, 0.38). Tm I 0.31 and Tm IV 0.19. Tibial spine formula: 2-2-2-2. Abdomen 1.04 long, 0.75 wide, oval, grey, mid dorsally with black patch; ventral side grey.

Palp (Fig. 15A–D): Patella as long as tibia; tibia with one retrolateral and one dorsal trichobothria and two apophyses; retrolateral tibial apophysis strongly sclerotized, wider than long, pointing laterally in dorsal view, dorsal tibial apophysis wider than long, with round tip. Cymbium with shallow depression at base retrolaterally. Paracymbium strongly sclerotized, distal arm tip triangular. Distal suprategular apophysis small, most of proximal part covered by the tegulum, distal end sclerotized, with narrow hook-shaped tip. Radix C-shaped. Lamella characteristic with 2 branches; posterior horn-shaped and anterior one long, extending towards the cymbial apex, tip bifurcated. Terminal apophysis longer than wide, tip serrated. Embolus conspicuously large, posteriorly curved about half circle, apex strongly sclerotized, finger-shaped with blunt tip; thumb short, covered by the lamella characteristic; embolus proper blunt.

Female. Unknown

Distribution. Known only from the type locality.

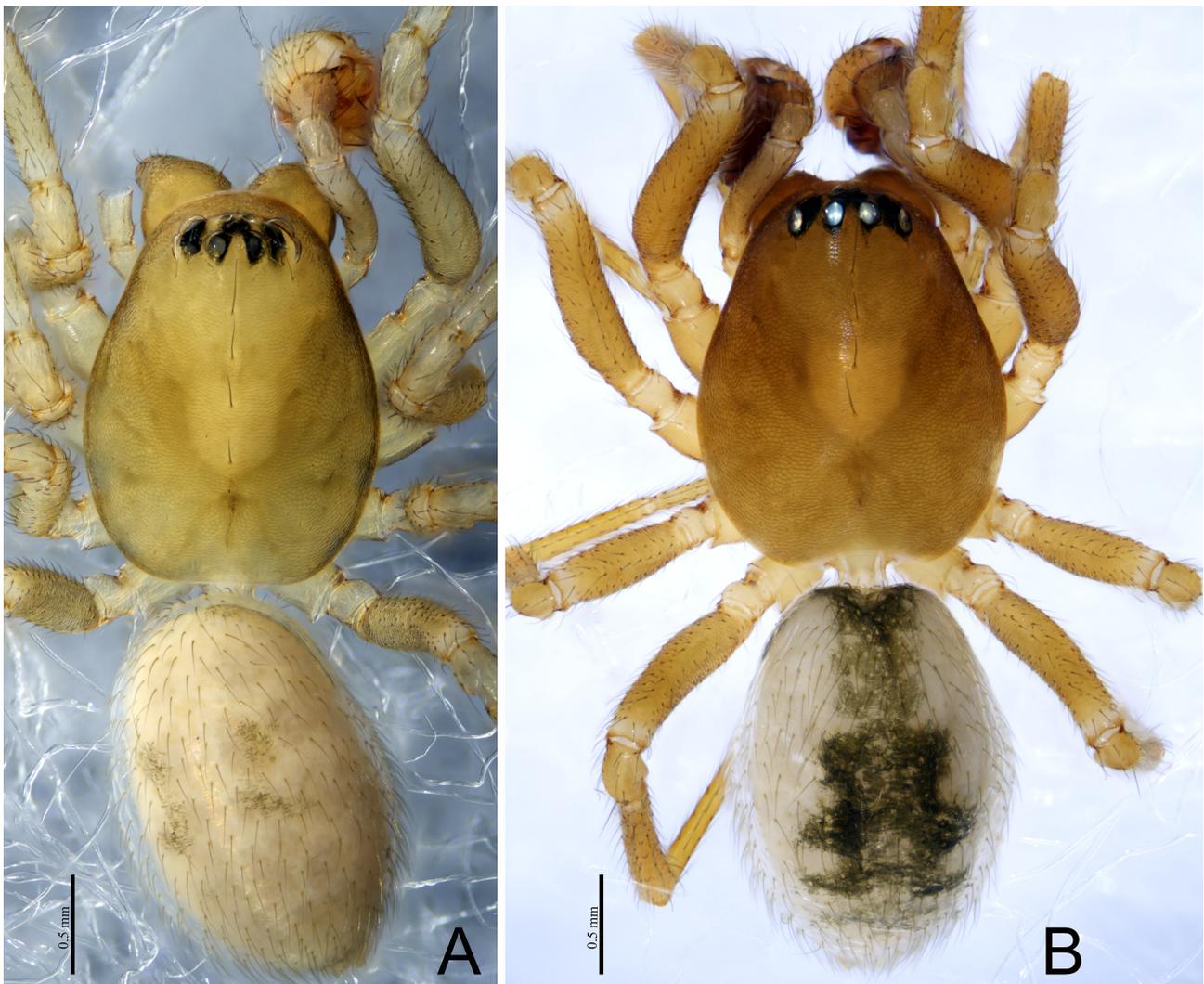


FIGURE 16. *Ryojius flosculus* sp. nov., male holotype (A), *Ryojius latus* sp. nov., male holotype (B). A, B habitus, dorsal view.

Genus *Shaanxinus* Tanasevitch, 2006 (陕蛛属)

Type species. *Shaanxinus rufus* Tanasevitch, 2006.

Remark. *Shaanxinus* comprises 16 species distributed China, and Vietnam (WSC, 2023). Out of which two species have been described with single sex (only male sex). Lin *et al.* (2019) described 13 species from Taiwan.

Shaanxinus shizhuziensis sp. n. (石柱子陕蛛)

Figure 17–20

Type material. Holotype male: CHINA: Chongqing, Wuxi County, YNR, Guanshan Forest Farm, Shizhuzi, 31°32'23.12"N, 109°41'50.75"E, elev. 2096 m, 24.VI.2022, Tan Bing leg. (SWUC-T-LIN-31-01). **Paratypes (1 male and 1 female):** 1 female, same data as holotype male (SWUC-T-LIN-31-02); 1 male, Wuxi County, Lanying Township, Xi'an Village, 31°24'41.8752"N, 109°54'01.2996"E, elev. 1801 m, 21.VI.2022, Tan Bing leg. (SWUC-T-LIN-31-03).

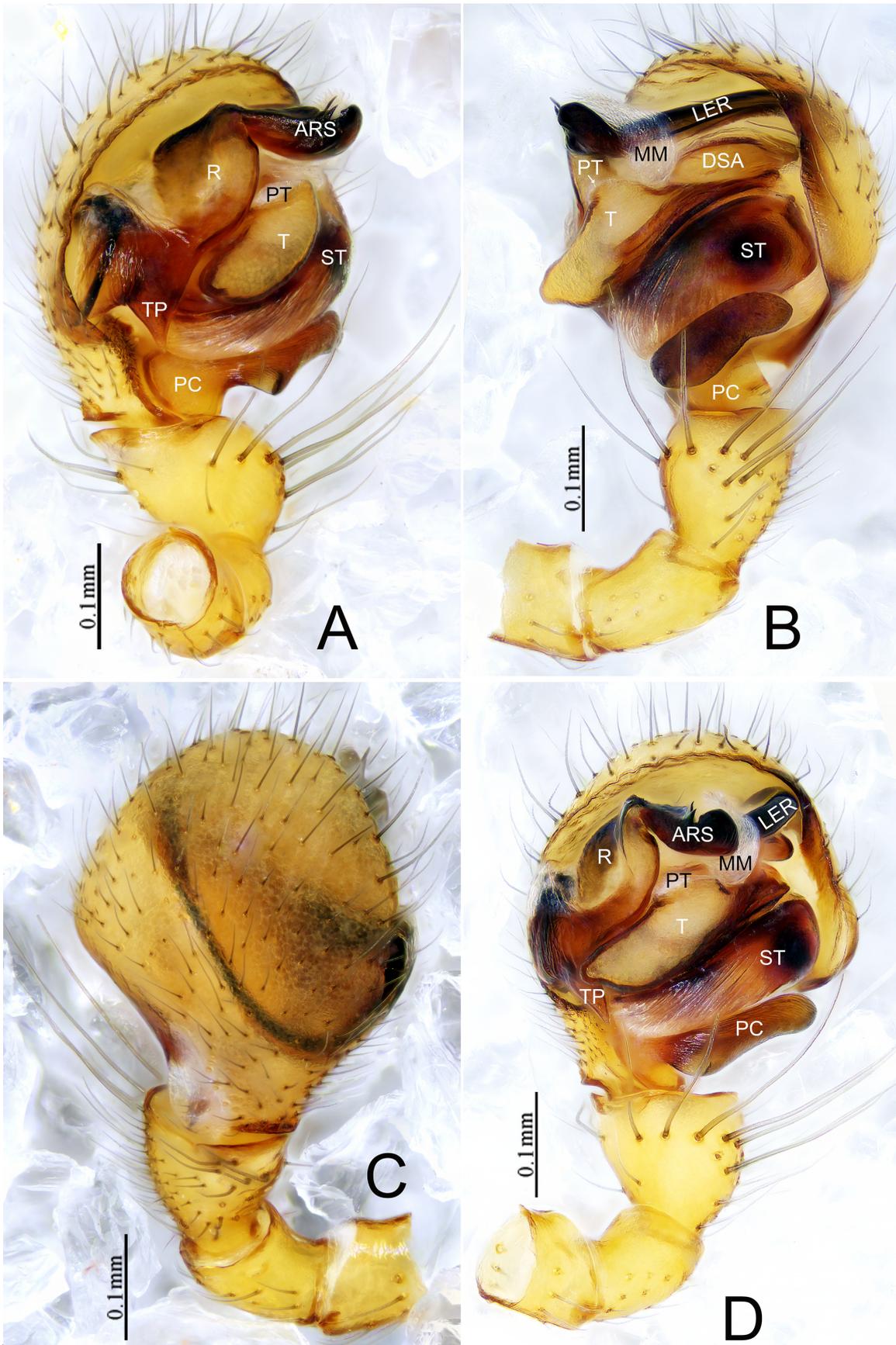
Etymology. This epithet derives from the type locality.

Diagnosis. *Shaanxinus shizhuziensis* sp. n. male resembles *S. rufus* Tanasevitch, 2006 in having the similar chaetotaxy (2222), leg II longer than other legs, having similar cephalic lobe (Fig. 20A, B; Lin *et al.* 2019, fig. 5A–C), palp with similar paracymbium (Fig. 17B, D; Lin *et al.* 2009, fig. 7B), but can be distinguished by the anterior radical process present in *S. shizhuziensis* sp. n. (Fig. 18C), vs., absent in *S. rufus* (Lin *et al.* 2019, fig. 7C); anterior radical scaly part with long sharp projection in *S. shizhuziensis* sp. n. (Figs 17A, 18A), vs., strongly sclerotized scaly sclerite in *S. rufus* (Lin *et al.* 2019, fig. 3C); distal suprattegular apophysis disc-shaped in *S. shizhuziensis* sp. n. (Figs 17B, 18B, C), vs., flat, membranous apical and partly covering the embolic division in *S. rufus* (Tanasevitch 2006, figs 51, 53, 54). Epigyne of *S. shizhuziensis* sp. n. can be distinguished from all other congeners by the copulatory ducts 9-shaped, forming one broad round loop anteriorly before turning dorsally towards the spermathecae in ventral view (Fig. 19A, C, D, E).

Description. Male (holotype, Fig. 20A, B): Total length: 3.36. Carapace 1.61 long, 1.13 wide, yellow, cephalic lobe 0.77 high with many microsetae, with eyes; sulcus present below the anterior eye row, sulcus seem blocked with some sort of secretions (white arrows, Fig. 20B); fovea, cervical and radial grooves distinct. Clypeus 0.38 high. Chelicerae with 5 promarginal and 4 retromarginal teeth. AER recurved, PER procurved, wider than AER. Eye sizes and interdistances: AME 0.04, ALE 0.07, PME 0.08, PLE 0.06, AME–AME 0.08, PME–PME 0.08, AME–PME 0.11, AME–ALE, 0.11, PME–PLE 0.12, ALE–ALE 0.38, PLE–PLE 0.45, ALE–PLE contiguous. Length of legs: I 5.15 (1.52, 1.75, 1.29, 0.59), II 5.92 (1.78, 2.13, 1.41, 0.60), III 4.32 (1.27, 1.39, 1.15, 0.51), IV 5.12 (1.37, 1.69, 1.43, 0.63). Leg formula leg II longer than I. TmI 0.39. Tibial spine formula: 2-2-2-2. Abdomen 1.87 long, 1.13 wide, oval, pale, greenish-grey pattern followed by three transverse chevrons, ventral side pale.

Palp (holotype, Figs 17A–D, 18A–C): Patella shorter than tibia, ventrally grooved; tibia with two reterolateral trichobothria and posterior margin with long thick spines, tibial apophysis absent; paracymbium C-shaped, distal arm almost parallel to the tibial margin, lower margin of distal arm wave-like in retrolateral view; tegulum extending retrolaterally, possess small membranous prottegulum; distal suprattegular apophysis disc-shaped. Radix with large anterior radical scaly part with 2 small sharp projections; anterior radical process ventrally grooved, wrapped around embolic base, invisible on undissected palp; lateral extension of radix slightly curved, apex blunt, ends in cymbium in retrolateral view, covering terminal part of embolus; tailpiece triangular with pointed end; median membrane present; embolus sclerotized, forming one complete circle, terminal part ends in anterior radical scaly part.

Female (paratype, Fig. 20C): Total length: 3.60. Carapace 1.51 long, 1.16 wide, yellow, cephalic region elevated; fovea, cervical and radial grooves distinct. Clypeus 0.44 high. Chelicerae with 4 promarginal and 5 retromarginal teeth. AER recurved, PER straight slightly wider than AER. Eye sizes and interdistances: AME 0.06, ALE 0.06, PME 0.07, PLE 0.07, AME–AME 0.04, PME–PME 0.08, AME–PME 0.07, AME–ALE, 0.04, PME–PLE 0.07, ALE–ALE 0.35, PLE–PLE 0.41, ALE–PLE 0.01. Length of legs: I 5.43 (1.59, 1.85, 1.32, 0.67), II 5.52 (1.60, 1.81, 1.46, 0.65), III 4.11 (1.26, 1.28, 1.04, 0.53), IV 4.88 (1.43, 1.50, 1.31, 0.64). TmI 0.31. Tibial spine formula



same as in male. Troganion 2.20 long, 1.57 wide, oval, other characters same as in male.

FIGURE 17. *Shaanxinus shizhuziensis* sp. nov., male holotype, left palp. A prolateral view B retrolateral view C dorsal view D ventral view.

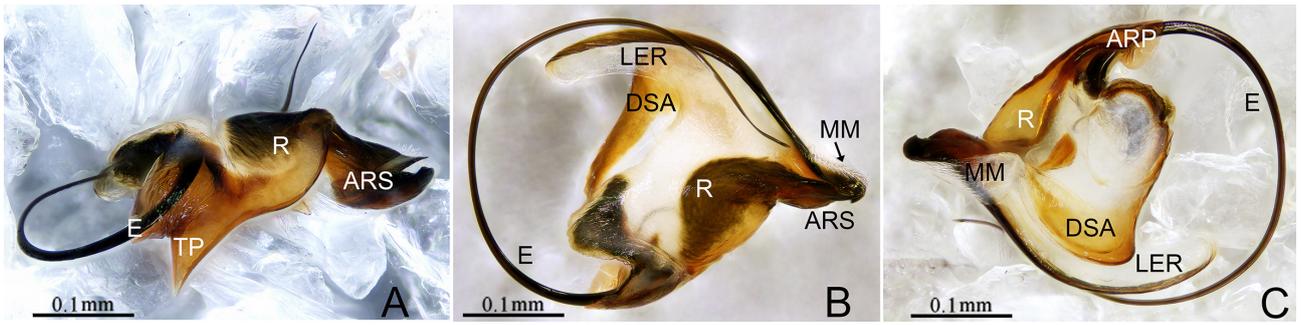


FIGURE 18. *Shaanxinus shizhuziensis* sp. nov., male (one of paratype, left palp). A–C Embolic division.

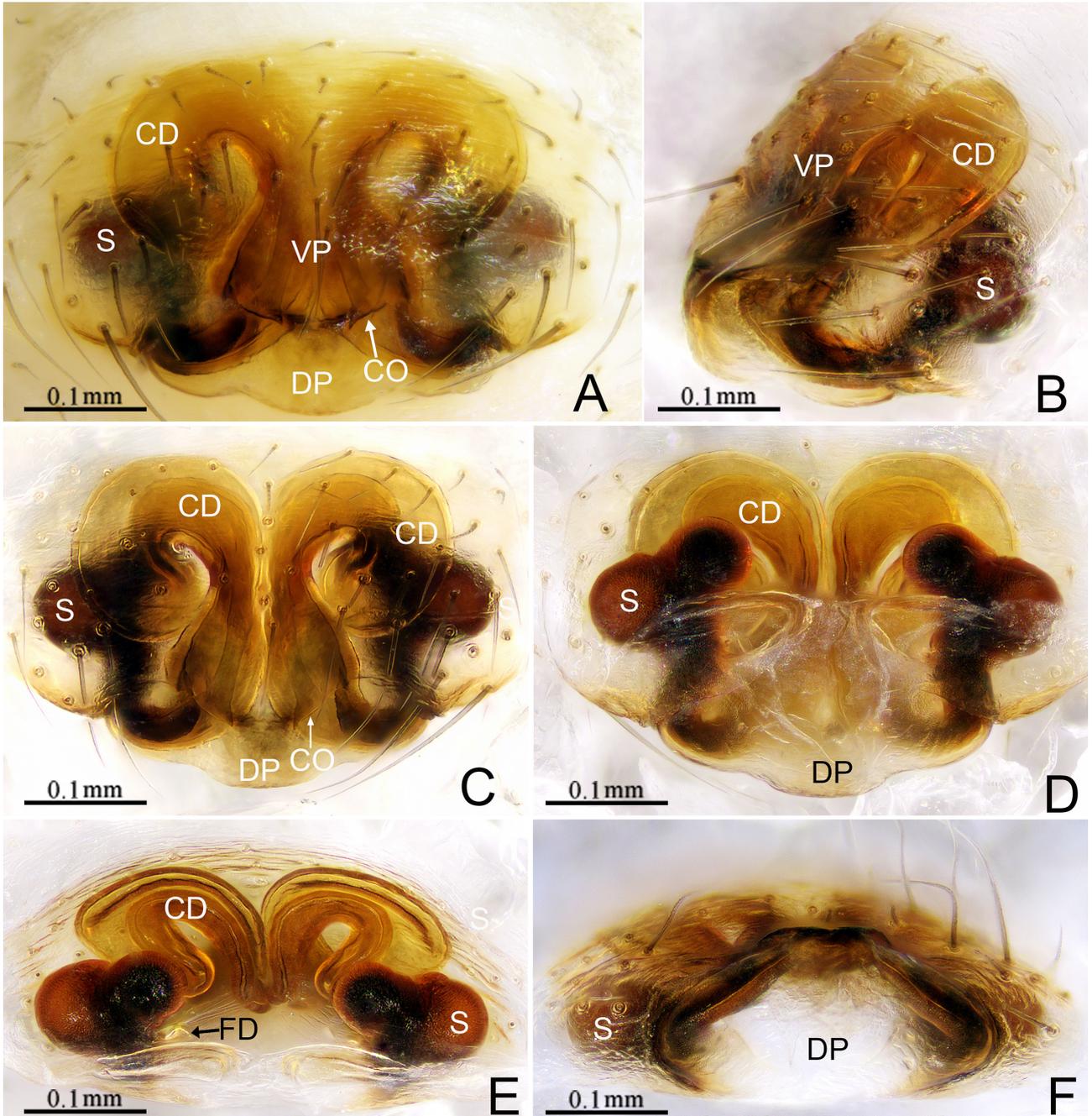


FIGURE 19. *Shaanxinus shizhuziensis* sp. nov., female (one of paratypes). A, C Epigyne, ventral view, B Epigyne, lateral view, D Vulva, dorsal view E Vulva, anterior view E Epigyne, posterior view.

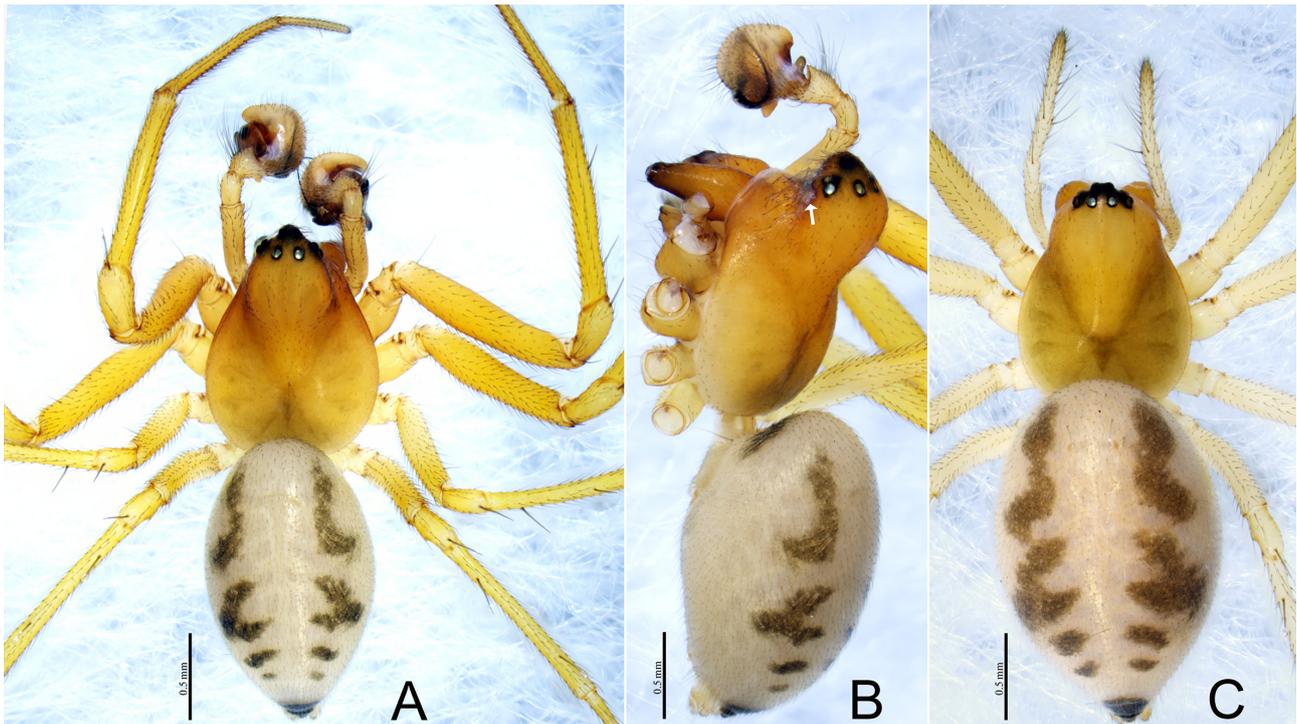


FIGURE 20. *Shaanxinus shizhuziensis* sp. nov., male holotype (A, B) and female (one of paratype, C). A, C habitus, dorsal view B habitus, lateral view. Arrow indicates the cephalic secretions dried out in the clypeal lobe of holotype male.

Epigyne (Fig. 19A–F): Dorsal plate partly visible in ventral view, posterior margin wave like, ventrally grooved in lateral view. Copulatory openings located mid-ventrally at the junction of the dorsal and ventral plates. Vulva: copulatory ducts 9-shaped, forming broad circular loop anteriorly before turning towards dorsal side. Spermathecae globular, located dorso-laterally, separated by 2 times distance of their diameter; fertilization ducts large, extending mesally.

Distribution. Known only from the type locality.

Sinogone gen. n. (华微蛛属)

Type species: *Sinogone caesuma* sp. n.

Etymology. The genus name is a combination of “*Sino*” (refers to Chinese) with the second part taken from subfamily “*Erigoninae*”. Gender is feminine.

Diagnosis. *Sinogone* gen. n. cannot be placed in any of the genus groups proposed by Millidge (1977). Male of *Sinogone* gen. n. can be differentiated from all other Erigoninae genera by the following unique combination of characters: 1) cephalic lobe absent rather than cephalic region elevated; cephalic pits conspicuous located behind the PLEs (Fig. 23A, B); 2) dorsal tibial apophysis with bifurcated apex, pointing retrolaterally in ventral view; 3) distal suprategular apophysis unmodified; 4) radix give rise to long curved embolus and round to oval anterior radical process (Fig. 21A–D); 5) paracymbium U-shaped, distal arm with hook-shaped tip (Fig. 21B). Female can be identified with unique structure as pair of lateral arms originate from the anterior margin of ventral plate of epigyne and extending posteriorly above the epigastric furrow, these lateral arms do not have any connection with the copulatory ducts or copulatory opening; ventral plate extending posteriorly above the epigastric furrow with copulatory opening as in genus *Dicristatus* Irfan, Wang & Zhang, 2023 (Fig. 22A–F; Fig. 9A–F).

Composition. Since *Sinogone caesuma* sp. n. doesn't fit into any known Erigoninae genera, we propose *Sinogone* gen. n. to accommodate the new species.

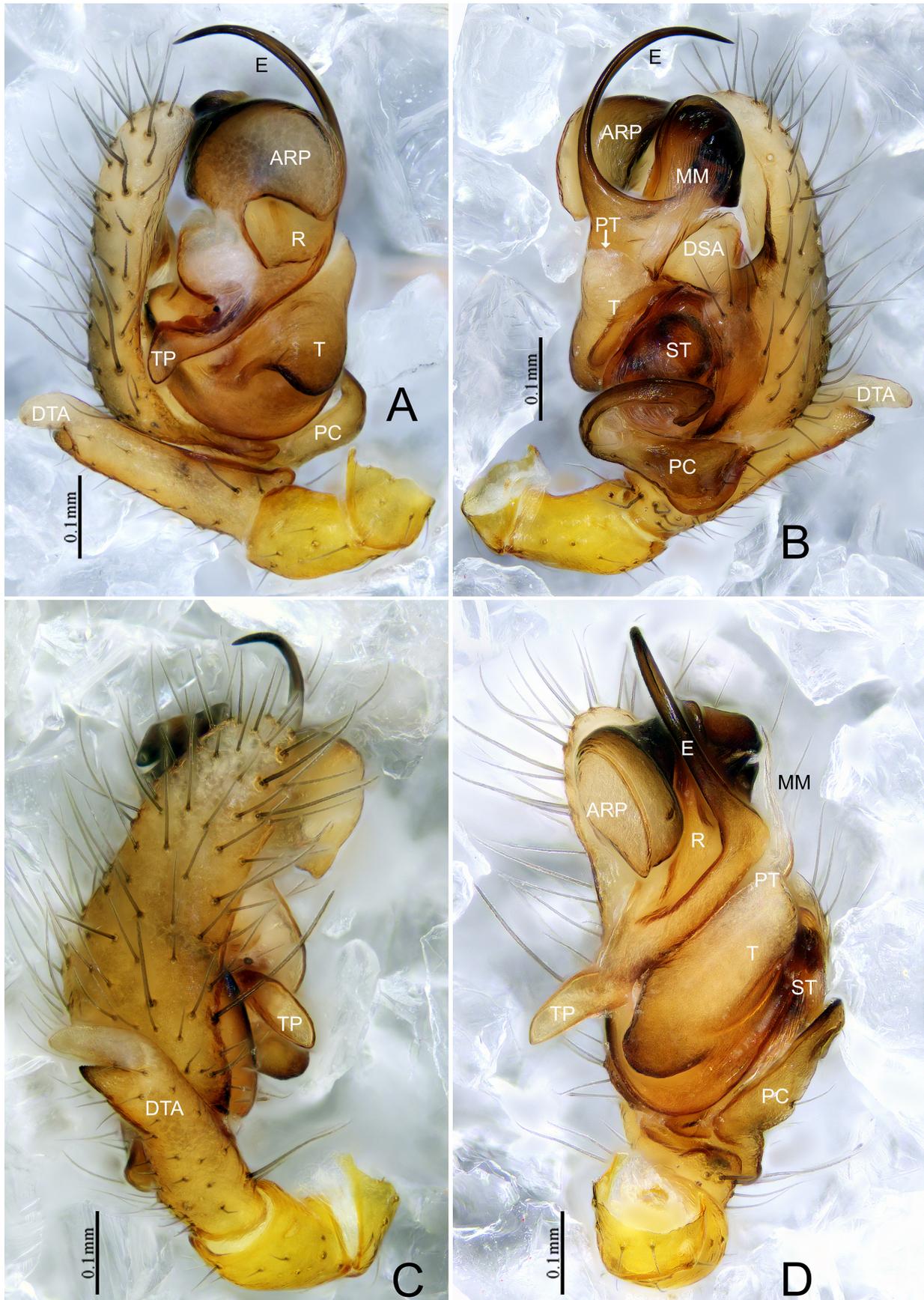


FIGURE 21. *Sinogone caesuma* sp. nov., male holotype, left palp. **A** prolateral view **B** retrolateral view **C** dorsal view **D** ventral view.

Sinogone caesuma sp. n. (逗号华微蛛)

Figures 21–23

Type material. Holotype male: CHINA: Chongqing, Wuxi County, YNR, Guan Shanlin, Chang Shizhuzi, 31°32'15.29"N, 109°41'49.82"E, 2147 m, 30 September 2020, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-32-01).

Paratype: 1 female, same data as holotype male (SWUC-T-LIN-32-02).

Etymology. This epithet derives from the Latin noun “*caesum*” meaning “comma” and referring to the comma-shaped anterior radical process of embolic division.

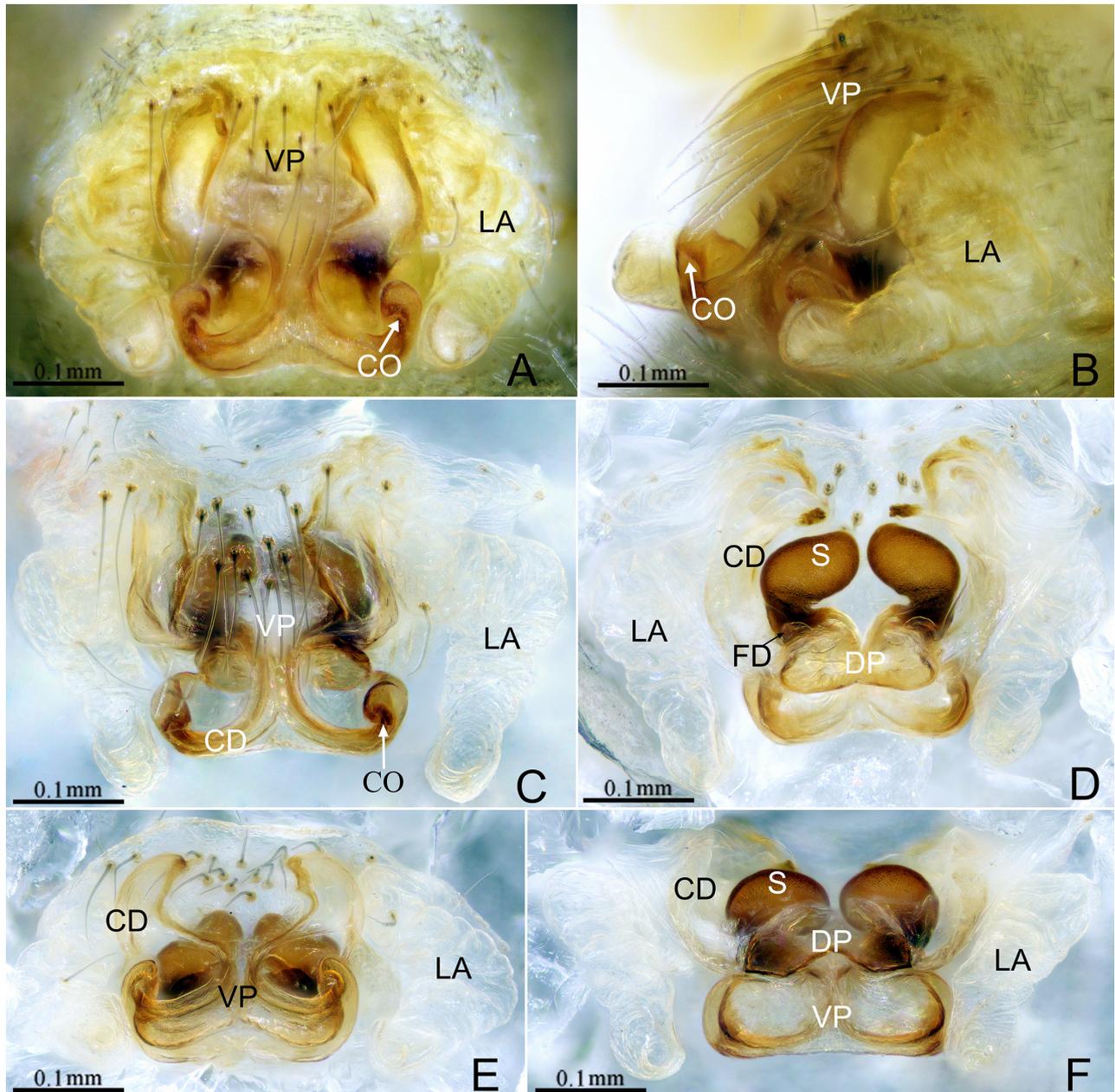


FIGURE 22. *Sinogone caesuma* sp. nov., female (one of paratypes). A, C Epigyne, ventral view, B Epigyne, lateral view, D Vulva, dorsal view, E Epigyne, posterior view F Vulva, posterior view.

Diagnosis. See genus diagnosis.

Description. Male (Fig. 23A, B): Total length: 2.23. Carapace 1.11 long, 0.92 wide, cephalic region slightly elevated and extended anteriorly with pits behind PLEs, yellow, fovea, cervical and radial grooves distinct. Clypeus 0.33 high. Chelicerae with 5 promarginal and 4 retromarginal teeth. Eye region narrow, AER recurved, PER straight, slightly wider than AER. Eye sizes and interdistances: AME 0.06, ALE 0.08, PME 0.06, PLE 0.06, AME–AME 0.03,

PME–PME 0.06, AME–ALE, 0.05, PME–PLE 0.09, AME–PME 0.04, ALE–ALE 0.34, PLE–PLE 0.36, ALE–PLE contiguous. Length of legs: I 3.92 (1.12, 1.35, 1.02, 0.43), II 3.65 (1.05, 1.22, 0.94, 0.44), III 2.84 (0.91, 0.91, 0.70, 0.32), IV 3.97 (1.14, 1.39, 0.98, 0.46). TmI 0.34. Tibial spine formula: 2-2-1-1. Abdomen 1.34 long, 0.83 wide, oval, greenish-grey, mid dorsally with 2 pairs of sigillae, ventral side greenish-grey.

Palp (Fig. 21A–D): Patella 2 times shorter than tibia; tibia $\frac{2}{3}$ length of cymbium, with 1 reterolateral trichobothrium, dorsal tibial apophysis with bifurcated apex, pointing retrolaterally in ventral view; paracymbium U-shaped, distal arm with hook-shaped tip; protegulum small and transparent; median membrane with broad frayed end; radix robust, tailpiece short with blunt tip; anterior radical apophysis comma-shaped in prolateral view; embolus long and curved, arc-shaped, extending above the apex of cymbium.

Female (Fig. 23C). Total length: 2.59. Carapace 1.19 long, 0.94 wide, cephalic region slightly elevated, yellow, fovea, cervical and radial grooves distinct. Clypeus 0.26 high. Chelicerae with 5 promarginal and 4 retromarginal teeth. Eye region narrow, AER recurved, PER straight, slightly wider than AER. Eye sizes and interdistances: AME 0.06, ALE 0.07, PME 0.06, PLE 0.06, AME–AME 0.02, PME–PME 0.05, AME–ALE, 0.03, PME–PLE 0.06, AME–PME 0.05, ALE–ALE 0.31, PLE–PLE 0.34, ALE–PLE 0.01. Length of legs: I 3.81 (1.16, 1.32, 0.92, 0.41), II 3.70 (1.14, 1.29, 0.87, 0.40), III 3.06 (0.96, 0.97, 0.75, 0.38), IV 4.02 (1.21, 1.27, 1.10, 0.44). TmI 0.29. Tibial spine formula: 2–2–1–1. Abdomen 1.63 long, 0.95 wide, oval, greenish-grey, mid dorsally with 2 pairs of sigillae, ventral side brown.

Epigyne (Fig. 22A–F): Ventral plate wider than long, extending posteriorly containing pits with copulatory openings; comprises of strikingly unique vestigial organ as pair of lateral arms originate from the anterior margin of ventral plate of epigyne and extending posteriorly, lateral arms do not have any connection with copulatory ducts or copulatory opening. Dorsal plate reduced in size, D-shaped. Vulva: copulatory ducts extending towards the anterior margin of epigyne and then forming long loop before entering the spermathecae. Spermathecae oval, located between the copulatory ducts; fertilization ducts long, extending mesally.

Distribution. Known only from the type locality.



FIGURE 23. *Sinogone caesuma* sp. nov., male holotype (A, B) and female (one of paratype, C). A, C habitus, dorsal view B habitus, dorso-lateral view.

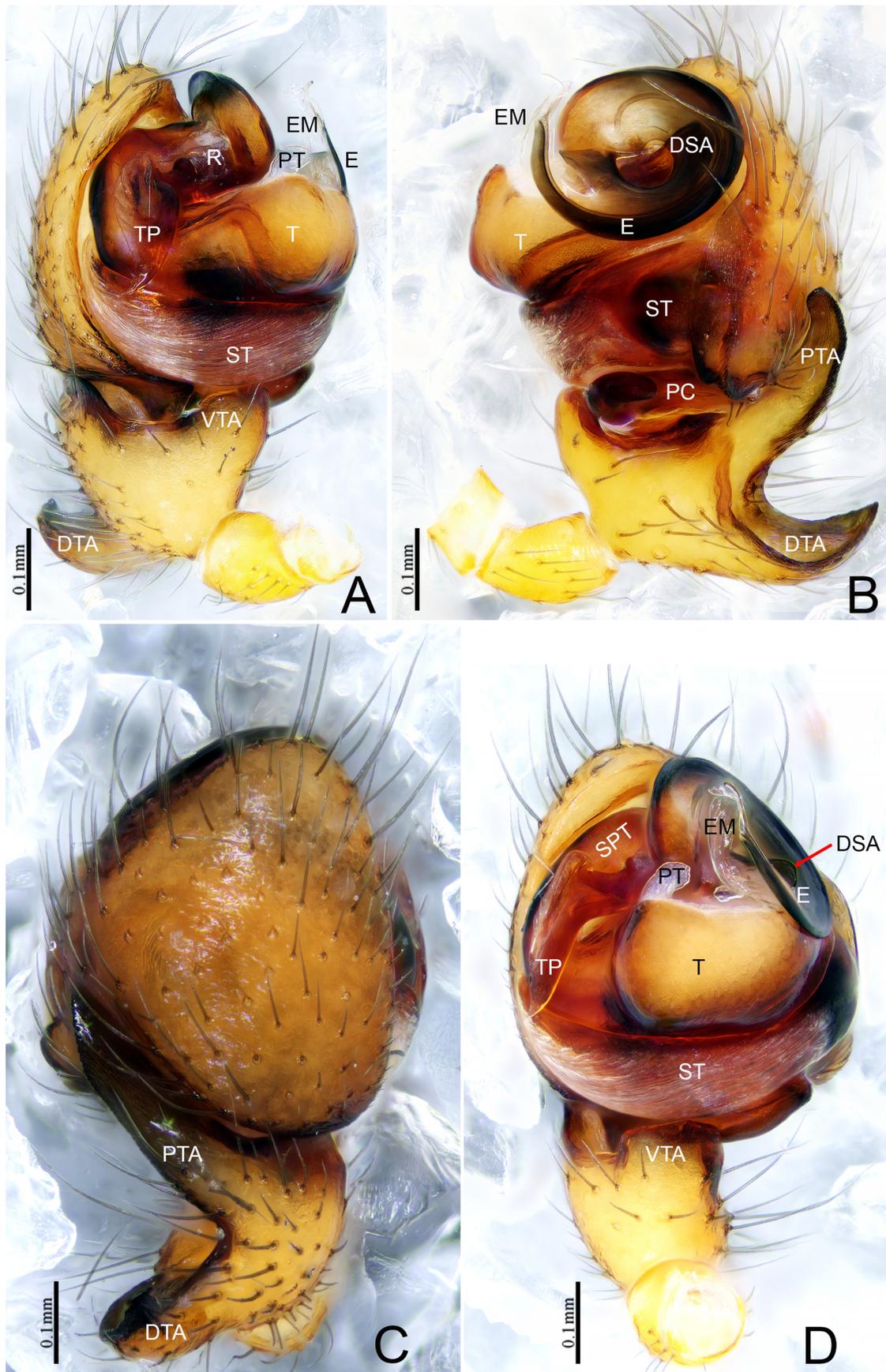


FIGURE 24. *Walckenaeria hongqiensis* sp. nov., male holotype, left palp. **A** prolateral view **B** retrolateral view **C** dorsal view **D** ventral view.

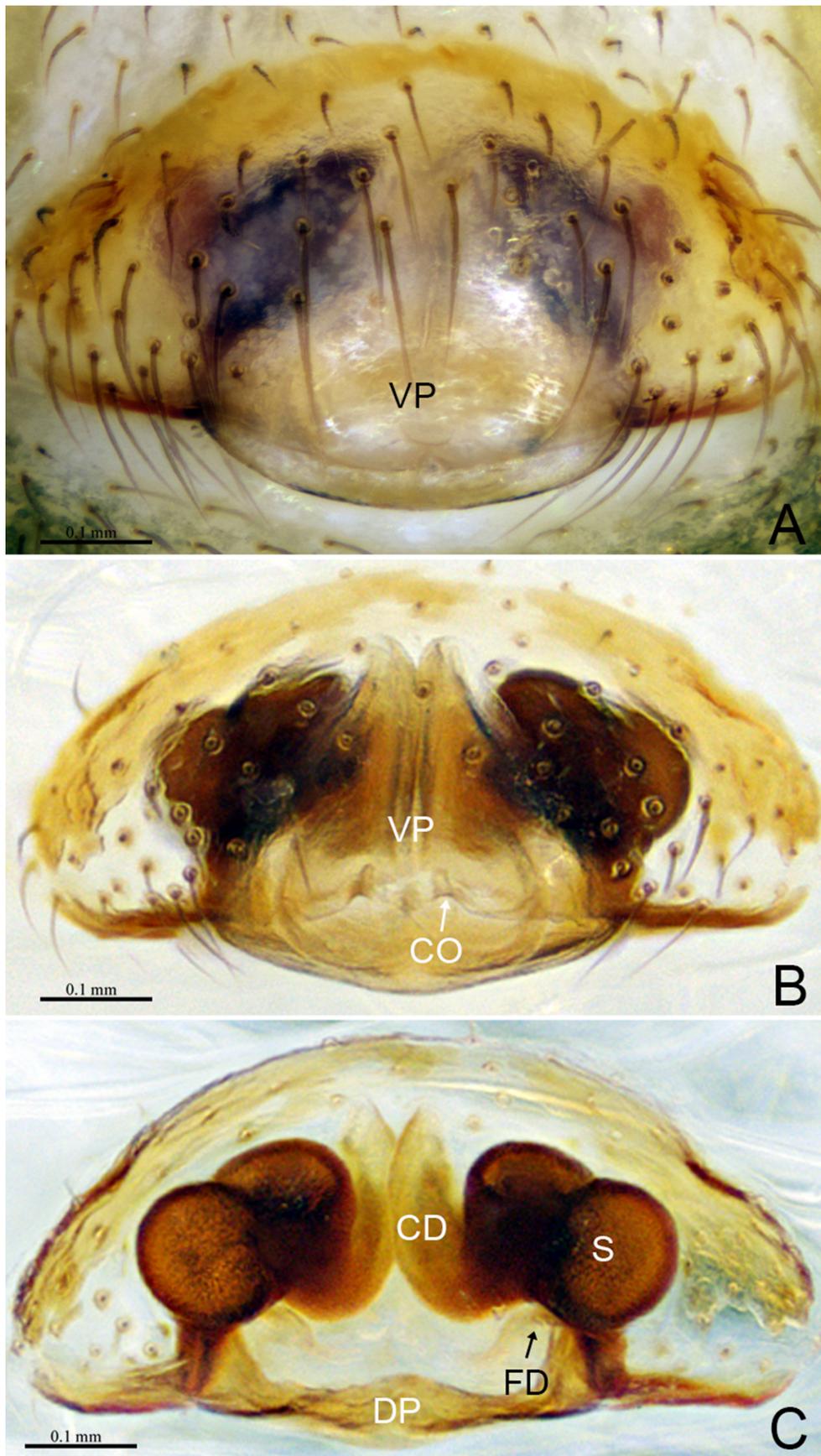


FIGURE 25. *Walckenaeria hongqiensis* sp. nov., female (one of paratypes). A, B Epigyne, ventral view, C Vulva, dorsal view.

Genus *Walckenaeria* Blackwall, 1833 (瓦蛛属)

Type species. *Walckenaeria acuminata* Blackwall, 1833; gender feminine

Remark. *Walckenaeria* comprises 197 species distributed across the globe, including nine species reported from China (WSC, 2023). Out of which 58 species have been described with single sex (33 with female and 25 with male sex).

***Walckenaeria hongqiensis* sp. n. (红旗瓦蛛)**

Figures 24–26

Type material. Holotype male: CHINA: Chongqing, Wuxi County, YNR, Baiguo Linchang, Mao Xuanwo, 31°29'25.02"N, 109°47'35.41"E, elev. 2010 m, 11.IV.2022, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-33-01). **Paratype:** 1 female, Wuxi County, YNR, Baiguo Linchang, Hongqi Management and Protection Station, 31°31'22.19"N, 109°49'36.80"E, elev. 1194 m, 10.IV.2022, Z.S. Zhang *et al.* leg. (SWUC-T-LIN-33-02).

Etymology. This epithet derives from the type locality.

Diagnosis. *Walckenaeria hongqiensis* sp. n. resembles *W. ferruginea* Seo, 1991 in having the similar copulatory organs (Figs 24A–D, 25A–C; Song & Li 2011, figs 6A–G, 7A–G), but can be distinguished by the dorsal tibial apophysis present in *W. hongqiensis* sp. n. (Fig. 24B, C), vs., dorsal tibial apophysis absent in *W. ferruginea* (Song & Li 2011, fig. 6D, G); distal suprategular apophysis protruding above the embolus in *W. hongqiensis* sp. n. (Fig. 24B, D), vs., retained below the embolus in *W. ferruginea* (Song & Li 2011, fig. 6G). Copulatory ducts sinuous in *W. hongqiensis* sp. n. (Fig. 25C), vs., straight in *W. ferruginea* (Song & Li 2011, fig. 7A, B); spermathecae located mid-dorsally in *W. hongqiensis* sp. n. (Fig. 25C), vs., anteriorly in *W. ferruginea* (Song & Li 2011, fig. 7A, B).

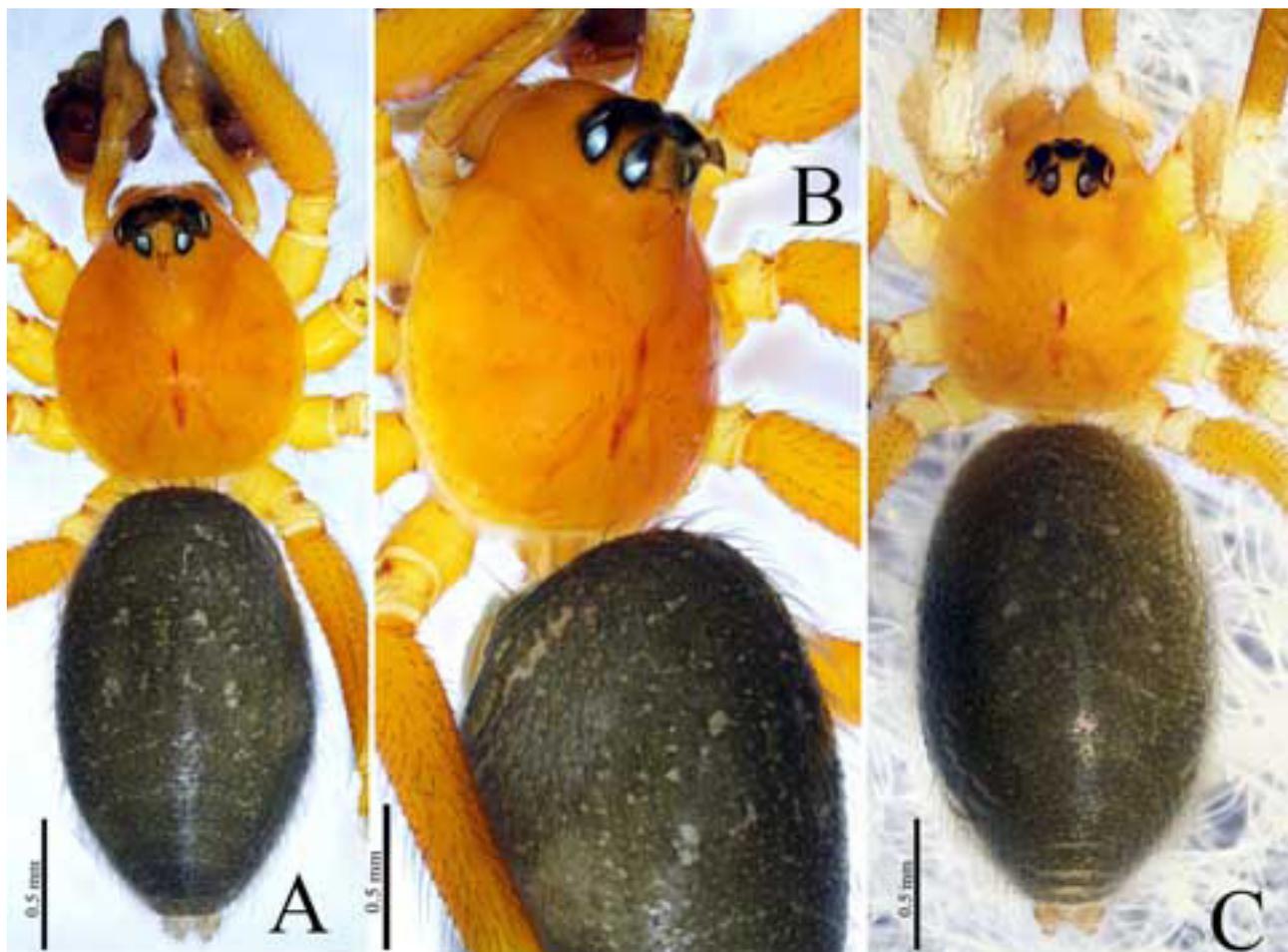


FIGURE 26. *Walckenaeria hongqiensis* sp. nov., male holotype (A, B) and female (one of paratype, C). **A, C** habitus, dorsal view **B** habitus, dorso-lateral view.



FIGURE 27. Location of Yintiaoling National Nature Reserve.

Description. Male (holotype, Fig. 26A, B): Total length 2.91. Carapace 1.19 long, 0.89 wide, orange, slightly elevated, with pair of small bird's wing-shaped macrosetae covering the PMEs, followed by thumb-shaped projection located between PMEs. Clypeus 0.18 high. Chelicerae with 4 promarginal and 5 retromarginal teeth. AER recurved, PER procurved slightly wider than AER. Eye sizes and interdistances: AME 0.05, ALE 0.08, PME 0.05, PLE 0.09, AME–AME 0.02, PME–PME 0.12, AME–ALE, 0.04, PME–PLE 0.06, AME–PME 0.16, ALE–ALE 0.33, PLE–PLE 0.34, ALE–PLE 0.01. Length of legs: I 4.52 (1.29, 1.53, 1.02), II 4.2 (1.23, 1.43, 0.91, 0.63), III 3.42 (0.91, 1.17, 0.77, 0.57), IV 4.62 (1.34, 1.57, 1.06, 0.65). TmI 0.48. Abdomen 1.72 long, 1.09 wide, oval, greenish-grey, with irregular patches.

Palp (Fig. 24A–D): Patella 2 times shorter than tibia; tibia broadened distally, cone-shaped, with 2 retrolateral trichobothria, tibia with three tibial apophyses, forming acute angle, dorsal tibial apophysis ventrally grooved, triangular, prolateral tibial apophysis long, apex curved with scaly inner surface, directed anteriorly, ventral tibial apophysis rectangular with blunt end; paracymbium J-shaped, distal arm hook-shaped; protégulum transparent with round margin; distal suprategular apophysis slightly grooved, protruding above the embolus with pointed tip. Radix swollen; embolus form complete circle; embolic membrane running along embolus; tailpiece broad at base, abruptly narrowed to a pointed dorsal-curved apex.

Female (paratype, Fig. 26C): Total length: 2.94. Carapace 1.16 long, 0.91 wide, orange, fovea, cervical and radial grooves distinct. Clypeus 0.17 high. Chelicerae with 4 promarginal and 5 retromarginal teeth. AER recurved, PER procurved, slightly wider than AER. Eye sizes and interdistances: AME 0.06, ALE 0.09, PME 0.08, PLE 0.09, AME–AME 0.01, PME–PME 0.08, AME–ALE, 0.01, PME–PLE 0.03, AME–PME 0.08, ALE–ALE 0.28, PLE–PLE 0.31, ALE–PLE contiguous. Length of legs: I 4.43 (1.28, 1.44, 0.95, 0.67), II 4.05 (1.22, 1.34, 0.86, 0.63), III 3.52 (1.12, 1.07, 0.79, 0.54), IV 5.03 (1.83, 1.48, 1.03, 0.69). TmI 0.24 and TmIV 0.19. Abdomen 1.31 long, 0.75 wide, oval, greenish-grey, with irregular patches.

Epigyne (Fig. 25A–C): Dorsal plate partly visible in ventral view and elliptical in posterior view. Copulatory openings present at junction of dorsal and ventral plate. Vulva: copulatory ducts sinuous, forming 3 turns before entering spermathecae. Spermathecae round, located anteriorly, separated from each other by about diameter, fertilization ducts long, extending mesally.

Distribution. Known only from the type locality.

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