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Research article

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Four new species of the genus *Psechrus* Thorell, 1878 (Araneae: Psechridae) from Yunnan Province, China

Run CHEN¹   & Zi-Zhong YANG^{2,*}  

^{1,2}Yunnan Provincial Key Laboratory of Entomological Biopharmaceutical R & D,
Dali University, Dali 671000, China.

*Corresponding author: yangzzh69@163.com

¹ Email: crun01@163.com

Abstract. Four new species of the genus *Psechrus* Thorell, 1878 are described from Yunnan Province, China: *Psechrus luopingensis* sp. nov. (♂♀), *P. mingshengi* sp. nov. (♂♀), *P. cornutus* sp. nov. (♂♀) and *P. cordatus* sp. nov. (♂♀). Detailed morphological descriptions, photographs of living specimens, and a distribution map of the new species are provided.

Keywords. Lace-sheet weavers, spider diversity, Southwest China, morphology, taxonomy.

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Introduction

The spider family Psechridae Simon, 1890 currently comprises only two genera and 66 species worldwide (World Spider Catalog 2026). Of these, *Fecenia* Simon, 1887 includes four species, while *Psechrus* Thorell, 1878 contains 62 species. Members of the genus *Psechrus* are relatively common in suitable habitats across tropical and subtropical Asia. Field investigations indicate that these spiders typically inhabit cool, shaded environments, constructing their webs in relatively open forests, along mountain roadsides, in rock crevices, and in synanthropic environments such as rural dwellings and abandoned buildings. These spiders exhibit considerable ecological plasticity, often modifying their web architecture in response to environmental conditions. Their webs are generally extensive, medium- to large-sized, slightly dome-shaped sheet webs (Fig. 1E–F), which has earned them the common name ‘lace-sheet weavers’ (Bayer 2012; Feng *et al.* 2016). The distal portion of the web usually forms a tubular retreat connected to deep crevices or cavities. During the day, individuals typically remain concealed within these retreats, emerging at night to suspend themselves upside down on the web surface to await prey. When disturbed, they rapidly retreat into their shelters (Omelko & Fomichev 2023).

In China, the family Psechridae is represented by two genera and 19 species, comprising one species of *Fecenia* Simon, 1887 and 18 species of *Psechrus* Thorell, 1878 (Yin *et al.* 1985; Song *et al.* 1999; Wang & Yin 2001; Yang *et al.* 2003; Bayer 2012, 2014; Feng *et al.* 2012, 2016; Hu 2025). Multi-year

surveys conducted in southwestern China have recorded 11 species of Psechridae from Yunnan Province: *Fecenia cylindrata* Thorell, 1895, *Psechrus kunmingensis* Yin, Wang & Zhang, 1985, *P. changminae* Feng *et al.*, 2016, *P. conicus* Feng *et al.*, 2016, *P. discoideus* Feng *et al.*, 2016, *P. spatulatus* Feng *et al.*, 2016, *P. fuscai* Bayer, 2012, *P. ghecuanus* Thorell, 1897, *P. senoculatus* Yin, Wang & Zhang, 1985, *P. inflatus* Bayer, 2012, and *P. triangulus* Yang *et al.*, 2003. These records account for approximately 57.9% of the species known from China, highlighting Yunnan Province as the most species-rich region for Psechridae in the country. Despite this relatively high documented diversity, we consider that additional undescribed species are likely to occur in this region.

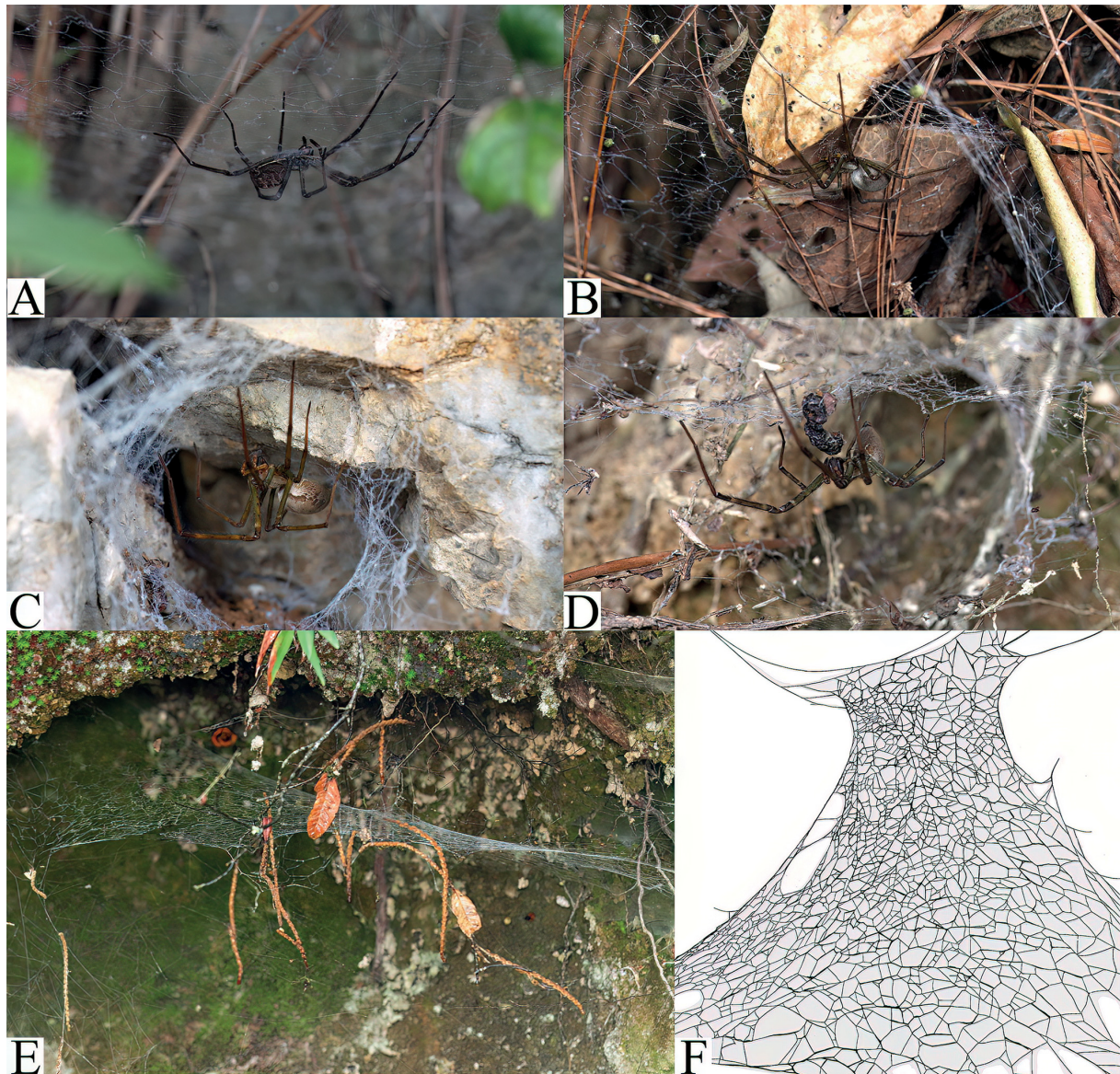


Fig. 1. Photos of living specimens and webs in the field. **A.** *Psechrus cordatus* sp. nov., juvenile. **B.** *Psechrus mingshengi* sp. nov., subadult ♂. **C.** *Psechrus luopingensis* sp. nov., subadult ♀. **D.** *Psechrus cornutus* sp. nov., juvenile. **E.** Horizontal sheet web of *Psechrus* sp. **F.** Illustration of the sheet web of *Psechrus* sp. (drawing by Yu-Jun Cai).

Material and methods

All examined specimens are preserved in 80% ethanol. The holotypes and paratypes are deposited in the Institute of Entomology & Bio-medicine, Dali University (DUIER), China.

Voucher specimens collected in 2025 are identified by collection numbers following the format: province + county + year + month + serial number (e.g., YNLC-25-0301). Catalog numbers are formatted as: county abbreviation + year + serial number (e.g., LC2501). For older specimens, original collection codes are retained (e.g., YY1501, LCh01).

All specimens were collected as juveniles or subadults and reared to maturity under laboratory conditions. Habitat photographs were taken in the field using a Canon EOS 90D DSLR camera equipped with a Canon EF 100 mm macro lens. Specimens were examined and measured using Motic SMZ-171 and Olympus SZX-16 stereo microscopes. Measurements are given in millimeters (mm). Total body length is provided excluding chelicerae and palps. The left palp and legs were removed for measurements. Epigynes were excised and cleared in a 10% NaOH solution for 6–10 hours to remove soft tissues prior to examination of the vulvae.

Photomicrographs were taken using a Leica M205A stereo microscope equipped with a Leica DMC 5400 digital camera and LAS X software. Images were stacked using the integrated extended-focus module. Digital illustrations were produced using Procreate (ver. 5.4.8) on an iPad Air. The distribution map was generated with ArcGIS 10.8 based on georeferenced locality data. Final plates were prepared in Adobe Photoshop. All measurements are provided in millimetres (mm).

Morphological terminology, particularly for the male palps and female genitalia, follows Bayer (2012, 2014). Following the conservative approach of Bayer (2012), the term ‘retrolateral tibial apophysis’ (RTA) is not employed for the tibial structures of the male palp, as their homology with the true RTA of other RTA-clade members remains unproven; instead, these structures are herein referred to as ‘retrolateral tibial processes’ or ‘protrusions’. Terminology for somatic morphology and the format of measurements follow Feng *et al.* (2016) and Zhao *et al.* (2021). Eye nomenclature follows standard spider taxonomy.

Abbreviations

ALE	=	anterior lateral eye
AME	=	anterior median eye
a.s.l.	=	above sea level
C	=	conductor
CD	=	copulatory duct
CO	=	copulatory opening
CS	=	cymbium scopula
E	=	embolus
EB	=	embolus base
EF	=	epigynal field
EM	=	epigynal muscle sigilla
FD	=	fertilisation duct
LL	=	lateral lobe
MS	=	median septum
PLE	=	posterior lateral eye
PME	=	posterior median eye
SD	=	sperm duct
SH	=	spermathecal head
SO	=	slit sense organ

Sp = spermatheca
ST = subtegulum
T = tegulum
I, II, III, IV = legs I to IV

Results

Class Arachnida Lamarck, 1801

Order Araneae Clerck, 1757

Family Psechridae Simon, 1890

Genus *Psechrus* Thorell, 1878

Fig. 2

Diagnosis

For description and diagnosis of the genus see Bayer (2012).

sinensis group

For description and diagnosis of the *sinensis* group see Bayer (2012: 96–97). All four new species described in the present study belong to the *sinensis* group.

Psechrus mingshengi sp. nov.

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Figs 1B, 3–6, 19; Table 1

Diagnosis

The new species belongs to the *sinensis* group and is most similar to *P. discoideus* Feng *et al.*, 2016 (see Feng *et al.* 2016: 191–193, figs 9–11) in the morphology of the male palp and female epigyne, but can be distinguished by the following combination of characters: palp with the prolateral tuberculate extension of the conductor prominent and auriform (vs extension discoid in *P. discoideus*); conductor oriented perpendicularly to the bulb in ventral view, possessing a dorsal mid-projection with a flattened, lamellar tip (vs projection absent in *P. discoideus*); embolus broad and flat-lamellar, tightly appressed to the conductor (vs narrower, needle-like, and separated from the conductor by a distinct gap in *P. discoideus*); sperm duct straight, with the embolus base positioned closer to the conductor (vs curved, with the embolus base more distant from the conductor in *P. discoideus*) (Fig. 3A–B, D); epigyne with the median septum nearly rectangular (vs subrectangular with lateral shoulders and a broad, trapezoidal outline, giving a ‘strongman’s back’ appearance in *P. discoideus*); copulatory openings laterally oriented and relatively large (vs smaller and differently oriented in *P. discoideus*). The female epigyne also resembles that of *P. spatulatus* Feng *et al.*, 2016 (see Feng *et al.* 2016: 194–197, figs 12–14) in general morphology, but differs in the presence of a distinct dorsal atrial chamber connecting to the copulatory ducts, and in having elongate spermathecal heads which are approximately twice the diameter of the spermatheca (vs shorter in *P. spatulatus*) (Fig. 5D, F).

Etymology

The specific epithet is a patronym honoring the late Professor Ming-Sheng Zhu (Hebei University, China), in recognition of his outstanding contributions to Chinese arachnology.

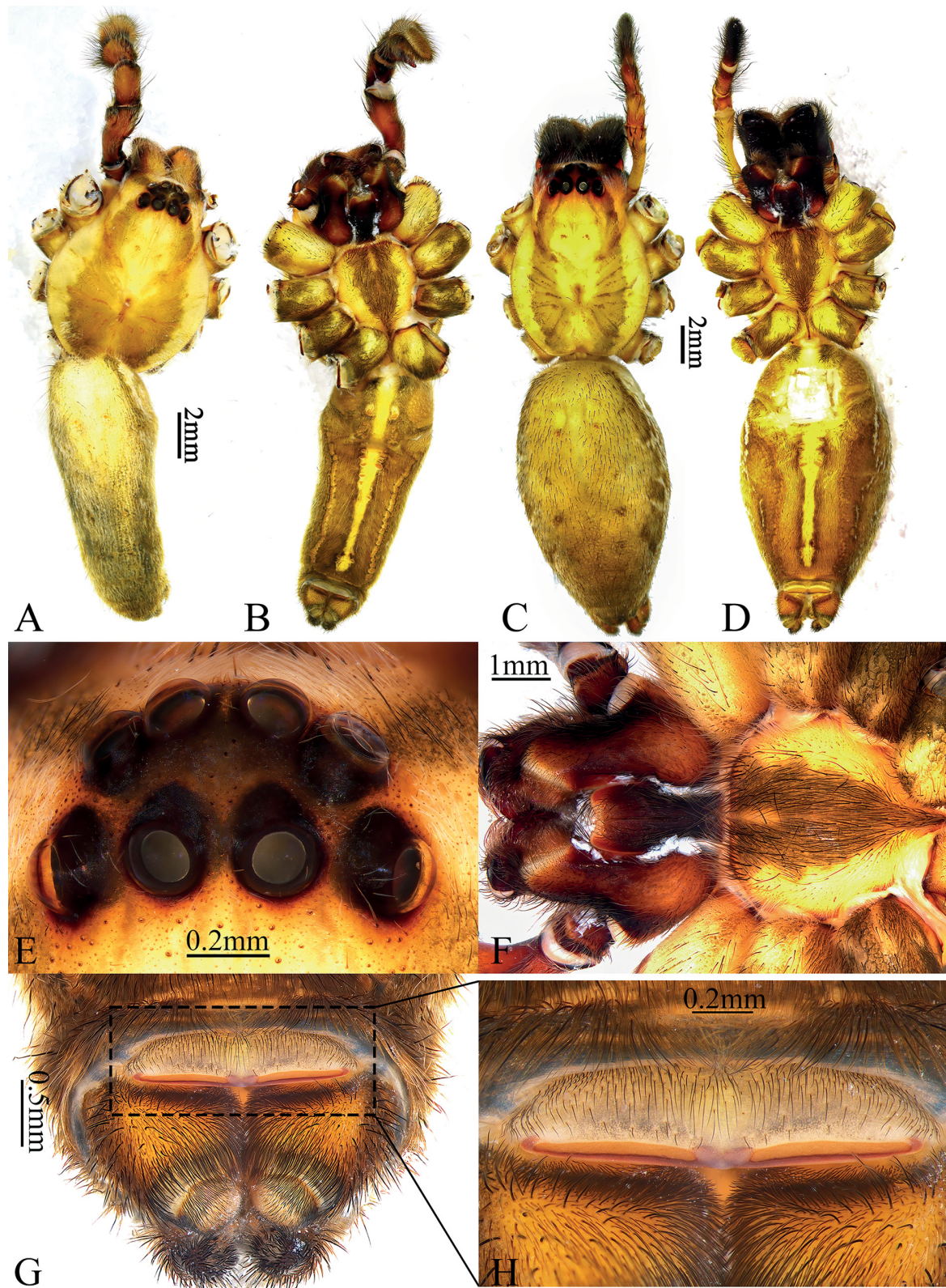


Fig. 2. Morphological characters of the genus *Psechrus* Thorell, 1878; *Psechrus luopingensis* sp. nov., paratypes. **A.** Male habitus (DUIER LP2503), dorsal view. **B.** Same, ventral view. **C.** Female habitus (DUIER LP2507), dorsal view. **D.** Same, ventral view. **E.** Eye field (DUIER LP2505). **F.** Labium and sternum (DUIER LP2508). **G.** Spinnerets (DUIER LP2505). **H.** Cribellum.

Type material

Holotype

CHINA • ♂; Yunnan Province, The Martyrs' Cemetery of Lüchun County, Honghe Hani and Yi Autonomous Prefecture; 22°59'38" N, 102°26'29" E; 1821.67 m a.s.l.; 6 Mar. 2025; Run Chen and Hong-Qiang Dai leg.; collection YNLC-25-0301; DUIER, LC2501.

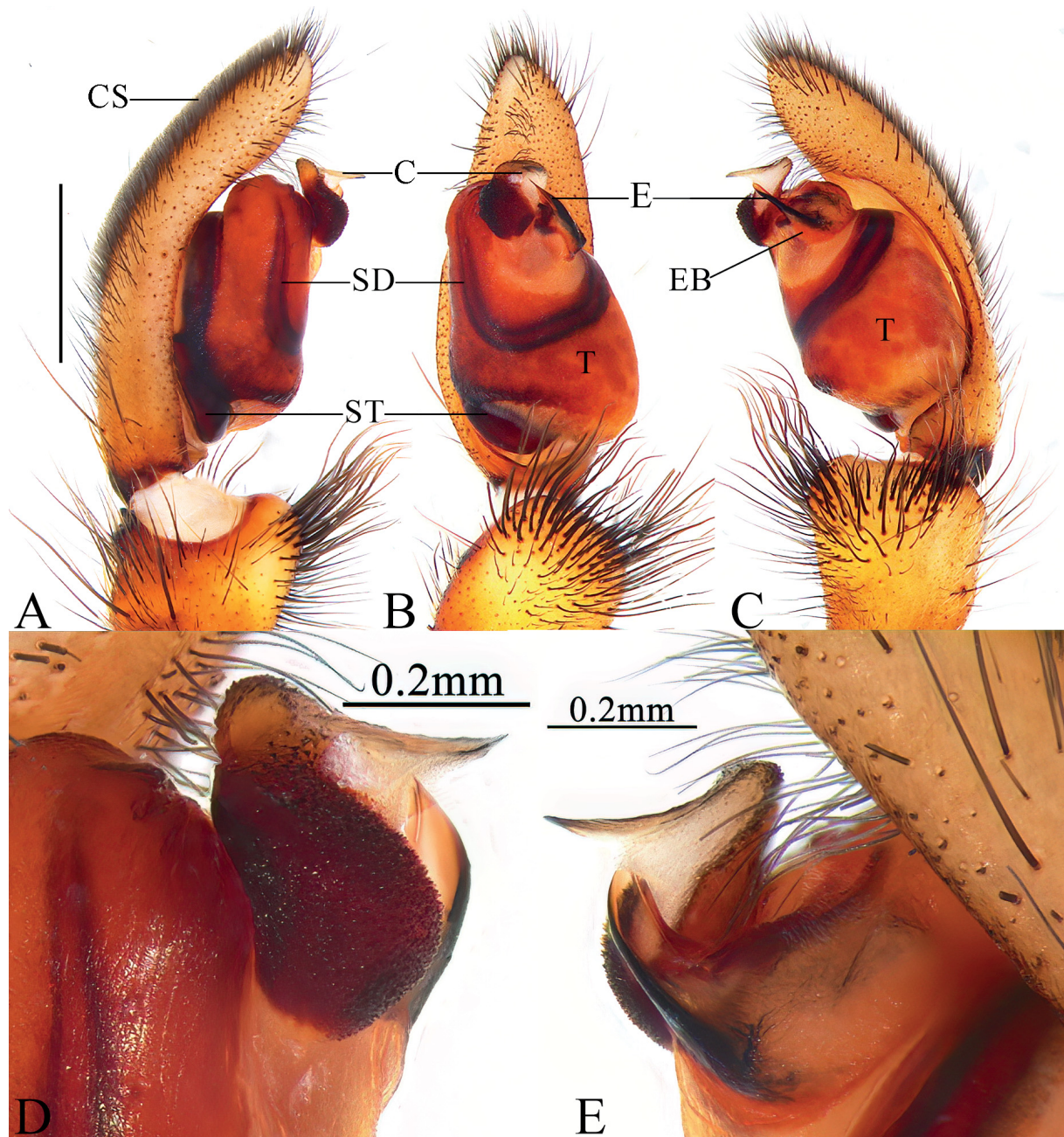


Fig. 3. *Psechrus mingshengi* sp. nov., holotype, ♂ (DUIER LC2501), left palp. A. Prolateral view. B. Ventral view. C. Retrolateral view. D. Conductor. E. Embolus. Abbreviations: see Material and methods. Scale bars = A–C = 1 mm.

Paratypes

CHINA • 4 ♂♂; same data as for holotype; collection YNLC-25-0301; DUIER LC2502–LC2505 • 3 ♀♀; same data as for holotype; collection YNLC-25-0301; DUIER LC2506–LC2508 • 2 ♀♀; Yunnan Province, near the Yuanyang Terraced Fields Scenic Area, Yuanyang County, Honghe Hani and Yi Autonomous Prefecture; 23°7'17.14" N, 102°46'59.10" E; 1885 m a.s.l.; 18 May 2015; Zi-Zhong Yang leg.; DUIER, YY1501, YY1502.

Other material examined

CHINA • 1 ♀; Yunnan Province, 44 km along the road from Lüchun County to Pinghe Village, Jinping County, Honghe Hani and Yi Autonomous Prefecture; 22°58'02.7" N, 102°27'49.3" E; 1880 m a.s.l.; 28 Jul. 2004; Zi-Zhong Yang leg.; DUIER, LCh01 • 1 ♀; Yunnan Province, Junzi Mountain, Shizong County, Qujing City; 24°37'57.6" N, 104°09'29.4" E; 2280 m a.s.l.; 3 Aug. 2008; Yu-Long Wang and Ben-Yong Mao leg.; DUIER, SiZ04 • 1 ♀; Yunnan Province, The Martyrs' Cemetery of Lüchun County, Honghe Hani and Yi Autonomous Prefecture; 22°59'21.7" N, 102°26'52.7" E; 1930 m a.s.l.; 27 Jul. 2004; Zi-Zhong Yang leg.; DUIER, LCh02 • 2 juvs; same data as for preceding; DUIER, LCh03, LCh04 • 3 ♀♀; Yunnan Province, Fenshuiling Nature Reserve, Jinping County, Honghe Hani and Yi Autonomous Prefecture; 22°54'09.5" N, 103°13'54.5" E; 1560 m a.s.l.; 24 Jul. 2006; Zi-Zhong Yang leg.; DUIER, JP01 to JP03.

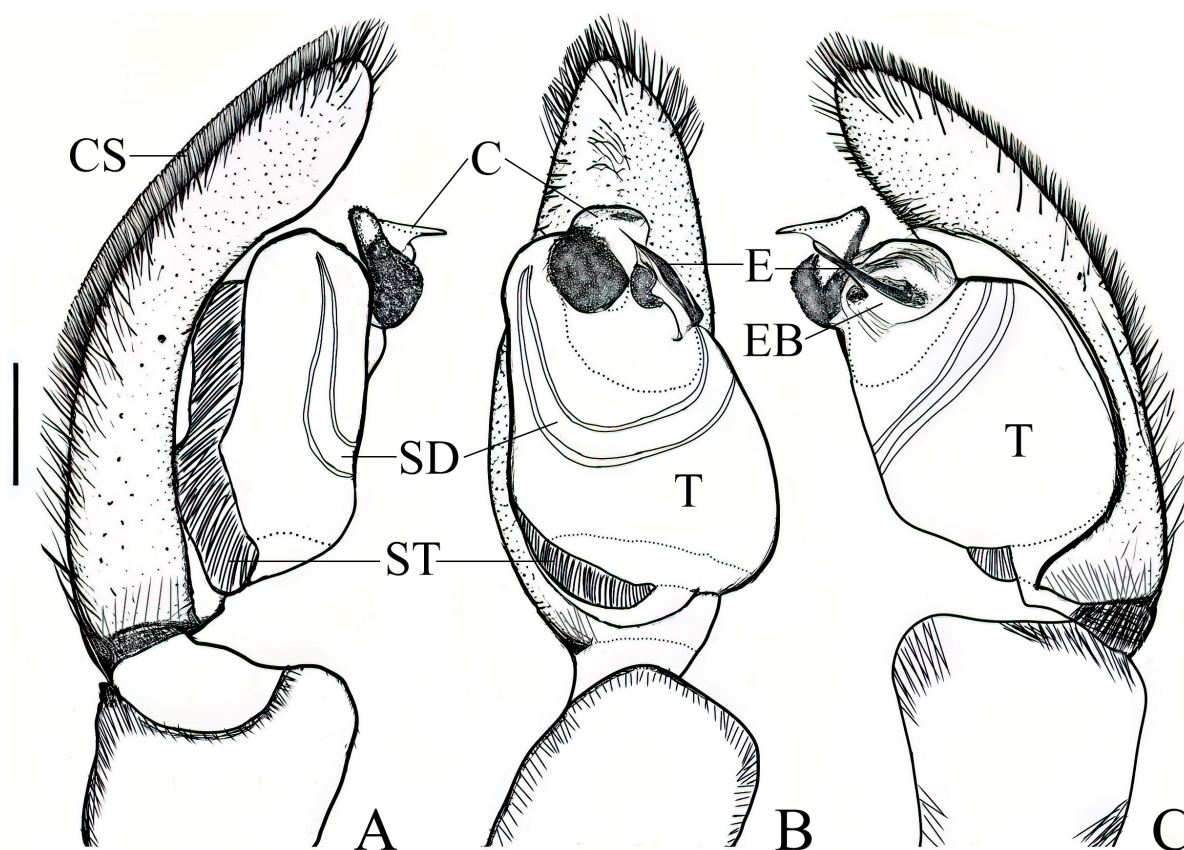


Fig. 4. *Psechrus mingshengi* sp. nov., holotype, ♂ (DUIER LC2501), left palp, line drawings. **A.** Prolateral view. **B.** Ventral view. **C.** Retrolateral view. Abbreviations: see Material and methods. Scale bar = 0.5 mm.

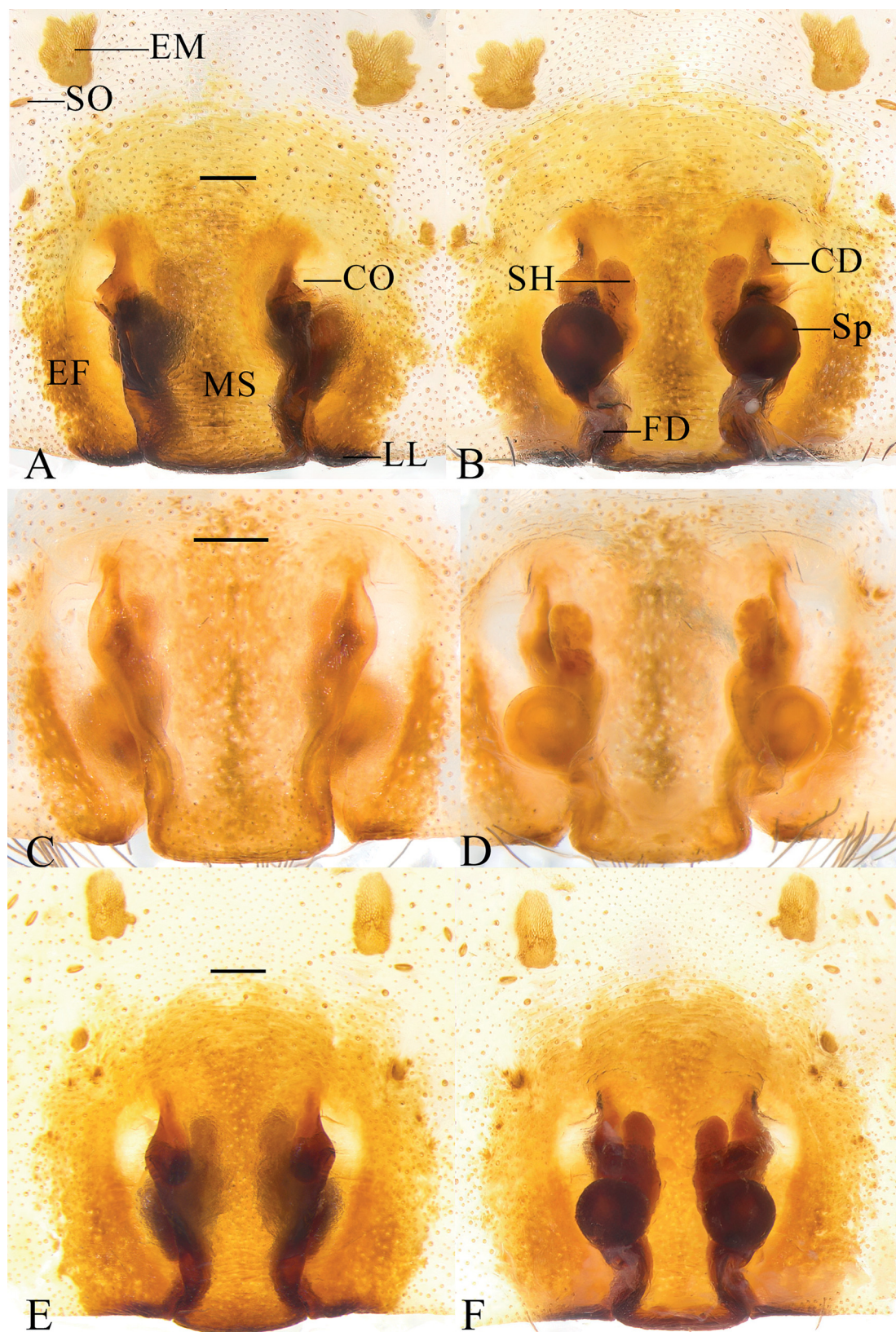


Fig. 5. *Psechrus mingshengi* sp. nov., paratype, ♀♀ (DUIER LC2506, LC2507, YY1502). **A, C, E.** Epigyne ventral views. **B, D, F.** Vulva dorsal views. Abbreviations: see Material and methods. Scale bars = 0.2 mm.

Description

Male (holotype, DUIER LC2501; see Figs 3–4)

MEASUREMENTS. Total length 32.25; prosoma length 13.89, width 10.79; opisthosoma length 18.36, width 9.11.

EYES. Eye diameters: AME 0.42, ALE 0.41, PME 0.45, PLE 0.43. Eye interdistances: AME–AME 0.17, AME–ALE 0.05, PME–PME 0.17, PME–PLE 0.21, AME–PME 0.26, ALE–PLE 0.15. Clypeus height at AME 0.79.

PROSOMA. Yellowish-brown; ocular area slightly darker, reddish-brown. Fovea longitudinal; radial furrows distinct. Carapace with a well-defined brown median longitudinal band extending from posterior eye row to posterior margin, flanked by irregular dark striae. Chelicerae brown and robust, densely covered with fine setae; promargin with 3 teeth, retromargin with 4 large, closely spaced teeth. Sternum suboval, with a V-shaped brown patch medially; surface covered with black setae. Labium and endites brown, with relatively sparse setae.

OPISTHOSOMA. Dark brown. Dorsum with black markings and spots laterally, and several irregular white longitudinal lines. Ventral side dark brown, with a slender, distinct, white median stripe, flanked by two rows of small, indistinct muscle sigilla.

LEGS. Yellowish-brown, without spots or annuli. Leg formula: 1243. Measurements of palp and legs as shown in Table 1.

MALE PALP. Tibia with a small, indistinct retrolateral protrusion. Conductor base densely covered with small tubercles; distal projection prominent, with apex flattened and lamellar, oriented nearly perpendicular to tegulum. Embolus flat-lamellar, with its base in close proximity to conductor.

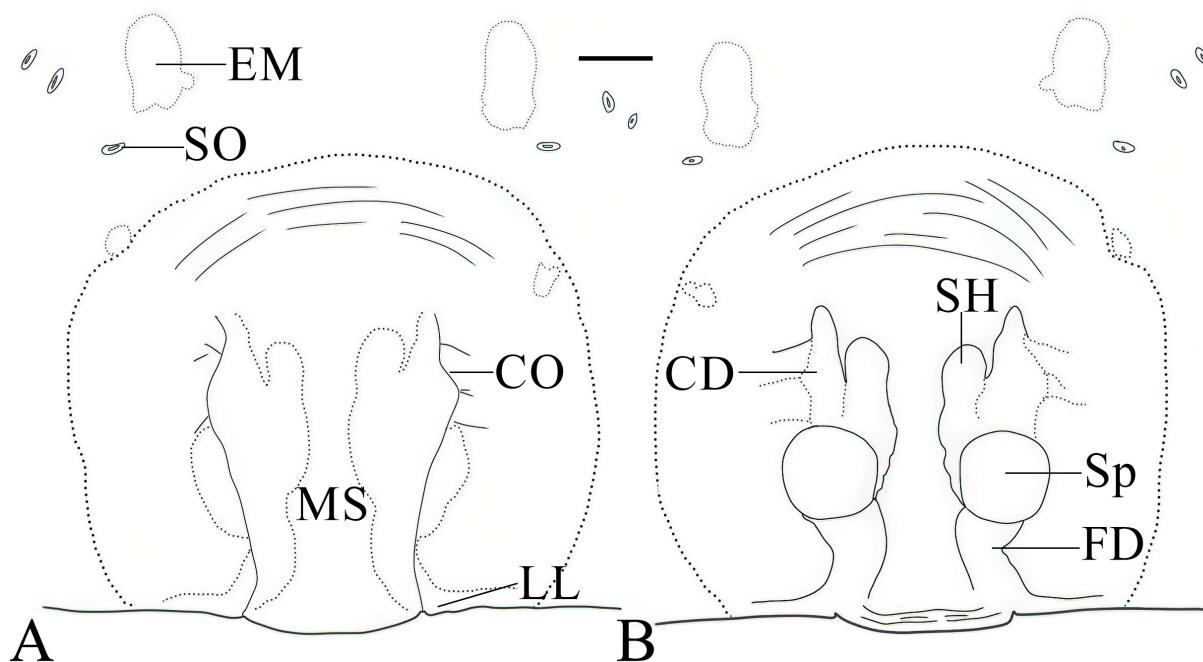


Fig. 6. *Psechrus mingshengi* sp. nov., paratype, ♀ (DUIER YY1502), line drawings. **A.** Epigyne ventral view. **B.** Vulva dorsal view. Abbreviations: see Material and methods. Scale bar = 0.2 mm.

Table 1. Measurements of palp and legs of *Psechrus mingshengi* sp. nov.

Male	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	3.74	1.40	1.27	–	3.94	10.35
I	14.36	2.65	16.32	14.95	6.46	54.74
II	11.44	2.80	11.72	10.94	5.19	42.09
III	8.25	2.06	6.72	7.13	3.86	28.02
IV	11.52	2.30	10.83	11.53	5.56	41.74
Female	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	2.98	0.95	1.39	–	2.71	8.03
I	10.50	2.51	11.96	10.46	5.23	40.66
II	9.14	2.30	8.80	7.81	4.16	32.21
III	6.61	1.70	5.14	5.28	2.94	21.67
IV	9.40	2.11	8.41	8.70	4.27	32.89

Female (paratype, DUIER LC2506; see Figs 5–6)

MEASUREMENTS. Total length 24.93; prosoma length 11.97, width 9.51; opisthosoma length 12.96, width 6.85.

EYES. Eye diameters: AME 0.42, ALE 0.45, PME 0.44, PLE 0.45. Eye interdistances: AME–AME 0.15, AME–ALE 0.10, PME–PME 0.37, PME–PLE 0.35, AME–PME 0.44, ALE–PLE 0.33. Clypeus height at AME 0.74.

SOMATIC CHARACTERS. Similar to male, but generally darker. Prosoma dark brown. Sternum with a dark brown V-shaped patch medially. Labium and endites reddish-brown, with denser setae than in male. Muscle sigilla on ventral side of opisthosoma larger and more distinct than in male. Other characters as in male.

EPIGYNE. The epigyne is approximately as long as wide, or slightly wider than long. Muscle sigilla and slit sense organ situated well away from the epigynal field; slit sense organs number 2–6. Median septum elongate, inversely trapezoidal, shield-shaped in outline, bearing a small lateral projection on each side at approximately two-thirds of its length; lateral lobes indistinct. Copulatory openings large. Copulatory ducts bearing a distinct atrial chamber. Spermathecal heads arising directly from the spermathecal base (not from the copulatory ducts), elongate and club-shaped, approximately 1.5–2 times the diameter of the spermathecal base.

Distribution

Lüchun County, Jinping County, Yuanyang County and Shizong County, Yunnan Province, China.

Psechrus luopingensis sp. nov.

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Figs 1C, 2, 7–10, 19; Table 2

Diagnosis

The new species belongs to the *sinensis* group and most closely resembles *P. obtectus* Bayer, 2012 (see Bayer 2012: 106, fig. 57a–c) and *P. jinggangensis* Wang & Yin, 2001 (see Zhao *et al.* 2021: 5–7, figs 1–3) in the morphology of the male palp, and *P. changminae* Feng *et al.*, 2016 (see Feng *et al.* 2016: 181–184, figs 2–5) in the female epigyne, but can be distinguished by the following combination of characters: palp with the sperm duct featuring a distinct conical projection, which has not been found in any other

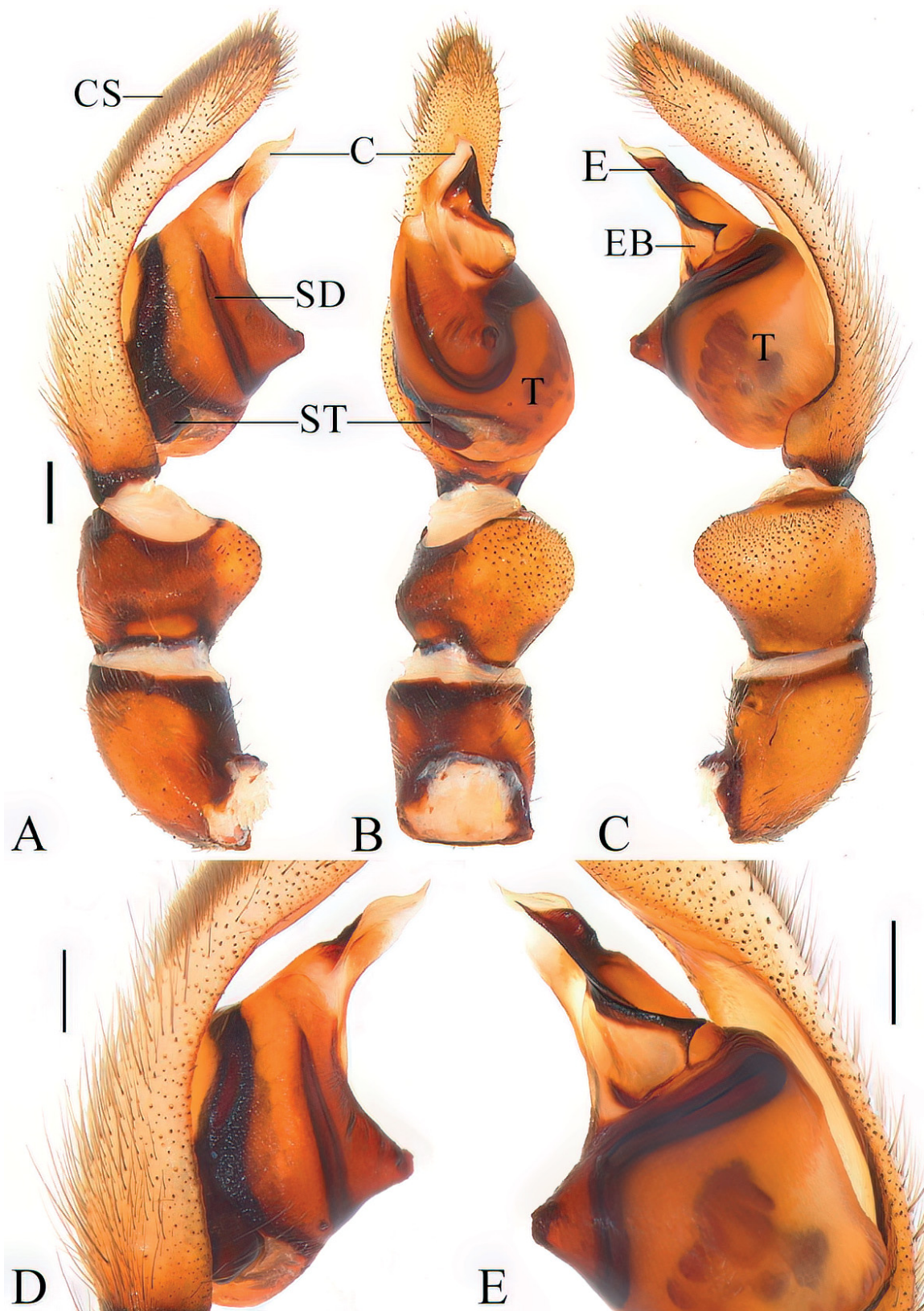


Fig. 7. *Psechrus luopingensis* sp. nov., holotype, ♂ (DUIER LP2501), left palp. **A.** Prolateral view. **B.** Ventral view. **C.** Retrolateral view. **D.** Conductor. **E.** Embolus. Abbreviations: see Material and methods. Scale bars = 0.5 mm.

known members of the *sinensis* group and thus constitutes a distinct diagnostic character for this species (Fig. 7A–D); embolus base with a large triangular projection directed toward the tegulum, occupying about $\frac{1}{2}$ the width of the embolus base (vs projection digitiform or small/indistinct in comparison species); a distinct concavity extending from the embolus base to about $\frac{2}{3}$ of its length (vs absent in both comparison species) (Fig. 7E); epigyne with the muscle sigilla weakly developed and remote from the epigynal field; median septum flask-shaped but with a shorter, broader neck and a wider base (vs neck longer and base narrower in *P. changminae*); dilated portion of the copulatory ducts not reflexed posteriorly (vs reflexed in *P. changminae*); spermatheca separated by more than three times their diameter; and spermathecal heads arising from the mesal bases of the spermatheca (Fig. 9D–E).

Etymology

The specific epithet is a toponym derived from the type locality, Luoping County, Yunnan Province, China; the suffix ‘-ensis’ is a Latin adjectival suffix denoting provenance.

Type material

Holotype

CHINA • ♂; Yunnan Province, Jiulong Waterfall, Luoping County, Qujing City; 25°0′42″ N, 104°24′17″ E; 1221 m a.s.l.; 7 Mar. 2025; Run Chen and Hong-Qiang Dai leg.; collection YNLP-25-0303; DUIER, LP2501.

Paratypes

CHINA • 4 ♂♂; same data as for holotype; collection YNLP-25-0303; DUIER LP2502–LP2505 • 4 ♀♀; same data as for holotype; collection YNLP-25-0303; DUIER LP2506–LP2509 • 2 ♀♀; Yunnan Province,

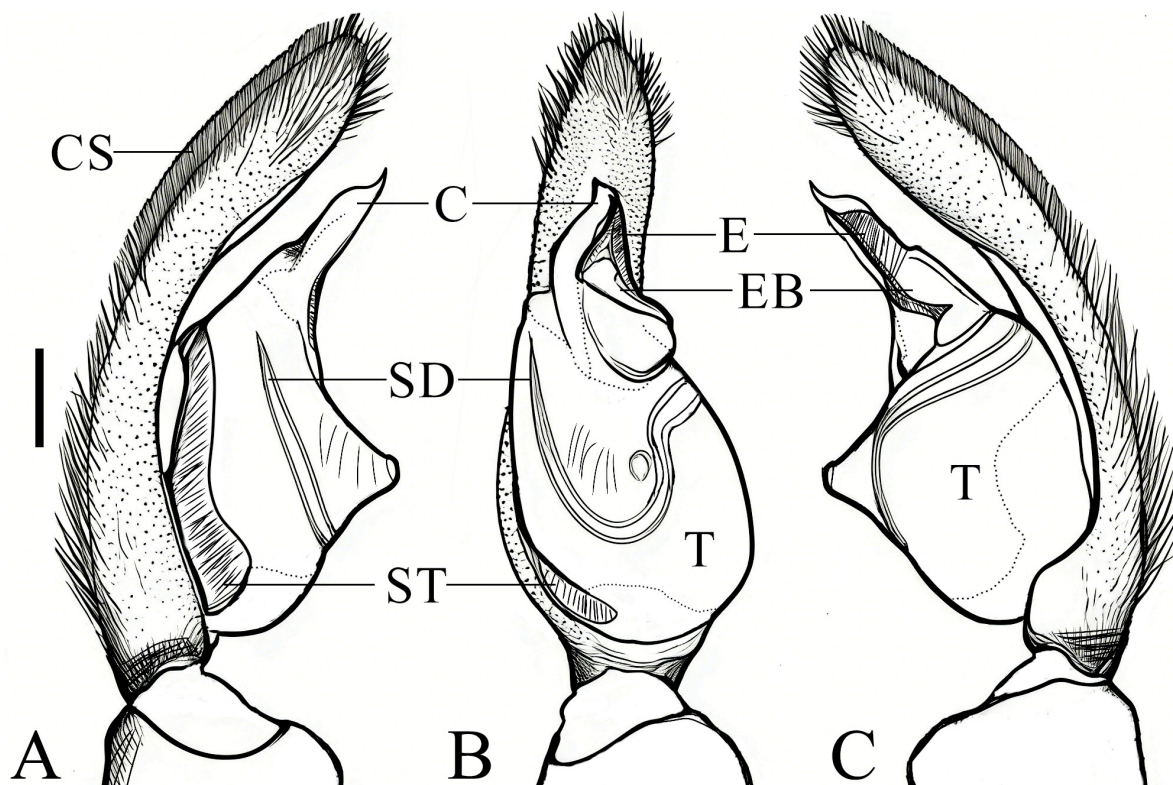


Fig. 8. *Psechrus luopingensis* sp. nov., holotype, ♂ (DUIER LP2501), left palp, line drawings. A. Prolateral view. B. Ventral view. C. Retrolateral view. Abbreviations: see Material and methods. Scale bar = 0.5 mm.

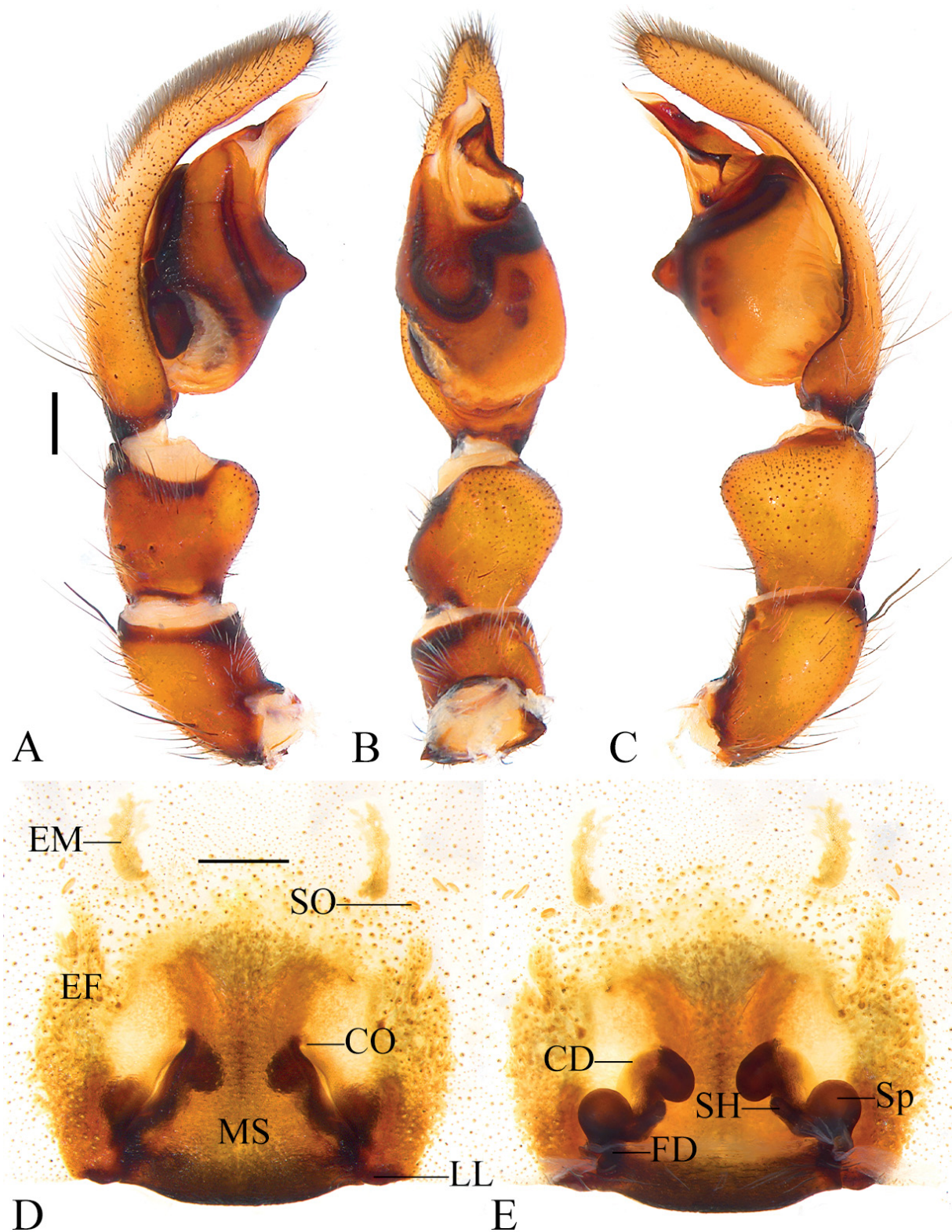


Fig. 9. *Psechrus luopingensis* sp. nov., paratypes. **A–C.** ♂ (DUIER LP2503), left palp. **D–E.** ♀ (DUIER LP2507). **A.** Prolateral view. **B.** Ventral view. **C.** Retrolateral view. **D.** Epigyne, ventral view. **E.** Vulva, dorsal view. Abbreviations: see Material and methods. Scale bars: A–C = 0.5 mm; D–E = 0.25 mm.

Jiulong Waterfall, Luoping County, Qujing City; 25°0'42.6" N, 104°24'16.8" E; 1263 m a.s.l.; 20 Jul. 2012; Ping Feng, Yan-Yan Ma and Ting-Bang Yang leg.; DUIER, LP06, LP07 • 1 ♀; Yunnan Province, Shuanglongying Township, Qiubei County, Wenshan Prefecture; 24°14'56.6" N, 104°10'57.9" E; 1530 m a.s.l.; 21 Jul. 2012; Ping Feng, Yan-Yan Ma and Ting-Bang Yang leg.; DUIER, QB01.

Description

Male (holotype, DUIER LP2501; see Figs 7–8)

MEASUREMENTS. Total length 17.85; prosoma length 7.38, width 7.14; opisthosoma length 10.47, width 3.62.

EYES. Eye diameters: AME 0.42, ALE 0.45, PME 0.47, PLE 0.58. Eye interdistances: AME–AME 0.15, AME–ALE 0.06, PME–PME 0.20, PME–PLE 0.10, AME–PME 0.30, ALE–PLE 0.20. Clypeus height at AME 0.78.

PROSOMA. Grayish-yellow; ocular area reddish-brown. Fovea longitudinal; radial furrows pale. Carapace with a distinct, broad, dark gray median longitudinal stripe extending from between the posterior median eyes to the posterior margin; flanked by irregular black striae or spots. Sternum subcordate, brown, with a distinct suboval black patch medially; patch densely covered with setae; margins of sternum pale. Chelicerae dark brown and robust; promargin with 3 teeth, retromargin with 5 large, closely spaced teeth. Endites and labium reddish-brown; endites with dense promarginal scopulae; labium long trapezoidal, with anterior margin pale and wide, posterior margin dark brown and narrow.

OPISTHOSOMA. Dorsum brown, with dense, irregular gray patterns and spots. Lateral sides with several distinct, irregular white longitudinal lines of varying lengths. Ventral side dark brownish, with a slender white median stripe extending from the pedicel to the spinnerets; flanked by two rows of distinct, regularly arranged, pale muscle sigilla appearing as small pits.

LEGS. The femur to tibia of the legs are dark gray, while the metatarsus and tarsus are reddish-brown, without annuli or spots. Coxa I with short black spines (absent in female). Leg formula: 1243. Measurements of palp and legs as shown in Table 2.

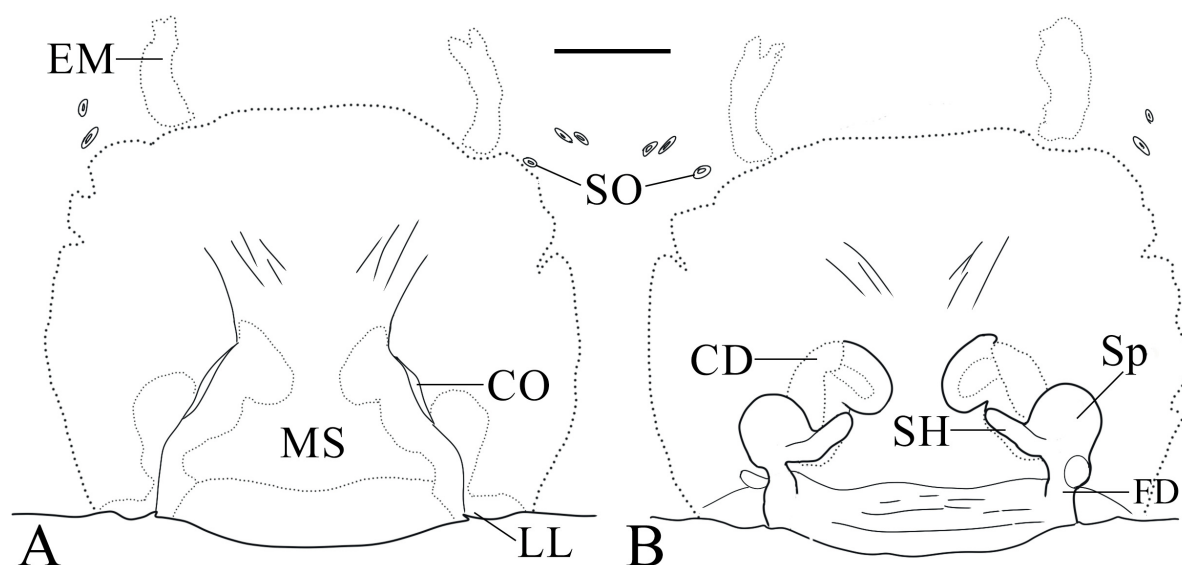


Fig. 10. *Psechrus luopingensis* sp. nov., paratype, ♀ (DUIER LP2507), line drawings. **A.** Epigyne ventral view. **B.** Vulva dorsal view. Abbreviations: see Material and methods. Scale bar = 0.25 mm.

Table 2. Measurements of palp and legs of *Psechrus luopingensis* sp. nov.

Male	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	3.74	1.39	1.27	–	3.94	10.34
I	14.79	3.29	16.00	17.07	6.28	57.43
II	12.14	2.93	12.63	13.14	5.05	45.89
III	9.29	1.98	7.62	8.51	3.82	31.22
IV	12.62	2.58	11.12	13.31	5.26	44.89
Female	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	3.58	1.21	2.09	–	3.87	10.75
I	10.74	2.29	11.18	9.35	4.96	38.52
II	9.45	2.27	9.04	7.68	4.03	32.47
III	6.89	1.55	5.72	5.50	3.06	22.72
IV	9.74	2.13	8.71	8.19	4.32	33.09

MALE PALP. Relatively robust; patella and tibia comparatively short; tibia with a short, digitiform retrolateral process. Tegulum with a distinct conical projection on the outer-mesal surface, situated at the bend of the sperm duct. Conductor membranous and semi-transparent, with a sharply pointed distal tip. Embolus broadly triangular in outline; base with a triangular projection directed toward tegulum; a distinct concavity present at about $\frac{2}{3}$ of its length; distal portion with dense ridged sculpture.

Female (paratype, DUIER LP2507; see Figs 9D–E, 10)

MEASUREMENTS. Total length 23.29; prosoma length 9.71, width 6.98; opisthosoma length 13.58, width 7.65.

EYES. Eye diameters: AME 0.48, ALE 0.53, PME 0.54, PLE 0.56. Eye interdistances: AME–AME 0.18, AME–ALE 0.06, PME–PME 0.18, PME–PLE 0.11, AME–PME 0.31, ALE–PLE 0.19. Clypeus height at AME 0.82.

SOMATIC CHARACTERS. Similar to male but generally darker. Radial furrows dark. Muscle sigilla on the ventral side of opisthosoma smaller and less distinct than in male. Other characters as in male.

EPIGYNE. The epigyne is wider than long. Muscle sigilla and slit sensilla situated outside the epigynal field, separated from each other by a distinct interval; slit sensilla 4–6, positioned at or above the anterior margin of the epigynal field. Median septum elongate-rectangular, flask-shaped in outline; lateral lobes indistinct. Copulatory openings narrow, slit-like. Copulatory ducts with a dilated portion basally, not reflexed posteriorly. Spermathecal heads short, club-shaped, arising from the mesal bases of the spermatheca.

Distribution

Luoping County and Qiubei County, Yunnan Province, China.

Psechrus cornutus sp. nov.

urn:lsid:zoobank.org:act:B580FF29-BB4B-41E8-A158-15216270E73F

Figs 1D, 11–14, 19; Table 3

Diagnosis

The new species belongs to the *sinensis* group and most closely resembles *P. discoideus* Feng *et al.*, 2016 (see Feng *et al.* 2016: 191–193, figs 9–11) in the morphology of the male palp, and both *P. discoideus* and *P. mingshengi* sp. nov. in the female epigyne, but can be distinguished by the following combination of

characters: palp with the prolateral surface of the conductor base having comparatively sparse granules (vs densely covered with minute granules in *P. discoideus*); prolateral extension of the conductor less sclerotized and lacking a disc-shaped dilation (vs more sclerotized and disc-shaped); a distinct concavity present at about $\frac{1}{3}$ of the conductor length from the base in retrolateral view (vs absent in *P. discoideus*); embolus broader, more curved, and horn-shaped in retrolateral view (vs narrower and less curved) (Figs 11A, D, 12C); epigyne with the median septum broadly shield-shaped and wider than long, featuring a large central projection (vs subrectangular with lateral shoulders and a broad, trapezoidal outline, giving a ‘strongman’s back’ appearance in *P. discoideus*; nearly rectangular to subrectangular in *P. mingshengi*); and spermathecal heads short, arising from the copulatory ducts (vs elongate, arising from the spermathecal bases in the compared species) (Fig. 13B, D).

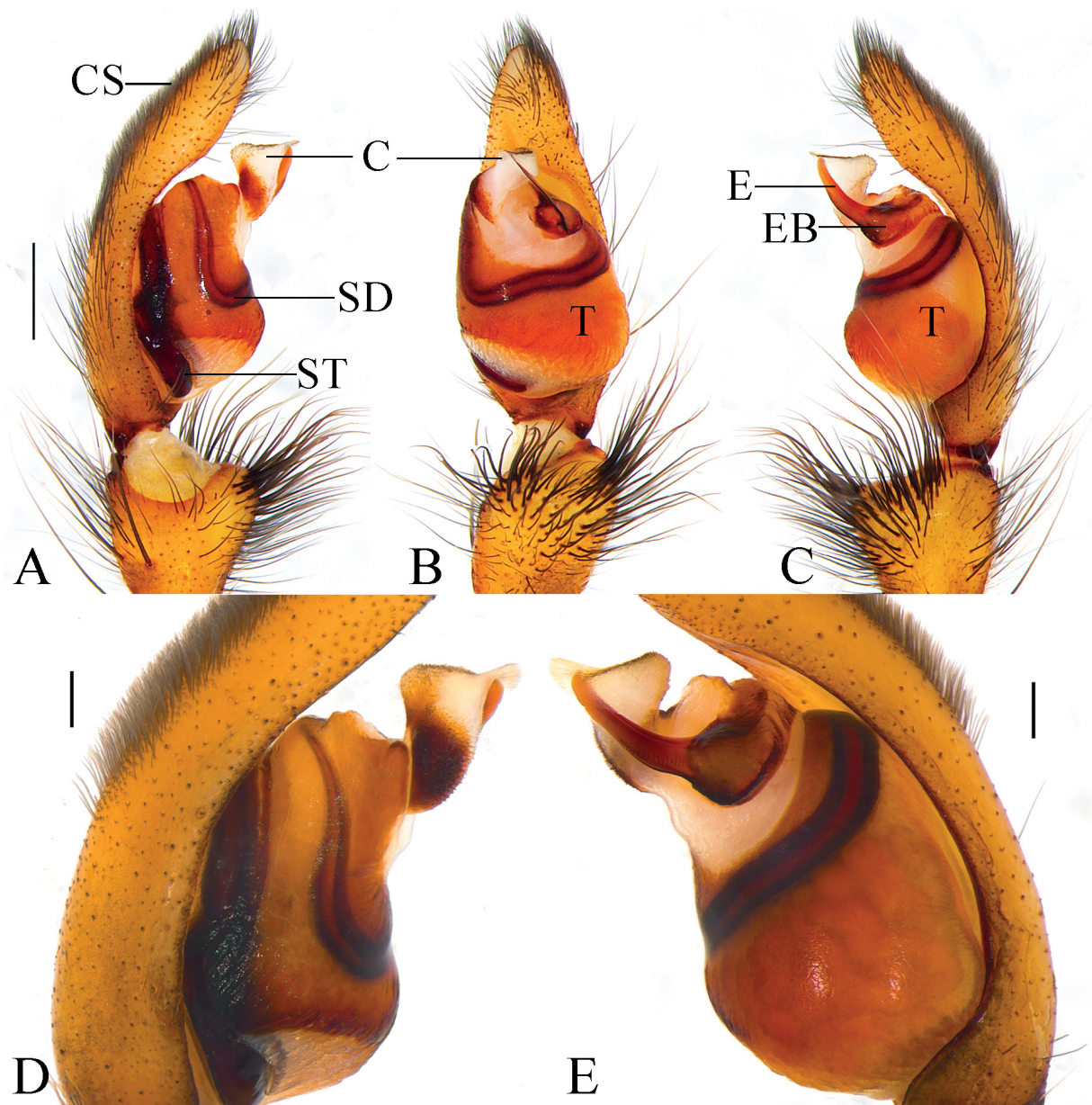


Fig. 11. *Psechrus cornutus* sp. nov., holotype, ♂ (DUIER NJ2501), left palp. **A.** Prolateral view. **B.** Ventral view. **C.** Retrolateral view. **D.** Conductor. **E.** Embolus. Abbreviations: see Material and methods. Scale bars: A–C = 0.5 mm; D–E = 0.2 mm.

Etymology

The specific epithet is a Latin adjective, '*cornutus*' (-a, -um), meaning 'horned'. It refers to the horn-like shape of the embolus. The masculine gender of the adjective agrees with that of the genus *Psechrus* Thorell, 1878.

Type material

Holotype

CHINA • ♂; Yunnan Province, Xi-jing Line, Wuliangshan Town, Nanjian County, Dali Prefecture; 24°47'22" N, 100°30'49" E; 1946.2 m a.s.l.; 11 Mar. 2025; Zi-Zhong Yang, Yu-Lin Zheng, Wen-Hao Yin, Run Chen and Hong-Qiang Dai leg.; collection YNNJ-25-0305; DUIER, NJ2501.

Paratypes

CHINA • 5 ♂♂; same data as for holotype; collection YNNJ-25-0305; DUIER NJ2502–NJ2506 • 5 ♀♀; same data as for holotype; collection YNNJ-25-0305; DUIER NJ2507–NJ2511 • 1 ♂; Yunnan Province, Duoju Village, Xishelu Township, Chuxiong City, Chuxiong Prefecture; 24°34'18.1" N, 101°3'44.3" E; 2150 m a.s.l.; 29 Oct. 2012; Zi-Zhong Yang and Yu-Jie Yang leg.; DUIER, CX15.

Description

Male (holotype, DUIER NJ2501; see Figs 11–12)

MEASUREMENTS. Total length 15.33; prosoma length 6.47, width 4.98; opisthosoma length 8.86, width 3.81.

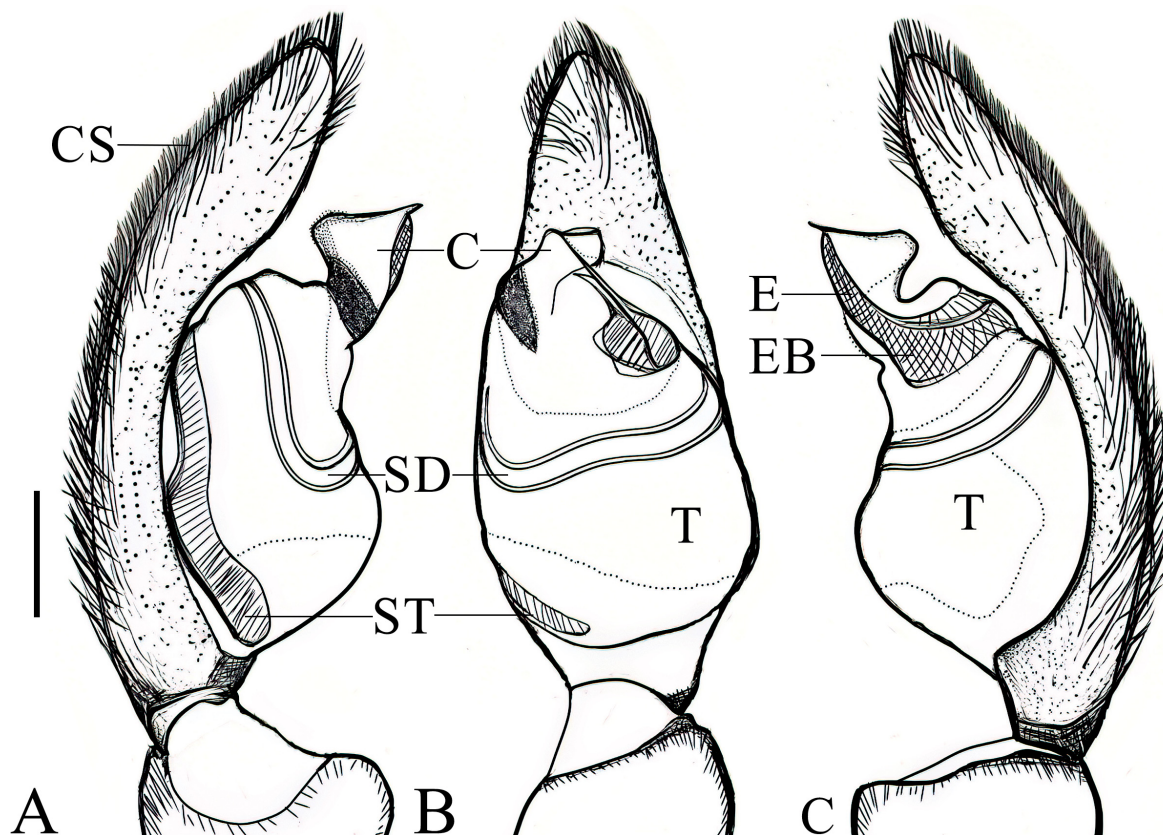


Fig. 12. *Psechrus cornutus* sp. nov., holotype, ♂ (DUIER NJ2501), left palp, line drawings. A. Prolateral view. B. Ventral view. C. Retrolateral view. Abbreviations: see Material and methods. Scale bar = 0.5 mm.

EYES. Eye diameters: AME 0.41, ALE 0.39, PME 0.40, PLE 0.38. Eye interdistances: AME–AME 0.13, AME–ALE 0.08, PME–PME 0.15, PME–PLE 0.13, AME–PME 0.28, ALE–PLE 0.16. Clypeus height at AME 0.80.

PROSOMA. Light brown; posterior two-thirds of lateral margins with a black border. Carapace with a grayish-brown median longitudinal stripe. Fovea longitudinal; radial furrows distinct and pale. Sternum suboval, brown, with a conical gray patch medially; surface with sparse black setae. Chelicerae brown; promargin with 3 teeth, retromargin with 4 teeth. Endites and labium dark brownish; margins covered with dense black setae.

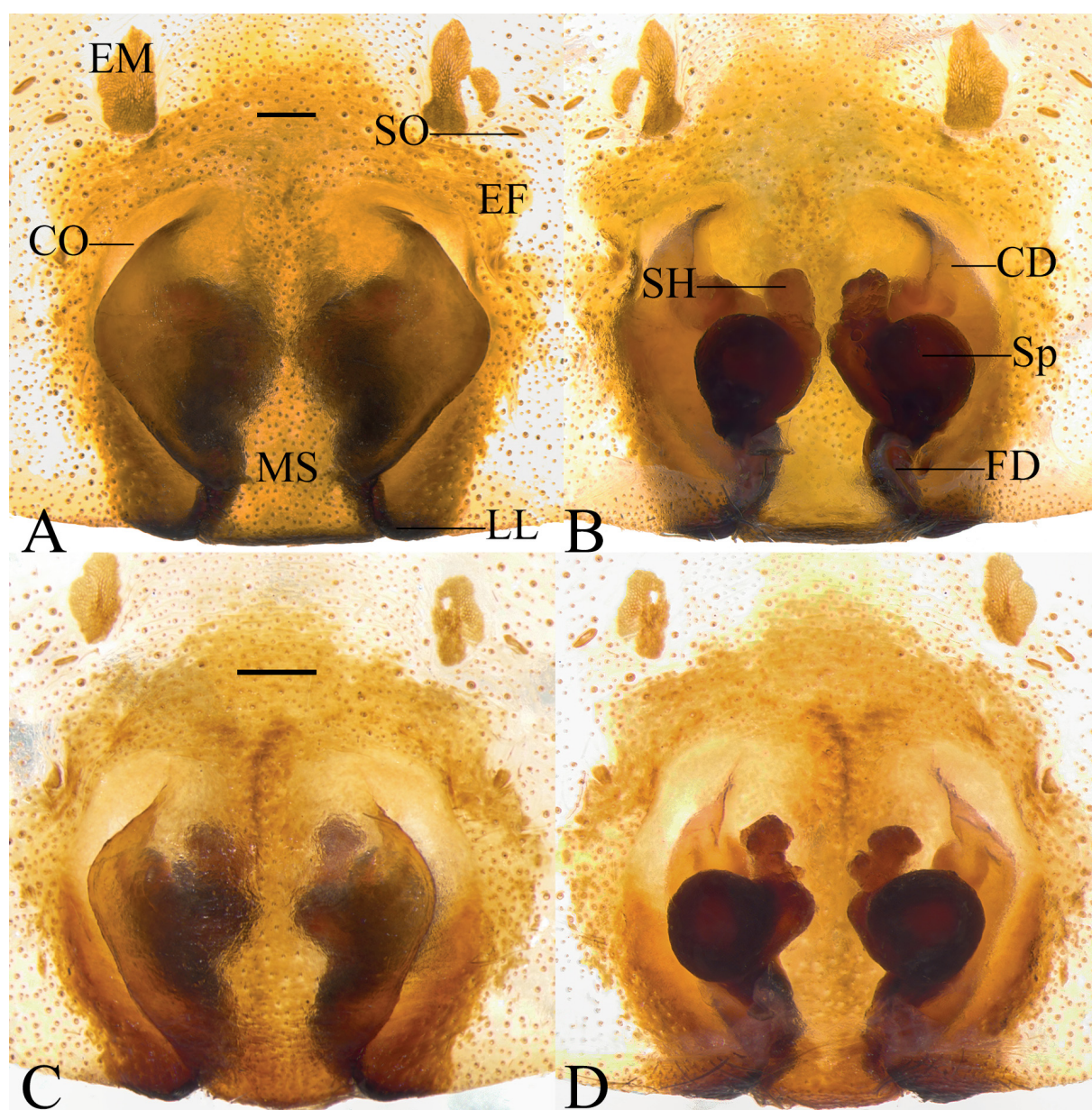


Fig. 13. *Psechrus cornutus* sp. nov., paratypes, ♀♀ (DUIER NJ2508, NJ2509). **A, C.** Epigyne, ventral view. **B, D.** Vulva, dorsal view. Abbreviations: see Material and methods. Scale bars: A–B = 0.2 mm; C–D = 0.25 mm.

Table 3. Measurements of palp and legs of *Psechrus cornutus* sp. nov.

Male	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	2.38	1.01	0.99	—	2.99	7.37
I	12.23	2.36	14.21	14.51	6.46	49.77
II	10.11	2.28	10.66	10.68	4.64	38.37
III	7.64	1.76	6.46	6.90	3.29	26.05
IV	10.67	2.23	10.22	11.22	5.25	39.59
Female	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	2.92	1.11	1.53	—	2.62	8.18
I	10.24	2.35	11.02	9.18	4.47	37.26
II	9.95	2.28	9.04	7.69	4.02	32.98
III	6.89	1.55	5.72	5.50	3.06	22.72
IV	9.75	2.13	8.71	8.19	4.32	33.10

OPISTHOSOMA. Dorsum dark gray; posterior part with five distinct, pale transverse bars. Lateral sides with several irregular longitudinal stripes. Ventral side brown, with a white median stripe; flanked by two rows of distinct, longitudinally arranged muscle sigilla.

LEGS. Yellowish-brown; annuli indistinct, without spots. Coxa I with short black spines distally, near trochanter (absent in female). Leg formula: 1423. Measurements of palp and legs as shown in Table 3.

MALE PALP. Palpal tibia short, with an indistinct retrolateral process; ventrodistally with a tuft of long setae on each side. Femur with a broad ventral apophysis. Conductor membranous and semi-transparent, its base with brown tubercles. Embolus brownish, originating from apex of tegulum, margins with faint transverse ridges. Sperm duct running transversely, nearly horizontal across tegulum, turning at about 70° into posterior tegulum distally.

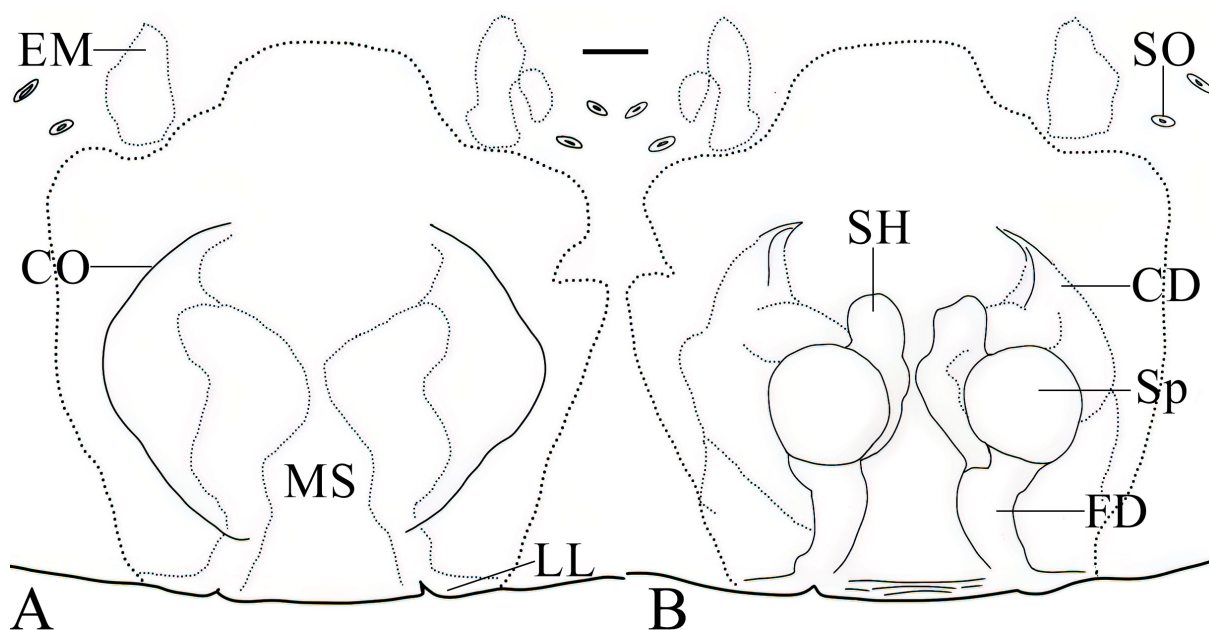


Fig. 14. *Psechrus cornutus* sp. nov., paratype, ♀ (DUIER NJ2508), line drawings. **A.** Epigyne ventral view. **B.** Vulva dorsal view. Abbreviations: see Material and methods. Scale bar = 0.2 mm.

Female (paratype, DUIER NJ2508; see Figs 13–14)

MEASUREMENTS. Total length 17.07; prosoma length 7.24, width 5.24; opisthosoma length 9.83, width 6.60.

EYES. Eye diameters: AME 0.40, ALE 0.42, PME 0.41, PLE 0.42. Eye interdistances: AME–AME 0.14, AME–ALE 0.06, PME–PME 0.14, PME–PLE 0.11, AME–PME 0.27, ALE–PLE 0.17. Clypeus height at AME 0.83.

SOMATIC CHARACTERS. Median longitudinal stripe on carapace paler, yellowish-brown. Sternum with denser setae than in male. Muscle sigilla on the ventral side of opisthosoma smaller and less distinct than in male. Other characters as in male.

EPIGYNE. The epigyne is approximately as long as wide. Muscle sigilla and 2–4 slit sense organs situated far from the epigynal field. Median septum distinctly longer than wide, with lateral margins nearly parallel in the anterior half and strongly diverging towards the posterior margin. Lateral lobes indistinct. Copulatory openings distinct and patent, positioned at the anterolateral margins of MS. Copulatory ducts characterized by a distinct reflexed section at their anterior part. Spermatheca subcircular. Spermathecal heads small and knob-like, arising from the mesal base of spermatheca. Fertilization ducts relatively broad, with a width approximately half the diameter of spermatheca, directed postero-laterally.

Distribution

Nanjian County and Chuxiong City, Yunnan Province, China.

Psechrus cordatus sp. nov.

urn:lsid:zoobank.org:act:9EF72F5F-C79D-4455-B9E3-655ABE927ECB

Figs 1A, 15–19; Table 4

Diagnosis

The new species belongs to the *sinensis* group and most closely resembles *P. obtectus* Bayer, 2012 (see Bayer 2012: 106, fig. 57a–c) in the morphology of the male palp, and both *P. tingpingensis* Yin, Wang & Zhang, 1985 and *P. obtectus* (see Bayer 2012: 103–104, 107, figs 55e–f, 56d, f, 58a–g) in the female epigyne, but can be distinguished by the following combination of characters: palp with the embolus base having a quadrate retrolateral projection in ventral view (vs digitiform in *P. obtectus*) (Figs 15B, D, 16B); a denticulate retrolateral protrusion present posterior to the embolus base (vs absent in *P. obtectus*) (Figs 15C, E, 16C); conductor with a single, rounded apex (vs two unequal, pointed apices in *P. obtectus*) (Fig. 15D); epigyne with the muscle sigilla remote from the epigynal field; median septum longer than wide (vs wider than long and posteriorly broadened in both comparison species) (Figs 17A, C, 18A); initial section of the copulatory ducts narrow and tubular, about ½ the duct diameter (vs trumpet-shaped in comparison species); and anterior parts of the copulatory ducts widely separated by about ½ the width of the median septum (vs closely spaced or nearly touching in comparison species) (Figs 17B, D, 18B).

Etymology

The specific epithet is a Latin adjective, ‘*cordatus* (-a, -um)’, meaning ‘heart-shaped’. It refers to the cordate outline of the embolus. The masculine gender of the adjective agrees with that of the genus *Psechrus*.

Type material

Holotype

CHINA • ♂; Yunnan Province, Laifeng Mountain National Forest Park, Tengchong County; 25°00′53.6″ N, 98°28′48.0″ E; 1850 m a.s.l.; 15 May 2004; Zi-Zhong Yang leg.; DUIER, TC01.

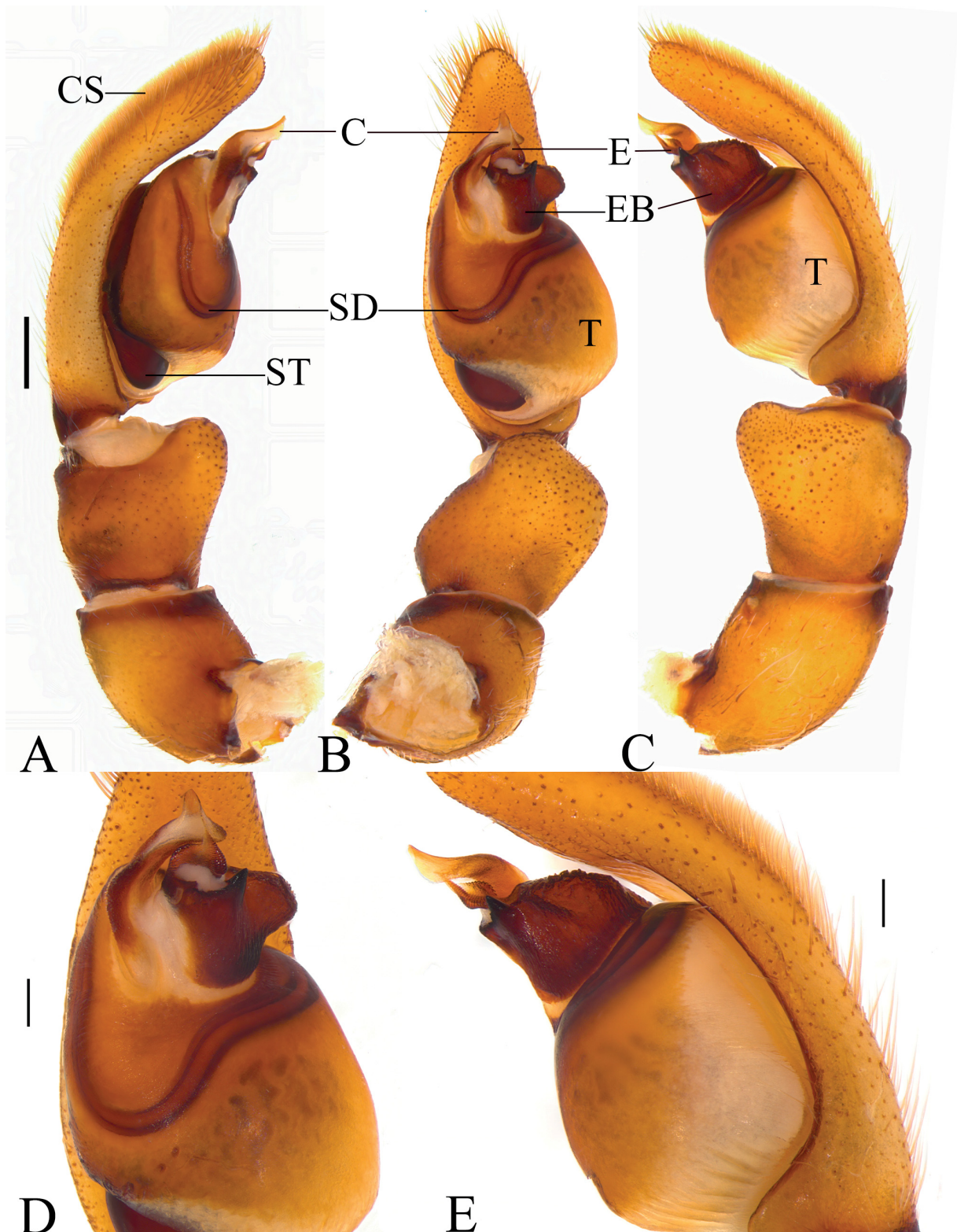


Fig. 15. *Psechrus cordatus* sp. nov., holotype, ♂ (DUIER TC01), left palp. **A.** Prolateral view. **B.** Ventral view. **C.** Retrolateral view. **D.** Conductor and embolus. **E.** Embolus. Abbreviations: see Material and methods. Scale bars: A–C = 0.5 mm; D–E = 0.2 mm.

Paratypes

CHINA • 5 ♀♀; data same as for holotype; DUIER, TC02 to TC06 • 3 ♀♀; Yunnan Province, Ma'anshan Township, Weishan County, Dali Prefecture; 25°15'51" N, 99°59'30" E; 1653.7 m a.s.l.; 11 Mar. 2025; Zi-Zhong Yang, Yu-Lin Zheng, Wen-Hao Yin, Run Chen and Hong-Qiang Dai leg.; collection YNWS-25-0305; DUIER, WS2501 to WS2503 • 1 ♀; Yunnan Province, Longjie Township, Weishan County, Dali Prefecture; 25°10'14.5" N, 100°1'28.9" E; 2100 m a.s.l.; 18 May 2002; Zi-Zhong Yang leg.; DUIER, WBS11.

Description

Male (holotype, DUIER TC01; see Figs 15–16)

MEASUREMENTS. Total length 16.56; prosoma length 7.25, width 5.52; opisthosoma length 9.31, width 4.66.

EYES. Eye diameters: AME 0.38, ALE 0.39, PME 0.45, PLE 0.47. Eye interdistances: AME–AME 0.22, AME–ALE 0.06, PME–PME 0.25, PME–PLE 0.31, AME–PME 0.53, ALE–PLE 0.50. Clypeus height at AME 0.78.

PROSOMA. Yellowish-brown; carapace with a dark brown median longitudinal band; posterior two-thirds of lateral margins with a black border; fovea longitudinal; radial furrows distinct but pale. Chelicerae dark brown, robust; promargin with 3 teeth, retromargin with 4 large teeth and 4 minute denticles. Sternum oval, yellowish-brown, with a dark brown median patch; surface densely covered with black setae. Labium and endites dark brownish, with black setae.

OPISTHOSOMA. Brown; dorsum scattered with gray spots; lateral sides with several irregular white longitudinal stripes. Ventral side dark brownish, with a slender white median stripe, flanked by two rows of large, distinct, pale, pit-like muscle sigilla.

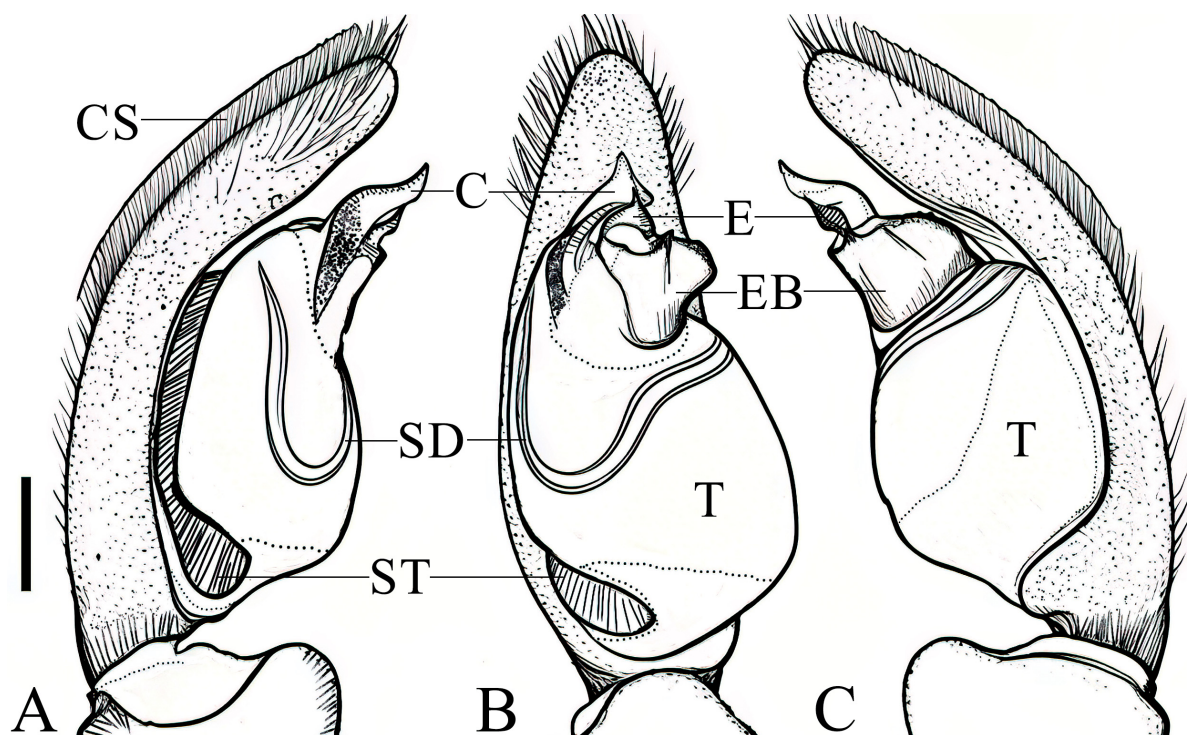


Fig. 16. *Psechrus cordatus* sp. nov., holotype, ♂ (DUIER TC01), left palp, line drawings. A. Prolateral view. B. Ventral view. C. Retrolateral view. Abbreviations: see Material and methods. Scale bar = 0.5 mm.

LEGS. Dark brownish, without spots or annuli. Leg formula: 1243. Measurements of palp and legs as shown in Table 4.

MALE PALP. Tibia with a distinct, short, digitiform retrolateral process, apex rounded. Conductor base semi-transparent and membranous, positioned in close proximity to embolus base; distal part of conductor with a reflexed structure, wrapping apex of embolus. Embolus cordiform in overall shape, surface densely

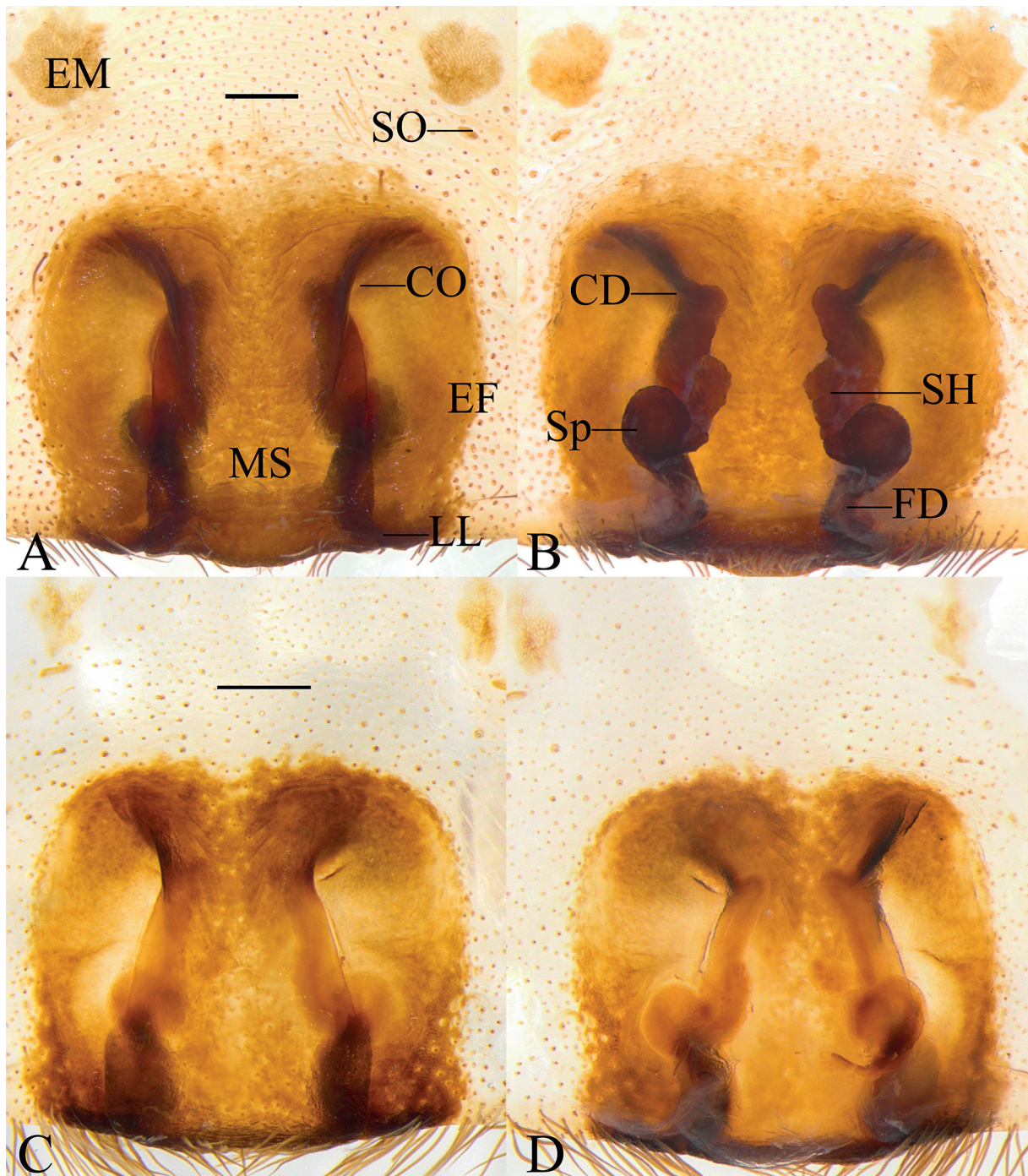


Fig. 17. *Psechrus cordatus* sp. nov., paratypes, ♀♀ (DUIER TC03, TC05). **A, C.** Epigyne ventral views. **B, D.** Vulva dorsal views. Abbreviations: see Material and methods. Scale bars = 0.2 mm.

Table 4. Measurements of palp and legs of *Psechrus cordatus* sp. nov.

Male	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	2.43	1.46	1.12	–	3.06	8.07
I	14.75	3.56	16.63	15.88	6.52	57.34
II	12.20	3.10	12.35	11.50	5.55	44.70
III	8.67	2.50	7.37	6.63	4.02	29.19
IV	12.11	2.75	11.60	12.26	5.67	44.39
Female	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	2.67	1.06	1.34	–	2.74	7.81
I	11.04	2.26	11.45	9.66	5.04	39.45
II	9.52	1.95	9.01	7.70	3.75	31.93
III	6.73	1.40	5.42	5.25	2.86	21.66
IV	9.37	1.79	8.75	7.74	4.02	31.67

covered with striae; embolus base with two projections, one trapezoidal and the other small and conical. Apex of embolus slender and acuminate, enveloped by distal portion of conductor.

Female (paratype, DUIER TC03; see Figs 17–18)

MEASUREMENTS. Total length 17.60; prosoma length 6.81, width 4.60; opisthosoma length 10.79, width 7.68.

EYES. Eye diameters: AME 0.38, ALE 0.41, PME 0.36, PLE 0.41. Eye interdistances: AME–AME 0.20, AME–ALE 0.07, PME–PME 0.23, PME–PLE 0.37, AME–PME 0.54, ALE–PLE 0.40. Clypeus height at AME 0.72.

SOMATIC CHARACTERS. More robust and generally darker than male. Labium and endites reddish-brown. Muscle sigilla on ventral side of opisthosoma smaller but darker. Other characters as in male.

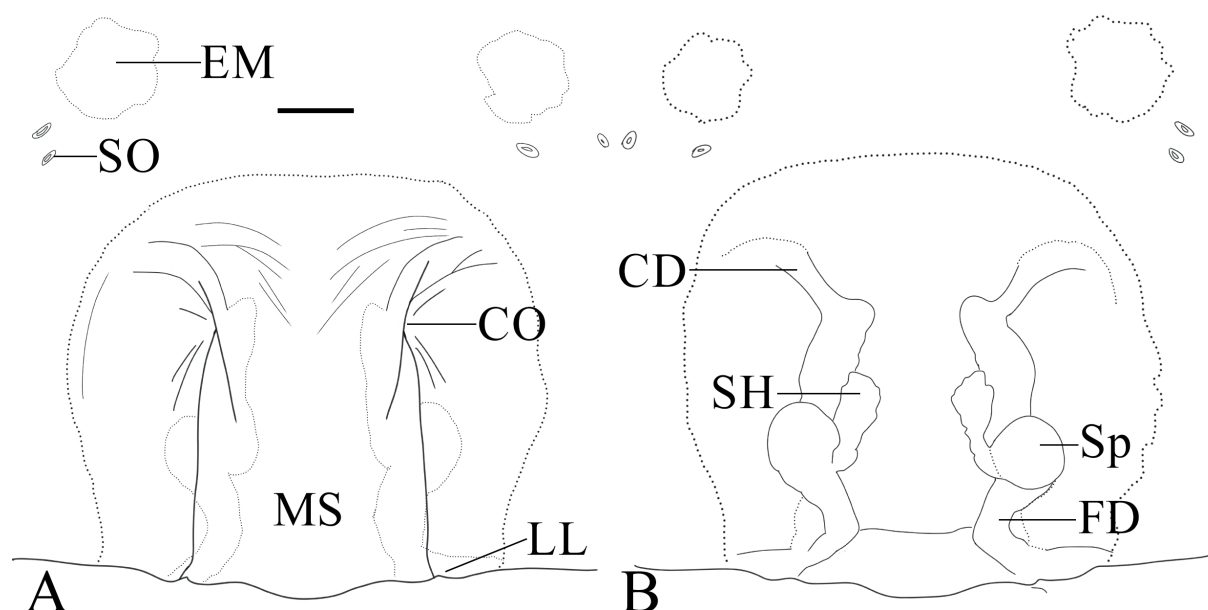


Fig. 18. *Psechrus cordatus* sp. nov., paratype, ♀ (DUIER TC03), line drawings. **A.** Epigyne ventral view. **B.** Vulva dorsal view. Abbreviations: see Material and methods. Scale bar = 0.2 mm.

EPIGYNE. The epigyne is approximately as long as wide. Muscle sigilla large and irregularly shaped, situated far from the epigynal field, accompanied by three pairs of small, oval slit sense organs. Median septum distinctly longer than wide, with lateral margins nearly parallel in the anterior half and strongly diverging towards the posterior margin. Lateral lobes indistinct. Copulatory openings positioned at the anterolateral margins of the median septum, distinct and patent. Copulatory ducts tubular and relatively narrow, characterized by a distinct reflexed (bent) section at their anterior part. Spermatheca subcircular, situated posteriorly. Spermathecal heads small and knob-like, arising from the mesal base of the spermatheca. Fertilization ducts broad and short, with a width approximately half the diameter of the spermatheca, directed (e.g., postero-laterally).

Distribution

Tengchong County and Weishan County, Yunnan Province, China.

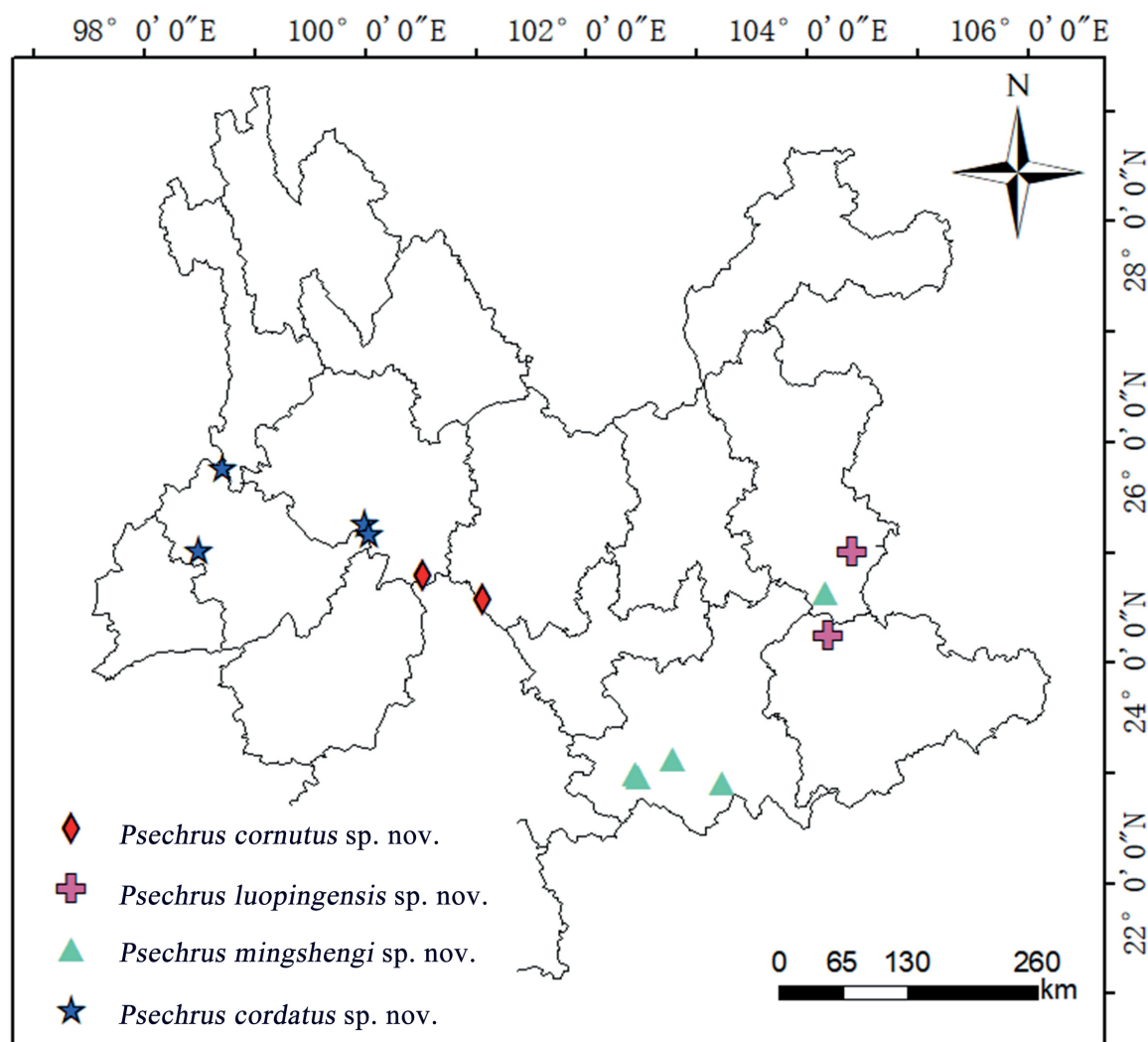


Fig. 19. Distribution map of the new species of *Psechrus* Thorell, 1878 in this study.

Discussion

The present study describes four new species of *Psechrus* from Yunnan Province, raising the total number of Psechridae species recorded in the region to 15. This figure represents approximately 65% of the family's known fauna in China, underscores Yunnan's status as a major biodiversity hotspot and a primary distributional center for the Psechridae nationwide.

Biogeographically, these new species are distributed from southeastern to western Yunnan (Fig. 19), a pattern consistent with Bayer's (2012) hypothesis that Southeast Asia constitutes the primary center of diversity for *Psechrus*. As a region geographically contiguous with the northern Indochinese Peninsula and the southern extension of the Hengduan Mountains, Yunnan serves as a critical transitional zone where this diversity center extends into China. The region's complex topography and climatic heterogeneity have likely facilitated local adaptation and allopatric speciation within this lineage.

While *Psechrus* spiders exhibit adaptability to diverse habitats—ranging from forests and scrublands to synanthropic environments—their survival is fundamentally dependent on stable microhabitats that provide both structural shelter and sufficient space for web construction. Habitat loss and degradation, driven by urbanization, forest fragmentation, and agricultural expansion, represent the primary threats to these spiders. Consequently, future taxonomic surveys should be integrated with population monitoring and habitat conservation assessments.

In conclusion, this study not only enriches the species inventory of Psechridae in China but also provides further evidence for the diversity patterns and evolutionary history of *Psechrus* along the Southeast Asia–Southwest China corridor. Future research should build upon this taxonomic foundation by integrating molecular systematics, historical biogeography, and ecology to comprehensively elucidate the origins, differentiation, and adaptive mechanisms of this group.

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Author contributions

Conceptualization: ZZY. Methodology: all authors. Project administration: ZZY. Species identification: RC and ZZY. Writing – original draft: RC and ZZY. Writing – review & editing: RC and ZZY. Both authors have read and agreed to the published version of the manuscript.

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<https://doi.org/10.3897/zookeys.1056.68504>

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