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Monograph

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A review of the *Ptocasius* Simon, 1885 spiders of Gaoligong Mountains, China (Araneae: Salticidae)

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Abstract. Sixteen new species of the genus *Ptocasius* are described from Mt. Gaoligong, Yunnan: *P. angulatus* sp. nov. (♀); *P. circulus* sp. nov. (♀); *P. danzhu* sp. nov. (♂♀); *P. davidi* sp. nov. (♀); *P. filiformis* sp. nov. (♂♀); *P. foliolatus* sp. nov. (♀); *P. geminus* sp. nov. (♂♀); *P. jietouensis* sp. nov. (♂♀); *P. longapophysis* sp. nov. (♂♀); *P. longlingensis* sp. nov. (♂♀); *P. rectangulus* sp. nov. (♀); *P. robustus* sp. nov. (♀); *P. tengchongensis* sp. nov. (♂♀); *P. umbellulatus* sp. nov. (♀); *P. zabkai* sp. nov. (♂♀) and *P. zonatus* sp. nov. (♀). Including *P. montanus* (Žabka, 1981) and *P. pseudoflexus* (Liu, Yang & Peng, 2016), a total of eighteen species of *Ptocasius* have been reported from Mt. Gaoligong. For each new species, a morphological description, photos of the body and copulatory organs, line drawings of copulatory organs, and locality maps are provided.

Keywords. Taxonomy, jumping spider, Asia, South China.

Yang S.-F. & Peng X.-J. 2023. A review of the *Ptocasius* Simon, 1885 spiders of Gaoligong Mountains, China (Araneae: Salticidae). *European Journal of Taxonomy* 903: 1–61. <https://doi.org/10.5852/ejt.2023.903.2321>

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Introduction

The genus *Ptocasius* Simon, 1885 contains 52 species distributed in the Oriental region (World Spider Catalog 2023), the majority of them having been described from China and Bhutan (Simon 1885, 1902; Thorell 1895; Peckham & Peckham 1907; Žabka 1980, 1981, 1985; Logunov 1995, 2021; Cao *et al.* 2016; Liu *et al.* 2016; Li *et al.* 2018; Lin & Li 2020; Patoleta *et al.* 2020; Peng 2020). Žabka (1980, 1981, 1985) revised the genus and recorded 27 new species from Bhutan, Myanmar and Nepal. Currently, there are 21 species recorded from China, including nine species were described with single-sex (3 with male and 6 with female) (Song 1991; Patoleta *et al.* 2020; Peng 2020).

Mt. Gaoligong is a sub-range of the Hengduan Mountains located in the southwest of Yunnan Province, with steep slopes ranging in altitude from 645 to 4640 m, diverse vegetation types, high forest coverage, multiple vertical climatic zones, complex mountain and canyon landforms. It is less affected by the Tertiary and Quaternary glaciers, therefore it serves as a ‘refuge’ for wildlife of worldwide importance, as well as a world-renowned biodiversity hotspot (Conservation International 2022). While examining specimens of Salticidae Blackwall, 1841 from the Sino-American joint biodiversity survey of the Gaoligong Mountains conducted by the California Academy of Sciences (CAS) and Hunan Normal University (HNU) from 1998 to 2007, sixteen new species of the genus *Ptocasius* Simon, 1885 were identified and are described here. The examined specimens are deposited in the College of Life Sciences, Hunan Normal University. This study aims to describe these sixteen new species as part of an ongoing revision of the Chinese fauna of Salticidae spiders.

Material and methods

Specimens were kept in 75% ethanol. Epigyna were cleared in lactic acid for examination and stored in small glass vials together with the specimens. The left male palps were used for descriptions and illustrations. Specimens were examined, measured, and drawn with Leica M205C and Olympus SZX16 stereo microscopes. Photos were taken with a digital camera, Canon Powershot G12 mounted on an Olympus BX53 and Leica MC170 HD mounted on a Leica M205C. Stacked focus images were generated using Helicon Focus Software (ver. 3.10, free).

All measurements are given in millimeters (mm). Leg measurements are given as total length (femur, patella + tibia, metatarsus, tarsus). The terminology used in the text and legends follows Patoleta *et al.* (2020).

Abbreviations

- AERW = anterior eye row width
 ALE = anterior lateral eye
 AME = anterior median eye
 CB = conic bulge
 CD = copulatory duct
 CO = copulatory opening
 E = embolus
 EL = eye field length
 FD = fertilization duct
 GL = genital lobe
 MOA = median ocular area
 P = pocket
 PERW = posterior eye row width
 PLE = posterior lateral eye
 PME = posterior median eye
 S = spermatheca
 TA = tibial apophysis

Repository

HNU = Hunan Normal University, Hunan, China

Results

Taxonomy

Class Arachnida Cuvier, 1812
 Order Araneae Clerck, 1757
 Family Salticidae Blackwall, 1841

 Genus *Ptocasius* Simon, 1885

Type species

Ptocasius weyersi Simon, 1885.

Diagnosis

A pair of dark longitudinal bands extending from the back of the ALE to the retromargin of the carapace and with a longitudinal bar-shaped fovea. The epigynum has sclerotized blind pockets that vary in size and position and are located away from the posterior edge. Copulatory ducts are of various lengths, with an internal ridge in the majority of species. Spermathecae vary in shape and size across species. The palpal organ is relatively simple, with the end of the embolus lying in a special groove on the ventral surface of the cymbium, usually more or less expanded laterally. Cymbium densely covered with setae. The tibial apophysis robust and heavily sclerotized. Species differ in the length and shape of the embolus, bulb and cymbium (Peng 2020).

Key to species of the Gaoligong Mountains

1. Male 2
 – Female 11

2. Tibial apophysis beyond the anterior margin of genital bulb	3
– Tibial apophysis below the anterior margin of genital bulb	5
3. Tibial apophysis band-shaped in retrolateral view	<i>P. longapophysis</i> sp. nov.
– Tibial apophysis not band-shaped in retrolateral view	4
4. Median area of genital bulb with a triangular outgrowth in retrolateral view	5
– Median area of genital bulb without outgrowth in retrolateral view	6
5. Tibial apophysis lamellar	<i>P. danzhu</i> sp. nov.
– Tibial apophysis needle-shaped	<i>P. tengchongensis</i> sp. nov.
6. Tibial apophysis knife-shaped	7
– Tibial apophysis not knife-shaped	8
7. Genital lobe as long as wide in ventral view	<i>P. jietouensis</i> sp. nov.
– Genital lobe much longer than wide in ventral view	<i>P. geminus</i> sp. nov.
8. Sperm duct originates at about 10:00 o'clock position	<i>P. zabkai</i> sp. nov.
– Sperm duct originates at about 9:00 o'clock position	9
9. Embolus originates at about 9:00 o'clock position	<i>P. pseudoflexus</i> (Liu, Yang & Peng, 2016)
– Embolus originates at about 8:00 o'clock position	10
10. Genital lobe triangular	<i>P. longlingensis</i> sp. nov.
– Genital lobe hook-shaped	<i>P. filiformis</i> sp. nov.
11. Pockets located at the median area of copulatory openings	12
– Pockets not located at the median area of copulatory openings	15
12. The anterior margin of copulatory openings near the anterior edge of epigynum	13
– The anterior margin of copulatory openings relatively away from the anterior edge of epigynum ...	14
13. The top of pockets almost above posterior margin of copulatory openings ...	<i>P. rectangulus</i> sp. nov.
– The top of pockets distinctly below posterior margin of copulatory openings ...	<i>P. robustus</i> sp. nov.
14. Pockets separated from each other	<i>P. montanus</i> (Žabka, 1981)
– Pockets close to each other	<i>P. geminus</i> sp. nov.
15. Pockets near the anterior edge of epigynum	16
– Pockets relatively away from the anterior edge of epigynum	19
16. Pockets relatively away from the anterior edge of epigynum	17
– Pockets close to copulatory openings	18
17. Pockets eyebrow-shaped	<i>P. longapophysis</i> sp. nov.
– Pockets not eyebrow-shaped	<i>P. pseudoflexus</i> (Liu, Yang & Peng, 2016)
18. Pockets horn-shaped	<i>P. tengchongensis</i> sp. nov.
– Pockets not horn-shaped	<i>P. angulatus</i> sp. nov.

19. Pockets located at the edge of epigynum	20
– Pockets not located at the edge of epigynum	22
20. Epigynum with a transverse W-shaped band	<i>P. circulus</i> sp. nov.
– Epigynum without a transverse W-shaped band	21
21. Copulatory openings almost parentheses-shaped	<i>P. foliolatus</i> sp. nov.
– Copulatory openings almost V-shaped	<i>P. zonatus</i> sp. nov.
22. Anterior interval of copulatory openings equal with posterior interval	23
– Anterior interval of copulatory openings narrower than posterior interval	24
23. Copulatory ducts thin and S-shaped	<i>P. filiformus</i> sp. nov.
– Copulatory ducts thick and L-shaped	<i>P. longlingensis</i> sp. nov.
24. The top margins of spermathecae close to copulatory openings	25
– The top margins of spermathecae relatively away from copulatory openings	<i>P. umbellulatus</i> sp. nov.
25. Interdistance of pockets almost as wide as pocket width	26
– Interdistance of pockets almost four times as wide as pocket width	<i>P. jietouensis</i> sp. nov.
26. Spermathecae close to each other	27
– Spermathecae separated from each other	<i>P. davidi</i> sp. nov.
27. Copulatory openings ()-shaped	<i>P. danzhu</i> sp. nov.
– Copulatory openings V-shaped	<i>P. zakkai</i> sp. nov.

Ptocasius angulatus sp. nov.

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Figs 1–2, 41

Diagnosis

The new species resembles *P. strupifer* Simon, 1901 (Peng 2020: fig. 275a–g), but can be distinguished by: (1) pockets present anteriorly parallel to copulatory openings in ventral view (Figs 1B, 2A), while pockets present in median area below copulatory openings in *P. strupifer* (Peng 2020: fig. 275f); (2) lateral margins of spermathecae extending dorso-laterally outside of copulatory ducts in dorsal view (Figs 1C, 2B), while spermathecae dorso-median inside of copulatory ducts in *P. strupifer* (Peng 2020: fig. 275f–g).

Etymology

The specific name derives from the Latin adjective ‘*angulatus*’ (‘provided with angles’).

Type material

Holotype

CHINA • ♀; Yunnan Province, 9 km Southeast of Pianma; 25°59’38” N, 98°39’49” E; 2400 m a.s.l.; 15–17 Oct. 1998; Charles Griswold, David Kavanaugh and Chun-lin Long leg.; HNU-98–EP–1A.

Paratype (1 ♀)

CHINA – Yunnan Province • 1 ♀; same collection data as for holotype; HNU-98–EP–1P.

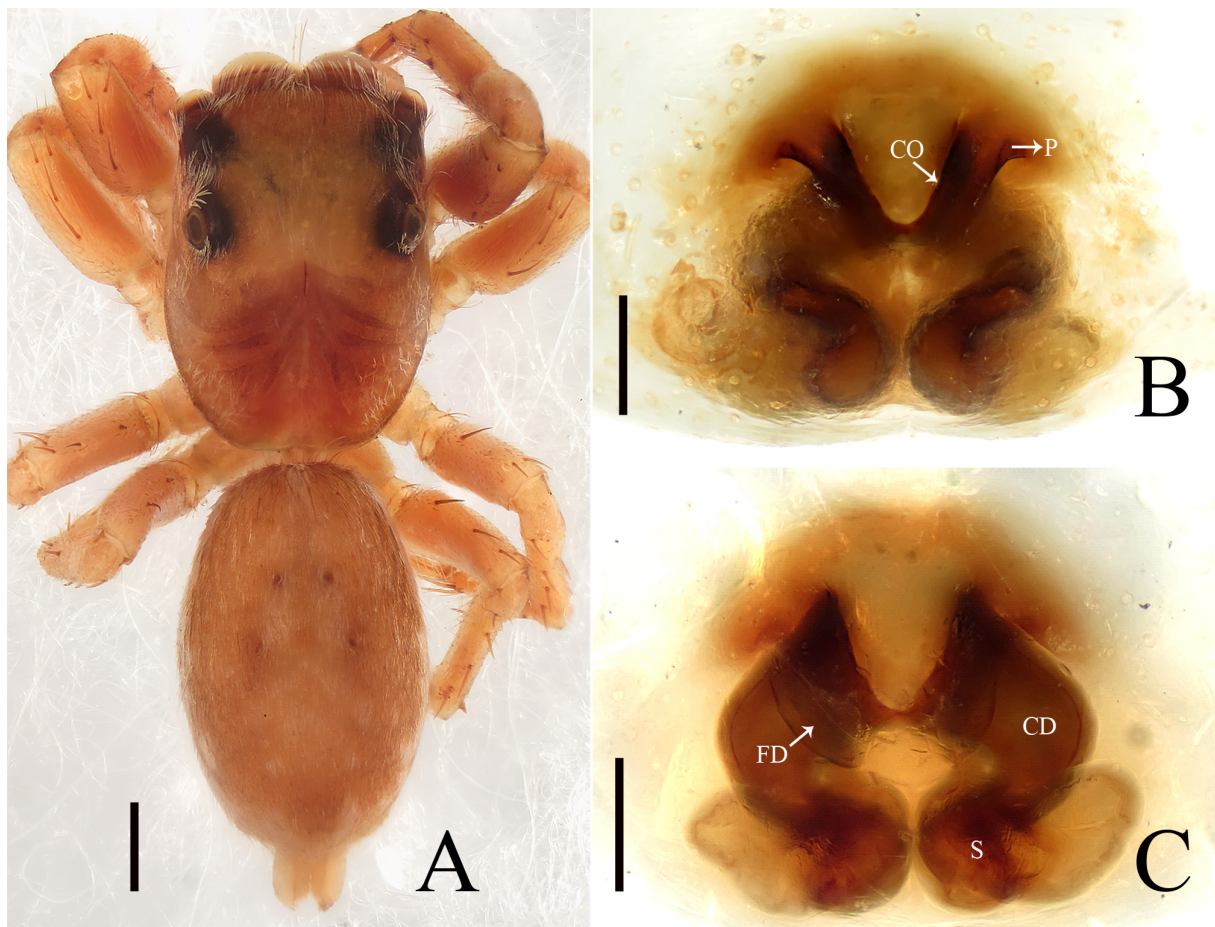


Fig. 1. *Ptocasius angulatus* sp. nov., holotype, ♀ (HNU-98-EP-1A). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

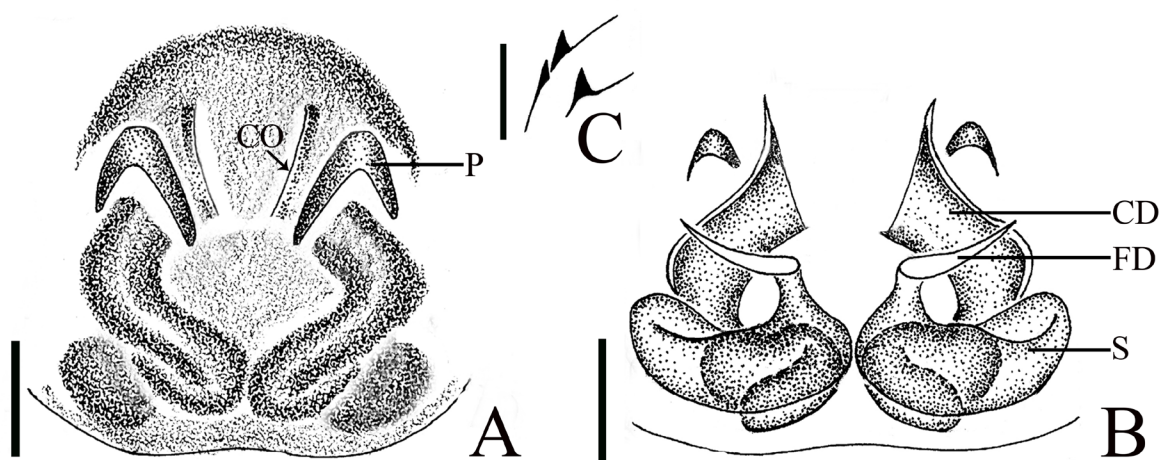


Fig. 2. *Ptocasius angulatus* sp. nov., holotype, ♀ (HNU-98-EP-1A). A. Epigynum, ventral view. B. Vulva, dorsal view. C. Chelicerae, posterior view. Scale bars = 0.1 mm.

Description

Female (holotype)

BODY AND HEAD. Total length 4.10. Prosoma 2.10 long, 1.60 wide. Opisthosoma 2.30 long, 1.45 wide. Clypeus height 0.10. Carapace (Fig. 1A) brown, sides with dense white hairs; carapace margins and eye base black; ocular area covered with long rough dark brown hairs, anterior and lateral margins black with dense white hairs. Fovea short, reddish brown, cervical groove indistinct, radial groove dark brown, distinct. Eye diameter and interdistances: AME 0.50, ALE 0.25, PLE 0.25, AERW 1.50, PERW 1.40, EL 0.90. Sternum olive-shaped, densely covered with short brown hairs; median area bulged and light yellow, margin grayish yellow. Clypeus light brown with grayish black markings; anterior margin with long white hairs, narrow, height less than $\frac{1}{2}$ AME. Endites and labium brown, distal area light brown, covered with black hairs.

CHELICERAE (Fig. 2C). Dark brown, distal area covered with long brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. No visible markings or annuli, light yellowish brown to brown. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 3.40 (1.10, 1.40, 0.50, 0.40), II = 3.30 (1.10, 1.30, 0.50, 0.40), III = 3.90 (1.30, 1.30, 0.80, 0.50), IV = 4.30 (1.40, 1.40, 1.00, 0.50). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 1A). Oval, dorsum yellowish brown with dark brown markings, sides with dark longitudinal bands, marginal area with one light incision; cardiac marking long and bar-shaped, the terminal area with black spots, mid-dorsally with two pairs of sigillae; ventral grayish white, the median area with a gray longitudinal band, lateral dark brown. Spinnerets brown.

EPIGYNUM (Figs 1B–C, 2A–B). Longer than wide; with angular pockets present antero-laterally; copulatory openings longitudinal, outline almost U-shaped, spermathecae sinuous, much complicated and close to each other, extending dorso-laterally, the distance between the margins of spermathecae indistinctly wider than that between the copulatory ducts.

Male

Unknown.

Distribution

China (Yunnan Province, Fig. 41).

Ptocasius circulus sp. nov.

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Figs 3–4, 42

Diagnosis

The new species resembles *P. strupifer* Simon, 1901 (Peng 2020: fig. 275f) in having the similar outline of copulatory openings and the position of pockets, but can be distinguished by: spermathecae relatively well folded, complicated in dorsal view (Figs 3C, 4B), while globular in *P. strupifer* (Peng 2020: fig. 275g).

Etymology

The specific name is derived from the Latin noun ‘*circulus*’ (‘circle’) in apposition, referring to the circular outline of the atrium.

Type material

Holotype

CHINA • ♀; Yunnan Province, Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00-QF-1.

Paratype (1 ♀)

CHINA – Yunnan Province • 1 ♀; Nujiang Prefecture, Gongshan County, Danzhu, 13.5 km Southwest of Gongshan; 27°37'50" N, 98°37'14" E; 2700 m a.s.l.; 30 Jun.–5 Jul. 2000; David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick, Heng-mei Yan and Da-zhi Dong leg.; HNU-00-GD-1.

Description

Female (holotype)

BODY AND HEAD. Total length 6.00. Prosoma 2.50 long, 1.85 wide. Opisthosoma 3.50 long, 2.20 wide. Clypeus height 0.10. Carapace (Fig. 3A) light brown; carapace margin and eye base black; ocular area dark brown, lateral margins black sparsely with long brown hairs. Fovea reddish brown, cervical

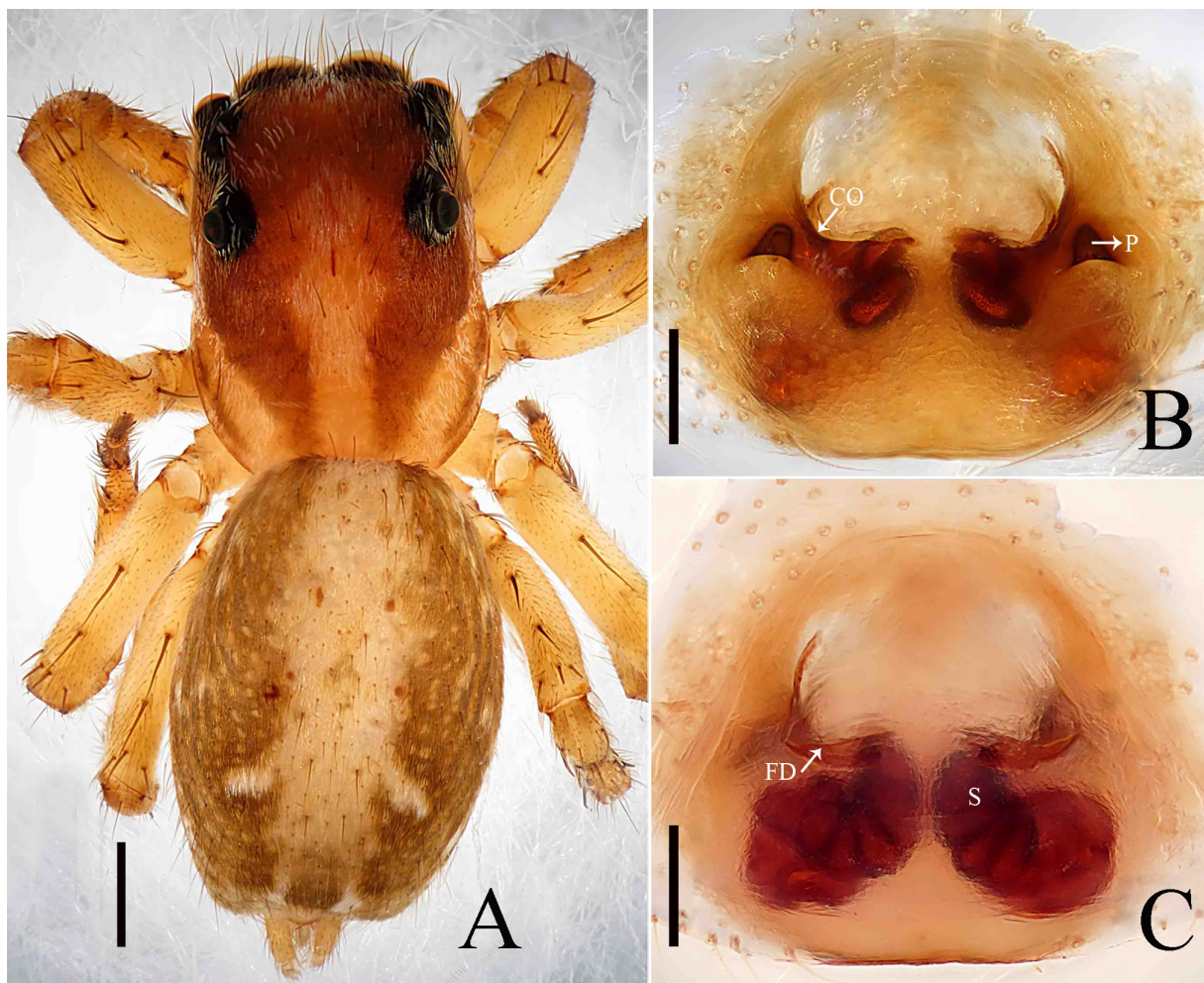


Fig. 3. *Ptocasius circulus* sp. nov., holotype, ♀ (HNU-00-QF-1). **A.** Body, dorsal view. **B.** Epigynum, ventral view. **C.** Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

and radial groove black, distinct. Eye diameter and interdistances: AME 0.53, ALE 0.30, PLE 0.30, AERW 1.70, PERW 1.65, EL 1.10. Sternum scutiform, covered with short brown hairs; the median area slightly bulged, yellowish brown, with dark brown margin. Clypeus dark brown, between sides and AMEs with three clusters long dark brown hairs; promargin with row of long hairs. Endites and labium brown, distal area light brown, covered with grayish black hairs.

CHELICERAE (Fig. 4C). Dark brown, distal area covered with long brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Grayish black with black annuli, densely covered with grayish black hairs, bearing long and strong spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 4.35 (1.35, 1.70, 0.70, 0.60), II = 4.00 (1.30, 1.50, 0.60, 0.60), III = 4.80 (1.45, 1.70, 0.90, 0.75), IV = 5.35 (1.60, 1.85, 1.20, 0.70). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 3A). Oval, dorsum long oval, light yellow, each side with a wide grayish black longitudinal band, the marginal area with a light incision; the posterior portion with five light markings, mid-dorsally with two pairs of sigillae; ventral light yellow, the median area with a grayish black longitudinal band, sides with irregular grayish black markings and twills. Spinnerets dark brown.

EPIGYNUM (Figs 3B–C, 4A–B). Almost as long as wide; the pockets triangular, almost touching copulatory openings; epigynum with a transverse W-shaped band between connecting the bases of copulatory openings; atrium outline almost circular; spermathecae folded, much complicated.

Male

Unknown.

Distribution

China (Yunnan Province, Fig. 42).

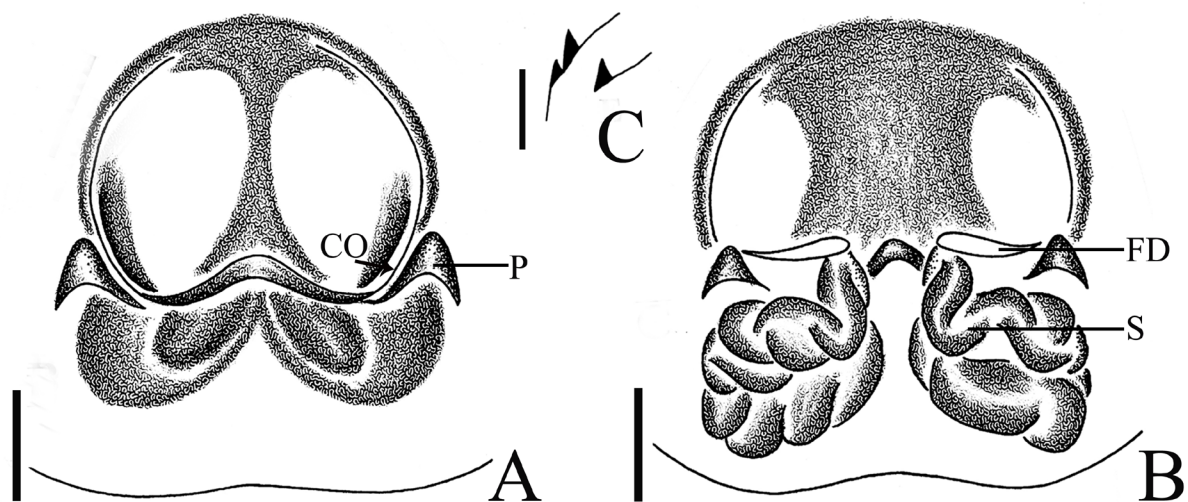


Fig. 4. *Ptocasius circulus* sp. nov., holotype, ♀ (HNU-00-QF-1). **A.** Epigynum, ventral view. **B.** Vulva, dorsal view. **C.** Chelicerae, posterior view. Scale bars = 0.1 mm.

Ptocasius danzhu sp. nov.

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Figs 5–7, 42

Diagnosis

The male of the new species resembles that of *P. tenzingsi* Żabka, 1980 (Żabka 1980: figs 2, 4, 6, 8), but can be distinguished by: (1) embolus originating at about 9:00 o'clock position in ventral view (Figs 5B, 7A), while originating at about 8:00 o'clock in *P. tenzingsi* (Żabka 1980: fig. 2); (2) genital lobe nearly rectangle in ventral view (Figs 5B, 7A), while globular in *P. tenzingsi* (Żabka 1980: fig. 2); (3) tibial apophysis spatuliform, almost rectangle, tip triangular in retrolateral view (Figs 5C, 7B), while needle-shaped with pointed tip in *P. tenzingsi* (Żabka 1980: fig. 4). The female of the new species resembles that of *P. tenzingsi* (Żabka 1980: figs 11, 15, 18), but can be distinguished by: pockets present antero-laterally in ventral view (Figs 6B, 7D), while present mid-ventrally in *P. tenzingsi* (Żabka 1980: fig. 15).

Etymology

The specific name is derived from the type locality Danzhu Village.

Type material

Holotype

CHINA • ♂; Yunnan Province, Nujiang Prefecture, Gongshan County, Danzhu Village, 15.7–16.0 km Southwest of Gongshan; 27°37'37" N, 98°35'31" E to 27°37'19" N, 98°35'14" E; 2800–3425 m a.s.l.; 2 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00-GDS-1A.



Fig. 5. *Ptocasius danzhu* sp. nov., holotype, ♂ (HNU-00-GDS-1A). A. Body, dorsal view. B. Palp, ventral view. C. Palp, retrolateral view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

Paratypes (13 ♂♂, 14 ♀♀)

CHINA – **Yunnan Province** • 3 ♂♂, 2 ♀♀; same collection data as for holotype; HNU-00-GDS-1P • 9 ♂♂, 11 ♀♀; Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00-QF-2 • 1 ♀; Nujiang Prefecture, Nujiang State Nature Reserve, No. 12 bridge Camp area, 16.3 km West of Gongshan; 27°42'54" N, 98°30'08" E; 2775 m a.s.l.; 15–19 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-000709-2 • 1 ♂; Nujiang Prefecture, Gongshan County, Danzhu, 13.5 km Southwest of Gongshan; 27°37'50" N, 98°37'14" E; 2700 m a.s.l.; 30 Jun.–5 Jul. 2000; David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick, Heng-mei Yan and Da-zhi Dong leg.; HNU-000709-3.

Description

Male (holotype)

BODY AND HEAD. Total length 4.60. Prosoma 2.10 long, 1.50 wide. Opisthosoma 2.50 long, 1.40 wide. Clypeus height 0.10. Carapace (Fig. 5A) light brown, covered with long white and brown hairs; margin

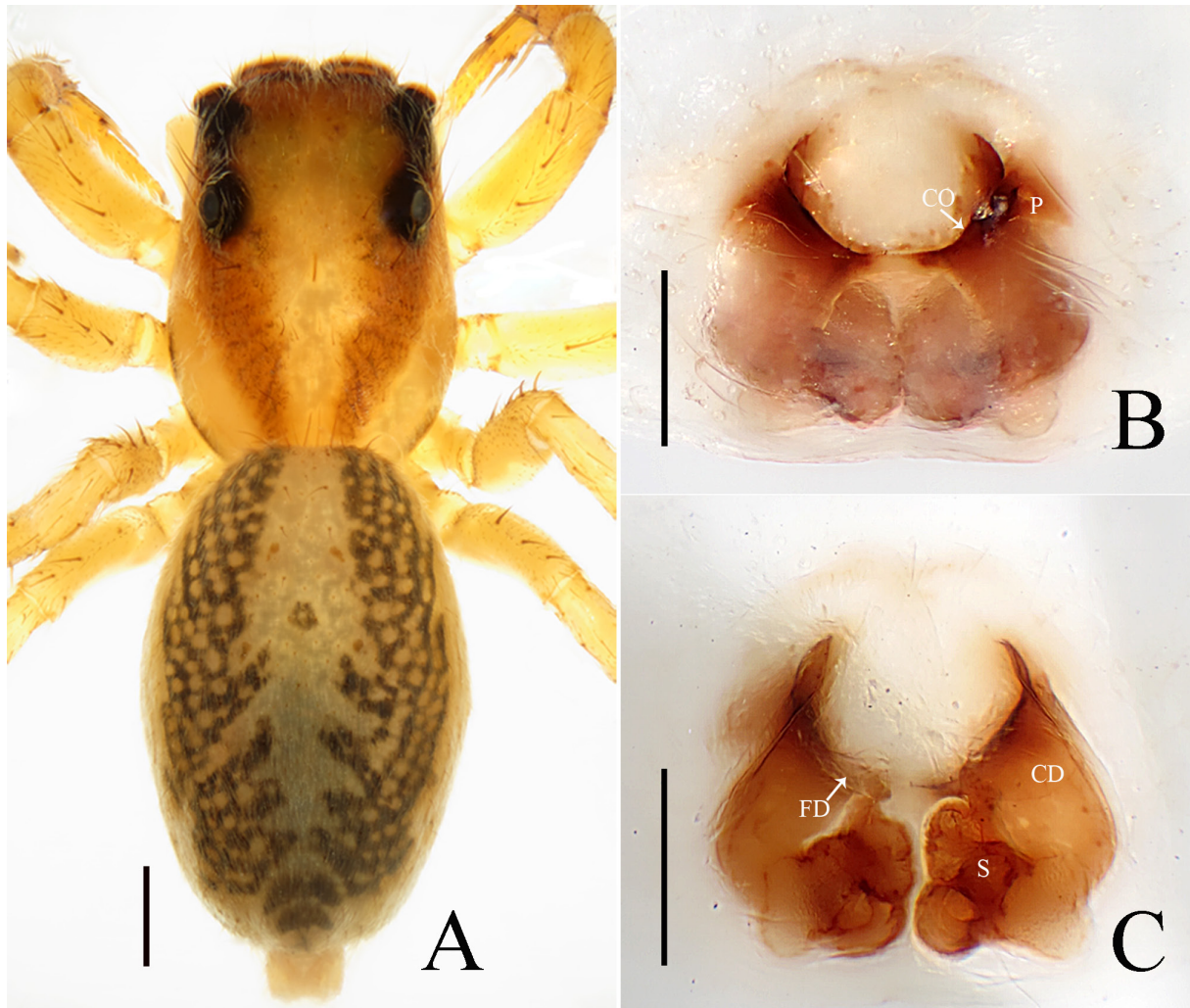


Fig. 6. *Ptocasius danzhu* sp. nov., paratype, ♀ (HNU-00-GDS-1P). **A.** Body, dorsal view. **B.** Epigynum, ventral view. **C.** Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

black; ocular area dark black. Fovea short, reddish brown, radial groove indistinct. Eye diameter and interdistances: AME 0.45, ALE 0.25, PLE 0.25, AERW 1.25, PERW 1.20, EL 0.85. Sternum obpyriform, light yellow, densely covered with fine brown hairs, margin dark brown. Clypeus brown, promargin black, covered with a row of long brown hairs. Endites light brown, distal area light yellow, covered with black hairs. Labium triangular, brown, margin light brown, distal area covered with grayish black hairs.

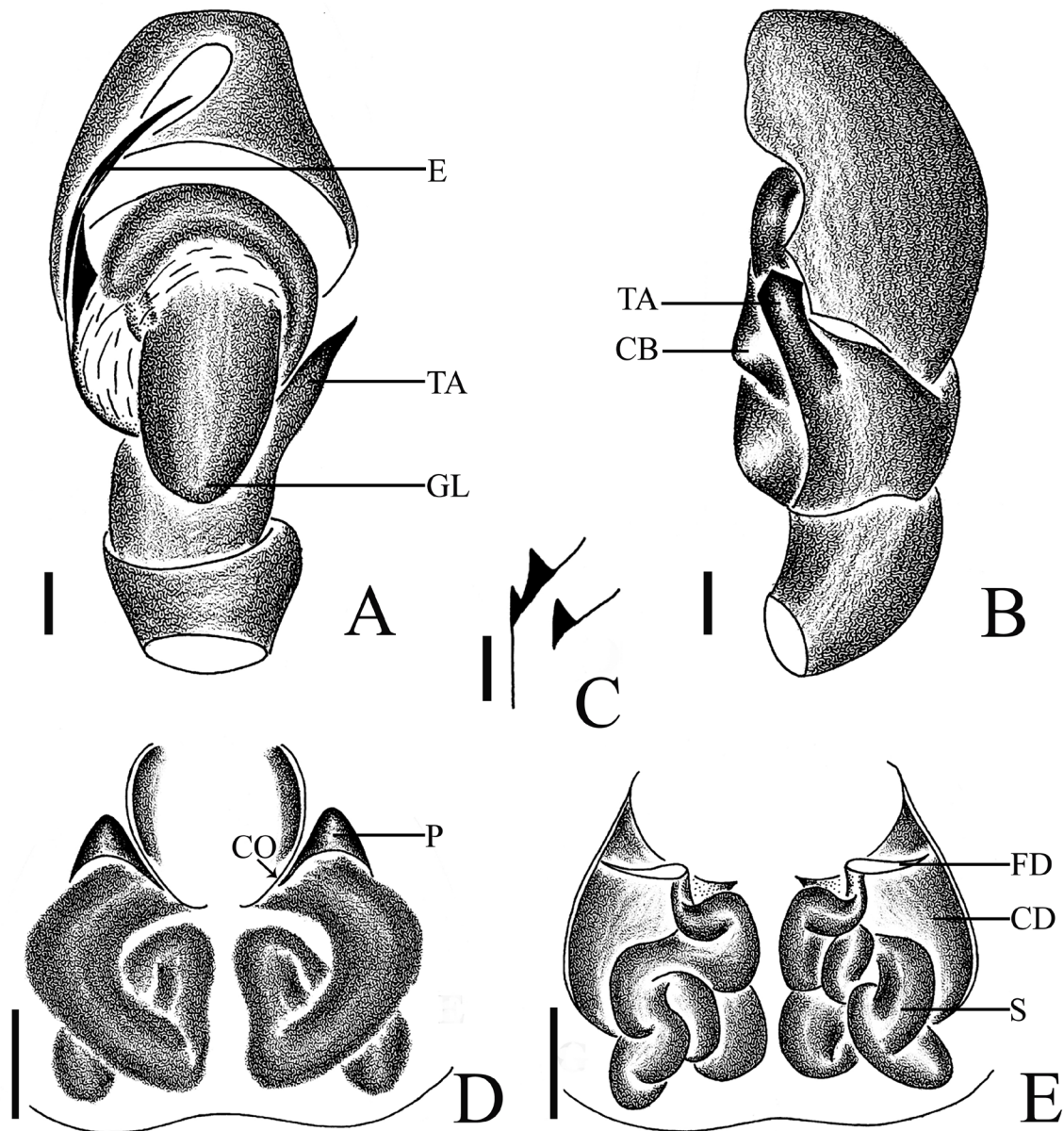


Fig. 7. *Ptocasius danzhu* sp. nov. **A–C.** Holotype, ♂ (HNU-00–GDS–1A). **D–E.** Paratype, ♀ (HNU-00–GDS–1P). **A.** Palp, ventral view. **B.** Palp, retrolateral view. **C.** Chelicerae, posterior view. **D.** Epigynum, ventral view. **E.** Vulva, dorsal view. Scale bars = 0.1 mm.

CHELICERAE (Fig. 7C). Brown, sparsely covered with long brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Light brown to brown, tibiae I relatively darker in color, bearing thin and weak spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 5.15 (1.60, 2.05, 0.90, 0.60), II = 4.00 (1.30, 1.50, 0.70, 0.50), III = 4.20 (1.30, 1.40, 1.00, 0.50), IV = 4.60 (1.40, 1.60, 1.00, 0.60). Leg formula: I–IV–III–II.

ABDOMEN (Fig. 5A). Elongated oval, dorsum light brown with two black longitudinal bands, the posterior one with three pairs of inclined markings; the posterior median area with three short black arc-shaped markings, mid-dorsally with two pairs of sigillae, reddish brown; ventral light white with three black longitudinal bands. Spinnerets dark brown.

PALP (Figs 5B–C, 7A–B). Longer than wide; embolus slender, as long as the width of the genital bulb, originates at about 9:00 o'clock position, tip reaches to the position of 13:00 o'clock; genital bulb with membranous structure and a conic bulge; genital lobe almost rectangular; tibial apophysis lamellar, tip triangular.

Female (paratypes)

BODY AND HEAD. Total length 4.90. Prosoma 2.00 long, 1.50 wide. Opisthosoma 2.75 long, 1.70 wide, light color. Clypeus height 0.08. Eye diameter and interdistances: AME 0.40, ALE 0.20, PLE 0.20, AER 1.25, PER 1.20, EFL 0.75. All of the body, markings, and other morphological features same as in male.

LEG MEASUREMENTS. I = 3.15 (1.00, 1.30, 0.50, 0.35), II = 3.00 (0.95, 1.20, 0.50, 0.35), III = 3.60 (1.10, 1.25, 0.75, 0.50), IV = 3.95 (1.25, 1.40, 0.80, 0.50). Leg formula: IV–III–I–II.

EPIGYNUM (Figs 6B–C, 7D–E). Longer than wide; the pockets angular, almost touching copulatory openings, present antero-laterally; copulatory openings ()-shaped, atrium outline circular; spermathecae relatively folded, complicated, the anterior margins of spermathecae close to copulatory openings in dorsal view.

Distribution

China (Yunnan Province, Fig. 42).

Ptocasius davidi sp. nov.

urn:lsid:zoobank.org:act:95B9B5D4-9038-4F59-9868-56C1B621657C

Figs 8–9, 43

Diagnosis

The new species resembles *P. urbanii* (Žabka, 1981) (Žabka 1981: figs 25–26), but can be distinguished by: (1) atrium outline V-shaped in ventral view (Figs 8B, 9A), while almost parallel to each other in *P. urbanii* (Žabka 1981: fig. 25); (2) posterior margin of pockets two times as wide as long in ventral view (Figs 8B, 9A), while as long as wide in *P. urbanii* (Žabka 1981: fig. 25); (3) interdistance of pockets almost as wide as pocket width in ventral view (Figs 8B, 9A), while almost four times wider in *P. urbanii* (Žabka 1981: fig. 25).

Etymology

The specific name is the patronym in honor of Dr David Kavanaugh, who collected the type specimen.

Type material

Holotype

CHINA • ♀; Yunnan Province, Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00-QF-3A.

Paratypes (29 ♀♀)

CHINA – Yunnan Province • 1 ♀; same collection data as for holotype; HNU-00-QF-3P • 1 ♀; Lushui County, Yaojiaping He at Pianma Road 44.7 Km; 25°58'29" N, 98°42'36" E; 2516 m a.s.l.; 20 May 2005; Charles Griswold and David Kavanaugh leg.; disturbed forest; night collection in forest and along road cuts; HNU-CGY113 • 1 ♀; Lushui County, Pianma Township, Chanyan He, 9.3 km ESE of Pianma; 25°59'37" N, 98°39'59" E; 2470 m a.s.l.; 13–14 May 2005; Charles Griswold leg.; mixed broadleaf deciduous and evergreen forest; night collecting; HNU-CGY105 • 1 ♀; Tengchong County, Jietou Township, Datang Village, on the road from Daheling Ganjiao to Dashu Dujuan;

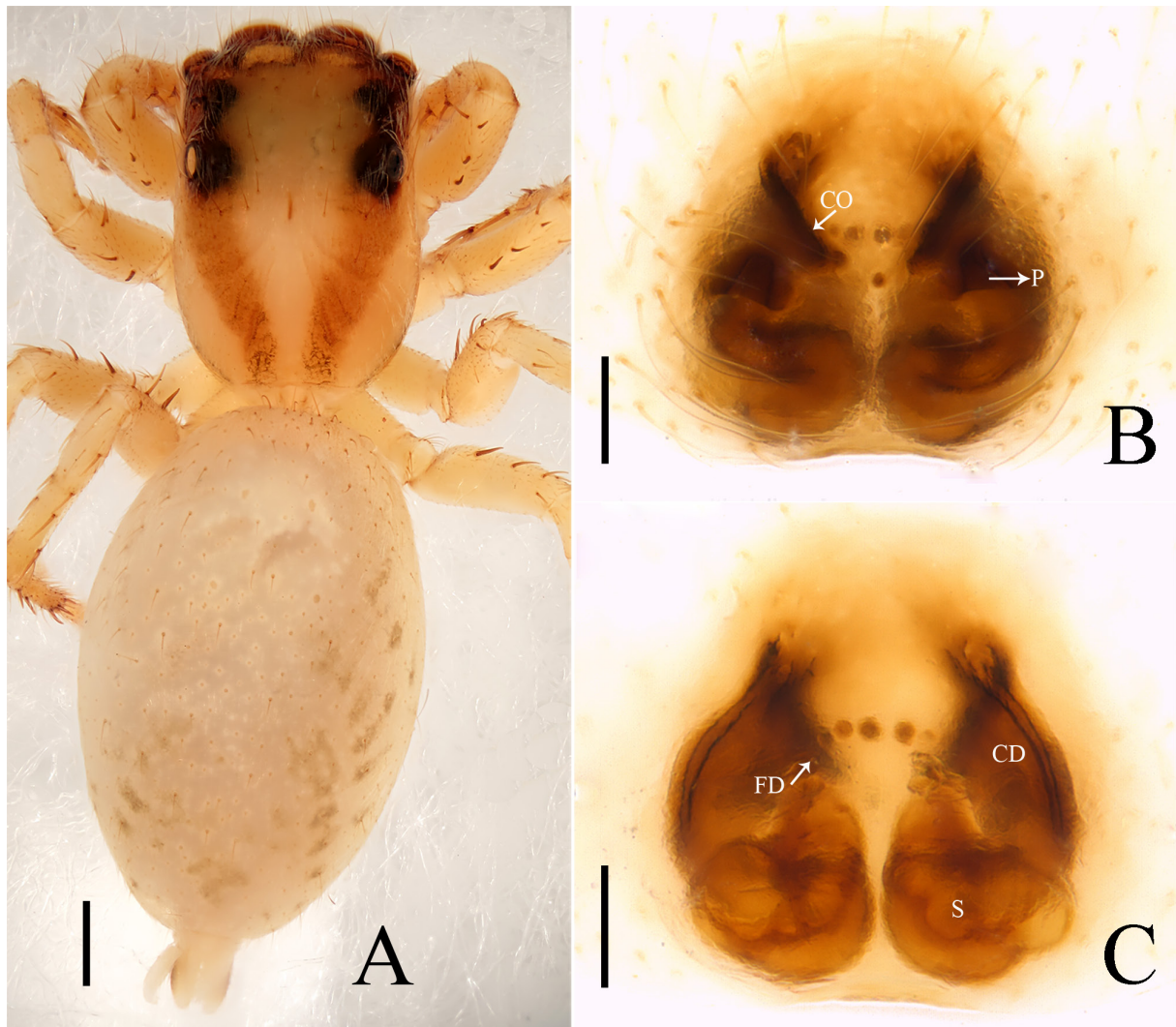


Fig. 8. *Ptocasius davidi* sp. nov., holotype, ♀ (HNU-00-QF-3A). **A.** Body, dorsal view. **B.** Epigynum, ventral view. **C.** Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

25°46'40" N, 98°42'29" E; 2430 m a.s.l.; 17 May 2006; Xian-jin Peng, Xin-ping Wang and Peng Hu leg.; HNU-Peng060517 • 1 ♀; Tengchong County, Jietou Township, Dahetou Lingganjiao; 25°44'22" N, 98°41'46" E; 2010 m a.s.l.; 16 May 2006; David Kavanaugh and Roberta Brett leg.; HNU-DHK-2006-025A • 1 ♀; Tengchong County, Mingguang Township, Zizhi Village, up slope; 25°48'35" N, 98°37'14" E; 2880 m a.s.l.; 25°47'53" N, 98°37'26" E; 2756 m a.s.l.; 19 May 2006; Chang-min Yin, Jia-fang Hu and Ming-wei Yang leg.; down slope; HNU-YHY06 • 14 ♀♀; Tengchong County, China, Yunnan Province, Tengchong County, Jietou Township, 2 km down the road from 8# boundary post of Yakou; 25°48'30" N, 98°37'14" E; 2890 m a.s.l.; 23 May 2006; Xian-jin Peng, Xin-ping Wang and Peng Hu leg.; HNU-Wang060523-2 • 1 ♀; Longling County, Longjiang Township, Xiaoheishan Nature Reserve (Guchengshan Mountain); 24°49'43" N, 98°45'33" E; 2010 m a.s.l.; 25 May 2005; Heng-mei Yan and Ke-ji Guo leg.; general collecting along river; HNU-GKJ024 • 5 ♀♀; Tengchong County, Qushi Township, Heiyuhe Landscape; 25°13'18" N, 98°34'18" E; 1550 m a.s.l.; 2 Jun. 2006; Chang-min Yin, Jia-fang Hu, Ming-wei Yang and Shao-xian He leg.; HNU-YHY20-1 • 3 ♀♀; Tengchong County, Puchuan Township, Miguo Village; 24°45'40" N, 98°32'13" E; 1920 m a.s.l.; 5 Jun. 2006; Chang-min Yin, Jia-fang Hu, Ming-wei Yang and Shao-xian He leg.; HNU-YHY30.

Description

Female (holotype)

BODY AND HEAD. Total length 5.30. Prosoma 2.00 long, 1.45 wide. Opisthosoma 3.30 long, 2.00 wide. Clypeus height 0.10. Carapace (Fig. 8A) light yellow; carapace margin and eye base black; ocular area brown, sparsely covered with long black hairs. Fovea reddish brown, radial groove indistinct. Eye diameter and interdistances: AME 0.45, ALE 0.25, PLE 0.25, AERW 1.40, PERW 1.30, EL 0.90. Sternum scutiform, covered with fine brown hairs; median area slightly bulged, yellowish brown, margin grayish brown. Clypeus light brown, covered with long light brown hairs. Endites and labium light brown, distal area yellowish brown, covered with grayish black hairs.

CHELICERAE (Fig. 9C). Light brown, anterior base grayish black, distal area covered with long brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Light brown to yellowish brown, annuli indistinct, spines thin. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

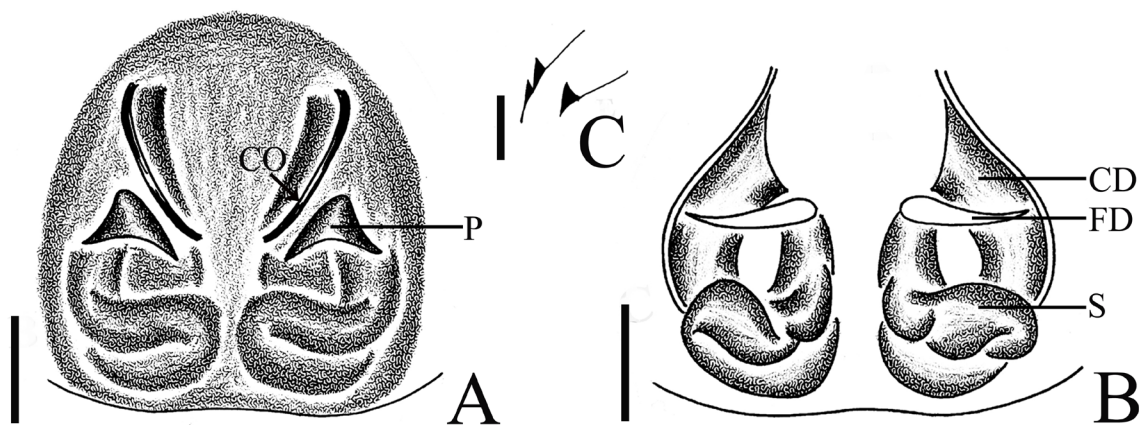


Fig. 9. *Ptocasius davidi* sp. nov., holotype, ♀ (HNU-00-QF-3A). **A.** Epigynum, ventral view. **B.** Vulva, dorsal view. **C.** Chelicerae, posterior view. Scale bars = 0.1 mm.

LEG MEASUREMENTS. I = 3.15 (1.00, 1.25, 0.50, 0.40), II = 3.00 (1.00, 1.15, 0.50, 0.35), III = 3.45 (1.05, 1.20, 0.60, 0.60), IV = 4.00 (1.20, 1.40, 0.80, 0.60). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 8A). Oval, dorsum pale with many irregular twills; the posterior median area with three grayish black herring bones; posteriorly with a large grayish black marking; ventral light yellow, the median area with a discrete grayish black longitudinal band, sides with irregular grayish-black spots. Spinnerets dark brown.

EPIGYNUM (Figs 8B–C, 9A–B). Longer than wide; the pockets angular, close to copulatory openings, interdistance of pockets almost as wide as pocket width in ventral view; copulatory ducts S-shaped; spermathecae slightly folded.

Male

Unknown.

Distribution

China (Yunnan Province, Fig. 43).

Ptocasius filiformis sp. nov.

[urn:lsid:zoobank.org:act:B3841DD1-531B-4A28-9F3E-F9F51A2C7B39](https://zoobank.org/urn:lsid:zoobank.org:act:B3841DD1-531B-4A28-9F3E-F9F51A2C7B39)

Figs 10–12, 41

Diagnosis

The male of the new species resembles that of *P. urbanii* (Žabka, 1981) (Žabka 1981: figs 31–34) in having the similar tibial apophysis in male palp, but can be distinguished by: (1) genital bulb significantly longer than wide in ventral view (Figs 10B, 12A), while as long as wide in *P. urbanii* (Žabka 1981: fig. 31); (2) tip of tibial apophysis reaching posterior half of genital bulb in ventral view (Figs 10B, 12A), while reaching anterior half of genital bulb in *P. urbanii* (Žabka 1981: fig. 31); (3) genital lobe long and horny, outer margin of genital lobe overpasses outer margin of tibial apophysis in ventral view (Figs 10B, 12A), while short and conic, just slightly overpassing inner margin of tibial apophysis in *P. urbanii* (Žabka 1981: fig. 31). The female of the new species resembles that of *P. urbanii* (Žabka 1981: figs 25–26, 41) in having similar pockets in the epigynum, but can be distinguished by: (1) epigynum almost as long as wide in ventral view (Figs 11B, 12D), while distinctly longer than wide in *P. urbanii* (Žabka 1981: fig. 25); (2) copulatory openings almost as long as pocket length in ventral view (Figs 11B, 12D), while almost two times as long as pocket length in *P. urbanii* (Žabka 1981: fig. 25); (3) top margins of spermathecae below and away from copulatory openings in dorsal view (Figs 11C, 12E), while slightly above and close to copulatory openings in *P. urbanii* (Žabka 1981: fig. 26).

Etymology

The specific name is derived from the combination of the Latin terms '*filum*' ('thread') and '*forma*' ('shape'), referring to the filiform embolus, noun in apposition.

Type material

Holotype

CHINA • ♂; Yunnan Province, Longling County, Longjiang Township, Xiaoheishan Nature Reserve (Guchengshan mountain); 24°49'43" N, 98°45'33" E; 2010 m a.s.l.; 26 May 2005; Heng-mei Yan leg.; in the forest; HNU-GKJ026–1A.

Paratypes (3 ♀♀)

CHINA – Yunnan Province • 3 ♀♀; same collection data as for holotype; HNU-GKJ026–1P.

Description

Male (holotype)

BODY AND HEAD. Total length 4.38. Prosoma 2.15 long, 1.77 wide. Opisthosoma 2.21 long, 1.23 wide. Clypeus high 0.09. Carapace (Fig. 10A) reddish brown, covered with white and brown hairs; carapace margin and eyes base black; ocular area covered with long thick dark brown hairs, anterior and lateral margins black with dense white hairs. Fovea sulciform, reddish brown. Cervical groove indistinct, radial groove dark brown. Eye diameters and interdistances: AME 0.49, ALE 0.23, PLE 0.29, PME 0.08, AERW 1.12, PERW 1.22, EL 1.08. Sternum scutiform, yellowish brown, covered with thin brown hairs; marginal areas with long brown hairs. Clypeus dark brown, sparsely covered with long brown hairs. Endites and labium yellowish brown, sparsely covered with long brown hairs; distal area light brown, densely covered with grayish hairs.

CHELICERAE (Fig. 12C). Yellowish brown, covered with long thick brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Light yellow, covered with thick brown hairs, bearing numerous short spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 4.97 (1.50, 1.98, 0.84, 0.65), II = 4.14 (1.28, 1.60, 0.68, 0.58), III = 4.51 (1.34, 1.58, 1.11, 0.48), IV = 4.77 (1.46, 1.63, 1.16, 0.52). Leg formula: I–IV–III–II.

ABDOMEN (Fig. 10A). Elongated oval, dorsum light yellow, covered with thick white hairs and black stripes, sparsely covered with long brown hairs; each side with a wide longitudinal band; the posterior inner area with three pairs of inclined markings; the median area with black arc-shaped markings; ventral yellowish white, covered with white hairs; the median area with a black longitudinal band and irregular black inclined markings. Spinnerets brown, densely covered with long brown hairs.

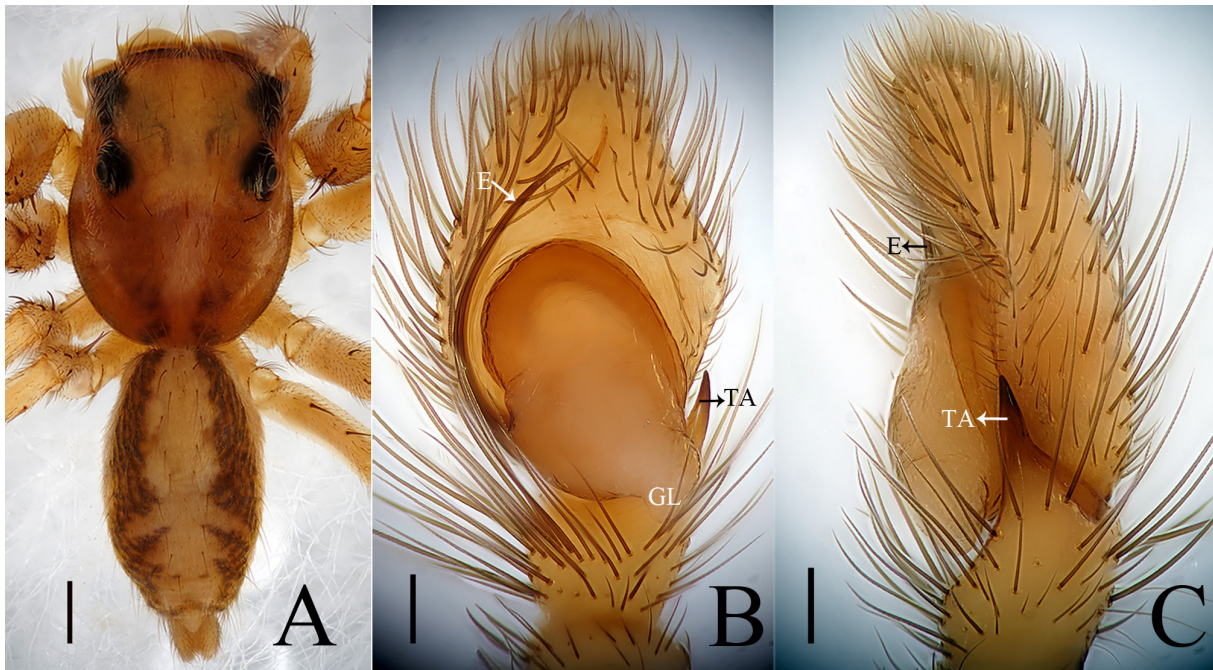


Fig. 10. *Ptocasius filiformis* sp. nov., holotype, ♂ (HNU-GKJ026–1A). A. Body, dorsal view. B. Palp, ventral view. C. Palp, retrolateral view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

PALP (Figs 10B–C, 12A–B). Longer than wide; embolus slender, originates at about 8:00 o'clock position; genital bulb almost rectangular, genital lobe comma-shaped; the tip of tibial apophysis only extending to the posterior half of genital bulb in ventral view.

Female (paratypes)

BODY AND HEAD. Total length 4.79. Prosoma 2.09 long, 1.46 wide. Opisthosoma 2.82 long, 1.66 wide. Clypeus high 0.08. Carapace (Fig. 11A) reddish brown, covered with white and brown hairs; base carapace margin and eyes base black; ocular area covered with long dark brown hairs, anterior and lateral margins black covered with dense white hairs. Fovea sulciform, reddish brown. Cervical groove indistinct, radial groove reddish brown. Eye diameters and interdistances: AME 0.43, ALE 0.22, PME 0.07, PLE 0.25, AERW 0.95, PERW 1.10, EL 0.88. Sternum scutiform, yellowish brown, covered with brown hairs. Clypeus dark brown, distal area covered with brown hairs. Endites and labium reddish brown, sparsely covered with long brown hairs; distal area light brown, densely covered with grayish hairs.



Fig. 11. *Ptocasius filiformis* sp. nov., paratype, ♀ (HNU-GKJ026–1P). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

CHELICERAE (Fig. 12F). Yellowish brown, sparsely covered with long brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Yellowish brown, densely covered with white hairs, bearing numerous short spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 3.07 (1.00, 1.18, 0.51, 0.38), II = 3.27 (1.01, 1.32, 0.53, 0.41), III = 3.54 (1.16, 1.22, 0.74, 0.42), IV = 3.98 (1.22, 1.45, 0.80, 0.51). Leg formula: IV–III–II–I.

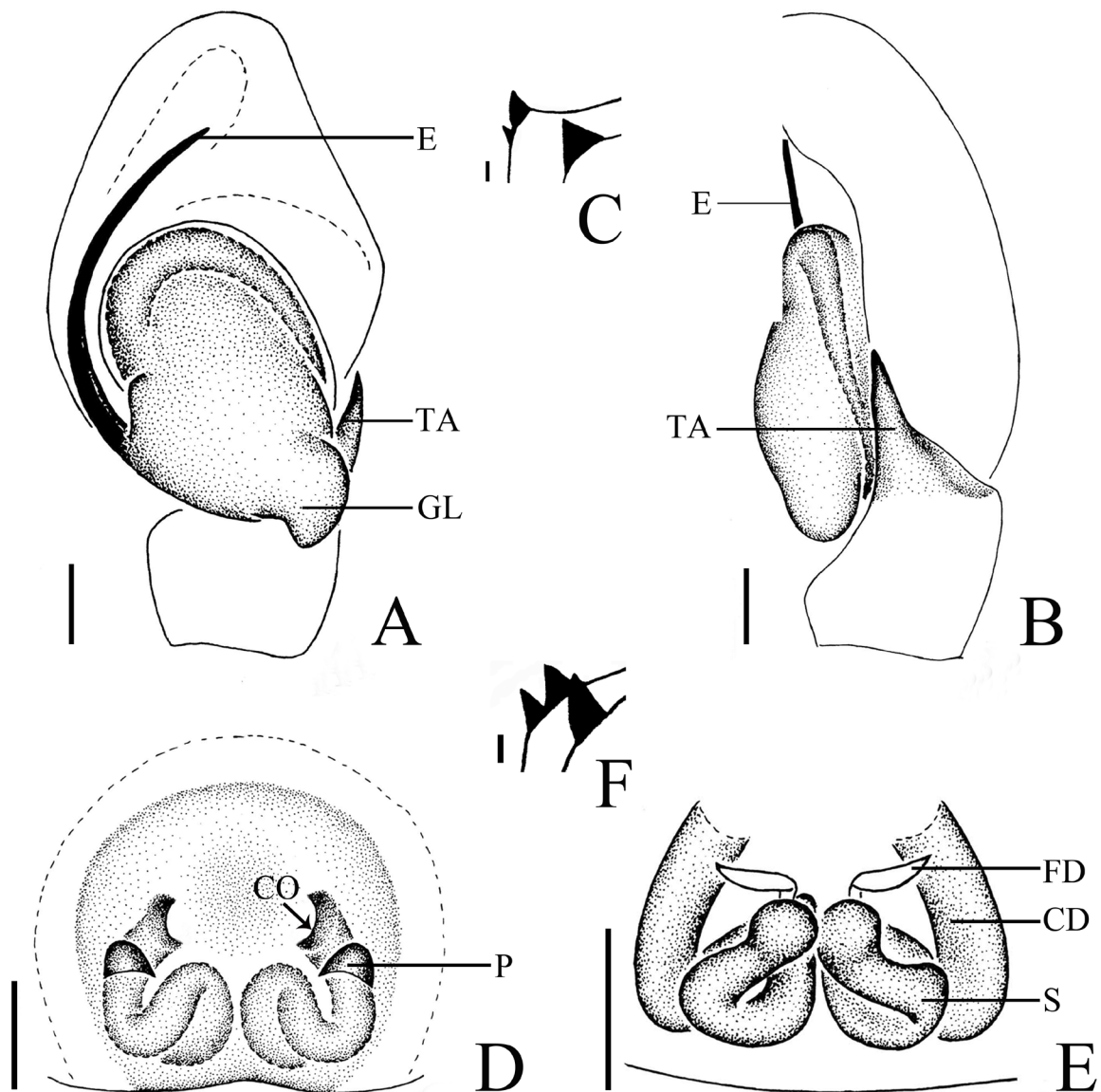


Fig. 12. *Ptocasius filiformis* sp. nov. A–C. Holotype, ♂ (HNU-GKJ026–1A). D–F. Paratype, ♀ (HNU-GKJ026–1P). A. Palp, ventral view. B. Palp, retrolateral view. C. Chelicerae, posterior view. D. Epigynum, ventral view. E. Vulva, dorsal view. F. Chelicerae, posterior view. Scale bars = 0.1 mm.

ABDOMEN (Fig. 11A). Oval, dorsum yellow, covered with brown hairs and black stripe; inner area with four inclined markings; distal area covered with long brown hairs; each side with a wide longitudinal band; the posterior median area with black herring bones; ventral light yellow, the median area with a brown longitudinal band. Spinnerets brown, densely covered with long brown hairs.

EPIGYNUM (Figs 11B–C, 12D–E). As long as wide; the pockets below and relatively away from copulatory openings, interdistance of pockets wider than interdistance of copulatory openings; copulatory openings small, almost ()-shaped; copulatory ducts S-shaped; spermathecae tube-shaped, close to each other, heads touching.

Distribution

China (Yunnan Province, Fig. 41).

Ptocasius foliolatus sp. nov.

[urn:lsid:zoobank.org:act:C5CE9EBE-C520-4ABA-BB40-F277E08EF474](https://zoobank.org/urn:lsid:zoobank.org:act:C5CE9EBE-C520-4ABA-BB40-F277E08EF474)

Figs 13–14, 43

Diagnosis

The new species resembles *P. zonatus* sp. nov. (Figs 39–40), but can be distinguished by: (1) pockets located relatively away from the copulatory openings in ventral view (Figs 13B, 14A), while located relatively closer to copulatory openings in *P. zonatus* (Figs 39B, 40A); (2) atrium margin somewhat parallel to each other in ventral view (Figs 13B, 14A), while somewhat V-shaped in *P. zonatus* (Figs 39B, 40A).

Etymology

The specific name is derived from the combination of the Latin noun ‘*folium*’ (‘leaf’) and the adjective ‘*latus*’ (‘wide’), referring to the leaf-like markings on abdominal dorsum.

Type material

Holotype

CHINA • ♀; Yunnan Province, Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00–QF–4A.

Paratype (1 ♀)

CHINA – Yunnan Province • 1 ♀; same collection data as for holotype; HNU-00–QF–4P.

Description

Female (holotype)

BODY AND HEAD. Total length 6.60. Prosoma 2.40 long, 1.80 wide. Opisthosoma 4.20 long, 2.60 wide. Clypeus height 0.13. Carapace (Fig. 13A) light yellowish brown, margin grayish black; eyes base black; ocular area dark brown. Fovea is short, reddish brown, sparsely covered with long black hairs, densely covered with short white and black hairs. Cervical and radial grooves are indistinct. Eye diameter and interdistances: AME 0.50, ALE 0.28, PLE 0.25, AERW 1.55, PERW 1.45, EL 1.00. Sternum scutiform, light yellowish brown, covered with short dark brown hairs. Clypeus brown, median area and promargin dark brown, covered with long white hairs. Endites and labium brown, distal area light brown, covered with grayish black hairs.

CHELICERAE (Fig. 14C). Light brown, covered with long brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Light brown to grayish brown, densely covered with grayish black hairs; spines dense and short. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 4.30 (1.40, 1.70, 0.60, 0.60), II = 4.00 (1.40, 1.50, 0.50, 0.60), III = 4.80 (1.60, 1.60, 0.90, 0.70), IV = 5.00 (1.50, 1.70, 1.00, 0.80). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 13A). Long oval, dorsum yellowish brown, each side with a light brown zone; the median area grayish black with two pairs of reddish-brown sigillae, cardiac marking long strip; posterior portion with four arc dark markings; ventral light yellow, the median area with a grayish black longitudinal strip, sides with grayish black markings and irregular white spots. Spinnerets grayish black.



Fig. 13. *Ptocasius foliolatus* sp. nov., holotype, ♀ (HNU-00–QF–4A). **A.** Body, dorsal view. **B.** Epigynum, ventral view. **C.** Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

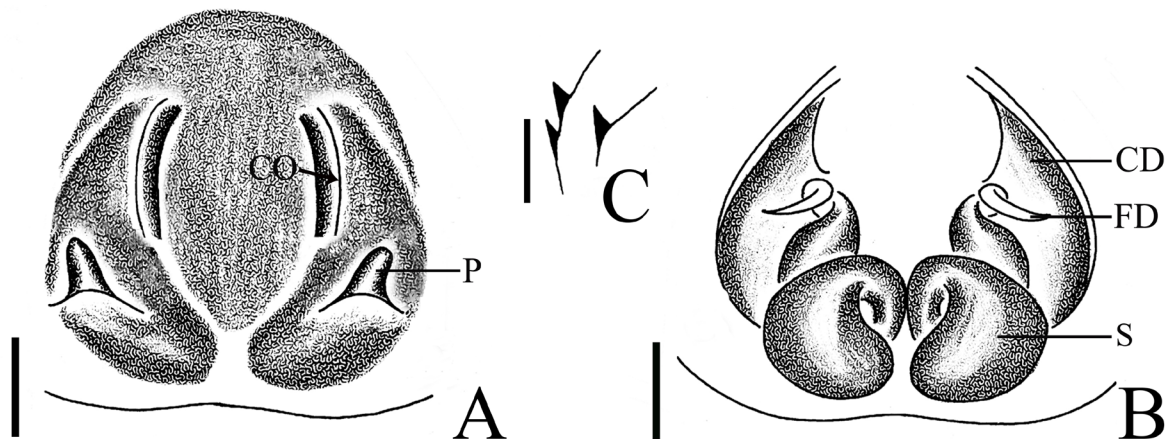


Fig. 14. *Ptocasius foliolatus* sp. nov., holotype, ♀ (HNU-00–QF–4A). **A.** Epigynum, ventral view. **B.** Vulva, dorsal view. **C.** Chelicerae, posterior view. Scale bars = 0.1 mm.

EPIGYNUM (Figs 13B–C, 14A–B). Almost as long as wide; the pockets angular, below and relatively away from copulatory openings; copulatory openings longitudinal, atrium margin almost parallel to each other in ventral view; copulatory ducts thick and large; spermathecae folded, heads touching.

Male

Unknown.

Distribution

China (Yunnan Province, Fig. 43).

Ptocasius geminus sp. nov.

[urn:lsid:zoobank.org:act:33D1E30D-1B0C-4A6B-8DF1-45B602413528](https://doi.org/10.3896/EBL.33D1E30D-1B0C-4A6B-8DF1-45B602413528)

Figs 15–17, 44

Diagnosis

The male of the new species resembles that of *P. falcatus* (Zhu *et al.*, 2005) (Zhu *et al.* 2005: fig. 13d–e) in having a similar morphology of the male palp, but can be distinguished by: (1) genital bulb distinctly longer than wide in ventral view (Figs 15B, 17A), while almost as long as wide in *P. falcatus* (Zhu *et al.* 2005: fig. 13d); (2) genital lobe thumb-shaped in ventral view (Figs 15B, 17A), while somewhat rectangular in *P. falcatus* (Zhu *et al.* 2005: fig. 13d); (3) tibial apophysis knife-shaped in retrolateral view (Figs 15C, 17B), while finger-shaped in *P. falcatus* (Zhu *et al.* 2005: fig. 13e). The female of the new species resembles that of *P. falcatus* (Zhu *et al.* 2005: fig. 13a–c) in having a similar morphology of the epigynum, but can be distinguished by: (1) top of pockets below posterior margin of copulatory openings in ventral view (Figs 16B, 17D), while anterior margin present between copulatory openings in *P. falcatus* (Zhu *et al.* 2005: fig. 13b); (2) posterior margin of pockets two times as wide as long in ventral view (Figs 16B, 17D), while as long as wide in *P. falcatus* (Zhu *et al.* 2005: fig. 13b).

Etymology

The specific name is derived from the Latin adjective ‘*geminus*’ (‘twin-born’), referring to the form of epigynum pockets.

Type material

Holotype

CHINA • ♂; Yunnan Province, Nujiang Prefecture, Gongshan County, Danzhu, 15.7–16.0 km Southwest of Gongshan; 27°37'37" N, 98°35'31" E to 27°37'19" N, 98°35'14" E; 2800–3425 m a.s.l.; 2 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00–GDS–2A.

Paratypes (14 ♂♂, 18 ♀♀)

CHINA – Yunnan Province • 4 ♀♀; same collection data as for holotype; HNU-00–GDS–2P • 10 ♂♂, 9 ♀♀; Nujiang Prefecture, Nujiang State Nature Reserve, No.12 bridge Camp area, 16.3 km West of Gongshan; 27°42'54" N, 98°30'08" E; 2775 m a.s.l.; 15–17 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-Yan000715 • 1 ♂; Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00–QF–5 • 3 ♂♂, 5 ♀♀; Nujiang Prefecture, Gongshan County, Danzhu, 13.5 km Southwest of Gongshan; 27°37'50" N, 98°37'14" E; 2700 m a.s.l.; 30 Jun.–5 Jul. 2000; David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick, Heng-mei Yan and Da-zhi Dong leg.; HNU-Yan000730.

Description

Male (holotype)

BODY AND HEAD. Total length 4.60. Prosoma 1.80 long, 1.40 wide. Opisthosoma 2.80 long, 1.30 wide. Clypeus height 0.10. Carapace (Fig. 15A) dark brown, carapace margin and eyes base black, anterior and lateral margins black; anterior and lateral margins of ocular area black with dense white hairs; PLE followed by two small slightly colored circles. Fovea thin, reddish brown, radial groove black, line-shaped. Eye diameter and interdistances: AME 0.40, ALE 0.20, PLE 0.20, AERW 1.20, PERW 1.10, EL 0.80. Sternum inverse pear-shaped, highly bulged, densely covered with fine brown hairs; yellowish



Fig. 15. *Ptocasius geminus* sp. nov., holotype, ♂ (HNU-00–GDS–2A). A. Body, dorsal view. B. Palp, ventral view. C. Palp, retrolateral view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

brown, margin black. Clypeus dark brown, sparsely covered with long brown hairs; promargin black, sides light brown. Endites and labium brown, distal area covered with light grayish black hairs.

CHELICERAE (Fig. 17C). Brown, anterolateral area black, two large promarginal teeth and one small retromarginal denticle.

LEGS. Light brown to brown, with black markings or annuli; spines short. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 3.30 (1.00, 1.30, 0.50, 0.50), II = 2.95 (0.95, 1.10, 0.45, 0.45), III = 3.35 (1.00, 1.10, 0.70, 0.50), IV = 3.70 (1.20, 1.20, 0.80, 0.50). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 15A). Oval, dorsum anterior margin black; cardiac marking bar-shaped, grayish black, with two pairs of sigillae; the posterior median with two large black herring bones; sides with some irregular black twills, ventral light yellow, the median area with small black spots, sides with many black twills; the posterior area with a big black marking. Spinnerets dark brown.

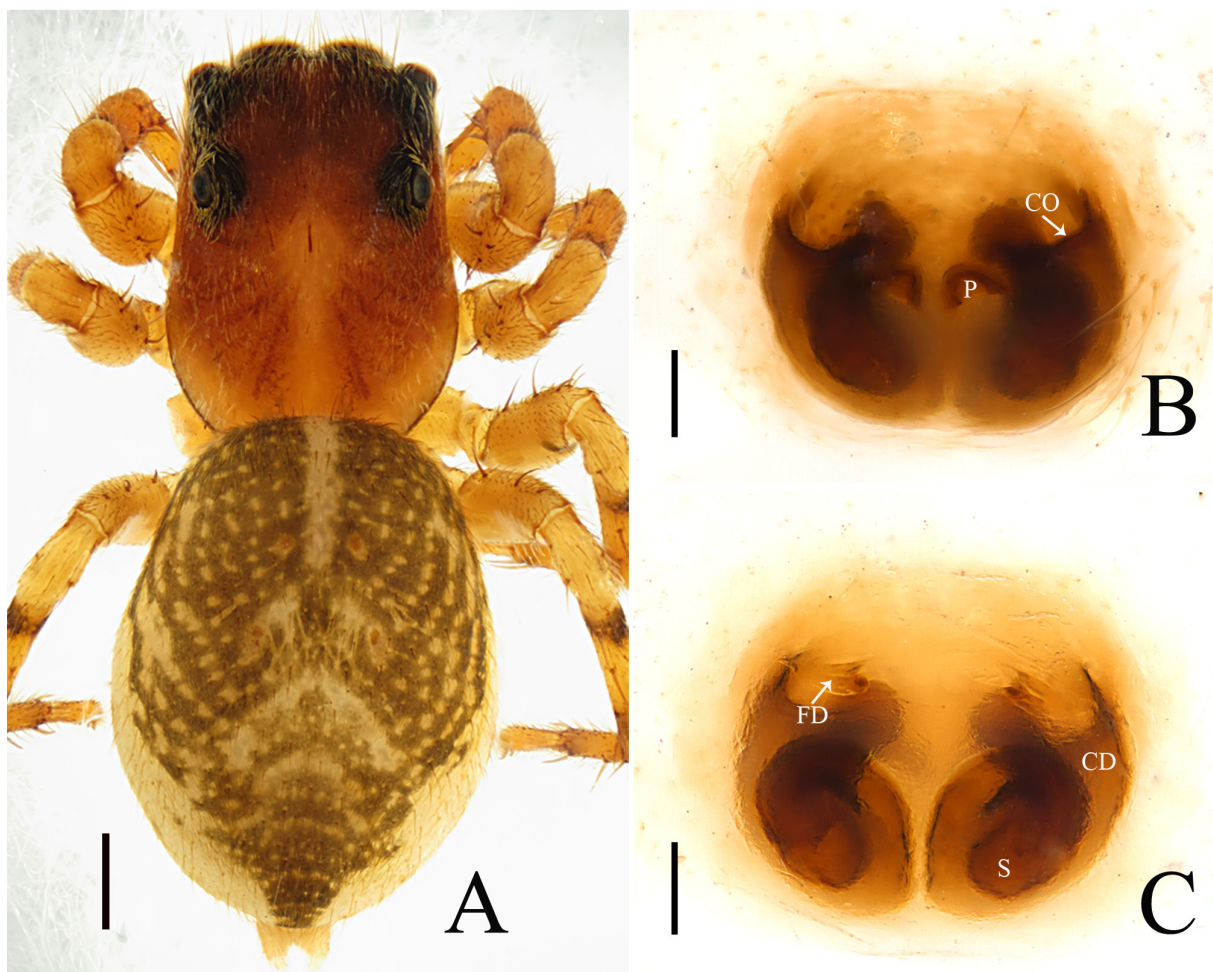


Fig. 16. *Ptocasius geminus* sp. nov., paratype, ♀ (HNU-00–GDS–2P). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

PALP (Figs 15B–C, 17A–B). Longer than wide; embolus originates at about 8:00 o'clock position; genital bulb with a membranous structure; genital lobe thumb-shaped in ventral view; tibial apophysis knife-shaped.

Female (paratypes)

BODY AND HEAD. Total length 5.60. Prosoma 2.10 long, 1.60 wide. Opisthosoma 3.50 long, 2.40 wide. Eye diameter and interdistances: AME 0.40, ALE 0.25, PLE 0.25, AER 1.35, PER 1.30, EFL 0.90. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 3.40 (1.10, 1.30, 0.50, 0.50), II = 3.10 (1.00, 1.20, 0.50, 0.40), III = 3.80 (1.20, 1.30, 0.70, 0.60), IV = 4.50 (1.40, 1.50, 1.00, 0.50). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 16A). Mid-ventrally with a grayish black longitudinal band. Markings and other morphological features the same as in male.

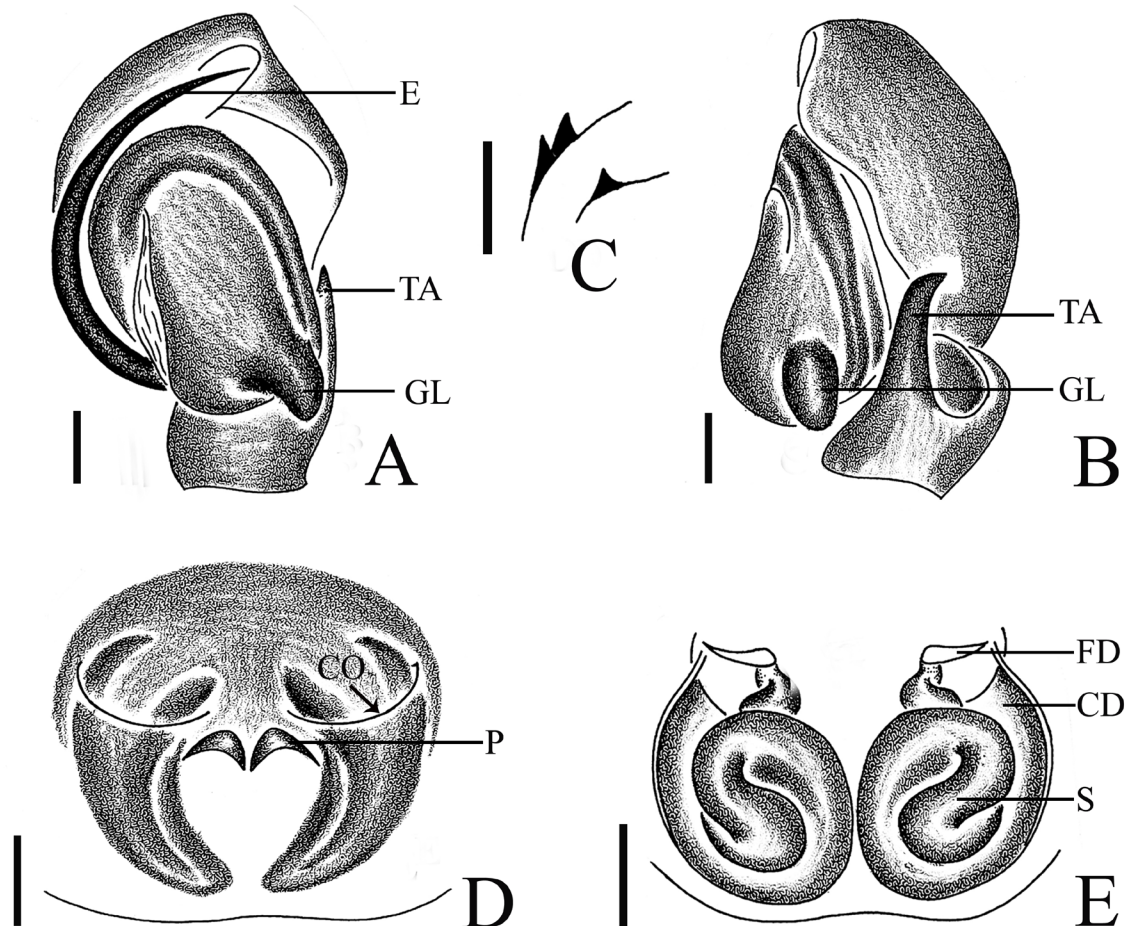


Fig. 17. *Ptocasius geminus* sp. nov. A–C. Holotype, ♂ (HNU-00-GDS-2A). D–E. Paratype, ♀ (HNU-00-GDS-2P). A. Palp, ventral view. B. Palp, retrolateral view. C. Chelicerae, posterior view. D. Epigynum, ventral view. E. Vulva, dorsal view. Scale bars = 0.1 mm.

EPIGYNUM (Figs 16B–C, 17D–E). Almost as long as wide; the pockets almost touching, present below the copulatory openings; copulatory openings almost transverse; copulatory ducts cylindrical; spermathecae spiral, close to each other.

Distribution

China (Yunnan Province, Fig. 44).

Ptocasius jietouensis sp. nov.

[urn:lsid:zoobank.org:act:F901D7B7-DE3B-4154-AB21-7CD98AB05EB7](https://zoobank.org/act:F901D7B7-DE3B-4154-AB21-7CD98AB05EB7)

Figs 18–20, 44

Diagnosis

The male of the new species resembles that of *P. lushiensis* (Zhang & Zhu, 2007) (Zhu & Zhang 2011: fig. 384a–c), but can be distinguished by: (1) genital bulb almost as long as wide in ventral view (Figs 18B, 20A), while distinctly longer than wide in *P. lushiensis* (Zhu & Zhang 2011: fig. 384b); (2) genital lobe somewhat rectangular, originating at about 5:00 o'clock position in ventral view (Figs 18B, 20A), while somewhat triangular, originating at about 6:00 o'clock in *P. lushiensis* (Zhu & Zhang 2011: fig. 384b); (3) tibial apophysis knife-shaped in retrolateral view (Figs 18C, 20B), while thorn-shaped in *P. lushiensis* (Zhu & Zhang 2011: fig. 384c). The female of the new species resembles that of *P. lushiensis* (Zhu & Zhang 2011: fig. 384d–e), but can be distinguished by: (1) interdistance of pockets almost four times as wide as pocket width in ventral view (Figs 19B, 20D), while narrower than pocket width in *P. lushiensis* (Zhu & Zhang 2011: fig. 384d); (2) copulatory openings diagonal in ventral view (Figs 19B, 20D), while longitudinal in *P. lushiensis* (Zhu & Zhang 2011: fig. 384d).

Etymology

The specific name is derived from the type locality Jietou Township.



Fig. 18. *Ptocasius jietouensis* sp. nov., holotype, ♂ (HNU-Tang031023A). **A.** Body, dorsal view. **B.** Palp, ventral view. **C.** Palp, retrolateral view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

Type material

Holotype

CHINA • ♂; Yunnan Province, Tengchong County, Jietou Township, Shaba Village, Lijiazhai Group; 25°14'10" N, 98°25'16" E; 1819 m a.s.l.; 23 Oct. 2003; Guo Tang leg.; HNU-Tang031023A.

Paratypes (1 ♂, 1 ♀)

CHINA – Yunnan Province • 1 ♂, 1 ♀; same collection data as for holotype; HNU-Tang031023P.

Description

Male (holotype)

BODY AND HEAD. Total length 3.99. Prosoma 2.13 long, 1.56 wide. Opisthosoma 2.01 long, 1.20 wide. Clypeus high 0.13. Carapace (Fig. 18A) dark brown, covered with short white hairs; carapace margin and eyes base black; anterior and eyes base covered with dense short brown hairs; lateral margins of ocular area black with dense white hairs. Fovea sulciform and dark brown. Cervical groove indistinct,



Fig. 19. *Ptocasius jietouensis* sp. nov., paratype, ♀ (HNU-Tang031023P). **A.** Body, dorsal view. **B.** Epigynum, ventral view. **C.** Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

radial groove brown. Eye diameters and interdistances: AME 0.46, ALE 0.23, PLE 0.25, AERW 1.08, PERW 1.08, EL 1.17. Sternum yellowish-brown and scutiform, densely covered with brown hairs. Clypeus yellowish-brown, sparsely covered with long brown hairs. Endites and labium yellowish-brown, sparsely covered with dark brown hairs; distal area yellowish-white, densely covered with grayish hairs.

CHELICERAE (Fig. 20C). Yellowish brown, covered with brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Light yellow, with black annuli and spots, densely covered with black hairs, bearing numerous short spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 3.51 (1.15, 1.39, 0.50, 0.47), II = 3.79 (1.20, 1.30, 0.79, 0.50), III = 3.52 (1.16, 1.20, 0.67, 0.49), IV = 2.89 (0.97, 1.08, 0.42, 0.42). Leg formula: II–III–I–IV.

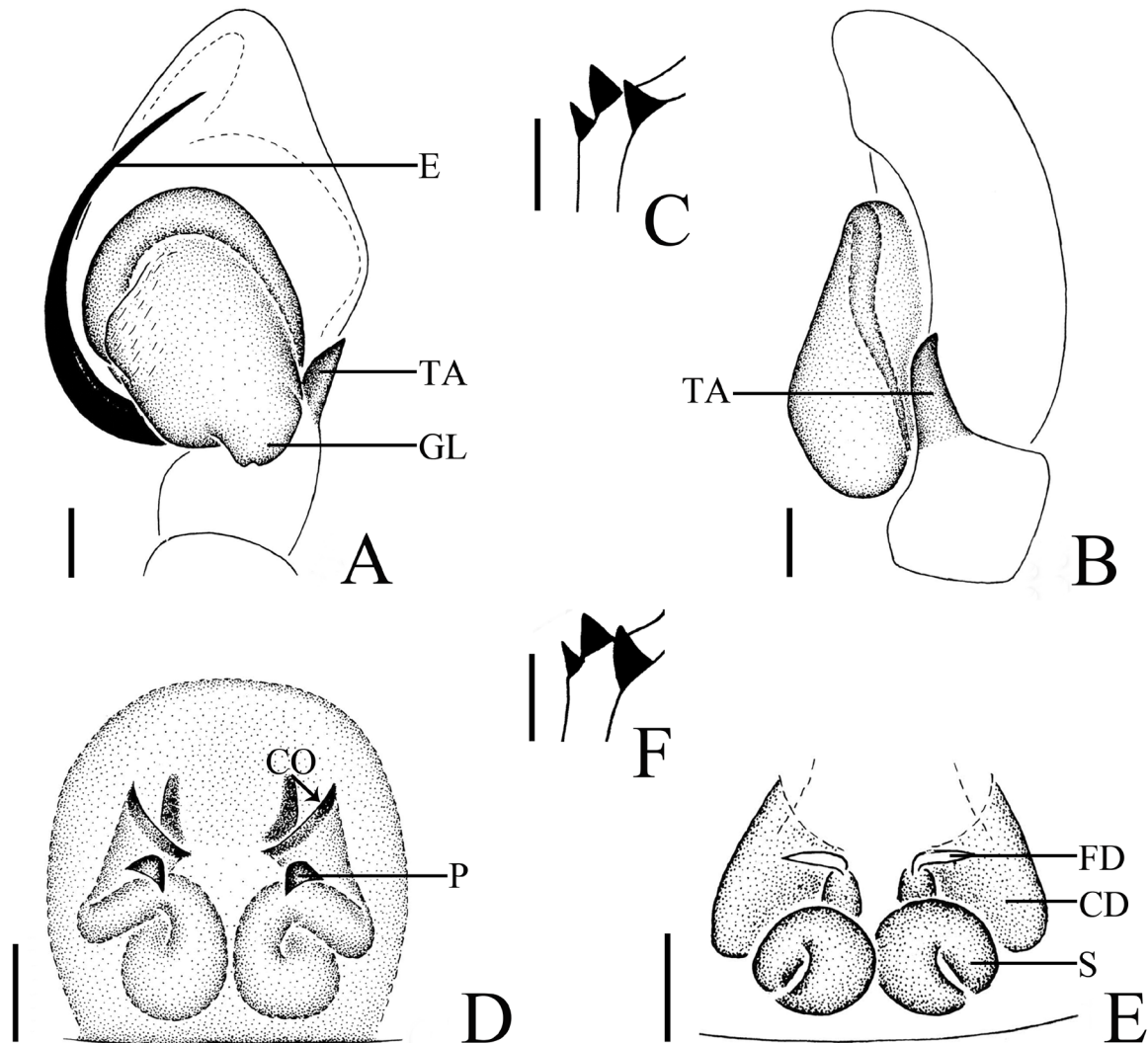


Fig. 20. *Ptocasius jietouensis* sp. nov. **A–C.** Holotype, ♂ (HNU-Tang031023A). **D–F.** Paratype, ♀ (HNU-Tang031023P). **A.** Palp, ventral view. **B.** Palp, retrolateral view. **C.** Chelicerae, posterior view. **D.** Epigynum, ventral view. **E.** Vulva, dorsal view. **F.** Chelicerae, posterior view. Scale bars = 0.1 mm.

ABDOMEN (Fig. 18A). Almost cylindrical, dorsum yellowish brown with black spots, densely covered with short brown hairs, each side with a black longitudinal band, sparsely covered with long brown hairs, four small light spots; the median area with a nail-shaped light spot; the posterior portion with three to four black herring bones; ventral yellowish white, densely covered with black hairs, scattered with black spots; sides with a discontinuous black longitudinal band. Spinnerets dark brown, densely covered with long white hairs.

PALP (Figs 18B–C, 20A–B). Longer than wide; embolus slender and sinuous, originates at about 7:00 o'clock position in ventral view; genital bulb with membranous structure, genital lobe somewhat rectangular; tibial apophysis knife-shaped, about $\frac{1}{3}$ the length of the genital bulb.

Female (a paratype)

BODY AND HEAD. Total length 4.37. Prosoma 2.80 long, 1.72 wide. Opisthosoma 2.38 long, 1.45 wide. Clypeus high 0.10. Carapace (Fig. 19A) dark brown, covered with brown hairs; carapace margin and eyes base black; anterior area covered with long brown brush-shaped hairs; lateral area yellowish white, densely covered with white hairs. Fovea dark brown and sulciform. Cervical groove indistinct, radial groove brown. Eye diameters and interdistances: AME 0.50, ALE 0.26, PME 0.62, PLE 0.23, AERW 1.05, PERW 1.17, EL 1.00. Sternum scutiform, yellowish brown, densely covered with brown hairs. Clypeus yellowish brown. Endites and labium brown, sparsely covered with long brown hairs; distal area yellow-white, densely covered with gray hairs.

CHELICERAE (Fig. 20F). Yellowish brown, sparsely covered with long and short brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Light yellow, covered with brown hairs, bearing numerous short spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 3.36 (0.95, 1.43, 0.56, 0.42), II = 3.28 (1.13, 1.27, 0.43, 0.45), III = 3.85 (1.33, 1.36, 0.67, 0.49), IV = 4.20 (1.41, 1.54, 0.74, 0.51). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 19A). Almost oval, dorsum yellowish white, densely covered with brown hairs, sparsely with long brown hairs; the posterior portion sparsely covered with long brown hairs; each side with a black longitudinal band, the median area with four dentations; the posterior portion with a black spot; ventral yellowish white, densely covered with white hairs, scattered with black spots; sides sparsely covered with short brown hairs. Spinnerets dark brown, densely covered with long white hairs.

EPIGYNUM (Figs 19B–C, 20D–E). Almost as long as wide; the pockets present below, relatively close to copulatory openings, interdistance of pockets four times as wide as pocket width in ventral view; copulatory openings diagonal; copulatory ducts thick, sinuous; spermathecae simple, distinctly twisting outward, close to each other.

Distribution

China (Yunnan Province, Fig. 44).

Ptocasius longapophysis sp. nov.

[urn:lsid:zoobank.org:act:9D525100-B97A-4CD7-8383-FEB52FE4588A](https://zoobank.org/urn:lsid:zoobank.org:act:9D525100-B97A-4CD7-8383-FEB52FE4588A)

Figs 21–23, 42

Diagnosis

The male of the new species resembles that of *P. pseudoflexus* (Liu, Yang & Peng, 2016) (Liu *et al.* 2016: figs 13–17), but can be distinguished by: (1) tibial apophysis band-shaped, terminal end extending beyond

anterior margin of genital bulb in ventral view (Figs 21B–C, 23A–B), while finger-shaped and retained below anterior margin of genital bulb in *P. pseudoflexus* (Liu *et al.* 2016: figs 14–17). The female of the new species resembles that of *P. pseudoflexus* (Liu *et al.* 2016: figs 19–24), but can be distinguished by: (1) pockets eyebrow-shaped, away from copulatory openings in ventral view (Figs 22B, 23D), while angular-shaped, close to copulatory openings in *P. pseudoflexus* (Liu *et al.* 2016: figs 20, 22); (2) top margins of spermathecae close to copulatory openings in dorsal view (Figs 22C, 23E), while away from copulatory openings in *P. pseudoflexus* (Liu *et al.* 2016: figs 21, 23).

Etymology

The specific name is derived from the Greek noun ‘*apophysis*’ (‘prominence’) in combination with the Latin adjective ‘*longus*’ (‘long’), referring to the long tibial apophysis.

Type material

Holotype

CHINA • ♂; Yunnan Province, Tengchong County, Houqiao Township, 2 km down the road from Guyong Forestry Station; 25°23'44" N, 98°18'44" E; 2374 m a.s.l.; 27 May 2006; Xin-ping Wang and Peng Hu leg.; HNU-Wang060527–3A.

Paratypes (37 ♂♂, 9 ♀♀)

CHINA – Yunnan Province • 11 ♂♂, 6 ♀♀; same collection data as for holotype; HNU-Wang060527–3P • 1 ♂; Tengchong County, Old Pass, 28 km East of Tengchong; 24°57'00" N, 98°45'00" E; 2300 m a.s.l.; 26–31 Oct. 1998; Charles Griswold, David Kavanaugh and Chun-lin Long leg.; HNU-98–OP–1 • 2 ♂♂, 1 ♀; Tengchong County, Houqiao Township, Danzha Forest Station, Zhaobitang Village, 25°32'16" N, 98°12'33" E; 2480 m a.s.l.; 29 May 2006; Xin-ping Wang and Peng Hu leg.; HNU-Wang060529–1 • 7 ♂♂; Baoshan City, Bawan Village, 40 km of the road Bawan to Tengchong; 24°33'16" N, 98°27'11" E; 2320 m a.s.l.; 16 Oct. 2003; Guo Tang leg.; HNU-Tang031016 • 14 ♂♂, 1 ♀; Baoshan City, Bawan Village, Luoshuidong cave of Yakou, 41 km of the Road Bawan to Tengchong; 24°33'44" N, 98°27'04" E; 2440 m a.s.l.; 15 Oct. 2003; Guo Tang leg.; HNU-Tang031015–2 • 2 ♂♂, 1 ♀; Baoshan City, Bawan Village, 41–42 km of the road Bawan to Tengchong (Yakou); 24°33'22" N, 99°27'05" E; 2416 m a.s.l.; 13 Oct. 2003; Guo Tang leg.; HNU-Tang031013.

Description

Male (holotype)

BODY AND HEAD. Total length 4.34. Prosoma 2.18 long, 1.62 wide. Opisthosoma 2.33 long, 1.36 wide. Clypeus height 0.15. Carapace (Fig. 21A) brown, carapace margin and eyes base black; lateral area of carapace and median area of thoracic region yellowish brown; ocular area covered with dense hairs, anterior and lateral margins black, covered with long brown hairs. Fovea reddish brown and sulciform. Cervical groove indistinct, radial groove brown. Eye diameters and interdistances: AME 0.40, ALE 0.20, PLE 0.20, AERW 1.35, PERW 1.20, EL 0.90. Sternum scutiform, yellowish brown, covered with short brown hairs; marginal areas brown. Clypeus dark brown. Endites and labium light yellow, distal area densely covered with grayish hairs.

CHELICERAE (Fig. 23C). Reddish brown, covered with white hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Brown, sparsely covered with short brown hairs, bearing numerous short spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 4.20 (1.30, 1.60, 0.80, 0.50), II = 3.70 (1.20, 1.40, 0.60, 0.50), III = 4.10 (1.30, 1.40, 0.80, 0.60), IV = 4.50 (1.40, 1.60, 0.90, 0.60). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 21A). Almost oval, dorsum yellowish brown, densely covered with white hairs and sparse brown hairs; each side with a discontinuous gray longitudinal band, mid-dorsally with two pairs of sigillae; the posterior median with two discontinuous herring bones; ventral yellow, covered with white hairs; the median area with a gray longitudinal band; ventral side with little black twills. Spinnerets dark brown, densely covered with long brown hairs.

PALP (Figs 21B–C, 23A–B). Longer than wide; embolus slender and sinuous, as long as the genital bulb, originates at about 10:00 o'clock position; genital bulb with membranous structure, the terminal area with a square genital lobe; tibial apophysis long, band-shaped, apex extending beyond genital bulb margin.

Female (paratypes)

BODY AND HEAD. Total length 4.55. Prosoma 1.92 long, 1.40 wide. Opisthosoma 2.62 long, 1.57 wide. Clypeus high 0.09. Carapace (Fig. 22A) yellowish white, sides yellowish brown; carapace margin and eyes base black; ocular area densely covered with hairs, anterior and lateral margins black, covered with long brown hairs. Fovea reddish brown and sulciform, covered with white hairs. Cervical groove indistinct, radial groove dark brown. Eye diameters and interdistances: AME 0.37, ALE 0.17, PLE 0.20, AERW 0.90, PERW 1.00, EL 0.80. Sternum scutiform, yellowish brown, margin darker, densely covered with brown hairs. Clypeus dark brown. Endites and labium dark brown, covered with long brown hairs; distal area yellowish brown with dense grayish brown hairs.

CHELICERAE (Fig. 23F). Dark brown, covered with black hairs, distal area yellowish brown, two promarginal teeth and one retromarginal denticle.



Fig. 21. *Ptocasius longapophysis* sp. nov., holotype, ♂ (HNU-Wang060527–3A). A. Body, dorsal view. B. Palp, ventral view. C. Palp, retrolateral view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

LEGS. Yellowish brown, sparsely covered with long yellowish-brown hairs, bearing numerous short spines; tibiae I strong, dark brown, covered with long brown hairs. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 3.04 (0.93, 1.20, 0.50, 0.41), II = 2.81 (0.91, 1.07, 0.40, 0.43), III = 3.38 (1.12, 1.13, 0.62, 0.51), IV = 3.77 (1.29, 1.15, 0.78, 0.55). Leg formula: IV–III–I–II.

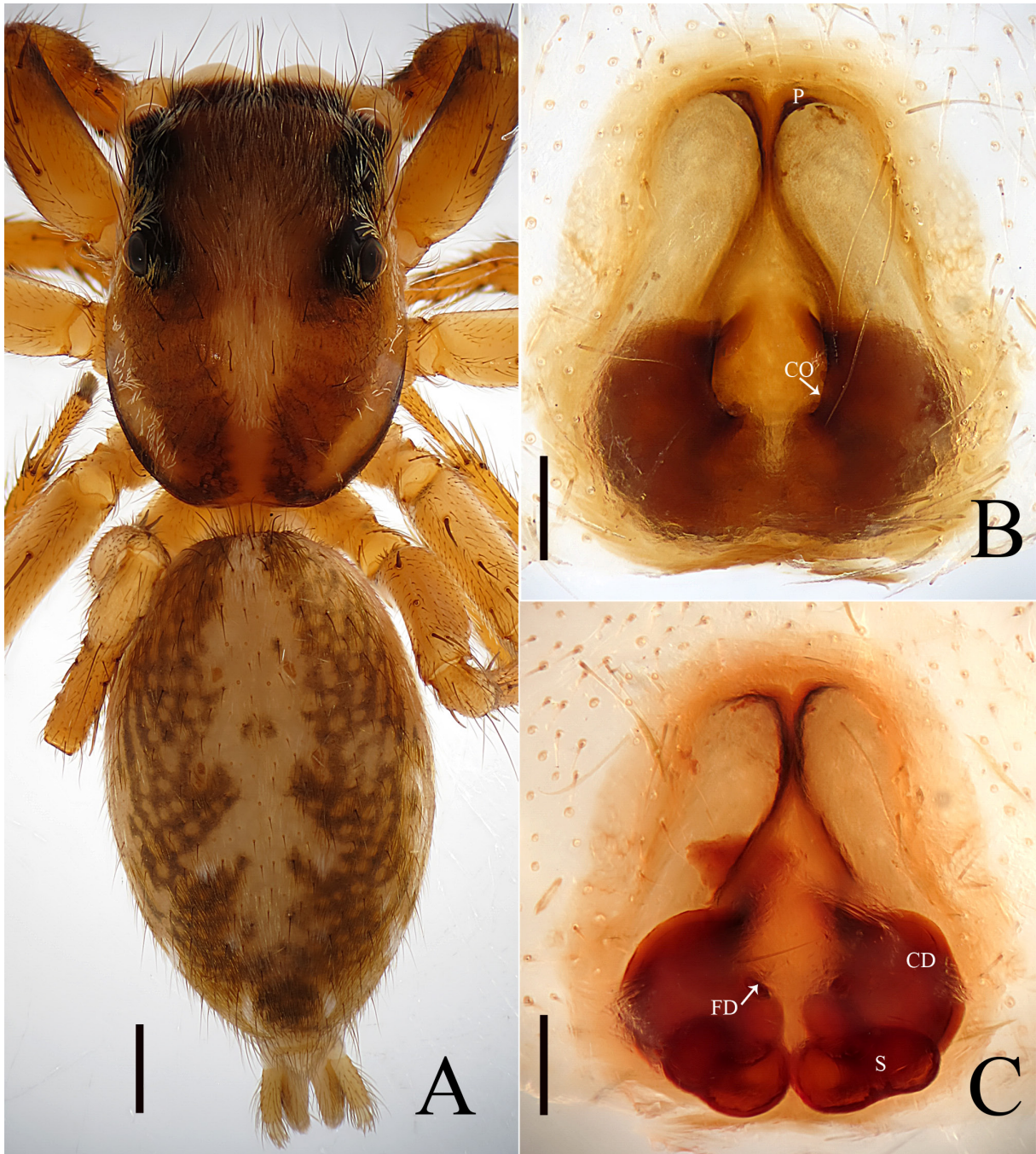


Fig. 22. *Ptocasius longapophysis* sp. nov., paratype, ♀ (HNU-Wang060527–3P). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

ABDOMEN (Fig. 22A). Oval, the posterior portion slightly pointed. Dorsum yellowish white, densely covered with white and sparse long brown hairs; margin sparsely covered with long brown hairs; the median area yellowish white, sparsely covered with brown dot spots; each side with a wide longitudinal band; the posterior inner with four inclined markings; the posterior median with four to five continuity herring bones. Ventral yellowish white, densely covered with white hairs; the median area with a grayish longitudinal band; sides with black twills. Spinnerets dark brown, densely covered with long brown hairs.

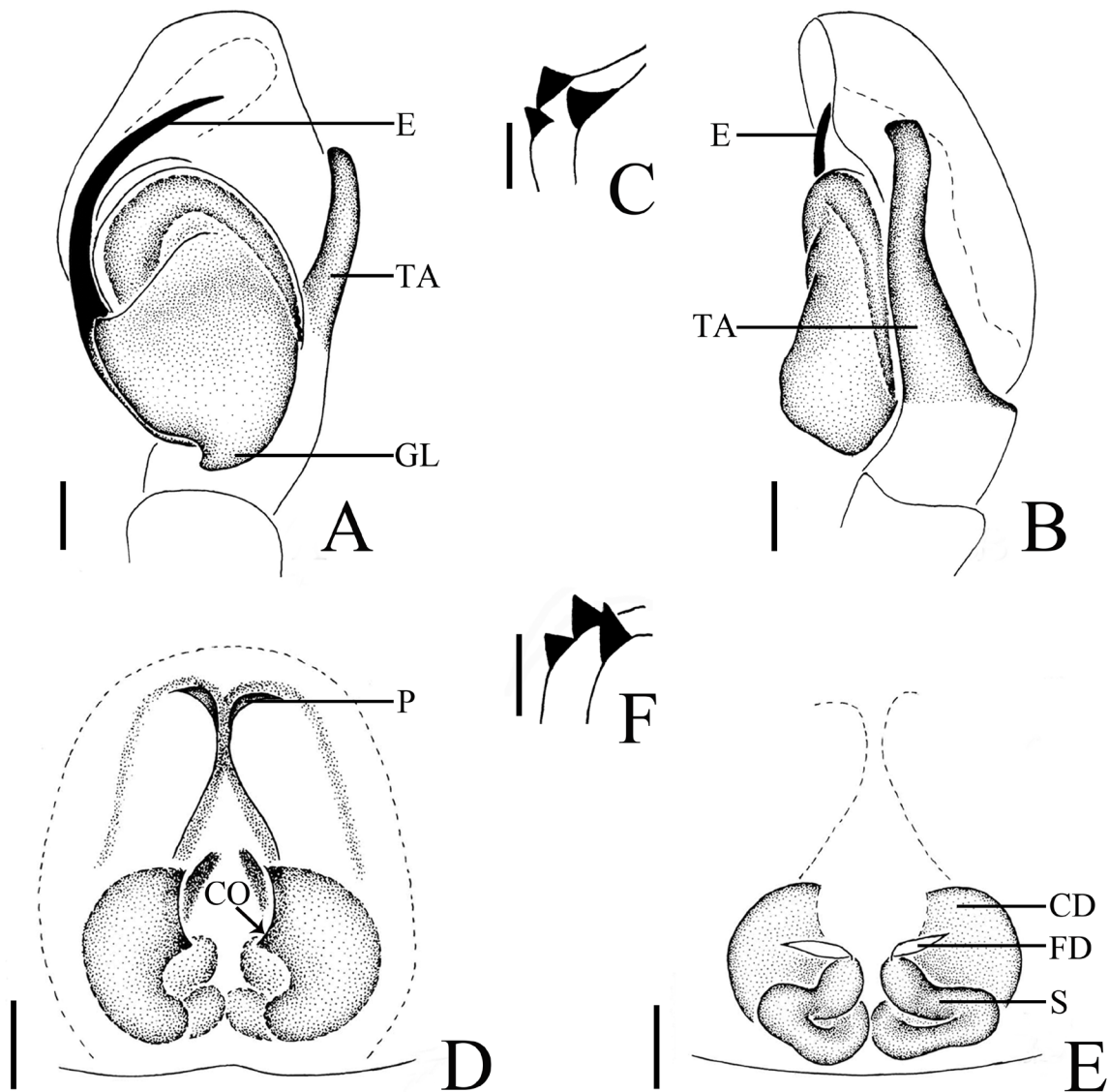


Fig. 23. *Ptocasius longapophysis* sp. nov. A–C. Holotype, ♂ (HNU-Wang060527–3A). D–F. Paratype, ♀ (HNU-Wang060527–3P). A. Palp, ventral view. B. Palp, retrolateral view. C. Chelicerae, posterior view. D. Epigynum, ventral view. E. Vulva, dorsal view. F. Chelicerae, posterior view. Scale bars = 0.1 mm.

PIGYNUM (Figs 22B–C, 23D–E). Longer than wide; the pockets eyebrow-shaped, away from copulatory openings; copulatory openings about arc-shaped; atrium about rectangular in dorsal view; spermathecae large, close to each other, the top margins of spermathecae close to copulatory openings.

Distribution

China (Yunnan Province, Fig. 42).

Ptocasius longlingensis sp. nov.

[urn:lsid:zoobank.org:act:95F38EC9-6370-40AC-AB4E-4B3B7D6AEA03](https://zoobank.org/act:95F38EC9-6370-40AC-AB4E-4B3B7D6AEA03)

Figs 24–26, 46

Diagnosis

The male of the new species resembles that of *P. urbanii* (Žabka, 1981) (Žabka 1981: figs 31–34), but can be distinguished by: (1) embolus originating at about 8:00 o'clock position in ventral view (Figs 24B, 26A), while originating at about 9:00 o'clock in *P. urbanii* (Žabka 1981: fig. 31); (2) tibial apophysis finger-shaped in retrolateral view (Figs 24C, 26B), while needle-shaped in *P. urbanii* (Žabka 1981: fig. 33). The female of the new species resembles that of *P. urbanii* (Žabka 1981: figs 25–26, 41), but can be distinguished by: (1) top of pockets close to posterior margin of copulatory openings in ventral view (Figs 25B, 26D), while relatively away from posterior margin of copulatory openings in *P. urbanii* (Žabka 1981: fig. 25); (2) spermathecae almost touching, distinctly twisting outward in dorsal view (Figs 25C, 26E), while distinctly diverging, twisting inward in *P. urbanii* (Žabka 1981: fig. 26); (3) the top margins of spermathecae below and away from copulatory openings in dorsal view (Figs 25C, 26E), while parallel and close to copulatory openings in *P. urbanii* (Žabka 1981: fig. 26).

Etymology

The specific name is derived from the type locality Longling County.

Type material

Holotype

CHINA • ♂; Yunnan Province, Longling County, Longjiang Township, Xiaoheishan Nature Reserve (Guchengshan mountain); 24°49'43" N, 98°45'33" E; 2010 m a.s.l.; 26 May 2005; Heng-mei Yan leg.; in the forest; HNU-GKJ026–2A.

Paratypes (3 ♀♀)

CHINA – Yunnan Province • 3 ♀♀; same collection data as for holotype; HNU-GKJ026–2P.

Description

Male (holotype)

BODY AND HEAD. Total length 4.15. Prosoma 2.01 long, 1.59 wide. Opisthosoma 2.14 long, 1.45 wide. Clypeus high 0.08. Carapace (Fig. 24A) dark brown, covered with brown hairs; carapace margin and eyes base black, densely covered with brown hairs; anterior ocular area covered with sparse long brown hairs; lateral area and median area of the thoracic region covered with sparse white hairs. Fovea dark brown and sulciform. Cervical groove indistinct, radial groove dark brown. Eye diameters and interdistances: AME 0.43, ALE 0.24, PME 0.06, PLE 0.22, AERW 0.96, PERW 1.06, EL 0.90. Sternum brown and scutiform, covered with brown hairs, the median area slightly bulged; marginal areas dark brown, covered with long brown hairs. Clypeus dark brown, sparsely covered with long brown hairs. Endites and labium dark brown, sparsely covered with long dark brown hairs; distal area yellowish brown, densely covered with grayish hairs.

CHELICERAE (Fig. 26C). Reddish brown, densely covered with long dark brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Legs I and II are dark brown, with grayish annuli, densely covered with long gray hairs; others are yellowish-brown, bearing numerous short spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 3.76 (1.17, 1.39, 0.63, 0.57), II = 3.41 (1.14, 1.19, 0.57, 0.51), III = 3.79 (1.19, 1.20, 0.90, 0.50), IV = 3.94 (1.30, 1.23, 0.90, 0.51). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 24A). Long oval, dorsum yellowish brown, densely covered with short brown hairs and sparse long brown hairs; each side with a black longitudinal band and black arc grains; the posterior inner sides with a triangular reddish-brown patch, the median area with dense white hairs and two pairs of sigillae; ventral yellow, densely covered with white hairs; the median area with a dark brown longitudinal band; sides with dark brown patches. Spinnerets dark brown, densely covered with long brown hairs.

PALP (Figs 24B–C, 26A–B). Longer than wide; embolus slender, originates at about 8:00 o'clock position; genital bulb about rectangular, with membranous structure; genital lobe large and triangular; tibial apophysis finger-shaped in retrolateral view, about $\frac{1}{3}$ the length of the genital bulb.

Female (paratypes)

BODY AND HEAD. Total length 4.86. Prosoma 2.24 long, 1.71 wide. Opisthosoma 2.56 long, 1.70 wide. Clypeus high 0.10. Carapace (Fig. 25A) reddish brown, densely covered with brown hairs; carapace

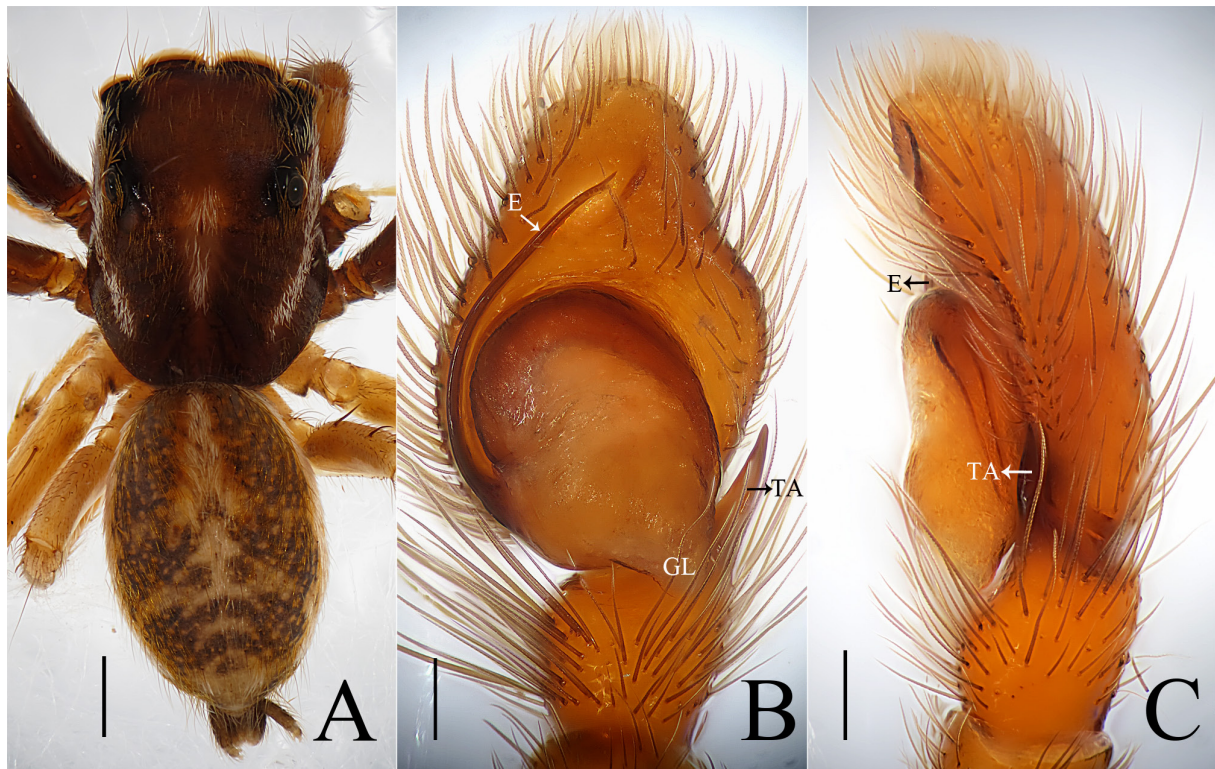


Fig. 24. *Ptocasius longlingensis* sp. nov., holotype, ♂ (HNU-GKJ026–2A). A. Body, dorsal view. B. Palp, ventral view. C. Palp, retrolateral view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

margin and eyes base black; lateral area and anterior covered with sparse long brown hairs. Fovea sulciform, reddish brown. Cervical groove indistinct, radial groove reddish brown. Eye diameters and interdistances: AME 0.51, ALE 0.27, PLE 0.27, AERW 1.24, PERW 1.09, EL 1.02. Sternum scutiform, yellowish brown, covered with brown hairs; the median area slightly bulged; marginal area dark brown, covered with long brown hairs. Clypeus brown, the anterior area covered with sparse long brown hairs. Endites and labium brown, sparsely covered with long dark hairs; distal area yellowish brown, covered with dense grayish hairs.

CHELICERAE (Fig. 26F). Brown, distal area covered with long dark brown hairs, two promarginal teeth and one retromarginal denticle.

LEGS. Reddish brown, with black annuli or spots, densely covered with long brown hairs, bearing numerous short spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

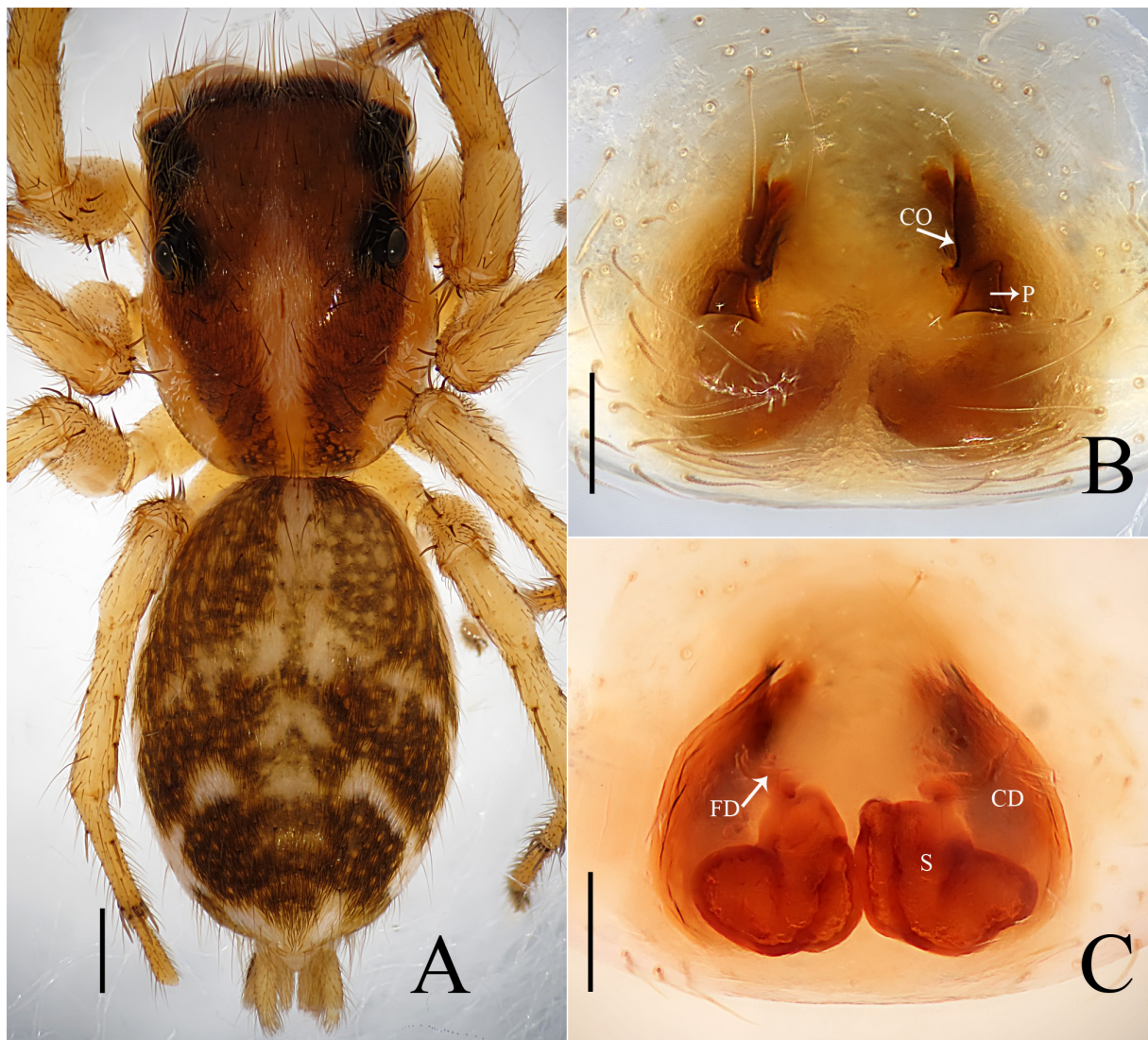


Fig. 25. *Ptocasius longlingensis* sp. nov., paratype, ♀ (HNU-GKJ026–2P). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

LEG MEASUREMENTS. I = 3.43 (1.13, 1.33, 0.49, 0.48), II = 3.17 (1.07, 1.19, 0.43, 0.48), III = 3.97 (1.30, 1.36, 0.67, 0.64), IV = 4.27 (1.35, 1.45, 0.82, 0.65). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 25A). Oval, dorsum light yellow, densely covered with white hairs; distal area sparsely covered with long brown hairs; each side with a black longitudinal band, densely covered with brown hairs and twills black; the posterior inner area with three pairs of herring bones; the posterior portion with a black round spot and two pairs of sigillae, small and dark brown; ventral light yellow, densely covered with white hairs, scattered with irregular grayish spots and streaks. Spinnerets dark brown, densely covered with long brown hairs.

EPIGYNUM (Figs 25B–C, 26D–E). Almost as long as wide; top of pockets close to posterior margin of copulatory openings in ventral view; copulatory openings longitudinal; spermathecae almost touching, distinctly twisting outward, the top margins below and away from copulatory openings in dorsal view.

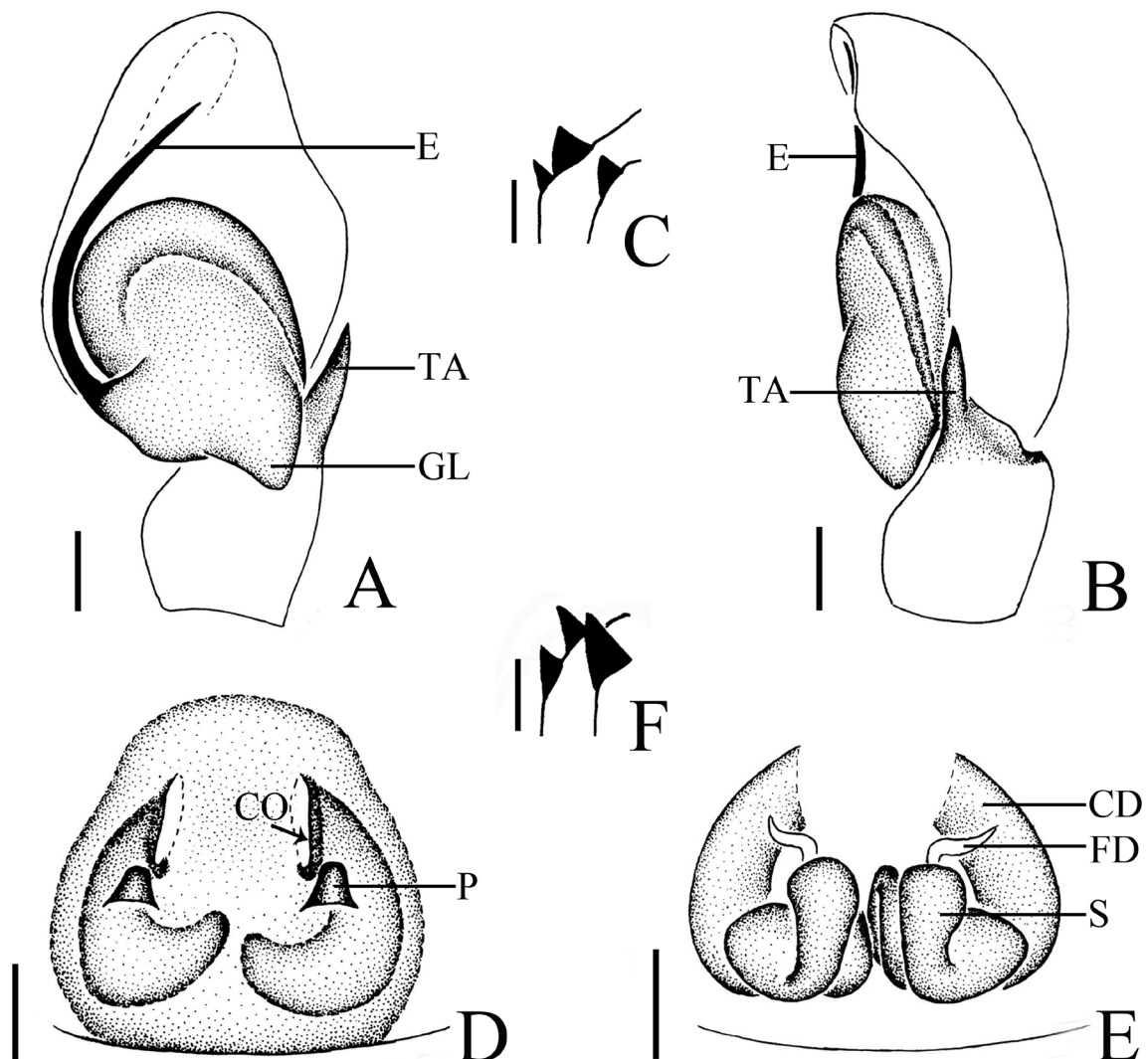


Fig. 26. *Ptocasius longlingensis* sp. nov. A–C. Holotype, ♂ (HNU-GKJ026–2A). D–F. Paratype, ♀ (HNU-GKJ026–2P). A. Palp, ventral view. B. Palp, retrolateral view. C. Chelicerae, posterior view. D. Epigynum, ventral view. E. Vulva, dorsal view. F. Chelicerae, posterior view. Scale bars = 0.1 mm.

Distribution

China (Yunnan Province, Fig. 46).

Ptocasius montanus (Žabka, 1981)

Fig. 46

Yaginumaella montana Žabka, 1981: 26, figs 48–49.

Yaginumaella montana – Xie & Peng 1995: 292, figs 13–15. — Song *et al.* 1999: 563, fig. 323d. — Yin *et al.* 2012: 1502, fig. 821a–c. — Peng 2020: 498, fig. 368a–c.

Ptocasius montanus – Patoleta *et al.* 2020: 17.

Diagnosis and description

See Yin *et al.* (2012) for description of female.

Material examined

CHINA – **Yunnan Province** • 2 ♀♀; Pi He; 26°31'52" N, 98°53'46" E; 1055 m a.s.l.; 20 Apr. 2004; Charles Griswold and David Kavanaugh leg.; HNU-CGY01 • 2 ♀♀; Fugong County, Lumadeng Township, 500 m radius of guesthouse at Shibali; 27°09'54" N, 98°46'44" E; 2525 m a.s.l.; 1–7 May 2004; Charles Griswold and David Kavanaugh leg.; HNU-CGY24 • 12 ♀♀; Fugong County, Lumadeng Township, 0.4 km Southeast of Shibali guesthouse; 27°09'48" N, 98°46'00" E; 2475 m a.s.l.; 5 May 2004; Charles Griswold and David Kavanaugh leg.; HNU-CGY26 • 1 ♀; Fugong County, Lumadeng Township, Yaping Village; 27°08'41" N, 98°48'52" E; 2530 m a.s.l.; 7 May 2004; Heng-mei Yan leg.; HNU-20040507–2A • 4 ♀♀; Fugong County, Yejiadi; 27°03'01" N, 98°46'23" E; 2307 m a.s.l.; 10 May 2004; Heng-mei Yan leg.; HNU-20040510–2 • 1 ♀; Tengchong County, Jietou Township, Datang Village, on the road from Daheling Ganjiao to Dashu Dujuan; 25°27'50" N, 98°25'22" E; 2430 m a.s.l.; 17 May 2006; Xian-jin Peng, Xin-ping Wang and Peng Hu leg.; HNU-PWH060517 • 1 ♀; Tengchong County, Jietou Township, Datang Village, Daheling Ganjiao; 25°25'12" N, 98°24'34" E; 1978 m a.s.l.; 20 May 2006; Xian-jin Peng, Xin-ping Wang and Peng Hu leg.; HNU-PWH060520 • 12 ♀♀; Tengchong County, Shangyin Township, Dahaoping Village; 25°58'29" N, 98°43'46" E; 2040 m a.s.l.; 4 Jun. 2006; Chang-min Yin, Jia-fang Hu and Ming-wei Yang and Shao-xian He leg.; HNU-YHY26–1.

Natural history

The species was found in shrub-land and collected by sieving.

Distribution

China (Yunnan Province, Fig. 46; Hunan Xinning, Yin *et al.* 2012), Bhutan (Dorjula, Žabka 1981).

Ptocasius pseudoflexus (Liu, Yang & Peng, 2016)

Yaginumaella pseudoflexa Liu, Yang & Peng, 2016: 62, figs 13–24.

Ptocasius pseudoflexus – Patoleta *et al.* 2020: 17.

Type material

Holotype

CHINA • ♂; Yunnan Province, Lushui County, Pianma Township; 25°59'37" N, 98°37'01" E; 1780 m a.s.l.; 15 May 2005; along the road in town; Guo Tang leg.; HNU-GKJ004.

Paratypes (1 ♂, 3 ♀♀)

CHINA – **Yunnan Province** • 1 ♂, 3 ♀♀; same collection data as for holotype; HNU-GKJ004.

Diagnosis and description

See Liu *et al.* (2016) for description of both sexes.

Natural history

The species was found in shrub-land and collected by sieving.

Distribution

China (Yunnan Province, Liu *et al.* 2016: 65, fig. 25).

Ptocasius rectangulus sp. nov.

[urn:lsid:zoobank.org:act:874EBEAA-5E73-44EF-9993-671E5E56561D](https://doi.org/10.3896/ABR-56561D)

Figs 27–28, 46

Diagnosis

The new species resembles *P. geminus* sp. nov. (Figs 16–17), but can be distinguished by: (1) posterior margin of pockets almost as long as wide in ventral view (Figs 27B, 28A), while two times as wide as long in *P. geminus* (Figs 16B, 17D); (2) top of pockets almost above posterior margin of copulatory openings in ventral view (Figs 27B, 28A), while below posterior margin of copulatory openings in *P. geminus* (Figs 16B, 17D); (3) copulatory openings almost rectangular in ventral view (Figs 27B, 28A), while almost arc-shaped in *P. geminus* (Figs 16B, 17D); (4) spermathecae distinctly diverging in dorsal view (Figs 27C, 28B), while almost touching in *P. geminus* (Figs 16C, 17E).

Etymology

The specific name is derived from the combination of the Latin adjective ‘*rectus*’ (‘straight’) and the Latin noun ‘*angulus*’ (‘angle’), referring to the atrium outline somewhat rectangular.

Type material

Holotype

CHINA • ♀; Yunnan Province, Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00–QF–6.

Description

Female (holotype)

BODY AND HEAD. Total length 4.90. Prosoma 2.20 long, 1.70 wide. Opisthosoma 2.70 long, 1.85 wide. Clypeus height 0.13. Carapace (Fig. 27A) light brown; carapace margin grayish black and eyes base black; ocular area dark brown. Fovea reddish brown. Radial groove dark brown. Eye diameter and interdistances: AME 0.50, ALE 0.28, PLE 0.28, AERW 1.60, PERW 1.55, EL 1.10. Sternum scutiform, the median area slightly bulged; light yellowish brown, margin dark; sides with three grayish black spots, covered with long brownish black hairs. Sternum brown, scattered with few black spots, sparsely covered with long light brown and dark brown hairs. Endites and labium dark brown, distal area yellowish brown, covered with grayish black hairs, labium triangular.

CHELICERAE (Fig. 28C). Brown, front side dark brown, distal area covered with grayish black hairs, two big promarginal teeth and one small retromarginal denticle.

LEGS. Yellowish brown, with black markings or annuli, densely covered with short black hairs; spines weak and short. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 3.70 (1.20, 1.60, 0.50, 0.60), II = 3.60 (1.20, 1.40, 0.50, 0.50), III = 4.55 (1.45, 1.50, 0.90, 0.70), IV = 4.80 (1.50, 1.60, 1.00, 0.70). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 27A). Oval, dorsum brown with irregular dark brown spots, densely covered with short dark brown hairs; ventral light gray with irregular black spots. Spinnerets dark brown.

EPIGYNUM (Figs 27B–C, 28A–B). As long as wide; the pockets close to each other, the top of pockets almost above posterior margin of copulatory openings in ventral view; copulatory openings almost rectangular.

Male

Unknown.



Fig. 27. *Ptocasius rectangularus* sp. nov., holotype, ♀ (HNU-00-QF-6). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

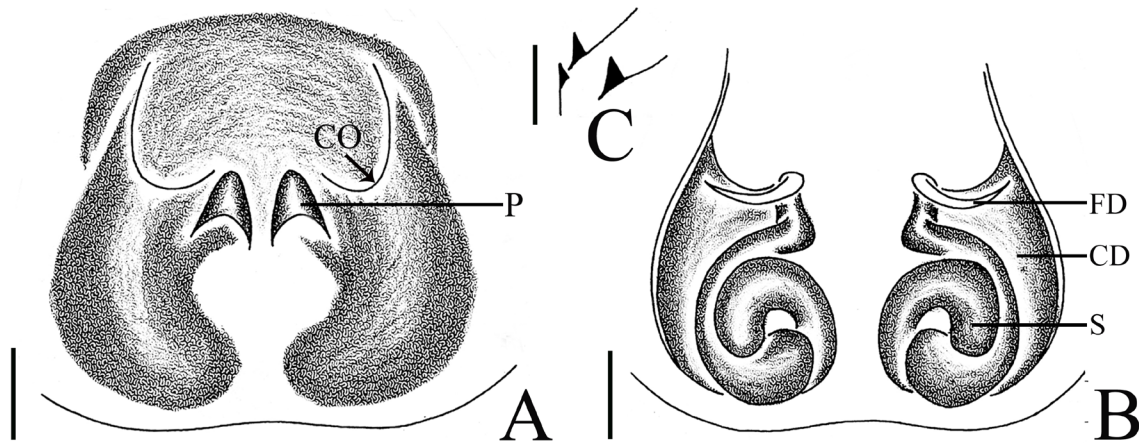


Fig. 28. *Ptocasius rectangulus* sp. nov., holotype, ♀ (HNU-00-QF-6). A. Epigynum, ventral view. B. Vulva, dorsal view. C. Chelicerae, posterior view. Scale bars = 0.1 mm.

Distribution

China (Yunnan Province, Fig. 46).

Ptocasius robustus sp. nov.

[urn:lsid:zoobank.org:act:F22A884D-56BA-4365-9C9F-B549720B176E](https://zoobank.org/urn:lsid:zoobank.org:act:F22A884D-56BA-4365-9C9F-B549720B176E)

Figs 29–30, 41

Diagnosis

The new species resembles *P. nobilis* (Žabka, 1981) (Žabka 1981: figs 46–47), but can be distinguished by: (1) the anterior margins of pockets almost located at median area of epigynum in ventral view (Figs 29B, 30A), while close to posterior of epigynum in *P. nobilis* (Žabka 1981: fig. 46); (2) copulatory openings ()-shaped in ventral view (Figs 29B, 30A), while almost V-shaped in *P. nobilis* (Žabka 1981: fig. 46); (3) spermathecae robust, twisting outward, distinctly thicker than copulatory ducts in dorsal view (Figs 29C, 30B), while narrow, twisting inward, thinner than copulatory ducts in *P. nobilis* (Žabka 1981: fig. 47); (4) terminal margins of spermathecae inside copulatory ducts in dorsal view (Figs 29C, 30B), while outside copulatory ducts in *P. nobilis* (Žabka 1981: fig. 47).

Etymology

The specific name is derived from the Latin adjective ‘*robustus*’ (‘strong’ or ‘robust’), referring to the robust spermathecae.

Type material

Holotype

CHINA • ♀; Yunnan Province, Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU- 00-QF-7A.

Paratypes (7 ♀♀)

CHINA – Yunnan Province • 7 ♀♀; same collection data as for holotype; HNU-00-QF-7P.



Fig. 29. *Ptocasius robustus* sp. nov., holotype, ♀ (HNU-00-QF-7A). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

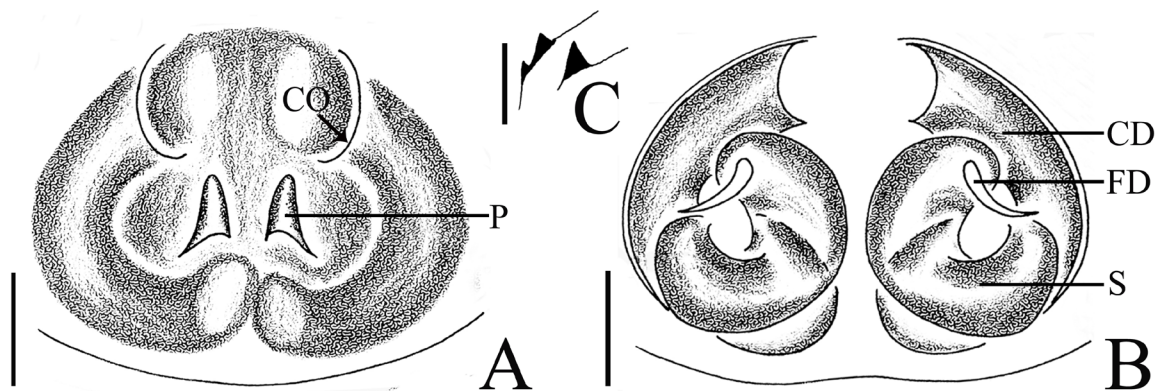


Fig. 30. *Ptocasius robustus* sp. nov., holotype, ♀ (HNU-00-QF-7A). A. Epigynum, ventral view. B. Vulva, dorsal view. C. Chelicerae, posterior view. Scale bars = 0.1 mm.

Description

Female (holotype)

BODY AND HEAD. Total length 4.10. Prosoma 1.90 long, 1.50 wide. Opisthosoma 2.20 long, 1.30 wide. Clypeus height 0.10. Carapace (Fig. 29A) light brown, sparsely covered with long brown hairs; eyes base black; ocular area grayish brown, with a pair of grayish black bar-shaped markings, anterior and lateral margins grayish black, covered with dense white hairs. Fovea reddish brown. Radial groove indistinct. Eye diameter and interdistances: AME 0.45, ALE 0.23, PLE 0.20, AERW 1.30, PERW 1.30, EL 0.85. Sternum oval, light yellowish brown, covered with thin brown hairs. Clypeus brown, densely covered with long white hairs and brown hairs. Endites and labium yellowish brown, distal area covered with grayish black hairs, labium black, almost triangular.

CHELICERAE (Fig. 30C). Light yellowish brown, with two short and robust promarginal teeth and one retromarginal denticle.

LEGS. Light yellowish brown, sparsely covered with hairs; bearing numerous thin spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 3.20 (1.00, 1.25, 0.50, 0.45), II = 3.10 (1.00, 1.20, 0.50, 0.40), III = 3.65 (1.10, 1.25, 0.80, 0.50), IV = 3.95 (1.20, 1.40, 0.80, 0.55). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 29A). Long oval, the posterior portion slightly wide. Dorsum yellowish brown with two pairs of reddish brown sigillae; each side with a grayish brown longitudinal band and irregular black longitudinal markings; the posterior median area with black arc markings; ventral yellowish brown, the median area with three black longitudinal bands. Spinnerets grayish brown.

EPIGYNUM (Figs 29B–C, 30A–B). Almost wider than long; the pockets angular, distinctly diverging in dorsal view, the pockets located at the medial area of epigynum; copulatory openings almost (-)-shaped; spermathecae twisted and robust, the top margins of spermathecae close to copulatory openings.

Male

Unknown.

Distribution

China (Yunnan Province, Fig. 41).

Ptocasius tengchongensis sp. nov.

urn:lsid:zoobank.org:act:BCCDBA23-A7BE-42DB-97D6-68C4F5C8C0DF

Figs 31–33, 44

Diagnosis

The male of the new species resembles that of *P. pseudoflexus* (Liu, Yang & Peng, 2016) (Liu *et al.* 2016: figs 13–17), but can be distinguished by: (1) embolus originating at about 8:00 o'clock position in ventral view (Figs 31B, 33A), while originating at about 9:00 o'clock in *P. pseudoflexus* (Liu *et al.* 2016: figs 15, 17); (2) the median area of the genital bulb with a conic bulge in retrolateral view (Figs 31C, 33B), while absent in *P. pseudoflexus* (Liu *et al.* 2016: figs 14, 16). The female of the new species resembles that of *P. pseudoflexus* (Liu *et al.* 2016: figs 19–24), but can be distinguished by: (1) pockets close to copulatory openings, almost two times as wide as long in ventral view (Figs 32B, 33D), while away from posterior margin of copulatory openings, almost as long as wide in *P. pseudoflexus* (Liu *et al.* 2016: figs 20, 22); (2) top of pockets below anterior margin of copulatory openings in ventral view (Figs 32B, 33D), while above anterior margin of copulatory openings in *P. pseudoflexus* (Liu *et al.* 2016: figs 20, 22).

Etymology

The specific name is derived from the type locality Tengchong County.

Type material

Holotype

CHINA • ♂; Yunnan Province, Tengchong County, Old Pass, 28 km East of Tengchong; 24°57'00" N, 98°45'00" E; 2300 m a.s.l.; 26–31 Oct. 1998; Charles Griswold, David Kavanaugh and Chun-lin Long leg.; HNU-98–OP–2A.

Paratypes (6 ♂♂, 6 ♀♀)

CHINA – Yunnan Province • 4 ♂♂, 3 ♀♀; same collection data as for holotype; HNU-98–OP–2P • 2 ♀♀; Tengchong County, Nankang; 24°49'00" N, 98°46'59" E; 2100 m a.s.l.; 4–7 Nov. 1998; Charles Griswold, David Kavanaugh and Chun-lin Long leg.; HNU-NK–21 • 1 ♂; Tengchong County, Old Pass, 28 km East of Tengchong; 24°57'00" N, 98°45'00" E; 2300 m a.s.l.; 26–31 Oct. 1998; Charles Griswold, David Kavanaugh and Chun-lin Long leg.; HNU-98–OP–23 • 1 ♀; Tengchong County, Old Pass, 28 km East of Tengchong; 24°57'00" N, 98°45'00" E; 2300 m a.s.l.; 26–31 Oct. 1998; Charles Griswold, David Kavanaugh and Chun-lin Long leg.; HNU-98–OP–24 • 1 ♂; 9 km Southeast of Pianma; 25°59'38" N, 98°39'49" E; 2400 m a.s.l.; 15–17 Oct. 1998; Charles Griswold, David Kavanaugh and Chun-lin Long leg.; HNU-98–EP–34.

Description

Male (holotype)

BODY AND HEAD. Total length 5.40. Prosoma 2.60 long, 1.90 wide. Opisthosoma 2.80 long, 1.70 wide. Clypeus height 0.15. Carapace (Fig. 31A) brown, sides with white hairs; carapace margin and eyes base black; three yellowish-brown longitudinal bands present in median and lateral areas, respectively;



Fig. 31. *Ptocasius tengchongensis* sp. nov., holotype, ♂ (HNU-98–OP–2A). A. Body, dorsal view. B. Palp, ventral view. C. Palp, retrolateral view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

ocular area with black lateral margins, anterior area covered with dense white and sparse brown rough hairs. Fovea reddish brown, line-shaped. Cervical groove indistinct, radial groove dark brown. Eye diameter and interdistances: AME 0.50, ALE 0.30, PLE 0.30, AERW 1.70, PERW 1.60, EL 1.10. Sternum scutiform, densely covered with short brown hairs; margin dark brown. Clypeus dark brown, covered with long brown hairs, promargin with sparse hairs. Endites have a brown base, distal area greenish brown, densely covered with dark brown hairs. Labium dark brown, distal area brown, covered with dark brown hairs.

CHELICERAE (Fig. 33C). Brown to dark brown, covered with brown hairs; two promarginal teeth one retromarginal denticle.

LEGS. Yellowish brown to dark brown, tibiae I dark brown, femur dark brown; bearing numerous long spines. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of ventral spines.

LEG MEASUREMENTS. I = 4.55 (1.65, 2.20, 1.00, 0.70), II = 4.80 (1.60, 1.80, 0.80, 0.60), III = 4.90 (1.60, 1.60, 1.00, 0.70), IV = 5.40 (1.75, 1.75, 1.20, 0.70). Leg formula: IV–III–II–I.

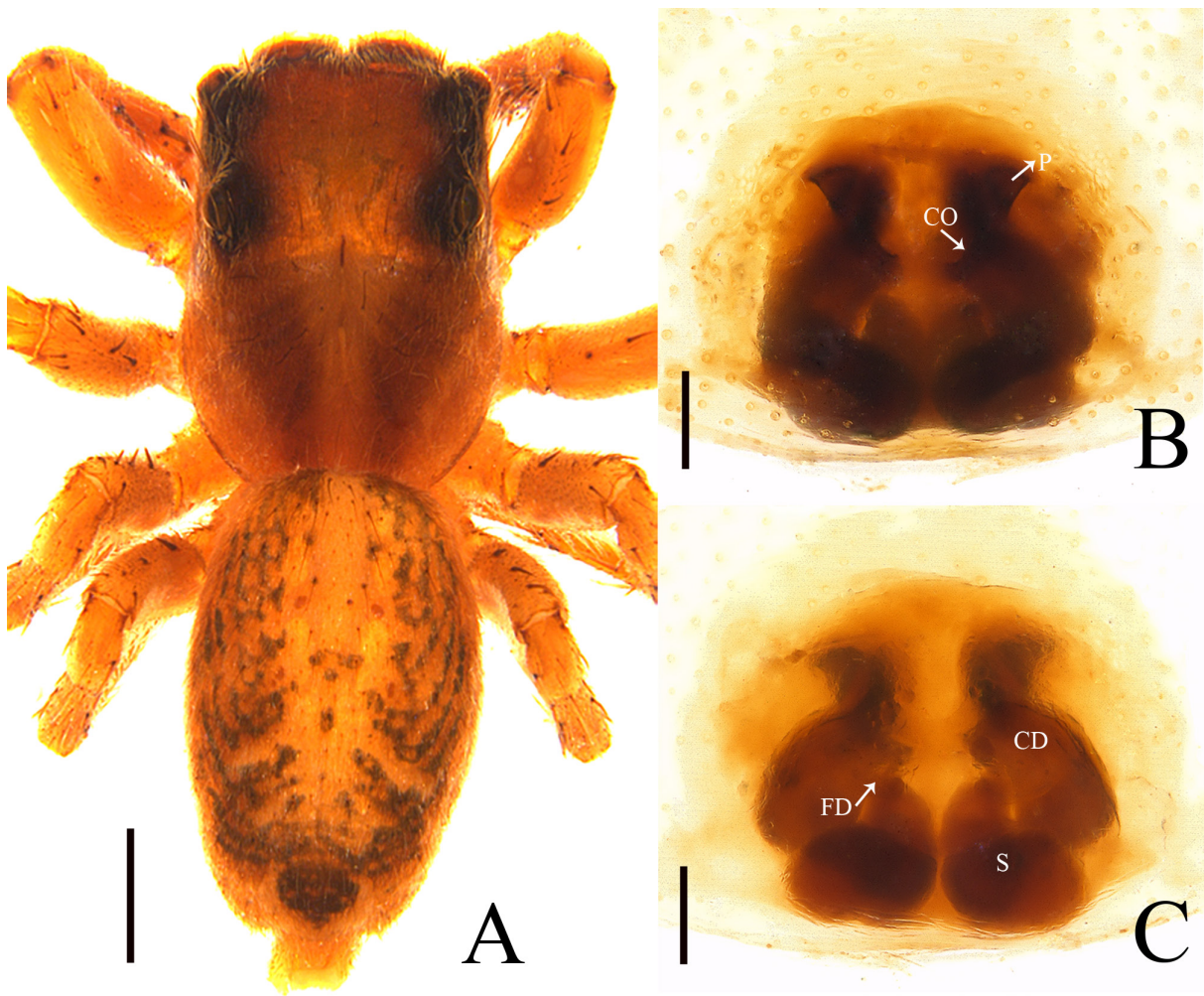


Fig. 32. *Ptocasius tengchongensis* sp. nov., paratype, ♀ (HNU-98–OP–2P). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

ABDOMEN (Fig. 31A). Cylindric, dorsum yellowish brown, with three pairs of sigillae; each side with a grayish black longitudinal band and many black twills; the posterior portion with arc markings; ventral yellowish white with many black spots; the median area with a black longitudinal band, sides with few black twills. Spinnerets dark brown.

PALP (Figs 31B–C, 33A–B). Longer than wide; embolus slender, originating at about 8:00 o'clock position; genital lobe protrusive; the median area of genital bulb with a triangular outgrowth in retrolateral view; tibial apophysis needle-shaped.

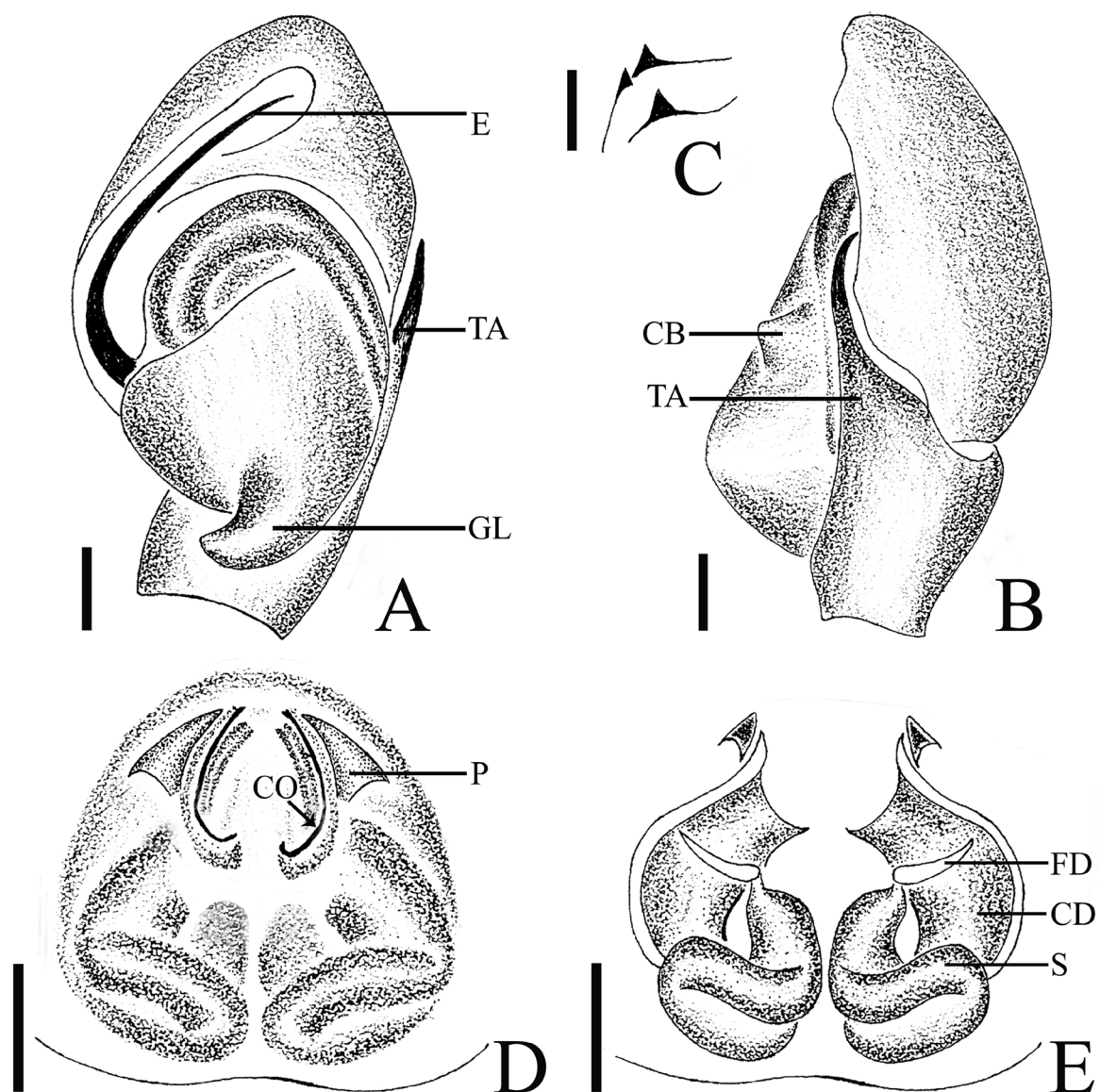


Fig. 33. *Ptocasius tengchongensis* sp. nov. A–C. Holotype, ♂ (HNU-98-OP-2A). D–E. Paratype, ♀ (HNU-98-OP-2P). A. Palp, ventral view. B. Palp, retrolateral view. C. Chelicerae, posterior view. D. Epigynum, ventral view. E. Vulva, dorsal view. Scale bars = 0.1 mm.

Female (paratypes)

BODY AND HEAD. Total length 5.40. Prosoma 2.40 long, 1.85 wide. Opisthosoma 3.00 long, 1.90 wide. Clypeus (Fig. 32A) height 0.15. Eye diameter and interdistances: AME 0.50, ALE 0.30, PLE 0.25, AERW 1.65, PERW 1.55, EL 1.00. Clypeus height 0.15.

LEG MEASUREMENTS. I = 4.30 (1.40, 1.70, 0.70, 0.50), II = 3.90 (1.30, 1.50, 0.60, 0.50), III = 4.80 (1.40, 1.70, 0.90, 0.80), IV = 5.20 (1.60, 1.90, 1.00, 0.70). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 32A). Female body slightly colored, markings and other morphological features same as in male.

EPIGYNUM (Figs 32B–C, 33D–E). As long as wide; pockets long angular, distinctly close to copulatory openings; top of pockets almost close to anterior margin of copulatory openings; copulatory openings ()-shaped.

Distribution

China (Yunnan Province, Fig. 44).

Ptocasius umbellulatus sp. nov.

urn:lsid:zoobank.org:act:A7702891-DDE2-4044-BFB8-298276C98381

Figs 34–35, 45

Diagnosis

The new species resembles *P. davidi* sp. nov. (Figs 8–9), but can be distinguished by: (1) anterior interval of copulatory openings slightly wider than posterior interval in ventral view (Figs 34B, 35A), while three times as wide as posterior interval in *P. davidi* (Figs 8B, 9A); (2) posterior margin of pockets almost two times as wide as long in ventral view (Figs 34B, 35A), while almost as long as wide in *P. davidi* (Figs 8B, 9A); (3) copulatory ducts L-shaped in ventral view (Figs 34B, 35A), while S-shaped in *P. davidi* (Figs 8B, 9A).

Etymology

The specific name is derived from the combination of the Latin noun ‘umbella’ (‘parasol’) and the adjective ‘latus’ (‘broad’), referring to the form of the pockets and copulatory tube.

Type material

Holotype

CHINA • ♀; Yunnan Province, Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00–QF–9A.

Paratypes (25 ♀♀)

CHINA–Yunnan Province • 1 ♀; same collection data as for holotype; HNU-00–QF–10P • 1 ♀; 0.4 km Southeast from Shibali, guesthouse; 27°09'48" N, 98°46'55" E; 2475 m a.s.l.; 5 May 2004; Charles Griswold and David Kavanaugh leg.; HNU-CGY30 • 5 ♀♀; Gongshan County, Dulongjiang Township, Mokewang bridge; 27°50'17" N, 98°19'15" E; 1455 m a.s.l.; 6–7 Nov. 2004; Guo Tang leg.; HNU-Tang–04–08 • 1 ♀; Gongshan County, Dabadi of new road; 27°28'30" N, 98°18'04" E; 3013 m a.s.l.; 12 Nov. 2004; Guo Tang leg.; HNU-Tang–04–11 • 2 ♀♀; Gongshan County, Heiwadi of new road; 27°28'15" N, 98°21'19" E; 1850 m a.s.l.; 13–16 Nov. 2004; Guo Tang leg.; HNU-Tang–04–12B • 4 ♀♀; Lushui County, Pianma Township, Chanyan He, 9.3 km Southeast of Pianma; 25°59'37" N, 98°39'59" E;

2470 m a.s.l.; 14 May 2005; Charles Griswold leg.; mixed broadleaf deciduous and evergreen forest; beating understory vegetation; HNU-CGY107 • 1 ♀; Tengchong County, Jietou Township, Datang Village, Daheling Ganjiao camping site; 25°25'39" N, 98°24'46" E; 1952 m a.s.l.; 20 May 2006; Xinping Wang and Peng Hu leg.; HNU-Wang060520 • 3 ♀♀; Longling County, Longjiang Township, Xiaoheishan Nature Reserve (Guchengshan Mountain); 24°49'43" N, 98°45'33" E; 2010 m a.s.l.; 26 May 2005; Heng-mei Yan leg.; in the forest; HNU-GKJ026–3 • 2 ♀♀; Fugong County, Lumadeng Township, Yakou of old Shibali; 27°03'51" N, 98°45'04" E; 3270 m a.s.l.; 13 Aug. 2005; Guo Tang leg.; HNU-Tang–05–06A • 1 ♀; Tengchong County, Qushi Township, Daba Village; 25°17'13" N, 98°42'10" E; 2170 m a.s.l.; 14 May 2006; Chang-min Yin, Jia-fang Hu and Ming-wei Yang leg.; HNU-YHY01 • 1 ♀; Tengchong County, Mingguang Township, Zizhi Village; 25°46'57" N, 98°36'58" E; 2200 m a.s.l.; 21 May 2006; leg Ming-wei Yang leg.; HNU-YHY10 • 1 ♀; Gongshan County, Du Longjiang Township, Maku; 27°41'07" N, 98°18'15" E; 1814 m a.s.l.; 28 Aug. 2006; Peng Hu leg.; HNU-Hu060828 • 1 ♀; Gongshan County, Dulongjiang Township, Maku; 27°40'42" N, 98°17'50" E; 1970 m a.s.l.; 30 Aug. 2006; Peng Hu leg.; HNU-Hu060830 • 1 ♀; Gongshan County, Dulongjiang Township, Maku; 27°41'09" N, 98°17'47" E; 2097 m a.s.l.; 2 Sep. 2006; Peng Hu leg.; HNU-Hu060902–2.



Fig. 34. *Ptocasius umbellulatus* sp. nov., holotype, ♀ (HNU-00–QF–9A). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

Description

Female (holotype)

BODY AND HEAD. Total length 5.80. Prosoma 2.10 long, 1.60 wide. Opisthosoma 3.70 long, 2.20 wide. Clypeus height 0.10. Carapace (Fig. 34A) light brown, carapace margin and eyes base black; with a pair of dark longitudinal bands extending from back of ALE to retromargin of carapace; ocular area covered with sparse long black hairs, lateral margins black. Fovea reddish brown, longitudinal bar-shaped. Radial groove distinct; ocular area sparsely covered with long black hairs. Eye diameter and interdistances: AME 0.50, ALE 0.25, PLE 0.25, AERW 1.45, PERW 1.35, EL 0.90. Sternum scutiform, covered with fine grayish black hairs; the median area slightly bulged, greenish brown; margin grayish brown. Clypeus light brown with long brown hairs covering the area between the AMEs and a row of long white hairs covering the promargin. Endites and labium light brown, distal area covered with grayish black hairs.

CHELICERAE (Fig. 35C). Brown, distal area covered with dense long dark brown hairs; two promarginal teeth and one retromarginal denticle.

LEGS. Yellowish brown to dark brown, annuli grayish black; spines short. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 3.65 (1.15, 1.50, 0.50, 0.50), II = 3.40 (1.10, 1.30, 0.50, 0.50), III = 4.10 (1.30, 1.30, 0.80, 0.70), IV = 4.60 (1.40, 1.50, 0.90, 0.70). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 34A). Long ovoid, dorsum light yellow; each side with a grayish black longitudinal band and black twills; the posterior portion with three grayish black herring bones, the posterior end with a grayish black spot; with two pairs of small, reddish brown sigillae; ventral light yellow; the median area with a grayish black longitudinal band, sides with irregular grayish black markings and twills. Spinnerets dark brown.

EPIGYNUM (Figs 34B–C, 35A–B). As long as wide; the pockets present below, relatively diverging from copulatory openings, posterior margin of pockets almost two times as wide as long; copulatory openings V-shaped; copulatory ducts L-shaped in ventral view.

Male

Unknown.

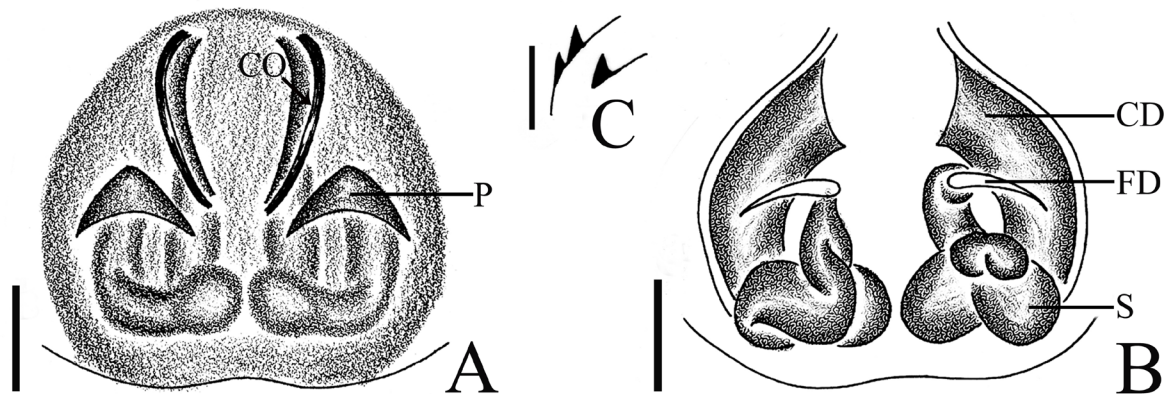


Fig. 35. *Ptocasius umbellulatus* sp. nov., holotype, ♀ (HNU-00-QF-9A). **A.** Epigynum, ventral view. **B.** Vulva, dorsal view. **C.** Chelicerae, posterior view. Scale bars = 0.1 mm.

Distribution

China (Yunnan Province, Fig. 45).

Ptocasius zabkai sp. nov.

[urn:lsid:zoobank.org:act:28D24F80-185D-422F-9D74-925674FE74B6](https://zoobank.org/urn:lsid:zoobank.org:act:28D24F80-185D-422F-9D74-925674FE74B6)

Figs 36–38, 43

Diagnosis

The male of the new species resembles that of *P. wuermli* (Žabka, 1981) (Žabka 1981: figs 56–59), but can be distinguished by: (1) sperm duct originating at about 10:00 o'clock position in ventral view (Figs 36B, 38A), while originating at about 8:00 o'clock in *P. wuermli* (Žabka 1981: fig. 56); (2) genital lobe bigger, angular in ventral view (Figs 36B, 38A), while obtuse in *P. wuermli* (Žabka 1981: fig. 56); (3) tibial apophysis finger-shaped in retrolateral view (Figs 36C, 38B), while needle-shaped in *P. wuermli* (Žabka 1981: fig. 58). The female of the new species resembles that of *P. wuermli* (Žabka 1981: figs 52–53), but can be distinguished by: (1) pockets close to posterior margin of copulatory openings, almost two times as wide as long in ventral view (Figs 37B, 38C), while relatively away from posterior margin of copulatory openings, almost as long as wide in *P. wuermli* (Žabka 1981: fig. 52); (2) anterior interval of copulatory openings slightly wider than posterior interval in ventral view (Figs 37B, 38C), while four times as wide as posterior interval in *P. wuermli* (Žabka 1981: fig. 52); (3) spermathecae almost touching in dorsal view (Figs 37C, 38D), while distinctly diverging in *P. wuermli* (Žabka 1981: fig. 53).

Etymology

The specific name is the patronym in honor of Dr Marek Žabka, one of the most famous arachnologists in Poland.



Fig. 36. *Ptocasius zabkai* sp. nov., holotype, ♂ (HNU-00-QD-1A). A. Body, dorsal view. B. Palp, ventral view. C. Palp, retrolateral view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

Type material

Holotype

CHINA • ♂; Yunnan Province, Nujiang Prefecture, Nujiang State Nature Reserve, No. 12 bridge Camp area, 16.3 km West of Gongshan; 27°42'54" N, 98°30'08" E; 2775 m a.s.l.; 15–19 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00-QD-1A.

Paratypes (13 ♂♂, 14 ♀♀)

CHINA – **Yunnan Province** • 1 ♂, 2 ♀♀; same collection data as for holotype; HNU-00-QD-1P • 1 ♂; Nujiang Prefecture, Gongshan County, Danzhu, 13.5 km Southwest of Gongshan; 27°37'50" N, 98°37'14" E; 2700 m a.s.l.; 30 Jun.–5 Jul. 2000; David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick, Heng-mei Yan and Da-zhi Dong leg.; HNU-000630 • 2 ♀♀; Nujiang Prefecture, Gongshan County, Nujiang State Nature Reserve, Qiqi, 9.9 km West of Gongshan; 27°42'55" N, 98°33'55" E; 2000 m a.s.l.; 9–14 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00-QF-10 • 1 ♀; Nujiang Prefecture, Gongshan County, Danzhu, 15.7–16.0 km Southwest of Gongshan; 27°37'37" N, 98°35'31" E to 27°37'19" N, 98°35'14" E;

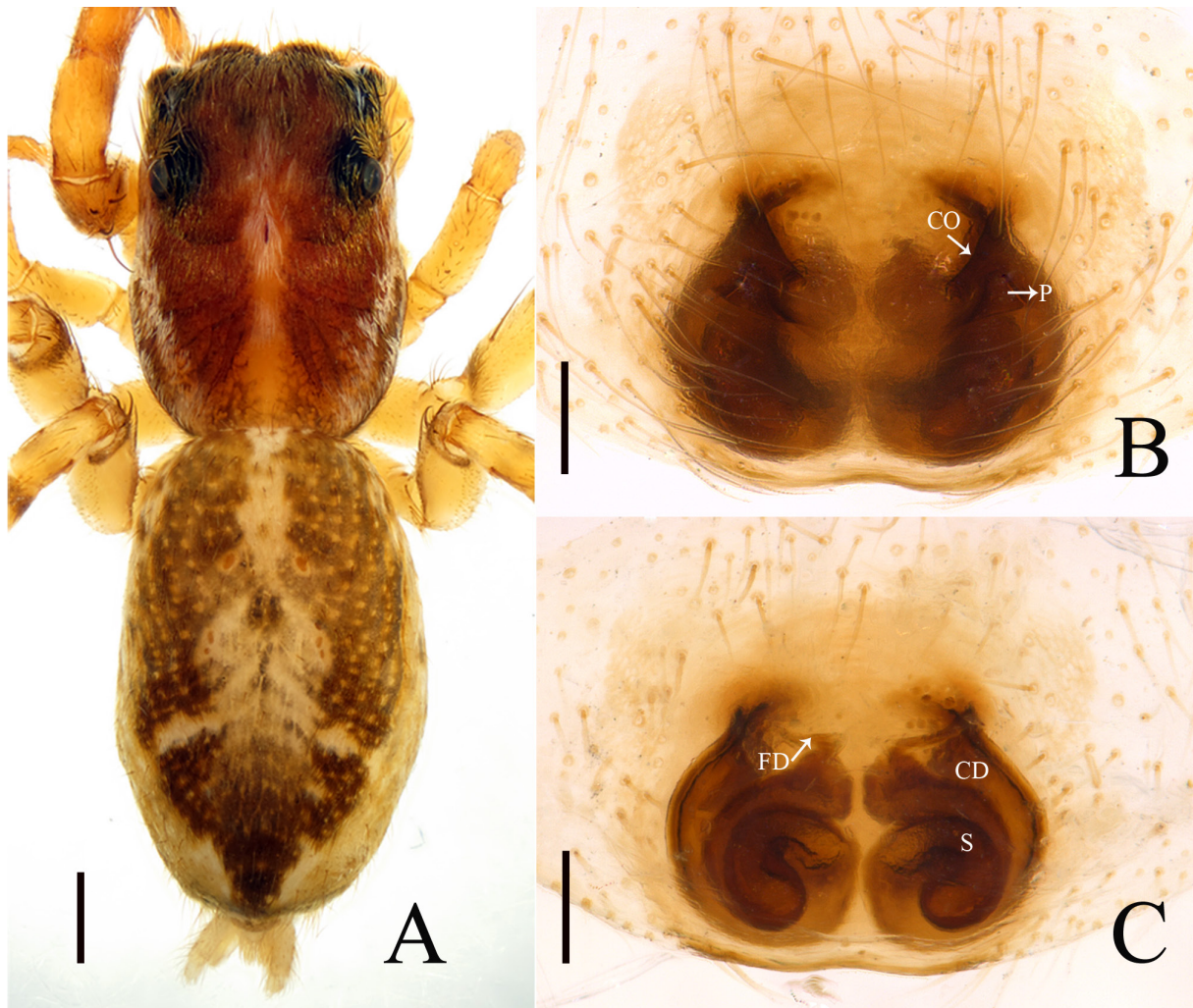


Fig. 37. *Ptocasius zabkai* sp. nov., holotype, ♂ (HNU-00-QD-1A). **A.** Body, dorsal view. **B.** Epigynum, ventral view. **C.** Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

2900–3125 m a.s.l.; 30 Jun.–5 Jul. 2000; Heng-mei Yan, David Kavanaugh, Charles Griswold, Hongbin Liang, Darrell Ubick and Da-zhi Dong leg.; HNU-00–GDS–3.

Description

Male (holotype)

BODY AND HEAD. Total length 5.00. Prosoma 2.50 long, 1.75 wide. Opisthosoma 2.50 long, 1.50 wide. Clypeus high 0.15. Carapace (Fig. 36A) reddish brown, densely covered with brown hairs; carapace margin and eye base black; each side with a longitudinal belt formed by white hairs. Fovea light brown. Cervical and radial groove indistinct. Eye diameters and interdistances: AME 0.45, ALE 0.25, PLE 0.25, AERW 1.40, PERW 1.40, EL 0.90. Sternum scutiform, covered with thin brown hairs, grayish brown, margin grayish black. Clypeus yellowish brown, sparsely covered with long dark brown hairs. Endites and labium grayish brown, distal area covered with dense black hairs, labium triangular.

CHELICERAE. Light brown, covered with short brown hairs, two promarginal teeth and one retromarginal denticle.

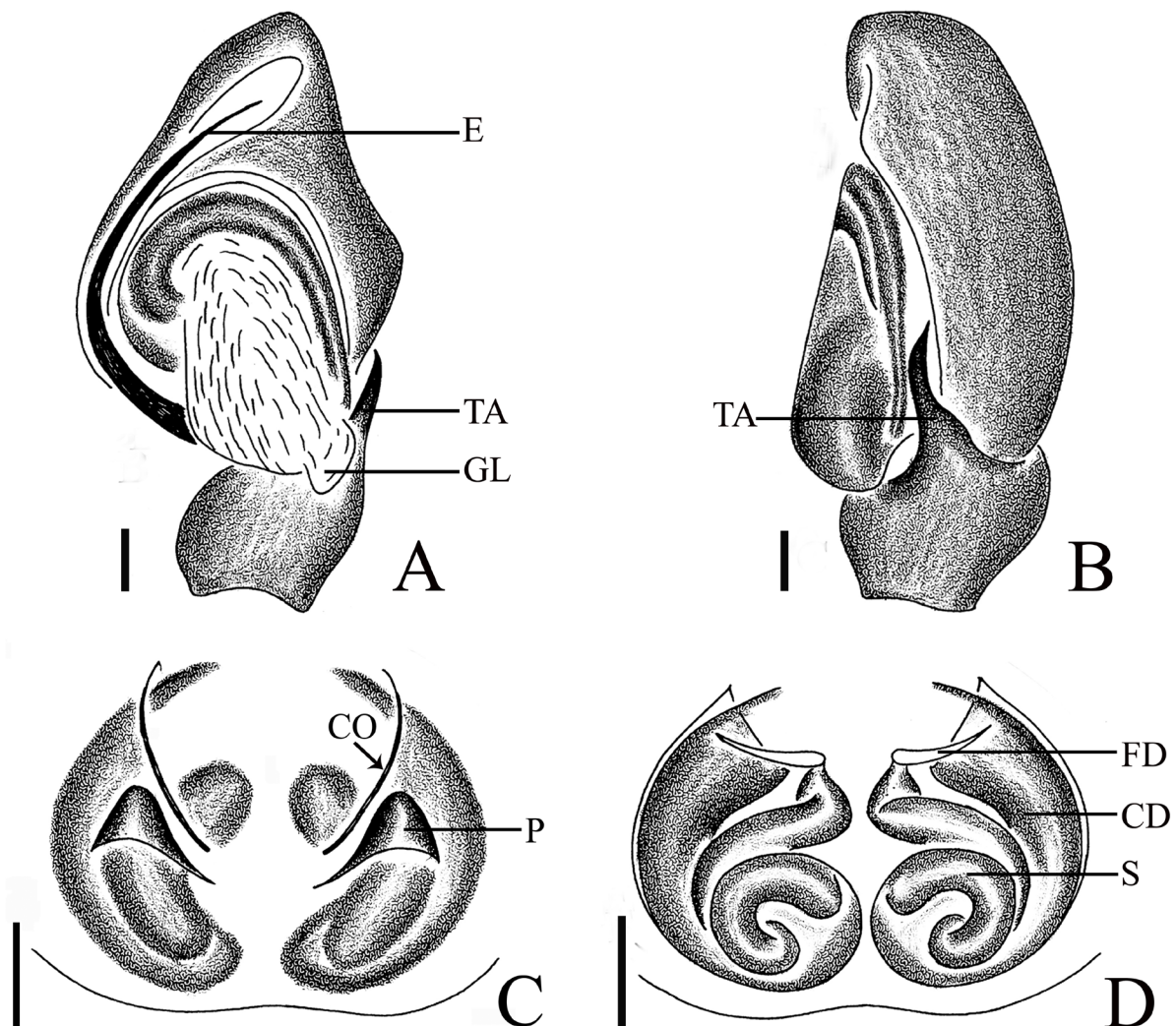


Fig. 38. *Ptocasius zabkai* sp. nov. A–B. Holotype, ♂ (HNU-00–QD–1A). C–D. Paratype, ♀ (HNU-00–QD–1P). A. Palp, ventral view. B. Palp, retrolateral view. C. Epigynum, ventral view. D. Vulva, dorsal view. Scale bars = 0.1 mm.

LEGS. Light yellowish with black annuli and spots, densely covered with black hairs, spines short and weak. Tibiae I and II with two pairs of long ventral spines, metatarsi I and II with one pair of ventral spines.

LEG MEASUREMENTS. I = 4.60 (1.60, 2.30, 1.00, 0.70), II = 4.40 (1.40, 1.70, 0.80, 0.50), III = 4.80 (1.50, 1.70, 0.80, 0.80), IV = 5.30 (1.50, 2.00, 1.00, 0.80), IV 2.89 (0.97, 1.08, 0.42, 0.42). Leg formula: IV–III–II–I.

ABDOMEN (Fig. 36A). Almost cylindrical, dorsum yellowish brown, covered with grayish white and black hairs; each side with a black longitudinal band and two small light spots; the median area with a black spike-shaped spot and two pairs of sigillae; ventral grayish white, scattered with black spots, the median area with a discontinuous black longitudinal band; sides with discontinuous black longitudinal grains. Spinnerets grayish black.

PALP (Figs 36B–C, 38A–B). As long as wide; embolus slender, slightly away from genital bulb, originating at about 8:00 o'clock position in ventral view; genital bulb with membranous structure, genital lobe angular; tibial apophysis finger-shaped.

Female (paratypes)

BODY AND HEAD. Total length 5.00. Prosoma 2.20 long, 1.60 wide. Opisthosoma 2.80 long, 1.80 wide. Clypeus (Fig. 37A) high 0.10. Eye diameter and interdistances: AME 0.45, ALE 0.25, PLE 0.25, AER 1.40, PER 1.35, EFL 0.90. Tibiae I and II with three pairs of long ventral spines, metatarsi I and II with two pairs of long ventral spines.

LEG MEASUREMENTS. I = 3.70 (1.20, 1.50, 0.60, 0.40), II = 2.70 (0.90, 1.00, 0.45, 0.35), III = 4.05 (1.30, 1.50, 0.75, 0.50), IV = 4.50 (1.35, 1.60, 1.00, 0.55). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 37A). The median area of the carapace with a yellowish-brown longitudinal band, clypeus covered with dense white hairs. The other morphological characteristics same as male.

EPIGYNUM (Figs 37B–C, 38C–D). Wider than long; the pockets below and close to copulatory openings, almost two times as wide as long; copulatory openings V-shaped, anterior interval of copulatory openings slightly wider than posterior interval in ventral view; spermathecae almost touching, twisted like coils, the top margins of spermathecae above copulatory openings.

Distribution

China (Yunnan Province, Fig. 43).

Ptocasius zonatus sp. nov.

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Figs 39–40, 45

Diagnosis

The new species resembles *P. zabkai* sp. nov. (Figs 37–38), but can be distinguished by: (1) posterior margin of pockets as long as wide in ventral view (Figs 39B, 40A), while two times as wide as long in *P. zabkai* (Figs 37B, 38C); (2) interdistance of pockets four times as wide as pockets in ventral view (Figs 39B, 40A), while as wide as pockets in *P. zabkai* (Figs 37B, 38C); (3) copulatory openings nearly transverse in ventral view (Figs 39B, 40A), while longitudinal in *P. zabkai* (Figs 37B, 38C); (4) anterior interval of copulatory openings four times as wide as posterior interval in ventral view (Figs 39B, 40A), while slightly wider than posterior interval in *P. zabkai* (Figs 37B, 38C).

Etymology

The specific name is derived from the Greece noun ‘ζώνη’ (‘band’), referring to the form of the copulatory tube.

Type material

Holotype

CHINA • ♀; Yunnan Province, Nujiang Prefecture, Gongshan County, Danzhu, 13.5 km Southwest of Gongshan; 27°37'50" N, 98°37'14" E; 2700 m a.s.l.; 2 Jul. 2000; David Kavanaugh, Charles Griswold, Hong-bin Liang, Darrell Ubick, Heng-mei Yan and Da-zhi Dong leg.; HNU-00–GD–3A.

Paratype (1 ♀)

CHINA – Yunnan Province • 1 ♀; same collection data as for holotype; HNU-00–GD–3P.

Description

Female (holotype)

BODY AND HEAD. Total length 5.30. Prosoma 2.10 long, 1.50 wide. Opisthosoma 3.20 long, 1.90 wide. Clypeus high 0.10. Carapace (Fig. 39A) brown, carapace margin and eye base black, covered with white hairs; the median area of carapace with a yellowish-brown longitudinal band, margin covered with dense white hairs. Fovea dark brown, short bar-shaped. Cervical and radial groove black. Eye diameters and interdistances: AME 0.40, ALE 0.20, PLE 0.20, AERW 1.30, PERW 1.30, EL 0.89. Sternum scutiform,

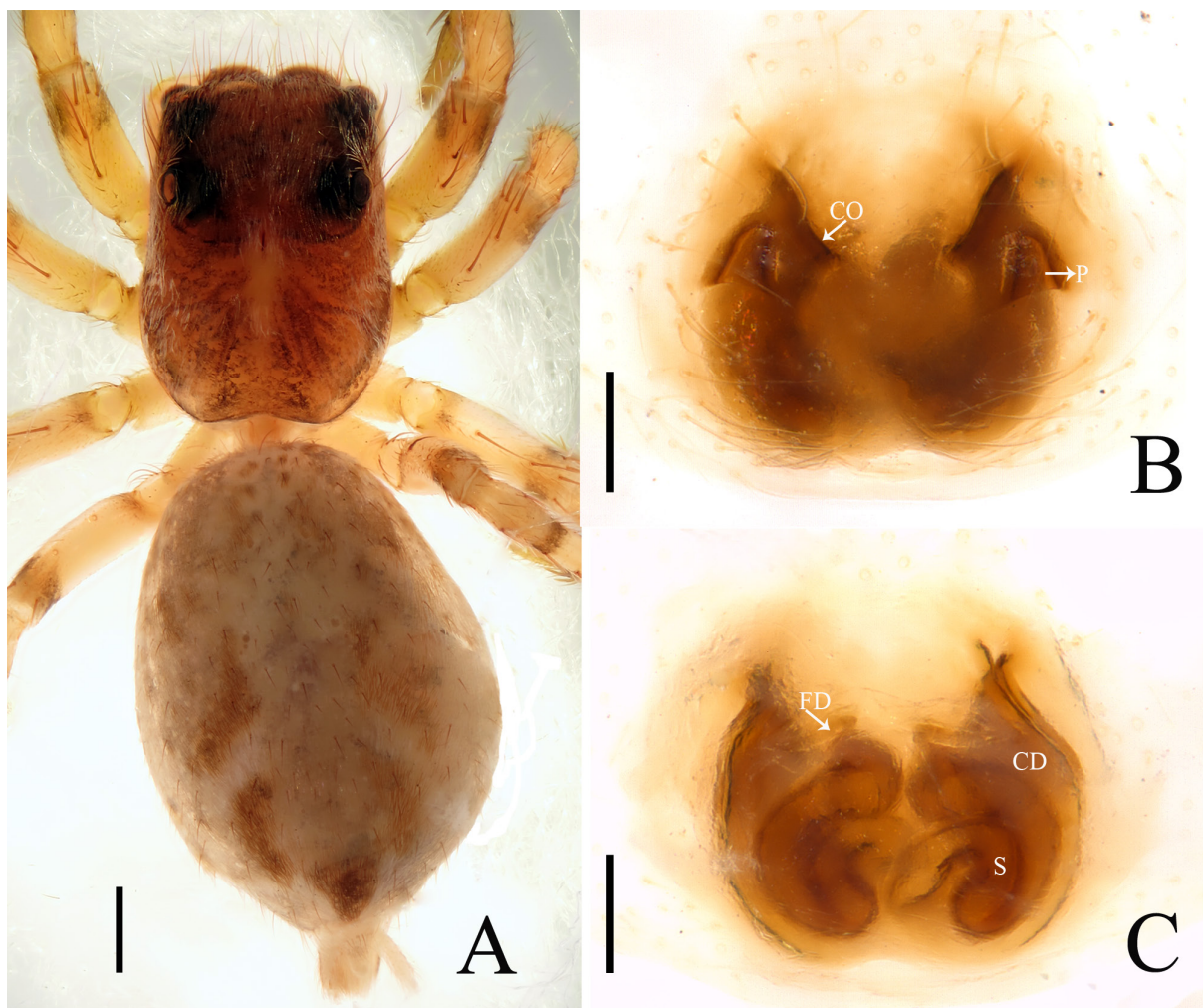


Fig. 39. *Ptocasius zonatus* sp. nov., holotype, ♀ (HNU-00–GD–3A). A. Body, dorsal view. B. Epigynum, ventral view. C. Vulva, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.1 mm.

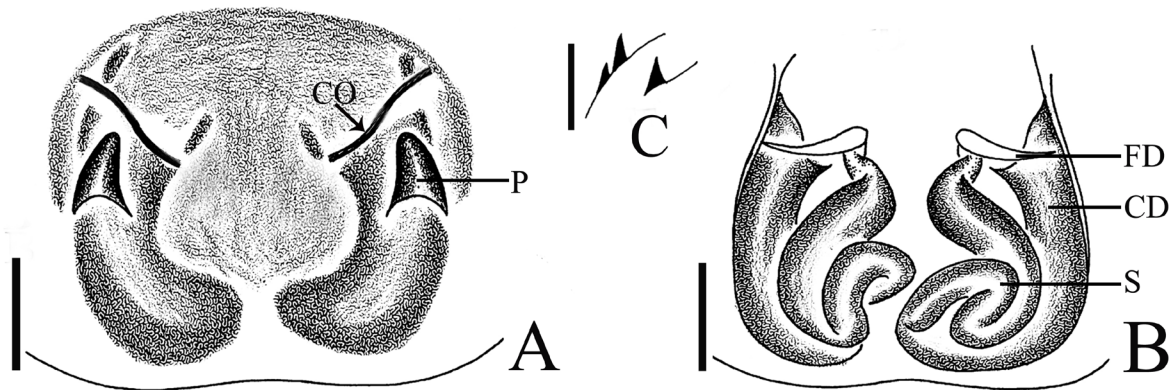


Fig. 40. *Ptocasius zonatus* sp. nov., holotype, ♀ (HNU-00-GD-3A). **A.** Epigynum, ventral view. **B.** Vulva, dorsal view. **C.** Chelicerae, posterior view. Scale bars = 0.1 mm.

slightly bulged, covered with short brown hairs, median area yellowish brown, margin grayish black. Clypeus greyish brown, densely covered with long white hairs. Endites and labium grayish brown, distal area light brown and covered with grayish black hairs.

CHELICERAE (Fig. 40C). Dark brown, two promarginal teeth and one retromarginal denticle.

LEGS. Yellowish brown to brown with grayish black markings or annuli; bearing numerous spines. Tibiae I and II with two pairs of long ventral spines, metatarsi I and II with one pair of ventral spines.

LEG MEASUREMENTS. I = 3.40 (1.10, 1.30, 0.50, 0.50), II = 3.10 (1.00, 1.20, 0.50, 0.40), III = 3.60 (1.10, 1.20, 0.70, 0.60), IV = 4.30 (1.30, 1.50, 0.80, 0.70). Leg formula: IV–III–I–II.

ABDOMEN (Fig. 39A). Oval, dorsum grayish black with irregular black markings; retromargin sides light yellow, the posterior median area with two big black markings; the median area with a triangular black marking; ventral yellowish brown with grayish black markings, the median area with a grayish black longitudinal band; each side with irregular grayish black twills. Spinnerets grayish black.

EPIGYNUM (Figs 39B–C, 40A–B). Wider than long; the pockets below and close to copulatory openings, interdistance of pockets four times as wide as pockets in ventral view; copulatory openings almost transverse; anterior interval of copulatory openings four times as wide as posterior interval in ventral view; copulatory ducts large; spermathecae twisted, band-shaped.

Male

Unknown.

Distribution

China (Yunnan Province, Fig. 45).

Discussion

Most taxonomists have reported that *Ptocasius* Simon, 1885 is closely related to *Yaginumaella* Prószyński, 1979 (Yaginuma 1972; Prószyński 1979, 2017). The males of *Ptocasius* can be diagnosed by the starting position of the embolus, but the characteristics of the females are so similar that it is difficult to separate them. So far, the two genera are still considered as separate genera. All females of *Ptocasius* have sclerotized blind pockets in the epigynum. The males of *Ptocasius* can be diagnosed by the position

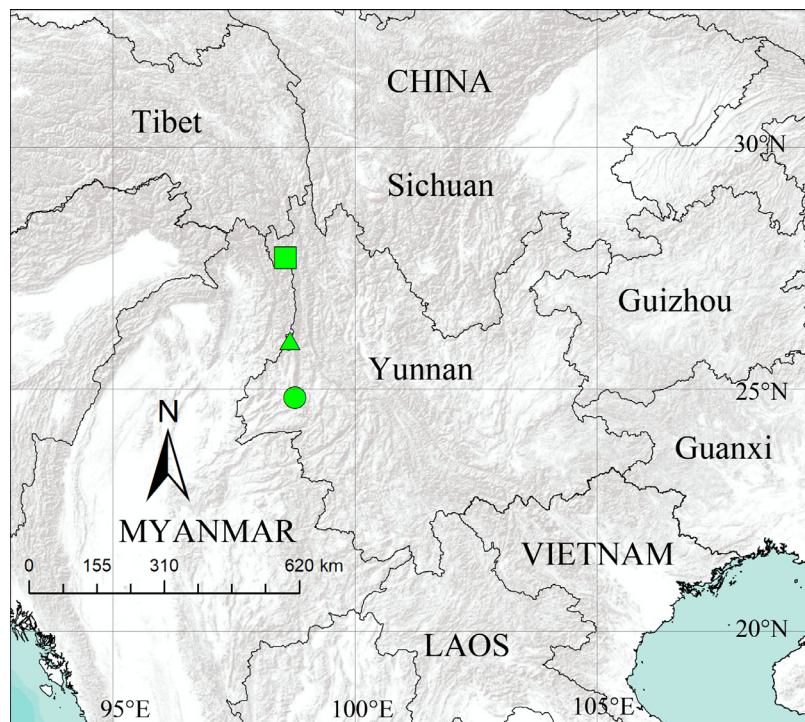


Fig. 41. Distribution records of the species: *P. angulatus* sp. nov. (▲), *P. filiformis* sp. nov. (●) and *P. robustus* sp. nov. (■).

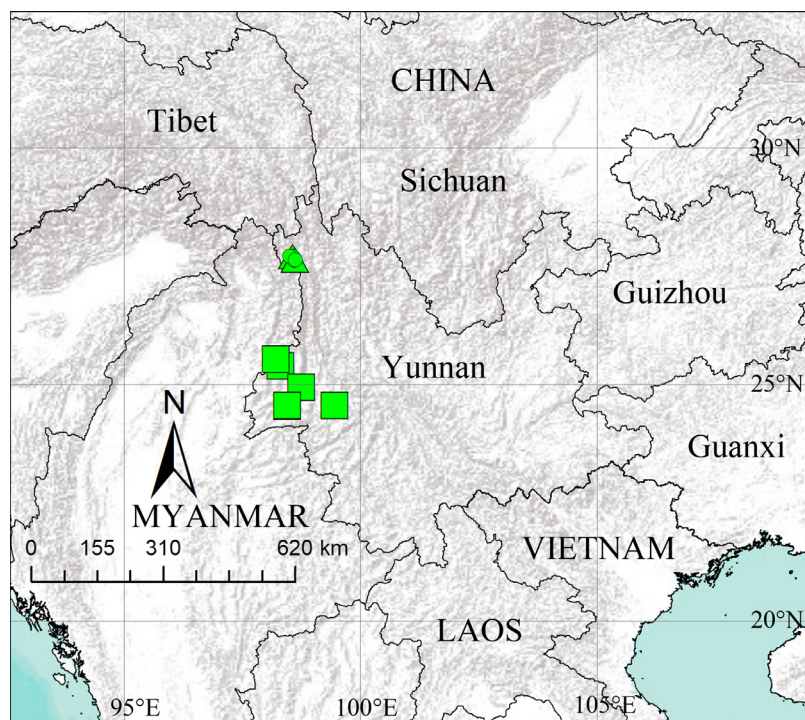


Fig. 42. Distribution records of the species: *P. circulus* sp. nov. (▲), *P. danzhu* sp. nov. (●) and *P. longapophysis* (■).

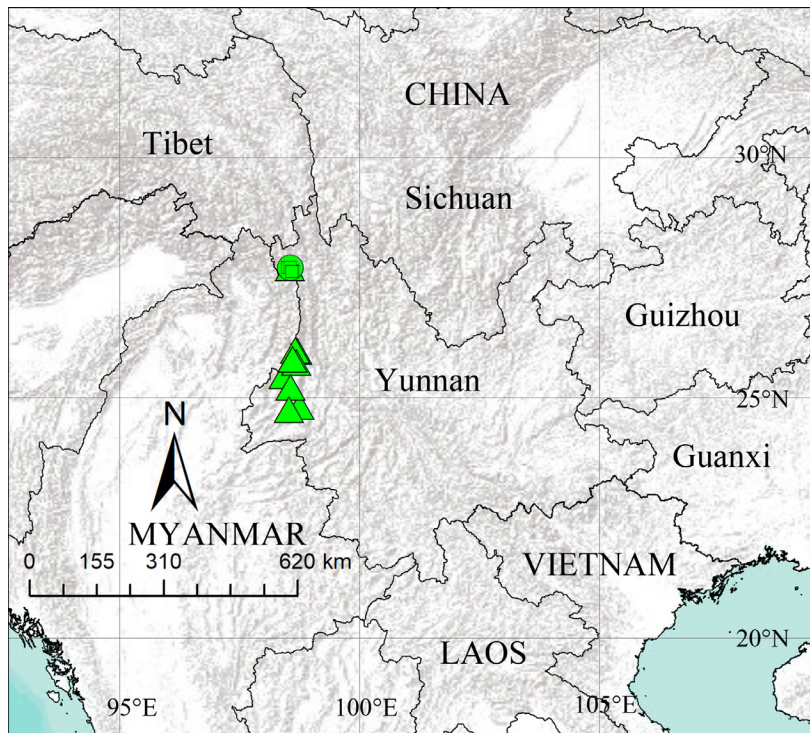


Fig. 43. Distribution records of the species: *P. davidi* sp. nov. (▲), *P. foliolatus* sp. nov. (●) and *P. zabkai* (■).

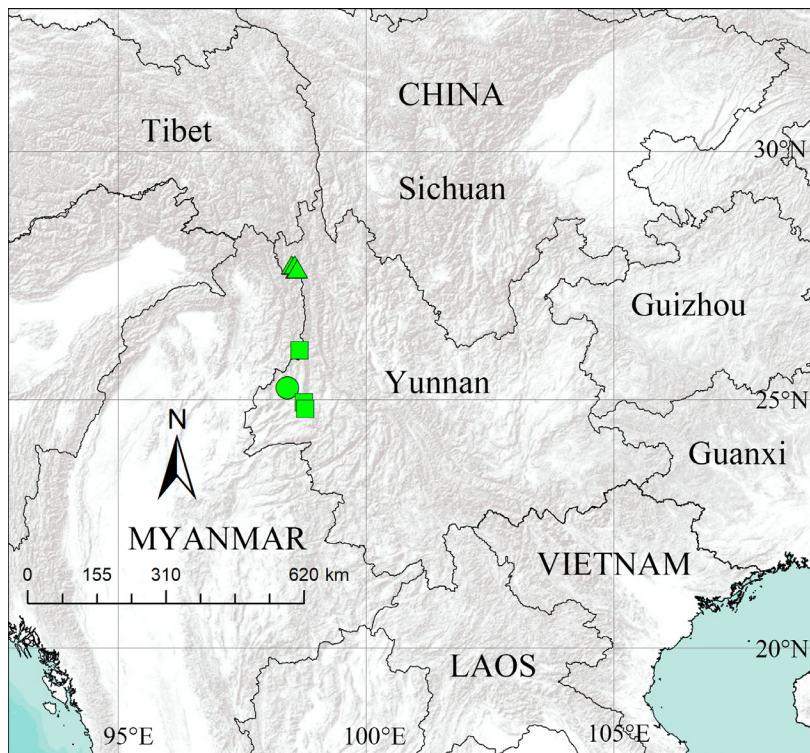


Fig. 44. Distribution records of the species: *P. geminus* sp. nov. (▲), *P. jietouensis* sp. nov. (●) and *P. tengchongensis* sp. nov. (■).

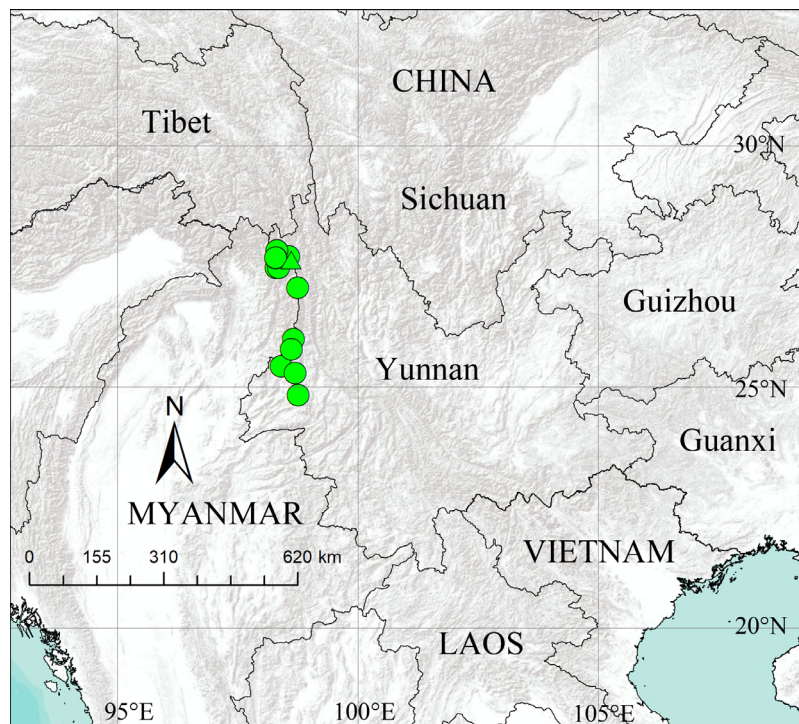


Fig. 45. Distribution records of the species: *P. umbellulatus* sp. nov. (●) and *P. zonatus* sp. nov. (▲).

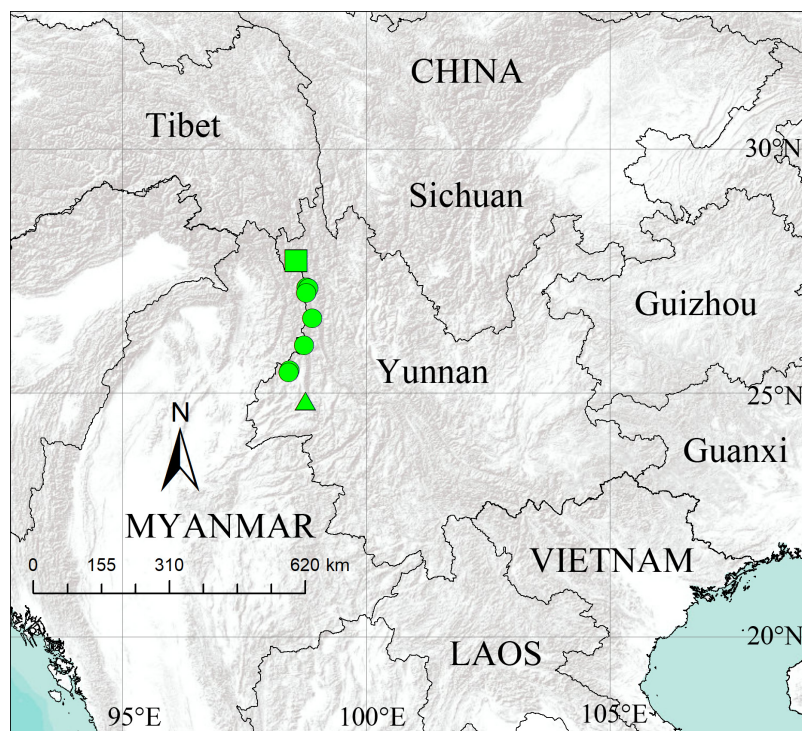


Fig. 46. Distribution records of the species: *P. longlingensis* sp. nov. (▲), *P. montanus* (Žabka, 1981) (●) and *P. rectangularus* sp. nov. (■).

of the embolus: its end is located in a special groove on the ventral surface of the cymbium (Žabka 1981). Up to now, many species of *Ptocasius* and *Yaginumaella* have been successively transferred and taxonomically revised. Some scholars think that some species of the genus *Yaginumaella* should be transferred to the genus *Ptocasius* on the basis of molecular, morphological and distributional data (Lin & Li 2020; Patoleta *et al.* 2020; Hu 2001). Patoleta *et al.* (2020) transferred 37 species, previously included in *Yaginumaella*, to *Ptocasius*.

Based on the characteristics of specimens checked by the present authors together with those illustrated in the literature, we think the males of the two genera can be separated by: (1) the embolus originating from the anterior of prolateral margin of the genital bulb, and close to the genital lobe in *Ptocasius*, but originating from the prolateral margin of the palpal bulb, and away from the genital lobe in *Yaginumaella*; (2) the embolus is slender and sinuous, as long as the genital bulb, and its tip points to the retrolateral margin of the palpal bulb in *Ptocasius*, but it is short and straight, shorter than the length of the palpal bulb, and its tip extends above the palpal bulb in *Yaginumaella*. The characteristics of the females of these two genera are so close that it is difficult to distinguish them. However, most females of *Ptocasius* have a nearly square epigynum, whereas it is generally wider than long in *Yaginumaella*. Thus, the sixteen new species we found, which are currently placed in *Ptocasius*, display identical diagnostic genitalic characters. However, more taxonomic and phylogenetic studies need to be done on the genus *Ptocasius* from Mt. Gaoligong in the Yunnan Province and across the adjacent areas to understand the distribution and origins of these taxa.

Acknowledgments

We are grateful to Charles Griswold, Chun-lin Long, Darrell Ubick, David Kavanaugh, Da-zhi Dong, Guo Tang, Heng-mei Yan, Hong-bin Liang, Peng Hu and Xin-ping Wang for collecting the specimens. We also thank Cheng Wang, Muhammad Irfan and Theo Blick (Germany) for their suggestions on the article. This research was sponsored by the National Natural Sciences Foundation of China (NSFC-30970327, 31272271, 31272272, 31301861). It is also partly supported by the National Special Fund on Basic Research of Science and Technology of China (No. 2014FY110100), the Hunan Provincial Program for Development of Key Disciplines in Ecology (grant number No. 0713), the Hunan Provincial Natural Science Foundation of China (No. 11JJ1004/12JJ3028/2017JJ3217), the China Postdoctoral Science Foundation (No. 20100471221/201104506), and by the program of the Hunan Provincial Science and Technology Plans (No. 2010RS4006).

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Manuscript received: 26 August 2022

Manuscript accepted: 8 May 2023

Published on: 7 November 2023

Topic editor: Tony Robillard

Section editor: Rudy Jocqué

Desk editor: Pepe Fernández

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