

A survey of *Pholcus* spiders (Araneae, Pholcidae) from the Qinling Mountains of central China, with descriptions of seven new species

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Abstract

We report 18 spider species of the genus *Pholcus* Walckenaer, 1805 from a survey in the Qinling Mountains of central China. They belong to four species groups and include seven species new to science: *Pholcus jiaozuo* Yang & Yao, **sp. nov.** (♂♀) in the *taishan* species group; *P. luonan* Yang & Yao, **sp. nov.** (♂♀), *P. luoyang* Yang & Yao, **sp. nov.** (♂♀), *P. lushan* Yang & Yao, **sp. nov.** (♂♀), *P. shangluo* Yang & Yao, **sp. nov.** (♂♀), *P. weinan* Yang & Yao, **sp. nov.** (♂♀) and *P. yuncheng* Yang & Yao, **sp. nov.** (♂♀) in the *yichengicus* species group. Detailed diagnoses, descriptions, photomicroscopy images and DNA barcodes of all new species are provided. Our study will make a significant contribution to understanding species diversity and zoogeography of the region.

Key Words

Biodiversity, daddy-long-legs, DNA barcode, morphology, taxonomy

Introduction

The family Pholcidae C.L. Koch, 1850 is a highly diverse group of spiders, with 97 extant genera and 1,937 extant species (WSC 2023). It has a wide distribution and occupies a variety of habitats, for example, in buildings, on rock walls, in caves (or at cave entrance ecotones), in leaf litter, on the underside of leaves and in webs between trunks and twigs of trees (Huber 2005, 2011; Yao and Li 2010, 2012, 2013; Yao et al. 2015, 2016). The genus *Pholcus* Walckenaer, 1805 is the most diverse genus in the family and one of the largest in Araneae Clerck, 1757, with 389 described species placed in 21 species groups (Huber 2011; Huber et al. 2018; WSC 2023). It is mainly distributed in the Palearctic, Oriental, Afrotropical and Australasian Realms (WSC 2023).

China exhibits the highest species diversity of the genus *Pholcus*. To date, 169 species have been recorded in China, which represent 43% of the genus (WSC 2023). Recently, a series of surveys of *Pholcus* have been carried out in northern China and a large number of new species have been reported. For instance, a wide-ranging expedition to the Changbai Mountains in 2020 recorded 27

species of *Pholcus*, including 13 new species (Lu et al. 2021; Yao et al. 2021; Zhao et al. 2023a). Another investigation in the Yanshan-Taihang Mountains in 2021 recorded 36 *Pholcus* species, of which 14 species were new to science (Lu et al. 2022a, b). In 2022, *Pholcus* spiders were collected for the first time during an expedition to the Lüliang Mountains and the study identified one known species and eight new species (Zhao et al. 2023b).

The Qinling Mountain range represents a major geographical dividing line between the temperate zone and the subtropical zone of China, as well as between the Palearctic and Oriental zoogeographic realms. It is home to many iconic wild animals, such as giant pandas and golden monkeys. For invertebrates, nearly 8,000 species of insects have been recorded in the Qinling Mountains (Yang 2018). However, reports on spiders from the Qinling Mountains are relatively few and the species diversity has not been systematically investigated.

The present study focuses on species diversity of the genus *Pholcus* from the Qinling Mountains. Previously, 14 species of *Pholcus* have been recorded in this region according to a series of previously published papers

(e.g. Zhang and Zhu (2009); Yao and Li (2012); Dong et al. (2016); WSC (2023)). We undertook a systematic investigation there in 2022 (Fig. 1) and the aim is to reveal the species diversity.

Materials and methods

All specimens were collected by Z Yao, L Yang and L Zhang. Specimens were examined and measured with a Leica M205 C stereomicroscope. Left male palps were photographed. Epigynes were photographed before dissection. Vulvae were photographed after treating them in a 10% warm solution of potassium hydroxide (KOH) to dissolve soft tissues. Images were captured with a Canon EOS 750D wide zoom digital camera (24.2 megapixels) mounted on the stereomicroscope mentioned above and assembled using Helicon Focus v. 3.10.3 image stacking software (Khmelik et al. 2005). All measurements are given in millimetres (mm). Leg measurements are shown as: total length (femur, patella, tibia, metatarsus, tarsus). Leg segments were measured on their dorsal side. The distribution map was generated with ArcGIS v. 10.2 (ESRI Inc.). The specimens studied are deposited in the College of Life Science, Shenyang Normal University (SYNU) in Liaoning, China and the Institute of Applied Ecology, Chinese Academy of Sciences (IAECAS) in Liaoning, China.

Terminology and taxonomic descriptions follow Huber (2011) and Yao et al. (2015, 2021). The following abbreviations are used: **a** = appendix, **aa** = anterior arch, **ALE** = anterior lateral eye, **AME** = anterior median eye, **b** = bulb, **da** = distal apophysis, **dp** = distal process, **ds** = dorsal

spine, **dt** = distal teeth, **e** = embolus, **fa** = frontal apophysis, **kn** = knob, **L/d** = length/diameter ratio, **mb** = median branch, **pa** = proximo-lateral apophysis, **PME** = posterior median eye, **pp** = pore plate, **pda** = prolatero-distal apophysis, **pr** = procurus, **pra** = proximal apophysis, **psa** = prolatero-subdistal apophysis, **pse** = prolatero-subdistal edge, **pss** = prolatero-subdistal sclerite, **pvp** = prolatero-ventral protuberance, **rb** = retrolateral branch, **rda** = retrolatero-distal apophysis, **rdb** = retrolatero-distal branch, **rma** = retrolatero-median apophysis, **rpa** = retrolatero-proximal apophysis, **sb** = subdistal branch, **sc** = sclerite, **u** = unculus, **va** = ventral apophysis, **vp** = ventral protuberance, **vsa** = ventro-subdistal apophysis.

DNA barcode sequences of new species were obtained. A partial fragment of the mitochondrial cytochrome oxidase subunit I (COI) gene was targeted using the following primers: forward: LCO1490 (5'-GGT-CAACAAATCATAAAGATATTGG-3') and reverse: HCO2198 (5'-TAAACTTCAGGGTGACCAAAAAATCA-3') (Folmer et al. 1994). Additional information on extraction, amplification and sequencing procedures is provided in Yao et al. (2016).

Results

A total of 18 species were identified, including seven new species. A list of known species is provided in Table 1 and descriptions of all the new species are provided below. In addition, one species, *P. bidentatus* Zhu, Zhang, Zhang & Chen, 2005, is recorded from the Qinling Mountains for the first time. Of the 14 previously recorded species from

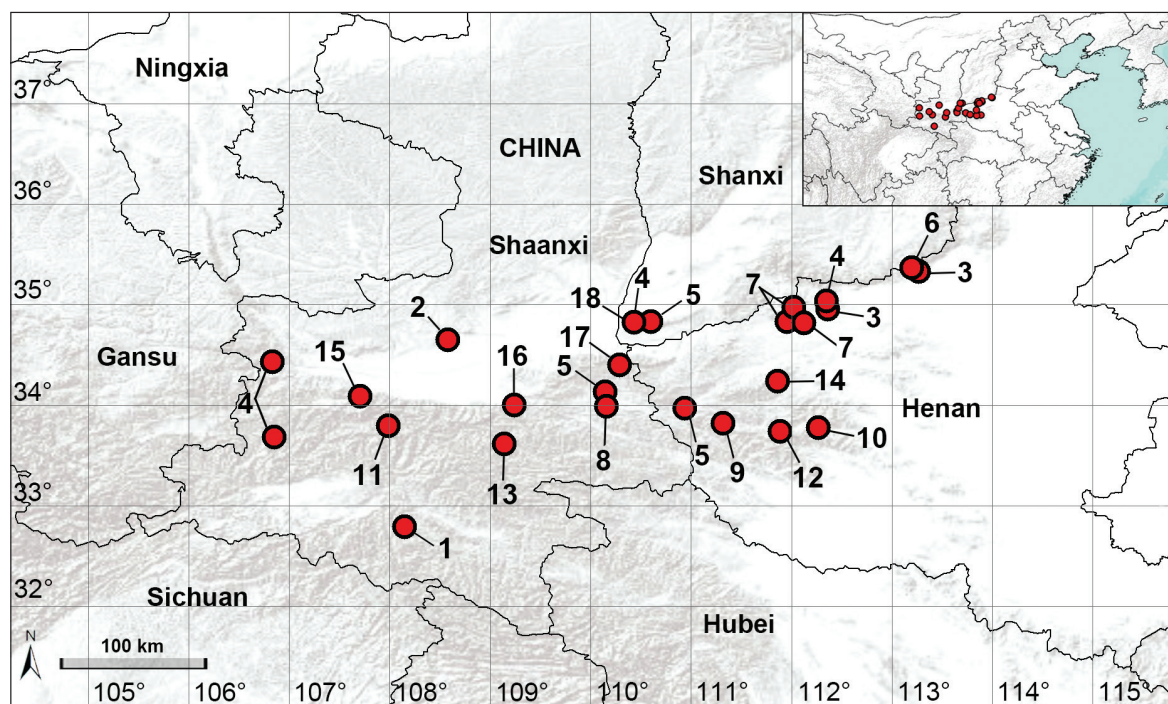


Figure 1. Distribution records of *Pholcus* spiders from the Qinling Mountains in this study. The *bidentatus* group: 1 *P. bidentatus*; the *crypticolens* group: 2 *P. jingyangensis*, 3 *P. langensis*, 4 *P. manuli*, 5 *P. zichyi*; the *taishan* group: 6 *P. jiaozuo* sp. nov., 7 *P. yugong*; the *yichengicus* group: 8 *P. luonan* sp. nov., 9 *P. luoyang* sp. nov., 10 *P. lushan* sp. nov., 11 *P. ovatus*, 12 *P. parayichengicus*, 13 *P. shangluo* sp. nov., 14 *P. songxian*, 15 *P. taibaiensis*, 16 *P. tangyuensis*, 17 *P. weinan* sp. nov., 18 *P. yuncheng* sp. nov.

the Qinling Mountains, we identified ten from our collection. We did not find four previously recorded species of the region, *P. paralinzhou* Zhang & Zhu, 2009, *P. henanensis* Zhu & Mao, 1983, *P. harveyi* Zhang & Zhu, 2009 and *P. lingguanensis* Yao & Li, 2016. All the identified species are endemic to the Qinling Mountains, except three widely-distributed species *P. bidentatus*, *P. manueli* Gertsch, 1937 and *P. zichyi* Kulczyński, 1901. One DNA

barcode sequence was obtained from each new species and all sequences are deposited in GenBank. The voucher numbers, GenBank accession numbers and other related information are given in Table 2. Our study significantly increases the number of known spider species in the Qinling Mountains and will make a significant contribution to the understanding of species diversity of the region, as well as zoogeography.

Table 1. Information of the 11 known species collected and identified.

Species	Voucher code	Collection locality
bidentatus group		
<i>P. bidentatus</i>	2♂ (SYNU-Ar00083F–84F)	Shaanxi* , Ankang, Shiquan County, Yundou Town, Hanjiang Yanxiangdong Scenic Spot, 32°47.75'N, 108°8.93'E, 393 m elev., 24/07/2022
	2♀ (SYNU-Ar00085F–86F)	
crypticolens group		
<i>P. jingyangensis</i>	2♂ (SYNU-Ar00087F–88F)	Shaanxi , Xianyang, Jingyang County, Wangqiao Town, Zhangjiashan Reservoir, 34°39.08'N, 108°34.58'E, 440 m elev., 01/08/2022
	2♀ (SYNU-Ar00089F–90F)	
<i>P. langensis</i>	2♂ (SYNU-Ar00091F–92F)	Henan , Jiyuan, Dayu Town, 34°57.62'N, 112°21.55'E, 373 m elev., 15/07/2022
	2♀ (SYNU-Ar00093F–94F)	
<i>P. manueli</i>	1♂ (SYNU-Ar00095F)	Henan , Jiaozuo, Xiuwu County, Xicun Town, 35°19.85'N, 113°15.97'E, 276 m elev., 14/07/2022
	1♀ (SYNU-Ar00096F)	
	1♂ (SYNU-Ar00097F)	Henan* , Jiyuan, Dayu Town, 35°2.52'N, 112°20.62'E, 443 m elev., 15/07/2022
	1♀ (SYNU-Ar00098F)	
	1♂ (SYNU-Ar00099F)	Shanxi , Yuncheng, Yongji, Shuiyukou Village, Shentan Grand Canyon Scenic Spot, 34°49.50'N, 110°25.72'E, 529 m elev., 20/07/2022
	1♀ (SYNU-Ar00100F)	
<i>P. zichyi</i>	2♀ (SYNU-Ar00101F–02F)	Shaanxi , Hanzhong, Liuba County, Liuhou Town, 33°41.27'N, 106°50.80'E, 1187 m elev., 27/07/2022
	1♂ (SYNU-Ar00103F)	
	1♀ (SYNU-Ar00104F)	Henan , Sanmenxia, Lushi County, Shuanglongwan Town, 33°58.30'N, 110°56.22'E, 580 m elev., 18/07/2022
	1♂ (SYNU-Ar00105F)	
	1♀ (SYNU-Ar00106F)	Shaanxi* , Shangluo, Luonan County, Chengguan Street, Liuwan Village, 34°8.13'N, 110°8.62'E, 893 m elev., 20/07/2022
	1♂ (SYNU-Ar00107F)	
<i>P. taishan group</i>	1♀ (SYNU-Ar00108F)	Henan , Sanmenxia, Mianchi County, Rencun Town, Honghuawo Village, 34°50.20'N, 111°57.22'E, 725 m elev., 16/07/2022
	1♂ (SYNU-Ar00109F)	
	1♀ (SYNU-Ar00110F)	Henan , Luoyang, Xin'an County, Shisi Town, 34°49.43'N, 112°7.43'E, 370 m elev., 16/07/2022
taishan group		
<i>P. yugong</i>	2♂ (SYNU-Ar00111F–12F)	Henan , Sanmenxia, Mianchi County, Rencun Town, Honghuawo Village, 34°50.20'N, 111°57.22'E, 725 m elev., 16/07/2022
	2♀ (SYNU-Ar00113F–14F)	
	2♂ (SYNU-Ar00115F–16F)	Henan , Luoyang, Xin'an County, Qingyaoshan Town, Longtan Grand Canyon Scenic Spot, 34°58.48'N, 112°1.27'E, 336 m elev., 16/07/2022
	1♀ (SYNU-Ar00117F)	
	1♂ (SYNU-Ar00118F)	Henan , Luoyang, Xin'an County, Shisi Town, 34°49.43'N, 112°7.43'E, 370 m elev., 16/07/2022
yichengicus group		
<i>P. ovatus</i>	1♂ (SYNU-Ar00120F)	Shaanxi , Xi'an, Zhouzhi County, Banfangzi Town, 33°48.02'N, 107°59.08'E, 1165 m elev., 31/07/2022
	1♀ (SYNU-Ar00121F)	
<i>P. parayichengicus</i>	2♂ (SYNU-Ar00122F–23F)	Henan , Luoyang, Song County, Baiyunshan Scenic Spot, 33°44.63'N, 111°52.97'E, 830 m elev., 17/07/2022
	2♀ (SYNU-Ar00124F–25F)	
<i>P. songxian</i>	2♂ (SYNU-Ar00126F–27F)	Henan , Luoyang, Song County, Tianchishan Scenic Spot, 34°14.35'N, 111°51.72'E, 810 m elev., 17/07/2022
	2♀ (SYNU-Ar00128F–29F)	
<i>P. taibaiensis</i>	3♂ (SYNU-Ar00130F–32F)	Shaanxi , Baoji, Mei County, Yingtou Town, Haopingsi Temple, 34°5.32'N, 107°42.33'E, 1101 m elev., 30/07/2022
	3♀ (SYNU-Ar00133F–35F)	
<i>P. tangyuensis</i>	2♂ (SYNU-Ar00136F–37F)	Shaanxi , Xi'an, Lantian County, Tangyu Town, Tangyuhu Forest Park, Laoaogou Village, 34°0.03'N, 109°14.43'E, 898 m elev., 31/07/2022
	3♀ (SYNU-Ar00138F–40F)	

* indicates new provincial records.

Table 2. Voucher specimen information.

New species	Voucher code	GenBank accession number	Sequence length	Collection locality
<i>P. jiaozuo</i> sp. nov.	W215	PP082960	626 bp	Henan , Jiaozuo, Xiuwu County
<i>P. luonan</i> sp. nov.	W257	PP082965	626 bp	Shaanxi , Shangluo, Luonan County
<i>P. luoyang</i> sp. nov.	W242	PP082962	626 bp	Henan , Luoyang, Luanchuan County,
<i>P. lushan</i> sp. nov.	W237	PP082961	626 bp	Henan , Pingdingshan, Lushan County
<i>P. shangluo</i> sp. nov.	W260	PP082966	626 bp	Shaanxi , Shangluo, Zhashui County
<i>P. weinan</i> sp. nov.	W252	PP082964	626 bp	Shaanxi , Weinan, Tongguan County
<i>P. yuncheng</i> sp. nov.	W251	PP082963	626 bp	Shanxi , Yuncheng, Yongji

Taxonomic accounts

Family Pholcidae C.L. Koch, 1850

Subfamily Pholcinae C.L. Koch, 1850

Genus *Pholcus* Walckenaer, 1805

Type species. *Aranea phalangioides* Fuesslin, 1775.

Pholcus taishan species group

This species group was recognised by Huber (2011). It currently includes ten species and is distributed in central China (Huber 2011; Peng and Zhang 2011). A new species, *P. jiaozuo* sp. nov., is described below.

Pholcus jiaozuo Yang & Yao, sp. nov.

<https://zoobank.org/A8DC2A11-B767-4FCA-A23C-487F8BFE22C3>

Figs 2, 3

Type material. *Holotype* ♂ (SYNU-Ar00363) and *paratypes* 2♂ (SYNU-Ar00364, IAECAS-Ar00365Y) 3♀ (SYNU-Ar00366–67, IAECAS-Ar00368Y), CHINA, Henan, Jiaozuo, Xiuwu County, Qinglongxia Scenic Spot (35°22.05'N, 113°11.77'E, 820 m elev.), 14/07/2022.

Etymology. The specific name refers to the type locality and is a noun in apposition.

Diagnosis. The new species resembles *P. henanensis* Zhu & Mao, 1983 (Yao and Li 2012: 18, figs 77A–D, 78A–B) by having similar male chelicerae, bulbal apophyses and epigyne (Fig. 3A, C, D), but can be distinguished by prolatero-subdistal sclerite of procursus laterally curved (Fig. 2C vs. laterally flat), by procursus with distal membranous process (Fig. 2C vs. absent), by retrolatero-distal apophysis of procursus distally pointed in prolateral view (Fig. 2C vs. distally blunt) and by wavy vulval anterior arch (Fig. 3B vs. arch-shaped).

Description. *Male (holotype).* Total length 5.38 (5.58 with clypeus), carapace 1.66 long, 1.88 wide, opisthosoma 3.72 long, 1.66 wide. Leg I: 39.95 (10.25, 0.79, 9.85, 16.31, 2.75), leg II: 28.15 (7.88, 0.72, 6.95, 10.96, 1.64), leg III: 20.28 (5.90, 0.66, 4.84, 7.63, 1.25), leg IV: 26.12 (7.76, 0.67, 6.67, 9.52, 1.50); tibia I L/d: 62. Eye interdistances and diameters: PME–PME 0.26, PME 0.17, PME–ALE 0.04, AME–AME 0.04, AME 0.10. Sternum width/length: 1.25/0.86. Habitus as in Fig. 3E, F. Carapace yellowish, with brown radiating marks and marginal brown bands; ocular area yellowish, with median and lateral brown bands; clypeus and sternum yellowish, with brown marks. Legs yellowish, but dark brown on patellae and whitish on distal parts of femora and tibiae, with darker rings on subdistal parts of femora and proximal and subdistal parts of tibiae. Opisthosoma yellowish, with dorsal and lateral spots. Chelicerae (Fig. 3D) with pair of proximo-lateral apophyses

and pair of distal apophyses. Palp as in Fig. 2A, B; trochanter with long (8 times longer than wide), retrolatero-proximally strongly bulged ventral apophysis; femur with small retrolatero-proximal apophysis and distinct ventral protuberance; tibia with prolatero-ventral protuberance; procursus (Fig. 2C, D) simple proximally, but complex distally, with raised prolatero-subdistal membranous edge, curved prolatero-subdistal sclerite, distal membranous process, sclerotised retrolatero-distal apophysis and two strong dorsal spines; uncus (Fig. 3C) distally widened, with proximal apophysis and distal scaly edge; appendix (Fig. 3C) hooked, with distal teeth; embolus (Fig. 3C) weakly sclerotised, with some indistinct transparent distal projections. Retrolateral trichobothrium on tibia I at 5% proximally; legs with short vertical setae on tibiae, metatarsi and tarsi; tarsus I with 38 distinct pseudosegments.

Female (paratype). Similar to male, habitus as in Fig. 3G, H. Total length 5.00 (5.19 with clypeus), carapace 1.52 long, 1.70 wide, opisthosoma 3.48 long, 1.60 wide; tibia I: 8.05; tibia I L/d: 50. Eye interdistances and diameters: PME–PME 0.21, PME 0.14, PME–ALE 0.04, AME–AME 0.03, AME 0.08. Sternum width/length: 1.03/0.80. Clypeus brown. Epigyne (Fig. 3A) nearly triangular, laterally slightly sclerotised, with knob developed into long scape (10 times longer than wide). Vulva (Fig. 3B) with wavy, posteriorly sclerotised anterior arch and pair of elliptic pore plates.

Variation. Tibia I in two paratype males: 9.55, 10.50. Tibia I in the other two paratype females: 7.95, 8.25.

Habitat. Underside of overhang on rocky cliffs in the mountain area.

Distribution. China (Henan, type locality; Fig. 1).

Pholcus yichengicus species group

This species group was recognised by Huber (2011). It currently includes 44 species and is widely distributed in central and southern China, as well as Thailand (Huber 2011; Zhu et al. 2018; Lan et al. 2020). Six new species are described below.

Pholcus luonan Yang & Yao, sp. nov.

<https://zoobank.org/4A9F4DB6-3FF3-46D9-8131-3BAD55918638>

Figs 4, 5

Type material. *Holotype* ♂ (SYNU-Ar00369) and *paratypes* 1♂ (IAECAS-Ar00370Y) 2♀ (SYNU-Ar00371, IAECAS-Ar00372Y), CHINA, Shaanxi, Shangluo, Luonan County, Beikuanping Town, Hanziping Village (33°59.67'N, 110°9.28'E, 1105 m elev.), 21/07/2022.

Etymology. The specific name refers to the type locality and is a noun in apposition.

Diagnosis. The new species resembles *P. tangyuenensis* Yao & Li, 2016 (Dong et al. 2016: 30, figs 21A–D,

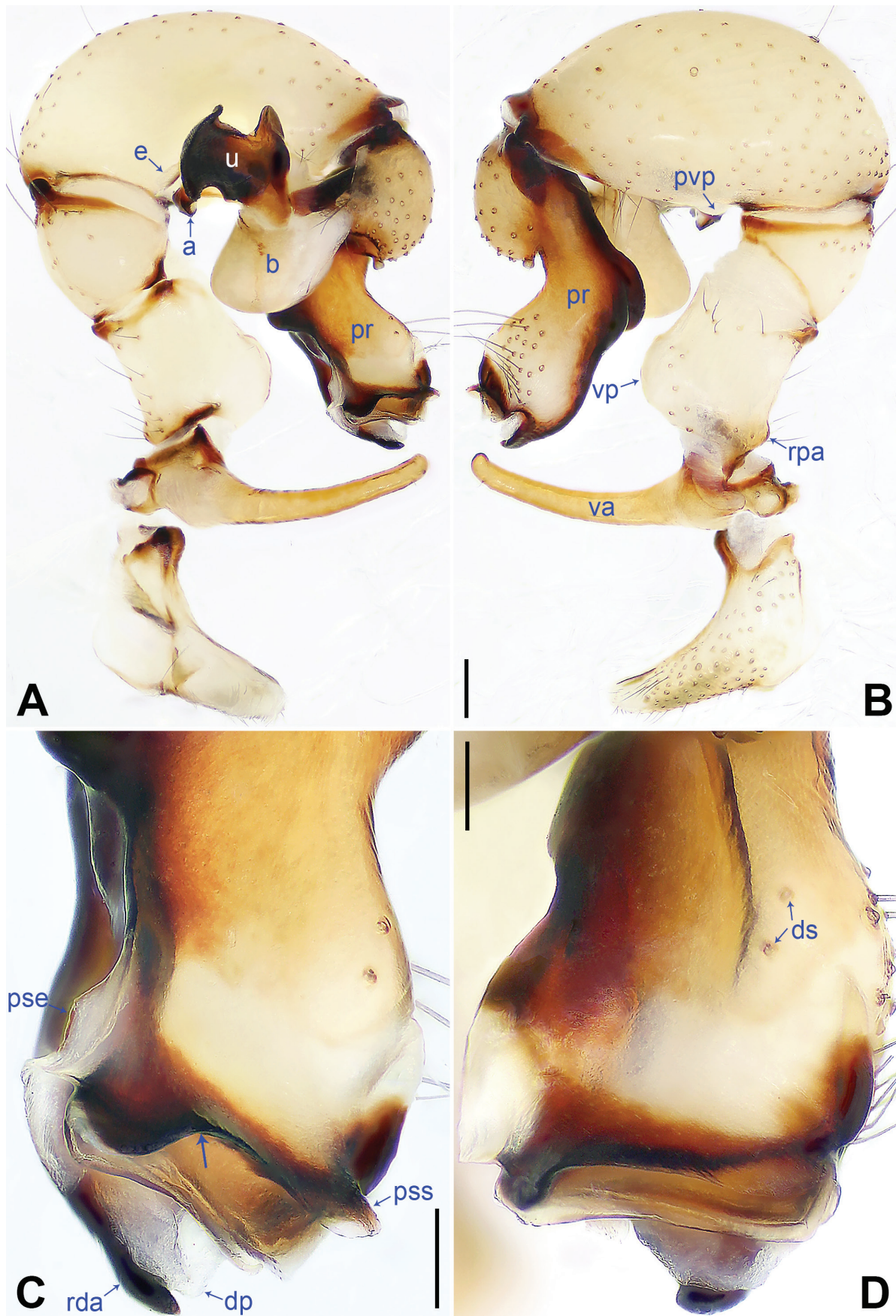


Figure 2. *Pholcus jiaozuo* sp. nov., holotype male **A**, **B**. Palp (**A**. Prolateral view; **B**. Retrolateral view); **C**, **D**. Distal part of pro-cursus (**C**. Prolateral view, arrow points at curved part of sclerite; **D**. Dorsal view). Scale bars: 0.20 mm (**A**, **B**); 0.10 mm (**C**, **D**).

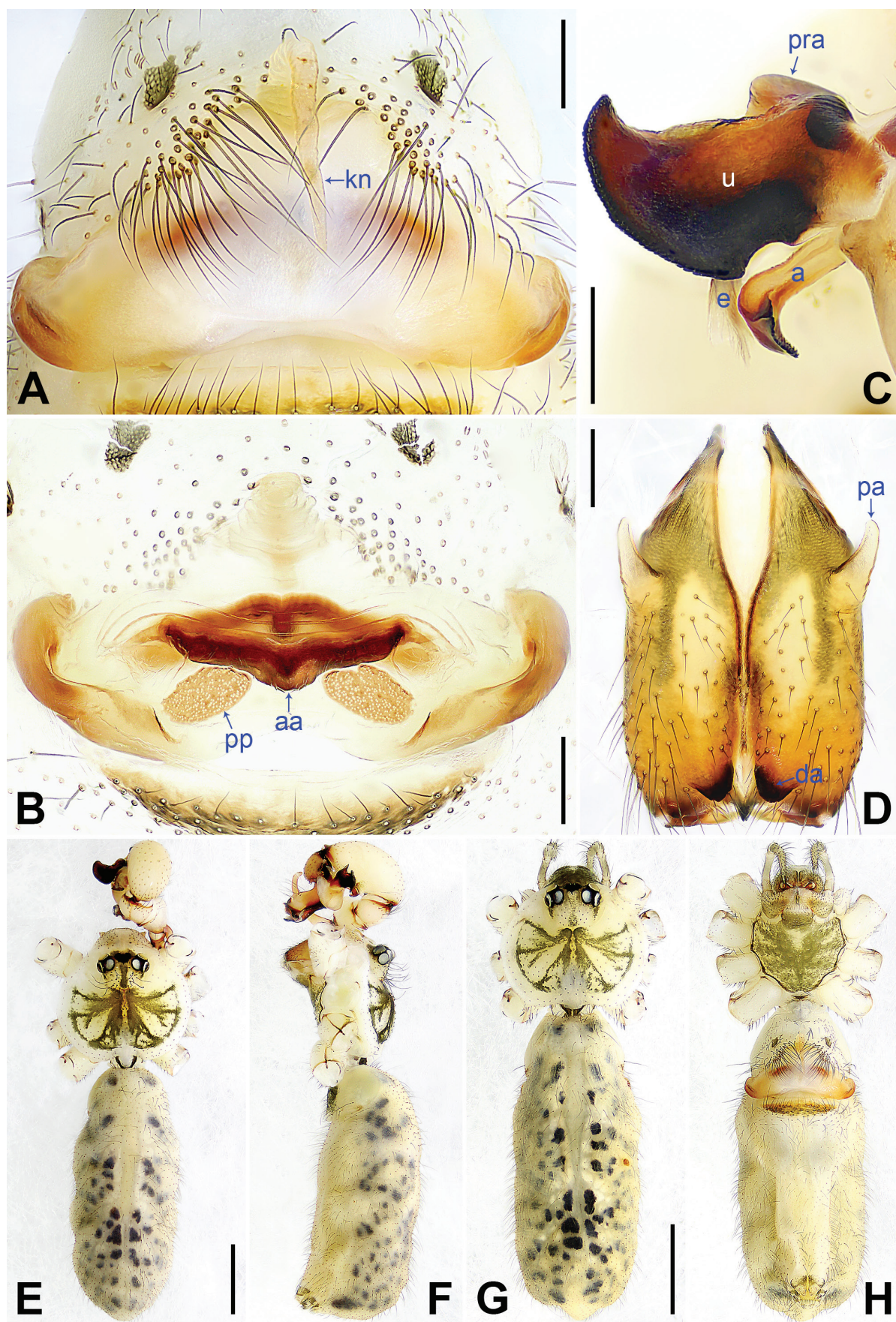


Figure 3. *Pholcus jiaozuo* sp. nov., holotype male (C–F) and paratype female (A, B, G, H) A. Epigyne, ventral view; B. Vulva, dorsal view; C. Bulbal apophyses, prolateral view; D. Chelicerae, frontal view; E–H. Habitus (E, G. Dorsal view; F. Lateral view; H. Ventral view). Scale bars: 0.20 mm (A–D); 1.00 mm (E–H).

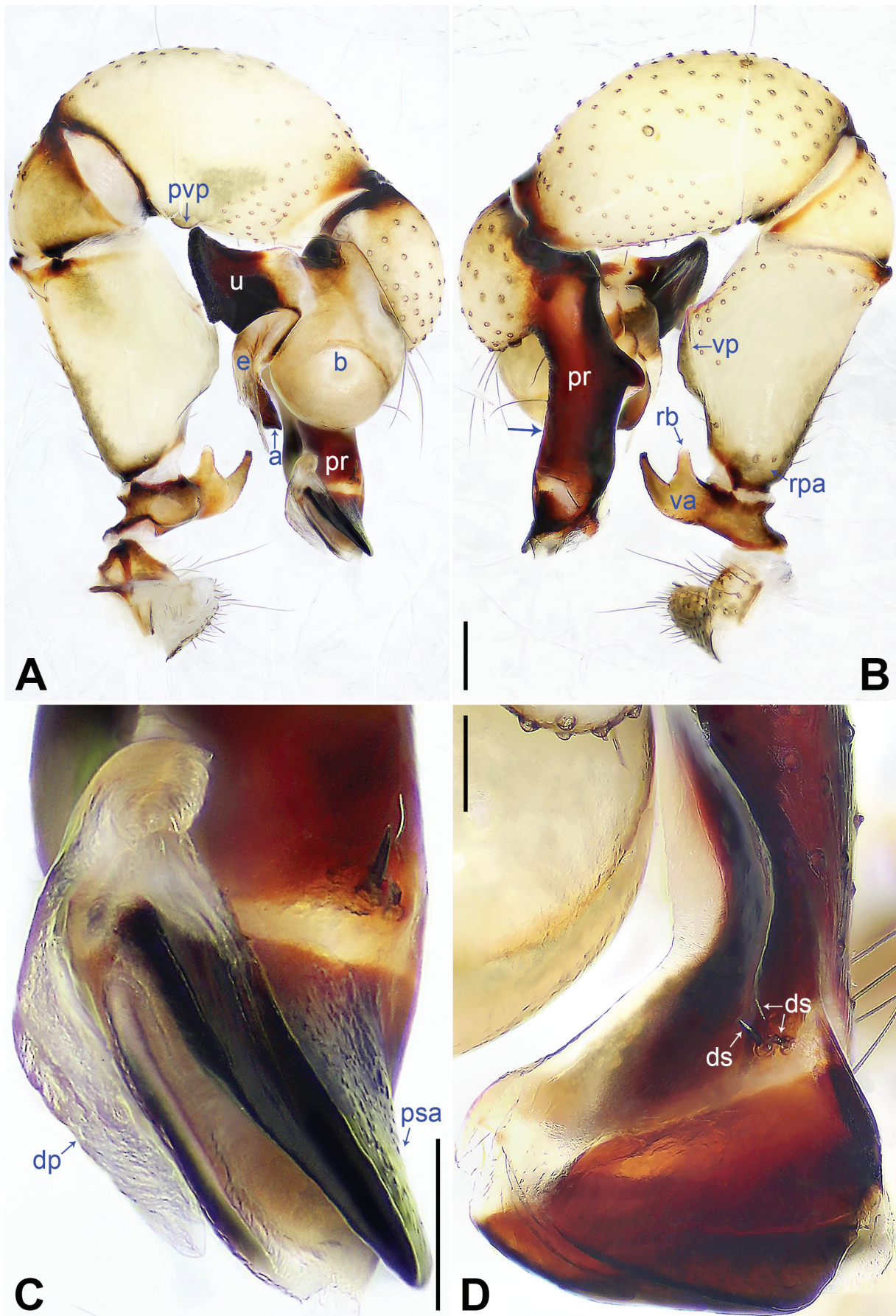


Figure 4. *Pholcus luonan* sp. nov., holotype male **A, B.** Palp (**A.** Prolateral view; **B.** Retrolateral view, arrow points at dorso-median part of procursus); **C, D.** Distal part of procursus (**C.** Prolateral view; **D.** Dorsal view). Scale bars: 0.20 mm (**A, B**); 0.10 mm (**C, D**).

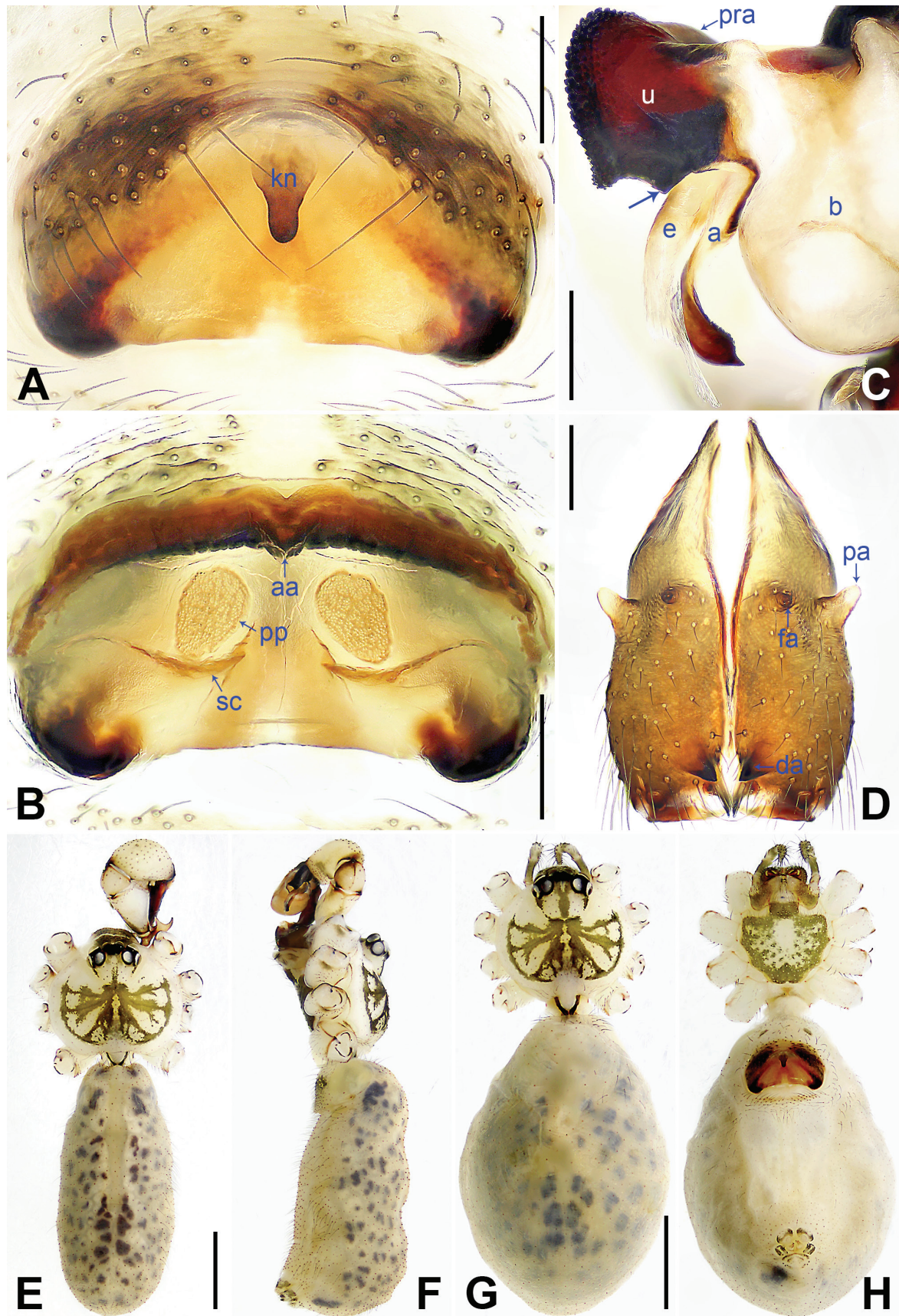


Figure 5. *Pholcus luonan* sp. nov., holotype male (C–F) and paratype female (A, B, G, H) A. Epigyne, ventral view; B. Vulva, dorsal view; C. Bulbal apophyses, prolateral view (arrow points at latero-median protrusion); D. Chelicerae, frontal view; E–H. Habitus (E, G. Dorsal view; F. Lateral view; H. Ventral view). Scale bars: 0.20 mm (A–D); 1.00 mm (E–H).

22A–H) by having similar male chelicerae and epigyne (Fig. 5A, D), but can be distinguished by dorso-median part of procursus not protruding (Fig. 4B vs. protruding), by male palpal trochanteral apophysis with distinct retrolateral branch (Fig. 4B vs. indistinct projection), by uncus latero-medially strongly protruding (Fig. 5C vs. latero-proximally slightly protruding), by appendix without branch (Fig. 5C vs. present) and by vulval pore plates nearly elliptic (anteriorly wide and posteriorly narrow, Fig. 5B vs. nearly round).

Description. Male (holotype). Total length 4.92 (5.06 with clypeus), carapace 1.56 long, 1.78 wide, opisthosoma 3.36 long, 1.56 wide. Legs I and II missing, leg III: 17.78 (5.19, 0.61, 4.10, 6.80, 1.08), leg IV: 24.87 (7.92, 0.65, 5.83, 9.12, 1.35). Eye interdistances and diameters: PME–PME 0.26, PME 0.17, PME–ALE 0.06, AME–AME 0.06, AME 0.12. Sternum width/length: 1.16/0.94. Habitus as in Fig. 5E, F. Carapace yellowish, with brown radiating marks and marginal brown bands; ocular area yellowish, with median and lateral brown bands; clypeus brown; sternum yellowish, with brown marks. Legs yellowish, but dark brown on patellae and whitish on distal parts of femora and tibiae, with darker rings on subdistal parts of femora and proximal and subdistal parts of tibiae. Opisthosoma yellowish, with dorsal and lateral spots. Chelicerae (Fig. 5D) with pair of proximo-lateral apophyses, pair of distal apophyses with two teeth each and pair of frontal apophyses. Palp as in Fig. 4A, B; trochanter with long (3 times longer than wide) ventral apophysis bearing distinct retrolateral branch; femur with small retrolatero-proximal apophysis and distinct ventral protuberance; tibia with prolatero-ventral protuberance; procursus (Fig. 4C, D) simple proximally, but complex distally, with raised prolatero-subdistal membranous edge bearing distal membranous process, sclerotised prolatero-subdistal apophysis and two strong and one slender dorsal spines; uncus (Fig. 5C) latero-medially protruding, with proximal apophysis and distal scaly edge; appendix (Fig. 5C) curved, with distal scales; embolus (Fig. 5C) weakly sclerotised, with some indistinct transparent distal projections. Legs with short vertical setae on tibiae, metatarsi and tarsi.

Female (paratype). Similar to male, habitus as in Fig. 5G, H. Total length 4.70 (4.80 with clypeus), carapace 1.38 long, 1.45 wide, opisthosoma 3.32 long, 2.31 wide; tibia I: 6.04; tibia I L/d: 48. Eye interdistances and diameters: PME–PME 0.23, PME 0.15, PME–ALE 0.05, AME–AME 0.06, AME 0.11. Sternum width/length: 0.96/0.78. Epigyne (Fig. 5A) nearly triangular, laterally strongly sclerotised, with knob (distally narrowed). Vulva (Fig. 5B) with laterally strongly curved, sclerotised anterior arch, pair of nearly elliptic pore plates (anteriorly wide and posteriorly narrow) and pair of wavy sclerites.

Variation. Tibia I in paratype male: 8.75; tibia I L/d: 58. Retrolateral trichobothrium on tibia I at 6% proximal-

ly; tarsus I with 31 distinct pseudosegments. Leg I missing in another female paratype.

Habitat. Underside of overhang on rocky cliffs in the mountain area.

Distribution. China (Shaanxi, type locality; Fig. 1).

Pholcus luoyang Yang & Yao, sp. nov.

<https://zoobank.org/4EF6B12F-2ADC-42CF-A45A-E3172BC7D3D7>

Figs 6, 7

Type material. Holotype ♂ (SYNU-Ar00373) and **paratypes** 2♂ (SYNU-Ar00374, IAECAS-Ar00375Y) 2♀ (SYNU-Ar00376, IAECAS-Ar00377Y), CHINA, Henan, Luoyang, Luanchuan County, Jiaohe Town, Tianhe Grand Canyon Scenic Spot (33°49.43'N, 111°18.82'E, 1140 m elev.), 18/07/2022.

Etymology. The specific name refers to the type locality and is a noun in apposition.

Diagnosis. The new species resembles *P. songxian* Zhang & Zhu, 2009 (Yao and Li 2012: 32, figs 159A–D, 160A–C) by having similar male chelicerae and epigyne (Fig. 7A, D), but can be distinguished by prolatero-distal apophysis of procursus curved (Fig. 6C vs. flat), by uncus narrow, distally pointed (Fig. 7C vs. wide, distally blunt), by appendix with subdistal branch (Fig. 7C vs. median branch), by vulval anterior arch medially sclerotised (Fig. 7B vs. entirely sclerotised) and by vulval pore plates long elliptic (length/width ratio: 5, Fig. 7B vs. elliptic and length/width ratio: 2).

Description. Male (holotype). Total length 4.44 (4.55 with clypeus), carapace 1.41 long, 1.66 wide, opisthosoma 3.03 long, 1.34 wide. Leg I: 34.83 (8.95, 0.69, 8.85, 14.10, 2.24), leg II: 23.67 (6.75, 0.66, 5.76, 9.04, 1.46), leg III: 15.75 (4.95, 0.61, 3.95, 5.10, 1.14), leg IV: 22.22 (6.65, 0.62, 5.65, 7.95, 1.35); tibia I L/d: 63. Eye interdistances and diameters: PME–PME 0.20, PME 0.16, PME–ALE 0.04, AME–AME 0.05, AME 0.11. Sternum width/length: 1.06/0.81. Habitus as in Fig. 7E, F. Carapace yellowish, with brown radiating marks and marginal brown bands; ocular area yellowish, with median and lateral brown bands; clypeus brown; sternum yellowish, with brown marks. Legs yellowish, but dark brown on patellae and whitish on distal parts of femora and tibiae, with darker rings on subdistal parts of femora and proximal and subdistal parts of tibiae. Opisthosoma yellowish, with dorsal and lateral spots. Chelicerae (Fig. 7D) with pair of proximo-lateral apophyses, pair of distal apophyses with two teeth each and pair of frontal apophyses. Palp as in Fig. 6A, B; trochanter with long (4 times longer than wide) ventral apophysis bearing retrolatero-distal branch; femur with small retrolatero-proximal apophysis and distinct ventral protuberance; tibia with prolatero-ventral protuberance; procursus (Fig. 6C, D) simple proximally, but complex distally, with raised prolatero-subdistal membranous edge bearing distal membranous process, curved sclerotised prolatero-distal

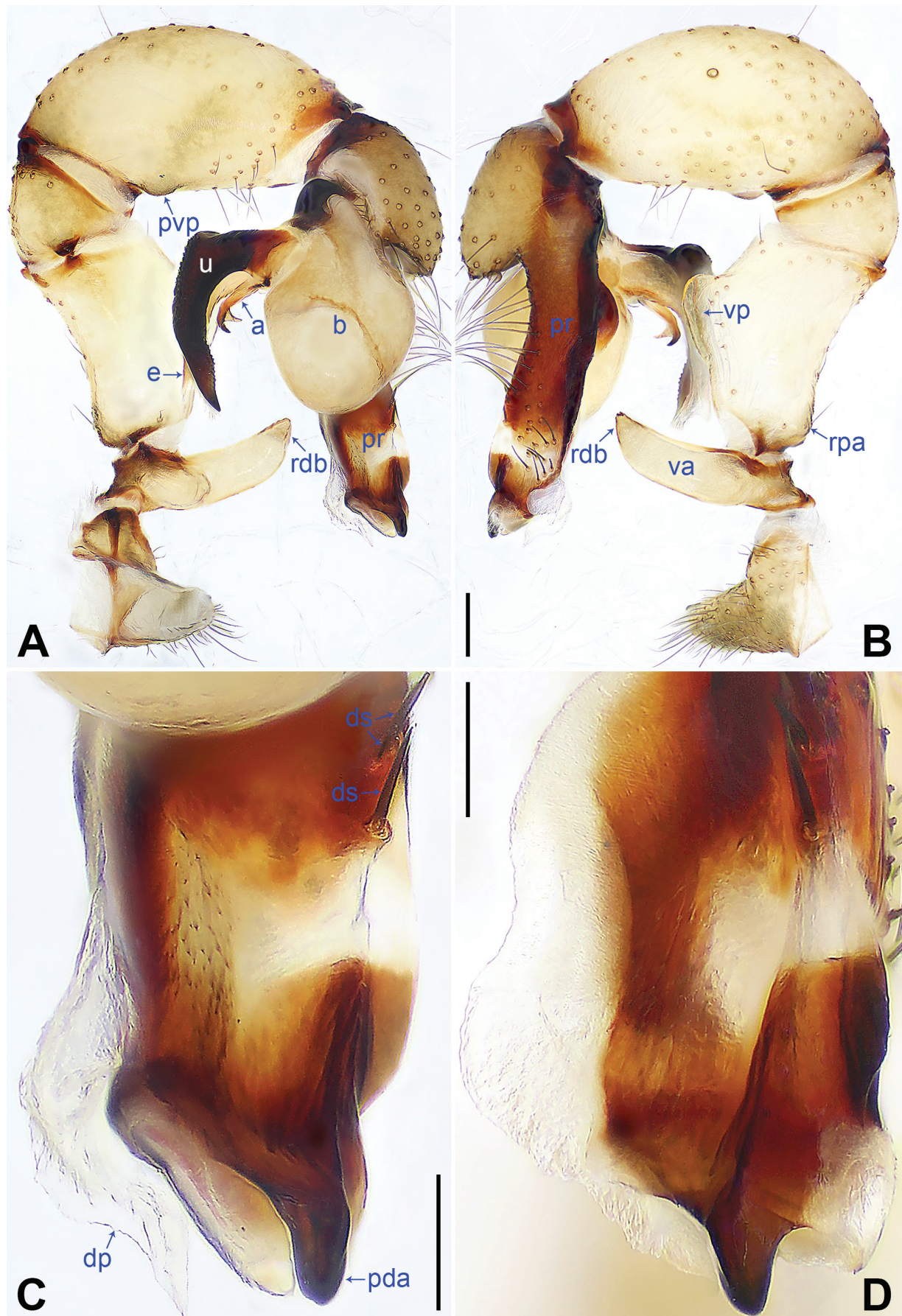


Figure 6. *Pholcus luoyang* sp. nov., holotype male **A, B.** Palp (**A.** Prolateral view; **B.** Retrolateral view); **C, D.** Distal part of pro-cursus (**C.** Prolateral view; **D.** Dorsal view). Scale bars: 0.20 mm (**A, B**); 0.10 mm (**C, D**).

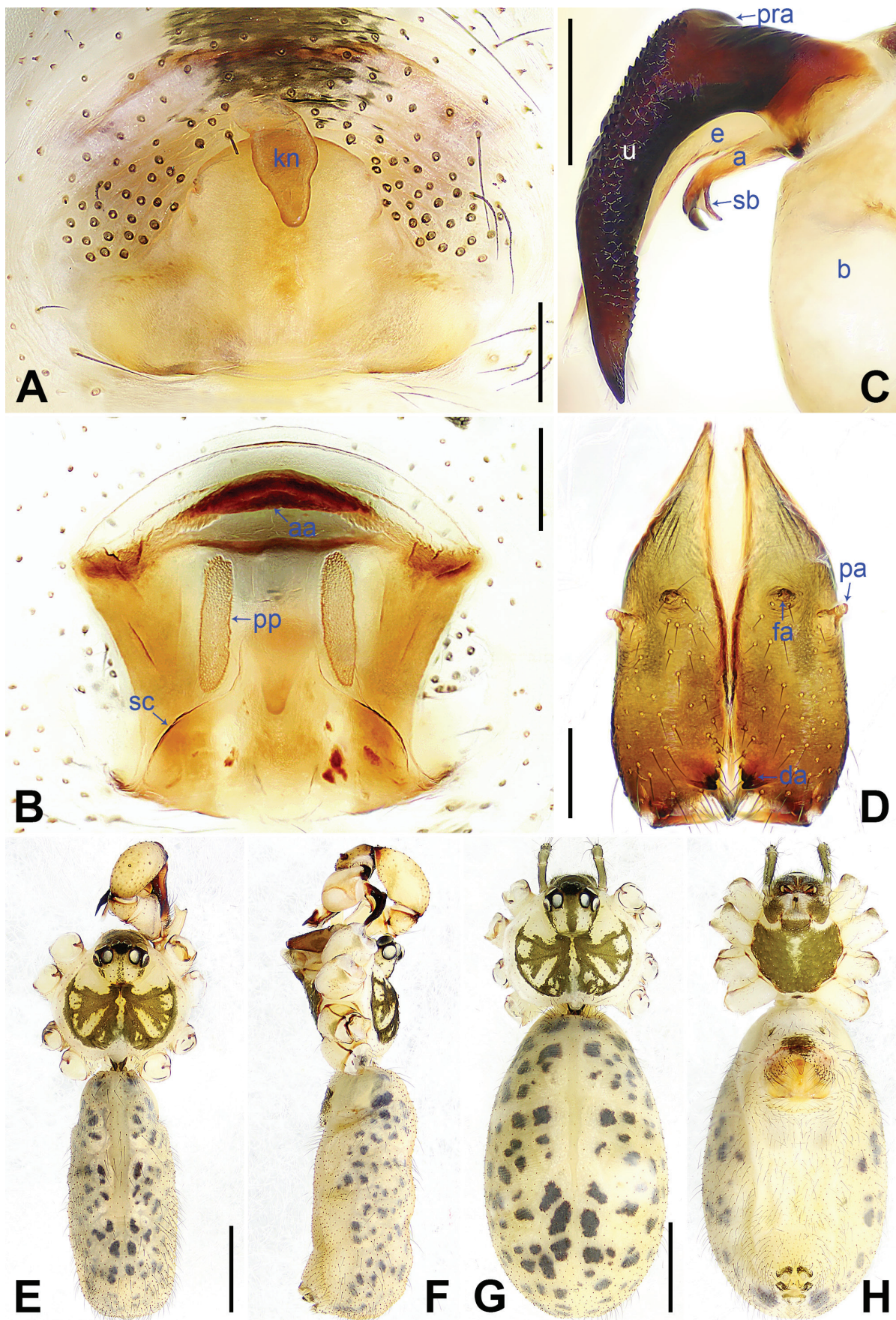


Figure 7. *Pholcus luoyang* sp. nov., holotype male (C–F) and paratype female (A, B, G, H) A. Epigyne, ventral view; B. Vulva, dorsal view; C. Bulbal apophyses, prolateral view; D. Chelicerae, frontal view; E–H. Habitus (E, G. Dorsal view; F. Lateral view; H. Ventral view). Scale bars: 0.20 mm (A–D); 1.00 mm (E–H).

apophysis and two strong and one slender dorsal spines; uncus (Fig. 7C) narrow, distally pointed, with proximal apophysis and scales; appendix (Fig. 7C) hooked, with angular subdistal branch; embolus (Fig. 7C) weakly sclerotised, with some indistinct transparent distal projections. Retrolateral trichobothrium on tibia I at 5% proximally; legs with short vertical setae on tibiae, metatarsi and tarsi; tarsus I with 38 distinct pseudosegments.

Female (paratype). Similar to male, habitus as in Fig. 7G, H. Total length 5.00 (5.13 with clypeus), carapace 1.48 long, 1.64 wide, opisthosoma 3.52 long, 2.23 wide; tibia I: 7.05; tibia I L/d: 47. Eye interdistances and diameters: PME–PME 0.20, PME 0.15, PME–ALE 0.04, AME–AME 0.05, AME 0.09. Sternum width/length: 1.03/0.78. Epigyne (Fig. 7A) nearly trapezoid, slightly sclerotised, with wedge-shaped knob. Vulva (Fig. 7B) with curved, medially sclerotised anterior arch, pair of long elliptic pore plates and pair of posterior sclerites.

Variation. Tibia I in two paratype males: 8.78, 9.95. Tibia I in another paratype female: 7.10.

Habitat. Underside of overhang on rocky cliffs in the mountain area.

Distribution. China (Henan, type locality; Fig. 1).

Pholcus lushan Yang & Yao, sp. nov.

<https://zoobank.org/E2C38327-FB2F-44E8-AADA-48C370724414>

Figs 8, 9

Type material. *Holotype* ♂ (SYNU-Ar00378) and *paratypes* 1♂ (IAECAS-Ar00379Y) 2♀ (SYNU-Ar00380, IAECAS-Ar00381Y), CHINA, Henan, Pingdingshan, Lushan County (33°46.72'N, 112°16.03'E, 743 m elev.), 17/07/2022.

Etymology. The specific name refers to the type locality and is a noun in apposition.

Diagnosis. The new species resembles *P. parayichengicus* Zhang & Zhu, 2009 (Yao and Li 2012: 29, figs 140A–D, 141A–C) by having similar male chelicerae and epigyne (Fig. 9A, D), but can be distinguished by distal membranous process of procurus wide (Fig. 8C vs. narrow), by ventro-subdistal apophysis of procurus spine-shaped (Fig. 8C vs. hooked), uncus latero-medially strongly protruding (Fig. 9C vs. latero-proximally slightly protruding) and by vulval anterior arch nearly half-round and posteriorly sclerotised (Fig. 9B vs. crescent-shaped and entirely sclerotised).

Description. *Male (holotype).* Total length 5.06 (5.19 with clypeus), carapace 1.54 long, 1.73 wide, opisthosoma 3.52 long, 1.43 wide. Leg I: 38.44 (9.81, 0.69, 9.60, 15.96, 2.38), leg II: 26.47 (7.44, 0.64, 6.47, 10.32, 1.60), leg III: 18.94 (5.58, 0.60, 4.55, 6.99, 1.22), leg IV: 26.04 (7.29, 0.62, 6.41, 10.26, 1.46); tibia I L/d: 60. Eye interdistances and diameters: PME–PME 0.23, PME 0.16, PME–ALE 0.06, AME–AME 0.05, AME 0.10. Sternum width/length: 1.10/0.88. Habitus as in Fig. 9E, F. Carapace yellowish, with brown ra-

diating marks and marginal brown bands; ocular area yellowish, with lateral brown bands; clypeus brown; sternum yellowish, with brown marks. Legs yellowish, but dark brown on patellae and whitish on distal parts of femora and tibiae, with darker rings on subdistal parts of femora and proximal and subdistal parts of tibiae. Opisthosoma yellowish, with dorsal and lateral spots. Chelicerae (Fig. 9D) with pair of proximo-lateral apophyses, pair of distal apophyses with two teeth each and pair of frontal apophyses. Palp as in Fig. 8A, B; trochanter with long (4 times longer than wide), retrolaterally strongly bulged ventral apophysis; femur with small retrolatero-proximal apophysis and distinct ventral protuberance; tibia with prolatero-ventral protuberance; procurus (Fig. 8C, D) simple proximally, but complex distally, with raised prolatero-subdistal membranous edge bearing distal membranous process, sclerotised prolatero-subdistal apophysis, sclerotised retrolatero-distal apophysis, spine-shaped ventro-subdistal apophysis and three strong and one slender dorsal spines; uncus (Fig. 9C) latero-medially protruding, with proximal apophysis and distal scaly edge; appendix (Fig. 9C) hooked, with angular median branch; embolus (Fig. 9C) weakly sclerotised, with some indistinct transparent distal projections. Retrolateral trichobothrium on tibia I at 6% proximally; legs with short vertical setae on tibiae, metatarsi and tarsi; tarsus I with 42 distinct pseudosegments.

Female (paratype). Similar to male, habitus as in Fig. 9G, H. Total length 4.60 (4.75 with clypeus), carapace 1.47 long, 1.62 wide, opisthosoma 3.13 long, 1.58 wide; tibia I: 7.45; tibia I L/d: 47. Eye interdistances and diameters: PME–PME 0.22, PME 0.15, PME–ALE 0.06, AME–AME 0.04, AME 0.08. Sternum width/length: 1.05/0.73. Ocular area with median and lateral brown bands. Epigyne (Fig. 9A) nearly trapezoid, laterally strongly sclerotised, with wedge-shaped knob. Vulva (Fig. 9B) with nearly half-round, posteriorly sclerotised anterior arch and pair of anteriorly blunt and posteriorly pointed pore plates.

Variation. Leg I missing in paratype male. Tibia I in another paratype female: 7.30.

Habitat. Underside of overhang on rocky cliffs in the mountain area.

Distribution. China (Henan, type locality; Fig. 1).

Pholcus shangluo Yang & Yao, sp. nov.

<https://zoobank.org/5BC2B733-B7D9-46A3-8A97-0F807A231E99>

Figs 10, 11

Type material. *Holotype* ♂ (SYNU-Ar00382) and *paratypes* 1♂ (IAECAS-Ar00383Y) 3♀ (SYNU-Ar00384–85, IAECAS-Ar00386Y), CHINA, Shaanxi, Shangluo, Zhashui County, Jiutianshan Scenic Spot (33°36.93'N, 109°8.45'E, 878 m elev.), 22/07/2022.

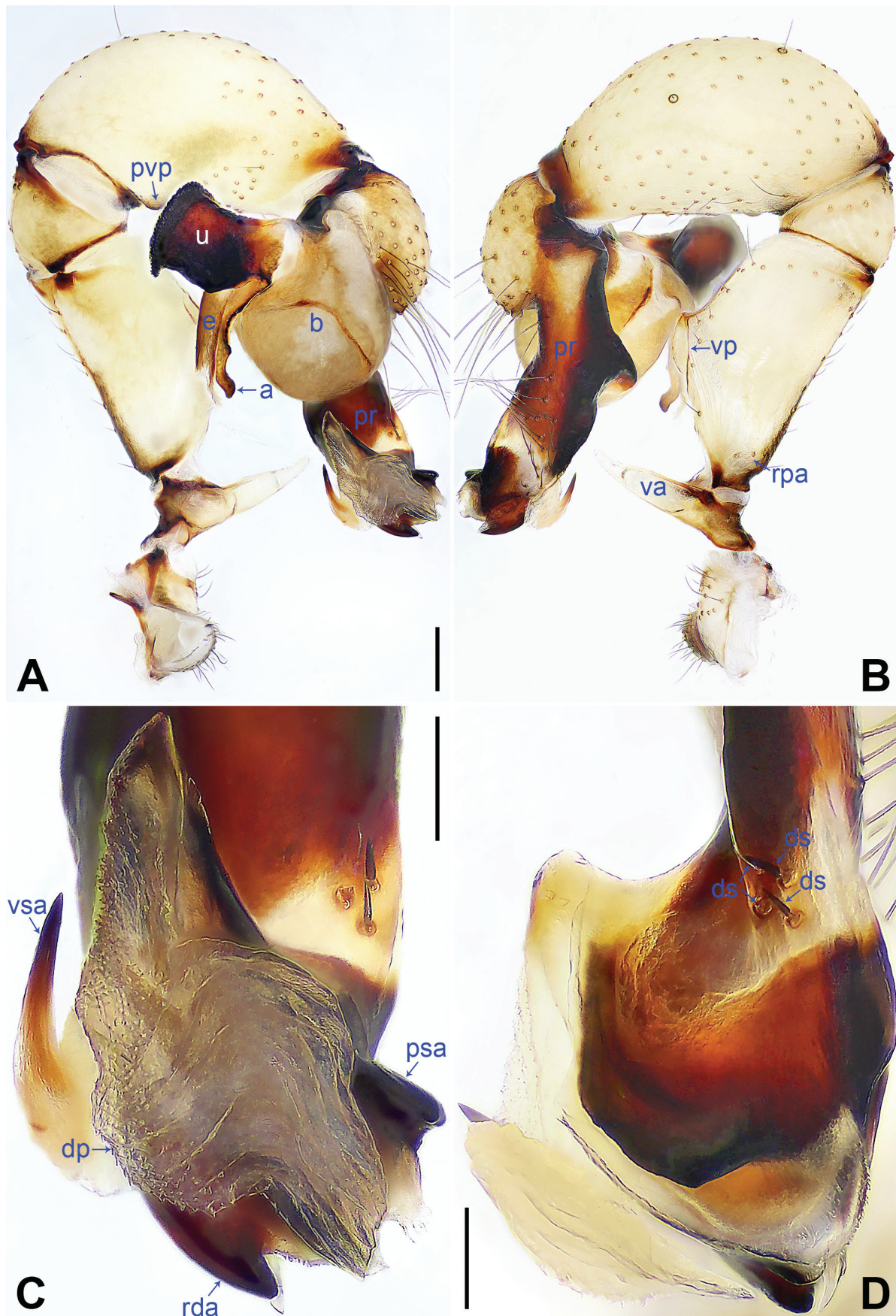


Figure 8. *Pholcus lushan* sp. nov., holotype male **A, B.** Palp (**A.** Prolateral view; **B.** Retrolateral view); **C, D.** Distal part of procurus (**C.** Prolateral view; **D.** Dorsal view). Scale bars: 0.20 mm (**A, B**); 0.10 mm (**C, D**).

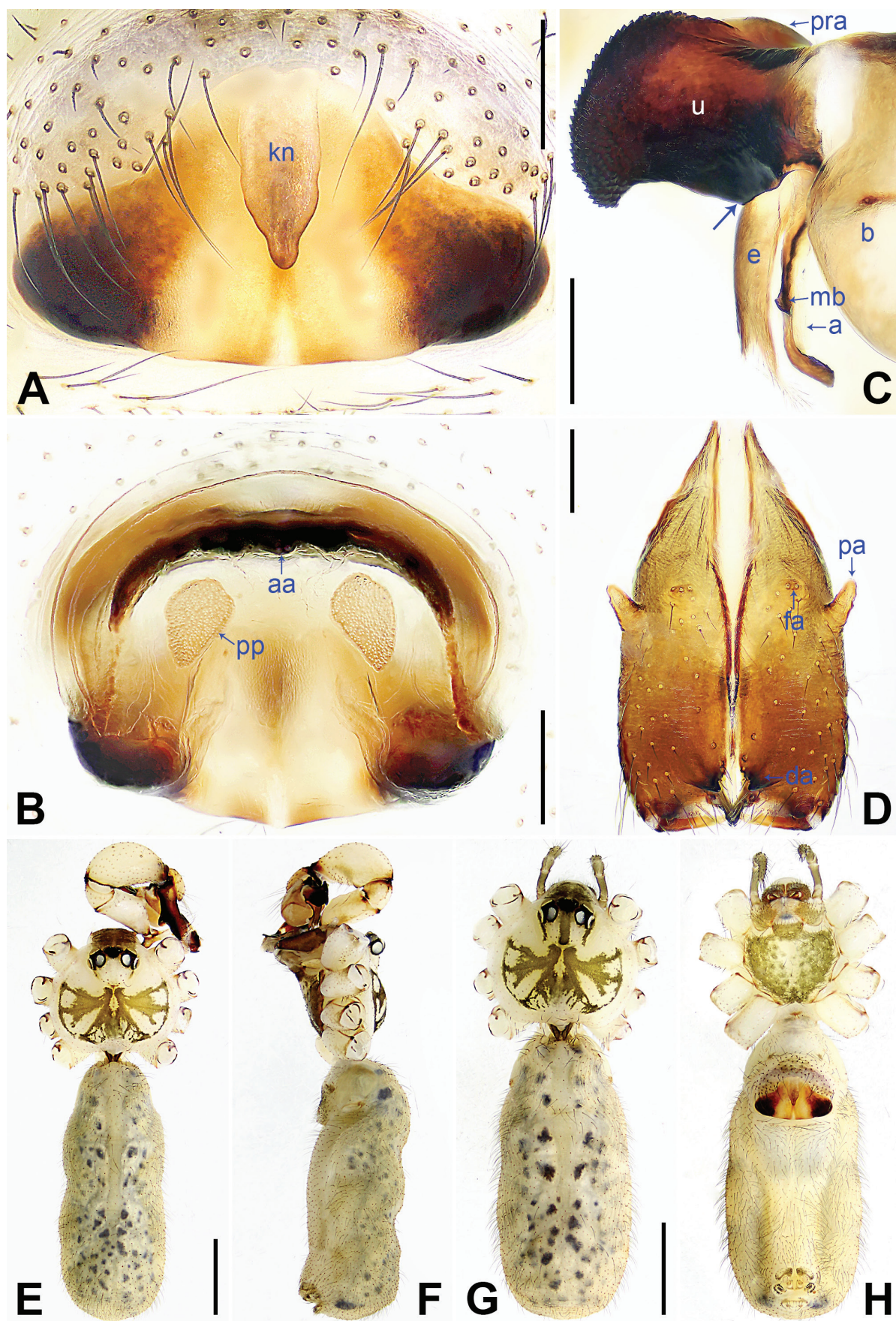


Figure 9. *Pholcus lushan* sp. nov., holotype male (C–F) and paratype female (A, B, G, H) A. Epigyne, ventral view; B. Vulva, dorsal view; C. Bulbal apophyses, prolateral view (arrow points at latero-median protrusion); D. Chelicerae, frontal view; E–H. Habitus (E, G. Dorsal view; F. Lateral view; H. Ventral view). Scale bars: 0.20 mm (A–D); 1.00 mm (E–H).

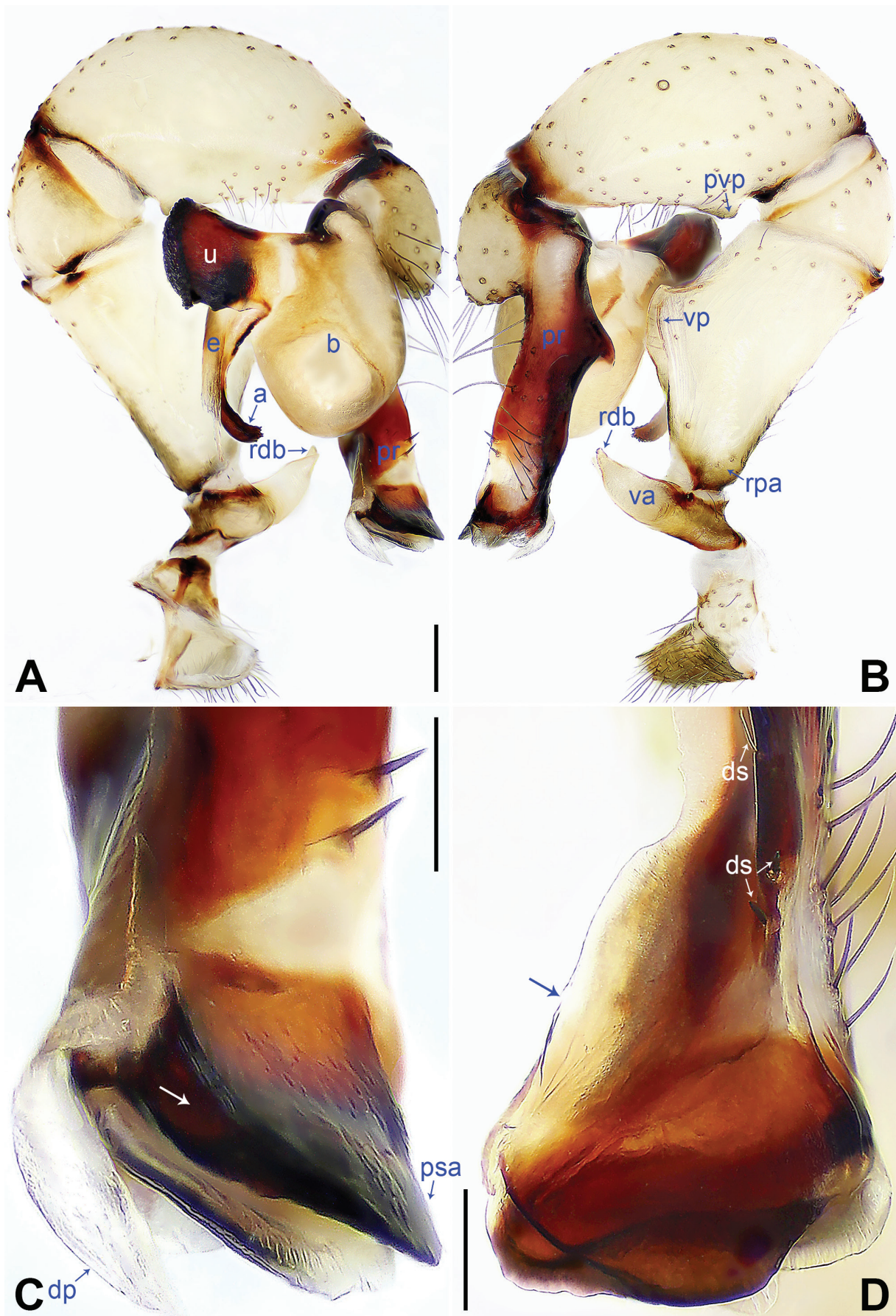


Figure 10. *Pholcus shangluo* sp. nov., holotype male **A, B.** Palp (**A.** Prolateral view; **B.** Retrolateral view); **C, D.** Distal part of procurus (**C.** Prolateral view, arrow points at thick part; **D.** Dorsal view, arrow points at straight part). Scale bars: 0.20 mm (**A, B**); 0.10 mm (**C, D**).

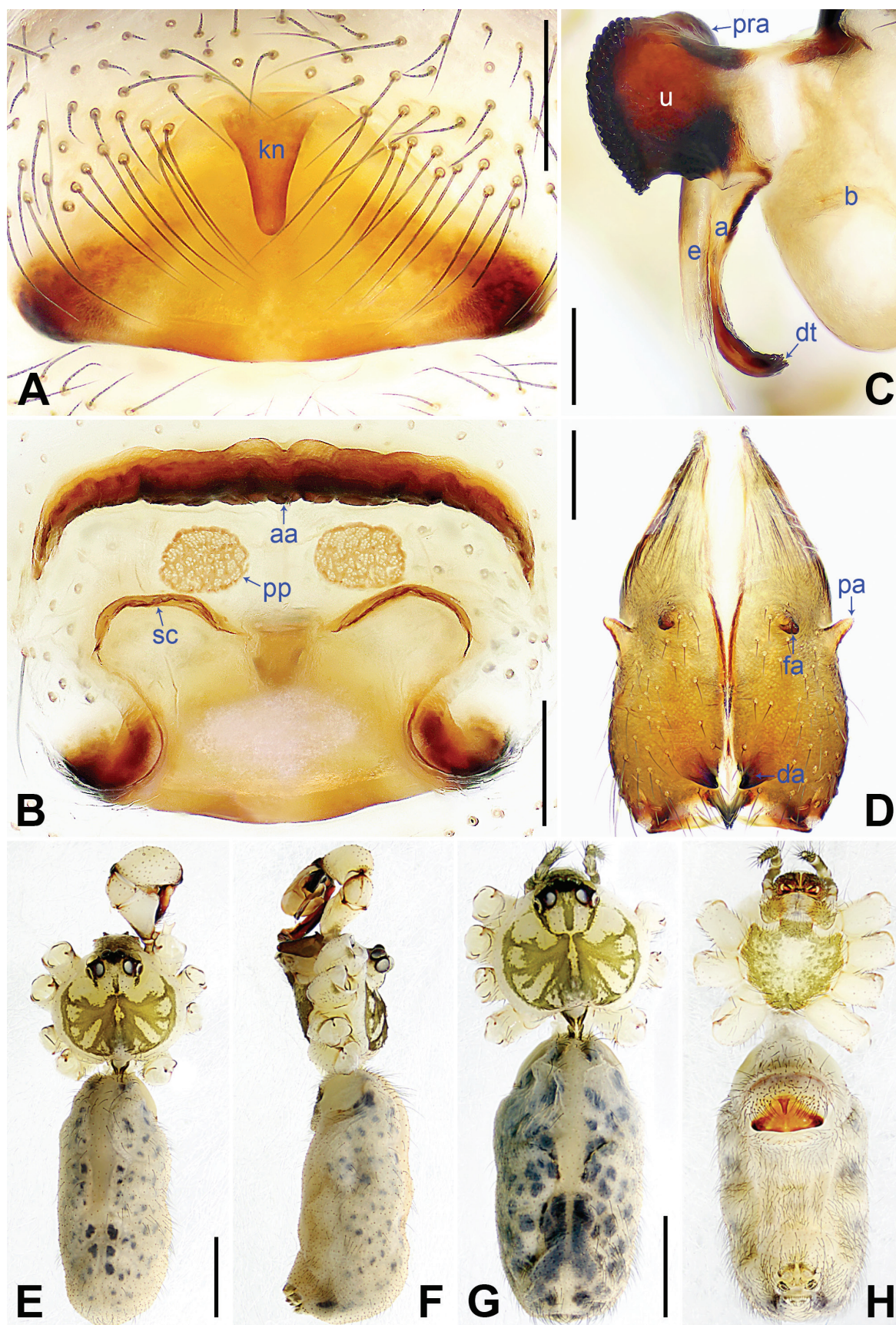


Figure 11. *Pholcus shangluo* sp. nov., holotype male (C–F) and paratype female (A, B, G, H). A. Epigyne, ventral view; B. Vulva, dorsal view; C. Bulbal apophyses, prolateral view; D. Chelicerae, frontal view; E–H. Habitus (E, G. Dorsal view; F. Lateral view; H. Ventral view). Scale bars: 0.20 mm (A–D); 1.00 mm (E–H).

Etymology. The specific name refers to the type locality and is a noun in apposition.

Diagnosis. The new species resembles *P. huberi* Zhang & Zhu, 2009 (Yao and Li 2012: 19, figs 83A–D, 84A–C) by having similar male chelicerae, uncus and epigyne (Fig. 11A, C, D), but can be distinguished by prolatero-subdistal apophysis of procursus proximally thick (Fig. 10C vs. thin), by prolatero-subdistal membranous edge of procursus laterally straight (Fig. 10D vs. latero-medially strongly curved), by male palpal trochanteral apophysis with retrolatero-distal branch (Fig. 10A, B vs. male palpal trochanteral apophysis retrolatero-medially strongly bulged, with retrolatero-median branch), by appendix with distal teeth (Fig. 11C vs. absent) and by vulval anterior arch laterally strongly curved (Fig. 11B vs. C-shaped).

Description. Male (holotype). Total length 4.68 (4.90 with clypeus), carapace 1.44 long, 1.66 wide, opisthosoma 3.24 long, 1.50 wide. Leg I: 36.43 (9.55, 0.73, 9.05, 14.74, 2.36), leg II: 24.19 (7.05, 0.68, 5.95, 9.17, 1.34), leg III: 17.65 (5.15, 0.62, 4.20, 6.60, 1.08), leg IV: 23.71 (6.90, 0.65, 5.83, 9.05, 1.28); tibia I L/d: 60. Eye interdistances and diameters: PME–PME 0.24, PME 0.17, PME–ALE 0.06, AME–AME 0.07, AME 0.12. Sternum width/length: 1.08/0.86. Habitus as in Fig. 11E, F. Carapace yellowish, with brown radiating marks and marginal brown bands; ocular area yellowish, with median and lateral brown bands; clypeus brown; sternum yellowish, with brown marks. Legs yellowish, but dark brown on patellae and whitish on distal parts of femora and tibiae, with darker rings on subdistal parts of femora and proximal and subdistal parts of tibiae. Opisthosoma yellowish, with dorsal and lateral spots. Chelicerae (Fig. 11D) with pair of proximo-lateral apophyses, pair of distal apophyses with two teeth each and pair of frontal apophyses. Palp as in Fig. 10A, B; trochanter with long (3 times longer than wide) ventral apophysis bearing retrolatero-distal branch; femur with small retrolatero-proximal apophysis and distinct ventral protuberance; tibia with prolatero-ventral protuberance; procursus (Fig. 10C, D) simple proximally, but complex distally, with raised prolatero-subdistal membranous edge bearing distal membranous process, sclerotised prolatero-subdistal apophysis and two strong and one slender dorsal spines; uncus (Fig. 11C) with proximal apophysis and distal scaly edge; appendix (Fig. 11C) curved, with distal teeth; embolus (Fig. 11C) weakly sclerotised, with some indistinct transparent distal projections. Retrolateral trichobothrium on tibia I at 5% proximally; legs with short vertical setae on tibiae, metatarsi and tarsi; tarsus I with 36 distinct pseudosegments.

Female (paratype). Similar to male, habitus as in Fig. 11G, H. Total length 4.35 (4.52 with clypeus), carapace 1.38 long, 1.53 wide, opisthosoma 2.97 long, 1.58 wide; tibia I: 7.45; tibia I L/d: 53. Eye interdistances and diameters: PME–PME 0.19, PME 0.15, PME–ALE 0.05,

AME–AME 0.05, AME 0.11. Sternum width/length: 1.02/0.80. Epigyne (Fig. 11A) nearly triangular, laterally strongly sclerotised, with cone-shaped knob. Vulva (Fig. 11B) with laterally strongly curved, sclerotised anterior arch, pair of nearly round pore plates and pair of C-shaped sclerites.

Variation. Tibia I in paratype male: 9.15. Tibia I in the other two paratype females: 7.15, 7.60.

Habitat. Underside of overhang on rocky cliffs in the mountain area.

Distribution. China (Shaanxi, type locality; Fig. 1).

***Pholcus weinan* Yang & Yao, sp. nov.**

<https://zoobank.org/A06698F6-1451-4E17-A61E-AB7559B2C6D1>

Figs 12, 13

Type material. Holotype ♂ (SYNU-Ar00387) and **paratypes** 1♂ (IAECAS-Ar00388Y) 3♀ (SYNU-Ar00389–90, IAECAS-Ar00391Y), CHINA, Shaanxi, Weinan, Tongguan County, Kuishudian Village (34°24.17'N, 110°17.05'E, 1214 m elev.), 20/07/2022.

Etymology. The specific name refers to the type locality and is a noun in apposition.

Diagnosis. The new species resembles *P. parayichengicus* Zhang & Zhu, 2009 (Yao and Li 2012: 29, figs 140A–D, 141A–C) by having similar male chelicerae, bulbal apophyses and epigyne (Fig. 13A, C, D), but can be distinguished by procursus without distal apophysis (Fig. 12C vs. with angular distal apophysis), by male palpal trochanteral apophysis without retrolateral branch (Fig. 12B vs. present), by epigynal knob column-shaped (Fig. 13A vs. wedge-shaped), by vulval anterior arch eyebrow-shaped (Fig. 13B vs. crescent-shaped) and by vulval pore plates elliptic (Fig. 13B vs. anteriorly wide and posteriorly narrow).

Description. Male (holotype). Total length 5.44 (5.58 with clypeus), carapace 1.76 long, 1.98 wide, opisthosoma 3.68 long, 1.80 wide. Leg I: – (10.32, 0.79, 10.19, 17.18, –), leg II: 28.79 (7.80, 0.77, 7.15, 11.54, 1.53), leg III: 20.78 (5.83, 0.68, 5.13, 8.01, 1.13), leg IV: 27.10 (7.75, 0.70, 6.95, 10.32, 1.38); tibia I L/d: 58. Eye interdistances and diameters: PME–PME 0.26, PME 0.13, PME–ALE 0.05, AME–AME 0.07, AME 0.11. Sternum width/length: 1.28/0.94. Habitus as in Fig. 13E, F. Carapace yellowish, with brown radiating marks and marginal brown bands; ocular area yellowish, with lateral brown bands; clypeus brown; sternum yellowish, with brown marks. Legs yellowish, but dark brown on patellae and whitish on distal parts of femora and tibiae, with darker rings on subdistal parts of femora and proximal and subdistal parts of tibiae. Opisthosoma yellowish, with dorsal and lateral spots. Chelicerae (Fig. 13D) with pair of proximo-lateral apophyses, pair of distal apophyses with two teeth each and pair of frontal apophyses. Palp as in Fig. 12A, B; trochanter with long (4 times longer than wide), retrolatero-proximally

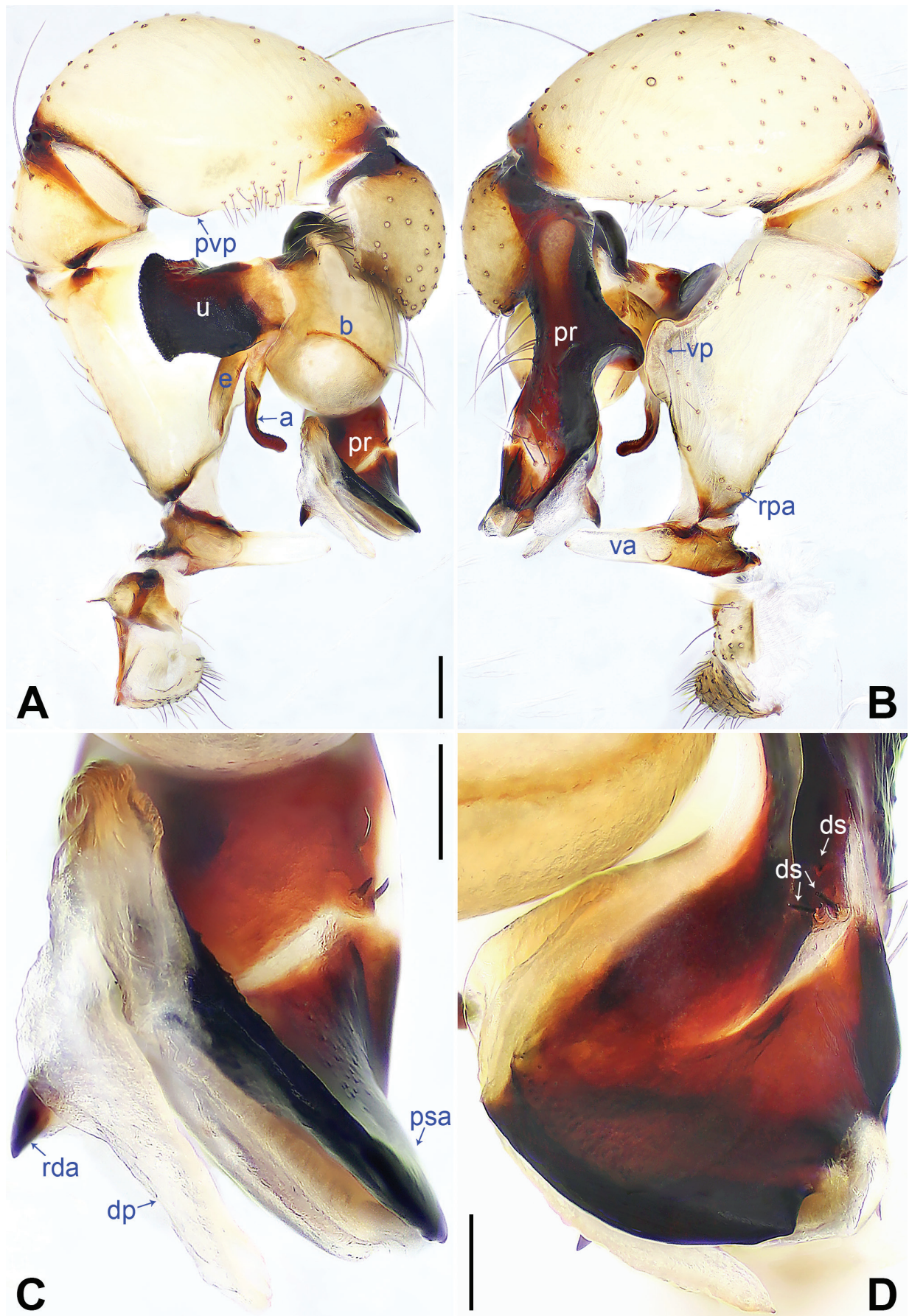


Figure 12. *Pholcus weinan* sp. nov., holotype male **A, B.** Palp (**A.** Prolateral view; **B.** Retrolateral view); **C, D.** Distal part of pro-cursus (**C.** Prolateral view; **D.** Dorsal view). Scale bars: 0.20 mm (**A, B**); 0.10 mm (**C, D**).

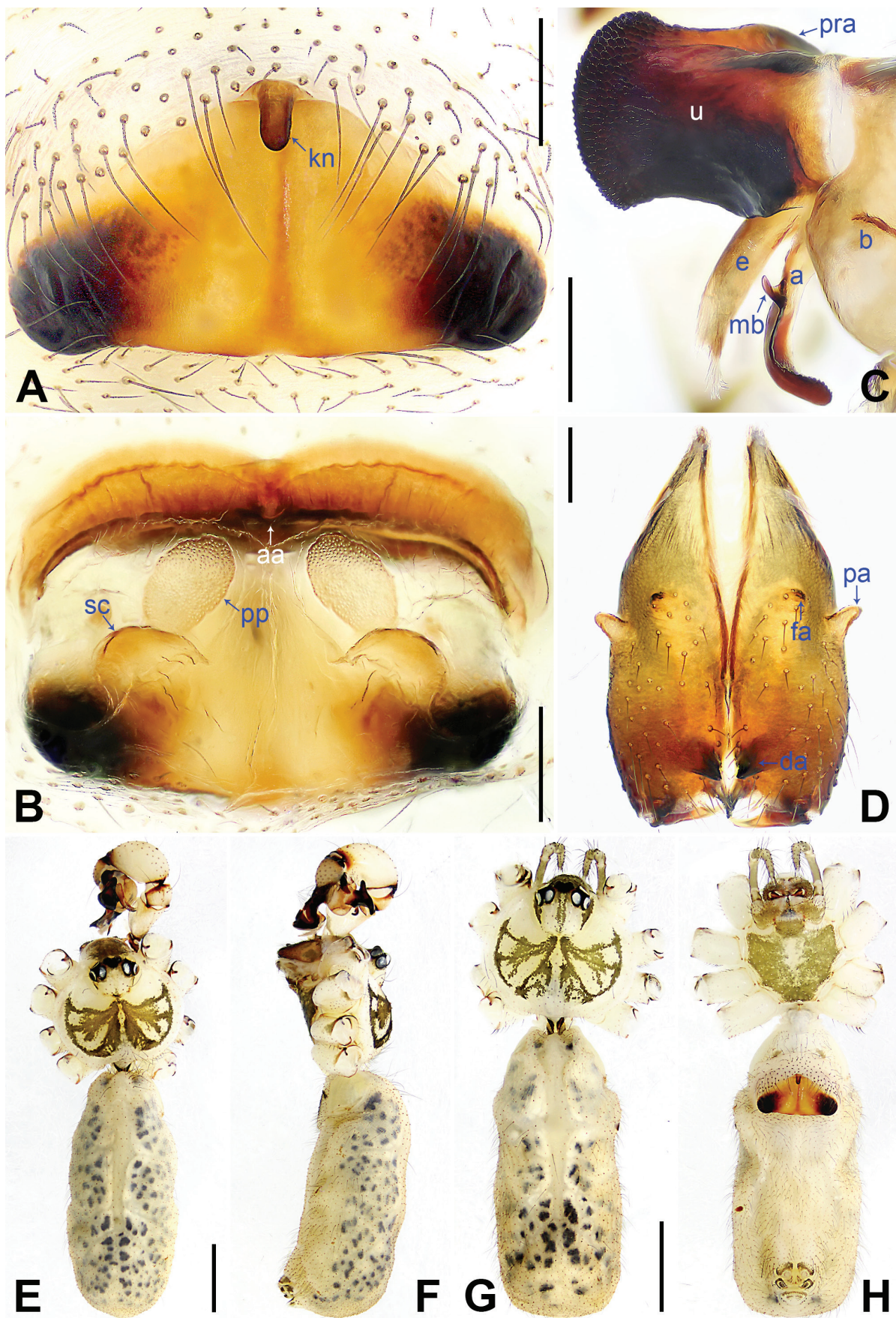


Figure 13. *Pholcus weinan* sp. nov., holotype male (C–F) and paratype female (A, B, G, H) A. Epigyne, ventral view; B. Vulva, dorsal view; C. Bulbal apophyses, prolateral view; D. Chelicerae, frontal view; E–H. Habitus (E, G. Dorsal view; F. Lateral view; H. Ventral view). Scale bars: 0.20 mm (A–D); 1.00 mm (E–H).

strongly bulged ventral apophysis; femur with small retrolatero-proximal apophysis and distinct ventral protuberance; tibia with prolatero-ventral protuberance; procurus (Fig. 12C, D) simple proximally, but complex distally, with raised prolatero-subdistal membranous edge bearing distal membranous process, sclerotised prolatero-subdistal apophysis, pointed sclerotised retrolatero-distal apophysis and two strong and one slender dorsal spines; uncus (Fig. 13C) latero-medially contracted, with proximal apophysis and distal scaly edge; appendix (Fig. 13C) hooked, with curved median branch and distal teeth; embolus (Fig. 13C) sclerotised, with some indistinct transparent distal projections. Retrolateral trichobothrium on tibia I at 5% proximally; legs with short vertical setae on tibiae and metatarsi.

Female (paratype). Similar to male, habitus as in Fig. 13G, H. Total length 4.76 (4.90 with clypeus), carapace 1.56 long, 1.78 wide, opisthosoma 3.20 long, 1.43 wide; tibia I: 7.45; tibia I L/d: 47. Eye interdistances and diameters: PME–PME 0.21, PME 0.14, PME–ALE 0.06, AME–AME 0.05, AME 0.09. Sternum width/length: 1.10/0.80. Ocular area with median and lateral brown bands. Epigyne (Fig. 13A) nearly triangular, laterally strongly sclerotised, with column-shaped knob. Vulva (Fig. 13B) with eyebrow-shaped, sclerotised anterior arch, pair of elliptic pore plates and pair of nearly half-round sclerites.

Variation. Tibia I in paratype male: 9.29. Tibia I in the other two paratype females: 6.45, 7.45.

Habitat. Underside of overhang on rocky cliffs in the mountain area.

Distribution. China (Shaanxi, type locality; Fig. 1).

Pholcus yuncheng Yang & Yao, sp. nov.

<https://zoobank.org/FEB41C4F-6B7C-4822-B322-C24C35AE9A7B>

Figs 14, 15

Type material. *Holotype* ♂ (SYNU-Ar00392) and *paratypes* 2♂ (SYNU-Ar00393, IAEAS-Ar00394Y) 3♀ (SYNU-Ar00395–96, IAEAS-Ar00397Y), CHINA, Shanxi, Yuncheng, Yongji, Shuiyukou Village, Shentan Grand Canyon Scenic Spot (34°49.50'N, 110°25.72'E, 529 m elev.), 20/07/2022.

Etymology. The specific name refers to the type locality and is a noun in apposition.

Diagnosis. The new species resembles *P. lushan* sp. nov. by having similar male chelicerae and bulbal apophyses (Fig. 15C, D), but can be distinguished by procurus without ventro-subdistal apophysis (Fig. 14C vs. with spine-shaped ventro-subdistal apophysis, Fig. 8C), by procurus with small pointed distal apophysis (Fig. 14C vs. large angular distal apophysis, Fig. 8C), by male palpal trochanteral apophysis with retrolatero-median apophysis (Fig. 14B vs. absent, Fig. 8B), by epigynal plate posteriorly straight (Fig. 15A vs. curved, Fig. 9A), by vulval anterior arch laterally strongly curved (Fig. 15B

vs. nearly half-round, Fig. 9B) and by vulval pore plates nearly round (Fig. 15B vs. anteriorly blunt and posteriorly pointed, Fig. 9B).

Description. Male (holotype). Total length 5.35 (5.51 with clypeus), carapace 1.59 long, 1.84 wide, opisthosoma 3.76 long, 1.60 wide. Leg I: 40.99 (10.64, 0.81, 10.38, 16.47, 2.69), leg II: 29.19 (8.21, 0.79, 7.18, 11.28, 1.73), leg III: 20.69 (6.15, 0.70, 5.06, 7.63, 1.15), leg IV: 28.40 (8.14, 0.77, 7.12, 10.83, 1.54); tibia I L/d: 59. Eye interdistances and diameters: PME–PME 0.25, PME 0.18, PME–ALE 0.07, AME–AME 0.06, AME 0.11. Sternum width/length: 1.24/1.02. Habitus as in Fig. 15E, F. Carapace yellowish, with brown radiating marks and marginal brown bands; ocular area yellowish, with indistinct median band; clypeus and sternum yellowish, with brown marks. Legs yellowish, but dark brown on patellae and whitish on distal parts of femora and tibiae, with darker rings on subdistal parts of femora and proximal and subdistal parts of tibiae. Opisthosoma yellowish, with dorsal and lateral spots. Chelicerae (Fig. 15D) with pair of proximo-lateral apophyses, pair of distal apophyses with two teeth each and pair of frontal apophyses. Palp as in Fig. 14A, B; trochanter with long (4 times longer than wide) ventral apophysis bearing retrolatero-median apophysis; femur with small retrolatero-proximal apophysis and distinct ventral protuberance; tibia with prolatero-ventral protuberance; procurus (Fig. 14C, D) simple proximally, but complex distally, with raised prolatero-subdistal membranous edge bearing distal membranous process, sclerotised prolatero-subdistal apophysis, pointed distal apophysis and two strong dorsal spines; uncus (Fig. 15C) latero-medially contracted, with proximal apophysis and distal scaly edge; appendix (Fig. 15C) hooked, with curved median branch and distal teeth; embolus (Fig. 15C) weakly sclerotised, with some indistinct transparent distal projections. Retrolateral trichobothrium on tibia I at 5% proximally; legs with short vertical setae on tibiae, metatarsi and tarsi; tarsus I with 35 distinct pseudosegments.

Female (paratype). Similar to male, habitus as in Fig. 15G, H. Total length 4.97 (5.13 with clypeus), carapace 1.53 long, 1.66 wide, opisthosoma 3.44 long, 1.66 wide; tibia I: 7.56; tibia I L/d: 54. Eye interdistances and diameters: PME–PME 0.22, PME 0.16, PME–ALE 0.06, AME–AME 0.06, AME 0.10. Sternum width/length: 1.06/0.84. Ocular area with median and lateral brown bands; clypeus brown. Epigyne (Fig. 15A) nearly triangular, laterally strongly sclerotised, with wedge-shaped knob. Vulva (Fig. 15B) with laterally strongly curved, posteriorly sclerotised anterior arch, pair of nearly round pore plates and pair of C-shaped sclerites.

Variation. Tibia I in two paratype males: 8.97, 10.96. Tibia I in the other two paratype females: 8.27, 8.33.

Habitat. Underside of overhang on rocky cliffs in the mountain area.

Distribution. China (Shanxi, type locality; Fig. 1).

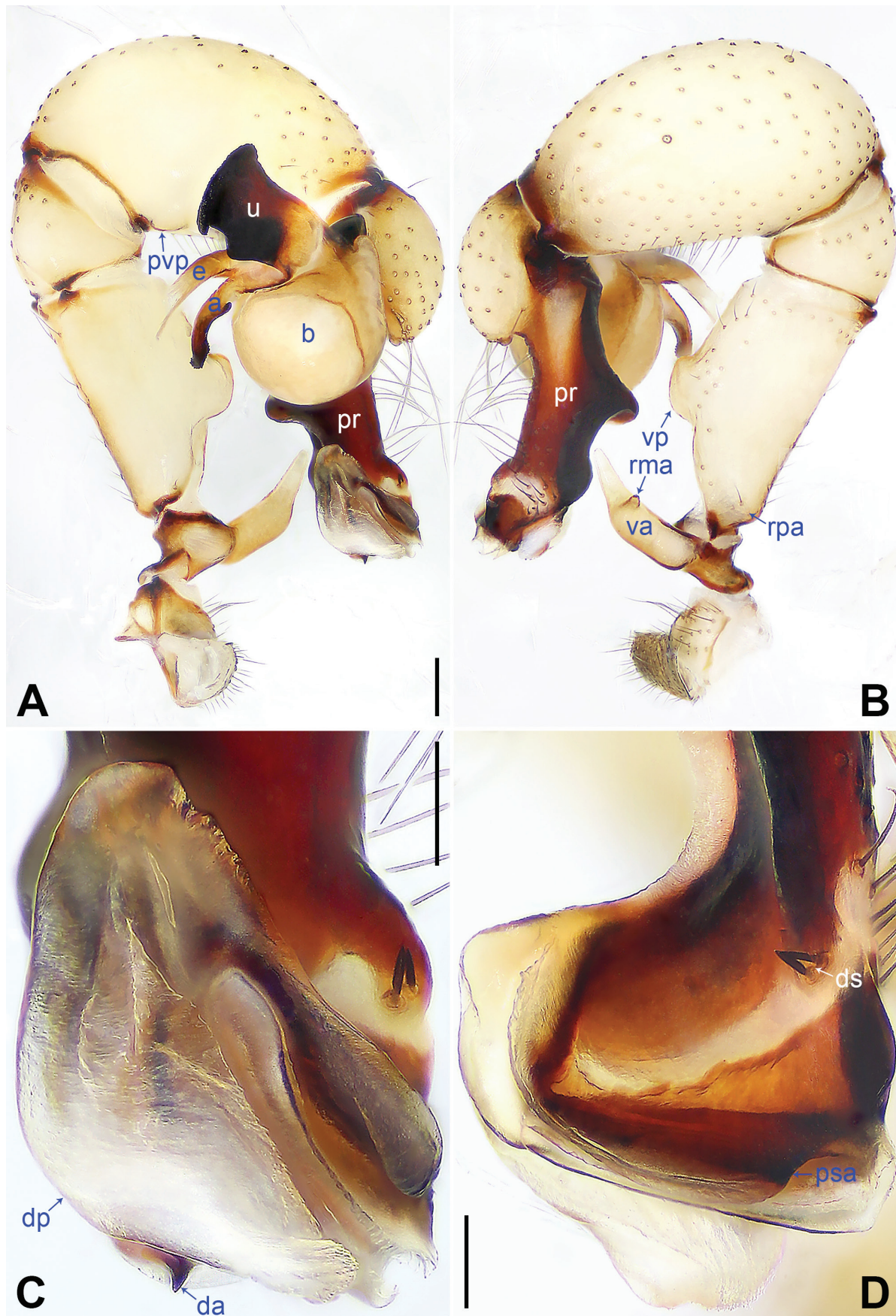


Figure 14. *Pholcus yuncheng* sp. nov., holotype male **A, B.** Palp (**A.** Prolateral view; **B.** Retrolateral view); **C, D.** Distal part of procursus (**C.** Prolateral view; **D.** Dorsal view). Scale bars: 0.20 mm (**A, B**); 0.10 mm (**C, D**).

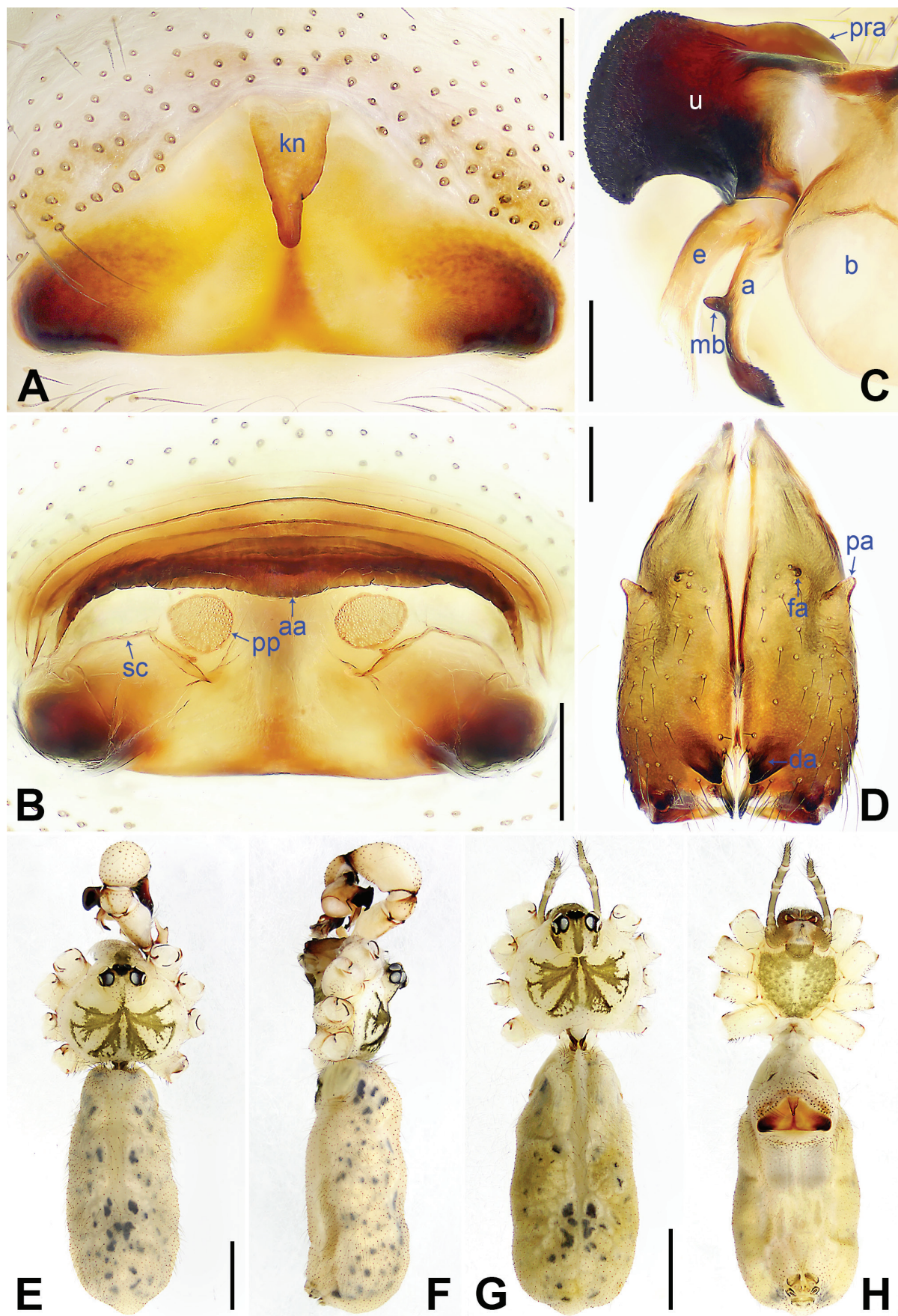


Figure 15. *Pholcus yuncheng* sp. nov., holotype male (C–F) and paratype female (A, B, G, H) A. Epigyne, ventral view; B. Vulva, dorsal view; C. Bulbal apophyses, prolateral view; D. Chelicerae, frontal view; E–H. Habitus (E, G. Dorsal view; F. Lateral view; H. Ventral view). Scale bars: 0.20 mm (A–D); 1.00 mm (E–H).

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