



<https://doi.org/10.70590/ice.2025.01.76>

<http://zoobank.org/urn:lsid:zoobank.org:pub:DF2C8675-885A-4673-8006-25CA65593355>

## ● A new species of the subgenus *Huaius* Tian & Huang, 2019 of the genus *Pterostichus* Bonelli, 1810 (Coleoptera, Carabidae, Pterostichinae) from China

Yu-Xin JIANG<sup>1</sup> & Fan-Hao ZENG<sup>2\*</sup>

<sup>1</sup>College of modern agriculture and ecological environment, Heilongjiang University, 74 Xuefu Road, Harbin 150080, China;

<https://orcid.org/0009-0000-6106-6503>; 2209143158@qq.com

<sup>2</sup>Sichuan University Jinjiang College, 1 Jinjiang Avenue, Meishan 620860, China;

<https://orcid.org/0009-0003-4735-9512>; 3945882350@qq.com

\*Corresponding author

**Abstract:** A new species of the subgenus *Huaius* Tian & Huang, 2019, *Pterostichus (Huaius) changgui* sp. nov., is described from Chongqing, China. This is the first record of the subgenus *Huaius* for Chongqing.

**Keywords:** Carabids, Chongqing, new taxon, Oriental Region, taxonomy

## ● 中国通缘步甲属华通缘步甲亚属一新种记述（鞘翅目：步甲科：通缘步甲亚科）

姜宇欣<sup>1</sup> & 曾凡豪<sup>2\*</sup>

<sup>1</sup>现代农业与生态环境学院，黑龙江大学，学府路74号，哈尔滨 150080，中国

<sup>2</sup>四川大学锦江学院，锦江大道1号，眉山 620860，中国

\*通讯作者

**摘要：**本文描述了采自重庆的华通缘步甲亚属一新种——侏鬼通缘步甲 *P. (Huaius) changgui* sp. nov.。该新种是该亚属于重庆的首次发现。

**关键词：**步甲，重庆，新分类单元，东洋区，分类学

**Citation:** Jiang Y-X & Zeng F-H 2025: A new species of the subgenus *Huaius* Tian & Huang, 2019 of the genus *Pterostichus* Bonelli, 1810 (Coleoptera, Carabidae, Pterostichinae) from China. *The Indochina Entomologist*, 1 (76): 763–772. [姜宇欣 & 曾凡豪 2025: 中国通缘步甲属华通缘步甲亚属一新种记述（鞘翅目：步甲科：通缘步甲亚科）。中南半島昆虫学家, 1 (76): 763–772.]

<https://doi.org/10.70590/ice.2025.01.76>

Accepted by Cheng-Bin WANG: 29.X.2025; published online: 31.X.2025

Copyright Yu-Xin JIANG & Fan-Hao ZENG. This is an open access article distributed under the terms of the Creative Commons Attribution License (CCBY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## ● Introduction

The subgenus *Huaius* Tian & Huang, 2019 of the genus *Pterostichus* Bonelli, 1810 contains four known species: *P. (H.) caoi* Tian & Ding, 2019 from Hubei, *P. (H.) tiankeng* Tian & Huang, 2019 and *P. (H.) yuae* Tian & Chen, 2019 from Shaanxi, *P. (H.) hanwang* Tian & He, 2020 from Sichuan, all cavernicolous species (Tian *et al.*, 2019; Tian & He 2020a).

In this paper, a new *Huaius* species: *P. (H.) changgui* **sp. nov.** is described and illustrated. This new species represents the first *Huaius* species for Chongqing City.

## ● Material and methods

Dissections and observations were performed under an Olympus 8ZX16 microscope. Dissected male genital pieces, including the median lobe and parameres of the aedeagus were put on small paper cards and then pinned beneath the specimens from which they were removed. The gonocoxites of ovipositors were pulled out and removed from the apex of the abdomen with gonosubcoxite, processing is the same as that for the male genitalia. Habitus images were taken using a Nikon Z5 camera with Laowa CF 90 mm f/2.8 2X Super Macro lens. Images of morphological details were taken using a Nikon Z7 camera with Laowa CF 25 mm f/2.8 2–2.5X Super Macro lens. Genitalia images were taken using a Canon 5Dsr camera with a customized 10x industrial lens. Images of the same object at different focal planes were combined using Zerene Stacker 1.04 stacking software. The map showing the locations of caves was made with QGIS 3.28. Adobe Photoshop CS6 was used for postprocessing.

The length of the body (**BL**) is measured from the right mandible (when opened) to the apex of the elytra and from apical margin of labrum to elytral apex. Abbreviations of measurements used in the text are as follows: **EL** = length of elytra, from base of scutellum to elytral apex; **EW** = maximum width of combined elytra; **HLL** = length of head excluding mandibles, from front of labrum to the occipital constriction; **HLm** = length of head including mandibles, from apex of right mandible to the occipital constriction; **HW** = maximum width of head, including eyes; **PAW** = pronotum anterior width measured along tips of anterior angles; **PBW** = pronotum basal width measured along tips of posterior angles; **PL** = length of pronotum, through mid-line; **PW** = maximum width of pronotum; **AL** = the length of apical lamella of aedeagus, measured from apical margin of apical orifice to the extreme apex of median lobe; **AW** = the width of apical lamella of aedeagus, measured along base of apical lamella.

The material examined for this study is deposited in the following collections:

SCAU South China Agricultural University, Guangzhou, Guangdong, China; **HLJU** Heilongjiang University, Harbin, Heilongjiang, China; **SCUJC** Sichuan University Jinjiang College, Meishan, Sichuan, China; **CFHZ** Personal collection of Fan-Hao Zeng, Dazhou, Sichuan, China; **CYXJ** Personal collection of Yu-Xin Jiang, Harbin, Heilongjiang, China; **CYYZ** Personal collection of Yu-Yang Zhou, Chengkou, Chongqing, China.

## ● Taxonomy

**Genus *Pterostichus* Bonelli, 1810** 通缘步甲属

**Subgenus *Huaius* Tian & Huang, 2019** 华通缘步甲亚属

***Pterostichus (Huaius) changgui* sp. nov.** 依鬼通缘步甲

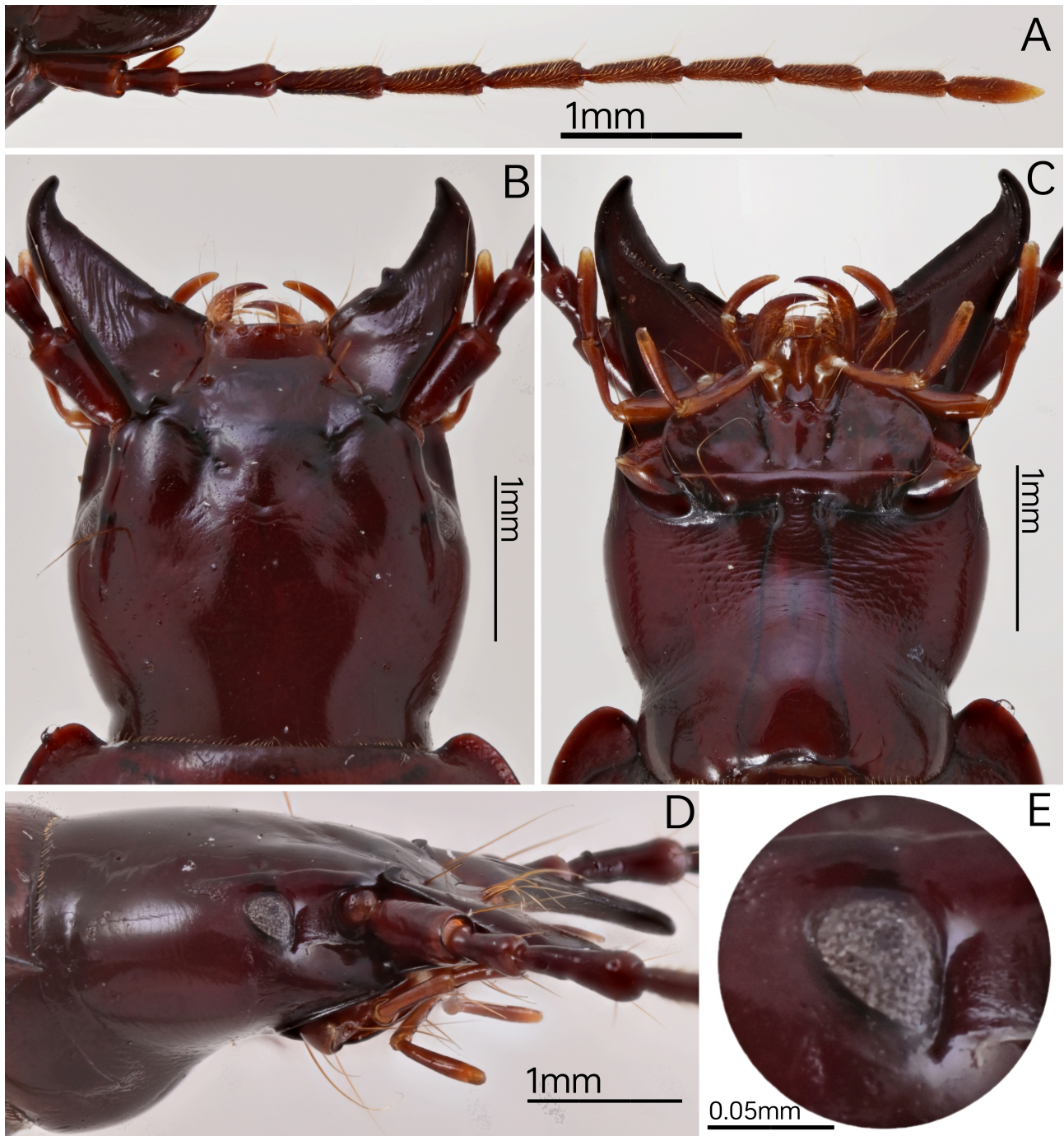
<https://zoobank.org/4FCEBF19-5EB5-4A47-8658-4CE5C2F813D5>

Figs 1–4; 6C

**Type material. Holotype:** ♂ (SCAU) CHINA, Chongqing City, Chengkou County [城口县], Miaoba Town [庙坝镇], Guannei Village [关内村], Laoying Cave [老鹰洞], N 31°55'39.51", E 108°30'22.22", alt. 700 m, 11-IV-2025, Yu-Yang Zhou & Fan-Hao Zeng leg. **Paratypes** (65♂43♀): 1♂1♀ (SCAU), same as holotype; 4♂5♀ (CYXJ), same as holotype;



**FIGURE 1.** Dorsal habitus of *Pterostichus (Huaius) changgui* sp. nov.



**FIGURE 2.** *Pterostichus (Huaius) changgui* sp. nov.: A right antenna B–D head E right eye (A, B dorsal view C ventral view D, E lateral view).

1♂ (HLJU), same as holotype; 23♂19♀ (SCUJC), same as holotype; 15♂14♀ (CFHZ), CHINA, Chongqing City, Chengkou County [城口县], Miaoba Town [庙坝镇], Muguakou [木瓜口], Huangni Cave [黄泥洞], N 31°57'40.55", E 108°32'57.80", alt. 650 m, 14-IV-2025, Fan-Hao Zeng leg. 2♂1♀ (CYYZ), CHINA, Chongqing City, Chengkou County [城口县], Miaoba Town [庙坝镇], Shixin Village [石新村], Konghe Cave [空河洞], N 31°56'14.31", E 108°30'52.95", alt. 680 m, 13-VII-2025, Fan-Hao Zeng & Yu-Xin Jiang leg. 5♂3♀ (CYYZ), CHINA, Chongqing City, Chengkou County [城口县], Miaoba Town [庙坝镇], Jiuchongshan National Forest Park [九重山国家森林公园], Jiuchonghanbing Cave [九重寒冰洞], N 31°52'38.96", E 108°31'28.69", alt. 1600 m, 18-VIII-2025, Fan-Hao Zeng, Ding Zhou & Yu-Xin Jiang leg. 3♂3♀ (CYXJ), CHINA, Chongqing City, Chengkou County [城口县], Zhiping Township [治平乡], Yanghe Village

[阳河村], Banjiu Cave [斑鸠洞], N 31°47'06.36", E 108°49'01.17", alt. 1200 m, 20-VIII-2025, Fan-Hao Zeng leg. 10♂1♀ (CFHZ), CHINA, Chongqing City, Chengkou County [城口县], Zhiping Township [治平乡], Xinghong Village [红星村], Guanyin Cave [观音洞], N 31°48'15.71", E 108°48'16.78", alt. 1100 m, 25-VIII-2025, Fan-Hao Zeng & Jing-Zhe Du leg. 2♀ (CYYZ), CHINA, Chongqing City, Chengkou County [城口县], Dongan Town [东安镇], Mishui Village [密水村], Hongyan Cave [红岩洞], N 31°45'59.38", E 109°02'34.85", alt. 1600 m, 29-VIII-2025, Fan-Hao Zeng & Yu-Xin Jiang leg.

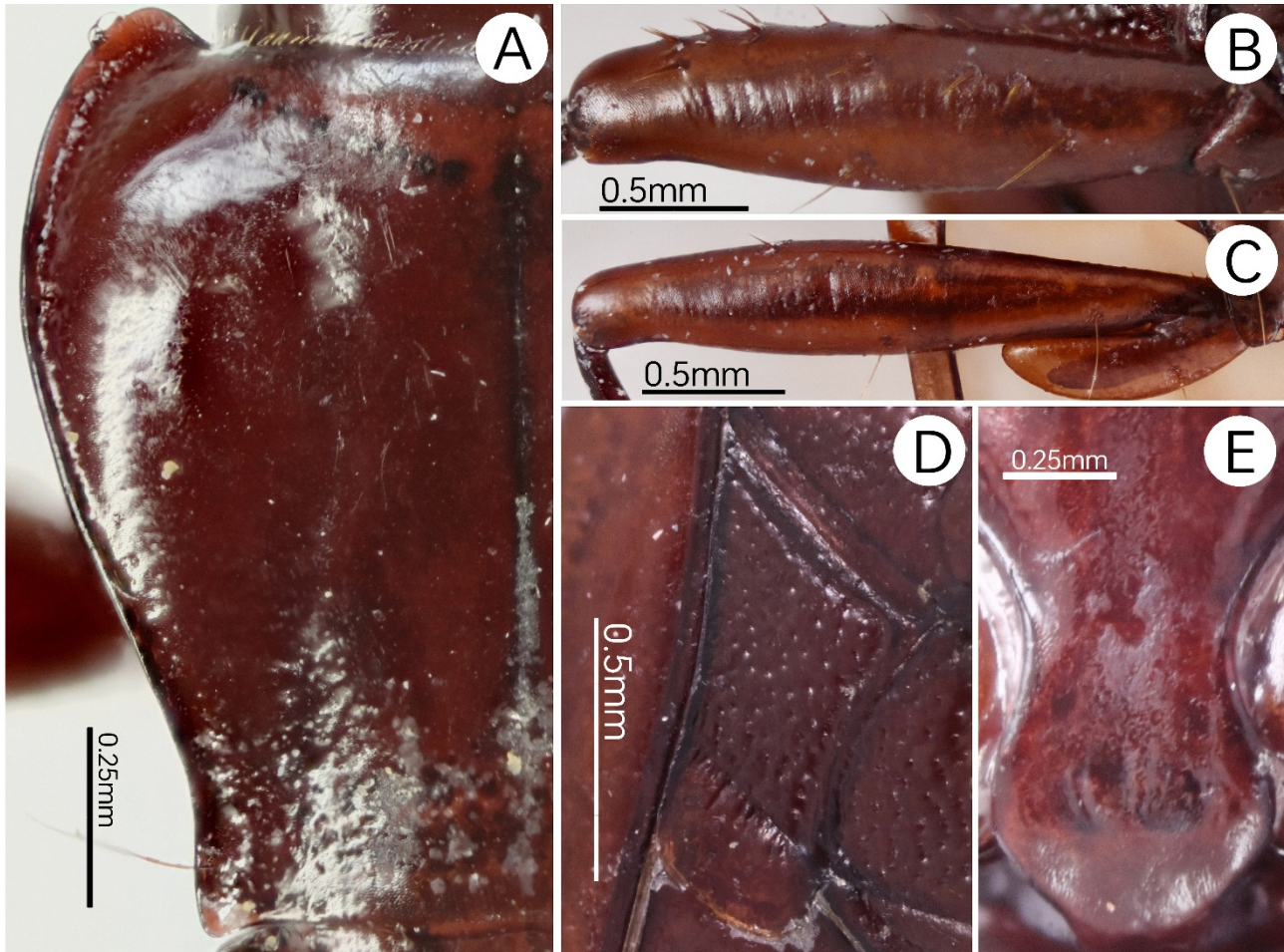
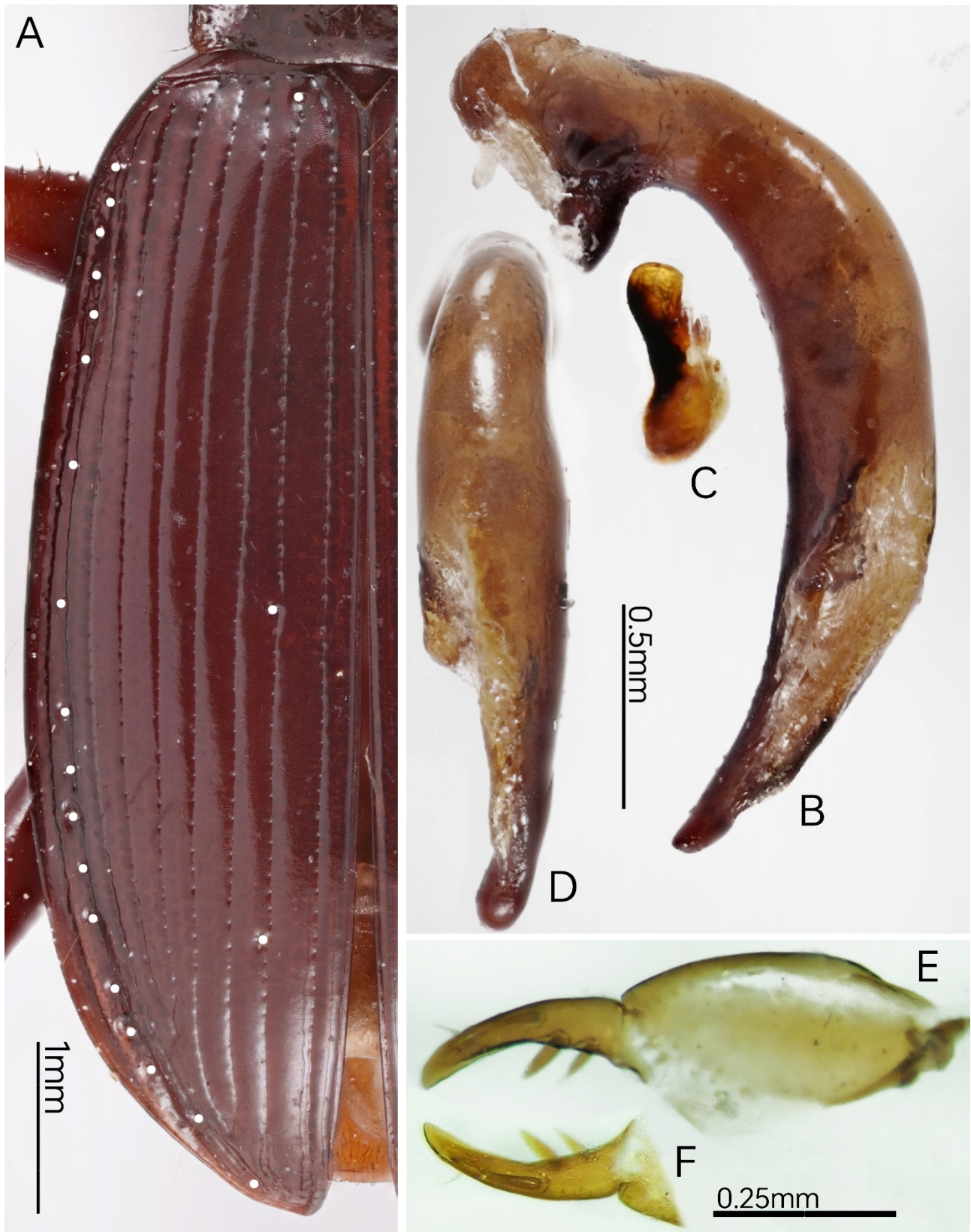


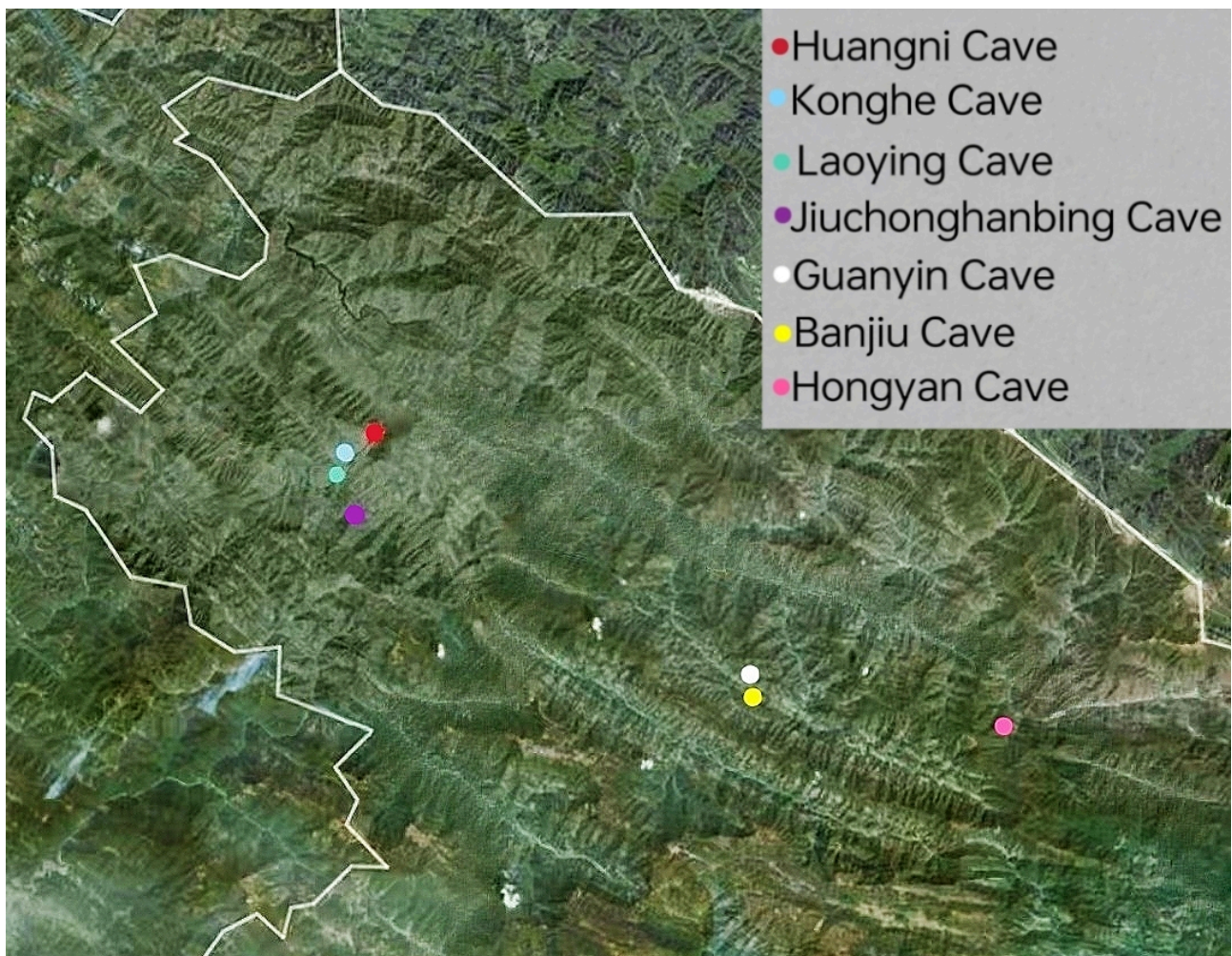
FIGURE 3. *Pterostichus (Huaius) changgui* sp. nov.: A pronotum B mid femora C hind femora D metepisternum and metepimeron E prosternal processes (A dorsal view B–E ventral view).

**Differential diagnosis.** The new species is most similar to *P. (H.) yuae* and *P. (H.) hanwang*. These three species are different from other *Huaius* species by the combination of following characters: (1) temporae well-expanded; (2) anterior margin of labrum nearly straight; (3) pronotum with anterior angles widely broad, posterior angles bluntly rectangular; (4) basal foveae moderately puncture; (5) each meso- and meta-femora with only two posterior setae. Comparing to *P. (H.) yuae*, *P. (H.) changgui* sp. nov. is different in the following important aspects: (1) pronotum with only single mid-lateral seta on each side (versus two setae in *P. (H.) yuae*); (2) clypeus bisetose (versus trisetose in *P. (H.) yuae*); (3) mentum blunt at apex (versus sharp in *P. (H.) yuae*); (4) gonocoxite 2 of female genitalia faintly bent outwards (versus strongly in *P. (H.) yuae*). *P. (H.) changgui* sp. nov. can be easily reminiscent of *P. (H.) hanwang*, but can be distinguished by the following characteristics: (1) body normal or a little thin (versus slightly stouter in *P. (H.) hanwang*); (2) pronotum with only single mid-lateral seta on each side (versus two setae in *P. (H.) hanwang*); (3) lateral margins of pronotum before posterior angles distinctly sinuate (versus almost straight in *P. (H.) hanwang*); (4) ventral margin of aedeagus almost straight near middle (versus strongly tumid in *P. (H.) hanwang*); (5) apex of apical lamella of aedeagus rounded and capitate in dorsal view (versus truncated in *P. (H.) hanwang*).

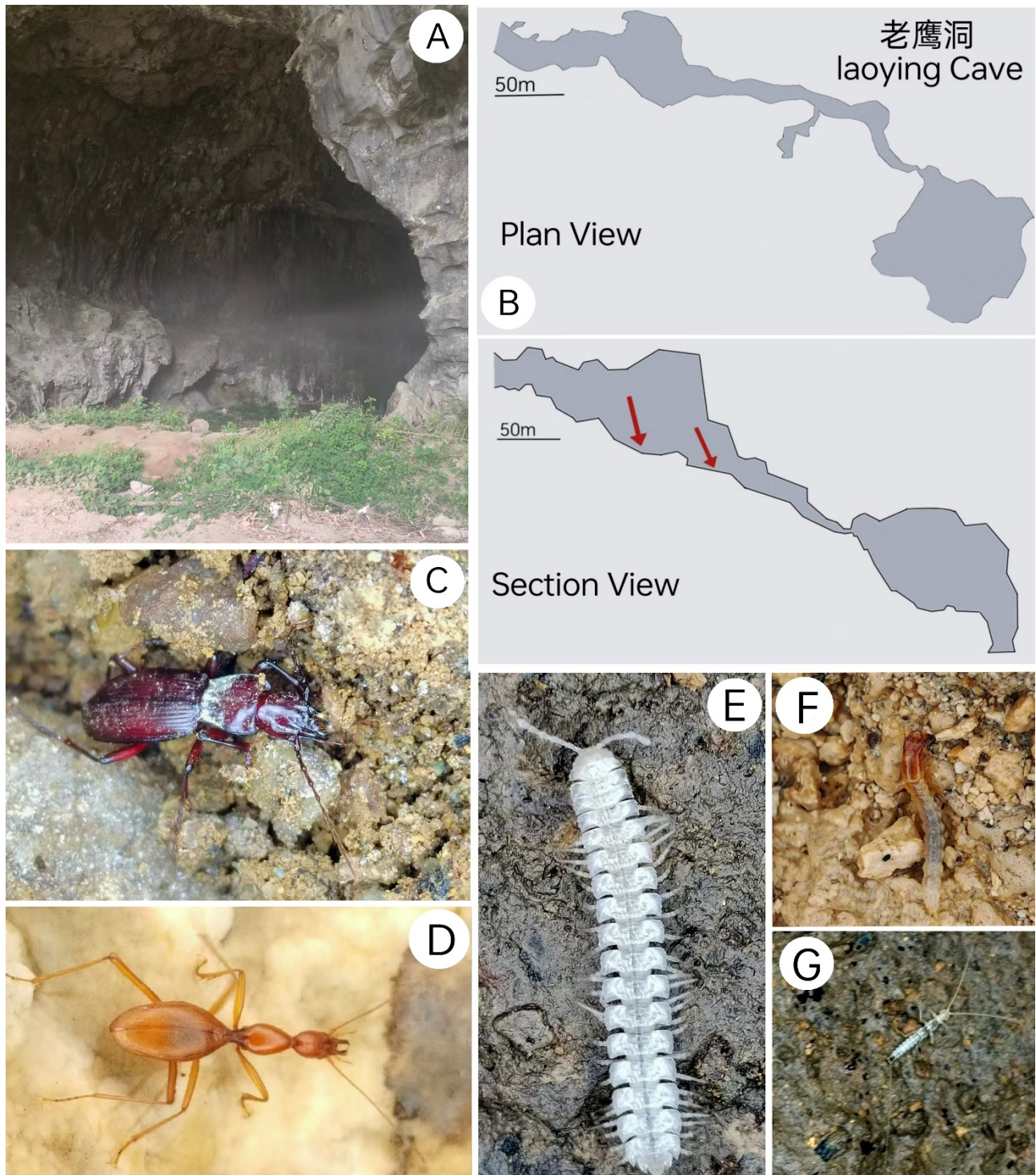


**FIGURE 4.** *Pterostichus (Huaius) changgui* sp. nov.: **A** left elytron **B, D** median lobe of aedeagus **C** right paramere **E, F** left and right (gonocoxite 2 only) gonocoxites of ovipositor (**A, D, F** dorsal view **B** left lateral view **C** lateral view **E** ventral view).

**Description.** (Habitus in Fig. 1) BL = 11.2–17.6 mm (including mandibles), 9.9–15.5 mm (excluding mandibles); dorsum dark reddish brown to dark brown, elytra dark reddish brown to dark brown with shiny surface, antennae, mouthparts and tarsomeres reddish brown. **Head** (Fig. 2) stout and thick (HLm/HW = 1.29–1.33) (HLl/HW = 0.92–0.95), temporae well-expanded, neck constriction short but distinct; frons and supraorbital areas smooth and slightly convex; frontal furrows short but deeply foveated; with two pairs of supraorbital setae; eyes (Fig. 2E) small and strongly atrophied; clypeus bisetose; labrum with anterior margin almost straight; mentum tooth short, bluntly bifid at apex; mentum bisetose, submentum bisetose each side; antennae (Fig. 2A) long, reaching at about 2/3 of elytral apex. **Pronotum** (Fig. 3A) subcordate, distinctly wider than long (PL/PW = 0.86–0.89); evidently wider than head (PW/HW = 1.31–1.34); widest at apical 1/4; posterior margin weakly concave, anterior margin almost straight, lateral margins evenly curved from anterior angles to half, then strongly sinuate and nearly straight before posterior angles; anterior margin wider than posterior margin (PAW/PBW = 1.13–1.16); anterior angles widely broad; posterior angles bluntly rectangular; basal foveae surface moderately punctate, with inner and outer grooves faintly defined and partly fused, outer groove slightly shorter than inner one which is approximately about 1/3 as long as the pronotum; middle area between two basal foveae sparsely punctate, with longitudinal rugose; disc glabrous and moderately convex, with faint transverse wrinkles; lateral grooves finely and sparsely punctate; median line sharply impressed; one mid-lateral setae at apical 1/4 and one basal-lateral seta at about a little before posterior angles present on each side. **Elytra** (Fig. 4A) oblong (EL/EW = 1.73–1.78), lateral margins subparallel before middle, slightly expanded behind middle, widest at about basal 2/3; shoulders widely rounded; basal border and lateral margin forming an obtuse angle, with small and narrow denticle, not protruded; basal setigerous pores present; parascutellar striae deep as other striae, with apex joint to stria 1; striae well incised, distinctly punctate,



**FIGURE 5.** Distribution map of *Pterostichus (Huaius) changgui* sp. nov. from Chengkou County, Chongqing.



**FIGURE 6.** Laoying Cave, the holotype locality of *Pterostichus (Huaius) changgui* **sp. nov.** and some sympatric cave animals: **A** entrance **B** maps of Laoying Cave, arrowhead indicating where the beetles were caught **C** a living adult of *P. (Huaius) changgui* **sp. nov.** **D** Trechinae sp. (Coleoptera: Carabidae) **E** *Epanerchodus wuxi* Chen, Zheng & Jiang, 2023 (Polydesmida, Polydesmidae) **F** a larva of *P. (Huaius) changgui* **sp. nov.** **G** *Plusiocampa* sp. (Diplura: Campodeidae).

angular base of stria 1 absent or vestigial; intervals slightly convex; interval 3 with two setiferous pores, all adjacent to stria 2, at about middle and basal 3/4, respectively; umbilical series interval 9 with composed of 16–18 pores, sparse in middle and dense in anterior and posterior areas; two apical pores present at end of stria 7; microsculptural meshes densely and transversely striate. **Ventral side.** Prosternal process (Fig. 3E) almost rounded, broad at apex;

metepisternum (Fig. 3D) lateral side twice length as basal width, moderately punctate, outer upper angle acute. **Legs.** Slender, meso- (Fig. 3B) and meta- (Fig. 3C) femora both with two posterior setae respectively on ventral side. **Male genitalia.** (Fig. 4B–D) Median lobe (Fig. 4B) of aedeagus quite large, well sclerotized, base moderately curved, moderately tapered to apex; in lateral view, ventral margin almost straight near middle, weakly curved to the ventral side at apical 1/3, apical orifice distinctly large, about 1/3 as long as median lobe, apical lamella (Fig. 4D) apically thickened; in dorsal view, apical lamella long ( $AL/AW = 1.45\text{--}1.53$ ), base slightly constricted, apex rounded and capitate, slightly bent to left. Right paramere (Fig. 4C) very short and laminar, apex rounded. **Female genitalia.** (Fig. 4E, F) Typical in this subgenus, gonocoxite 2 elongate and faintly bent outwards, presence of two and one ensiform setae on inner and outer margin respectively, and two short nematiform setae at subapex, apex blunt.

**Etymology.** The new species is named after the Chinese term “changgui” (侏鬼), which refers to the mythical spirits of individuals killed by tigers and subsequently compelled to serve them. This name reflects both the species’ observed behavior—preferring dark habitats and exhibiting notably aggressive tendencies—and its connection to the long-standing tradition of tiger deity worship in the type locality, a tradition that can be traced back to the 8th century BCE.

**Distribution.** China (Chongqing). Known from several caves (Fig. 5) (Laoying Cave, Konghe Cave, Jiuchonghanbing Cave, Huangni Cave, Guanyin Cave, Banjiu Cave and Hongyan Cave) in Chengkou County.

Laoying Cave (Fig. 6) (holotype locality), entrance (Fig. 6A) relatively large, featuring two large chambers connected by a narrow passage and form a small branch (Fig. 6B). Almost all specimens were collected from under the gravel in the shallower chamber (Fig. 6C). Other troglobites found also inside the same cave were *Trechinae* sp. (Coleoptera: Carabidae) (Fig. 6D), *Epanerchodus wuxi* Chen, Zheng & Jiang, 2023 (Polydesmida, Polydesmidae) (Fig. 6E), a larva of *P. (Huaius) changgui* sp. nov. (Fig. 6F), *Plusiocampa* sp. (Diplura: Campodeidae) (Fig. 6G).

## ● Acknowledgements

We sincerely thank Yu-Yang Zhou (Chengkou, Chongqing), Ding Zhou (Chengdu, Sichuan) and Jing-Zhe Du (Nanchang, Jiangxi) for serving as a guide during the cave exploration and providing some specimens for our study. We also thank an anonymous reviewer and the chief editor for helping to improve the quality of the manuscript.

## ● References

- Tian M-Y, Huang S-B, Chen M-Z & Ding K-J 2019: Remarkable cave-adapted ground beetles of the tribe Pterostichini from China: a new subgenus and three new species (Coleoptera: Carabidae). *Annales de la Société entomologique de France, New Series*, 55 (1): 1–16.  
<https://doi.org/10.1080/00379271.2018.1546554>
- Tian M-Y & He L 2020a: New species and new record of cavernicolous ground beetles from Sichuan Province, China (Coleoptera: Carabidae: Pterostichini and Platynini). *Zootaxa*, 4881 (3): 545–558.  
<https://doi.org/10.11646/zootaxa.4881.3.7>

## ● Additional information

**Author contributions:** Conceptualization: Y-X Jiang & F-H Zeng. Project administration: F-H Zeng. Resources: F-H Zeng. Supervision: F-H Zeng. Visualization: Y-X Jiang. Writing—original draft: Y-X Jiang. Writing—review and editing: Y-X Jiang & F-H Zeng.

**Conflict of interest:** The authors have declared that no competing interests exist.

**Data availability:** All of the data that support the findings of this study are available in the main text.

**Ethical statement:** No ethical statement was reported.

**Funding:** This study was self-funded by the authors.

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of *ICE* and/or the editor(s). *ICE* and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.