



A new species of genus *Homotechnes* Candèze, 1882 from Guangxi, China (Coleoptera: Elateridae: Hypnoidinae)

LU QIU^{1*} & YONG-YING RUAN²¹Engineering Research Center for Forest and Grassland Disaster Prevention and Reduction, Mianyang Normal University, Mianxing West Road, 621000, Mianyang, Sichuan, China.²Plant Protection Research Center, Shenzhen Polytechnic University, 518055, Shenzhen, China.✉ yongyingruan@hotmail.com; <https://orcid.org/0000-0002-5025-5592>*Corresponding author: ✉ 123church@163.com; <https://orcid.org/0000-0002-0946-1634>

Abstract

Homotechnes choui sp. nov., a new species from Guangxi, China, is described and illustrated. An updated key and list of Chinese *Homotechnes* species, with corrected or supplementary distribution data, are provided.

Key words: Hypnoidini, Hypnoidinae, click-beetle, taxonomy, China

Introduction

In China, over 1,517 species of Elateridae have been recorded, belonging to more than 174 genera (Jiang & Yang 2023). The authors participated in several large-scale insect surveys in the Nanling Mountains (南岭山脉) from 2020 to 2022, resulting in the identification of over 100 scientifically named species from more than 40 genera (unpublished data). Notably, we discovered several species new to science, including the new *Homotechnes* species described herein.

The genus *Homotechnes* Candèze, 1882 (Elateridae: Hypnoidinae) comprises 14 species distributed in China (7 spp.), Japan (5 spp.), India (1 sp.) and Vietnam (1 sp.) (Stibick 1979a; Cate *et al.* 2007; Platia 2017; Platia *et al.* 2023). Before Platia (2017), knowledge of *Homotechnes* species in China was limited, with only the type species *Homotechnes corymbitoides* Candèze, 1882 documented. However, Platia's (2017) review introduced four novel species, thereby enhancing our understanding of this genus in China. Recently, Platia *et al.* (2023) reported two more species from China and the first species from Vietnam. This genus has been accommodated in the subfamily Hypnoidinae since Ôhira (1973). Although Stibick (1979a, 1979b) suggested a possible affiliation of *Homotechnes* to the tribe Ctenicerini, subsequent authors placed the genus within the tribe Hypnoidini either under the subfamily Hypnoidinae or Denticollinae/Dendrometrinae (e.g. Kishii & Jiang 1994; Jiang & Wang 1999; Cate *et al.* 2007; Platia 2017; Jiang & Yang 2023). In the recent molecular phylogeny, Douglas *et al.* (2021) treated Hypnoidinae as a distinct subfamily from Dendrometrinae. However, *Homotechnes* has not yet been sampled in any phylogenetic analysis published so far. Thus, its true phylogenetic position within Elateridae still requires further investigation.

This study aims to report a new species of *Homotechnes* from China and to provide an updated key and checklist of Chinese *Homotechnes* with supplemental notes on the locality names.

Material and methods

The studied specimens were cleaned with warm water, then the genital segments were dissected after treatment in 10% KOH (70–80°C for 10 minutes). Habitus were photographed using a Canon® EOS RP + Mount Adapter EF-EOS R plus a 100 mm F2.8 CA-Dreamer Macro 2 × lens (for Canon EF); diagnostic characters were photographed using the same camera in conjunction with a Laowa 25 mm F2.8 2.5–5 × Ultra Macro Lens (for Canon EF), or a

Mitutoyo M Plan Apo 10 × /0.28 lens. All figures were modified in Adobe Photoshop® CC 2019. Body length was measured from the anterior margin of head to the apex of elytra, pronotal length was measured at mid-line, pronotal width was measured at hind angles, and width of body was measured at the widest part of elytra. The studied materials are stored in the Invertebrate Collection of Mianyang Normal University, Mianyang, Sichuan, China (MYNU) and Plant Protection Research Center, Shenzhen Polytechnic University, Guangdong, China (SZPT). The collecting data of the studied specimens are presented in English, with their Chinese names in square brackets. In the checklist, type localities and other locality names are quoted verbatim in quotation marks from the original sources; the corrected locality names and their Chinese names, as well as other additional information, are given in square brackets.

Taxonomy

Genus *Homotechnes* Candèze, 1882

Chinese vernacular name: 平额叩甲属

Homotechnes choui sp. nov.

Chinese vernacular name: 周氏平额叩甲
(Figs 1–3)

Type material. HOLOTYPE: CHINA: male (MYNU), near Yinshan Park [银杉公园], Jinxiu County [金秀县], Laibin City [来宾市], Guangxi, 1000 m, 17.IV.2011, Wen-I Chou [周文一] leg. **PARATYPES: CHINA:** 4 males and 4 females (1 male and 1 female in SZPT, the rest in MYNU), same data as holotype; 1 male (MYNU), Huananzhidian [华南之巅], Maoershan Mountain [猫儿山], Guilin City [桂林市], Guangxi, 2000–2100m, 23.V.2023, Xiao-Han Ye leg.; 1 male (MYNU), Maoershan Mountain, Guilin City, Guangxi, 1900m, 20.V.2024, Yi-Fan Wang leg.; 2 females (MYNU), Anjiangping [安江坪], Huaping Nature Reserve [花坪自然保护区], Guilin City, Guangxi, 1110–1570m, 26–30.V.2023, Yong Zhou leg. 1 female (MYNU), way from Tianpingshan to Cuijiang [天平山到粗江沿途], Huaping Nature Reserve, Guilin City, Guangxi, 750–900m, V.2023, Cong-Cong Du leg.

Diagnosis. Antennae extend beyond hind angle of pronotum by about one and a half apical antennomeres. Pronotum with large central black spot, sides subparallel. Legs almost black in dorsal view.

Comparison. *H. choui* sp. nov. can be distinguished from *Homotechnes mertliki* Platia, 2017 and *Homotechnes opacicollis* Platia, 2017 by pronotum with narrow mid-longitudinal depression (while the latter two with mid-longitudinal impunctate carina) (Platia 2017). It differs from other Chinese species by its obviously black legs and subparallel sides of pronotum in male. It can be further distinguished from *Homotechnes kucerai* Platia, Mertlik & Dušánek, 2023 and *Homotechnes emeiensis* Platia, 2017 by antennae extend beyond hind angle of pronotum by about one and a half apical antennomeres (while the latter two with antennae not reaching the apices of hind angles of pronotum, falling short by about one antennomere).

Description. Male holotype (Fig. 1A): length 14.4 mm; width 3.4 mm; antenna length 5.5 mm; pronotum length 3.5 mm, width 3.5 mm; elytron length 9.8 mm. Elongate, flattened. Body smooth, bicolor, head, antennae, center and hind angles of pronotum, elytra, scutellar shield, legs, prosternum and mesoventrite black, claws and hind tibiae lighter; lateral portions of pronotum, chin piece, hypomeron, metasternum, abdomen, trochanter reddish brown. Central black spot shape illustrated in Figure 1A.

Head. Weakly depressed in middle, anterior margin complete, elevated. Punctures large, umbilicate; intervals between punctures subequal to their diameter. Antenna beyond hind angle of pronotum about one and a half apical antennomeres; serrate from antennomere IV. Scape robust, slightly curved, antennomere III about 1.4 times longer than antennomere II; antennomere IV to X triangular; apical antennomere subrhomboid.

Thorax. Pronotum almost as wide as long, sides subparallel, widest at hind angles. Area before hind angle slightly angularly arched. Hind angle elongated, slightly divergent and curved inward apically, apical portion slightly protruded at inner margin and tapered at apex; carina of hind angle present, short, not reaching hind third of pronotum. Disc of pronotum weakly convex, center with a longitudinal shallow furrow. Punctures small, intervals between punctures at disc about 4–6 times their diameter, punctures denser and larger laterally, intervals between punctures about 3–4 times their diameter. Pubescence of pronotum curved. Hypomeron very coarse, with dense punctures; intervals between punctures less than one puncture diameter. Prosternal lobe normally convex, carinate

along margin, coarsely punctured, with large umbilicate punctures. Prosternal process straight, apical portion tapered. Metacoxal plate widened inwards, and narrowed from basal third to the outer end. Scutellum depressed, surface with small and shallow punctures. Elytra elongate, lateral margin weakly arched, widest near middle, 2.9 times as long as pronotum; apical half narrowed, with margins slightly arched. Elytral striae distinctly lined; interstriae flat, with sparse punctures. Hindwings fully developed.

Abdomen. Tergite VIII sub-triangular, apical portion weakly enlarged, apex obtuse triangular (Fig. 2B); sternite VIII membrane, with two dark portions laterally, basally with a narrowed part; tergite IX with hind margin concave, distal portion with two protruded lobes, apices tapered, with long setae, middle shallowly concave (Fig. 2A); tergite X large, tongue-shaped, apex blunt (Fig. 2A); sternite IX elongate, hind margin narrowed and protruded in middle, basal portion transparent medially, distal portion narrowed, apex setose, rounded (Fig. 2C).

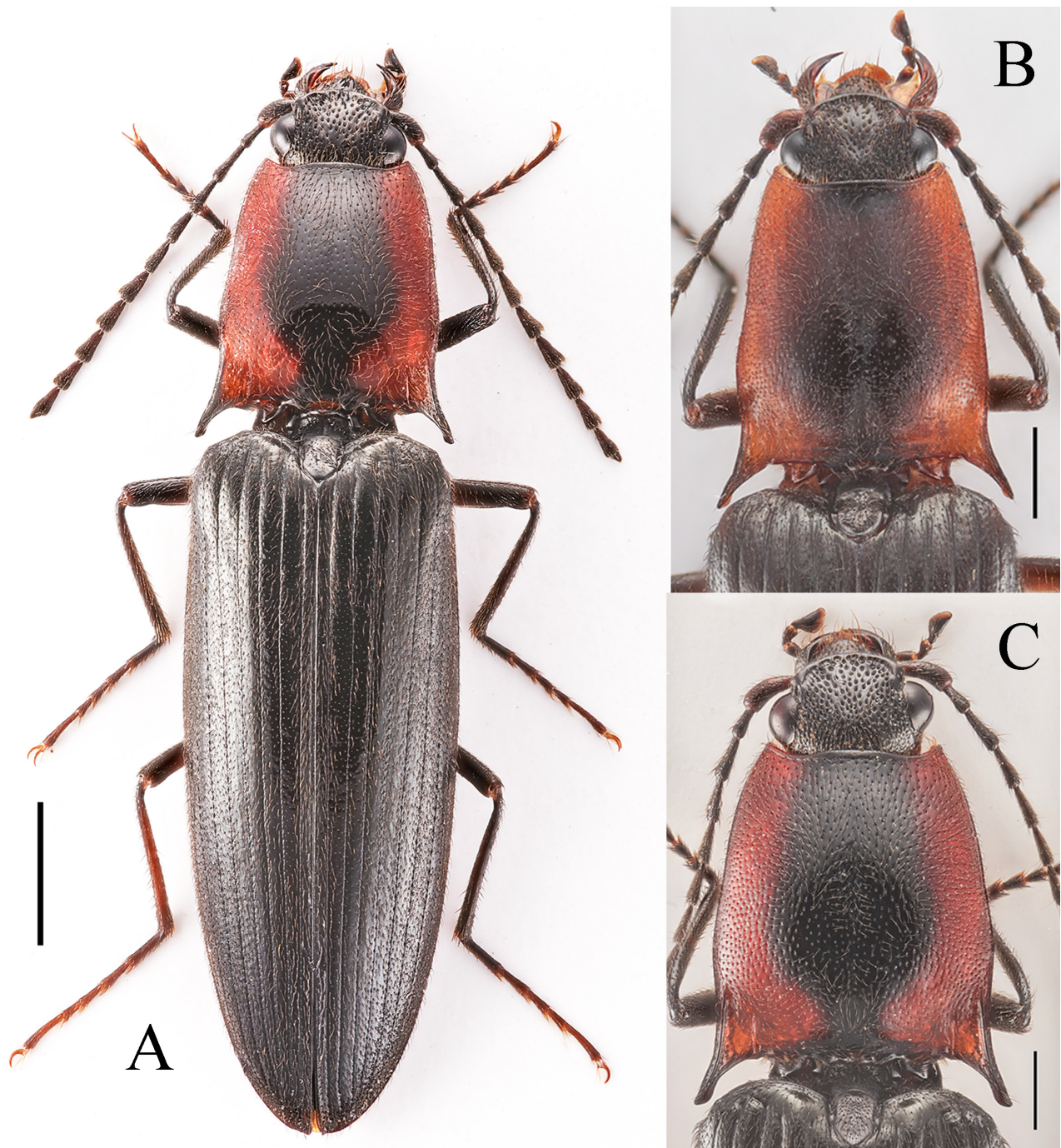


FIGURE 1. *Homotechnes choui* sp. nov. from Guangxi, China: **A.** dorsal habitus of holotype, male (Jinxiu). **B.** Head and pronotum of paratype, male (Guilin). **C.** Head and pronotum of paratype, female (Jinxiu). Scale bars 2 mm for A; 1 mm for B–C.

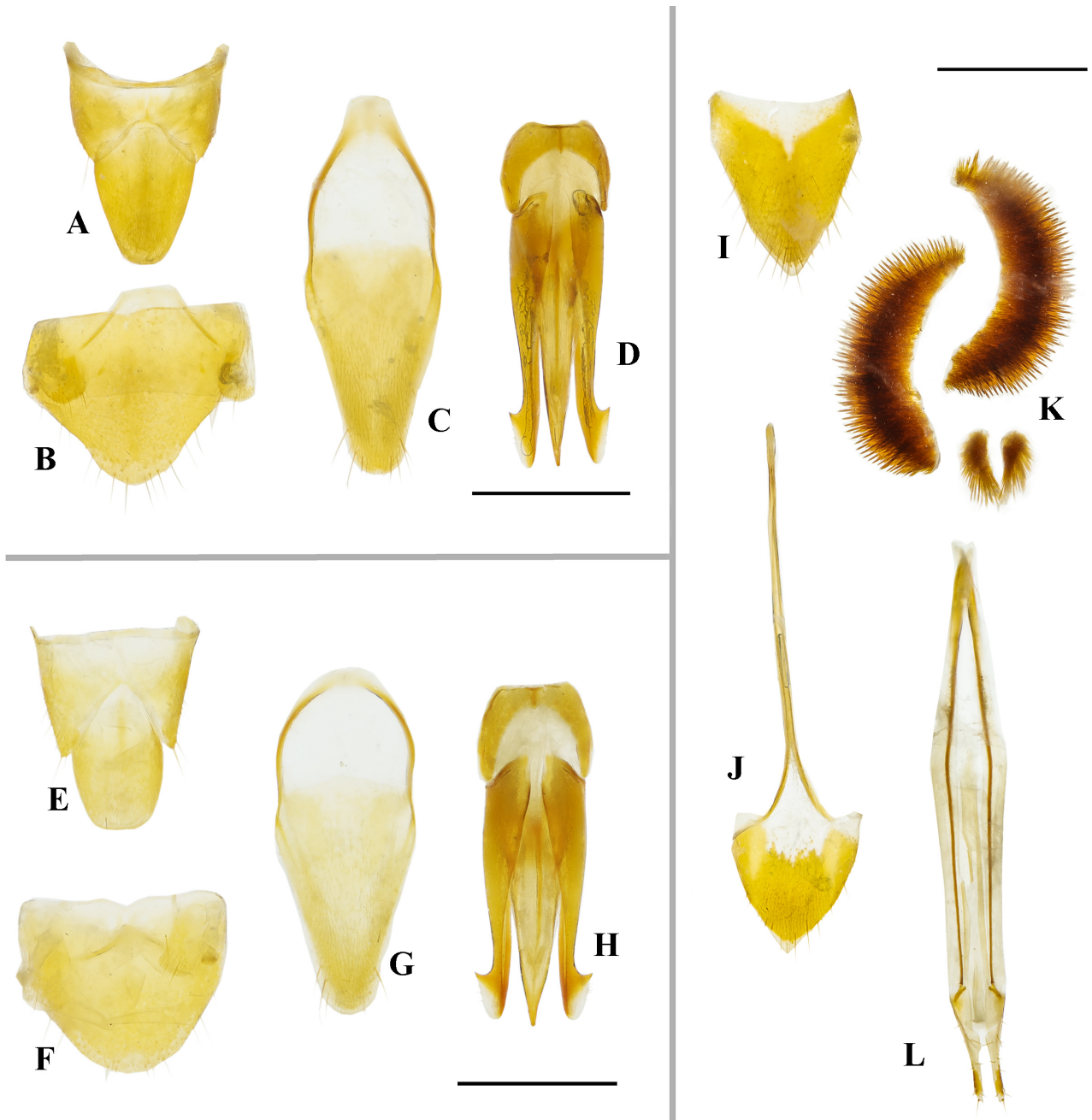


FIGURE 2. Genitalia and pregenital segments of *Homotechnes choui* sp. nov.: **A–D.** male holotype (Jinxiu). **E–H.** male paratype (Maoershan, Guilin). **I–L.** female paratype (Jinxiu). **A, E.** Tergites IX–X, dorsal view; **B, F.** Sternite VIII and tergite VIII, dorsal view. **C, G.** Sternite IX, ventral view. **D, H.** aedeagus, ventral view. **I.** Tergite VIII, dorsal view. **J.** Sternite VIII, ventral view. **K.** Sclerotized plates of bursa copulatrix. **L.** Ovipositor, ventral view. Scale bars 1 mm.

Genitalia (Fig. 2D): median lobe as long as paramere, tapered towards apex, apex rounded. Paramere slender, distal portion with sharp subapical hook, apical portion rounded, slightly elongated and weakly narrowed, outer portion less sclerotized, with small setae laterally.

Male paratypes: body length 13.8–14.7 mm, several specimens from Jinxiu with more narrowed pronotum. In all other respects similar to holotype. The individual from Guilin have the lateral portions of pronotum yellow-reddish brown. One specimen from Maoershan having the boundary between the two color of pronotum indistinct (Fig. 1B). The shapes of metacoxal plate, Tergite VIII, tergite X, sternite IX and apices of paramere may show some variation in different specimens (e.g. Fig. 2E–H).

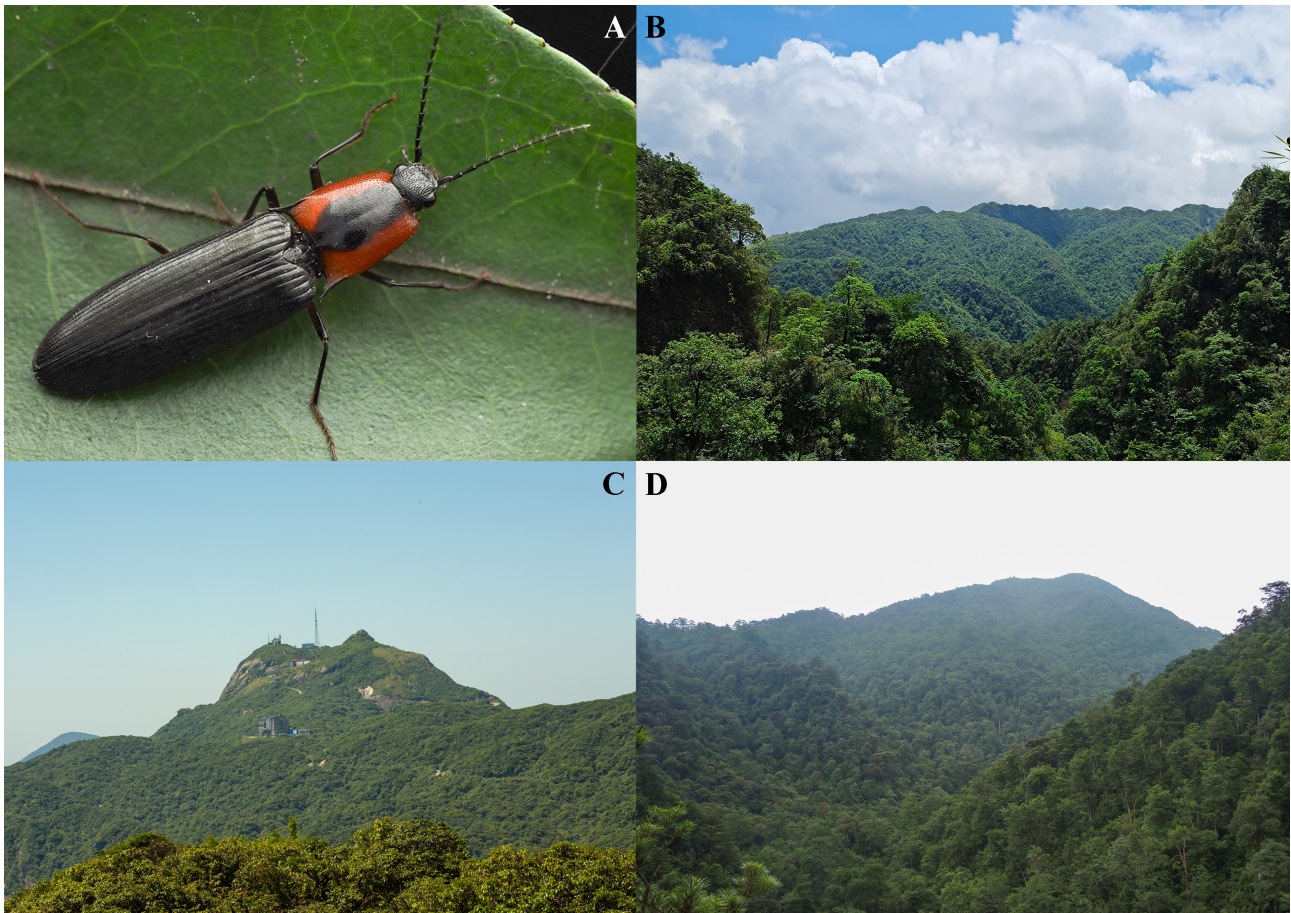


FIGURE 3. Living individual and habitat photographs for *Homotechnes choui* sp. nov.: **A.** the living female paratype from Anjiangping, Huaping N. R. **B.** Anjiangping, Huaping N. R., Guangxi. **C.** the peak of Maoershan Mountain, Guilin City, Guangxi. **D.** Yinshan Park, Jinxiu County, Guangxi. A–D photographed by Lu Qiu.

Female: similar to male. Body length 15.1–15.3 mm. Body width usually larger than in males. Pronotum (Fig. 1C) with more arched lateral margins, denser punctures, and hind angle with apical portion more enlarged. Abdominal tergite VIII subtriangular, basal portion in middle less sclerotized (Fig. 2I); sternite VIII longer than wide, sub-triangular, apical portion pointed, spiculum ventrale slender, about 2.7 times the length of sternite VIII (Fig. 2J). Ovipositor long; coxite with apical portion darkened and elongated, with small pubescence, stylus very small, attached almost near apex (Fig. 2L). Bursa copulatrix with a pair of large sclerotized plates and a pair of smaller sclerotized plates. All plates bearing dense and long spines (Fig. 2K).

Bionomics. Adults of this species occur in broad-leaved forests from April to May (Fig. 3A–D).

Etymology. Named after Dr. Wen-I Chou (Taiwan, China), the collector of the holotype.

Distribution. China (Guangxi Zhuang Autonomous Region).

Discussion

Species of *Homotechnes* from China can be divided into two groups. One comprises *H. opacicollis* Platia, 2017 and *H. mertliki* Platia, 2017 which are characterized by the pronotum with a narrow mid-longitudinal impunctate carina; the other group contains remaining species, including the newly described one; they are characterized by the pronotum with a shallow, mid-longitudinal depression (Platia 2017; Platia *et al.* 2023). Most species from the second group are rather uniform in morphology. They are similar in coloration and have low variability in the shape of aedeagus. These species are usually black dorsally, with conspicuous bicolor pronotum (reddish brown or yellowish brown with large black spot at the middle). The most useful characters to distinguish these species are the

outline, punctures, and coloration of pronotum, the coloration of legs and ventral side, and the sclerites of the bursa copulatrix in female (Platia 2017; Platia *et al.* 2023). However, the interspecies variations in the aforementioned characteristics are mostly subtle. For morphologically homogenous groups such as *Homotechnes*, future studies must distinguish species based on molecular data and additional morphological evidence.

Annotated checklist of Chinese *Homotechnes*

***Homotechnes candezei* Platia, 2017 坎氏平额叩甲**

Type locality: “Sichuan, Mt. Emei, 180 km S of Chengdu, m 3100 [峨眉山].”

Distribution. Sichuan.

***Homotechnes corymbitoides* Candèze, 1882 宝兴平额叩甲**

Type locality: “Chine centrale; Moupin [Muping, Baoxing County, Ya’an City, Sichuan/ 四川雅安市宝兴县穆坪镇].”

Remarks. Ôhira (1973) first reviewed this species and provided a brief redescription in Japanese and a black-white illustration of the dorsal view for the single type specimen. Jiang & Wang (1999) recorded this species from Jiangxi Province. However, the specimen (examined by the authors) is without a center pronotal spot and belongs to an undescribed species. Cate *et al.* (2007) recorded this species from Henan, Hubei, Jiangxi, and Sichuan. Jiang & Yang (2023) additionally recorded it from “North China” and Chongqing. The recent works recorded this species from Kanding City and Xiaozhaizigou in Beichuan County of Mianyang City [绵阳市北川县小寨子沟] (Platia 2017; Platia *et al.* 2020). Since the type specimen of this species has not yet been fully studied and the strong similarity in the morphology of species from China, the abovementioned records need in further investigations in future studies.

Distribution. Sichuan, Henan?, Hubei?, Jiangxi?, Chongqing?

***Homotechnes choui* sp. nov. 周氏平额叩甲**

Type locality: “near Yinshan Park, Jinxiu County, Laibin City, Guangxi, 1000 m.”

Distribution. Guangxi.

***Homotechnes emeiensis* Platia, 2017 峨眉平额叩甲**

Type locality: “Central Sichuan, Emei Shan massive, betw. Qingyingge & Xixiangchi, m 1500 [峨眉山清音阁到洗象池].”

Remarks. Platia *et al.* (2023) also recorded this species from “SE Sichuan, Jinfo Shan, m 1700–1950”. Now it is Jinfoshan in Nanchuan District of Chongqing Municipality [重庆南川区金佛山].

Distribution. Sichuan, Chongqing.

***Homotechnes kucerai* Platia, Mertlik & Dušánek, 2023 库氏平额叩甲**

Type locality: “Sichuan, Jintang env. [Jintang Town in Kangding City/ 康定市金汤镇], Teho nin [probably Sheliang Village near Yutong Town in Kangding City/ 鱼通镇舍连村].”

Distribution. Sichuan.

***Homotechnes mertliki* Platia, 2017 梅氏平额叩甲**

Type locality: “Sichuan, XilingXue Shan [成都市西岭雪山], m 2200.”

Distribution. Shaanxi, Hubei and Sichuan.

Homotechnes opacicollis Platia, 2017 暗边平额叩甲

Type locality: “S Shaanxi, pass 50 km S Xi'an, road Xi'an-Ningshan, Qin Ling Shan, m 2000 [秦岭: 西安市到宁陕县]”.

Distribution. Shaanxi, Hubei, Henan, Sichuan, and Gansu.

Homotechnes turnai Platia, Mertlik & Dušánek, 2023 图氏平额叩甲

Type locality: “W Hubei, 5 km S of Lücongpo [Lvcongpo Town in Badong County/ 巴东县绿葱坡镇].”

Remarks. The paratypes were collected from “SW Hubei, 30 km NE Hefeng, Mulinzi [Mulinzi N.R. in Hefeng County 鹤峰县木林子自然保护区].”

Distribution. Hubei.

Key to Chinese species of *Homotechnes* (males)

1. Pronotum with narrow mid-longitudinal impunctate carina 2
- Pronotum with narrow mid-longitudinal depression 3
2. Pronotum blackish with sides and hind angles reddish *H. opacicollis*
- Pronotum entirely black *H. mertliki*
3. Apices of hind angles of pronotum truncate in dorsal view 4
- Apices of hind angles of pronotum acuminate in dorsal view 5
4. Pronotum black with narrow lateral yellow margins; punctures on disk with intervals larger than their diameters; elytral interstriae perfectly flat and finely punctured *H. candezei*
- Pronotum with small central black spot and large yellow areas laterally; punctures on the disk with intervals smaller than their own diameters; elytral interstriae subconvex with larger punctures *H. corymbitoides*
5. Femur yellow, with apical portion black; tibiae yellow to brown, with apical portion darker. 6
- Femur almost black; tibiae dark brown to black *H. choui* **sp. nov.**
6. Antennae reaching the apices of hind angles of pronotum. *H. turnai*
- Antennae not reaching the apices of hind angles of pronotum by about one antennomere. 7
7. Pronotum elongate, elytra 2.80 times longer than pronotum *H. emeiensis*
- Pronotum stout, elytra 2.96 times longer than pronotum *H. kucerai*

Acknowledgements

We thank Xiao-Han Ye (Zhejiang), Wen-I Chou (Taiwan), Yong Zhou (Chongqing Normal University), Cong-Cong Du (Guangxi Normal University) and Yi-Fan Wang (Jiangsu) for providing the specimens. We are grateful to Alexander S. Prosvirov (Moscow State University, Russia) and Robin Kundrata (Palacky University, Czech) for their valuable comments, and to the editors Zheng-Zhong Huang and Zi-Wei Yin for their assistance. The first author also thank Zhi-Lin Chen and Cong-Cong Du (Guangxi Normal University) for various help during the collecting trip in Huaping Nature Reserve in 2023. This research was supported by the Grants from Sichuan Provincial Science and Technology Plan Project (Grant No. 2022NSFSC0127), Mianyang Normal University (no. QD2020A07), the National Natural Science Foundation of China (Grant No. 32270483), and the Guangdong Basic and Applied Basic Research Foundation (Grant No. 2023A1515030133).

References

- Candèze, E. (1882) Élatérides nouveaux. Troisième fascicule. *Mémoires de la Société Royale des Sciences de Liège*, 2 (9), 1–115.
- Cate, P.C., Sánchez-Ruiz, A., Löbl, I. & Smetana, A. (2007) Elateridae. In: Löbl, I. & Smetana, A. (Eds.), *Catalogue of Palaearctic Coleoptera. Vol. 4*. Apollo Books, Stenstrup, pp. 89–209.
- Douglas, H.B., Kundrata, R., Brunke, A.J., Escalona, H.E., Chapados, J.T., Eyres, J., Richter, R., Savard, K., Ślipiński, A., McKenna, D. & Dettman, J.R. (2021) Anchored phylogenomics, evolution and systematics of Elateridae: are all bioluminescent Elateroidea derived click beetles? *Biology*, 10 (6), 451.
<https://doi.org/10.3390/biology10060451>
- Jiang, S.-H. & Wang, S.-Y. (1999) *Economic click beetle fauna of China (Coleoptera: Elateridae)*. China Agriculture Press,

- Beijing, 195 pp.
- Jiang, S. & Yang, Y. (2023) Elateroidea. In: Yang, X. (Ed.), *Catalogue of Chinese Coleoptera Vol. 6*. Science Press, Beijing, pp. 1–353.
- Kishii, T. & Jiang, S.-H. (1994) Notes on the Chinese Elateridae, 1 (Coleoptera). *Entomological review of Japan*, 49 (2), 87–102.
- Ôhira, H. (1973) Notes on some elaterid-beetles from Japan (Coleoptera) (XVII). *New Entomologist*, 22 (1–2), 21–23.
- Platia, G. (2017) The click beetles of the genera *Ligmargus* Stibick, 1976 and *Homotechnes* Candèze, 1882 of Pakistan, India and China (Coleoptera, Elateridae, Hypnoidini). *Boletín de la Sociedad Entomológica Aragonesa (S.E.A.)*, 60, 132–140.
- Platia, G., Konvicka, O. & Zhang, T. (2020) Click-beetles (Coleoptera: Elateridae) collected in the Xiao-Zhaizigou National Nature Reserve and in the environs of Jiuzhaigou (Sichuan, China). *Boletín de la Sociedad Entomológica Aragonesa (S.E.A.)*, 67, 43–73.
- Platia, G., Mertlik, J. & Dušánek, V. (2023) New species, new records, new combination, new generic synonymy of click beetles from China and Vietnam (Coleoptera, Elateridae). *Boletín de la Sociedad Entomológica Aragonesa (S.E.A.)*, 72, 83–104.
- Stibick, J.N.L. (1979a) A revision of the Hypnoidinae of the world (Col. Elateridae). Part III. The Hypnoidinae of Eurasia. *Eos*, 53 (1–4), 223–307.
- Stibick, J.N.L. (1979b) Classification of the Elateridae (Coleoptera). Relationships and classification of the subfamilies and tribes. *Pacific Insects*, 20, 145–186.

广西省平额叩甲属*Homotechnes*一新种（鞘翅目：叩甲科：胖叩甲亚科）

邱鹭¹, 阮用颖²

¹绵阳师范学院, 森林与草原防灾减灾工程研究中心, 绵兴西路166号, 绵阳 621000, 四川, 中国

✉ 123church@163.com; <https://orcid.org/0000-0002-0946-1634>

²深圳职业技术大学, 植物保护研究中心, 深圳, 518055, 广东, 中国

✉ yongyinguan@hotmail.com; <https://orcid.org/0000-0002-5025-5592>

摘要: 记述和图示中国平额叩甲属*Homotechnes*一新种, 即周氏平额叩甲*Homotechnes choui* sp. nov. (广西)。提供中国平额叩甲属物种名录和检索表, 并对国外学者发表和记录物种所涉及的国内分布地名进行考证和修订。

关键词: 胖叩甲族; 胖叩甲亚科; 叩甲; 分类学; 中国