



Notes on the genus *Grouvellinus* Champion, 1923 (Coleoptera: Elmidae) from Xizang Autonomous Region, China, with description of a new species

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Abstract

The genus *Grouvellinus* Champion, 1923 comprises 67 described species distributed across the Oriental and Palearctic regions. Species diversity of this genus is very high in mainland China, with 33 recorded species, and three of these were recorded from Xizang Autonomous Region, China. In the present paper, we describe a new *Grouvellinus* species from Mêdog County, a distribution map and a list of all species of *Grouvellinus* known from Xizang Autonomous Region are provided.

Key words: Aquatic beetles, Elmidae, riffle beetles, Southwestern China, water environment

Introduction

The riffle beetle genus *Grouvellinus* Champion, 1923 is widely distributed in the Oriental and Palearctic regions, and currently includes 67 known species (Bian and Sun 2016; Jäch *et al.* 2016; Bian and Jäch 2018, 2019; Bian and Zhang 2023; Freitag *et al.* 2018, 2020; Jiang *et al.* 2023, 2024; Hayashi *et al.* 2024). This genus exhibits a high diversity in China, with 33 species recorded from mainland China (Jäch and Kodada 1995; Bian and Zhang 2023; Jiang *et al.* 2023, 2024). The Chinese fauna of the genus *Grouvellinus* was recently reviewed by a series of papers, and 23 new species were described (Bian and Sun 2016; Bian and Jäch 2018, 2019; Bian and Zhang 2023; Jiang *et al.* 2023, 2024).

Among known Chinese *Grouvellinus* species, three were recorded from Xizang Autonomous Region. Jäch (1984) described *G. tibetanus* Jäch and *G. hercules* Jäch and recorded *G. nepalensis* Delève, 1970 from Tatopani, Nepal, a township located on the border of Nepal and Xizang, China. Jäch and Kodada (1995) firstly provided a checklist of Chinese riffle beetles and those three species were added to the Chinese fauna. The subsequent world catalogue of the family Elmidae (Jäch *et al.* 2016) approved the distribution information of those three *Grouvellinus* species. Recently, Bian and Sun reviewed the Chinese fauna of the genus *Grouvellinus* by series work, which include the three known species from Xizang (Bian and Sun 2016; Bian and Jäch 2018, 2019; Bian and Zhang 2023).

In the present paper, a new *Grouvellinus* species from Xizang Autonomous Region is described and illustrated: *G. mupengxui* sp. nov. from Mêdog County. A distribution map (Fig. 4B) and species list (Table 1) of the known *Grouvellinus* species from Xizang Autonomous Region is also provided.

Materials and methods

The examined material is deposited in the Institute of Entomology, Guizhou University, Guiyang, China (GUGC).

Label data are quoted verbatim. The Chinese translation of each locality below the provincial level is included in parentheses at its first appearance in the text. Each type specimen bears the following label: ‘HOLOTYPE (red) (or PARATYPE (yellow)), ♂ (or ♀), *Grouvellinus mupengxui* sp. nov., Jiang & Chen, 2025.’

Dissected parts were preserved in Euparal on plastic slides and were placed on the same pin with the specimen. Habitus images were taken using a Canon 5D Mark IV digital camera with MP-E 65 mm f/2.8 1–5× macro lens. A Godox MF12 flash was used as the light source. Images of the morphological structures were taken using a Canon 5D Mark IV digital camera with a Mitutoyo Plan NIR 10 lens and a Godox MF12 flash was used as the light source, or a Nikon SMZ25 stereoscopic microscope with a Nikon DS-Ri2 camera. Genitalia were soaked in 10% NaOH solution for half an hour, and dehydrated in 100% alcohol, then preserved in Euparal on plastic slides. Images of genitalia were taken using a Nikon N1-E microscope with a Nikon DS-Ri2 camera. Zerene Stacker v. 1.04 was used for image stacking. All images were modified and grouped into plates using Adobe Photoshop CS5 Extended. Measurements of metric characters were taken by NIS-Elements AR, and added in Microsoft Excel to compute mean and standard deviations.

Morphological terminology and the format for the descriptions follow those of Bian and Sun (2016). The following abbreviations are used: PL—length of pronotum along the midline; PW—maximum width of pronotum; EL—length of elytra along the suture; EW—maximum width of elytra; CL—length of body, as the sum PL + EL.

Taxonomy

Grouvellinus Champion, 1923

Chinese common name: 格溪泥甲属

Grouvellinus mupengxui Jiang & Chen, sp. nov.

Chinese common name: 穆氏格溪泥甲

(Figs 1–3)

Type material (3 ♂♂, 2 ♀♀): **HOLOTYPE: CHINA:** ♂, labeled ‘China: Xizang (西藏自治区), Linzhi City (林芝市), Mêdog County (墨脱县), near Gongri Village (贡日村), 29.663842° N, 95.495567° E, H: ~2177m, 19.VIII.2023, Peng-Xu Mu leg.’ (GUGC). **PARATYPES: CHINA:** 2 ♂♂, 2 ♀♀, with same label data as holotype (GUGC).

Diagnosis. Body, long-oval, dark brown, surface shiny with cupreous metallic luster. Pronotum widest at basal 2/5, longitudinal impression absent, with a pair of linear and shallow impressions located in front of angles of scutellum. Elytral intervals VII and VIII with granulate carinae, intervals I, III and V with rows of long setae. Strial punctures of elytra large in basal 2/3 and much smaller in apical 1/3. Aedeagus with phallobase short, less than 1/3 length of median lobe, median lobe longer than parameres, weakly curved in lateral view, gradually narrowed from base to apex, apex rounded, apical 1/8 of parameres with short setae, apex of parameres with much longer setae.

Description. *Male.* Body long-oval (Fig. 1B), dark brown with tibiae and antenna pale brown, surface shiny with distinct cupreous metallic luster. Plastron area confined to head except for frons, vertex and clypeus, lateral portions of prosternum (except disc and prosternal process), epipleura, lateral portions of metaventrite (outer portions of the impressions of metaventrite), abdomen (except inner portions of admedian carinae of ventrite I, disc portions of ventrites II–IV, and disc and posterior portion of ventrite V), and femora (except apical 1/2 of dorsal surface).

Head (Fig. 2A) wider than long, dorsal surface shiny, densely covered with short setae (except discal part) and with sparse large punctures, each bearing a longer seta. Surface of clypeus shiny, with sparse small punctures and long setae. Labrum transverse, narrower than clypeus, surface shiny, with sparse long setae, lateral margins with long bristles, apical margin rounded.

Pronotum (Fig. 2B), wider than long, widest near basal 1/3. Disc finely punctured with sparse large punctures, punctures with longer adpressed setae, intervals glabrous, shiny. Surface of anterior and posterior angles densely covered with large round punctures. Anterior margin arcuate, anterior angles weakly produced, rounded, lateral margins finely curved. Basal margin trisinate, posterior angles acutangular. Longitudinal impression absent, with a pair of linear and shallow impressions located in front of angles of scutellum. Sublateral carinae present in basal 1/2 of pronotum, trisinate, each side of sublateral carinae with a shallow and indistinct oblique impression, extending

from apical end of carina to near anterior angle. Prosternal process (Fig. 2C) with round apex, surface covered with sparse small punctures and long setae, intervals shiny.

Scutellar shield (Fig. 2B) about as long as wide, widest near middle; surface glabrous, with several small punctures; lateral margins finely curved, apex acutangular.

Elytra (Fig. 2F) $\sim 1.4 \times$ as long as wide, widest behind basal 1/2. Surface shiny, with distinct cupreous metallic luster and rows of sparse long setae. Strial punctures larger in basal 1/2, separated by $\sim 1.0\text{--}1.5 \times$ their diameters, much smaller and widely separated in other parts. Granulate carinae on striae VII and VIII, other intervals flat, intervals I, III and V with rows of long setae. Hind wings well developed.

Metaventrite (Fig. 2D), disc shiny with sparse long setae and small punctures. Median sulcus distinct, extending from posterior margin to anterior margin, with a pair of curved protuberances on each side of median suture at base. Lateral sides of disc with series of elliptical shallow impressions.

Abdomen. Middle regions of ventrites I–IV and anterior part of ventrite V shiny and with sparse long setae, other parts of abdomen (Fig. 2E) covered with plastron setae mixed with sparse long setae. Ventrite I with well-developed pair of admedian carinae, straight, extending from base to apex, surface with sparse small punctures. Ventrites II–IV sparsely granulate. Apex of ventrite V weakly concave, posterior 2/3 densely granulate.

Legs simple, femora widened, surface with plastron setae (except apical 1/2 of dorsal surface); femora widened; inner side of tibiae with cleaning fringes; tarsi slightly shorter than tibiae; tarsal claws simple.

Aedeagus (Fig. 3A–D), 0.98 mm in length, long and slender, symmetrical; median lobe (0.83 mm) longer than $3 \times$ of the length of phallobase (0.24 mm), gradually narrowed from base to apex, weakly curved in lateral view, apex rounded. Parameres shorter than median lobe, apical 1/8 with short setae, apex of parameres with much longer setae. Sternite IX (Fig. 3E) oblong, with a pair of lateral sclerites, thin and distinctly curved, median strut curved.

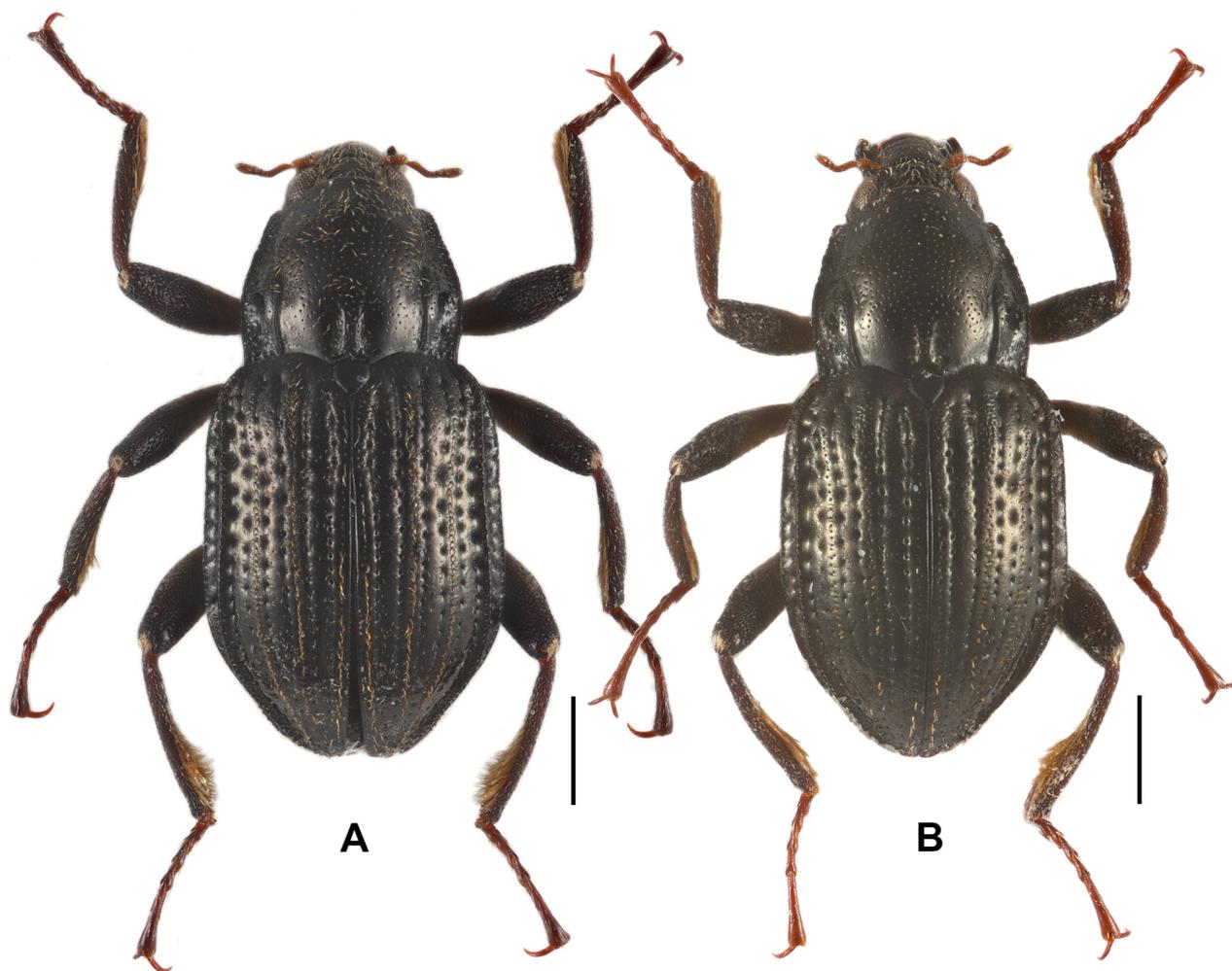


FIGURE 1. Dorsal habitus of *Grouvellinus mupengxui* sp. nov. A. Male, holotype; B. Female, paratype. Scale bars: 0.5 mm.

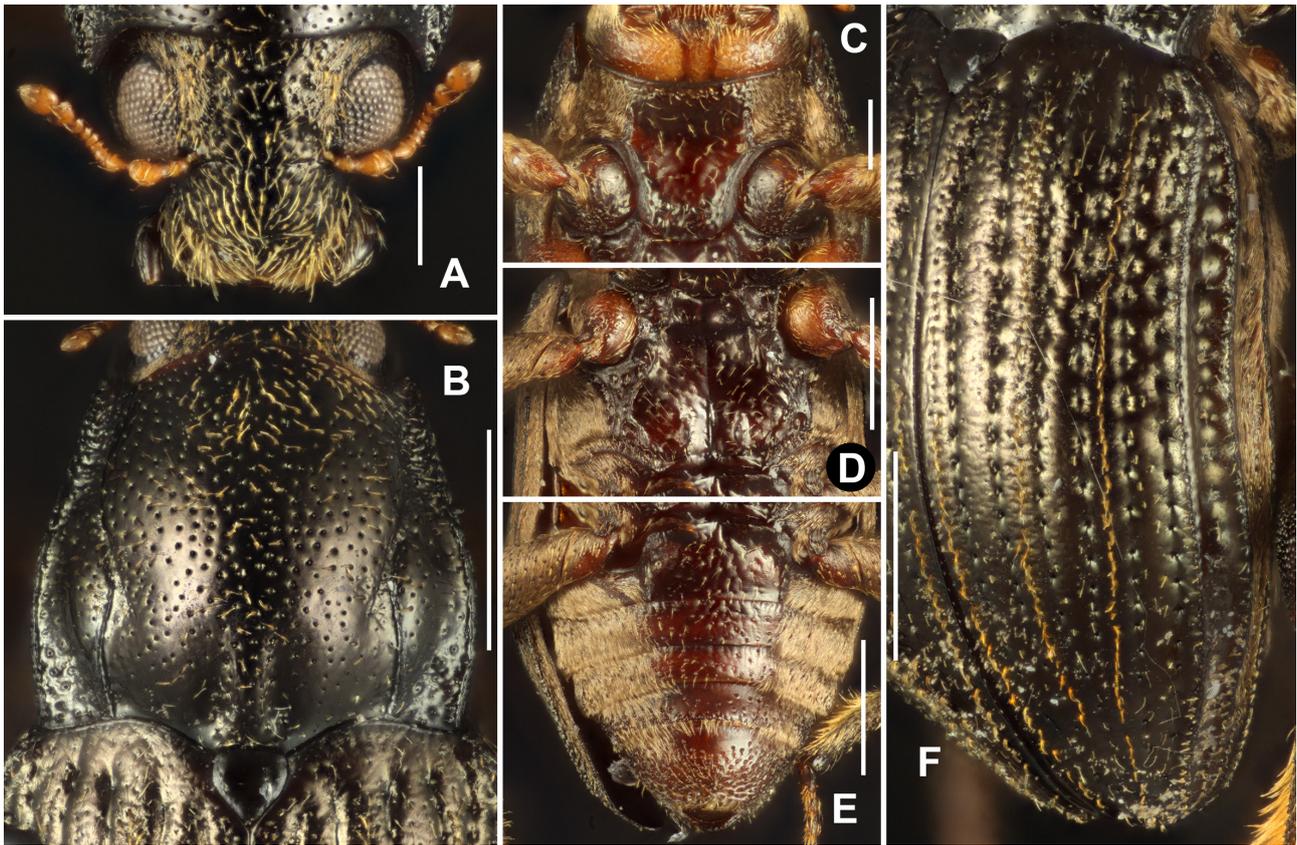


FIGURE 2. *Grouvellinus mupengxui* sp. nov. A. Head; B. Pronotum; C. Prosternum; D. Metaventricle; E. Abdomen; F. Elytra. Scale bars: 0.2 mm in A & C; 0.5 mm in B & D–F.

Female. Externally similar to the male, posterior margin of ventrite V rounded, the median groove of the metaventricle shallower than in male. Ovipositor as in Fig. 3F–H, stylus curved, apex with several short sensilla; apex of coxite broadly rounded toward the outer margin, with three short and curved sensilla; valvifer longer than coxite, longitudinal baculum near straight.

Measurements. *Male.* CL: 2.65–2.70 mm; PL: 0.79–0.87 mm, PW: 0.94–1.01 mm; EL: 1.80–1.90 mm, EW: 1.29–1.32 mm. *Female.* CL: 2.61–2.70 mm; PL: 0.80–0.87 mm, PW: 0.93–0.99 mm; EL: 1.81–1.83 mm, EW: 1.25–1.30 mm.

Distribution. Southwest China: Xizang.

Biology. All adults were collected from submerged stones in a moderately large stream (Fig. 4A).

Etymology. The species epithet honors our friend and colleague Mr. Peng-Xu Mu (Fujian Agriculture and Forestry University, Fuzhou City, China), the collector of the new species; the name is treated as a proper noun in the genitive case.

Comparative diagnosis. *Grouvellinus mupengxui* sp. nov. is most similar to *G. tibetanus* in habitus character. It can be easily distinguished from the latter by the following characters of aedeagus: 1) phallobase, shorter than 1/3 length of median lobe (vs. longer than 1/2 length of median lobe); 2) apex of median lobe gradually narrowed (vs. abruptly narrowed); 3) outer margins of parameres nearly straight at middle portions (vs. curved near middle).

The aedeagus of the new species is most similar to *G. hercules*, they can be distinguished from each other by the following characters: 1) phallobase short, shorter than 1/3 length of median lobe (vs. much longer, about 1/2 length of median lobe); 2) median lobe distinctly longer than parameres in the new species (vs. slightly longer than parameres in *G. hercules*); 3) body size smaller, body length: 2.61–2.70 mm (vs. larger, body length: 2.80–3.10 mm in *G. hercules*), wider body form and anterior angles of pronotum weakly produced (vs. relatively distinctly produced).

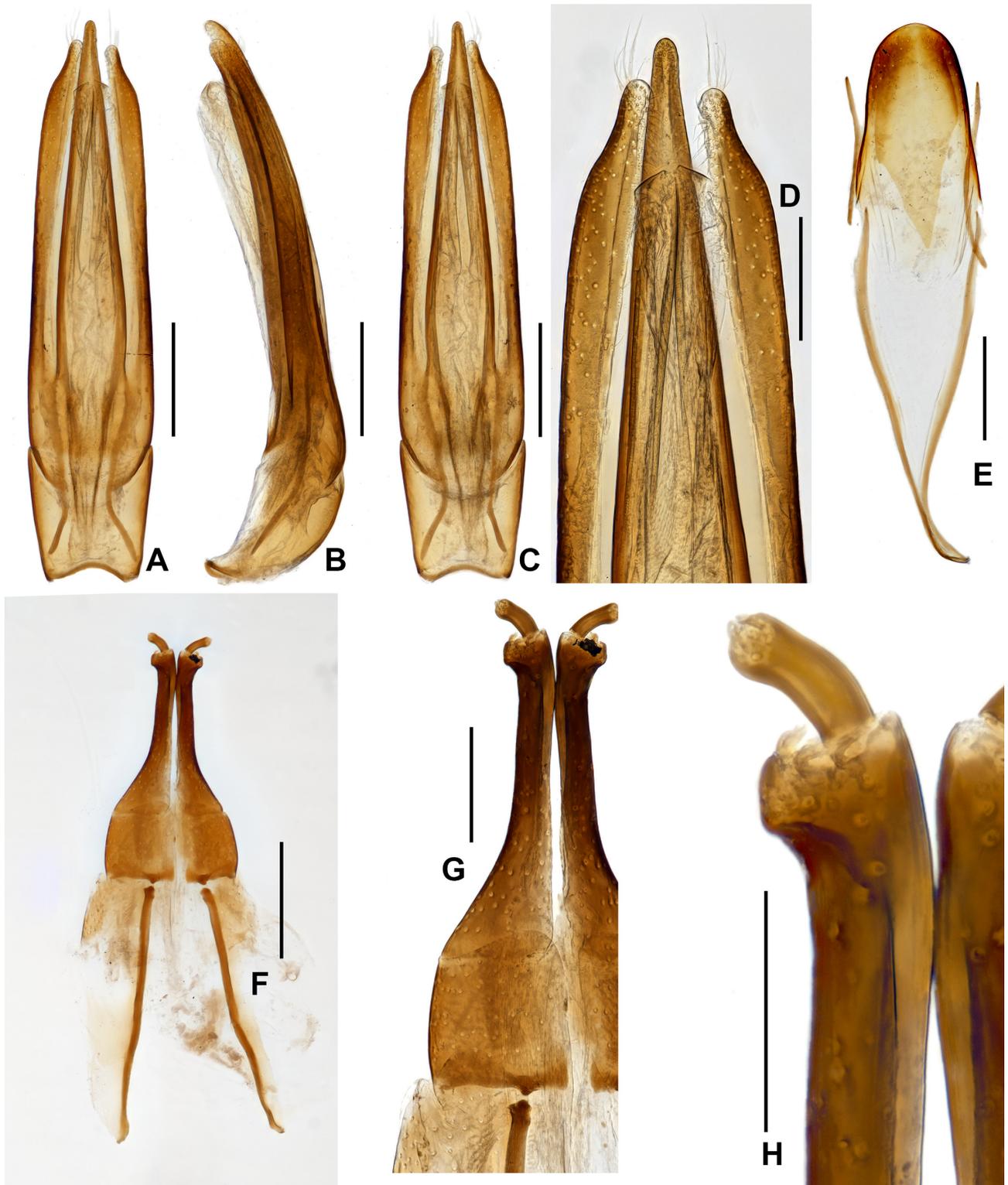


FIGURE 3. Diagnostic features of *Grouvellinus mupengxui* **sp. nov.** **A.** Aedeagus, ventral view; **B.** Ditto, lateral view; **C.** Ditto, dorsal view; **D.** Ditto, apical part of median lobe and parameres; **E.** Sternite IX; **F.** Ovipositor; **G & H** Ditto, apical part. Scale bars: 0.1 mm in D & G–H; 0.2 mm in A–C, E–F.

TABLE 1. List of *Grouvellinus* species from Xizang, China.

Species	Type locality	Distribution	Reference
<i>G. nepalensis</i> Delève, 1970 尼格溪泥甲	Nepal (Ningale)	Nepal, China	Delève (1970), Jäch (1984), Bian & Sun (2016), Jäch <i>et al.</i> (2016)
<i>G. hercules</i> Jäch, 1984 壮格溪泥甲	Nepal (Tatopani)	Nepal, China	Jäch (1984), Bian & Sun (2016), Jäch <i>et al.</i> (2016)
<i>G. tibetanus</i> Jäch, 1984 藏格溪泥甲	Nepal (Tatopani)	Nepal, China	Jäch (1984), Bian & Sun (2016), Jäch <i>et al.</i> (2016)
<i>G. mupengxui</i> sp. nov. 穆氏格溪泥甲 新种	China (Mêdog County)	China	present paper

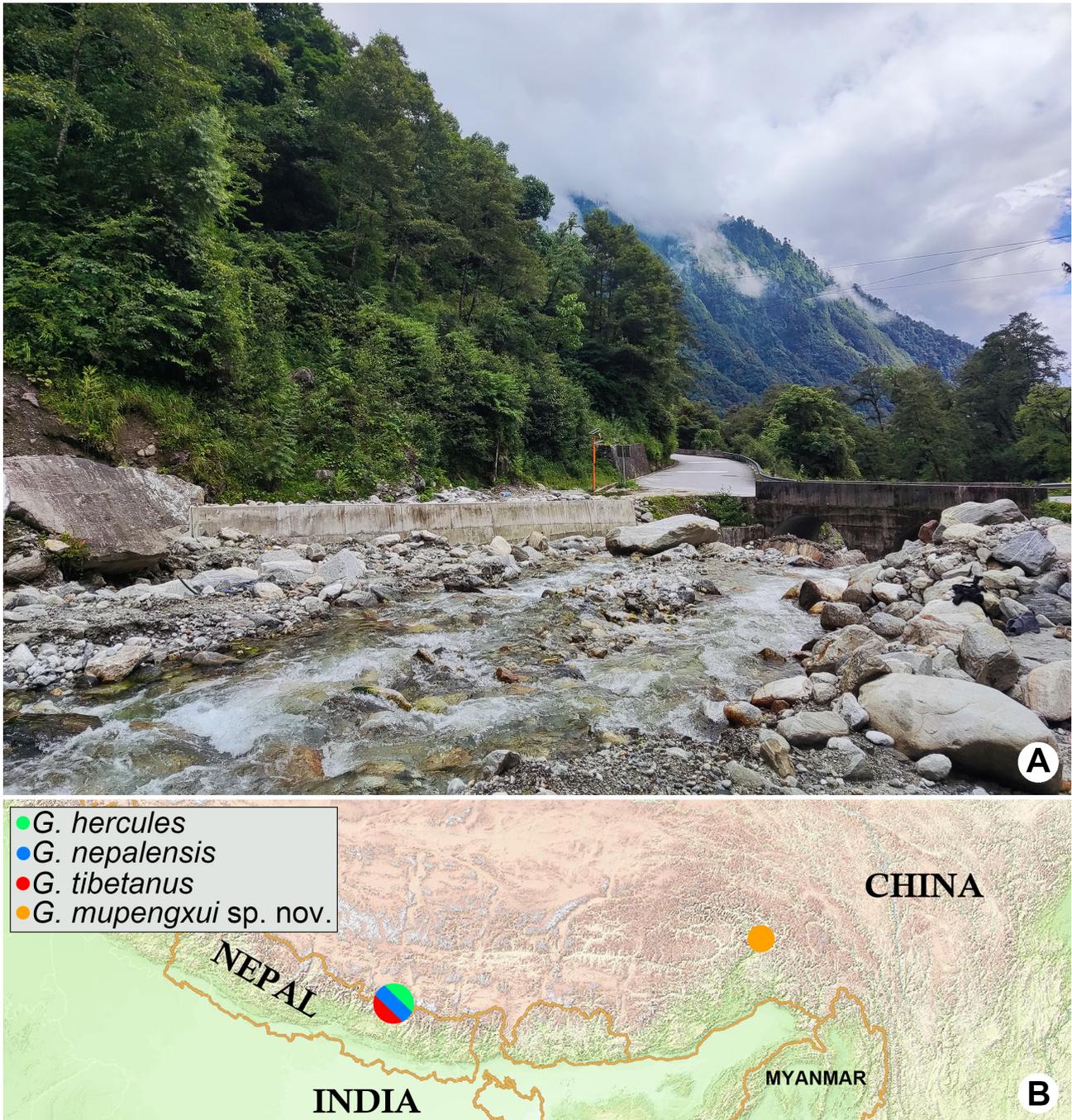


FIGURE 4. A. Habitat of *Grouvellinus mupengxui* sp. nov. type locality; B. Distribution map of the known *Grouvellinus* species of Xizang Autonomous Region, China.

Discussion

The previously reported three species of *Grouvellinus* from the Xizang Autonomous Region were based on specimens collected from Tatopani, Nepal. Tatopani is a significant border port between China and Nepal, known as ‘Zhangmu Port (樟木口岸)’ on the Chinese side.

Previous research has demonstrated the high diversity of the genus *Grouvellinus* in Southeast Asia, particularly in southern China. Compared to other parts of southern China, there has been relatively less survey work focusing on elmid beetles in the Xizang Autonomous Region. This suggests that the current species diversity of the genus *Grouvellinus* in this area warrants further investigation in the future.

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西藏自治区格溪泥甲属*Grouvellinus*记述及一新种描述（鞘翅目：溪泥甲科）

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摘要: 格溪泥甲属分布于东洋区和古北区, 包含65个已知种。该属在中国大陆地区具有很高的多样性, 33个物种记录于中国大陆地区, 其中三种记录于西藏。本文描述了产自西藏自治区墨脱县的格溪泥甲属一新种, 并提供了西藏自治区格溪泥甲属已知物种的名录与分布图。

关键词: 水生甲虫, 溪泥甲亚科, 溪泥甲, 中国西南地区, 水环境