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# A new earwig species of the genus *Liparura* Burr, 1907 (Dermaptera: Forficulidae) from China

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## Abstract

A new earwig species of the genus *Liparura* Burr, 1907 of the family Forficulidae, namely *L. chongqingensis* **sp. nov.**, is described from Chongqing, southwestern China. The new species is characterized by the male forceps basally approached to each other, and each with a small tooth protruding dorsad. A key to the species of *Liparura* is provided.

**Key words:** Skendylinae, *Liparura chongqingensis* **sp. nov.**, taxonomy, Chongqing

## Introduction

The family Forficulidae Latreille, 1810 is the most species-rich group of Dermaptera, currently comprising approximately 500 species in the world (Hopkins et al. 2018). Species of Forficulidae are characterized by the second tarsomere basally expanded to both sides to form heart- or kidney-shaped lobes. The forficulid subfamily Skendylinae Burr, 1907 (= Cosmiellinae Steinmann, 1975; see Engel & Haas 2007) includes the species characterized by the 4th antennomere subequal in length to the 3rd antennomere and the tegmina bearing sharp lateral ridges (Steinmann 1975, 1993; Srivastava 2013). The genus *Liparura* Burr, 1907, a relatively small group of Skendylinae, consists of eight Oriental species mostly occurring along the Himalayas, and all these species share the sharp lateral longitudinal ridges and obliquely truncate posterior margin of the tegmina, and the absence of hindwings (Steinmann1993; Chen & Ma 2004; Matzke 2012; Srivastava 1993, 2013). Previously, there were only two Chinese species: *L. punctata* Burr, 1910, from Xizang and Yunnan (Chen & Ma 2004), and *L. cornuta* (Bey-Bienko, 1959), from Yunnan (Srivastava 2013).

Here we describe a new species of *Liparura* from the Yintiaoling National Nature Reserve, Chongqing, China. Both male and female of the new species are described and illustrated in detail, and compared with all known congeners. A key to the species of *Liparura* is provided.

## Material and methods

The specimens herein studied were collected by hand and preserved in 75% ethanol. Details of the morphology were studied with a stereo microscope Motic SMZ-161 (Chongqing, China). Figs 1, 4 were taken with a Canon EOS 5DSR camera (Tokyo, Japan) with Laowa FF 100 mm F2.8 CA-Dreamer Macro 2X (Hefei, China), Figs 2, 5 with Laowa FF 25 mm F2.8 Ultra Macro 2.5-5X (Hefei, China), Fig. 3 was taken with ZEISS Smartzoom 5 (Jena, Germany) and optimized in Adobe Photoshop CS 2017. Line drawings were made using Adobe Illustrator CC 2015. The type material of the new species is deposited in the Entomological Museum, China Agricultural University (CAU), Beijing, China. Terminology follows Chen & Ma (2004).

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## Taxonomy

### Family Forficulidae Latreille, 1810

### Subfamily Skendylinae Burr, 1907

### Genus *Liparura* Burr, 1907

*Liparura* Burr, 1907: 119. Type species: *Neolobophora asiatica* Bormans in Bolivar, 1897 [= *Liparura punctata* Burr, 1910], subsequently designated by Burr, 1910: 182.

**Generic characters** (Adapted from Steinmann 1993). Head weakly convex, transverse, with median sutures faint or distinct; antennae long and slender, 3rd and 4th antennomeres subequal in length but shorter than 5th antennomere. Tegmina abbreviated, nearly as long as wide, with posterior margin obliquely truncate; lateral longitudinal ridges sharp, well developed; hindwings absent. Legs long and slender, first tarsomere longer than remaining two tarsomeres together. Abdomen punctate, greatly expanded at middle; ultimate tergite generally trapezoidal, strongly sloping backwards and distinctly narrowed. Male forceps variously shaped, elongated, internally armed; female forceps simple and straight.

**Distribution.** Bhutan; China; India; Nepal.

### Key to species of *Liparura* based on male characters

1. Male forceps simple, without any tooth or dorsal edge (Steinmann 1993: fig. 275; Fig. 6A) . . . . . *L. simplex* **Brindle, 1975**
- Male forceps with inner tooth or teeth or dorsal edge basally . . . . . 2
2. Male forceps with dorsal edge basally . . . . . 3
- Male forceps without dorsal edge basally . . . . . 4
3. Male forceps straight and without internal teeth (Steinmann 1993: fig. 276; Fig. 6B) . . . . . *L. punctata* **Burr, 1910**
- Male forceps slightly curved with 1-2 small teeth at base (Matzke, 2012: Table VII, fig. 6; Fig. 6C) . . . . . *L. charlottea* **Matzke, 2012**
4. Male ultimate tergite with smaller, but well-marked lateral spine (Steinmann 1983: fig. 9; Fig. 6D) . . . . . *L. cornuta* **(Bey-Bienko, 1959)**
- Male ultimate tergite without lateral spine . . . . . 5
5. Male ultimate tergite with four black longitudinal stripes . . . . . 6
- Male ultimate tergite without longitudinal stripes . . . . . 7
6. Abdomen deeply punctuate; inner margin of forceps crenate and with a large tooth at middle (Srivastava 1977: fig. 4e; Fig. 6E) . . . . . *L. serrata* **Srivastava, 1977**
- Abdomen shallowly punctate; inner margin of forceps smooth, except for a small tooth at middle (Srivastava 1977: fig. 4a; Fig. 6F). . . . . *L. kamengensis* **Srivastava, 1977**
7. Base of male forceps each with two teeth (Figs 2, 6H) . . . . . *L. chongqingensis* **sp. nov.**
- Male forceps armed with one or two teeth but not at base . . . . . 8
8. Pronotum almost quadrate; abdominal tergites shallowly punctate; forceps armed with a strong or weak tooth medially (Kapoor et al. 1971: fig. 89; Fig. 6I). . . . . *L. debrepaniensis* **(Kapoor, Bharadwaj & Banerjee, 1971)**
- Pronotum longer than broad; abdominal tergites deeply punctate; forceps armed with one or two teeth (Fig. 6G) . . . . . *L. dentata* **Srivastava, 1977**

### *Liparura chongqingensis* sp. nov.

(Figs 1–7)

**Diagnosis.** Tegmina laterally with a distinct ridge, posterior margin obliquely truncate; legs generally relatively short compared with congeners; ultimate tergite immaculate, smooth, without protrusions; pygidium small, rounded; male forceps basally approached to each other, and bearing two inner teeth; basalmost tooth directed dorsad; distal 2/3 distinctly arched, terminally acutely tapering and bearing a subdistal tooth.

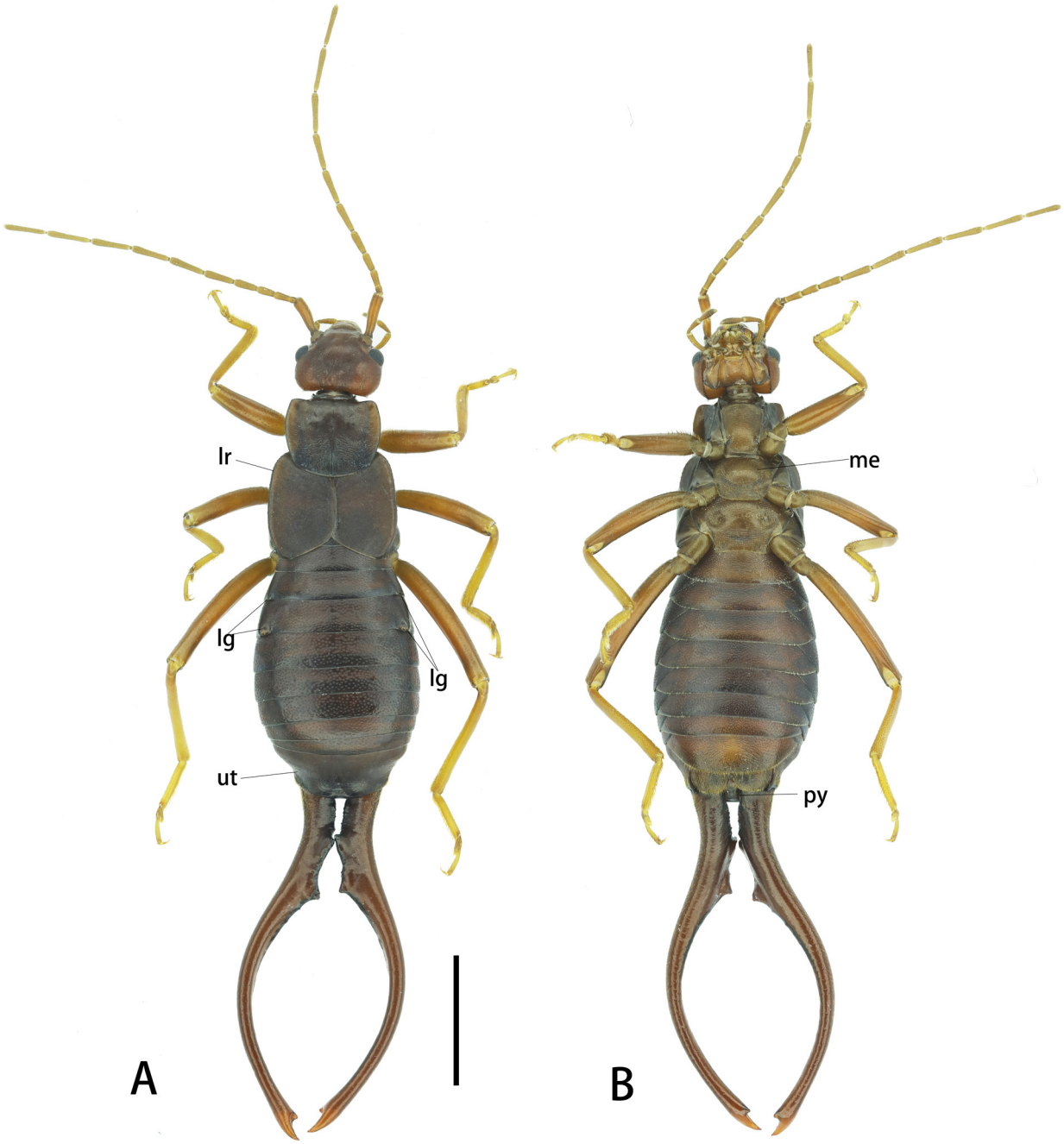


**FIGURE 1.** *Liparura chongqingensis* **sp. nov.**, holotype male, habitus photo. A. Dorsal view; B. Ventral view. Scale bar = 5 mm. lr: lateral ridges; lg: lateral glands; ut: ultimate tergite; me: mesosternum; py: pygidium.

**Description.** Male. Body length 14–15 mm from anterior margin of labrum to posterior margin of ultimate tergite; forceps length 9 mm. Coloration generally reddish brown, but abdomen darker, antennae and forceps slightly paler, legs yellowish.

Head large, frons bulged, surface rough and densely wrinkled, transverse median sutures visible but not conspicuous, posterolateral angles rounded, posterior margin concaved. Eyes dark, small but prominent, shorter than length of head posteriad eyes. Antenna 12-segmented, scape (1st antennomere) long, longer than distance between antennal bases; pedicel (2nd antennomere) short; 1st flagellomere (3rd antennomere) twice as long as pedicel; 2nd flagellomere (4th antennomere) slightly shorter than 1st flagellomere; remaining flagellomeres gradually prolonged.

Pronotum trifle wider than long, anterior angle not prominent, posterior margin slightly convex, median longitudinal furrow present, with a small pit on each side. Tegmina longer than pronotum; lateral margin with a distinct ridge (Fig. 1: lr), slightly rounded at shoulders; partial region of elytra densely rugose, but without larger points; posterior margin obliquely truncate. Hindwings absent. Mesosternum (Fig. 1: me) quadrate, nearly as wide as long. Legs relatively shorter than many congeners; posteriorly stretched hind leg reach to base of forceps.

Abdominal tergites with weak punctures; lateral glands (Fig. 1: lg) on tergites 3-4 well marked, with that on tergite 4 much larger. Ultimate tergite (Figs 1: ut, 2) narrowed posteriad, posteromedially with a small pit. Penultimate sternite normal, with arched posterior margin. Lateral plates large, well protruded beneath the penultimate sternite. Pygidium (Fig. 1: py) small, rounded.

Forceps (Figs 2, 6H) basally approached to each other, and each bearing two inner teeth; basalmost tooth directed dorsad; distal 2/3 distinctly arched as a semicircular curve, terminally acutely tapering and bearing a subdistal tooth.


**FIGURE 2.** *Liparura chongqingensis* **sp. nov.**, holotype male, terminalia. A. Dorsal view. B. Ventral view. Scale bar = 2 mm.

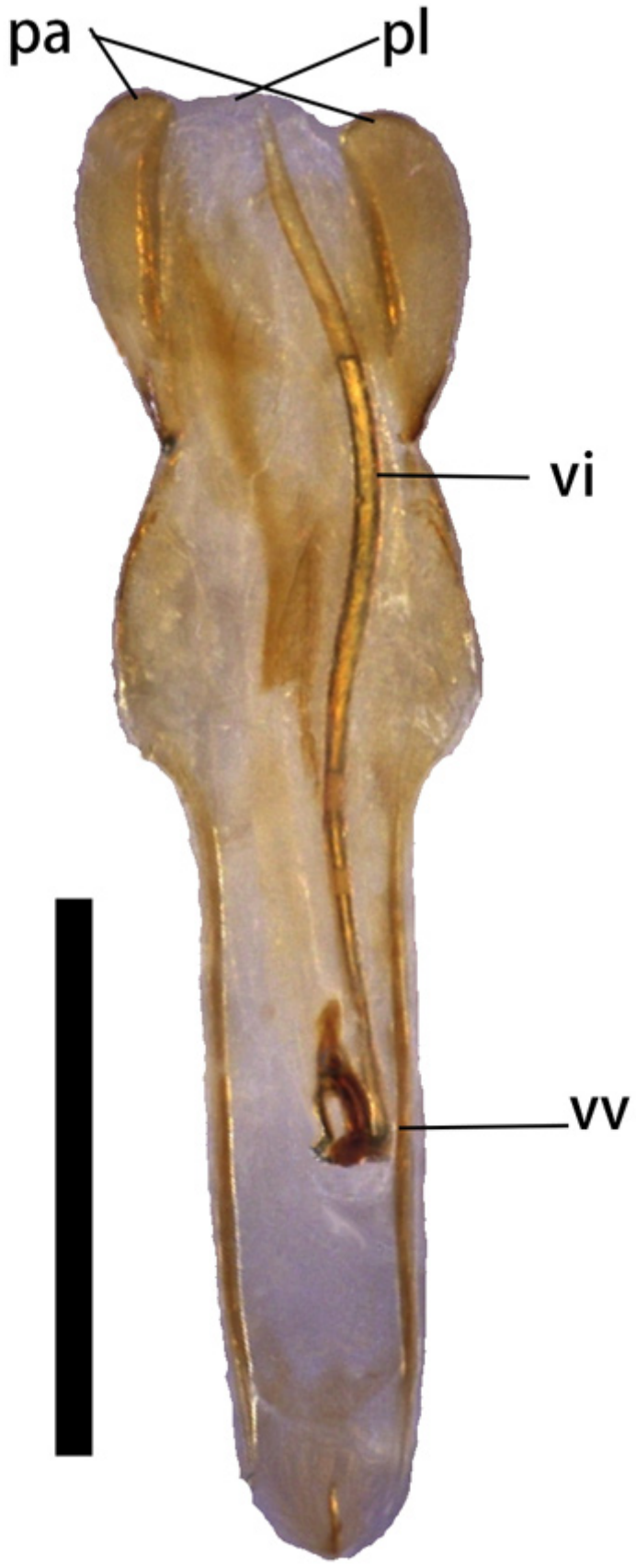


**FIGURE 3.** *Liparura chongqingensis* **sp. nov.**, holotype male, genitalia. Dorsal view. Scale bar = 1 mm. pa: paramere; pl: penis lobe; vi: virga; vv: vesicle of virga.

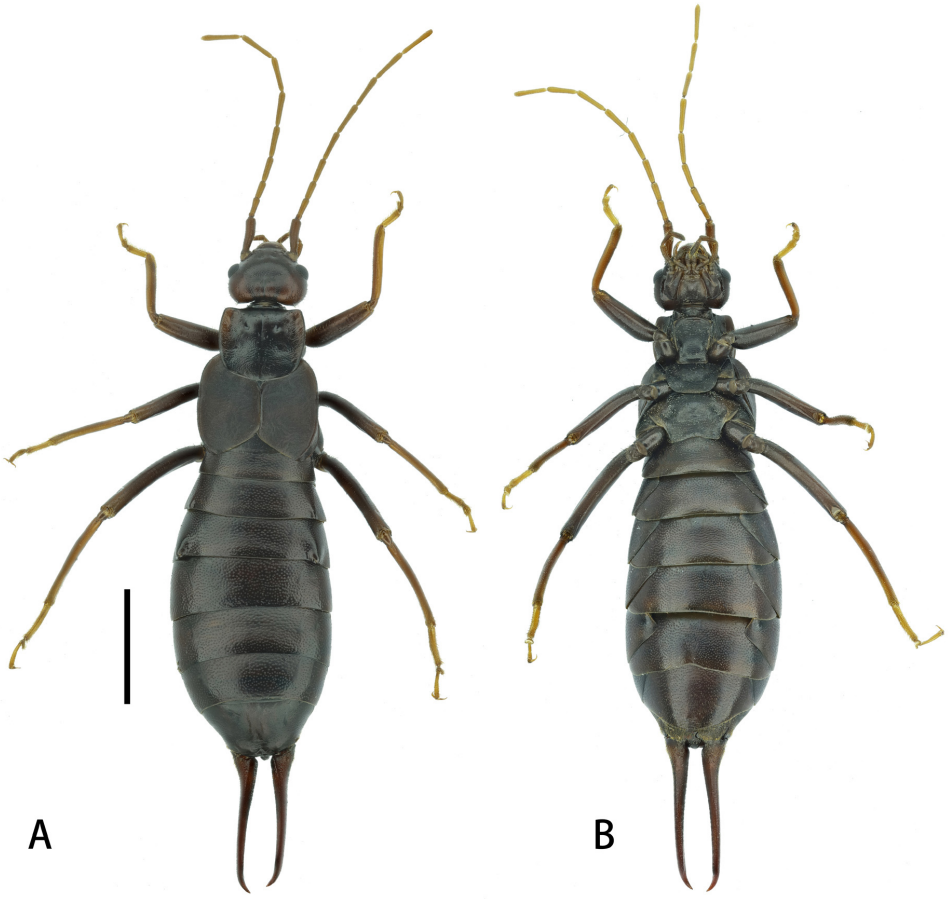


**FIGURE 4.** *Liparura chongqingensis* **sp. nov.**, paratype female, habitus photo. A. Dorsal view. B. Ventral view. Scale bar = 5 mm.

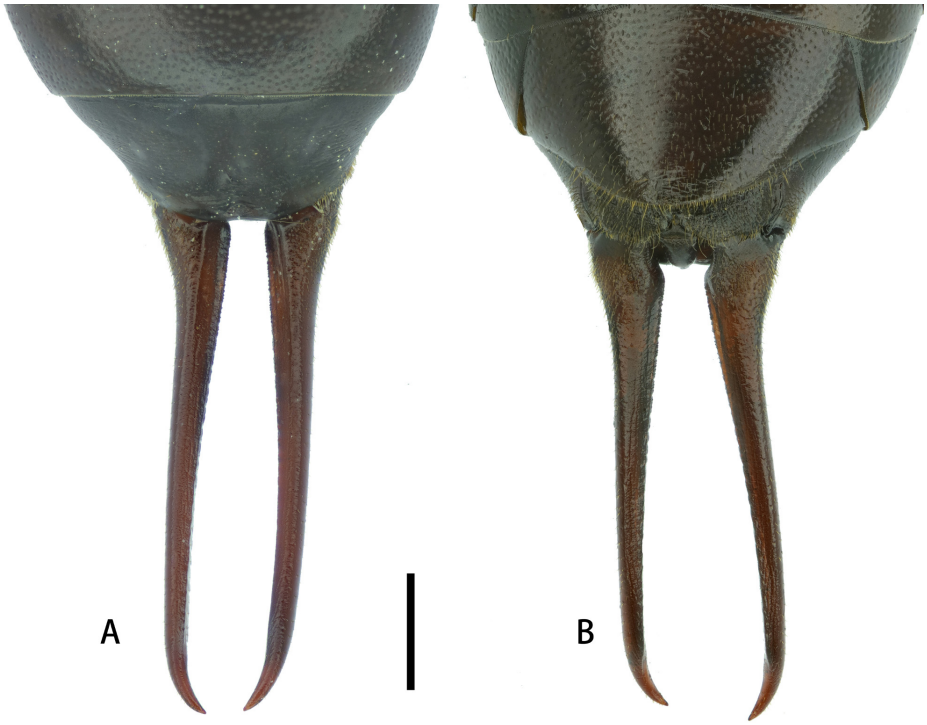


**FIGURE 5.** *Liparura chongqingensis* **sp. nov.**, paratype female, terminalia. A. Dorsal view. B. Ventral view. Scale bar = 1 mm.

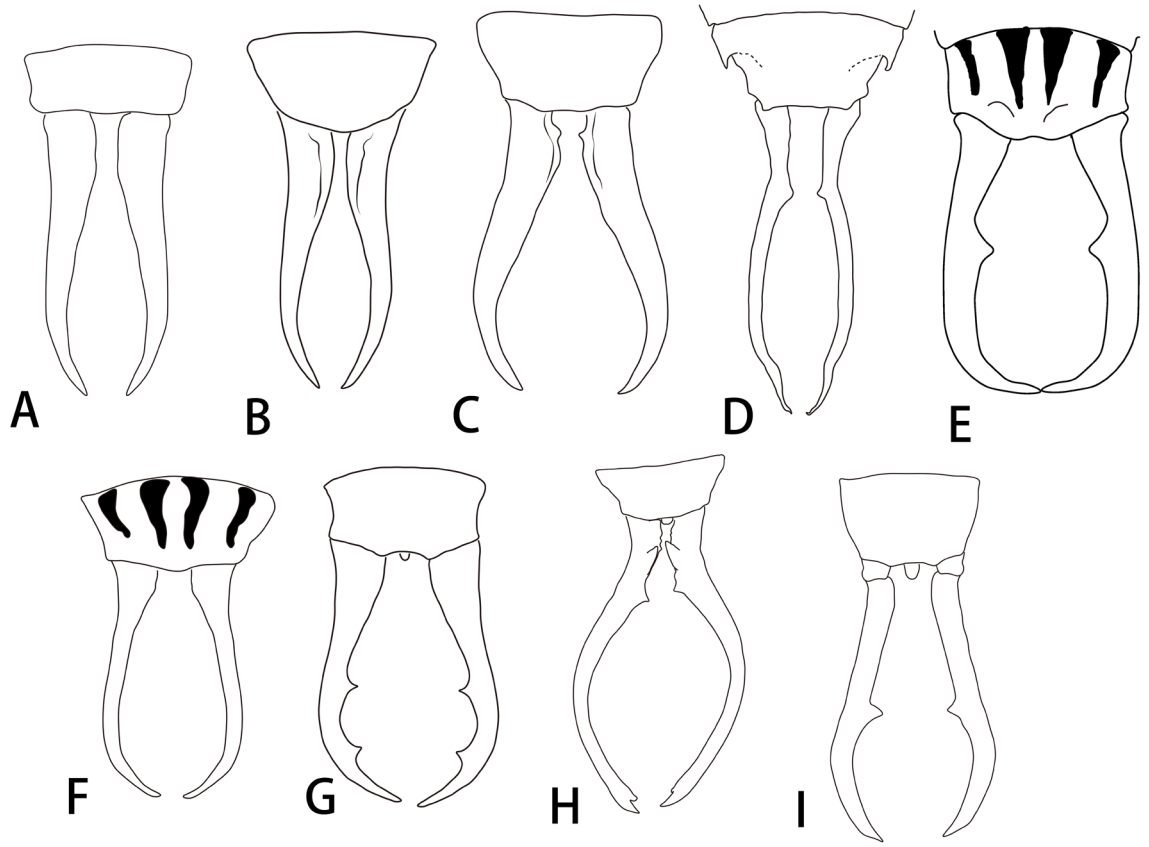


**FIGURE 6.** Male ultimate tergite and forceps of *Liparura* Burr, 1907. A. *L. simplex* Brindle, 1975; B. *L. punctata* Burr, 1910; C. *L. charlottea* Matzke, 2012; D. *L. cornuta* (Bey-Bienko, 1959); E. *L. serrata* Srivastava, 1977; F. *L. kamengensis* Srivastava, 1977; G. *L. dentata* Srivastava, 1977; H. *L. chongqingensis* **sp. nov.**; I. *L. debrepaniensis* (Kapoor, Bharadwaj & Banerjee, 1971). A, B, D redrawn from Steinmann; C redrawn from Matzke; E, F, G redrawn from Srivastava; I redrawn from Kapoor, Bharadwaj & Banerjee.

Genitalia (Fig. 3): Paramere (Fig. 3: pa) short, penis lobe (Fig. 3: pl) wide, which is narrowed distad, shorter than paramere. Virga (Fig. 3: vi) within genital lobe comparatively elongate, vesicle of virga (Fig. 3: vv) sclerotized and curved.

Female. Body length 13 mm; forceps length 5 mm. Similar to male, but darker; penultimate sternite normal, rounded posteriorly; pygidium smaller; forceps straight and simple.

**Type material. Holotype** male: CHINA, Chongqing City, Yintiaoling National Nature Reserve, 31°24′1.3353″N, 109°51′51.8995″E, 1637 m, 24.IX.2022, Xulong Chen (CAU). **Paratypes**: 1 male and 1 female, Yintiaoling National Nature Reserve, 31°31′29.51″N, 109°49′30.86″E, 1261 m, 10.IV.2022, Qianle Lu (CAU); 1 female, Yintiaoling National Nature Reserve, 31°24′49.56″N, 109°55′41.48″E, 2000 m, 19.VIII.2022, Quanyu Ji (CAU).

**Etymology.** The new species is named after Chongqing where its type locality is located.

**Distribution.** China (Chongqing).

**Remarks.** The new species is assigned to *Liparura* based on the scape longer than distance between antennal bases, the tegmina with a sharp ridge along the costal margin and obliquely truncate on posterior margins, the absence of hindwings, the penis lobe and paramere short, and the virga elongate with sclerotized curvature basally. The new species can be readily distinguished from most other *Liparura* species except *L. cornuta* by the male forceps basally close to each other and distally incurved. The new species differs from *L. cornuta* by the ultimate tergite smooth without lateral protrusions, and the different shape of male forceps.

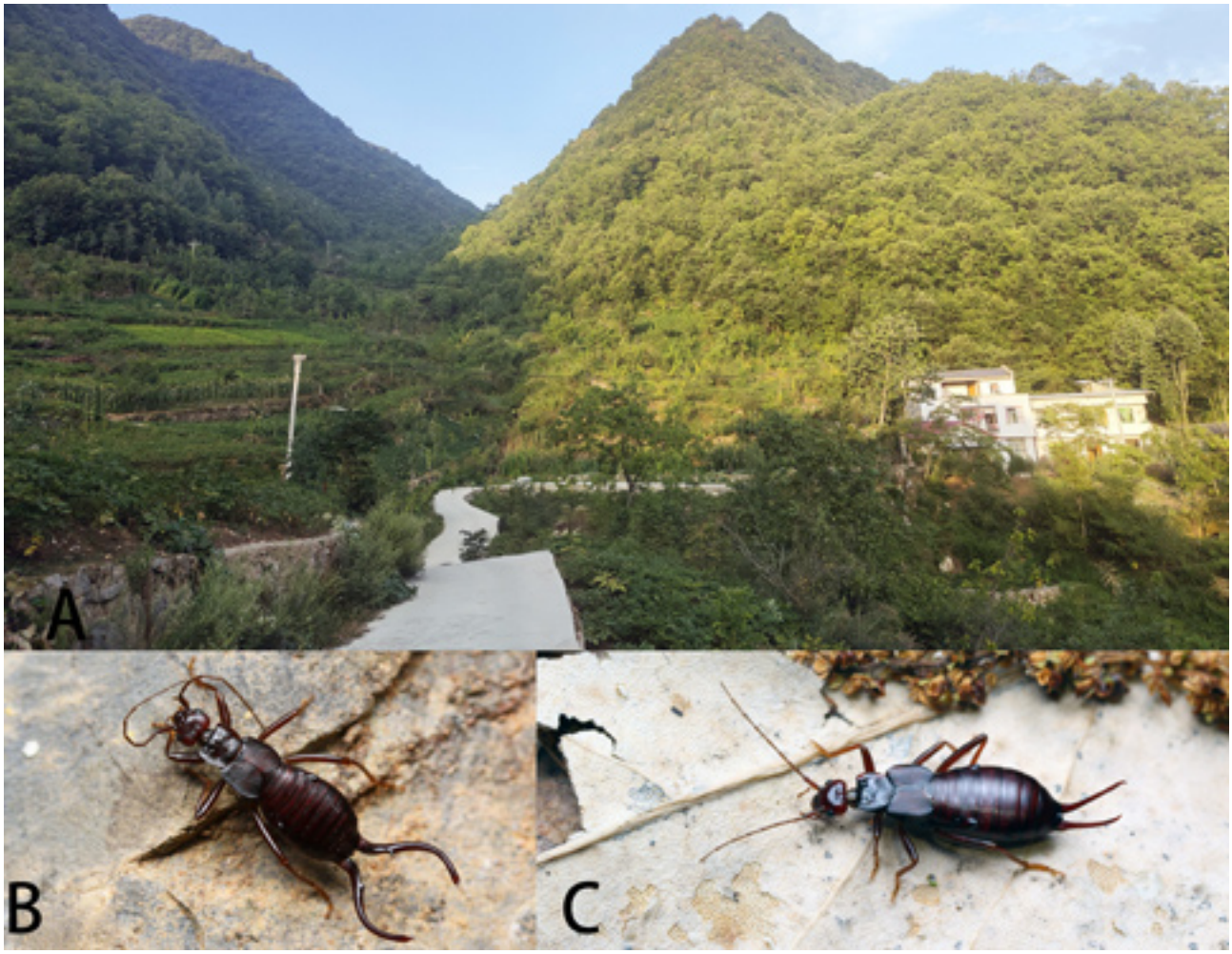


**FIGURE 7.** *Liparura chongqingensis* **sp. nov.**, A. habitat of collecting site from the Yintiaoling National Nature Reserve; B. habitus of live male adult; C. habitus of live female (photograph by Qianle Lu).

## Discussion

Srivastava (2013) transferred *Cosmiella cornuta* (Bey-Bienko, 1959) to the genus *Liparura*, and treated *L. montusa* [sic: *L. montuosa*] Steinmann, 1983 as a junior synonym of this species. According to this view, most species of *Liparura* are distributed around the Himalayas except *L. punctata* and *L. cornuta* that occur in Yunnan. *L. cornuta* is distributed in Mts. Wuliangshan of central Yunnan, while the exact location of *L. punctata* is still unknown. The present finding of a new *Liparura* species from Chongqing represents the easternmost and northernmost record of this genus. The specimens of the new species were collected from the mid-elevated areas with evergreen broad-leaf forests in the Yintiaoling Nature Reserve (Fig. 7). It suggests that more species of *Liparura* may be distributed and be found from southwestern China.

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