Description a new species of the genus *Orphnebius* Motschulsky, 1858 (Coleoptera: Staphylinidae: Aleocharinae) from Xizang, China

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Abstract

A new species of the genus *Orphnebius* Motschulsky: *Orphnebius lilizheni* sp. nov. is described from Xizang, China. All specimens examined in this study were collected from the nest of an ant species *Myrmica* sp. (Hymenoptera, Formicidae). The adults and larvae of the new species are described, figured and compared with its congeners.

Key words: Staphylinidae, Lomechusini, myrmecophile, new species, China

Introduction

The genus *Orphnebius* Motschulsky, 1858 currently includes approximately 190 species, most of them are distribute in the Oriental and Neotropical regions (Assing 2017, 2019). Among these *Orphnebius* species, 24 are recorded from China. Species from China and adjacent regions have been studied by the serial works of Assing (2006a, b, 2009, 2010, 2015, 2016, 2017, 2019) and Pace (2004, 2008, 2010, 2012).

The biology of the genus *Orphnebius* is poorly known. According to our current knowledge, they are myrmecophiles (Assing 2006). The previous research showed that they have some special behavioral features (Kistner & Klein 1996).

Recently, a new species of the genus *Orphnebius* was collected from Xizang, China, including nine adults and ten third instar larvae. All specimens were collected in a nest of an ant species *Myrmica* sp. The new species is described, figured and compared with its congeners herein.

Material and methods

Materials examined in this study are deposited in the Insect Collection of Shanghai Normal University, Shanghai, China (SHNU, Zhong Peng) and the Insect Collection of Institute of Entomology, Guizhou University, Guizhou, China, (GUGC).

Collecting data of the materials are quoted verbatim. The Chinese translation of each locality below provincial level is included in parentheses at the first appearance in the text. Each type specimen bears the following label: ‘HOLOTYPE (red) (or PARATYPE (yellow)), ♂, *Orphnebius* + specific name *sp. n.*, Jiang, Li & Wang, 2019.’

Habitus images were taken using a Canon 5D SR camera in conjunction with a Canon MP-E 65mm f/2.8 1–5X Macro Lens, and a Canon MT-24EX Macro Twin Flash was used as light source. Images of the morphological details were made using a Canon 5D SR camera in conjunction with a Mitutoyo Plan NIR 10 lens. Zerene Stacker (version 1.04) was used for image stacking. All images were modified and grouped into plates in Adobe Photoshop CS5 Extended.

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The beetle larvae frequently melanized and deformed due to improper preserving methods. In this study, the larvae were fixed in hot water (> 90 °C) for over half a minute, then transferred in to 75% alcohol for further preservation. By this way, the larvae can stay in the original size and devoid of melanization for a long time.

The following abbreviations are applied: AnL—length of antenna; HL—length of head from the anterior clypeal margin to the occipital constriction; HW—width of head across eyes; PL—length of pronotum along the midline; PW—maximum width of pronotum; EL—length of elytra along the suture; EW—maximum width of elytra; AL—length of the dorsally visible part of the abdomen (posterior to elytra) along the midline; AW—maximum width of the abdomen; BL—Length of body is the sum of HL + PL + EL; AdL—length of aedeagus.

Taxonomy

*Orphnebius lilizheni* sp. nov. Jiang, Li & Wang sp. nov. 李氏凹板隐翅虫
(Figs. 1–4)

Type material (9 exs, 3 ♂, 6 ♀). Holotype: CHINA: ♂, labeled ‘China: Xizang, Linzhi City (林芝市), Milin County (米林县), Nanyigou (南伊沟), H: 3166 m, 19.VII.2019, Li Bo-yan leg., in nest of *Tetraponera* sp.’ (SHNU).

Paratypes: CHINA: 2 ♂, 6 ♀. Same label data as the holotype (1 ♂, 2 ♀ SHNU; 1 ♂, 4 ♀ GUGC).

FIGURE 1. Habitus of *Orphnebius lilizheni* sp. nov. A. Male; B. Female.
Description. Male (Figs 1A, 2A–B, D–H, K–M). Body bicolarable, head, pronotum and elytra black, abdomen brown, dorsal surface shiny and without punctures.

Head (Fig. 2A) slightly wider than long, shiny and covered with sparse long hairs. Antenna (Fig. 2B) moderately long and apically asymmetric; antennomere I–V longer than wide, I expanded near apex; II about as long as IV; III long, about 1.5 times as long as II; V shorter than IV; VI about as long as wide; VII–X similar, obviously wider than long; VII–X similar, obviously wider than long; XI of ovoid shape and approximately as long as the combined length of IX–X.

Pronotum (Fig. 2A), about 1.4 times as wide as long; dorsal surface shiny and without punctures and pubescence; lateral margins with several long hairs.

Elytra wider than long; near trapezoid shape; dorsal surface shiny, covered with sparse hairs and small punctures; lateral margins with erect long black hairs. Hind wings present.

Legs simple. All femora black, without modification. Tibiae dark brown, protibiae covered with very dense short hairs, and mesotibiae and metatibiae covered with much sparse short hairs.

Abdominal segments III–VIII reddish brown, III–VII with weakly tapering posteriad, III widest. Posterior margin of tergites III–VI with moderately long black hairs. Tergite VII weakly impressed and in basal 1/3 with transverse row of regular striae, posterior margin of tergite VII with pronounced palisade fringe. Tergite VIII (Fig. 2E) transverse with convex posterior margins and covered with sparse strong setae. Sternite VIII (Fig. 2D) with sparse long setae at posterior margin. IX–X (Figs 2G–H) strongly modified, covered with dense and long hairs.
Media lobe of aedeagus broad and short (Figs 2K–M). Paramere small in relation to median lobe, apical truncate, with two short setae (Fig. 2F).

Measurements. AnL 1.88–1.94 mm, BL 4.94–5.04 mm, HL 0.81–0.84 mm, HW 0.99–1.00 mm, PL 0.78–0.80 mm, PW 1.14–1.17 mm, EL 0.76–0.77 mm, EW 1.88–1.93 mm, AL 2.58–2.63 mm, AW 1.83–1.88 mm, Adl 1.29 mm.

Female (Figs 1B, 2C, I–J) generally similar to male, usually slightly larger. Segments IX–X (Figs 2I–J) distinctly modified, with long and dense setae; spermathecal (Fig. 2C) duct simply bent, proximally straight, neither twisted nor undulate.

FIGURE 3. A. Larva of Orphnebius lilizheni sp. nov., dorsal view; B. Same, lateral view; C. Same, ventral view; D. Myrmica sp., dorsal view; E. Same, lateral view; F. Larva of Myrmica sp.
Measurements. AnL 1.90–1.95 mm, BL 5.00–5.17 mm, HL 0.81–0.84 mm, HW 1.00–1.03 mm, PL 0.80–0.82 mm, PW 1.16–1.19 mm, EL 0.76–0.79 mm, EW 1.88–1.95 mm, AL 2.63–2.73 mm, AW 1.83–1.93 mm.

Larvae (Figs 3A–C, third instar), ivory-white, fat, soft and much weakly osteogenated, more or less resembling the larvae of *Myrmica* sp (Fig. 3F).

**FIGURE 4.** Habitat of *Orphnebius lilizheni* sp. nov. A. Adults and larvae in a nest of *Myrmica* sp.; B. A *Myrmica* sp. ant in nest; C. General environment of the type locality: Baotianman (Xizang, China). La—a larva of the host ant; La—Larva of *Orphnebius lilizheni* sp. nov.; ad—Adults of *Orphnebius lilizheni* sp. nov.

**Comparative Notes.** The new species is similar to *Orphnebius longistriatus* Assing, 2006 and *O. hamatus* Assing, 2006 in general appearance. But *O. lilizheni* sp. nov. has concolorous abdominal segments, while the abdominal segments III–V, VI and VII–VIII are respectively blackish, brown and reddish in *O. longistriatus*. The new species can be distinguished from *O. hamatus* by the different form of median lobe of aedeagus. *O. hamatus* possess a very
large median lobe, and the ventral process is short, broad and apically curved, while the median lobe of the new species is simple and short, and the ventral process of the new species is more strongly curved. The paramere of *O. hamatus* has four long and two short setae while the new species with only two long setae.

**Distribution.** China: Xizang.

**Biological notes.** The adults and larvae of this new species were collected in a nest of *Myrmica* sp. (Figs 4A–B).

**Etymology.** This species is named in honor of Prof. Li-Zhen Li (Shanghai Normal University, Shanghai, China), a famous Chinese insect taxonomist, who works on the Staphylinid beetles for a long time.

**Discussion**

All specimens of the new species, including adults and larvae were found in the nest of *Myrmica* sp. They are ignored by the ants and free from the latter insect’s attack. The larvae are stout with short legs and weakly sclerotized mandible, suggesting that they might have a weak predation ability. The previous research on *Orphnebius kleini* Kistner, 1996 (Kistner & Klein 1996) showed that *O. kleini* exhibits highly developed maternal care behaviors, including prey provisioning and a unique obligate oral feeding to the larvae. The larvae of *O. lilizheni* also coinhabit with the adults in the ant nest, indicating that this species might exhibits similar behavior to *O. kleini*.

In addition, in the same room of the ant nest, the number of the larvae of the new species was found to be more than that of the ant’s larvae. The predation behavior of the new species has probably caused to the reduction of the ant’s population.

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**References**


