



New genus, species, and faunistic records of the tribe Ripidiini (Coleoptera: Ripiphoridae) from the mainland of China

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Abstract

Anatoripidius cylindricus gen. & sp. nov., a new genus and species of Ripidiinae Gerstaecker, 1855 from Guangdong, China, is described and illustrated. The new genus is distinguished from other ripidiine genera by the combined characters that include postocular ommatidia missing, mouthparts strongly reduced, 11-segmented antennae, and others dealing with hind wings, and tarsal formula. A key to the extant genera of Ripidiini from the Palaearctic and Oriental regions is presented. Furthermore, *Ripidius longicollis* (Schilder, 1923) is newly recorded for the mainland of China, as well as redescribed and illustrated.

Key words: wedge-shaped beetle, new genus, new species, new record, China

Introduction

The subfamily Ripidiinae Gerstaecker, 1855, a member of the wedge-shaped beetle family Ripiphoridae, consists of 26 genera (including fossil genera) belonging to two tribes: Eorhipidiini Iablokoff-Khnzorian, 1986 and Ripidiini Gerstaecker, 1855 (Kaupp & Nagel 2001; Batelka & Hájek 2010; Batelka *et al.* 2011; Falin *et al.* 2014a; Cai *et al.* 2018; Vega-Badillo *et al.* 2022). Ripidiini, represented by 24 extant and fossil genera, is characterized by the absence of mandibles, the antennae usually uniflabellate (except filiform in *Protoripidius* Cai, Yin & Huang, 2018 and biflabellate in *Paleoripiphorus* Perrichot, Nel, & Néraudeau, 2004), and male eyes expanded, almost holoptic (Batelka *et al.* 2011; Cai *et al.* 2018; Vega-Badillo *et al.* 2022). Members of the tribe are cockroach parasitoids as larvae, with paedomorphic females and highly modified males as adults (Lawrence *et al.* 2010; Falin *et al.* 2014a, b). Most genera are only identifiable through the winged males, with a challenging association of corresponding females captured in isolation (Batelka *et al.* 2011).

The taxonomy of the extant taxa of Ripidiini in the Palaearctic and Oriental regions is quite limited, especially in China where only two species of *Ripidius* Thunberg, 1806, *R. longicollis* (Schilder, 1923) and *R. pectinicornis* Thunberg, 1806, have been recorded (Batelka 2008; Barclay 2020).

During the insect investigation in the Nanling Mountains and Lingnan area, some specimens of Ripidiini were discovered. After a comparative study with known genera and species, we propose that there is one new genus and species, as well as one newly recorded species for China's mainland. These findings are described and illustrated below.

Material and methods

One male specimen (the holotype) of the new genus and species, and six male specimens of the newly recorded species were examined and have been deposited at the Museum of Hebei University, Baoding, China (MHBU).

The photographs were taken using a Canon EOS 5D Mark III (Canon Inc., Tokyo, Japan) connected to a Laowa EF 100 mm F2.8 CA-Dreamer Macro 2× or Laowa EF 25 mm F2.8 Ultra Macro 2.5–5× (Anhui Changgeng Optics Technology Co., Ltd, Hefei, China). Genitalia were taken using an Olympus BX51 microscope equipped with a Kuy Nice CCD camera and were imported into Helicon Focus v. 7 for stacking. The line drafts were drawn by hand using a Nikon SMZ1500 with a camera lucida. The images were edited using Adobe Photoshop to create the final figure plates. The label data is presented verbatim. Line breaks on labels are denoted by a single slash (/); metadata and notes (not written on the labels, themselves) are presented in square brackets ([]). Scientific names are uniformly presented in italics.

General morphological terminology in the descriptions is from previous literature (e.g., Rivnay 1929; Falin *et al.* 2014a; Vega-Badillo *et al.* 2022).

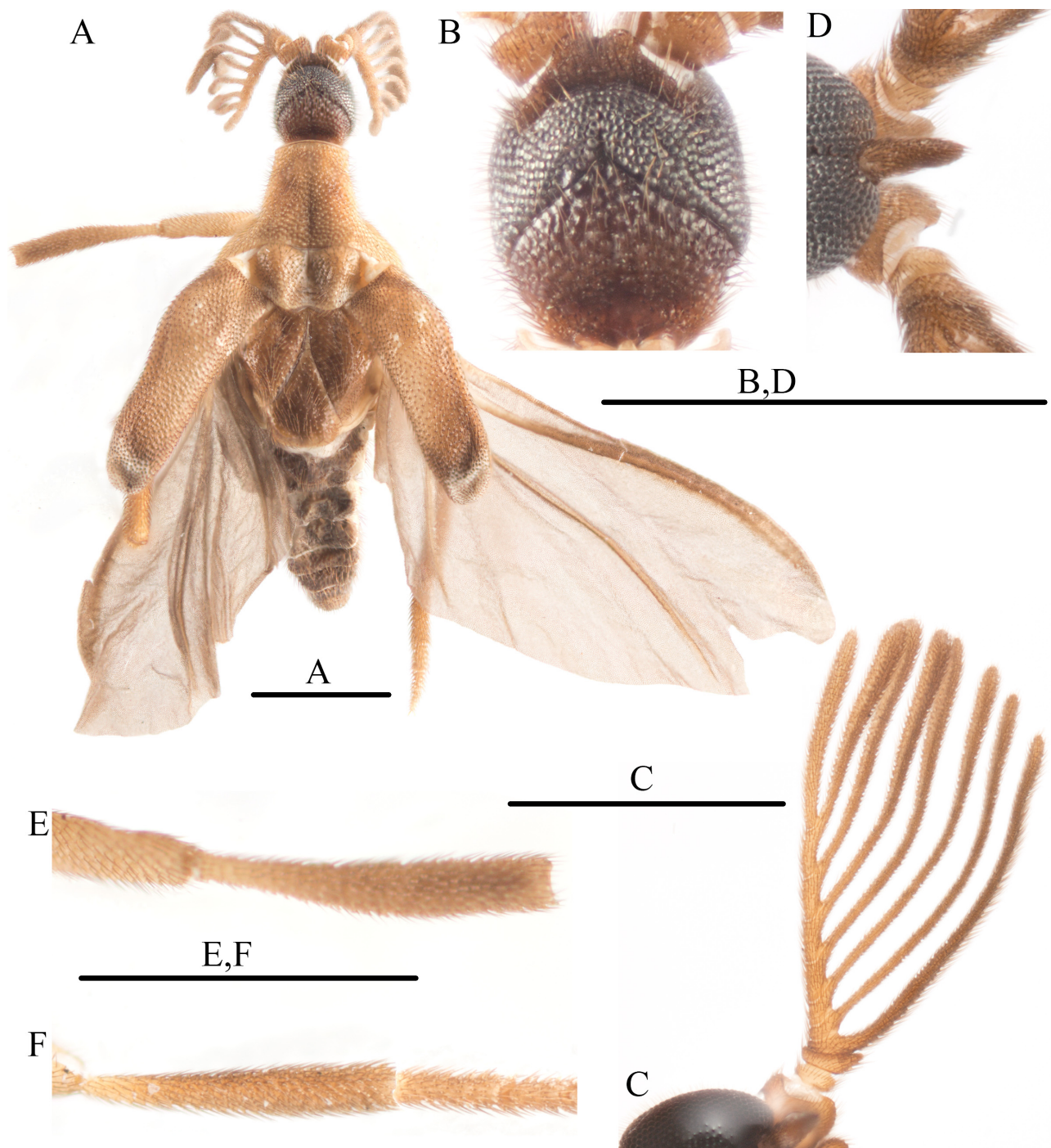


FIGURE 1. *Anatoripidius cylindricus* Jiang & Pan, **sp. nov.**, holotype. **A.** Habitus, dorsal view. **B.** Head, dorsal view. **C.** Antenna, ventral view. **D.** Maxillary palpi, ventral view. **E.** Protibia, lateral view. **F.** Mesotibia, lateral view. Scale bar: 1 mm.

Taxonomy

Anatoripidius Jiang & Pan, gen. nov.

urn:lsid:zoobank.org:act:C87192D1-22D6-49A6-AED7-F7501F1F98AC

Chinese common name: 东蠊大花蚤属

(Figs 1–2)

Type species. *Anatoripidius cylindricus*, new species, by monotypy and present designation.

Diagnosis. *Anatoripidius* is easily distinguishable from other genera of Ripidiini by the combination of following characters: compound eye without ommatidia adjacent to posterior edge (postocular ommatidia); mouthparts strongly reduced, labrum absent, maxillary palpi fused and formed an unpaired tubercle; antennae with 11 antennomeres, last 8 antennomeres uniflabellate; posterior margin of pronotum straight, mesonotal scutellum absent, postscutellum very transverse; hind wings without crossveins; protibia longer than mesotibia; tarsal formula 5-5-4.

Description. *Male.* Head (Fig. 1B) globular, widest at level of compound eyes. Compound eyes large, coarsely faceted, surrounding antennal sockets in a “ring”, without postocular ommatidia. Mouthparts strongly reduced, only consisting of tubercle-like maxillary palpi. Antennae (Fig. 1C) with 11 antennomeres; antennomere I enlarged, rectangular; antennomere II flattened; antennomere III trapezoidal, small, and flat; antennomeres IV–X with uniflabellate rami; last antennomere uniflabellate, without ramous.

Pronotum (Fig. 2A, B) trapezoidal, anterior and posterior margins straight, posterior angles acute; disc without longitudinal depressions or impressions. Mesothorax small, mesonotal scutellum absent. Metathorax strongly enlarged, postcoxal lines present. Elytra elongate, cylindrical, with apical spot, not completely covering hind wings and abdomen (Fig. 1A); hind wings without crossveins. Legs long and thin, without tibial spurs; protibia longer than mesotibia; tarsal formula 5-5-4; claws simple.

Abdomen with seven ventrites, sternite I membranous and invisible, sternites II–VIII largely sclerotized; posterior margin of last ventrite (sternite VIII) truncate. Male genitalia (Fig. 2C–H) with lower sclerotization.

Female. Unknown.

Etymology. The new genus name is from the Latin word “*anatole*” for “east” and *Ripidius*, in reference to the genus discovery in the Oriental region. This generic name is masculine.

Distribution. South China.

Remarks. The new genus is strongly characterized by the general features of Ripidiini. Combined features of number of antennomeres and strongly reduced mouthparts, makes *Anatoripidius* gen. nov. morphologically similar to the Australian genus *Rhipidioides* Riek, 1955 and the Southeast Asian genus *Pseudorhipidius* Chobaut, 1894. However, the hind wings of *Rhipidioides* bear crossveins and a more complex venation (crossveins absent in *Anatoripidius*), while a mesoscutellum is present in *Pseudorhipidius* (absent in *Anatoripidius*).

There is little comparative research on the male genitalia of the subfamily Ripidiinae. The male genitalia may generally lack diagnostic characteristics at the species level, and this may be also the case among genera with close phylogenetic relationships within the tribe (Falín *et al.* 2014b).

Till now, seven extant genera of the tribe Ripidiini were recorded in the Palearctic and Oriental regions. To facilitate the identification, a brief key is proposed here.

Key to Ripidiini genera from the Palearctic and Oriental regions (males)

1. Tarsal formula 4-4-4. 2
- Tarsal formula 5-5-4. 3
2. Antennae with 6 antennomeres; mesonotal scutellum reduced to a bulge on posterior edge of mesonotal disc.
 *Falsorhipidius* Pic, 1947
- Antennae with 8 antennomeres; mesonotal scutellum absent *Neopauroripidius* Falín & Engel, 2014
3. Antennae with 10 antennomeres; pronotum with a deep U-shaped impression *Blattivorus* Chobaut, 1891
- Antennae with 11 antennomeres; pronotum without U-shaped impression. 4
4. Compound eyes with postocular ommatidia; maxillary palpi 2-segmented, unfused 5
- Compound eyes without postocular ommatidia; maxillary palpi fused, forming an unpaired tubercle. 6
5. Compound eyes with 2 postocular ommatidia *Rhipidocyrtus* Falín & Engel, 2014
- Compound eyes with 4 postocular ommatidia *Ripidius* Thunberg, 1806
6. Posterior angles of pronotum blunt; mesonotal scutellum present. *Pseudorhipidius* Chobaut, 1894
- Posterior angles of pronotum acute; mesonotal scutellum absent *Anatoripidius* gen. n.

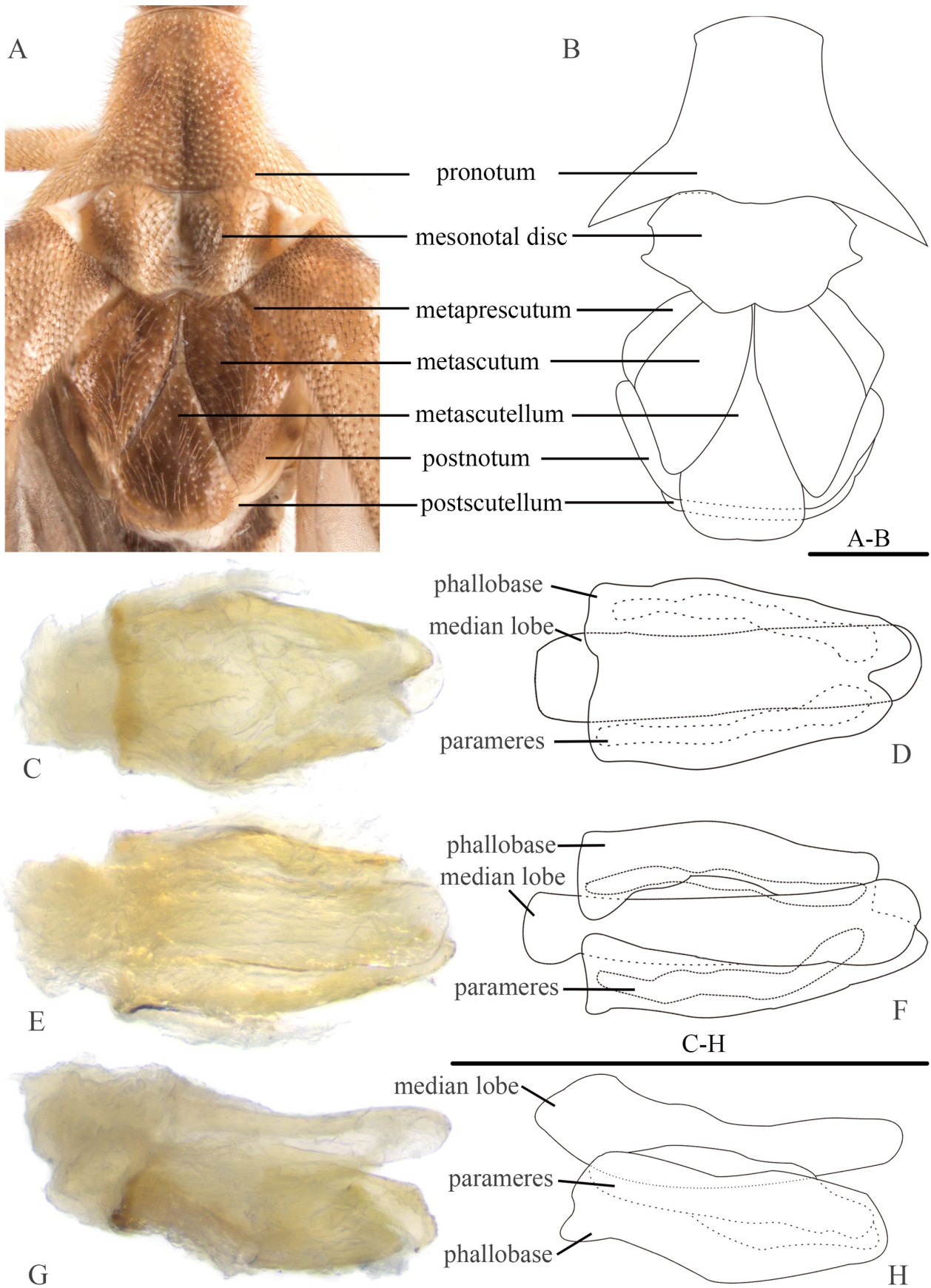


FIGURE 2. *Anatoripidius cylindricus* Jiang & Pan, **sp. nov.**, holotype. **A, B.** Thorax, dorsal view. **C–H.** Male genitalia, dorsal view (C–D), ventral view (E–F), and lateral view (G–H). **A, C, E, G.** Photograph. **B, D, F, H.** Line draft. Scale bar: 0.5 mm.

***Anatoripidius cylindricus* Jiang & Pan, sp. nov.**

urn:lsid:zoobank.org:act:B5E9BDDC-CFDF-442A-A57F-7A8976B397BA

Chinese common name: 颞东蠊大花蚤

(Figs 1–2)

Type material. HOLOTYPE: CHINA: ♂ (MHBUS), with the following labels: “车八岭保护区始兴县 [China, Guangdong, Shixing County, Chebaling Nature Reserve] / E114°15'28.60" N24°42'44.55" / 2020.V.23–VI.12 MT-5”, “HOLOTYPE / *Anatoripidius cylindricus* n. gen. & sp. / Det. Jiang & Pan”.

Diagnosis. This is the only known species of *Anatoripidius* which may be recognized by the generic diagnostic traits given above.

Description. *Male.* Body (Fig. 1A) sandy-yellow, but head reddish brown, pro-, mesonotum, and elytra ochraceous, apical portion of elytra white. Body densely covered by golden setae. Body length (base of antennae to apex of abdomen): 4.10 mm; width (maximum width of metathorax): 1.68 mm.

Head (Fig. 1B) globular, longer than wide (0.7 mm vs. 0.58 mm), densely and finely punctured. Occipital slightly elevated above margin of pronotum. Compound eyes separated by narrow midline in dorsal and ventral view, dorsal length approximately 0.23× of head, setae inserted among ommatidia. Antennal sockets tightly contact; antennae (Fig. 1C) approximately 1.5 mm in length, distinctly longer than head; antennomere I rectangular, wider than long; antennomere II oblong; antennomere III bald, elongated trapezoid-shaped, antennomeres IV–X bearing long uniflabellate rami, antennomere XI flat and fan-shaped without ramus; length ratio of stems of antennomeres III–XI: 0.6: 0.5: 0.5: 0.9: 1.6: 1.7: 1.7: 1.9: 8.6, rami subequal in length, gradually widen from base to tip. Maxillary palpi (Fig. 1D) unpaired, fused, forming rod-like structure.

Pronotum (Fig. 2A, B) trapezoid in shape, wider than long (1.33 mm vs. 0.72 mm); with dense and regular punctures, each puncture bearing a seta; anterior and posterior margins straight, posterior angles sharp. Mesonotal disc (Fig. 2A, B) rectangular, with dense and small punctures, anterior and posterior margins deeply concave in middle. Metascutum (Fig. 2A, B) strongly raised and adjacent; metascutellum acute anteriorly, drop-shaped, with shallow, sparse punctures. Elytra with long and dense setae, widely separated, longer than 3× of pronotum, truncate at base, and blunt at apex, covered by dense and regular punctures. Hind wings largely exposed, without crossveins. Legs slender and elongate; protibiae (Fig. 1E) (1.09 mm) longer than mesotibiae (Fig. 1F) (0.89 mm).

Abdomen (Fig. 1A) elongate oval (1.65 mm in length), with small and dense punctures. Aedeagus as in Fig. 2C–H; phallobase truncate basally and emarginate apically; parameres asymmetric, left side smaller than right; median lobe extremely simple, and bends towards ventral.

Female. Unknown.

Etymology. From the Latin adjective “*cylindricus*” for “cylindrical”, in reference to the maxillary palps reduced to an unpaired cylindrical tubercle.

Distribution. China: Guangdong.

Remarks. The specimen was collected using a Malaise trap.

Genus *Ripidius* Thunberg, 1806

Chinese common name: 蠊大花蚤属

***Ripidius longicollis* (Schilder, 1923)**

Chinese common name: 长颈蠊大花蚤

(Figs 3–4)

Ripidius longicollis Schilder 1923: 203 [Type locality: Sokotsu (Banshoryo-Distr.), located in Taiwan, China. Type depository: Martin-Luther-Universitat, Halle, Germany]; Hua 2002: 129.

Ripidius longicollis: Batelka 2008: 75; Barclay 2020: 61.

Material examined. 5 ♂♂ (MHBUS), with the following label: “LSX703 广东茂名云开山 [China, Guangdong, Maoming, Mt. Yunkaishan] / GD33. elev. 1480 m / 22°17'40.72"N 111°12'37.97"E / 2020.V.29–VII.04. 陈龙龙等 [Long-Long Chen *et al.* leg.]”; 1 ♂ (MHBUS), with the following label: “LSX966 广东茂名云开山 [China, Guangdong, Maoming, Mt. Yunkaishan] / GD333. elev. 1480 m / 22°17'40.22"N 111°12'37.97"E / 2020.VIII.31–IX.27. 陈龙龙等 [Long-Long Chen *et al.* leg.]”.

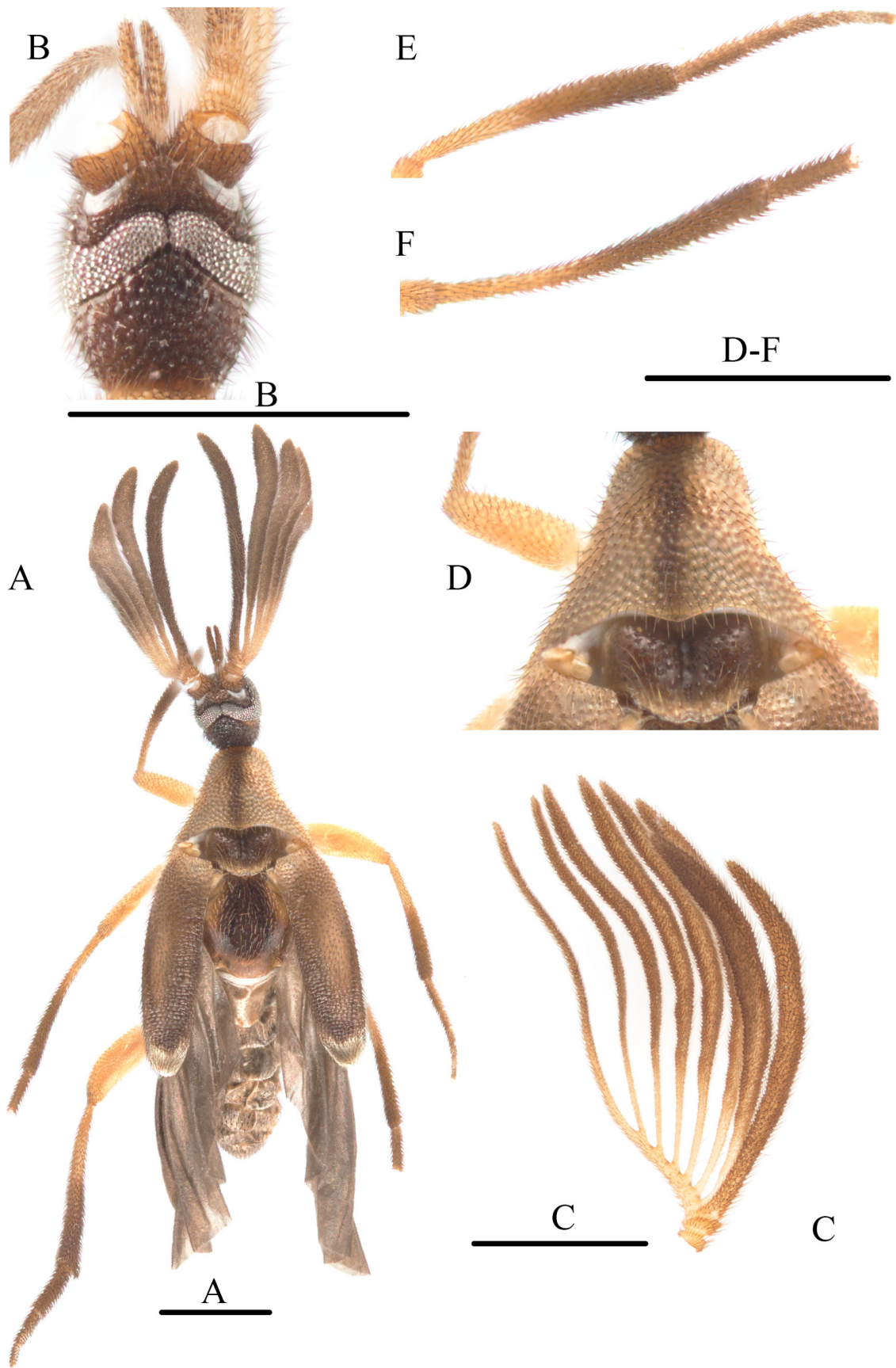


FIGURE 3. *Ripidius longicollis* (Schilder, 1923), ♂, from Guangdong. **A.** Habitus, dorsal view. **B.** Head, dorsal view. **C.** Antenna, ventral view. **D.** Pronotum, dorsal view. **E.** Protibia, lateral view. **F.** Mesotibia, lateral view. Scale bar: 1 mm.

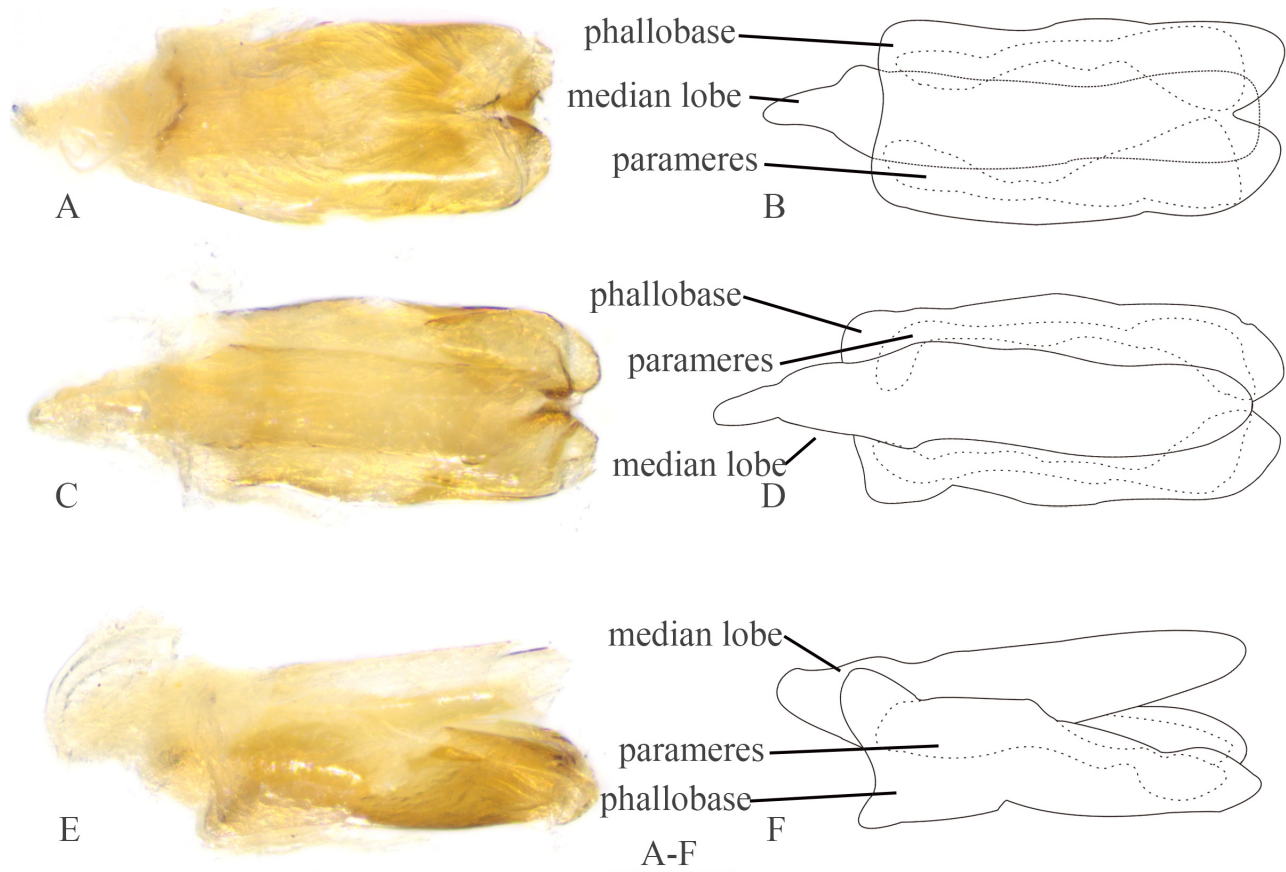


FIGURE 4. Male genitalia of *Ripidius longicollis* (Schilder, 1923), from Guangdong. **A–B.** Dorsal view. **C–D.** Ventral view. **E–F.** Lateral view. **A, C, E.** Photograph. **B, D, F.** Line draft. Scale bar: 0.5 mm.

Description. *Male.* Body length: 4.7–5.1 mm, width (maximum width of metathorax): 1.28–1.78 mm. Body (Fig. 3A) dark brown: stems of antennae yellow, longitudinal midline of pronotum brown, elytra brown but white at apex, thorax pale yellow in ventral view, femora and base of tibiae yellowish brown. Body covered by dense and regular punctures and long setae; setation yellow but brownish black on pronotum. Head (Fig. 3B) longer than wide; compound eyes large, dorsal length approximately 0.16× of head, separated by midline in dorsal and ventral view; setae inserted among ommatidia. Antennae (Fig. 3C) long, antennomeres IV–X bearing flat and long rami, gradually widen from base to tip, antennomere XI long without ramus. Pronotum (Fig. 3D) wider than long, anterior margin straight, posterior margin slightly protuberant in middle. Elytra approximately 4.0× as long as pronotum, scattered with regular punctures. Mesonotal disc (Fig. 3A) heart-shaped, with sparse punctures. Metascutellum (Fig. 3A) with shallow, sparse punctures. Protibiae (Fig. 3E) shorter than mesotibiae (Fig. 3F). Abdomen with seven ventrites, with dense punctures; aedeagus as in Fig. 4; lateral view of median lobe almost flat (Fig. 4E, F), slightly downward and not pronounced.

Female. Unknown.

Distribution. China: Guangdong, Taiwan. **New record for China’s mainland.**

Remarks. The specimens were collected using the Malaise trap.

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中国大陆蠃大花蚤族Ripidiini (鞘翅目：大花蚤科) 一新属种及新记录

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摘要: 描述中国广东蠃大花蚤亚科Ripidiinae一新属新种, 即颞东蠃大花蚤 *Anatoripidius cylindricus* gen. et sp. nov.; 新属根据复眼后小眼、口器、触角、后翅、跗节式等综合特征与蠃大花蚤族其他属区分; 提供了古北和东洋区蠃大花蚤族现生属检索表。此外, 记述中国大陆一新纪录种——长颈蠃大花蚤 *Ripidius longicollis*。还提供了两个物种的整体照和特征图。

关键词: 大花蚤; 新属; 新种; 新记录; 中国