



## Definition of the *Ichthyurus davidi* species group (Coleoptera: Cantharidae), with description of new species and additional faunistic records from China

WEN-WEN ZHANG<sup>1,4</sup>, HAO-YU LIU<sup>1,2,5</sup>, XING-KE YANG<sup>3,6</sup> & YU-XIA YANG<sup>1,2\*</sup>

<sup>1</sup>Key Laboratory of Zoological Systematics and Application of Hebei Province, College of Life Sciences, Hebei University, Baoding 071002, Hebei, China

<sup>2</sup>Hebei Basic Science Center for Biotic Interaction, Hebei University, Baoding 071002, Hebei, China

<sup>3</sup>State Key Laboratory of Animal Biodiversity Conservation and Integrated Pest Management, Institute of Zoology, Chinese Academy of Sciences, Beijing 100101, China

<sup>4</sup>✉ [2394780125@qq.com](mailto:2394780125@qq.com); <https://orcid.org/0009-0008-5766-1316>

<sup>5</sup>✉ [liuhy@hbu.edu.cn](mailto:liuhy@hbu.edu.cn); <https://orcid.org/0000-0003-1383-5560>

<sup>6</sup>✉ [yangxk@ioz.ac.cn](mailto:yangxk@ioz.ac.cn); <https://orcid.org/0000-0003-3676-6828>

\*Corresponding author: ✉ [yxyang@hbu.edu.cn](mailto:yxyang@hbu.edu.cn); <https://orcid.org/0000-0002-3118-6659>

### Abstract

The *Ichthyurus davidi* species group is proposed based on the anatomical comparison. It comprises a total of nine species, including *I. davidi* Gestro, 1892, *I. senensis* Pic, 1926, *I. laniger* Gestro, 1891, *I. platyurus* Gestro, 1906, *I. bisignatus* Pic, 1926, *I. maculicollis* Gestro, 1888 (new record to China), *I. luctuosus* Gestro, 1891 (new record to China), *I. vitalisi* Gestro, 1918 (new record to China), and *I. medogensis* sp. nov. (China: Xizang). These species are illustrated with habitus and genital segments of both sexes, mesothoracic legs and aedeagus of the male, as well as internal genitalia of the female. A key for identification and a distribution map of this species group are provided.

**Key words:** *Ichthyurus*, new species, new faunistic records, China

### Introduction

*Ichthyurus* Westwood, 1848 is the largest genus within the tribe Ichthyurini of the beetle family Cantharidae, comprising approximately 200 species worldwide (Delkeskamp 1977; Brancucci 1983, 2009; Li *et al.* 2014; Li & Gao 2015; Lin *et al.* 2024a, b, 2025a, b; Zhang *et al.* 2025). To facilitate the taxonomy of this speciose genus, we have adopted the concept of species group, as done for other genera of cantharid beetles (e.g., Okushima 2005; Yang *et al.* 2019a, b; Ge *et al.* 2021; Lin *et al.* 2025b). Until now, we have established three species groups within *Ichthyurus*, including the *I. bourgeoisi* group and the *I. vandepolli* group (Lin *et al.* 2024a), as well as the *I. feae* group (Lin *et al.* 2025a).

During our recent study, we recognized another species group that is similar to the *I. feae* group, characterized by the strongly swollen mesofemora in males, while it can be easily differentiated from the latter by the short latero-apical projections on terminal abdominal tergite in the appearance. Furthermore, a close examination of the specimens revealed their distinct characteristics in both the terminal abdominal ventrite and aedeagus. Based on these differences, we propose herein the establishment of the *I. davidi* species group. This group includes several previously known species (Zhang *et al.* 2025), along with new faunistic records and an unknown species discovered from China. These findings will enhance our understanding of the species diversity within the genus *Ichthyurus*.

### Material and methods

The studied materials are preserved in the following collections:

**CAU** Entomological Museum, China Agriculture University, Beijing, China;

**IZCAS** Institute of Zoology, Chinese Academy of Sciences, Beijing, China;

**MGI** Museo Civico di Storia Naturale “Giacomo Doria”, Genova, Italy;  
**MHBU** Museum of Hebei University, Baoding, China;  
**NHMB** Naturhistorisches Museum Basel, Switzerland.

First, the specimen was softened in water, after which the reproductive organs and associated structures of both male and female individuals were carefully dissected. Following dissection, the aedeagus was immersed in a 10% sodium hydroxide solution and subsequently heated in a metal water bath at 90 °C for one minute, and finally affixed to a paper card for long-term preservation. The female reproductive organs underwent staining with hematoxylin, were observed in a 75% ethanol solution, and ultimately preserved in glycerol. For each species, at least one specimen was selected for these anatomical operations. If any damage occurs during dissection, additional specimens must be procured to ensure data accuracy. In cases where a species exhibits broad geographical distribution, it is imperative that at least one specimen from each region is included for comparative studies. Images of the adults were captured using a Canon EOS 80D digital camera, while those of the anatomical organs obtained with a Leica M205A. All of the images were stacked in Helicon Focus 8 software and edited utilizing Adobe Photoshop 2022.

Morphological terminology used in this study mainly follows that of Brancucci (1980). Body length is measured from the front of head to apices of the latero-apical projections on terminal abdominal tergite and width at humeri of conjoint elytra. Interocular distance is measured at the minimal part between eyes, and diameter of an eye at its maximal part.

Complete label data are listed for type specimens of the previously known species, using square brackets “[ ]” for our remarks and comments, [p] indicating that the following data are printed and [h] that they are handwritten. Quotation marks are used to separate data from different labels and a backslash “/” to separate data from different lines of the same label. For the additional specimens, quotation marks are used if their original labels are written in English. All the labels written in Chinese are transliterated into English.

The geographic data was collected from a relevant publication (Zhang *et al.* 2025) and the material in this study. The distribution map was compiled using ArcMap 10.8 software and edited in Adobe Photoshop 2022.

## Taxonomy

**Class Insecta Linnaeus, 1758**

**Order Coleoptera Linnaeus, 1758**

**Family Cantharidae Imhoff, 1856 (1815)**

**Subfamily Chauliognathinae LeConte, 1861**

**Tribe Ichthyurini Champion, 1915**

**Genus *Ichthyurus* Westwood, 1848**

### *Ichthyurus davidi* species group

**Diagnosis.** Body medium and large size (9.0–14.0 mm). Antennae (Figs 2, 7; Zhang *et al.* 2025: figs 1, 5, 12A, B) filiform and simple in both sexes. Pronotum (Figs 2, 7; Zhang *et al.* 2025: figs 1, 5, 12A, B) transverse, wider than long, widest near posterior margin. Mesotrochanters usually with two small teeth in male (Fig. 3; Zhang *et al.* 2025: figs 2B, 4A, 6A, D, E), mesofemora strongly swollen, mesotibiae usually with a finger-like protrusion at inner apex, while all simple in female (Fig. 7B, D; Zhang *et al.* 2025: figs 1B, D, 5B, D, 12B). Terminal abdominal tergite (or tergite VIII) of male with postero-lateral projections stout and short, no more than half length of the tergite (Figs 4A, C, 9A, E; Zhang *et al.* 2025: figs 2C, 4C, 7C, 11C, 13C). Terminal abdominal ventrite (or sternite VIII) of male trilobed, with latero-apical lobes more or less diverging posteriorly, of which both inner and outer apical angles acute at apices and directed inwards (Figs 4B, D, 9B, F; Zhang *et al.* 2025: figs 2E, 4E, 7E, 11E, 13E). Proctiger small and completely surrounded by paraproct, which is simple at lateral margins (Figs 4A, C, 9A, E; Zhang *et al.* 2025: figs 2C, 4C, 7C, 11C, 13C). Aedeagus (Figs 6, 10; Zhang *et al.* 2025: figs 3, 9, 14A–D): left paramere distinctly longer than right paramere, hooked at apex; right paramere usually conical, acute at apex; setiferous extension mostly very short and tuberos projection-like, sometimes almost invisible, except for a few well-developed (Zhang *et al.* 2025: figs 3A–D, 9A–D, 14A–D); median lobe feebly longer than or nearly as long as tegmen, more or less rounded at apex.

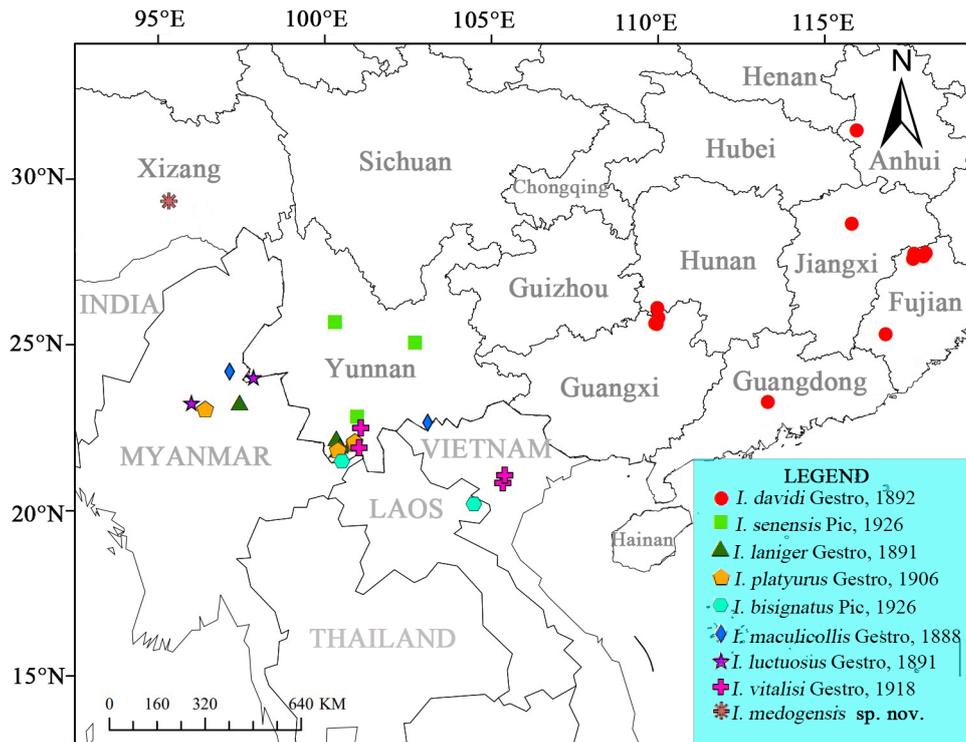


FIGURE 1. Distribution map of the *Ichthyurus davidi* species group.

**Included species.** *I. davidi* Gestro, 1892, *I. senensis* Pic, 1926, *I. laniger* Gestro, 1891, *I. platyurus* Gestro, 1906, *I. bisignatus* Pic, 1926, *I. maculicollis* Gestro, 1888, *I. luctuosus* Gestro, 1891, *I. vitalisi* Gestro, 1918 and *I. medogensis* sp. nov.

**Distribution.** (Fig. 1). China (Anhui, Fujian, Guangxi, Jiangxi, Guangdong, Yunnan, Xizang), N. Vietnam, N. Myanmar.

### *Ichthyurus davidi* Gestro, 1892

*Ichthyurus davidi* Gestro, 1892: 1038; Zhang *et al.* 2025: 184, figs 1C–D, 3E–H, 4, 8B.

**Distribution.** China (Anhui, Fujian, Guangxi, Jiangxi, Guangdong).

### *Ichthyurus senensis* Pic, 1926

*Ichthyurus senensis* Pic, 1926: 5; Zhang *et al.* 2025: 180, figs 1A, B, 2, 3A–D, 8A.

**Distribution.** China (Yunnan).

### *Ichthyurus laniger* Gestro, 1891

*Ichthyurus laniger* Gestro, 1891: 581, fig. 42; 1906: 272, fig. 15; Zhang *et al.* 2025: 190, figs 5C, D, 6B–D, 8D, 9E–H, 11.

**Distribution.** China (Yunnan), N. Myanmar.

### *Ichthyurus platyurus* Gestro, 1906

*Ichthyurus platyurus* Gestro, 1906: 295, figs 18–20; Zhang *et al.* 2025: 186, figs 5A, B, 6A, 7, 8C, 9A–D, 10A.

**Distribution.** China (Yunnan), N. Myanmar.

### *Ichthyurus bisignatus* Pic, 1926

*Ichthyurus bisignatus* Pic, 1926: 5; Zhang *et al.* 2025: 195, figs 6E, 8E, 10B, 12A, B, 13, 14A–D.

**Distribution.** China (Yunnan), N. Vietnam.

### *Ichthyurus maculicollis* Gestro, 1888

(Figs 2A, 3A, 4A, B, 5A, 6A–D)

*Ichthyurus maculicollis* Gestro, 1888: 119; 1891: 560.

**Type material examined.** Holotype ♂ (MGI), [p] “Bhamò / Birmania / Fea X. 1886”, [p] “TYPUS”, [h] “maculicollis / Gestro”.

**Additional material examined.** China: Yunnan: 1 ♂ (IZCAS), Jinping, Mengla, 400 m, 24.IV.1956, leg. Keren Huang; 3 ♂♂ (IZCAS), Jinping, Mengla, 400 m, 25.IV.1956, leg. Keren Huang.

**Redescription.** Body length: 8.9–9.5 mm; body width: 1.9–2.0 mm.

Male (Fig. 2A). Coloration. Body black, head yellow, with a black marking on vertex, antennomeres I–III yellow ventrally, pronotum yellow with a black butterfly-shaped marking in the middle of disc, scutellum yellow, legs yellow at coxae, trochanters, basal 2/3 parts of profemora, 1/4 parts of mesofemora and 1/2 parts of metafemora, abdomen yellow posteriorly and laterally.

Eyes moderately protruding, interocular distance about 0.5 times of diameter of an eye. Antennae reaching elytral apex, antennomeres II about 1/3 length of I, III–XI subequal in length and about 3.0 times longer than II.

Pronotum 1.2 times wider than long, anterior margin arcuate, lateral margins feebly diverging posteriorly, posterior margin slightly bisinuate, anterior angles confluent with anterior margin, posterior angles nearly rectangular.

Elytra 1.6 times longer than wide, about 2.5 times longer than pronotum, with outer margins nearly straight, inner margins nearly straight and diverging posteriorly at apical 2/3 parts, distance between inner margins as wide as apical width of an elytron, apices rounded.

Mesofemur (Fig. 3A) 2.7 times longer than wide, nearly even in width in lateral view, with a very small acute tooth at base and a large sharp tooth at apical 1/3 portion; mesotibia (Fig. 3A) even in width and longitudinally ridged along whole length, feebly truncate at apex; mesotarsomere I lengthened, and ca. 1.6 times longer than II (Fig. 3A).

Terminal abdominal tergite (Fig. 4A) about 1.4 times longer than wide, with postero-lateral projections about 1/3 length of the tergite, slightly arcuate at both inner and outer margins. Proctiger (Fig. 4A) semicircle and evenly sclerotized; paraproct (Fig. 4A) strongly developed and tubular, distinctly shrunk apically, hardly emarginate in the middle of dorso-posterior margin, tergal flange (destroyed and missing).

Terminal abdominal ventrite (Fig. 4B) with latero-apical lobes trapezoid, nearly as long as wide, sinuate and diverging posteriorly at inner margins, moderately arcuate and converging posteriorly at outer margins, inner apical angles nearly rectangular, outer apical angles rounded at apices, triangularly emarginate at posterior margins.

Abdominal sternite IX (Fig. 5A) moderately sclerotized and nearly triangular, about 1.2 times longer than wide, with posterior margin almost confluent with posterior right and left angles, as well as right margin, anterior right angle beak-shaped and left angle strongly protruding anteriorly, slightly expanded and rounded at apex.

Aedeagus (Fig. 6A–D): left paramere abruptly narrowed and vertically stepped at the middle part and hooked at apex (Fig. 6A, D), 2.0 times longer than wide; right paramere 1/3 shorter than left paramere, conical and acute at apex, weakly sclerotized at basal part of inner side, (Fig. 6A, D); setiferous extension small and tumorous projection-like (Fig. 6B, C); median lobe slightly longer than tegmen, widely rounded at apex (Fig. 6A–D).

**Distribution.** China (Yunnan), N. Myanmar.



FIGURE 2. Male habitus, dorsal view. A. *Ichthyurus maculicollis* Gestro, 1888. B. *I. medogensis* sp. nov. Scale bars: 2.0 mm.

***Ichthyurus luctuosus* Gestro, 1891**  
(Figs 3B, 4C–F, 5B, 6E–H, 7A, B, 8A)

*Ichthyurus luctuosus* Gestro, 1891: 562; 1906: 271, fig. 8.

**Type material examined.** Holotype ♂ (MGI), [p] “Carin Chebà / 900 – 1100. m. / L. Fea V XII-88”, [h] “luctuosus / Gestro”, [p] “TYPUS”.

**Additional material examined. China:** Yunnan: 4 ♂♂, 1 ♀ (IZCAS), Ruili, 8.VI.1956, 1460 m, leg. Tianrong Huang.

**Redescription.** Body length: (both sexes): 13.4–14.0 mm; body width (both sexes): 2.0 mm.

Male (Fig. 7A). Coloration. Body black, antennomeres I–III yellow ventrally, pronotum yellow at anterior and posterior angles, and a small semicircular portion before the middle of posterior margin, as well as posterior margin, scutellum yellow, elytra yellow at humeri, with a pair of yellow triangular markings at inner apical 1/3 portions, legs yellow at trochanters and basal parts of pro- and meta-femora, abdomen yellow posteriorly and laterally.

Eyes moderately protruding, interocular distance about 0.6 times of diameter of an eye. Antennae extending to posterior margin of abdominal tergite II, antennomeres II about 1/3 length of I, III–XI subequal in length and about 2.8 times longer than II.



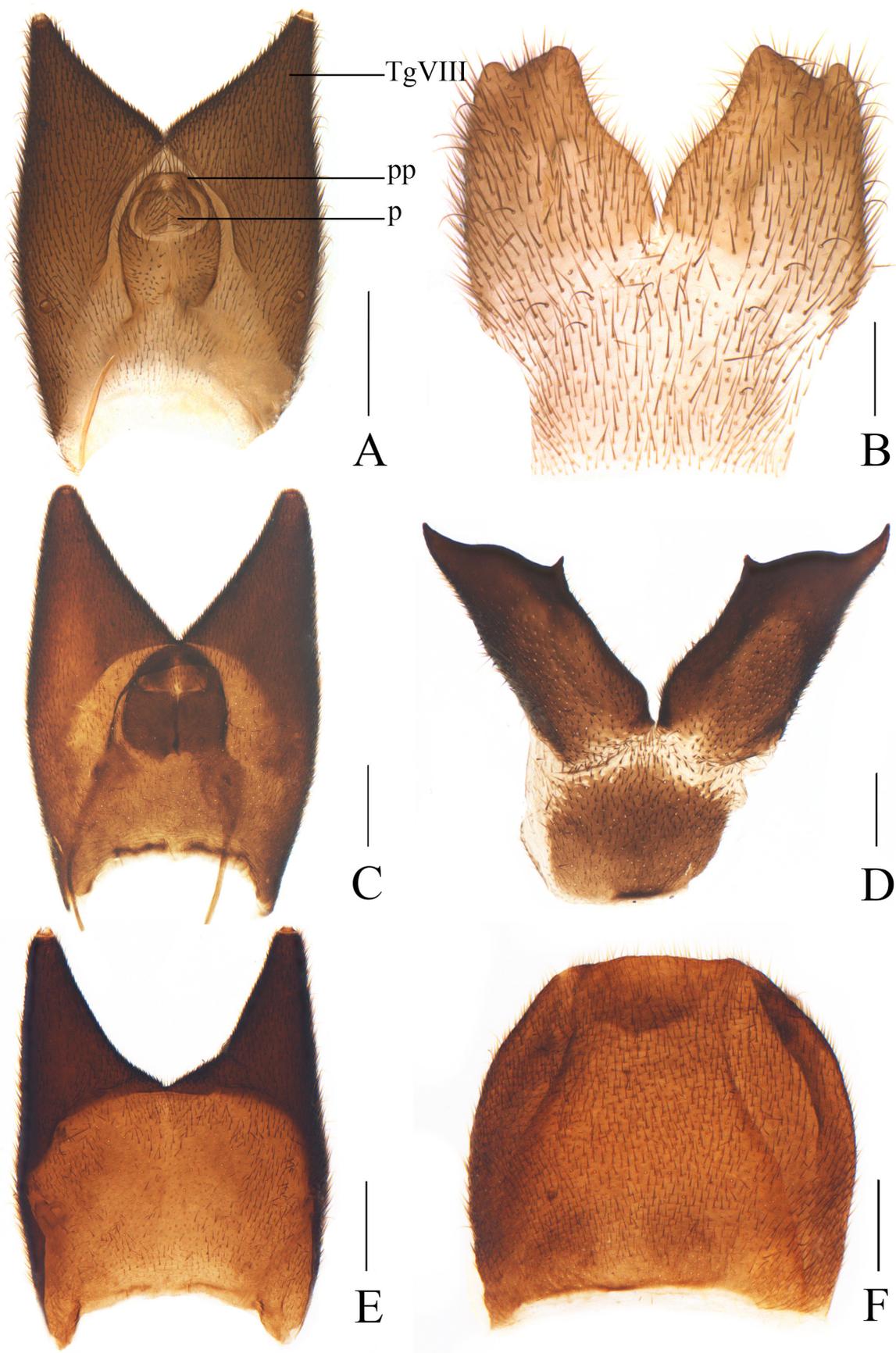
**FIGURE 3.** Mesothoracic legs of male, lateral views. **A.** *Ichthyurus maculicollis* Gestro, 1888. **B.** *I. luctuosus* Gestro, 1891. **C.** *I. vitalisi* Gestro, 1918. **D.** *I. medogensis* sp. nov. Scale bars: 0.5 mm.

Pronotum 1.5 times wider than long, anterior margin slightly arcuate, lateral margins feebly diverging posteriorly, posterior margin feebly sinuate, anterior angles confluent with anterior margin, posterior angles nearly rectangular.

Elytra 1.4 times longer than wide, about 2.8 times longer than pronotum, with outer margins nearly straight, inner margins nearly straight and diverging posteriorly at apical 2/3 parts, distance between inner margins as wide as apical width of an elytron, apices rounded.

Mesofemur (Fig. 3B) 1.6 times longer than wide, widest near the middle portion in lateral view, with a pair of small and acute teeth at base; mesotibia (Fig. 3B) obliquely truncate and longitudinally ridged along apical half part of inner margin, with a finger-like protrusion at inner apex; mesotarsomere I ca. 1.5 times longer than II (Fig. 3B).

Terminal abdominal tergite (Fig. 4C) about 1.4 times longer than wide, with postero-lateral projections about 1/2 length of the tergite, slightly arcuate at inner margins, and moderately arcuate at outer margins. Proctiger (Fig. 4C) semicircle and slightly sclerotized; paraproct (Fig. 4C) strongly developed and tubular, moderately shrunk



**FIGURE 4.** Genital segments (A, C, E: terminal abdominal tergite; B, D, F: terminal abdominal ventrite), ventral view. **A, B.** *I. maculicollis* Gestro, 1888. **C–F.** *I. luctuosus* Gestro, 1891. **A–D.** male; **E, F.** female. Abbreviations: TgVIII: abdominal tergite VIII; pp: paraproct; p: proctiger. Scale bars: 0.5 mm.



**FIGURE 5.** Abdominal sternite IX of male, dorsal view. **A.** *I. maculicollis* Gestro, 1888. **B.** *I. luctuosus* Gestro, 1891. **C.** *I. vitalisi* Gestro, 1918. Scale bars: 0.2 mm.

apically, hardly emarginate in the middle of dorso-posterior margin, tergal flange moderately sclerotized, expanded at base and narrowly protruding apically.

Terminal abdominal ventrite (Fig. 4D) with latero-apical lobes nearly rectangular, about twice longer than wide, nearly straight and parallel at inner and outer margins, inner apical angles feebly protruding while outer apical angles strongly protruding, both acute at apices, feebly arcuate at posterior margins.

Abdominal sternite IX (Fig. 5B) moderately sclerotized and nearly trapezoid, about 1.7 times longer than wide, with posterior margin straight, left margin bisinuate, posterior right and left angles nearly rectangular, anterior right angle elongate beak-shaped and left angle strongly protruding anteriorly, distinctly expanded and truncate at apex.

Aedeagus (Fig. 6E–H): left paramere abruptly narrow at apical 1/3 part and largely hooked at apex (Fig. 6E, H), 3.0 times longer than wide; right paramere 1/3 shorter than left paramere, slender and hooked at apex, evenly sclerotized along whole length (Fig. 6E, H); setiferous extension very short and tumorous projection-like (Fig. 6E, H); median lobe nearly as long as tegmen, narrowly rounded at apex (Fig. 6E–H).

Female (Fig. 7B). Similar to male, but body larger, eyes less protruding, mesothoracic legs slender and simple; terminal abdominal tergite (Fig. 4E) about 1.4 times longer than wide, with postero-lateral projections about 1/3 length of the tergite; terminal abdominal ventrite (Fig. 4F) 1.1 times wider than long, nearly straight at posterior margin, widely rounded at lateral margins which confluent with latero-apical angles. Internal organ of reproductive system (Fig. 8A): bursa copulatrix elongate tube-shaped at apex; accessory gland even in width at apical 3/4 part.

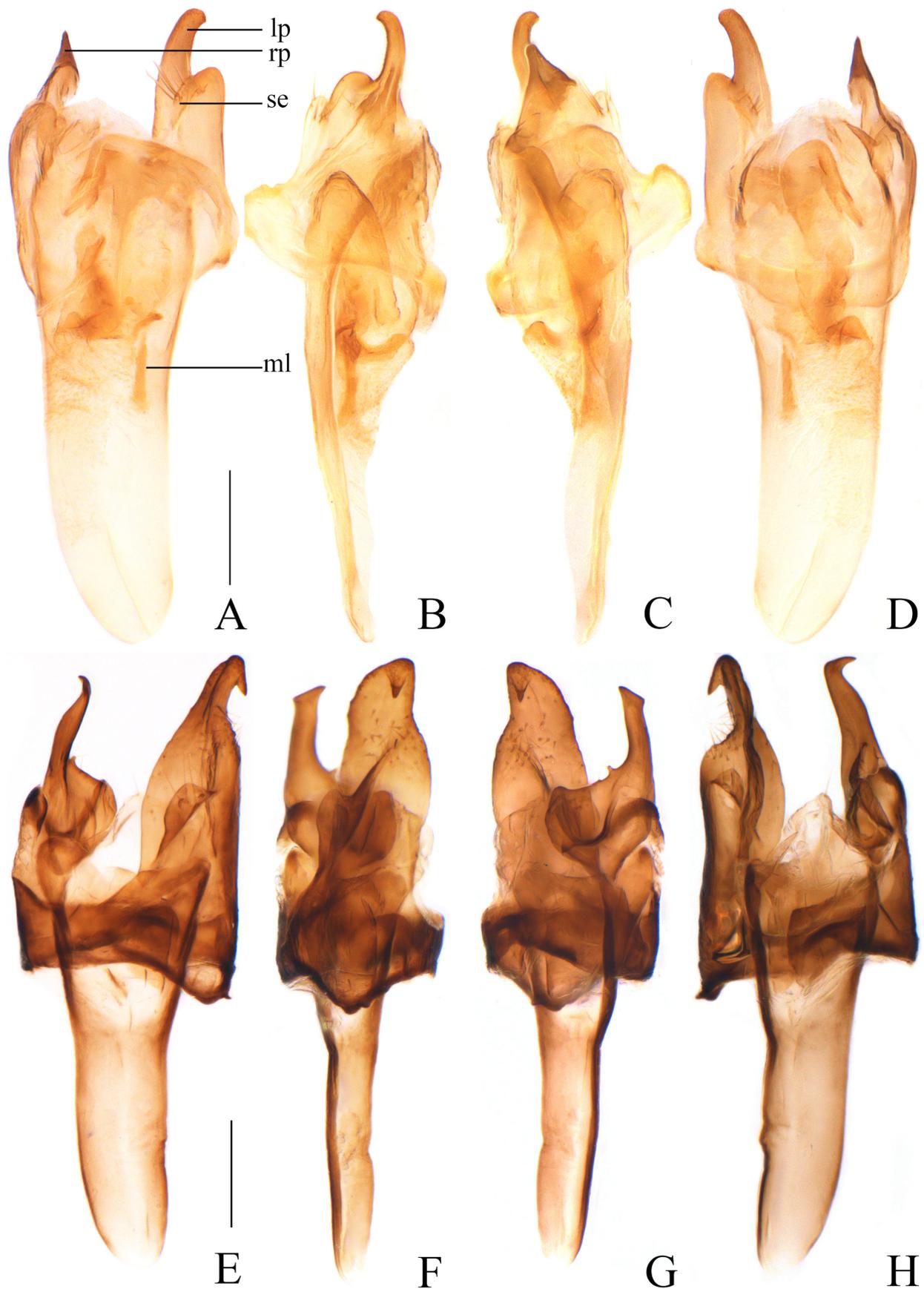
**Distribution.** China (Yunnan), N. Myanmar.

### *Ichthyurus vitalisi* Gestro, 1918

(Figs 3C, 5C, 7C, D, 8B, 9A–D, 10A–D)

*Ichthyurus vitalisi* Gestro, 1918: 97.

**Determined material examined.** 1 ♀ (NHMB), [h] “Hoa Binh / Tonkin”, [h] “*I. / vitalisi / Gestro / det. W. Wittmer*”, [p] “Naturhistorisches / Museum Basel / coll. W. Wittmer”.



**FIGURE 6.** Aedeagus (A, E, dorsal view; B, F, left-lateral view; C, G, right-lateral view; D, H, ventral view). **A–D.** *Ichthyurus maculicollis* Gestro, 1888. **E–H.** *I. luctuosus* Gestro, 1891. Abbreviations: lp: left paramere; ml: median lobe; rp: right paramere; se: setiferous extension. Scale bars: 0.2 mm.



**FIGURE 7.** Habitus, dorsal view. **A, B.** *Ichthyurus luctuosus* Gestro, 1891. **C, D.** *I. vitalisi* Gestro, 1918. **A, C.** males; **B, D.** females. Scale bars: 2.0 mm.

**Additional material examined. China:** Yunnan: 7 ♂♂, 1 ♀ (IZCAS), Xishuangbanna, Ganlanba, 18.III.1957, leg. Lingchao Zang; 1 ♀ (IZCAS), Xishuangbanna, Ganlanba, 700 m, 16.IV.1957, leg. Fuji Pu; 2 ♂♂ (IZCAS), Xishuangbanna, Ganlanba, 700 m, 21.III.1957, leg. Shuyong Wang; 6 ♂♂, 3 ♀♀ (IZCAS), Xishuangbanna, Ganlanba, 540 m, 18.III.1957, leg. Fuji Pu; 3 ♂♂, 2 ♀♀ (IZCAS), Xishuangbanna, Ganlanba, 540 m, 20.III.1957, leg. Fuji Pu; 3 ♂♂, 2 ♀♀ (CAU), Puwen, 9.IV.1981, leg. Fasheng Li. **Vietnam:** 2 ♂♂, 3 ♀♀ (IZCAS), “Vietnam, Tonkin, Hoa-Binh, VII.1939, leg. A. de Cooman.”; 1 ♂, 1 ♀ (IZCAS), “Vietnam, Tonkin, Hoa-Binh, VII.1940, leg. A. de Cooman.”; 1 ♀ (IZCAS), “Vietnam, Tonkin, Hoa-Binh, III.1937, leg. A. de Cooman.”.

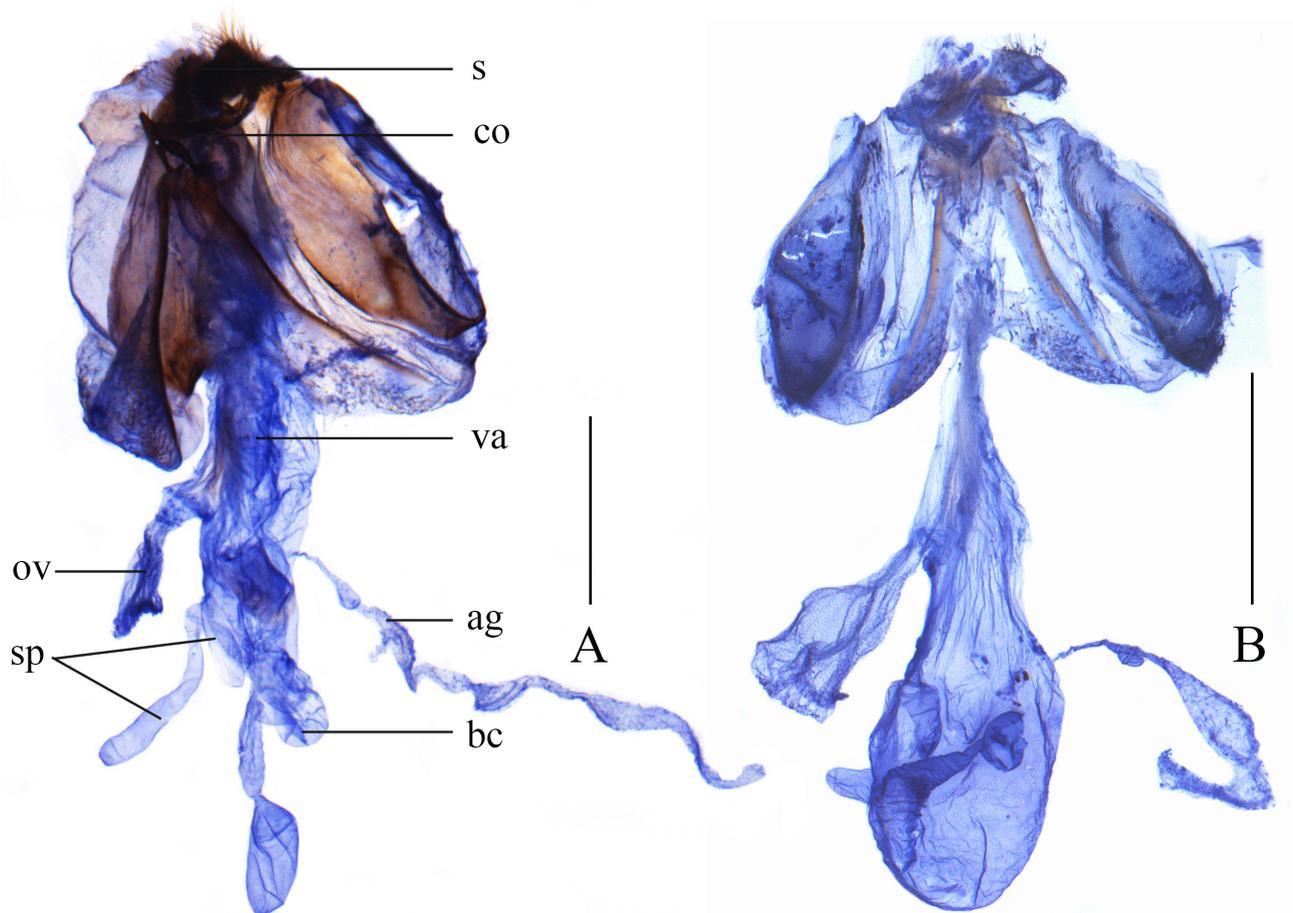
**Redescription.** Body length: (both sexes): 12.0–12.5 mm; body width (both sexes): 1.5–1.7 mm.

Male (Fig. 7C). Coloration. Body yellow, head with a small black marking on vertex, antennomeres V–XI black, elytra with a pair of irregularly longitudinal black stripes along outer margins, apical half parts of inner margins and apices, legs black at tarsi, slightly darkened at apical parts of tibiae, and mesofemora each with a black stripe dorsally, abdomen black laterally, terminal abdominal tergite with postero-lateral projections black at apices.

Eyes strongly protruding, interocular distance about 0.4 times of diameter of an eye. Antennae extending to posterior margin of abdominal tergite II, antennomeres II about 1/3 length of I, III–XI subequal in length and about 2.6 times longer than II.

Pronotum about 1.5 times wider than long, anterior margin arcuate, lateral margins feebly diverging posteriorly, posterior margin nearly straight, anterior angles confluent with anterior margin, posterior angles nearly rectangular.

Elytra 1.5 times longer than wide, about 2.7 times longer than pronotum, with outer margins nearly straight, inner margins sinuate and diverging posteriorly at apical 2/3 parts, distance between inner margins as wide as apical width of two elytra, apices rounded.



**FIGURE 8.** Internal organs of female reproductive systems, ventro-lateral views. **A.** *Ichthyurus luctuosus* Gestro, 1891. **B.** *I. vitalisi* Gestro, 1918. Abbreviations: ag: accessory gland; bc: bursa copulatrix; co: coxites; ov: median oviduct; s: style; sp: spermatheca; va: vagina. Scale bars: 0.5 mm.

Mesofemur (Fig. 3C) 1.7 times longer than wide, progressively thinned apically in lateral view, with three large teeth at base; mesotibia (Fig. 3C) obliquely truncate and longitudinally ridged along apical 1/3 part of inner margin, with a finger-like projection at inner apex; mesotarsomere I lengthened, and ca. 2.1 times longer than II (Fig. 3C).

Terminal abdominal tergite (Fig. 9A) about 1.2 times longer than wide, with postero-lateral projections about 1/4 length of the tergite, nearly straight at inner margins, and moderately arcuate at outer margins. Proctiger (Fig. 9A) peach-shaped and slightly sclerotized; paraproct (Fig. 9A) moderately developed and tubular, feebly shrunk apically, hardly emarginate in the middle of dorso-posterior margin, tergal flange (destroyed and missing).

Terminal abdominal ventrite (Fig. 9B) with latero-apical lobes nearly ovate, 1/3 longer than wide, nearly straight at inner margins, moderately arcuate at outer margins, inner apical angles slightly protruding while outer apical angles strongly protruding posteriorly, both acute at apices, moderately arcuate at posterior margins.

Abdominal sternite IX (Fig. 5C) feebly sclerotized and nearly trapezoid, about as long as wide, with posterior margin straight, left margin wide-triangularly protuberant in the middle, posterior left angle rectangular and right angle widely triangular, anterior right angle small beak-shaped and left angle strongly protruding anteriorly.

Aedeagus (Fig. 10A–D): left paramere progressively narrowed apically and feebly hooked at apex (Fig. 10A, D), 3.2 times longer than wide; right paramere about half length of left paramere, conical and acute at apex, weakly sclerotized at basal part of outer side (Fig. 10A–D); setiferous extension very small and hardly visible (Fig. 10A); median lobe nearly as long as tegmen, narrowly rounded at apex (Fig. 10A, D).

Female (Fig. 7D). Similar to males, but body larger, eyes less protruding, pronotum as long as wide, elytra with narrower longitudinal black stripes, mesothoracic legs slender and simple; terminal abdominal tergite (Fig. 9C) about 1.1 times longer than wide, with postero-lateral projections about 1/3 length of the tergite; terminal abdominal ventrite (Fig. 9D) about 1.1 times as long as wide, hardly emarginate in the middle of posterior margin, widely rounded at lateral margins which confluent with latero-apical angles. Internal organ of the reproductive system (Fig. 8B): bursa copulatrix swollen and globular at apex; accessory gland widened at apical 2/3 part.

**Distribution.** China (Yunnan), N. Vietnam.

### *Ichthyurus medogensis* Y. Yang, Zhang & Liu, sp. nov.

(Figs 2B, 3D, 9E, F, 10E–H)

**Type material. HOLOTYPE: CHINA:** ♂ (MHBUS), Xizang, Nyingchi, Mêdog, 10.VII.2023, leg. Yanhao Duan & Jie Su.

**Differential diagnosis.** This species is similar to *I. vitalisi* in the aedeagus, but can be easily distinguished from the latter in the body coloration (Fig. 2B vs. Fig. 7C, D); mesofemur without distinct tooth in male (Fig. 3D), while with three large teeth in *I. vitalisi* (Fig. 3C); mesotibia minutely dentate at apical half part in male (Fig. 3D), while never dentate, but obliquely truncate and longitudinally ridged at apical inner 1/3 parts in *I. vitalisi* (Fig. 3C); terminal abdominal ventrite with latero-apical lobes ovate, 1.5 times longer than wide (Fig. 9F), while nearly square and nearly as long as wide in *I. vitalisi* (Fig. 9B).

**Description.** Body length: 11.0 mm; body width: 1.5 mm.

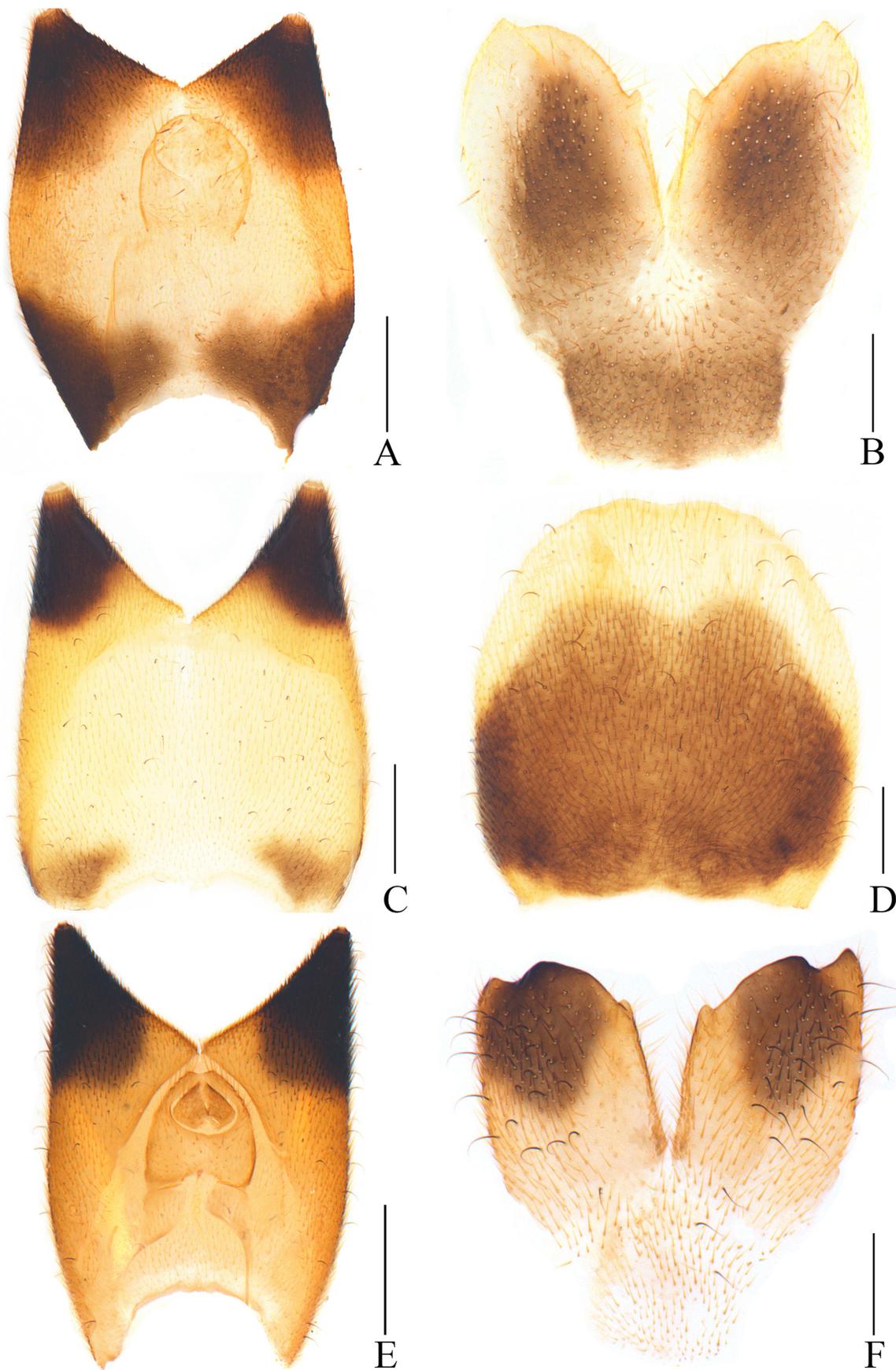
Male (Fig. 2B). Coloration. Body black, head yellow before antennal sockets, antennomeres I–II yellow ventrally, pronotum yellow at posterior angles, scutellum yellow, elytra yellow around humeri and apices, legs yellow at coxae, trochanters and bases of tibiae, femora yellow but black at dorso-apical 1/4 parts, abdomen yellow laterally, terminal abdominal tergite with postero-lateral projections black at apices.

Eyes strongly protruding, interocular distance about 0.4 times of diameter of an eye. Antennae extending to elytral apices, antennomeres II about 1/3 length of I, III–XI subequal in length and about 2.0 times longer than II.

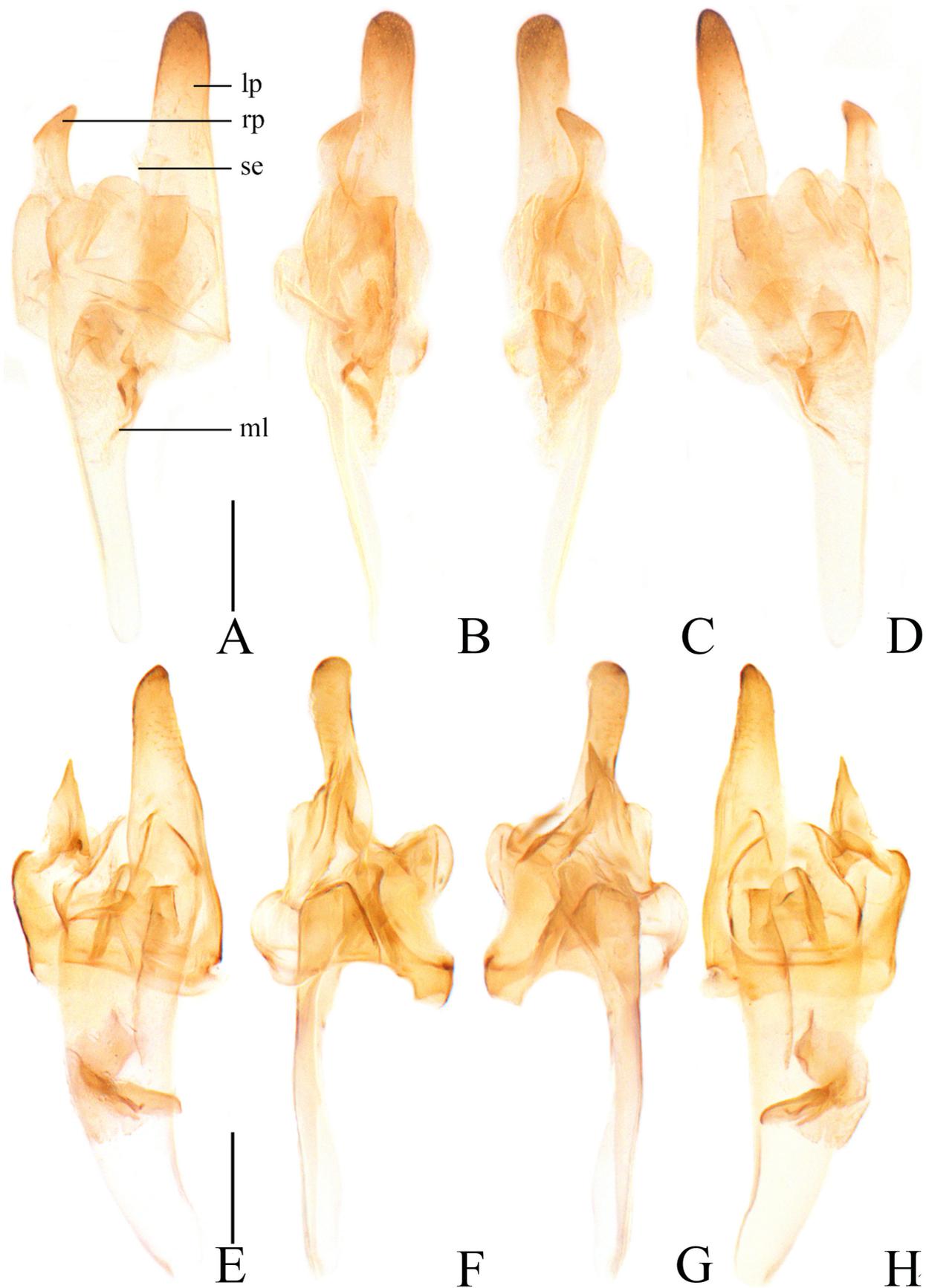
Pronotum 1.2 times wider than long, anterior margin widely rounded, lateral margins feebly diverging posteriorly, posterior margin nearly straight, anterior angles confluent with anterior margin, posterior angles nearly rectangular.

Elytra 1.3 times longer than wide, about 2.1 times longer than pronotum, with lateral margins slightly sinuate, inner margins slightly sinuate and moderately diverging posteriorly at apical 2/3 parts, distance between sutures twice as wide as apical width of two elytra, apices subrounded.

Mesofemur (Fig. 3D) 2.8 times longer than wide, nearly even in width in lateral view, with an indistinct tooth at base; mesotibia (Fig. 3D) nearly even in width, minutely dentate at apical half part of inner margin, with a finger-like projection at inner apex; mesotarsomere I lengthened, and ca. 1.8 times longer than II (Fig. 3D).



**FIGURE 9.** Genital segments (A, C, E. terminal abdominal tergite; B, D, F. terminal abdominal ventrite), ventral view. **A–D.** *Ichthyurus vitalisi* Gestro, 1918. **E–F.** *I. medogensis* sp. nov. A, B, E, F. male; C, D. female. Scale bars: 0.5 mm.



**FIGURE 10.** Aedeagus (A, E, dorsal view; B, F, left-lateral view; C, G, right-lateral view; D, H, ventral view). **A–D.** *Ichthyurus vitalisi* Gestro, 1918. **E–H.** *I. medogensis* **sp. nov.** Abbreviations: lp: left paramere; ml: median lobe; rp: right paramere; se: setiferous extension. Scale bars: 0.2 mm.

Terminal abdominal tergite (Fig. 9E) about 1.4 times longer than wide, with postero-lateral projections about 1/3 length of the tergite, moderately arcuate at inner margins, and slightly arcuate at outer margins. Proctiger (Fig. 9E) peach-shaped and evenly sclerotized, completely surrounded by paraproct; paraproct (Fig. 9E) strongly developed and tubular, distinctly shrunk apically, feebly emarginate in the middle of dorso-posterior margin, tergal flange weakly sclerotized, expanded at base and narrowly protruding apically.

Terminal abdominal ventrite (Fig. 9F) with latero-apical lobes nearly square, feebly longer than wide, straight and moderately diverging posteriorly at inner margins, slightly arcuate at outer margins, inner apical angles feebly protruding while outer apical angles moderately projecting posteriorly, both acute at apices, nearly straight at posterior margins.

Aedeagus (Fig. 10E–H): left paramere progressively narrowed apically and feebly hooked at apex (Fig. 10E, H), 3.0 times longer than wide; right paramere about half length of left paramere, conical and acute at apex, weakly sclerotized at basal part of outer side (Fig. 10E, H); setiferous extension reduced and almost invisible (Fig. 10E, H); median lobe feebly longer than tegmen, narrowly rounded at apex (Fig. 10E, H).

Female. Unknown.

**Etymology.** The specific name is derived from its type locality, Mêdog, Xizang, China.

**Distribution.** China (Xizang).

**Remark.** Abdominal sternite IX of the holotype is missing.

## Discussion

The *I. davidi* species group seems similar to the *I. feae* species group (Lin *et al.* 2025b) in the strongly swollen mesofemora in male, but it can be definitely distinguished from the latter by the triangular or peach-shaped proctiger (Figs 4A, C, 9A, E; Zhang *et al.* 2025: figs 2C, 4C, 7C, 11C, 13C), terminal abdominal ventrite of male trilobed (Figs 4B, D, 9B, F; Zhang *et al.* 2025: figs 2E, 4E, 7E, 11E, 13E), terminal abdominal tergite with stout postero-lateral projections (Figs 4A, C, 9A, E; Zhang *et al.* 2025: figs 2C, 4C, 7C, 11C, 13C), and aedeagus (Figs 6, 10; Zhang *et al.* 2025: figs 3, 9, 14A–D) with left paramere hooked at apex. Unlike in the *I. feae* species group, proctiger is oblong, with a tightly closed fissure in the middle (Lin *et al.* 2025: figs 4A, B, 9A, B, 10A, B, 14A, C, 15A, B), terminal abdominal ventrite of male subquadrate or trapezoidal (Lin *et al.* 2025: figs 4C, 10E, F, 15C, D), terminal abdominal tergite with slender postero-lateral projections (Lin *et al.* 2025: figs 4A, B, 9A, B, 10A, B, 14A, C, 15A, B); aedeagus (Lin *et al.* 2025: figs 5, 11, 16) with left paramere S-rod shaped or shovel-shaped, strongly expanded at apical 2/5 part and rounded at apex. These morphological differences validate their separation as two distinct species groups at the moment. Nevertheless, as additional species are discovered or assigned to these groups, it is essential to acquire more evidence (i.e., DNA analysis) to corroborate the findings presented in this study.

Within the *I. davidi* species group, there is considerable variability in body coloration among the species, which can range from either mostly yellow (Fig. 7C, D; Zhang *et al.* 2025: fig. 5) to black (Figs 2, 7A, B; Zhang *et al.* 2025: figs 1, 12A, B). In addition to the distinct sexual dimorphism observed in the mesothoracic legs and terminal abdominal ventrite, variations may also be present in the metathoracic legs, which are characterized by long hairs in the male of *I. laniger* (Zhang *et al.* 2025: fig. 6C), along with protibiae that are emarginate at inner apical parts (Zhang *et al.* 2025: fig. 6B). Unusually, the terminal abdominal tergite may strongly dorso-ventrally flattened in male, as seen in *I. platyurus* (Zhang *et al.* 2025: fig. 7A, C). Occasionally, the profemora may also display swelling in male, exemplified by *I. senensis* (Zhang *et al.* 2025: fig. 2A). Although these individual species possess unique characteristics, their features in the aedeagus, terminal abdominal ventrite, and mesothoracic legs exhibit consistency with those of other species. This alignment supports the classification of these species into a single species group.

## Key to species of the *Ichthyurus davidi* group

- |   |  |                                 |
|---|--|---------------------------------|
| 1 | Elytra yellow, with black longitudinal stripes along outer margins (Fig. 7C, D; Zhang <i>et al.</i> 2025: figs 5, 12A, B) . . . . .  | 2                               |
| – | Elytra uniformly or mostly black (Figs 2, 7A, B; Zhang <i>et al.</i> 2025: fig. 1) . . . . .   | 5                               |
| 2 | Pronotum uniformly yellow (Fig. 7C, D); mesofemur with three large teeth in male (Fig. 3C) . . . . .   | <i>I. vitalisi</i> Gestro, 1918 |
| – | Pronotum yellow with black markings (Zhang <i>et al.</i> 2025: figs 5, 12A, B); mesofemur at most with two teeth in male (Zhang <i>et al.</i> 2025: fig. 6A, D, E) . . . . . | 3                               |

- 3 Mesotibia with a large tooth in the middle of inner margin in male (Zhang *et al.* 2025: fig. 6A); terminal abdominal tergite strongly dorso-ventrally flattened in male (Zhang *et al.* 2025: fig. 7A, C) . . . . . ***I. platyurus* Gestro, 1906**
- Mesotibia without any tooth in male (Zhang *et al.* 2025: fig. 6D, E); terminal abdominal tergite never dorso-ventrally flattened in male (Zhang *et al.* 2025: figs 11A, C, 13A, C) . . . . . 4
- 4 Pronotum with a pair of black markings on both sides of disc (Zhang *et al.* 2025: fig. 5C, D); metathoracic legs covered with long hairs in male (Zhang *et al.* 2025: fig. 6C); protibiae emarginate at inner apical parts in male (Zhang *et al.* 2025: fig. 6B). . . . . ***I. laniger* Gestro, 1891**
- Pronotum with a pair of black markings in center of disc (Zhang *et al.* 2025: fig. 12A, B); pro- and metathoracic legs normally simple, without any long hairs or never emarginate (Zhang *et al.* 2025: figs 6E, 12A, B) . . . . . ***I. bisignatus* Pic, 1926**
- 5 Mesofemora mostly yellow, black at dorso-apical parts (Fig. 3D); terminal abdominal tergite yellow, black at apices (Fig. 9E); aedeagus with almost invisible setiferous extension (Fig. 10E–H) . . . . . ***I. medogensis* sp. nov.**
- Mesofemora mostly black, yellow at basal parts (Fig. 3A, B; Zhang *et al.* 2025: figs 2B, 4A); terminal abdominal tergite uniformly black (Fig. 4A, C; Zhang *et al.* 2025: figs 2C, 4C); aedeagus with large or small but visible setiferous extension (Fig. 6; Zhang *et al.* 2025: fig. 3)
- 6 Head mostly yellow, with a black marking on occiput (Fig. 2A); mesofemur with a large tooth at apical 1/3 portion in male (Fig. 3A) . . . . . ***I. maculicollis* Gestro, 1888**
- Head uniformly or mostly black, at most yellow before antennal sockets (Fig. 7A, B; Zhang *et al.* 2025: fig. 1); mesofemur with tooth at basal portion in male (Fig. 3B; Zhang *et al.* 2025: figs 2B, 4A) . . . . . 7
- 7 Mesofemora uniformly black (Fig. 3B); terminal abdominal ventrite of male (Fig. 4D) with latero-apical lobes nearly rectangular, about twice longer than wide; aedeagus with right paramere slender and hooked at apex (Fig. 6E–H), setiferous extension very small and tumorous projection-like (Fig. 6E, H) . . . . . ***I. luctuosus* Gestro, 1891**
- Mesofemora bicolored, mixed yellow with black (Zhang *et al.* 2025: figs 2B, 4A); terminal abdominal ventrite of male (Zhang *et al.* 2025: figs 2E, 4E) with latero-apical lobes nearly trapezoid, nearly as long as wide; aedeagus with right paramere conical and acute at apex (Zhang *et al.* 2025: fig. 3), setiferous extension well-developed and style-like (Zhang *et al.* 2025: fig. 3A, D, E, H) . . . . . 8
- 8 Profemora moderately swollen in male (Zhang *et al.* 2025: fig. 2A); aedeagus with left paramere progressively thinned apically and feebly hooked at apex (Zhang *et al.* 2025: fig. 3A–D) . . . . . ***I. senensis* Pic, 1926**
- Profemora normally slender in male (Zhang *et al.* 2025: fig. 1C); aedeagus with left paramere abruptly thinned apically and distinctly hooked at apex (Zhang *et al.* 2025: fig. 3E–H) . . . . . ***I. davidi* Gestro, 1892**

## Acknowledgments

We are grateful to the late Dr Michel Brancucci (NHMB) for his guidance to Yu-Xia Yang in the taxonomy of soldier beetles. Furthermore, we would like to extend our gratitude to Dr Roberto Poggi (MGI) for providing Yu-Xia Yang with the opportunity to access the cantharid types under his charge, as well as to the anonymous reviewer for his comments to improve our original manuscript. Additionally, we thank Prof. Dr Xing-Yue Liu (CAU) for his help in loaning some studied material to us. The present study was supported by the National Natural Science Foundation of China (No. 32270491), and the Interdisciplinary Research Program of Hebei University (No. DXK202302).

## References

- Brancucci, M. (1980) Morphologie comparée, évolution et systématique des Cantharidae (Insecta: Coleoptera). *Entomologica Basiliensia*, 5, 215–388.
- Brancucci, M. (1983) La famille des Cantharidae (Coleoptera) sur l'île de Taiwan. 4. La sous-famille des Chauliognathinae. *Entomologica Basiliensia*, 8, 256–309.
- Brancucci, M. (2009) Ichthyurini from Nepal (Insecta: Coleoptera: Cantharidae). In: Hartmann, M. & Weipert, J. (Eds.), *Biodiversity and natural heritage of Himalaya*, III. Verein der Freunde & Förderer des Naturkundemuseums Erfurt, Erfurt, pp. 313–326.
- Delkeskamp, K. (1977) Cantharidae. Editio secunda. In: Wilcox, J.A. (Ed.), *Coleopterorum Catalogus Supplementa. Pars 165. Fasc. 1*. W. Junk, The Hague, pp. 1–485.
- Ge, S., Yang, X., Liu, H. & Yang, Y. (2021) Definitions of two species groups of *Stenothemus* Bourgeois (Coleoptera, Cantharidae), with descriptions of three new species from China. *Zootaxa*, 5047 (2), 139–152. <https://doi.org/10.11646/zootaxa.5047.2.3>
- Gestro, R. (1888) Viaggio di Leonardo Fea in Bimania e regioni vicine. IV, Nuove specie di Coleotteri. *Annali del Museo Civico di Storia Naturale di Genova*, 26, 87–132.
- Gestro, R. (1891) Appendice ai materiali per lo studio dei generi *Ichthyurus*. *Annali del Museo Civico di Storia Naturale di Genova*, 26–28, 556–594.
- Gestro, R. (1892) Appendice ai materiali per lo studio del generi *Ichthyurus*. *Annali del Museo Civico di Storia Naturale di*

Genova, 30, 1022–1048.

- Gestro, R. (1906) Studii sugli *Ichthyurus*. *Annali del Museo Civico di Storia Naturale di Genova*, 42, 266–307. [1905–1906]
- Gestro, R. (1918) Studii sugli *Ichthyurus*. *Annali del Museo Civico di Storia Naturale di Genova*, 48, 97–100.
- Li, J., Zhang, X., Gao, M., Lin, L. & Wang, X. (2014) New species and new record for Coleoptera from Asia. *Le Coléoptériste*, 17 (3), 182–184.
- Li, J. & Gao, M. (2015) Eight new species of *Ichthyurus* Westwood, 1848 from North Laos. *Le Coléoptériste*, 18 (3), 193–196.
- Lin, H., Liu, H., Yang, X. & Yang, Y. (2024a) Establishment of two species groups of *Ichthyurus* Westwood (Coleoptera: Cantharidae), with description of two new species from China and Vietnam. *Zootaxa*, 5528 (1), 184–210.  
<https://doi.org/10.11646/zootaxa.5528.1.15>
- Lin, H., Liu, H., Yang, X. & Yang, Y. (2024b) A new and widely distributed species of *Ichthyurus* Westwood, 1848 (Cantharidae, Chauliognathinae, Ichthyurini) from China. *Biodiversity Data Journal*, 12, e131829.  
<https://doi.org/10.3897/BDJ.12.e131829>
- Lin, H., Liu, H., Yang, X. & Yang, Y. (2025a) Definition of the *Ichthyurus feae* species group (Cantharidae, Chauliognathinae, Ichthyurini), with descriptions of three new species from China. *Journal of Asia-Pacific Entomology*, 28, 102400.  
<https://doi.org/10.1016/j.aspen.2025.102400>
- Lin, H., Liu, H., Yang, X. & Yang, Y. (2025b) Taxonomy of the genus *Microichthyurus* Pic (Coleoptera, Cantharidae, Chauliognathinae), with descriptions of nine new species from China. *Deutsche Entomologische Zeitschrift*, 72 (1), 27–56.  
<https://doi.org/10.3897/dez.72.145885>
- Okushima, Y. (2005) A taxonomic study on the genus *Lycocerus* (Coleoptera, Cantharidae) from Japan, with zoogeographical considerations. *Japanese Journal of Systematic Entomology, Monographic Series*, 2, 1–383.
- Pic, M. (1926) Nouveautés diverses. *Mélanges Extico-Entomologiques*, 47, 1–32.
- Yang, Y., Xi, H., Yang, X. & Liu, H. (2019a) Taxonomic review of the *Themus* (*Telephorops*) *nepalensis* species-group (Coleoptera, Cantharidae). *ZooKeys*, 884, 81–106.  
<https://doi.org/10.3897/zookeys.884.32550>
- Yang, Y., Zong, L., Yang, X. & Liu, H. (2019b) A taxonomic study on *Themus* (*Telephorops*) *dauidis* species-group (Coleoptera, Cantharidae), with description of a new species from China. *Zootaxa*, 4612 (3), 401–411.  
<https://doi.org/10.11646/zootaxa.4612.3.6>
- Zhang, W., Lin, H., Liu, H., Yang, X. & Yang, Y. (2025) Review of the Chinese species of *Ichthyurus* (Coleoptera, Cantharidae). *Deutsche Entomologische Zeitschrift*, 72 (2), 179–215.  
<https://doi.org/10.3897/dez.72.158992>

## 大卫短翅花萤 *Ichthyurus davidi* 种团建立及中国新种与新纪录种报道 (鞘翅目: 花萤科)

张文文<sup>1,4</sup>, 刘浩宇<sup>1,2,5</sup>, 杨星科<sup>3,6</sup>, 杨玉霞<sup>1,2\*</sup>

<sup>1</sup>河北大学生命科学学院河北省动物系统学与应用重点实验室, 保定071002, 河北, 中国

<sup>2</sup>河北大学河北省生物互作基础研究中心, 保定071002, 河北, 中国

<sup>3</sup>中国科学院动物研究所动物多样性保护与有害动物防控全国重点实验室, 北京100101, 中国

<sup>4</sup>✉ 2394780125@qq.com; <https://orcid.org/0009-0008-5766-1316>

<sup>5</sup>✉ liuhy@hbu.edu.cn; <https://orcid.org/0000-0003-1383-5560>

<sup>6</sup>✉ yangxk@ioz.ac.cn; <https://orcid.org/0000-0003-3676-6828>

\*通讯作者: ✉ yxyang@hbu.edu.cn; <https://orcid.org/0000-0002-3118-6659>

**摘要:** 建立大卫短翅花萤 *Ichthyurus davidi* 种团, 包括9种: 大卫短翅花萤 *I. davidi*、中华短翅花萤 *I. senensis*、长毛短翅花萤 *I. laniger*、扁尾短翅花萤 *I. platyurus*、二斑短翅花萤 *I. bisignatus*、斑胸短翅花萤 *I. maculicollis* (中国新纪录种)、黑足短翅花萤 *I. luctuosus* (中国新纪录种)、靓丽短翅花萤 *I. vitalisi* (中国新纪录种) 和墨脱短翅花萤 *I. medogensis* sp. nov. (西藏)。提供了新种和新纪录种的整体图、生殖节、雄性外生殖器和中足、雌性内生殖系统等特征图; 还编制了该种团检索表并绘制地理分布图。

**关键词:** 短翅花萤属; 新种; 新纪录; 中国