

A new species in the genus *Brithura* Edwards (Diptera: Tipulidae) from southwest China, with a key to species in China

Jiaxin CHEN¹, Shuhua HE², Qicheng YANG^{1, 3①}, Xiaoyan LIU^{3①}, Ding YANG⁴

1. College of Agronomy and Life Sciences, Kunming University, Kunming, Yunnan 650214, China

2. Forestry and Grassland Bureau of Lushui, Nujiang, Yunnan 673200, China

3. Hubei Insect Resources Utilization and Sustainable Pest Management Key Laboratory, College of Plant Science & Technology, Huazhong Agriculture University, Wuhan, Hubei 430070, China

4. Department of Entomology, College of Plant Protection, China Agricultural University, Beijing 100193, China

Abstract: The genus *Brithura* Edwards, 1916 is mainly distributed in China and India. There were 17 known species in the world and 13 species previously known in China. This article describes a new species *Brithura cristacauda* sp. nov. from southwest China, and updates the key to the genus *Brithura* of China.

Key words: crane flies; Tipulinae; taxonomy

中国西南尖头大蚊属 *Brithura* 一新种附中国分种检索表（双翅目：大蚊科）

陈嘉鑫¹, 何树华², 杨棋程^{1, 3①}, 刘晓艳^{3①}, 杨定⁴

1. 昆明学院农学与生命科学学院, 云南 昆明 650214; 2. 泸水市林业和草原局, 云南 怒江 673200;

3. 华中农业大学植物科学技术学院湖北省昆虫资源利用与害虫可持续治理重点实验室, 湖北 武汉 430070; 4. 中国农业大学植物保护学院昆虫学系, 北京 100193

摘要: 尖头大蚊属 *Brithura* Edwards, 1916 主要分布于中国和印度, 全球已知 17 种, 中国已知 13 种。本文记述采自中国西南地区 1 新种: 冠尾华尖头大蚊 *Brithura cristacauda* sp. nov., 并编制了中国尖头大蚊属的分种检索表。

关键词: 大蚊; 大蚊亚科; 分类

Introduction

The genus *Brithura* Edwards, 1916 is mainly distributed in China and India. Seventeen species are known in the world and 13 species were previously recorded in China (Oosterbroek 2024). The genus is characterized by the following features: body stout, mainly with dark color. Frons of head with a sharp-pointed conical tubercle anteriorly. Wings usually spotted; male wing R₁ protruded outward usually, forming a hill-like protrusion at the anterior margin of the wing; distal end of female Sc vein not reaching margin of wing. Posterior margin of male tergite nine often with lamellar process, outer gonostylus complex (Edwards 1916; Liu & Yang

Accepted 12 March 2025. Published online 8 September 2025.

① Corresponding authors, E-mails: qichengyang@foxmail.com; yanziliu52@163.com

2009). This paper describes a new species in this genus from Motuo County in southwest China, and provides an updated key to the genus *Brithura* in China.

Material and methods

The specimens were examined and illustrated with an OLYMPUS SZ61 stereo microscope. Details of coloration were checked in pinned specimens. Genital preparations of males were made by immersion in a heated lactic acid solution ($C_3H_6O_3$ >85%, 90–95°C) for 4–6 minutes and cooled down to room temperature. After examination, genitalia were transferred to fresh glycerine ($C_3H_8O_3$) and stored in a microvial attached to the specimen. Type specimens are deposited in the Entomological Museum of China Agricultural University (CAU), Beijing. All pictures were adjusted and assembled into plates using Adobe Photoshop CS6.

The morphological terminology mostly follows Alexander & Byers (1981), Gelhaus (2005), Cumming & Wood (2017) and de Jong (2017). The following abbreviations are used in figures: bk — beak; ig — inner gonostylus; l bk — lower beak; og — outer gonostylus; st 8 — sternite eight; st 9 — sternite nine; tg 8 — tergite eight; tg 9 — tergite nine; u bk — upper beak. For abbreviations in wings, see de Jong (2017).

Taxonomy

Key to species of *Brithura* from China (♂)

(*B. argyrospila* (Alexander, 1935) was only described as female and is not included in this key)

1. Wing R_1 protruded outward, anterior margin of wing with a hill-like protrusion 2
- . Wing R_1 not protruded outward, anterior margin of wing without protrusion 9
2. Protrusion of anterior margin of wing with a spur posteriorly 3
- . Protrusion of anterior margin of wing without spur posteriorly 6
3. Posterior margin of tergite 9 with large and long middle processes 4
- . Posterior margin of tergite 9 without large and long middle processes 5
4. Processes of tergite 9 narrow; wing dark grayish brown with some light golden areas (Liu & Yang 2010; Liu 2011) *B. aureola* Liu & Yang
- . Processes of tergite 9 wide; wing yellowish (Liu & Yang 2010; Liu 2011) *B. shii* Liu & Yang
5. Outer gonostylus with a large sharp lobe-like processes at base *B. fracticosta* (Alexander)
- . Outer gonostylus with a small sharp lobe-like processes at middle (Alexander 1925, 1935; Liu 2011) *B. fractistigma* Alexander
6. Posterior margin of tergite 9 with forked process 7
- . Posterior margin of tergite 9 without forked process 8
7. Posterior margin of tergite 9 with a forked process; lower part of beak of inner gonostylus with a finger-like processes (Liu & Yang 2010; Liu 2011) *B. flaviflagellum* Liu & Yang
- . Posterior margin of tergite 9 with two forked processes; lower part of beak of inner gonostylus without finger-like processes (Figs 2C, 2D) *B. cristacauda* **sp. nov.**
8. Depression of middle of posterior margin of tergite 9 shallow; outer gonostylus with sharp lobe-like processes (Edwards 1916; Alexander 1970; Liu 2011) *B. imperfecta* (Brunetti)
- . Depression of middle of posterior margin of tergite 9 deep; outer gonostylus without sharp lobe-like

- processes *B. jinpingensis* Liu & Yang
9. Apex of R_3 bent at right angles (Alexander 1929; Liu 2011) *B. sancta* Alexander
- Apex of R_3 not bent at right angles 10
10. Middle of posterior margin of tergite 9 without process *B. stigmosa* Liu & Yang
- Middle of posterior margin of tergite 9 with process 11
11. Posterior margin of tergite 9 only with a pair of finger-like processes, and middle of processes smooth
..... *B. triprocessa* Men & Liu
- Posterior margin of tergite 9 not only with a pair of finger-like processes, but middle of processes with
small processes 12
12. Abdominal tergites cinnamon brown *B. nymphica* Alexander
- Abdominal tergites orange *B. guangxiensis* Liu & Yang

***Brithura cristacauda* sp. nov.** (Figs 1, 2)

Description. Male ($n = 1$): body length 23.5 mm; wing length 18.6 mm; antenna length 3.0 mm.

Head reddish brown (Figs 1A, 1C). Beak and nasus reddish brown. Gena dark brown. Orbital pale. Frons with sub-triangular tubercle, apex slightly curved and color slightly dark. Margin of antennal fossa with silvery pruinescence. Occipital pubescence shows ring-like patterns. Setae on head brown. Antennal scape and pedicel reddish-brown, except margin of terminus of scape and pedicel pale; base of each segment of flagellum reddish-brown, and terminus pale-brown, with white pruinescence. Labellum brownish-black, with brown setae. 1st and 2nd segments of palpus brownish-black, 3rd segment brownish-yellow, base of terminal segment brownish-yellow and apex brownish-black, with brown setae.

Thorax mainly reddish-brown velvety, with mottled silvery pruinescence (Figs 1A, 1C). Pronotum brownish-black, anterior margin dark. Prescutum reddish-brown, anterior part black, posterior part pale, spotted areas brown; anterior and posterior parts of prescutal suture with obvious white pruinescence; scutellum reddish-brown, median stripe and posterior margin with small white pruinescence, spots not obvious; postnotum and scutellum brownish-black, with small white pruinescence. Setae on thorax yellow. Thoracic pleuron reddish-brown. Margin of each pleuron with small white pruinescence. Anatergites and katatergites with an obvious longitudinal stripe with silvery pruinescence. Coxae and trochanters reddish-brown, with small white pruinescence, trochanter with black margin; femora dark yellow except terminal off-white; tibiae dark yellow, except off-white basally, and brown at apical connection; tarsus brownish black, first segment slightly pale, connections of each segment brown, claw with obvious single tooth basally; setae on legs shiny brownish-yellow; tibial spur formula 1-1-2. Wings grey variegated, each cell with cream or yellowish-white spots (Fig. 1D). Sc_1 cell, stigma and anterior of R_1 cell amber; Rs with a brownish-black spot basally; M_2 bent down and smoothly arc-shaped; M_1 cell about twice as long as stem. Calypter yellowish-brown, with setae dorsally. Halter with stem brown, knob brownish-black.

Abdomen mainly dark yellow (Figs 1A, 1C). Lateral margins with uninterrupted black stripes of tergite and sternite, and black spots gradually narrowed from 1st abdominal segment to 8th abdominal segment; 9th segment mainly reddish brown. Abdomen with shiny brown setae.

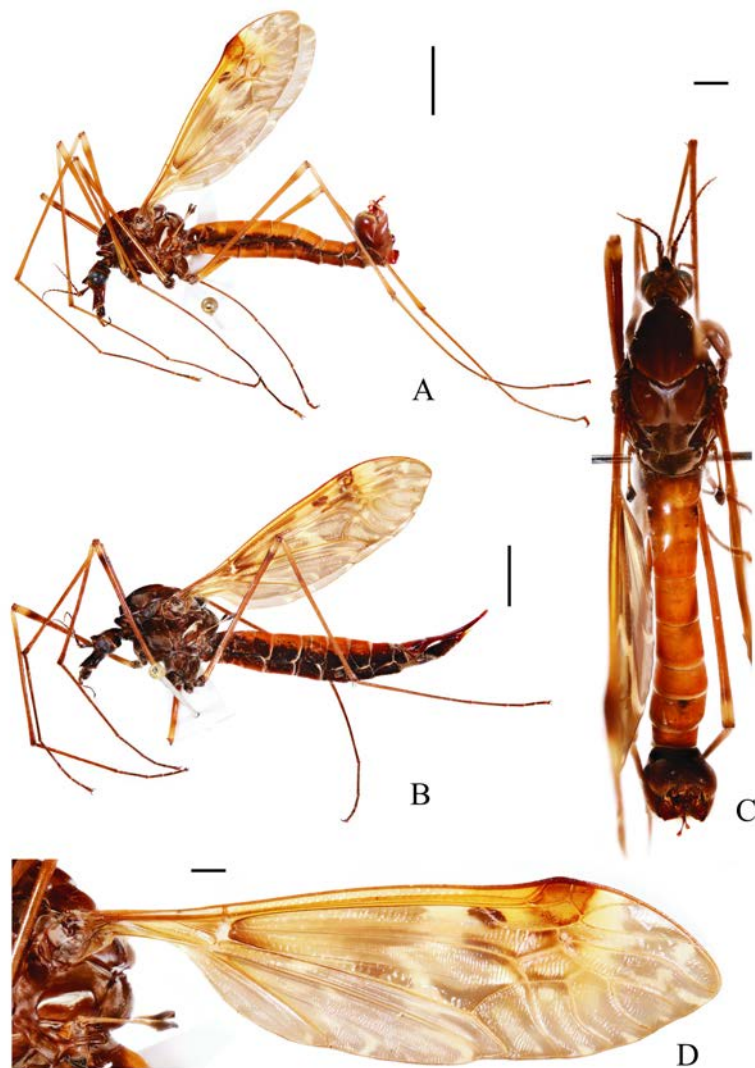


Figure 1. *Brithura cristacauda* **sp. nov.** A. Male habitus, lateral view; B. Female habitus, lateral view; C. Male habitus, dorsal view; D. Wing. Scale bars = 5 mm (A, B); 1 mm (C, D).

Hypopygium (Fig. 2) reddish-brown, lower part of posterior margin of gonocoxite horn-like, with pubescence. Posterior margin of tergite 9 depressed, with a pair of sclerotized forked processes, approximately forceps-like, with wide base and thin apex. Anterior middle part of sternite 9 with a large glabrous process, posterior ventral surface with a pair of small flaky processes. Adminiculum shot. Middle of outer gonostylus bent, upper part flake-like, with an approximately mallet-shaped protrusion dorsally near apex. Inner gonostylus with a banded wrinkled area near beak, base of inner gonostylus with two protrusions with long setae.

Female ($n = 1$). Body length 29.5 mm; wing length 22.0 mm; antenna length 3.9 mm.

Mainly similar to male (Fig. 1B), with larger and dark black body, head and thorax more brownish-black than male's head and thorax, abdomen orange, and black stripe wider than

male. Claw without teeth. Sc not reaching outer margin, apex of Sc spur-shaped. Hypopygium reddish-brown. Cercus slender, blood amber, and apex blunt; hyperactive amber, length of hyperactive about 2/3 length of cercus.

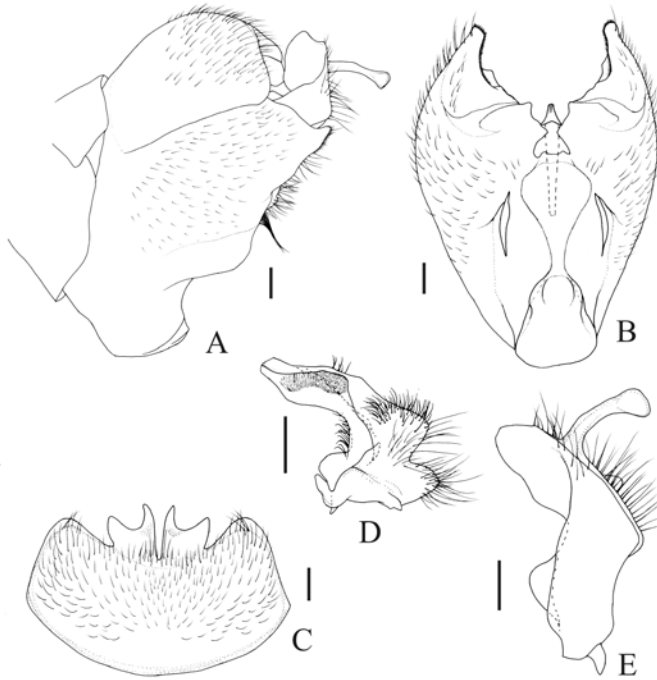


Figure 2. *Brithura cristacauda* sp. nov. A, B. Hypopygium, lateral and ventral views; C. Tergite 9, dorsal view; D. Inner gonostylus, lateral view; E. Outer gonostylus, lateral view. Scale bars = 0.5 mm.

Holotype. ♂, China, Xizang, Motuo County (Medog County) 80 k, 95°29'E, 29°39'N, 21-VIII-2020, 2,115 m, light trap, Yucheng ZHENG (CAU); **Paratypes.** 2♀, Xizang, Motuo County (Medog County) 80 k, 95°29'E, 29°39'N, 20-VIII-2020, 2,115 m, light trap, Qicheng YANG (CAU).

Etymology. The specific epithet is from the Latin “crista + cauda” (“crowned tail”) referring to the outer gonostylus with mallet-shaped protrusion dorsally, like the “fishing rod” of anglerfish.

Diagnosis. Stigma and Sc₁ cell amber fully; M₂ bent down and smoothly arc-shaped; length of m₁ cell approximately twice m₁₊₂; abdomen mainly dark yellow, both sides of tergite with continuous black spots, and black spot gradually narrows from first abdominal segment to eighth abdominal segment. Dorsal side of outer gonostylus with 1 rod-shaped protrusion near apex; apex of protrusion subglobose.

Remarks. This species is similar to *B. crassa* Edwards, 1916 in Darjeeling, India. But the latter differs in the following characters: the abdomen without yellow areas, the anterior part of stigma with a white spot, the length of M₁ cell about twice longer than the length of the stem, and M₃ bending amplitude is small. Protrusion of outer gonostylus dorsally small, thorn-shaped (Edwards 1916).

Acknowledgements

We would like to express our sincere thanks to anonymous reviewers for providing valuable comments on the revision of the manuscript. This study was supported by the Biodiversity Survey and Assessment Project of the Ministry of Ecology and Environment, China (2019HJ2096001006) and the University Talent Introduction Program (XJ20230092).

References

- Alexander CP. 1925. New or little-known Tipulidae (Diptera). XXVII. Palearctic species. *Annals and Magazine of Natural History* (9), 15: 385–408.
- Alexander CP. 1927. Undescribed crane-flies from the Holarctic region in the United States National Museum. *Proceedings of the United States National Museum*, 72(2): 1–17.
- Alexander CP. 1929. New or little-known Tipulidae from eastern Asia (Diptera). IV. *Philippine Journal of Science*, 40: 317–348.
- Alexander CP. 1935. New or little-known Tipulidae from eastern Asia (Diptera). XXV. *Philippine Journal of Science*, 57: 81–148.
- Alexander CP. 1970. New or little-known species of Asiatic Tipulidae (Diptera). III. *Transactions of the American Entomological Society*, 96: 307–352.
- Alexander CP & Byers GW. 1981. Tipulidae. In: McAlpine JF *et al.* (Eds.), *Manual of Nearctic Diptera. Vol. 1. Biosystematics Research Institute, Ottawa*, pp. 153–190.
- Cumming JM & Wood DM. 2017. Adult morphology and terminology. In: Kirk-Spriggs AH & Sinclair BJ (Eds.), *Manual of Afrotropical Diptera. Volume 1. Introductory chapters and keys to Diptera families. Suricata 4* South African National Biodiversity Institute, Pretoria, pp. 107–151.
- de Jong H. 2017. Limoniidae and Tipulidae (crane flies). In: Kirk-Spriggs AH & Sinclair BJ (Eds.), *Manual of Afrotropical Diptera. Volume 2. Nematocerous Diptera and Lower Brachycera. Suricata 5*. South African National Biodiversity Institute, Pretoria, pp. 427–477.
- Edwards FW. 1916. New and little-known Tipulidae, chiefly from Formosa. *Annals and Magazine of Natural History*, 18(8): 245–269.
- Gelhaus JK. 2005. Systematics and biogeography of the desert crane fly subgenus *Tipula* (*Eremotipula*) Alexander (Diptera: Tipulidae). *Memoirs of the American Entomological Society*, 46: 1–235.
- Liu Q. 2011. *Systematics of Tipulinae from China (Diptera: Tipulidae)*. PhD. Thesis. China Agriculture University, Beijing, 264 pp.
- Liu Q & Yang D. 2009. Two new species of the genus *Brithura* Edwards from China, with a key to world species (Diptera, Tipulidae). *Zootaxa*, 1991: 51–56.
- Liu Q & Yang D. 2010. Four new species of the genus *Brithura* Edwards from China, with an updated key to world species (Diptera, Tipulidae). *Zootaxa*, 2401: 52–60.
- Men Q, Wang H, Sheng N, Zhao Q & Zhang J. 2019. A new species of *Brithura* Edwards from China, with notes on its internal reproductive system (Diptera: Tipulidae). *Zoological Systematics*, 44: 158–166.
- Oosterbroek P. 2024. *Catalogue of the Craneflies of the World, (Diptera, Tipuloidea, Pediciidae, Limoniidae, Cylindrotomidae, Tipulidae)*. Available from : <https://ccw.naturalis.nl/> (accessed 9 June 2024)