



A new species of *Rhopalopsole* (Plecoptera, Leuctridae) from Yunnan Province, China

Xiao Yang[‡], Yu-Zhou Du[‡]

[‡] School of Plant Protection & Institute of Applied Entomology, Yangzhou University, Yangzhou 225009, China

Corresponding author: Yu-Zhou Du (yzdu@yzu.edu.cn)

Academic editor: Jean-Luc Gattolliat

Received: 08 Aug 2024 | Accepted: 28 Oct 2024 | Published: 31 Oct 2024

Citation: Yang X, Du Y-Z (2024) A new species of *Rhopalopsole* (Plecoptera, Leuctridae) from Yunnan Province, China. Biodiversity Data Journal 12: e134258. <https://doi.org/10.3897/BDJ.12.e134258>

ZooBank: [urn:lsid:zoobank.org:pub:972C772D-0D1B-4BCB-9C77-0E9FFD6D4017](https://zoobank.org/pub:972C772D-0D1B-4BCB-9C77-0E9FFD6D4017)

Abstract

Background

A new species of the genus *Rhopalopsole* (Plecoptera, Leuctridae) from Yunnan Province, China, *Rhopalopsole dulongjianga* **sp. nov.**, is described and illustrated.

New information

This new species is compared to the similar species, *Rhopalopsole bispina* (Wu, 1949). Additionally, we provide a supplemental description and colour plates of *R. bispina*. A key to *Rhopalopsole* species from Yunnan Province, China, is also provided in this paper.

Keywords

Rhopalopsole, Plecoptera, Leuctridae, new species, Yunnan Province, China

Introduction

Rhopalopsole Klapálek, 1912 is a species-rich genus in the family Leuctridae, with more than 80 valid species known from the Oriental and eastern Palaearctic Regions (Klapálek 1912, Okamoto 1922, Wu 1949, Jewett 1958, Illies 1966, Kawai 1967, Kawai 1968, Kawai 1969, Wu 1973, Jewett 1975, Harper 1977, Zwick 1977, Sivec et al. 2008, Stark and Sivec 2008, Harrison and Stark 2008, Stark et al. 2012, Li et al. 2017, DeWalt et al. 2024). Currently, more than 50 species of this genus have been recorded from China, with recent contributions made by Yang et al. (2004), Yang and Li (2006), Sivec et al. (2008), Yang et al. (2009), Li and Yang (2010), Li et al. (2010a), Li et al. (2010b), Li and Yang (2011), Li et al. (2011), Qian and Du (2011), Li and Yang (2012), Qian and Du (2012a), Qian and Du (2012b), Qian and Du (2013), Qian et al. (2014), Chen and Du (2017), Li et al. (2017), Qian and Du (2017), Mo et al. (2018), Yang and Du (2021a), Yang and Du (2021b), Yang and Du (2021c), Yang et al. (2021), Chen et al. (2022), Li et al. (2022), Yang et al. (2022), Yang and Du (2024).

Yunnan Province is located on the south-western border of China, bordering Myanmar, Laos and Vietnam. The northern part of Yunnan Province belongs to the southwest region and the southern part belongs to the South China Region. Yunnan Province belongs to the Oriental realm and has many large rivers flowing through it, with significant differences in elevation. Its unique geographical location and favourable climatic conditions provide an excellent environment for Leuctridae insects. However, identification is challenging due to the simplicity of some species drawings and the lack of colour pictures. Therefore, it is necessary to reorganise and summarise the Leuctridae species of Yunnan Province.

Recently, we visited Yunnan Province to survey aquatic insect diversity and collected and examined a batch of Plecoptera specimens. We describe and illustrate a new species of *Rhopalopsole* Klapálek, 1912 from Yunnan Province, *Rhopalopsole dulongjianga* Yang & Du, sp. nov. Additionally, we found *Rhopalopsole bispina* (Wu, 1949) in this batch of specimens and provided a high-definition picture.

Materials and methods

Specimens were collected by hand and preserved in 75% ethanol. Morphological details were examined with a Leica MZAPO microscope. Colour illustrations were taken with a KEYENCE VHX-5000. All specimens used in this study are deposited in the Insect Collection of Yangzhou University (ICYZU), Jiangsu Province, China. The morphological terminology follows that of Sivec et al. (2008).

Taxon treatments

Rhopalopsole dulongjianga Yang & Du, sp. nov.

- ZooBank [E2CA530C-A1F9-4D3C-B3F1-C926E57EFC41](https://doi.org/10.21203/rs.3.rs-3111111/v1)

Material

Holotype:

- scientificName: *Rhopalopsole dulongjianga*; class: insecta; order: Plecoptera; family: Leuctridae; genus: *Rhopalopsole*; specificEpithet: *dulongjianga*; stateProvince: Yunnan; county: Nuijiang Lisu Autonomous Prefecture; locality: Dulongjiang town; minimumElevationInMeters: 1397; maximumElevationInMeters: 1397; decimalLatitude: 27.841533; decimalLongitude: 98.328782; year: 2024; month: 6; day: 4; sex: male; lifeStage: adult; recordedBy: Yang Xiao and Zeng Liang-Liang; occurrenceStatus: present; institutionID: ICYZU; occurrenceID: 1DC7F786-9DFF-5643-AA72-A7FEE8FDBBD7

Description

Male. Body length 5.7 mm. Fore-wings length 5.5 mm, hind-wings length 4.2 mm. Head dark brown, wider than pronotum; ocelli pale brown, antennae and palpi light brown. Pronotum brown, quadrate. Legs brown. Wings hyaline and veins light brown (Figs 1, 2). Tergum 9 mostly sclerotised, with the median pentagonal area being somewhat less sclerotised and featuring paired posterior process with sensilla basiconica. Sternum 9 basally with subcircular vesicle bearing dense hairs, apically with a comparatively longer subgenital plate. Tergum 10 bears a large central plate covered with a broad sensilla basiconica patch in the lower half and slightly sclerotised in the upper half. Transverse plates nearly triangular and have some setae. Lateral projections of tergum 10 gradually and regularly taper to a sharp, slightly upturned point. Epiproct thick at base, rod-like, with its tip narrowing and turned forwards. Subanal lobes long and upturned with distinct ventral flaps and longitudinal furrows covering the ventral surface. Cercus hairy and upcurved, with a small spine (Figs 2, 3).

Female. Unknown.

Egg and nymph. Unknown.

Diagnosis

Rhopalopsole dulongjianga is similar to members of the *R. magnicerca* group (Sivec et al. 2008). The new species closely resembles *Rhopalopsole bispina* (Wu, 1949), with both species sharing similar shapes of the epiproct and the central plate of tergum 10. In *R. dulongjianga*, the cercus is hairy and upcurved, with a small spine and tergum 9 is mostly sclerotised, somewhat less so in the median pentagonal area with a paired posterior process with sensilla basiconica. In contrast, *R. bispina* lacks a spine on the cerci and the hind border of tergum 9 features a band of knob-like

ornamentations, narrowly connected in the middle and broadly expanded on each side.



Figure 1. [doi](#)

Rhopalopsole dulongjianga, sp. nov. Male head and pronotum, dorsal view.



Figure 2. [doi](#)

Rhopalopsole dulongjianga, sp. nov. **A** Male fore-wings; **B** Male hind-wings.



Figure 3. [doi](#)

Rhopalopsole dulongjiangana, sp. nov. **A** Male terminalia, dorsal view; **B** Male terminalia, lateral view; **C** Male terminalia; ventral view.

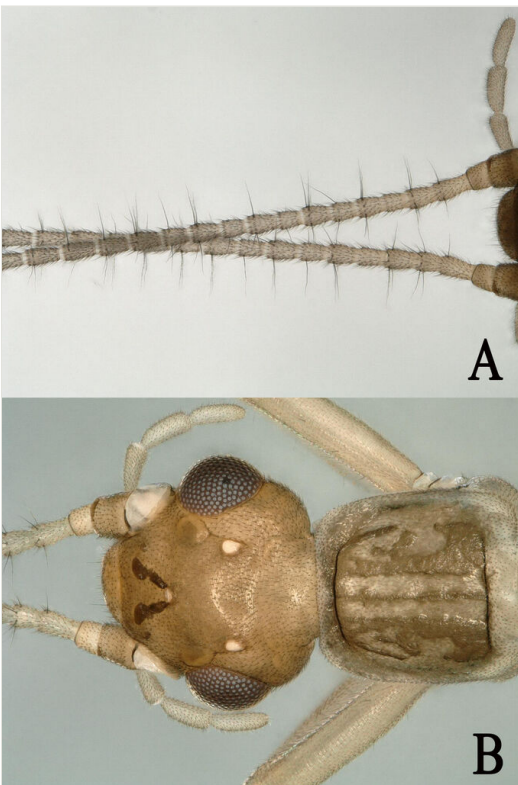


Figure 4. [doi](#)

Rhopalopsole bispina (Wu, 1949). **A** Male head and pronotum, dorsal view; **B** Male antennae, dorsal view.

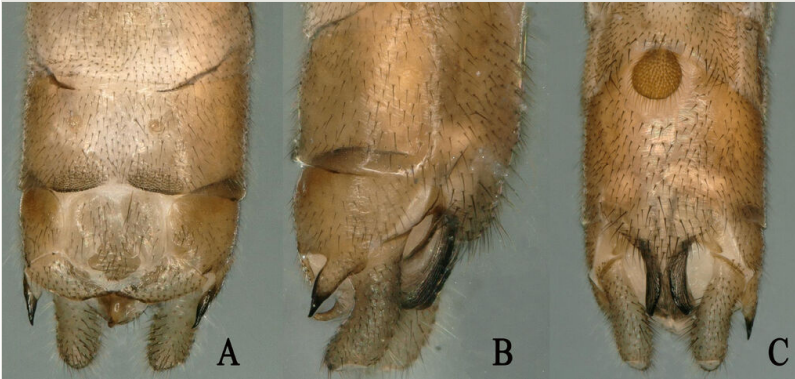


Figure 5. [doi](#)

Rhopalopsole bispina (Wu, 1949). **A** Male terminalia, dorsal view; **B** Male terminalia, lateral view; **C** Male terminalia, ventral view.

Etymology

This new species is named after its collection site, Dulongjiang Town.

Distribution

China, Yunnan (Fig. 6).

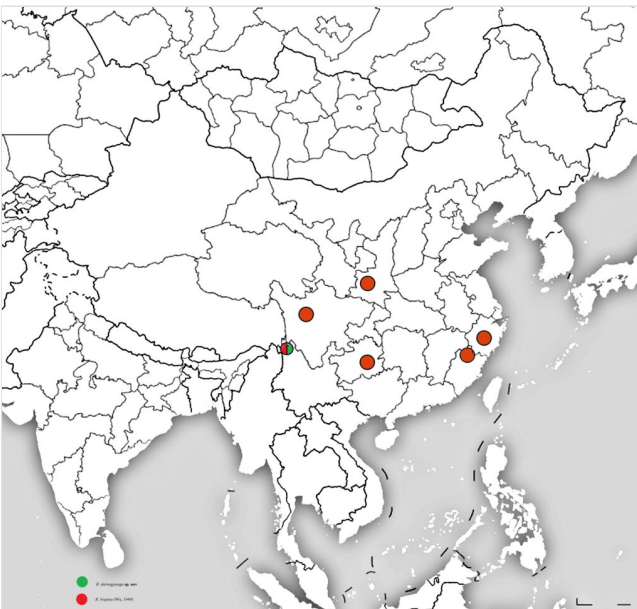


Figure 6. [doi](#)

The distribution of *R. dulongjianga* sp. nov and *Rhopalopsole bispina* (Wu, 1949) in China.

Rhopalopsole bispina (Wu, 1949)

Material

- a. scientificName: *Rhopalopsole bispina*; class: Insecta; order: Plecoptera; family: Leuctridae; genus: *Rhopalopsole* ; specificEpithet: *bispina*; country: China; stateProvince: Yunnan; county: Nujiang Lisu Autonomous Prefecture; locality: Dulongjiang town; minimumElevationInMeters: 1400; decimalLatitude: 27.841534; decimalLongitude: 98.328783; year: 2024; month: 6; day: 14; sex: 2 males; lifeStage: 2 adult; recordedBy: Yang Xiao & Zeng Liang-Liang; occurrenceStatus: present; institutionID: ICYZU; occurrenceID: 93CAE033-74C7-58B7-A4AB-C11B227C172B

Description

This species was well re-described by Sivec et al. (2008) (Fig. 4). Additionally, we observed that the antennae of *R. bispina* have long hairs. Therefore, we provide only colour picture in this paper (Figs 4, 5) and a map of the distribution of *R. bispina* in China (Fig. 6).

Distribution

China, Guizhou; Sichuan; Zhejiang; Yunnan; Fujian.

Identification keys

Key to the males of <i>Rhopalopsole</i> species from Yunnan Province of China		
1	Lateral processes of tergum 10 bifurcate	2
–	Lateral processes of tergum 10 not bifurcate	4
2	Epiproct triangulate in dorsal view	<i>R. brevidigitata</i> Qian & Du, 2017
–	Epiproct not triangulated in dorsal view	3
3	Antennae with long hairs	<i>R. sinensis</i> Yang & Yang, 1993
–	Antennae without long hairs	<i>R. yunnana</i> Sivec & Harper, 2008
4	Subanal lobes are divided into three parts	<i>R. dentiloba</i> (Wu, 1973)
–	Subanal lobes are not divided into three parts	5

5	Lateral projections of tergum 10 nearly parallel-sided in lateral view	<i>R. emeishan</i> Sivec & Harper, 2008
–	Lateral projections of tergum 10 gradually taper towards the apex in the lateral view	6
6	Tergum 10 with central sclerite is about the same length and width	<i>R. faciursina</i> Qian & Du, 2017
–	Tergum 10 with central sclerite distinctly broader than long	7
7	Tergum 9 with a T-shaped weakly sclerotised area in the median	<i>R. siculiformis</i> Qian & Du, 2012
–	Tergum 9 without a T-shaped weakly sclerotised area in the median	8
8	The cercus with a small spine and tergum 9 is mostly sclerotised, somewhat less so in the median pentagonal area with a paired posterior process with sensilla basiconica	<i>R. dulongjianga</i> Yang & Du, sp. nov.
–	The cercus without spine and tergum 9 without a pentagonal weakly sclerotised area in the median	<i>R. bispina</i> (Wu, 1949)

Acknowledgements

This research was supported by the National Natural Science Foundation of China (No. 32370480; 31572295).

References

- Chen J, Wang HL, Li WH (2022) Two new species of the genus *Rhopalopsola* (Plecoptera: Leuctridae) from China. *Zootaxa* 5129 (4): 569-578. <https://doi.org/10.11646/zootaxa.5129.4.6>
- Chen ZT, Du YZ (2017) Description of the first new species of Leuctridae (Plecoptera) from Jiangsu Province of China. *Zootaxa* 4319 (1): 185-193.
- DeWalt RE, Maehr MD, Hopkins H, Neu-Becker U, Stueber G (2024) <http://Plecoptera.SpeciesFile.org>
- Harper PP (1977) Capniidae, Leuctridae, and Perlidae (Plecoptera) from Nepal. *Oriental Insects* 11: 53-62. <https://doi.org/10.1080/00305316.1977.10432083>
- Harrison AB, Stark BP (2008) *Rhopalopsola alobata* (Plecoptera: Leuctridae), a new stonefly species from Vietnam. *Illiesia* 4: 76-80.
- Illies J (1966) *Katalog der rezenten Plecoptera. Das Tierreich, Berlin* 82: 1-632.
- Jewett SG (1958) Entomological survey of the Himalaya. 23. Stoneflies (Plecoptera) from the Northwest (Punjab) Himalaya. *Proceedings of the National Academy of Sciences, India* 28: 320-329.

- Jewett SG (1975) Some stoneflies from Bangladesh, India and Southeast Asia. *Oriental Insects* 9: 127-134. <https://doi.org/10.1080/00305316.1975.10434482>
- Kawai T (1967) Plecoptera (Insecta). *Fauna Japonica*. Biogeographical Society of Japan 1-211.
- Kawai T (1968) Stoneflies from Thailand and India with descriptions of a new genus and two new species. *Oriental Insects* 2: 107-139. <https://doi.org/10.1080/00305316.1968.10433877>
- Kawai T (1969) Stoneflies (Plecoptera) from Southeast Asia. *Pacific Insects* 11: 613-625.
- Klapálek F (1912) H. Sauter's Formosa-Ausbeute. *Plecoptera. Entomologische Mitteilungen* 1: 342-351. <https://doi.org/10.5962/bhl.part.25903>
- Li WH, Yang D (2010) Two new species of *Rhopalopssole vietnamica* group (Plecoptera: Leuctridae: *Rhopalopssole*) from China. *Zootaxa* 2614: 59-64.
- Li WH, Li GL, Yang D (2010a) A new species of the genus *Rhopalopssole* (Plecoptera: Leuctridae) from Sichuan, China. *Acta Zootaxonomica Sinica* 35: 310-312.
- Li WH, Lu WY, Yang D (2010b) A new species of *Rhopalopssole vietnamica* group (Plecoptera: Leuctridae) from China. *Entomological News* 121: 163-164. <https://doi.org/10.3157/021.121.0207>
- Li WH, Yang D (2011) A new species of *Rhopalopssole dentata* group from China (Plecoptera: Leuctridae). *Transactions of the American Entomological Society* 137: 199-201. <https://doi.org/10.3157/061.137.0112>
- Li WH, Kong FB, Yang D (2011) A new species of *Rhopalopssole shaanxiensis* species group (Plecoptera: Leuctridae) from China. *Acta Zootaxonomica Sinica* 36: 246-248.
- Li WH, Yang D (2012) A review of *Rhopalopssole magnicerca* group (Plecoptera: Leuctridae) from China. *Zootaxa* 3582 (1): 17-32.
- Li WH, Muranyi D, Gamboa M, Yang D, Watanabe K (2017) New species and records of Leuctridae (Plecoptera) from Guangxi, China, on the basis of morphological and molecular data, with emphasis on *Rhopalopssole*. *Zootaxa* 4243 (1): 165-176.
- Li WL, Zhang Y, Yang D, Li WH (2022) *Rhopalopssole magnispina* sp. nov., a new species of Leuctridae (Plecoptera) from China, with notes on *R. horvati* Sivec & Harper, 2008. *Zootaxa* 5141 (1): 94-100. <https://doi.org/10.11646/zootaxa.5141.1.9>
- Mo RR, Wang GQ, Yang D, Li WH (2018) Two new species of the *Rhopalopssole magnicerca* group (Plecoptera: Leuctridae) from China. *Zootaxa* 4388 (3): 444-450.
- Okamoto H (1922) Zweiter Beitrag zur Kenntnis der Japanischen Plecoptera. *Bulletin of the Agricultural Experiment Station, Government-General of Chosen, Korea* 1: 1-46.
- Qian YH, Du YZ (2011) Two new species of genus *Rhopalopssole* (Insecta, Plecoptera, Leuctridae) from China. *ZooKeys* 154: 1-7. <https://doi.org/10.3897/zookeys.154.2234>
- Qian YH, Du YZ (2012a) Two new species of the genus *Rhopalopssole* (Plecoptera: Leuctridae) from China. *Entomotaxonomia* 34: 17-21.
- Qian YH, Du YZ (2012b) Two new species of the genus *Rhopalopssole* (Plecoptera: Leuctridae) from China. *Entomotaxonomia* 34: 17-21.
- Qian YH, Du YZ (2013) Two new species of *Rhopalopssole* (Plecoptera: Leuctridae) from China. *Zootaxa* 3599 (6): 588-592.
- Qian YH, Li HL, Du YZ (2014) Two new species of *Rhopalopssole* (Plecoptera: Leuctridae) from China. *Zootaxa* 4273 (2): 296-300.
- Qian YH, Du YZ (2017) Two new species of *Rhopalopssole* (Plecoptera: Leuctridae) from China. *Zootaxa* 4273 (2): 296-300.

- Sivec I, Harper PP, Shimizu T (2008) Contribution to the study of the Oriental genus *Rhopalopsole* (Plecoptera: Leuctridae). *Scopolia* 64: 1-122.
- Stark BP, Sivec I (2008) *Rhopalopsole mataikan* (Plecoptera: Leuctridae), a new stonefly from Brunei Darussalam. *Illiesia* 4: 139-142.
- Stark BP, Sivec I, Shimizu T (2012) Notes on *Rhopalopsole* Klapálek (Plecoptera: Leuctridae), with descriptions of three new species from Vietnam. *Illiesia* 8: 134-140.
- Wu CF (1949) Sixth supplement to the stoneflies of China (Order Plecoptera). *Peking Natural History Bulletin* 17: 251-256.
- Wu CF (1973) New species of Chinese stoneflies (Order Plecoptera). *Acta Entomologica Sinica* 16: 97-118.
- Yang D, Li WH, Zhu F (2004) Two new species of *Rhopalopsole* (Plecoptera: Leuctridae) from China. *Entomological News* 115 (5): 279-282.
- Yang D, Li Z (2006) A new species of *Rhopalopsole* (Plecoptera: Leuctridae) from China. *Entomological News* 117 (4): 433-435. [https://doi.org/10.3157/0013-872X\(2006\)117\[433:ANSORP\]2.0.CO;2](https://doi.org/10.3157/0013-872X(2006)117[433:ANSORP]2.0.CO;2)
- Yang D, Shi L, Li WH (2009) A new species of *Rhopalopsole* from Oriental China (Plecoptera: Leuctridae). *Transactions of American Entomological Society* 135 (2): 193-195. <https://doi.org/10.3157/061.135.0207>
- Yang X, Du YZ (2024) A new species of *Rhopalopsole* (Plecoptera, Leuctridae) from Hainan Province, China. *Biodiversity Data Journal* 12: e122999.
- Yang YB, Du YZ (2021a) Two new species of *Rhopalopsole* (Plecoptera: Leuctridae) from Wuyi Mountains of China. *Zootaxa* 5071 (1): 143-150. <https://doi.org/10.11646/zootaxa.5071.1.8>
- Yang YB, Du YZ (2021b) A new synonym species with description of a new species of *Rhopalopsole* from China (Plecoptera: Leuctridae). *European Zoological Journal* 89 (1): 183-189.
- Yang YB, Du YZ (2021c) A new synonym with a new species of *Rhopalopsole* (Plecoptera: Leuctridae) from China. *Zootaxa* 5072 (5): 485-492. <https://doi.org/10.11646/zootaxa.5072.5.5>
- Yang YB, Du YZ, Zhu BQ (2021) Two new species of *Rhopalopsole* (Plecoptera: Leuctridae) from Wuyi Mountains of China. *Zootaxa* 5071 (1): 143-150. <https://doi.org/10.11646/zootaxa.5071.1.8>
- Yang YB, Du YZ, Zhu BQ (2022) A new species of *Rhopalopsole* Klapálek, 1912 with preliminary female identifications in this genus. *Zootaxa* 5133 (2): 270-278. <https://doi.org/10.11646/zootaxa.5133.2.7>
- Zwick P (1977) Ergebnisse der Bhutan-Expedition 1972 der Naturhistorischen Museums in Basel. *Entomologica Basiliensia* 2: 85-134.