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The genus *Pareuryaptus* (Carabidae, Pterostichini) from China, with three new country records

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Abstract

Background

Pareuryaptus is a genus of Carabidae containing 18 species and one subspecies distributed mainly in the Oriental Realm. However, only one species and one subspecies were recorded from China before the present study.

New information

Four species and one subspecies of *Pareuryaptus* are reported from China with three of them newly recorded: *Pareuryaptus adoxus* (Tschitschérine) from Yunnan; *Pareuryaptus exiguus* Dubault, Lassalle & Roux from Guangxi; and *Pareuryaptus luangphabangensis* Kirschenhofer from Yunnan. Moreover, the male of *Pareuryaptus exiguus* Dubault, Lassalle & Roux is firstly described and a key to all known Chinese species is provided.

Keywords

Trigonotomina, *Pareuryaptus*, key, new record, China

Introduction

Pareuryaptus is a genus under the subtribe Trigonotomina (Carabidae, Pterostichini). Dubault et al. (2008a) established the genus *Pareuryaptus* to accommodate some species previously placed in genus *Trigonotoma* Dejean and described several new species. A total of 18 species and one subspecies are known in the genus, mainly distributed in the

Oriental Realm. However, only one species and one subspecies were recorded from China before the present study.

It's not surprising for us to find some new records of *Pareuryaptus* in China, because many species distribute in China's southern neighboring countries, such as Vietnam, Laos and Myanmar. We got a specimen from Xishuangbanna (South Yunnan) in the second half of 2020, which aroused our interests in this genus. After that, to make a more complete study, we collected more specimens and studied the collection of the Institute of Zoology, Chinese Academy of Sciences.

The primary purposes of this paper are to represent three new records of *Pareuryaptus* species from China, firstly describe the male of *P. exiguus* that was originally described by a female holotype, and provide a key for all Chinese *Pareuryaptus* species.

Materials and methods

The specimens examined in the present study are from these collections:

CHLC Collection of Haoyuan Li, Beijing, China.

CJCC Collection of Jiaheng Chen, Guangdong, China.

CYLC Collection of Yihang Li, Beijing, China.

IZAS Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

In the citations of species, the following abbreviations of collections were mentioned, but there is no specimen examination from these collections:

CADA Collection of A. Dostal, Vienna, Austria.

MNHN Museum National d'Histoire Naturelle, Paris, France.

ZMAS Zoological Institute, Russian Academy of Sciences, Saint Petersburg, Russia.

NMPC Narodni Muzeum Prirodovedcke Muzeum, Prague, Czech Republic.

Habitus and aedeagus were captured by Nikon D7200 camera with LAOWA 60mm F2.8 2:1 Super Macro Lens. Maxillary palpi and pronota were captured by Nikon D5500 camera with Nikon SMZ18 stereomicroscope. Stains and dust on specimens were moderately cleared using Photoshop Elements 2022 Editor 20.0 after photographing.

Taxon treatments

Pareuryaptus Dubault, Lassalle & Roux, 2008

Type species

Trigonotoma curtula Chaudoir 1868

Diagnosis

Among the six genera (*Trigonotoma* Dejean, *Lesticus* Dejean, *Euryaptus* Bates, *Nesites* Andrews, *Pareuryaptus* Dubault, Lassalle & Roux, and *Leiolesticus* Roux, Lassalle & Dubault) of Trigonotomina, *Pareuryaptus* can be distinguished by the following character combinations: first antennomere (scape) longer than the length of the second and third antennomeres combined; apex of labrum emarginate, with six apical setae, four grouped near the middle, the lateral setae evidently distant from the median four ones; parascutellar striae absent or very short; females with one seta on each side of sternite VII (Roux et al. 2016).

Pareuryaptus adoxus (Tschitschérine, 1900), new record to China

Nomenclature

Tschitschérine 1900: 162 (original: *Trigonotoma*; type locality: Saigon; holotype in ZMAS); Lorenz 2005: 300 (*Trigonotoma*, catalogue); Dubault et al. 2008a: 241; Dubault et al. 2008b: 199; Roux et al. 2016: 52.

Materials

- a. country: China; stateProvince: Yunnan; verbatimLocality: Xishuangbanna, Damenglong; verbatimElevation: 650m; year: 1958; month: 7; day: 12; individualCount: 1; sex: female; recordedBy: Chunpei Hong; institutionCode: IZAS
- b. country: China; stateProvince: Yunnan; verbatimLocality: Jinghong, Nabanhe Natural Reserve, Mengsong Country, Danuoyou; verbatimElevation: 770m; verbatimLatitude: 22.20699°N; verbatimLongitude: 100.63761°E; samplingProtocol: pitfall trap; year: 2009; month: 5; day: 26; individualCount: 1; sex: female; recordedBy: L. Z. Meng; institutionCode: IZAS

Diagnosis

Habitus: Fig. 1a. Maxillary palpus: Fig. 3a. Pronotum: Fig. 4a.

Body length = 12.2 - 12.6 mm. Dorsal surface largely black. Terminal maxillary palpmere cylindrical, in similar width as distal end of penultimate one, distinctly longer than penultimate one. Pronotum faintly blue, transversal round (pronotum width / pronotum length = 1.40 – 1.42), widest a little behind anterior third; pronotum densely

and coarsely punctate between basal foveae; lateral margins hardly sinuate in front of posterior angles; posterior angles rounded obtuse.

This species can be well distinguished from other Chinese species by the terminal maxillary palpmere cylindrical, not wider but much longer than the penultimate one.

Remarks

Xishuangbanna, the collection locality of the two specimens we examined, is a little far from South Vietnam, the type locality of *P. adoxus*. However, we are confident in determining them as *P. adoxus* because all characteristics are nearly identical to the description and images of the type specimen (Roux et al. 2016).

Distribution

China (Yunnan) & Vietnam: Fig. 5.

Pareuryaptus exiguus Dubault, Lassalle & Roux, 2008, new record to China

Nomenclature

Dubault et al. 2008b: 201 (type locality: Hagiang; holotype in MNHN); Roux et al. 2016: 60.

Materials

- a. country: China; stateProvince: Guangxi; verbatimLocality: Fangcheng District, Nasuo Town, Naqin village, 248 platform; verbatimElevation: 852m; verbatimLatitude: N21.7669; verbatimLongitude: E108.0598; samplingProtocol: soil sieve; year: 2020; month: 12; day: 10; individualCount: 1; sex: male; recordedBy: Feng Zegang; institutionCode: IZAS
- b. country: China; stateProvince: Guangxi; verbatimLocality: Daqing Mt.; verbatimElevation: 700m; year: 1983; month: 5; day: 5; individualCount: 1; sex: female; recordedBy: Subai Liao; institutionCode: IZAS

Diagnosis

Habitus: Fig. 1b. Male genitalia: Fig. 2a, b. Maxillary palpus: Fig. 3b. Pronotum: Fig. 4b.

Body length = 12.6 – 13.7 mm. Dorsal surface dark brown to black. Terminal maxillary palpmere cylindrical, as long as penultimate one. Pronotum black, rounded, narrower than the previous species (pronotum width / pronotum length = 1.24 – 1.29), widest near middle; pronotum completely smooth between basal foveae; lateral margins hardly sinuate in front of posterior angles; posterior angles rounded obtuse.

This species can be well distinguished from other Chinese species by the narrower pronotum and lateral margins evenly curved, widest near middle.

Supplementary descriptions.

Male genitalia: in lateral view, median lobe of aedeagus with ventral margin very weakly curved near middle, apical lamella near straight; in dorsal view, median lobe of aedeagus with two lateral margins sinuate, widest near basal third, gradually constricted near apical third, apex rounded with apical lamella very short, apical orifice opened left-dorsally.

Remarks

This species was originally described by a single female. We herein firstly record the male of this species and provide description and illustration for the male genitalia.

Distribution

China (Guangxi) & Vietnam: Fig. 5.

Pareuryaptus luangphabangensis Kirschenhofer, 2011, new record to China

Nomenclature

Kirschenhofer 2011: 33 (type locality: Luang Phabang; holotype in CADA); Roux et al. 2016: 78.

Materials

- a. country: China; stateProvince: Yunnan; verbatimLocality: Jinghong Menglun xishuangbanna P G 2 – 19; verbatimDepth: 558m; verbatimLatitude: N: 21°55.035'; verbatimLongitude: E: 101°16.500'; year: 2007; month: 5; day: 10; individualCount: 1; sex: male; recordedBy: Zheng Guo; institutionCode: IZAS
- b. country: China; stateProvince: Yunnan; verbatimLocality: Xishuangbanna Dai Autonomous Prefecture, Jinghong City, Jino Mt.; verbatimLatitude: 22.0373N; verbatimLongitude: 101.0044E; year: 2020; month: 5; day: 18-2; individualCount: 1; sex: male; recordedBy: Yi Li; collectionCode: CHLC
- c. country: China; stateProvince: Yunnan; verbatimLocality: Xishuangbanna Dai Autonomous Prefecture, Jinghong City, Gasa Town, Nanpaxiaozhai; verbatimElevation: 1000m; year: 2021; month: 3-5; individualCount: 2; sex: 1 male, 1 female; recordedBy: Hui Ce; collectionCode: CHLC

Diagnosis

Habitus: Fig. 1c, d. Male genitalia: Fig. 2c, d. Maxillary palpus: Fig. 3c, d. Pronotum: Fig. 4c.

Body length = 12.8 – 14.6 mm. Dorsal surface black. Terminal maxillary palpmere cylindrical, as long as penultimate one. Pronotum black, widely cordate (pronotum width / pronotum length = 1.37 – 1.44), widest a little behind anterior third; pronotum

completely smooth between basal foveae; lateral margins strongly sinuate in front of posterior angles; posterior angles rectangular with sharp apices.

This species can be well distinguished from other Chinese species by its special pronotum that is strongly cordate with evidently sinuation in front of posterior angles that are sharp.

Remarks

This species is somewhat similar to *P. aethiops* distributed in Myanmar. Based on the descriptions in literature (Roux et al. 2016), these two species are mainly different in the shape of pronotum: lateral margins evidently sinuate before posterior angles in *P. luangphabangensis* but hardly sinuate in *P. aethiops*; apex of posterior angles sharp in *P. luangphabangensis* but near rounded in *P. aethiops*.

Distribution

China (Yunnan) & Laos: Fig. 5.

Pareuryaptus chalceolus chalceolus (Bates, 1873)

Nomenclature

Bates 1873: 328 (original: *Trigonotoma*; type locality: Hong Kong; lectotype in MNHN); Bates 1889: 16 (*Trigonotoma*, Saigon); Lorenz 2005: 300 (*Trigonotoma*, catalogue); Dubault et al. 2007: 216 (*Trigonotoma*); Dubault et al. 2008a: 241; Dubault et al. 2008b: 207; Roux et al. 2016: 84; Löbl and Löbl 2017: 688 (catalogue).

Synonym: *Trigonotoma annamensis* Jedlička 1962: 313 (type locality: Cuatung, holotype in NMPC); Dubault et al. 2008b: 208 (synonymized to *P. chalceolus*).

Materials

- a. country: Vietnam; verbatimLocality: TONKIN Hoa Binh; individualCount: 1; sex: male; recordedBy: A de cooman; institutionCode: IZAS
- b. country: China; stateProvince: Guangxi; verbatimLocality: Daqing Mt.; verbatimElevation: 700m; year: 1983; month: 5; day: 5; individualCount: 1; sex: male; recordedBy: Subai Liao; institutionCode: IZAS
- c. country: China; stateProvince: Guangxi; verbatimLocality: Jingxi County, near Longbang Town Hotel; verbatimElevation: 700m; verbatimLatitude: 22.879343N; verbatimLongitude: 106.330014E; samplingProtocol: collect at night; year: 2018; month: 4; day: 29; individualCount: 1; sex: male; recordedBy: Weifeng Yan; institutionCode: IZAS
- d. country: China; stateProvince: Guangdong; verbatimLocality: Guangzhou City, Xinhui District, Guanyin Mt.; year: 2021; month: 3; individualCount: 5; sex: 2 males, 3 females; recordedBy: native collector; collectionCode: CHLC
- e. country: China; stateProvince: Fujian; verbatimLocality: Putian City, Hanjiang District; year: 2020; month: 3; day: 10; individualCount: 1; sex: female; recordedBy: native collector; collectionCode: CJCC

- f. country: China; stateProvince: Hunan; verbatimLocality: Chenzhou City, Yizhang County, Yuxi Town; year: 2021; month: 5; day: 1; individualCount: 2; sex: females; recordedBy: Jinse Song; collectionCode: CYLC

Diagnosis

Habitus: Fig. 1e. Male genitalia: Fig. 2e, f. Maxillary palpus: Fig. 3e. Pronotum: Fig. 4e, f.

Body length = 11.9 - 14.5 mm. Dorsal surface black. Terminal maxillary palpmere long-ovate, much longer and wider than penultimate one. Pronotum black, widely rounded (pronotum width / pronotum length = 1.33 – 1.43), widest a little behind anterior third; pronotum densely punctate between basal foveae; lateral margins hardly sinuate in front of posterior angles; posterior angles obtuse.

This species can be well distinguished from other Chinese species by the terminal maxillary palpmere long-ovate, much longer and wider than the penultimate one.

Distribution

China (Hong Kong, Hainan, Guangxi, Guangdong, Fujian, Hunan) & Vietnam: Fig. 5.

Pareuryaptus chalceolus formosanus (Jedlička, 1962)

Nomenclature

Jedlička 1962: 314 (original: *Trigonotoma formosanus*; type locality: Takao; holotype in NMPC); Lorenz 2005: 300 (*Trigonotoma formosanus*, catalogue); Dubault et al. 2008a: 241 (*Pareuryaptus formosanus*); Dubault et al. 2008b: 208 (as subspecies of *P. chalceolus*); Dubault et al. 2008c: 211 (*Pareuryaptus formosanus*); Roux et al. 2016: 84; Löbl and Löbl 2017: 688 (catalogue).

Material

- a. country: China; stateProvince: Taiwan; verbatimLocality: Pingtung County, Jialeshui; year: 2008; month: 6; day: 8; individualCount: 1; sex: female; recordedBy: Changchin Chen; institutionCode: IZAS

Diagnosis

Habitus: Fig. 1f. Maxillary palpus: Fig. 3f. Pronotum: Fig. 4d.

Body length = 11.7 mm. Dorsal surface black. Similar to the nominal-typical subspecies, but different in the pronotum only sporadically punctate between basal foveae.

Distribution

China (Taiwan): Fig. 5.

Identification keys

Key to Chinese species and subspecies of <i>Pareuryaptus</i>		
1	Pronotum more or less punctate between basal foveae; terminal maxillary palpimere much longer than penultimate one.	2
–	Pronotum completely smooth between basal foveae; terminal maxillary palpimere as long as penultimate one.	4
2	Terminal maxillary palpimere long-ovate, distinctly wider than distal end of penultimate one.	3
–	Terminal maxillary palpimere cylindrical, not wider than distal end of penultimate one.	<i>P. adoxus</i> (Tschitschérine, 1900)
3	Pronotum densely punctate between basal foveae, distributed in Mainland China.	<i>P. chaldeolus chaldeolus</i> (Bates, 1873)
–	Pronotum sporadically punctate between basal foveae, distributed in Taiwan, China.	<i>P. chaldeolus formosanus</i> (Jedlička, 1962)
4	Pronotum lateral margins near straight before posterior angles, apex of posterior angles obtuse.	<i>P. exiguus</i> Dubault, Lassalle & Roux, 2008
–	Pronotum lateral margins strongly sinuate before posterior angles, apex of posterior angles sharp.	<i>P. luangphabangensis</i> Kirschenhofer, 2011

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References

- Bates HW (1873) On the Geodephagous Coleoptera of Japan. Fam. Carabidae. The Transactions of the Entomological Society of London 1873 (2): 229-322.
- Bates HW (1889) Contributions à la faune indo-chinoise. 3e mémoire. Annales de la Société Entomologique de France 6) 9: 261-286.
- Chaudoir M (1868) Révision des Trigonotomides. Annales de la Société Entomologique de Belgique 11 (1867): 151-165.
- Dubault G, Lassalle B, Roux P (2007) Types of «Trigonotomi» of the collections of the Muséum national d'Histoire naturelle, in Paris (Coleoptera, Pterostichidae. Bulletin de la Société Entomologique de France 112 (2): 209-222. <https://doi.org/10.3406/bsef.2007.16423>
- Dubault G, Lassalle B, Roux P (2008a) Les genres des "Trigonotomi": Pareuryaptus n. gen. et révision des Euryaptus Bates, 1892 (Coleoptera, Pterostichidae. Bulletin de la Société Entomologique de France 113: 239-248. <https://doi.org/10.3406/bsef.2008.16526>
- Dubault G, Lassalle B, Roux P (2008b) Révision du genre Pareuryaptus Dubault, Lassalle & Roux, 2008 et description de cinq espèces nouvelles (Coleoptera Pterostichidae Trigonotomi. L'Entomologiste 64 (3): 197-211.
- Dubault G, Lassalle B, Roux P (2008c) Types de Trigonotomi conservés dans les Musées d'histoire naturelle de Bâle, de Berlin, de Paris (complément) et de Prague. Lambillionea 108 (4): 199-215.
- Jedlička A (1962) Monographie des Tribus Pterostichini aus Ostasien (Pterostichi, Trigonotomi, Myadi) (Coleoptera-Carabidae). Abhandlungen und Berichte aus dem Staatlichen Museum für Tierkunde in Dresden 26: 177-346.
- Kirschenhofer E (2011) Zwei neue Arten der Gattung Pareuryaptus Dubault, Lassalle & Roux aus Laos sowie eineneue Art der Gattung Trigonognatha Motschulsky aus China. Mitteilungen des Internationalen Entomologischen Vereins 36 (1-2): 33-41.
- Löbl I, Löbl D (2017) Catalogue of Palaearctic Coleoptera, Volume 1: Archostemata - Myxophaga - Adephaga. E J Brill, Denmark, 1477 pp.
- Lorenz W (2005) Systematic List of Extant Ground Beetles of the World (Insecta Coleoptera Geadephaga: Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae), Second Edition. Wolfgang Lorenz, Tutzing, Germany, 530 pp.
- Roux P, Lassalle B, Dubault G (2016) Les Trigonotomi. Révision. B. Lassalle et P. Roux, France, 569 pp.
- Tschitschérine T (1900) Notes sur les Platysmatini du Muséum d'Histoire Naturelle de Paris. II. Horae Societatis Entomologicae Rossicae 34: 153-198.

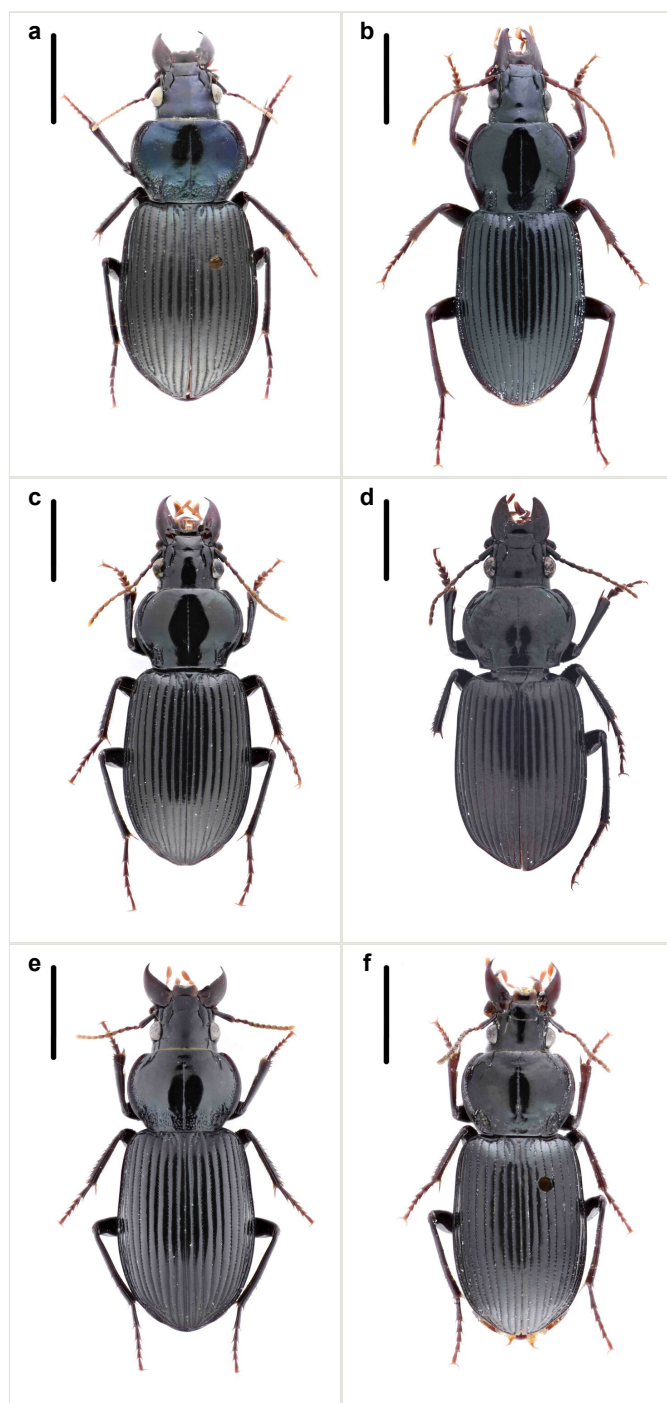


Figure 1.

Habitus of *Pareuryaptus* spp. from China (scale bars = 3 mm): **a**, *P. adoxus* (Tschitschérine), female from Danuoyou, Yunnan; **b**, *P. exiguus* Dubault, Lassalle & Roux, male from Naqin

village, Guangxi; **c**, *P. luangphabangensis* Kirschenhofer, male from Nanpaxiaozhai, Yunnan; **d**, *P. luangphabangensis* Kirschenhofer, male from Jino Mt., Yunnan (taken by Xiaoran Yang); **e**, *P. chalceolus chalceolus* (Bates), female from Hanjiang, Fujian; **f**, *P. chalceolus formosanus* (Jedlička), female from Jialeshui, Taiwan.

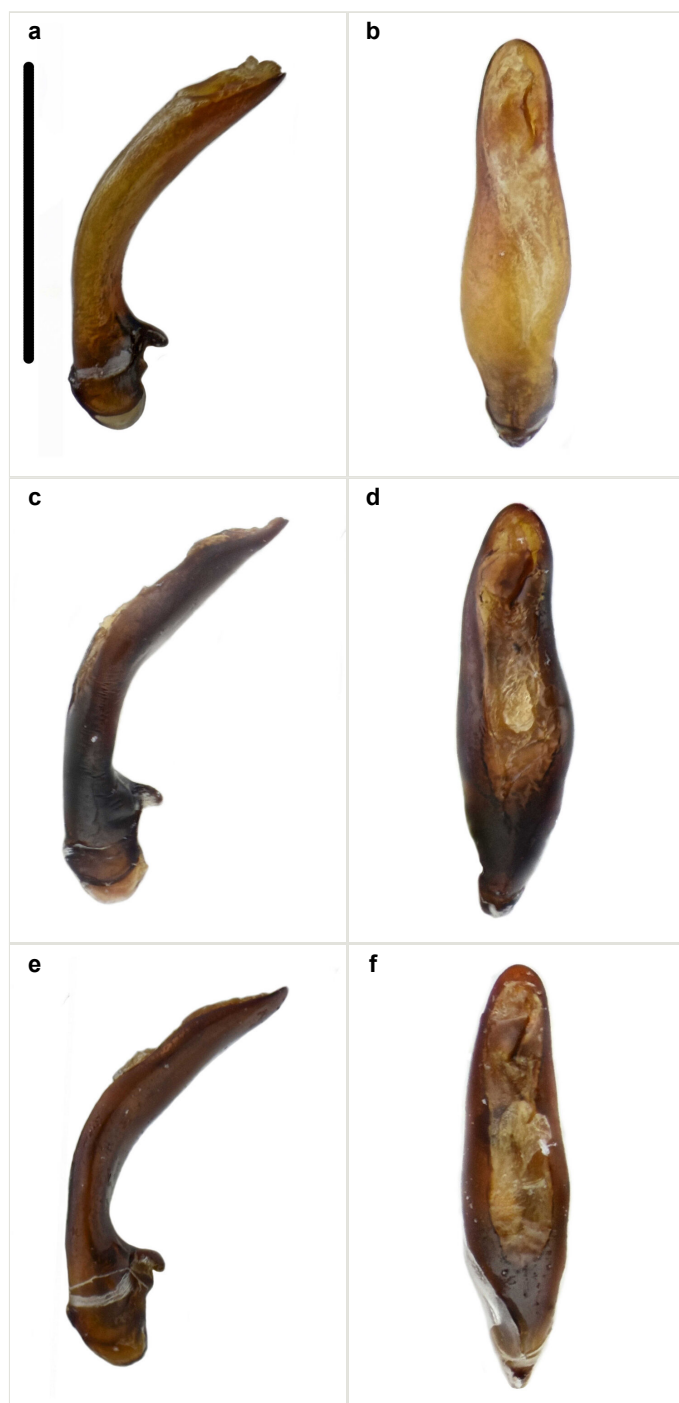


Figure 2.

Left lateral view and dorsal view of median lobe of aedeagus of *Pareuryaptus* spp. from China (scale bar = 2 mm): **a & b**, *P. exiguus* Dubault, Lassalle & Roux, Naqin village, Guangxi; **c & d**,

P. luangphabangensis Kirschenhofer, Nanpaxiaozhai, Yunnan; **e & f**, *P. chalceolus chalceolus* (Bates), Guanyin Mt., Guangdong.

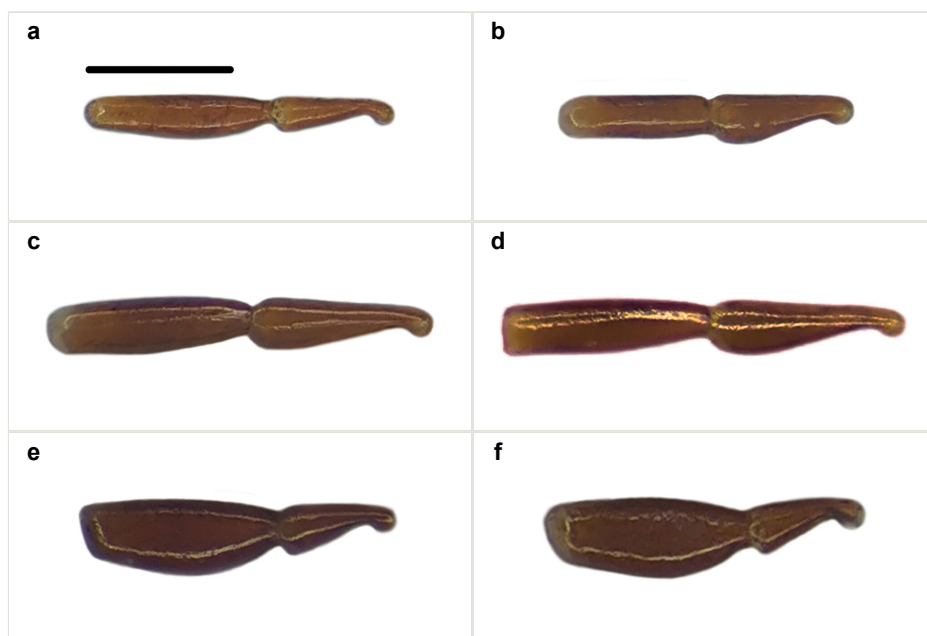


Figure 3.

Maxillary palpi of *Pareuryaptus* spp. from China (scale bar = 0.3 mm): **a**, *P. adoxus* (Tschitschérine), female from Damenglong, Yunnan; **b**, *P. exiguus* Dubault, Lassalle & Roux, male from Naqin village, Guangxi; **c**, *P. luangphabangensis* Kirschenhofer, female from Nanpaxiaozhai, Yunnan; **d**, *P. luangphabangensis* Kirschenhofer, male from Jino Mt., Yunnan; **e**, *P. chalceolus chalceolus* (Bates), male from Guanyin Mt., Guangdong; **f**, *P. chalceolus formosanus* (Jedlička), female from Jialeshui, Taiwan.

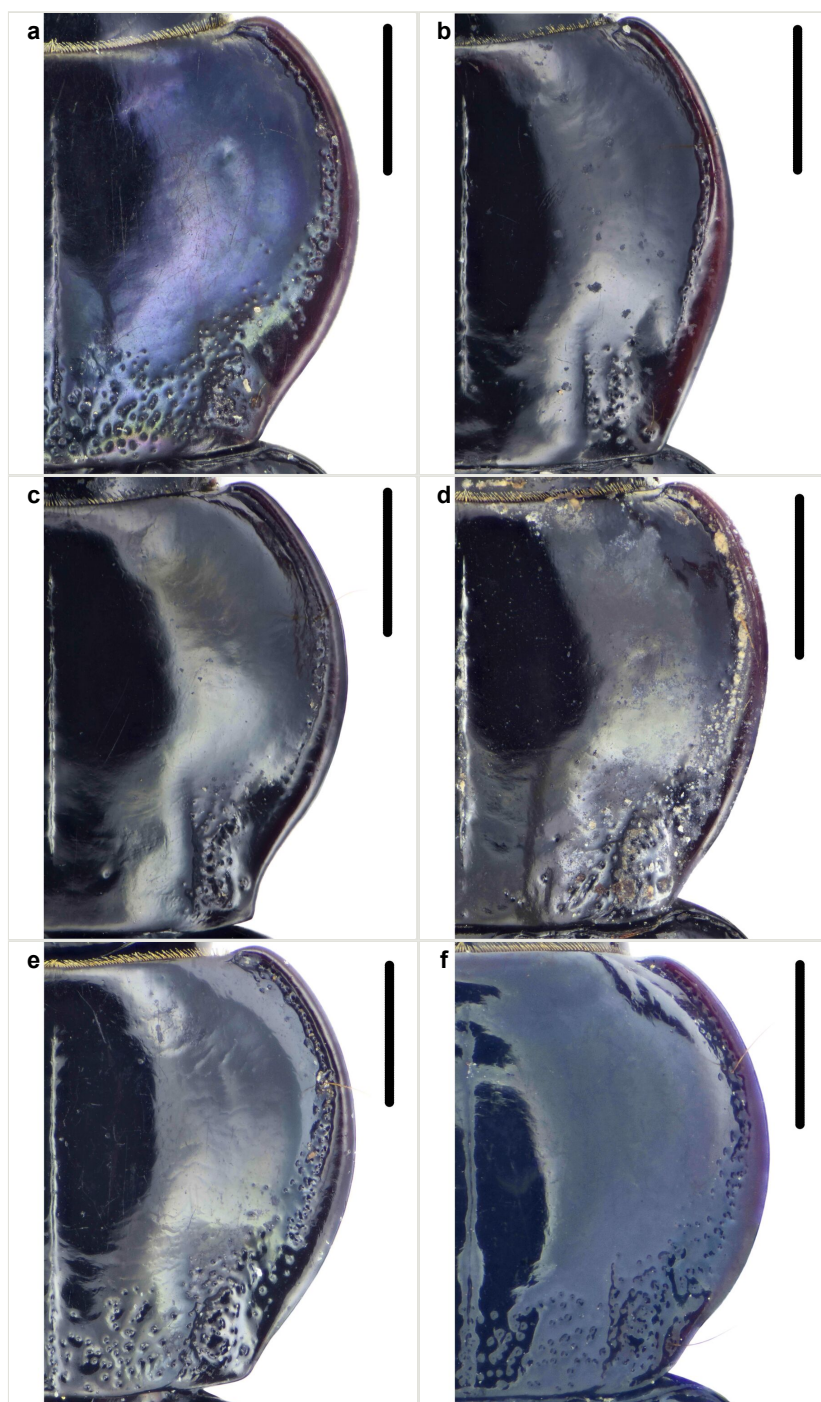


Figure 4.

Pronota of *Pareuryaptus* spp. from China (scale bars = 1 mm): **a**, *P. adoxus* (Tschitschérine), female from Danuoyou, Yunnan; **b**, *P. exiguus* Dubault, Lassalle & Roux, male from Naqin

village, Guangxi; **c**, *P. luangphabangensis* Kirschenhofer, male from Nanpaxiaozhai, Yunnan; **d**, *P. chalceolus formosanus* (Jedlička), female from Jialeshui, Taiwan; **e**, *P. chalceolus chalceolus* (Bates), male from Guanyin Mt., Guangdong; **f**, *P. chalceolus chalceolus* (Bates), female from Hanjiang, Fujian.



Figure 5.

Distribution map for *Pareuryaptus* spp. known from China: *P. adoxus* (Tschitschérine) (blue); *P. exiguus* Dubault, Lassalle & Roux (red); *P. luangphabangensis* Kirschenhofer (orange); *P. chalceolus chalceolus* (Bates) (green); *P. chalceolus formosanus* (Jedlička) (magenta).