The genus *Pareuryaptus* (Carabidae, Pterostichini) in 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 Region. 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* (Tschitscherine) from Yunnan; *Pareuryaptus exigus* Dubault, Lassalle & Roux from Guangxi; and *Pareuryaptus luangphabangensis* Kirschenhofer from Yunnan. Moreover, the male of *Pareuryaptus exigus* 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 is not surprising for us to find some new records of Pareuryaptus in China, because many species are distributed in China’s southern neighbouring countries, such as Vietnam, Laos and Myanmar. We obtained a specimen from Xishuangbanna (South Yunnan) in the second half of 2020, which aroused our interest 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 to describe the male of P. exigus that was originally described by a female holotype and to 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.
- NMPC Narodni Muzeum Prirodovedecke Muzeum, Prague, Czech Republic.
- ZMAS Zoological Institute, Russian Academy of Sciences, Saint Petersburg, Russia.

Habitus and aedeagus were captured by a Nikon D7200 camera with LAOWA 60 mm F2.8 2:1 Super Macro Lens. Maxillary palpi and pronota were captured by a Nikon D5500.
camera with a 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**

Amongst the seven genera (*Trigonotoma* Dejean, *Lesticus* Dejean, *Euryaptus* Bates, *Nesites* Andrews, *Pareuryaptus* Dubault, Lassalle & Roux, *Leiolesticus* Roux, Lassalle & Dubault and *Trigonaptus* Fedorenko) 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; antennal pedicel glabrous, without ventral seta; 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; metacoxa unisette; females with one seta on each side of sternite VII (Roux et al. 2016, Fedorenko 2020).

**Pareuryaptus adoxus** (Tschitschérine, 1900)

**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. scientificName: *Pareuryaptus adoxus* (Tschitschérine, 1900); country: China; stateProvince: Yunnan; verbatimLocality: Xishuangbanna, Damenglong; verbatimElevation: 650 m; year: 1958; month: 7; day: 12; individualCount: 1; sex: female; recordedBy: Chunpei Hong; institutionCode: IZAS

b. scientificName: *Pareuryaptus adoxus* (Tschitschérine, 1900); country: China; stateProvince: Yunnan; verbatimLocality: Jinghong, Nabane Nature Reserve, Mengsong Country, Danuoyou; verbatimElevation: 770 m; 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.
Figure 1.
Habitus of *Pareuryaptus* spp. from China (scale bars = 3 mm): a, *P. adoxus* (Tschitschérine), female from Danuoyou, Yunnan; b, *P. exigus* 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 Jialeshi, Taiwan.
The genus Pareuryaptus (Carabidae, Pterostichini) in China, with three ...
Body length = 12.2–12.6 mm. Dorsal surface largely black. Terminal maxillary palpimere cylindrical, of 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 and obtuse.

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

**Remarks**

Xishuangbanna, the collection locality of the two specimens we examined, is quite 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 this species (Roux et al. 2016).

**Distribution**

Vietnam, Laos and a new record for China (Yunnan): Fig. 5.
Figure 4.
Pronota of *Pareuryaptus* spp. from China (scale bars = 1 mm): a, *P. adoxus* (Tschitschérine), female from Danuoyou, Yunnan; b, *P. exigus* 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.
**Pareuryaptus exiguus** Dubault, Lassalle & Roux, 2008

**Nomenclature**

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

**Materials**

a. **scientificName:** *Pareuryaptus exiguus* Dubault, Lassalle & Roux, 2008; **country:** China; **stateProvince:** Guangxi; **verbatimLocality:** Fangcheng District, Nasuo Town, Naqin Village, 248 platform; **verbatimElevation:** 852 m; **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. **scientificName:** *Pareuryaptus exiguus* Dubault, Lassalle & Roux, 2008; **country:** China; **stateProvince:** Guangxi; **verbatimLocality:** Daqing Mt.; **verbatimElevation:** 700 m; **year:** 1983; **month:** 5; **day:** 5; **individualCount:** 1; **sex:** female; **recordedBy:** Subai Liao; **institutionCode:** IZAS

Figure 5. Distribution map for *Pareuryaptus* spp. known from China: *P. adoxus* (Tschitscherine) (blue); *P. exiguis* Dubault, Lassalle & Roux (red); *P. luangphabangensis* Kirschenhofer (orange); *P. chalceolus chalceolus* (Bates) (green); *P. chalceolus formosanus* (Jedlička) (magenta).
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 palpimere cylindrical, as long as penultimate one. Pronotum black, rounded, narrower than that of 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 and 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 nearly straight; in dorsal view, median lobe of aedeagus with both 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 from a single female. We herein provide the first record of the male of this species and provide description and illustration for the male genitalia.

Distribution

Vietnam and a new record for China (Guangxi): Fig. 5.

Pareuryaptus luangphabangensis Kirschenhofer, 2011

Nomenclature

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

Materials

a. scientificName: Pareuryaptus luangphabangensis Kirschenhofer, 2011; country: China; stateProvince: Yunnan; verbatimLocality: Jinghong Menglin xishuangbanna P G 2 – 19; verbatimDepth: 558 m; 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. scientificName: Pareuryaptus luangphabangensis Kirschenhofer, 2011; country: China; stateProvince: Yunnan; verbatimLocality: Xishuangbanna Dai Autonomous Prefecture,
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 palpimere 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 characteristic pronotum that is strongly cordate with evident sinuation in front of posterior angles, which 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 nearly rounded in *P. aethiops*.

Distribution

Laos and a new record for China (Yunnan): 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 (synonymised to *P. chalceolus*).

**Materials**

a. scientificName: *Pareuryaptus chalceolus chalceolus* (Bates, 1873); country: Vietnam; verbatimLocality: TONKIN Hoa Binh; individualCount: 1; sex: male; recordedBy: A de cooman; institutionCode: IZAS

b. scientificName: *Pareuryaptus chalceolus chalceolus* (Bates, 1873); country: China; stateProvince: Guangxi; verbatimLocality: Daqing Mt.; verbatimElevation: 700 m; year: 1983; month: 5; day: 5; individualCount: 1; sex: male; recordedBy: Subai Liao; institutionCode: IZAS

c. scientificName: *Pareuryaptus chalceolus chalceolus* (Bates, 1873); country: China; stateProvince: Guangxi; verbatimLocality: Jingxi County, near Longbang Town Hotel; verbatimElevation: 700 m; 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. scientificName: *Pareuryaptus chalceolus chalceolus* (Bates, 1873); 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. scientificName: *Pareuryaptus chalceolus chalceolus* (Bates, 1873); 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. scientificName: *Pareuryaptus chalceolus chalceolus* (Bates, 1873); 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 elongated and 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**

Vietnam and China (Hong Kong, Hainan, Guangxi, Guangdong, Fujian, Hunan): 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. scientificName: Pareuryaptus chalceolus formosanus (Jedlička, 1962); 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 being only sparsely punctate between basal foveae.

Distribution

China (Taiwan): Fig. 5.

Identification keys

| Key to Chinese species and subspecies of Pareuryaptus |
|-----------------------------------------------------|
| 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.  | P. adoxus (Tschitschérine, 1900) |
3 Pronotum densely punctate between basal foveae, distributed in Mainland China.  
- Pronotum sparsely punctate between basal foveae, distributed in Taiwan, China.  
4 Pronotum lateral margins nearly straight before posterior angles, apex of posterior angles obtuse.  
- Pronotum lateral margins strongly sinuate before posterior angles, apex of posterior angles sharp.

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