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Notes on *Arthrotus* Motschulsky, 1857 from Nanling region of China (Coleoptera: Chrysomelidae), with descriptions of two new species

JIAN SHEN[1,3], HAI-DONG YANG[2], CHANG-PING DING[1,4] & MEI-XIA YANG[1,5*]
[1]*Shaanxi Institute of Zoology, Xi'an, Shaanxi 710000, China*
[2]*Guangdong Public Laboratory of Wild Animal Conservation and Utilization, Guangdong Key Laboratory of Animal Conservation and Resource Utilization, Institute of Zoology, Guangdong Academy of Sciences, Guangzhou, Guangdong 510260, China*
tsaeyang@126.com; https://orcid.org/0000-0002-3157-2090
[3] *shenjian0418@163.com; https://orcid.org/0009-0005-8734-9102*
[4] *dingchangping501@163.com; https://orcid.org/0009-0008-1062-4294*
[*]*Corresponding author: ymeixia2013@163.com; https://orcid.org/0009-0001-9910-6133*

Abstract

Seventeen species of *Arthrotus* Motschulsky, 1857 (Coleoptera: Chrysomelidae: Galerucinae) from the Nanling area of China are reviewed, including two new species: *A. hamatus* **sp. nov.** and *A. oculatus* **sp. nov.**, and one newly recorded species for China: *A. kalimponganus* Kimoto, 2004. Illustrations of the habitus and external genitalia of the new species are provided, and a key to the species of *Arthrotus* from Nanling region is given.

Key words: leaf beetles, morphology, faunistics

Introduction

The genus *Arthrotus* was established by Motschulsky in 1857 with *Arthrotus niger*, 1857 from Japan as type. Nie *et al*. (2017) listed 48 species distributed in Oriental and Palaearctic regions, and Yang *et al*. (2015) recorded 28 species that distributed in China. Bezděk and Nie (2019) transferred *Gallerucida malaisei* Bryant, 1954 to this genus, and firstly reported the distribution of this species in Yunnan, China. Lee (2022) revised *Arthrotus* species in Taiwan, he described two new species and proposed three new synonyms. Bezděk and Sekerka (2024) listed 32 species from Palaearctic with 28 species recorded in China.

In this study, we examined *Arthrotus* specimens collected from Nanling, China. Nanling region is located in southern China, and this region includes Guangdong, Guangxi, Hunan and part of western Jiangxi. We found that there were 17 species distributed in Nanling, including two new species and one new record, which brought the number of known species in the world to 50, and the number of Chinese species to 31.

Material and Methods

All examined specimens are conserved in the Institute of Zoology, Guangdong Academy of Sciences, Guangzhou, China.

The extraction of genitalia was performed under a Nikon SMZ745 stereomicroscope. The specimen was placed under the stereomicroscope with the ventral side facing up. The tip of a needle was inserted into the thoracoabdominal joint; then, the entire abdomen was pried and removed. The whole abdomen was boiled in a 10% NaOH solution for about 3-5min (the specific time depended on the ossification degree of the specimen), and it was then taken out when the muscle dissolved completely. The treated abdomen was rinsed in distilled water and placed in a clean petri dish with the ventral side facing up, followed by extraction of the external genitalia with tweezers. The abdomen and external genitalia were stored together in a micro-centrifuge tube with glycerin, and the centrifuge tube was pinned with the needle specimen on the same needle.

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Photographs of the habitus and genitals were taken with a Leica DFC450 micro digital imaging system (CCD), attached to a Leica M205C microscope. All figures were edited using Adobe Photoshop CS 6.0.

Abbreviations used in the paper are TL (type locality) and TD (type depository).

The type depositories covered in this paper are as follows:

BASEL Naturhistorisches Museum Basel/Natural History Museum Basel, Basel, Switzerland;
BMNH The Natural History Museum, London, UK;
BPBM Bernice Pauahi Bishop Museum, Honolulu, USA;
EMTU Naturhistorisches Museum Wien/Natural History Museum Vienna, Vienna, Austria;
FMTM Museum G. Frey, Tutzing, Germany;
IZAS Institute of Zoology, Academia Sinica, Beijing, China;
KUEC Faculty of Agriculture, Kyushu University, Fukuoka, Japan;
MSNG Giacomo Doria Museum of Natural History, Genoa, Italy;
NMNS National Museum of Natural Science, Taichung, Taiwan, China;
TARI Taiwan Agricultural Research Institute, Taichung, Taiwan, China;
UKM The National University of Malaysia, Hulu Langat District, Selangor, Malaysia;
USNM National Museum of Natural History, Washington, D.C, USA.

Taxonomy

Arthrotus Motschulsky, 1857

Arthrotus Motschulsky, 1857: 38. Type species: *Arthrotus niger* Motschulsky, 1857, by monotypy.
Anicera Jacoby, 1884a: 207. Type species: *Anicera bimaculata* Jacoby, 1884.
Cerotrus Jacoby, 1884b: 33. Synonymized by Medvedev, 2001: 612, removal from synonymy of *Taphinella*.
Taphinella Jacoby, 1889: 224. Type species: *Taphinella nigripennis* Jacoby, 1889. Synonymized by Gressitt & Kimoto, 1963: 691.
Anastena Maulik, 1936: 296. Type species: *Astena nigromaculata* Jacoby, 1896, by original designation and monotypy. Synonymized by Medvedev, 1992: 19.
Dercestra Chûjô, 1962: 163. Type species: *Dercestra abdominalis* Chûjô, 1962, by original designation and monotypy. Synonymized by Kimoto, 1965: 488.

The genus *Arthrotus* is characterized as follows: Body oblong. Vertex with median furrow, postantennal tubercle well developed, with a longitudinal furrow between postantennal tubercles; a ridge-like convex located between antennae; antennae longer than half the length of the body; in both sexes, antennomere II shortest, antennomere III second shortest, antennomere IV longer than the sum of antennomeres II+III. Pronotum wider than long, bordered all around; disc convex with or without punctures. Scutellum triangular and convex dorsally. Elytra narrow at base, widening after middle; humeral calli protruding, disc with coarse and deep punctures; epipleura wide at base, gradually narrowing to apex. The front coxal cavities closed, tarsal claws appendiculate. Last sternite of male trilobed; in female, last sternite with no incisions.

The genera *Arthrotus* and *Dercetina* are very similar, with no significant difference in male external genitalia. At present they can only be distinguished by the length of male antennomeres II and III. In *Arthrotus*, the antennomere III of male is the shortest, antennomere II is slightly longer than antennomere III, or the length of antennomere II and III of male are equal, the length of antennomere IV is longer than the sum of antennomeres II+III. Whereas in *Dercetina*, antennomere III of the male is significantly longer than antennomere II, and antennomere IV is shorter than the sum of antennomeres II+III (Lee & Bezděk, 2013; Lee, 2022).

Distribution. Oriental and Palaearctic Region.

Arthrotus abdominalis (Chûjô, 1962)

Dercestra abdominalis Chûjô, 1962: 166. TL China: Taiwan. TD EMTU.
Arthrotus abdominalis: Kimoto, 1965: 488.

Specimens examined. CHINA: Guangdong Prov.: 1♂, Ruyuan County**,** Nanling National Nature Reserve, 9.IV–28.V.2021, leg. Nanling Expedition Team;1♂1♀, Nanling National Nature Reserve, Qinshuigu, 18.V.2021, leg. Nanling Expedition Team; 2♀, Nanling National Nature Reserve, 29.V.2021, leg. Feng Chuan; 1♂, Nanling National Nature Reserve,19.VI.2021, leg. Feng Chuan; 1♂, Shixing County, Chebaling National Nature Reserve, 25.VII.2022, leg. Lin Meiying.

Distribution. China: Taiwan (Lee 2022); first record for Guangdong (Ruyuan, Shixing).

Arthrotus coeruleus (Chen, 1942)

Proegmena coeruleus Chen, 1942: 43. TL China: Sichuan. TD IZAS.
Arthrotus coeruleus: Gressitt & Kimoto, 1963: 694.

Specimens examined. CHINA: Guangdong Prov.: 1♂, Ruyuan County, Nanling National Nature Reserve,1210m, 28.V–12.VI.2021, leg. Nanling Expedition Team; 1♀, Babaoshan Station, Nanling National Nature Reserve, 17.V.2021, leg. Nanling Expedition Team; 1♀, Nanling National Nature Reserve, Mt. Xiaohuang, 19.V.2021, leg. Nanling Expedition Team; 1♂, Nanling National Nature Reserve, Xingonglu, 20.V.2021, leg. Nanling Expedition Team; 1♂, Nanling National Nature Reserve, 6.VI.2021, leg. Feng Chuan. **Hunan Prov.:** 2♀, Yizhang County, Mangshan National Nature Reserve, Zeziping, 22.V.2021, leg. Ruan Yongying.

Distribution. China: Sichuan (Chen 1942; Gressitt & Kimoto 1963), Yunnan (Gressitt & Kimoto 1963), first records for Guangdong (Ruyuan) and Hunan (Yizhang).

Arthrotus cyaneus (Chûjô, 1966)

Anastena cyaneus Chûjô, 1966: 8. TL Nepal. TD Unknown.
Arthrotus hauseri Kimoto, 1967: 72, fig. Synonymized by Medvedev & Sprecher-Uebersax, 1998: 36.
Dercetina viridicyanea Kimoto, 1977: 383. Synonymized by Medvedev & Sprecher-Uebersax, 1998: 36.
Arthrotus cyaneus: Medvedev 1992: 18.

Specimens examined. CHINA: Hunan Prov.: 2♀, Yizhang County, Mangshan Nanling National Nature Reserve, 21–24.V.2021, leg. Nanling Expedition Team.

Distribution. China: Sichuan (Yang *et al*. 2015), first record for Hunan (Yizhang); India (Kimoto 1967), Nepal (Chûjô 1966; Kimoto 1977), Bhutan (Kimoto 1977).

Arthrotus daliensis Lopatin, 2009

Arthrotus daliensis Lopatin 2009: 5. TL China: Yunnan. TD IZAS.

Specimen examined: CHINA: Hunan Prov.: 1♀, Xinning County, Mt. Shunhuang National Nature Reserve, 6.IX.2020, leg. Xu Siyuan.

Distribution. China: Yunnan (Lopatin, 2009); first record for Hunan (Xinning).

Arthrotus elongatus Gressitt *et* Kimoto, 1963

Arthrotus elongatus Gressitt *et* Kimoto, 1963: 694, fig. TL China: Sichuan. TD FMTM.

Specimens examined. CHINA: Guangdong Prov.: 1♂1♀, Shixing County, Chebaling Nature Reserve Museum, 370m, 21.VIII.2020, leg. Xu Siyuan. **Hunan Prov.:** 1♀, Chengbu County, Jintongshan National Nature Reserve, 15.VIII.2021, FIT–13; 1♀, Yizhang County, Mangshan National Nature Reserve, Jiangjunzhai,1403m, 27.VIII.2020, leg. Xu Siyuan; 1♂1♀, Yizhang County, Mangshan National Nature Reserve, Xiaotiantai, 8.VIII.2020, leg. Nanling Expedition Team. **Jiangxi Prov.:** 1♂, Longnan City, Jiulianshan National Nature Reserve, 16.VIII.2020, light trap, leg. Group B of Nanling Expedition Team.

Distribution. China: Sichuan (Gressitt & Kimoto, 1963); first records for Guangdong (Shixing), Hunan (Yizhang) and Jiangxi (Longnan).

Arthrotus fulvus Chûjô, 1938

Arthrotus fulvus Chûjô, 1938: 139. TL China: Taiwan. TD TARI.
Dercetina nakanei Kimoto, 1969: 65. Synonymized by Lee, 2022: 178.

Specimens examined. CHINA: Guangdong Prov.: 1♂, Ruyuan County, Nanling National Nature Reserve, 845m, 26.VI–28.IX.2021, MT–14; 1♀, Nanling National Nature Reserve, Mt. Xiaohuang, 1431m, 24.VIII.2020, leg. Xu Siyuan; 1♀, Nanling National Nature Reserve, Mt. Xiaohuang, 1431m, 19.VII.2022, leg. Lin Meiying; 1♀, Shixing County, Chebaling National Nature Reserve, 500m, 23.VIII.2020, leg. Ruan Yongying. **Jiangxi Prov.:** 2♀, Longnan City, Jiulianshan National Nature Reserve, Xiagongtang, 533m, 18.VIII.2020, leg. Xu Siyuan; 1♀, Jiulianshan National Nature Reserve, 16.VIII.2020, light trap, leg. Group B of Nanling Expedition Team.

Distribution. China: Taiwan (Chûjô, 1938; Lee, 2022); first records for Guangdong (Ruyuan, Shixing and Jiangxi (Longnan).

Arthrotus gressitti Kimoto, 1969

Arthrotus gressitti Kimoto, 1969: 61, fig. TL China: Taiwan. TD KUEC.

Specimens examined. CHINA: Guangdong Prov.: 1♂, Ruyuan County, Nanling National Nature Reserve, Babaoshan Station, 17.V.2021, leg. Nanling Expedition Team; 2♀, Nanling National Nature Reserve, 14.VI.2022, leg. Feng Chuan; 1♀, Nanling National Nature Reserve, Mt. Tianjing, 25.V.2022, leg. Feng Chuan. **Guangxi Prov.:** 1♀, Longsheng County, Huaping National Nature Reserve, 14.VII.2022, leg. Lin Meiying.

Distribution. China: Taiwan (Chûjô, 1938; Lee, 2022); first records for Guangdong (Ruyuan, Guangxi (Longsheng).

Arthrotus hamatus sp. nov.

Chinese common name: 钩茎阿萤叶甲
(Figs 1, 2A, B)

Type material. HOLOTYPE: CHINA: ♂, Guangdong Prov., Ruyuan County, Nanling National Nature Reserve, Xingonglu, 113°1'32.06"E, 24°54'36.27"N, 20.V.2021, leg. Nanling Expedition Team. **PARATYPES: CHINA: Guangdong Prov.:** 1♂, Nanling National Nature Reserve, Mt. Xiaohuang, 19.V.2021, leg. Nanling Expedition Team; 1♂, Nanling National Nature Reserve, Mt. Xiaohuang, 18.VII.2022, leg. Lin Meiying; 1♂, Nanling National Nature Reserve, Qinshuigu, 7.V.2022, leg. Yang Haidong; 1♂, Nanling National Nature Reserve, Qinshuigu, 7.VII.2022, leg. Yang Haidong. **Hunan Prov.:** 1♂, Yizhang County, Mangshan National Nature Reserve, 21.V.2021, leg. Nanling Expedition Team.

Description. Body length 7.5–8.5 mm (Fig. 1A–C).

Body blue with purple metallic luster; eyes grayish-white; antennae blackish-brown, antennomeres I & II metallic blue; pro- and mesothorax black; abdomen yellowish-brown; tarsomere I black, the rest brown.

Vertex with fine punctures and irregularly scattered slender setae, postantennal tubercle square with a transverse groove behind; antennae about 9/10 length of body, antennomeres IV to XI densely covered with short setae, antennomeres II and III shortest and subequal, antennomere IV longest, antennomeres V to X decrease in length successively, antennomere VI slightly longer than antennomere X; pronotum transverse, 1.7× wider than long, with borders all around, lateral margins straight; disc convex with fine punctures; scutellum triangular, scattered with small punctures; elytra with prominent humeral calli, lateral margins slightly concave at basal 1/4, disc densely punctate, distance between punctures about twice the diameter of the punctures; epipleura wide at base, narrowing and end at middle; legs slender, length of tarsomere I of hind leg longer than sum of tarsomeres II+III.

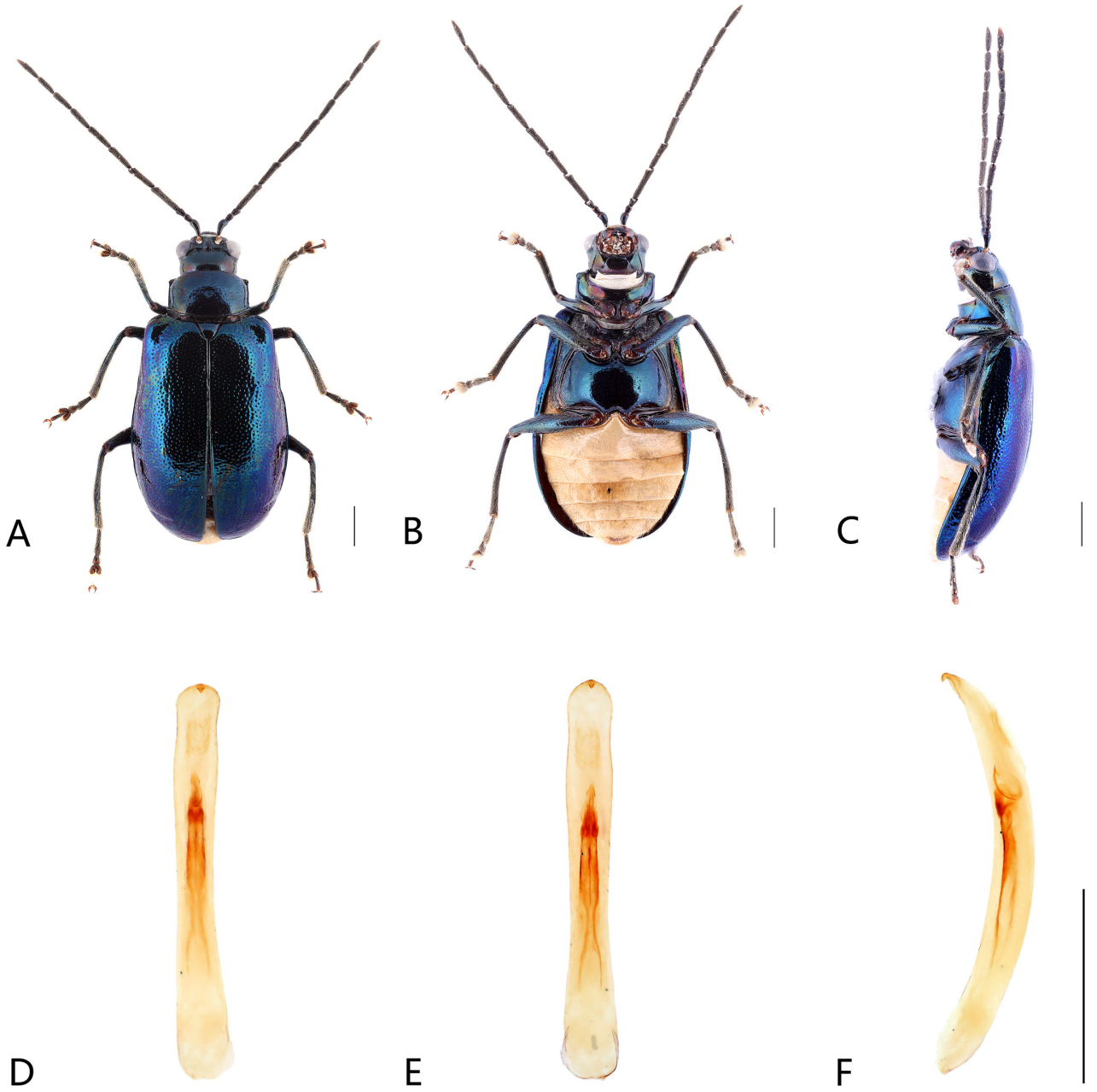

FIGURE 1. *Arthrotus hamatus* **sp. nov. A**–**C** Habitus. **A.** Male, dorsal view. **B.** Male, ventral view. **C.** Male, lateral view. **D**–**F** Aedeagus. **D.** Dorsal view. **E.** Ventral view. **F.** Lateral view. Scale bars: 1 mm.

Aedeagus (Fig. 1D–F, 2A, B) slender and nearly parallel-sided, only slightly narrowed at middle and subapical region; apex rounded with a hook-shaped end; the primary endophallus sclerite about 0.5× as long as aedeagus, sclerite bifurcate from base to basal 1/4, constricted greatly at basal 1/2 and subapical region, apex covered with densely setae, a small sclerite located above the primary one, hook-shaped on lateral view and arrow-shaped on ventral view.

Diagnosis. The new species is very similar to *A. hijau* Mohamedsaid, 2001 from Malaysia. The main differences are that in the new species antennomere I is longer and narrower; setae on antennomeres III-XI are shorter and denser; antennomere IV is the longest; lateral margins of pronotum are straight; aedeagus is more elongate, slightly constricted at subapical region and its end has a hook-shaped structure; whereas in *A. hijau* Mohamedsaid, antennomere I is slightly shorter and more dilated; setae on antennomeres III-XI are longer and slightly sparser; antennomere V is the longest; lateral margins of pronotum are slightly curved; aedeagus is shorter and broader, expanded at end, not constricted at subapical region, more slender at apex, not hooked at end.

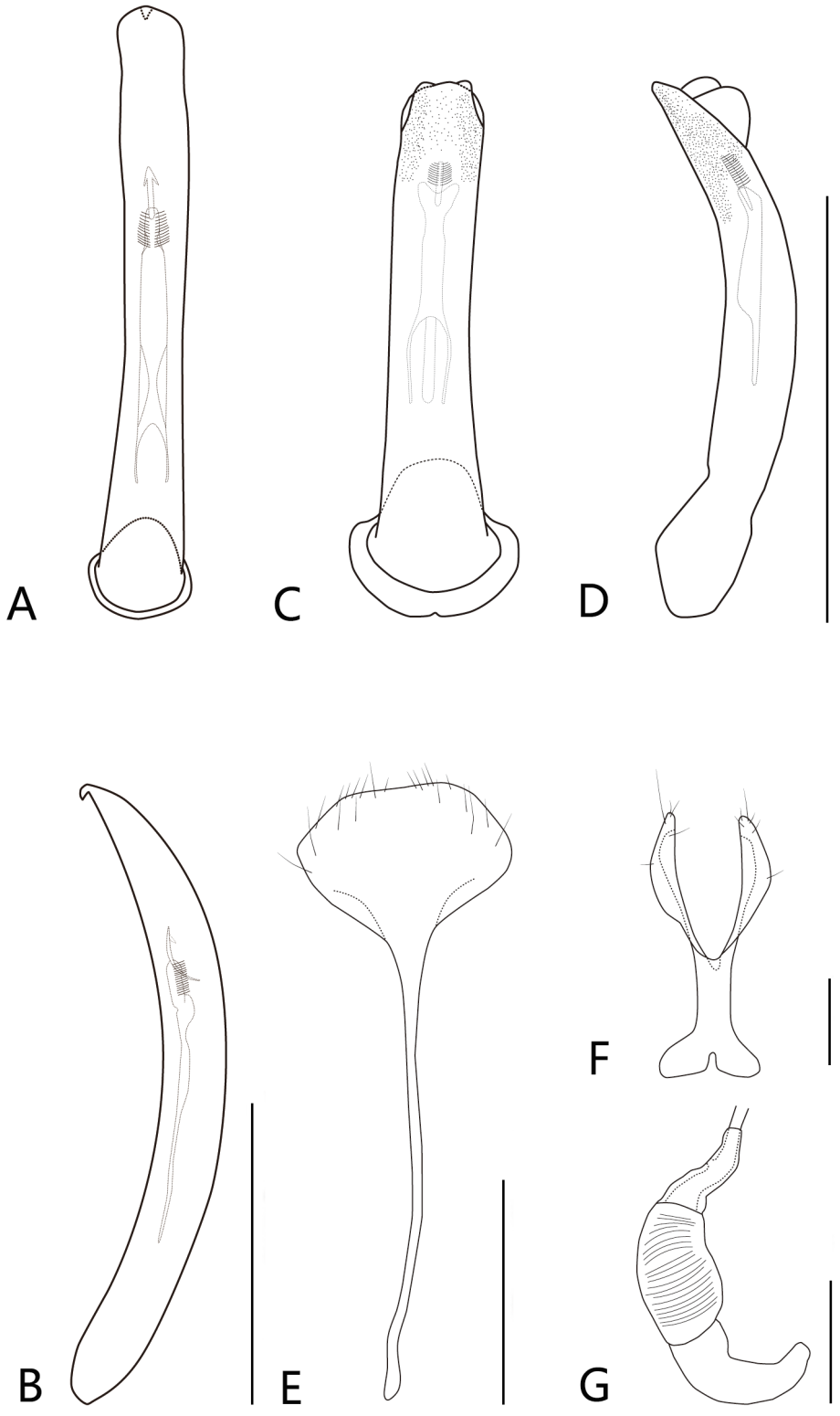

FIGURE 2. Diagnostic characters of *Arthrotus hamatus* **sp. nov.** and *Arthrotus oculatus* **sp. nov. A**–**B** *Arthrotus hamatus*. **A**. Aedeagus, Dorsal view; **B**. Aedeagus, Ventral view; **C**–**G** *Arthrotus oculatus*. **C**. Aedeagus, Dorsal view; **D**. Aedeagus, Ventral view; **E**. Abdominal sternite VIII; **F**. Gonocoxae; **G**. Spermatheca. Scale bars: 1 mm (A–D); 0.5 mm (E); 0.2 mm (F–G).

Etymology. The specific name is derived from the Latin word "*hamatus*", referring to the hook-shaped end of aedeagus.

Distribution. China: Guangdong (Ruyuan), Hunan (Yizhang).

Arthrotus hirashimai Kimoto, 1969

Arthrotus hirashimai Kimoto, 1969: 60, fig. TL China: Taiwan. TD KUEC.
Proegmena taiwana Takizawa, 1978: 125. Synonymized by Lee, 2022: 171.

Specimens examined. CHINA: Guangdong Prov.: 1♂, Ruyuan County, Nanling National Nature Reserve, 5.VI.2021, leg. Feng Chuan; 1♂, Ruyuan County,Nanling National Nature Reserve, 7.VI.2021, leg. Feng Chuan. **Hunan Prov.:** 1♂, Yizhang County, Mangshan National Nature Reserve, 24.V.2021, leg. Nanling Expedition Team.

Distribution. China: Taiwan (Kimoto, 1969; Lee, 2022); first records for Guangdong (Ruyuan) and Hunan (Yizhang).

Arthrotus kalimponganus Kimoto, 2004
(Fig 3)

Arthrotus kalimponganus Kimoto, 2004: 51. TL India: Darjeeling. TD BASEL.

Specimens examined. CHINA: Guangdong Prov.: 2♀, Shixing County, Chebaling National Reserve, 24.VII.2022, leg. Lin Meiying. **Hunan Prov.:** 4♀, Yizhang County, Mangshan National Nature Reserve, Zongshukan, 3.VIII.2021, leg. Nanling Expedition Team.

Diagnostic characteristics. Body length 5.5–6.2mm. Body reddish brown, antennae blackish brown, basal antennomeres IV–V lighter in color.

Vertex smooth, almost impunctate; postantennal tubercle well developed, oblong, surface impunctate; antennae slightly shorter than body length, antennomeres II and III shortest and subequal, antennomere IV 1.5× length of antennomeres II+III, antennomere V shorter than antennomere IV, antennomeres V–X subequal, antennomere XI longer than antennomere X; pronotum 1.8× wider than long, lateral margins rounded at middle; disc with fine punctures, with a depression at middle on both sides near lateral margins; scutellum triangular, surface smooth, impunctate; base of elytron wider than pronotum, lateral margins near apex rounded; disc convex, with dense punctures.

Distribution. First record for China: Guangdong (Shixing) and Hunan (Yizhang); India (Kimoto, 2004).

Arthrotus micans (Chen, 1942)

Proegmena micans Chen, 1942: 43. TL China: Sichuan. TD IZAS.
Arthrotus micans: Gressitt & Kimoto, 1963: 699.

Specimens examined. CHINA: Guangdong Prov.: 1♀, Ruyuan County, Nanling National Nature Reserve, 19.V.2021, leg. Xu Siyuan; 1♂, Nanling National Nature Reserve, Mt. Xiaohuang, 18.VII.2022, leg. Lin Meiying; 1♀, Shixing County, Chebaling National Nature Reserve, 25.VII.2022, leg. Lin Meiying. **Hunan Prov.:** 1♂, Yizhang County, Mangshan National Nature Reserve, Zeziping, 21.V.2021, leg. Xu Siyuan. **Jiangxi Prov.:** 1♀, Longnan City, Jiulianshan National Nature Reserve, Wudangzhen, 6.VI.2021, leg. Xu Siyuan.

Distribution. China: Hunan (Yizhang) (Yang *et al*. 2015), Zhejiang, Sichuan (Chen 1942; Gressitt & Kimoto 1963; Yang *et al*. 2015), first records for Guangdong (Ruyuan, Shixing) and Jiangxi (Longnan).

Arthrotus nigrofasciatus (Jacoby, 1890)

Antipha nigrofasciata Jacoby, 1890: 196. TL China: Hubei. TD BMNH.
Arthrotus nigrofasciatus: Gressitt & Kimoto, 1963: 700.

Specimens examined. CHINA: Guangdong Prov.: 1♀, Ruyuan County, Nanling National Nature Reserve, 1267m, 9.IV–28.V.2021, MT–7; 1♂3♀, Ruyuan County, Nanling National Nature Reserve, 844m, 9.IV–28.V.2021, MT–15;

FIGURE 3. Habitus of *A. kalimponganus*, female. Scale bars: 1mm.

2♂, Ruyuan County, Nanling National Nature Reserve, 1061m, 28.V–12.VI.2021, MT–10; 1♂, Ruyuan County, Nanling National Nature Reserve, 1022m, 28.V–12.VI.2021, MT–9; 1♀, Shixing County, Chebaling National Nature Reserve, 20.VIII.2020, leg. Nanling Expedition Team; 1♂, Shixing County, Chebaling National Nature Reserve, 31.V.2021, leg. Nanling Expedition Team; 1♀, Shixing County, Chebaling National Nature Reserve, 2.VI.2021, leg. Nanling Expedition Team; 1♂1♀, Shixing County, Chebaling National Nature Reserve, 27.VII.2022, leg. Lin Meiying. **Hunan Prov.:** 1♀, Chengbu County, Jintongshan National Nature Reserve, 1102m, 8.IX.2020, leg. Xu Siyuan; 1♀, Yizhang County, Mangshan National Nature Reserve, Mengshikeng, 26.VIII.2020, leg. Xu Siyuan. **Jiangxi Prov.:** 1♀, Longnan City, Jiulianshan National Nature Reserve, Daqiutian, 17.VIII.2020, leg. Xu Siyuan; 1♂, Longnan City, Jiulianshan National Nature Reserve, Daqiutian, 28.VII.2022, leg. Lin Meiying.

Distribution. China: Guangdong (Ruyuan, Shixing), Hunan (Chengbu, Yizhang), Jiangxi (Longnan), Gansu, Anhui, Zhejiang, Hubei, Fujian, Sichuan (Gressitt & Kimoto 1963; Yang *et al.* 2015); Shaanxi (Yang & Zhang 2017).

***Arthrotus oculatus* sp. nov.**
Chinese common name: 猫眼阿萤叶甲
(Figs 2C–G, 4)

Type material. HOLOTYPE: CHINA: ♂, Guangdong Prov., Ruyuan County, Nanling National Nature Reserve, 113°2'37.20"E, 24°54'46.05"N, 9.IV–28.V.2021. **PARATYPES: CHINA: Guangdong Prov.:** 1♂, Nanling National Nature Reserve, Baoshan Station, 113°1'32.00"E, 24°54'36.27"N, 17.VII.2022, leg. Lin Meiying; 1♂, Shaoguan City, Ruyuan County, Nanling National Nature Reserve, 113°2'25.02"E, 24°54'50.40"N, 11.VI.2021, leg. Feng Chuan; 1♂1♀, Nanling National Nature Reserve, Mt. Xiaohuang, 113°2'25.02"E, 24°54'50.40"N, 18.VII.2022, leg. Lin Meiying.

Description. Body length: ♂ 4.9–5.1 mm; ♀5.1 mm (Fig. 4A–D).

Head brown; antennae black-brown, except antennomeres I and II yellowish brown; pronotum yellowish brown; scutellum yellow; elytra pale yellow, with a pattern of greyish and black markings, humeral calli covered with a black spot, another black spot located at apical 1/3, scutellum around and basal 1/2 near mesal suture dark brown mixed with black; epipleura black from base to apical 1/3; a greyish transverse band cross both elytra with middle narrowed greatly, expanding alone the mesal suture, fading and disappear at apex. The single female specimen shows a second black spot near middle band, not obvious; ventral side of body, coxa, trochanter and femur yellowish-brown, tibia and tarsus black-brown.

Vertex convex and impunctate; postantennal tubercle well developed and subtriangular, surface smooth and impunctate; antennae shorter than body length, antennomeres II and III shortest and subequal, antennomere IV longest, twice as long as sum of antennomeres II+III, antennomeres V–VIII equal, shorter than antennomere IV, antennomeres IX–X equal, shorter than antennomere VIII, antennomere XI slightly shorter than antennomere X; pronotum 2× wider than long, anterior angle distinctly protruding, disc covered with sparse inconspicuous punctures, with a slight depression at central region; scutellum triangular, smooth and impunctate; humeral calli of elytra protruding, disc with middle region moderately convex, with densely coarse punctures; epipleurae begin to narrow between coxae of mid and hind legs, reaching to apex; length of tarsomere I of hind-leg equal to the sum of tarsomeres II+III. Aedeagus (Figs 2C–D & 4E–G) slender, nearly parallel-sided with middle slightly narrowed and basal widened, apex rounded; tectum membranous, covered with tiny and stout setae; moderately curved in lateral view; endophallus sclerite 0.5× as long as aedeagus, apex trifurcated, with densely setae near apex. Female sternite VIII (Figs 2E & 4H) weakly sclerotized, apical region fan-shaped with apex truncate, apical margin with sparse long setae; spiculum extremely long and slender. Receptacle of spermatheca (Figs 2G & 4J) moderately swollen; pump slender and slightly curved, apex rounded; proximal spermathecal duct sclerotized, wide and long. Gonocoxae (Figs 2F & 4I) connected from basal and bifurcate at middle, with one longest hair at apex and several additional hairs at apical region.

Diagnosis. The new species is very similar to *A. yangi* Lee, and the main differences are the dark pattern and punctures of elytra. The new species has more distinct punctures on elytra, and the distance between punctures is significantly narrower than in *A.yangi*. Apex of elytron in the new species is not black, but has a black spot do not reach margins. In *A. yangi*, margins of elytra are all black, and the black area is narrow at base and broad at apex, disc has no free black spot. In the new species, spiculum of sternite VIII in female longer and slender;receptacle

of spermatheca more swollen, apex of aedeagus is rounded. In contrast, apex of aedeagus of *A. yangi* Lee is more acute, sternite VIII with spiculum relatively shorter, and the receptacle of spermatheca slightly swollen.

Etymology. The specific name is derived from the Latin word "*oculatus*", referring to the black spot in the white area at apex of elytra, shaped like cat's eyes.

Distribution. China: Guangdong (Ruyuan).

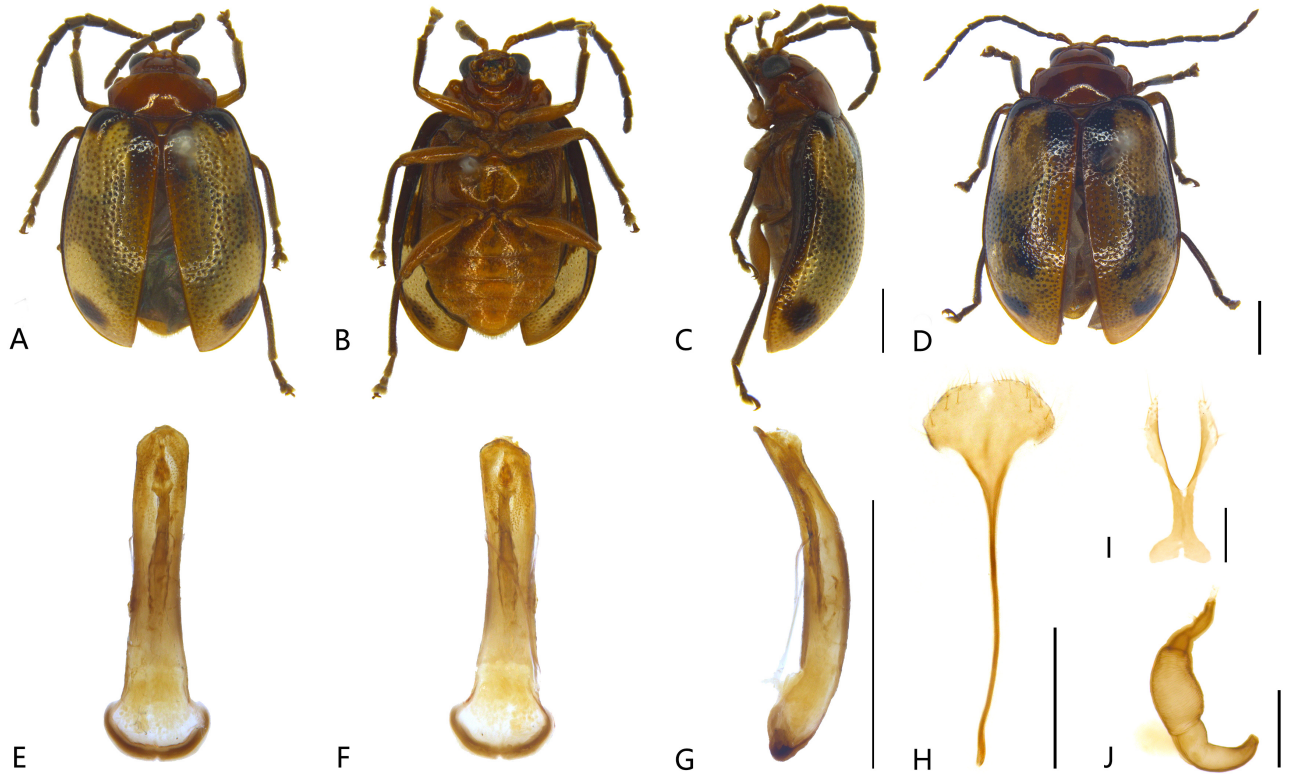

FIGURE 4. *Arthrotus oculus* **sp. nov. A–D** Habitus. **A.** Male, dorsal view. **B.** Male, ventral view. **C.** Male, lateral view. **D.** Female, dorsal view. **E–G.** Aedeagus. **E.** Dorsal view. **F.** Ventral view. **G.** Lateral view. **H.** Abdominal sternite VIII. **I.** Gonocoxae. **J.** Spermatheca. Scale bars: 1 mm (A–G); 0.5 mm (H); 0.2 mm (I–J).

Arthrotus purpureus Gressitt & Kimoto, 1963

Arthrotus purpureus Gressitt & Kimoto, 1963: 701, fig. TL China: Sichuan. TD USNM.

Specimens examined. CHINA: Guangdong Prov.: 1♂, Yangshan County, Chengjia Village, 720m, 26.V.2022, leg. Feng Chuan; 1♀, Shixing County, Chebaling National Nature Reserve, 31.V.2022, leg. Feng Chuan.

Distribution. China: Sichuan (Gressitt & Kimoto, 1963), first record for Guangdong (Yangshan, Shixing).

Arthrotus saigusai Kimoto, 1969

Arthrotus saigusai Kimoto, 1969: 62, fig. TL China: Taiwan. TD KUEC.

Specimens examined: CHINA: Guangdong Prov.: 1♂, Ruyuan County, Nanling National Nature Reserve, Mt. Xiaohuang, 18.VII.2022, leg. Lin Meiying; 2♀, Shixing County, Chebaling National Nature Reserve, 3.VI.2021, leg. Nanling Expedition Team; 1♀, Shixing County, Chebaling National Nature Reserve, 25.VII.2022, leg. Lin Meiying. **Hunan Prov.:** 1♂1♀, Chengbu County, Jintongshan National Nature Reserve, Baimaoping, 8.IX.2020, leg. Xu Siyuan.

Distribution. China: Taiwan (Kimoto, 1969), first records for Guangdong (Ruyuan, Shixing) and Hunan (Chengbu).

Arthrotus testaceus Gressitt & Kimoto, 1963

Arthrotus testaceus Gressitt & Kimoto, 1963: 702. TL China: Fujian. TD BPBM.
Arthrotus shibatai Kimoto, 1984: 55. Synonymized by Lee, 2022: 196.

Specimens examined. CHINA: Guangdong Prov.: 2♀, Ruyuan County, Nanling National Nature Reserve, 1100m, 26.VI–28.IX.2021, MT–12; 1♂, Nanling National Nature Reserve, Babaoshan Station, 17.VII.2022, leg. Lin Meiying; 1♂, Shixing County, Chebaling National Nature Reserve, 30.V.2021, leg. Nanling Expedition Team. **Hunan Prov.:** 1♀, Yizhang County, Mangshan National Nature Reserve, Jiangjunzhai, 6.VIII.2021, leg. Nanling Expedition Team. **Jiangxi Prov.:** 2♀, Longnan City, Jiulianshan National Nature Reserve, 16.VIII.2021, light trap,leg. Group B of Nanling Expedition Team; 1♀, Jiulianshan National Nature Reserve, Qitangshan Forest Farm, 6.VI.2021, leg. Nanling Expedition Team.

Distribution. China: Zhejiang, Hubei, Fujian (Gressitt & Kimoto, 1963; Yang *et al.*, 2015); Taiwan (Lee, 2022), Sichuan (Yang *et al.*, 2015), first records for Guangdong (Ruyuan, Shixing), Hunan (Yizhang) and Jiangxi (Longnan).

Arthrotus yangi Lee, 2022

Arthrotus yangi Lee, 2022: 201. TL: China, Taiwan. TD: NMNS.

Specimens examined. CHINA: Guangdong Prov.: 4♂, Ruyuan County, Nanling National Nature Reserve, 9.VI.2020, MT–10; 1♂, Ruyuan County, Nanling National Nature Reserve, 9. IV–28.V.2021, MT–4; 1♂, Ruyuan County, Nanling National Nature Reserve, 9. IV–28.V.2021, MT–5; 1♀, Ruyuan County, Nanling National Nature Reserve, 9.IV–28.V.2021, MT–17; 3♂, Ruyuan County, Nanling National Nature Reserve, 9.IV–28.V.2021, MT–18; 1♂3♀, Ruyuan County, Nanling National Nature Reserve, 28.V–12.VI.2021, MT–4; 1♀, Ruyuan County, Nanling National Nature Reserve, 12–26.VI.2021, MT–3; 1♂, Ruyuan County, Nanling National Nature Reserve, 12–26.VI.2021, MT–12; 1♂, Ruyuan County, Nanling National Nature Reserve, 5.VI.2021, leg. Feng Chuan; 1♂, Ruyuan County, Nanling National Nature Reserve, 14.VI.2021, leg. Feng Chuan; 1♂, Ruyuan County, Nanling National Nature Reserve, 17.VI.2021, leg. Feng Chuan. **Hunan Prov.:** 1♂, Chengbu County, Jintongshan National Nature Reserve, 10.VI.2020, MT–9.

Distribution. China: Taiwan (Lee, 2022), first records for Guangdong (Ruyuan) and Hunan (Chengbu).

Key to the species of genus *Arthrotus* from Nanling region of China

1 Body oblong-oval, elytra more than 1.4x longer than wide 2
– Body oval, elytra less than or equal to 1.4x longer than wide 16
2 Disc of pronotum impunctate, sides with punctures . . . . . *A. daliensis* Lopatin
– Disc of pronotum punctate, sides with punctures. 3
3 Elytra black or with black patterns, or blue, or purple, or black-blue 4
– Elytra have no above characteristics 11
4 Lateral margins of pronotum straight 5
– Lateral margins of pronotum rounded or slightly rounded. 9
5 Head not black 6
– Head black or partly darkened 8
6 Abdomen pale yellow. . . . . ***A. hamatus* sp. nov.**
– Abdomen brown or pale reddish brown 7
7 Antennae entirely black . . . . . *A. abdominalis* (Chûjô)
– Antennae black with first three antennomeres brownish, often with a metallic tinge . . . . . *A. coeruleus* (Chen)
8 Upper part of head darkened; entirely ventral side yellowish brown. . . . . *A. hirashimai* Kimoto
– Head entirely black, abdomen reddish brown . . . . . *A. gressitti* Kimoto
9 Pronotum subquadrate, nearly 1.5x as wide as long . . . . . *A. cyaneus* (Chûjô)
– Pronotum narrow transverse, about 1.7-2.0x as wide as long 10
10 Antennomere III of male 1.1x longer than wide, pronotum with a distinct or feeble longitudinal band; sometimes elytra with irregular black spots; sometimes elytra with black bands on disc or part of suture, and the pronotum dark brown . . . . . *A. saigusai* Kimoto (partly)

– Antennomere III of male 0.7-0.8x longer than wide; when elytra with black patterns, the basal 1/4-1/3 all black; when elytra maculate with black, suture and areas surrounded scutellum black at least. . . . . *A. fulvus* Chûjô (partly)
11 Body head, pronotum or legs, at least one of these features purple with metallic sheen . . . . . *A. purpureus* Gressitt *et* Kimoto
– Body without purple metallic sheen 12
12 Elytra testaceous, red or reddish brown 13
– Elytra yellowish brown. 15
13 Head black, antennae longer than end of elytra . . . . . *A. fulvus* Chûjô (partly)
– Head reddish brown, antennae not longer than end of elytra 14
14 Body red-brown with a slight metallic sheen; body small, length about 4.5mm . . . . . *A. micans* (Chen)
– Body with no metallic sheen, body medium size, length longer than or equal to 8.0mm . . . . . *A. elongatus* Gressitt *et* Kimoto
15 Antennae black, antennomere I yellow-brown, antennomeres II-III yellow-brown with blackish slightly; legs yellow-brown, tibiae and tarsi black . . . . . *A. saigusai* Kimoto (partly)
– Antennae black or yellowish brown, antennomeres I-IV pale yellowish brown; legs entirely yellowish brown . . . . . *A. kalimponganus* Kimoto
16 Dorsal surface color black to yellowish brown, with various color patterns, but elytra have no median or postmedian black band . . . . . *A. testaceus* Gressitt *et* Kimoto
– Elytra pale yellow or yellowish brown, elytra with median or post median black ban 17
17 Margins of elytra not black completely; apex of elytron pale yellow, with a black spot at apical 1/3, not reaches margins. . . . . ***A. oculatus* sp. nov.**
– Margins of elytra black completely 18
18 Pronotum distinctly punctate, bands on elytra and along lateral margins narrow, antennomere III longer than wide . . . . . *A. nigrofasciatus* (Jacoby)
– Pronotum with sparse fine punctures, bands on elytra and along lateral margins wide, antennomere III wider than long . . . . . *A. yangi* Lee

Discussion

The genus *Arthrotus* Motschulsky is distributed in China, Japan, Vietnam, Laos, Thailand, Cambodia, Myanmar, India, Nepal, Malaysia, Indonesia (Yang *et al.* 2015; Bezděk & Sekerka 2024), and mainly in China. Strictly speaking, the distribution area of this genus is the Oriental Region.

There are 28 species recorded in China (Yang *et al.* 2015; Bezděk & Sekerka 2024), through our study, only in Nanling region we found 19 species, accounting for 67.9% of the known species, and there are still seven to eight species that have not been identified, indicating a rich diversity of *Arthrotus* in this region. However, as we all know, Yunnan and Sichuan are the most biodiverse regions in China, and there are still many unidentified species in current collections. With systematic research, the number of species could increase significantly.

In terms of *Arthrotus* alone, the species in the Nanling region show a high degree of similarity with those on the island of Taiwan. At present, seven species, accounting for 36.8%, or more than one-third of the species distributed in both the Nanling region and Taiwan. Notably, on the mainland of China, six species of them are currently only found in the Nanling region. Therefore, the similarity of insect species between the Nanling region and Taiwan Island is worth further study.

Within the subfamily Galerucinae, *Arthrotus* and *Dercetina* are relatively complex genera. Firstly, the boundaries between the two genera are unclear (Lee & Bezděk 2013; Lee 2022). Particularly, some female *Arthrotus* species have the third antennal segment longer than the second, making them easily misidentified as *Dercetina* or even placed in other genera in the absence of male specimens. Therefore, a comprehensive revision of the known species in these two genera is needed based on the study of their respective type species. Secondly, the distinct morphological characteristics defining the independence of these two genera are still unclear, necessitating further research into their biology, larval, and pupal stages. Additionally, there is a need to accelerate work in molecular systematics.

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南岭地区阿萤叶甲属*Arthrotus*记述（鞘翅目：叶甲科）

申健[1,3]，杨海东[2]，丁昌萍[1,4]，杨美霞[1*]
[1]陕西省动物研究所，西安710000，陕西，中国
[2]广东省野生动物保护与利用公共实验室，广东省动物保护与资源利用重点实验室，广东省科学院动物研究所，广州510260，广东，中国
tsaeyang@126.com；https://orcid.org/0000-0002-3157-2090
[3] shenjian0418@163.com；https://orcid.org/0009-0005-8734-9102
[4] dingchangping501@163.com；https://orcid.org/0009-0008-1062-4294
[*]通讯作者：ymeixia2013@163.com；https://orcid.org/0009-0001-9910-6133

摘要：记述南岭地区阿萤叶甲属*Arthrotus* Motschulsky17种，包含2新种，即钩茎阿萤叶甲*A. hamatus* **sp. nov.**和猫眼阿萤叶甲*A. oculatus* **sp. nov.**及1个中国新纪录种，即卡林蓬阿萤叶甲*A. kalimponganus* Kimoto, 2004；提供了新种的外部形态图和雌、雄外生殖器特征图；编制了南岭地区该属已知种检索表。

关键词：叶甲；形态学；区系