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# Diversity of flea beetles from the Nanling Mountains, China, with description of three new species of *Minota* Kutschera (Coleoptera: Chrysomelidae)

MENG-NA ZHANG[1,6], YONG-YING RUAN[1,7*], ZU-LONG LIANG[2,3], XING-KE YANG[2,4], XIAO-QIN CHEN[1,8], YING-YING PENG[1,9], QI XIE[1,10] & ZI-YE MENG[1,5*]

[1]*Plant Protection Research Center, Shenzhen Polytechnic University, Shenzhen 518055, China*
[2]*Key Laboratory of Zoological Systematics and Evolution, Institute of Zoology, Chinese Academy of Sciences, Beijing 100101, China*
[3]*University of Chinese Academy of Sciences, Beijing 100101, China*
*liangzulong@ioz.ac.cn; https://orcid.org/0000-0002-1289-2697*
[4]*Guangdong Public Laboratory of Wild Animal Conservation and Utilization, Institute of Zoology, Guangdong Academy of Sciences, Guangzhou 510260, China*
*yangxk@ioz.ac.cn; https://orcid.org/0000-0003-3676-6828*
[5]*School of Life Sciences, Guizhou Normal University, Guiyang 550025, China*
*ziyemeng@outlook.com; https://orcid.org/0009-0000-1102-1737*
[6] *mengnazhang@szpt.edu.cn; https://orcid.org/0000-0002-7265-2038*
[7] *yongyingruan@hotmail.com; https://orcid.org/0000-0002-5025-5592*
[8] *chenxiaoqin@szpt.edu.cn; https://orcid.org/0009-0006-3450-5738*
[9] *pengyy2024@hotmail.com; https://orcid.org/0009-0001-2162-2445*
[10] *xueki4886@outlook.com; https://orcid.org/0009-0002-0099-2508*
[*]*Corresponding authors*

## Abstract

The Nanling Mountains is one of the sixteen biodiversity hotspots in China. It divides the central and southern regions of the country. This paper documents the diversity of flea beetles in the Nanling Mountains based on a comprehensive insect biodiversity survey from 2020 to 2022. Three new species of the genus *Minota* Kutschera, 1859 *viz*. *M. cuiae* Zhang, Ruan, Liang & Yang **sp. nov.** (Guangxi), *M. maoer* Zhang, Ruan, Liang & Yang **sp. nov.** (Guangxi), and *M. bimaculata* Zhang, Ruan, Liang & Yang **sp. nov.** (Jiangxi) from the Nanling Mountains are described and illustrated. A checklist and key to the Chinese *Minota* species are provided.

**Key words:** taxonomy, Oriental Region, biodiversity

## Introduction

The Nanling Mountains (南岭山脉; Fig. 1), stretching over 1,400 kilometers from east to west, is the most extensive mountain range in South China (Zhang *et al.* 2007; Wang *et al*. 2023). It demarcates the Pearl River Basin from the Yangtze River Valley, serving as a defining boundary between the south and central subtropical zones (Zhang *et al.* 2007; Wang *et al*. 2023). Also known as the Wuling Mountains, which translates to "Five Mountains" in Chinese (五岭), the Nanling Mountains comprise Yuechengling (越城岭), Dupangling (都庞岭), Mengzhuling (萌渚岭), Qitianling (骑田岭) and Dayuling (大庾岭). Traversing from east to west, it spans four provinces: Guangxi, Hunan, Guangdong, and Jiangxi, forming a natural geographic barrier that divides the central and southern regions of China (Huang *et al.* 2023). The south slopes of the Nanling Mountains enjoy a consistently moist and warm climate with infrequent frost and snow, while the northern slopes experience colder winters and frequent snowfall, rendering it a pivotal natural geographic barrier in China (Zhang *et al.* 2007).

The Nanling Mountains range stands as one of the sixteen biodiversity hotspots in China (Ban *et al.* 2018). It is also prominently listed as one of the 35 Chinese Biodiversity conservation priority areas designated by the Chinese government after rigorous consideration of factors such as ecosystem representativeness, species richness, rarity, and threats of extinction. This designation underscores the crucial role the range plays in the protection of

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biodiversity, making it a vital sanctuary for numerous species and ecosystems (Zhuang *et al.* 2021). This region is defined by a humid climate and lush vegetation that serves as a habitat for numerous rare and endangered wildlife species (Zhuang *et al.* 2021; Ban *et al.* 2018). The dominant vegetation in the Nanling Mountains constitutes the largest subtropical monsoon evergreen broad-leaved forest at the same latitude on Earth (Fan *et al.* 2023).


**FIGURE 1.** Overview of Nanling Mountains. **A.** The range of Nanling Mountains (lower ellipse); numbers represent different collecting spots, see Table 1. for more information) (map is downloaded from www.tianditu.gov.cn). **B, C.** Nanling Mountains insect diversity expedition team. **D–F.** Topographical and vegetation characteristics of Nanling Mountains.

A comprehensive three-year survey (spanning 2020 to 2022) aimed at exploring the insect diversity in the Nanling Mountains was spearheaded by Xingke Yang (Institute of Zoology, Chinese Academy of Sciences, China; Institute of Zoology, Guangdong Academy of Sciences, China). A substantial portion of Chinese insect taxonomists actively engaged in the project, significantly contributing to the fieldwork.

The authors of this study participated in the collecting expeditions conducted in 2020 and 2021, which involved ten major national nature reserves. These included Nanling (南岭), Mangshan (莽山), Shimentai (石门台), Jiulianshan (九连山), Chebaling (车八岭), Dupanling (都庞岭), Shunhuangshan (舜皇山), Maoershan (猫儿山), Nanshan (南山) and Huaping (花坪) National Nature Reserves. Furthermore, the authors also embarked on an additional collecting journey to the Jingganshan Mountains (井冈山). In total, approximately 6000 flea beetle specimens were collected (housed in SZPT). Among them, 39 genera and 102 species were identified and listed in this paper. Some of these species were new to science, including three *Minota* species described in this study.

Genus *Minota* currently includes 12 species (Bezděk & Konstantinov 2024). *Minota* are bryophiles (they could be found on bryophytes but may survive elsewhere also) (Konstantinov *et al.* 2013), however, there is no definite record that confirms their ingestion of moss, yet it is highly probable that species of *Minota* feed on various mosses. According to recent molecular work (Damaška *et al.* 2022), *Minota* belongs to the *Mantura* group, which includes the leaf-surface-living genera *Mantura* Stephens and *Novofoudrasia* Jacobson; while the *Mantura* group is a sister group to (*Dibolia* group + *Leptophysa* group). *Dibolia* includes *Argopistes* Motschulsky and *Apteropeda* Stephens; the *Leptophysa* group includes *Stevenaltica* Konstantinov *et al.*, 2014, *Borinken* Konstantinov & Konstantinova, 2011, and *Leptophysa* Baly. However, the samples of their study did not cover most flea beetle genera, the accurate phylogenetic position of *Minota* may need further investigations. Douglas *et al.* (2023) indicated that *Mantura* was a sister group with *Leptophysa* group, but their phylogenetic analyses did not include *Minota*.

*Minota* is morphologically allied to *Paraminota* Scherer, 1989, *Mantura* Stephens, 1831, and *Sinosphaera* Ruan *et al.*, 2017. *Sinosphaera* share with *Minota* the slightly developed lateral longitudinal impressions on the pronotum, regularly punctate elytra, wide epipleuron, and the structure of the frontal ridge; it can be separated from *Minota* by the posteriorly open procoxal cavities (closed in *Minota*) and the shape of ridges and sulci on the head. *Minota* can be separated from *Paraminota* by the procoxal cavities closed behind (open in *Paraminota*) (Damaška *et al.* 2022). *Minota* also resembles its phylogenetic sister group *Mantura*, from which it can be separated by the absence of hind wings and humeral calli (Damaška *et al.* 2022).

The new species were all extracted from mosses in the Nanling Mountains. They are characterized by distinct features unprecedented in Minota species, namely, the entirely yellowish body color and a dark spot on each elytron. The three new species exhibit close similarity in external characters and could be classified into the same species group (*Minota bimaculata* group). With the inclusion of the newly described species, the total number of *Minota* species in China stands at seven.

## Material and Methods

Observations of flea beetle habitus and diagnostic characters were made using the Nikon SMZ645 stereomicroscope and Nikon OPTIPHOT microscope. Genitalia with the last few abdominal tergites were separated using sharp insect pins attached to plastic sticks. The tissues surrounding the median lobe of aedeagus were cleared. Female genitalia and accompanying structures (the last tergites) were immersed in a hot 10% NaOH solution for 30 s (or the appropriate time required to soften irrelevant tissue). The extra tissues surrounding the genitalia were carefully removed using insect pins. For photography, the female genitalia were mounted on slides in glycerine; the male genitalia were glued to paper card points. Digital images were taken with a Canon D800 camera attached to a Canon MP-E 65-mm lens or microscope lens.

Morphological terminology follows Ruan *et al.* (2019). Specimen labels are cited verbatim. Abbreviations. **TL**: Type Locality. **TD**: Type Depository. **BMNH**: The Natural History Museum (formerly British Museum), London, United Kingdom. **IZCAS**: Institute of Zoology, Chinese Academy of Sciences, Beijing, China. **MDGC**: Döberl Manfred Collection, German. **SZPT (=SZPU)**: Plant Protection Research Center, Shenzhen Polytechnic University, Shenzhen, Guangdong, China. Field-collected and lab-reared specimens are deposited in SZPT. As understood herein, the boundary of the Oriental Region (**OR**) and Palaearctic Region (**PA**) in China follows Ruan *et al.* (2019) and Yang *et al.* (2005).

## Taxonomy

### Genus *Minota* Kutschera, 1859

Chinese vernacular name: 米跳甲属

*Minota* Kutschera, 1859: 141. Type species: *Haltica obesa* Waltl, 1839, by monotypy.
*Hypnophila* Foudras, 1859: 146 (*nec* Bourguignat, 1858). Type species: *Balanomorpha carisis* Märkel, 1847
= *Minota obesa* Waltl, 1839, by monotypy. Synonymized by Kutschera, 1864: 453.

**Distribution.** Palaearctic and Oriental Regions.

**Host plants.** Most probably feed on moss.

### Key to Chinese species of *Minota*

1. Body length not exceeding 2.0 mm; supraantennal calli transverse, subquadrate, narrowly joined at middle; supracallinal sulci poorly developed; elytra widest at basal third, strongly narrowed from basal third to posterior end; distal half of elytra with punctures almost absent; body chestnut-brown to red-brown . . . . . ***M. sichuanica* Chen *et* Wang, 1980**
- Body length more than 2.0 mm; supraantennal calli triangular; supracallinal sulci well developed, deep; elytra widest at middle . . . . . 2
2. Dorsum bicolorous, with dark spot on yellowish-brown to brown elytra . . . . . 3
- Dorsum unicolorous, without dark spot on elytra . . . . . 5
3. Ventral side of median lobe of aedeagus with an oval excavation near basal opening. Dark spot on elytron large, approximately twice as large as the metafemur . . . . . 4
- Ventral side of median lobe of aedeagus without an oval excavation near basal opening, with five longitudinal ridges extending from middle part to near basal opening (Fig. 2D). Dark spot on elytron small, approximately as large as the metafemur . . . . . ***M. cuiae* sp. nov.**
4. Ventral side of median lobe of aedeagus without longitudinal ridges (Fig. 4E). Length to width ratio of longitudinal groove on pronotum: 5.24–6.27 . . . . . ***M. maoer* sp. nov.**
- Ventral side of median lobe of aedeagus with two longitudinal ridges extending from near apex to oval excavation (Fig. 9F). Length to width ratio of longitudinal groove on pronotum: 2.50–3.19 . . . . . ***M. bimaculata* sp. nov.**
5. Pronotum 1.8 times as wide as long, strongly punctured; longitudinal grooves on base of pronotum short, point-like; dorsum pitchy black to pitchy brown with metallic luster; body length 2.0–2.9 mm. . . . . ***M. nigropicea* Baly, 1874**
- Pronotum narrower, 1.5 times as wide as long; longitudinal grooves on base of pronotum long, not point-like; dorsum without metallic luster; body length 2.6–3.2 mm . . . . . 6
6. Lateral margins of pronotum straight; longitudinal grooves on base of pronotum straight; body entirely chestnut-brown . . . . . ***M. chinensis* Döberl, 2007**
- Lateral margins of pronotum convex; longitudinal grooves on base of pronotum oblique; dorsum dark brown, legs and antennae reddish brown. . . . . ***M. medvedevi* Döberl, 2007**

### Checklist of Chinese *Minota* species

**genus *Minota* Kutschera, 1859: 141** type species: *Haltica obesa* Waltl, 1839

#### *Minota chinensis* Döberl, 2007

Chinese vernacular name: 中华米跳甲

*Minota chinensis* Döberl, 2007: 330. **TL** China: Sichuan. **TD** MDGC.

**Distribution.** China: Sichuan.

#### *Minota medvedevi* Döberl, 2007

Chinese vernacular name: 梅氏米跳甲

*Minota medvedevi* Döberl, 2007: 330. **TL** China: Hubei. **TD** MDGC.

**Distribution.** China: Hubei.

***Minota nigropicea* (Baly, 1874)**
Chinese vernacular name: 黑米跳甲

*Apteropoda nigropicea* Baly, 1874: 207. **TL** Japan. **TD** BMNH.
*Minota nigropicea*: Heikertinger, 1930: 1340.

**Distribution.** China: Fujian (Wuyishan, Fuzhou) (Wang *et al*. 2002). Japan (Baly 1874).

**Material examined.** Labels: 1) 1♂ (IZCAS), Anhui Province, Jinzhai County, Tangjiahui Township, Jiaoyuan village, Miao-wan (安徽金寨县汤家汇镇焦园村庙湾), 560.06m, 2021.V.2, D1, Institute of Zoology, Chinese Academy of Sciences; 2) *Minota nigropicea* (Baly, 1874) Det. Ruan Y.

***Minota sichuanica* Chen *et* Wang, 1980**
Chinese vernacular name: 四川米跳甲

*Minota sichuanica* Chen *et* Wang, 1980: 7, 20. **TL** China: Sichuan. **TD** IZCAS.

**Distribution.** China: Sichuan.

**Type material examined.** 1 (IZCAS), Labels: 1) Sichuan, Chengdu (成都), 1955.V.29, Keren Huang *et* Gentao Jin leg.; 2) Holotype.

***Minota cuiae* Zhang, Ruan, Liang & Yang, sp. nov.**
Chinese vernacular name: 崔氏米跳甲

**TL** China: Guangxi. **TD** SZPT.

**Distribution.** China: Guangxi.

***Minota maoer* Zhang, Ruan, Liang & Yang, sp. nov.**
Chinese vernacular name: 猫儿米跳甲

**TL** China: Guangxi. **TD** SZPT.

**Distribution.** China: Guangxi.

***Minota bimaculata* Zhang, Ruan, Liang & Yang, sp. nov.**
Chinese vernacular name: 双斑米跳甲

**TL** China: Jiangxi. **TD** SZPT.

**Distribution.** China: Jiangxi.

**Description of new species**

***Minota cuiae* Zhang, Ruan, Liang & Yang, sp. nov.**
Chinese vernacular name: 崔氏米跳甲
urn:lsid:zoobank.org:act:6D1A79FA-9D6F-4F27-B422-0EC1E6EBFE8E
(Figs 2, 3)

**Type material. HOLOTYPE: CHINA:** ♂ (SZPT), labels: 1) China, Guangxi Prov., Guilin City (桂林市), Maoershan Mountain (猫儿山), Huananzhidian (华南之巅), 6.IX.2020, 2100m, 25.8650°N, 110.4122°E, Yongying Ruan leg., Berlese Funnel; 2) HOLOTYPE *Minota cuiae* sp. nov. Des. Ruan *et al.* 2024.

**Diagnosis.** Body longer than 2.0 mm; supraantennal calli triangular; supraantennal sulci well delimited; pronotum with one shallow depression at base on each side; dorsum bicolorous, with a dark spot on yellowish-brown elytron; elytra widest at middle; ventral side of median lobe without an oval excavation near basal opening; ventral side of median lobe with five longitudinal ridges extending from middle to near basal opening (Fig. 2D).

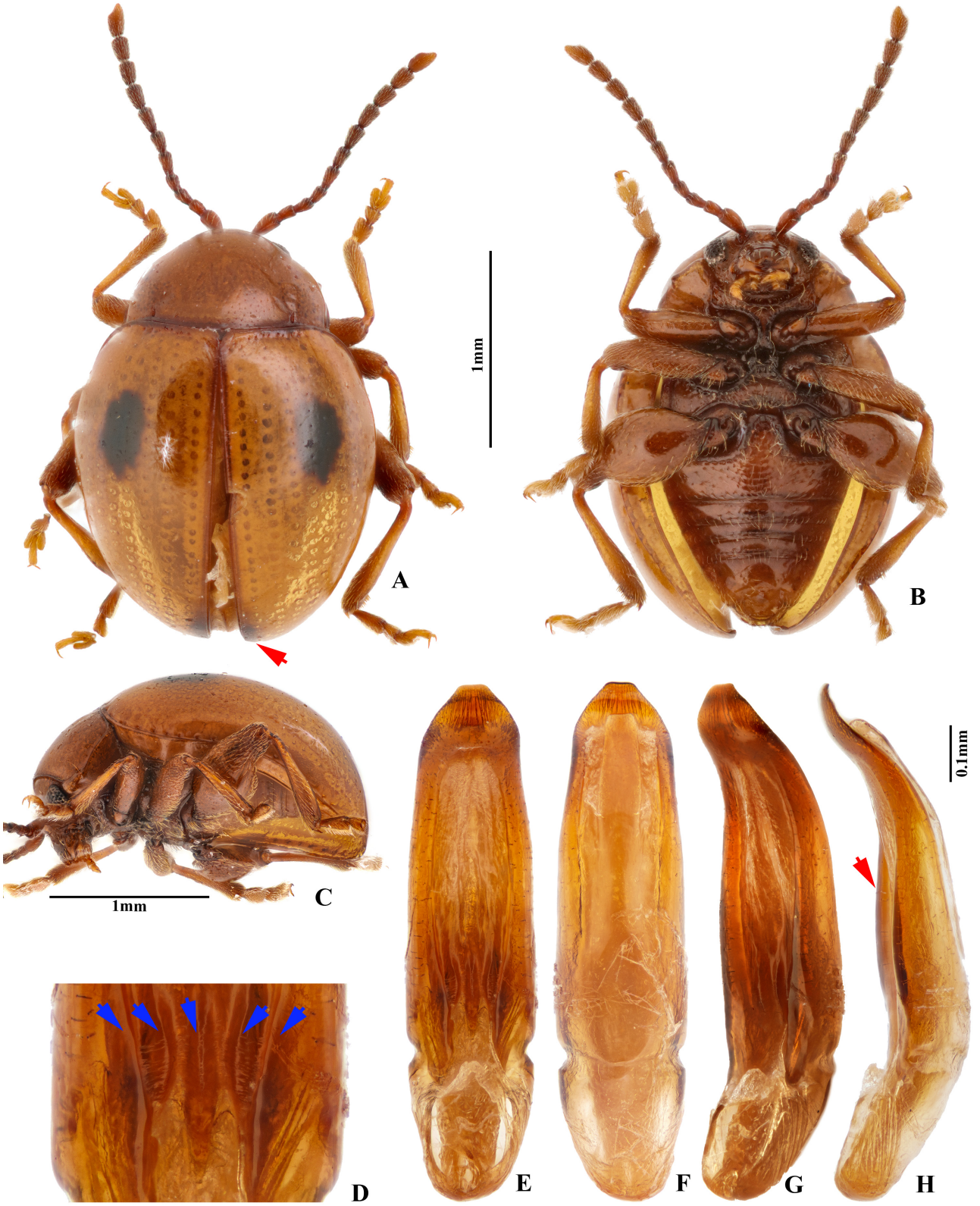


**FIGURE 2.** Adult morphology of *Minota cuiae* sp. nov. **A.** Holotype, male, dorsal view, arrow showing dark spot near apex of elytra. **B.** Holotype, male, ventral view. **C.** Holotype, male, lateral view. **D–H.** Median lobe of aedeagus (holotype), ventral, dorsal, and lateral views, arrows showing five longitudinal ridges.

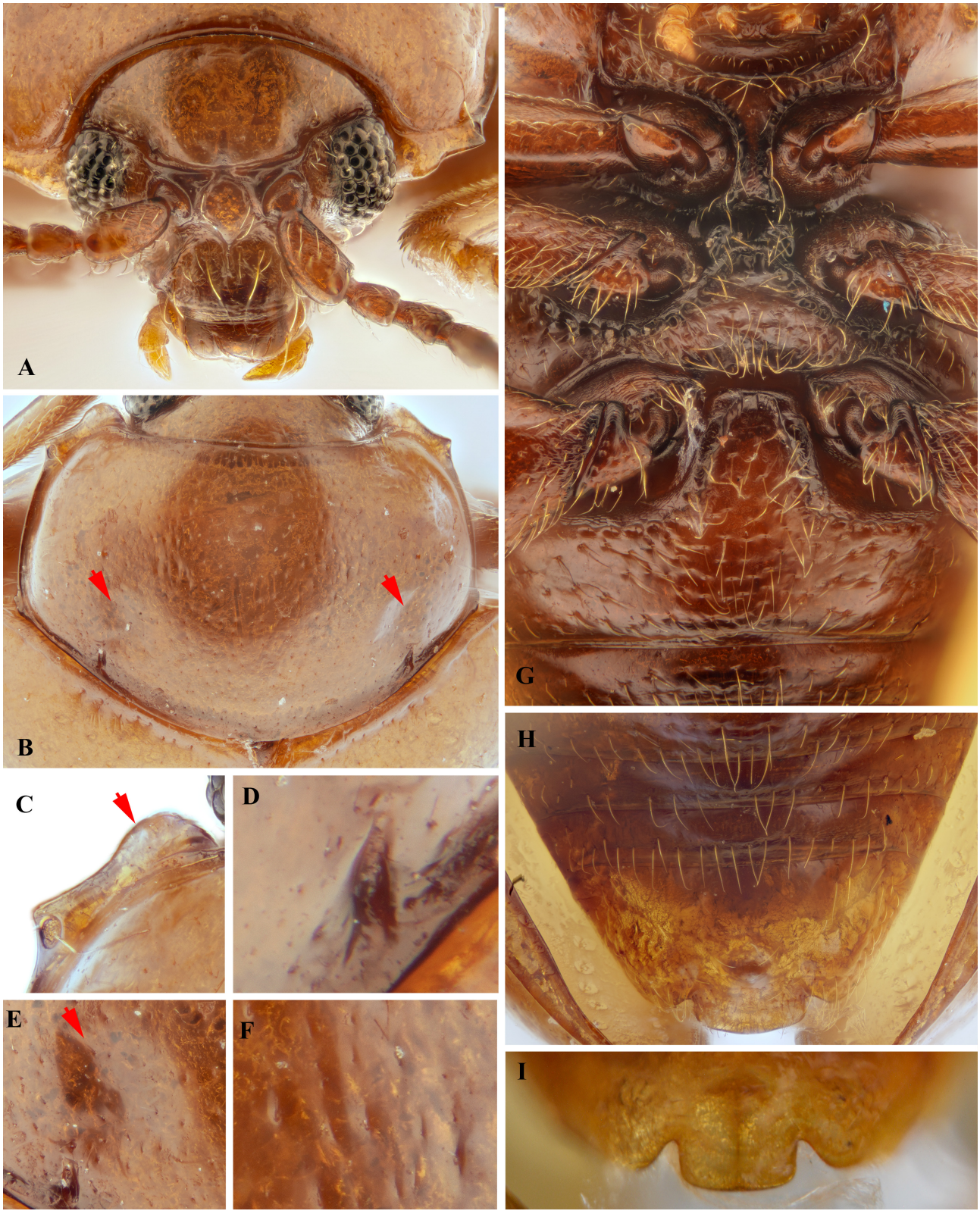


**FIGURE 3.** Adult morphology of *Minota cuiae* sp. nov. (holotype, male). **A.** Head. **B.** Pronotum, arrows show shallow depressions. **C.** Anterolateral callosity of pronotum, arrow shows dilated anterior part. **D.** Longitudinal groove on base of pronotum. **E.** Shallow depression on left side of pronotum. **F.** Puntures on disc of pronotum. **G.** Ventral view of middle part of thorax and abdomen. **H.** Abdominal ventrites II-V. **I.** Last abdominal ventrite.

*Minota cuiae* **sp. nov.** and *Minota maoer* **sp. nov.** are sympatric and similar in external characters. However, they could be well differentiated from each other by the following characters. In *M. cuiae* **sp. nov.**, the ventral surface of median lobe with five longitudinal ridges; while in *M. maoer* **sp. nov.**, longitudinal ridges are absent on the ventral surface of the median lobe. In *M. cuiae* **sp. nov.**, the dark spot on elytron is small, approximately as large as the metafemur; while in *M. maoer* **sp. nov.**, the dark spot on the elytron is approximately twice as large as the metafemur.

*Minota cuiae* **sp. nov.** could be differentiated from *Minota bimaculata* **sp. nov.** by the much smaller maculation on elytron.

**Description.** Male body length 2.10 mm, width 1.55 mm. Ratio of body length to width: 1.36. Ratio of antenna length to body length: 0.62. Ratio of pronotum width (measured at posterior edge) to length: 1.55. Ratio of elytron length (along suture) to width (maximum): 2.05. Ratio of elytron length to pronotum length (along middle): 3.14. Ratio of elytra width to pronotum width (maximum): 1.49. Entire body evenly yellowish-brown, with one small black spot near middle of each elytron, elytral suture near apex with a hue of black (Fig. 2A); antennae and legs yellowish-brown to dark brown. Antennae, legs and ventral side covered with yellow setae.

Head. Head hypognathous. Vertex smooth, with minute punctures. Antennal calli poorly differentiated, triangular. Supracallinal and supraorbital sulci deep, somewhat sinuate near supraorbital pore (Fig. 3A). Supraantennal sulcus poorly developed. Proportionate length of antennomeres 1–11 equals 100: 69: 56: 58: 83: 81: 92: 86: 82: 83: 104. Ratio of frontal ridge width to antennal socket width: 1.15. Frontal ridge widest between antennal sockets, much narrowed and ridged towards clypeus. Fronto-genal ridge present. Anterior margin of labrum slightly concave in middle.

Thorax. Pronotum convex, widest at posterolateral callosity. Anterolateral callosity truncate, oblique and long, with an anterolateral setiferous pore situated at posterior end. Pronotal base convex, with one short deep longitudinal groove on each side, length to width ratio of groove: 2.63–3.34. A small depression present in front of each groove (Fig. 3B). Pronotal punctures weak; diameter of pronotal punctures 2 to 4 times smaller than distance between them. Procoxal cavities closed posteriorly, leaving a narrow gap.

Elytra with convex lateral sides, humeral calli absent. Elytra with minute punctures arranged in regular rows. Hind wings absent.

Legs. Length of metatibia to first metatarsomere in male ratio: 100: 30. Proportions of male metatarsomere lengths: 100: 60: 62: 94.

Hind margin of male last abdominal ventrite trilobed, with apex of middle lobe truncate (Fig. 3I).

Male genitalia. Median lobe of aedeagus in ventral view: length to width ratio 3.95; sides sub-parallel, widest near middle; five longitudinal ridges extending from middle part to near basal opening (Fig. 2D); apex narrowing abruptly, truncate apically, without denticle. Median lobe of aedeagus in lateral view: basal part and apical part slightly bent ventrally, apex bent dorsally.

**Bionomics.** This new species inhabits thick moss cushions on rocks and trees near the top of the mountain at an altitude of 2100 m.

**Etymology.** This new species is named in honor of the Chinese entomologist Prof. Junzhi Cui (崔俊芝), who has dedicated extensive efforts to the insect diversity survey of Nanling Mountains.

**Distribution.** China: Guangxi.

### *Minota maoer* Zhang, Ruan, Liang & Yang, sp. nov.

Chinese vernacular name: 猫儿米跳甲

urn:lsid:zoobank.org:act:37DCE598-08F9-49C2-9870-14EC26F83E21

(Figs 4–6)

**Type material. HOLOTYPE: CHINA:** ♂ (SZPT), labels: 1) China, Guangxi Prov., Guilin City (桂林市), Maoershan Mountain (猫儿山), Huananzhidian (华南之巅), 6.IX.2020, 2100m, 25.8650°N, 110.4122°E, Yongying Ruan leg., Berlese Funnel; 2) HOLOTYPE *Minota maoer* sp. nov. Des. Ruan *et al.* 2024.

**Diagnosis.** Body longer than 2.0 mm; wrinkles present near supraorbital pore above supraorbital sulci on each side; supraantennal calli triangular; supraantennal sulci well delimited; elytra widest at middle; dorsum bicolor, with dark spot on yellowish-brown elytra; ventral side of median lobe of aedeagus with an oval excavation near basal opening; ventral side of median lobe without longitudinal ridges (Fig. 4E).

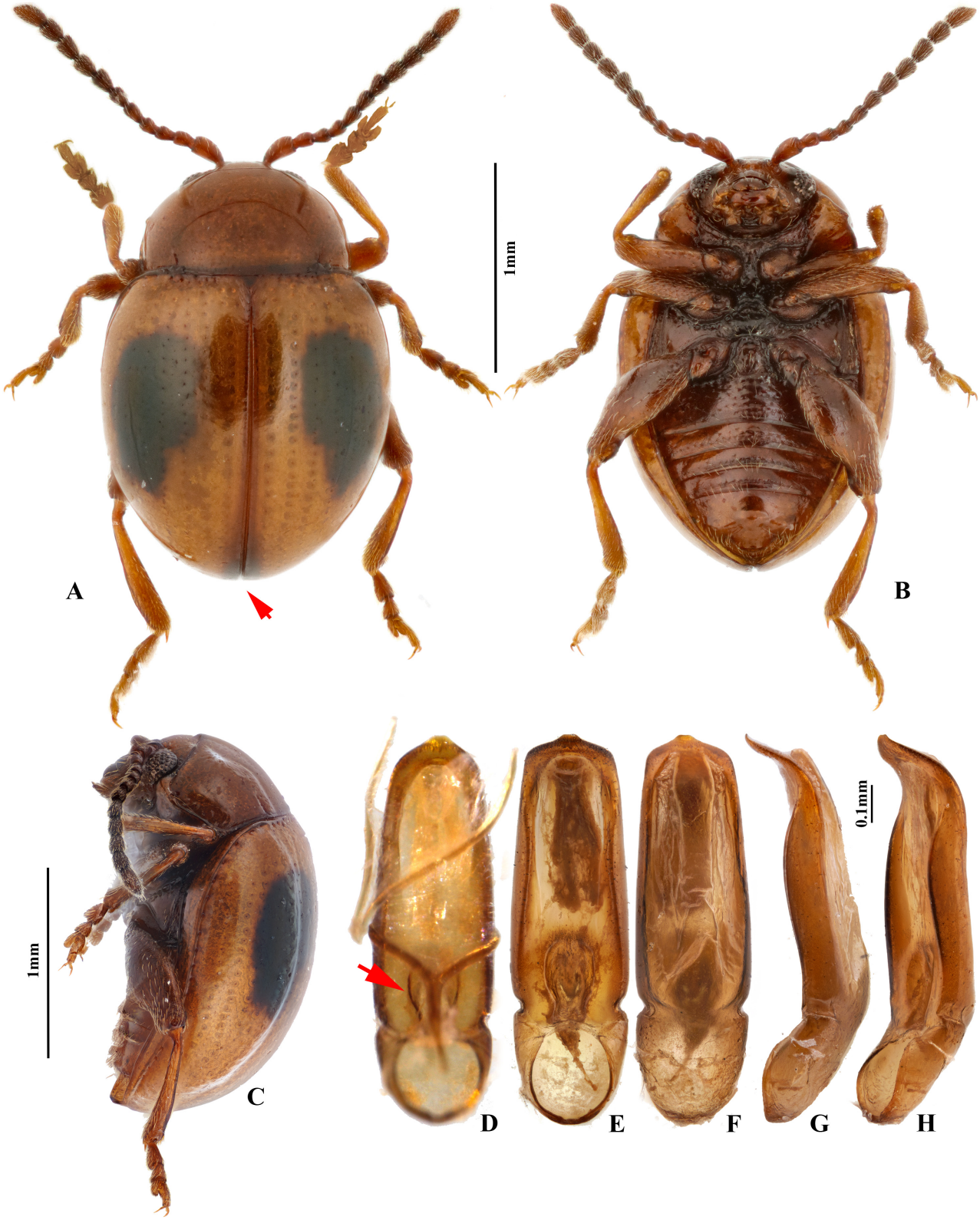


**FIGURE 4.** Adult morphology of *Minota maoer* sp. nov. **A.** Holotype, male, dorsal view, arrow showing dark spot near apex of elytra. **B.** Holotype, male, ventral view. **C.** Holotype, male, lateral view. **D–H.** Median lobe of aedeagus (holotype). showing ventral, dorsal, and lateral views. arrow showing the oval excavation.

*Minota maoer* **sp. nov.** and *Minota cuiae* **sp. nov.** are sympatric and similar in external characters. For differential diagnosis, see the text under *Minota cuiae* **sp. nov.**

*Minota maoer* **sp. nov.** resembles *Minota bimaculata* **sp. nov.** in the external characters, especially in the similar large dark spot on the elytron. However, in *M. maoer* **sp. nov.**, the ventral surface of the median lobe of aedeagus without longitudinal ridges (with two longitudinal ridges in *M. bimaculata* **sp. nov.**); the longitudinal groove on pronotum is longer, with length to width ratio 5.24–6.27 (2.50–3.19 in *M. bimaculata* **sp. nov.**).

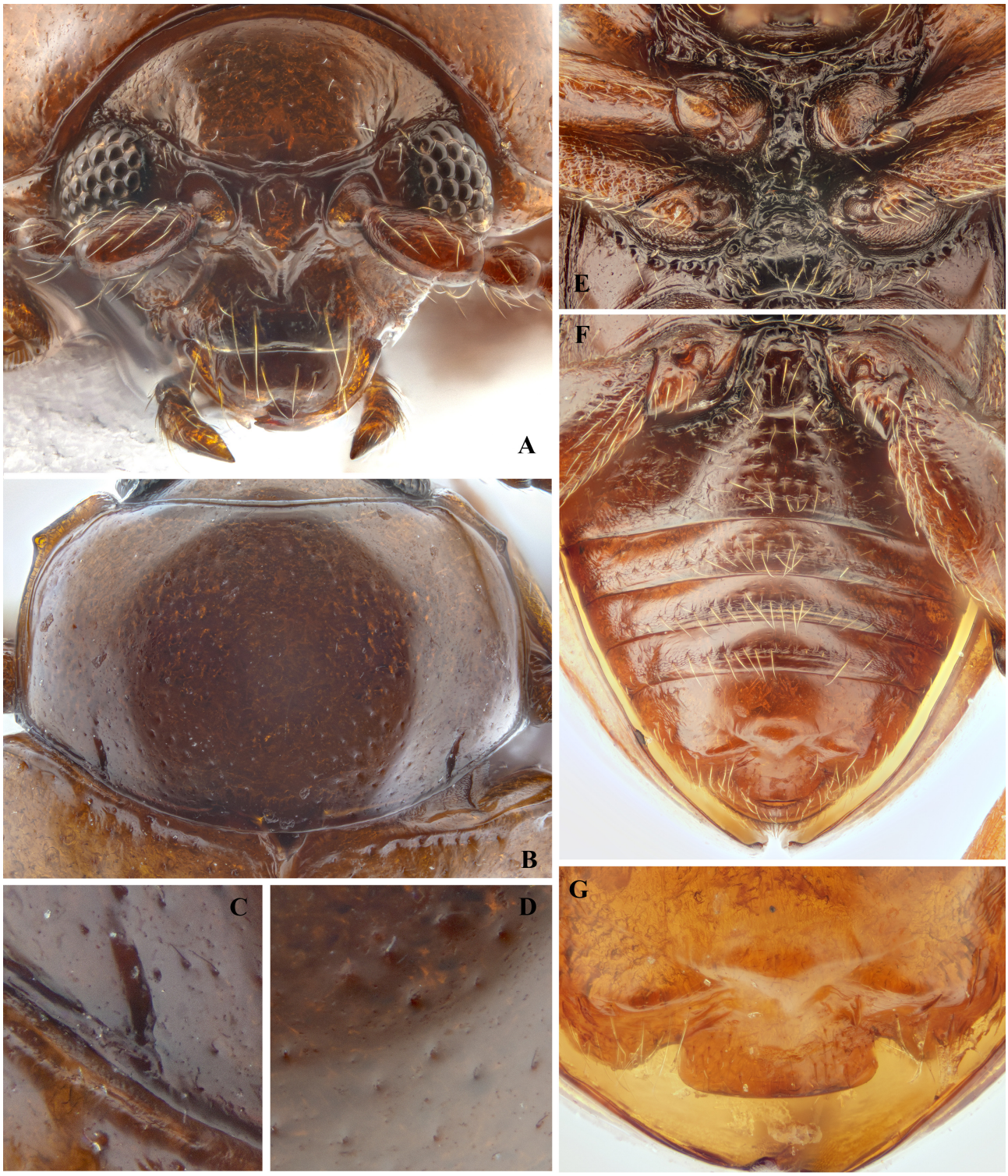


**FIGURE 5.** Adult morphology of *Minota maoer* sp. nov. (holotype, male). **A.** Head. **B.** Pronotum. **C.** Longitudinal groove on base of pronotum. **D.** Puntures on disc of pronotum. **E.** Ventral view of thorax. **F.** Abdominal ventrites. **G.** Last abdominal ventrite.


**FIGURE 6.** Habitat of *Minota maoer* sp. nov. in Maoershan Mountain. **A.** Topographical and vegetation characteristics. **B.** One of the authors collecting moss-inhabiting flea beetles at the type locality. **C.** Moss on trees near the type locality.

**Description.** Male body length 2.00 mm, width 1.40 mm. Ratio of body length to width: 1.44. Ratio of antenna length to body length: 0.61. Ratio of pronotum width (measured at posterior edge) to length: 1.54. Ratio of elytron length (along suture) to width (maximum): 2.10. Ratio of elytron length to pronotum length (along middle): 2.86. Ratio of elytra width to pronotum width (maximum): 1.37. Entire body evenly yellow brown to brown, with one large black spot at middle part of each elytron, elytral suture with a hue of black near apex (Fig. 4A); antennae and legs yellow brown to brown. Antennae, legs and ventral side covered with yellow setae.

Head. Hypognathous. Vertex smooth, with minute punctures. Wrinkles present near supraorbital pore above supraorbital sulci on each side. Antennal calli poorly differentiated, triangular. Supracallinal and supraorbital sulci deep, very slightly curved (Fig. 5A). Supraantennal sulcus poorly developed. Proportionate length of antennomeres 1−11 equals 100: 59: 46: 49: 63: 60: 60: 65: 62: 67: 98. Ratio of frontal ridge width to antennal socket width: 1.15. Frontal ridge widest between antennal sockets, much narrowed and ridged towards clypeus. Fronto-genal ridge present. Anterior margin of labrum slightly concave in middle.

Thorax. Pronotum convex, widest at posterolateral callosity. Anterolateral callosity truncate, oblique and long, with an anterolateral setiferous pore situated at posterior end. Pronotal base convex, with one short deep longitudinal groove on each side (Fig. 5B), length to width ratio of groove: 5.24–6.27. Pronotal punctures small, poorly differentiated; diameter of pronotal punctures 2 to 4 times smaller than distance between them. Procoxal cavities closed posteriorly, leaving a narrow gap.

Elytra with convex lateral sides, humeral calli absent. Elytra with punctures arranged in regular rows. Hind wings absent.

Legs. Length of metatibia to first metatarsomere in male: 100: 25. Proportions of male metatarsomere lengths: 100: 50: 58: 84.

Hind margin of male last abdominal ventrite trilobed, with apex of middle lobe truncate (Fig. 5G).

Male genitalia. Median lobe of aedeagus in ventral view: length to width ratio: 3.29; sides sub-parallel, widest near middle, slightly narrowing from middle to apex; a deep oval depression present near basal opening (Fig. 4D);

apical denticle well-differentiated, wide, truncate. Median lobe of aedeagus in lateral view: middle part slightly curved; apical part strongly bent ventrally, apical denticle bent dorsally.

**Bionomics.** This new species inhabits thick moss cushions on rocks and trees at an altitude of 2100 m.

**Etymology.** The name of the new species is derived from a fairy tale of Maoershan Mountain, the type locality of the new species. The top of this mountain resembles a lying cat ("maoer" in Chinese). According to the legend, there was once a divine cat who violated the heavenly rules and was banished to the mortal realm, transforming into this stone. Day after day, the divine cat gazes up at the sky, hoping that one day it can return to heaven.

**Distribution.** China: Guangxi.

### *Minota bimaculata* Zhang, Ruan, Liang & Yang, sp. nov.

Chinese vernacular name: 双斑米跳甲

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(Figs 7–9)

**Type material. HOLOTYPE: CHINA:** ♂ (SZPT), labels: 1) China, Jiangxi Prov., Ji'an City (吉安市), Jinggangshan Mountain (井冈山), Bamianshan (八面山), 2.II.2024, 1260m, 26.562°N, 114.107°E, Yongying Ruan leg., Berlese Funnel; 2) HOLOTYPE *Minota bimaculata* sp. nov. Des. Ruan *et al.* 2024.

Paratype: 1♀(SZPT), labels: 1) China, Jiangxi Prov., Ji'an City (吉安市), Jinggangshan Mountain (井冈山), Bamianshan (八面山), 2.II.2024, 1260m, 26.562°N, 114.107°E, Yongying Ruan leg., Berlese Funnel; 2) PARATYPE *Minota bimaculata* **sp. nov.** Des. Ruan *et al.* 2024.

**Diagnosis.** Body longer than 2.0 mm; supraantennal calli triangular; supraantennal sulci well delimited; elytra widest at middle; dorsum bicolorous, with dark spot on yellow elytra; ventral side of median lobe with an oval excavation near basal opening; ventral surface of median lobe of aedeagus with two longitudinal ridges extending from near apex to oval excavation (Fig. 9E, F).

*Minota bimaculata* **sp. nov.** and *Minota maoer* **sp. nov.** are similar to each other in elytral maculation. For a differential diagnosis, see the text under *Minota maoer* **sp. nov.**

**Description.** Male body length 2.50 mm, width 1.50 mm; female body length 2.43 mm, width 1.61 mm. Ratio of body length to width: 1.51–1.63. Ratio of antenna length to body length: 0.59–0.61. Ratio of pronotum width (measured at posterior edge) to length: 1.66–2.22. Ratio of elytron length (along suture) to width (maximum): 2.00–2.20. Ratio of elytron length to pronotum length (along middle): 2.32–3.49. Ratio of elytra width to pronotum width (maximum): 1.30–1.38 (all measurements pertain to the two type specimens). Entire body evenly chestnut-brown (yellowish-brown when beetle is alive, Fig. 7D, E), including antennae and legs, with one large black spot at middle of each elytron (Fig. 7A). Antennae, legs, and ventral side covered with yellow setae.

Head hypognathous. Vertex smooth, with minute punctures. Antennal calli poorly differentiated, triangular. Supracallinal and supraorbital sulci deep, forming an oblique straight line. Supraantennal sulcus poorly developed. Proportionate length of antennomeres 1 to 11 equals 100: 46: 46: 48: 66: 60: 66: 72: 68: 73: 119. Ratio of frontal ridge width to antennal socket width: 1.14. Frontal ridge widest between antennal sockets, narrowed and ridged towards clypeus. Anterior margin of labrum slightly concave in middle.

Thorax. Pronotum convex, widest at posterolateral callosity. Anterolateral callosity truncate, oblique, and long, with an anterolateral setiferous pore situated at posterior end. Pronotal base convex, with one short deep longitudinal groove on each side (Fig. 8B, C), length to width ratio of groove: 2.50–3.19. Pronotal punctures weak, diameter of pronotal punctures 2 to 4 times smaller than distance between adjacent punctures. Procoxal cavities closed posteriorly, leaving a narrow gap.

Elytra with convex lateral sides, humeral calli absent. Elytra with punctures arranged in regular rows.

Legs. Length of metatibia to first metatarsomere in male: 100: 28. Proportions of male metatarsomere lengths: 100: 48: 56: 84.

Hind margin of male last abdominal ventrite trilobed, with apex of middle lobe slightly rounded (Fig. 8F).

Male genitalia. Median lobe of aedeagus in ventral view: length to width ratio: 4.05; sides sub-parallel, widest near middle; a deep oval depression present near basal opening; two longitudinal ridges extending from near apex to oval excavation (Fig. 9E, F); apex narrowing abruptly, denticle poorly developed. Median lobe of aedeagus in lateral view: middle part almost straight; apical part slightly bent ventrally, apical denticle bent dorsally.

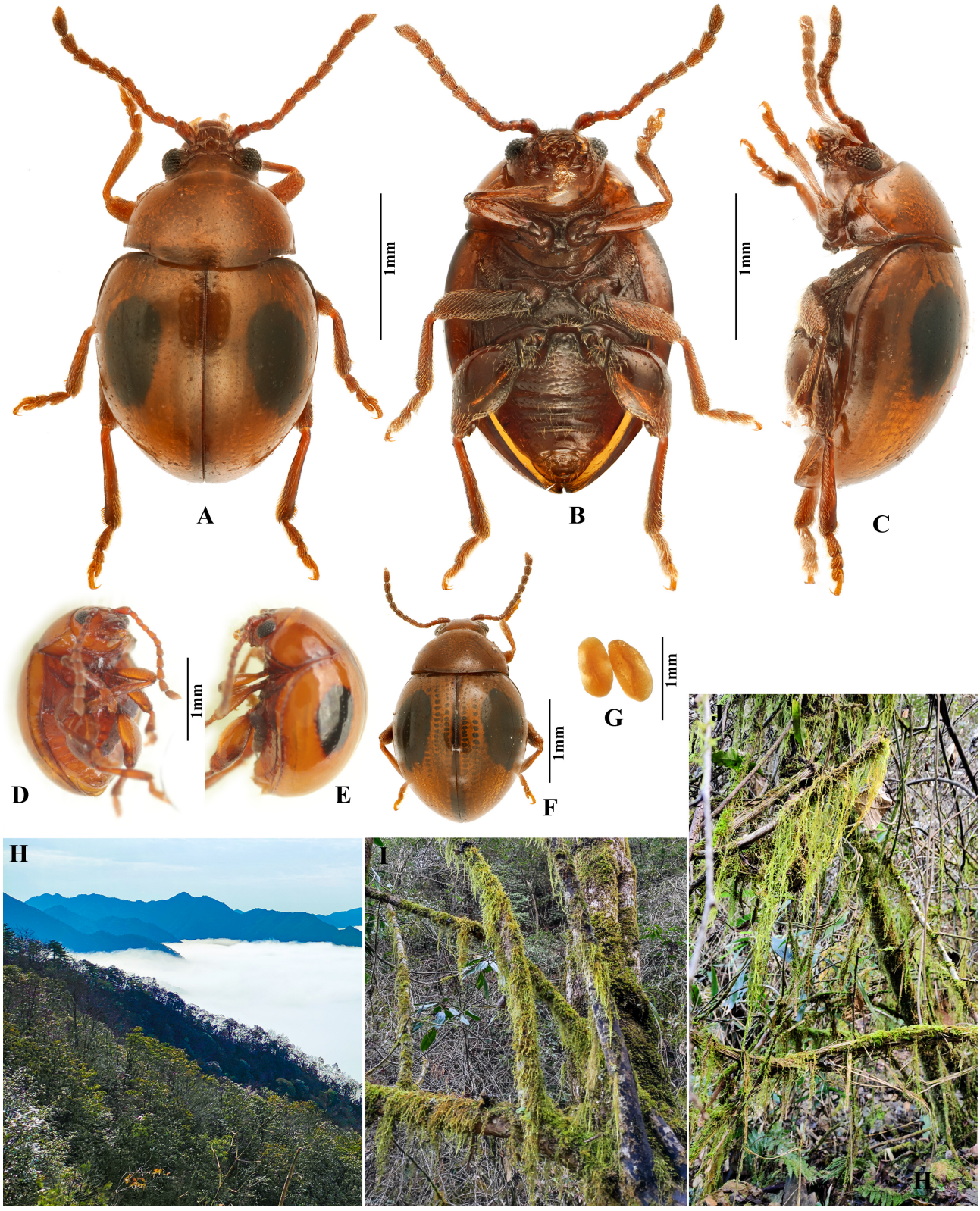


**FIGURE 7.** Adult morphology and habitat of *Minota bimaculata* sp. nov. **A.** Holotype, male, dorsal view. **B.** Holotype, male, ventral view. **C.** Holotype, male, lateral view. **D–E.** Freshly killed holotype specimen, possesses a paler body hue that undergoes darkening upon drying. **F.** Female (paratype), dorsal view. **G.** Immature eggs extracted from the ovary. **H–J.** Habitat at the type locality.

Female genitalia. Spermathecal pump cylindrical, apex narrow, with basal part merge with receptacle; making acute angle with receptacle (Fig. 9B). Receptacle of spermatheca cylindrical, slightly narrowed towards spermathecal duct, with sides slightly curved near middle. Spermathecal duct with coils near base. Middle part of vaginal palpus slightly narrowed; posterior sclerotization of vaginal palpus poorly developed.

**Bionomics.** This new species inhabits moss cushions on the ground surface and trees in a moist valley at an altitude of 1260 m (Fig. 7H–J).

**Etymology.** This species is named after the two dark maculations on its elytra (Fig. 7A).

**Distribution.** China: Jiangxi.


**FIGURE 8.** Adult morphology of *Minota bimaculata* sp. nov. (holotype, male). **A.** Head. **B.** Pronotum. **C.** Longitudinal groove on base of pronotum. **D.** Puntures on disc of pronotum. **E.** Ventral view of thorax and abdomen. **F.** Last abdominal ventrite.

**TABLE 1. Checklist of the flea beetles of the Nanling Mountains.** Abbreviations: **PA**=Palearctic Region; **OR**=Oriental Region; **NNR**=National Nature Reserve; **1**—Guangdong: Qingyuan, Shimentai NNR (石门台自然保护区); **2**—Guangdong: Shaoguan, Nanling NNR (南岭自然保护区); **3**—Hunan: Chengbu, Jintongshan NNR (金童山自然保护区); **4**—Jiangxi: Ganzhou, Jiulianshan NNR (九连山自然保护区); **5**—Guangdong: Qingyuan, Chengjia NNR (称架自然保护区); **6**—Guangxi: Guilin, Maoershan NNR (猫儿山自然保护区); **7**—Guangxi: Guilin, Huaping NNR (花坪自然保护区); **8**—Hunan: Yongzhou, Shunhuangshan NNR (舜皇山自然保护区); **9**—Hunan: Chenzhou, Mangshan NNR (莽山自然保护区); **10**—Hunan: Yongzhou, Dupangling NNR (都庞岭自然保护区); **11**—Hunan: Shaoyang, Nanshan NNR (南山自然保护区); **12—**Guangxi: Yangshuo (阳朔); **13—**Guangxi: Guilin, Longsheng (龙胜); **14**—Guangxi: Guilin, Lingui (临桂区); **15** -Jiangxi: Ji'an, Jinggangshan NNR (井冈山自然保护区). The Qinling Mountains (秦岭) and Huaihe River (淮河) are treated as the boundary between the Oriental Region (OR) and Palaearctic Region (PA) in China, a distinction previously adopted by Ruan *et al*. (2019) and Yang *et al.* (2005). Examples of flea beetle species identified in the current study from Nanling Mountains are shown in Figs 10–14.

| Genera | Species | Distribution in Nanling Mts. | Biogeographic affinity of species |
|---|---|---|---|
| ***Altica* Geoffroy, 1762**跳甲属 | *Altica aenea* (Olivier, 1808) 丁香蓼跳甲 | 4; 10; 11 | OR |
| | *Altica caerulescens* (Baly, 1874) 朴草跳甲 | 11 | PA+OR |
| | *Altica fragariae* (Nakane, 1955) 蛇莓跳甲 | 1; 4; 7; 10; 11 | PA+OR |
| ***Aphthona* Chevrolat, 1836**侧刺跳甲属 | *Aphthona chinchihi* Chen, 1939 大戟侧刺跳甲 | 12 | OR |
| | *Aphthona howenchuni* (Chen, 1934) 隆基侧刺跳甲 | 6; 9 | PA+OR |
| | *Aphthona omeishanica* Konstantinov *et* Lingafelter, 2002 峨眉山侧刺跳甲 | 2; 9 | OR |
| | *Aphthona renhwai* Chen, 1939 任氏侧刺跳甲 | 12 | PA+OR |
| | *Aphthona rufosanguinea* Chen, 1939 红色侧刺跳甲 | 12 | OR |
| | *Aphthona semiviridis* Jacoby, 1885 微绿侧刺跳甲 | 2; 6; 8; 9 | OR |
| | *Aphthona strigosa* Baly, 1874 细背侧刺跳甲 | 1; 2; 4; 7; 9; 10; 12 | OR |
| | *Aphthona yangsoensis* Chen, 1939 阳朔侧刺跳甲 | 12 | OR |
| ***Aphthonoides* Jacoby, 1885**刀刺跳甲属 | *Aphthonoides latipennis* Chen *et* Wang, 1980 阔翅刀刺跳甲 | 13 | OR |
| ***Argopistes* Motschulsky, 1860** 瓢跳甲属 | *Argopistes sinensis* Chen, 1939 中华瓢跳甲 | 12 | OR |
| ***Argopus* Fischer, 1824**凹唇跳甲属 | *Argopus nigritarsis* (Gebler, 1823) 黑跗凹唇跳甲 | 12 | PA+OR |
| | *Argopus subfurcatus* Chen, 1939 叉凹唇跳甲 | 12 | OR |
| ***Asiophrida* Medvedev, 1999**拟直缘跳甲属 | *Asiophrida scaphoides* (Baly, 1865) 漆树拟直缘跳甲 | 4; 9 | PA+OR |
| ***Aulacothorax* Boheman, 1858**小毛跳甲属 | *Aulacothorax laboissierei* (Chen, 1935) 拉氏小毛跳甲 | 7 | OR |
| ***Batophila* Foudras, 1859**圆肩跳甲属 | *Batophila acutangula* Heikertinger, 1921 尖角圆肩跳甲 | 6; 9; 10 | OR |
| ***Benedictus* Scherer, 1969**贝跳甲属 | *Benedictus fuanensis* Ruan & Konstantinov, 2023 福安贝跳甲 | 2 | OR |

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**TABLE 1.** (Continued)

| Genera | Species | Distribution in Nanling Mts. | Biogeographic affinity of species |
|---|---|---|---|
| ***Bikasha* Maulik, 1931**律点跳甲属 | *Bikasha antennata* (Chen, 1934) 角律点跳甲 | 12 | OR |
| | *Bikasha collaris* (Baly, 1877) 红胸律点跳甲 | 1; 2; 4; 8; 9; 10 | OR |
| | *Bikasha intermedia* (Chen, 1934) 褐色律点跳甲 | 4 | OR |
| | *Bikasha minuta* (Chen, 1934) 小律点跳甲 | 7 | OR |
| | *Bikasha nipponica* (Chûjô, 1959) 黑色律点跳甲 | 2; 7 | OR |
| | *Bikasha simplicithorax* (Chen, 1934) 简胸律点跳甲 | 4 | OR |
| ***Chaetocnema* Stephens, 1831**凹胫跳甲属 | *Chaetocnema concinnicollis* (Baly, 1874) 古铜凹胫跳甲 | 2; 3; 4; 8 | PA+OR |
| | *Chaetocnema fortecostata* Chen, 1939 高脊凹胫跳甲 | 1; 4; 11 | OR |
| | *Chaetocnema kingpinensis* Ruan, Konstantinov & Yang, 2014 金平凹胫跳甲 | 1; 4; 6; 7; 8; 10 | OR |
| | *Chaetocnema modiglianii* Jacoby, 1896 越南凹胫跳甲 | 1; 10 | PA+OR |
| | *Chaetocnema warchalowskii* Döberl, 2009 沃氏凹胫跳甲 | 2; 4; 7; 9; 10 | PA+OR |
| | *Chaetocnema yaosanica* Chen, 1939 瑶凹胫跳甲 | 2; 4; 5; 10 | OR |
| | *Chaetocnema bella* (Baly, 1876) 尖尾凹胫跳甲 | 2; 4; 10 | OR |
| | *Chaetocnema constricta* Ruan, Konstantinov & Yang, 2014 窄凹胫跳甲 | 1; 2; 3; 4; 5; 7; 8; 9; 10; 11 | OR |
| | *Chaetocnema nigrica* Motschulsky, 1858 黑凹胫跳甲 | 10 | OR |
| | *Chaetocnema paragreenica* Ruan, Konstantinov & Yang, 2014 类金绿凹胫跳甲 | 10 | OR |
| | *Chaetocnema puncticollis* (Motschulsky, 1858) 甜菜凹胫跳甲 | 4 | OR |
| | *Chaetocnema tonkinensis* (Chen, 1934) 越北凹胫跳甲 | 4 | OR |
| ***Hemipyxis* Chevrolat, 1836** 沟胫跳甲属 | *Hemipyxis balyi* (Bates, 1866) 白缘沟胫跳甲 | 1 | OR |
| | *Hemipyxis lusca* (Fabricius, 1801) 斑翅沟胫跳甲 | 2 | OR |
| | *Hemipyxis moseri* (Weise, 1922) 棕顶沟胫跳甲 | 4 | OR |
| | *Hemipyxis privignus* Gressitt *et* Kimoto, 1963 肿缘沟胫跳甲 | 7 | OR |
| | *Hemipyxis quadripustulata* (Baly, 1876) 四斑沟胫跳甲 | 1; 2; 4; 7 | OR |
| ***Hespera* Weise, 1889**丝跳甲属 | *Hespera lomasa* Maulik, 1926 波毛丝跳甲 | 2; 9; 11 | PA+OR |
| ***Lipromela* Chen, 1933**九行跳甲属 | *Lipromela pubipennis* Chen *et* Wang, 1980 毛翅九行跳甲 | 13 | OR |
| ***Lipromima* Heikertinger, 1924**方胸跳甲属 | *Lipromima fulvipes* Chûjô, 1935 黄足方胸跳甲 | 2; 3; 4 | OR |
| | *Lipromima minuta* (Jacoby, 1885) 小方胸跳甲 | 2; 7; 10 | PA+OR |
| ***Lipromorpha* Chûjô *et* Kimoto, 1960**束跳甲属 | *Lipromorpha difficilis* (Chen, 1934) 原束跳甲 | 4 | OR |
| ***Liprus* Motschulsky, 1860**玉簪跳甲属 | *Liprus geminatus* Chen *et* Wang, 1980 双行玉簪跳甲 | 2; 9 | OR |

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**TABLE 1.** (Continued)

| Genera | Species | Distribution in Nanling Mts. | Biogeographic affinity of species |
|---|---|---|---|
| ***Longitarsus* Latreille, 1829**长跗跳甲属 | *Longitarsus bimaculatus* (Baly, 1874) 双斑长跗跳甲 | 1 | OR |
| | *Longitarsus birmanicus* Jacoby, 1892 缅甸长跗跳甲 | 14 | OR |
| | *Longitarsus championi* Maulik, 1926 钱氏长跗跳甲 | 4; 12 | OR |
| | *Longitarsus consobrinellus* Chen, 1939 小长跗跳甲 | 12 | OR |
| | *Longitarsus dorsopictus* Chen, 1939 黑缝长跗跳甲 | 1; 9 | OR |
| | *Longitarsus hedini* Chen, 1934 赫定长跗跳甲 | 2; 4; 6; 8; 9; 12 | OR |
| | *Longitarsus lewisii*（Baly, 1874）车前长跗跳甲 | 1; 4; 8; 9 | PA+OR |
| | *Longitarsus longiseta* Weise, 1889 长鬃长跗跳甲 | 12 | PA+OR |
| | *Longitarsus hsienwe*ni Chen, 1939 献文长跗跳甲 | 2 | OR |
| | *Longitarsus piceorufus* Chen, 1939 暗红长跗跳甲 | 9; 11 | OR |
| | *Longitarsus pulexoides* Chen, 1939 蚤形长跗跳甲 | 12 | OR |
| | *Longitarsus quadraticollis* Jacoby, 1885 方胸长跗跳甲 | 4 | OR |
| | *Longitarsus rufotestaceus* Chen, 1933 红背跗跳甲 | 12 | OR |
| | *Longitarsus waltherhorni* Csiki, 1939 沃氏长跗跳甲 | 1; 12 | OR |
| ***Luperomorpha* Weise, 1887**寡毛跳甲属 | *Luperomorpha albofasciata* Duvivier, 1892 横带寡毛跳甲 | 7 | OR |
| | *Luperomorpha birmanica* (Jacoby, 1892) 缅甸寡毛跳甲 | 12 | OR |
| | *Luperomorpha costipennis* Wang, 2002 脊鞘寡毛跳甲 | 8 | OR |
| | *Luperomorpha nobilis* Weise, 1889 棕头寡毛跳甲 | 7 | PA+OR |
| | *Luperomorpha sibirica* (Csiki, 1916) 葱黄寡毛跳甲 | 4 | PA+OR |
| | *Luperomorpha xanthodera* (Fairmaire, 1888) 黄胸寡毛跳甲 | 1; 2; 4; 7; 10 | PA+OR |
| ***Mandarella* Ogloblin, 1936**瘦跳甲属 | *Mandarella nipponensis* (Laboissiera, 1913) 日本瘦跳甲 | 2; 6; 7; 8; 9; 11 | PA+OR |
| ***Manobia* Jacoby, 1885**玛碧跳甲属 | *Manobia coomani* Chen, 1934 库氏玛碧跳甲 | 12 | OR |
| ***Mantura* Stephens, 1831** 曼跳甲属 | *Mantura bicoloripes* Chen, 1939 双色曼跳甲 | 12 | OR |
| ***Meishania* Chen & Wang, 1980**眉山跳甲属 | *Meishania rufa* Chen *et* Wang, 1980红眉山跳甲 | 9 | OR |
| ***Minota* Kutschera, 1859**米跳甲属 | *Minota cuiae* Zhang, Ruan, Liang & Yang, **sp. nov.** 崔氏米跳甲 | 6 (see above notes for specific localities) | OR |
| | *Minota maoer* Zhang, Ruan, Liang & Yang, **sp. nov.** 猫儿米跳甲 | 6 | OR |
| | *Minota bimaculata* Zhang, Ruan, Liang & Yang, **sp. nov.** 双斑米跳甲 | 15 | OR |
| ***Neocrepidodera* Heikertinger, 1911**连瘤跳甲属 | *Neocrepidodera manobioides* (Chen, 1939) 玛连瘤跳甲 | 1; 4; 8; 9 | OR |

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**TABLE 1.** (Continued)

| Genera | Species | Distribution in Nanling Mts. | Biogeographic affinity of species |
|---|---|---|---|
| ***Nisotra* Baly, 1864**四线跳甲属 | *Nisotra gemella* (Erichson, 1834) 麻四线跳甲 | 1; 2; 4; 6; 7; 10 | OR |
| ***Nonarthra* Baly, 1862**九节跳甲属 | *Nonarthra coreanum* Chûjô, 1935 寇九节跳甲 | 12 | PA+OR |
| | *Nonarthra cyaneum* Baly, 1874 蓝色九节跳甲 | 1; 2; 4; 6; 7; 8; 10 | PA+OR |
| | *Nonarthra variabilis* Baly, 1862 异色九节跳甲 | 1; 2; 4; 6; 7; 8; 9; 11 | PA+OR |
| ***Omeisphaera* Chen *et* Zia, 1974**峨眉球跳甲属 | *Omeisphaera anticata* Chen *et* Zia, 1974 峨眉球跳甲 | 2 | OR |
| ***Parathrylea* Duvivier, 1892**宽额跳甲属 | *Parathrylea septempunctata* (Jacoby,1892) 七点宽额跳甲 | 1; 2 | OR |
| ***Philopona* Weise, 1903**肿爪跳甲属 | *Philopona vibex* (Erichson, 1834) 牡荆肿爪跳甲 | 4 | PA+OR |
| ***Phygasia* Chevrolat, 1836**粗角跳甲属 | *Phygasia ornata* Baly, 1876 斑翅粗角跳甲 | 2; 6; 9 | PA+OR |
| ***Phyllotreta* Stephens, 1836**菜跳甲属 | *Phyllotreta striolata* (Fabricius, 1801) 黄曲条菜跳甲 | 1; 4; 5; 9 | World wide |
| ***Podontia* Dalman, 1824** 凹缘跳甲属 | *Podontia lutea* (Olivier, 1790) 黄色凹缘跳甲 | 2; 4; 9 | PA+OR |
| ***Psylliodes* Latreille, 1829**蚤跳甲属 | *Psylliodes attenuata* (Koch, 1803) 大麻蚤跳甲 | 1; 2; 4; 8; 9; 12 | PA+OR |
| | *Psylliodes brettinghami* Baly, 1862 红足蚤跳甲 | 4 | OR |
| | *Psylliodes obscurofasciata* Chen, 1933 模带蚤跳甲 | 9 | PA |
| | *Psylliodes plana* Maulik, 1926 窄蚤跳甲 | 8 | PA+OR |
| ***Sangariola* Jacobson, 1888** 细角跳甲属 | *Sangariola fortunei* (Baly, 1888) 缝细角跳甲 | 4 | PA+OR |
| ***Sinocrepis* Chen, 1933**沟基跳甲属 | *Sinocrepis obscurofasciata* (Jacoby, 1892) 木槿沟基跳甲 | 12 | OR |
| ***Sphaeraltica* Ohno, 1961**脊腹跳甲属 | *Sphaeraltica affinis* (Chen, 1939) 近脊腹跳甲 | 12 | OR |
| | *Sphaeraltica flavicornis* (Baly, 1874) 黄角脊腹跳甲 | 10 | OR |
| ***Sphaeroderma* Stephens, 1831**球跳甲属 | *Sphaeroderma apicale* Baly, 1874 黄尾球跳甲 | 2 | PA+OR |
| | *Sphaeroderma bambusicola* Wang, Ge *et* Li, 2010 箬竹黄尾球跳甲 | 12 | OR |
| | *Sphaeroderma fraternale* Chen, 1939 弗球跳甲 | 12 | OR |
| | *Sphaeroderma rubi* Chûjô, 1937 红色球跳甲 | 2; 4; 8; 9 | OR |
| | *Sphaeroderma separatum* Baly, 1874 离球跳甲 | 6; 9 | OR |
| | *Sphaeroderma sinuatum* Gressitt *et* Kimoto, 1963 微球跳甲 | 2; 3; 8; 9 | OR |
| ***Trachytetra* Sharp, 1886**长瘤跳甲属 | *Trachytetra cyanea* (Chen, 1939) 金绿长瘤跳甲 | 12 | OR |
| | *Trachytetra lewisi* (Jacoby, 1885) 路氏长瘤跳甲 | 4 | OR |

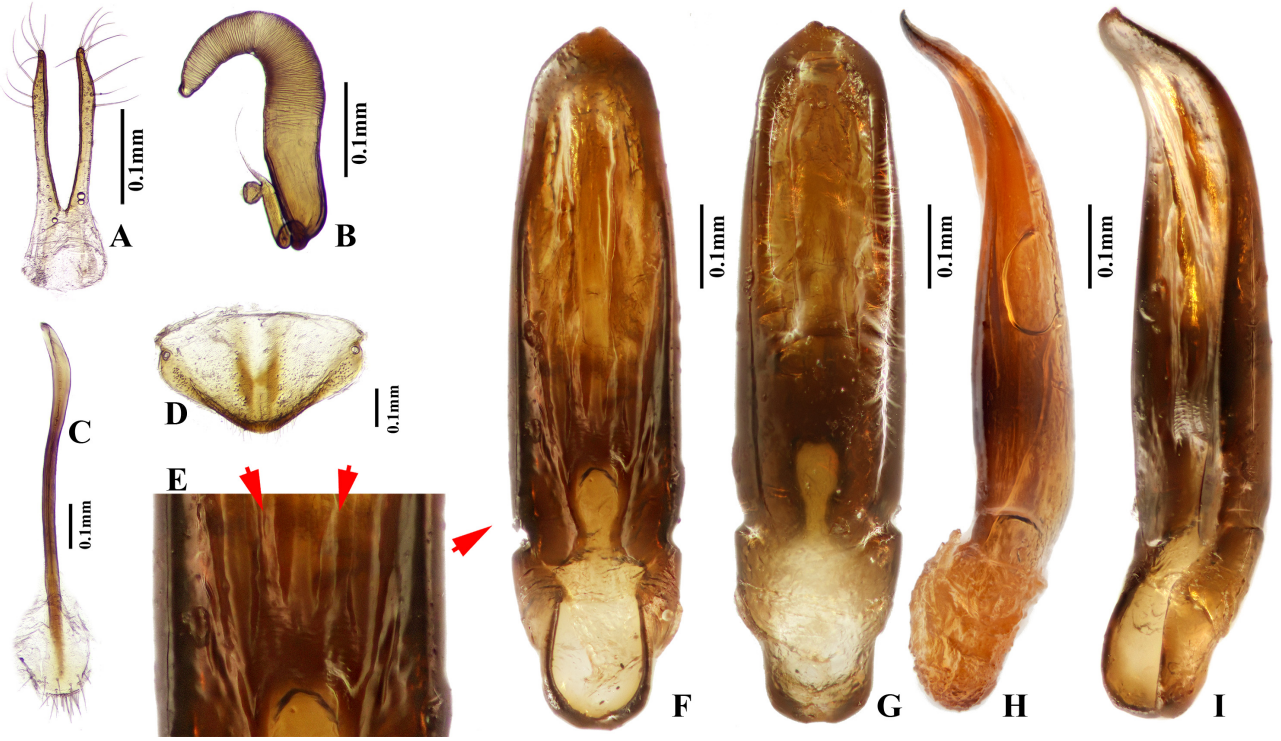


**FIGURE 9.** Genitalia of *Minota bimaculata* sp. nov. **A.** Vaginal palpi. **B.** Spermatheca. **C.** Tignum. **D.** Last visible abdominal tergite of female. **E.** Basal area of median lobe of aedeagus (holotype), arrows showing two longitudinal ridges on ventral surface. **F–I.** Ventral, dorsal, lateral, and ventral-lateral views.

## Discussion

Seventy-one percent of flea beetles collected so far in Nanling Mountains are exclusively Oriental (OR), 1% are exclusively Palearctic (PA), and 27% are distributed in PA+OR. A previous study in the Qinling Mountains (秦岭山脉) identified 29 flea beetle genera and 62 species, of which 6% are exclusively Oriental, 13% are exclusively Palearctic, and 79% are distributed in PA+OR (Ruan & Yang 2017) (Fig. 15). Fifteen species from the Nanling Mountains were previously recorded in the Qinling Mountains.

The Qinling Mountains, a pivotal transverse range, delineates the Yangtze and Yellow River valleys, the subtropical and warm temperate zones, and the northern limit of subtropical evergreen broadleaf forests (Yang 2005). It further delineates the Palearctic and Oriental biogeographic regions with respect to Chinese insect fauna (Yang 2005). The finding in this paper reinforces the hypothesis that the Qinling Mountains serve as the demarcation between the Palearctic and Oriental flea beetle faunas in China.

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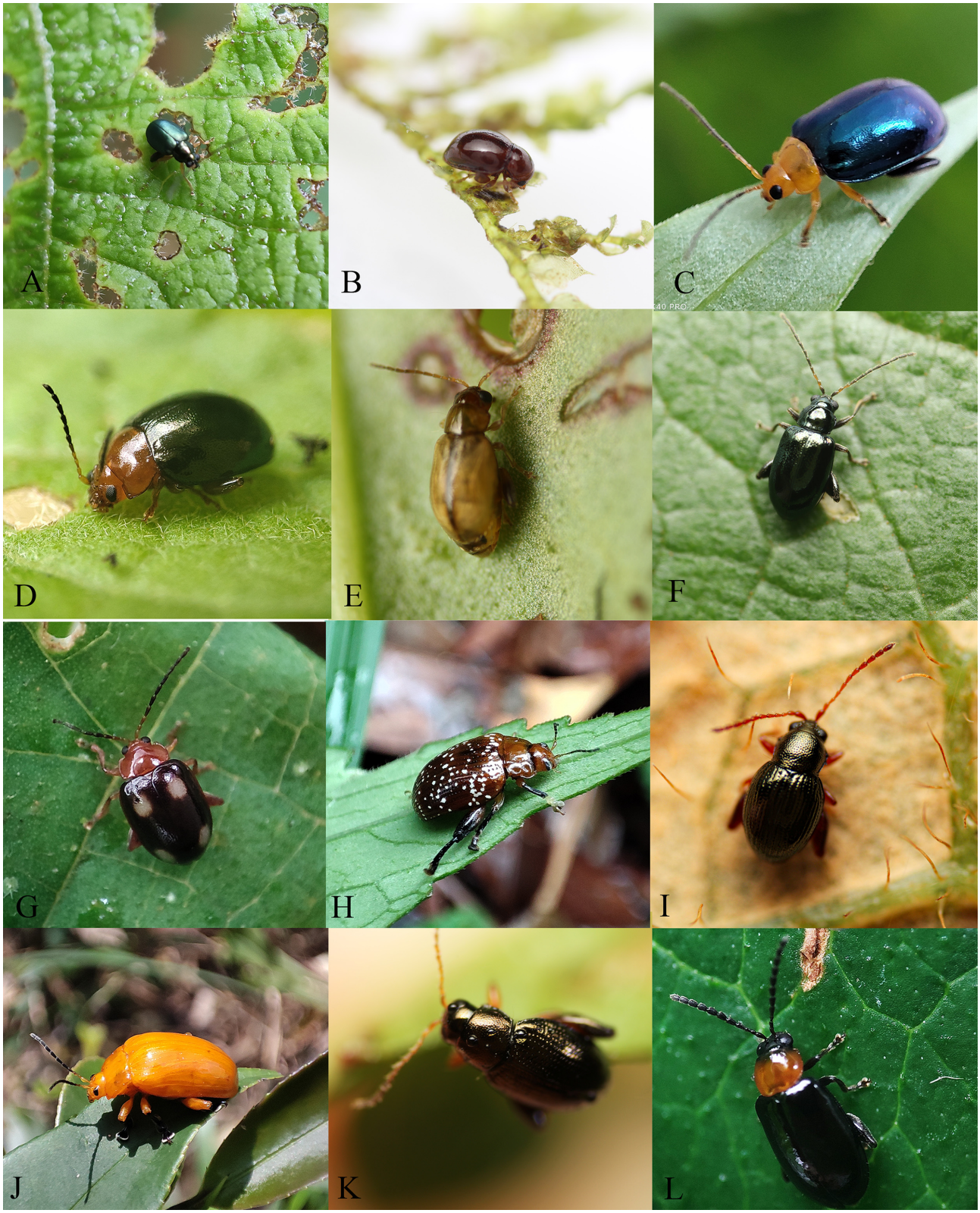


**FIGURE 10.** Photos of flea beetles taken during the field survey in Nanling Mountains. **A.** *Aphthona strigosa* Baly, 1874. **B.** *Benedictus* sp. **C.** *Hemipyxis* cf. *tonkinensis* (Chen, 1933). **D.** *Nisotra gemella* (Erichson, 1834). **E.** *Longitarsus* sp. **F.** *Apthona semiviridis* Jacoby 1885. **G.** *Hemipyxis quadripustulata* (Baly, 1876). **H.** *Asiophrida scaphoides* (Baly, 1865). **I.** *Batophila acutangula Heikertinger*, 1921. **J.** *Podontia lutea* (Olivier, 1790). **K.** *Chaetocnema constricta* Ruan, Konstantinov & Yang, 2014. **L.** *Luperomorpha xanthodera* (Fairmaire, 1888).

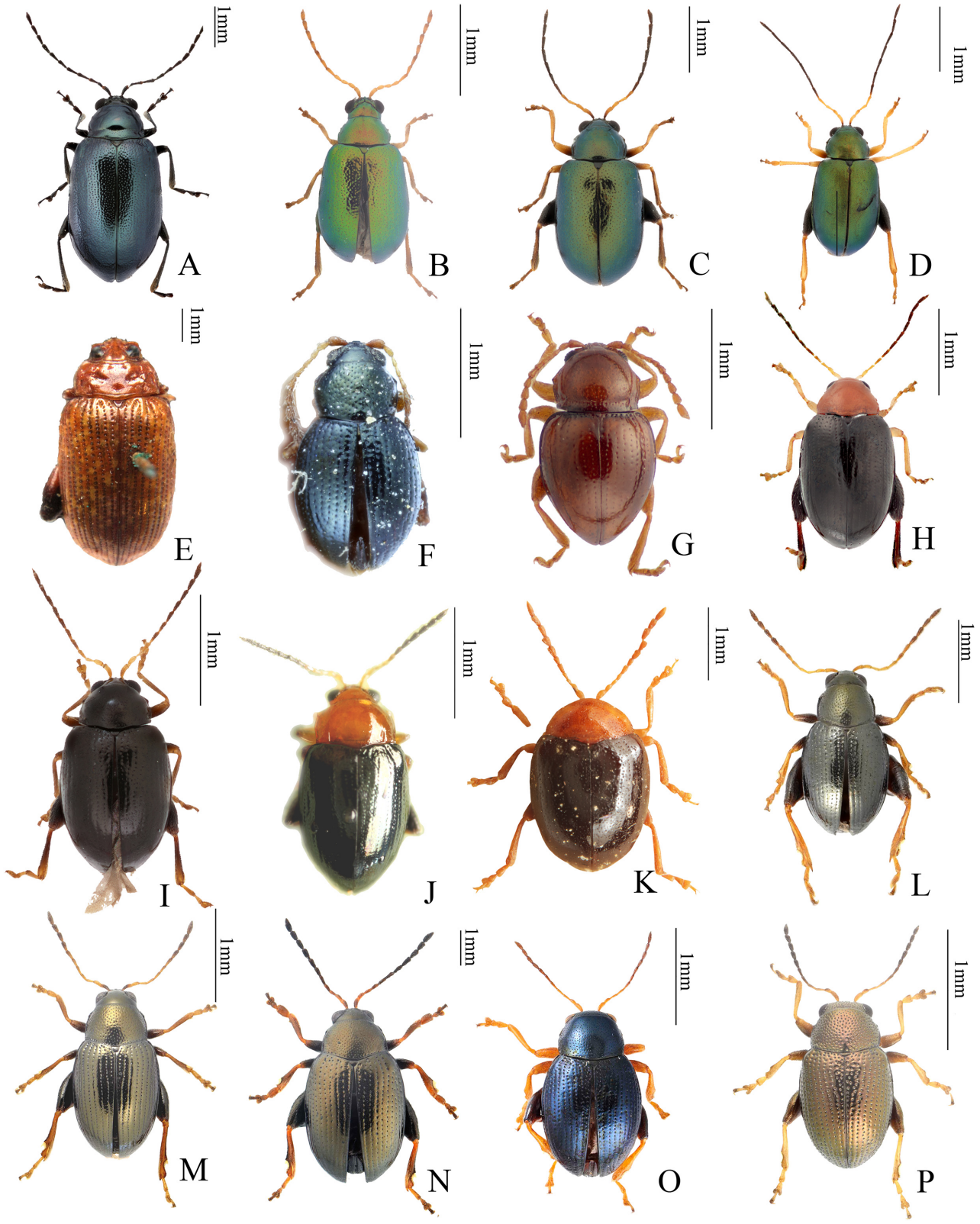


**FIGURE 11.** Examples of Alticines collected from Nanling Mountains. **A.** *Altica aenea* (Olivier, 1808). **B.** *Aphthona omeishanica* Konstantinov *et* Lingafelter, 2002. **C.** *Aphthona semiviridis* Jacoby, 1885. **D.** *Aphthona strigosa* Baly, 1874. **E.** *Asiophrida scaphoides* (Baly, 1865). **F.** *Batophila acutangula* Heikertinger, 1921. **G.** *Benedictus fuanensis* Ruan & Konstantinov, 2023. **H.** *Bikasha collaris* (Baly, 1877). **I.** *Bikasha nipponica* (Chûjô, 1959). **J.** *Sinocrepis obscurofasciata* (Jacoby, 1892). **K.** *Sphaeroderma apicale* Baly, 1874. **L.** *Chaetocnema kingpinensis* Ruan, Konstantinov & Yang, 2014. **M.** *Chaetocnema constricta* Ruan, Konstantinov & Yang, 2014. **N.** *Chaetocnema fortecostata* Chen, 1939. **O.** *Chaetocnema bella* (Baly, 1876). **P.** *Chaetocnema concinnicollis* (Baly, 1874).

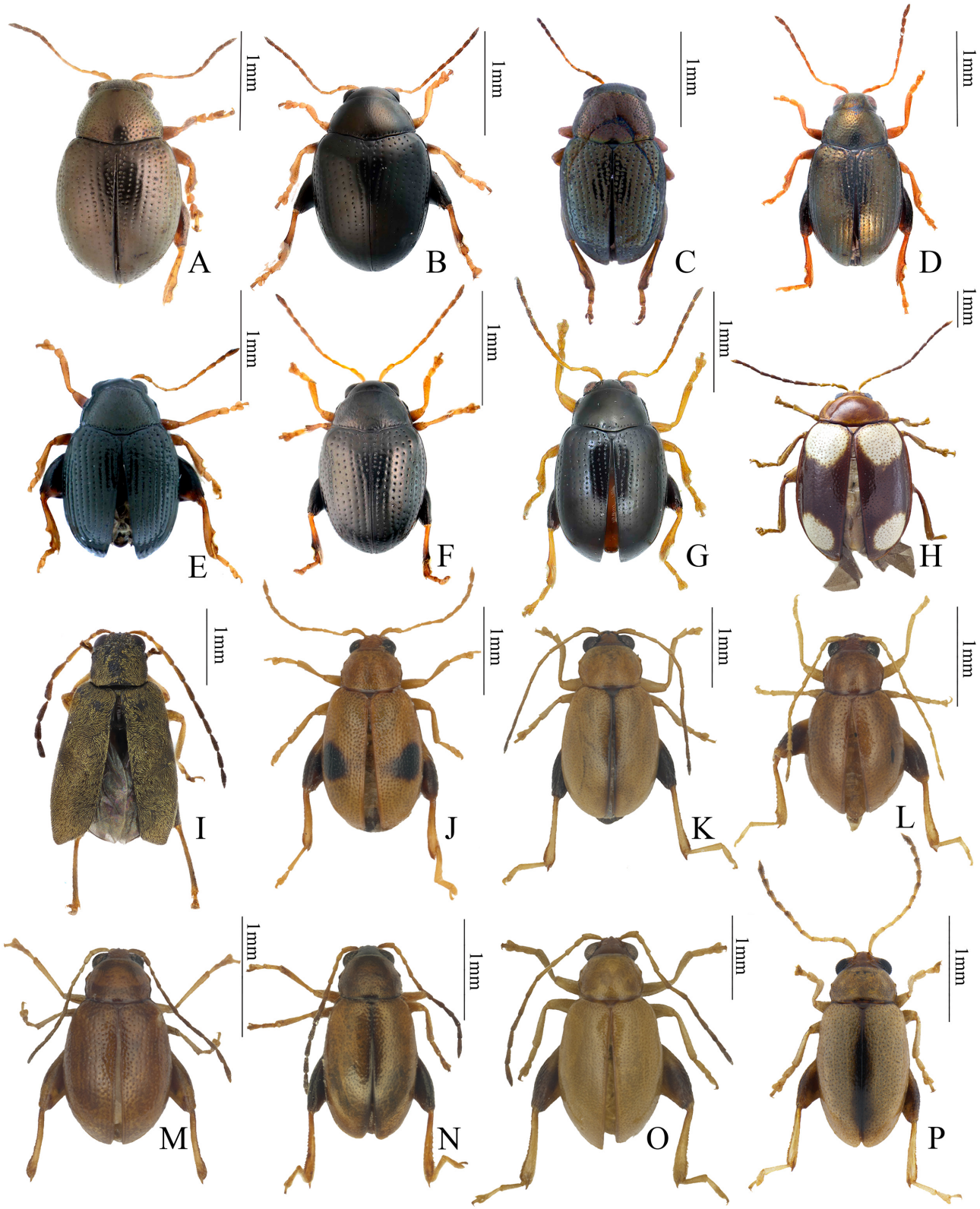


**FIGURE 12.** Examples of Alticines collected from Nanling Mountains. **A.** *Chaetocnema modiglianii* Jacoby, 1896. **B.** *Chaetocnema nigrica* Motschulsky, 1858. **C.** *Chaetocnema paragreenica* Ruan, Konstantinov & Yang, 2014. **D.** *Chaetocnema puncticollis* (Motschulsky, 1858). **E.** *Chaetocnema tonkinensis* (Chen, 1934). **F.** *Chaetocnema warchalowskii* Döberl, 2009. **G.** *Chaetocnema yaosanica* Chen, 1939. **H.** *Hemipyxis quadripustulata* (Baly, 1876). **I.** *Hespera lomasa* Maulik, 1926. **J.** *Longitarsus bimaculatus* (Baly, 1874). **K.** *Longitarsus birmanicus* Jacoby, 1892. **L.** *Longitarsus championi* Maulik, 1926. **M.** *Longitarsus consobrinellus* Chen, 1939. **N.** *Longitarsus dorsopictus* Chen, 1939. **O.** *Longitarsus hedini* Chen, 1934. **P.** *Longitarsus lewisii* (Baly, 1874).

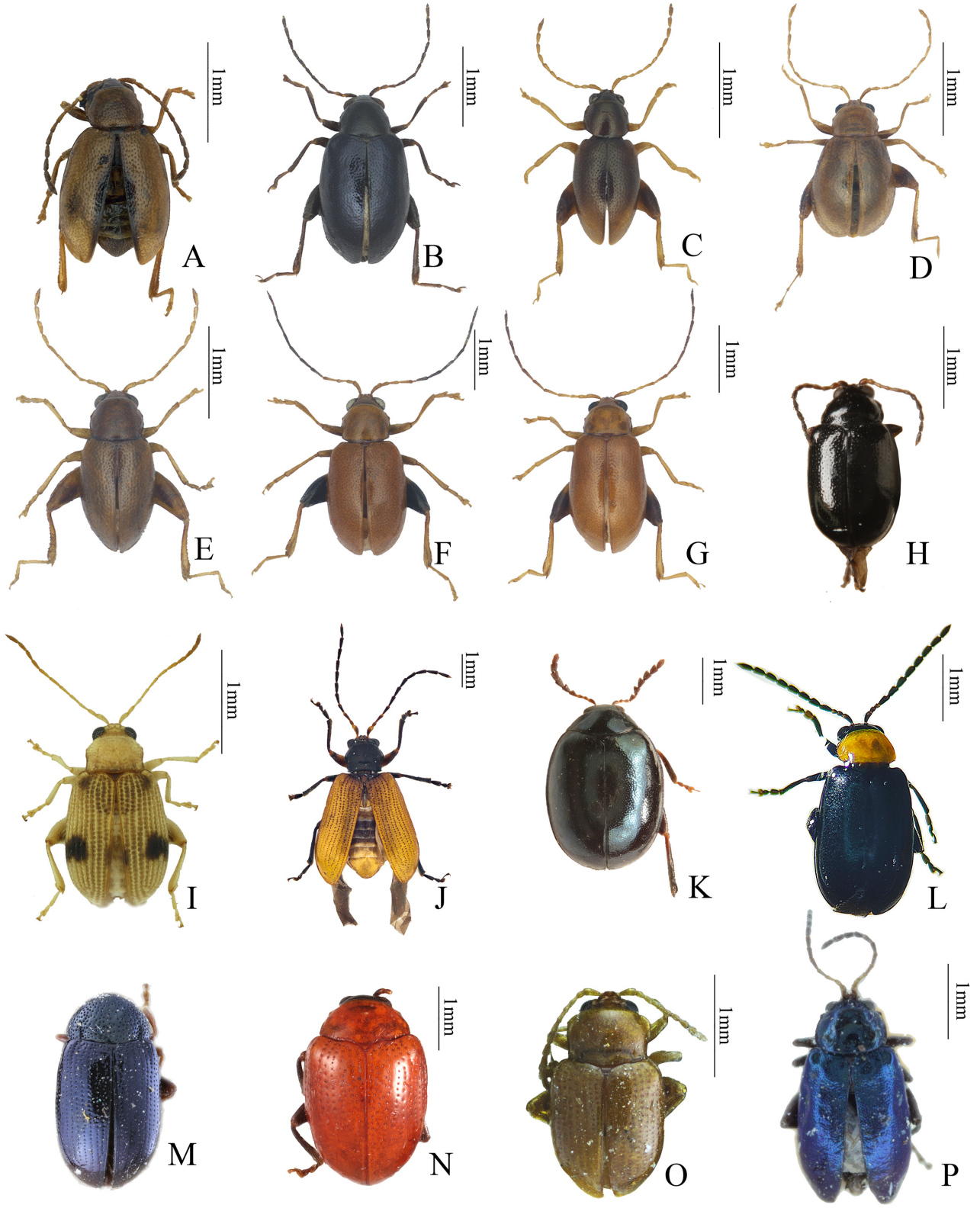


**FIGURE 13.** Examples of Alticines collected from Nanling Mountains. **A.** *Longitarsus longiseta* Weise, 1889. **B.** *Longitarsus hsienweni* Chen, 1939. **C.** *Longitarsus piceorufus* Chen, 1939. **D.** *Longitarsus pulexoides* Chen, 1939. **E.** *Longitarsus quadraticollis* Jacoby, 1885. **F.** *Longitarsus rufotestaceus* Chen, 1933. **G.** *Longitarsus waltherhorni* Csiki, 1939. **H.** *Sphaeraltica affinis* (Chen, 1939). **I.** *Lipromima minuta* (Jacoby, 1885). **J.** *Liprus geminatus* Chen *et* Wang, 1980. **K.** *Nonarthra cyaneum* Baly, 1874. **L.** *Luperomorpha xanthodera* (Fairmaire, 1888). **M.** *Mantura bicoloripes* Chen, 1939. **N.** *Meishania rufa* Chen *et* Wang, 1980. **O.** *Neocrepidodera manobioides* (Chen, 1939). **P.** *Trachytetra cyanea* (Chen, 1939).

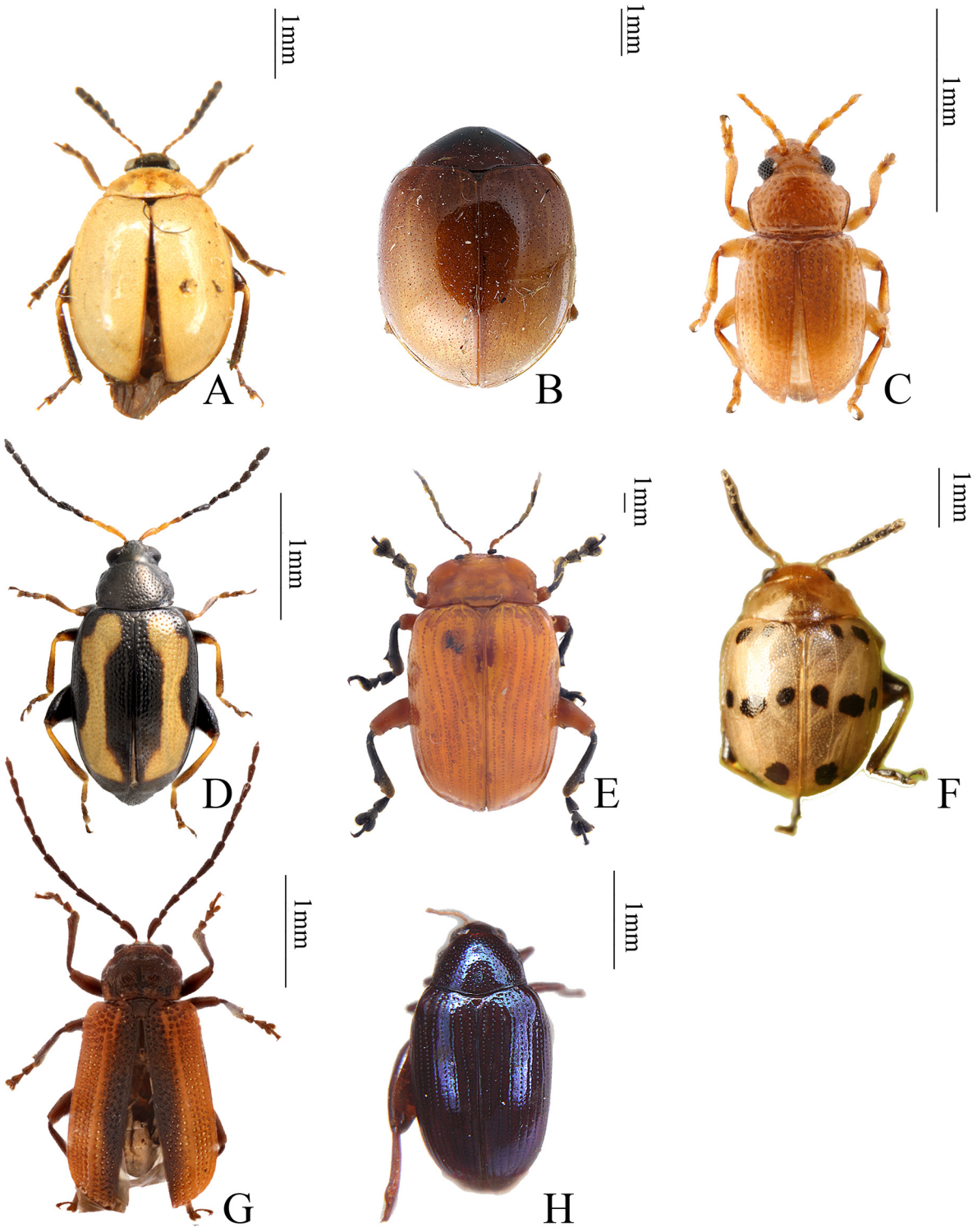


**FIGURE 14.** Examples of Alticines collected from Nanling Mountains. **A.** *Nonarthra variabilis* Baly, 1862. **B.** *Omeisphaera anticata* Chen *et* Zia, 1974. **C.** *Aulacothorax laboissierei* (Chen, 1935). **D.** *Phyllotreta striolata* (Fabricius, 1801). **E.** *Podontia lutea* (Olivier, 1790). **F.** *Parathrylea septempunctata* (Jacoby, 1892). **G.** *Sangariola fortunei* (Baly, 1888). **H.** *Psylliodes brettinghami* Baly, 1862.

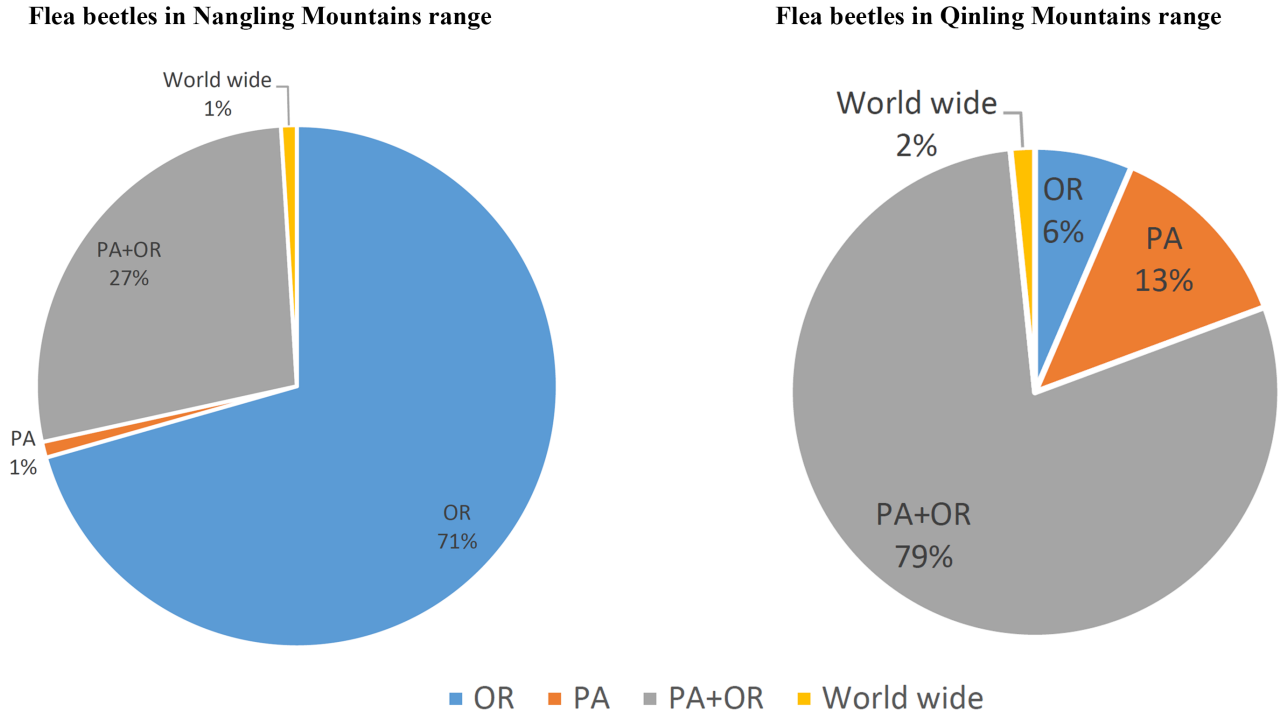


**FIGURE 15.** Comparison of the biogeographic affinity of Alticini species of Nanling and Qinling Mountains.

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# 南岭山脉跳甲多样性及米跳甲属*Minota*三新种（鞘翅目：叶甲科：蚤叶甲亚科：跳甲族）

张萌娜[1,6], 阮用颖[1,7*], 梁祖龙[2,3], 杨星科[2,4], 陈晓琴[1,8], 彭滢滢[1,9], 谢琪[1,10], 孟子烨[1,5*]
[1]深圳职业技术大学，植物保护研究中心，深圳 518055，广东，中国
[2]中国科学院动物研究所，动物进化与系统学院重点实验室，北京100101，中国
[3]中国科学院大学，北京100101，中国
liangzulong@ioz.ac.cn； https://orcid.org/0000-0002-1289-2697
[4]广东省科学院动物研究所，广东省野生动物保护与利用公共实验室，广州510260，广东，中国
yangxk@ioz.ac.cn； https://orcid.org/0000-0003-3676-6828
[5]贵州师范大学，生命科学学院，贵阳 550025，贵州，中国
ziyemeng@outlook.com； https://orcid.org/0009-0000-1102-1737
[6] mengnazhang@szpt.edu.cn； https://orcid.org/0000-0002-7265-2038
[7] yongyingruan@hotmail.com； https://orcid.org/0000-0002-5025-5592
[8] chenxiaoqin@szpt.edu.cn； https://orcid.org/0009-0006-3450-5738
[9] pengyy2024@hotmail.com； https://orcid.org/0009-0001-2162-2445
[10] xueki4886@outlook.com； https://orcid.org/0009-0002-0099-2508
*通讯作者

**摘要：**南岭山脉是中国16个生物多样性热点地区之一，它形成了中国中部和南部地区的分界线。本文根据2020年至2022年的综合调查，记录了南岭山脉范围内跳甲物种的多样性。此外，描述了中国米跳甲属*Minota*三新种，分别为崔氏米跳甲*Minota cuiae* **sp. nov.**（广西），猫儿米跳甲*Minota maoer* **sp. nov.**（广西）和双斑米跳甲*Minota bimaculata* **sp. nov.**（江西）。提供了中国米跳甲属物种名录及检索表。

**关键词**：分类；东洋区；生物多样性