



Four new species of *Gallerucida* Motschulsky, 1861 from China (Coleoptera: Chrysomelidae: Galerucinae)

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Abstract

Four new species of the genus *Gallerucida* Motschulsky, 1861 from China, *G. mantillerii* **sp. nov.** distributed in Guangxi and Guizhou, *G. rubicornis* **sp. nov.** distributed in Henan, Hunan, Hubei, Fujian and Guizhou, *G. rubiginosa* **sp. nov.** distributed in Xizang, and *G. rubrimelaena* **sp. nov.** distributed in Guangxi, Guizhou and Yunnan, are described, with their habitus and major diagnostic features illustrated.

Key words: Coleoptera, Chrysomelidae, Galerucinae, *Gallerucida*, new species

Introduction

Gallerucida Motschulsky, 1861 belonging to Galerucinae (Coleoptera: Chrysomelidae) boasts a diverse array of 92 known species distributed across the Palearctic and Oriental regions. In China, 71 species have been recorded (Yang *et al.* 2015; Xu *et al.* 2022), representing a significant portion of *Gallerucida*'s global diversity. The extensive biodiversity within *Gallerucida* emphasizes its significance and prominent position as one of the largest genera in Galerucinae.

Gallerucida exhibits a wide range of elytral color pattern. In a previous study, the spotted-elytron Chinese species, comprising 14 members, have been reviewed (Xu *et al.* 2022). Following our recent survey in China, we focus on the species with yellow or red brown elytra and have recognized four additional species, which are described here.

Material and methods

The specimens were examined with an Olympus SZ61 microscope.

Dissections

Abdomen and aedeagus of each species were dissected using the following procedure: A dissecting needle separated the abdomen along the junction between the softened end of the metasternum and the abdomen, the entire abdomen was placed in a solution containing 10% KOH, which was heated at 60–70°C for about 20–25 minutes. The above step was to remove the muscle tissue inside the abdomen. After the muscle tissue was basically dissolved, the entire abdomen was placed in cold water to rinse the residual KOH solution. Subsequently the entire abdomen was placed

on a concave slide; the aedeagus was gently pulled with sharp forceps from the end of the abdomen. After studying and photographing, the aedeagus was placed in glycerol for long-term preservation. The tube with the aedeagus in glycerol was attached to the same pin as the beetle.

Photographs

Habitus images were taken using a Canon EOS 5DSR digital camera connected to a MP-E 65 mm f/2.8 five-times lens. Different species were photographed using different magnifications based on their body length, with approximately 35–40 images automatically stacked and taken using a soft box or external flash.

Aedeagus images were taken using a Nikon D610 digital camera connected to a Zeiss microscope, with a 5× objective lens and manual shutter. About 20 photos of different depths of field were taken, and individual pictures of different depths of field were obtained by stacking them through the Helicon Focus 6 software to generate an ultra-deep image. The image was then imported into Adobe Photoshop CC 2019 software for processing.

Software

HELICON FOCUS 6 (<http://www.heliconsoft.com/heliconsoft-products/helicon-focus>) stacked full depth of images. Adobe Photoshop CC (<https://www.photoshop.com>) edited images and resulted output.

Labels

The original Chinese label data have been translated into English.

The label information records are transcribed in strict accordance with the original label information in the top-down order. The same line within the same label in the same specimen is separated by a "," in order to distinguish the administrative division of China, and a "/" indicates a line break. Different labels are distinguished by a "'". The specimen record content is based on the original label information.

Type depository

Type specimens of the four new species are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZAS).

Taxonomy

Genus *Gallerucida* Motschulsky, 1861

Gallerucida Motschulsky, 1861: 24. Type species: *Gallerucida bifasciata* Motschulsky, 1861, by monotypy.

Eustetha Baly, 1861: 296. Type species: *Eustetha flaviventris* Baly, 1861, by original designation. Synonymized by Chûjô (1962: 147).

Melospila Baly, 1861: 297. Type species: *Melospila nigromaculata* Baly, 1861, by original designation. Synonymized by Chapuis (1875: 227).

Hylaspes Baly, 1865: 436. Type species: *Hylaspes longicornis* Baly, 1865, by original designation. Synonymized by (Gressitt & Kimoto 1963: 717).

Galerucida: Chapuis, 1875: 224, 227. Incorrect subsequent spelling for *Gallerucida* Motschulsky, 1861: 24.

Stethidea Baly, 1890: 13. Type species: *Doryida balyi* Duvivier, 1885, by original designation. Synonymized by Kimoto (1989: 234).

Coptomesa Weise, 1912: 91. Type species: *Gallerucida (Coptomesa) maculata* Weise, 1912, by monotypy. Synonymized by Kimoto (1965: 398).

Distribution: Palaearctic region, Oriental region (Wilcox 1971).

Gallerucida mantillerii Xu & Yang, sp. nov.

Chinese common name: 褐跗柱萤叶甲

(Fig. 1)

Type material. HOLOTYPE: CHINA: ♂, Guangxi, Longsheng, Baiyan / 1150 m // 19-VI-1963 / Shu-Yong Wang leg. // HOLOTYPE (IZAS). **PARATYPES:** CHINA: 1 ♂, Guangxi, Longsheng, Baiyan / 1150 m // 19-VI-1963 / Shu-Yong Wang leg.; 1 ♂, 1 ♀, Guizhou, Leishan, Taojiang / 870-1100 m / 5-VII-1988 / Shu-Yong Wang leg. (all IZAS).

Diagnosis. *Gallerucida mantillerii* sp. nov. in general body length 9–12 mm, pronotum yellow brown, femora yellow brown, tibiae and tarsi brown are different from the other members with yellow brown elytra. The new species closely resembles *Gallerucida rubicornis* sp. nov., both two new species can be distinguished from other members of the genus by their body shape and the puncture arrangement on the elytra. *Gallerucida mantillerii* sp. nov. is characterized by brown tibiae and tarsi, along with denser punctures on elytra. The apical area of the metasternal process slightly sharp, and the aedeagus curved towards the ventral side, with a noticeably sharp apex in lateral view. On the other hand, *Gallerucida rubicornis* sp. nov. is differentiated by darker antennae, tibiae and tarsi. In dorsal view there are a pair of darker lateral longitudinal sclerites inside the aedeagus that curve towards each other in the apical area; in both species the lateral margins expand towards the apex in dorsal view, the difference is that in *Gallerucida mantillerii* sp. nov. the aedeagus is widest at 1/10 from apex, whereas in *Gallerucida rubicornis* sp. nov. widest at 3/10 from apex.

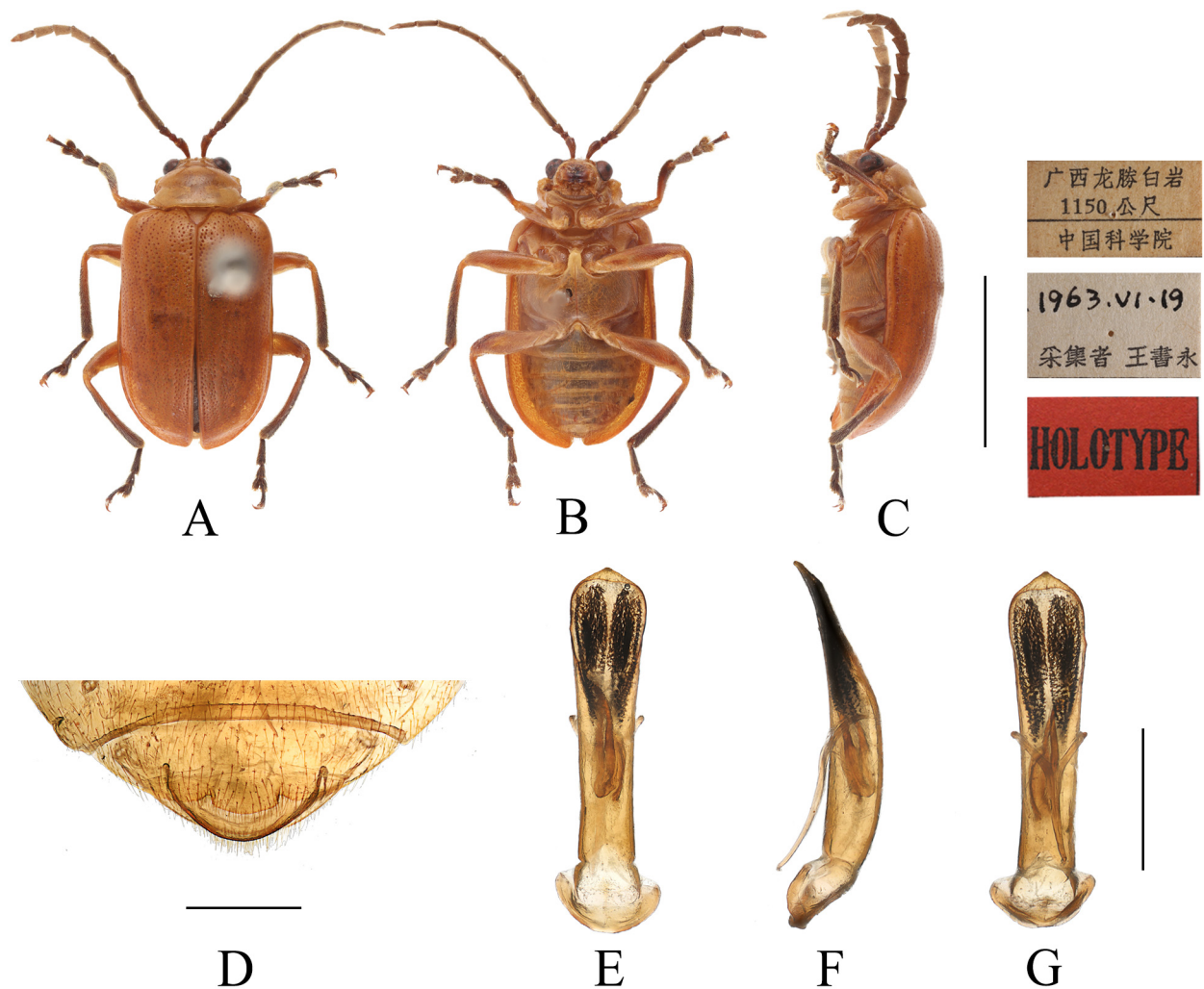


FIGURE 1. *Gallerucida mantillerii* sp. nov. (holotype). **A.** Dorsal view. **B.** Ventral view. **C.** Lateral view. **D.** Ventral view of 5th ventrite, male. **E.** Aedeagus, dorsal view. **F.** Ditto, lateral view. **G.** Ditto, ventral view. Scale bar: 5 mm (A–C); 1 mm (D–G).

Description. Length 8.3–8.7 mm, width 4.5–5.0 mm. Holotype length 8.5 mm, width 4.5 mm.

Male. Body oblong. General color (Fig. 1A–C) yellow brown; first three segments of antennae reddish-brown, the rest brown; tibiae and tarsi brown.

Head distinctly narrower than prothorax; occiput smooth, with sparse light punctures; frontoclypeus surface rough, with sparsely long hairs along the edge; frontal tubercle developed, irregular. Antennae longer than half the length of the elytra, with the basal three segments moderately shiny and sparsely adorned with long hairs, from 4th segment, covered with fine pale hairs; the length ratios of antennomeres I–V 1.0 : 0.4 : 0.5 : 1.5 : 1.3, 4th segment longest, 5th–11th segments subequal in length.

Pronotum transverse, around 2.2 times as broad as long, with all margins bordered, lateral margin contracts significantly inwards at the middle, anterior margin concave, with distinct anterior corners, basal margin slightly convex; disc area displays scattered light punctures, both sides of middle area present an oblique shallow depression. Anterior metasternal process extends visibly beyond halfway without reaching the front of the meso-coxal cavities, surface smooth, edged with sporadic long hairs, lateral margin subparallel, apical area slightly spiculate. Scutellum subtriangular, with rounded apex and sparsely strong punctures. Elytra 1.7 times as long as broad, with a subparallel lateral margin and a light depression near the humerus; disc slightly convex, bearing two types of irregular punctures, with spaces between them larger than the puncture diameter; the epipleura surface displays a row of strong punctures longitudinally. Apical margin of males last sternite trilobed, with the margin of middle lobe forming rounded (Fig. 1D).

Aedeagus in dorsal view regularly expanding; widest at 1/10 from apex, approaching a right angle at the apex; internal sclerites (Fig. 1E–G), a pair of longitudinal sclerites, converging apically; slightly curving towards ventral side, and terminating in a sharp apex.

Etymology. Dedicated to Antoine Mantilleri for providing key holotypes deposited at Muséum national d'Histoire naturelle, in Paris (France). Noun in the genitive case.

Distribution. China: Guangxi, Guizhou.

***Gallerucida rubicornis* Xu & Yang, sp. nov.**

Chinese common name: 褐角柱萤叶甲

(Fig. 2)

Type material. HOLOTYPE: CHINA: ♂, Henan, Tongbaishan / 400 m / 16-VII-2001 Kang-Zhen Dong leg. (IZAS). **PARATYPES:** CHINA: 1 ♀, Hunan, Yongshun, Shan-mu-he, Lin-chang 600 m / 9-VIII-1988 / Shu-Yong Wang leg.; 1 ♂, Hunan, Dayongxian / Zhang-jia-jie // 12-10-1988 / Huan-li Li leg.; 2 ♀♀, Hunan, Yongshun, Shan-mu-he, Lin-chang 600–920 m / 8-VIII-1988 / Shu-Yong Wang leg.; 1 ♂, Hunan, Cili // 3-IX-1988; 1 ♀, Hubei, Lichuan / Xing-dou-shan 810 m // 24-VII-1989 / Shu-Yong Wang leg.; 1 ♂, Hubei, Hefeng / 28-VII-1989 / 850 m Da-Zhi Dong leg.; 1 ♀, Fujian, Chonganxingcun, San-gang / 740–840 m // 11-VII-1960 / Cheng-Lin Ma leg.; 2 ♂♂, 1 ♀, Fujian, Chonganxingcun, Tong-mu-guan / 850–970 m // 27-VI-1960 / Sheng-Qiao Jiang leg.; 1 ♂, Fujian, Huangkeng, Liu-dun / 300-450 m // 7-VII-1960 / Fu-Ji Pu leg.; 2 ♂♂, 1 ♀, 3-VIII-2001 / Guizhou, Jiangkou, Hei-wan / Guo-Dong Ren leg.; 1 ♀, 5-VIII-2001 / Guizhou, Jiangkou, Hei-wan / Guo-Dong Ren leg.; 1 ♀, 13-VIII-2001 / Guizhou, Maolanbaohuqu / Jun-Xia Zhang and Zhi-Sheng Zhang leg.; 1 ♀, Guizhou, Fanjingshan / 5-VIII-1988 // Xing-Cai Liang leg. // Co.189; 1 ♀, Guizhou, Fanjingshan, Hei-wan-he / 500 m // 27-VII-2001 Qiong-Zhang Song leg.; 1 ♀, Guizhou, Leigongshan / 1000 m / 14-VII-1983 / Ping leg.; 1 ♂, Guizhou, Fanjingshan, Hu-guo-si / 1350 m // 3-VIII-2001 Qiong-Zhang Song leg.; 1 ♂, Guizhou, Jiangkou, Fan-jing-shan / 550–850 m // 16-VII-1988 Shu-Yong Wang leg. (all IZAS)

Diagnosis. *Gallerucida rubicornis* sp. nov. is different in apex of femora, tibiae and tarsi black from the other members with red brown elytra. The new species closely resembles *Gallerucida mantillerii* sp. nov., the new species is different in elytra with shallow depression near humerus, possessing distinct punctures, disc with unclear punctures; Aedeagus stouter than *G. mantillerii* sp. nov. In male, trilobed last abdominal sternite has stronger incisions at both sides of central lobe.

Description. Length 10.7–11.4 mm, width 5.7–6.1 mm. Holotype Length 10.7 mm, width 5.7 mm.

Male. Body oblong. General color (Fig. 2A–C) reddish-brown; the basal three segments of antennae reddish-brown, the rest brown; end of femora, tibiae and tarsi black.

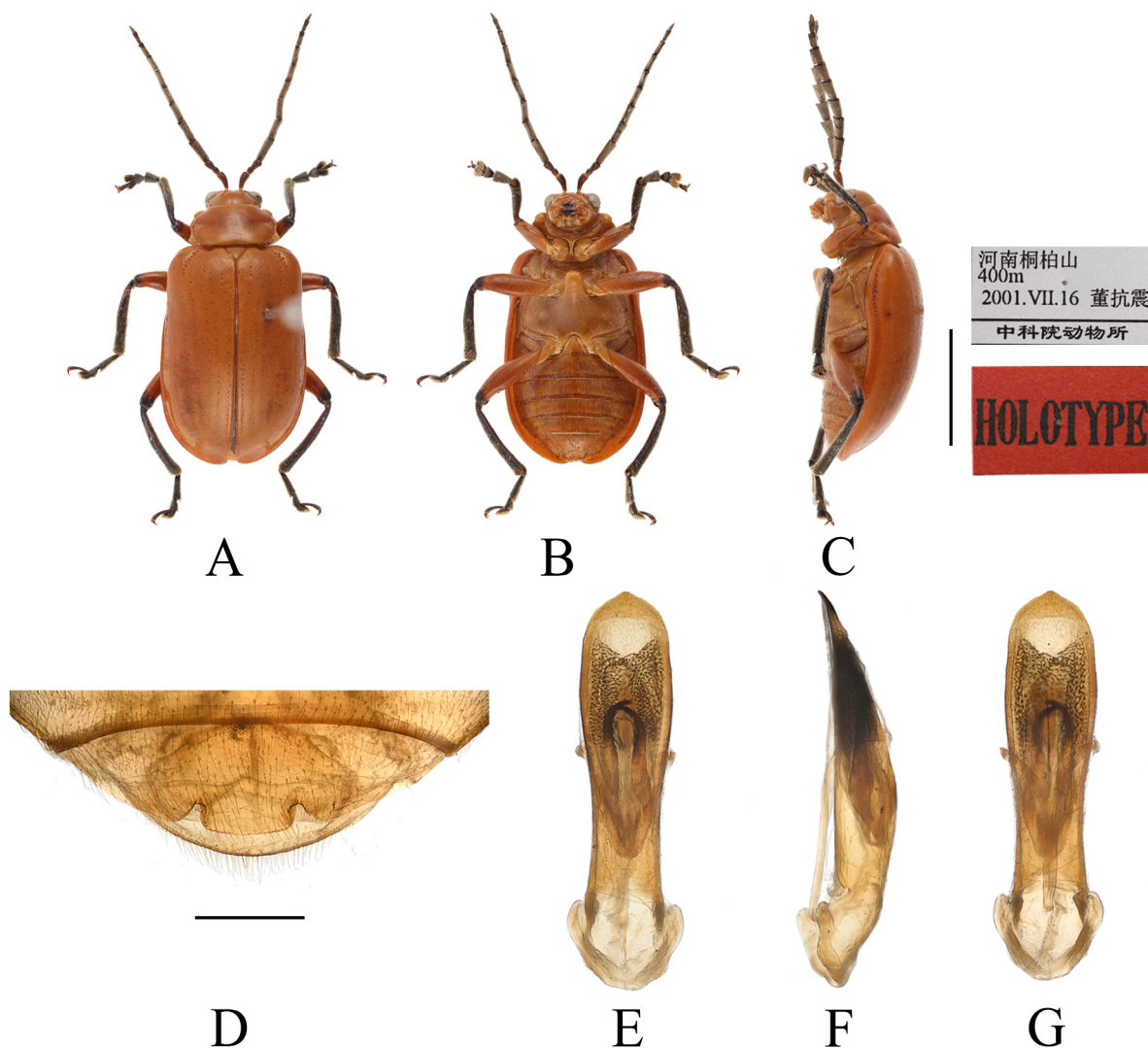


FIGURE 2. *Gallerucida rubicornis* sp. nov. **A.** dorsal view (holotype); **B.** ventral view (holotype); **C.** lateral view (holotype); **D.** ventral view of 5th ventrite, male (paratype); **E.** aedeagus, dorsal view (paratype); **F.** ditto, lateral view (paratype); **G.** ditto, ventral view (paratype). Scale bar: 5 mm (A–C); 1 mm (D–G).

Head narrower than prothorax, occiput with sparsely fine punctures; frontoclypeus triangular, with a smooth surface devoid of punctures and sparse long hairs along the edge; frontal tubercle developed and square. Antennae reach half the length of elytra, basal three segments rough and sparsely covered with short hairs, from 4th segment, covered densely with short pale hairs, 4th–10th segments cylindrical, last segment coniform; the length ratios of antennomeres I–V, 1.0 : 0.4 : 0.6 : 1.5 : 1.4, 4th segment longest, 5th segment slightly shorter than 4th segment, 6th–11th segments subequal in length. Pronotum transverse, around 2.1 times as broad as long, with slightly expanded lateral margins after middle area, anterior margin concave, with distinct anterior corners, basal margin slightly convex, posterior corner with distinct obtuse angle, disc area with irregular sparse fine punctures, middle area has a pair of oblique shallow depressions with sparse strong punctures. Anterior metasternal process reaches the apex of mesocoxal cavities, with a surface showing sparse punctures and covered in hairs, the lateral edge of apical area slightly expanded, with a rounded apex. Scutellum subtriangular, with a rounded apex, smooth and impunctate. Elytra subparallel-sided, 1.5 times as long as broad, disc slightly convex, with two types of punctures, the strong punctures almost evenly distributed in rows of 10, with space between them 1.5 times larger than the puncture diameter longitudinally, and 5 to 6 times larger transversely, between the strong punctures, there are densely the fine punctures irregularly distributed, with space larger than puncture diameter. Near humerus, there is a shallow depression with sparse strong punctures, and the space between punctures subequal to puncture diameter; epipleura

near lateral margin of elytra with a row of longitudinally fine rough punctures. Apical margin of males last abdominal sternite distinctly trilobed with margin of median lobe straight and lateral lobes slightly expanded. (Fig. 2D).

Aedeagus in dorsal view regularly expanding; widest at 3/10 from apex, with the apex approaching a right angle in dorsal view; internal sclerites (Fig. 2E–G): a pair of longitudinal sclerites, each half the length of the aedeagus, strongly curved and darkened at apex; in lateral view, upright, with a sharp apex curved slightly towards ventral side.

Etymology. The specific epithet *rubicornis*, comes from the Latin adjective *ruber* ('red') and the Latin noun *cornus* ('horn'). It refers to the red brown and brown antennae (horned = provided with antennae) of this species.

Distribution. China: Henan, Hunan, Hubei, Fujian, Guizhou.

***Gallerucida rubiginosa* Xu & Yang, sp. nov.**

Chinese common name: 棕红柱萤叶甲

(Fig. 3)

Type material. HOLOTYPE: CHINA: ♂, Xizang, Zhang-mu-kou-an / 10-IX-1984 // Ai-Hua Li leg. (IZAS).

PARATYPES: CHINA: 1 ♀, Xizang, Zhang-mu-kou-an / 10-IX-1984 // Ai-Hua Li leg.; 2 ♀♀, Xizang, Zhang-mu-kou-an / 20-VII-1984 // Sheng-Chang Hu leg.; 1 ♀, Xizang, Zhang-mu-you-yi-qiao / 1700 m // 22-VI-1975 // Fu-Sheng Huang leg.; 1 ♂, Xizang, Nie-la-mu-you-yi-qiao / 1680 m // 21-VI-1975 // Zi-Qin Wang leg. (all IZAS).

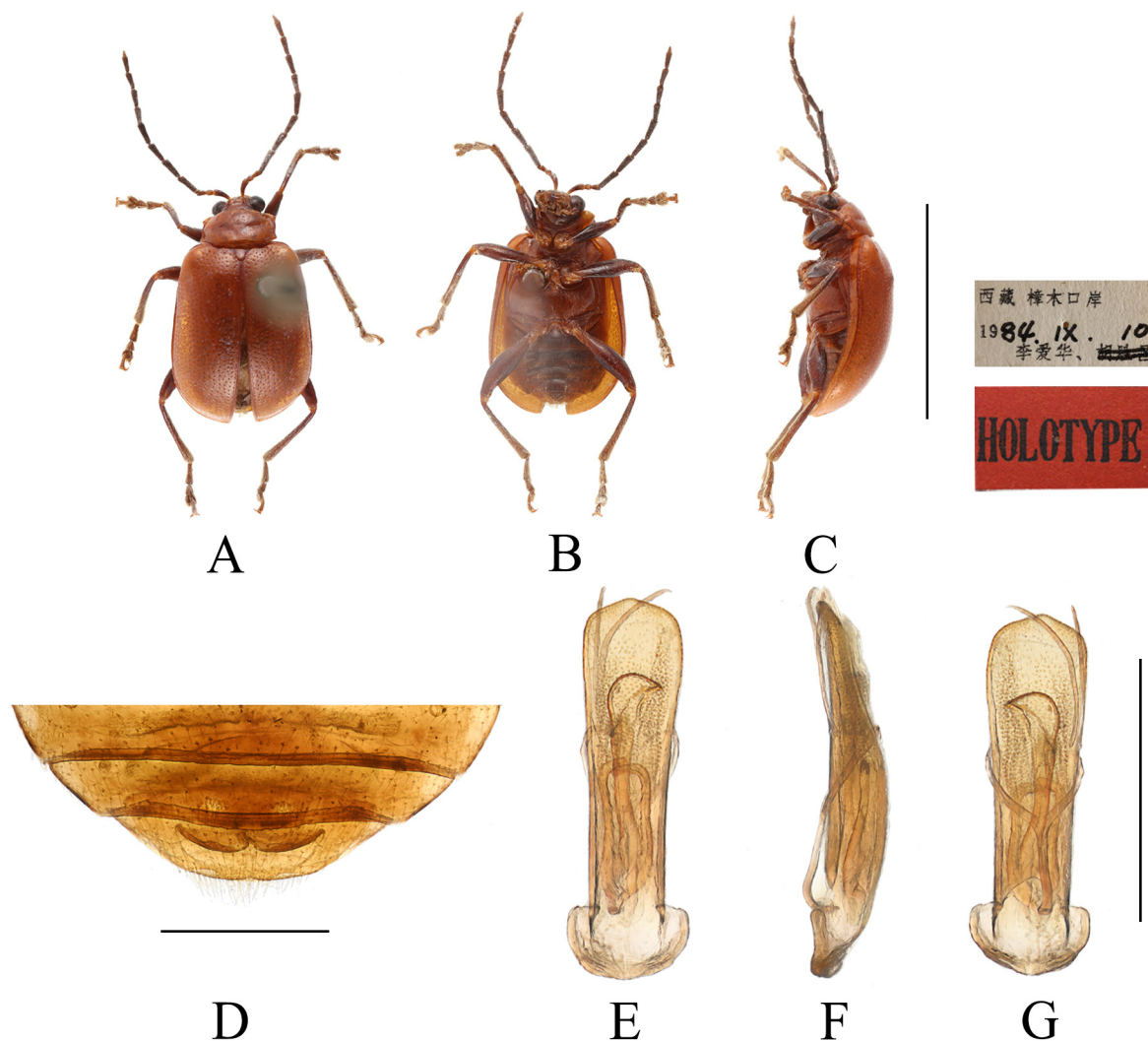


FIGURE 3. *Gallerucida rubiginosa* sp. nov. (holotype). A. dorsal view; B. ventral view; C. lateral view; D. ventral view of 5th ventrite, male; E. aedeagus, dorsal view; F. ditto, lateral view; G. ditto, ventral view. Scale bar: 5 mm (A–C); 1 mm (D–G).

Diagnosis. *Gallerucida rubiginosa* sp. nov. exhibits a smaller body size compared to other members with red brown elytra of the genus; general color is reddish-brown, with 4th- 11th segments of antennae and legs being darker in color; elytral punctures evenly distributed across the disc; anterior metasternal process slightly prominent; last sternite of male trilobed, the margin of median lobe concave in the center; internal sclerites intricate in structure. The new species is well distinguished within the genus.

Description. Length 5.1–5.5 mm, width 2.8–3.4 mm. Holotype length 5.1 mm, width 3.1 mm.

Male. Body oval. General color (Fig. 3A–C) generally red brown; basal three segments of antennae red brown, the rest segments dark red brown.

Head narrower than prothorax, occiput with sparsely fine punctures, frontoclypeus smooth and impunctate, frontal tubercle developed, subelliptic. Antennae length reach the end of elytra, with basal three segments moderately shiny and lacking hairs, from 4th segment covered with densely short pale hairs; the length ratios of antennomeres I–V, 1.0 : 0.3 : 0.6 : 1.3 : 1.1, 3rd segment almost 2 times longer than 2nd segment, 4th segment longest, 5th–10th segments subequal, 11th segment slightly shorter than 4th segment in length. Pronotum transverse, around 2 times as broad as long, with subparallel lateral margins slightly expanded in the middle, anterior margin concave, anterior corners distinct, basal margin slightly convex, posterior corner nearly right angle, disc area with mussy slight fine punctures and a pair of transverse shallow depressions. Anterior metasternal process extends beyond half of mesocoxal cavities, with smooth surface covered in densely long hairs, lateral edge of apical area slightly converges, apex rounded. Scutellum triangular, with apex rounded and sparsely fine punctures. Elytra lateral margin after half evenly expanding, 1.53 times as long as broad, disc slightly convex, with equably punctures, spaces between punctures 7 times larger than puncture diameter, near humerus with no obvious depression; epipleura surface smooth and nearly impunctate. Apical margin of males last abdominal sternite distinctly trilobed, median lobe with slight incision in the middle. (Fig. 3D).

Aedeagus in dorsal view slightly expanded towards blunt apex, internal sclerites: (Fig. 3E–G): central elongate sclerite reach 2/3 the length of aedeagus, with ending in a flagellum; longitudinal median sclerite the longest, expanded apically and sharp at apex, accompanied by a pair of lateral longitudinal sclerites reaching 3/4 the length of the median sclerite, in apical area, these lateral sclerites curve towards each other, with the left sclerite slightly higher than the right; in lateral view, upright, with the apex slightly curved towards ventral side.

Etymology. The specific epithet *rubiginosa* is formed from the Latin adjective *rubiginosus* ('rust-colored') referring to the general reddish-brown color of this species.

Distribution. China: Xizang.

***Gallerucida rubrimelaena* Xu & Yang, sp. nov.**

Chinese common name: 红黑柱萤叶甲

(Fig. 4)

Type material. HOLOTYPE: CHINA: ♂, Yunnan, Yunlong, Zhi-ben-shan / 2550 m // 22-VI-1981 / Su-Bai Liao leg. (IZAS). **PARATYPES:** CHINA: 3 ♂♂, Yunnan, Tengchong, 2400 m / 10-V-1955 / Xi-Ke Bu leg.; 1 ♀, Yunnan, Tengchong, 2400 m / 10-V-1955 / Zi-Feng Xue leg.; 2 ♂♂, Guangxi, Longsheng, Bai-yan / 1150 m // 19-VI-1963 / Shu-Yong Wang leg.; 1 ♂, Guizhou, Leishan, Tao-jiang / 870-1100 m // 5-VII-1988 / Shu-Yong Wang leg. (all IZAS).

Diagnosis. *Gallerucida rubrimelaena* sp. nov. basal three segments of antennae distinctly differing in color from remaining antennal segments; legs entirely black specially distinguished with other members with red brown pronotum and elytra of the genus; anterior metasternal process protrude visibly; aedeagus short and stout.

Description. Length 5.9–6.5 mm, width 3.5–4.0 mm. Holotype length 5.9 mm, width 3.5 mm.

Male. Body oval. General color (Fig. 4A–C) generally red brown; basal three segments of antennae red brown, the rest segments black; legs black.

Head narrower than prothorax, occiput with sparsely strong punctures, frontoclypeus smooth and impunctate, frontal tubercle developed, irregular. Antennae not extending beyond half the length of elytra, with basal three segments moderately shiny and sparsely covered with short hairs, from 4th segment covered with densely short pale hairs; the length ratios of antennomeres I–V, 1.0 : 0.3 : 0.3 : 1.3 : 1.1, 3rd and 2nd segment subequal, 4th segment longest, 5th–11th segments subequal in length. Pronotum transverse, around 2.4 times as broad as long, with subparallel lateral

margins slightly expanded in the middle, anterior margin concave, anterior corners nearly right angle, basal margin slightly convex, posterior corner nearly right angle, disc area with mussy sparse fine punctures without depression. Anterior metasternal process extends to the front edge of meso-coxal cavities, with surface smooth and sparse long hairs along the edge, lateral edge subparallel-sided, apical area slightly converges, apex rounded. Scutellum triangular, with apex rounded, smooth and impunctate. Elytra subparallel-sided, 1.5 times as long as broad, disc slightly convex, with fuzzy two types of punctures, strong punctures in approximately 16 rows and fine punctures irregularly distributed in between, with longitudinal spaces equal to the diameter of the puncture, and transverse spaces 2–3 times larger; near humerus with no distinct depression; epipleura surface smooth and almost impunctate. Apical margin of males last abdominal sternite distinctly trilobed, margin of median lobe straight. (Fig. 4D).

Aedeagus robust, subparallel-sided, apex blunt, internal sclerites: (Fig. 4E–G): median longitudinal sclerite longest, expanded in apical area, apex turned sideways, ending in a sharp tooth; the paired longitudinal sclerites reach 2/3 the length of median sclerite, in apical area curved towards each other, with the left sclerite slightly higher than the right, due to lesser curvature.

Etymology. The specific epithet *rubrimelaena* is formed from the Latin adjectives *ruber* ('red') and the Greek adjective *melas* ('black') referring to body color with red, legs with black.

Distribution. China: Guangxi, Guizhou, Yunnan.

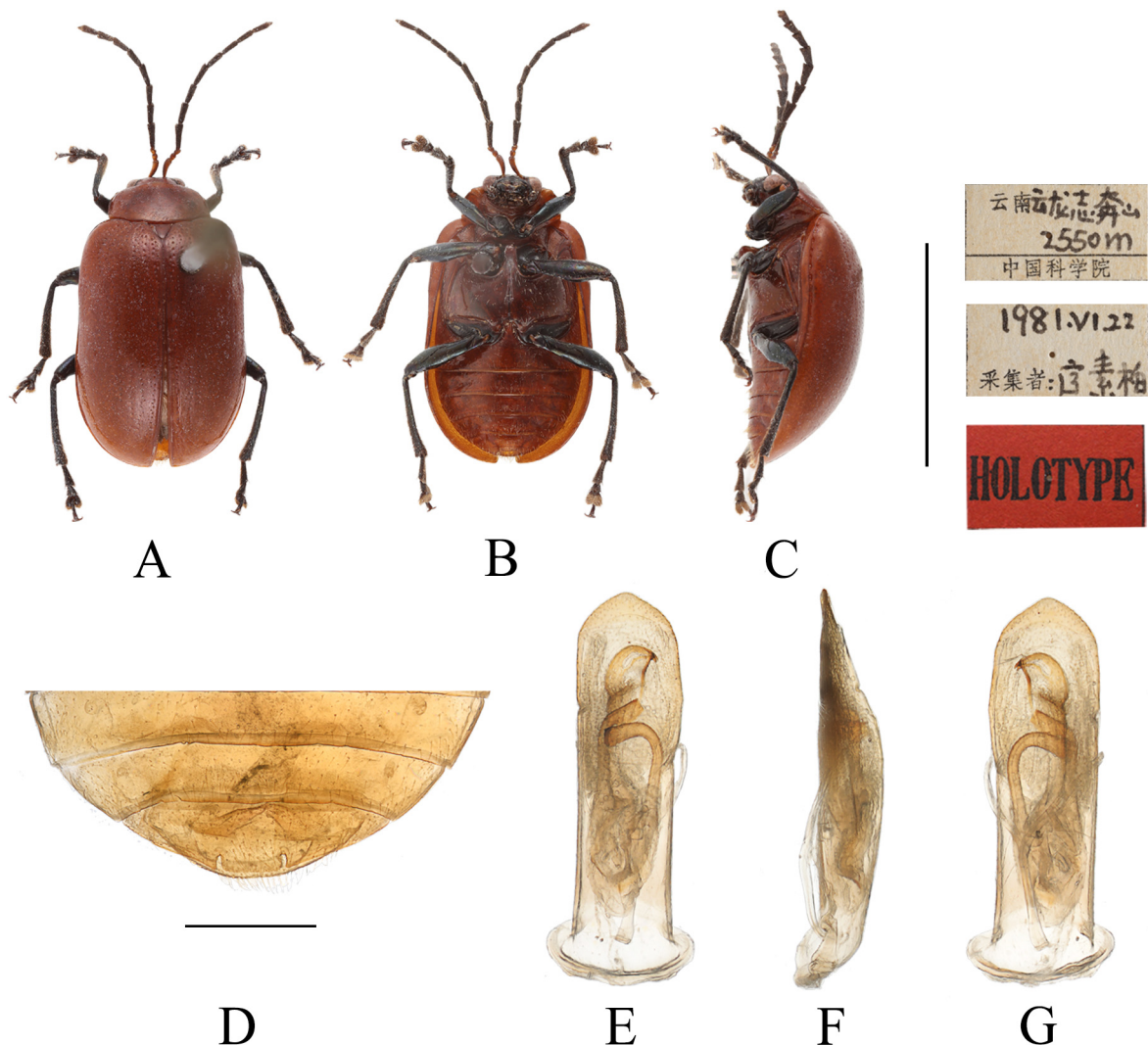


FIGURE 4. *Gallerucida rubrimelaena* sp. nov. **A.** Dorsal view (holotype); **B.** Ventral view (holotype); **C.** Lateral view (holotype); **D.** Ventral view of 5th ventrite, male (paratype); **E.** Aedeagus, dorsal view (paratype); **F.** Ditto, lateral view (paratype); **G.** Ditto, ventral view (paratype). Scale bar: 5 mm (A–C); 1 mm (D–G).

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中国柱萤叶甲属 *Gallerucida* 四新种 (鞘翅目: 叶甲科: 萤叶甲亚科)

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摘要: 描述中国柱萤叶甲属 *Gallerucida* 四新种, 即分布于广西和贵州的褐跗柱萤叶甲 *G. mantillerii* **sp. nov.**、分布于河南、湖南、湖北、福建和贵州的褐角柱萤叶甲 *G. rubicornis* **sp. nov.**、分布于西藏的棕红柱萤叶甲 *G. rubiginosa* **sp. nov.** 和分布于广西、贵州及云南的红黑柱萤叶甲 *G. rubrimelaena* **sp. nov.**; 图示了各新种的整体和鉴别特征。

关键词: 鞘翅目; 叶甲科; 萤叶甲亚科; 柱萤叶甲属; 新种