



A new species and a new record of *Morphosphaera* Baly, 1861 (Coleoptera: Chrysomelidae: Galerucinae) from China

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Abstract

A new species of *Morphosphaera* Baly from Mêdog County, Xizang Autonomous Region is described: *M. medogensis* sp. nov., and a newly recorded species from China is reported: *M. montivaga* Maulik. Illustrations of the habitus and external genitalia of these species are provided, along with a key and a checklist of all known *Morphosphaera* species worldwide. And the new provincial distribution of *Morphosphaera* in China has been added.

Key words: leaf beetles, Xizang, taxonomy, key

Introduction

Morphosphaera Baly, 1861 (Coleoptera: Chrysomelidae: Galerucinae) was established by Baly with *M. maculicollis* Baly, 1861 from India as the type species by monotypy. This genus is primarily distributed in the Oriental and Palearctic regions. In the “Coleopterorum Catalogus Supplementa” edited by Wilcox (1971, 1975), *Morphosphaera* contained 24 species. Yang *et al.* (2015) systematically collated Chinese leaf beetles, recording 14 species of *Morphosphaera* distributed in China. Lee & Bezděk (2016) conducted a comprehensive revision of the genus by examining external morphology and genital structure characteristics of primary type specimens. The revision included 12 new synonyms, one new combination (transferring *Morphosphaera peregrina* Weise, 1913 to *Borneola* Mohamedsaid, 1998), one new species, and one species of uncertain taxonomic status (*M. impunctata* Allard, 1890). Consequently, they recognized 11 valid species of *Morphosphaera*, of which 9 are distributed in China (Lee & Bezděk 2016; Beenen 2024).

Mêdog County belongs to Nyingchi City, located in the southeastern part of Xizang. It spans an elevation range of 154 m to 7782 m, situated in the middle and lower reaches of the Yarlung Tsangpo River. The county possesses a unique, typical three-dimensional climatic zonation and diverse landforms, with significant elevation differences. The mountainous areas exhibit distinct vertical climatic variations, and the region boasts abundant animal species and rich resources, making it one of the most biodiverse areas. This study examined *Morphosphaera* specimens collected from Mêdog County, Xizang Autonomous Region, China, and identifies one new species and one new record for China.

Material and methods

The materials in this study are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS).

The abdominal dissection was conducted under a Nikon SMZ745 stereomicroscope. The specimen was inverted with the ventral side facing upwards. Initially, the needle tip was inserted ventrally at the thoraco-abdominal junction.

Then gently prying open the connection and remove the entire abdomen. The detached abdomen was boiled in a 10% NaOH solution for approximately 3–5 minutes (duration adjusted based on the degree of sclerotization of the specimen). After complete dissolution of muscle tissues, the abdomen was rinsed thoroughly in distilled water and placed in a clean petri dish filled with distilled water. External genitalia were extracted using forceps. Both the abdomen and genitalia were stored together in a microcentrifuge tube containing glycerol. The microcentrifuge tube was mounted on the same pin as the specimen for permanent storage.

The morphological and genitals characteristics were captured using a Leica M205C microscope equipped with a DFC450 digital imaging unit (CCD camera). All figures preparation were performed with Adobe Photoshop CS6.

Taxonomy

Morphosphaera Baly, 1861

Morphosphaera Baly, 1861: 298. Type species: *Morphosphaera maculicollis* Baly, 1861, by monotypy.

Generic characteristics. Body elliptical. Head partially concealed under pronotum; vertex without median sulcus; frontal tubercles undeveloped; clypeal base broad, triangularly raised. Antennae with antennomere 2 shortest, antennomere 3 slightly longer, generally about 1.5x longer than antennomere 2. Pronotum width exceeding twice its length; anterior angles projecting; anterior margin arcuate; lateral and posterior margins rounded; bordered entirely; disc moderately convex, without depressions. Scutellum triangular, smooth and impunctate. Elytra broad, sides rounded; humeral angles not projecting; disc with distinct punctures. Epipleura broad over basal half, then abruptly narrowed toward apex. Anterior coxal cavities open. Legs robust; apex of tibia with spine; length of tarsomere 1 of hind leg shorter than sum of tarsomeres 2+3; claws appendiculate. Aedeagus strongly sclerotized, slender, gradually tapering to a triangular shape at apex; endophallus present. Spiculum of female genitalia reduced; spermatheca hook-shaped; abdominal sternite VIII ginkgo-leaf shaped.

Distribution. Oriental and Palearctic regions.

Key to species of *Morphosphaera*

- | | | |
|----|--|--|
| 1 | Pronotum without black spots | <i>M. takizawai</i> Lee & Bezděk |
| – | Pronotum with black spots | 2 |
| 2 | Pronotum with a single, large black spot | <i>M. collaris</i> Laboissière |
| – | Pronotum with two or more black spots | 3 |
| 3 | Pronotum with two lateral spots and a broad median band | 4 |
| – | Pronotum with four or more black spots | 5 |
| 4 | Pronotum with a regularly-shaped, brown median band | <i>M. bimaculata</i> Chûjô |
| – | Pronotum with a brown median band which embeds one irregular black spot | <i>M. montivaga</i> Maulik |
| 5 | Pronotum with four black spots | 6 |
| – | Pronotum with five or more black spots | 8 |
| 6 | Pronotum with large lateral spots and smaller median spots | <i>M. caerulea</i> (Schönfeldt) (part) |
| – | Pronotum with four equally-sized black spots | 7 |
| 7 | Head brown; femora largely brown with apical region black, tibiae and tarsi entirely black | <i>M. medogensis</i> sp. nov. |
| – | Head black; all legs entirely black | <i>M. maculicollis</i> Baly |
| 8 | Pronotum with seven black spots | <i>M. albipennis</i> Allard |
| – | Pronotum with five black spots | 9 |
| 9 | Head brown | <i>M. coomani</i> Laboissière |
| – | Head black | 10 |
| 10 | Elytra reddish-brown with purplish metallic luster | <i>M. sumatrana</i> Jacoby |
| – | Elytra with blue or green metallic reflection | 11 |
| 11 | Pronotum with black transverse band medially at anterior margin | <i>M. japonica</i> (Hornstedt) |
| – | Pronotum without transverse band at anterior margin | 12 |
| 12 | Pronotum bears uniformly sized black spots | <i>M. chrysomeloides</i> (Bates) |
| – | Pronotum bears black spots, with larger ones on sides and smaller ones in middle | <i>M. caerulea</i> (Schönfeldt) (part) |

Morphosphaera medogensis sp. nov.

(Figs 1, 2)

Type material. HOLOTYPE: CHINA: ♂, Xizang Autonomous Region, Nyingchi City, Mêdog County, Mêdog Road, 2127 m, 29°35'28.58"N, 95°29'23.96"E, 15. IX. 2020, leg. Liang Hongbin, Xu Yuan (IZCAS). **PARATYPES:** 2 ♀♀, same data as holotype (IZCAS).

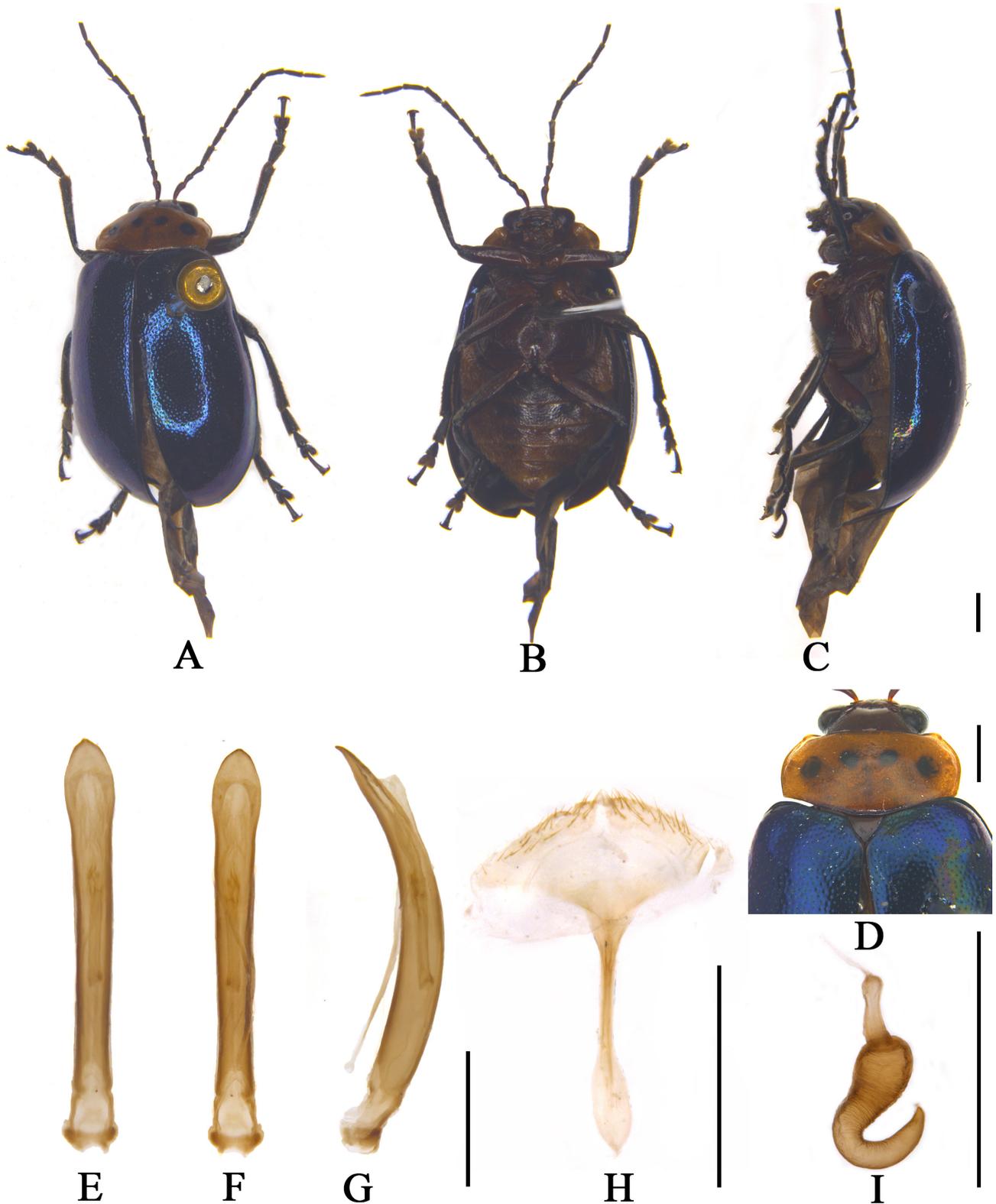


FIGURE 1. *Morphosphaera medogensis* sp. nov. A–D. Male habitus. E–G. Aedeagus. H. Female sternite VIII. I. Spermatheca. A, D, E. Dorsal view. B, F. Ventral view. C, G. Lateral view. Scale bar: 1 mm.

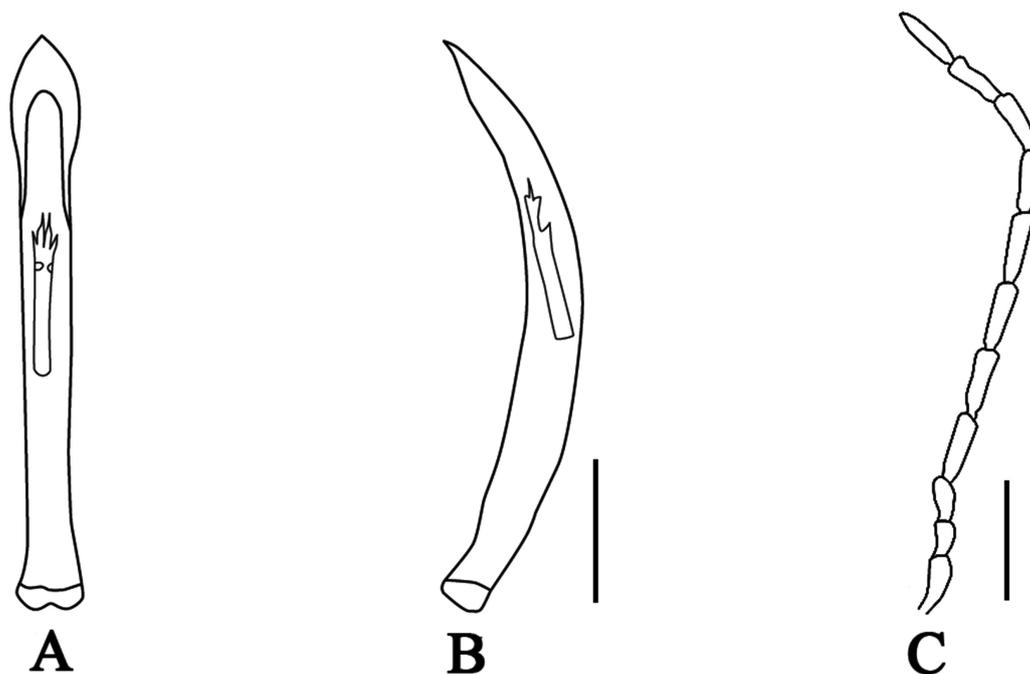


FIGURE 2. *Morphosphaera medogensis* sp. nov., male. **A.** Aedeagus, dorsal view. **B.** Aedeagus, lateral view. **C.** Antenna. Scale bar: 1 mm.

Description. Length 6.1–9.8 mm, width 3.4–5.5 mm. Body entirely brown; antennae black except for antennomere I; pronotum yellowish-brown, bearing four black rounded spots, medial two slightly smaller than lateral two, with a dark brown transverse stripe medially near anterior margin; elytra bluish-purple; abdominal ventrites I–III dark brown medially; femora black apically, tibiae and tarsi black (Fig. 1A–D).

Head with very fine punctures; frontal tubercles indistinct, with relatively dense punctures; behind frontal tubercles with a transverse depression, and a Y-shaped longitudinal groove extending from depression to midpoint between two antennae; antennae slender (Fig. 2C), extending to middle of elytra; antennomere 2 shortest, twice as long as wide; antennomere 3 slightly longer; antennomere 4 longer than 3 and slightly shorter than 5; antennomeres 5–7 subequal in length; antennomere 8 slightly shorter than 4 and about equal to 9 and 10; antennomere 11 slender, equal in length to 5; pronotum 2.5x as wide as long, sides arcuate, anterior width wider than basal width, anterior angles thickened and projecting, posterior angles obtusely rounded; disc moderately convex, surface smooth, with very fine punctures (Fig. 1D); scutellum triangular, smooth and impunctate (Fig. 1D); elytra slightly wider than pronotum basally, 1.45x as long as wide, sides rather rounded, broadest at apical 1/2; disc strongly convex with dense punctures, interspaces slightly larger than puncture diameter; epipleura broadened at basal 1/3, then gradually narrowed (Fig. 1A–C); all legs with femora robust, tibiae and tarsi slender; tibiae with spines apically; tarsomere I slender and slightly shorter than combined length of II and III; tarsomere V longest (Fig. 1B).

Aedeagus extremely slender in dorsal view, length about 11.2x width, sides nearly parallel, slightly narrowed near base, apex distinctly swollen, flame-shaped (Figs 1E, 2A); in lateral view, narrow and long, moderately curved ventrally, apex acute (Figs 1G, 2B); endophallus sclerite with apical process slightly curved ventrally, apicolateral processes slightly curved inward, with paired of erect processes at apical 1/3, base tubular and long, representing 2/3 of total length, connected to erect processes (Fig. 2A, B).

Female genitalia with gonocoxae reduced; abdominal sternite VIII ginkgo-leaf shaped, spiculum long with distal end swollen, apical region densely covered with long and short bristles, with middle of upper part slightly depressed (Fig. 1H); spermatheca basal half slender, constricted at basal 1/3, middle part distinctly swollen with spiral threads, apical half narrow and hook-shaped, strongly curved upward (Fig. 1I).

Diagnosis. The new species is similar to *M. maculicollis*, but can be primarily distinguished by the following characteristics: in the new species, the head is dark brown (Fig. 1D); the thorax, abdomen, and approximately 3/4 of the femur are brown (Fig. 1B); the middle part of abdomen is dark brown; and aedeagus has the apical swollen

portion distinctly constricted at its base in dorsal view (Figs 1G, 2A); without setae near the opening of the internal sac; apico-lateral is small (Fig. 2A, B). In contrast, the corresponding parts of *M. maculicollis* are entirely black, and the aedeagus, when viewed dorsally, gradually swollen apically (Fig. 3); with several setae near opening of internal sac (Lee & Bezděk 2016).

Etymology. The specific name is named after its type locality “Mêdog County”.

Distribution. China: Xizang (Mêdog).

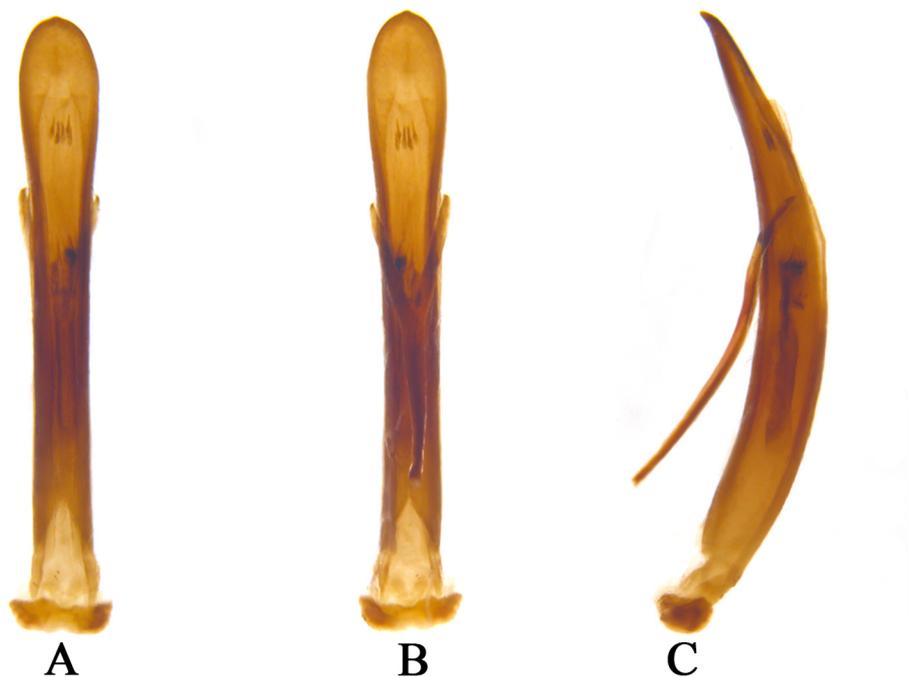


FIGURE 3. *Morphosphaera maculicollis* Baly, male. A–C. Aedeagus. A. Dorsal view. B. Ventral view. C. Lateral view. Scale bar: 1 mm.

Morphosphaera montivaga Maulik, 1936

(Fig. 4)

Morphosphaera montivaga Maulik, 1936: 319; Wilcox 1971: 220; Lee & Bezděk 2016: 29; Beenen 2024: 410.

Material examined. CHINA: 2 ♂♂, Xizang Autonomous Region, Nyingchi City, Mêdog County, Mêdog Road, 2127 m, 29°35'28.58"N, 95°29'23.96"E, 15. IX. 2020, leg. Liang Hong-bin, Xu Yuan.

Description. Length 10.4–12.3 mm, width 5.9–6.7 mm. Body entirely black; pronotum yellowish-brown, bearing one large black rounded spot on each side, and two connected oval black spots medially forming irregular black band, surrounded by a dark brown halo; elytra reddish-brown with faint purplish metallic luster; scutellum reddish-brown; outer margins of abdomen margins yellowish-brown (Fig. 4A–D).

Head with very fine punctures; frontal tubercles distinct, bearing relatively dense punctures, and posteriorly depressed into small pit; with black longitudinal stripe from middle of frontal tubercles to anterior margin of head; antennae (Fig. 4A) filiform, slender, extending to middle of elytra; antennomere 2 shortest, antennomere 3 slightly longer; antennomere 4 longest, subequal to combined length of 2+3 and equal in length to antennomeres 5 and 11; antennomere 6 shorter than 5 and about equal to 8–10; antennomere 7 slightly longer than 6; pronotum 2.2x as wide as long, approximately rectangular, anterior angles obtusely rounded and thickened, anterior margin slightly wider than base (Fig. 4D); disc slightly convex, surface with sparse fine punctures; scutellum triangular, smooth and impunctate (Fig. 4D); elytra slightly wider than pronotum basally, 1.3x as long as wide, sides rather rounded, broadest at apical 1/2; disc convex, punctures dense and uniform in size, interspaces approximately equal to puncture diameter; epipleura broadened at basal third, then gradually narrowed, extending to apex of elytra (Fig. 4A, C); In all legs, femora relatively robust; tibiae longer than tarsi; tarsomere I slightly shorter than combined length of tarsomeres II and III; tarsomere III covered with brown setae; tarsomere V longest; tarsal claws appendiculate (Fig. 4B).

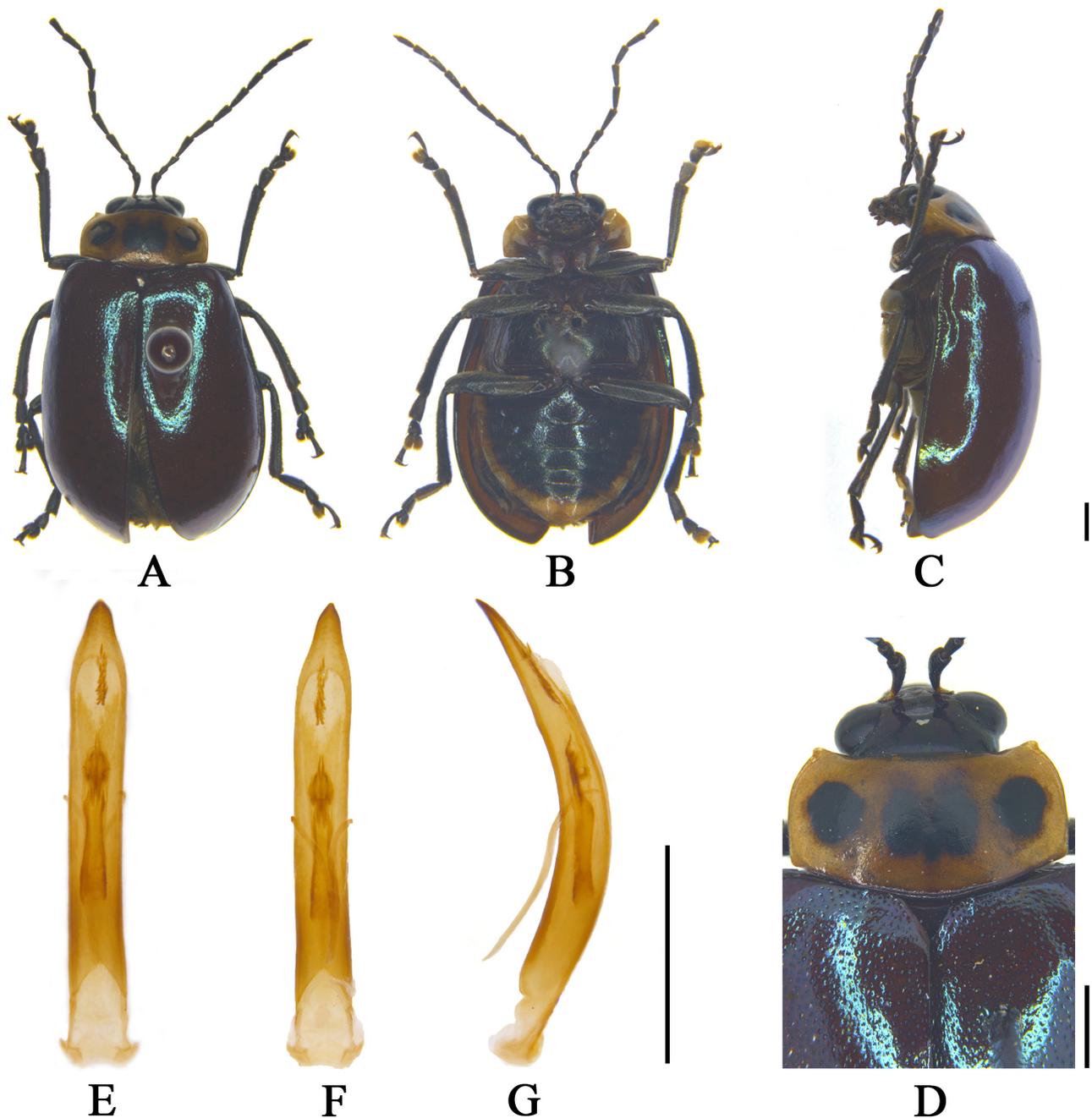


FIGURE 4. *Morphosphaera montivaga* Maulik, male. A–D. Habitus. E–G. Aedeagus. A, D, E. Dorsal view. B, F. Ventral view. C, G. Lateral view. Scale bar: 1 mm.

Aedeagus slender in dorsal view, length about 8.4x width, sides parallel, distal end gradually narrowed, apex narrowly rounded (Fig. 4E); in lateral view, narrow and long, moderately curved ventrally, apex acute (Fig. 4G).

Distribution. China: Xizang (Médog); India. **New country record for China.**

Checklist of *Morphosphaera* Baly, 1861

1. *Morphosphaera albipennis* Allard, 1889

Distribution. China (Guizhou, Yunnan, Guangxi); Cambodia; India; Laos; Myanmar; Nepal; Thailand; Vietnam.

2. *Morphosphaera bimaculata* Chûjô, 1938

Distribution. China (Taiwan).

3. *Morphosphaera caerulea* (Schönfeldt, 1890)

Material examined. 1 ♂, China: Zhejiang Province, Yandang Mountain, 200 m, 1.IV.1963, leg. Jin Gentao; 1 ♀, Fujian Province, Guangze County, 200-300m, 30.V.1960, leg. Jin Gentao, Lin Yangming; 1 ♀, Fujian Province, Chongxin Village, 230-250m, 10.VI.1960, leg. Jin Gentao, Lin Yangming.

Distribution. China (Hong Kong, Zhejiang, Fujian); Japan: Ryukyu Islands. **New provincial record for Zhejiang and Fujian.**

4. *Morphosphaera chrysoloides* (Bates, 1866)

Material examined. 1 ♀, China: Guangdong Province, Shixing County, Chebaling National Nature Reserve, 2.VI.2021, leg. Xu Siyuan.

Distribution. China (Taiwan, Guangdong). **New provincial record for Guangdong.**

5. *Morphosphaera collaris* Laboissière, 1930

Material examined. 1 ♀, China: Guangdong Province, Ruyuan County, Nanling National Nature Reserve, 23.V.2021, leg. Feng Chuan.

Distribution. China (Guangxi, Sichuan, Guangdong); Vietnam; Laos. **New provincial record for Guangdong.**

6. *Morphosphaera coomani* Laboissière, 1930

Material examined. 1 ♀, China: Fujian Province, Guangze County, 450-600m, 23.IV.1960, leg. Jin Gentao, Lin Yangming.

Distribution. China (Zhejiang, Sichuan, Guizhou, Yunnan, Xizang, Fujian); Vietnam; Laos; Thailand; Cambodia; Myanmar; India; Bhutan; Nepal. **New provincial record for Fujian.**

7. *Morphosphaera japonica* (Hornstedt, 1788)

Material examined. 1 ♂, China: Guangdong Province, Ruyuan County, Nanling National Nature Reserve, 17.V.2021, leg. Nanling Expedition Team; 1 ♀, Guangdong Province, Ruyuan County, Nanling National Nature Reserve, 17.VII.2022, leg. Lin Meiyang.

Distribution. China (Jilin, Shandong, Hubei, Zhejiang, Jiangxi, Hunan, Fujian, Taiwan, Guangxi, Guizhou, Sichuan, Chongqing, Yunnan, Guangdong); India; Japan; Nepal; Pakistan; Russia; Vietnam. **New provincial record for Guangdong.**

8. *Morphosphaera maculicollis* Baly, 1861

Distribution. China (Xizang); India; Nepal.

9. *Morphosphaera medogensis* sp. nov.

Distribution. China (Xizang).

10. *Morphosphaera montivaga* Maulik, 1936

Distribution. China (Xizang); India. **New country record for China.**

11. *Morphosphaera sumatrana* Jacoby, 1886

Distribution. China (Gansu, Hubei, Jiangxi, Sichuan, Guizhou, Yunnan, Xizang, Hunan, Fujian, Guangdong); Vietnam; Laos; Thailand; India; Bhutan; Nepal; Malaysia; Indonesia.

12. *Morphosphaera takizawai* Lee & Bezděk, 2016

Distribution. Malaysia; Indonesia.

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References

- Baly, J.S. (1861) Descriptions of new genera and species of Phytophaga. *Journal of Entomology*, 1, 275–302.
- Beenen, R. (2024) Galerucinae: Galerucitae. In: Bezděk, J. & Sekerka, L. (Eds.), *Catalogue of Palaearctic Coleoptera. Vol. 6/2/1. Chrysomeloidea II (Orsodacnidae, Megalopodidae, Chrysomelidae). Updated and Revised 2nd Edition*. Brill, Leiden and Boston, pp. 378–468.
- Lee, C.F. & Bezděk, J. (2016) Revision of the genus *Morphosphaera* Baly (Coleoptera: Chrysomelidae: Galerucinae). *Zootaxa*, 5528 (1), 744–757.
<https://doi.org/10.11646/zootaxa.4179.1.1>
- Maulik, S. (1936) *The Fauna of British India, including Ceylon and Burma. Coleoptera. Chrysomelidae (Galerucinae)*. Taylor & Francis, London, 648 pp.
- Wilcox, J.A. (1971) Chrysomelidae: Galerucinae (Oidini, Galerucini, Metacyclini, Sermlylini). In: Wilcox, J.A. (Ed.), *Coleopterorum Catalogus Supplementa. Pars 78 (1). 2nd Edition*. W. Junk, 's-Gravenhage, pp. 1–220.
- Wilcox, J.A. (1975) Chrysomelidae: Galerucinae. Addenda et index. In: Wilcox, J.A. (Ed.), *Coleopterorum Catalogus Supplementa. Pars 78 (4). 2nd Edition*. W. Junk, 's-Gravenhage, pp. 667–770.
- Yang, X.-K., Ge, S.-Q., Nie, R.-E., Ruan, Y.-G. & Li, W.-Z. (2015) *Chinese Leaf Beetles*. Science Press, Beijing, 507 pp., 83 pls.

中国榕萤叶甲属*Morphosphaera*一新种及一新纪录种 (鞘翅目: 叶甲科: 萤叶甲亚科)

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摘要: 描述中国西藏榕萤叶甲属*Morphosphaera*一新种, 即墨脱榕萤叶甲*M. medogensis* **sp. nov.** 并报道一中国新纪录种, 即山榕萤叶甲*M. montivaga*; 提供了以上物种的成虫外部特征图和外生殖器特征图以及世界该属分种检索表和物种名录; 还补充了榕萤叶甲属种类中国新省级分布地。

关键词: 叶甲; 西藏; 分类; 检索表