

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Publications from USDA-ARS / UNL Faculty

U.S. Department of Agriculture: Agricultural  
Research Service, Lincoln, Nebraska

---

4-3-2018

**New contributions to the knowledge of Chinese flea beetle fauna  
(III): revision of Meishania Chen & Wang with description of five  
new species (Coleoptera: Chrysomelidae: Galerucinae)**

Yongying Ruan

Alexander S. Konstantinov

Kaniyarikkal Divakaran Prathapan

Menga Zhang

Shihong Jiang

*See next page for additional authors*

Follow this and additional works at: <https://digitalcommons.unl.edu/usdaarsfacpub>

---

This Article is brought to you for free and open access by the U.S. Department of Agriculture: Agricultural Research Service, Lincoln, Nebraska at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Publications from USDA-ARS / UNL Faculty by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

---

**Authors**

Yongying Ruan, Alexander S. Konstantinov, Kaniyarikkal Divakaran Prathapan, Menga Zhang, Shihong Jiang, and Xing-Ke Yang

---

<https://doi.org/10.11646/zootaxa.4403.1.11><http://zoobank.org/urn:lsid:zoobank.org:pub:71960F3A-FD9E-4EC9-9C5B-2DF34FF4F63E>

## New contributions to the knowledge of Chinese flea beetle fauna (III): revision of *Meishania* Chen & Wang with description of five new species (Coleoptera: Chrysomelidae: Galerucinae)

YONGYING RUAN<sup>1,2</sup>, ALEXANDER S. KONSTANTINOV<sup>3</sup>, K. D. PRATHAPAN<sup>4</sup>, MENGNA ZHANG<sup>1</sup>,  
SHIHONG JIANG<sup>1,5</sup> & XINGKE YANG<sup>2,5</sup><sup>1</sup>*School of Applied Chemistry and Biological Technology, Postdoctoral Innovation Practice Base, Shenzhen Polytechnic, Shenzhen, Guangdong 518055, China.*<sup>2</sup>*Key Laboratory of Zoological Systematics and Evolution, Institute of Zoology, Chinese Academy of Sciences, Beijing 100101, China.*<sup>3</sup>*Systematic Entomology Laboratory, USDA, ARS, Washington DC, USA*<sup>4</sup>*Department of Entomology, Kerala Agricultural University, Vellayani P.O., Trivandrum—695 522, Kerala, INDIA.**E-mail: prathapankd@gmail.com*<sup>5</sup>*Corresponding authors. Shihong Jiang. E-mail: sjiang@szpt.edu.cn & Xingke Yang. E-mail: yangxk@ioz.ac.cn*

### Abstract

The flea beetle genus *Meishania* Chen & Wang is revised and five new species—*M. cangshanensis* sp. nov., *M. flavipennis* sp. nov., *M. fulvotigera* sp. nov., and *M. sichuanica* sp. nov. from China and *M. bhutanensis* sp. nov. from Bhutan—are described. All species of *Meishania* are illustrated and a key to species is provided.

**Key words:** leaf beetles, Alticini, Bhutan, China, biodiversity

### Introduction

The known Chinese flea beetle fauna consists of 858 described species placed in 104 genera (Ruan *et al.* 2017a). This includes numerous new taxa described recently (Konstantinov & Lingafelter 2002; Lopatin & Konstantinov, 2009; Sprecher-Uebersax *et al.* 2009; Konstantinov *et al.* 2011, 2013; Ruan *et al.* 2014a; Ruan *et al.* 2014b; Ruan *et al.* 2015; Ruan *et al.* 2017a; Ruan *et al.* 2017b). However, flea beetles in many areas of the country, especially Tibet, Yunnan and Sichuan in south-west China, are still poorly known as thorough expeditions and taxonomical studies are still lacking. With the addition of four new species described here, the total number of named species of flea beetles in China stands at 862.

*Meishania* was erected by Chen & Wang in 1980 as a monotypic genus, for a new species, *M. rufa*, from Sichuan. It can be separated from other Chinese genera based on external characters, especially structure of the antennal calli and the enlarged disc-like third tarsomeres. Other Chinese genera (*Argopistes* Motschulsky, *Argopus* Fischer, *Bhamoina* Bechyné, *Chilocoristes* Weise, *Jacobyana* Maulik, *Omeisphaera* Chen & Zia, *Parargopus* Chen, *Pentamesa* Harold, and *Sphaeroderma* Stephens) having broad and entire third tarsomeres, are hemispherical in dorsal view, while *Meishania* is oblong with elytra basally broader than pronotum. Here we revise the genus *Meishania* with description of 5 new species (four from China and one from Bhutan). We re-describe the genus and the type species *Meishania rufa* Chen & Wang. Illustrations and key to species of *Meishania* are provided.

### Materials and methods

Observations of the male genitalia and habitus were made with a Zeiss Discovery V20 microscope and digital

images were taken with an AxioCam HRC digital camera attached to it. Female genitalia were dissected and mounted in glycerin on slides and the photographs were taken with Leitz Diaplan Microscope and the camera module of Blackberry Q10 mobile phone (with a resolution of 800MP). Morphological terminology follows Konstantinov (1998).

Specimens are deposited in the following collections:

IZCAS Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

NBCB National Biodiversity Centre, Bhutan.

USNM National Museum of Natural History, Washington DC, USA.

## Results

### Genus *Meishania* Chen & Wang, 1980

*Meishania* Chen & Wang, 1980: 13, 24. Type species: *Meishania rufa* Chen & Wang, 1980, by original designation.

**Distribution:** Bhutan, China (Yunnan, Sichuan).

**Host plants:** Unknown.

**Description:** Body small, ovate in dorsal view, moderately convex in lateral view. Body length: 1.85–3.45 mm, width: 1.10–2.15 mm. Color of dorsum variable: red, yellow brown or metallic blue. Dorsum glabrous, with or without metallic luster, pronotum and elytra differently colored in some species.

Head hypognathous. Vertex glabrous, impunctate or with extremely tiny scattered punctures. Supraorbital pore large, bearing a long seta, situated on each side near eye. Antennal calli contiguous, separated by midfrontal sulcus, moderately or well delimited. Midfrontal, supraorbital and orbital sulci deep, strongly developed. Supracallinal, supraantennal, and suprafrontal sulci moderately to poorly developed. Frontal ridge in lateral view moderately convex. Width of frontal ridge less than that of one antennal socket. Orbit narrow, not wider than diameter of antennal socket. Antennal sockets situated at middle level of eye or slightly below. Anterior margin of labrum not incised. Apical maxillary palpomere conical. Clypeus band-like. Mandible laterally produced, often extremely robust.

Antenna long and stout, with 11 antennomeres, reaching near middle of elytra over pronotum. First antennomere about as long as next two combined. Distal antennomeres robust, wider than middle ones.

Pronotum about 1.5–2 times wider than long, glabrous, weakly or moderately punctate. Lateral margins of pronotum slightly curved, converging anteriorly. Hind margin of pronotum more or less sinuate, forming a lobe at middle. Anterolateral callosity protruding anteriorly, round or slightly truncate; posterolateral callosity poorly developed.

Procoxal cavities open. Intercoxal prosternal process extends slightly beyond procoxae, lateral margins concave, apical margin straight or slightly concave, apex wider than middle.

Elytra with humeral calli well developed. Width of elytra at base prominently exceeds that of pronotum at base. Elytral punctures large to medium sized, confused or semi-regularly arranged in lines. Scutellum small, ligulate to triangular. Elytral apex rounded to slightly acute, covering entire abdomen. Lateral sides of elytra convex. Epipleura outwardly oblique, gradually narrowing from base to apex, reaching end of elytron, with maximum width less than that of profemur.

Mesosternum more or less flat. Meso- and metasternum without elevated projection in middle. Abdominal ventrites 1 and 2 not fused. Abdominal ventrite 1 slightly longer than 2–4 together. Abdominal ventrite 5 longer than or about as long as 3 and 4 together. First abdominal ventrite without subparallel longitudinal ridges on intercoxal part. Anterior end of first abdominal ventrite normally wide, truncate.

Third tarsomere of all legs entire, without incision, disc like, much wider than other tarsomeres. Pro- and meso- tibiae without apical spurs. Metatibia with slender apical spur. Metafemoral spring present. Hind and middle tibiae without visible distal excavation laterally. Metatibia apparently straight, nearly round in cross-section around middle. Dorso-lateral margin of metatibia without a row of sharp denticles. First metatarsomere articulated at apex of metatibia, not longer than second and third metatarsomeres together. Claw appendiculate.

Aedeagus short and robust. In lateral view, aedeagus moderately curved to nearly straight. In ventral view, sides of aedeagus parallel; apical denticle and ventral groove absent.

Spermatheca with comparatively small and narrow receptacle, medium sized pump and duct. Vaginal palpi extremely short and wide, fused with each other. Tignum spatulate with apex broad and strongly expanded.

**Diagnosis:** *Meishania* is rather distinct amongst Oriental flea beetle genera with the following combination of characters: all third tarsomeres strongly widened and not incised; vaginal palpi of female short and entirely fused; antennal calli adjacent and separated by midfrontal sulcus; basal margin of pronotum distinctly sinuate; and frontal ridge narrower than antennal socket.

The following genera share broad and entire third tarsomeres with *Meishania*: *Argopistes* Motschulsky, *Argopus* Fischer, *Bhamoina* Bechyné, *Chilocoristes* Weise, *Jacobyana* Maulik, *Omeisphaera* Chen & Zia, *Parargopus* Chen, *Pentamesa* Harold, and *Sphaeroderma* Stephens. However, all of them, except the closely resembling *Sphaeroderma*, are separable from *Meishania* by the hemispherical body as well as other salient characters of each of them: *Argopistes* has first metatarsomere preapically articulated on metatibia and subparallel ridges on first ventrite; *Argopus* has anterofrontal ridge strongly curved and emarginate medially; *Bhamoina* has highly spherical body shape and strongly forward produced antero-lateral corner of pronotum; in *Chilocoristes* elytral epipleura is vertical and apical maxillary palpomeres are globose; *Jacobyana* is unique with rugose head, deep antennal channel between eye and anterofrontal ridge and long first metatarsomere; *Omeisphaera* has the metasternum covering the mesosternum; *Parargopus* has the strongly convex body shape from lateral view, highly spherical shape from dorsal view and widely separated antennal calli.

*Meishania* resembles *Pentamesa* Harold in having short and stout aedeagus, similar shape of spermatheca, highly shortened vaginal palpi and tignum with posterior part strongly expanded. However, they can be separated based on many external characters. In *Meishania*, antennal calli are adjacent and are separated by a midfrontal sulcus, while in *Pentamesa*, they are widely separated; further, sexually dimorphic foretibia in *Pentamesa* will quickly separate these two genera.

*Meishania* is closely allied to *Sphaeroderma*. However, species of *Sphaeroderma* are generally spherical, while those of the former are oblong. The antennal calli are generally broader than long and well delimited posteriorly in *Sphaeroderma* as supracallinal sulci are well developed. However, in *Meishania*, the antennal calli are poorly delimited posteriorly, longer, broadly connected medially and are separated by midfrontal sulcus.

### Key to the species of *Meishania*

- 1 Dorsum uniform red to deep red-brown; body length 3.35–3.45 mm . . . . . *Meishania rufa* Chen & Wang
- Pronotum and elytra differently colored or dorsum entirely pale yellow or metallic blue; body length 1.85 to 2.70 mm . . . . . 2
2. Elytra yellow to yellow brown, pronotum pale yellow to dark brown . . . . . 3
- Dorsum entirely blue or elytra dark brown with bluish metallic luster and pronotum yellow brown . . . . . 4
3. Anterolateral calli of pronotum poorly developed, produced antero-laterally; body length: 1.95–2.05 mm . . . . .
- . . . . . *Meishania flavipennis* sp. nov.
- Antero-lateral calli of pronotum strongly developed, produced anteriorly; body length: 2.60–2.70 mm . . . . .
- . . . . . *Meishania fulvotigera* sp. nov.
4. Dorsum entirely metallic blue; tarsomere I of front and middle legs in male less than two times longer than tarsomere II . . . 5
- Elytra dark brown with bluish metallic luster, pronotum and head yellow brown; tarsomere I of front and middle legs in male 3 times longer than tarsomere II. . . . . *Meishania sichuanica* sp. nov.
5. Antennomeres 1–3 deep yellow brown, 4–11 dark brown; legs entirely dark brown. . . . . *Meishania cangshanensis* sp. nov.
- Antennae and legs entirely yellow brown, except metafemora slightly darker . . . . . *Meishania bhutanensis* sp. nov.

### 1. *Meishania rufa* Chen & Wang, 1980

(Fig. 1)

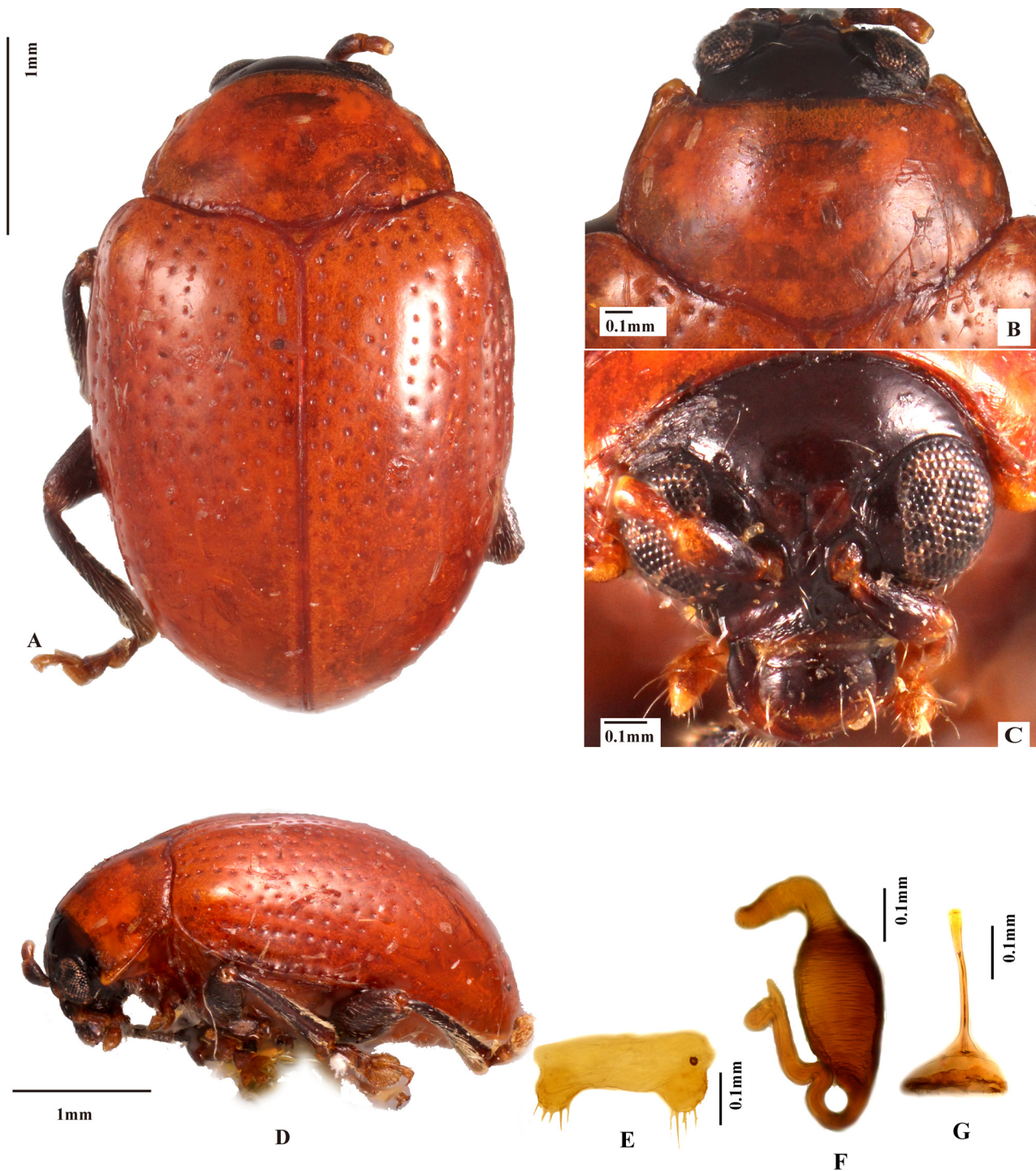
*Meishania rufa* Chen & Wang, 1980:13, 24 (type Locality: Sichuan, E'meishan Mt., China. Holotype and paratype (IZCAS) examined).

**Distribution:** China.

**Description.** Body length: 3.35–3.45 mm. Body width: 2.10–2.15 mm. Body length to width ratio: 1.55–1.65.

Pronotum width to length ratio: 2.00–2.05. Pronotum width at base to width at apex ratio: 1.65–1.70. Elytron length (measured along suture) to width of both ratio: 1.15–1.20. Length of elytron to length of pronotum ratio: 3.05–3.15. Width of elytra at base (measured across middle of humeral callus) to width of pronotum at base ratio: 1.15–1.20.

Elytron and pronotum red to deep red brown. Head brown to dark red brown. Legs brown. Body ovate in dorsal view, strongly convex dorsally in lateral view.



**FIGURE 1.** *Meishania rufa* Chen & Wang. **A:** habitus (Holotype, female). **B:** prothorax, dorsal view (Holotype). **C:** head, frontal view (Holotype). **D:** Holotype, lateral view. **E:** vaginal palpi (Paratype). **F:** spermatheca (Paratype). **G:** tignum (Paratype).

Vertex shiny, without punctures, except for one supraorbital pore on each side near eye. Antennal calli well delimited. Supracallinal, midfrontal, supraantennal and suprafrontal sulci shallow and weak. Supraorbital and orbital sulci deep. Width of frontal ridge to antennal sockets (excluding surrounding ridges) ratio: 0.65–0.75. Longitudinal diameter of eye to transverse diameter of eye in frontal view ratio: 1.65–1.75. Distance between eyes (just above antennal sockets) to transverse diameter of eye in frontal view ratio: about 2.00. Anterior margin of labrum weakly convex.

Pronotum with extremely minute, scattered, hardly visible punctures. Lateral margins of pronotum slightly curved, converging forward. Anterolateral callosity protruding forward. Posterolateral callosity poorly developed.

Elytra converging posteriorly with maximum width near base. Humeral calli well-developed. Elytral punctures confused at sides, arranged in regular rows in middle.

Length (excluding trochanter) to maximum width ratio of metafemur: 2.45–2.55. Length of first metatarsomere to length of second metatarsomere ratio: 1.25–1.35.

Spermatheca with receptacle convex on either side, about 1.8 times longer than wide, widest beyond middle towards pump. Spermathecal pump much shorter than receptacle, horizontal part longer than vertical, apex rounded. Spermathecal duct forms a single loop. Posterior part of tignum triangular, strongly expanded with posterior margin nearly straight. Vaginal palpi together 2.25 times wider than long, posterior ends widely separated.

**Diagnosis:** *Meishania rufa* is distinct among the species of *Meishania* Chen & Wang with red to red brown pronotum and elytra. It may be differentiated from all other species of the genus by its larger body size (*M. rufa* is 3.35–3.45 mm long, while others are less than 2.70 mm).

**Types examined:** Holotype: ♀, labels (in Chinese): 1) **Sichuan**, E'meishan Mt., 2100–3100 m, 1955.vi.25, Leg. Xingchi Yang, 2) OPEN, 3) HOLOTYPE, 4) *Meishania rufa*, des. Shixiang Chen (IZCAS).

Paratype: 1♀, labels: 1) **Sichuan**, E'meishan Mt., 2100–3100m, 1955.vi.25, Leg. Zhonglin Ge, 2) *Meishania rufa* (IZCAS).

## 2. *Meishania bhutanensis* Konstantinov, Ruan and Prathapan, new species

(Fig. 2)

**Etymology:** This new species is named after the type locality.

**Distribution:** Bhutan.

**Description:** Body length: 1.85–1.95 mm. Body width: 1.10–1.20 mm. Body length to width ratio: 1.60–1.65. Pronotum width to length ratio: 1.81–1.91. Pronotum width at base to width at apex ratio: 1.15–1.20. Elytron length (measured along suture) to width of both ratio: 1.10–1.15. Length of elytron to length of pronotum ratio: 3.10–3.20. Width of elytra at base (measured across middle of humeral callus) to width of pronotum at base ratio: 1.09–1.19.

Dorsum dark blue, with strong metallic luster. Antenna entirely yellow brown. Legs yellow brown except metafemur darker. Body ovate in dorsal view.

Vertex with a few scattered minute punctures and one large supraorbital pore on each side near eye. Supracallinal, supraantennal, and suprafrontal sulci poorly developed, barely visible. Midfrontal, supraorbital and orbital sulci deep. Frontal ridge much wider dorsally, distinctly narrowed ventrally. Distance between eyes (just above antennal sockets) to transverse diameter of eye in frontal view ratio: 1.10–1.20. Longitudinal diameter of eye to transverse diameter of eye in frontal view ratio: 1.60–1.70. Width of frontal ridge to antennal sockets (excluding surrounding ridges) ratio: 0.75–0.85. Anterior margin of labrum weakly convex.

Proportions of antennomeres as follows: 13:9:8:7:9:10:13:12:12:12:19. Length to width ratio of antennomere 9: 1.77–1.87; antennomere 10: 2.00–2.10; antennomere 11: 2.85–2.95.

Pronotum broad, with lateral margins slightly converging forward. Pronotal surface evenly covered with numerous punctures as large as those on elytra, with diameter 2–3 times smaller than distance between them. Lateral margins of pronotum nearly straight, slightly converging forward. Anterolateral callosity truncate, protruding antero-laterally, posterolateral callosity poorly developed.

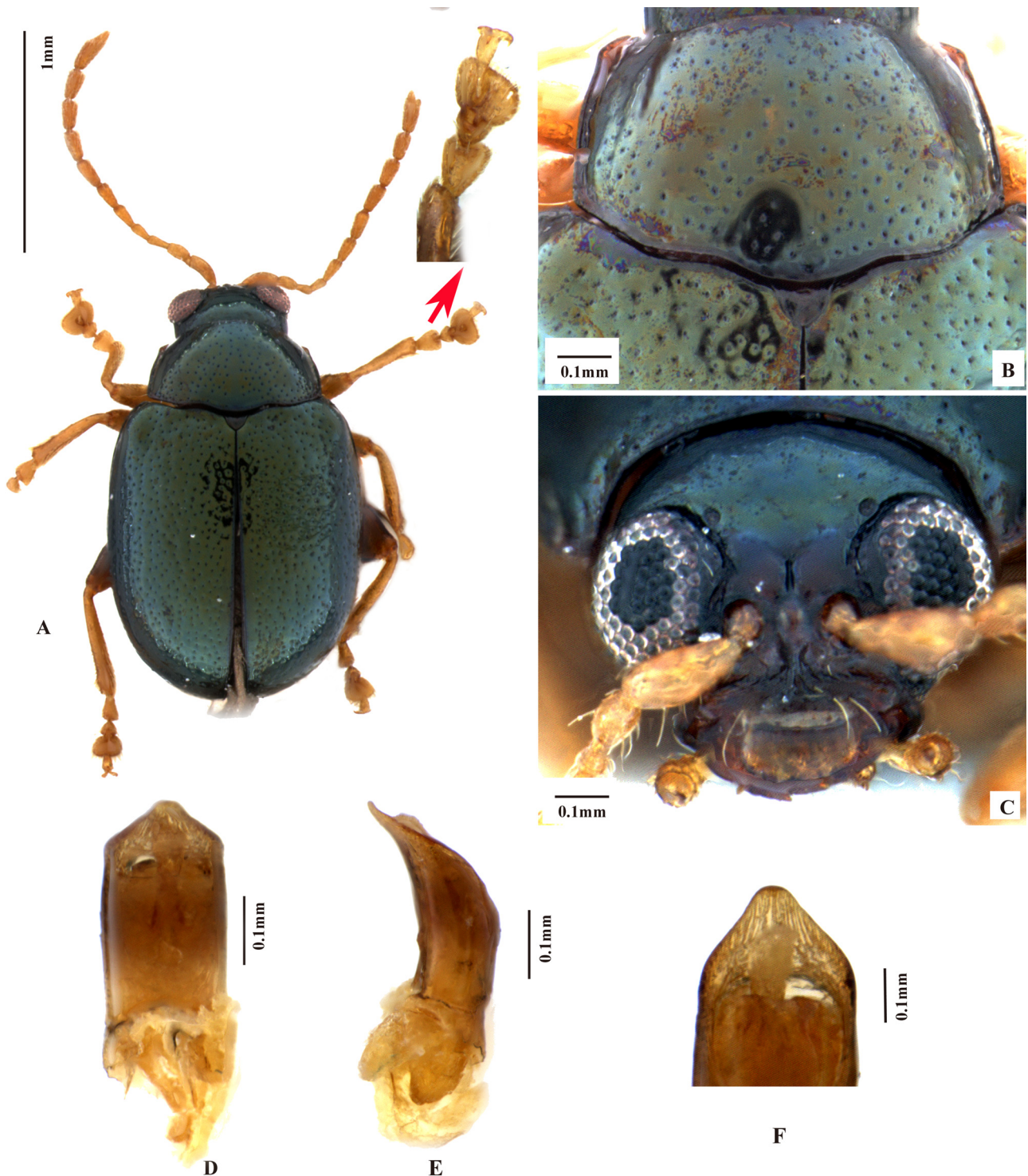
Elytra with parallel sides; punctures entirely confused.

Length (not counting trochanter) to maximum width ratio of metafemur: 1.90–1.95. First protarsomere of



male, length to width ratio (in dorsal view): 1.25–1.35. First metatarsomere of male, length to width ratio (in dorsal view): 1.40–1.50. Length of first metatarsomere to length of second metatarsomere ratio: 1.75–1.85.

Aedeagus short and robust. In lateral view aedeagus bent ventrally at distal part and almost straight at base, with apex slightly bent dorsally. In ventral view, parallel sided, apex abruptly narrowed.



**FIGURE 2.** *Meishania bhutanensis* sp. nov. **A:** habitus (Holotype, male). **B:** prothorax, dorsal view (Holotype). **C:** head, frontal view (Holotype). **D:** aedeagus, ventral view (Holotype). **E:** aedeagus, lateral view (Holotype). **F:** apex of aedeagus, dorsal view (Holotype).



**Diagnosis:** *Meishania bhutanensis* **sp. nov.** closely resembles *M. cangshanensis* **sp. nov.** with the dorsum entirely metallic blue. However, it may be distinguished from the latter by the darker color of antennae and legs: in *M. bhutanensis* **sp. nov.**, antennomeres 1–3 are deep yellow brown, 4–11 dark brown and the legs are entirely dark brown; while in *M. cangshanensis* **sp. nov.**, antennae and legs are entirely yellow brown, with metafemora slightly darker.

**Types:** Holotype: ♀, (currently in USNM, to be deposited at NBCB), labels: 1) **Bhutan**, 5km E. Nobding mixed for. with Rhododendr., N27°32'387" E90°10'957", 17.IX.2005, 2863m, Leg. A. Konstantinov & K. D. Prathapan, 2) Holotype, 3) *Meishania bhutanensis* **n. sp.** des Konstantinov & Ruan, 2016.

Paratypes: 1♂, 1) **Bhutan**, Tongsa dist. 10km S Tongsa slope, N27°29'249", E90°30'482", 12.IX.2005, 2131m, Leg. K. Mahat, P. Loday, A. Konstantinov & K. D. Prathapan, Paratype, *Meishania bhutanensis* **n. sp.** des Konstantinov & Ruan, 2016 (USNM). 1♀, **Bhutan**, Buntang env., 20km E. Tongsa, N27°32'058" E90°34'307", 5.IX.2005, 3132m, Leg. A. Konstantinov & K. D. Prathapan, Paratype, *Meishania bhutanensis* **n. sp.** des Konstantinov & Ruan, 2016 (USNM). 1♀, **Bhutan**, Tongsa dist. 20km W Tongsa, N27° 27'128" E90°24'242", 11.IX.2005, 2410m, Leg. K. Mahat, P. Loday, A. Konstantinov & K. D. Prathapan, Paratype, *Meishania bhutanensis* **n. sp.** des Konstantinov & Ruan, 2016 (NBCB).

### 3. *Meishania cangshanensis* Konstantinov, Ruan and Prathapan, new species

(Fig. 3)

**Etymology:** This new species is named after the type locality.

**Distribution:** China (Yunnan).

**Description:** Body length: 2.00–2.10 mm. Body width: 1.20–1.30 mm. Body length to width ratio: 1.62–1.67. Pronotum width to length ratio: 1.65–1.75. Pronotum width at base to width at apex ratio: 1.30–1.35. Elytron length (measured along suture) to width of both ratio: 1.15–1.20. Length of elytron to length of pronotum ratio: 2.73–2.83. Width of elytra at base (measured across middle of humeral callus) to width of pronotum at base ratio: 1.15–1.25.

Dorsum dark blue with strong metallic luster. Antennomeres 1–3 light brown, 4–11 dark brown. Legs dark brown; femoro-tibial joints lighter in color. Body ovate in dorsal view.

Vertex glabrous, lacks punctures, except one large supraorbital pore on each side near eye. Antennal calli poorly delimited. Supracallinal, supraantennal, and suprafrontal sulci poorly developed. Frontal ridge wider between antennal sockets than near clypeus. Midfrontal sulcus distinct, long and straight. Supraorbital and orbital sulci deep. Width of frontal ridge to antennal sockets (excluding surrounding ridges) ratio: 0.85–0.95. Distance between eyes (just above antennal sockets) to transverse diameter of eye in frontal view ratio: 2.30–2.35. Longitudinal diameter of eye to transverse diameter of eye in frontal view ratio: 1.90–1.95. Anterior margin of labrum straight.

Proportions of antennomeres as follows: 14:6:6:6:8:9:10:10:12:13:20. Length to width ratio of antennomere 9: 1.55–1.60; antennomere 10: 1.90–1.95; antennomere 11: 2.53–2.58.

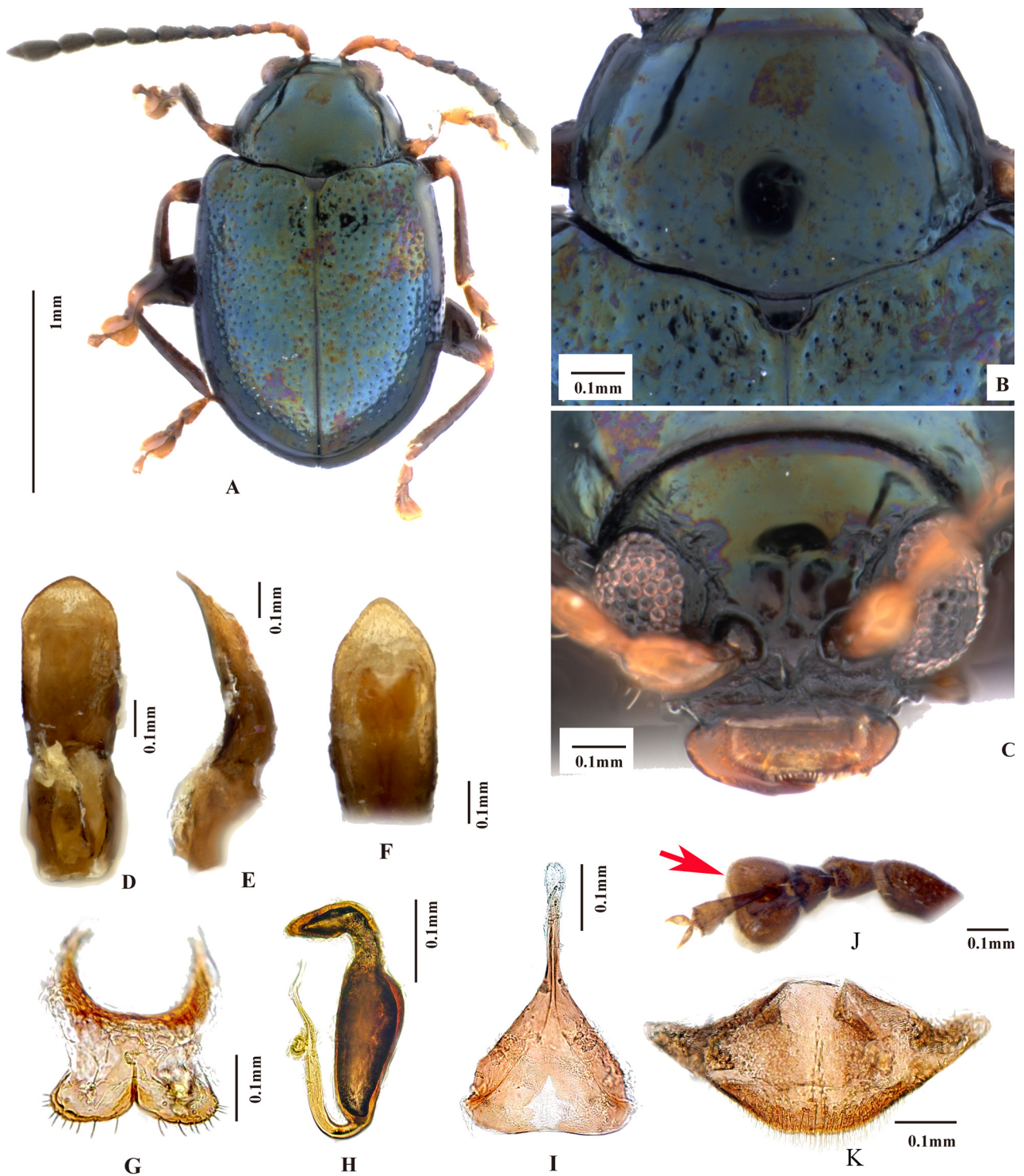
Pronotal punctures much smaller than those on elytra, with diameter 3–4 times smaller than distance between them. Lateral margins of pronotum gently convex, converging forward. Pronotal base slightly sinuate. Anterolateral callosity weak, protruding anteriorly; posterolateral callosity poorly developed.

Elytra with subparallel lateral margins, punctures closely placed, entirely confused.

Length (excluding trochanter) to maximum width ratio of metafemur: 2.32–2.42. First protarsomere of male, length to width ratio (in dorsal view): 1.75–1.85. First metatarsomere of male, length to width ratio (in dorsal view): 2.20–2.25. Length of first metatarsomere to length of second metatarsomere ratio: 1.65–1.75.

Aedeagus short and robust. In lateral view, aedeagus strongly bent at middle, with apex slightly bent ventrally. In ventral view, sides of aedeagus nearly parallel; apex narrowing abruptly.

Spermathecal receptacle gently convex along inner side, outer side strongly convex towards apex near pump, a little concave proximally, 2.4 times longer than maximum width. Receptacle proximally narrower than apically, widest near apex. Horizontal part of pump subequal to vertical, narrowed apically. Duct shorter than receptacle, not coiled, curved towards duct. Posterior sclerotization of tignum broad, subtriangular, with concave apical margin. Vaginal palpi together about 1.6 times wider than long, entirely fused with each other along middle, each broad and round distally.



**FIGURE 3.** *Meishania cangshanensis* sp. nov. **A:** habitus (Holotype, male). **B:** prothorax, dorsal view (Holotype). **C:** head, frontal view (Holotype). **D:** aedeagus, ventral view (Holotype). **E:** aedeagus, lateral view (Holotype). **F:** apex of aedeagus, dorsal view (Holotype). **G:** vaginal palpi (Paratype). **H:** spermatheca (Paratype). **I:** tignum (Paratype). **J:** foreleg, female (Paratype), red arrow indicates enlarged disc-like third tarsomere. **K:** pygidium of female (Paratype).

**Diagnosis:** *Meishania cangshanensis* sp. nov. resembles *Meishania bhutanensis* sp. nov. in having entirely metallic blue dorsum. However, it may be distinguished from *M. bhutanensis* sp. nov. by the lighter color of antennae and legs: in *M. cangshanensis* sp. nov., antennae and legs are entirely yellow brown, with metafemora slightly darker; while in *M. bhutanensis* sp. nov., antennomeres 1–3 are deep yellow brown, 4–11 dark brown and the legs are entirely dark brown.

**Types:** Holotype: ♂, labels: 1) China, **Yunnan**, env. Dali, Cangshan Mts., 06.IV.2002, 3700–3500m, forest/trail, N25°41'06", E100°06'13", leg. A. Kontantinov & M. Volkovitsh, 2) Holotype, *Meishania cangshanensis* n. sp. des Konstantinov & Ruan, 2016 (IZCAS),

Paratypes: 2♀, China, **Yunnan**, env. Dali, Cangshan Mts., 06.IV.2002, 3700–3500m, forest/trail, N25°41'06", E100°06'13", leg. A. Kontantinov & M. Volkovitsh, Paratype, *Meishania cangshanensis* n. sp. des Konstantinov & Ruan, 2016 (USNM).

#### 4. *Meishania flavipennis* Konstantinov, Ruan and Prathapan, new species

(Fig. 4)

**Etymology:** This new species is named after its body color.

**Distribution:** China (Yunnan).

**Description:** Body length: 1.95–2.05 mm. Body width: 1.15–1.25 mm. Body length to width ratio: 1.60–1.70. Pronotum width to length ratio: 1.95–2.05. Pronotum width at base to width at apex ratio: 1.20–1.25. Elytron length (measured along suture) to width of both: 1.20–1.25. Length of elytron to length of pronotum ratio: 3.43–3.53. Width of elytra at base (measured across middle of humeral callus) to width of pronotum at base ratio: 1.18–1.28.

Pronotum yellow to dark brown. Elytra yellow to yellow brown. Entire body yellow to yellow brown, pronotum and head darker than elytra in some specimens. Body ovate in dorsal view.

Head hypognathous. Vertex glabrous with one supraorbital pore on each side near eye. Antennal calli well delimited. Supracallinal, midfrontal, supraantennal and suprafrontal sulci shallow and weak. Supraorbital and orbital sulci deep. Width of frontal ridge to antennal sockets (measured excluding ridges) ratio: 0.40–0.50. Distance between eyes (just above antennal sockets) to transverse diameter of eye in frontal view ratio: 2.55–2.65. Longitudinal diameter of eye to transverse diameter of eye in frontal view ratio: 1.90–2.00. Anterior margin of labrum slightly convex.

Proportions of antennomeres as follows: 11:6:6:7:9:9:13:13:15:15:20. Length to width ratio of antennomere 9: 2.12–2.22; antennomere 10: 2.10–2.20; antennomere 11: 2.70–2.80.

Pronotum with minute, distantly scattered punctures. Lateral margins of pronotum slightly curved, posterior margin weakly sinuate. Anterolateral callosity weak, protruding antero-laterally; posterolateral callosity poorly developed.

Elytra with lateral sides almost parallel, punctures confused near sides, somewhat regular in middle.

Length (excluding trochanter) to maximum width ratio of metafemur: 2.30–2.40. First protarsomere of male, length to width ratio (in dorsal view): 1.15–1.20. First metatarsomere of male, length to width ratio (in dorsal view): 1.57–1.62. Length of first metatarsomere to length of second metatarsomere ratio: 1.33–1.38.

Aedeagus short and robust. In lateral view, aedeagus almost straight with apical denticle slightly bent dorsally. In ventral view, sides of aedeagus nearly parallel, with apex narrowing abruptly.

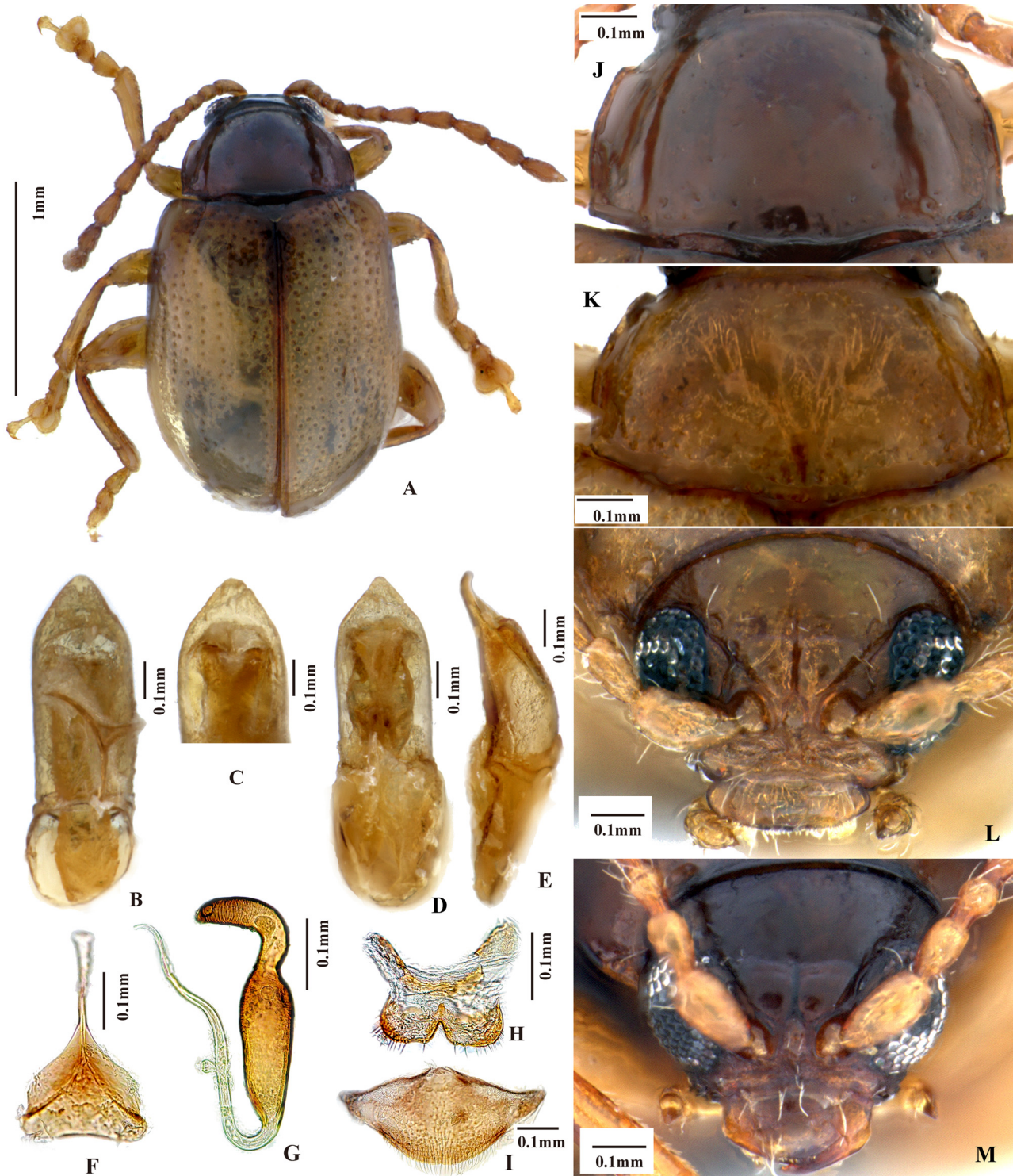
Spermathecal receptacle about three times longer than maximum width; inner side apparently concave in middle, outer side almost straight, proximally narrower than distally. Spermathecal pump shorter than receptacle, horizontal part longer than vertical, apex rounded. Posterior sclerotization of tignum strongly expanded, spatulate, with concave posterior margin. Vaginal palpi together a little longer than wide, separated at base and apex, entirely fused with each other at middle. The distal part of vaginal palpi broad and round.

**Types:** Holotype: ♂, labels: 1) China, **Yunnan**, env. Dali, Cangshan Mts., 06.IV.2002, 3700–3500m, forest/trail, N25°41'06", E100°06'13", leg. A. Konstantinov & M. Volkovitsh, 2) Holotype, *Meishania flavipennis* n. sp. des Konstantinov & Ruan, 2016 (IZCAS).

Paratypes: 1♂ 3♀, China, **Yunnan**, env. Dali, Cangshan Mts., 06.IV.2002, 3700–3500m, forest/trail, N25°41'06", E100°06'13", leg. A. Konstantinov & M. Volkovitsh, Paratype, *Meishania flavipennis* n. sp. des Konstantinov & Ruan, 2016 (USNM).

**Diagnosis:** *Meishania flavipennis* sp. nov. resembles *Meishania fulvotigera* sp. nov. in having yellow brown body. However, it can be differentiated from *M. fulvotigera* sp. nov. by the larger size (body length 2.60–2.70 mm in *M. flavipennis*; 1.95–2.05 mm in *M. fulvotigera*) and the strongly produced anterolateral calli of pronotum (poorly produced in *M. fulvotigera*).





**FIGURE 4.** *Meishania flavipennis* sp. nov. **A:** habitus (Holotype, male). **B:** aedeagus, ventral view (Holotype). **C:** apex of aedeagus, dorsal view (Holotype). **D:** aedeagus, dorsal view (Paratype). **E:** aedeagus, lateral view (Paratype). **F:** tignum (Paratype). **G:** spermatheca (Paratype). **H:** vaginal palpi (Paratype). **I:** pygidium of female (Paratype). **J:** prothorax, dorsal view (Holotype). **K:** prothorax, dorsal view (Paratype). **L:** head, frontal view (Paratype). **M:** head, frontal view (Holotype).

## 5. *Meishania fulvotigera* Konstantinov, Ruan and Prathapan, new species

(Fig. 5)

**Etymology:** This new species is named after the color of its dorsum and the comparatively larger size. The name is a noun in apposition.

**Distribution:** China (Yunnan).

**Description:** Body length: 2.60–2.70 mm. Body width: 1.80–1.90 mm. Body length to width ratio: 1.40–1.50. Pronotum width to length ratio: 1.90–2.00. Pronotum width at base to width at apex ratio: 1.20–1.30. Elytron length (measured along suture) to width of both: 1.00–1.10. Length of elytron to length of pronotum ratio: 3.15–3.25. Width of elytra at base (measured across middle of humeral callus) to width of pronotum at base ratio: 1.15–1.25.

Body entirely pale yellow brown. Ovate in dorsal view.

Vertex impunctate, except for one supraorbital pore on each side near eye. Antennal calli well delimited. Supracallinal sulcus poorly developed; midfrontal, supraantennal, and suprafrontal sulci well developed. Frontal ridge trapezoidal and sharply widened near antennal calli, extremely narrow beneath. Supraorbital and orbital sulci deep. Width of frontal ridge to antennal sockets (excluding outer ridges) ratio: 0.40–0.50. Distance between eyes (just above antennal sockets) to transverse diameter of eye in frontal view ratio: 2.55–2.65. Longitudinal diameter of eye to transverse diameter of eye in frontal view ratio: 1.80–1.90. Anterior margin of labrum straight.

Proportions of antennomeres 1 to 11 as follows: 12:11:6:8:9:9:10:10:11:10:16. Length to width ratio of antennomere 9: 2.00–2.10; antennomere 10: 1.70–1.80; antennomere 11: 2.80–2.90.

Pronotum with punctures extremely sparse, shallow and minute. Lateral margins of pronotum convex, with maximum width near middle. Posterior margin feebly sinuate. Anterolateral callosity protruding forward, rounded; posterolateral callosity weak, slightly projecting laterally.

Elytra parallel sided, with humeral calli well developed; punctures closely spaced, confused.

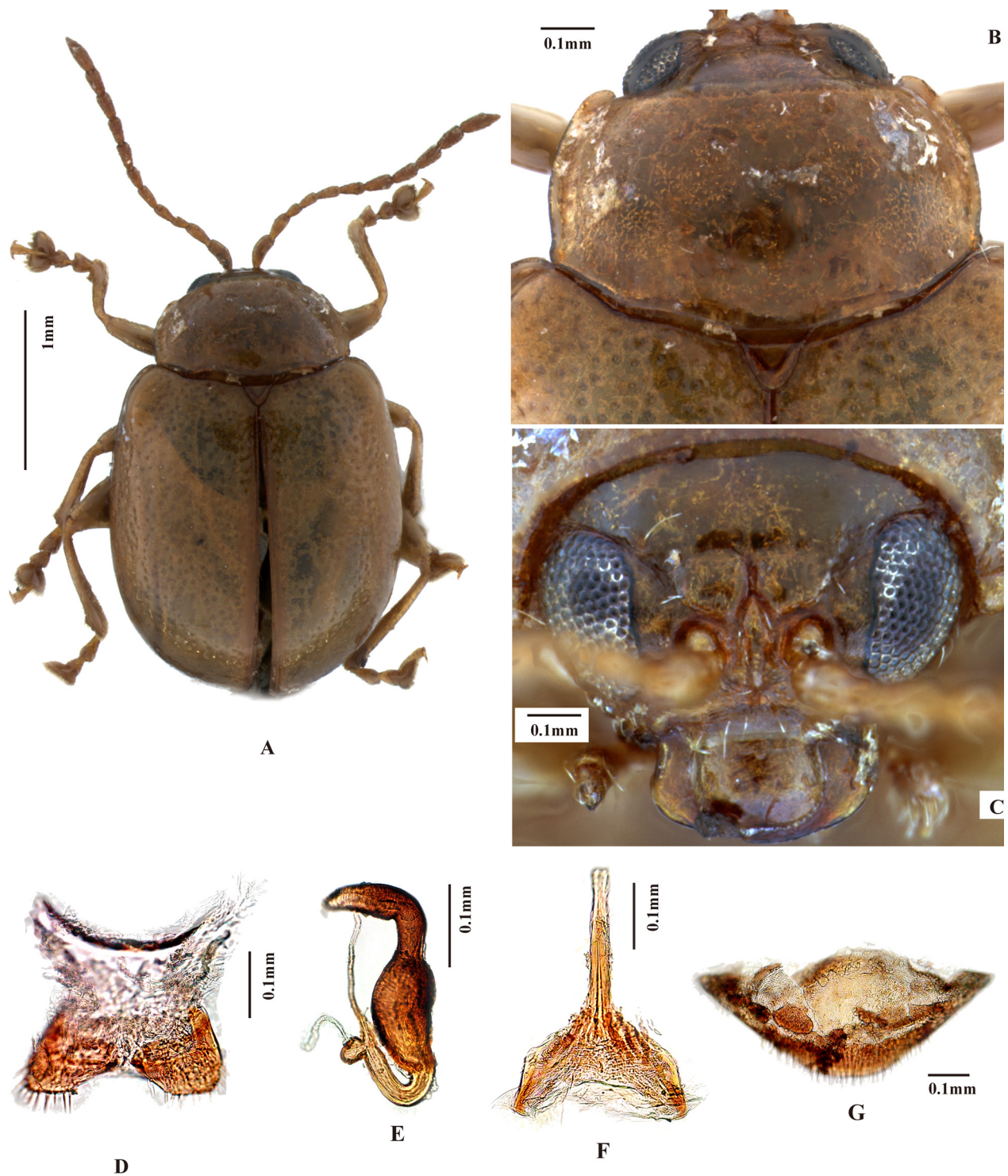
Length (excluding trochanter) to maximum width ratio of metafemur: 2.10–2.20. Length of first metatarsomere to length of second metatarsomere ratio: 2.03–2.13.

Spermathecal receptacle about 1.6 times longer than maximum width, inner side convex, outer side concave, widest near middle. Spermathecal pump longer than receptacle, with horizontal part longer than vertical, apex slightly pointed. Tignum Y shaped, strongly expanded, with deeply concave posterior margin. Anterior part of tignum narrow and straight. Vaginal palpi nearly as wide as long, separated at base and apex, entirely fused with each other along middle.

**Type:** Holotype: ♀, labels: 1) CH, S Sichuan, NE of Mianning, 8km NW of Lajiajia, upper forest, 3000–3400m, 5.08.2002, Belousov & Kabak leg, 2) Holotype, *Meishania fulvotigera* n. sp. des Konstantinov & Ruan, 2016 (IZCAS).

**Diagnosis:** *Meishania fulvotigera* sp. nov. resembles *Meishania flavipennis* sp. nov. in having yellow brown body. However, it can be differentiated from *M. flavipennis* sp. nov. by the smaller size (body length 1.95–2.05 mm in *M. fulvotigera*; 2.60–2.70 mm in *M. flavipennis*) and the poorly developed anterolateral calli of pronotum (strongly produced forward in *M. fulvotigera*).



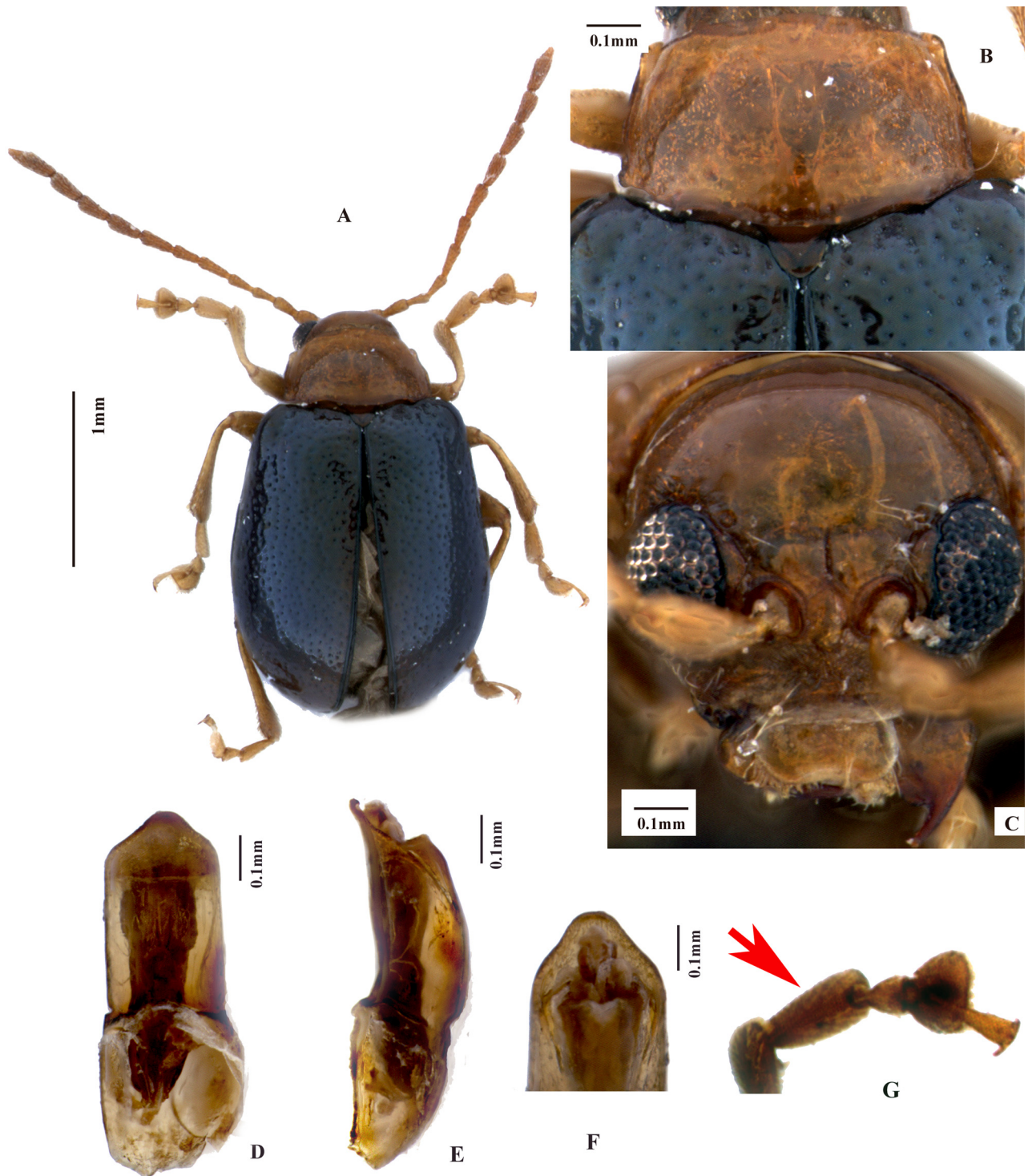


**FIGURE 5.** *Meishania fulvotigera* sp. nov. **A:** habitus (Holotype, female). **B:** prothorax, dorsal view (Holotype). **C:** head, frontal view (Holotype). **D:** vaginal palpi (Holotype). **E:** spermatheca (Holotype). **F:** tignum (Holotype). **G:** pygidium (Holotype).

**6. *Meishania sichuanica* Konstantinov, Ruan and Prathapan, new species**  
(Fig. 6)

**Etymology:** This new species is named after the type locality.

**Distribution:** China (Sichuan).



**FIGURE 6.** *Meishania sichuanica* sp. nov. **A:** habitus (Holotype, male). **B:** prothorax, dorsal view (Holotype). **C:** head, frontal view (Holotype). **D:** aedeagus, ventral view (Holotype). **E:** aedeagus, lateral view (Holotype). **F:** apex of aedeagus, dorsal view (Holotype). **G:** foreleg (Holotype), red arrow indicates strongly enlarged fist protarsomere of male.

**Description:** Body length: 2.30–2.40 mm. Body width: 1.25–1.35mm. Body length to width ratio: 1.75–1.85. Pronotum width to length ratio: 1.90–2.00. Pronotum width at base to width at apex ratio: 1.15–1.20. Elytron length (measured along suture) to width of both ratio: 1.35–1.45. Length of elytron to length of pronotum ratio: 3.80–3.90. Width of elytra at base (measured across middle of humeral callus) to width of pronotum at base ratio: 1.28–1.38.

Pronotum yellow brown; elytra dark brown with metallic blue luster. Antennae entirely yellow brown, with distal antennomeres slightly darker. All legs yellow brown. Body ovate in dorsal view.

Vertex glabrous and impunctate, with one supraorbital pore on each side near eye. Antennal calli well delimited with weak supracallinal, supraantennal, and suprafrontal sulci. Frontal ridge narrow, pointed at dorsal end. Midfrontal sulcus well developed. Width of frontal ridge to antennal sockets (excluding ridges) ratio: 0.60–0.70. Distance between eyes (just above antennal sockets) to transverse diameter of eye in frontal view ratio: 2.30–2.40. Longitudinal diameter of eye to transverse diameter of eye in frontal view ratio: 1.70–1.80. Anterior margin of labrum weakly emarginated.

Proportions of antennomeres as follows: 17:10:10:10:13:11:14:14:13:13:20. Length to width of antennomere 9 ratio: 2.23–2.33. Length to width of antennomere 10 ratio: 2.37–2.47. Length to width of antennomere 11 ratio: 2.85–2.95.

Pronotum with weak and shallow punctures barely visible. Lateral margins of pronotum nearly straight, converging anteriorly. Posterior margin feebly sinuate. Anterolateral callosity protruding antero-laterally, weak and round; posterolateral callosity poorly developed, projecting postero-laterally.

Elytra with humeral calli well developed. Punctures on elytron closely placed, confused. Elytra nearly parallel sided.

Length (excluding trochanter) to maximum width ratio of metafemur: 2.32–2.42. First protarsomere and mesotarsomere of male extremely enlarged; length to width ratio of first protarsomere: (in dorsal view): 2.05–2.15. First metatarsomere of male, length to width ratio: (in dorsal view) 2.45–2.55. Length of first metatarsomere to length of second metatarsomere ratio: 1.95–2.05.

Aedeagus short and robust; almost straight with apex and base slightly bent ventrally. In ventral view, parallel sided, with apex narrowing abruptly.

**Type:** Holotype: ♂, labels: 1) CH, S **Sichuan**, NE of Mianning, 8km NW of Lajiajia, upper forest, 3000–3400m, 5.08.2002, Belousov & Kabak leg. 2) Holotype, *Meishania sichuanica* **n. sp.** des. Konstantinov & Ruan, 2016 (IZCAS).

**Diagnosis:** *Meishania sichuanica* **sp. nov.** can easily be separated from other species in the genus by the strongly enlarged first tarsomere of the front and middle legs and the unique body color (elytra is dark brown with metallic blue luster and the rest of the body is yellow brown).

## Acknowledgements

This work was supported by grants from the National Science Foundation of China to Shihong Jiang (Grant No. 31372231) and Xingke Yang (PI, Grant No. 31372239), an Ernst Mayr Travel Grant in Animal Systematics (Harvard University, USA) to Yongying Ruan (2016) and a travel fund from the Chinese Scholarship Council to Yongying Ruan (No. 201504910567). Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the USDA; USDA is an equal opportunity provider and employer.

## Literature cited

- Chen, S. & Wang, S. (1980) New genera and species of Chinese Alticinae. *Entomotaxonomia*, 2 (1), 1–25.
- Konstantinov, A.S. (1998) Revision of the Palearctic species of *Aphthona* Chevrolat and cladistic classification of the Aphthonini (Coleoptera: Chrysomelidae: Alticinae). In: *Memoirs on Entomology, International. Vol.11*. Associated Publishers, Gainesville, pp. 1–429.
- Konstantinov, A.S. & Lingafelter, S.W. (2002) *Revision of the Oriental species of Aphthona Chevrolat (Coleoptera: Chrysomelidae)*. Entomological Society of Washington, Washington, D.C., 349 pp.
- Konstantinov, A.S., Baselga, A., Grebennikov, V.V., Prena, J. & Lingafelter, S.W. (2011) *Revision of the Palearctic Chaetocnema species (Coleoptera: Chrysomelidae: Galerucinae alticini)*. Pensoft, Sofia-Moscow, 363 pp.
- Konstantinov, A.S., Chamorro, M.L., Prathapan, K.D., Ge, S. & Yang, X. (2013) Moss-inhabiting flea beetles (Coleoptera: Chrysomelidae: Galerucinae: Alticini) with description of a new genus from Cangshan, China. *Journal of Natural History*, 47 (37–38), 2459–2477.  
<https://doi.org/10.1080/00222933.2012.763068>



- Lopatin, I.K. & Konstantinov, A.S. (2009) New genera and species of leaf beetles (Coleoptera: Chrysomelidae) from China and South Korea. *Zootaxa*, 2083, 1–18.
- Ruan, Y., Konstantinov, A.S., Ge, S. & Yang, X. (2014a) Revision of the *Chaetocnema picipes* species-group (Coleoptera, Chrysomelidae, Galerucinae, Alticini) in China, with descriptions of three new species. *ZooKeys*, 387, 11–32.  
<https://doi.org/10.3897/zookeys.387.6672>
- Ruan, Y., Konstantinov, A.S., Ge, S. & Yang, X. (2014b) Revision of the *Chaetocnema semicoerulea* species-group (Coleoptera, Chrysomelidae, Galerucinae, Alticini) in China, with descriptions of three new species. *ZooKeys*, 463, 57–74.  
<https://doi.org/10.3897/zookeys.463.8147>
- Ruan, Y., Konstantinov, A.S., Prathapan, K.D., Ge, S. & Yang, X. (2015) *Penghou*, a new genus of flea beetles from China (Coleoptera: Chrysomelidae: Galerucinae: Alticini). *Zootaxa*, 3973 (2), 300–308.  
<https://doi.org/10.11646/zootaxa.3973.2.5>
- Ruan, Y., Konstantinov, A.S., Prathapan, K.D. and Yang X. (2017a). Contributions to the knowledge of Chinese flea beetle fauna (II): *Baoshanaltica* new genus and *Sinosphaera* new genus (Coleoptera, Chrysomelidae, Galerucinae, Alticini). *Zookeys*, 720, 103–120.  
<https://doi.org/10.3897/zookeys.720.12715>
- Ruan, Y., Konstantinov, A.S., Prathapan, K.D. & Yang, X. (2017b) New contributions to the knowledge of Chinese flea beetle fauna (I): *Gansuapteris* new genus and *Primulavorus* new genus (Coleoptera: Chrysomelidae: Galerucinae). *Zootaxa*, 4282 (1), 111–122.  
<https://doi.org/10.11646/zootaxa.4282.1.6>
- Sprecher-Uebersax, E., Konstantinov, A.S., Prathapan, K.D. & Döberl, M. (2009) Revision of the genus *Benedictus* Scherer (Insecta: Coleoptera: Chrysomelidae: Galerucinae). In: Hartmann, M. & Weipert J. (Eds.), *Biodiversity and Natural Heritage of the Himalaya*. Vol. 3. Verein der Freunde und Förderer des Naturkundemuseums Erfurt e. V., Erfurt. pp. 367–406.