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ORIGINAL ARTICLE

Revision of *Phaedon* Latreille from China (Coleoptera: Chrysomelidae)

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Abstract Sixteen species of the genus *Phaedon* Latreille are revised and illustrated from China, including five new species described herein, namely *P. geminatus* **sp. nov.**, *P. huizuensis* **sp. nov.**, *P. igori* **sp. nov.**, *P. insolitus* **sp. nov.**, *P. prosternalis* **sp. nov.** All species are redescirbed or original described. Figures of important morphological features are provided. The natural history of some species are provided including the host plants records. A key to species of *Phaedon* from China is presented. The type specimens of the new species described here are deposited in Institute of Zoology, Chinese Academy of Sciences (IZCAS), Mauro Daccordi collection (MDC), Horst Kippenberg collection (HKC) and Zoological Institute, Russian Academy of Sciences (ZIN).

Key words Chrysomelinae, *Phaedon*, taxonomy, new species.

1 Introduction

The genus *Phaedon* was erected by Latreille in 1829 with *Chrysomela armoraciae* Linnaeus as type species, and subsequently designated by Maulik (1926). Up to now, the genus includes five valid subgenera as following: *Allophaedon* Kontkanen, 1933, *Hemiphaedon* Jakobson, 1901, *Orthostica* Motschulsky, 1860, *Paraphaedon* Sharp, 1910 and *Phaedon* Latreille, 1829. The bulk of the species occur between 60°N and 50°S in temperate and sub-tropical regions. Species inhabit the farmlands of plains up to alpine meadows. For example, *P. alpinus* Ge & Wang, occurs at 4700 m which is the highest altitude recorded for this genus. The host plants of *Phaedon* are different between Holarctic, Neotropical and Asia species (Jolivet & Hawkeswood, 1995). Following plant families are recorded as *Phaedon* host plants in temperate zone: Ranunculaceae, Brassicaceae, Scrophulariaceae, Lamiaceae, Callitrichaceae. Whereas, Ehretiaceae, Asteraceae, Malvaceae, Mimosaceae, Verbenaceae are recorded in tropical area (Jolivet & Hawkeswood, 1995). In China, some species of *Phaedon* are pests to agriculture. For example, the lowland species, *P. brassicae* Baly mainly feeds on cabbage, radish, shepherd's-purse, carrot, shallot, lettuce and other similar crops. *P. armoraciae* Linnaeus mainly feed on *Armoracia* sp., Brassicaceae. The two species are important pests in China. Furthermore, *P. alticola* Chen, a montane species, feeds on *Halerpestes tricuspis*, Ranunculaceae and *Lancea* sp., Mazaceae.

The genus *Phaedon* was first studied in China during 1934 by the late Prof. Chen Si-Cien who redescribed two species, *P. armoraciae* Linnaeus and *P. brassicae* Baly in that year. Subsequently, 12 new species were described by Chen (1936, 1974, 1984), Wang (1984, 1992a, 1992b, 1996) and Gressitt and Kimoto (1963). Most recently, Ge *et al.* (2002) described three new species, and Lopatin (2005) described one new species. Some of these species are now transferred to

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different other genera. For instance, *Phaedon chinensis* Gressitt & Kimoto, *P. fulvescens* Weise, *P. limbatus* Lopatin, *P. macullicollis* Chen and *P. potentillae* are transferred to *Odontoedon* (Ge *et al.*, 2013). Until now, a total of 11 species have been described from China. In this paper, we give a key to the species of Chinese *Phaedon*, and describe five new species from China. The type specimens of the new species described here are deposited in Institute of Zoology, Chinese Academy of Sciences, Mauro Daccordi collection, Horst Kippenberg collection and Zoological Institute, Russian Academy of Sciences.

2 Materials and methods

The present study was based on the examination of all known species occurring in China. Specimens were assembled through our own collections, loaned from museums and private collections, and by gifts from individual collections. Depositories of all specimens examined here are listed as following.

BMNH: The Natural History Museum, London, United Kingdom.
HKC: Horst Kippenberg's collection, Herzogenaurach, Germany.
IZCAS: Institute of Zoology, Chinese Academy of Sciences, Beijing, China.
LSUK: Linnean Society, London, United Kingdom.
MDC: Mauro Daccordi's collection, Verona, Italy.
NMEG: Naturkundesmuseum, Erfurt, Germany.
NMPC: National Museum (Natural History), Prague, Czech Republic.
ZIN: Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

Adults were placed and dissected in 75% ethanol. Some specimens were digested with 10% solution of potassium hydroxide for the study of head, mouthparts and internal skeleton. All of the materials, including adults, were treated with ultrasonic vibrations before being observed under the SEM; adult samples were fixed by dehydration in different percentages of alcohol followed by air drying and gold-sputter coating; then photographed with XL20 ESEM-TMP. In the SEM microscope, we photographed the frontal, lateral and dorsal views of the head, and close-ups of the anterior view of the mouthparts and legs. Drawings of the skeleton were made with a camera lucida on a Leica MZ 125. For the female genitalia a Zeiss Axioplan microscope and Delta-Pix software was used. All pictures were evaluated and assembled with Adobe Photoshop® CS 5 and Illustrator® CS 5 software.

3 Taxonomy

Genus *Phaedon* Latreille, 1829

Phaedon Latreille, 1829: 151. Type species: *Chrysomela armoraciae* Linnaeus, 1758: 369, designated by Maulik, 1926.
Alitene Gistl, 1857: 530. Type species: not designated. Synonymy by Gressitt & Kimoto, 1961.
Emmetrus Motschulsky, 1860: 221. Type species: *Chrysomela betulae* Küster, 1846, by original designation. Synonymy by Gressitt & Kimoto, 1961.
Allophaedon Kontkanen, 1933: 70. Type species: *Phaedon prasinellus* Le Conte.
Hemiphaedon Jacobson, 1902: 131. Type species: *Phaedon subtilis* Weise.
Orthosticha Motschulsky, 1860: 196. Type species: *Plagiodera bonariense* Boheman, 1858, by original designation.
Paraphaedon Sharp, 1910: 4. Type species: *Chrysomela tumidula* Germar, 1824).

Descriptions (Fig. 1). Elongate, strongly convex.

Head. Small, deeply inserted into prothorax. Compound eyes elongate or sub-spherical. Anterior part of labrum incised. Apical segment of maxillary palpi slender, twice as long as penultimate segment. Antennae extending to base of elytra, segments 7–11 broadened apically.

Thorax and abdomen. Pronotum with coarse punctures; anterior margin broadly emarginate with projecting anterior angles; anterior side, lateral side and posterior side with margin. Scutellum triangular with rounded apex, impunctate or

Fig. 1. *Phaedon brassicae* Baly, 1874, habitus.

with sparse punctures. Elytra broader than pronotum at base, slightly broadened after middle (Fig. 14); with ten striae arranged in single stria or double striae, not including incomplete basal scutellar row; humeral callus prominent or not; apically interspace tapered and narrow; interspace equally spaced except 8th which is wider. Epipleura plain, flat, broadened basally, slightly narrowed posteriorly, inner edge without hairs. Underside. Prosternal process narrow or wide, truncate apically, slightly broadened; procoxal cavities open behind; mesosternal process broadened, emarginate apically (Fig. 2A); antero-lateral plate of metaventrite small or large, without punctures (Fig. 2A). Legs. Femora robust (Fig. 2A); tibiae slender, outer-lateral margin of tibiae curved, with dense pubescence especially at apex; third segment of tarsi bilobed; onychium enlarged or not apically (Fig. 2D), claws simple (Fig. 2D).

Aedeagus. In dorsal view broadened basally, tapered to apex, slightly pointed apically (Fig. 3C); in lateral view bent at left angles (Fig. 3D); internal sac invisible at posterior border of basal foramen; flagellum invisible.

Spermatheca. Falciform or C-shaped, with or without long convoluted duct, with or without bulbiform structure (Figs 3F, 4E).

Remarks. The genus is similar of *Neophaedon*, but it can be distinguished by the following characters: punctures of eight stria entire and reach the apex of elytra, metaventrite with antero-lateral plate.

Distribution. Worldwide except Australia Region and Africa Region, temperate and sub-tropical regions.

Key to the Chinese species of the genus *Phaedon* Latreille, 1829

1. Pronotum and elytra black, lateral margins of pronotum and elytra yellowish manila ..... ***P. gressitti***
   Lateral margin of pronotum and elytra as same color as pronotum and elytra 2
2. With hind wings 3
   Brachypterus or apterus 8
3. Elytral intervals without punctures ..... ***P. brassicae***
   Elytral intervals with punctures 4
4. Distal part of the onychium enlarged ..... ***P. cochleariae***
   Distal part of the onychium not enlarged 5

5. Humeral callus flat, not prominent; lateral striae distinct until the apex 6
   Humeral callus prominent; elytral striae confused at the apex 7
6. Frons with fine and sparse punctures ..... ***P. alticola***
   Frons with coarse and dense punctures ..... ***P. mellyi***
7. Elytra strongly shining, usually greenish-blue, often with golden, purplish or violaceus reflex; apex of abdomen usually entirely black; distance among punctures of lateral stria 4–5 times than their diameter ..... ***P. concinnus***
   Elytra not strongly shining, usually greenish blue or blue-black; apex of abdomen usually with yellowish margine; distance among punctures of lateral stria 2–3 times of their diameter ..... ***P. armoraciae***
8. Prosternal process narrow 9
   Prosternal process wide 13
9. Tibiae reddish brown; hypomeron with dense punctures 10
   Tibiae not reddish brown; hypomeron with sparse punctures 11
10. Pronotum with sparse and fine punctures, much bigger in lateral sides ..... ***P. flavotibialis***
    Pronotum with the same punctures ..... ***P. huizuensis* sp. nov.**
11. Head and pronotum with sparse and fine punctures 12
    Head and pronotum with dense and coarse punctures ..... ***P. alpinus***
12. Pronotum quadrangular, lateral margin straight ..... ***P. wumingshanensis***
    Pronotum trapezoidal, lateral margin slightly curved anteriorly ..... ***P. apterus***
13. Lateral margin of pronotum straight; antero-lateral plate of metaventrite large, elytral puncture very fine; body shape round ..... ***P. igori* sp. nov.**
    Lateral margin of pronotum curved; antero-lateral plate of metaventrite small; elytral punctures bigger; body shape elongate 14
14. Elytra with very strong single striae; punctures very closed with each other, interspaces of striae silk like without shining ..... ***P. insolitus* sp. nov.**
    Elytra with shallow striae, punctures not closed with each other; interspaces of striae silk like, shining 15
15. Elytra with double striae ..... ***P. geminatus* sp. nov.**
    Elytra with single striae ..... ***P. prosternalis* sp. nov.**

***Phaedon alpinus* Ge & Wang, 2002** (Figs 2–3)

Phaedon alpinus Ge & Wang, 2002: 321.

Description. Body length 3.5 mm, width 2.6 mm. Body elongate, rather convex, hind wings absent. Colour dark-brown with metallic reddish-purple; underside, legs, antennae, maxillary palpi black; two basal segments of antennae more or less reddish-brown.

Head. Frons and vertex with coarse and sparse punctures (Fig. 2B). Antennae slender, extending beyond to humeri, shown as Figs 3A, 3B.

Thorax and abdomen. Pronotum length 0.1 mm, width 1.6 mm; straight basely, rounded outward; base margined; disc with coarse, dense punctures. Scutellum triangular, apex slightly rounded; smooth and impunctate. Elytra length 2.6 mm; slightly broader than pronotum at base, humeri not convex; punctures striae arranged in pairs, especially 6, 7 and 8, 9 striae; 6, 7 and 8, 9 joined together at base; 9 situated much nearer to lateral margin than 8, much sparse; interspace flat, impunctate, with longitudinal lines and transversal rugosity. Underside. Prosternal process narrow, apex slightly widen; hypomeron, mesoventrite, metaventrite and abdomen with dense and coarse punctures; antero-lateral plate of metaventrite small, impunctate. Aedeagus. Shown as Figs 3C, 3D.

Spermatheca. Shown as Fig. 3F.

Material examined. Holotype male, Sichuan, Dege Queershan, West slope (elev. 4250 m), 7 July 1983, coll. Shu-Yong Wang (IZCAS). Paratypes: 1 female, Sichuan, Dege Queershan (elev. 4600 m), 7 July 1983, coll. Xue-Zhong Zhang (IZCAS); 1 male, 1 female, Queershan Yakou (elev. 4250 m), 7 July 1983, coll. Shu-Yong Wang (IZCAS); 1 male, West slope (elev. 4250 m), 7 July 1983, coll. Shu-Yong Wang (IZCAS); 1 male, Dege Keluodong (elev. 3600 m), 25 July 1983, coll. Xue-Zhong Zhang (IZCAS); 5 males and 1 female, Garze (elev. 4000–4300 m), 9–10 July 1983, coll. Shu-Yong Wang, Chun-Lai Niu (IZCAS); 1 female, Sichuan, Dege Queershan, East slope (elev. 4700 m), 7 July 1983, coll. Shu-Yong Wang (IZCAS). Other materials: 1 female, China, W. Sichuan, road Qianning Dawu pass 35 km NNW. Qianning (elev. 3951 m), 1 August 1994, coll. J. Tuma. alpine and forest region (MDC); 1 male and 2 females, China, N. Yunnan, Dali Bai Nat. Aut. Prof. 4 km E Dali old town, shore terrain of Er Hai Lake (25°42′N, 100°01′5″E; elev. 2020 m), 27 July–

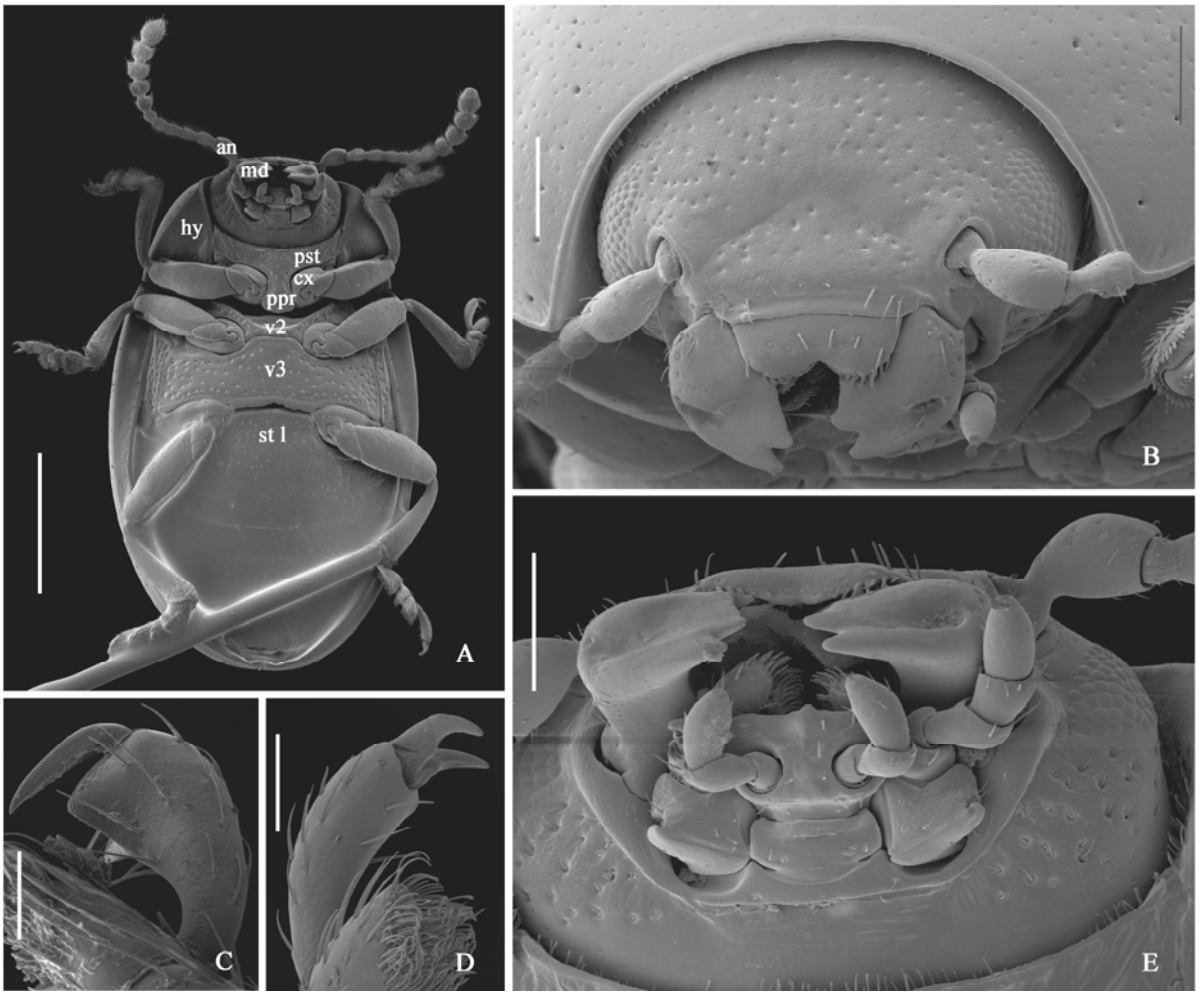

Fig. 2. *Phaedon alpinus* Ge & Wang, 2002, SEM. A. Habitus, ventral view. B. Head, frontal view. C. Onychium, lateral view, *Odontedon fulvescens*. D. Onychium, lateral view, *Phaedon alpinus*. E. Head, ventral view. Scale bars: A = 1.0 mm; B, D = 0.2 mm; C, E = 0.1 mm.

21 October 2003, coll. David W. Wrase, young willows with Kontgrass, under vegetation / in roots (HKC); 1 female, China, W. Sichuan, Ganzi, Tibet Aut. Pref. Yajiang Co., Shalui Shan 20 km W. Yaijiang, brook cleft alp. meadow (30°01′N, 100°41′E; elev. 4250 m), 2 August 1999, coll. D. W. Wrase (HKC); 1 female, China, E. Qinghai, Huashixia (elev. 4200 m), 27 June 1992 (MDC).

Remarks. The species is distinguished from *P. apterus* Wang by interspace of elytra striae smooth and impunctate, with transveral rugosity; epipleura smooth and impunctate.

Distribution. China (Sichuan, Yunnan).

***Phaedon alticola* Chen, 1974** (Fig. 4)

Phaedon alticola Chen, 1974: 45, 48.

Description. Body length 2.5–3.5 mm, width 1.8–2.0 mm. Body elongate, rather convex, hind wings present. Colour. Head and pronotum blackish aeneous; scutellum nearly balck; elytra dart blue, violaceous or purple; underside black or pitchy black, with a metallic luster.

Head. Frons and vertex with fine and sparse punctures. Antennae shown as Figs 4A, 4B.

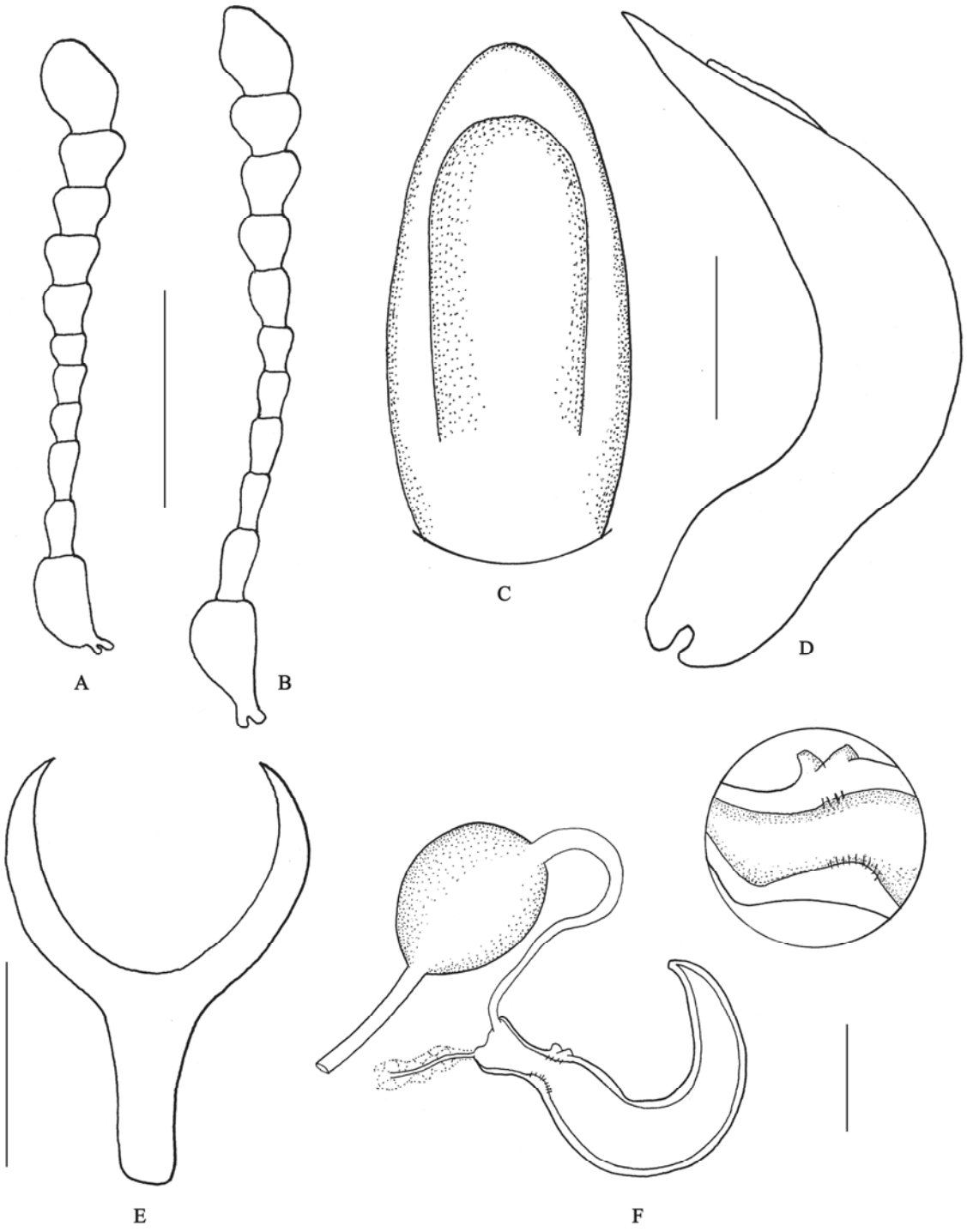

Fig. 3. *Phaedon alpinus* Ge & Wang, 2002. A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Tegman. F. Spermatheca. Scale bars: A–B = 0.5 mm; C–E = 0.2 mm; F = 0.1 mm.

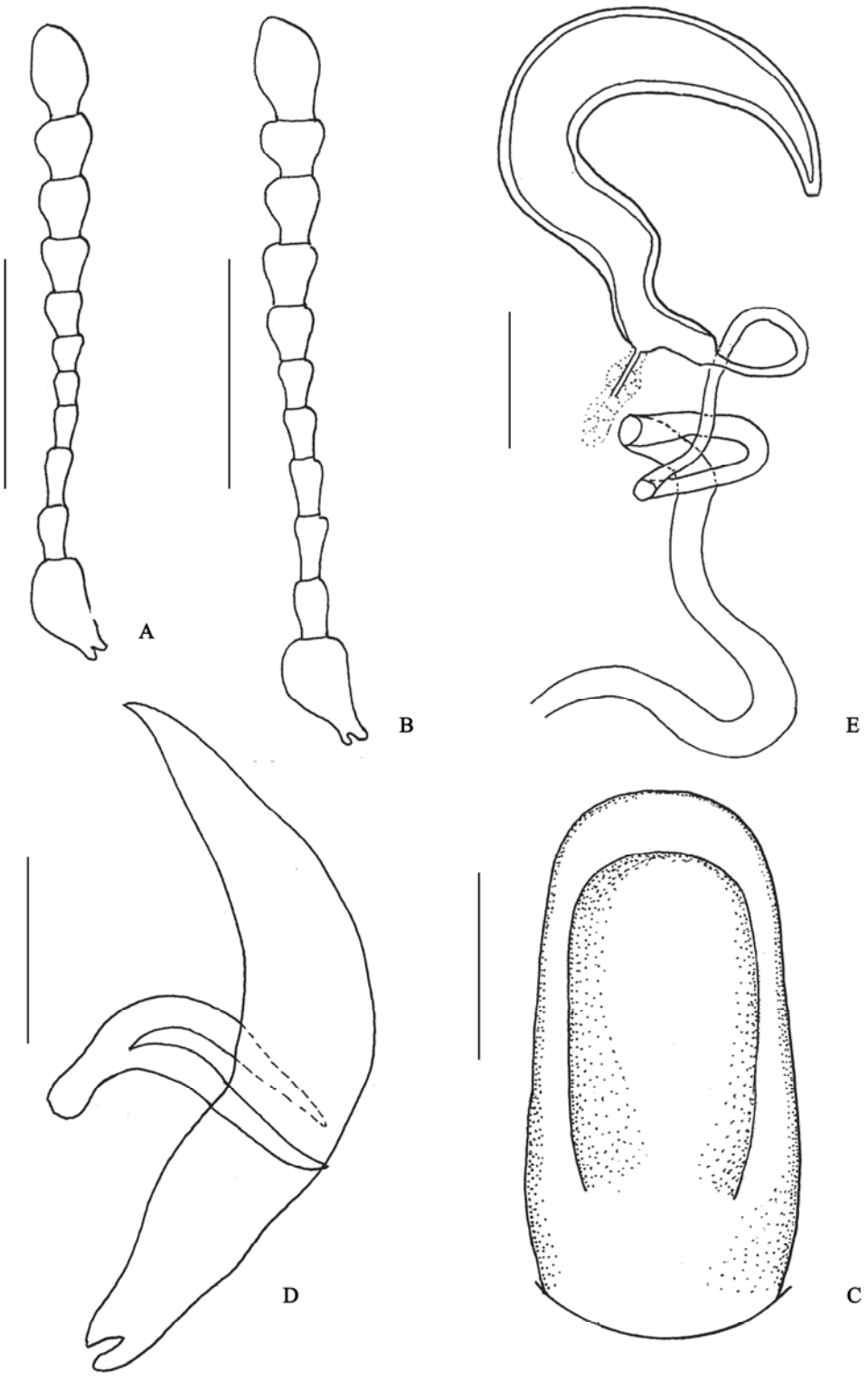

Fig. 4. *Phaedon alticola* Chen, 1974. A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

Thorax and abdomen. Pronotum length 0.85 mm, width 1.4 mm; disc with dense and coarse punctures. Scutellum subtriangular, smooth and impunctate. Elytra length 2.9 mm; striae regular; interspace with fine and sparse punctures. Underside. Prosternal process narrow, slightly widened apically. Hypomeron, mesoventrite and metaventrite, abdomen with fine and sparse punctures. Antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 4C, 4D.

Spermatheca. Shown as Fig. 4E.

Material examined. Holotype male, Qinghai, Nangqian (elev. 3700 m), 3 September 1965, coll. Shu-Yong Wang (IZCAS). Allotype female, same data as holotype (IZCAS). Paratypes: 4 males, 6 females, same data as holotype (IZCAS); 3 males, 3 females, Tibet, Markam (elev. 2230 m), 9 June 1961, coll. Suo-Fu Li (IZCAS); 1 male, Qinghai, Yushu (elev. 3750 m), 2 June 1965, coll. Shu-Yong Wang (IZCAS). Other materials: 3 males, 3 females, Sichuan, Hongyuan, Longriba (elev. 3500–3700 m), 24 August 1983, coll. Shu-Yong Wang (IZCAS); 1 male and 2 females, Sichuan, Dege, Keluodong (elev. 3500–4250 m), coll. Shu-Yong Wang (IZCAS); 1 male, 2 females, China, Gansu, ca. 5 km sw. Luqu / (Ioc Hua-er / Lin Ke-river) (elev. 3400 m), 12–13 July 1994, coll. Heize (1 male in MDC, 2 female in HKC); 1 female, China, E. Qinghai, pass 30 km S. of E. U. (elev. 3600 m), 1–3 August 1992 (MDC); 1 female, China, Sichuan, Östl. Zhangla (elev. 3500 m), 27 June 1996, coll. D. Erber (MDC).

Remarks. The species is similar to *Phaedon brassicae* Baly, but it can be distinguished by the following characters: dorsal side of body not unicolorous, the punctures of vertex finer and more scattered, being much finer than those of the elytra and the ninth stria of elytra situated in the middle of the marginal space, with its basal part closer to the eighth stria than the lateral margin.

Distribution. China (Qinghai, Sichuan, Gansu, Yunnan).

Host plant. *Ranunculus tricuspia*, *Lancea* sp.

***Phaedon apterus* Chen & Wang, 1984** (Fig. 5)

Phaedon apterus Chen & Wang, 1984: 173, 175.

Description. Body length 3.0–3.2 mm, width 2.0–2.2 mm. Body elongate, rather convex, hind wings absent. Colour general colour purple, shining; antennae black.

Head. Frons and vertex with fine and sparse punctures. Antennae showing as Figs 5A, 5B.

Thorax and abdomen. Pronotum length 0.9 mm, width 1.7 mm; alutaceous, fairly closed punctuate in the middle, more strongly and very sparingly punctuate at sides. Scutellum triangular, apex rounded, smooth and impunctate. Elytra length 2.5 mm; with regular striae, interspace shargreen and impunctate. Underside. Prosternal process narrow, apex slightly widened. Hypomeron, mesoventrite and metaventrite, abdomen with fine and sparse punctures. Antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 5C, 5D.

Spermatheca. Shown as Fig. 5E.

Material examined. Holotype male, Sichuan, Batang, Haizishan (elev. 4350–4600 m), 19 August 1982, coll. Shu-Yong Wang (IZCAS). Allotype female, same data as holotype (IZCAS). Paratypes: 10 males and 15 females, same data as holotype (IZCAS); 1 male, Yunnan, Deqin, Baimang Xueshan, East slope (elev. 4000 m), 29 August 1981, coll. Shu-Yong Wang (IZCAS). Other materials: 1 male, 3 female, China. N. W. Sichuan, Pass Zokm NW Rongbaca picea forest (31°46′N, 99°32′E; elev. 4091 m), 20 July 1995, coll. Jaroslav Turma (1 male and 1 female in IZCAS; 2 female in MDC); 2 male, 1 female, China, Sichuan, road Garze-batang, pass 25 km, S. Garze (elev. 4000–4500 m), 8–10 July 1995, coll. Kalab (1 male in MDC, 1 male and 1 female in IZCAS).

Remarks. The species is distinguished by the purple colour, the absence of hind wings and antennae black.

Distribution. China (Sichuan, Yunnan).

***Phaedon armoraciae* (Linnaeus, 1758)** (Fig. 6)

Chrysomela armoraciae Linnaeus, 1758: 369.

Phaedon armoraciae: Weise, 1884: 547.

Description. Body length 4.2–4.5 mm, width 2.3–2.7 mm. Body elongate, rather convex, hind wings present. Colour dark blue, tarsi and last segment of abdomen yellowish brown.

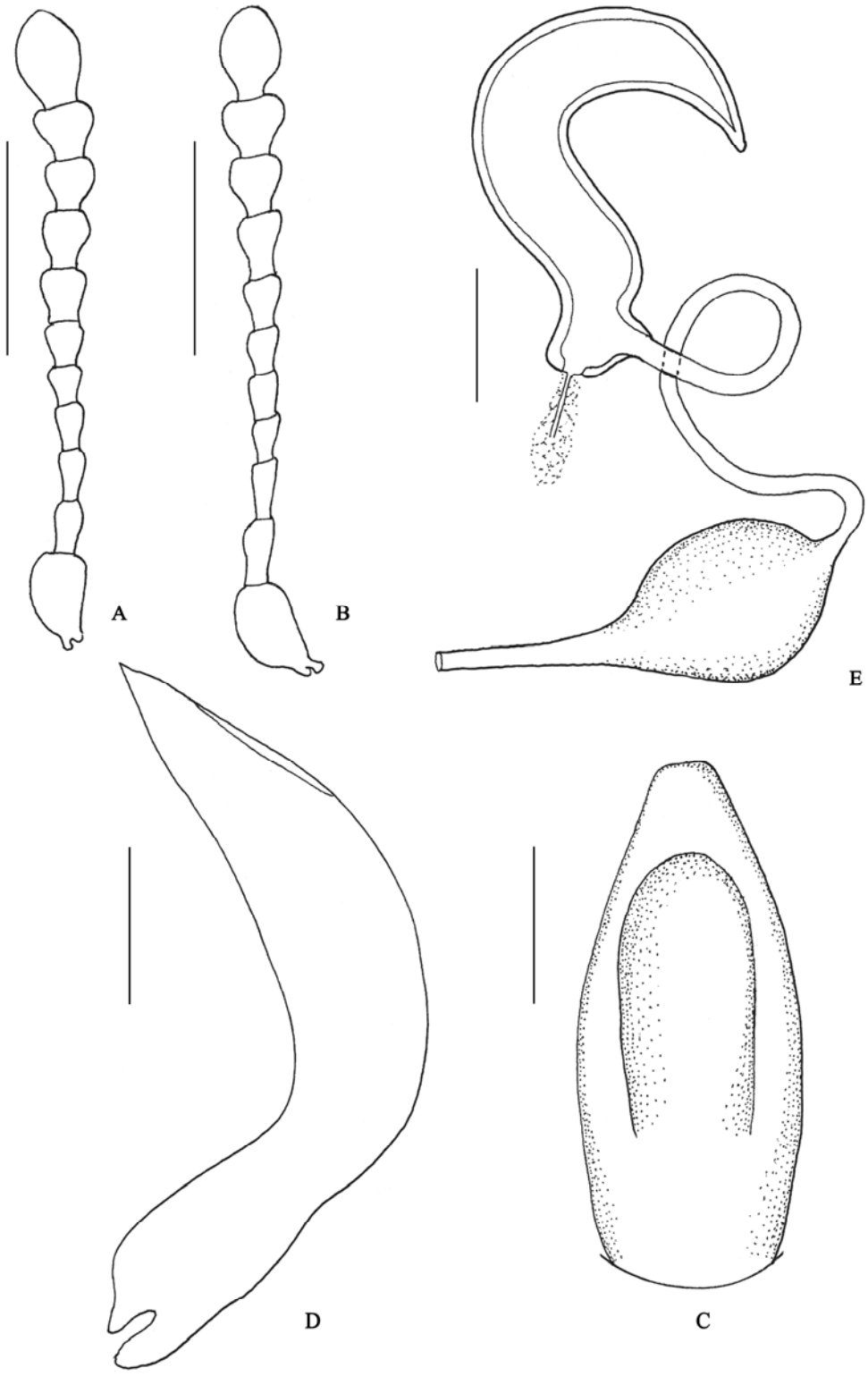

Fig. 5. *Phaedon apterus* Chen & Wang, 1984. A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

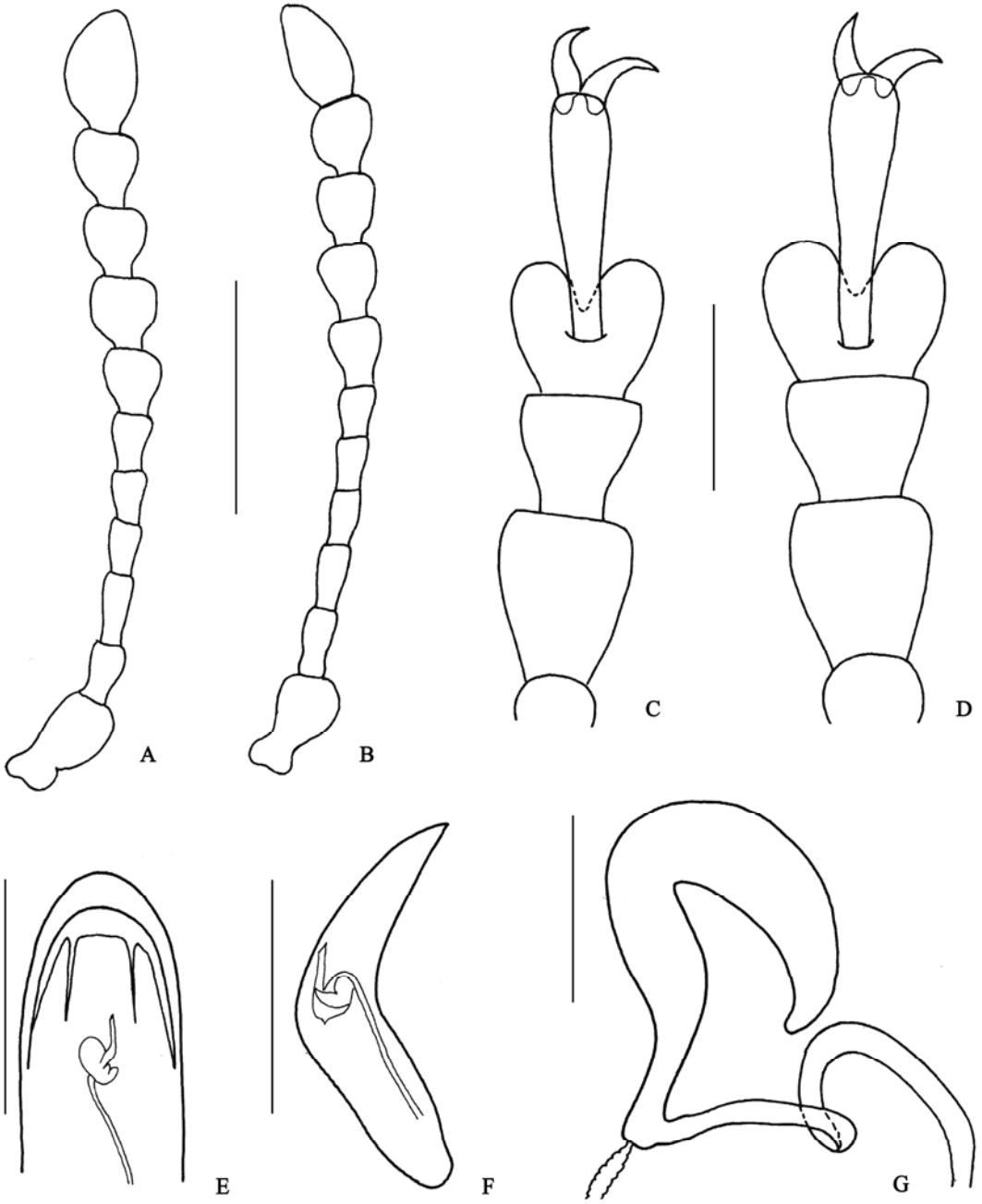

Fig. 6. *Phaedon amoraciae* (Linnaeus, 1758), from Daccordi and Lavarini (1993). A. Antenna, male. B. Antenna, female. C. Tarsus, dorsal view, male. D. Tarsus, dorsal view, female. E. Aedeagus, dorsal view. F. Aedeagus, lateral view. G. Spermatheca. Scale bars: A–B, E–F = 0.5 mm; C–D, G = 0.2 mm.

Head. With coarse and dense punctures. Antennae shown as Figs 6A, 6B.

Thorax and abdomen. Pronotum length 0.9 mm, width 1.8 mm; disc with coarse and dense punctures. Scutellum triangular, impunctate. Elytra length 3.4 mm; striae regular, interspace with fine and dense punctures; interspace ninth and tenth striae equal in length; epipleuron with fine and sparse punctures. Underside. Prosternal process narrow, slightly widened apically; hypomeron, mesoventriate, metaventrate and abdomen with dense and coarse punctures; antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 6E, 6F.

Spermatheca. Shown as Fig. 6G.

Material examined. Lectotype male, labelled: armoraciae / No. 16 / Lectotype / Lectotype, *Chrysomela armoraciae* Linné, 1758, male, Designated, S. GE, 2004 / *Phaedon armoraciae* (L.), Det. S. GE, 2004. Paralectotypes: 2 males, 1 female, same data as lectotype (LSUK). Other materials: 7 males and 5 females, Beijing, Badaling (elev. 700 m), 29 June 1962, coll. Shu-Yong Wang (IZCAS); 1 male, Xinjiang, Altai (elev. 800m), 23 August 1960, coll. Shu-Yong Wang (IZCAS).

Remarks. The species can be distinguished from other species of the genus by the following characters: dorsum without markings; hind wing present; third antennal segment shorter than second; elytral interstice 9 and 10 equal in width; epipleuron broadened basally, with punctures.

Distribution. China (Beijing, Hebei, Xinjiang), Russia (Siberia), Central Asia, Europe.

Host plant. *Armoracia* sp.

***Phaedon brassicae* Baly, 1874** (Fig. 7)

Phaedon brassicae Baly, 1874: 174.
Phaedon incertum Baly, 1874: 175.
Phaedon baolacensis Achard, 1926: 139.

Description. Body length 3.4–3.9 mm, width 2.2–2.5 mm. Body elongate, rather convex, hind wings present. Colour. Dorsum metallic blue, purple or black, sometimes dark aerugo; underside of body, legs black or dark blue, last segment of abdomen yellowish brown; antennae black, basal two segments of antennae reddish brown.

Head. Frons and vertex with very coarse and dense punctures. Antennae shown as Figs 7A, 7B.

Thorax and abdomen. Pronotum length 0.65 mm, width 1.75 mm; disc with dense and coarse punctures, with one longitudinal impunctate stripe in medal line. Scutellum subtriangular, impunctate. Elytra length 3.0 mm; elytra striae regular, ninth stria closed to lateral margin, tenth situated lateral margin, shagreened; interspace with very fine and sparse punctures, sometimes impunctate; epipleuron with dense punctures. Underside. Prosternal process narrow, slightly widened apically. Hypomeron, mesoventriate, metaventrate and abdomen with dense and coarse punctures. Antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 7C, 7D.

Spermatheca. Shown as Fig. 7E.

Material examined. Holotype, male, China, coll. Baly (BMNH). Other materials: 1 male, Yunnan, Jingjiang, 31 March 1919, coll. unknown (IZCAS); 1 male and 3 females, Zhejiang, Mt. Tianmu, 21 September 1953, coll. unknown (IZCAS); 1 female, Zhejiang, Zhoushan, Dinghai, 24 April 1991, coll. unknown (IZCAS); 2 males, Zhejiang, Qingyuan, Baishanzu (elev. 1300 m), 19 April 1994, coll. Hong Wu (IZCAS); 1 female, Fujian, Longqishan, 21 May 1991, coll. Hong Liu (IZCAS); 1 male, Fujian, Jianyang, Huangkeng (elev. 270 m), 11 April 1960, coll. Yi-Ran Zhang (IZCAS); 1 female, Guangxi, Guilin, 12 October 1932, coll. unknown (IZCAS); 1 female, Guangxi, Longzhou (elev. 800 m), 26 March 1998, coll. Chun-Sheng Wu (IZCAS); 1 male, 1 female, Guangxi, Daxin (elev. 280 m), 30 March 1998, coll. Chun-Sheng Wu (IZCAS); 1 male, Guangxi, Jingxi (elev. 840 m), 1 April 1998, coll. unknown (IZCAS); 1 female, Yunnan, Wenquan, 26 April 1982, coll. Chun-Mei Huang (IZCAS); 2 males, 3 females, China, W. Henan, Quanbaoshan, Xiangershan (39°07'N, 111°25'E; elev. 1600–2000 m), 23–24 May 2010, coll. Jaroslov Turna (MDC); 1 male, 1 female, China, Shaanxi, bank tributary of Wei He riv., 7 km E Zhouzhi auto-route km 100 (106.17°E, 34.09°N; elev. 400 m), 24 August 1975, coll. Wrase (MDC); 1 male and 2 females, China, Yunnan, Dali Bai Nat. Aut. Pref. 4 km E Dali old town, shore terrain of Er Hai Lake, Young willows with knotgrass under vegetation in roots (25°42'N, 100°01'5"E; elev. 2020 m), 27 August–21 October 2003, coll. Wrase (MDC).

Remarks. The species is similar to *Phaedon alticola* Chen, but it can be distinguished by the following characters: dorsum with same colour; head with dense punctures; interspace of elytra with very fine and sparse punctures, sometimes impunctate. The ninth stria of elytra is closed to lateral margin.

Distribution. China (Anhui, Jiangsu, Zhejiang, Hubei, Hunan, Fujian, Taiwan, Guangxi, Sichuan, Guizhou, Yunnan), Japan, Vietnam.

Host plant. *Brassica* sp., *Pekinensis* sp., *Rupr* sp. or *Ruppia*, *Raphanus* sp., *Capsella* sp., *Allium* sp., *Beta* sp., *Lactuca* sp.

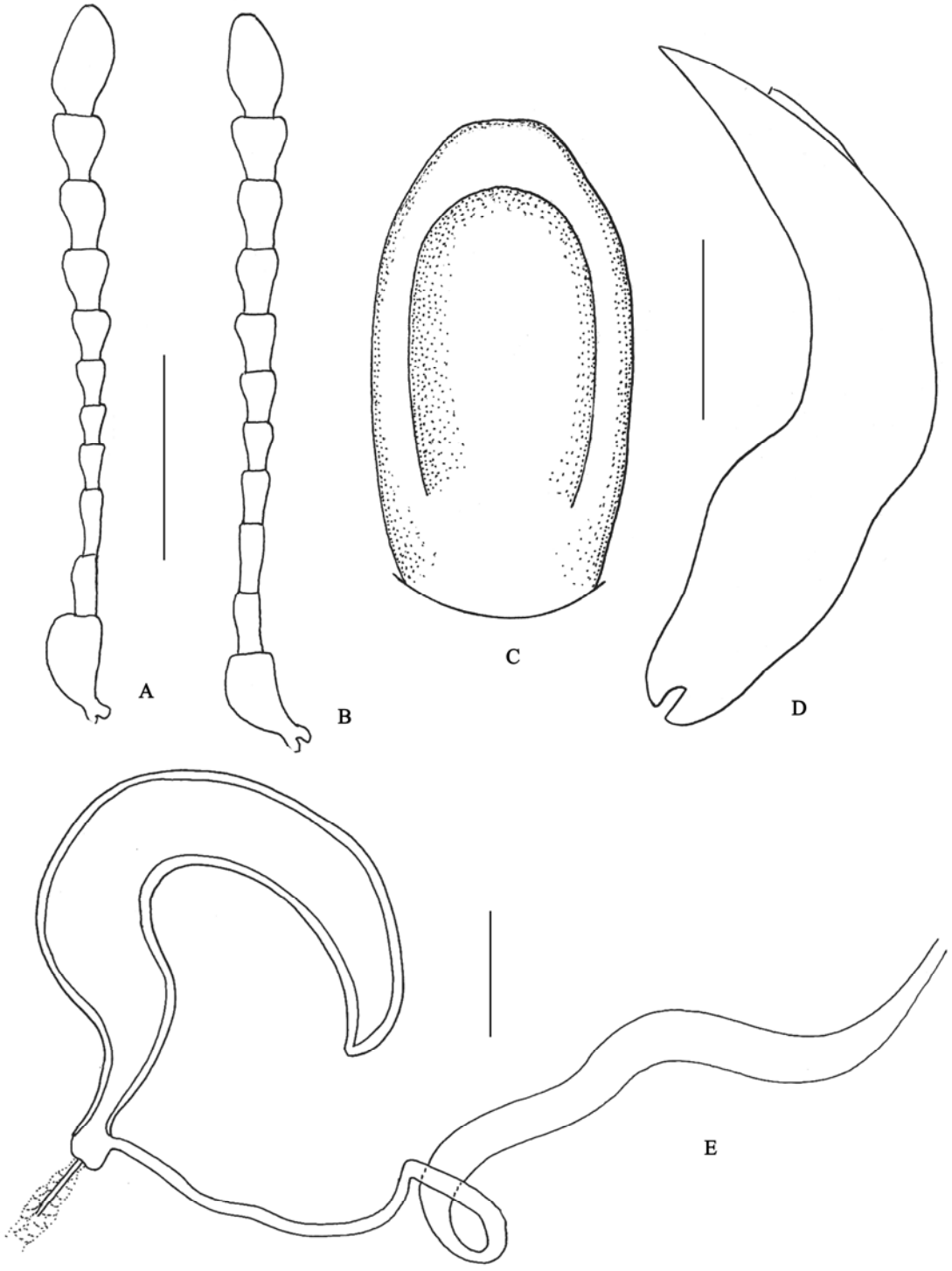

Fig. 7. *Phaedon brassicae* Baly, 1874. A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

***Phaedon cochleariae* Panzer, 1794** (Fig. 8)
Phaedon cochleariae Panzer, 1797: 14.

Description. Body length 3.8–4.0 mm, width 2.0–2.2 mm. Body elongate, rather convex, hind wings present. Colour dark blue, green or purple, basal two segments of antennae, tarsi, apical margin of abdominal segments yellowish brown.

Head. Frons and vertex with dense and coarse punctures. Antennae shown as Figs 8A, 8B.

Thorax and abdomen. Pronotum length 0.9 mm, width 1.6 mm; disc with dense and coarse punctures. Scutellum. Subtriangular, smooth. Elytra length 3.0 mm; striae regular, interspace with fine and dense punctures. Epipleuron with fine and sparse punctures. Legs. Apex of onychium slightly enlarged. Underside. Prosternal process narrow, slightly widened apically. Hypomeron, mesoventriate, metaventrate and abdomen with dense and coarse punctures. Antero-lateral plate of

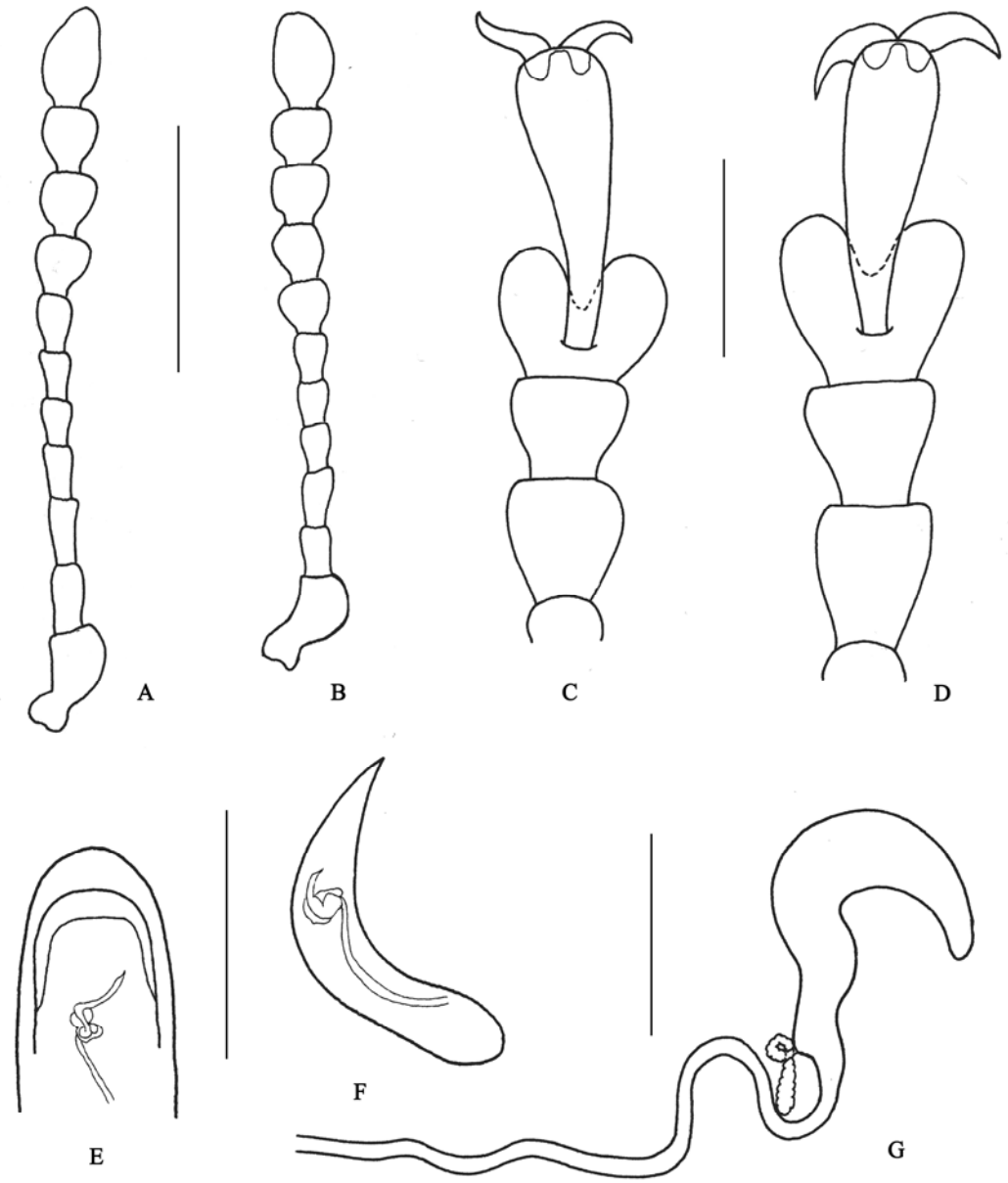

Fig. 8. *Phaedon cochleariae* Panzer, 1794, from Daccordi and Lavarini (1993). A. Antenna, male. B. Antenna, female. C. Tarsus, dorsal view, male. D. Tarsus, dorsal view, female. E. Aedeagus, dorsal view. F. Aedeagus, lateral view. G. Spermatheca. Scale bars: A–B, E–F = 0.5 mm; C–D, G = 0.2 mm.

metaventrite large and impunctate.

Aedeagus. Shown as Figs 8E, 8F.

Spermatheca. Shown as Fig. 8G.

Material examined. 4 males and 5 females, China, Xinjiang, Qinghe, Ertai (elev. 940 m), 2 July 1960, coll. Shu-Yong Wang (IZCAS); 1 male, China, Xinjiang, Qinghe, Ertai (elev. 940 m), 30 June 1960, coll. Fa-Cai Zhang (IZCAS).

Remarks. The species is similar to *Phaedon alticola* Chen, but it can be distinguished by the following characters: dorsum with same colour,head and pronotum with dense punctures, and interspace of elytra with dense and fine punctures.

Distribution. China (Xinjiang).

***Phaedon concinnus* Stephens, 1834** (Fig. 9)

Phaedon concinnus Stephens, 1834: 334.

Description. Body length 4.2–4.3 mm, width 2.3–2.4 mm. Body elongate, rather convex, hind wings present. Colour greenish blue, often with golden, purplish or violaceus; apex of abdomen usually entirely black.

Head. With coarse and dense punctures. Antennae shown as Figs 9A, 9B.

Thorax and abdomen. Pronotum length 0.9 mm, width 1.7 mm; disc with coarse and dense punctures. Scutellum triangular, impunctate. Elytra length 3.3 mm; striae regular, interspace with fine and dense punctures; interspace ninth and tenth striae equal in length, punctures of lateral stria 4–5 times than their diameter. Epipleuron with fine and sparse punctures. Underside. Prosternal process narrow, slightly widened apically. Hypomeron, mesoventriate, metaventrate and abdomen with dense and coarse punctures. Antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 9C, 9D.

Spermatheca. Shown as Fig. 9E.

Material examined. 1 male, Russia, Dzakhanskij, tzs-Gol, 10 km (elev. 1 300 m) (MDC).

Remarks. The species is similar to *P. armoraciae*, but it can be distinguished from the latter by following: elytra strongly shining, usually greenish-blue, often with golden, purplish or violaceus reflex; apex of abdomen usually entirely black; punctures of lateral stria 4–5 times than their diameter. We add this species here because it occurs in border of China, and it probably occurs in China too.

Distribution. Russia (border of China, near Xinjiang), Europe.

***Phaedon flavotibialis* Lopatin, 2005** (Fig. 10)

Phaedon flavotibialis Lopatin, 2005: 936.

Description. Body length 3.4–3.8 mm, width 2.0–2.4 mm. Body elongate, rather convex, hind wings reduced. Colour. Dorsum metallic dark green; underside of two basal antennal segments, all tibiae, and two basal segments of tarsi yellowish brown; labrum, onychium, bases of tibiae, and other antennal segments black. Underside black with bronze reflection.

Head. Frons and vertex with dense and coarse punctures, interspersed very fine punctures. Antennae shown as Figs 10A, 10B.

Thorax and abdomen. Pronotum length 1.0 mm, width 2.0 mm; disc with sparse and fine punctures, much bigger and denser in lateral sides. Scutellum subtriangular, with very fine punctures. Elytra with regular striae; interspace of elytra with fine and dense punctures. Epipleuron with dense and fine punctures. Underside. Prosternal process narrow, with few separate punctures, slightly widened apically. Hypomeron, mesoventriate, metaventrate and abdomen with dense and coarse punctures. Antero-lateral plate of metaventrite narrow and impunctate.

Aedeagus. Shown as Figs 10C, 10D.

Spermatheca. Shown as Fig. 10E.

Material examined. Holotype male, China, Sichuan, E. Danba, E. Suopo, H (30°52'54"N, 102°03'05"E–30°52'46"N, 102°03'34"E; elev. 4 560–4 780 m), 14 August 2004, coll. Belousov and Kabak (ZIN). Paratype 1 female, same data as holotype (ZIN).

Remarks. The species is distinguished by the following characters: tibiae yellowish brown, the punctures of pronotum fine and sparse, much bigger in lateral sides.

Distribution. China (Sichuan).

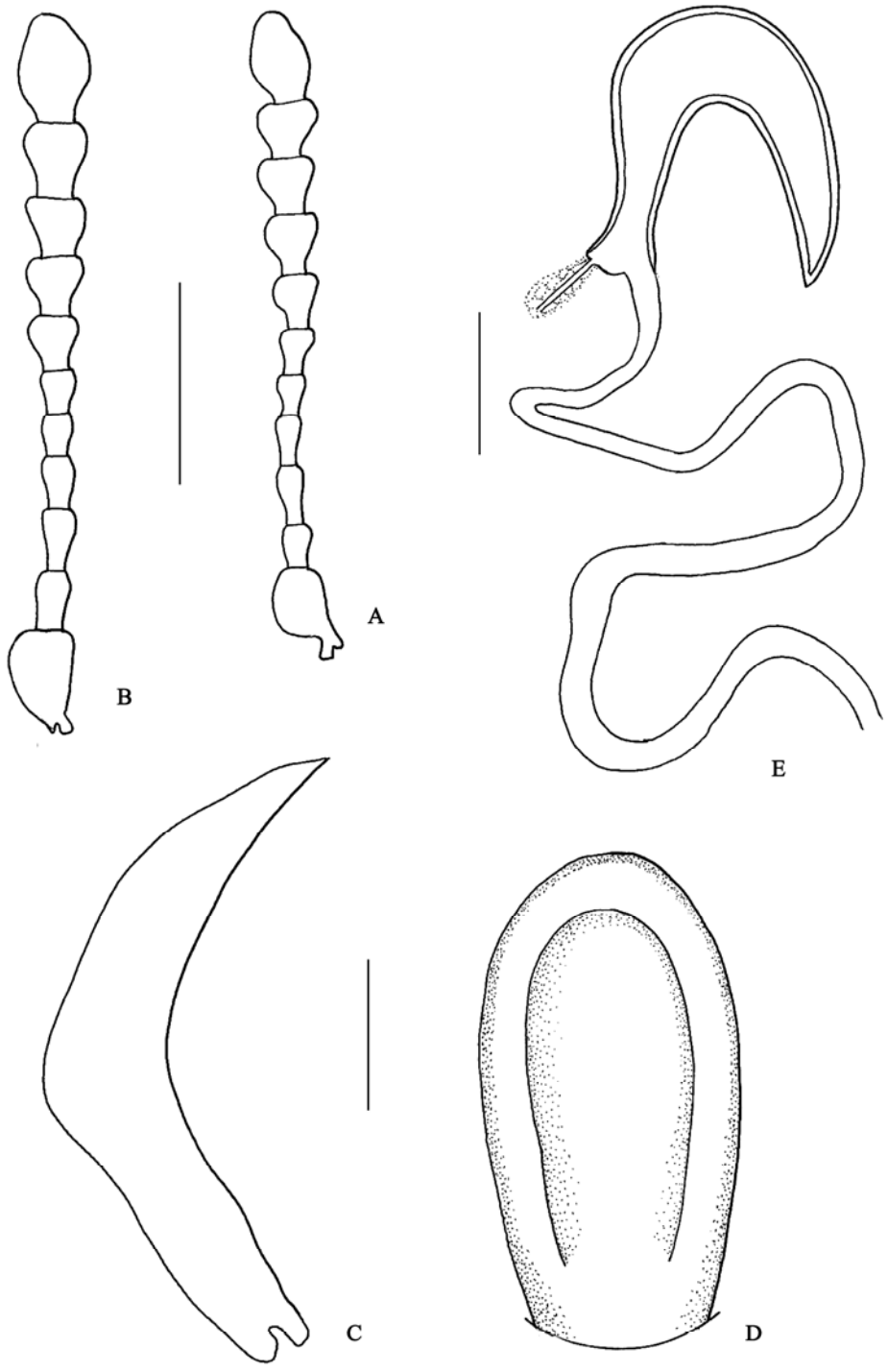

Fig. 9. *Phaedon concinus* Stephens, 1834. A. Antenna, male. B. Antenna, female. C. Aedeagus, lateral view. D. Aedeagus, dorsal view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

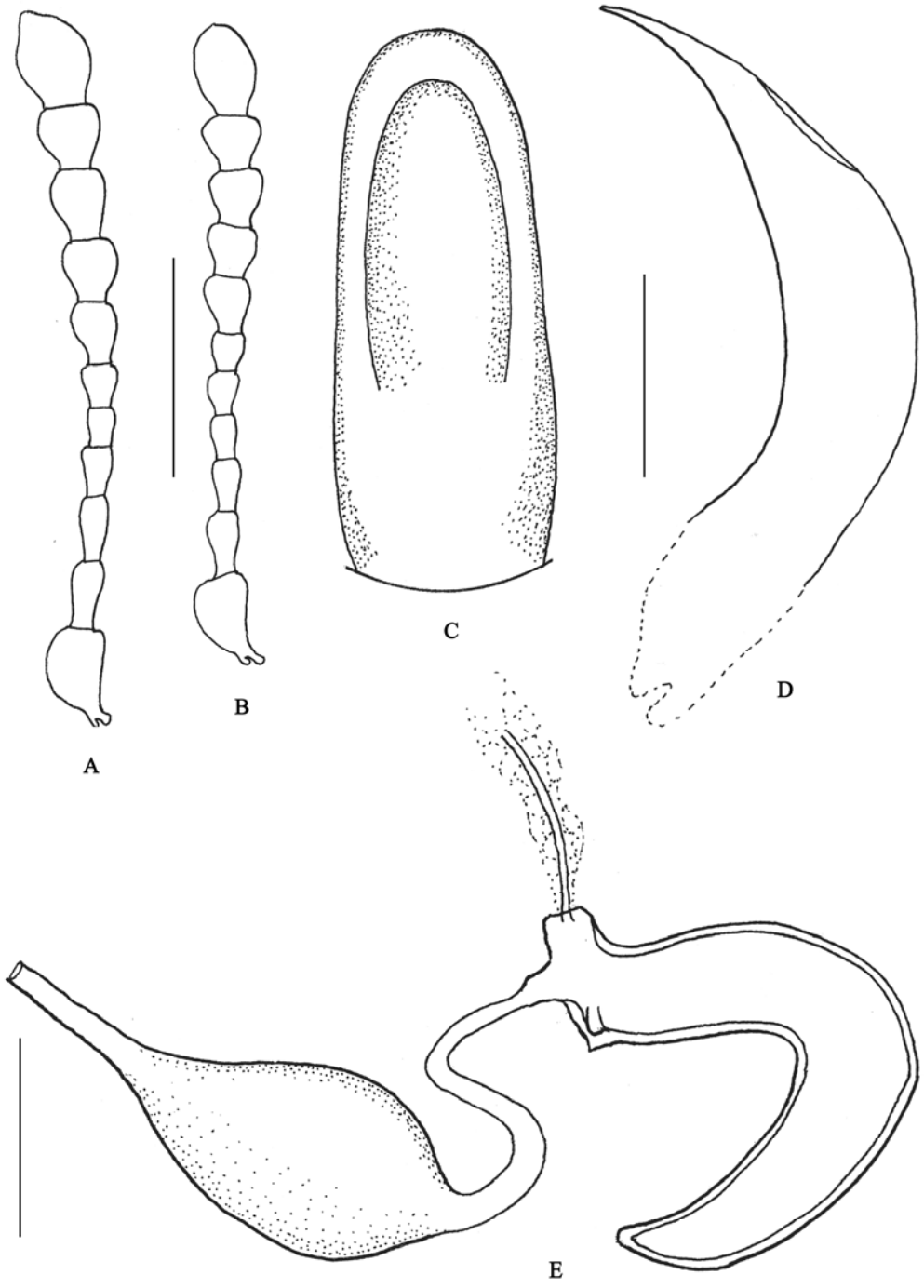

Fig. 10. *Phaedon flavotibialis* Lopatin, 2005. A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

***Phaedon geminatus* Daccordi & Ge, sp. nov.** (Fig. 11)

Description. Body length 3.1 mm, width 2.3 mm. Body ellipsoid, rather convex, hind wings absent. Colour hooker's green to cobalt blue.

Head. Frons and vertex with sparse and fine punctures. Antennae shown as Figs 11A, 11B.

Thorax and abdomen. Pronotum length 0.9 mm, width 1.8 mm; central disc with very thin and sparse punctures, lateral sides more denser. Scutellum sub-triangular, smooth and impunctate. Elytra length 2.4 mm; with double striae, interspace with very fine and sparse punctures. Epipleura glazed with very few punctures. Underside. Prosternal process wide, apex truncate. Hypomeron, mesoventrite and metaventrite, abdomen with coarse and dense punctures, lateral sides of prosternum, mesoventrite, metaventrite and first segment of abdomen. Antero-lateral plate of metaventrite small and impunctate.

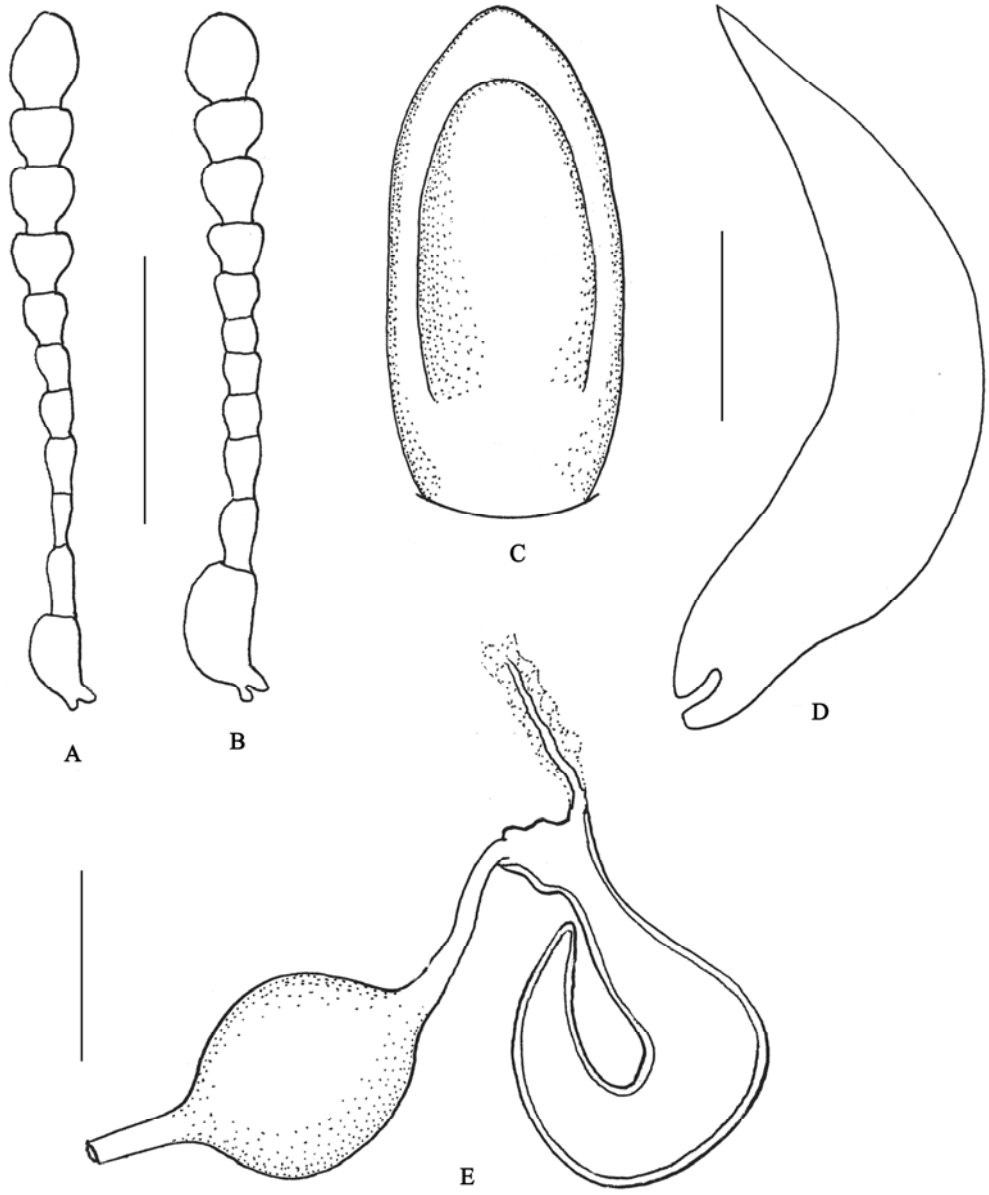

Fig. 11. *Phaedon geminatus* Daccordi & Ge, **sp. nov.** A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

Aedeagus. Shown as Figs 11C, 11D.

Spermatheca. Shown as Fig. 11E.

Material examined. Holotype male, Sichuan, Dofu, Songlinkou (elev. 3900 m), 12 July 1983, coll. Shu-Yong Wang (IZCAS). Paratypes: 1 female, same data as holotype (IZCAS); 1 male, N. Sichuan, W. Songpingou (elev. 3850 m), 17 August 2007, coll. Kabak (MDC).

Etymology. The specific name "*geminatus"* means elytra with double striae.

Remarks. The new species is similar to *Phaedon prosternalis*, but it can be distinguished from the latter by the elytra with double striae.

Distribution. China (Sichuan).

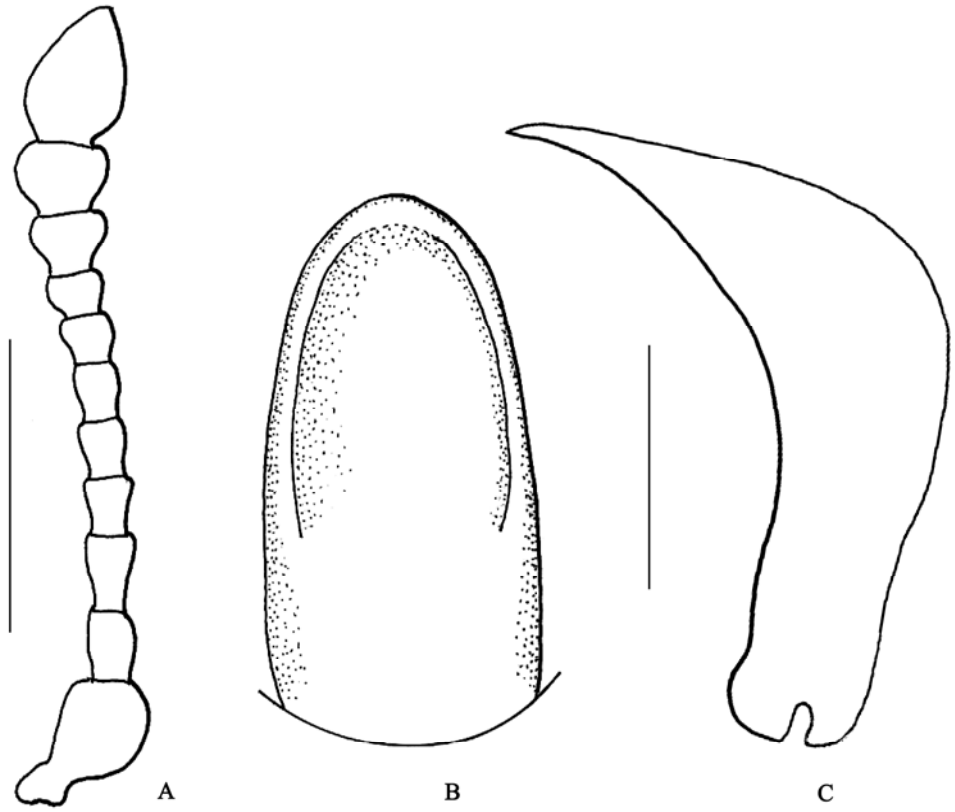

Fig. 12. *Phaedon gressitti* Daccordi, 1979. A. Antenna, male. B. Aedeagus, dorsal view. C. Aedeagus, lateral view. Scale bars: A = 0.5 mm; B–C = 0.2 mm.

***Phaedon gressitti* Daccordi, 1979** (Fig. 12)

Phaedon gressitti Daccordi, 1979: 448.

Description. Body length 3.1 mm, width 2.3 mm. Body elongate, rather convex, hind wings absent. Colour. Body black except lateral margins of pronotum and elytra, lateral margins of pronotum and elytra yellowish manila. Ventral side of body black, sometimes with metallic blue shining; legs, mouthparts, clypeus, antennae and scutellum brown. Lateral side of pronotum, hypomeron, epipleuron, lateral margin of elytra and elytra suture, base and apex of elytra yellow manila.

Head. Frons and vertex with dense punctures, the diameter same as those of pronotum.

Thorax and abdomen. Pronotum length 0.8 mm, width 1.6 mm; diameter of punctures being one and half times larger than those of elytra. Scutellum subtriangular, with very sparse punctures. Elytra length 2.2 mm; striae regular, interspace with fine and dense punctures. Epipleuron impunctate, with transversal wrinkles especially on apical one third part. Underside. Prosternal process narrow, apex slightly widened; hypomeron, mesoventrite, metaventrite and abdomen with

dense and fine punctures; antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 12B, 12C.

Spermatheca. Unknown.

Material examined. Holotype male, Tibet, Rongshar valley (elev. 2896 m), 25 June 1924, Maj. R., W.G. Hingston Everest Exp. Brit. (BMNH).

Remarks. The species can be distinguished by the following characters: black elytra and pronotum, lateral margin with yellowish manila.

Distribution. China (Tibet).

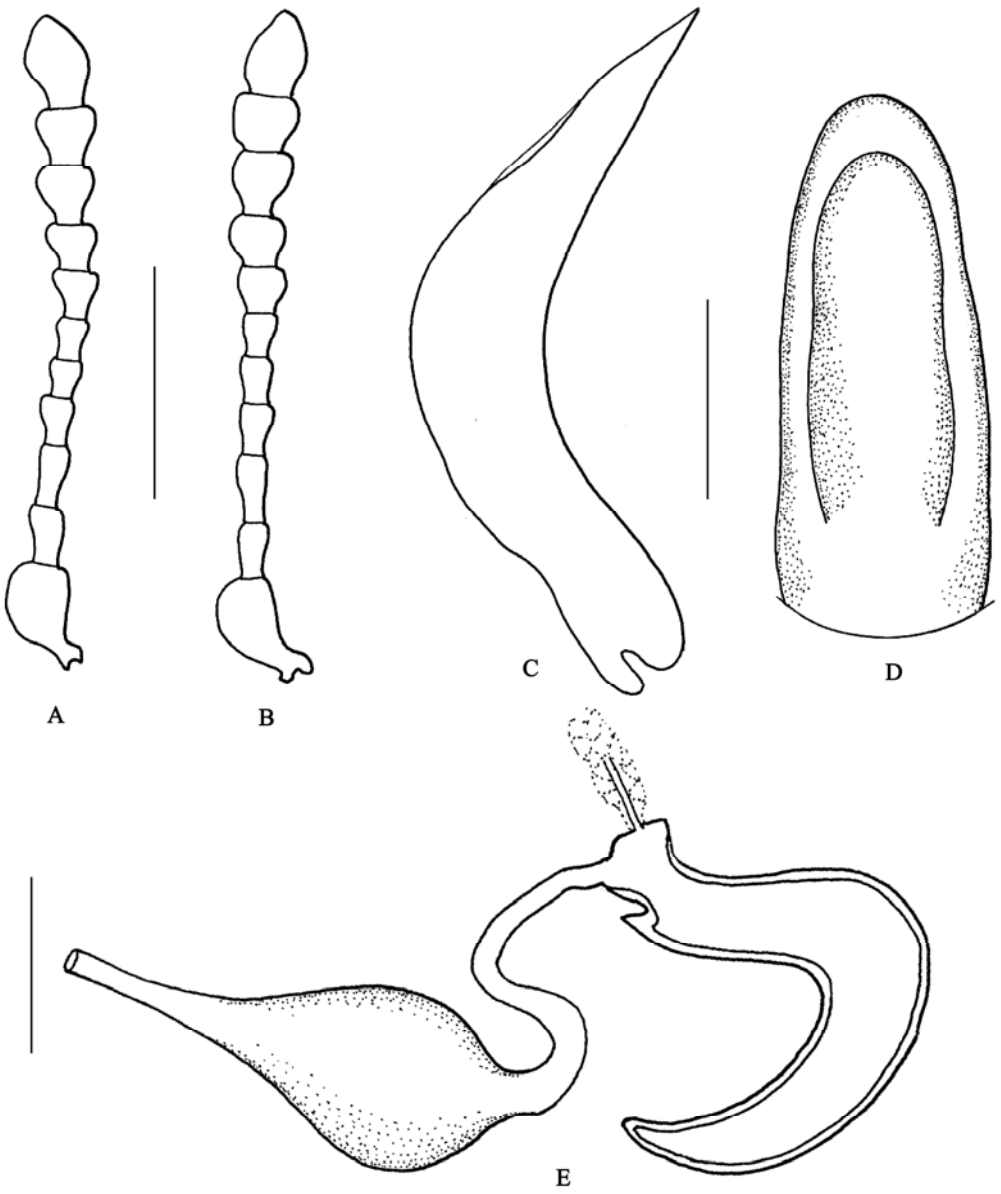

Fig. 13. *Phaedon huizuensis* Daccordi & Ge, **sp. nov.** A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

***Phaedon huizuensis* Daccordi & Ge, sp. nov.** (Fig. 13)

Description. Body length 2.9–3.2 mm, width 1.9–2.1 mm. Body elongate, rather convex, hind wings absent. Colour dark brown to dark green with dark blue reflection; tibiae and tarsi brick red.

Head. Vertex and frons with sparse and small punctures. Antennae shown as Figs 13A, 13B.

Thorax and abdomen. Pronotum length 0.9–1.0 mm, width 1.6–1.7 mm; with sparse punctures. Scutellum subtriangular, with very sparse punctures. Elytra length 2.3–2.5 mm; striae regular, interspace with fine and dense punctures. Epiperuron impunctate, with transversal wrinkles expecially on apical one third part. Underside. Prosternal process narrow, apex slightly widened. Hypomeron, mesoventrite, metaventrite and abdomen with dense and fine punctures. Antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 13C, 13D.

Spermatheca. Shown as Fig. 13E.

Material examined. Holotype male, China, E. Qinghai, pass 30 km S. of Huizu (elev. 3 600 m), 1–3 August 1992 (IZCAS). Paratypes 4 female, same data as holotype (1 female in IZCAS, 3 female in MDC).

Etymology. The specific name is referring to the type locality, Huizu.

Remarks. The new species is similar to *P. alpinus*, but it can distinguished from the latter by shinning interspace of elytra striae, slender aedeagus, and almost parallel lateral sides.

Distribution. China (Qinghai).

***Phaedon igori* Daccordi & Ge, sp. nov.** (Figs 14–15)

Description. Body length 2.0–2.4 mm, width 1.6–1.8 mm. Body hemisferic, rather convex, hind wings absent. Colour. Hooker's Green to cobalt blue; apex of tibiae, tarsi, antennomeres 1–3 and mandible mahogany red.

Head. Vertex and frons with sparse and small punctures. Antennae shown as Figs 15A, 15B.

Thorax and abdomen. Pronotum length 0.5–0.6 mm, width 1.2–1.4 mm; central disc with very sparse punctures; lateral side slightly denser. Scutellum subtriangular and impunctate. Elytra length 1.7–2.2 mm; with regular striae, punctures of striae sparse and fine, interspace with very few fine punctures. Underside. Hypomeron with dense punctures similar to prosternum; prosternal process wide, with some punctures along the sides, and wrinkled in the middle; metaventrite and abdomen with sparse punctures; antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 15C, 15D.

Spermatheca. Shown as Fig. 15E.

Material examined. Holotype male, China, Sichuan, E. of Danba, E. of Suopo (30°52'54"N, 102°03'05"E – 30°52'46"N, 102°03'34"E; elev. 4 560 – 4 780 m, 14 August 2004, coll. Belousov and Kabak (ZIN).

Paratypes 2 female, same data as holotype (1 female in IZCAS, 1 female in MDC).

Etymology. The speces is named for the Russian Entomologist, Prof. Igor Lopatin, who passed away in 2012.

Remarks. The new species can be distinguished from the other species of the genus by the following characters: body hemisferic, mouth part narrow, slender, rostriform, elytra striae with sparse and fine punctures.

Distribution. China (Sichuan).

***Phaedon insolitus* Ge & Daccordi, sp. nov.** (Figs 16–17)

Description. Body length 2.9 mm, width 1.9 mm. Body ellipsoid, rather convex, hind wings absent. Colour. Hooker's green to smalt blue; apex of the tibiae, tarsi and the antennomeres 1–3 mahogani red to burnt sienna.

Head. Frons and vertex with dense and fine punctures. Antennae shown as Fig. 17A.

Thorax and abdomen. Pronotum length 0.8 mm, width 1.6 mm; disc with dense and coarse punctures especially in lateral sides (Fig. 16A). Scutellum subtriangular and impunctate (Fig. 16C). Elytra length 2.3 mm; striae regular, interspace with fine and sparse punctures (Fig. 16C). Epipleuron with double range punctures near the inner margin (Fig. 16E). Underside. Prosternal process wide, apex truncate. Hypomeron, mesoventrite, metaventrite and abdomen with sparse and fine punctures; Antero-lateral plate of metaventrite small and impunctate (Figs 16B, 16D, 16E).

Aedeagus. Shown as Figs 17B, 17C.

Spermatheca. Unknown.

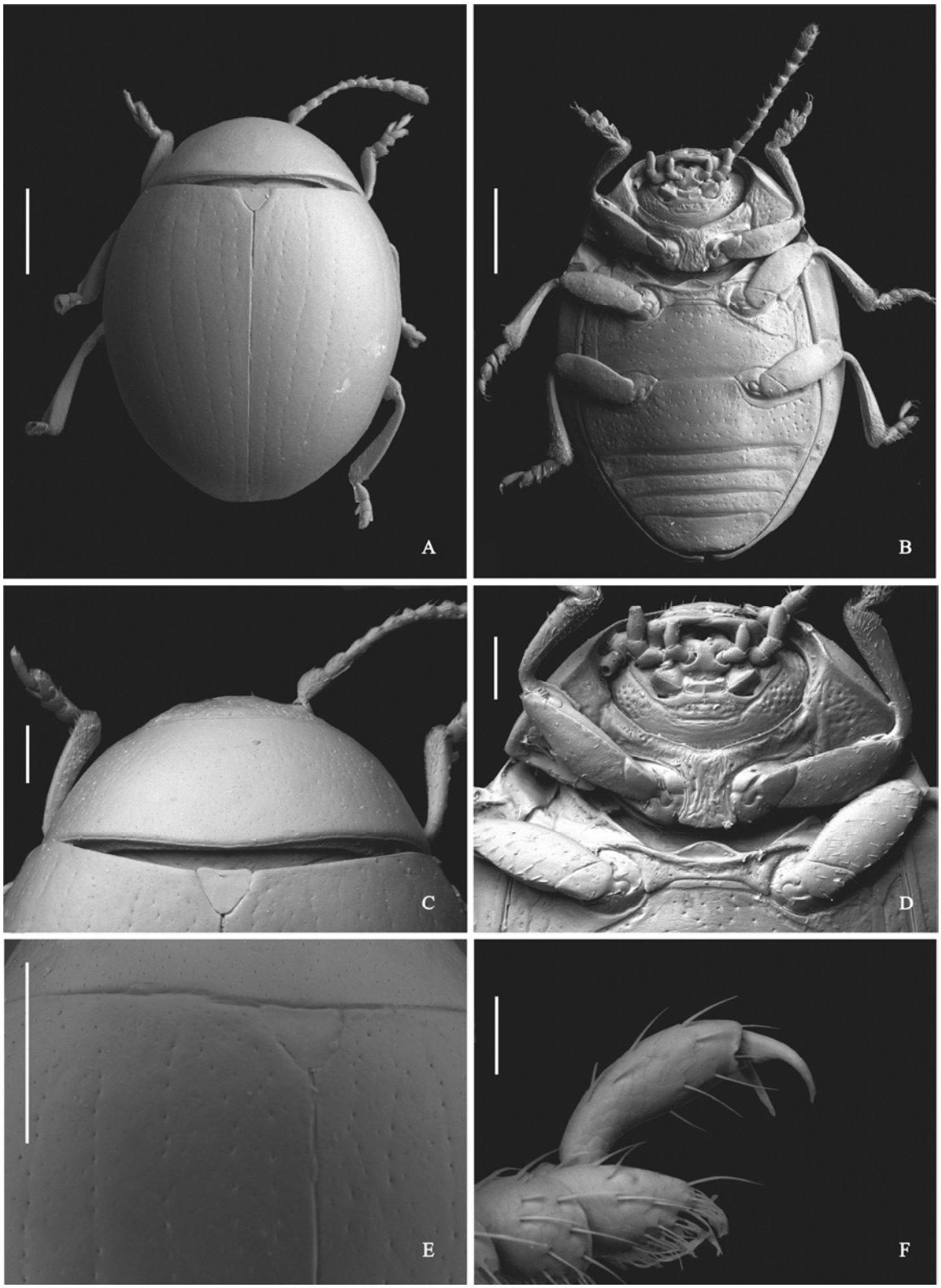

Fig. 14. *Phaedon igori* Daccordi & Ge, **sp. nov.**, SEM. A. Habitus, dorsal view. B. Habitus, ventral view. C. Head and thorax, dorsal view. D. Head and thorax, ventral view. E. Base of elytra, showing punctures. F. Onychium, lateral view. Scale bars: A–B, E = 0.5 mm; C–D = 0.2 mm; F = 0.05 mm.

Material examined. Holotype male, China, NW. Sichuan, between Luhuo-Sanggarmai pass, W. of Luhuo, Alpine region (elev. 4200–4300 m), 8–28 June 2004, coll. R. Fabbri (ZIN). Paratypes 2 male, same data as holotype (MDC).

Etymology. The specific name is referring to the strange body shape.

Remarks. The new species can be distinguished from *Phaedon igori* by the dull surface and dense punctures in pronotum.

Distribution. China (Sichuan).

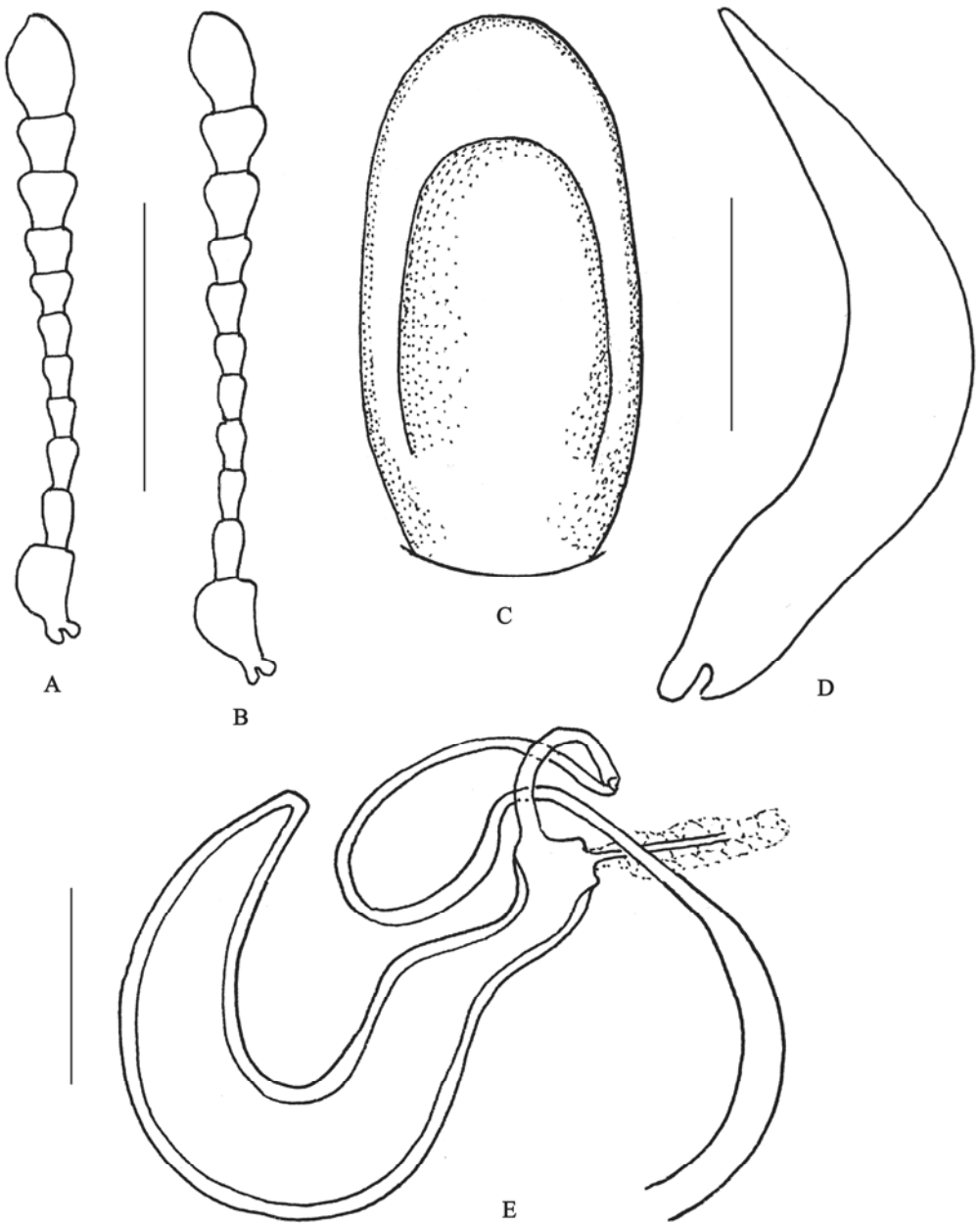

Fig. 15. *Phaedon igori* Daccordi & Ge, **sp. nov.** A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

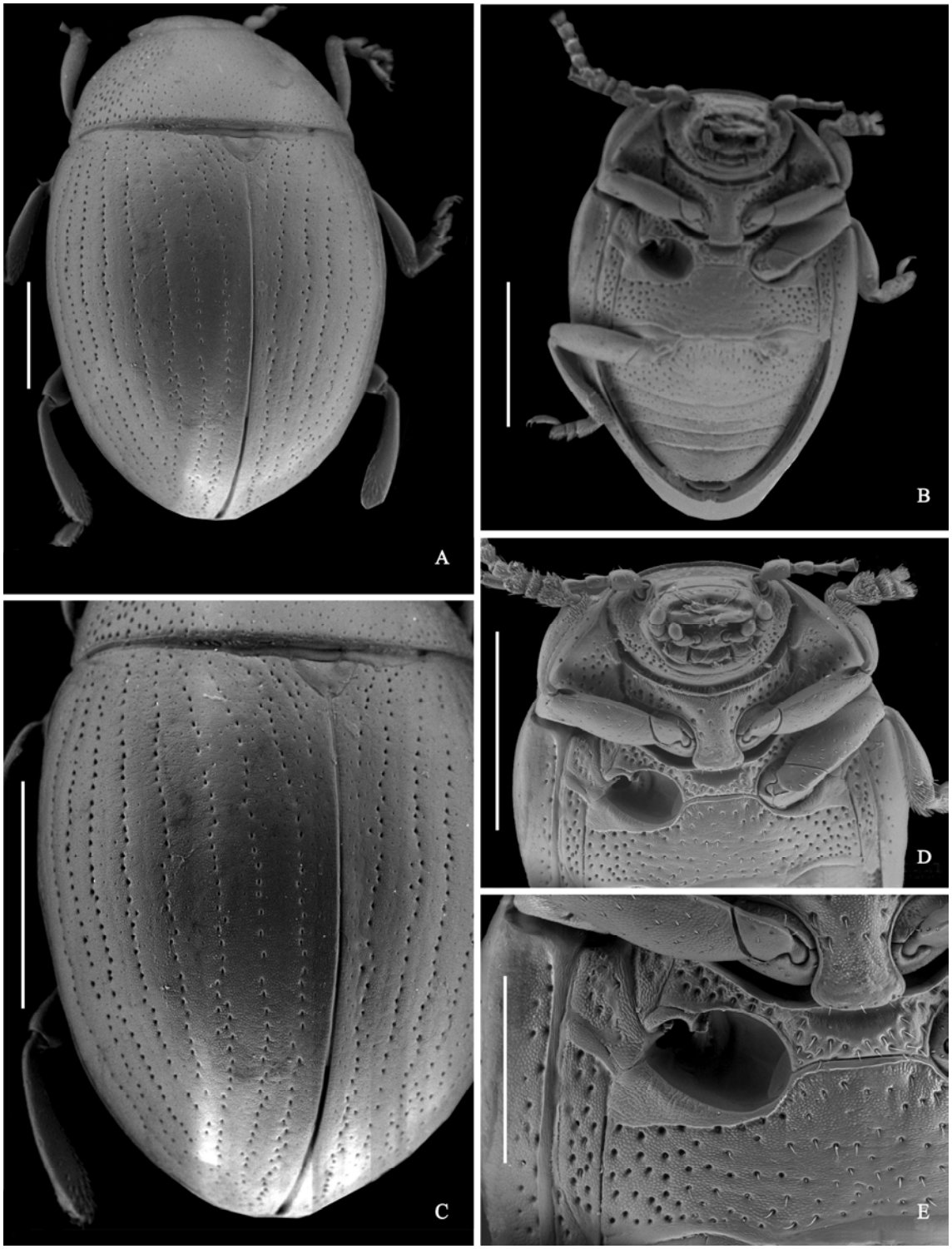

Fig. 16. *Phaedon insolitus* Daccordi & Ge, **sp. nov.**, SEM. A. Habitus, dorsal view. B. Habitus, ventral view. C. Elytra. D. Head and thorax, ventral view. E. Metaventrite, ventral view. Scale bars: A–B, D = 1 mm; C, E = 0.5 mm.

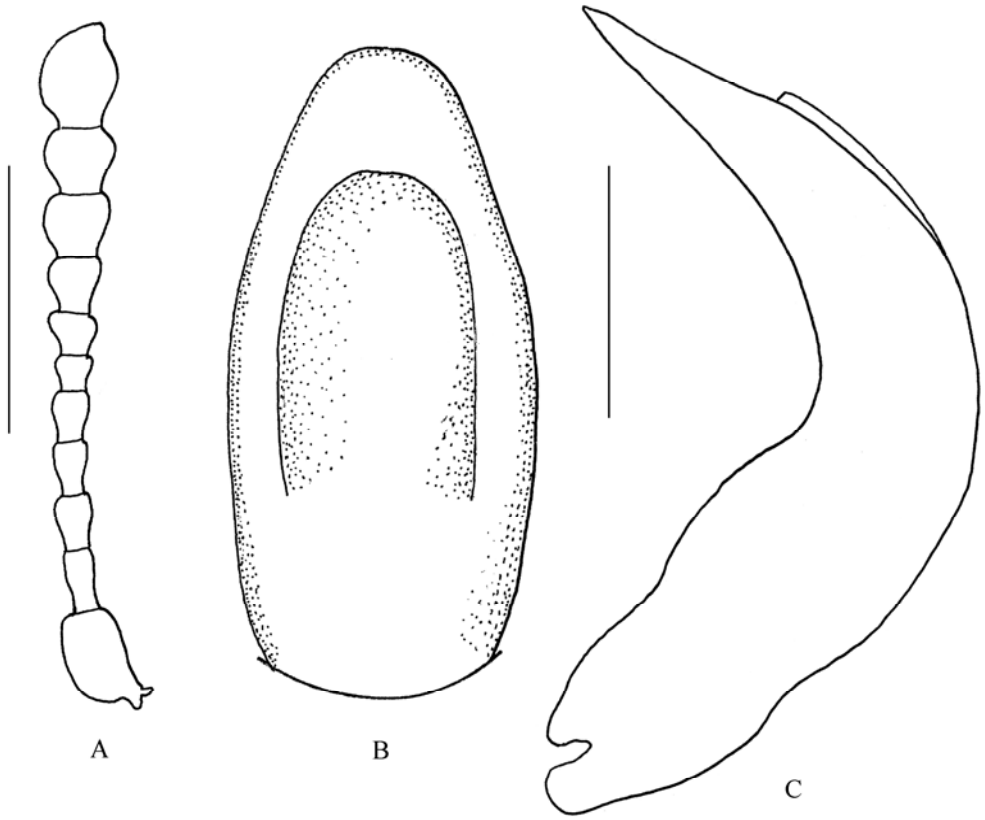

Fig. 17. *Phaedon insolitus* Daccordi & Ge, **sp. nov.** A. Antenna, male. B. Aedeagus, dorsal view. C. Aedeagus, lateral view. Scale bars: A = 0.5 mm; B–C = 0.2 mm.

***Phaedon mellyi* Achard, 1926** (Figs 18–19)

Phaedon mellyi Achard, 1926: 137.

Description. Body length 3.5 mm, width 2.2 mm. Body elongate, rather convex, hind wings present. Colour dorsum metallic blue; underside of body, legs dark blue, last segment of abdomen yellowish brown; antennae black, basal two segments of antennae reddish brown.

Head. Frons and vertex with coarse and dense punctures (Fig. 18B). Antenna shown as Fig. 19A.

Thorax and abdomen. Pronotum length 0.9 mm, width 1.9 mm; disc with dense and coarse punctures (Fig. 18A). Scutellum subtriangular, impunctate (Fig. 18C). Elytra length 2.9 mm; striae regular, interspace with fine and sparse punctures. Epipleuron with dense punctures. Underside. Prosternal process narrow, slightly widened apically; hypomeron, mesoventriate, metaventrate and abdomen with dense and coarse punctures; antero-lateral plate of metaventrite large and impunctate.

Aedeagus. Shown as Figs 19B, 19C.

Spermatheca. Unknown.

Material examined. Holotype male, China, Hung-Kom. Melly / Chevrolat collection (teste Achard): "Chinense Chevr., Chine boréale, Hong-Kung, Melly" / Type / Phaedon mellyi n: sp. J. Achard det. (NMPC).

Remarks. The species is similar to *Phaedon alticola* (Chen), but it can be distinguished by the frons with coarse and dense punctures.

Distribution. China (HongKong).

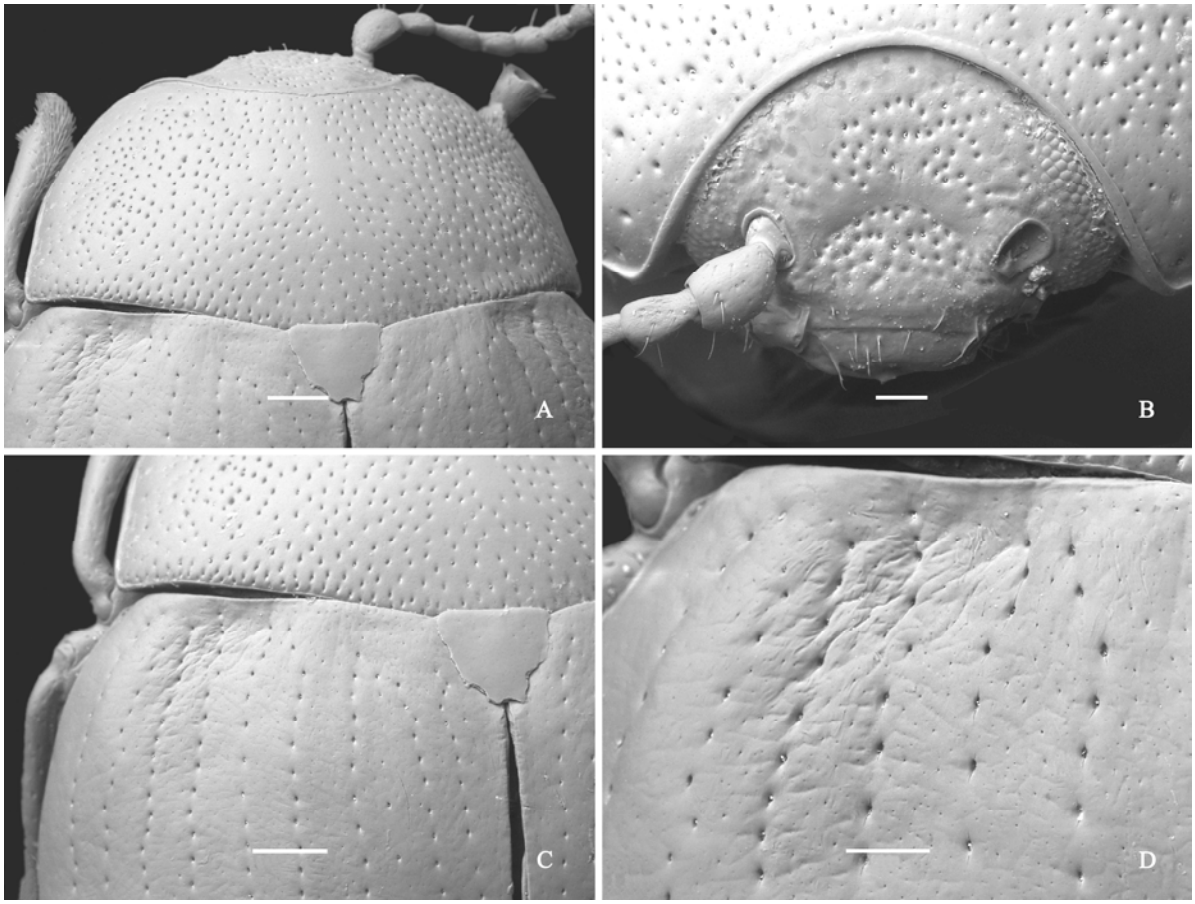

Fig. 18. *Phaedon mellyi* Achard, 1926, SEM. A. Head and thorax, dorsal view. B. Head, dorsal view. C. Base of elytra. D. Base of Elytra, high magnification, showing punctures. Scale bars: A, C = 0.2 mm; B, D = 0.1 mm.

***Phaedon prosternalis* Daccordi & Ge, sp. nov.** (Figs 20–21)

Description. Body length 2.9–3.5 mm, width 1.9–2.5 mm. Body ellipsoid, rather convex, hind wings absent. Colour vandyke brown to natal brown; tarsi and tibiae mikado brown to tone down.

Head. Frons and clypeus with sparse punctures (1–3 times the diameter). Antenna shown as Figs 21A, 21B.

Thorax and abdomen. Pronotum length 0.7–0.8 mm, width 1.5–1.7 mm; central disc with very thin and sparse punctures, lateral sides with distincte separate punctures. Scutellum subtriangular, smooth and impunctate. Elytra length 2.2–2.4 mm; elytra glazed and dull in particular apically; elytra with single striae, interspace with very fine and sparse punctures. Epipleura glazed with very few punctures. Underside. Prosternal process wide, apex truncate; hypomeron, mesoventrite and metaventrite, abdomen with coarse and dense punctures, lateral sides of prosternum, mesoventrite, metaventrite and first segment of abdomen; antero-lateral plate of metaventrite small and impunctate (Figs 20A, 20C, 20D).

Aedeagus. Shown as Figs 21C, 21D.

Spermatheca. Shown as Fig. 21E.

Material examined. Holotype male, W. Sichuan (Ganzi Tibet. Aut. Pref. Yajiang Co.), Shalui Shan, 20 km W. Yajiang, brook cleft, alp. Meadow (30°01'N, 100°41'E; elev. 4250 m), 2 July 1999, coll. D. W. Wrase (NMEG). Paratypes: 1 male, W. Sichuan, Yaan Pref., Shimiana Co. Xiaoxiang Ling Pass betw. Shimian–Garduo, 27 km SE. Shimian, springfed-swamp (29°02'75"N, 102°31'48"E; elev. 2450 m), 8 July 1999, coll. A. Putz (MDC); 1 female, W. Sichuan, Ganzi Tibet. Aut. Pref. Yajiang Shalui Shan Waldrest 32 km WNW. Yajiang, Nadeistreu (30°08'N, 100°42'E; elev. 4300 m), 4 July 1999, coll. M.

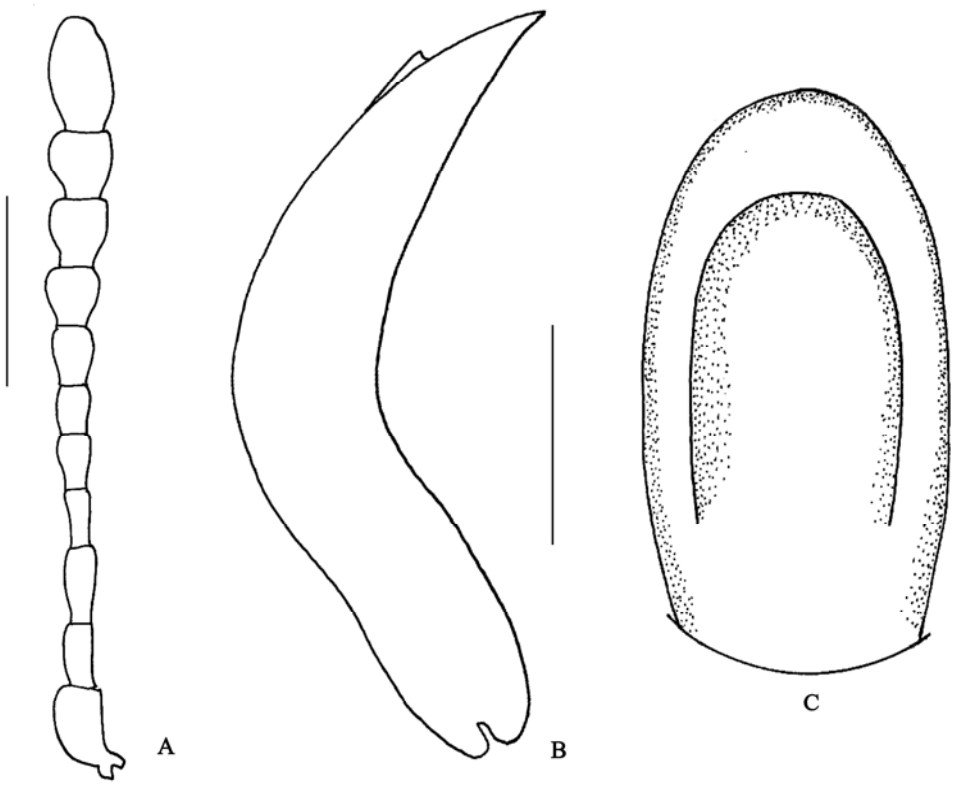

Fig. 19. *Phaedon mellyi* Achard, 1926. A. Antenna, male. B. Aedeagus, lateral view. C. Aedeagus, dorsal view. Scale bars: A = 0.5 mm; B–C = 0.2 mm.

Schulke (NMEG); 1 male, N. Sichuan, NNE. of Luoduo Village. (32°09'42"N, 103°23'03"E – 32°09' 42"N, 103°21'52"E; elev. 3800 – 4585 m), 18 August 2007, coll. Belousov & Kabak, with a Lopatin's label "Neophaedon" (ZIN); 1 female, W. Sichuan, road Qianning-Dawru pass, 35 km NNW. Qianning, Alpine and forest Region (elev. 3951 m), 1 August 1994. coll. J. Turna. (MDC); 1 male, N. Sichuan, W. Song-Pinggou (elev. 3890 m), 17 August 2007, coll. Kabak. (ZIN).

Etymology. The specific name is referring to the wide prosternal process.

Remarks. The new species is similar to *Phaedon geminatus*, but it can be distinguished from the latter by elytra with single striae.

Distribution. China (Sichuan).

***Phaedon wumingshanensis* Ge & Wang, 2002** (Fig. 22)

Phaedon wumingshanensis Ge & Wang, 2002: 322.

Description. Body length 4.8 mm, width 2.5 mm. Body elongate, rather convex, hind wings absent. Colour metallic greenish aeneous; underside, antennae, legs, maxillary palpi black.

Head. Frons and vertex with coarse and dense punctures. Antenna shown as Fig. 22A.

Thorax and abdomen. Pronotum length 1.0 mm, width 1.85 mm; disc with two kinds of punctures, coarse punctures mainly at lateral and base, fine punctures mainly in center, and mixed among coarse punctures. Scutellum triangler, with fine punctures at base. Elytra length 2.75 mm; punctures striae arranged in pair, 6, 7 and 8, 9 rows convergent joined together at base; ninth situated much nearer to lateral margin than eighth, very sparse; interspace flat, impunctate. Epipleura broadened at base, much narrowed behind, with coarse punctures. Underside. Prosternal process wide, apex rounded. Hypomeron, mesoventrite and metaventrite, abdomen with fine and sparse punctures. Antero-lateral plate of metaventrite small and impunctate.

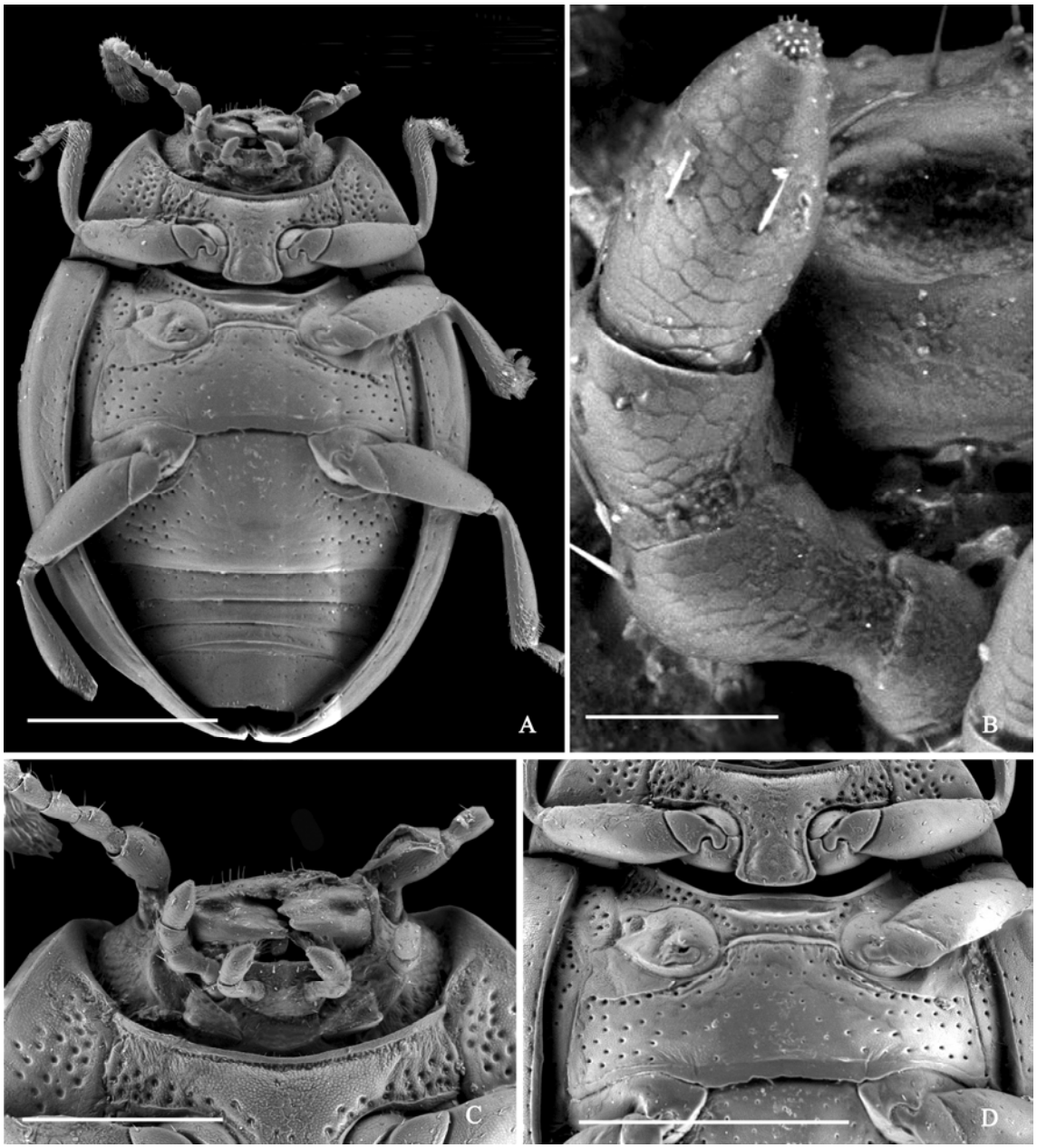

Fig. 20. *Phaedon prosternalis* Daccordi & Ge, **sp. nov.**, SEM. A. Habitus, dorsal view. B. Maxillary palpi. C. Head and prothorax, ventral view. D. Head and thorax, ventral view. Scale bars: A, D = 1 mm; B = 0.1 mm; C = 0.5 mm.

Aedeagus. Lateral side almost parallel near apex, apex pointed.

Spermatheca. Shown as Fig. 22B.

Material examined. Holotype male, Sichuan, Wumingshan Yakou (elev. 4600 m), 5 August 1982, coll. Shu-Yong Wang (IZCAS). Paratype 1 female, same data as holotype (IZCAS). Other materials: 1 female, China, W. Sychuan, 60 km E. Siangcheng (Xiangcheng) (elev. 4500–4700 m), 3 August 1996, coll. S. Murzin (MDC).

Remarks. The species is distinguished from *Phaedon apterus* Wang by pronotum with two kinds of punctures, interspace of elytra striae flat, impunctate and epipleura with coarse punctures.

Distribution. China (Sichuan).

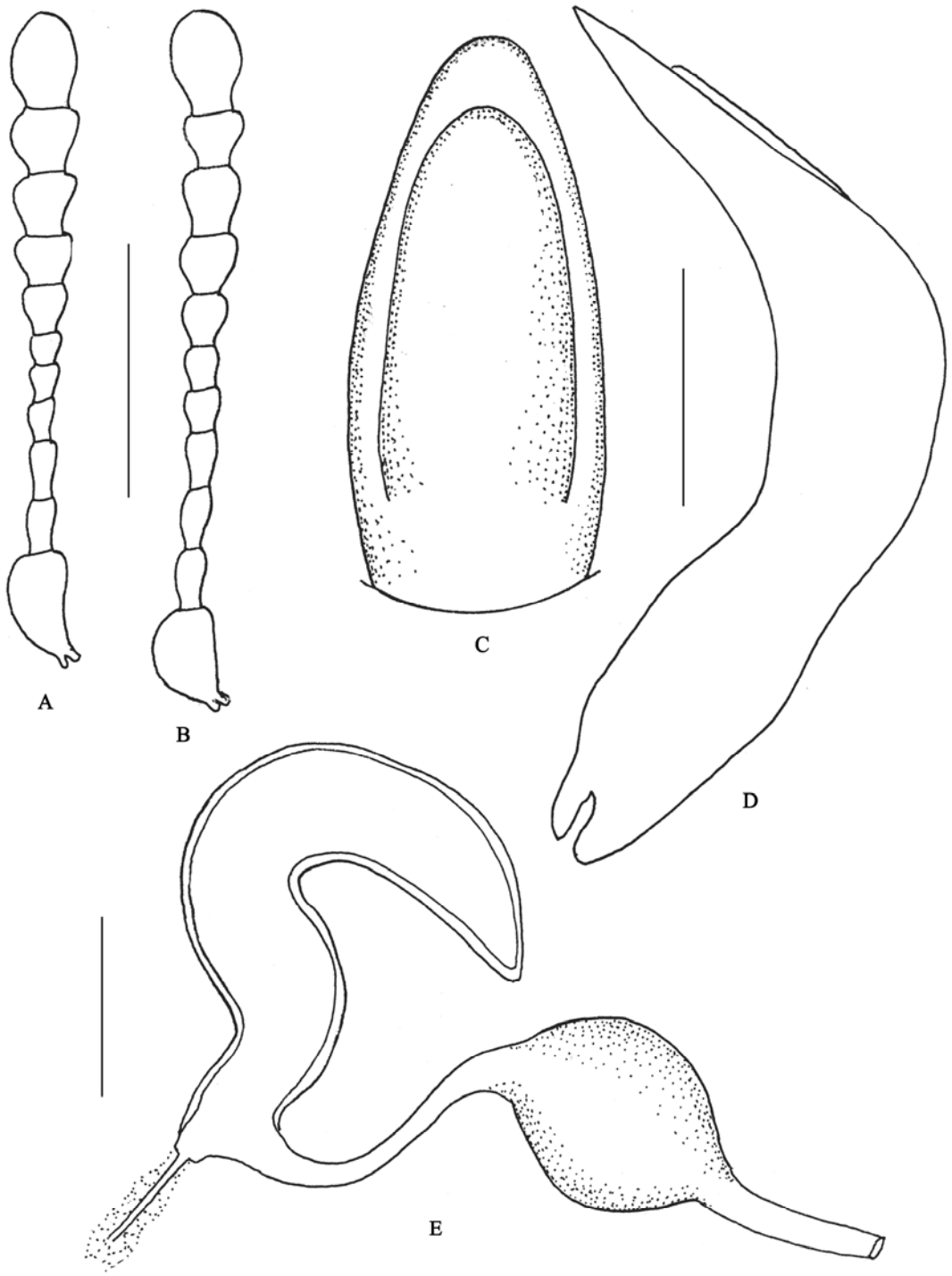

Fig. 21. *Phaedon prosternalis* Daccordi & Ge, **sp. nov.** A. Antenna, male. B. Antenna, female. C. Aedeagus, dorsal view. D. Aedeagus, lateral view. E. Spermatheca. Scale bars: A–B = 0.5 mm; C–D = 0.2 mm; E = 0.1 mm.

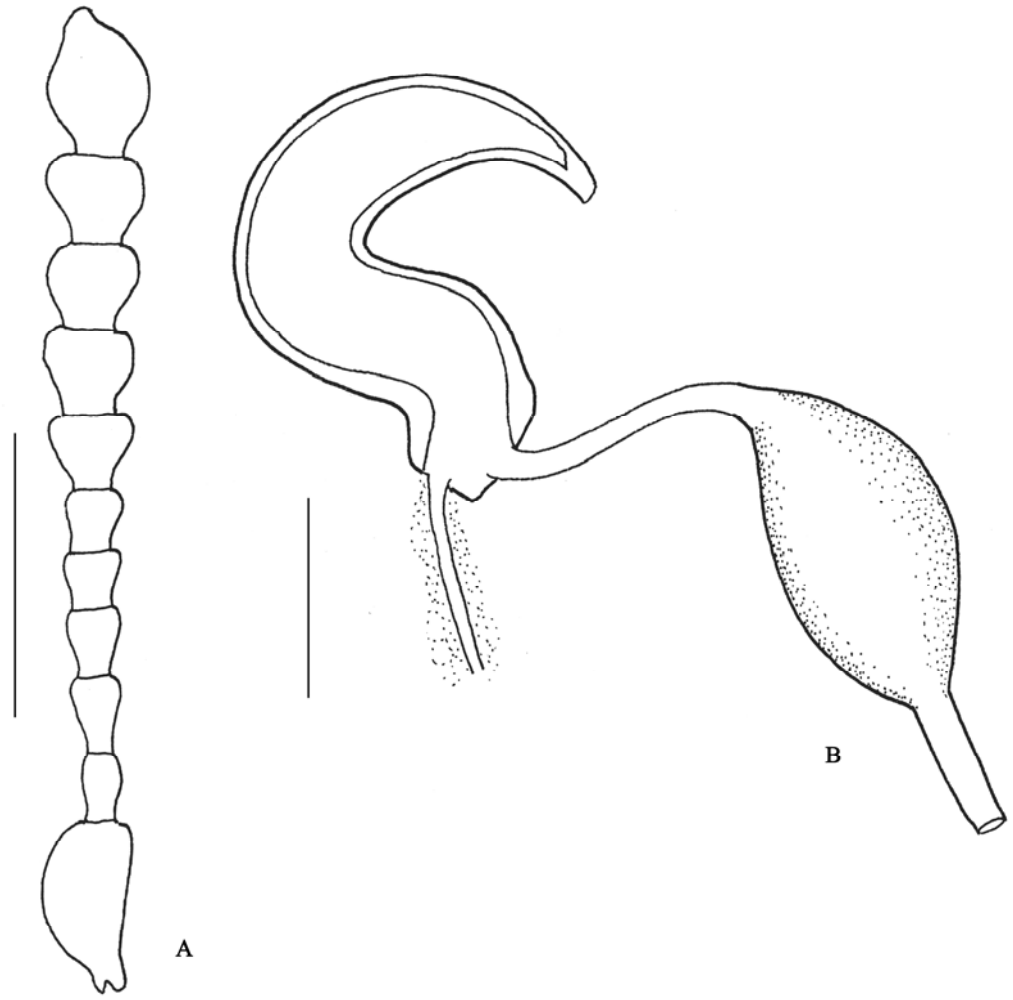

Fig. 22. *Phaedon wumingshanensis* Ge & Wang, 2002. A. Antenna, female. B. Spermatheca. Scale bars: A = 0.5 mm; B = 0.1 mm.

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