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● Description of a new species of genus *Dorcus* MacLeay, 1819 (Coleoptera: Lucanidae: Lucaninae) from Sichuan, China

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Abstract: *Dorcus hei* sp. nov. is described from eastern Sichuan of China. For comparing with the new species, male genitalia of *Dorcus fujiii* Nagai & Maeda, 2010 from north Vietnam is illustrated for the first time.

Keywords: Dorcini, morphology, stag beetle, taxonomy, Vietnam

● 中国四川一大锹属新种记述（鞘翅目：锹甲科：锹甲亚科）

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摘要: 描述了一种产自中国四川省的大锹属新种: 贺氏刀锹 *Dorcus hei* sp. nov.。作为对比, 本文首次提供了产自越南北部的藤居刀锹 *Dorcus fujiii* Nagai & Maeda, 2010 的生殖器图版。

关键词: 刀锹族, 形态学, 锹甲, 分类学, 越南

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● Introduction

The genus *Dorcus* MacLeay, 1819 is one of the most species-rich genera in stag beetles, occurring from the Australasian, Nearctic, Oriental, and Palaearctic Regions (Fujita 2010). Before this study, 75 species of the genus had been recorded from China (Huang & Chen 2013, 2017, 2023, 2024; Wang & He 2024; Qi *et al.* 2025; Zhan & Young 2025). In 2025, the first author collected several paired *Dorcus* specimens, and the female individuals exhibit impressive unusual appearance. These individuals mated successfully under an artificial environment, and the females laid some eggs. After comparison with known congeners, we confirm that these specimens represent a species new to science, herein describe as *Dorcus hei* **sp. nov.**

● Material and methods

Type specimens of the new species bear the following labels: 1. “HOLOTYPE [red]” or “PARATYPE [yellow]”; 2. “*Dorcus hei*, Liu, Luo & Wang 2025”; 3. Collecting data label. Data labels of type specimens are quoted verbatim. Separate label lines are indicated by a slash (/), and separate labels by a double slash (//). Photos were taken using a Canon D60 digital camera with Canon AF 100 mm macro lens.

The specimens examined in this study are deposited in the following collections:

DQPC—personal collection of Qing-Yun Deng, Chengdu, China;

HTPC—personal collection of Tian-Long He, Huainan, China;

LJPC—personal collection of Jun-Jie Liu, Chongqing, China;

MYNU—Invertebrate Collection of Mianyang Normal University, Mianyang, China (Hao Xu).

The following specimens of the genus *Dorcus* were used for comparison:

Dorcus fujiii Nagai & Maeda, 2010: 2♂♂ (HTPC), Mucangchai-Yen Bai, Viet Nam, 1700 m, 7/2022.

Dorcus tanakai Nagai, 2002: 1♀ (LJPC), Nanling, Guangdong, 2024.7, Local leg.

Dorcus striatipennis davidi (Seguy, 1954): 1♀ (LJPC), Longwang Mount, Anji County, Huzhou City, Zhejiang, 2023.6, Local leg.

● Taxonomy

Dorcus hei Liu, Luo & Wang **sp. nov.** 贺氏刀锹

<https://zoobank.org/592A2492-70D2-4634-B356-86743E0BB416>

Figs. 1, 2, 4, 5, 7, 10, 12, 14, 16, 18, 20, 22, 24, 26–32

Type material. Holotype, ♂ (MYNU): CHINA: Sichuan Province / Guang’an City, Huangying Mount / alt. 1400 m, 12–15.VIII.2025 / Jun-Jie Liu, Qing-Yun Deng & Jun-Jie Tan leg. // HOLOTYPE // *Dorcus hei* / Liu, Luo & Wang 2025.

Paratypes (3♂♂2♀♀): 2♂♂ (LJPC): same data as the holotype; 1♂1♀ (DQPC): same data as the holotype; 1♀ (MYNU): same data as the holotype.

Description. Holotype. large-sized male. Body 34.2 mm long, widest across anterior 1/2 of pronotum. Length of particular parts (mm): head (4.3), mandible (9.4), pronotum (5.9), elytra (14.6); width (mm): head (9.1), pronotum (10.1), elytra (9.2).

Habitus. Color black, some distinct, recumbent, yellowish villous present on lateral parts of metasternum, some yellowish pubescence sparsely present on abdominal sternite III–VI and densely along posterior margin of abdominal sternite VII.

Head about 2.1 times as broad as long, broadest across posterior end of preocular margin, surface entirely covered with rather fine punctures, interstices shagreened. Vertex inconspicuously depressed in a triangular center area. Clypeolabrum shortly transverse slightly concave in medial part of anterior margin. Mandible about 2.2 time as long as head, slender, bifurcate at apices and provided with a pair of bidentate inner teeth, apical tooth is sharply

projected anteriad. Preocular margin obviously arcuate. Postocular margin bulged into a round process. Antennal club with three pubescent antennomeres; antennomere 7 sharp at inner apical angle; antennomeres 8–10 lamellate. Mentum subtrapezoidal, surface covered with indistinct coarse punctate, anterolateral angles rounded. Submentum inverted trapezoidal, ultrafinely punctate. Gula elongate, smooth.

Pronotum 1.7 times as wide as long, widest at anterior $2/5$, and 1.1 times as wide as head. Lateral margin distinctly arcuate before posterior angle. Posterior margin slightly bisinuate. Lateral angles well produced. Posterior angles roundly acute. Surface mostly smooth, slightly depressed along posterior part of midline, covered with ultrafinely punctures.

Scutellar shield linguiform. Surface finely and roundly punctate, interstices microreticulate.

Elytra 1.6 times as long as wide, widest around anterior $1/3$, about 0.9 times as wide as pronotum. Surface smooth, anterior part fine punctures, remaining parts with ultrafine punctures.

Legs. Protibia with 5–6 large teeth, slightly acute along outer margin; apex bifurcate with branches acute at tip. Except apical spurs and spines, each meso- and metatibia with one sharp spine and one denticle along outer margin.

Male genitalia. Abdominal tergite VIII subhexagonal, with subrectangular membranous area at middle of anterior half; sternite VIII transverse, with subtriangular membranous area at middle of anterior part. Abdominal tergite IX subtrapezoidal at posterior margin; pleurite IX separated dorsally; sternite IX uniform in thickness at anterior. Aedeagus in ventral view about 3.1 times as long as wide; basal piece distinctly constricted in anterior part, about 1.3 times as long as parameres, with paired sclerotized large dorsal plates; ventral caudal plate not bifurcate at apex; paramere with basal process; median lobe slender and biarcuate, about half length of parameres; flagellum rather long and narrow, apical part very linear, median part narrow, basal part wide, two short additional branches at end of basal part.

Male paratype. Small-sized male (Figs. 2, 5). Body 25.9 mm long. Length of particular parts (mm): head (3.6), mandible (5.8), pronotum (4.9), elytra (11.6); width (mm): head (6.9), pronotum (8.4), elytra (8.1).

Habitus. Color black, some distinct, recumbent, yellowish villous present on lateral parts of metasternum, some yellowish pubescence sparsely present on abdominal sternite III–VI and densely along posterior margin of abdominal sternite VII.

Head about 1.9 times as broad as long, broadest across posterior end of preocular margin, surface entirely covered with rather fine punctures, interstices shagreened. Vertex inconspicuously depressed in a triangular center area. Clypeolabrum shortly transverse. Slightly concave in medial part of anterior margin. Mandibles about 1.6 times as long as head, slender and with a pair of bidentate inner teeth, apical tooth weak, portion just before inner tooth abruptly narrowed toward apex. Preocular margin obviously arcuate. Postocular margin bulged into a round process. Antennal club with three pubescent antennomeres; antennomere 7 sharp at inner apical angle; antennomeres 8–10 lamellate. Mentum subtrapezoidal, surface covered with coarse punctate, anterolateral angles rounded. Submentum inverted trapezoidal, ultrafinely punctate. Gula elongate, smooth.

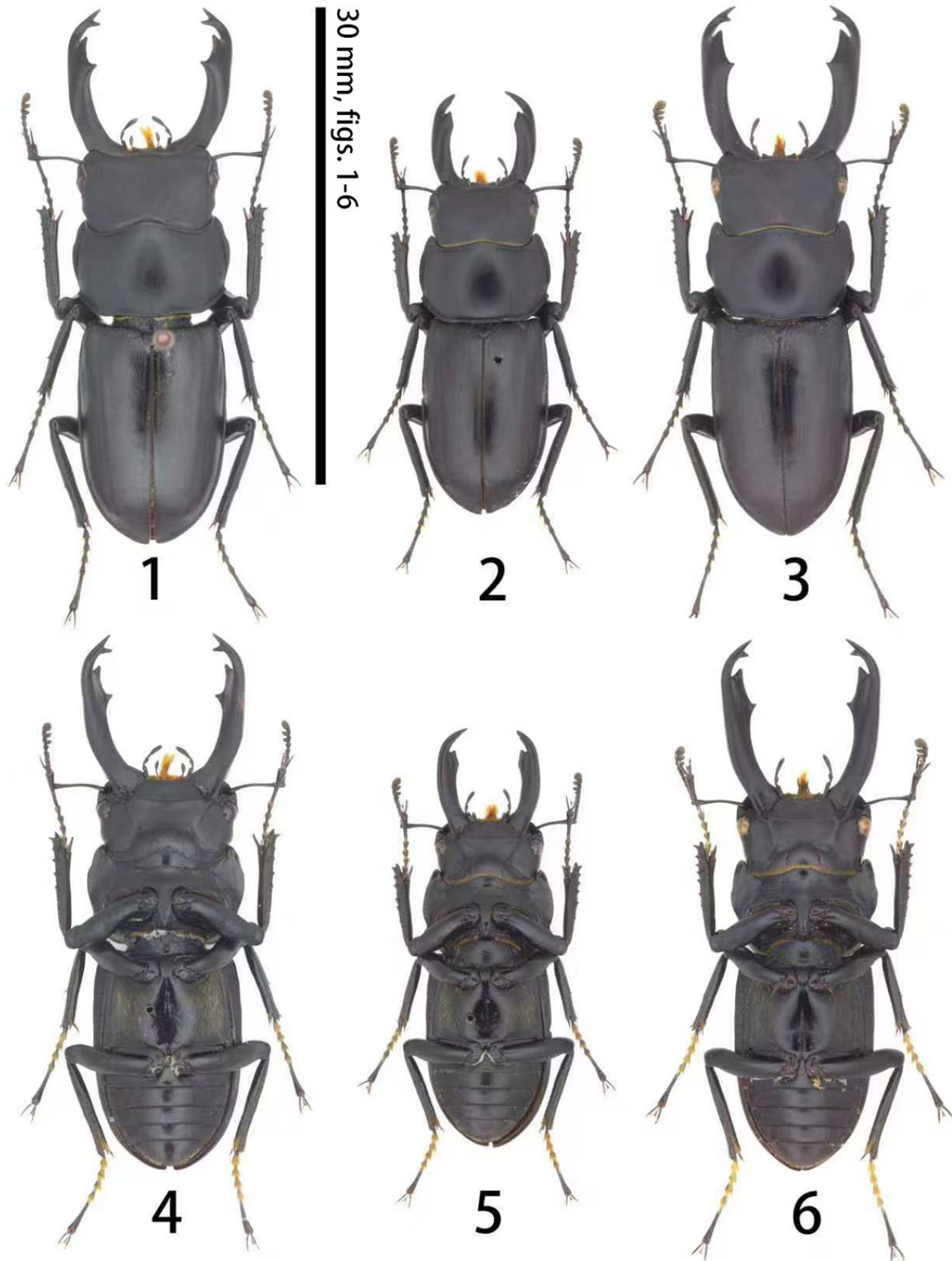
Pronotum 1.7 times as wide as long, widest at anterior $1/2$, and 1.2 times as wide as head. Lateral margin distinctly arcuate before posterior angle. Posterior margin slightly bisinuate. Lateral angles degenerated. Posterior angles roundly acute. Surface mostly smooth, slightly depressed along posterior part of midline, covered with ultrafinely punctures.

Scutellar shield linguiform. Surface finely and roundly punctate, interstices microreticulate.

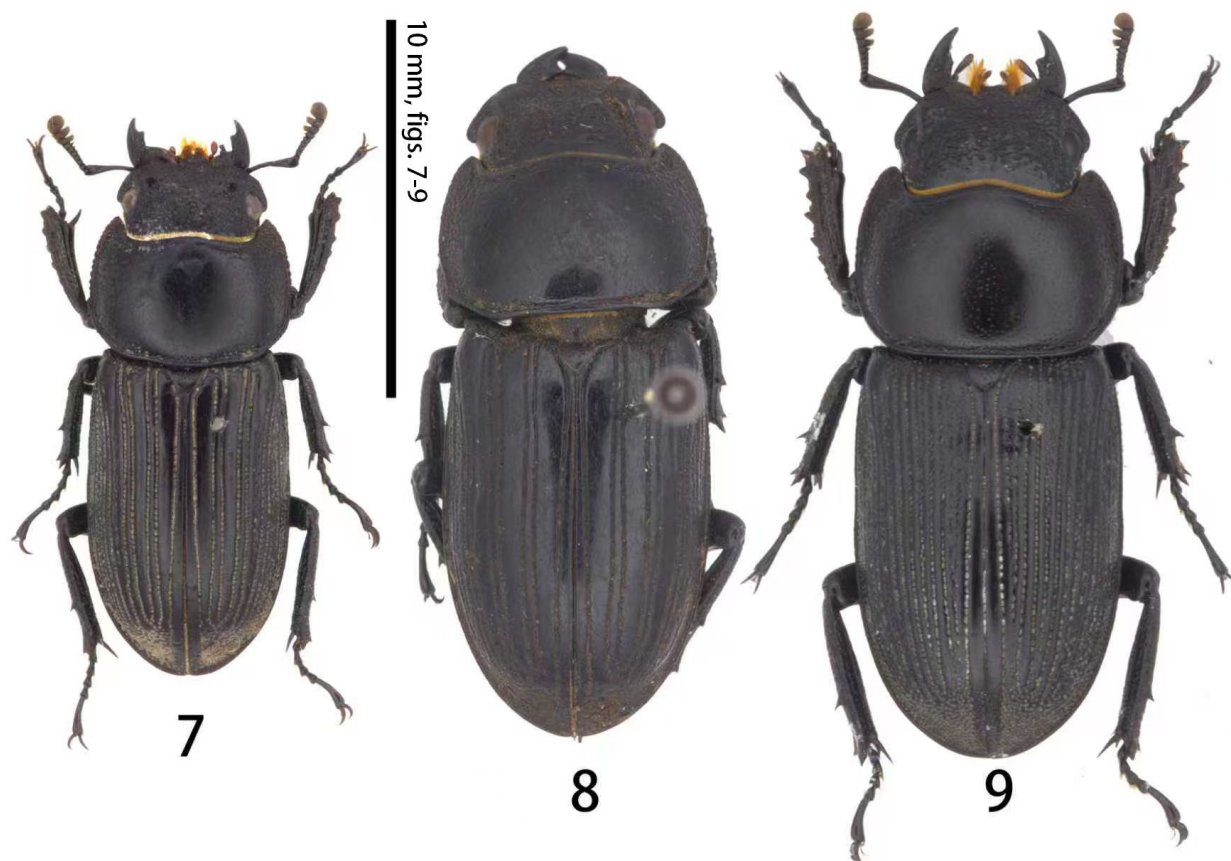
Elytra 1.4 times as long as wide, widest around anterior $1/3$, with width subequal to pronotum. Surface smooth, covered with fine punctures which as if in rows.

Legs. Protibia with 5–6 large teeth, slightly acute along outer margin; apex bifurcate with branches acute at tip. Except apical spurs and spines, each meso- and metatibia with one sharp spine and one denticle along outer margin.

Male genitalia just like holotype.



FIGURES 1–6. 1, 4 Habitus of *Dorcus hei* sp. nov., large-sized male, holotype (Sichuan) 2, 5 habitus of *Dorcus hei* sp. nov., small-sized male, paratype (Sichuan) 3, 6 habitus of *Dorcus fujii* Nagai & Maeda, 2010 (Vietnam). 1–3 dorsal views, 3–6 ventral views.



FIGURES 7–9. 7 Dorsal habitus of *Dorcus hei* sp. nov. (Sichuan) 8 dorsal habitus of *Dorcus tanakai* Nagai, 2002, female (Guangdong) 9 dorsal habitus of *Dorcus striatipennis davidi* (Seguy, 1954), female (Zhejiang).

Female paratype (Fig. 7). Body 16.1 mm long. Length of particular parts (mm): head (1.8), mandible (1.3), pronotum (3.8), elytra (9.2); width (mm): head (4.5), pronotum (5.9), elytra (5.6).

Habitus. Color black, strongly lustrous. Body generally lustreless and glabrous; some fine, recumbent, yellowish pubescence sparsely present on lateral parts of metasternum and abdominal sternite.

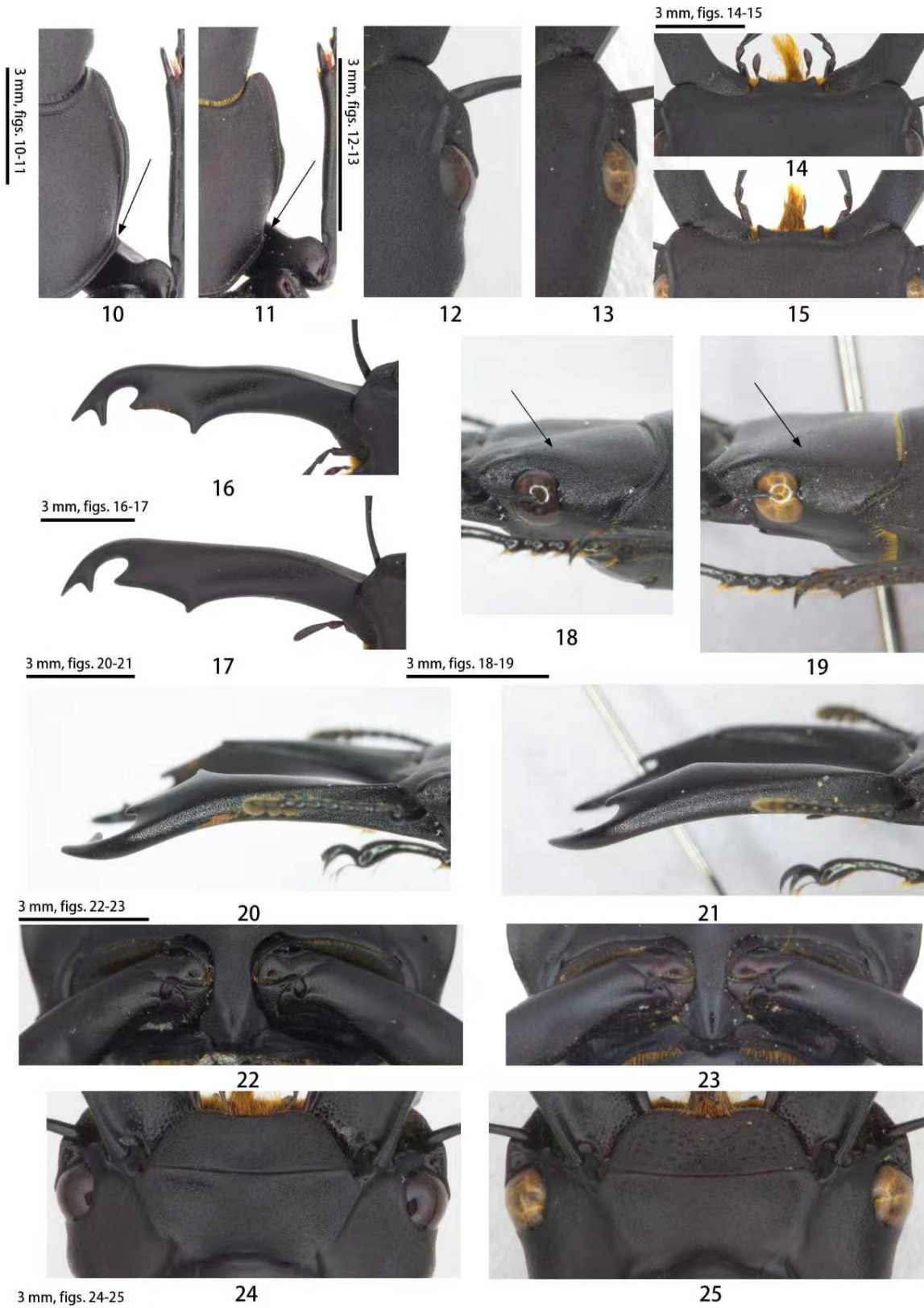
Head about 2.5 times as broad as long, surface strongly rugose, surface densely and irregularly covered with coarse punctures, interstices shagreened. Vertex slightly depressed anteriorly. Clypeolabrum small, semicircular. Canthus without posterior angle. Mandible about 3/4 length of head, right and left ones similar to each other, one inner tooth ahead of middle. Preocular margin slightly emarginate. Postocular margin relatively short. Mentum subtrapezoidal, rather coarsely punctate, with anterolateral angles rounded. Submentum trapezoidal, sparsely with large and round punctures. Gula elongate, smooth.

Pronotum 1.5 times as wide as long, widest at anterior 3/5, and 1.3 times as wide as head. Lateral margin crenulated, gently arcuate. Posterior margin almost simply curved. Surface mostly smooth, middle area of pronotum finely, sparsely punctured, posterior margin and lateral margins densely punctured, interstices shagreened.

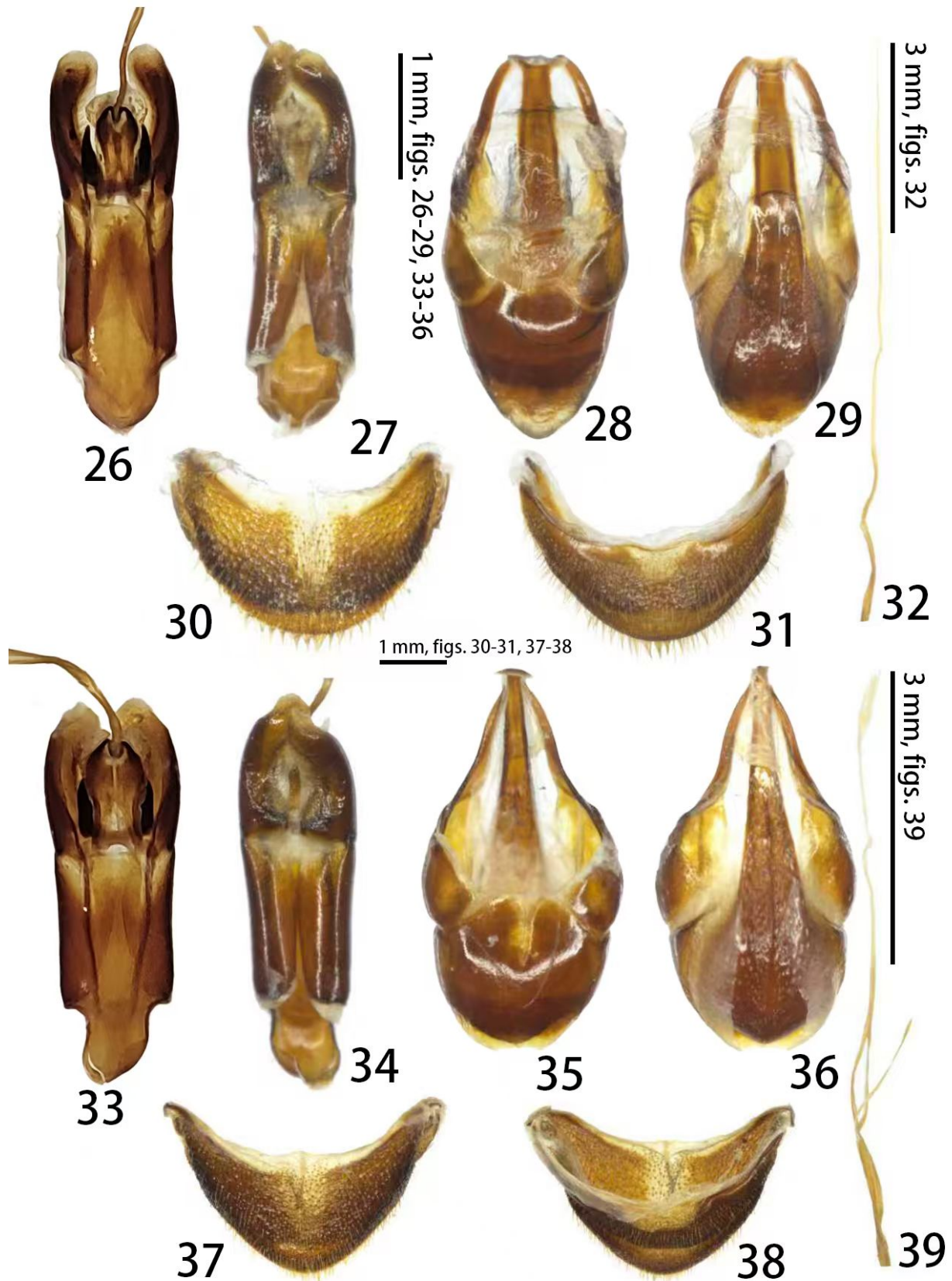
Scutellar shield linguiform. Surface finely and roundly punctate, interstices microreticulate.

Elytra 1.6 times as long as wide, widest around anterior 3/8, about 0.9 times as wide as pronotum. 9 pairs of striae formed by punctate rows, with intervals lustrous. Longitudinal costae 2 and 4 of elytra (costa 1 as sutural costa) distinct board and smooth.

Legs. Protibia with 4–5 large teeth, more or less bluntly rounded along outer margin; apex bifurcate with branches bluntly rounded at tip. Except apical spurs and spines, each meso- and metatibia with one spine along outer margin.



FIGURES 10–25. 10, 12, 14, 16, 18, 20, 22, 24 Male of *Dorcus heii* sp. nov., holotype 11, 13, 15, 17, 19, 21, 23, 25 male of *D. fujiii* Nagai & Maeda, 2010 (Vietnam): 10, 11 side of pronotum 12, 13 head 14, 15 clypeolabrum 16, 17 dorsal view of mandible 18, 19 lateral view of head 20, 21 lateral view of mandible 22, 23 prosternal propose 24, 25 mentum.



FIGURES 26–39. 26–32 Male genitalia of *Dorcus heii* sp. nov., holotype 33–39 male genitalia of *D. fujiii* Nagai & Maeda, 2010 (Vietnam): 26, 27, 33, 34 aedeagus 28, 29, 35, 36 abdominal segment IX 30, 31, 37, 38 segment VIII 32, 39 flagellum.



FIGURES 40, 41. 40 A living male of *Dorcus hei* sp. nov., holotype (photo by Qing-Yun Deng) 41 type locality of *Dorcus hei* sp. nov., Huaying Mount, Sichuan (photo by Jun-Jie Tan).

Differential diagnosis. We can distinguish *D. hei* sp. nov. from most *Dorcus* species (eg. *Dorcus striatipennis davidi* (Seguy, 1954), fig. 9) by the longitudinal costae 2 and 4 of elytra (costa 1 as sutural costa) distinct board and smooth in female (compare figs. 7, 9). Depending on the characteristic of elytra in female (figs. 7, 8), this new

species resembles four *Dorcus* species in Oriental and Palaearctic Regions (Huang & Chen 2013; Nagai 2002; Nagai & Maeda 2010): *D. fujiii* Nagai & Maeda, 2010, *D. meridionalis* Nagai & Maeda, 2010, *D. tanakai* Nagai, 2002, and *D. ursulae* (Schenk, 1996). In males, we can distinguish this new species from *D. meridionalis* and *D. tanakai* by area between mandible tip and inner teeth without continuous serration (Huang & Chen 2013; Nagai & Maeda 2010), and from *D. ursulae* (Schenk, 1996) by the distance of two inner teeth of mandible distinct short (Zhan & Yang 2025). *Dorcus hei* sp. nov. is closely related and very similar to *Dorcus fujiii* Nagai & Maeda, 2010 from north Vietnam. This new species differs from *D. fujiii* by the following characters (in the individuals of the same size): 1. color black at first glance (compare figs. 1, 3, 4, 6); 2. Body shape stronger and broader (compare figs. 1, 3); 3. Posterior angles of pronotum prolonged (compare figs. 10, 11); 4. Preocular margin covers more than half of its eyes (compare figs. 12, 13, 18, 19); 5. Protrusions of clypeolabrum less expand outward (compare figs. 14, 15); 6. Mandible shorter in the individuals of the same size (compare figs. 16, 17); 7. The triangular depressed area of head without significantly large separate punctures (compare figs. 18, 19); 8. In lateral view, mandible more curved (compare figs. 20, 21); 9. Prosternal process broader and shorter (compare figs. 22, 23); 10. Mentum with shallow punctures (compare figs. 24, 25); 11. Median lobe of genitalia smaller (compare figs. 26, 33); 12. Apex abdominal tergite VIII of genitalia more rounded (compare figs. 30, 31, 37, 38); 13. Sternite of abdominal tergite IX wider (compare figs. 28, 29, 35, 36); 13. Flagellum of genitalia slender, apex unexpanded (compare figs. 32, 39).

Etymology. The new species is named after Mr. Tian-Long He, who kindly provided the principal specimens used for comparing.

Distribution. *Dorcus hei* sp. nov. is at present known only from Huaying Mount in eastern Sichuan Province, western China.

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● Additional information

Author contributions: Conceptualization: J-J Liu, X-Z Luo & F-L Wang. Project administration: J-J Liu. Resources: J-J Liu. Supervision: X-Z Lou. Visualization: X-Z Lou & F-L Wang. Writing—original draft: J-J Liu. Writing—review and editing: J-J Liu.

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