

Two newly recorded species of the genus *Sora* (Coleoptera: Tenebrionidae: Lagriinae), with redescription of two known species from China

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Abstract: *Sora* Walker, 1859 belongs to the tribe Lagriini Latreille, 1825. In this paper, two species, *Sora barapanica* Merkl, 2019 and *Sora marmoreipennis* Merkl, 2019, are newly recorded from China. *Sora mimica* (Pic, 1912) and *Sora thibetana* (Pic, 1914) are redescribed with illustrations of type specimens provided for the first time. *Sora mimica* var. *testaceipennis* (Pic, 1912) is proposed as a synonym of *Sora mimica*.

Key words: long-jointed beetle; Lagriini; new record; redescription; Oriental Region

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中国丘伪叶甲属二新记录种及二已知种记述 (鞘翅目: 拟步甲科: 伪叶甲亚科)

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摘要: 丘伪叶甲属 *Sora* Walker, 1859 隶属伪叶甲族 Lagriini Latreille, 1825。本文记述了丘伪叶甲属 2 个中国新记录种: 黑带丘伪叶甲 *Sora barapanica* Merkl, 2019 和斑纹丘伪叶甲 *Sora marmoreipennis* Merkl, 2019, 重新描述了 2 个已知种: 小丘伪叶甲 *Sora mimica* (Pic, 1912) 和西藏丘伪叶甲 *Sora thibetana* (Pic, 1914), 将 *Sora mimica* var. *testaceipennis* (Pic, 1912) 修订为 *Sora mimica* 的次异名。本文首次提供了小丘伪叶甲和西藏丘伪叶甲的模式标本照, 并附西藏丘伪叶甲新检视标本的整体图、阴茎图, 以及斑纹丘伪叶甲的种内鞘翅斑纹变异图。

关键词: 伪叶甲; 伪叶甲族; 新记录; 再描述; 东洋区

Introduction

Sora Walker, 1859 belongs to the family Tenebrionidae Latreille, 1802 in the tribe Lagriini Latreille, 1825. This genus can be distinguished from other genera by the spindle-shaped terminal labial palpomere (sometimes triangular) and campanulate pronotum (Borchmann 1936). *Sora* comprises about 180 species from the Palaearctic, Oriental, Ethiopian and Australian regions, and 14 are known from China (Merkl 2020; Zhou & Chen 2024). In this paper, another two *Sora* species are newly recorded from Yunnan, China: *Sora*

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barapanica Merkl, 2019 (originally in Bhutan, India) and *Sora marmoreipennis* Merkl, 2019 (originally in Bhutan, Nepal, Vietnam) (Merkl 2019). Two known species, *Sora mimica* (Pic, 1912) and *Sora thibetana* (Pic, 1914) are difficult to recognize only by their brief descriptions (Pic 1912, 1914). Therefore these two are redescribed here based on examination of their type materials and new specimens, with illustrations of habitus and aedeagus now provided. *Sora mimica* var. *testaceipennis* (Pic, 1912) is proposed as a new synonym of *Sora mimica*. These results lay a foundation for taxonomic review of *Sora* in the Chinese fauna.

Material and methods

All photographs of type materials are provided by the Muséum National d'Histoire Naturelle, Paris, France. Morphological observation and aedeagus dissection were performed under a stereomicroscope (Olympus SZ2-ILST). The dissected aedeagus of *S. thibetana* is preserved in a vial filled with glycerol. Photographs of habitus, aedeagus, as well as measurements were taken using a digital stereomicroscope (KEYENCE-VHX-5000), and annotated using Adobe Photoshop CS6.

The acronyms of institutions where specimens are deposited are as follows:

CNU — Chongqing Normal University, Chongqing, China;

DU — Dali University, Dali, China;

IZCAS — Institute of Zoology, Chinese Academy of Sciences, Beijing, China;

MHBU — Museum of Hebei University, Baoding, China;

MNHN — Muséum National d'Histoire Naturelle, Paris, France;

MYNU — Invertebrate Collection of Mianyang Normal University, Mianyang, China;

SEMCAS — Shanghai Entomological Museum, Chinese Academy of Sciences, Shanghai, China.

Taxonomy

Sora barapanica Merkl, 2019, new record to China

Sora barapanica Merkl, 2019: 76 (Bhutan, India, description, illustrations of habitus and aedeagus).

Male. Small, stramineous, each elytron with a dark longitudinal band extending from striae I to VI, not reaching elytral base and apex, obsolete anteriorly and posteriorly. Eyes large, interocular distance about 0.30× as long as eye diameter; antennomere XI elongate, subequal to combined length of four preceding antennomeres; elytral punctures regularly disposed as striae rows, odd-numbered intervals with few, fine setigerous punctures. Female: similar to male, but interocular distance wider, about 0.50× as long as eye diameter; antennomere XI subequal to combined length of two preceding antennomeres.

Specimens examined. 2♂1♀ (CNU), **China**, Yunnan, Yingjiang County, Mangyun Village, Zhongshan, 1,300 m, 04–05-VI-2020, Hao XU & Chengbin WANG leg.

Remarks. *S. barapanica* has variability in body color. Some specimens have unicolor elytra, stramineous or dark brown, without longitudinal band; when banded, the width of the bands varies (Merkl 2019).

Distribution. China (Yunnan); Bhutan; India.

***Sora marmoreipennis* Merkl, 2019** (Figs 1A, 1B), new record to China

Sora marmoreipennis Merkl, 2019: 78 (Bhutan, Nepal, Vietnam, description, illustrations of habitus and aedeagus); Telnov, 2022: 337 (interspecific variability).

Male. light brown, elytra with dispersed dark spots. Eyes small, interocular distance about 1.30× as long as eye diameter; antennae slender, extending to mid-abdominal ventrite 2 when directed backwards, antennomere XI slightly shorter than combined length of two preceding antennomeres; pronotum sparsely punctate; elytral punctures regularly disposed as stria rows, odd-numbered intervals with few, fine setigerous punctures; legs unmodified. Female: quite similar to male, including length of antennae and length proportions of antennomeres, but body larger, antennomere XI shorter, interocular distance wider, and pronotum broader.

Specimens examined. 1♂ (IZCAS), **China**, Yunnan, Lushui County, Pianma Town, 2,300 m, 30-V-1981, Subai LIAO leg., IOZ(E)1281102; 1♂ (IZCAS), **China**, Yunnan, Nujiang Prefecture, Lushui County, Luzhang Town, Yaojiaping, 03-V-2015, 2,248 m, 25.5819°N, 98.4237°E, Meiying LIN leg.; 1♂ (IZCAS), **China**, Yunnan, Baoshan City, Longyang District, Baihualing Nature Reserve, 05-V-2015, 1,992 m, 25.1800°N, 98.4713°E, Wenxuan BI leg., net sweeping, IOZ(E)2003997; 1♂2♀ (CNU), **China**, Yunnan, Gongshan County, 2,400 m, V-2023, Baijun LI leg.; 1♀ (IZCAS), **China**, Yunnan, Tengchong County, 2,500 m, 02-04-VI-1992, Dayong XUE leg., IOZ(E)1964925; 1♀ (IZCAS), **China**, Yunnan, Fugong Co. Lishadi town, Shibali village, roadside, 27.16520°N, 98.77980°E, 2,530 m, 07-V-2004, day, Hongbin LIANG leg., California Academy & IOZ., Chinese Acad. Sci., IOZ(E)1964991; 1♀ (DU), **China**, Yunnan, Lanping County, Lashashan Mountain, 2,900 m, 08-VII-2017, Jishan XU leg.

Remarks. This species was originally reported from Bhutan (Wangdue Phodrang District), Nepal (Dhading, Dolakha, Kaski, Solukhumbu Districts), and Vietnam (Lao Cai Province). This new record of conspecific specimens from Yunnan, China fills in the gap of the distribution of this species between Vietnam and the Himalayas. Merkl (2019) described intraspecific variation when registering *S. marmoreipennis*. He noted that the elytral dark spots can be more extensive, accounting for most of the elytra (Fig. 1A), or expanding to the entire elytra (Fig. 1B). Some specimens have less-produced anterior angles (Fig. 1A). Telnov (2022) identified a group of specimens from Yunnan as *S. marmoreipennis*, with a habitus photograph of female. A series of intraspecific variations were described based on morphological comparison of this group of specimens with the type of *S. marmoreipennis*. For unknown reasons, Telnov (2022) noted in the article that the characteristics of the male specimens were “not available”, although there were males in the examined specimens. However, the author here believes that the group of specimens studied by Telnov (2022) actually represent another species of Lagriini, not intraspecific variations of *S. marmoreipennis*. The three most obvious differences are: the group of specimens studied by Telnov (2022) with bicolor femur and tibiae (unicolor in *S. marmoreipennis*), shorter antennae and antennomeres, and denser punctures on pronotum.

Distribution. China (Yunnan); Bhutan; Nepal; Vietnam.

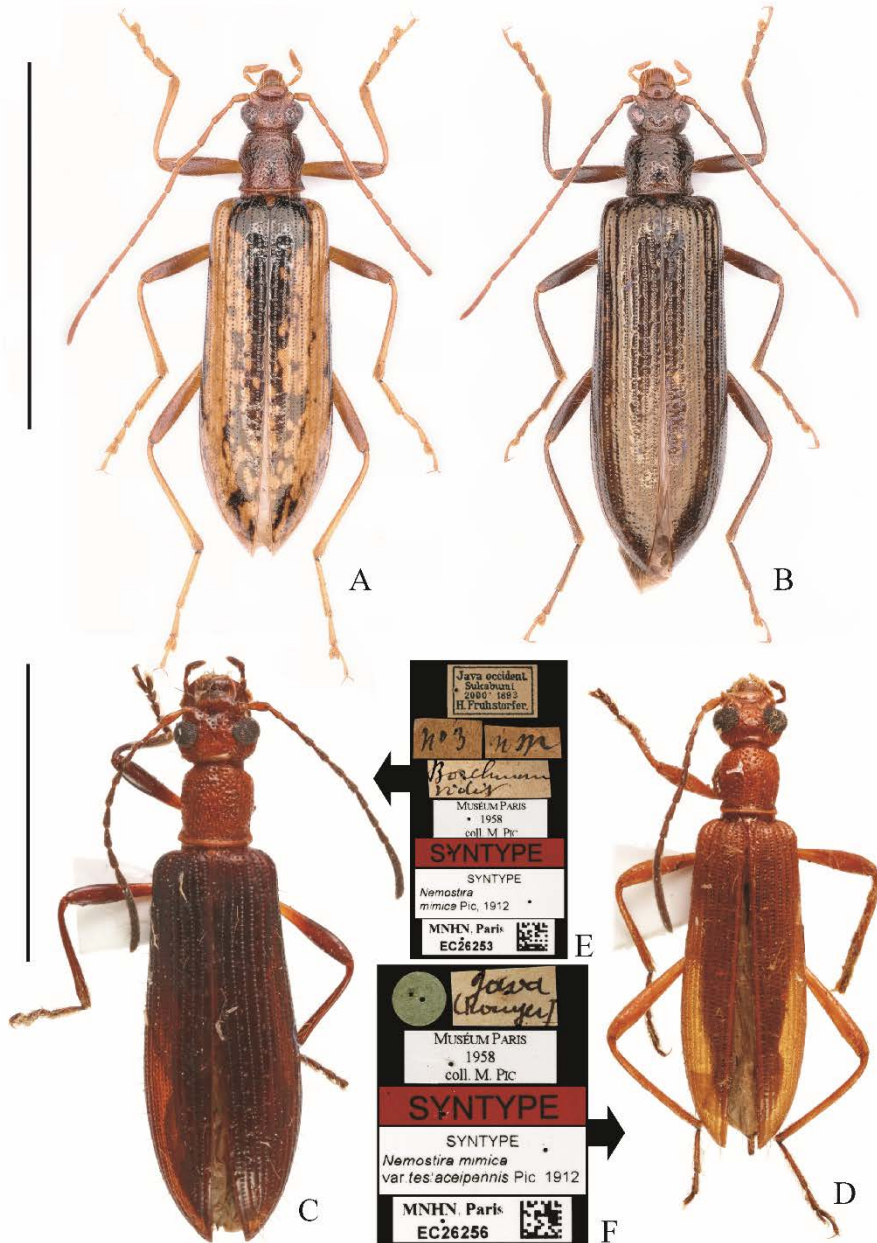


Figure 1. A, B. Habitus of *Sora marmoreipennis* Merkl, 2019 (to show intraspecific variation); A. Elytra with large amount dark spots, anterior angle of pronotum rounded, male; B. Dark spots extended to the entire elytra, female; C, D. Type specimen. C. *Sora mimica* (Pic, 1912), female; D. *Sora mimica* var. *testaceipennis* (Pic, 1912), male; E, F. Labels of type specimens. Scale bars = 1 cm (A, B); 4 mm (C, D).

***Sora mimica* (Pic, 1912)** (Figs 1C–F, 2)

Nemostira mimica Pic, 1912: 31 (Java, description).

Sora mimica: Borchmann, 1936: 363 (new combination).

Sora mimica: Merkl, 2020: 363 (Yunnan).

Sora mimica var. *testaceipennis* (Pic, 1912): 31, **new synonym.**

Redescription. Male (Fig. 1D). Elongate, body length 6.0–7.2 mm. Head, prothorax, and scutellum brown, antennae brown at base, gradually darkening toward the apex; elytra and legs dark brown (lighter at base of legs); some specimens entirely brown, except a few apical antennomeres and tarsi darker. Tempora, elytra, and abdominal ventrites with sparse long setae, tibiae and tarsi with dense short setae.

Head obviously broader than prothorax. Mouthparts moderately protruding forwards; terminal labial palpomere elongate oval, pointed at apex; terminal maxillary palpus triangularly elongate, with cavate inner surface, broadest before base; labrum slightly cordiform, anterior margin emarginate; labroclypeal membrane widely exposed; clypeus politus, anterior margin straight. Frons between eyes with sparse coarse punctures, sparser on vertex. Eyes slightly bulging, anterior margin slightly emarginate, interocular distance about 1.25× as long as eye diameter. Antennae filiform, extending to metacoxae when directed backwards, antennomere I depressed, oval, about 1.50× as long as antennomere II, gradually shortening from antennomere III to X, antennomere XI curved, subequal to combined length of four preceding antennomeres.

Prothorax widest at the middle, slightly shorter than length, constricted in basal half. Pronotum with coarse punctures, sparse on disc, denser toward lateral parts; anterior angles broadly rounded, posterior angles moderately projecting laterally; anterior margins slightly arched forwards, posterior margins slightly arched backwards, with elevated carina, lateral parts with the margins invisible in dorsal view. Prosternal process moderately wide, elevated. Scutellum triangular, obtuse at apex.

Elytra slender, slightly expanded backwards, elytral length 2.30× as long as combined maximum width; humeral callosity rounded in dorsal aspect, separated from disc by shallow impression; striae rows with no contiguous punctures, separated by 1 puncture diameter; intervals entirely flat, odd-numbered intervals with few, fine setigerous punctures; elytral margin weak, visible except humeral callosity; elytral epipleura entire, gradually narrowing towards apex.

Legs slender, unmodified. Abdominal ventrites smooth in disc, with a nearly round impression on each ventrite laterally.

Female (Fig. 1C). Body larger. Eyes narrower, interocular distance wider, about 1.56× as long as eye diameter; antennomere XI subequal to combined length of three preceding antennomeres.

Type specimens examined. *S. mimica*, 1♀ (MNHN) (Fig. 1C, 1E); 1♀ (MNHN) (Fig. 2A, 2E); 1♀ (MNHN) (Fig. 2C, 2F). *S. mimica* var. *testaceipennis*, 1♂ (MNHN) (Fig. 1D, 1F); 1♀ (MNHN) (Fig. 2B, 2D).

Other specimens examined. 1♂ (IZCAS), **China**, Yunnan, Xishuangbanna Prefecture, Xiaomengyang, 850 m, 28-VI-1957, Shuyong WANG leg., IOZ(E)1196314; 1♀ (IZCAS), **China**, Yunnan, Xishuangbanna Prefecture, Xiaomengyang, 850 m, 12-X-1957, Shuyong WANG leg., *Sora mimica* (Pic) det. O. Merkl. 1993, IOZ(E)1196313; 1♀ (IZCAS), **China**, Yunnan, Jinping County, Mengla Town, 400 m, 25-IV-1956, Keren HUANG *et al.* leg., IOZ(E)1196320; 1♀ (SEMCAS), **China**, Yunnan, Xishuangbanna Prefecture, Sanchahe, 750 m, 09–10-VI-2009, LIU, WU, ZHU, BI leg., 24218820; 1♀ (IZCAS), **China**, Fujian, Chong'an, Xingcun Village, 06-VI-1960, JIN & LIN leg., 24276147.



Figure 2. A–C. Type specimen. A. *Sora mimica* (Pic, 1912), female; B. *Sora mimica* var. *testaceipennis* (Pic, 1912), female; C. *Sora mimica* (Pic, 1912), female; D–F. Labels of type specimens. Scale bar = 4 mm (A–C).

Diagnosis. Body small, head obviously broader than pronotum; antennomere I depressed, oval, broadest at the middle (unlike most congeneric species, antennomere I broadest before apex).

Remarks. Based on variation in body color, the specimens with entirely brown body were named as a variety, *S. mimica* var. *testaceipennis* (Pic 1912; Borchmann 1936) (Figs 1D, 2B). In this paper, no obvious structural difference was supported between *S. mimica* and *S. mimica* var. *testaceipennis* after examination of the type specimens of these two taxa. The difference in color should be an intraspecific variation. Since *S. mimica* var. *testaceipennis*

was published before 1961, it may have subspecies rank according to Article 45.6.4 (ICZN 1999). Consequently, it is considered to be a junior subjective synonym of *S. mimica*.

Distribution. China (Yunnan, Fujian)(new province record); Indonesia.

***Sora thibetana* (Pic, 1914)** (Fig. 3)

Nemostira thibetana Pic, 1914: 304 (Xizang, description).

Sora thibetana: Borchmann, 1936: 369 (new combination).

Redescription. Male (Fig. 3A). Body length 16.9–17.8 mm. Shiny, black, except brass elytra. Body with dense white setae.

Head obviously narrower than prothorax. Mouthparts strongly protruding forwards; terminal labial palpomere nearly trapezoidal, with apex obliquely truncated; terminal maxillary palpus triangularly elongate, broadest before base; labrum nearly rectangular, with fine sparse punctures, anterior margin straight; labroclypeal membrane invisible; clypeus trapezoid, with fine sparse punctures, anterior margin slightly emarginate. Frons uneven, with sparse coarse punctures and irregular sculptures. Eyes large, slightly bulging, anterior margin slightly emarginate, interocular distance subequal to eye diameter. Antennae slender, surpassing metacoxae when directed backwards, antennomere I elongate, about 4.51× as long as antennomere II, gradually shortening from antennomere III to X, antennomere XI curved, subequal to combined length of two preceding antennomeres.

Prothorax widest at base, slightly shorter than length, about 0.92× as long as length, constricted in basal half. Pronotum with fine sparse punctures; anterior angles rounded, posterior angles projecting laterally; anterior margins slightly arched backwards, posterior margins slightly elevated and arched backwards, lateral parts with the margins invisible in dorsal view. Prosternal process narrow, elevated. Scutellum triangular, obtuse at apex.

Elytra broad, convex, expanded backwards, elytral length 2.30× as long as combined maximum width; humeral callosity rounded; striae rows clear on anterior 1/3 of elytra, intervals with punctures and transverse wrinkles on the posterior 2/3 of elytra; elytral margin weak, visible except humeral callosity; elytral epipleura entire, gradually narrowing towards apex.

Legs slender, unmodified. Abdominal ventrites densely punctate, with a nearly round impression on each ventrite laterally.

Aedeagus stout (Fig. 3E, 3F), curved in lateral view. Parameres wide, pointed at apex in ventral view.

Female (Fig. 3B). Body larger. Differences between male and female similar to *S. marmoreipennis*, interocular distance wider, and pronotum broader.

Type specimens examined. 1♀ (MNHN) (Fig. 3C, 3D).

Other specimens examined. 1♂ (DU), **China**, Yunnan, Xiaohei mountain, Longjiang town, Longling county, Baoshan prefecture, light trap, 2,024 m, 07-VI-2016, Yue LI *et al.* leg.; 1♂ (CNU), **China**, Yunnan, Tengchong County, Diantan Town, light trap, 06-VII-2016, Guiqiang HUANG leg.; 2♂ (DU), **China**, Yunnan, Dehong Prefecture, Longchuan County, Husa Town, Husa tunnel, light trap, 1,538 m, 22-V-2014, Zhuangzhi CHEN *et al.* leg.; 1♂ (MYNU), **China**, Yunnan, Gongshan County, Pengdang Town, Dimaluo Village, 1,870 m, 12–14-VII-2021, Lu QIU, Jishen WANG & Hao XU leg.; 1♀ (CNU), **China**, Yunnan, Tengchong County, Diantan Town, light trap, 03-VII-2016, Guiqiang HUANG leg.; 2♀

(IZCAS), **China**, Yunnan, Tengchong County, Dahaoping, 2,020 m, 24–26-V-1992, Dayong XUE leg., IOZ(E)1281120, IOZ(E)1281121; 1♀ (CNU), **China**, Yunnan, Nujiang Prefecture, Maji Town, 2,400–2,600 m, VI-2023, Baijun LI leg.; 1♂1♀ (MHB), **China**, Xizang, Zayü County, Xiazayü Town, 1,500–1,580 m, 12-VII-2005, Aimin SHI leg.; 1♂1♀ (CNU), **China**, Xizang, Mêdog County, 80k (Location names derived from the remaining distance (kilometers) to Bomi County seat along the Mêdog-Bomi rode), 10-VII-2013, Yong ZHOU leg.; 1♀ (CNU), **China**, Xizang, Mêdog County, Bolonggong Village, 80k, 20-VII-2016, Hao XU & Jianyue QIU leg.

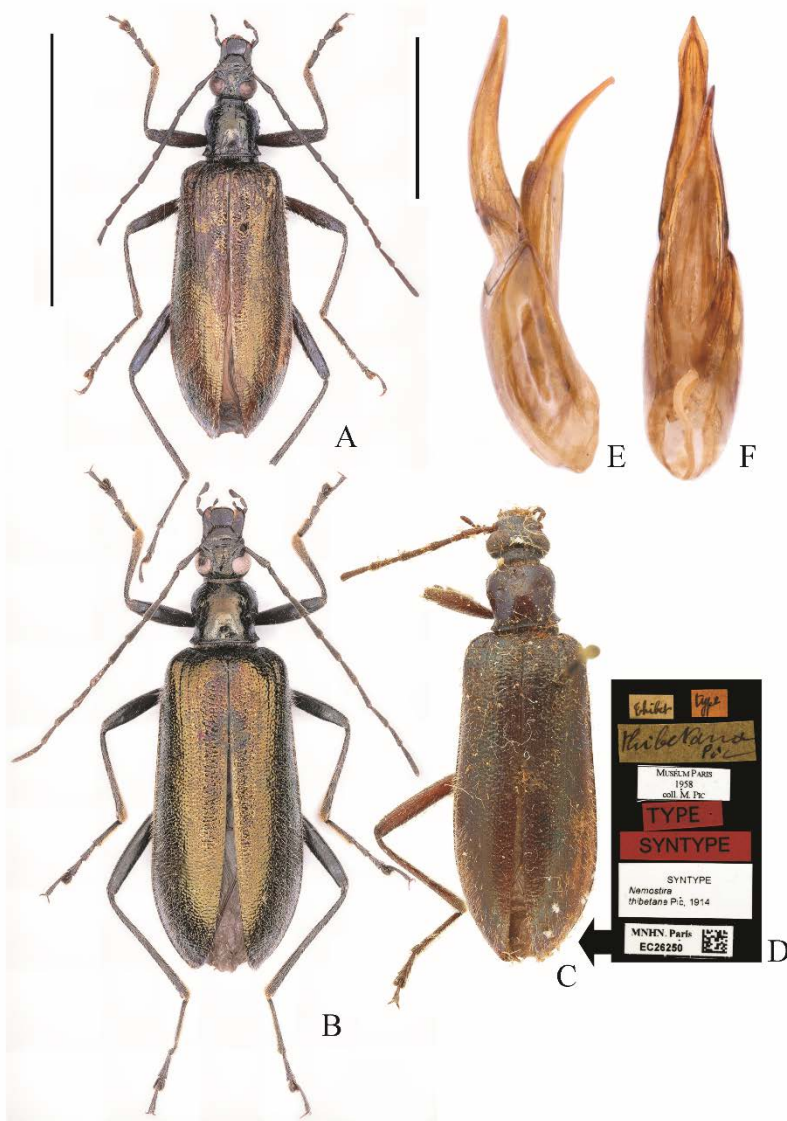


Figure 3. *Sora thibetana* (Pic, 1914); A. Habitus of male, terminal two antennomeres and right tarsi missing; B. Habitus of female; C. Type specimen, female; D. Labels of type specimens; E, F. Aedeagus, lateral and ventral views. Scale bars = 1 cm (A–C); 1 mm (E, F).

Diagnosis. Body large, broad, with dense white setae, elytral punctures regularly disposed, strial rows clear on anterior 1/3 of elytra, intervals with punctures and transverse wrinkles on the posterior 2/3 of elytra.

Distribution. China (Yunnan (new province record), Xizang).

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