

Taxonomy of the genus *Luprops* from China, with description of the larva of *Luprops horni* (Coleoptera: Tenebrionidae)

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Abstract: The genus *Luprops* Hope, 1833 is distributed in Palaearctic, Oriental, Sino-Japanese and Afrotropical regions, including 3 new Chinese record species described in this paper. Eleven species of this genus are known in China. The new Chinese record species are: *L. brancuccii* Schawaller, 2013, *L. kaszabi* Schawaller, 1997 and *L. rugosissimus* Kaszab, 1980. A key to the known *Luprops* species and its morphological details are provided. In addition, larva of *Luprops horni* (Gebien, 1914) is reported for the first time.

Key words: darkling beetles; Lagriinae; taxonomy; China

中国垫甲属分类及霍氏垫甲幼虫特征描述记（鞘翅目：拟步甲科）

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摘要: 垫甲属 *Luprops* Hope, 1833 广泛分布于古北界、东洋界、中日界和非洲界。包括本文记述的 3 个中国新记录种在内, 中国该属已知 11 种。中国新记录种分别是: 布氏垫甲 *L. brancuccii* Schawaller, 2013、卡氏垫甲 *L. kaszabi* Schawaller, 1997 和横纹垫甲 *L. rugosissimus* Kaszab, 1980。本文提供了中国种分类检索表及其相关特征图。此外, 首次报道了霍氏垫甲 *L. horni* (Gebien, 1914) 的幼虫形态特征。

关键词: 拟步甲科; 伪叶甲亚科; 分类; 中国

Introduction

The genus *Luprops* Hope, 1833 belongs to the tribe Lupropini. Seventy-seven species are known worldwide with eight species described from China. The species of *Luprops* occur in Palaearctic, Oriental, Sino-Japanese and Afrotropical regions. The members of *Luprops* from Indian Peninsula and Sri Lanka were summarized by Sabu *et al.* (2007), those from the Nepal-Himalayan region were studied by Schawaller (1997), *Luprops* from South Africa were studied by Schawaller (2011) and those from Borneo and Laos were studied by Schawaller (2003, 2013). The *Luprops horni* species-group was erected by Schawaller (2013). Chinese *Luprops* species have been described by Motschulsky (1868), Marseul (1876), Fairmaire (1887, 1889), Gebien (1914a, b) and Pic (1915). The larval morphology of *L. orientalis*

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(Motschulsky, 1868) was described by Hayashi (1963). The life history of *L. tritis* was studied by Sabu *et al.* (2008).

In this paper, the species *L. brancuccii* Schawaller, 2013 (Yunnan), *L. kaszabi* Schawaller, 1997 (Guangdong) and *L. rugosissimus* Kaszab, 1980 (Yunnan) are recorded in China for the first time. The larva of *Luprops horni* (Gebien, 1914) from Taiwan Island is first described. A key is provided to separate the known species of *Luprops* in China.

Material and methods

All specimens were examined, illustrated, photographed and measured using a Leica M205C stereomicroscope equipped with a drawing tube and using a Leica DFC450 camera. Line drawings and photos were edited in CorelDRAW 14 SP2 and Adobe Photoshop 7.0.

Abbreviation.

CWNU—China West Normal University, Nanchong, China.

HBUM—Hebei University Museum, Baoding, China.

HNHM—Hungarian Natural History Museum, Budapest, Hungary.

IZAS—Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

NHMB—Natural History Museum of Basel, Basel, Switzerland.

NJFU—Nanjing Forestry University, Nanjing, China.

SHNU—Shanghai Normal University, Shanghai, China.

SMNS—Staatliches Museum für Naturkunde, Stuttgart, Germany.

TD—Type depository.

TL—Type locality.

Taxonomy

Genus *Luprops* Hope, 1833

Luprops Hope, 1833: 63. Type species: *Luprops chrysophthalmus* Hope, 1833. TL: India Orientali.

Luprops Hope, 1834: 101. Type species: *Lypros chrysophthalmus* Hope, 1834. TL: India Orientali.

Oligorus Dejean, 1834: 206. Type species: *Tagenia indica* Wiedemann, 1823. TL: India Orientali.

Syggona Fähræus, 1870: 330. Type species: *Syggona concinna* Fähræus, 1870. TL: Caffraria.

Syngona Rye, 1873: 293. [unjustified emendation]

Etazeta Fairmaire, 1889: 358. Type species: *Etazeta aeneicolor* Fairmaire, 1889. TL: Húe, Tonkin.

Diagnosis. Body elongate, moderately convex. Eyes large and prominent, slightly divided by epistomal canthi; abruptly narrowed after eyes. Antennomere III prolonged, antennomeres XI slightly extended. Pronotum and elytra with irregular punctures, with or without setae. Pronotal width distinctly smaller than elytral base. Elytral humeri prominent, near round; epipleurae abruptly narrow short after hind coxal cavity; hind wings developed. Intersegmental membranes exposed between ventrites III and V. Legs without modification. Penultimate tarsomere strongly lobed below, with dense setae.

Distribution. Palearctic; Sino-Japanese; Oriental; Afrotropical regions.

Key to the known species of *Luprops* from China modified from Schawaller (2013)

1. Elytra with metallic shine, without setae..... 2

- Elytra without metallic shine, with distinct long and short setae 7
- 2. Elytra with costae, at least laterally 3
- Elytra smooth, or with wrinkles not arranged in costae 4
- 3. Antennomere III long, 2× longer than antennomere IV; pronotal punctures and elytral punctures of same size *L. aeneicolor*
- Antennomere III short, about 1.2× longer than antennomere IV; pronotal puncture smaller than elytral punctures *L. horni*
- 4. Elytral punctation arranged in multiple rows or irregular rows 5
- Elytral punctation not arranged in multiple rows 6
- 5. Elytral punctation larger than pronotal punctures; about half portion of antennomere I exposed in dorsal view *L. costulatus*
- Elytral punctation as large as pronotal punctures; mostly antennomere I shielded in dorsal view *L. irregularis*
- 6. Pronotum reddish-black, elytra reddish; pronotal punctures larger; antennomere I dorsally with longitudinal keel, antennomere III shorter, about 1.2× as long as antennomere IV *L. kaszabi*
- Pronotum black, elytra reddish; pronotal punctures finer; antennomere dorsally without keel, antennomere III longer, about 1.5× as long as antennomere IV *L. brancuccii*
- 7. Body length >10 mm, with longer erect setae; elytral disc with longitudinal wrinkles arranged in costae; aedeagus as in Figs. 26, 27 *L. rugosissimus*
- Body length <10 mm, with long or short, erect or appressed setae; elytral disc with or without wrinkles, not arranged in costae 8
- 8. Pronotum nearly cordiform in dorsal view, posterior angles rounded 9
- Pronotum nearly square in dorsal view, posterior angles distinctly pointed or rectangular 10
- 9. Pronotum and elytra with denser punctures; tibiae distinctly thick; elytra strongly shining; aedeagal apicale slightly curved at middle in lateral view *L. cribrifrons*
- Pronotum and elytra with dense punctures; tibiae slightly thick; elytra shining; aedeagal apicale distinctly curved at apex in lateral view *L. yunnanus*
- 10. Posterior angles rounded; apex of prosternal process narrow and prominent *L. luzonicus*
- Posterior angles pointed; apex of prosternal process wide and flat *L. orientalis*

1. *Luprops aeneicolor* (Fairmaire, 1889)

Etazeta aeneicolor Fairmaire, 1889: 359; Schawaller, 2013: 331. TL: Vietnam, Tonkin Húe. TD: HNHM.

Specimens examined. None.

Distribution. China (Fujian); Laos; Vietnam.

2. *Luprops brancuccii* Schawaller, 2013 (Figs. 1A, 2A, 3A, 4A, B, 6A), new record to China

Luprops brancuccii Schawaller, 2013: 330, figs. 3, 4. TL: Laos, Phongsaly Prov., Ban Sano Mai. TD: NHMB.

Specimens examined. 1♂, **China**, Yunnan, Mengla, alt. 2999 m, 03-VI-2011, Xiaoyu ZHU leg., HBUM; 1 ex, **China**, Yunnan, Xishuangbanna, Mengla County, Xinshan Village, alt. 1064 m, 21.84600°N, 101.585253°E, 01-VIII-2009, Hongliang SHI leg., IZAS.

Distribution. China (Yunnan); Laos.

3. *Luprops costulatus* Pic, 1915 (Figs. 1B, 2B, 3B, 6B)

Luprops costulatus Pic, 1915: 20; Schawaller, 2013: 331. TL: Vietnam, Húe. TD: HNHM.

Specimens examined. China, 1♀, Sichuan, Wanyuan City, Huaeshan, 28-VII-2017, 21.695361°N, 100.043771°E, alt. 592 m, 28-VII-2017, Zhaoxu LI & Qiaoqiao JI leg., HBUM; 2♀, Henan, Tongbaishan, 25-VII-2010, Yibin Ba & Zhenxing Zhang Leg., HBUM.

Distribution. China (Guangdong, Jiangxi, Sichuan); Laos; Vietnam.

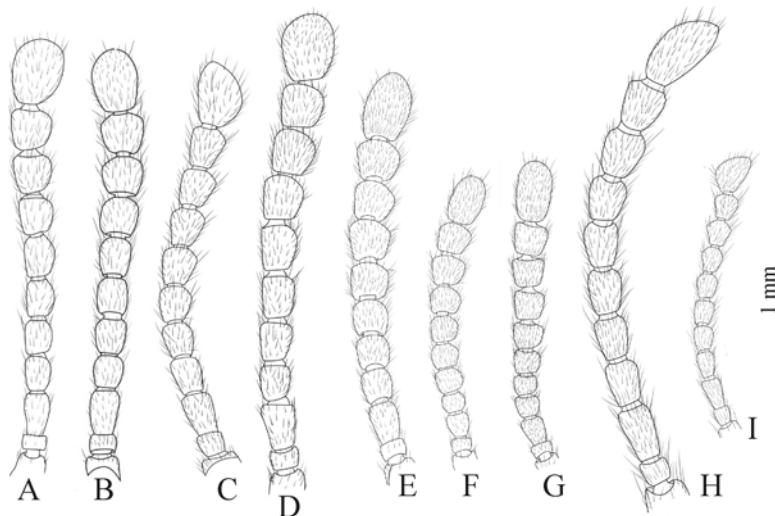


Figure 1. Antennae. A. *L. brancuccii* Schawaller, 2013; B. *L. costulatus* Pic, 1915; C. *L. cribrifrons* (Marseul, 1876); D. *L. horni* (Gebien, 1914); E. *L. kaszabi* Schawaller, 1997; F. *L. luzonicus* (Gebien, 1914); G. *L. orientalis* (Motschulsky, 1868); H. *L. rugosissimus* Kaszab, 1980; I. *L. yunnanus* Fairmaire, 1887.

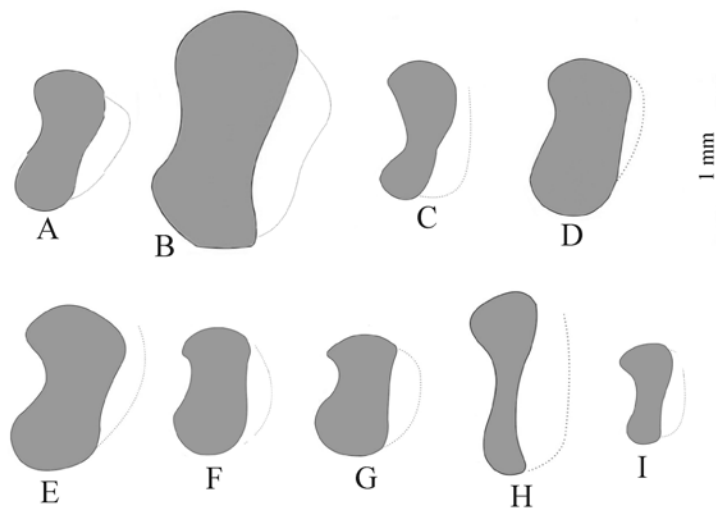


Figure 2. Eyes. A. *L. brancuccii* Schawaller, 2013; B. *L. costulatus* Pic, 1915; C. *L. cribrifrons* (Marseul, 1876); D. *L. horni* (Gebien, 1914); E. *L. kaszabi* Schawaller, 1997; F. *L. luzonicus* (Gebien, 1914); G. *L. orientalis* (Motschulsky, 1868); H. *L. rugosissimus* Kaszab, 1980; I. *L. yunnanus* Fairmaire, 1887.

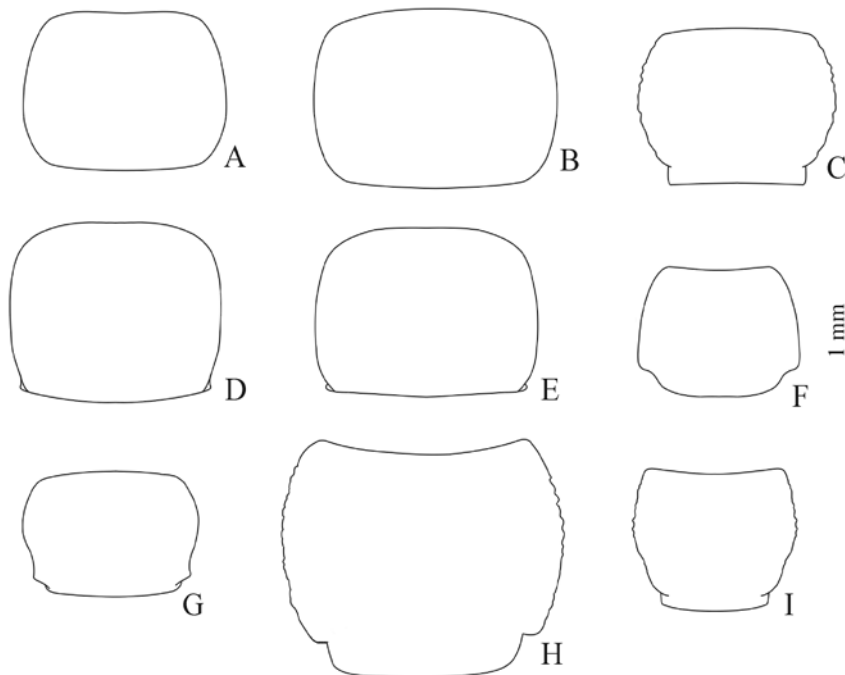


Figure 3. Pronotum. A. *L. brancuccii* Schawaller, 2013; B. *L. costulatus* Pic, 1915; C. *L. cribrifrons* (Marseul, 1876); D. *L. horni* (Gebien, 1914); E. *L. kaszabi* Schawaller, 1997; F. *L. luzonicus* (Gebien, 1914); G. *L. orientalis* (Motschulsky, 1868); H. *L. rugosissimus* Kaszab, 1980; I. *L. yunnanus* Fairmaire, 1887.

4. *Luprops cribrifrons* (Marseul, 1876) (Figs. 1C, 2C, 3C, 4C, D, 6C)

Lyprops cribrifrons Marseul, 1876: 125; Merkl, 1992: 262; Ando *et al.*, 2016: 8. TL: Japan, Nippon, Kiu-Siu.

Specimens examined. China, 1♂, Taiwan, Taitung, shouka, 08-V-2005, Wen-I CHOU leg., HBUM; 1 ex, Taiwan, Yijia, Falu, 15-V-2005, Wenxin LIN leg., HBUM; 4 ex, Shandong, Tai'an, Mountain Taishan, 10-IV-2014, Xiaoyu ZHU leg., HBUM; 1 ex, Shandong, Pingyi, Mengshan, Dawa, 13-V-2007, Jiliang WANG & Fengyan WANG leg., HBUM; 6 ex, Henan, Shangcheng, Jingangtai, 22-VII-2005, Chao GAO & Jiliang WANG leg., HBUM; 1 ex, Henan, Huixian, Shangbali, 27-VII-2006, Fengyan WANG & Wenjing HUANG leg., HBUM; 4 ex, Beijing, Badachu, 04-VI-1981, unknown leg., HBUM; 1 ex, Hebei, Xiangtai, Zhangguolaoshan, 17-VII-1988, Wei WANG leg., HBUM; 1 ex, Jiangsu, Nanjing, hills behind Nanjing Forestry University, 14-III-2018, Xiaodi SHI leg., NJFU.

Distribution. China (Beijing, Hebei, Henan, Jiangsu, Shandong, Taiwan); Japan; Korea; Laos; Vietnam.

5. *Luprops horni* (Gebien, 1914) (Figs. 1D, 2D, 3D, 4E, F, 5, 6D)

Lyprops horni Gebien, 1914a: 34; Schawaller, 2013: 331; Ando *et al.*, 2016: 9. TL: China, Taiwan, Sokutsu (Banshoryo-District) and Kosempo. TD: NHMB.

Larval morphology

Diagnosis. The larvae of *L. horni* can be separated from *L. orientalis* (Gebien, 1914) by

the following characters: (1) antenna widest at apex; (2) posterior margin of anal segment rounded, without median incision; (3) femora and tibiae with long erect setae at inner side.

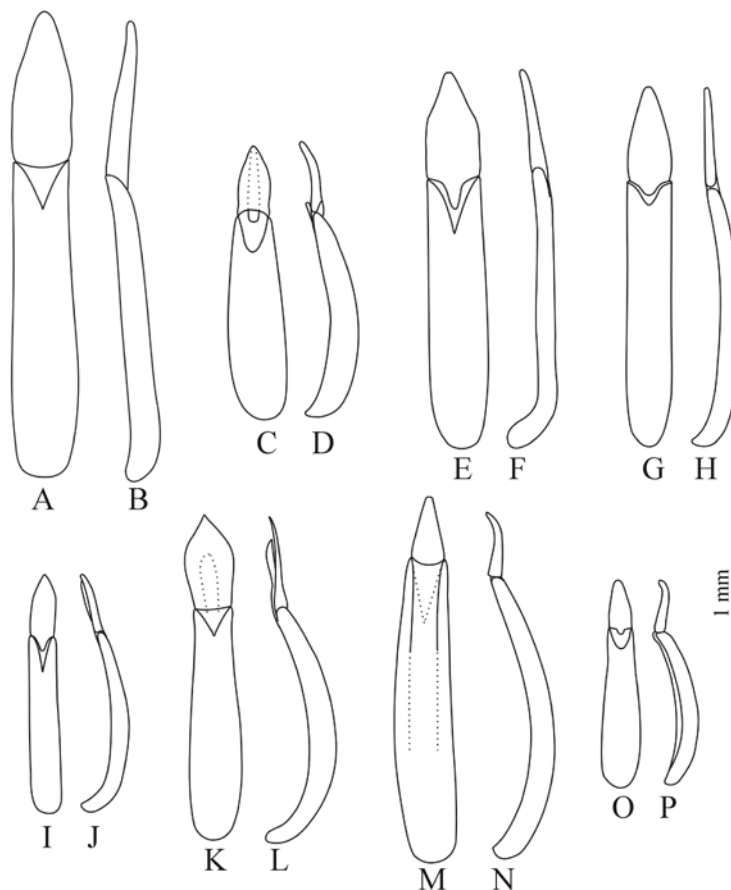


Figure 4. Aedeagus, in dorsal and ventral views. A, B. *L. brancuccii* Schawaller, 2013; C, D. *L. cribrifrons* (Marseul, 1876); E, F. *L. horni* (Gebien, 1914); G, H. *L. kaszabi* Schawaller, 1997; I, J. *L. luzonicus* (Gebien, 1914); K, L. *L. orientalis* (Motschulsky, 1868); M, N. *L. rugosissimus* Kaszab, 1980; O, P. *L. yunnanus* Fairmaire, 1887.

Description. Body (Fig. 5H) slightly sclerotized, onisciform, markedly flat, with short setae; body black, labrum, tibiae and claws light brown, setae silver greyish-brown.

Head (Fig. 5B). Prognathous type, covered with minute punctures bearing short dense setae. Epicranial suture stem length approximately one-third of head capsule; frontal arm Y-shaped, basally curved. Labrum transverse, slightly swollen, near trapezoidal; anterior margin emarginated, distinctly narrower than posterior margin; lateral margins curved; surface with twelve long erect setae. Clypeus convex, trapezoidal; anterior margin weakly emarginate to straight; surface with one long erect seta at each side and four long erect setae near base. Five stemmata present on each epicranial plate, near short column. Frons smooth, surface with short setae. Frontoclypeal suture deep. Epicranial plates smooth, setose dorsally; ventral portion of each plate rugose, with short sparse setae. Ligula apex with two long erect setae present ventrally. Prementum broadened, widest near anterior margin; surface smooth, with

minute puncture and four to six long erect setae. Mentum distinctly swollen, anterior distinctly wider than posterior; surface smooth with minute punctures and four to six long setae. Maxillary palpi three-segmented, column-shaped; first and second segments distinctly wider than the third one. Gula near semicircle; anterior margin narrower than posterior; surface glossy, with short sparsed setae and transverse wrinkles. Labial palpi small, two-segmented; second segment distinctly thinner than first. Antennae (Fig. 5A) very long, reaching to base of pronotum, 2-segmented; distal antennomere clavate, apex swollen, distinctly wider than base.

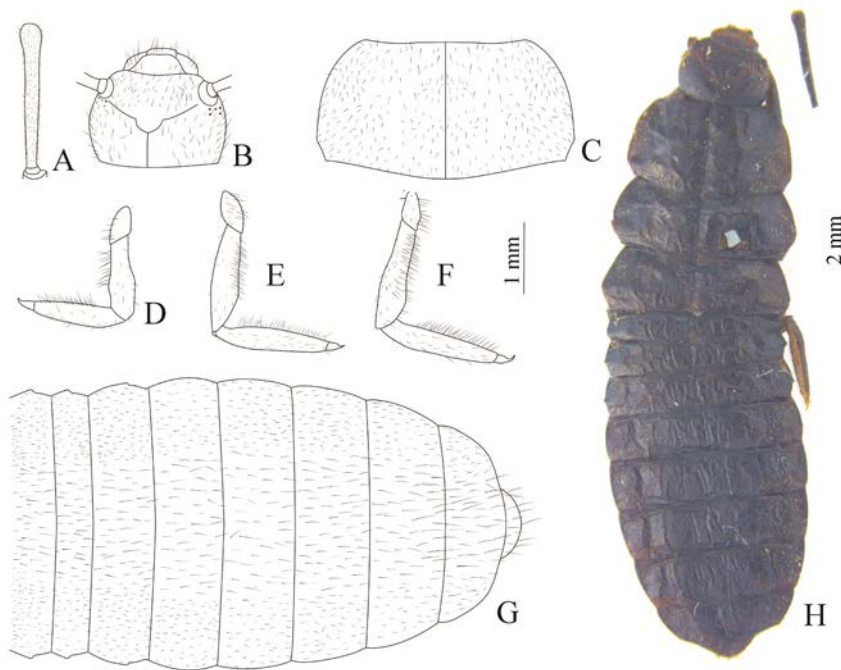


Figure 5. Morphological details of larva of *Luprops horni* (Gebien, 1914). A. Antenna; B. Head, dorsal view C. Pronotum; D–F. Pro-, meso- and metathoracic legs, ventral view; G. Abdomen, ventral view; H. Habitus, dorsal view. Scale bars = 1 mm (Figs. A–G); 2 mm (Fig. H).

Thorax. Thoracic tergites slightly sclerotized, black, sternite and legs brown; tergal suture deep and distinct. Prothoracic tergum (Fig. 5C) trapezoidal, wider than long, approximately 1.9 time as wide as long, widest before posterior margin; anterior margin nearly straight, distinctly narrower than posterior margin; lateral margins curved, abruptly narrowed at one-sixth base; posterior margin weakly protruded at middle portion; anterior angles and posterior angles rounded; surface with minute punctures bearing short setae. Mesothoracic tergite distinctly wider than long, distinctly wider than prothoracic tergum, widest at one-fourth of base; surface smooth, with minute punctures bearing short setae, lateral portions with setae slightly denser than middle; anterior and posterior angles rounded; lateral margins abruptly narrowed at one-fourth of base. Metathoracic tergite distinctly wider than long, slightly wider than that of mesothorax; surface with minute punctures bearing short setae, lateral portion with setae slightly denser than that of middle. Prothoracic legs (Fig. 5D) slightly shorter, thinner than meso- (Fig. 5E) and metathoracic legs (Fig. 5F). Femora and tibiae with

long erect setae at inner sides, with short sparse setae at upper, lower and lateral sides.

Abdomen. Abdominal tergites smooth, black-brown, with minute punctures bearing short setae. Tergites I, II and III each with protruded angle at middle of each lateral margin. Tergite IV wider than others; tergite VII longer than others. Abdominal sternites (Fig. 5G) brown or black-brown, with setae at middle longer than setae of lateral portions. Spiracles circular, near anterior angles of each tergite, covered by front tergite. Abdominal sternites VI, VII and VIII with few long setae near lateral margins. Abdominal segment IX semicircular, without triangular incision and urogomphi.

Specimens examined. China, 2♂, Taiwan, Pingdong, Kending, Jialeshui, 03-I-2007, Wenyi ZHOU leg., HBUM; ♂, Taiwan, Hualian, Tongmen, 01-IV-2010, Wenyi ZHOU leg., HBUM; 6 ex (4 larvae), Taiwan, Hualian, Ruihui, 11-VI-2009, Wenyi ZHOU leg., HBUM; 2 ex, Taiwan, Taibei, Wulai, Fushanlin, 13-V-2000, Wenyi ZHOU leg., HBUM; 1 ex, Taiwan, Taibei, Wulai, 03-V-1997, Wenyi ZHOU leg., HBUM; 2 ex, Taiwan, Nantou, 01-V-1994, Wenyi ZHOU leg., HBUM; 1 ex, Taiwan, Pingdong, Neiwen, 24-III-2013, Changqing CHEN leg., HBUM; 1 ex, Taiwan, Taibei, Sanxia Town, 24-IV-1994, Wenyi ZHOU leg., HBUM; 1 ex, Taiwan, Pingdong, Neiwencun, 28-III-2009, Wenxin LIN leg., HBUM; 2 ex, Taiwan, Pingdong, Fenggang, 06-I-2006, Wenxin LIN leg., HBUM; 1 ex, Taiwan, Taidong, Shouka, 14-IV-2008, Wenyi ZHOU leg., HBUM; 1 ex, Zhejiang, Mt. Tianmu Shan, Xianrending, 08-VII-2012, Guanglin XIE leg., HBUM; 1 ex, Zhejiang, Mt. Tianmu Shan, Xianrending, 06-VII-2012, Guanglin XIE leg., HBUM; 1 ex, Zhejiang, Qingliangfeng, Longtangshan, 18–21-V-2012, Jishan XU leg., HBUM; 7 ex, Zhejiang, Zhoushan, Mahuangshan, 06-VIII-2016, Yibin BA leg., HBUM; 1 ex, Zhejiang, Zhoushan, Taohuadiao, 04-VIII-2016, Yibin BA leg., HBUM; 1 ex, Zhejiang, Anji, Longwanshan, 13-VI-1996, Wenzhu LI leg., HBUM; 1 ex, Fujian, Shanghang County, Gutian Town, 02–03-VI-2004, Caixia YUAN leg., HBUM; 1 ex, Shaanxi, Nanzheng County, Piba Town, 19–21-VI-2005, Yibin BA leg., HBUM; 1 ex, Guizhou, Libo, Maolan, 30-VII-2010, Yong ZHOU leg., HBUM; 1 ex, Guangxi, Fusui, Bapen, Nonggengqiao, 22.4637°N, 107. 8867°E, alt. 151 m, 16-VI-2016, Xinglong BAI leg., HBUM. 1♂, Hunan, Xinchao County, Tangkoujie, 27.346°N, 111.4024°E, alt. 210 m, 25-VI-2015, Kaidong ZHAO leg., IZAS; 1 ex, Hunan, Hongjiang, Xuefeng, Xianfengxicun, 27.3281°N, 110.3422°E, alt. 560 m, 25-VI-2015, Hongbin LIANG leg., IZAS; 1 ex, Hunan, Huitong County, Tuanhe Town, Paizicun, 26.9352°N, 109.8792°E, alt. 546 m, 23-VI-2015, Hongbin LIANG leg., IZAS.

Distribution. China (Taiwan).

6. *Luprops irregularis* (Gebien, 1914) (Fig. 6E)

Luprops irregularis Gebien, 1914a: 35; Ando *et al.*, 2016: 9. TL: China, Taiwan, Sokutsu (Banshoryo-Distr.). TD: NHMB.

Specimens examined. Photos of syntype.

Distribution. China (Taiwan).

7. *Luprops kaszabi* Schawaller, 1997 (Figs. 1E, 2E, 3E, 4G–H, 6F), new record to China

Luprops kaszabi Schawaller, 1997: 296; Schawaller, 2013: 332. TL: Nepal, Janakpur. TD: NHMB.

Diagnosis. Body (Fig. 6F) elongate; pronotum and elytra reddish, antennae, lower surface of body and legs dark brown. Clypeal suture distinct. Clypeus distinctly elevated with large punctures. In dorsal view, eye (Fig. 2E) diameter longer than length of temple. First

antennomere dorsally with longitudinal keel in dorsal view, the ratio of II to XI antennomeres as follows: 11.8 : 33.2 : 28.0 : 26.8 : 29.0 : 31.6 : 34.7 : 33.0 : 32.2 : 55.8. Pronotum (Fig. 3E) widest before the middle, lateral margins of pronotum smooth and bordered; surface with sparse and large punctuation. Prosternal process wide, inflated to lateral sides before apex. Scutellum shining, without punctures, basal part with two impressions. Elytra with sparse and irregular punctures.

Specimens examined. 1♂1♀, **China**, Guangxi, Napo, Baihe, alt. 440 m, 08-IV-1998, Chaodong ZHU leg., IZAS.

Distribution. China (Guangxi); Nepal; Northern India; West Malaysia.

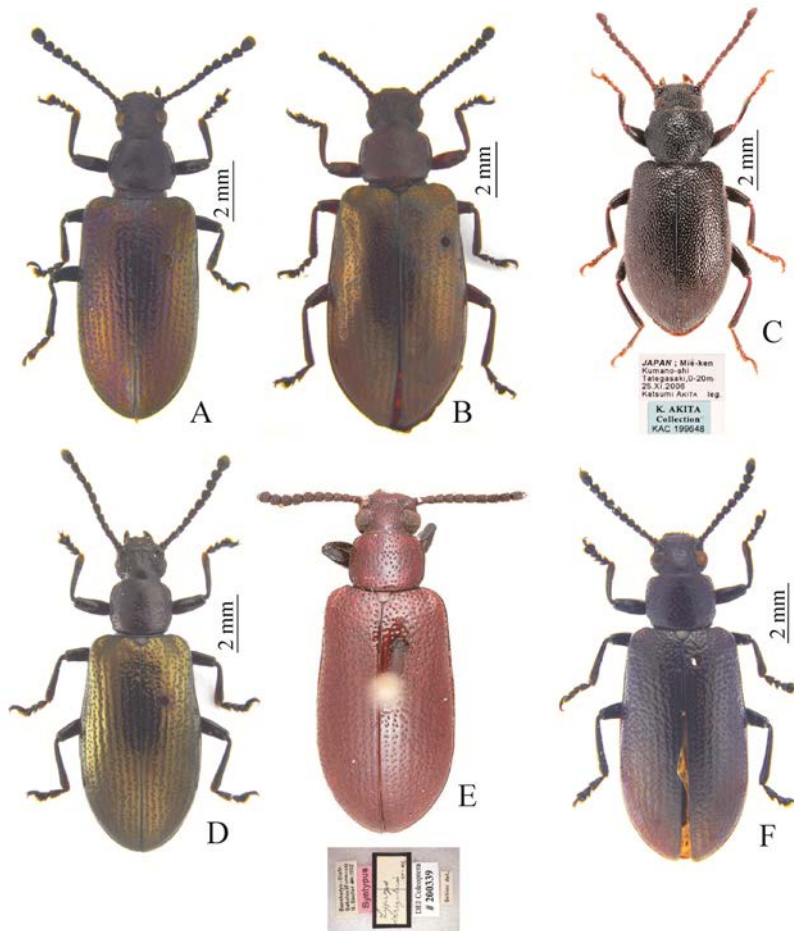


Figure 6. Habitus of *Lypros*. A. *L. brancuccii* Schawaller, 2013; B. *L. costulatus* Pic, 1915; C. *L. cribrifrons* (Marseul, 1876); D. *L. horni* (Gebien, 1914); E. *L. irregularis* (Gebien, 1914); F. *L. kaszabi* Schawaller, 1997.

8. *Lypros luzonicus* (Gebien, 1914) (Figs. 1F, 2F, 3F, 4I–J, 7A)

Lypros luzonicus Gebien, 1914b: 405; Ando *et al.*, 2016: 9. TL: Philippines, Bacuit, Palawan.

Specimens examined. **China**, 1♂1♀, Yunnan, Mengla County, Bubangcun, 21.6014°N, 101.5861°E, alt. 680 m, 20-V-2017, Zhaoxu LI leg., HBUM; 1♂2♀, Hainan, Changjiang, Bawangling, alt. 750 m, 05–07-VI-2008, Yibing BA leg., HBUM; 1 ex, Hainan, Bawangling,

Yajialinchang, 19°04.809'N, 109°07.045'E, alt. 906 m, 12-IV-2016, Lingxiao CHANG & Xinglong BAI leg., HBUM.

Distribution. China (Hainan, Taiwan, Yunnan); Philippines.

9. *Luprops orientalis* (Motschulsky, 1868) (Figs. 1G, 2G, 3G, 4K, L, 7B)

Anaedus orientalis Motschulsky, 1868: 195; Ando *et al.*, 2016: 9. TL: Mongolia.

Lypros sinensis Marseul, 1876: 126. TL: Japan, Nihon, Kiu-Siu.

Specimens examined. China, 1♂, Anhui, Yuexi, Baojiaxiang, 23–25-VII-2007, Yibin BA leg., HBUM; 2 ex, Jilin, Changbai, Tianchi Shan, 16-VIII-2002, Lizhen LI leg., SHNU; 20 ex, Liaoning, Kuandian, Danianggou, 15-VIII-2012, Feilin WANG leg., HBUM; 6 ex, Liaoning, Anshan, Qian Shan, 06-VII-2012, Feilin WANG leg., HBUM; 2 ex, Shandong, Pingyi, Mengshan, Dawa, 13–15-V-2007, Jiliang WANG leg., HBUM; 1 ex, Shandong, Yishui, 23-VII-2007, Fengyan WANG leg., HBUM; 10 ex, Hebei, Qianxi, Hanerzhuang, 03-VIII-2012, Jiliang WANG leg., HBUM; 1 ex, Hebei, Weixian, Xiaowutai Shan, 06–13-VII-2008, unknown leg., HBUM; 109 ex, Hebei, Qianxi, Hanerzhuang, 29-VII-2012, Haoyu LIU leg., HBUM; 6 ex, Hebei, Qianxi, Hanerzhuang, 02-VIII-2012, Jiliang WANG & Shenyan TANG leg., HBUM; 4 ex, Hebei, Jingjing County, Gaoyu Village, 22–28-VII-1998, Xinsheng TIAN leg., HBUM; 7 ex, Hebei, Renqiu, Motianling, 06-VIII-1998, Zhiqiang TAO leg., HBUM; 2 ex, Hebei, Fuping County, Longquanshan, 05-VIII-1998, Shiyu LIU leg., HBUM; 1 ex, Hebei, Xinglong County, Mt. Wuling Shan, 14–22-VII-1998, Zhe LI leg., HBUM; 2 ex, Hebei, Qianxi County, Linchang, 28-VII-1998, Qiuzhuang REN leg., HBUM; 1 ex, Hebei, Zhuolu, Yangjiaping, 28-VII-2012, Chao WEN leg., HBUM; 1 ex, Hebei, Xinglong, Mt. Wuling Shan, 15–22-VII-2012, Haoyu LIU leg., HBUM; 1 ex, Hebei, Pingquan County, Guangtoushan, 21-VII-1998, Zhe LI leg., HBUM; 6 ex, Hebei, Xianghe, 02-X-2006, Haoyu LIU leg., HBUM; 22 ex, Hebei, Xiaowutaishan, Jinhekou, 07–11-VII-2006, unknown leg., HBUM; 2 ex, Hebei, Yuxian, Longquanguan, 05-VIII-1999, Aimin SHI leg., HBUM; 9 ex, Hebei, Pingquan, Huangtuliang, 03-VIII-2012, Yibin BA & Yiping NIU leg., HBUM; 3 ex, Hebei, Chengde, Chadaolinchang, 18-VII-1999, Xinliang LI leg., HBUM; 1 ex, Hebei, Yuxian, Jinhekou, 22-VII-2012, Chao WEN leg., HBUM; 1 ex, Henan, Shangcheng, Jingangtai, 22–23-VII-2005, Chao GAO leg., HBUM; 3 ex, Henan, Linzhou, Shibanyan, 22-VII-2006, Fengyan WANG & Wenjing HUANG leg., HBUM; 1 ex, Henan, Shubai, alt. 600–800 m, 17-VII-2001, Ming BAI leg., HBUM; 2 ex, Henan, Nei County, Jiayouzhuan, 23-VIII-2008, Guodong REN leg., HBUM; 1 ex, Shaanxi, Nanzheng, Beiba, 19–23-VI-2005, Yibin BA leg., HBUM; 2 ex, Shaanxi, Ziyang, Maoba County, 08-VII-2003, Caixia YUAN leg., HBUM; 1 ex, Shaanxi, Langao County, 04-VII-2003, Yushuang LIU leg., HBUM; 57 ex, Shaanxi, Zhenan County, north of Yungaisi Town, 33°29'16"N, 109°0'54"E, alt. 850 m, 18-VI-2014, Caixia YUAN leg., HBUM; 1 ex, Shaanxi, Nanzheng County, Gaiyunsu, 33°53'14"N, 110°18'42"E, 30-VI-2014, Caixia YUAN leg., HBUM; 1 ex, Shaanxi, Nanzheng Town, 19–21-VI-2005, Yibin BA leg., HBUM; 2 ex, Shaanxi, Foping, alt. 890 m, 26-VI-1999, Youwei ZHANG leg., IZAS; 1 ex, Shaanxi, Foping, 27-VI-1999, alt. 900 m, Jian YAO leg., IZAS; 1 ex, Shanxi, Foping, alt. 900 m, 27-VI-1999, Tongli HE leg., IZAS; 2 ex, Shanxi, Ningxia, Huodidi, alt. 1580–1650 m, 28-VI-1999, Decheng YUAN leg., IZAS; 1 ex, Shaanxi, Zhouzhi County, Houzhenzi, alt. 1350 m, 25-VI-1999, Jian HU leg., IZAS; 6 ex, Shaanxi, Danfeng, Caichuan Town, Gonglu, 33.8831°N, 110.29666°E, alt. 1280 m, 03-VII-2014, Caixia YUAN leg.,

HBUM; 1 ex, Shaanxi, Shanyang County, 33.5563°N, 109.8719°E, alt. 679 m, 05-VI-2014, Caixia YUAN leg., HBUM; 2 ex, Shaanxi, Chushui, Zhonghecun, 33.5522°N, 109.3686°E, 25-VI-2014, Caixia YUAN leg., HBUM; 1 ex, Sichuan, Jialing, VII-2012, Yang CHEN leg., CWNU; 1 ex, Anhui, Xi County, Zhupu, 05–06-VI-2013, Jishan XU & Caixia YUAN leg., HBUM; 1 ex, Zhejiang, Qingliangfeng, Longtangshan, 18-V-2012, Jishan XU leg., HBUM; 2 ex, Zhejiang, Moganshan, 26-VI-1995, Yinquan LIU leg., HBUM; 1 ex, Zhejiang, Wuyanling, 02-III-2005, Qiang LI leg., HBUM; 1 ex, Zhejiang, Taishun, Wuyanling, 02-VII-2005, Yibin BA leg., HBUM; 1 ex, Zhejiang, Hangzhou, 27-VII-2005, Yibin BA leg., HBUM; 1 ex, Gansu, Huixian, Chengguan Town, 14-VII-2012, Guodong REN leg., HBUM; 1 ex, Gansu, Kangxian, Qinghelinchang, alt. 1400 m, 08-VII-1999, Jian YAO leg., IZAS; 2 ex, Gansu, Wenxian, Bikou, alt. 720 m, 27-VII-1999, Chaodong ZHU leg., IZAS; 1 ex, Gansu, Wenxian, Bifengkou, alt. 940–1500 m, 28-VII-1999, Jian YAO leg., IZAS; 1 ex, Chongqing, Chengkou County, Xiuqi Town, 13-VII-2003, Caixia YUAN leg., HBUM; 1 ex, Chongqing, Beibei, Jinyun Shan, 03-VII-2012, Wen WU leg., CWNU; 1 ex, Hubei, Shennongjia, Songbai Town, river side, 31.74419°N, 110.8184°E, alt. 910 m, 07-VIII-2003, Hongbin LIANG leg., IZAS; 1 ex, Yunnan, Xiping, Xinhua, 24.1135°N, 101.8568°E, alt. 1870 m, 29–30-VII-2009, Jishan XU leg., HBUM; 1 ex, Yunnan, Gongshan County, Dulongjiangcun, Sino-America Exped., alt. 1950–3680 m, 16-VII-2000, Yun XIONG leg., HBUM; 1 ex, Yunnan, Mengla County, Bubang Village, 21.6014°N, 101.5861°E, alt. 680 m, 20-V-2017, Zhaoxu LI leg., HBUM; 1 ex, Guangxi, Jinxiu, Shengtangshan, alt. 900 m, 17-V-1999, Guoqing ZHANG leg., IZAS; 1 ex, Taiwan, Taidong, Lijialindao, 30-IV-2009, Changqing CHEN leg., HBUM; 1 ex, Taiwan, Taidong, Shouka, 14-VII-2012, Wenyi ZHOU leg., HBUM; 1 ex, Taiwan, Shouka, Neiwen, 28-XII-2007, Wenxin LIN leg., HBUM; 1 ex, Taiwan, Pingdong, Fenggang, 06-I-2009, Wenxin LIN leg., HBUM.

Distribution. China (Chongqing, Fujian, Gansu, Guangxi, Hainan, Hebei, Heilongjiang, Henan, Hubei, Inner Mongolia, Jiangsu, Jilin, Jiangxi, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang); Bhutan; Indochina; Mongolia; Nepal; North Korea; Russian Far East; South Korea.

10. *Luprops rugosissimus* Kaszab, 1980 (Figs. 1H, 2H, 3H, 4M, N, 7C), new record to China.

Luprops rugosissimus Kaszab, 1980: 194; Sabu *et al.*, 2007: 51. TL: Sri Lanka, Kala Wewa. TD: HNHM.

Diagnosis. Body (Fig. 7C) elongate, black. Head, pronotum and elytra with dense punctures and long erect setae. Anterior margin of clypeus concave; clypeal suture deep. In dorsal view, eye (Fig. 7C) diameter longer than length of temple. Temple with rough large punctures. Antennae (Fig. 1A) long and thick, antennomere III short, about 1.2 times as long as antennomere 4; the ratio of II to XI antennomeres as follows: 21.1: 44.1: 37.5: 35.0: 36.2: 37.0: 35.2: 38.2: 37.1: 67.4. Pronotum (Fig. 3H) nearly cordiform, widest before the middle; anterior margin concave, without border; lateral margins bordered, smooth; before basal margin abruptly narrowed. Middle and apex of prosternal apophysis enlarged. Elytra elongate, parallel-sided, disc with irregular dense punctures and with longitudinal wrinkles arranged in costae. Aedeagal apicale (Fig. 4M) triangular.

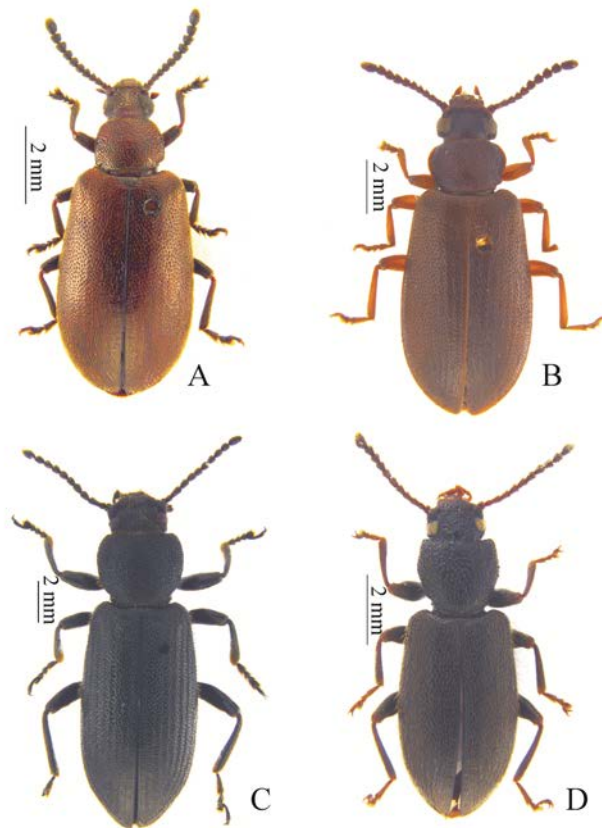


Figure 7. Habitus of *Luprops*. A. *L. luzonicus* (Gebien, 1914); B. *L. orientalis* (Motschulsky, 1868); C. *L. rugosissimus* Kaszab, 1980; D. *L. yunnanus* (Fairmaire, 1887).

Specimens examined. **China**, 1♂, Yunnan, Puer, Guanyinsitai, 25-IX-2009, Xiaoyu ZHU leg., HBUM; 1♂, Yunnan, Gengma, Mengding, 25-VII-2013, Guanglin XIE leg., HBUM; 1 ex, China, Yunnan, Baoshan, Bawan, on the street near a ditch, 24.955°N, 98.8385°E, alt. 1030 m, 13-X-2003, night, Hongbin LIANG leg., IZAS; 3 ex, Yunnan, Jinghong, Menghai, Banna River Reserve, Guomenshan, alt. 1110 m, 22.2453°N, 100.6038°E, 10-XI-2008, Zengling MENG leg., IZAS; 6 ex, Yunnan, Mengla, North of Bubang, 21.6014°N, 101.5861°E, alt. 680 m, 13-VII-2018, Zhaoxu LI & Qiaoqiao JI leg., HBUM; 1 ex, Yunnan, Mengla, Menglun, 55 km, alt. 703 m, 09-X-2013, Xiaodong YANG leg., HBUM; 1 ex, Yunnan, Jinping, Jinhe, alt. 1300 m, IV-2010, Xiaoyu ZHU leg., HBUM; 1 ex, Yunnan, Liuku, 01-V-2004, Xiujuan YANG leg., HBUM; 1 ex, Yunnan, Simao, Nuozhadu, Kanjie River, alt. 650 m, 17-V-2001, Jinxin SONG leg., HBUM; 1 ex, China, Yunnan, Jinghong, Jingna, alt. 1500 m, 06-IX-2002, Hongbin LIANG leg., IZAS; 1 ex, Yunnan, Ruili, 17-V-2004, Xiujuan YANG & Yushuang LIU leg., HBUM; 1 ex, Yunnan, Ruili, 18-V-2004, Xiujuan YANG leg., HBUM; 1 ex, Yunnan, 14-VIII-2005, Haoyu LIU leg., HBUM. **India**, 1♂, Andhra Pradesh, Nellore District, Naidupet mandal, 14-IX-2010, Changing CHENG leg., HBUM; 1 ex, Andhra Pradesh, Nellore District, Naidupet mandal, 10-VII-2010, Changqing CHENG leg., HBUM; 1

ex, Andhra Pradesh, Nellore District, Naidupet mandal, 03-X-2010, Changqing CHEN leg., HBUM; 2 ex, Andhra Pradesh, Nellore District, Naidupet mandal, 05-X-2010, Changqing CHEN leg., HBUM; 1 ex, Andhra Pradesh, Nellore District, Naidupet mandal, 06-X-2010, Changqing CHEN leg., HBUM; 1 ex, Andhra Pradesh, Nellore District, Naidupet mandal, 07-X-2010, Changqing CHEN leg., HBUM; 1 ex, Andhra Pradesh, Nellore District, Naidupet mandal, 12-IX-2010, Changqing CHEN leg., HBUM.

Distribution. China (Yunnan); India (Andhra Pradesh); Sri Lanka.

11. *Luprops yunnanus* (Fairmaire, 1887) (Figs. 1I, 2I, 3I, 4O, P, 7D)

Lypros yunnanus Fairmaire, 1887: 128. Kaszab, 1972: 40; Merkl, 1992: 263. TL: China, Yunnan. TD: SMNS.

Specimens examined. China, 3♂8♀, Hainan, Diaoluo Shan, 21-V-2010, Xiaoqing YANG leg., HBUM; 1♀, Hainan, Qiongzong, Diaoluo Shan, 19–22-V-2011, Xiaoqing YANG leg., HBUM; 1 ex, Hainan, Changjiang, Bangwangling, alt. 750 m, 05–07-VI-2008, Yibin BA leg., HBUM; 1 ex, Hainan, Jiangfengling, Shumuyuan, 26-V-2011, Xiaoqing YANG leg., HBUM; 1 ex, Hainan, Baisha, Nankai, Daoda, 24-V-2008, alt. 450 m, Yibin BA leg., HBUM; 1 ex, Hainan, Yuanling, Jiemuxi, 02–11-VIII-2004, Fengjian WANG leg., HBUM; 1 ex, Hainan, Dongfang, Mihouling, 11-VI-2008, Yibin BA leg., HBUM; 3 ex, Yunnan, Banna Botanical Garden, 21.9322°N, 101.2544°E, alt. 550 m, 12-V-2017, Zhaoxu LI leg., HBUM; 2 ex, Yunnan, Banna Botanical Garden, alt. 550 m, 12-V-2017, Zhaoxu LI & Qiaoqiao JI leg., HBUM; 13 ex, Yunnan, Banna Botanical Garden, 21.9355°N, 101.2522°E, alt. 550 m, 14-V-2017, Zhaoxu LI & Qiaoqiao JI leg., HBUM; 3 ex, Yunnan, Banna Botanical Garden, 21.9169°N, 101.2544 E, alt. 540 m, 14-V-2017, Zhaoxu LI leg., HBUM; 6 ex, Yunnan, Banna Botanical Garden, 21.9355°N, 101.2522°E, alt. 550 m, 14-V-2017, Zhaoxu LI & Qiaoqiao JI leg., HBUM; 2 ex, Yunnan, Banna Botanical Garden, 21.9127°N, 101.2828°E, alt. 670 m, 15-V-2017, Zhaoxu LI leg., HBUM; 2 ex, Yunnan, Mengla, north of Bubangcun, 21.6014°N, 101.5861°E, 20-V-2017, Zhaoxu LI leg., HBUM; 4 ex, Guangxi, Chongzhou, Zuozhou, Nongquancun, 22.5794°N, 107.4177°E, 11-VI-2016, leg. Xinglong BAI, HBUM; 1 ex, Yunnan, Xishuangbanna, Nangong Shan, 07-VII-2003, Liang TANG leg., HBUM.

Distribution. China (Guangxi, Guangdong, Hainan, Yunnan); Bhutan; Nepal.

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