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New or little-known stag beetles (Coleoptera: Lucanidae: Lucaninae) from China

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Abstract

Lucanus cenwanglaoshanus sp. nov. and *Dorcus taoi* sp. nov. are described from Guangxi and Sichuan respectively. The females of *Lucanus zhuxiangi* Wang & Zhan, 2018 are described correctly for the first time. The males of *Lucanus fonti* Zilioli, 2005 from Fujian are figured.

Keywords

Lucanus, *Dorcus*, new species, Sichuan, Guangxi, China

Introduction

Mr. Cheng-Hai Fu (Nanning) collected two large-sized males of a strange looking *Lucanus* species from Mt. Cenwanglaoshan, Guangxi, southern China and generously gave them to Mr. Wei Liu (Hangzhou) who shared this collection with Mr. Chao Li (Beijing). Both W. Liu and C. Li kindly lent the authors the specimens which had been dissected and proved to represent a scientifically unknown species, described herein.

A good number of both male and female specimens of *Lucanus zhuxiangi* Wang & Zhan, 2018 were collected by Mr. Yu-Tang Wang, Ms. Jian-Yue Qiu and Mr. Yi-Ting Chung from Nanling, Guangdong during the summer of 2019, and the authors concluded that the female paratype specimen figured in the original description (Wang & Zhan 2018: Fig. 1D-E) does not belong to *Lucanus zhuxiangi*. However, a careful study of the correct females supported *Lucanus zhuxiangi* to be independent from *L. brivioi* Zilioli, 2003, though Wang & Zhan (2018) based their viewpoint on a misidentification of female. Mr. Peng-Yu Liu kindly lent the authors some males of *Lucanus fonti* collected from Fujian. The authors take this opportunity to figure this rare material.

Mr. Rong-Chuan Tao unexpectedly discovered some males of an undescribed *Dorcus* species from Yingjing, Sichuan, of which the females had been figured and discussed in the authors' second book on Chinese stag beetles, well known as Mt. Erlang's *Dorcus* (Huang & Chen 2013). Therefore this famous *Dorcus* species is formally described herein and named after R.-C. Tao.

The specimens are deposited in the following public and private collections:

- SHNU - Department of Biology, Shanghai Normal University, China
- CCCC - private collection of Chang-Chin Chen, Tianjin, China
- CTRC - private collection of Rong-Chuan Tao, Yingjing, Ya'an, China
- CPYL - private collection of Peng-Yu Liu, Fuzhou, China
- CWL - private collection of Wei Liu, Hangzhou, China

***Lucanus cenwanglaoshanus* Huang & Chen spec. nov.**

Type Data

CHINA: Guangxi province: **Holotype** ♂ (CCCC, will be deposited in SHNU soon, Figs. 1 & 10), Baise City, Tianlin County, Cenwanglaoshan National Nature Reserve, IV. 2019, Cheng-Hai Fu leg.;

Paratype: 1 ♂ (CWL, Figs. 3 & 11), same data as holotype.

Etymology

This new species is named after the type locality, "Cenwanglaoshan", at the request of the collector, Mr. Cheng-Hai Fu, who gave up the chance to be named after.

Diagnosis & Discussion

The males of this new species are similar to the same-sized males of *Lucanus zhuxiangi* Wang & Zhan, 2018 (11 ♂♂ examined; Figs. 2 & 12) from Mangshan and Nanling in external features, but can be distinguished from the latter by the following combination of characters:

- 1) upper branch of the apical fork of the mandible markedly longer;
- 2) clypeolabrum constantly longer;
- 3) pubescence longer and denser on both sides of the entire body;
- 4) median lobe of male genitalia gradually tapered apically, not even in width throughout;
- 5) permanently everted internal sac (flagellum) of male genitalia markedly shorter.

The males of this new species are rather similar to those of *Lucanus fonti* Zilioli, 2005 (12 ♂♂ examined; Figs. 20-21) in the apical fork of the mandible, but can be distinguished from the latter by the following combination of characters:

- 1) major tooth of mandible markedly longer;
- 2) median lobe of male genitalia gradually tapered apically.

In genitalia, the males of this new species can be distinguished from those of *L. deveianus* Boucher, 1998 (5 ♂♂ dissected) by having the median lobe gradually tapered apically, not abruptly contracted near middle, from *L. zhanbishengi* Wang & Zhu, 2017 (4 ♂♂ dissected) by the much shorter flagellum, and from *L. fairmairei* Planet, 1897, *L. szetschuanicus* Hanus, 1932, *L. brivioi* Zilioli, 2003 and *L. hewenjiaei* Huang & Chen, 2013 by the different shape of the median lobe. Nevertheless, this new species is the closest to *L. zhanbishengi* in the shape of the median lobe.

In external features, this new species can be easily distinguished from *L. zhanbishengi* in males by having the much longer branches of the apical fork of the mandible and the more evenly rounded lateral ridges of the head. It should be noted that the correct type locality of *L. zhanbishengi* is assumed to be Yanling County, Zhuzhou instead of Xuefengshan, Hongjiang. According to Mr. Zhong Peng and Mr. Ri-Xin Jiang (personal communications), the very first specimens of *L. zhanbishengi* were collected by the students of the Shanghai Normal University during a few entomological surveys at Mt. Nanfengmian and the news were spread to the collectors of the type series who announced Xuefengshan, Hongjiang as the type locality (Wang & Zhu 2017), probably trying to keep secret. However, Mr. Yu-Tang Wang tried hard to collect at Xuefengshan for days and failed to find any *Lucanus* there, but he succeeded in collecting a good number of *L. zhanbishengi* from Yanling, Zhuzhou in the same month.

Length of body: Male: 54.2-60.0mm

Distribution: S. China (W. Guangxi).

Lucanus zhuxiangi* Wang & Zhan, 2018*Material**

CHINA: Guangdong province: 11 ♂♂ & 9 ♀♀ (CCCC), Nanling Nature Reserve, 1670m, 3-4.VI.2019, Y.-T. Wang, J.-Y. Qiu & Y.-T. Chuang leg..

Female. The female paratype of *L. zhuxiangi* figured by Wang & Zhan (2018: Fig. 1D-E) does not represent the normal form, showing a curious resemblance to *L. klapperichi* Bomans, 1989 in both the shape of the pronotum and the spermatheca of the genitalia. However, the living female figured by Wang & Zhan (2018: Fig. 7D) belongs to the normal form by having a well-developed pubescence and a rather squarish pronotum.

The newly collected females of *L. zhuxiangi* examined by the authors (Figs. 4, 6, 7 & 15-17) possess the rather squarish pronotum shared by *L. fairmairei*, *L. szetschuanicus*, *L. fonti*, *L. brivioi*, *L. deuveianus*, *L. zhanbishengi* and *L. hewenjiae*. A close examination shows that the females of *L. zhuxiangi* (Figs. 4, 6, 7 & 15-17) differ from those of *L. brivioi* (Figs. 5, 8, 9 & 18-19) by having the longer inner ridge of the right mandible, the more expanded apex of the protibia, the larger spermatheca, and especially the extremely protruded prosternal process. Such considerable differences in female characters support *L. zhuxiangi* to be independent from *L. brivioi*, though the two species are hardly distinguished by genital characters.

Lucanus fonti* Zilioli, 2005*Material**

CHINA: Fujian province: 3 ♂♂ (CPYL), on road from Gutian to Jian'ou, 6-9.VII.2018, P.-Y. Liu leg..

Individual and geographical variations

The males from Fujian have the mandibles more bent at base but less bent at middle than in those from Zhejiang, but an examination of male genitalia shows no constant difference between the populations from Fujian and Zhejiang. However, as figured herein (Figs. 20-21), the male genitalia show considerable individual variations in the shape of the median lobe and the pigmented part of the ventral plate of the basal piece.

Dorcus taoi Huang & Chen spec. nov.
= *Dorcus* spec. incert. 1: Huang & Chen, 2013: 387

Type data

CHINA: Sichuan province: **Holotype** ♂ (CCCC, will be deposited in SHNU in future, Figs. 22 & 25), Ya'an City, Yingjing County, Longcanggou National Forest Park, 1700m, old larva collected by Rong-Chuan Tao on 21.V.2019 and emerged on 24.VI.2019.

Paratype: 1 ♂ & 1 ♀ (CCCC), same locality as holotype, but 2300m, adults collected by Rong-Chuan Tao on 28.VII.2019; 8 ♂♂ & 7 ♀♀ (2♂♂ & 1 ♀ in CCCC, 6 ♂♂ & 6 ♀♀ in CTRC), same data as holotype.; 1 ♀ (CCCC), Ya'an City, Tianquan County, Mt. Erlangshan, 2400m, 8.VIII.2007, Hai-Cheng Shan leg.; 2 ♀♀ (CCCC), Ya'an City, Tianquan County, Mt. Erlangshan, 2200-2400m, 22-25.VI.2012, Ye Liu & Hao Huang leg..

Etymology

This new species is named in honour of Mr. Rong-Chuan Tao, who discovered the males of this new species.

Diagnosis

This new species is phylogenetically closer to *Dorcus branaungi* Nagai, 2000 than to any other *Dorcus* species, but can be distinguished from the latter by the following combination of characters:

- 1) anterior angle of the pronotum in the same-sized male more broadly rounded;
- 2) inner tooth of the mandible in the same-sized male better developed and usually double;
- 3) aedeagus markedly smaller in size no matter how long the specimen is;
- 4) female mandible markedly slenderer;
- 5) lateral margin of the female pronotum more curved at anterior one third;
- 6) hemisternite of female genitalia markedly smaller;
- 7) spermatheca of female genitalia much longer and more expanded at terminal end.

Length of body. Male: 27.5-32.5 mm. Female: 24.5-30.0 mm.

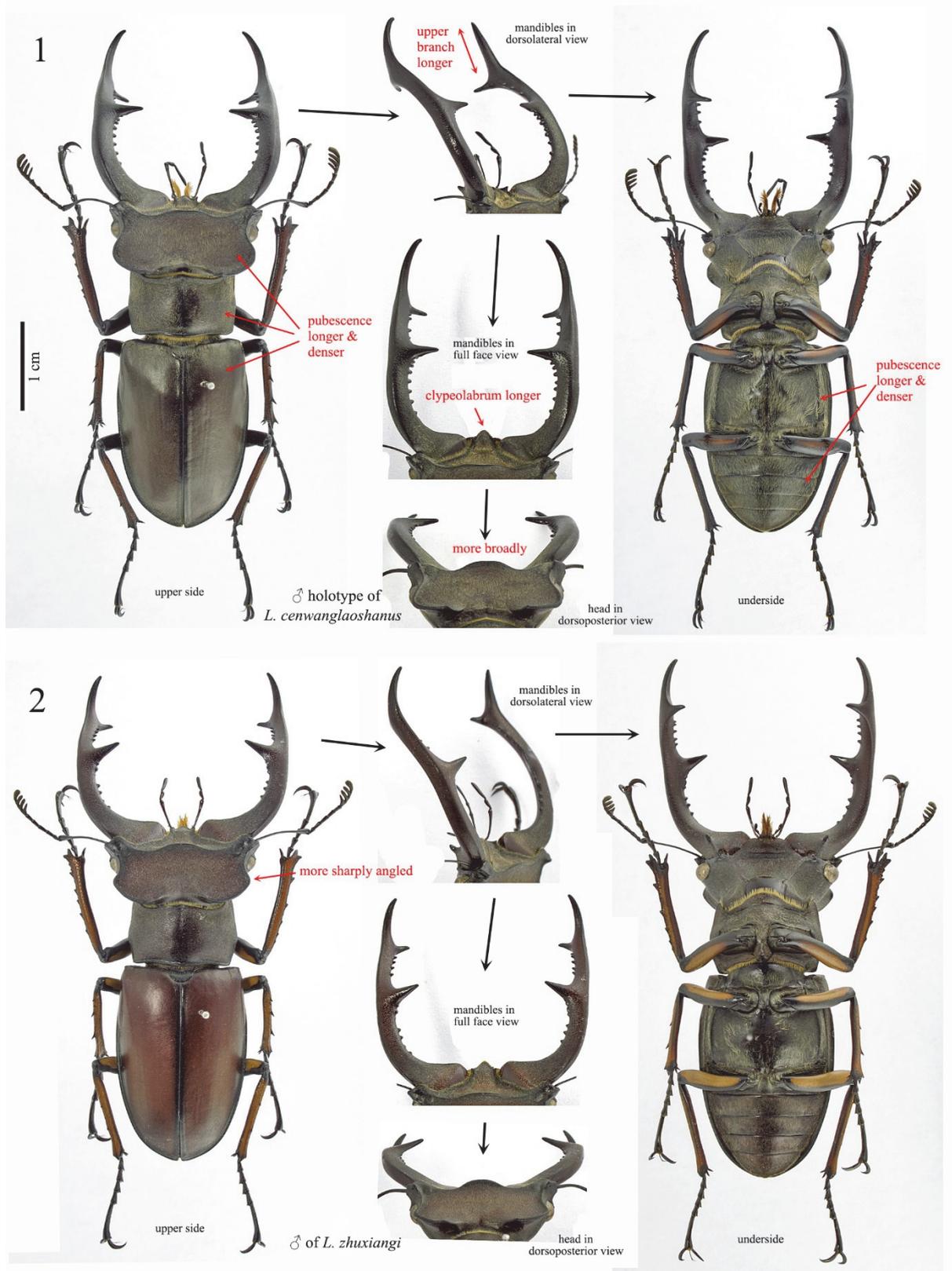
Distribution. SW. China (Ya'an area of Sichuan).

Acknowledgements

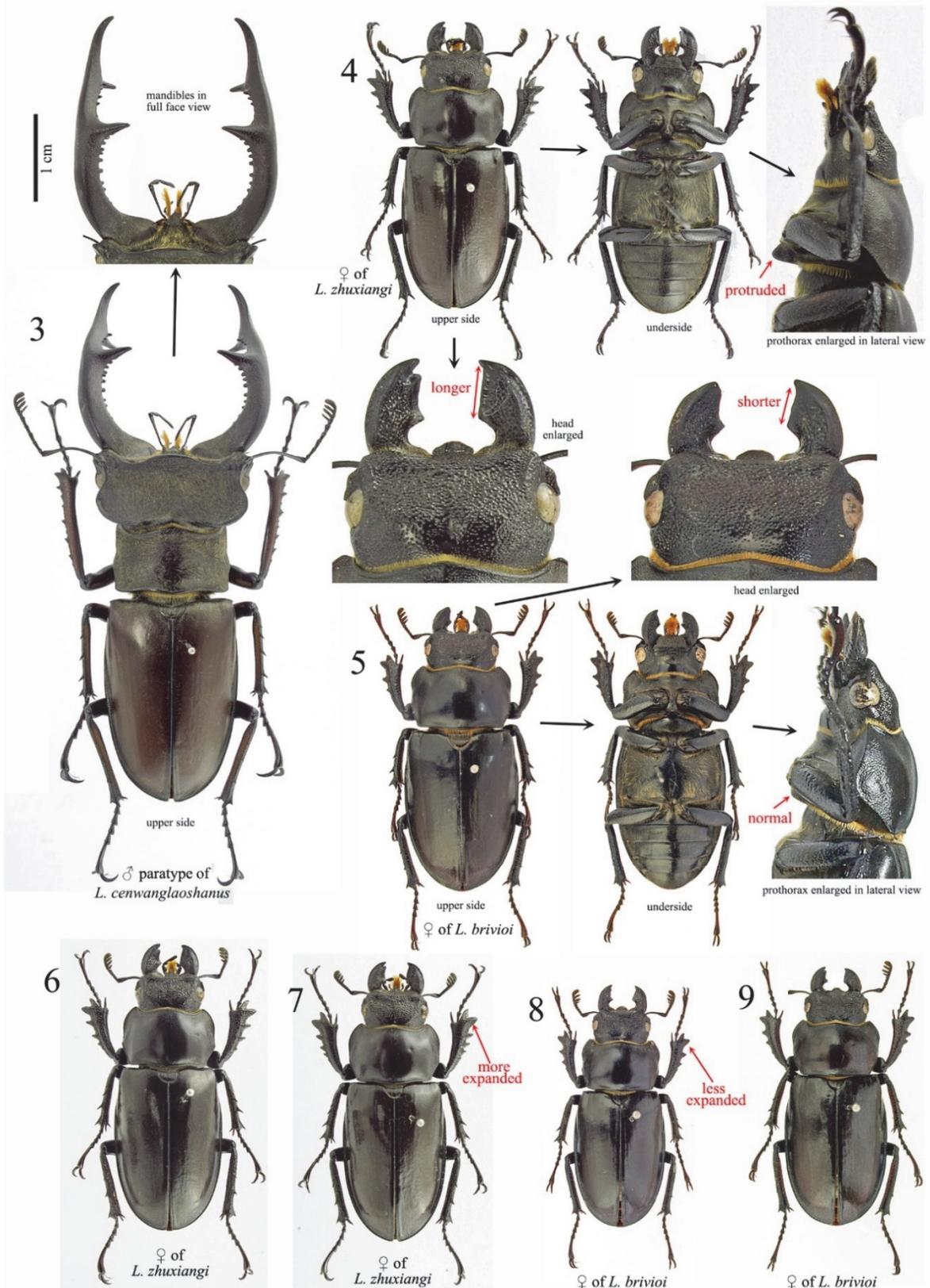
The following friends helped in collecting and loaning materials: Mr. Cheng-Hai Fu (Nanning), Mr. Wei Liu (Hangzhou), Mr. Chao Li (Beijing), Mr. Rong-Chuan Tao (Yingjing), Mr. Peng-Yu Liu (Fuzhou), Mr. Yu-Tang Wang (Taiwan), Ms. Jian-Yue Qiu (Mianyang) and Mr. Yi-Ting Chung (Taiwan). Mr. Zhong Peng (Shanghai) and Mr. Ri-Xin Jiang (Qingdao) kindly shared their information on *Lucanus zhanbishengi*.

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- WANG, C.-B. & X. ZHU (2017) *Lucanus zhanbishengi* sp. n., a new species from Hunan, central China (Coleoptera: Lucanidae: Lucaninae). International Journal of Research Studies in Zoology 3(4): 54-69.



Figs. 1-2: *Lucanus* specimens nearly in same size, habitus and characters at same scale. (1) Male holotype of *L. cenwanglaoshanus*; (2) male of *L. zhuxiangi* (Nanling, VI. 2019).

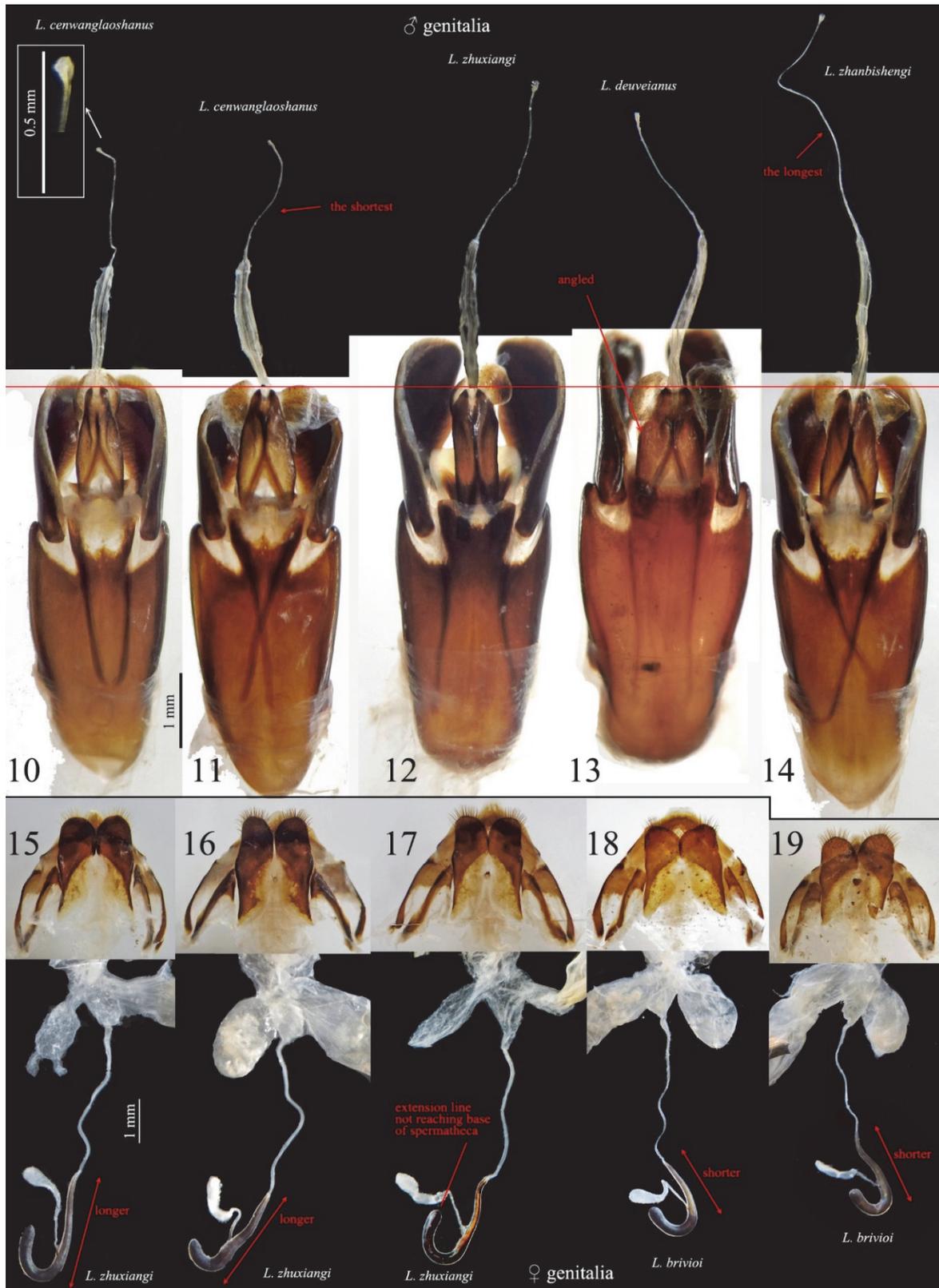


Figs. 3-9: *Lucanus* specimens, habitus at same scale with some parts enlarged.

(3) Male paratype of *L. cenwanglaoshanus*;

(4 & 6-7) females of *L. zhuxiangi* (Nanling, VI. 2019);

(5 & 8-9) females of *L. brivioi* (Dehua, Fujian, VI. 2014).



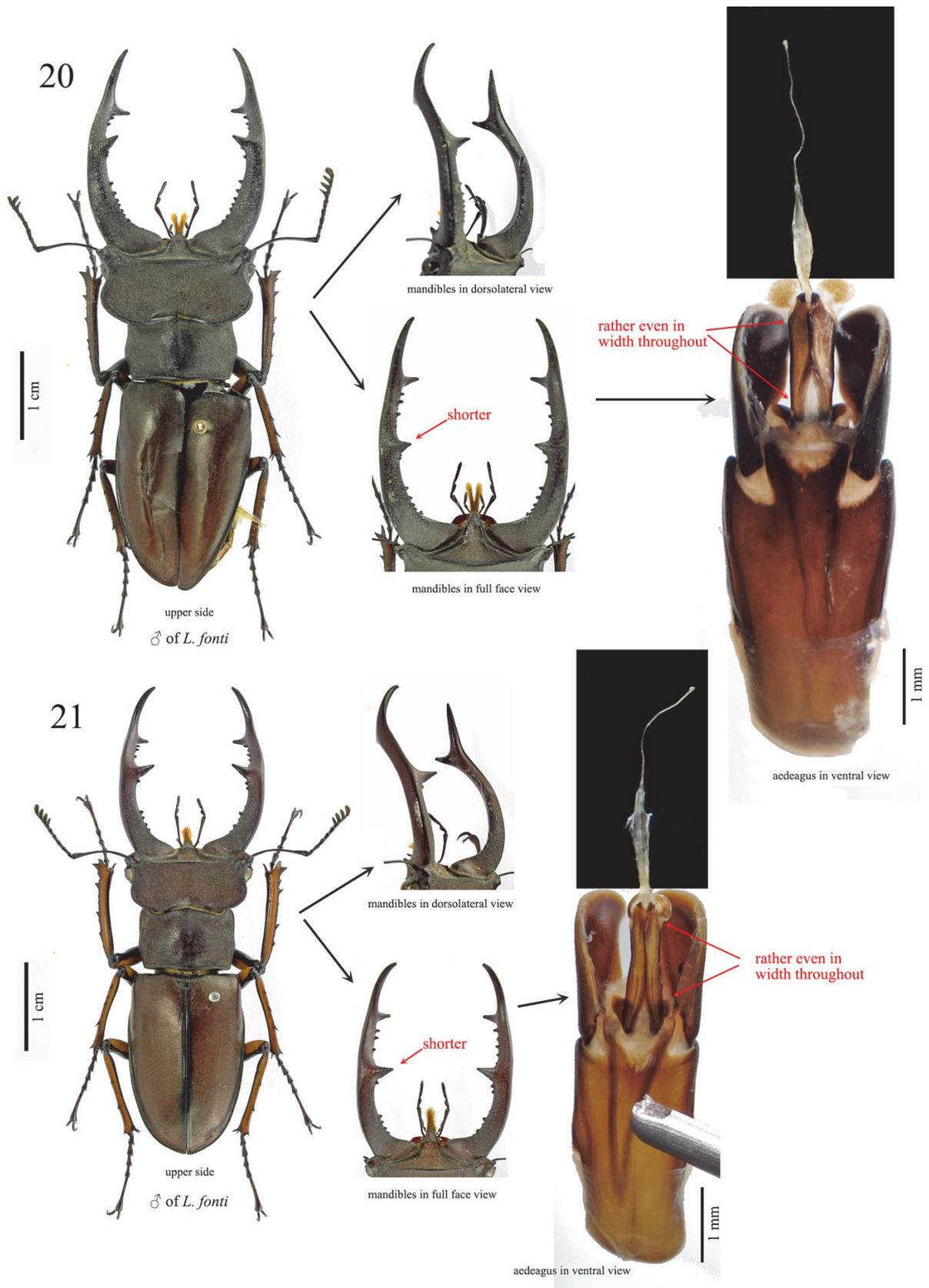
Figs. 10-19: Male and female genitalia of *Lucanus* species.

(10-14) Aedeagi in ventral view at same scale; (15-19) female genitalia at same scale;

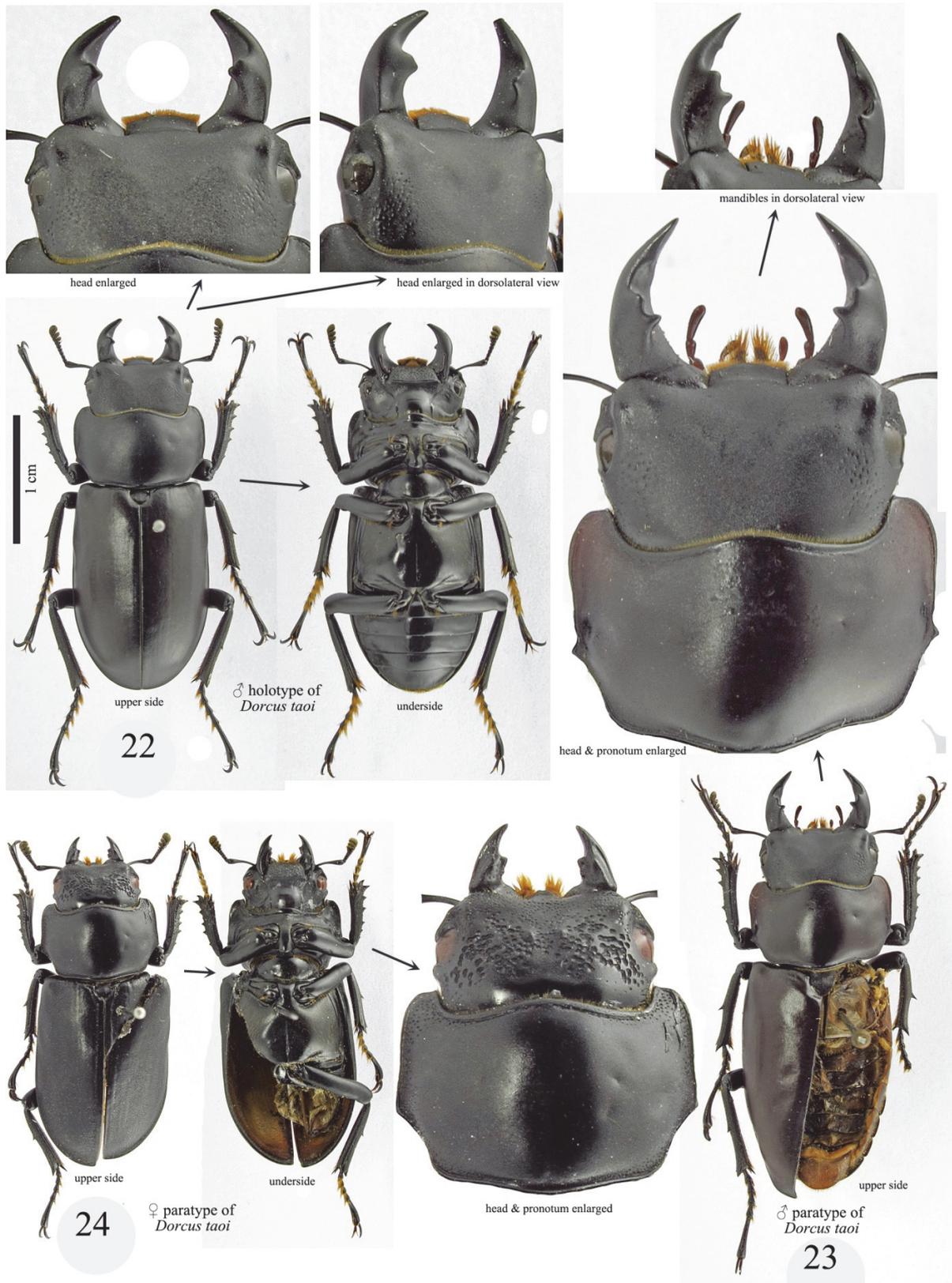
(10-11) *L. cenwanglaoshanus*; (12) *L. zhuxiangi*, specimen shown in Fig. 2;

(13) *L. deuveianus* (Damingshan, Guangxi); (14) *L. zhanbishengi* (Yanling, Hunan, V. 2019);

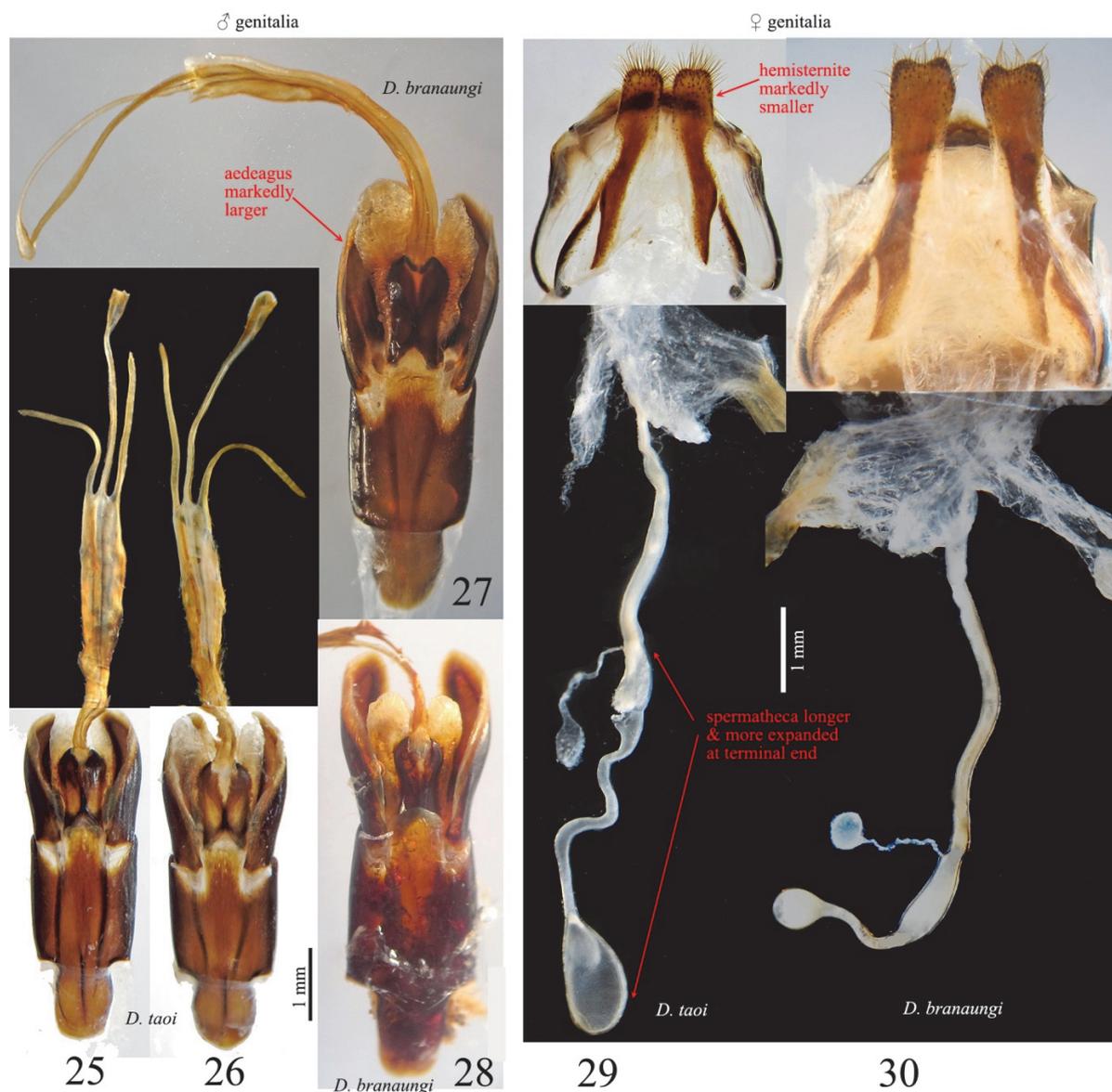
(15-17) *L. zhuxiangi*, specimens shown in Figs. 4, 6 & 7 respectively; (18-19) *L. brivioi*, Figs. 5 & 8.



Figs. 20-21: Males of *Lucanus fonti* (Gutian-Jian'ou, Fujian), habitus, characters and genitalia.



Figs. 22-24: *Dorcus taoi*, habitus at same scale with some parts enlarged.
 (22) Male holotype; (23) male paratype; (24) female paratype.



Figs. 25-30: male and female genitalia of *Dorcus* species.
 (25-28) Aedeagi in ventral view at same scale;
 (29-30) female genitalia at same scale;
 (25-26) *D. taoi*, specimens shown in Figs. 22-23 respectively;
 (27-28) *D. branaungi* (Gongshan, Yunnan);
 (29) *D. taoi*, specimen shown in Fig. 24;
 (30) *D. branaungi* (Gongshan).

A new species of *Ceruchus* (Coleoptera: Lucanidae: Syndesinae) from SE Tibet, China

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Abstract

A new species of *Ceruchus* MacLeay, 1819 is described from Motuo area, SE Tibet, China, with the male and female genitalia illustrated.

Keywords

Ceruchus, new species, Motuo, Tibet, China

Introduction

The third and fourth authors of this paper collected two males and one female of a *Ceruchus* species from some decayed logs at Motuo, SE Tibet. The specimens were lent to the second author and transferred to the first author for an identification. A careful examination of both external features and genital structures reveals that these specimens belong to a scientifically unknown species, described herein.

The type specimens are deposited in the following public and private collections:

SHNU - Department of Biology, Shanghai Normal University, China

CCCC - private collection of Chang-Chin Chen, Tianjin, China

***Ceruchus motuoensis* Huang, Chen, Tao & Xiao spec. nov.**

Type Data

CHINA: Tibet autonomous region: **Holotype** ♂ (CCCC, will be deposited in SHNU soon, Figs. 1 & 6), Linzhi Division, Motuo County, 62k, 2754m, 13.XI.2019, R.-C. Tao & C.-M. Xiao leg.;

Paratype: 1 ♂ (CCCC, Figs. 2 & 7) & 1 ♀ (CCCC, Figs. 4 & 14), same data as holotype.

Etymology

This new species is named after the type locality, Motuo.

Diagnosis & Discussion

Ceruchus motuoensis Huang, Chen, Tao & Xiao sp. nov. is close to *Ceruchus tabanai* Okuda, 2008, *C. sinensis* Nagel, 1933 and *C. niger* Boucher & Kral, 1997 in morphology, but can be distinguished from all of them by the following combination of characters:

- 1) lateral sides of the male head more coarsely punctured and more deeply grooved, with lateral margins in dorsal view markedly waved, not rather smooth as in all other species;
- 2) posterior one-third of the lateral margins of the male pronotum more oblique than in all other species;
- 3) male mandibles markedly longer, with major tooth placed more apically than in the same sized males of *C. sinensis* and *C. niger*;
- 4) lateral sides of the female head more coarsely punctured than in all other species;
- 5) lateral margins of the female pronotum in dorsal view more arched than in all other species, with the posterior one-sixth markedly concave;
- 6) central split on the basal piece of the aedeagus V-shaped, not m-shaped as in *C. niger*;
- 7) median lobe of the male genitalia in lateral view markedly wider at base than in all other species;
- 8) median lobe in dorsal view markedly swollen at middle as in *C. niger*, not gradually tapered apically as in *C. tabanai* and *C. sinensis*;
- 9) median lobe markedly stouter than in *C. niger*, with a smaller length-width ratio;
- 10) lateral apex of the median lobe not so strongly sclerotized and pigmented as in *C. tabanai*;
- 11) female genitalia as in *C. tabanai*, with a shorter spermathecal duct than in *C. niger* and a smaller spermatheca than in *C. sinensis*.

This new species seems to be a transitional form between *C. tabanai* and *C. niger* in morphology. A primary phylogenetic analysis using morphological characters concluded that this new species is phylogenetically closer to *C. tabanai* than to all others. The female genitalia of this new species are indistinguishable from those of *C. tabanai*. However, this new species should be treated as independent from *C. tabanai* by having a less flattened median lobe of the male genitalia with the middle part markedly swollen laterally as in *C. niger* and *C. yangi* Huang, Imura & Chen, 2011. Although this new species shares such a peculiar shape of the median lobe with *C. niger* and *C. yangi*, it possesses a V-shaped central split on the basal piece of the aedeagus. It should be noted that the m-shaped central split on the basal piece of the aedeagus is a very constant character for both *C. niger* and *C. yangi*, as a large series of specimens have been examined. Moreover, the female genitalia of this new species are easily distinguishable from those of *C. niger* and *C. yangi* by having a markedly shorter spermathecal duct.

The very little known taxon, *C. katerinae gonjoicus* Li, 2015 from Gongjue (GonJo), NE. Tibet was treated by Huang & Chen (2017) as a junior synonym of *C. niger*. According to the original description (Li, 2015), the male holotype of *gonjoicus*, nearly in the same size as the male type specimens of *C. motuoensis* sp. nov., with a total length of 14.67 mm, possesses a pair of very short mandibles and a rather squarish pronotum as in the same sized males of *C. niger*. The male genitalia of *gonjoicus* figured in low resolution have a traceable m-shaped central split on the basal piece as in *C. niger*.

Length of body. Male: 14.8-15.2mm. Female: 13.5 mm.

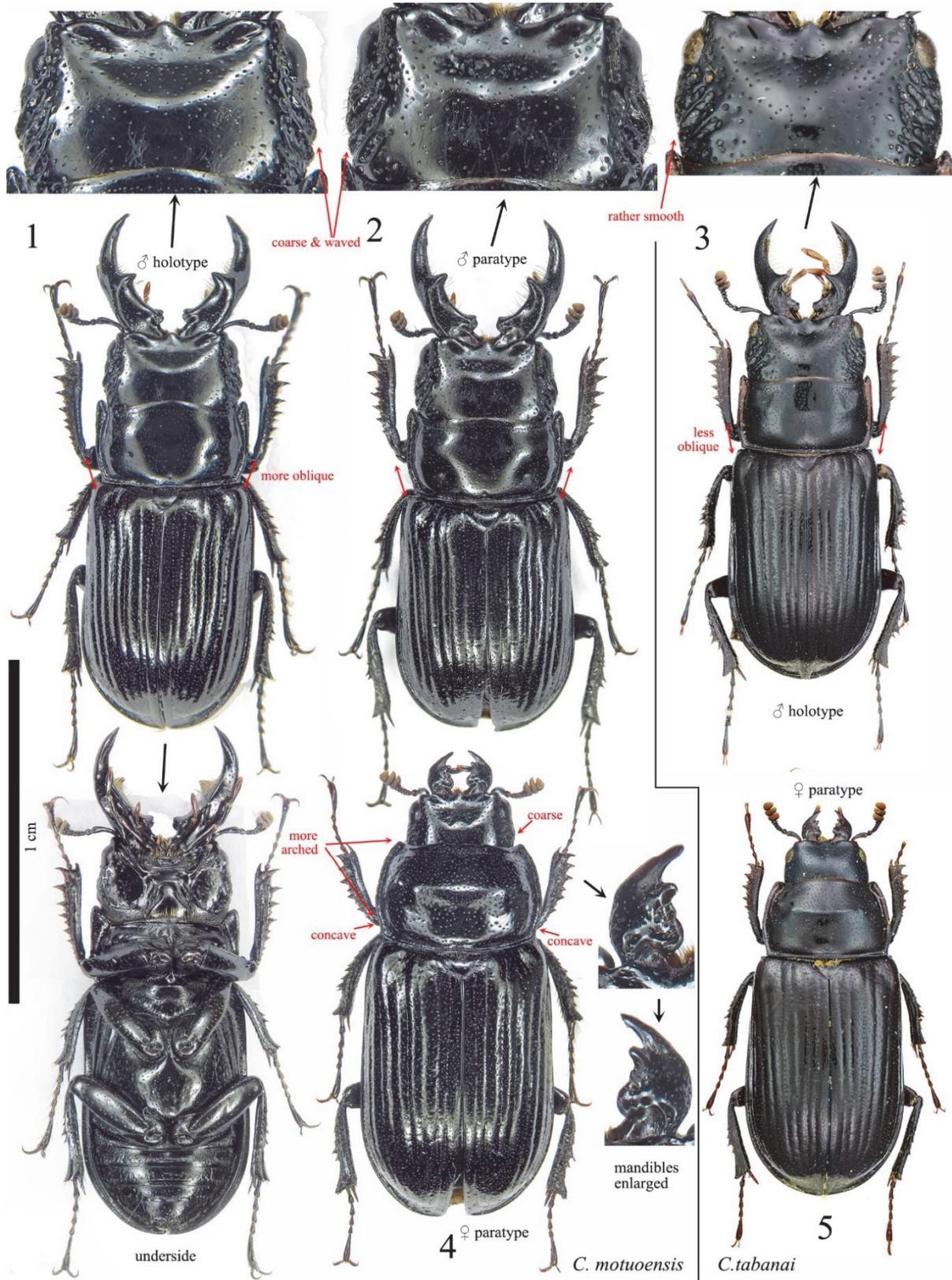
Distribution. SE Tibet (Motuo).

Acknowledgements

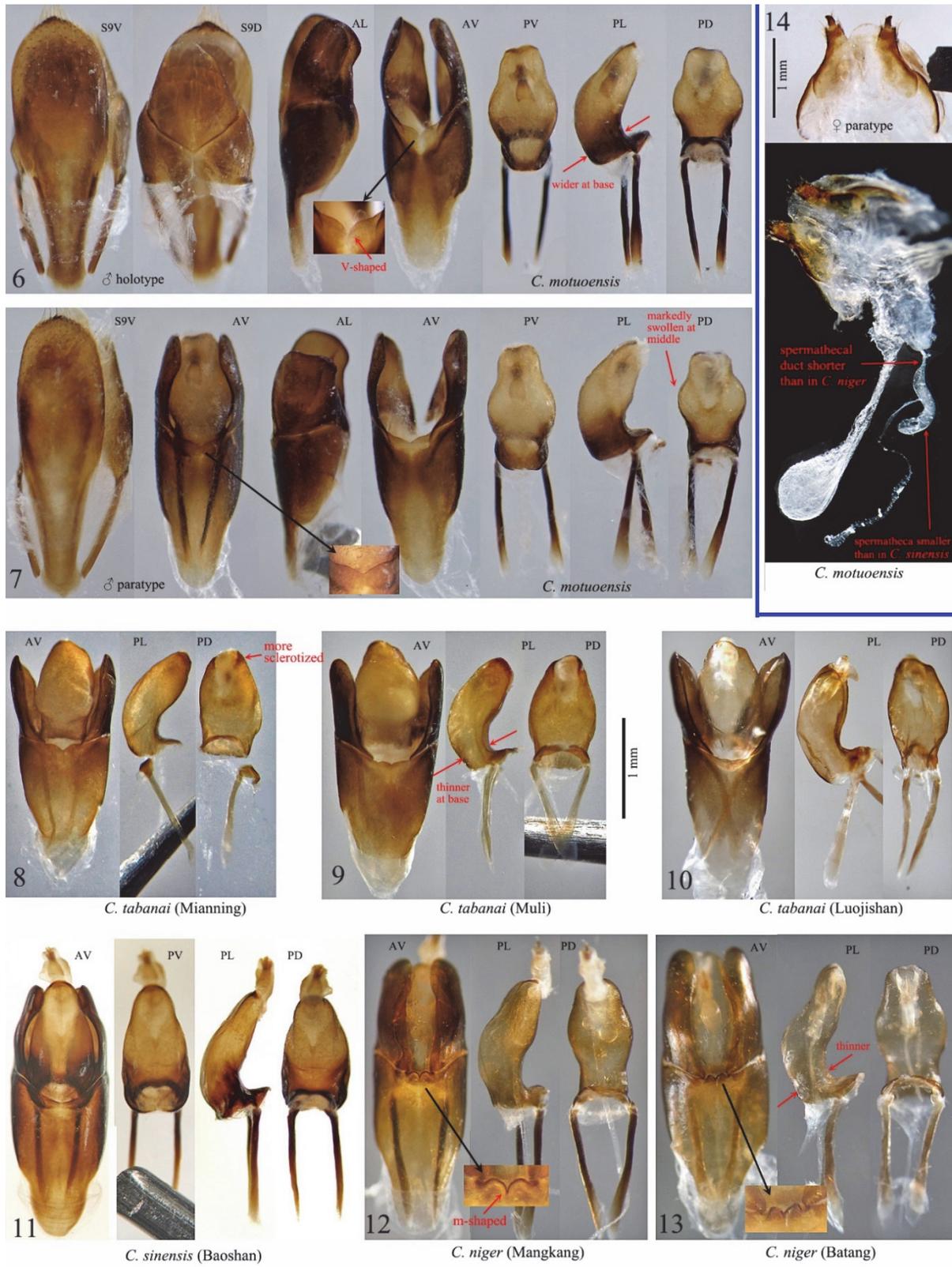
Dr. Y. Imura (Japan) helped to take photos of the type specimens of *Ceruchus tabanai*.

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Figs. 1-5: *Ceruchus* specimens, habitus at same scale with some parts enlarged.
 (1-2 & 4) *C. motuoensis*; (3 & 5) *C. tabanai*



Figs. 6-14: Male genitalia of *Ceruchus* species at same scale and female genitalia of *C. motuoensis*.

(S9V) 9th abdominal segment in ventral view; (S9D) 9th abdominal segment in dorsal view; (AL) aedeagus in lateral view; (AV) aedeagus in ventral view; (AD) aedeagus in dorsal view; (PV) median lobe in ventral view; (PL) median lobe in lateral view; (PD) median lobe in dorsal view

Description of *Prosopocoilus flavidus borneoensis* sspec. nov. from Borneo Island, Sabah (Coleoptera, Lucanidae)

Klaus-Dirk Schenk

Abstract

Prosopocoilus flavidus borneoensis sspec. nov. from Borneo island is described and compared with the nominotypical taxon *Prosopocoilus flavidus flavidus* (Parry, 1866) from Sumatra Island and a specimen from west Malaysia. The female of *Prosopocoilus flavidus flavidus* is figured first time.

Key words

Coleoptera, Lucanidae, *Prosopocoilus flavidus borneoensis*, Borneo, Sumatra, Malaysia

Prosopocoilus flavidus borneoensis sspec. nov.

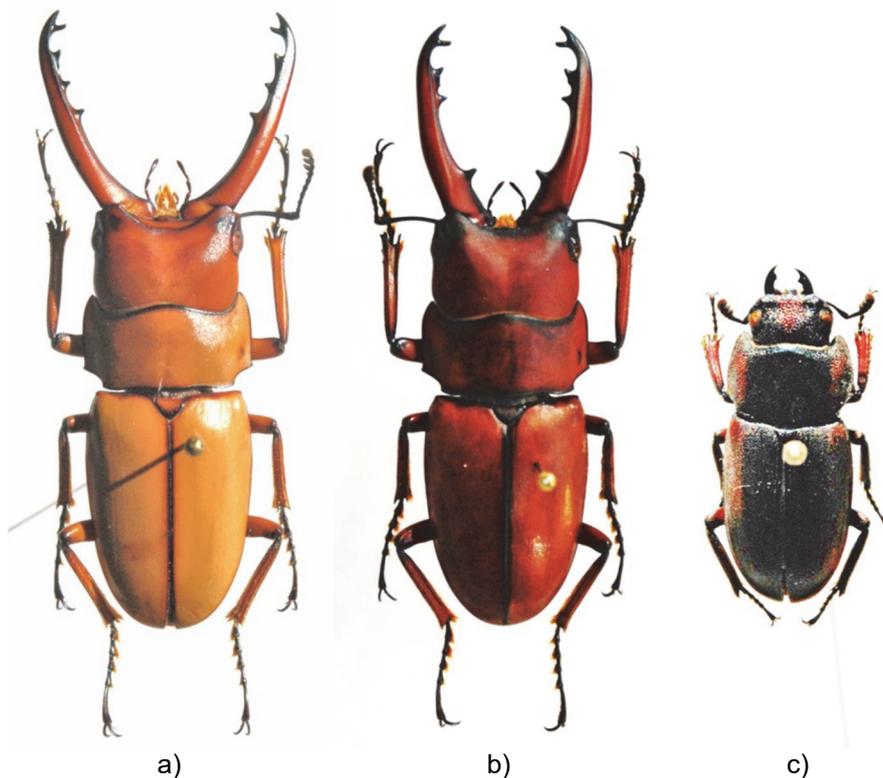


Fig. 1: a) *Prosopocoilus flavidus borneoensis* sspec. nov. ♂ **Holotype**, 39,0 mm, E Malaysia, N Borneo, Sabah Ranau env., Poring Hot Springs, 3.- 4. XII. 2000, H. Rudolph leg.,

b) *Prosopocoilus flavidus flavidus* (Parry, 1866), ♂, 38,5 mm, Indonesia, W Sumatra, Gugul, 12 km west of Padangpanjang, 5.V.1997, local collector

c) *Prosopocoilus flavidus flavidus* (Parry, 1866), ♀, 17,2 mm, Indonesia, W Sumatra, III.1993

(♂♂ in coll. Dr. K.-D. Schenk, Wehretal, Germany, ♀ in coll. A. Kirchner, Neuburg, Germany)

Holotype. ♂, east Malaysia, Sabah (northern Borneo), Ranau env., Poring Hot Springs, 3.- 4.XII.2000, H. Rudolph leg., in coll. Dr. K. - D. Schenk, Wehretal, Germany.

Paratypes. 2 ♂, same collecting data as Holotype, in coll. Dr. K. - D. Schenk, Wehretal, Germany, 11 ♂, east Malaysia, Sabah (northern Borneo), Crocker Range, Chew. leg., in coll. Dr. K. - D. Schenk, Wehretal, Germany, 4 ♂, east Malaysia, Sabah (northern Borneo), Crocker Range, Chew. leg., in coll. A. Kirchner, Neuburg, Germany.

Etymology. The name is referring to Borneo Island, patria of the new taxon.

Description and diagnosis

Holotype (Fig. 1), ♂, total length 39,0 mm, mandibles length 12,5 mm, head width 9,6 mm, prothorax width 11,1 mm, elytra length 16,3 mm, elytra width 10,0 mm.

Paratypes, ♂, total length 18,0 - 40,5 mm, ♀, total length 17,2 mm.

P. flavidus borneoensis is rather similar to the nominotypical taxon from Sumatra Island in most external features, but can be distinguished from the latter by the following combination of characters:

- 1) Entire body yellowish-brown (*P. flavidus flavidus*: chestnut brown);
- 2) Mandibles more elongate, longer in comparison to the body (versus *P. flavidus flavidus*);
- 3) Big and medium sized males have the major tooth of mandibles at or in front of the middle (*P. flavidus flavidus*: major tooth close to base of the mandibles).

The female of the new subspecies is characterized by the bicolored elytra and the dark brown prothorax with a reddish-brown spot on each site (FUJITA, 2010, plate 117, figs. 552, 5).

Discussion

Cladognathus flavidus was described in 1866 by Parry (PARRY, 1866). He figured the single male specimen from Ind. Or. (India orientalis) on plate VIII of his paper. The type locality is most probably Sumatra Island because at that time, the terminus Ind. Or. was used for most places east of the former British India including the Greater Sunda Islands Java and Sumatra.

The description of Parry is as following: "Yellowish-chestnut, margined with black, head broader than long, rather narrower than the prothorax; sites behind the eyes slightly arcuate, in front notched. Mandibles as long as the head and prothorax together, depressed, a small tooth near the base, a smaller blunt tooth behind the middle, closely followed by another rather large tooth large and triangular; close to the apex is an obtuse tooth, separated from the preceding by a rounded sinus. Prothorax chestnut, narrowly margined with black, considerably wider than the elytra at the base, sides slightly rounded, obliquely emarginated behind, the emargination with a tooth in front, and above the posterior angles a fovea. The elytra of a pale chestnut brown, finely and closely punctured, shining, the suture somewhat darker, the humeral angles prominent. The tibiae are all entirely without tooth"

This description fits exactly the male specimens of *Prosopocoilus flavidus* from Sumatra. Therefore, it is obvious that *P. flavidus flavidus* (PARRY, 1866) is distributed on Sumatra Island. The female was unknown to Parry. It is figured here first time (Fig. 1 c).

Fujita is figuring 4 males and a female of *P. flavidus borneoensis* sspec. nov. from northern Borneo, Sabah, IV.1993 (FUJITA, 2010, plate 117, figs. 552, 1-5).

There is only one medium sized ♂ of *P. flavidus* in the author's collection coming from west Malaysia (Cameron Highlands). Further specimens from west Malaysia have to be examined to decide whether the *P. flavidus* population of the Malay Peninsula is identical with *P. flavidus flavidus* or maybe is representing a further subspecies.

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Two new species of Lucanidae (Coleoptera) from SE Tibet, China

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Abstract

A new species of *Dorcus* Macleay, 1819 and a new species of *Prismognathus* Motschulsky, 1860 are described from Motuo area, SE Tibet, China, with the male and female genitalia illustrated.

Keywords

Dorcus, *Prismognathus*, new species, Motuo, Tibet, China

Introduction

The third and fourth authors of this paper collected a large series of Lucanidae specimens from the decayed logs at Motuo, SE Tibet, among which a new species of the *Dorcus nepalensis* group and a new species of *Prismognathus* were found, described herein.

The type specimens are deposited in the following public and private collections:

SHNU - Department of Biology, Shanghai Normal University, China

CCCC - private collection of Chang-Chin Chen, Tianjin, China

CXCM - private collection of Cheng-Ming Xiao, Shanghai, China

CLPY - private collection of Peng-Yu Liu, Fuzhou, China

CTRC - private collection of Rong-Chuan Tao, Yingjing, Sichuan, China

CCYY - private collection of Yang-Yang Chen, China

***Dorcus linzhiensis* Huang, Chen, Tao & Xiao spec. nov.**

Type data

CHINA: Tibet autonomous region:

Holotype ♂ (CCCC, will be deposited in SHNU soon, Figs. 3 & 8), Linzhi Prefecture, Motuo County, Gong-ri, 2600m, 20.X.2019, R.-C. Tao & C.-M. Xiao leg.;

Paratypes: 15 ♂♂ & 14 ♀♀ (6 ♂♂ & 5 ♀♀ in CCCC, 3 ♂♂ & 5 ♀♀ in CXCM, 2 ♂♂ & 1 ♀ in CCYY, 2 ♂♂ & 1 ♀ in CTRC, 2 ♂♂ & 2 ♀♀ in CLPY) Linzhi, Motuo, Gong-ri, 62k and 80k, 2700-2800 m, 10-20.XI.2019, R.-C. Tao & C.-M. Xiao leg.. 5 ♂♂ & 2 ♀♀ in various sizes dissected.

Etymology

This new species is named after the superior name of the type locality, Linzhi (Nyingchi) Prefecture.

Diagnosis & Discussion

This new species undoubtedly belongs to the *D. nepalensis* group (sensu Huang & Chen 2013). It is close to *Dorcus sinensis* (Boileau, 1899) in external features, to *Dorcus wui* Huang & Chen, 2013 in male genitalia and to *Dorcus kikunoae* Hosoguchi, 2004 in female genitalia, but can be distinguished from all of them by the following combination of characters:

- 1) lateral margin of pronotum in large-sized male excavated at anterior part and strongly bent afterward, forming a frontal lateral angle, not rounded as in *D. wui* and *D. kikunoae*;
- 2) mandible of large-sized male longer than in *D. kikunoae*, with a wider dorsomedial branch than in *D. kikunoae*;
- 3) female head with a pair of tubercles on vertex, not with a single tubercle as in *D. wui*;
- 4) female clypeolabrum slightly longer than in all others;
- 5) median lobe of male genitalia wider than in *D. wui*;
- 6) flagellum of male genitalia with a longer basal belt-like part and a shorter terminal trifurcating part than in *D. sinensis* and *D. kikunoae*;
- 7) spermatheca of female genitalia with a larger terminal part than in *D. sinensis*;
- 8) spermatheca of female genitalia with a markedly shorter tubular part than in *D. wui* and *D. kikunoae*.

This new species can be hardly distinguished from the population of *D. sinensis* from Gongshan, the Nujiang valleys in external features. However, the following external characters in large-sized males and females might be useful to separate the two species:

- 1) male mandible seems to be thinner at frontal part in *D. linzhiensis* than in *D. sinensis*, with outer lateral margin more uprising at base in *D. linzhiensis* than in *D. sinensis*;
- 2) male pronotum is narrower at anterior lateral angle than at posterior lateral angle in *D. linzhiensis*, but is often in equal width at both lateral angles in *D. sinensis*;
- 3) female head seems to be narrower in *D. linzhiensis* than in *D. sinensis*. For medium and small-sized males, a dissection is always needed for an identification as in case of *D. sinensis*, *D. kikunoae*, *D. wui* and *D. semenowi* Jakowlew, 1900.

It should be noted that *D. sinensis*, *D. kikunoae*, *D. semenowi*, *D. wui* and *D. linzhiensis* are allopatric. The discovery of *D. linzhiensis* fills the gap between *D. sinensis* and *D. kikunoae*. The taxonomy of the various taxa concerning *D. sinensis* and *D. semenowi* has been reviewed by Huang & Chen (2013), thus is not discussed herein.

Length of body. Male: 35-49 mm. Female: 31-36 mm.

Distribution. SE Tibet (Motuo).

***Prismognathus transiens* Huang, Chen, Tao & Xiao spec. nov.**

Type data

CHINA: Tibet autonomous region: **Holotype** ♂ (CCCC, will be deposited in SHNU soon, Figs. 18 & 20), Linzhi Prefecture, Motuo County, 62k, 2770m, larva collected on 10.XI.2019 and reared by R.-C. Tao & C.-M. Xiao, emerged on 10.II.2020.

Paratype: 1 ♀ (CCCC, Figs. 19 & 21), same data as holotype. All dissected.

Etymology

The specific name refers to that the new species possesses some transitional characters from the Himalayan species to the Chinese species.

Diagnosis & Discussion

Externally, this new species seems to form a mixture of many previously known species, with no close affinities found, thus a pure description is provided below. It is similar to *P. zhangii* Huang & Chen, 2013, *P. delislei* Endrodi, 1971 and *P. mixtus* Huang & Chen, 2017 in the shape of Antennomere 10, but differs from them in most of the male external characters, such as the broader head, the stouter body-shape, the mandibles in rather even width and the larger number of the teeth on protibia. It is similar to *P. miyashitai* Ikeda, 1997 and *P. yukinobui* Nagai, 2005 in the shape of the male head, but differs from them in the details of the male mandibles, the number of the teeth on the protibia, and the appearance of Antennomere 10. It is similar to *P. formosanus* Nagel, 1928 in the male mandibles, but differs from the latter in the postocular margins of the male head, the number of the teeth on the male protibia, the shape of Antennomere 10 and most of the female characters. It is somewhat similar to *P. shanii* Huang & Chen, 2012 and *P. nigricolor* Boucher, 1996 in a few female characters, but differs markedly from the latter in most of the male characters and still some female characters, such as the concaved apex of Antennomere 10.

In male and female genitalia, this new species is somewhat close to *P. zhangii*, but still differs markedly from the latter in some details, such as the much longer flagellum of male genitalia, the entirely different shape of the median lobe in male genitalia and the more spherical spermatheca in female genitalia. On account of the genital characters, the closest species of the new species might be *P. zhangii*. However, besides the above mentioned characters, the new species differs from *P. zhangii* also in females by having the clypeolabrum not emarginate at apex, the inner tooth of the left mandible remote from the base of the mandible, and the absence of the inner tooth of the right mandible.

The genus *Prismognathus* was recently reviewed by Huang & Chen (2017), except for very few species, such as *P. mekolaorum* Okuda & Maeda, 2015 and *P. ruficephalus* Lacroix, 1978 from NE. India. A further species, *P. yutangi* Huang & Chen, 2018 was recently described from W. Yunnan, a nearby area of SE Tibet. However, this new species is separable from *P. mekolaorum* and *P. yutangi* simply by having the male and female genitalia in entirely different forms (Okuda & Maeda, 2015; Huang & Chen, 2018). The very little known *P. ruficephalus* has only a small-sized male known, with male genitalia not examined yet, however, it differs from *P. transiens* sp. nov. by having the apex of Antennomere 10 not concaved, the protibia with much fewer teeth, and the mesotibia with two clear spines (Lacroix, 1978).

Description Male. Antennomere 10 with apex of medial extension markedly concaved. Clypeolabrum unknown, as the only known male specimen not in good condition, possessing a single tubercle at left part. Mandibles asymmetrical, bifurcating dorsoventrally at apex, and bearing very few ventral teeth. Left mandible nearly even in width throughout in dorsal view, with a large medial tooth near base. Right mandible nearly even in width in major part, with a large dorsal tooth at base. Postocular margins of head convergent posteriorly. Canthus with a rounded obtuse anterior angle. Protibia with 7-9 large teeth. Mesotibia with a clear spine. Metatibia with a small spine or tubercle. Metasternum and abdominal ventrites glabrous.

Male genitalia. Median lobe large, nearly as long as wide. Flagellum nearly twice longer than aedeagus, non-trifurcating, narrowed gradually distad, and a little swollen at apex.

Description Female. Antennomere 10 with apex of medial extension markedly concaved. Clypeolabrum flat at apex, with round lateral corners. Mandibles asymmetrical, with dorsal tooth well developed and close to apex of mandible. Left mandible with an inner tooth at middle. Right mandible with no inner tooth. Postocular margin shorter than eye. Head, pronotum and elytra coarsely punctured. Metasternum and abdominal ventrites glabrous.

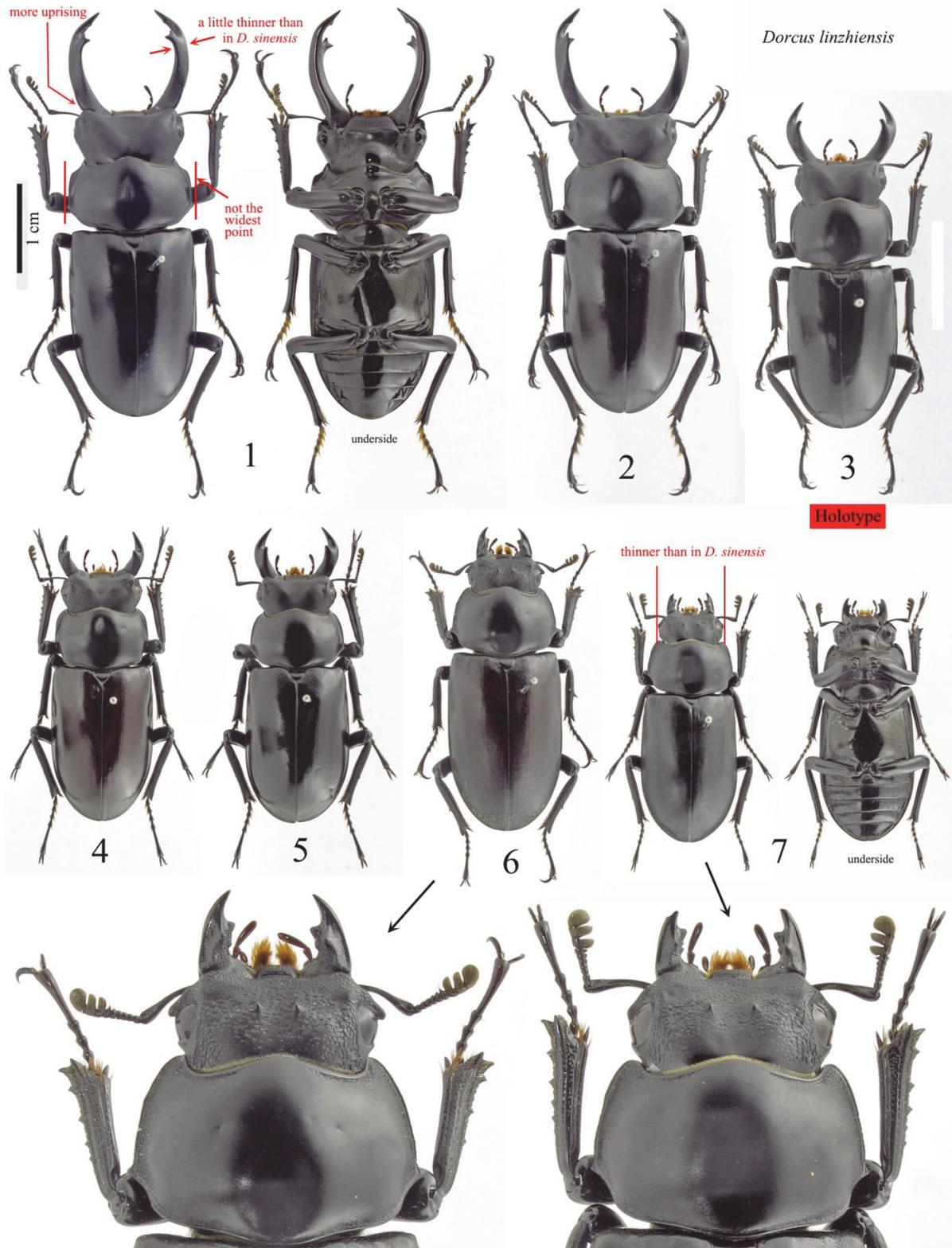
Female genitalia. Spermathecal duct hardly expansible, with rather smooth surface. Spermatheca a little depressed, with apical part somewhat spherical, wider than long and without accessory sac or branch.

Length of body. Male: 23.2 mm. Female: 18.8 mm.

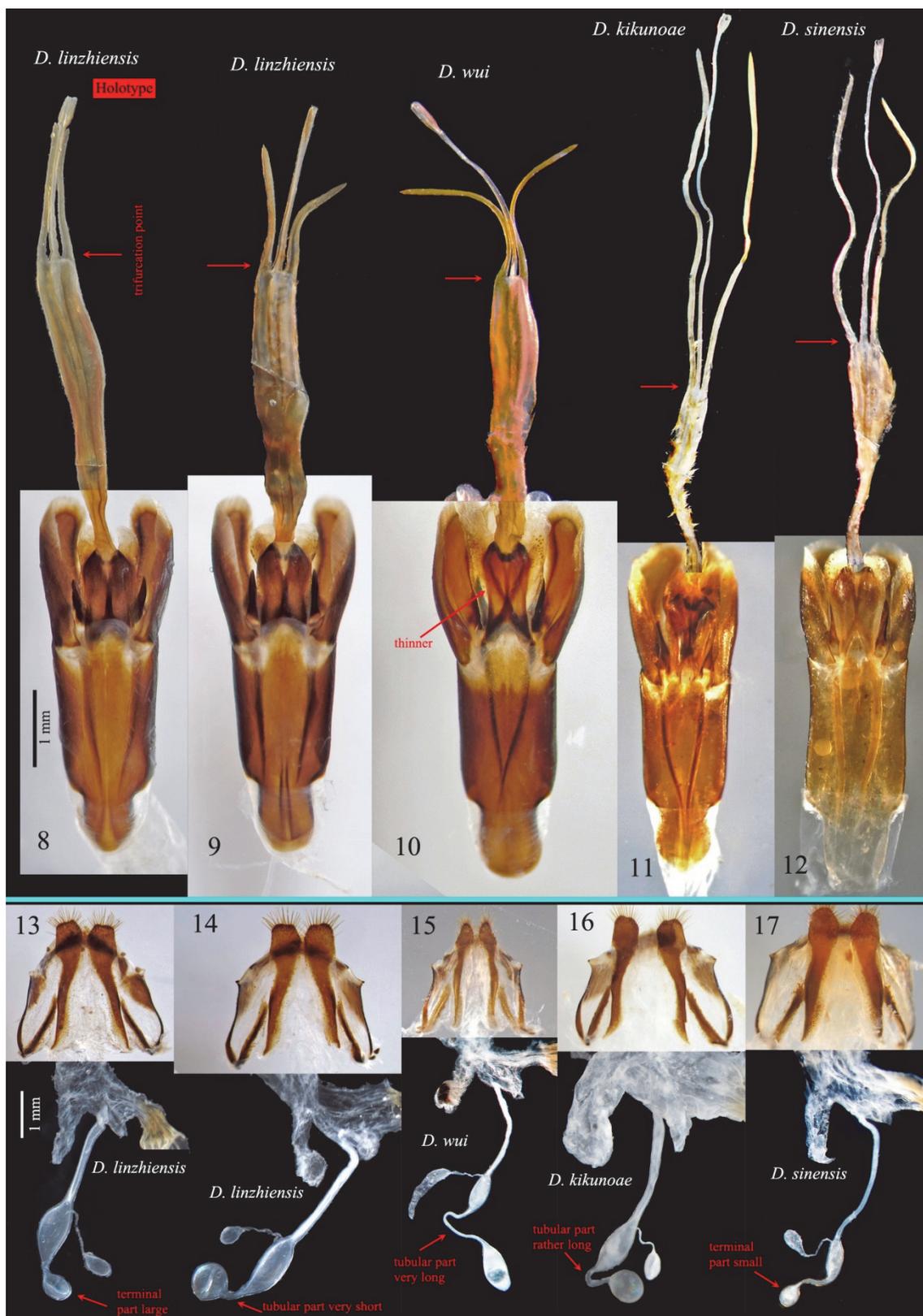
Distribution. SE Tibet (Motuo).

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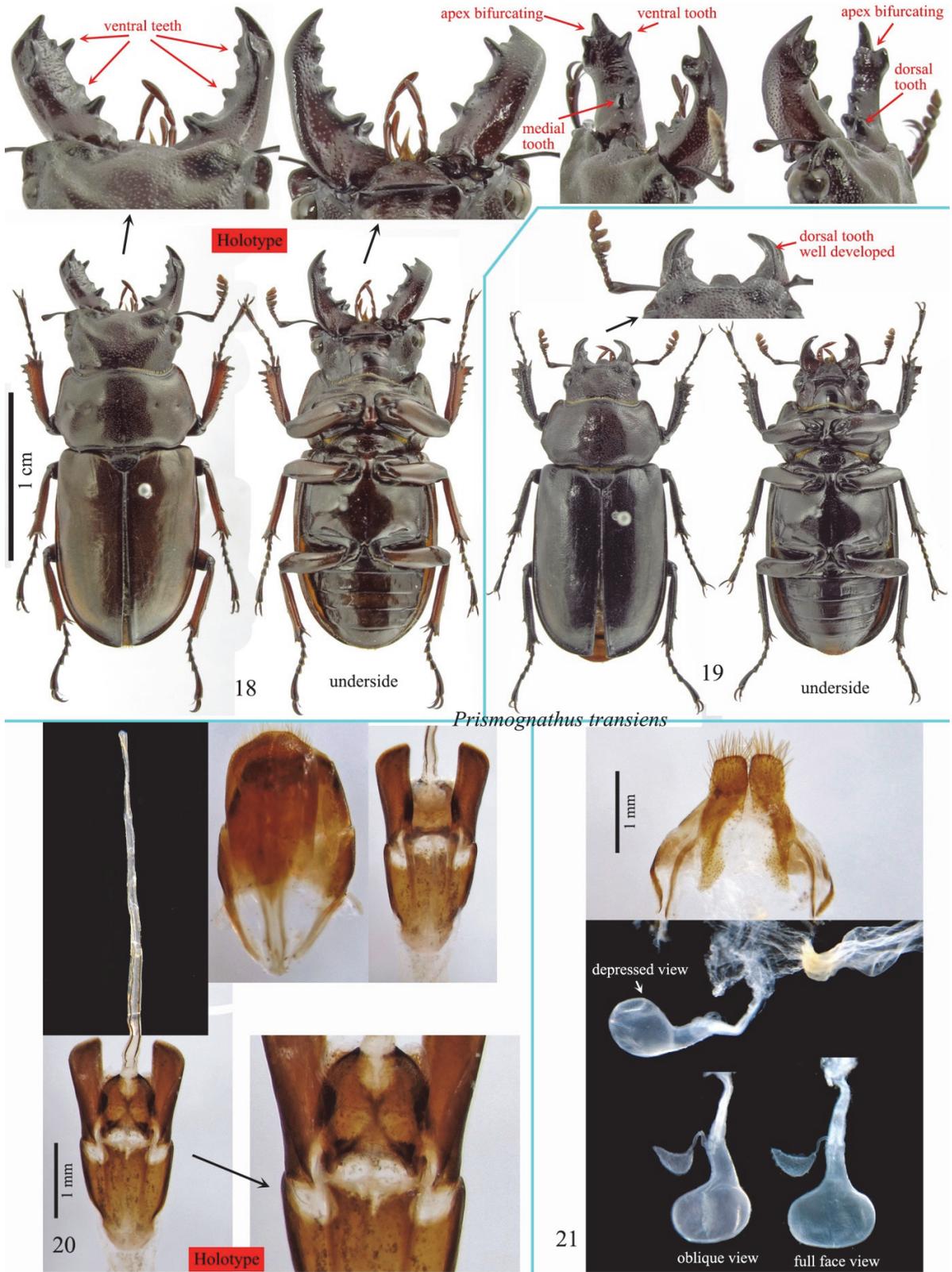


Figs. 1-7: *Dorcus linzhiensis*, habitus at same scale with some parts enlarged. (1-2 & 4-5) male paratypes; (3) male holotype; (6-7) female paratypes.



Figs. 8-12: Male genitalia of *Dorcus* at same scale.
 (9) specimen shown in fig. 2; (10) Qinling, Shaanxi; (11) Cuona, SC Tibet;
 (12) Gongshan, NW Yunnan.

Figs. 13-17: Female genitalia of *Dorcus* at same scale.
 (13) specimen shown in fig. 7; (14) specimen shown in fig. 6; (15) Qinling; (16) Cuona; (17) Gongshan.



Figs. 18-21: *Prismognathus transiens*, habitus and genitalia.
 (18 & 20) male holotype, with mandibles enlarges in various views;
 (19 & 21) female paratype, with mandibles enlarged,
 and with spermatheca shown in various views.

Notes about the *Lucanidae* fauna of Turkey with description of *Lucanus (Pseudolucanus) fiedleri* (Coleoptera, Lucanidae)

Klaus-Dirk Schenk & Frank Fiedler

Abstract

The recently in western Turkey discovered new species *Lucanus (Pseudolucanus) fiedleri* is described and compared with the related and sympatric distributed taxa.

Key words

Coleoptera, *Lucanidae*, *Lucanus (Pseudolucanus) fiedleri*, *Lucanus (Pseudolucanus) busignyi*, *Lucanus (Pseudolucanus) macrophyllus*, *Lucanus (Lucanus) laticornis*, Turkey

Introduction

Unexpectedly the second author did receive recently from a local Turkish collector 3 male and 1 female of the genus *Lucanus* Scopoli, 1763 which turned out to represent a new species belonging to the subgenus *Pseudolucanus* Hope et Westwood, 1845. The habitat of the new species *Lucanus (Pseudolucanus) fiedleri* described herein is a more or less degraded old oak forest in a mountainous area of the south-western part of Turkey (Fig. 1).

Lucanus (Pseudolucanus) fiedleri spec. nov. is living in this habitat sympatric with *Lucanus (Lucanus) laticornis* Deyrolle, 1864 and *Lucanus (Pseudolucanus) busignyi* Planet, 1909.



Fig. 1: Habitat of *Lucanus (Pseudolucanus) fiedleri spec. nov.*, a degraded old oak forest in a mountainous area of the south-western part of Turkey. The specimens have been taken out from the ground, close to a rotten oak trunk.

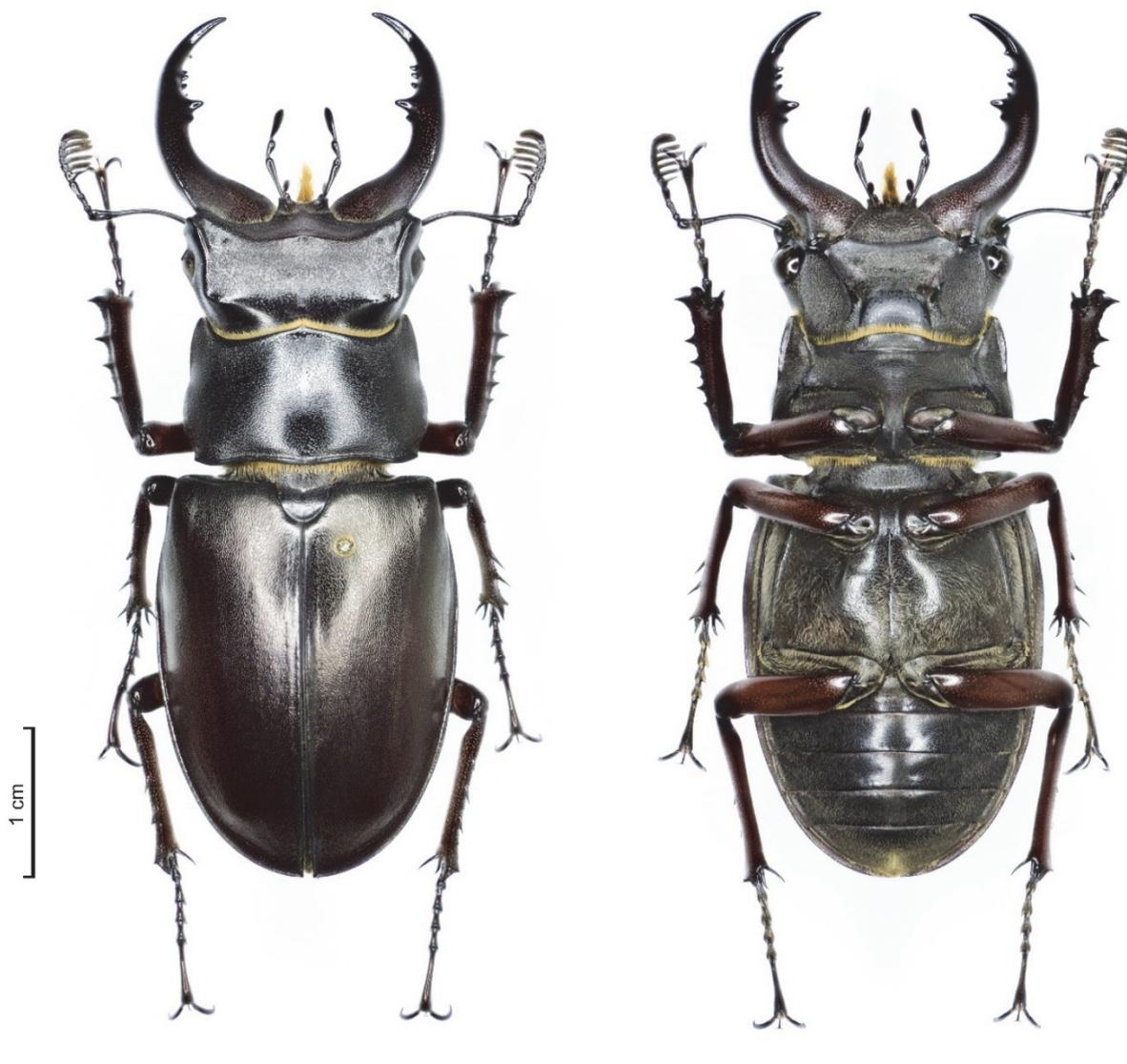
Lucanus (Pseudolucanus) fiedleri spec. nov.

Fig. 2: *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♂, **Holotype**, 54.6 mm; dorsal and ventral view (in coll. F. Fiedler, Großbreitenbach, Germany)

Holotype. ♂, south-west Turkey, Mountains near Kizilbel, VII.2019, local Turkish collector, in coll. F. Fiedler, Großbreitenbach, Germany (Fig. 2).

Paratypes. 1 ♂, same collecting data as Holotype, in coll. Dr. K. - D. Schenk, Wehretal, Germany (Fig. 3), 1 ♂ and 1 ♀, same collecting data as Holotype, in coll. F. Fiedler, Großbreitenbach, Germany (Figs. 4 & 5).

Etymology. The name is dedicated to the second author, Frank Fiedler.

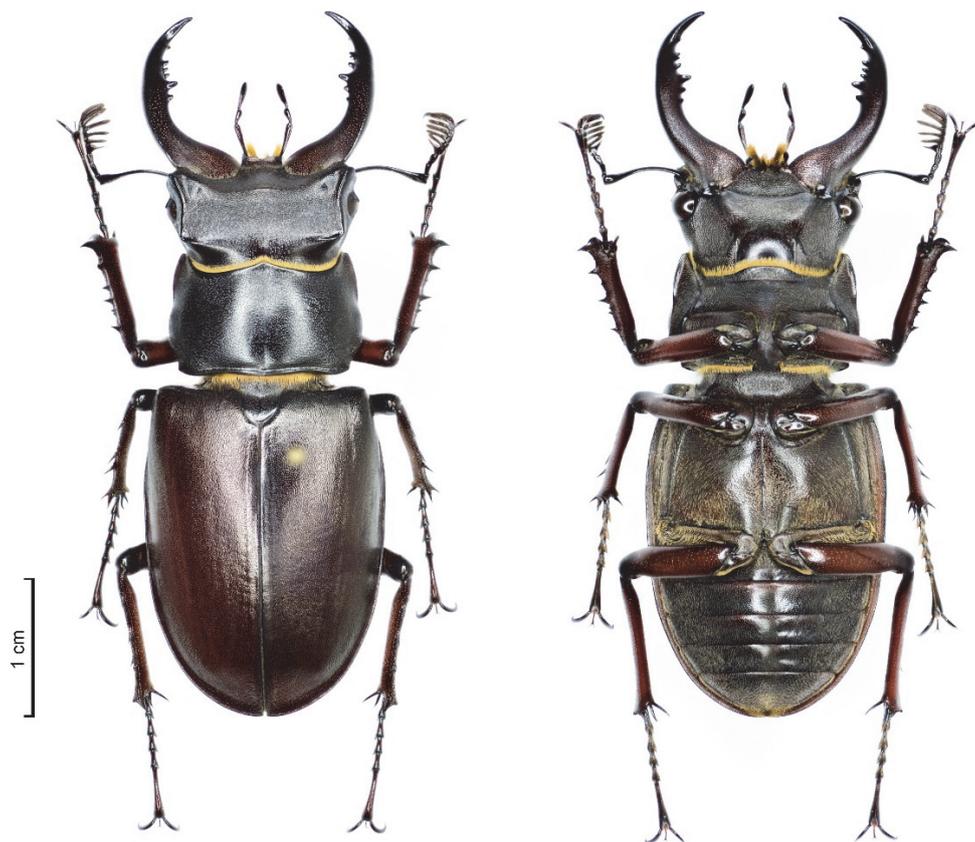


Fig. 3: *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♂, **Paratype**, 50.8 mm; dorsal and ventral view (in coll. Dr. K.-D. Schenk, Wehretal, Germany)

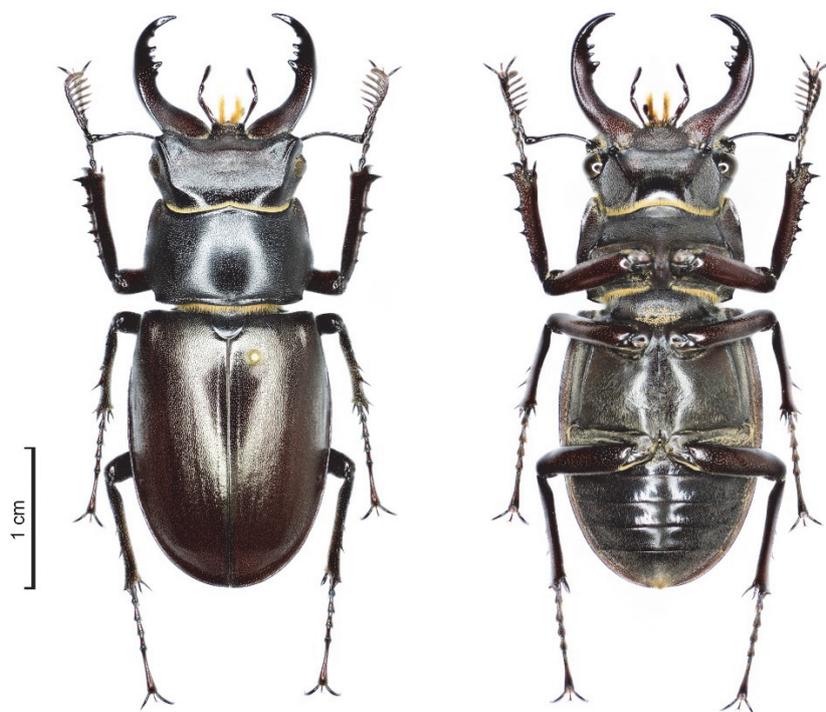


Fig. 4: *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♂, **Paratype**, 44.3 mm; dorsal and ventral view (in coll. F. Fiedler, Großbreitenbach, Germany)

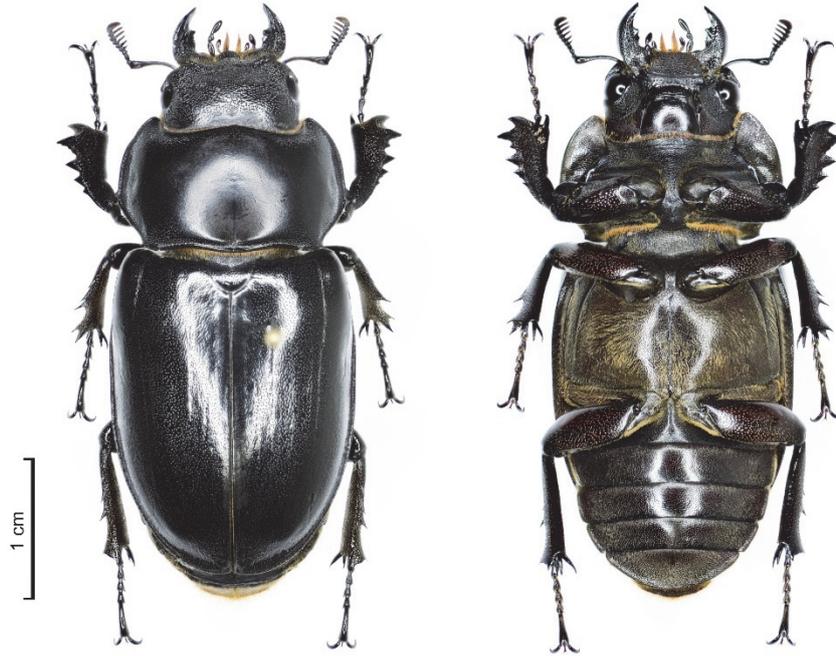


Fig. 5: *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♀, **Paratype**, 46.0 mm; dorsal and ventral view (in coll. F. Fiedler, Großbreitenbach, Germany)

Description and Discussion

Holotype (Fig. 2), ♂, total length 54.6 mm, mandibles length 14.1 mm, head width 15.2 mm, prothorax width 15.3 mm, elytra length 25.4 mm, elytra width 19.0 mm.

Paratypes, ♂, total length 50.8 mm (Fig. 3) and 44.3 mm (Fig. 4) ♀, total length 46.0 (Fig. 5)

Lucanus (Pseudolucanus) fiedleri spec. nov. is differing versus *Lucanus (Pseudolucanus) busignyi* (Planet, 1909) by the following external morphological characters:

- 1) ♂ & ♀ antennal club with 6 lamellomeres, ♂ lamellomeres shorter (Fig. 8);
- 2) ♂ body in total somewhat more slender;
- 3) ♂ mandibles more elongate, longer in comparison to head and prothorax;
- 4) ♂ major tooth placed about at middle of mandibles with a tiny subapical ventral tooth;
- 5) ♂ femora colour darker; from reddish-brown to blackish-brown
- 6) ♂ elytra colour from reddish-brown to blackish-brown
- 7) ♀ femora colour darker; blackish-brown
- 8) ♀ elytra colour dark blackish-brown

The difference between *Lucanus (Pseudolucanus) fiedleri* spec. nov. and the taxa *Lucanus (Pseudolucanus) busignyi* and *Lucanus (Lucanus) laticornis*, which have been collected in the same place, are listed in table 1.

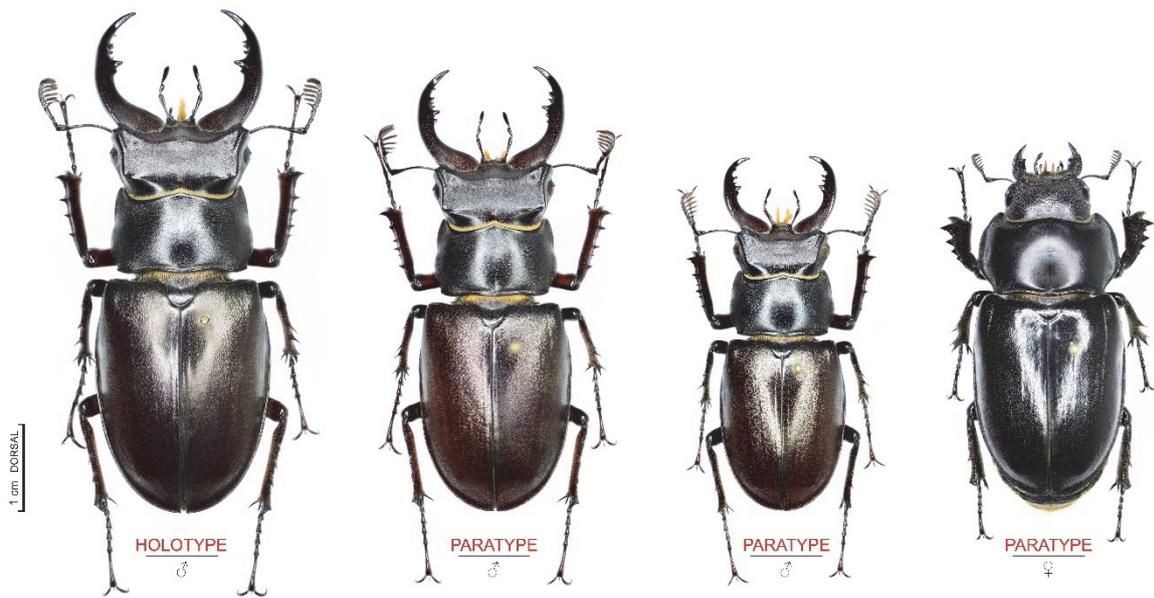


Fig. 6: *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♂ Holotype, ♂ Paratypes and ♀ Paratype (Allotype); dorsal view

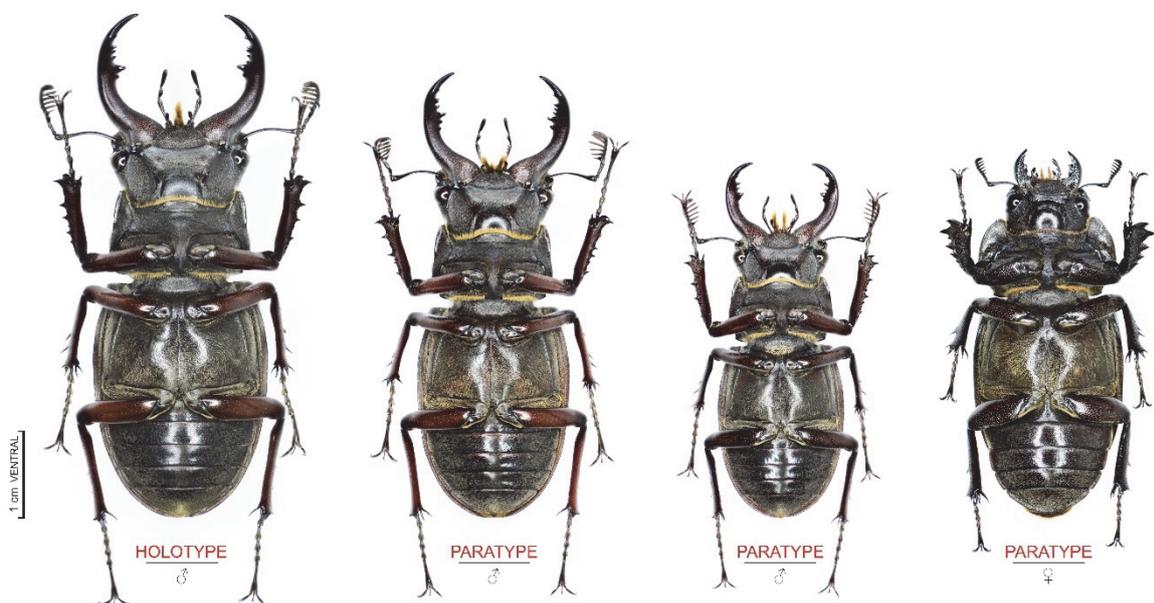


Fig. 7: *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♂ Holotype, ♂ Paratypes and ♀ Paratype (Allotype); ventral view

Table 1: Differential characters between *Lucanus (Pseudolucanus) fiedleri* spec. nov., *Lucanus (Pseudolucanus) busignyi* and *Lucanus (Lucanus) laticornis*.

character stated	<i>L (P.) fiedleri</i>	<i>L (P.) busignyi</i>	<i>L (L.) laticornis</i>
♂ male			
size (mm)	44.5 - 54.6	33.8 - 50.2	34.0 - 54.3
body shape	less stout	stout	more elongated
elytra	dark reddish-brown shiny	light reddish-brown shiny	blackish brown dull
femora	dark reddish	light to dark reddish	black
mandibles	less regular incurved	regularly incurved	middle part straighter
mandibles tip	simple, followed by a tiny denticle	simple	bifid
major tooth	at middle	little closer to base	little in front of middle
clypeolabrum	transverse with lateral processes	transverse, straight	transverse with lateral processes
shape of antennal club	lamellomeres shorter	lamellomeres longer	lamellomeres longer
♀ female			
size mm	46.0	32.8	23.3 - 43.5
body shape	less stout	stout	stout
elytra	black shiny	light reddish brown shiny	blackish brown dull
femora	black	reddish-brown	black



Fig. 8: Comparison of mandibles & antennae:
a) *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♂ Holotype,
b) *Lucanus (Pseudolucanus) busignyi* ♂,
c) *Lucanus (Lucanus) laticornis* ♂; dorsal view

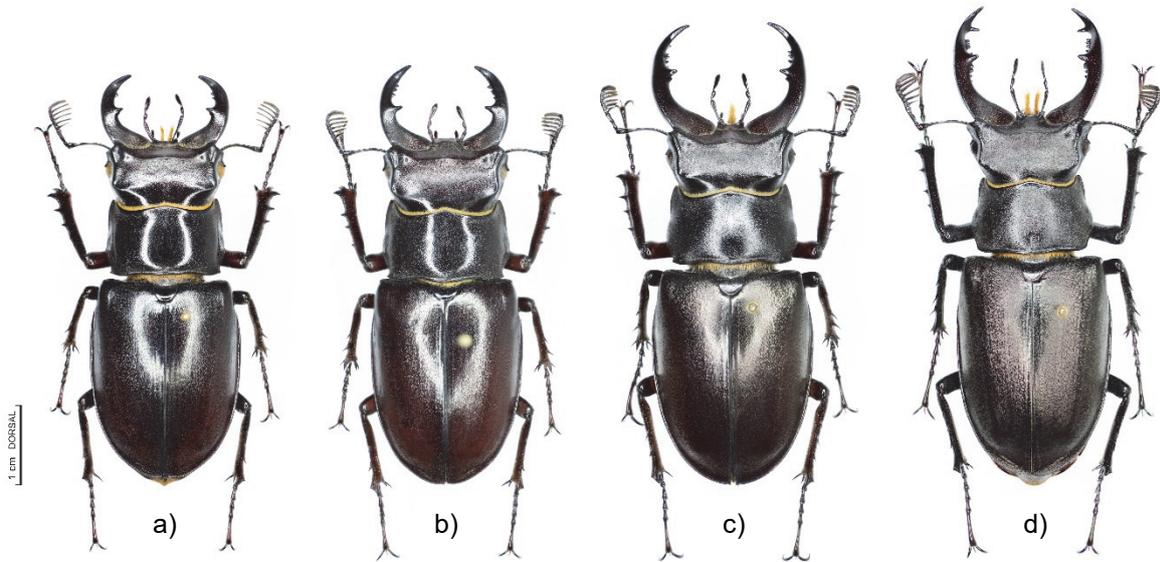


Fig. 9: Comparison of: a), b) *Lucanus (Pseudolucanus) busignyi* ♂, c) *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♂ Holotype, d) *Lucanus (Lucanus) laticornis* ♂; dorsal view

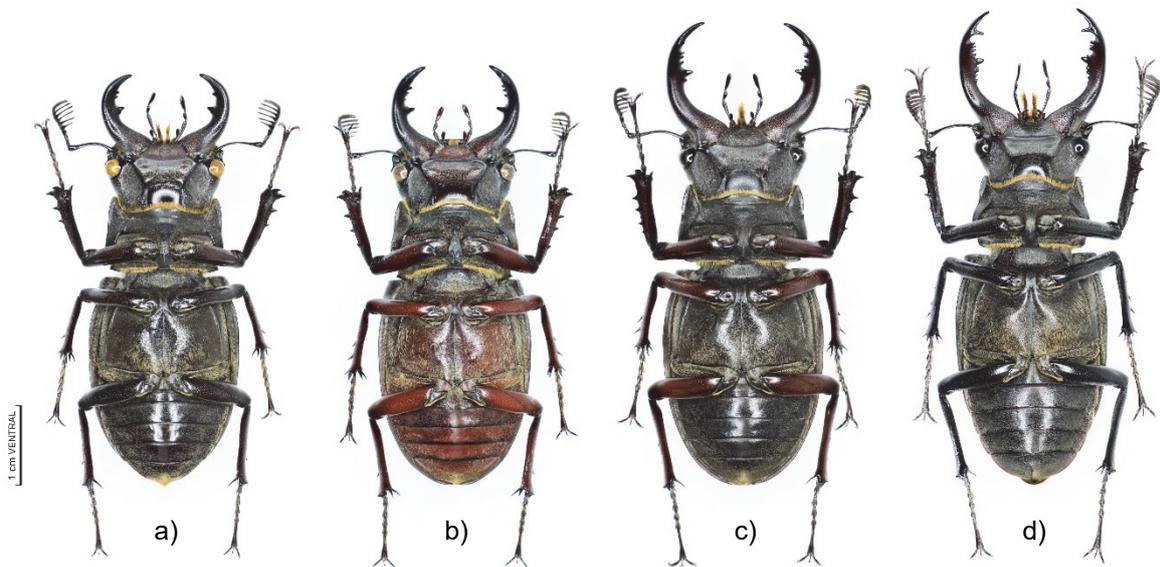


Fig. 10: Comparison of ♂: a), b) *Lucanus (Pseudolucanus) busignyi* ♂, c) *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♂ Holotype, d) *Lucanus (Lucanus) laticornis* ♂; ventral view

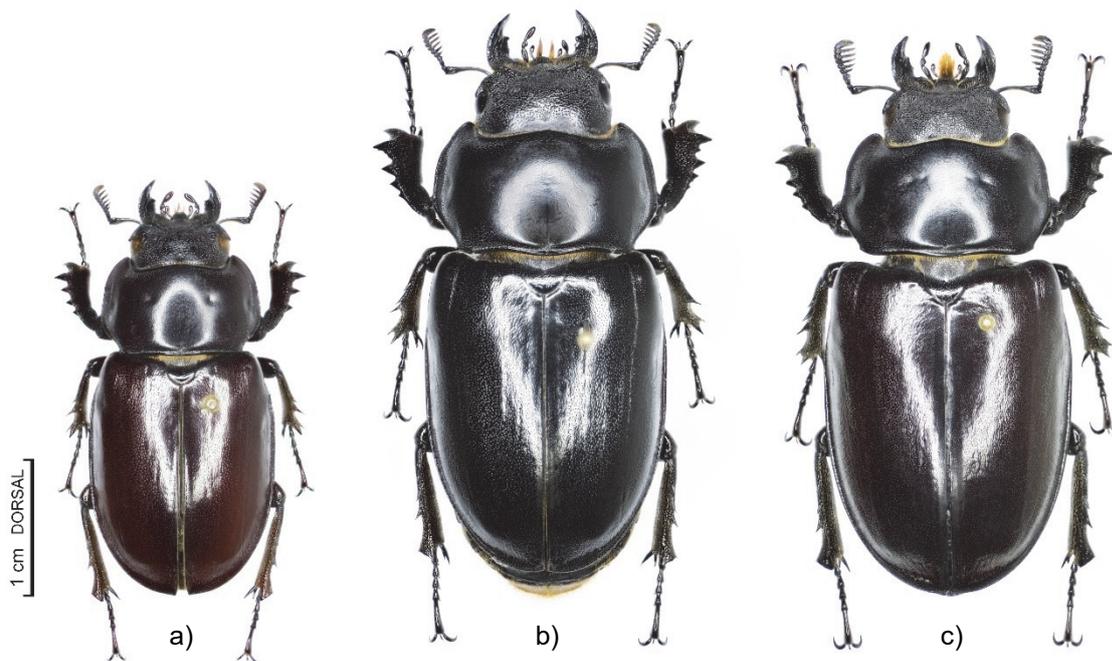


Fig. 11: Comparison of:
 a) *Lucanus (Pseudolucanus) busignyi* ♀,
 b) *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♀ Paratype,
 c) *Lucanus (Lucanus) laticornis* ♀; dorsal view



Fig. 12: Comparison of:
 a) *Lucanus (Pseudolucanus) busignyi* ♀,
 b) *Lucanus (Pseudolucanus) fiedleri* spec. nov. ♀ Paratype,
 c) *Lucanus (Lucanus) laticornis* ♀; ventral view

Lucanus (Pseudolucanus) fiedleri spec. nov. can be separated easily from *Lucanus (Pseudolucanus) macrophyllus* by color, body-shape and form of mandibles and antennae. For comparison a large male and a female of *Lucanus (Pseudolucanus) macrophyllus* are figured here for first time (Figs. 13 & 14, specimens in coll. A. Kirchner, Neuburg, Germany).



Fig. 13: *Lucanus (Pseudolucanus) macrophyllus* (large ♂ 41.7 mm and ♀ 34.9 mm), Turkey, SW Anatolia, south of Egirdir, Davras-dag, VII. 1974, Czipka leg. (in coll. A. Kirchner, Neuburg, Germany)



Fig. 14: Head of a large *Lucanus (Pseudolucanus) macrophyllus* (♂ 41.7 mm), Turkey, SW Anatolia, south of Egirdir, Davras-dag, VII. 1974, Czipka leg. (in coll. A. Kirchner, Neuburg, Germany)

The very large lamellae of the antennal club and the truncated internal teeth of the mandibles which are characteristic for this rare species are clearly visible.

Lucanus (Pseudolucanus) fiedleri is representing a further taxon of Turkish fauna of the subgenus *Pseudolucanus* Hope et Westwood, 1845 which is characterized by short, strongly bent mandibles with a simple tip or with a small final fork and by reduced posterior-lateral processes of the cephalic crown. The closest species to *Lucanus (Pseudolucanus) fiedleri* spec. nov. are *Lucanus (Pseudolucanus) busignyi* and *Lucanus (Pseudolucanus) macrophyllus*.

The following 3 taxa of the subgenus *Pseudolucanus* Hope et Westwood, 1845 can be recorded now for Turkey. The collecting places of the checked specimens and the type localities including *Lucanus* (*Lucanus*) *laticornis* Deyrolle, 1864 are shown in the following map (Fig. 15).

Subgenus *Pseudolucanus*

***Lucanus* (*Pseudolucanus*) *macrophyllus* Kraatz, 1860**

SC Turkey, type locality: Asia minor, Caramania (= SC Anatolia)

checked material: 1 ♂, Turkey, SC Anatolia, Taurus Mt., Tashkent env. (in coll. Dr. K.-D. Schenk), 10 ♂, 5 ♀ Turkey, SW Anatolia, south of Egirdir, Davras-dag (in coll. A. Kirchner).

***Lucanus* (*Pseudolucanus*) *busignyi* Planet, 1909**

SW Turkey, type locality: Asie mineure

checked material: 19 ♂, 1 ♀ SW Turkey, Mugla, Incirköy env. 830 m (in coll. Dr. K.-D. Schenk), 108 ♂, 2 ♀ Turkey, SW Anatolia, Mountains near Kizibel (in coll. F. Fiedler).

***Lucanus* (*Pseudolucanus*) *fiedleri* Schenk & Fiedler, 2020**

SW Turkey, type locality: Mountains near Kizibel

checked material: 2 ♂, 1 ♀ Turkey, SW Anatolia, Mountains near Kizibel (in coll. F. Fiedler), 1 ♂, Turkey, SW Anatolia, Mountains near Kizibel (in coll. Dr. K.-D. Schenk).

Subgenus *Lucanus*

***Lucanus* (*Lucanus*) *laticornis* Deyrolle, 1864**

Turkey, type locality: Syrie (?), Ararat

checked material: 18 ♂, 1 ♀ Turkey, S Anatolia, Akcali Daglari, 20 km N Aydinçik, 1250 m, (in coll. Dr. K.-D. Schenk); 6 ♂, SW Turkey, Mugla, Incirköy env., 830 m (in coll. Dr. K.-D. Schenk); 53 ♂, 4 ♀ Turkey, SW Anatolia, Mountains near Kizibel (in coll. F. Fiedler).

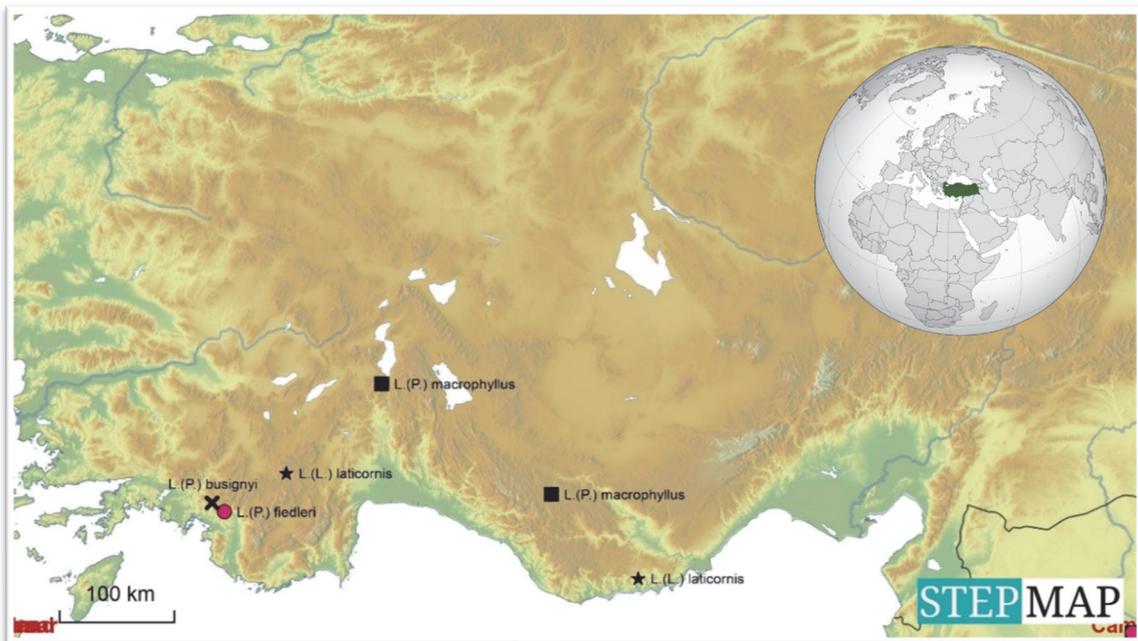


Fig. 15: Collecting places in Turkey of *Lucanus* (*Pseudolucanus*) *fiedleri* spec. nov. and the checked related taxa.

The habitat of *Lucanus (Pseudolucanus) busignyi* in south-west Turkey was unknown for decades before it has been rediscovered some years ago (SCHENK & FIEDLER, 2011). Only very few new captures of *Lucanus (Pseudolucanus) macrophyllus* are known to the authors.

Due to the destroying of the original habitats by progressing deforestation of Turkey most taxa of the genus *Lucanus* are nowadays rare and localised. Some are under severe threat due to the alarming decrease of their population and are listed on the IUCN Red List (POLAT & YILDIRIM, 2019).

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