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## Research article

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# Review of the species of *Stenothemus* from Southeast China (Coleoptera, Cantharidae)

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**Abstract.** The species of *Stenothemus* Bourgeois, 1907 from Southeast China are reviewed. *Stenothemus fukienensis* Wittmer, 1974 and *S. kuatunensis* Wittmer, 1979 are supplementarily described. Two new species are described, *S. longicornis* Y. Yang & H. Liu sp. nov. (China: Guangdong) and *S. flavus* Y. Yang & X. Yang sp. nov. (China: Zhejiang). Five new combinations are established: *S. biimpressiceps* (Pic, 1930) comb. nov. (from *Cantharis* L.), *S. chinensis* (Wittmer, 1982) comb. nov., *S. limbatipennis* (Pic, 1926) stat. rev. et comb. nov., *S. nigriceps* (Wittmer, 1955) comb. nov. and *S. pallicolor* (Wittmer, 1951) comb. nov. (from *Lycocerus* Gorham). *Leiothorax atosanguineus* Švihla, 2005 syn. nov. is synonymized with *S. chinensis*, *Lycocerus limatus* Kazantsev, 2007 syn. nov. with *S. limbatipennis*. The above species are illustrated with habitus photos, aedeagi, abdominal sternites VIII and internal genitalia of female. A key for the identification of the above species is provided.

**Keywords.** *Stenothemus*, new species, new combination, new synonym, China.

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## Introduction

The genus *Stenothemus* was proposed by Bourgeois (1907) based on *Themus harmandi* Bourgeois, 1902. It was revised by Wittmer (1974) and since then, the genus became better known. Later, some more species were added by Wittmer (1979), Okushima & Satô (1997, 1999), Švihla (2004, 2005, 2011), Yang *et al.* (2014) and Hsiao *et al.* (2015, 2016). At present, it comprises 74 species in total, which are distributed in the Oriental and eastern Palearctic regions. In China, 47 species are hitherto

known. However, some species were originally described based on a single female or male type, which made them quite poorly known, and their status hard to clarify. During our study, the large series of specimens of *Stenothemus* at our disposal allowed us to review the genus based on the examination of the types. In the present study, the species from Southeast China are treated, and the others will be included in another paper.

## **Material and methods**

The material studied is preserved in the following collections, and the primary types were returned to the collections from which they were borrowed or were otherwise deposited in public museums.

Genitalia of both sexes and abdominal sternites VIII of females were dissected and cleared in a solution of 10% NaOH, female genitalia were dyed with hematoxylin. Habitus photos were taken using a Leica M205A stereo microscope, multiple layers were stacked using Combine ZM (Helicon Focus 5.3). Line drawings were made using a camera lucida attached to a Nikon SMZ1500 stereo microscope, then edited in CorelDRAW 12 and Adobe Photoshop CS3.10.0.1.

Complete label data are listed for type specimens of the previously known species, using square brackets [ ] for our remarks and comments, [p] indicating that the following data are printed and [h] that they are handwritten. Quotation marks are used to separate data from different labels and a double slashes // to separate data from different lines of the same label. For additional specimens, quotation marks are used if their original labels are written in English.

Body length is measured from the anterior margin of the clypeus to the elytral apex and body width across the humeral part of elytra. Morphological terminology of female genitalia follows that of Brancucci (1980).

## **Abbreviations**

### **Institutional**

- CAS = California Academy of Sciences, San Francisco, USA  
IZAS = Institute of Zoology, Chinese Academy of Sciences, Beijing, China  
MHBU = Museum of Hebei University, Baoding, China  
MNHN = Muséum national d'histoire naturelle, Paris, France  
NHMB = Naturhistorisches Museum Basel, Switzerland  
SYSU = Sun Yat-Sen University, Guangzhou, China  
ZFMK = Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany

### **Morphological characters**

- ag = accessory gland  
di = diverticulum  
sd = spermathecal duct  
sp = spermatheca  
ov = median oviduct  
va = vagina

## Results

### *Taxonomic treatments*

Phylum Arthropoda Latreille, 1829  
Class Insecta Linnaeus, 1758  
Order Coleoptera Linnaeus, 1758  
Superfamily Elateroidea Leach, 1815  
Family Cantharidae Imhoff, 1856  
Subfamily Cantharinae Imhoff, 1856  
Genus *Stenothemus* Bourgeois, 1907

*Stenothemus biimpressiceps* (Pic, 1930) comb. nov.  
Figs 1A, 2A, 3A–C, 6A, 8A

*Cantharis biimpressiceps* Pic, 1930: 78.

### Material examined

#### Holotype

CHINA • ♀; [h] “Chine”, [p] “81”, [h-p] “Déterminé par//Heyden”, [h] “sp.ignota”, [h] “*biimpressiceps*//n. sp.”, [p] “HOLOTYPUS”, [h-p] “*Stenothemus*//*biimpressiceps* (Pic)//det. Y. X. Yang, 2009”; MNHN.

#### Other material

CHINA – **Anhui** • 1 ♂; Yaoluoping National Natural Reserve; Jul. 2015; J. Fang leg.; MHB. – **Hubei** • 1 ♂; Baokang; 8 Apr. 2011; H.F. Huang leg.; IZAS • 1 ♂; Yichang, Dalaoling; 1 May 2014; J.Y. Su leg.; MHB. – **Jiangxi** • 1 ♀; date and collector unknown; IZAS. – **Zhejiang** • 1 ♂, 2 ♀♀; Anji, Longwangshan; 450 m a.s.l.; 11 May 1996; H. Wu leg.; IZAS • 1 ♂; same locality and collector as for preceding; 12 May 1996; IZAS.

### Redescription

MEASUREMENTS. Body length (both sexes): 10.0–14.0 mm; width: 2.5–3.5 mm.

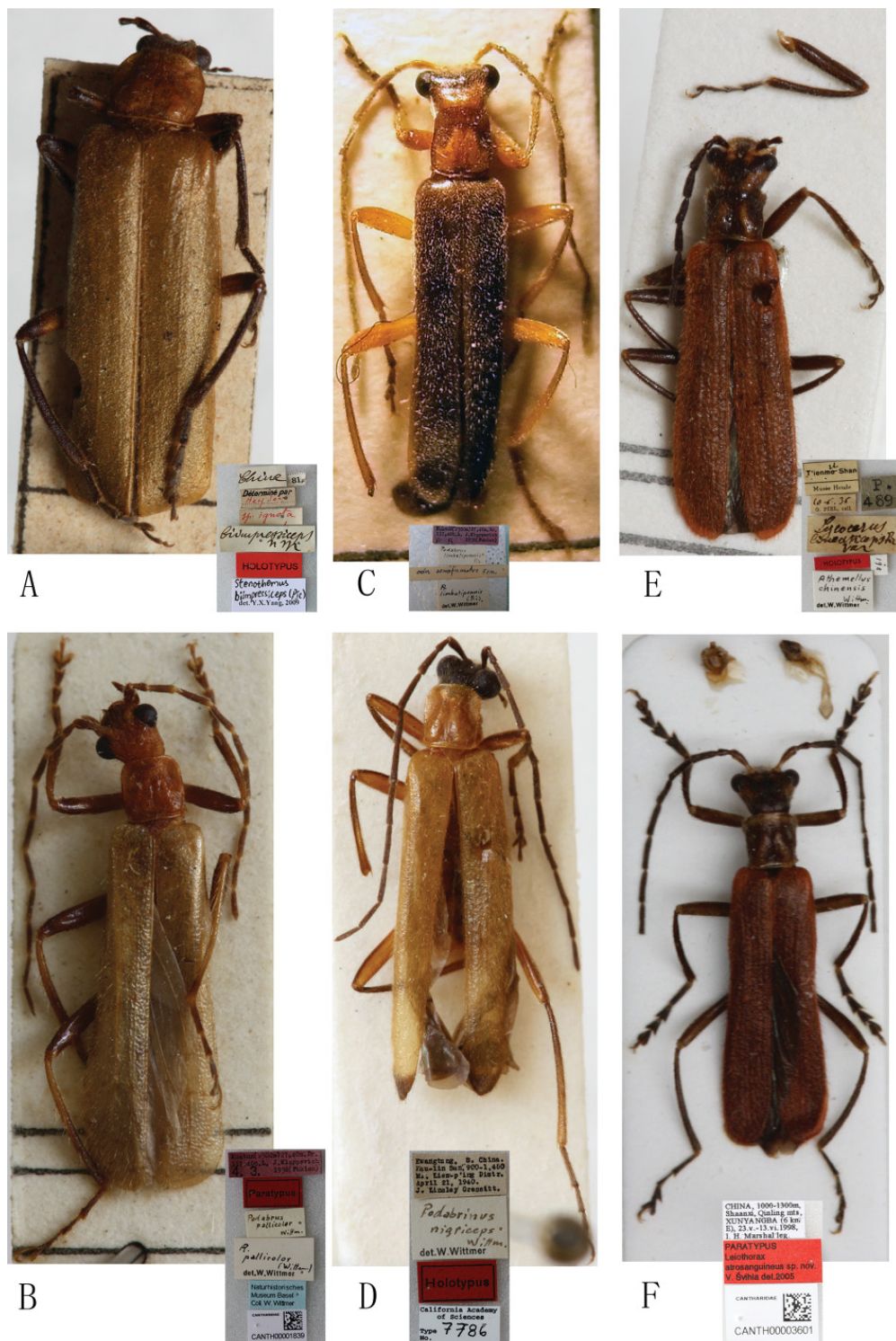
#### Male (Fig. 2A)

COLORATION. Body yellowish brown, sometimes with brown markings on disc of pronotum, mouthparts light brown, reddish brown at apices of mandibles, antennae, tarsi, tibiae and apices of femora dark brown. Body densely covered with yellow pubescence, sparsely on pronotum.

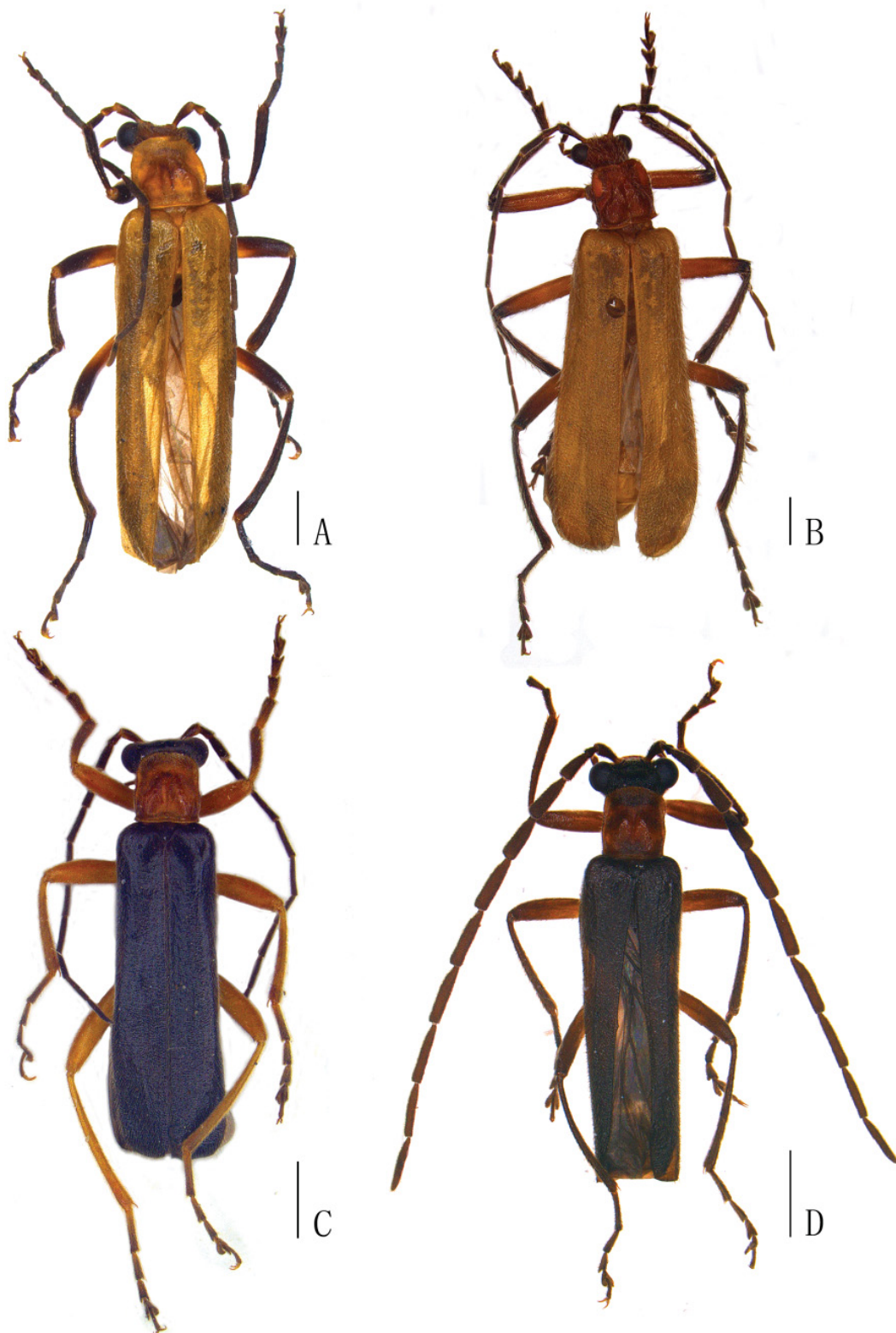
HEAD. Subquadrate, surface densely and finely punctate, each side with smooth and rectangular impression behind antennal socket; eyes strongly protruding, head width across eyes 1.2 times as wide as pronotum; terminal maxillary palpomeres long-triangular, widest in middle; antennae filiform, extending to two-thirds length of elytra; antennomeres II about 1.5 times as long as wide at apices, III about 1.5 times as long as II, VII longest, XI slightly longer than X, pointed at apex.

PRONOTUM. Subrounded, nearly as wide as long, anterior margin arcuate, anterior angles rounded, lateral margins sinuate, posterior margin nearly straight and narrowly bordered, posterior angles sharp and protruding, disc distinctly convex on posterolateral parts, surface finely and densely punctate.

ELYTRA. Nearly parallel-sided, about 3.5 times as long as humeral width, 5.2 times as long as pronotum, surface finely and densely punctate, with weakly indicated longitudinal costae.



**Fig. 1.** Habitus, dorsal view. **A.** *Stenothemus biimpressiceps* (Pic, 1930) comb. nov., holotype, ♀ (MNHN), originally in *Cantharis* Linnaeus, 1758. **B.** *S. pallicolor* (Wittmer, 1951) comb. nov., paratype, ♂ (NHMB, CANTH00001839), originally in *Podabrinus* Fairmaire, 1896. **C.** *S. limbatipennis* (Pic, 1926) stat. rev. et comb. nov., ♂, specimen determined by W. Wittmer (NHMB), originally in *Podabrinus*. **D.** *S. nigriceps* (Wittmer, 1955) comb. nov., holotype, ♂ (CAS, 7786), originally in *Podabrinus*. **E.** *S. chinensis* (Wittmer, 1982) comb. nov., holotype, ♀ (MNHN), originally in *Athemellus*. **F.** *Leiothorax atosanguineus* Švihla, 2005 syn. nov. of *S. chinensis*, holotype, ♂ (NHMB, CANTH00003601).



**Fig. 2.** Male habitus, dorsal view. **A.** *Stenothemus biimpressiceps* (Pic, 1930) comb. nov., non-type specimen from Zhejiang (IZAS). **B.** *S. flavus* Y. Yang & X. Yang sp. nov., holotype, ♂ (IZAS, IOZ(E)1123159). **C.** *S. limbatipennis* (Pic, 1926) stat. rev. et comb. nov., non-type specimen from Zhejiang (MHBUS). **D.** *S. longicornis* Y. Yang & H. Liu sp. nov., holotype, ♂ (MHBUS, HBU(E)410001). Scale bars: 1.0 mm.

**AEDEAGUS** (Fig. 3A–C). Strongly swollen laterally at basal part, shrunk apically in diameter; basal piece nearly as long as dorsal plate of each paramere, with a large, bifurcate conjoint middle nodule at base of ventral side; ventral process of each paramere nearly parallel to each other, short and distinctly thickened apically, bent dorsally in lateral view; dorsal plate slightly longer than ventral process, abruptly narrowed in middle and wide-triangularly protuberant at apical part, near to each other at basal part, apex acute and folded ventrally; apical parts of laterophyses depressed and separate from each other, apex acute and bent dorsally, not reaching middle emargination between dorsal plates.

#### **Female** (Fig. 1A)

Similar to male, but eyes less protruding, antennae shorter and roughly extending to elytral mid-length; pronotum slightly wider than long, elytra about 3.0 times as long as humeral width.

**ABDOMINAL STERNITE VIII** (Fig. 8A). Obliquely narrowed posteriorly, latero-apical angles obtusely rectangular, posterior margin deeply and roundly emarginate in middle and feebly sinuate on both sides, behind notch with membrane which presents small longitudinal sclerite at center.

**INTERNAL ORGAN OF REPRODUCTIVE SYSTEM** (Fig. 6A). Vagina stout, with median oviduct situated at ventro-apical part, diverticulum and spermathecal duct arising from apex; diverticulum moderately long, about 0.12 times body length, evenly thinned apically, slender tube-shaped and spiral; spermathecal duct much shorter than diverticulum; spermatheca slender tube-shaped and spiral, obviously thinner than spermathecal duct and slightly longer than diverticulum, with basal part extended into short tube, where accessory gland opening. Accessory gland thin and obviously shorter than spermatheca.

#### **Remarks**

This species was originally described based on a single female type (Pic 1930). During our study, the type was located at MNHN, as well as some additional specimens, making it possible for us to study this species in detail. The morphological characters, especially the structure of the aedeagus, show that it belongs to *Stenothemus* and not to *Cantharis*.

#### **Distribution**

China (Anhui, Hubei, Zhejiang, Jiangxi).

*Stenothemus pallicolor* (Wittmer, 1951) comb. nov.

Figs 1B, 3D–F, 6B, 8B

*Podabrinus pallicolor* Wittmer, 1951: 98.

*Pseudoabsidia pallicolor* – Wittmer 1969: 128.

*Athemellus pallicolor* – Wittmer 1972: 124.

*Lycocerus pallicolor* – Kazantsev & Brancucci 2007: 252.

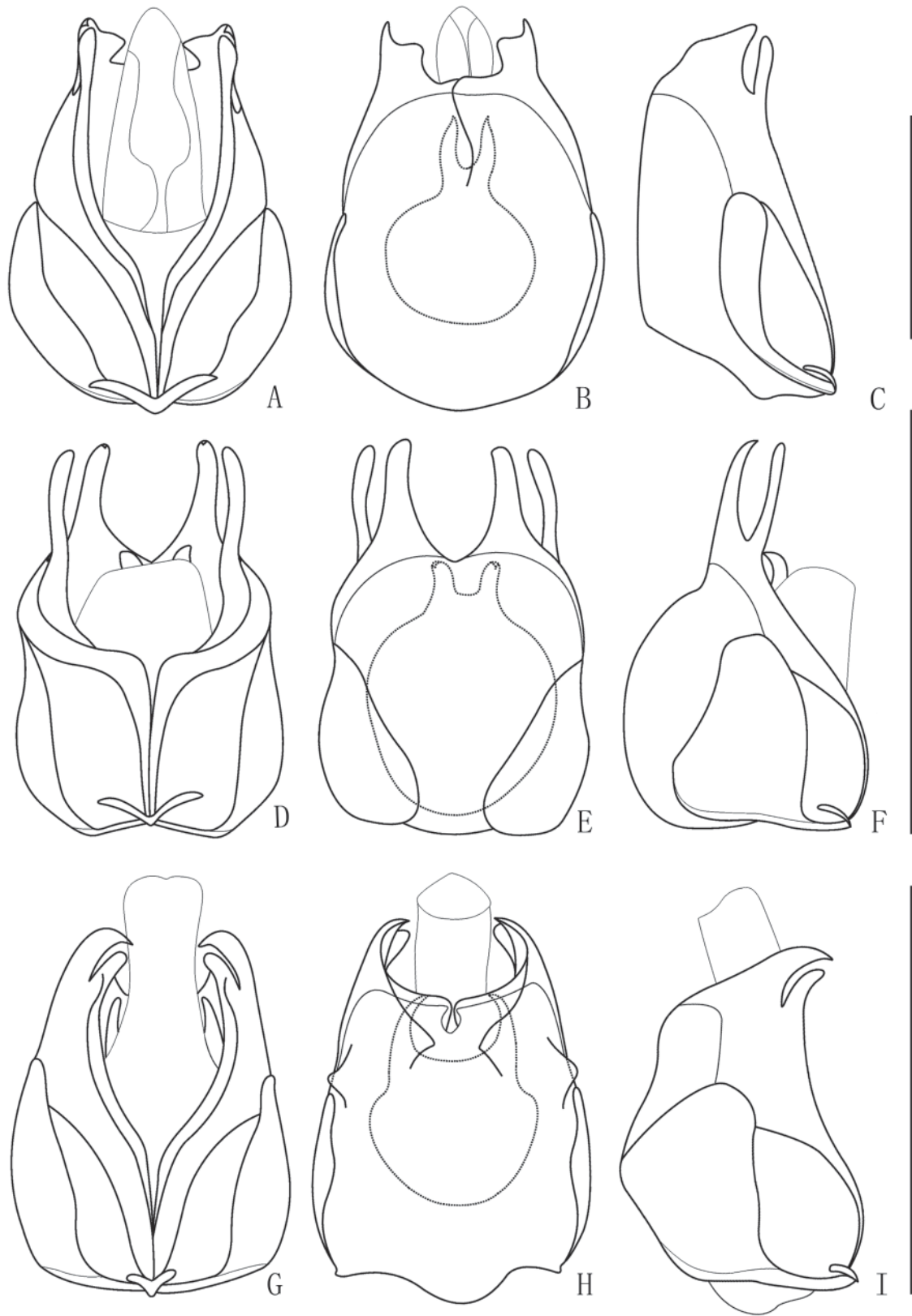
#### **Material examined**

##### **Holotype**

CHINA • ♂; [p] “Kuatun (2300m) 27, 40n. Br.//117. 40ö. L. J. Klapperich//1. 3. 1938 (Fukien)”, [h] “*Podabrus*//*pallicolor*//Wittm.”, [h-p] “Holotypus//*Podabrinus*//*pallicolor*//n. sp.//Wittmer, 1949”; ZFMK.

##### **Paratype**

CHINA • 1 ♂; [p] “Kuatun (2300m) 27, 40n. Br.//117. 40ö. L. J. Klapperich//4. 3. 1938 (Fukien)”, [p] “Paratypus”, [h] “*Podabrinus*//*pallicolor*//Wittm.”, [h-p] “*A.*//*pallicolor*//(Wittmer.)//det. W. Wittmer”;



**Fig. 3.** Aedeagus (A, D, G = ventral view; B, E, H = dorsal view; C, F, I = lateral view). **A–C.** *Stenothemus biimpressiceps* (Pic, 1930) comb. nov. (IZAS). **D–F.** *S. pallicolor* (Wittmer, 1951) comb. nov. (IZAS). **G–I.** *S. limbatipennis* (Pic, 1926) stat. rev. et comb. nov. (MHBU). Scale bars: 1.0 mm.

[p]“Naturhistorisches//MuseumBasel//Coll.W.Wittmer”, [p]“CANTHARIDAE//CANTH00001839”; NHMB.

#### **Other material**

CHINA – **Fujian** • 2 ♂♂; Wuping, Liangyeshan, Kongxia; 627 m a.s.l.; 17 Nov. 2008; G.Y. Yang leg.; IZAS • 2 ♂♂, 3 ♀♀; Chong’an, San’gang; 1 Dec. 1980; L.Z. Hua leg.; SYSU • 1 ♀; Kuatun; 8 Apr. 1946; Tschung Sen leg.; NHMB.

#### **Redescription**

MEASUREMENTS. Body length (both sexes): 7.2–10.0 mm; width: 1.3–2.2 mm.

#### **Male** (Fig. 1B)

COLORATION. Body dark brown, head, prothorax and scutellum testaceous, pronotum orange at anterior angles, elytra light brown, with irregular brown markings. Body mixed with short, recumbent and slightly long, semi-erect light yellow pubescence.

HEAD. Subquadrate, surface sparsely and finely punctate, each side with smooth and rectangular impression behind antennal socket; eyes strongly protruding, head width across eyes 1.2 times as wide as pronotum; terminal maxillary palpomeres long-triangular, widest in basal third; antennae filiform, extending to two-thirds length of elytra; antennomere II about twice as long as wide at apices, III about 2.5 times as long as II, IV longest, XI slightly longer than X, pointed at apex.

PRONOTUM. Subquadrate, about 1.1 times as long as wide, anterior margin nearly straight, anterior angles roundly truncate, lateral margins slightly sinuate, posterior margin straight and narrowly bordered, posterior angles nearly rectangular and slightly protruding, disc distinctly convex on posterolateral parts, surface finely and sparsely punctate.

ELYTRA. Slightly dilated posteriorly, about 4.3 times as long as humeral width, 6.0 times as long as pronotum, surface densely and finely punctate, present with hardly visible longitudinal costae.

AEDEAGUS (Fig. 3D–F). Strongly swollen dorsally at basal part, nearly parallel-sided in apical part; basal piece obviously as long as dorsal plate of each paramere, with a large, bifurcate conjoint middle nodule at base of ventral side; ventral process of each paramere nearly parallel to each another, long and slightly thickened apically, bent dorsally in lateral view; dorsal plate nearly as long as ventral process, strongly narrowed and even in width along the whole length, acute at apex and folded ventrally; apical parts of laterophyses depressed and separate from each other, apex acute and almost reaching middle emargination between dorsal plates.

#### **Female**

Similar to male, but body stouter, eyes less protruding, head width across eyes slightly wider than anterior margin of pronotum; antennae shorter, extending to elytral mid-length; elytra about 4.0 times as long as humeral width.

ABDOMINAL STERNITE VIII (Fig. 8B). Strongly narrowed posteriorly, latero-apical angles obtusely wide-triangular, posterior margin deeply and rectangularly emarginate in middle and hardly emarginate on both sides, behind notch with membrane which presents small traverse-triangular sclerite at center.

INTERNAL ORGAN OF REPRODUCTIVE SYSTEM (Fig. 6B). Vagina stout, with median oviduct situated at ventro-apical part, diverticulum and spermathecal duct arising from apex; diverticulum moderately long, about 0.12 times body length, evenly thinned apically, slender tube-shaped and spiral; spermathecal duct long but shorter than diverticulum; spermatheca slender tube-shaped and spiral, slightly thinner



than spermathecal duct and shorter than diverticulum, with basal part extended into short tube, where accessory gland opening. Accessory gland thin, and shorter than spermatheca.

### Remarks

The morphological characters, including the aedeagus, indicate that this species should belong to *Stenothemus*.

### Distribution

China (Fujian).

*Stenothemus limbatipennis* (Pic, 1926) stat. rev. et comb. nov.  
Figs 1C, 2C, 3G–I, 6C, 8C

*Podabrus limbatipennis* Pic, 1926: 235.

*Lycocerus limatus* Kazantsev, 2007: 54 (replacement name for *Lycocerus limbatipennis* (Pic, 1926), preoccupied by Pic, 1906). **Syn. nov.**

*Pseudoabsidia limbatipennis* – Wittmer 1969: 129.

*Athemellus limbatipennis* – Wittmer 1972: 124.

*Lycocerus limbatipennis* – Kazantsev & Brancucci 2007: 251.

### Material examined

#### Determined material

CHINA – **Fujian** • 1 ♂; [p] “Kuatun (2300m) 27, 40n. Br.//117. 40ö. L. J. Klapperich//8. 5. 1938 (Fukien)”, [h] “*Podabrus//limbatipennis//Pic*”, [h] “*odus. semifumatus. frm.*”, [h-p] “*A.//limbatipennis//Pic*”//det. W. Wittmer”; NHMB • 1 ♂; “Kuatun, 1946.V.2, leg, Tschung Sen”; NHMB • 1 ♀; Kuatun; 12 May 1946; Tschung Sen leg.; NHMB • 2 ♂♂; Shaowu, Tachulan; 6 May 1943; T.C. Maa leg.; NHMB.

#### Other material

CHINA – **Fujian** • 1 ♀; Chong’an, Xingcun, Guadun 8400–1160 m a.s.l.; 11 Apr. 1960; Y.R. Zhang leg.; IZAS • 1 ♀; Jianyang, Huangkeng, Aotou; 700–950 m a.s.l.; 23 Apr. 1960; F.J. Pu leg.; IZAS • 1 ♂; same locality as for preceding; 800–1050 m a.s.l.; 26 Apr. 1960; Y.R. Zhang leg.; IZAS • 1 ♂; same locality as for preceding; 800–950 m a.s.l.; 29 Apr. 1960; Y.R. Zhang leg.; IZAS • 1 ♀; same locality as for preceding; 720–950 m a.s.l.; 30 Apr. 1960; C.L. Ma leg.; IZAS • 1 ♂; Wuyishan, San’gang; 740 m a.s.l.; Y.Y. Wu leg.; IZAS. – **Jiangxi** • 1 ♂; Jinggangshan; 21 Apr. 2006; Y.B. Ba leg.; MHB. – **Zhejiang** • 1 ♀; Jingning, Wangdongyang; 1069 m a.s.l.; 16 May 2017; Y.P. Niu and C. Fang leg.; MHB. • 2 ♂♂; same locality and collectors as for preceding; 1150 m a.s.l.; 17 May 2017; MHB. • 2 ♂♂, 4 ♀♀; same locality and collectors as for preceding; 970 m a.s.l.; 18 May 2017; MHB. • 2 ♂♂, 3 ♀♀; Chuanghua, Qingliangfeng, Longtansi; 14 May 2017; Y.B. Ba and H.H. Guan leg.; MHB. • 5 ♀♀; same locality as for preceding; 15–18 May 2012; J.S. Xu and L.X. Chang leg.; MHB. • 2 ♀♀; same locality as for preceding; 20 May 2011; G.L. Xie leg.; MHB. • 1 ♂; Qingliangfeng, Tianchi; 21–23 May 2012; J.S. Xu and L.X. Chang leg.; MHB. • 8 ♂♂, 4 ♀♀; Lin’an, Qingliangfeng; 16–22 May 2012; J.S. Xu leg.; MHB. • 2 ♂♂, 1 ♀; same collection data as for preceding; G.L. Xie leg.; MHB. • 9 ♀♀; Qingliangfeng, Shunxiwu; 15–18 May 2012; J.S. Xu and L.X. Chang leg.; MHB. • 1 ♂, 2 ♀♀; same collection data as for preceding; G.L. Xie leg.; MHB. • 1 ♂, 2 ♀♀; Qingyuan, Baishanzu; 1557 m a.s.l.; 22 May 2017; Y.P. Niu and C. Fang leg.; MHB. • 1 ♂; same locality and collectors as for preceding; 23 May 2017; MHB. • 1 ♂; Pan’an, Dapanshan; 970 m a.s.l.; 13 May 2017; Y.P. Niu and C. Fang leg.; MHB. • 1 ♀; same locality and collectors as for preceding; 641 m a.s.l.; 14 May 2017; MHB. • 2 ♀♀; Jingning, Dayanghu; 1030 m a.s.l.; 19 May 2017; Y.P. Niu and C. Fang leg.; MHB.

## Redescription

MEASUREMENTS. Body length (both sexes): 5.5–10.5 mm; width: 1.0–2.2 mm.

### Male (Figs 1C, 2C)

COLORATION. Body black, clypeus, mouthparts, antennomeres I and II, prothorax, legs except tarsi, posterior margins of abdominal ventrites and the entire terminal one orange, elytra light yellow at margins. Body densely covered with short, recumbent yellow pubescence.

HEAD. Subquadrate, surface densely and finely punctate, each side with smooth rectangular impression behind antennal socket; eyes moderately protruding, head width across eyes 1.3 times as wide as pronotum; terminal maxillary palpomeres long-triangular, widest in middle; antennae filiform, extending to two-thirds length of elytra, antennomere II about twice as long as wide at apices, III about 2.5 times as long as II, IV–XI each with smooth longitudinal impression in middle of outer edge, VI longest, XI slightly longer than X, pointed at apex.

PRONOTUM. Subquadrate, about 1.1 times as long as wide, anterior margin slightly arcuate, anterior angles obtuse, subrounded, lateral margins nearly parallel and slightly sinuate, posterior margin straight, posterior angles moderately sharp and protruding, disc strongly convex on posterolateral parts, surface lustrous, finely and densely punctate.

ELYTRA. Parallel-sided, about 3.4 times as long as humeral width, 4.8 times as long as pronotum, humeral lustrous, the rest of surface densely and finely punctate, with hardly indicated longitudinal costae.

AEDEAGUS (Fig. 3G–I). Moderately swollen laterally at basal part, shrunk apically in diameter; basal piece nearly as long as dorsal plate of each paramere, with a moderately large, bifurcate conjoint of middle nodule at base of ventral side; ventral process of each paramere approaching to each other, short and slightly narrowed apically, bent ventrally in lateral view; dorsal plate slightly longer than ventral process, abruptly narrowed near base and bent to each other, apex acute and directing ventrally; apical part of laterophyses depressed and separated far from each other, apex acute and reaching middle emargination between dorsal plates.

### Female

Similar to male, but more robust, eyes smaller, slightly protruding, antennae thinner and shorter, roughly extending to elytral mid-length, IV–XI without smooth longitudinal impressions; pronotum slightly wider.

ABDOMINAL STERNITE VIII (Fig. 8C). Strongly narrowed posteriorly, latero-apical angles widely rounded, posterior margin widely and roundly emarginate in middle and feebly sinuate on both sides, behind notch with membrane which is weakly sclerotised and tapered at apex.

INTERNAL ORGAN OF REPRODUCTIVE SYSTEM (Fig. 6C). Vagina elongate, with median oviduct situated at ventro-apical part, diverticulum and spermathecal duct arising from apex; diverticulum relatively short, about 0.08 times body length, evenly thinned apically, slender tube-shaped and spiral; spermathecal duct moderately long but obviously shorter than diverticulum; spermatheca slender tube-shaped and spiral, obviously thinner than spermathecal duct and extremely long, much longer than diverticulum, basal part extended into a moderately long tube, where accessory gland opening. Accessory gland moderately thin and shorter than spermatheca.

### Variation

Head sometimes orange at vertex, pronotum more or less darkened at anterior part or both sides, elytra light yellow at more or less parts of margins.

### Remarks

The type was not located in MNHN although we tried several times; several specimens with labels written by Dr W. Wittmer with the specific name were found in NHMB. According to the previous work done by Wittmer (1969, 1972), it is speculated that he had examined the types during his working period, so the specimens determined by him are our references for the identification.

Kazantsev (2007) introduced the new name *Lycocerus limatus* for *L. limbatipennis* (Pic, 1926) (originally in *Podabrus*), which was preoccupied by *Lycocerus limbatipennis* (Pic, 1906) (originally in *Cantharis*). Judging from the male genitalia, *Podabrus limbatipennis* Pic, 1926 is a member of *Stenothemus*, to which it is transferred here. With the change of the genus, the replacement name *Lycocerus limatus* Kazantsev, 2007 becomes a junior synonym of *S. limbatipennis* (Pic, 1926) (ICZN Article 59.4).

### Distribution

China (Zhejiang, Fujian, Jiangxi).

### *Stenothemus nigriceps* (Wittmer, 1955) comb. nov.

Figs 1D, 4A–C, 6D, 8D

*Podabrinus nigriceps* Wittmer, 1955: 39, fig. 1.

*Pseudoabsidia nigriceps* – Wittmer 1969: 128.

*Athemellus nigriceps* – Wittmer 1972: 124.

*Lycocerus nigriceps* – Kazantsev & Brancucci 2007: 252.

### Material examined

#### Holotype

CHINA • ♂; [p] “Kwangtung. S. China.//Kau- lin San. 900-1.450//Mt. Lien-p’ing Distr.//April 21. 1940.//J. Linsley Gressitt”, [h-p] “*Podabrinus nigriceps*//Wittm.//det. W. Wittmer”, [p] “Holotypus”, [p-h] “California Academy//of Sciences//Type//NO.7786”; CAS.

#### Other material

CHINA – Hong Kong • 1 ♀; “Taipokan, 2011.III.11, coll. Paul Aston”; MHBU • 1 ♂; “Taipokan, 2014. II.13, coll. Paul Aston”; MHBU.

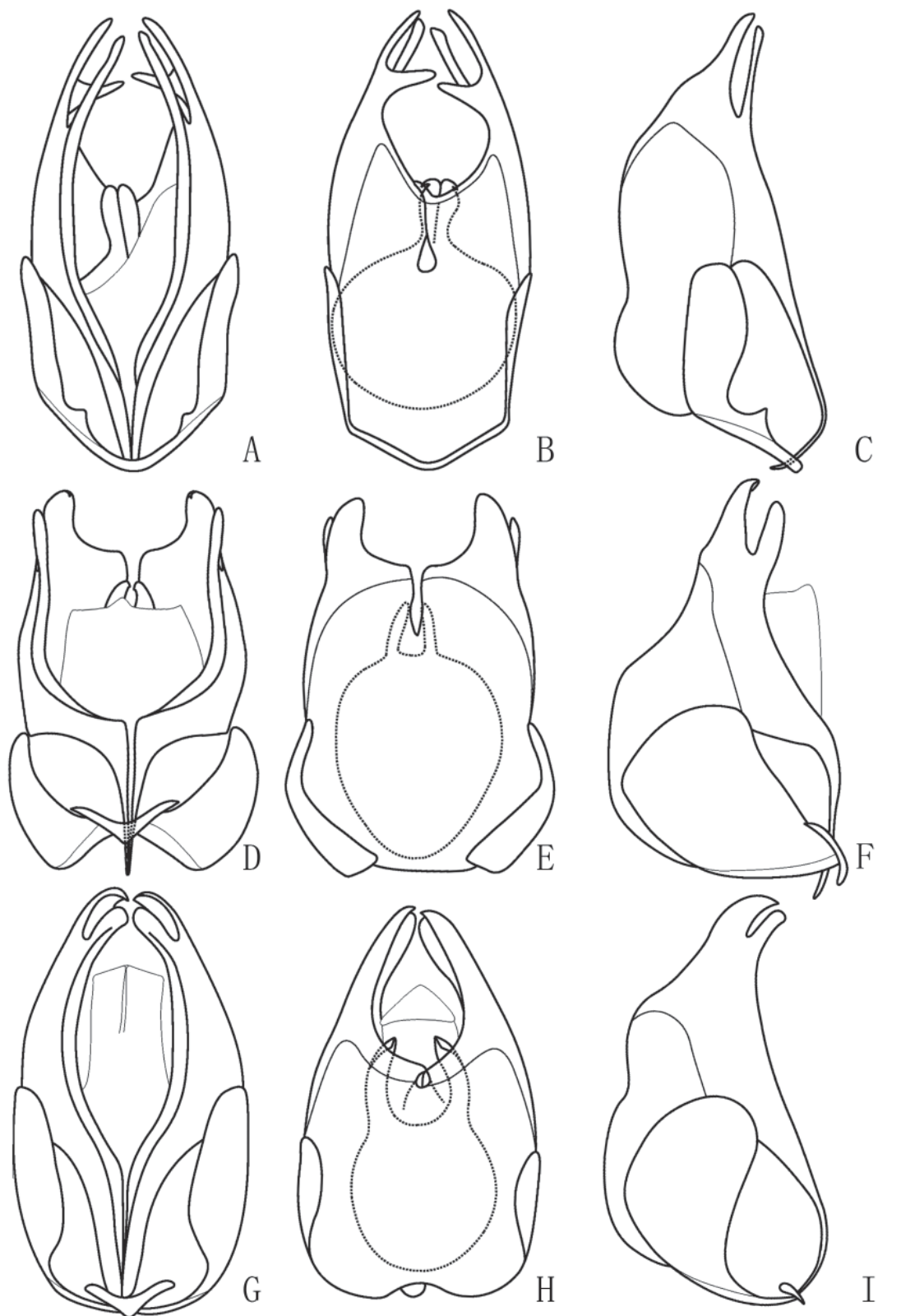
### Redescription

MEASUREMENTS. Body length (both sexes): 8.5–11.0 mm; width: 2.0–2.4 mm.

#### Male (Fig. 1D)

COLORATION. Body yellow, head and apices of elytra black, antennae, tarsi and bases of tibiae dark brown. Body densely covered with short, recumbent yellow pubescence, mixed with slightly longer semi-erect pubescence on elytra.

HEAD. Subquadrate, surface densely and finely punctuate, each side with smooth rectangular impression behind antennal socket; eyes strongly protruding, head width across eyes about 1.2 times as wide as pronotum; terminal maxillary palpomeres long-triangular, widest in middle; antennae filiform, extending to two-thirds length of elytra; antennomeres II about 2.5 times as long as wide at apices, III about twice as long as II, IV longest, XI slightly longer than X, pointed at apex.



**Fig. 4.** Aedeagus (A, D, G = ventral view; B, E, H = dorsal view; C, F, I = lateral view). **A–C.** *Stenothemus nigriceps* (Wittmer, 1955) comb. nov. (MHBU). **D–F.** *S. flavus* Y. Yang & X. Yang sp. nov. (IZAS, IOZ(E)1123159). **G–I.** *S. longicornis* Y. Yang & H. Liu sp. nov. (MHBU, HBU(E)410001). Scale bars: 1.0 mm.

**PRONOTUM.** Subquadrate, about 1.2 times as long as wide, anterior margin nearly arcuate, anterior angles widely rounded, lateral margins nearly parallel, posterior margin straight, posterior angles moderately sharp, protruding, disc distinctly convex on posterolateral parts, surface finely and densely punctate.

**ELYTRA.** Parallel-sided, about 4.0 times as long as humeral width, 4.2 times as long as pronotum, surface densely and finely punctate, with hardly indicated longitudinal costae.

**AEDEAGUS** (Fig. 4A–C). Weakly swollen dorsally in basal part, weakly contracted in diameter basally; basal piece obviously shorter than dorsal plate of each paramere, each with triangular protuberance but without conjoint middle nodule at base of ventral side; ventral processes of parameres approaching to each other, long and slightly widened at apices, bent dorsally in lateral view; dorsal plate slightly longer than ventral process, strongly narrowed apically, narrow-triangularly protuberant in middle, apex acute and approaching to each other; apical part of laterophyses compressed and next to each other in middle, apex hooked and directed laterally, slightly exceeding middle emargination between dorsal plates.

### Female

Similar to male, but body stouter, eyes less protruding, head width across eyes slightly wider than anterior margin of pronotum; antennae narrower and shorter, extending to elytral mid-length; pronotum wider, nearly as long as wide; elytra slightly dilated posteriorly, about 3.1 times as long as humeral width.

**ABDOMINAL STERNITE VIII** (Fig. 8D). Obliquely narrowed posteriorly, latero-apical angles widely triangular, posterior margin deeply and roundly emarginate in middle and nearly straight on both sides (membrane missing behind notch).

**INTERNAL ORGAN OF REPRODUCTIVE SYSTEM** (Fig. 6D). Vagina moderately elongate, with median oviduct situated at ventro-apical part, diverticulum and spermathecal duct arising from apex; diverticulum moderately long, about 0.16 times body length, evenly thinned apically, slender tube-shaped and spiral; spermathecal duct much shorter than diverticulum; spermatheca slender tube-shaped and spiral, obviously thinner than spermathecal duct and shorter than diverticulum, with basal part extended into short tube, where accessory gland opening. Accessory gland thin and shorter than spermatheca.

### Remarks

In this study, the structure of abdominal sternite VIII of the female is incomplete. Because there is only one female specimen, the structural description of abdominal sternite VIII needs to be improved.

### Distribution

China (Guangdong, Hong Kong).

*Stenothemus chinensis* (Wittmer, 1982) comb. nov.

Figs 1E–F, 5G–I, 7C, 8G

*Athemellus chinensis* Wittmer, 1982: 344, fig. 1.

*Leiothorax atosanguineus* Švihla, 2005: 104, figs 72–74. **Syn. nov.**

*Lycocerus chinensis* – Kazantsev & Brancucci 2007: 250.

### Material examined

#### Holotype of *Athemellus chinensis*

CHINA • ♀; [h-p] “u//T’ ienmo-Shan//Musée Heude”, [h-p] “10. 6. 36//O. PIEI, coll.”, [p] “P.//489”, [h] “*Lycocerus//lineaticeps* Pic//n. sp.”, [p] “HOLOTYUS”, [h]“198”, [h-p] “*Athemellus//chinensis*//Wittmer.//det. W. Wittmer”; MNHN.

**Holotype of *Leiothorax atosanguineus***

CHINA • ♂; [p] “CHINA, 1000–1300m//Shaanxi, Qinling mts, //XUNYANGBA (6km//E), 23.v.–13.vi.1998, //I. H. Marshal leg.”, [p] “HOLOTYPUS // *Leiothorax// atosanguineus* sp. nov. // V. Švihla det. 2005”; “CANTHARIDAE//CANTH000036013”; NHMB.

**Other material**

CHINA – **Fujian** • 1 ♂; Chong’an, Xingcun, San’gang; 740 m a.s.l.; 25 May 1960; Y.R. Zhang leg.; IZAS • 1 ♂; same collection data and collector as for preceding, 17 May 1960; IZAS. – **Guangxi** • 1 ♂; Wuming, Damingshan; 1230–1423 m a.s.l.; 20 May 2011; H.Y. Liu leg.; MHB. – **Hubei** • 1 ♀; Xingshan, Longmenhe; 1300 m a.s.l.; 21 Jun. 1993; R.Z. Huang leg.; IZAS • 1 ♀; same locality as for preceding; 1280 m a.s.l.; 23 Jun. 1993; W.Z. Li leg.; IZAS • 1 ♀; Shennongjia; 19 Jul. 1980; P.Y. Yu leg.; IZAS • 1 ♀; Shennongjia, Hongping; 1660 m a.s.l.; 16 Jul. 1981 Y.H. Han leg.; IZAS • 1 ♀; same locality and collector as for preceding; 19 Jul. 1981; IZAS • 1 ♀; same locality as for preceding; 6 Jun. 2018; P. Wang leg.; MHB. • 1 ♂, 1 ♀; Shennongjia, Hongping, Wenshui; 1 Jun. 2018; P. Wang and L.M. Li leg.; MHB. • 1 ♂; Shennongjia, Jiuchong; 711.9 m a.s.l.; 11–15 Jul. 2014; Y.B. Ba and S.Y. Tang leg.; MHB. • 1 ♀; Yichang, Dalaoling; 6 May 2015; T.F. Qiu leg.; MHB. • 1 ♀; Zhuxi, Xiangba; 1208 m a.s.l.; 5 Jul. 2017; Z.Z. Xia leg.; IZAS • 1 ♂; Shennongjia, Baozidong; 23 May 2018; P. Wang leg.; MHB. • 1 ♂; Dongxi management zone; 17 May 2019; P. Wang leg.; MHB. – **Jiangxi** • 1 ♀; Shangrao, Sanqingshan; 15–20 Apr. 2007; L. Shi leg.; SYSU. – **Shaanxi** • 1 ♀; Yangxian, Huayang, Yantoushang; 1206 m a.s.l.; 107°31’6.9” E, 33°38’29” N, 27 Jun. 2017; H.Y. Liu leg.; IZAS. – **Sichuan** • 1 ♀; Emeishan, Jiulaodong; 1800–1900 m a.s.l.; 13 Jun. 1957; Y.C. Lu leg.; IZAS • 1 ♀; Emeishan; 1600–2100 m a.s.l.; 24 Jun. 1955; Бушик leg.; IZAS. – **Yunnan** • 1 ♂; Lushui, Yaojiaping; 2500 m a.s.l.; 24 May 1981; S.Y. Wang leg.; IZAS • 1 ♀; Zhibenshan; 2550 m a.s.l.; 22 Apr. 1981; S.Y. Wang leg.; IZAS. – **Zhejiang** • 1 ♂; Qingyuan, Baishanzu; 1500 m a.s.l.; 18 May 1994; H. Wu leg.; IZAS • 1 ♀; same locality as for preceding; 800 m a.s.l.; 20 Apr. 1994; Y.Z. Xu leg.; IZAS • 2 ♂♂; same collection data as for preceding; leg. H. Wu; IZAS • 1 ♂; Tianmushan, Bingchuan Valley; 7 Jun. 2011; H.T. Song leg.; MHB. • 1 ♀; Changhua, Jiufu; 13 May 2017; Y.B. Ba and H.H. Guan leg.; MHB. • 1 ♂; “T’ienmo-Shan, Musée Heude, 1936.VI.9; leg. O. Piel”; IZAS • 2 ♂♂, 3 ♀♀; “T’ienmo-Shan, Musée Heude, 1936.VI.10; leg. O. Piel”; IZAS.

**Supplementary description**

MEASUREMENTS. Body length (both sexes): 7.0–10.5 mm; width: 1.2–2.3 mm.

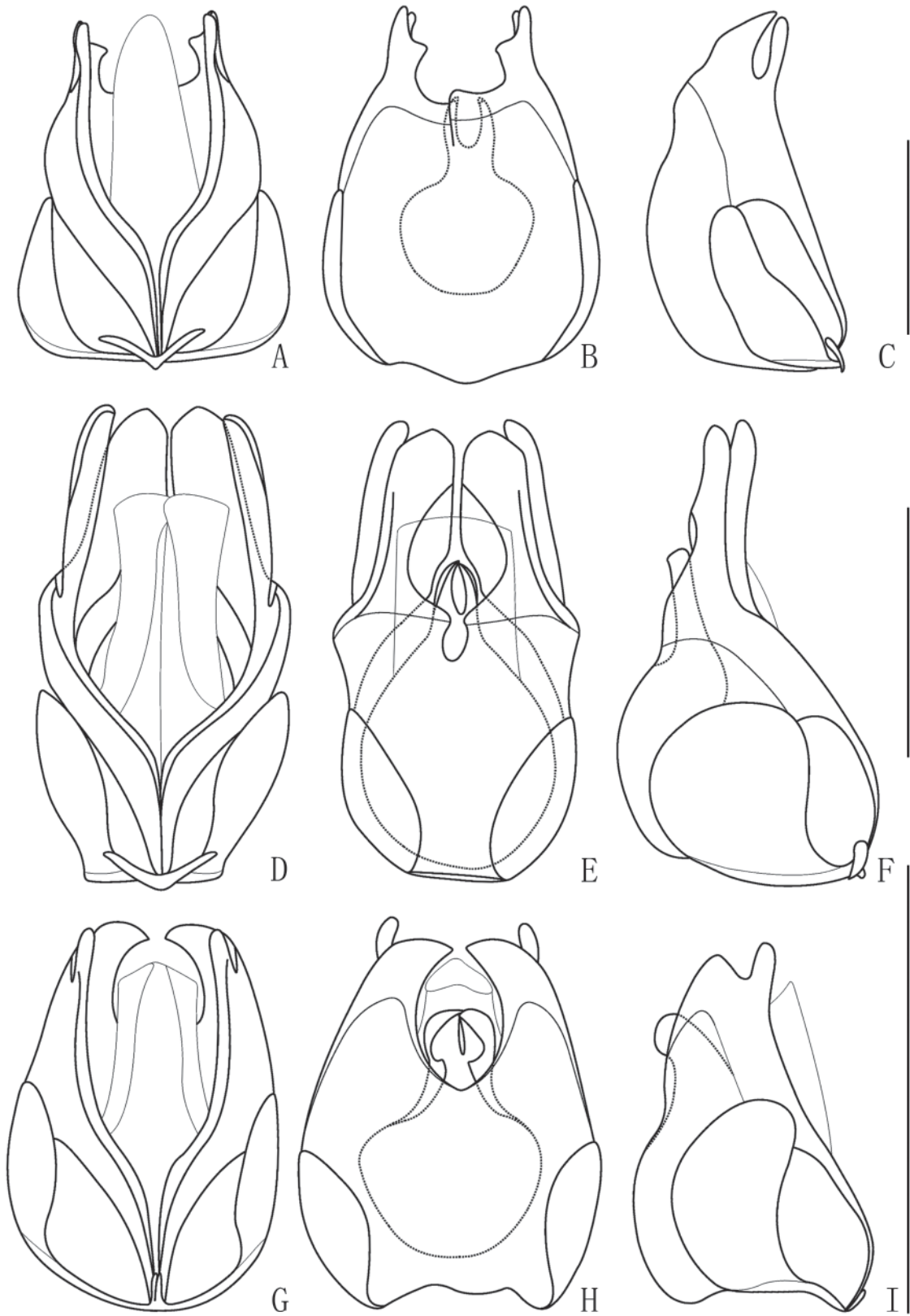
**Male (Fig. 1F)**

AEDEAGUS (Fig. 5G–I). Moderately swollen laterally at basal part, contracted apically in diameter; basal piece nearly as long as dorsal plate of each paramere, with a moderately large, parallel-sided conjoint middle nodule at base of ventral side; ventral processes of parameres nearly parallel to each other, short and slightly narrowed apically, bent dorsally in lateral view; dorsal plate slightly shorter than ventral process, evenly narrowed apically, apex acute and bent to each other; apical part of laterophyses compressed and next to each other in middle, dorsolateral margin emarginate near apex, rounded and obviously exceeds middle emargination between dorsal plates.

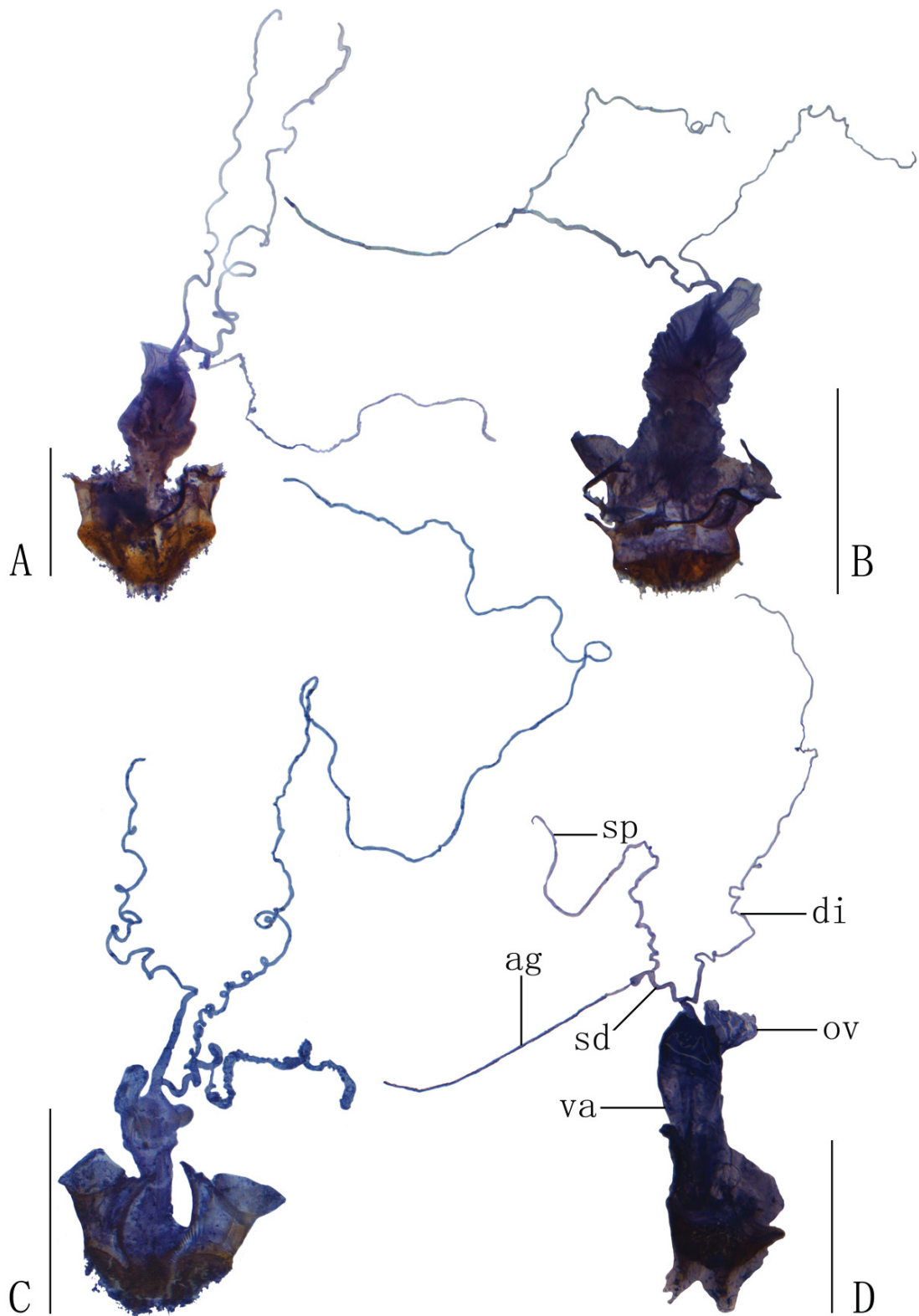
**Female (Fig. 1E)**

ABDOMINAL STERNITE VIII (Fig. 8G). Obliquely narrowed posteriorly, latero-apical angles obtusely rectangular, posterior margin deeply and triangularly emarginate in middle and feebly sinuate on both sides, behind notch with membrane which weakly sclerotised and rounded at apex.

INTERNAL ORGAN OF REPRODUCTIVE SYSTEM (Fig. 7C). Vagina stout, with median oviduct situated at ventro-apical part, diverticulum and spermathecal duct arising from apex; diverticulum moderately long, about 0.12 times body length, evenly thinned apically, slender tube-shaped and spiral; spermathecal duct much shorter than diverticulum; spermatheca slender tube-shaped and spiral, obviously thinner



**Fig. 5.** Aedeagus (A, D, G = ventral view; B, E, H = dorsal view; C, F, I = lateral view). **A–C.** *Stenothemus fukienensis* Wittmer, 1974 (IZAS, IOZ(E)1659634). **D–F.** *S. kuatunensis* Wittmer, 1979 (IZAS). **G–I.** *S. chinensis* (Wittmer, 1982) comb. nov. (IZAS, IOZ(E)1436585). Scale bars: 1.0 mm.



**Fig. 6.** Female internal reproductive system, lateral view. **A.** *Stenothemus biimpressiceps* (Pic, 1930) comb. nov. (IZAS, IOZ(E)1435863). **B.** *S. pallicolor* (Wittmer, 1951) comb. nov. (SYSU, En-076948). **C.** *S. limbatipennis* (Pic, 1926) stat. rev. et comb. nov. (MHBUS). **D.** *S. nigriceps* (Wittmer, 1955) comb. nov. (MHBUS). Scale bars: 0.5 mm.



than spermathecal duct and shorter than diverticulum, with basal part extended into short tube, where accessory gland opening. Accessory gland thin and much longer than spermatheca.

### Remarks

Wittmer (1982), having only females at his disposal, assigned this species to the genus *Athemellus* Wittmer, 1972, now a junior synonym of *Lycocerus* Gorham, 1889 (Okushima 2005). Some additional material, also including males from the type locality, is available here, and the morphological characters show that this species is a member of *Stenothemus*.

Furthermore, the holotype male of *Leiothorax atosanguineus* shows that it has no differences from *S. chinensis* comb. nov.; also, a large series of additional material from several localities is available for examination though their type localities are far away. Therefore, *L. atosanguineus* is considered to be a junior synonym of *S. chinensis*.

### Distribution

China (Shaanxi, Zhejiang, Hubei, Fujian, Sichuan, Jiangxi, Yunnan, Guangxi).

### *Stenothemus flavus* Y. Yang & X. Yang sp. nov.

urn:lsid:zoobank.org:act:0F33A6EA-1C0A-4528-8A44-CF59FC42EF73

Figs 2B, 4D–F, 7A, 8E

### Differential diagnosis

The new species is related to *S. melleus* Švihla, 2005 (located in Sichuan, China), but can be distinguished by its larger body (no more than 9.0 mm length in the latter); femur orange, darkened only at base (in the latter, darkened at least at apical third part); aedeagus: middle emargination between dorsal plates deep, nearly as long as half its length (shallow in the latter, much shorter than half length).

### Etymology

The specific name is derived from the Latin '*flavus*', meaning 'golden-yellow' and referring to its body coloration.

### Material examined

#### Holotype

CHINA • ♂; Zhejiang, Xitianmushan, Xianrending; 1500 m a.s.l.; 30 May 1998; H. Wu leg.; IZAS IOZ(E)1123159.

#### Paratypes

CHINA – **Zhejiang** • 1 ♂; Anji, Longwangshan; 490 m a.s.l.; 17 Jul. 1995; H. Wu leg.; IZAS IOZ(E)1659904 • 1 ♀; same locality and collector as for preceding; 770 m a.s.l.; 19 Oct. 1995; IZAS IOZ(E)1659887 • 1 ♂; same locality and collector as for preceding; 21 Oct. 1995; IZAS IOZ(E)1659896 • 1 ♂; Xitianmushan; 500 m a.s.l.; 21 Jul. 1998; M.S. Zhao leg.; IZAS IOZ(E)225767 • 1 ♂; Xitianmushan, Chanyuansi; 380 m a.s.l.; 13 Nov. 1998; H. Wu leg.; IZAS IOZ(E)215768 • 1 ♀; same collection data as for preceding; IZAS IOZ(E)215769 • 1 ♂; Tianmushan; 12 Nov. 1998; M.S. Zhao leg.; IZAS IOZ(E)215770 • 1 ♂; Tianmushan; 24 Nov. 1998; C.L. Ma leg.; IZAS IOZ(E)215771 • 1 ♂; Qingyuan, Baishanzu; 1500 m a.s.l.; 23 Oct. 1993; H. Wu leg.; IZAS IOZ(E)215772.

## **Description**

MEASUREMENTS. Body length (both sexes): 9.0–14.0 mm (12.0 mm in holotype); width: 2.5–3.0 mm (2.8 mm in holotype).

### **Male** (Fig. 2B)

COLORATION. Body yellow, head and prothorax testaceous, pronotum orange at anterior angles, mouth-parts, antennae, tarsi, tibiae and bases of femora black brown. Body densely mixed with short recumbent and slightly longer semi-erect light yellow pubescence.

HEAD. Subquadrate, surface sparsely and finely punctate, each side with smooth and rectangular impression behind antennal socket; eyes strongly protruding, head width across eyes 1.2 times as wide as pronotum; terminal maxillary palpomeres long-triangular, widest at basal third; antennae filiform, extending to two-thirds length of elytra, antennomere II about 2.3 times as long as wide at apices, III about 1.7 times as long as II, IV longest, XI slightly longer than X, pointed at apex.

PRONOTUM. Subquadrate, about 1.1 times as long as wide, anterior margin nearly straight, anterior angles roundly truncate, lateral margins slightly sinuate, posterior margin slightly sinuate, posterior angles moderately sharp and protruding, disc strongly convex on posterolateral parts, surface finely and densely punctate.

ELYTRA. Moderately dilated posteriorly, about 3.6 times as long as humeral width, 5.1 times as long as pronotum, surface densely and finely punctate, with hardly indicated longitudinal costae.

AEDEAGUS (Fig. 4D–F). Strongly swollen dorsally at basal part, nearly parallel-sided in apical part; basal piece nearly as long as dorsal plate of each paramere, with a large, bifurcate conjoint middle nodule at base of ventral side; ventral processes of parameres nearly parallel to each other, short and slightly narrowed apically, bent dorsally in lateral view; dorsal plate slightly longer than ventral process, abruptly narrowed in middle, near to each other at basal part, acute at apex and folded ventrally; apical part of laterophyses depressed and separate from one another, apex acute and not reaching middle emargination between dorsal plates.

### **Female**

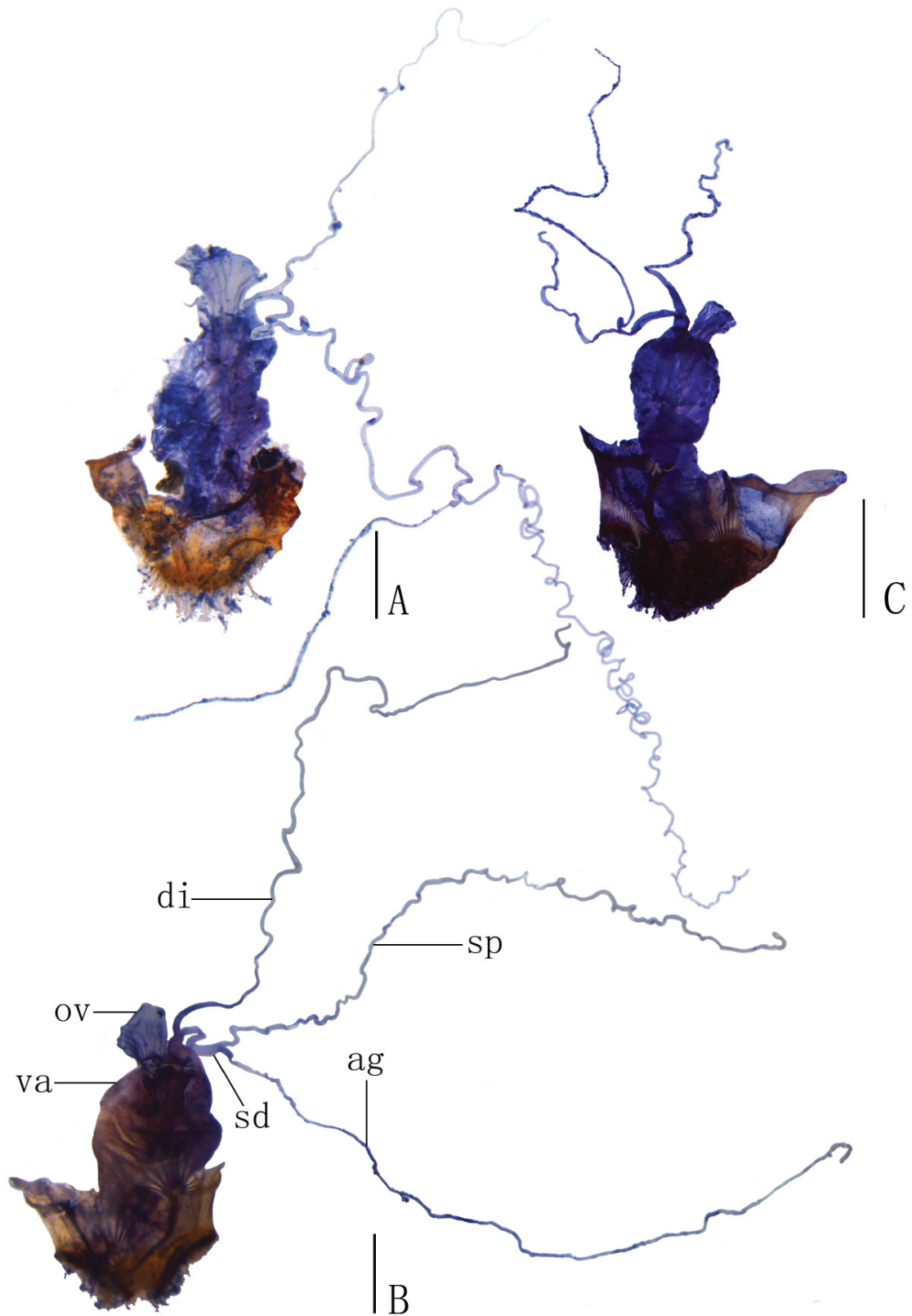
Similar to male, but stouter, eyes less protruding; antennae shorter, reaching elytral mid-length, pronotum wider, nearly as wide as long.

ABDOMINAL STERNITE VIII (Fig. 8E). Moderately narrowed posteriorly, latero-apical angles widely rounded, posterior margin widely and rectangularly emarginate in middle and truncate on both sides, behind notch with membrane which sclerotised and triangularly bilobed at apex and present with traverse-triangular sclerite at center and small rounded sclerite on each side.

INTERNAL ORGAN OF REPRODUCTIVE SYSTEM (Fig. 7A). Vagina stout, with median oviduct situated at ventro-apical part, diverticulum and spermathecal duct arising from apex; diverticulum moderately long, about 0.16 times body length, evenly thinned apically, slender tube-shaped and spiral; spermathecal duct longer than diverticulum; spermatheca slender tube-shaped and spiral, obviously thinner than spermathecal duct and much longer than diverticulum, with basal part extended into short tube, where accessory gland opening. Accessory gland thin and much shorter than spermatheca.

## **Distribution**

China (Zhejiang).



**Fig. 7.** Female internal reproductive system, lateral view. **A.** *Stenothemus flavus* Y. Yang & X. Yang sp. nov. (IZAS, IOZ(E)1659887). **B.** *S. fukienensis* Wittmer, 1974 (IZAS). **C.** *S. chinensis* (Wittmer, 1982) comb. nov. (MHBUS). Scale bars: 0.5 mm.

*Stenothemus longicornis* Y. Yang & H. Liu sp. nov.

urn:lsid:zoobank.org:act:642A908A-1F99-44DD-BC37-142F864A35E2

Figs 2D, 4G–I

**Differential diagnosis**

The new species resembles *S. hajeki* Švihla, 2011 (from N Yunnan, China), but differs in the following characters: antennae without impressions on middle antennomeres (with small oval impressions on antennomeres IV–XI in the latter), pronotum obviously longer than wide (nearly as long as wide in the latter); elytra more elongate, about 3.5 times humeral width (3.2 times in the latter); aedeagus: parameres approaching each other (far from each other in the latter).

**Etymology**

The specific name is derived from the Latin ‘*longus*’, meaning ‘long’, and ‘*cornus*’, meaning ‘horn’, and referring to its long antennae.

**Material examined**

**Holotype**

CHINA • ♂; Guangdong, Nanling, Ruyuan; 8 Apr. 2009; L. Gao leg.; MHBH HBU(E)410001.

**Description**

**Male** (Fig. 2D)

MEASUREMENTS. Body length: 6.8 mm; width: 1.4 mm.

COLORATION. Body black, mouthparts light brown, reddish brown at apices of mandibles, more or less darkened at maxillary and labial palpi, prothorax reddish brown, femora light brown at basal. Body densely covered with short, recumbent yellow pubescence.

HEAD. Subquadrate, surface densely and finely punctate, each side with smooth and rectangular impression behind antennal socket; eyes strongly protruding, head width across eyes about 1.4 times as wide as pronotum; terminal maxillary palpomeres long-triangular, widest at basal two-thirds; antennae quite long, obviously exceeding apices of elytra; antennomeres II slightly longer than wide at apices, III about 2.6 times as long as II, III–XI flattened and subparallel-sided, IV widest, V to XI gradually narrowing towards apex, VIII longest, XI slightly longer than X, pointed at apex.

PRONOTUM. Subquadrate, about 1.2 times as long as wide, anterior margin rounded, anterior angles obtuse, subrounded, lateral margins nearly parallel and slightly sinuate, posterior margin straight and finely bordered, posterior angles obtusely rectangular, disc strongly convex on posterolateral parts, surface finely and densely punctate.

ELYTRA. Parallel-sided, about 3.5 times as long as humeral width, 4.8 times as long as pronotum, surface densely and finely punctate, with hardly visible longitudinal costae.

AEDEAGUS (Fig. 4G–I). Moderately swollen laterally at basal part, strongly contracted in diameter apically; basal piece nearly as long as dorsal plate of each paramere, with a large, bifurcate conjoint middle nodule at base of ventral side; ventral processes of parameres approaching each other, short and slightly thickened apically, bent ventrally in lateral view; dorsal plate slightly longer than ventral process, strongly narrowed near base, approaching to each other, apex acute and directed ventrally; apical part of laterophyses separate from each other, apex wide-triangular and bent dorsally, feebly exceeding middle emargination between dorsal plates.

**Female**

Unknown.

**Distribution**

China (Guangdong).

*Stenothemus fukienensis* Wittmer, 1974  
Figs 5A–C, 7B, 8F

*Stenothemus fukienensis* Wittmer, 1974: 60, figs 20–21.

**Material examined**

**Holotype**

CHINA • ♂; [p] “Kuatun (2300m) 27, 40n. Br.//117. 40ö. L. J. Klapperich//3. 4. 1938 (Fukien)”, [h] “*Stenothemus//fukienensis//Wittm.//det. W. Wittmer*”, [p] “HOLOTYPUS”, [p] “Naturhistorisches//Museum Basel//Coll. W. Wittmer”, [p] “Cantharidae//CANTH00003399”; NHMB.

**Other material**

CHINA – **Fujian** • 1 ♂; Shaowu, Tachuland; 14 May 1945; collector unknown; NHMB. – **Zhejiang** • 2 ♂♂, 1 ♀; Qingyuan, Baishanzu, Chameiyu; 1300 m a.s.l.; 19 Apr. 1994; H. Wu leg.; IZAS • 1 ♂; same locality as for preceding; 800 m a.s.l.; 20 Apr. 1994; W.G. Zhang leg.; IZAS • 1 ♂; Longquan, Fengyangshan; 1800 m a.s.l.; 18 May 2007; J.F. Gao and B.F. Zhou leg.; IZAS • 1 ♀; same locality as for preceding; 1250 m a.s.l.; 10 May 2007; S.L. Liu leg.; IZAS.

**Supplementary description**

**Male**

AEDEAGUS (Fig. 5A–C). Strongly swollen laterally in basal part, contracted in diameter apically; basal piece nearly as long as dorsal plate of each paramere, with a large, bifurcate conjoint middle nodule at base of ventral side; ventral processes of parameres nearly parallel to one another, distinctly thickened apically, bent dorsally in lateral view; dorsal plate slightly longer than ventral process, abruptly narrowed in middle and wide-triangularly protuberant at apical part, near to each other at basal part, apex acute and folded ventrally; apical parts of laterophyses depressed and separate from each other, apex acute and bent dorsally, reaching middle emargination between dorsal plates.

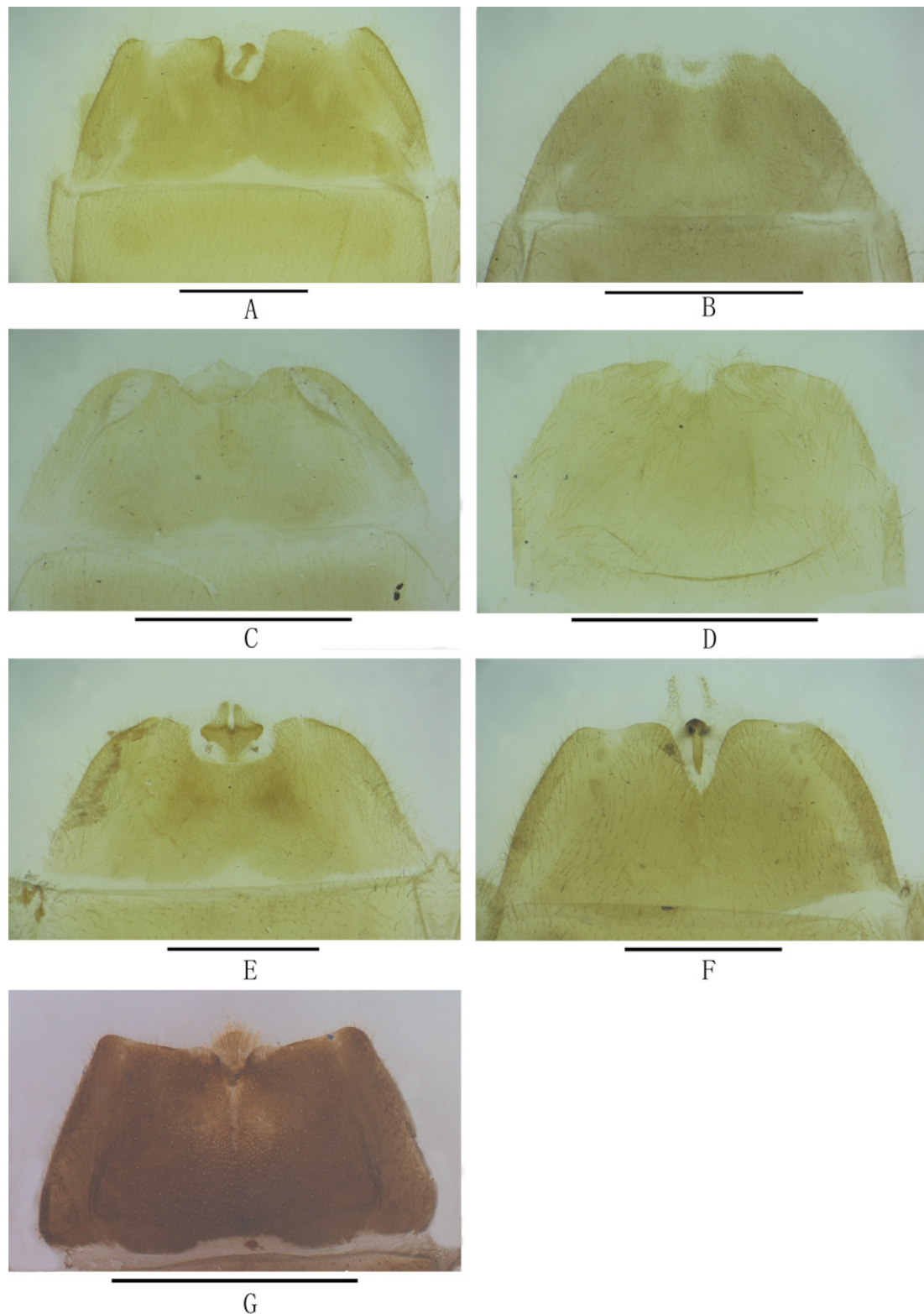
**Female**

ABDOMINAL STERNITE VIII (Fig. 8F). Moderately narrowed posteriorly, posterior margin deeply and triangularly emarginate in middle and feebly emarginate on both sides; behind notch with membrane, narrowly bilobed at apex and present with longitudinal sclerite at center.

INTERNAL ORGAN OF REPRODUCTIVE SYSTEM (Fig. 7B). Vagina stout, with median oviduct situated at ventro-apical part, diverticulum and spermathecal duct arising from apex; diverticulum extremely long, about 0.33 times body length, evenly thinned apically, slender tube-shaped and spiral; spermathecal duct much shorter than diverticulum; spermatheca slender tube-shaped and spiral, obviously thinner than spermathecal duct and nearly as long as diverticulum, with basal part extended into short tube, where accessory gland opening. Accessory gland thin and nearly as long as spermatheca.

**Remarks**

This species was described only based on the male, and the female is here recorded for the first time.



**Fig. 8.** Female abdominal sternite VIII, ventral view. **A.** *Stenothemus biimpresciceps* (Pic, 1930) comb. nov. (IZAS, IOZ(E)1435863). **B.** *S. pallicolor* (Wittmer, 1951) comb. nov. (SYSU, En-076948). **C.** *S. limbatipennis* (Pic, 1926) stat. rev. et comb. nov. (MHBUS). **D.** *S. nigriceps* (Wittmer, 1955) comb. nov. (MHBUS). **E.** *S. flavus* Y. Yang & X. Yang sp. nov. (IZAS, IOZ(E)1659887). **F.** *S. fukienensis* Wittmer, 1974 (IZAS). **G.** *S. chinensis* (Wittmer, 1982) comb. nov. (MHBUS). Scale bars: 1.0 mm.

**Distribution**

China (Zhejiang, Fujian).

*Stenothemus kuatunensis* Wittmer, 1979

Fig. 5D–F

*Stenothemus kuatunensis* Wittmer, 1979: 330, fig. 2.

**Material examined**

**Holotype**

CHINA • ♂; [p] “KUATUN, FUKIEN//China, 26.9.(19)46//(TSCHUNG SEN.)”, [h] “*Stenothemus//kuatunensis*//Wittm.”, [p] “Naturhistorisches//Museum Basel//Coll. W. Wittmer”, [p]“CANTHARIDAE//CANTH00002946”; NHMB.

**Other material**

CHINA – Anhui • 2 ♂♂; Fengyangshan, Miaopudi; 1430 m a.s.l.; 24 Aug. 2007; S.L. Liu leg.; IZAS. – Zhejiang • 1 ♂; Qingyuan, Baishanzu; 1500 m a.s.l.; 9 Sep. 1993; H. Wu leg.; IZAS.

**Supplementary description**

AEDEAGUS (Fig. 5D–F). Strongly swollen dorsally in basal part, contracted in diameter basally; basal piece obviously shorter than dorsal plate of each paramere, with a large, bifurcate conjoint middle nodule at base of ventral side; ventral process of each paramere nearly parallel to one another, long and flattened, apex rounded; dorsal plate slightly shorter than ventral process, nearly parallel-sided, layered in middle, external layer roundly emarginate in middle, internal layer feebly emarginate, apex subrounded; apical parts of laterophyses compressed and next to each other in middle, apex rounded and obviously exceeding middle emargination between dorsal plates.

**Remarks**

In the original publication (Wittmer 1979), the aedeagus of this species was illustrated only in ventral view; here, it is also illustrated in dorsal and lateral views.

**Distribution**

China (Anhui, Fujian, Zhejiang).

**Key to the species of *Stenothemus* from Southeast China**

1. Elytra red, with moderately indicated longitudinal costae on disc ..... *S. chinensis* (Wittmer, 1982) comb. nov.
- Elytra black, yellow or light brown, with weakly or hardly indicated longitudinal costae on disc... 2
2. Pronotum subrounded, with lateral margins obviously sinuate, posterior angles distinctly protruding ..... 3
- Pronotum subquadrate, with lateral margins nearly parallel or feebly sinuate, posterior angles hardly protruding ..... 5
3. Elytra light brown, with irregular dark markings; aedeagus: dorsal plate of each paramere rounded at apex, layered but without protuberance at inner margin..... *S. kuatunensis* Wittmer, 1979
- Elytra yellow or black, without markings; aedeagus: dorsal plate of each paramere acute at apex, not layered, with a wide triangular protuberance at inner margin ..... 4

4. Elytra uniformly yellow.....*S. biimpressiceps* (Pic, 1930) comb. nov.  
– Elytra black, with light yellow margins..... *S. fukienensis* Wittmer, 1974
5. Antennae extending beyond elytral apices, antennomeres III–XI obviously widened and flattened in male..... *S. longicornis* Y. Yang & H. Liu sp. nov.  
– Antennae unlike above, at most reaching apical one-third length of elytra ..... 6
6. Elytra yellow, black at apices; aedeagus: basal piece with a triangular protuberance but without middle nodule on ventral side, laterophyses hooked at apices .....*S. nigriceps* (Wittmer, 1955) comb. nov.  
– Elytra unlike above, without apical macula; aedeagus: basal piece with a middle nodule on ventral side, laterophyses acute, never hooked..... 7
7. Elytra black, at most light brown at margins; antennae with smooth longitudinal grooves on antennomeres III–XI in male ..... *S. limbatipennis* (Pic, 1926) stat. rev. et comb. nov.  
– Elytra yellow or light brown, at most with brown markings; antennae without smooth longitudinal grooves on antennomeres III–XI in male ..... 8
8. Elytra uniformly yellow; aedeagus: dorsal plate of each paramere abruptly narrowed in middle .....  
.....*S. flavus* Y. Yang & X. Yang sp. nov.  
– Elytra light brown, with brown markings; aedeagus: dorsal plate of each paramere nearly parallel-sided..... *S. pallicolor* (Wittmer, 1951) comb. nov.

## Discussion

The diagnosis of *Stenothemus* was summarized by Okushima & Satô (1999), but no characters of female genitalia were included. Here, the internal organ of the female reproductive system is described for the first time. All studied species share the following common characters: slender tube-shaped and spiral diverticulum and spermatheca, the situation of median oviduct, diverticulum and spermathecal duct in the vagina. They differ from one another in the relative length of diverticulum, spermathecal duct, spermatheca and accessory gland. It is shown once more that the female genitalia are a source of useful characters for cantharid taxonomy.

The female abdominal sternite VIII of *Stenothemus*, according to Okushima & Satô (1999) lacks a membranous plate at the center of the terminal margin. However, this structure is present in the type species, *S. harmandi* (Bourgeois) (Yang *et al.* 2014), and the species studied here, except for *S. nigriceps* in which the membranous plate is absent.

Examination of the morphological characters of the types and a large series of additional material, especially characters of the male genitalia (Okushima & Satô, 1999), including fused parameres being deeply cleft on the ventral side, and a pair of laterophyses present between the median lobe and dorsal plates that are moderately developed but much shorter than lateral lobes, with the basal part surmounting laterophyses more or less globularly swollen, indicated that the following species should be transferred to this genus: *Stenothemus biimpressiceps* (Pic, 1930) comb. nov. (from *Cantharis* Linnaeus, 1758), and *Stenothemus chinensis* (Wittmer, 1982) comb. nov., *Stenothemus limbatipennis* (Pic, 1926) stat. rev. et comb. nov., *Stenothemus nigriceps* (Wittmer, 1955) comb. nov. and *Stenothemus pallicolor* (Wittmer, 1951) comb. nov. (all from *Lycocerus* Gorham, 1889).

Based on the examination and comparison of the types as well as referring to some more additional material, *Leiothorax atrosanguineus* Švihla, 2005 is proposed as a junior synonym of *Stenothemus chinensis*. With the change in genus, *S. limbatipennis* is reinstated as a valid name, and *Lycocerus limatus* Kazantsev, 2007 becomes a junior synonym (ICZN Article 59.4).



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## References

- Brancucci M. 1980. Morphologie comparée, évolution et systématique des Cantharidae (Insecta: Coleoptera). *Entomologica Basiliensia* 5: 215–388.
- Bourgeois J. 1907. Sur quelques Malacodermes de l'Inde. *Annales de la Société entomologique de Belgique* 51: 291–293.
- Hsiao Y. 2015. Description of two new species of the genus *Stenothemus* from Taiwan (Coleoptera: Cantharidae). *Zootaxa* 3937 (2): 386–392. <https://doi.org/10.11646/zootaxa.3937.2.9>
- Hsiao Y., Okushima Y. & Yang P. 2016. Review of the genus *Stenothemus* Bourgeois from Taiwan, with description of three new species (Coleoptera: Cantharidae) and additional distributional records of previously known species. *Zootaxa* 4117 (1): 101–114. <https://doi.org/10.11646/zootaxa.4117.1.5>
- Kazantsev S.V. 2007. Cantharidae. In: Löbl I & Smetana A. (eds) *Catalogue of Palaearctic Coleoptera* 4: 47–54. Apollo Books, Stenstrup.
- Kazantsev S.V. & Brancucci, M. 2007. Cantharidae. In: Löbl I & Smetana A. (eds) *Catalogue of Palaearctic Coleoptera* 4: 234–298. Apollo Books, Stenstrup.
- Okushima Y. 2005. A taxonomic study on the genus *Lycocerus* (Coleoptera, Cantharidae) from Japan, with zoogeographical considerations. *Japanese Journal of Systematic Entomology, Monographic Series* 2: 1–383.
- Okushima Y. & Satô M. 1997. Two new species of the genus *Stenothemus* (Coleoptera, Cantharidae) from Taiwan. *Elytra* 25 (1): 85–91.
- Okushima Y. & Satô M. 1999. Cantharid beetles of the genus *Habronychus* (Coleoptera, Cantharidae) from Taiwan, with description of a new subgenus. *Elytra* 27 (2): 387–403.
- Pic M. 1906. Noms nouveaux et diagnoses de “Cantharini” (Telephorides) européens et exotiques. *L'Échange* 22: 81–85.
- Pic M. 1930. Malacodermes exotiques (Suite). *L'Échange* 66 [hors-texte] (439): 77–80.
- Švihla V. 2004. New taxa of the subfamily Cantharinae (Coleoptera, Cantharidae) from southeastern Asia with notes on other species. *Entomologica Basiliensia* 26: 155–238.
- Švihla V. 2005. New taxa of the subfamily Cantharinae (Coleoptera: Cantharidae) from south-eastern Asia with notes on other species II. *Acta Entomologica Musei Nationalis Pragae* 45: 71–110.

- Švihla V. 2011. New taxa of the subfamily Cantharinae (Coleoptera: Cantharidae) from south-eastern Asia, with notes on other species III. *Zootaxa* 2895: 1–34.
- Wittmer W. 1951. Neue Cantharidae aus Herrn Joh. Klapperichs' Südchina Ausbeute (14. Beitrag zur Kenntnis der palaearktischen Malacodermata Col.). *Entomologische Blätter für Biologie und Systematik der Käfer* 47: 96–103.
- Wittmer W. 1955. 21. Beitrag zur Kenntnis der Palaearktischen Malacodermata (Coleoptera). *Mushi* 29 (6): 39–45.
- Wittmer W. 1969. Synonymische und systematische Notizen über Coleopteren. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 42 (1–2): 126–134.  
<https://doi.org/10.5169/SEALS-401586>
- Wittmer W. 1972. Beitrag zur Kenntnis der palaearktischen Cantharidae und Malachiidae (Col.). *Entomologische Arbeiten aus dem Museum G. Frey* 23: 122–141.
- Wittmer W. 1974. Zur Kenntnis der Gattung *Stenothemus* Bourg. (Col. Cantharidae). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 47 (1–2): 49–62.
- Wittmer W. 1979. 64. Beitrag zur Kenntnis der palaearktischen Cantharidae, Phengodidae und Malachiidae (Col.). *Entomologica Basiliensia* 4: 327–346.
- Wittmer W. 1982. 71. Beitrag zur Kenntnis der palaearktischen Cantharidae. *Entomologica Basiliensia* 7: 340–347.
- Yang Y.X., Su J.Y. & Yang X.K. 2014. Review of the *Stenothemus harmandi* species-group (Coleoptera, Cantharidae), with description of six new species from China. *Zootaxa* 3847 (2): 203–220.  
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