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## Revision on genus *Xizicus* Gorochov (Orthoptera, Tettigoniidae, Meconematinae, Meconematini) with description of three new species from China

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### Abstract

This work presents a revision of genus *Xizicus*. two new subgenera are described: *Xizicus* (*Zangxizicus*) subgen. nov. and *Xizicus* (*Haploxizicus*) subgen. nov. Three new species are described, namely *Xizicus* (*Paraxizicus*) *fallax* sp. nov., *Xizicus* (*Zangxizicus*) *tibeticus* sp. nov. and *Xizicus* (*Zangxizicus*) *quadrifascipes* sp. nov.. Keys to subgenera and species are provided.

**Key words:** Orthoptera, Tettigoniidae, Meconematinae, *Xizicus*, *Paraxizicus*, *Zangxizicus*, *Haploxizicus*, new species

### Introduction

The taxonomy of the tribe Meconematini is very far from clear. Since 2000, a considerable number of Meconematini species have been reported in Oriental Region from China, the generic classification is in flux. Gorochov (1993) erected *Xizicus* for *Xiphidiopsis fascipes* Bey-Bienko, 1955 based on the genitalia of *Xiphidiopsis* and the male 10<sup>th</sup> abdominal tergite of *Kuzicus*. He also subdivided it into *Xizicus* and *Eoxizicus* and noted *Xizicus* (?) *ikonnikovi* Gorochov, 1993. Subsequently, Gorochov (1998) transferred *Xiphidiopsis juxtafurca* Xia & Liu, 1988 and *X. biloba* Bey-Bienko, 1962 to *Xizicus* (*Eoxizicus*), discussed *Xizicus* (*Xizicus*) *proximus* Gorochov, 1998, *Xizicus* (*Eoxizicus*) *tam* Gorochov, 1998, *X. (E.) dao* Gorochov, 1998, *X. (E.) dumplum* Gorochov, 1998, *X. (E.) khaosoki* Gorochov, 1998 and *X. (E.) danangi* Gorochov, 1998. In addition, he proposed the genus *Axizicus* for *Axizicus sergeji* Gorochov, 1998 and the genus *Neoxizicus*. Liu and Zhang (2000) reviewed the tribe Meconematini, elevated *Eoxizicus* to generic status and synonymized *Axizicus* with it, transferring *Xiphidiopsis cheni* Bey-Bienko, 1955, *Xiphidiopsis magna* Xia & Liu, 1992, *Xiphidiopsis divida* Shi & Zheng, 1995, *Xiphidiopsis arctalamina* Jin, 1999, *Xiphidiopsis concavilamina* Jin, 1999 to *Eoxizicus* along with 8 new species. Later, Gorochov (2002) erected subgenus *Furcixizicus* for *Xizicus* (*Furcixizicus*) *furcicercus* Gorochov, 2002 (type) and *Xizicus* (*Furcixizicus*) *changi* Gorochov, 2002, also *Xiphidiopsis cryptosticta* Hebard, 1922, *X. siamensis* Karny, 1926 and *X. biloba* Bey-Bienko, 1962 were included. Liu (2004) proposed subgenus *Paraxizicus* for *Xizicus* (*Paraxizicus*) *anisocercus* Liu, 2004, included *Xizicus* (*Paraxizicus*) *biprocerus* (Shi & Zheng, 1998), described male of *Xizicus* (?) *ikonnikovi* Gorochov, 1993 and transferred this species to *Xiphidiopsis* (*Dinoxiphidiopsis*). Subsequently, *Xizicus* (*E.*) *orlovi* Gorochov, 2005, *Xizicus* (*E.*) *ryabovi* Gorochov, 2005 and *Xizicus* (*E.*) *hue* Gorochov, 2005 were discussed by Gorochov in 2005. That same year, Gorochov and Kong stressed it was better to keep *Eoxizicus* as a subgenus due to lack of evidence with respect to Liu's (2000) opinion that *Xizicus* consisted of three subgenera excluding *Furcixizicus*: *Xizicus*, *Eoxizicus* and *Axizicus*. They described another 3 species: *X. (E.) hainani* Gorochov & Kang, 2005, *X. (E.) abnormalis* Gorochov & Kang, 2005, *Xizicus* (*A.*) *lineosus* Gorochov & Kang, 2005, and proposed a homonymous genus (with Liu, 2004) *Paraxizicus* Gorochov & Kang, 2005 containing different species. Sanger and Helfert (2006) reported *Xizicus kaltenbachi* Sanger & Helfert, 2006 which was

reported to be parasitized by a Nemestrinid fly (*Atriadops* sp.), this was the first recorded incident of this form of parasitism for the Meconematinae. They provided descriptions of life style strategies, but they refrained from designating their meconematine species to any subgenus due to the taxonomic instability of *Xizicus*. Liu *et al.* (2010) reaffirmed the generic rank of *Eoxizicus* which contained *Axizicus*, reported *Eoxizicus* (*Eoxizicus*) *fengyangshanensis* Liu, Zhou & Bi, 2010, nullified *Paraxizicus* Gorochov & Kang, 2005 and transferred all of the species to *Euxiphidiopsis* including the species Mao and Shi (2007) reported. Gorochov (2011) reported *Xizicus* (*Xizicus*) *daedalus* Gorochov, 2011 and male of *Xizicus* (*Eoxizicus*) *hue* Gorochov, 2005 from Vietnam. Recently, Jiao *et al.* (2013) reported two new species based on single males from Xizang: *Xizicus* (*Axizicus*) *spinocercus* Jiao & Shi, 2013 and *Xizicus* (*Axizicus*) *xizangensis* Jiao & Shi, 2013. According to the photographs they provided, the former is atypical of *Axizicus* because of the absence of paired longitudinal stripes on pronotum. The latter is probably a male of *Xiphidiopsis quadrinotata* Bey-Bienko, 1971, but Burmese specimens are required to determine this for certain, and now we deem *X. quadrinotata* belongs to genus *Meconemopsis* Karny, 1922 because of the black dorsum of rostrum.

The systematics of *Xizicus* are confusing. The Orthoptera Species File (Eades, *et al.*, 2014) website reflects Gorochov's view with a few adjustments. Some of the changes made by Chinese colleagues are not considered in the OSF probably because they were published in Chinese and translations were not provided.

Here a synthesis of various views has been made, we believe the genus *Xizicus* which recognized mainly by four longitudinal line on disc of vertex and a bifid posterior marginal process of 10<sup>th</sup> abdominal tergite of which absent in some case, consists of *Xizicus* s. str., *Paraxizicus* Liu, 2004, *Haploxizicus* subgen. nov. and *Zangoxizicus* subgen. nov., *Eoxizicus* at normal rank of a genus for its paired longitudinal line on disc of pronotum, absence of longitudinal line on disc of vertex, and dual posterior marginal process of male 10<sup>th</sup> abdominal tergite, contains *Eoxizicus* s. str. and *Axizicus* Gorochov, 1998 which is absence of male caudal process. In addition, three new species *Xizicus* (*Paraxizicus*) *fallax* **sp. nov.**, *Xizicus* (*Zangxizicus*) *tibeticus* **sp. nov.** and *Xizicus* (*Zangxizicus*) *quadrifascipes* **sp. nov.** from Guangxi and Xizang are described.

## Material and methods

The type specimens for this research were collected by us and colleagues in field work, studied by using a Leica MZ 125 and an OLYMUPS SZX 16 stereomicroscope, images were taken using a Motic Moticam Pro 252A digital imaging system, drawings were produced by Adobe Photoshop from the digital images or handmade sketches. All specimens of new and examined species are deposited in the SEM (Shanghai Entomological Museum, Chinese Academy of Science).

## Systematics

### *Xizicus* Gorochov, 1993

Body medium sized of this tribe, macropterous, usually variegated brown and black patches. Disc of vertex with 4 dark longitudinal stripes. Wings very long exceeding apex of hind femora, tegmina more or less shorter than hind wings. Each femur armless, tympana of tibia both opened. 10<sup>th</sup> abdominal tergite of male with a bifid process or null on posterior margin, small or medium sized. Cerci relatively simple, incurved generally, apex somewhat lobed and bifurcate. Subgenital plate of male specialized or not. Male genitalia entirely membranous or feebly sclerotized. Female subgenital plate variable in shape, ovipositor relatively long and straight, cerci stout.

**Diagnosis.** We believe the 4 dark longitudinal stripes on the head are the most remarkable feature of this genus and easily distinguishes it from other macropterous genera. In the brachypterous group the 4 dark longitudinal lines are found in *Phlugiolopsis*. The marginal process of male 10<sup>th</sup> abdominal tergite, bifid or bifurcate but base united, and absent in subgenera *Zangxizicus* and *Haploxizicus*.

## Key to subgenera of *Xizicus* Gorochov, 1993

1. Hind femora with three or four dark latitudinal bands ..... 2
- Hind femora without any latitudinal bands ..... 3
2. Male metazona longer than prozona, 10<sup>th</sup> abdominal tergite without any processes ..... *Xizicus (Zangxizicus)* subgen. nov.
- Male metazona no longer than prozona, 10<sup>th</sup> abdominal tergite with a process ..... *Xizicus* s. str.
3. Male cerci processed or lobed, subgenital plate specialized ..... *Xizicus (Paraxizicus)* Liu, 2004
- Male cerci simple in shape, subgenital plate conventional ..... *Xizicus (Haploxizicus)* subgen. nov.

### *Xizicus* s. str.

Type species: *Xiphidiopsis fascipes* Bey-Bienko, 1955

Body color variegated, dorsum of head with 4 dark longitudinal stripes, disc of pronotum usually covered by a wide dark band with black lateral edges, tegmina with a distinct dark spot, hind femora with 3 latitudinal dark bands. Posterior margin of male 10<sup>th</sup> abdominal tergite with a single bifid process of which apex enlarged laterally, subgenital plate of male somehow convex at posterior margin between short styli. Hind margin of female subgenital plate rounded, ovipositor long and relative straight.

**Diagnosis.** We have examined the specimens of type species before they dried, found the posterior marginal process of abdominal tergite 10 cleaving at the end tip, two parts pressing against each other ahead till the oblique site where the process breaks as in fig. 3. We regard it as a single process which bears a deep sulcus.

Species included: *Xizicus (Xizicus) fascipes* (Bey-Bienko, 1955), *Xizicus (Xizicus) proximus* Gorochov, 1998, *Xizicus (Xizicus) kaltenbachi* Sanger & Helfert, 2006, *Xizicus (Xizicus) daedalus* Gorochov, 2011, *Xizicus (Xizicus) spinicauda* (Sanger & Helfert, 1998)

### *Xizicus (Xizicus) fascipes* (Bey-Bienko, 1955)

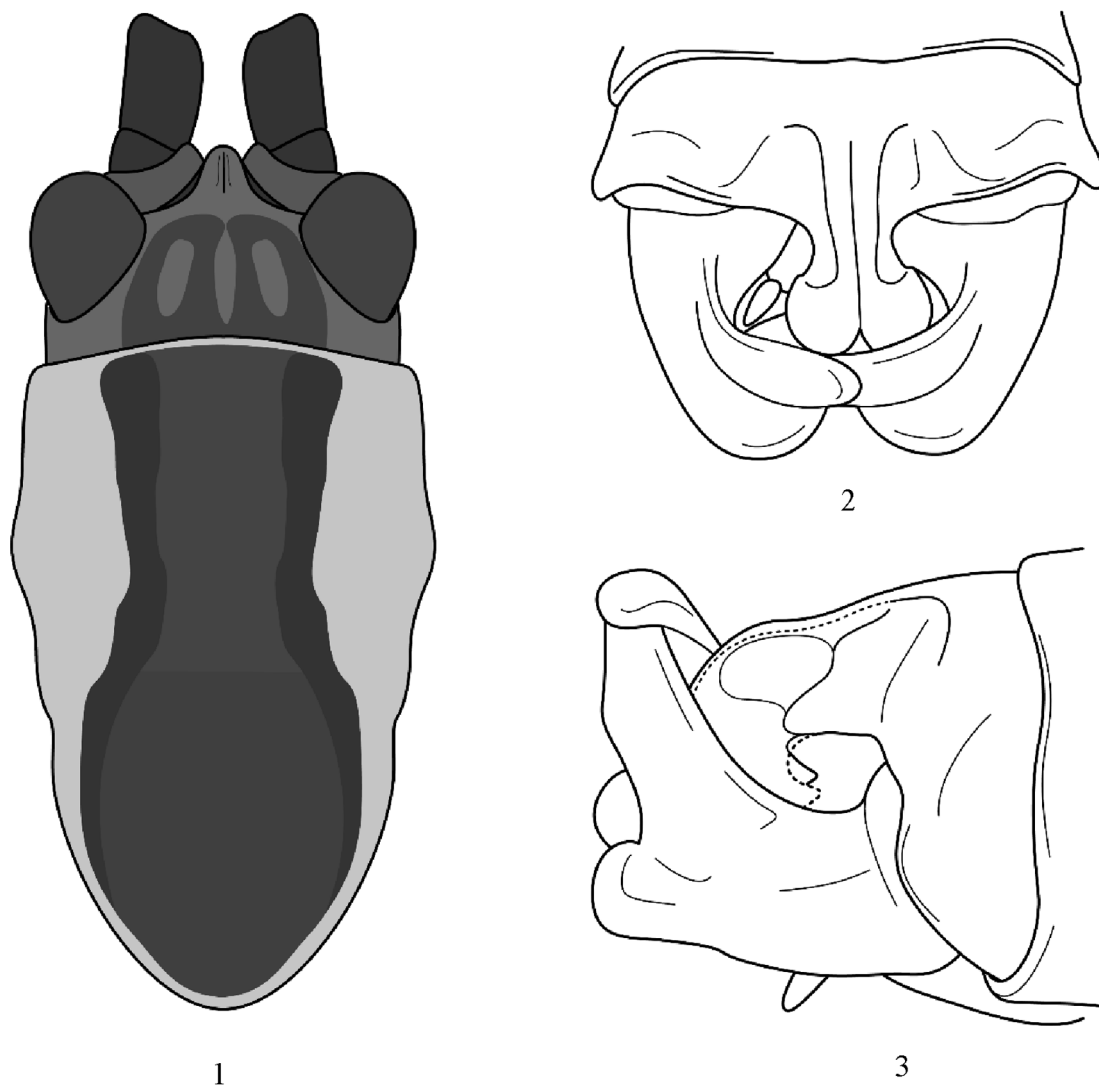
*Xiphidiopsis fascipes* Bey-Bienko, 1955: *Zoologicheskii Zhurnal*, 34, 1260.

*Xizicus (Xizicus) fascipes* Gorochov, 1993: *Zoosystematica Rossica*, 2(1), 74, 76; Gorochov, 1998: *Zoosystematica Rossica*, 7(1), 108; Gorochov *et al.*, 2005: *Oriental Insects*, 39, 73. Shi *et al.*, 2013: *Zootaxa*, 3717(4), 593.

*Xizicus fascipes* Shi & Wang, 2005: *Insects from Dashahe Nature Reserve of Guizhou*, 71; Yang *et al.*, 2012: *Jour. Genet.* 81(2), 141.

**Material examined.** 1♂1♀, Qingchengshan, Sichuan, 1979.IX.12, leg. ZHENG Zhe-Min; 2♂♂1♀, Hongtan, Huaping, Longsheng, Guangxi, 1979.VII.28, anonymous; 1♀, Shuinian, Tianping, Guangxi, 1979.VII.30, anonymous; 3♀♀, Jinxiu, Guangxi, 1981.IX.7–22, leg. LI Tian-Shan; 1♀, Liluo, Longsheng, Guangxi, alt. 1000m, 1984.VIII.5, leg. LI Jun; 2♂♂2♀♀, Longsheng, Guangxi, alt. 960–1020m, 1985.VIII.24–26, anonymous; 2♂♂, Zhangjiajie, Dayong, Hunan, 1986.X.2, leg. LIU Xian-Wei; 6♂♂16♀♀, Suoxiyu, Cili, Hunan, 1988.IX.2–10, leg. LIU Xian-Wei; 4♀♀, Shanmuhe forest farm, Yongshun, Hunan, alt. 600m, 1988.VIII.5–IX.3, leg. YANG Xing-Ke; 1♀, Cili, Hunan, 1988.IX.3, anonymous; 1♀, Qingchengshan, Sichuan, 1992.VII.27, leg. WANG Tian-Qi; 1♂1♀, Maoershan, Xing'an, Guangxi, 1992.VIII.24, leg. LIU Xian-Wei & YIN Hai-Sheng; 1♂3♀♀, Chuanshan, Huanjiang, Guangxi, 1993.VIII.24–25, leg. JIANG Guo-Fang; 1♀, Mulun, Huanjiang, Guangxi, 1993.VIII.28, leg. JIANG Guo-Fang; 1♂1♀, Zhonglun, Huanjiang, Guangxi, alt. 600–700m, 1994.VIII.9, leg. JIANG Guo-Fang & JIANG Zong-Yu; 1♀, Guilin, Guangxi, Undate, anonymous; 2♂♂1♀, Qingyin Pavilion, Emeishan, Sichuan, alt. 850m, 2006.VIII.10, leg. ZHOU Shun; 1♀, Wuxiangang, Emeishan, Sichuan, alt. 700m, 2007.VIII.2–4, leg. LIU Xian-Wei *et al.*

**Distribution.** China (Hunan, Sichuan, Guizhou, Guangxi).



**FIGURES 1–3.** *Xizicus (Xizicus) fascipes* (Bey-Bienko, 1955). 1. Male pronotum and head, dorsal view; 2. Tip of male abdomen, dorsal view; 3. Tip of male abdomen, lateral view (half of the single process shown, circular region is the area where two parts pressing against each other).

***Xizicus (Xizicus) proximus* Gorochov, 1998**

*Xizicus (Xizicus) proximus* Gorochov, 1998: *Zoosystematica Rossica*, 7(1), 109.

No material examined.

**Distribution.** Vietnam.

***Xizicus (Xizicus) daedalus* Gorochov, 2011**

*Xizicus (Xizicus) daedalus* Gorochov, 1998: *Far Eastern Entomologist*, 236, 9.

No material examined.

**Distribution.** Vietnam.

### *Xizicus (Xizicus) spinicaudus* (Sänger & Helfert, 1998)

*Xiphidiopsis spinicauda* Sänger & Helfert, 1998: *Senckenbergiana Biologica*, 77(2), 212.

No material examined.

**Discussion.** We unable to examine any specimens of this species, but the illustrations from Sänger and Helfert and photographs from OSF clearly demonstrate the key feature about this species, upon that we made the transfer.

**Distribution.** Thailand.

### *Xizicus kaltenbachi* Sänger & Helfert, 2006

*Xizicus kaltenbachi* Sänger & Helfert, 2006: *Z. Arbeitsgem. Österr. Entomol.*, 58(3–4), 56.

No material examined.

**Discussion.** Sänger and Helfert considered this taxon resembles species of subgenus *Furxizicus*, but different in caudal tergite process and cerci; based on picture of their article, green body color is very different from members of *Xizicus* s. str. and stripes or spots are unable to identify, so we leave its status intact.

**Distribution.** Thailand.

### *Xizicus (Paraxizicus) Liu, 2004*

*Xizicus (Paraxizicus)* Liu & Yin, 2004: *Insects from Mt. Shiwandashan Area of Guangxi*, 100.

Type species: *Xizicus (Paraxizicus) anisocercus* Liu, 2004

Body brown with blackish stripe, disc of vertex with 4 dark longitudinal bands, tegmina accompanied distinct dark spot, hind femora without dark latitudinal bands. Metazona no longer than prozona; wings fully developed; a forked process present on posterior margin of 10<sup>th</sup> abdominal tergite, male cerci lobed or processed, a lump of membrane appears under lateral margin of 10<sup>th</sup> abdominal tergite, subgenital plate specialized, apex spinous. Hind margin of female subgenital plate concave in middle.

**Diagnosis.** *Paraxizicus* differs from the nominate subgenus in absence of hind femora stripes, membranous protrusions under male 10<sup>th</sup> abdominal tergite and very specialized male subgenital plate.

**Discussion.** The generic name *Paraxizicus* first mentioned by Liu in 2004 for the erection of a subgenus which subdivided from *Xizicus*, while Gorochov used the same in 2005 for the erection of a genus about a group of very different species, apparently *Paraxizicus* Gorochov, 2005 is a homonym of *Xizicus (Paraxizicus)* Liu, 2004. In fact Liu have already dealt with it in 2010.

### Key to known species of subgenus *Paraxizicus*

1. Middle process of male 10<sup>th</sup> abdominal tergite short, forked apically; apical lobes of female subgenital plate rounded. . . . . 2
- Middle process of male 10<sup>th</sup> abdominal tergite long, not forked; apical lobes of female subgenital plate sharp . . . . .  
. . . . . *Xizicus (Paraxizicus) tonicosus* (Shi & Chen, 2002)
2. Middle process of male 10<sup>th</sup> abdominal tergite with ventral lobe; concave of female subgenital plate narrowed . . . . .  
. . . . . *Xizicus (Paraxizicus) anisocercus* Liu, 2004
- Middle process of male 10<sup>th</sup> abdominal tergite without lobe ventrally; concave of female subgenital plate widen. . . . . 3
3. Middle process of male 10<sup>th</sup> abdominal tergite rather small; base of male cerci without ventral lobe; male subgenital plate without lateral spines . . . . . *Xizicus (Paraxizicus) fallax* sp. nov.
- Middle process of male 10<sup>th</sup> abdominal tergite medium sized, fork shaped; base of male cerci with ventral lobe; male subgenital plate with a pair of lateral spines . . . . . *Xizicus (Paraxizicus) biprocerus* (Shi & Zheng, 1996)

***Xizicus (Paraxizicus) tonicosus* (Shi & Chen, 2002) Wang, Jing, Liu, Li, comb. nov.**

*Xiphidiopsis tonicosus* Shi & Chen, 2002: *Entomologia sinica*, 9(3), 69.

No material examined.

**Discussion.** This species was originally described as a *Xiphidiopsis*. The original description did not mention any membranous protrusions under male 10<sup>th</sup> abdominal tergite but portrayed in the illustrations, 4 longitudinal stripes of dorsal surface of the head and specialized male subgenital plate meet the subgeneric characteristics of *Xizicus (paraxizicus)*. However the process of male 10<sup>th</sup> abdominal was not bifurcate disagreed with other species of subgenus *Paraxizicus*. In light of the above characteristics, and the comparison with *Xiphidiopsis* it is more appropriate to be included in *Xizicus*.

**Distribution.** China (Guizhou).

***Xizicus (Paraxizicus) anisocercus* Liu, 2004**

*Xizicus (Paraxizicus) anisocercus* Liu, 2004: *Insects from Mt. Shiwandashan Area of Guangxi*, 100.

No material examined.

**Distribution.** China (Guangxi).

***Xizicus (Paraxizicus) biprocerus* (Shi & Zheng, 1996)**

*Xiphidiopsis biprocera* Shi & Zheng, 1996: *Acta Zootaxonomica Sinica*, 32 (3), 332; Liu & Jin, 1999: *Fauna of Insects Fujian Province of China Vol.1*, 155.

*Xizicus (Paraxizicus) biprocerus* Liu, 2004: *Insects from Mt. Shiwandashan Area of Guangxi*, 100; Liu *et al.*, 2010: *Insects of Fengyangshan National Nature Reserve*, 82.

**Material examined.** 1♀, Jiulongshan, Suichang, Zhejiang, 1991.VIII.1, anonymous. 2♂♂1♀, Sangang, Wuyishan, Fujian, 1994.VIII.27–IX.3, leg. JIN Xing-Bao, YIN Hai-Sheng; 1♂, Ludai, Fengyangshan, Longquan, Zhejiang, alt. 1100m, 2008.VII.31–VIII.4, leg. LIU Xian-Wei, BI Wen-Xuan.

**Distribution.** China (Zhejiang, Fujian).

***Xizicus (Paraxizicus) fallax* Wang, Jing, Liu, Li sp. nov.**

(Figs. 4–14)

**Material examined.** Holotype ♂, Maoershan, Xing'an, Guangxi, alt. 450–600m, 1992.VIII.25, leg. LIU Xian-Wei, YIN Hai-Sheng; Paratype 1♂, Lannijing, Dayu, Jiangxi, alt. 400m, 1985.VIII.14, leg. LIAO Su-Bo, 1♀, Maoershan, Xing'an, Guangxi, alt. 800m, 2013.VIII.1–2, leg. LIU Xian-Wei, ZHU Wei-Bin, WANG Han-Qiang, ZHANG Hai-Guang.

**Description.** Male. Fastigium of vertex conical, apex blunt, furrowed on middle of disc. Subapical segment of maxillary palpi about equal to apical segment. Metazona of pronotum no longer than prozona (Fig. 7), hind margin of lateral lobe oblique, humeral sinus inconspicuous. Tegmental end far exceeded apex of hind femora, and shorter than wings by 2.0 mm. All femora armless, fore coxa bear a spine, fore tibia with ventral spines armed of type 4,5 (1,1), tibial tympana ovoid, hind tibiae with 29–31 dorsal teeth each margin above and 3 pairs of apical spurs. Hind margin of 10<sup>th</sup> abdominal tergite with a small process which branches at base, and concave on area where this process attaches (Figs. 8, 11–12). Cerci moderately incurved, apex branched, base with a quadrate ventral lobe (Figs. 11–12). Subgenital plate extremely upcurved, apex sulcus into two spines, and middle of lateral margin where near the base with a small finger-shaped process, which may be the vestiges of styli (Figs. 12–13).

Female. Body form similar to that of male. Fastigium of vertex little shorter and base wider than that of male, a shallow furrow on the dorsum, last segment of maxillary palpi equal to preceding. Hind margin of lateral lobe



4



5



6



7



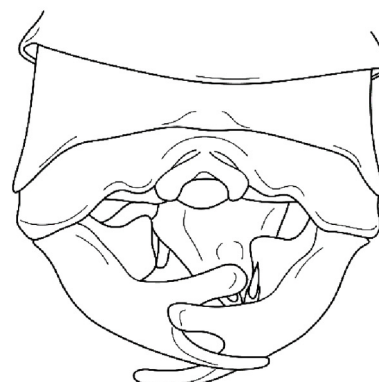
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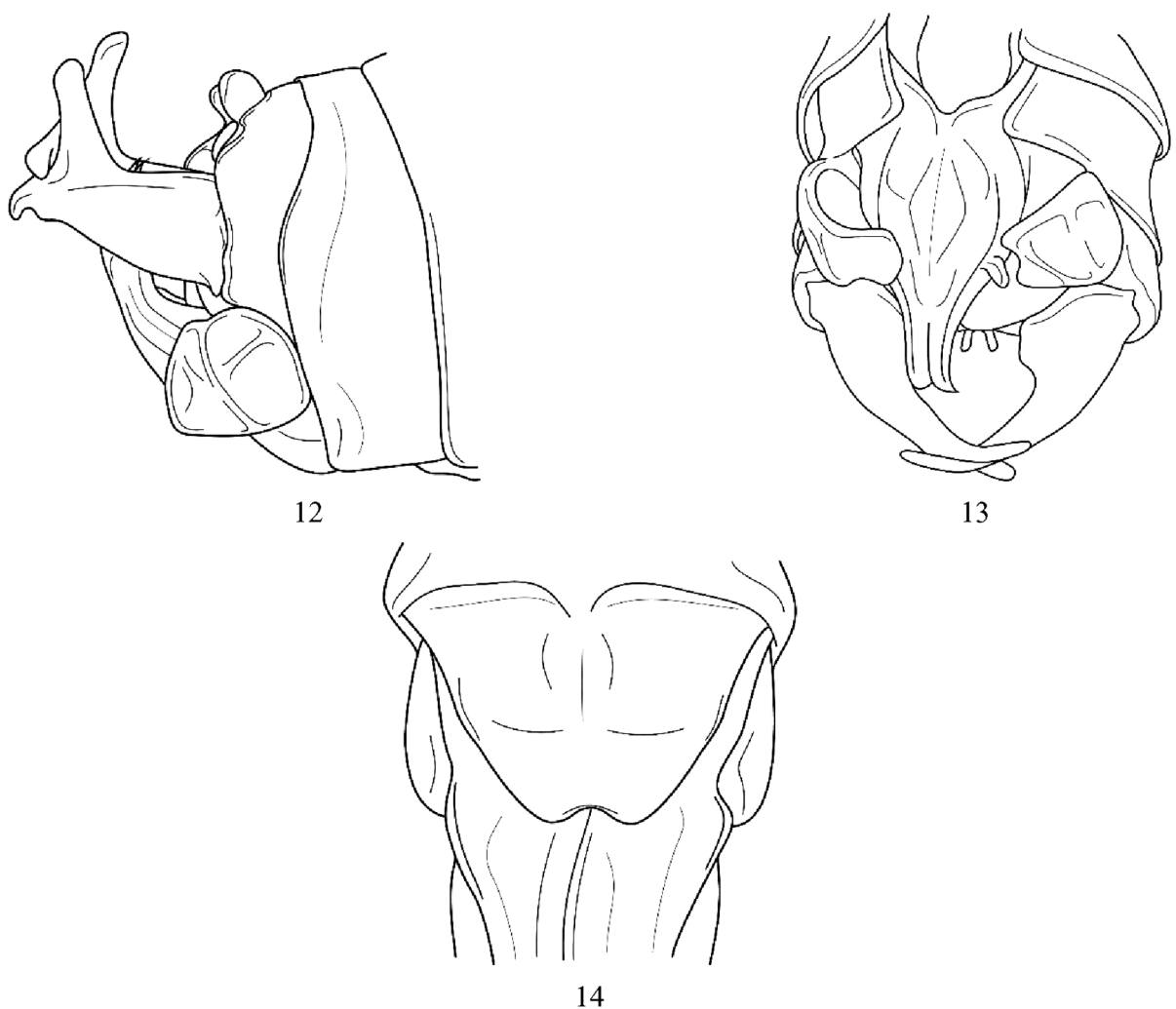


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11

**FIGURES 4–14.** *Xizicus (Paraxizicus) fallax* sp. nov. 4, 5. Male body, lateral view; 6. Female body, lateral view; 7. Head and pronotum, dorsal view; 8, 11. Tip of male abdomen, dorsal view; 9, 13. Tip of male abdomen, ventral view; 10, 14. Female subgenital plate, ventral view; 12. Tip of male abdomen, lateral view.



**FIGURES 4–14.** *Xizicus (Paraxizicus) fallax* sp. nov. **4, 5.** Male body, lateral view; **6.** Female body, lateral view; **7.** Head and pronotum, dorsal view; **8, 11.** Tip of male abdomen, dorsal view; **9, 13.** Tip of male abdomen, ventral view; **10, 14.** Female subgenital plate, ventral view; **12.** Tip of male abdomen, lateral view.

oblique, humeral sinus absent, metazona shorter. Cerci short, apex thin and acute; subgenital plate nearly triangular, hind margin sunk at midst (Fig. 14). Ovipositor long and straight, upcurved and gently raised in height apically, ventral valve with an apical hook (Fig. 6).

**Coloration.** Body yellowish brown. Disc of vertex compact 4 dark longitudinal lines, converge at fastigium, upper edge of scrobe and three basal segments of antenna darkish brown, antenna darkish annulated. Disc of pronotum brownish, fringed with dark discontinuous purples either margin aside. Tegmina with conspicuous dark spots, female wings dark. 3<sup>rd</sup> thoracic segment of female dark laterally, dorsum of female abdomen tergite blackish. Tibial spines of ambulatorial leg darkish, geniculation of hind femora darkish. Ovipositor with a dark transverse band in basal one-third.

**Measurement.** (in mm) Body ♂10.0–10.5, ♀11.2; pronotum ♂4.1–4.5, ♀4.1; tegmina ♂19.1–19.5, ♀17.5; hind femora ♂12.0–12.1, ♀12.0; ovipositor ♀11.2.

**Etymology.** The specific epithet from Latin ‘fallō’, means very similar to *Xizicus (Paraxizicus) biprocerus*.

**Diagnosis.** The general appearance of this species very similar to *Xizicus (Paraxizicus) biprocerus*, the differences are the small and, short process at hind margin of male 10<sup>th</sup> abdominal tergite, ventral lobe of cerci and absence of lateral spines at subgenital plate.

**Distribution.** China (Guangxi, Jiangxi).



***Xizicus (Zangxizicus) Wang, Jing, Liu, Li, subgen. nov.***

Type species: *Xizicus (Zangxizicus) quadrifascipes* Wang, Jing, Liu, Li, **sp. nov.**, here designated.

Body dark brown with blackish stripe, disc of vertex with 4 dark longitudinal bands, tegmina variegated conspicuous dark spots, hind femora with four dark latitudinal bands. Male metazona longer than prozona, no process at hind margin of 10<sup>th</sup> abdominal tergite, styli degenerated to small tubercles or disappeared.

**Etymology.** The subgeneric name is derived from the district name of distribution ‘Xizang’ and generic name ‘Xizicus’.

**Diagnosis.** Unlike nominate subgenus, species of this new subgenus without process at hind margin of male 10<sup>th</sup> abdominal tergite.

***Xizicus (Zangxizicus) quadrifascipes* Wang, Jing, Liu, Li sp. nov.**

(Figs. 15–22)

**Materials.** Holotype ♂, Motuo, Xizang, China, alt. 1060m, 2011.VIII.6–8, leg. BI Wen-Xuan.

**Description.** Male. Fastigium of vertex conical, apex blunt, disc with a longitudinal sulcus (Fig. 17). Subapical segment of maxillary palpi approximately equal to apical one. Metazona of pronotum longer than prozona, hind margin of lateral lobe oblique, humeral sinus inconspicuous. Tegminal tip far exceeding apex of hind femora, and shorter than wings by 1.0 mm (Fig. 15). All femora unarmed, fore coxa bears a spine, fore tibia with spines armed ventrally of type 4,5 (1,1), tibial tympana oval, each dorsal margin of hind femora with 26–30 teeth, 3 pairs of apical spurs armed on terminal. Middle of 10<sup>th</sup> abdominal tergite slightly protruded, without processes (Figs. 18, 20). Cerci tapering caudally, inner surface of base with a wider dorsal lobe and a sharper ventral lobe (Figs. 18, 20). Subgenital plate long and narrow, apex rounded, subapex with a pair of small tubercle which may be the vestiges of styli (Figs. 19, 22).

Female unknown.

**Coloration.** Body yellowish brown and darkish brown. Disc of vertex compact 4 dark longitudinal lines, converge at fastigium; middle of face, inner margin of scrobe and three basal segments of antenna darkish brown, antenna darkish annulated. Dorsum of pronotum brownish, pair of dark discontinuous stripes laterally. Tegmina darkish brown, vein pale yellow. Fore and mid leg with darkish rings, hind femora with 4 darkish latitudinal bands on outer surface, tibial spines and dorsal abdomen darkish brown. Cerci light yellow, apical half dark.

**Measurement.** (in mm) Body ♂8.9; pronotum ♂4.2; tegmina ♂18.2; hind femora ♂11.1.

**Etymology.** The specific epithet from Latin ‘quadri’ + ‘fascipes’, stands for stripes of hind femora.

**Diagnosis.** The general appearance of this species agree with *Xizicus*, but without process at hind margin of male 10<sup>th</sup> abdominal tergite and degenerated styli differentiates it from *Xizicus*.

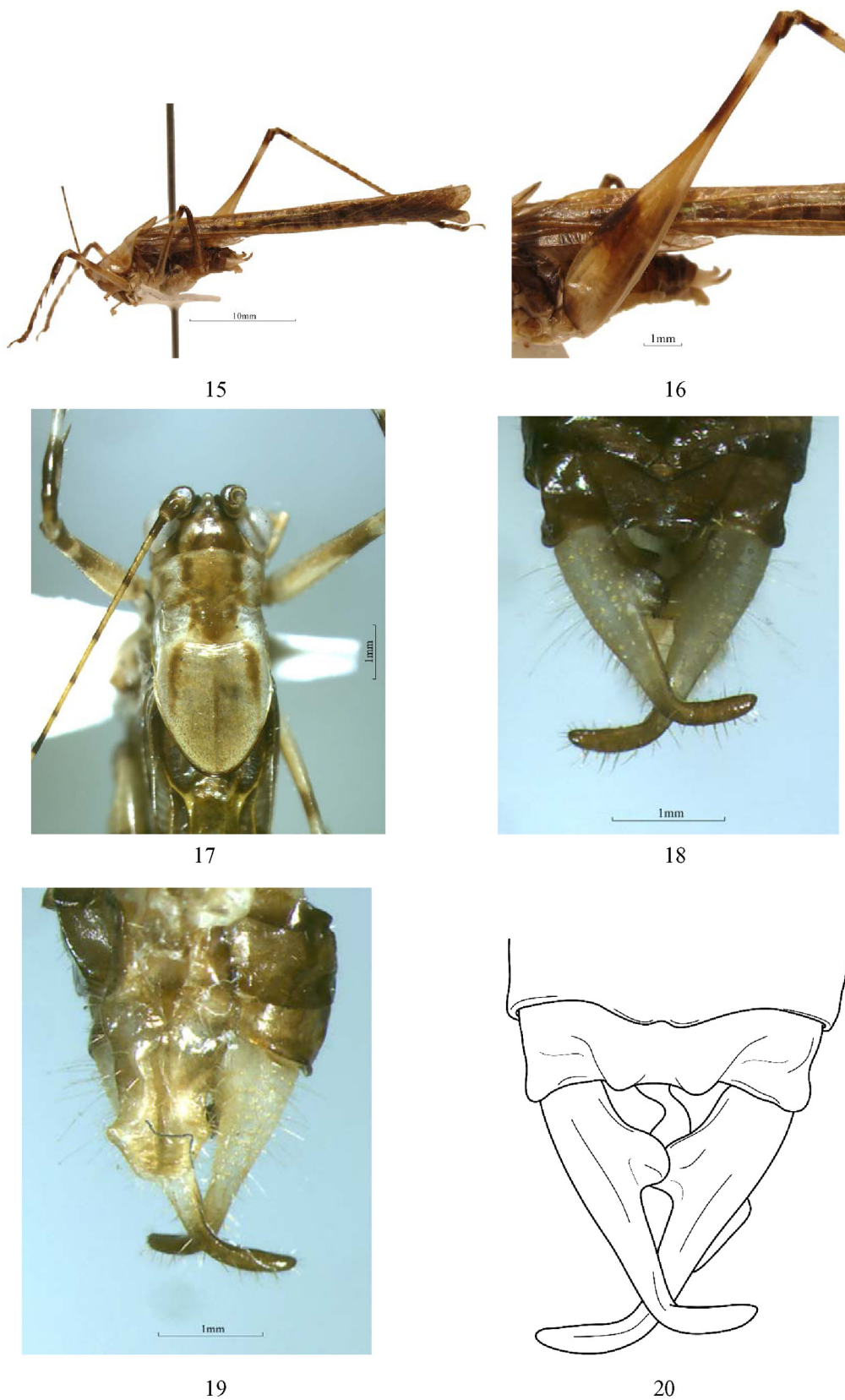
**Distribution.** China (Xizang).

***Xizicus (Zangxizicus) tibeticus* Wang, Jing, Liu, Li, sp. nov.**

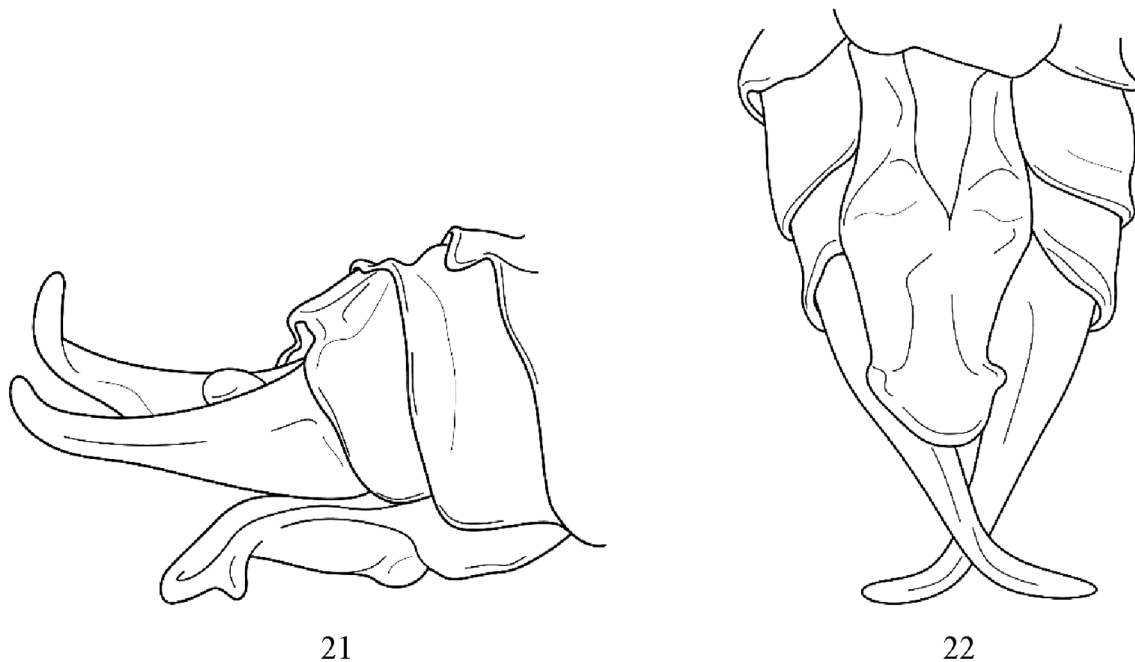
(Figs. 23–32)

**Materials.** Holotype ♂, Chayu, Xizang, alt. 1900m, 2011.VII.7, leg. BI Wen-Xuan; Paratype 1♀, Motuo, Xizang, alt. 1100m, 2011.VII.16, leg. BI Wen-Xuan.

**Description.** Male. Fastigium of vertex conical, apex little acute, furrowed on middle of disc. Metazona of pronotum little longer than prozona (Fig. 25), hind margin of lateral lobe oblique, humeral sinus shallower. Tegminal apex far exceeding apex of hind femora and shorter than wings by 1.5 mm. All femora unarmed, fore coxa bearing a spine, fore tibia with ventral spines of type 4,5 (1,1) armed, tibial tympana oval, hind tibiae with 30–32 dorsal teeth each margin above also 3 pairs of apical spurs. Hind margin of 10<sup>th</sup> abdominal tergite without any processes, slightly concave at middle, with a small lobe at each side (Figs. 26, 29). Cerci robust, internal surface longitudinal concave, lower edge becoming a basal lobe and apical arm, upper edge rounded but pointed at terminal angle, edge between upper apical corner and lower arm sunken (Figs. 26–27, 29–31). Subgenital plate specialized, basal half rounded and swollen, but contracted at middle, with a spine at each lateral angle of apex, largely the vestiges of styli, and a pair of small lobe at hind margin (Figs. 27, 30).



**FIGURES 15–22.** *Xizicus (Zangxizicus) quadrifascipes* sp. nov. **15.** Male body, lateral view; **16.** Male hind femora, lateral view; **17.** Head and pronotum, dorsal view; **18, 20.** Tip of male abdomen, dorsal view; **19, 22.** Tip of male abdomen, ventral view; **21.** Tip of male abdomen, lateral view.



**FIGURES 15–22.** *Xizicus (Zangxizicus) quadrifascipes* sp. nov. **15.** Male body, lateral view; **16.** Male hind femora, lateral view; **17.** Head and pronotum, dorsal view; **18, 20.** Tip of male abdomen, dorsal view; **19, 22.** Tip of male abdomen, ventral view; **21.** Tip of male abdomen, lateral view.

Female. Fastigium of vertex little longer and more slender than that of male, last segment of maxillary palpi little longer than preceding. Lateral lobe of pronotum oblique at posterior margin, metazona shorter than prozona. Veins of tegmina more conspicuous. Cerci conical, base wider, apex acute; subgenital plate nearly trapezoid, a lateral angle on each side of base, midst little concave at posterior margin (Figs. 28, 32). Ovipositor long, gently upcurved, tapering towards end (Fig. 24), ventral valve bear a weak apical hook.

**Coloration.** Body yellowish brown. Disc of vertex with 4 dark longitudinal lines, converge at fastigium, upper margin of scrobe and three basal segments of antenna darkish brown, antenna with darkish rings. Dorsum of pronotum brownish, with dark discontinuous stripes laterally. Tegmina with conspicuous darkish spots, female wings darkish basally. Tibial spines and geniculum of male darkish, female genicular lobes darkish at apex, Four transverse bands of femora light-colored in male, absent in female. Dorsum of abdomen darkish in male, abdomen and ovipositor of female yellowish brown.

**Measurement.** (in mm) Body ♂11, ♀13.5; pronotum ♂4.6, ♀4.7; tegmina ♂19.2, ♀21.8; hind femora ♂12.1, ♀12.4; ovipositor ♀12.1.

**Etymology.** The specific epithet from Latinization of ‘Tibet’, where this species distributed.

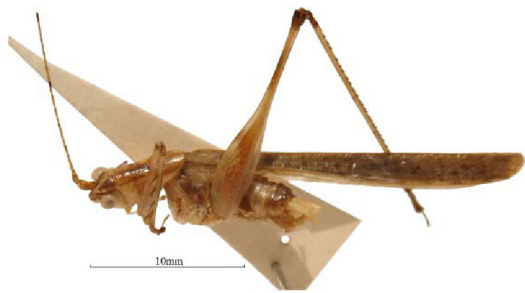
**Diagnosis.** The apical spines of male subgenital plate reminds us of some *Paraxizicus*, but without membranous protrusions and posterior process of male 10<sup>th</sup> abdominal tergite, also with the 4 transverse bands of the male hind femora and morphology of the female subgenital plate, it is more reasonable to regard this species as a *Zangxizicus*.

**Distribution.** China (Xizang).

### *Xizicus (Haploxizicus) Wang, Jing, Liu, Li, subgen. nov.*

Type species: *Xiphidiopsis szechwanensis* Tinkham, 1944, here designated.

Body dark brown with blackish stripe, disc of vertex with 4 dark longitudinal bands, tegmina with conspicuous dark spots, hind femora without any dark latitudinal bands. Male metazona no longer than prozona, no process at hind margin of 10<sup>th</sup> abdominal tergite, cerci very simple without any processes or lobes, apex compressed, subgenital plate as usual, styli not degenerated.



23



24



25



26

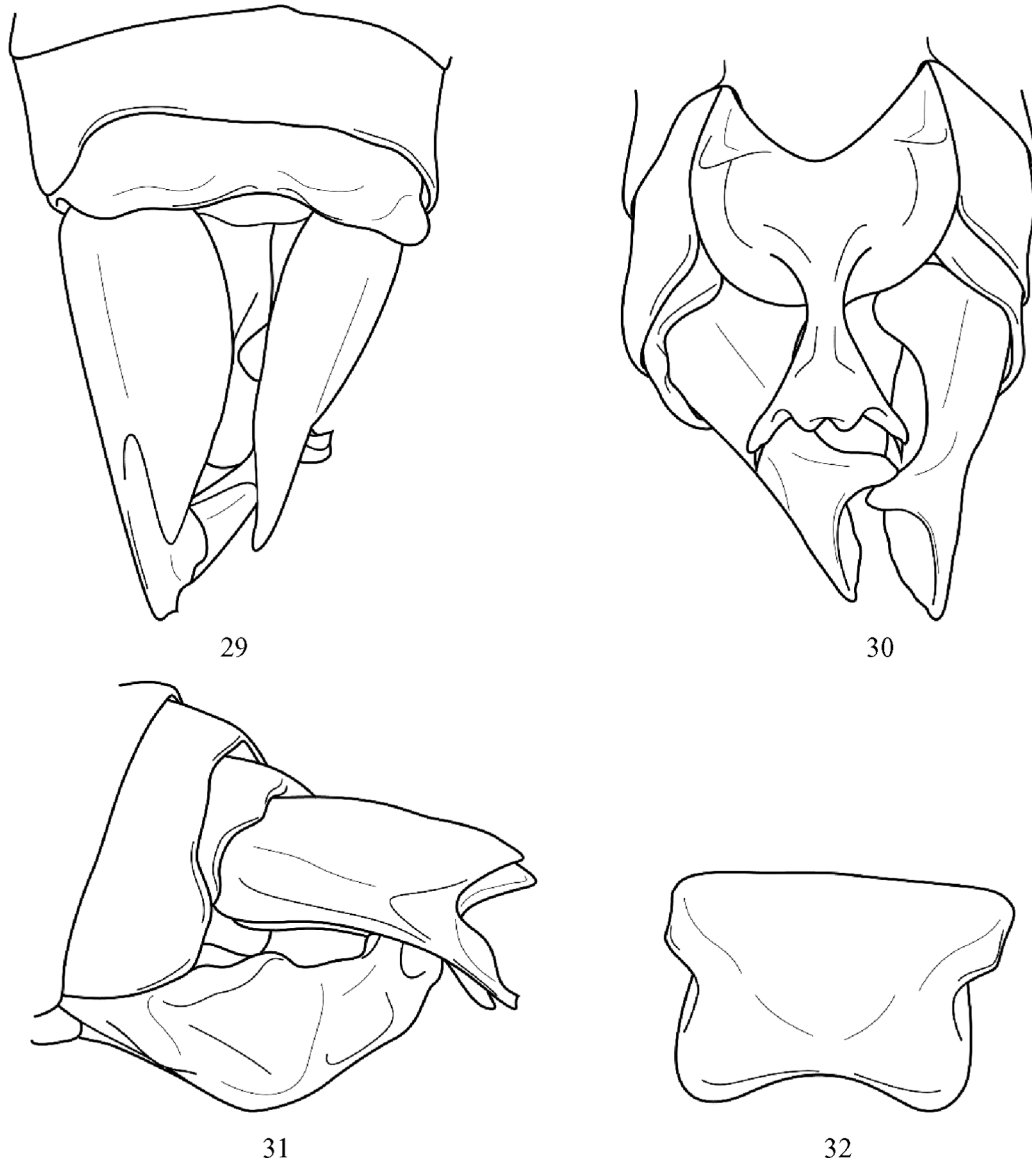


27



28

**FIGURES 23–32.** *Xizicus (Zangxizicus) tibeticus* sp. nov. 23. Male body, lateral view; 24. Female body, lateral view; 25. Head and pronotum, dorsal view; 26, 29. Tip of male abdomen, dorsal view; 27, 30. Tip of male abdomen, ventral view; 31. Tip of male abdomen, lateral view; 28, 32. Female subgenital plate, ventral view.



**FIGURES 23–32.** *Xizicus (Zangxizicus) tibeticus* sp. nov. **23.** Male body, lateral view; **24.** Female body, lateral view; **25.** Head and pronotum, dorsal view; **26, 29.** Tip of male abdomen, dorsal view; **27, 30.** Tip of male abdomen, ventral view; **31.** Tip of male abdomen, lateral view; **28, 32.** Female subgenital plate, ventral view.

**Etymology.** The subgeneric name is formed from a combinations of prefix ‘haplo’ and ‘Xizicus’ which refers to features of male cerci.

**Diagnosis.** This subgenus is a combination of the known five species which had described as *Xiphidiopsis* originally before assigned to *Eoxizicus* and *Axizicus*, all recognized by apically compressed male cerci, processless hind margin of male 10<sup>th</sup> abdominal tergite and normal male subgenital plate.

*Xizicus (Haploxizicus) szechwanensis* (Tinkham, 1944) Wang, Jing, Liu, Li comb. nov.

*Xiphidiopsis szechwanensis* Tinkham, 1944: 518; Xia & Liu, 1992: 96; Liu & Jin, 1994: 111; Jin & Xia, 1994: 27.

*Euxiphidiopsis szechwanensis* Liu & Zhang, 2001: 95; Shi & Wang, 2005: 70.

*Xizicus (Axizicus?) szechwanensis* Gorochov et. al., 2005: 77.

**Material examined.** 1♀, alt. 800–1000m, 1957.VII.15, leg. HUANG Ke-Ren; 1♂, Baoguosi, Emeishan, Sichuan, alt. 550–750m, 1957.VII.27, leg. ZHU Fu-Xing; 1♀, Hongmaochong, Huaping, Guangxi, 1962.VIII.21, anonymous; 1♀, Jianfengling, Hainan, 1981.VI.30, leg. LIN You-Dong; 1♀, Moganshan, Zhejiang, 1981.VII.21,

leg. YAN Heng-Yuan; 7♀♀, Tianmushan, Zhejiang, 1981.VII.21, YAN Heng-Yuan; 1♂, Yaan, Sichuan, 1985.IX.1, leg. JIN Gen-Tao; 1♂2♀♀, Jiulianshan, Jiangxi, alt. 450m, 1986.IX.8, leg. ZHENG Jian-Zhong, GAN Guo-Pei; 1♀, Emeishan, Sichuan, 1987.VIII.6, leg. LIU Xian-Wei; 1♀, Huangshan, 1987.IX.1, leg. BI Dao-Ying, HE Xiu-Song; 2♀♀, Tianpingshan, Sangzhi, Hunan, alt. 1100m, 1988.VIII.18, leg. YANG Xing-Ke; 11♂♂15♀♀, Suoxiyu, Cili, Hunan, 1988.IX.1–4, leg. LIU Xian-Wei; 2♀♀, Tianmushan, Zhejiang, 1989.VIII.29, leg. LIU Xian-Wei; 2♀♀, Mao'er mountain, alt. 700–800m, 1992.VIII.24, leg. JIANG Zheng-Hui; 1♂, Waidong, Huanjiang, Guangxi, alt. 600–960m, 1994.VIII.22, leg. JIANG Zong-Yu; 1♂1♀, Laodian, Tianmushan, Zhejiang, 1999.X.11–13, leg. LIU Xian-Wei, YIN Hai-Sheng; 1♂5♀♀, Mengdingshan, Yaan, Sichuan, alt. 1450m, 2007.VII.31–VIII.1, LIU Xian-Wei *et al.*; 1♂, Wuxiangang, Emeishan, Sichuan, alt. 700m, 2007.VIII.2–4, LIU Xian-Wei *et al.*; 2♀♀, west Tianmushan, Zhejiang, alt. 350m, 2008.VIII.15–19, leg. BI Wen-Xuan; 1♀, Tianmushan, alt. 245–1000m, 2009.VI.23–30, leg. WU Jie.

**Distribution.** China (Anhui, Zhejiang, Jiangxi, Hunan, Sichuan, Guangxi, Hainan).

***Xizicus (Haploxizicus) incisus (Xia & Liu, 1988) Wang, Jing, Liu, Li comb. nov.***

*Xiphidiopsis incisus* Xia & Liu, 1988: 221, figs.1–5; Liu & Jin, 1994: 110; Jin & Xia, 1994: 27; Liu & Jin, 1999: 155.  
*Axizicus incisus* Gorochoy, 1998: 113.

**Material examined.** 1♀, Maoershan, Xing'an, Guangxi, 1979.VI.25, anonymous; 1♂1♀ (Holotype and Allotype), Tiantong, Yinzhou, Zhejiang, 1986.VII.6–29, leg. LIU Zu-Yao; 1♂ (Paratype), Baishanzu, Qingyuan, Zhejiang, 1986.VIII.12–20, leg. JIN Xing-Bao, ZHANG Wei-Nian; 1♀, Baishanzu, Qingyuan, Zhejiang, 1993.VII.20, anonymous; 1♀, Sangang, Wuyishan, Fujian, 1994.VIII.27–IX.3, leg. JIN Xing-Bao, YIN Hai-Sheng; 1♀, Nanling, Shaoguan, Guangdong, 2011.VIII.11–14, leg. HUANG Bao-Ping.

**Distribution.** China (Zhejiang, Fujian, Jiangxi, Guangdong, Guangxi).

***Xizicus (Haploxizicus) hunanensis (Xia & Liu, 1993) Wang, Jing, Liu, Li comb. nov.***

*Xiphidiopsis hunanensis* Xia & Liu, 1993: 96; Liu & Jin, 1994: 110; Jin & Xia, 1994: 27.

**Material examined.** 6♂♂17♀♀ (Holotype and Paratype), Zhangjiajie, Dayong, Hunan, 1988.IX.10–12, leg. LIU Xian-Wei.

**Distribution.** China (Hunan).

***Xizicus (Haploxizicus) spathulatus (Tinkham, 1944) Wang, Jing, Liu, Li comb. nov.***

*Xiphidiopsis spathulata* Tinkham, 1944: 520; Xia & Liu, 1993: 96; Liu & Jin, 1994: 111; Jin & Xia, 1994: 27; Liu & Jin, 1999: 155.

*Axizicus spathulatus* Gorochoy, 1998: 113; Shi & Wang, 2005: 70; Shi & Chang, 2006: 106.

*Xizicus (Axizicus) spathulatus* Gorochoy *et al.*, 2005: 77.

*Eoxizicus spathulatus* Shi & Du, 2006: 125.

**Material examined.** 1♀, Hefeng, Hubei, 1989.VII.28, leg. LIU Zu-Yao; 1♂, Qingyinge, Emeishan, Sichuan, alt. 850m, 2006.VIII.10, ZHOU Shun; 1♂1♀, Chishui Spinulose Tree Fern Reserve of Guizhou, alt. 300m, 2006.X.20, leg. LIU Xian-Wei, ZHOU Shun; 1♂4♀♀, Sanchahe, Xishui, Guizhou, alt. 1100m, 2006.X.21–26, leg. LIU Xian-Wei, ZHOU Shun; 1♂, Wuxiangang, Emeishan, Sichuan, alt. 700m, 2007.VIII.2–4, leg. LIU Xian-Wei; 2♂♂, Mengdingshan, Yaan, Sichuan, alt. 1450m, 2007.VII.31–VIII.1, leg. LIU Xian-Wei *et al.*.

**Distribution.** China (Hubei, Sichuan, Guizhou).

***Xizicus (Haploxizicus) maculatus (Xia & Liu, 1992) Wang, Jing, Liu, Li comb. nov.***

*Xiphidiopsis maculata* Xia & Liu, 1992: 97; Liu & Jin, 1994: 111; Jin & Xia, 1994: 27.

*Axizicus maculatus* Gorochov, 1998: 113.

**Material examined.** 2♂♂14♀♀ (Holotype and Paratype), Suoxiyu, Cili, Hunan, 1988.IX.4–12, leg. LIU Xian-Wei.

**Distribution.** China (Hunan).

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