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The *Stenopsyche simplex* Species Group from China with descriptions of three new species (Trichoptera: Stenopsychidae)

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Abstract

The Chinese *Stenopsyche simplex* Group is revised for the first time since Weaver's (1987) revision. The group includes 14 described species and 3 new species. Two diagnostic subgroups were recognized by Schmid (1959). The first subgroup of Chinese species includes *S. anaximander* Malicky 2011, *S. brevata* Tian & Zheng 1989, *S. chinensis* Hwang 1957, *S. dentata* Navás 1930, *S. splendida* Martynov 1935, *S. dubia* Schmid 1965, *S. rotundata* Schmid 1965, *S. simplex* Schmid 1959, and *S. tienmushanensis* Hwang 1957; of these, *S. dentata* is assigned to this first subgroup for the first time. The second diagnostic subgroup includes *S. denticulata* Ulmer 1926, *S. longispina* Ulmer 1926, *S. stoetzneri* Döhler 1929, *S. uniformis* Schmid 1965 and *S. formosana* Kobayashi, 1987. The species newly described here include *Stenopsyche ningshanensis* **sp. nov.**, from Shaan-xi Province, belonging to the first subgroup, and *Stenopsyche acanthoclada* **sp. nov.** and *Stenopsyche jinxiuensis* **sp. nov.**, both from Guang-xi Province and belonging to the second subgroup. Distribution maps of the two diagnostic subgroups of Chinese species and illustrations of male genitalia of the three new species are provided along with collection data for additional specimens for the previously described species.

Key words: diagnostic subgroup, Shaan-xi Province, Guang-xi Province, male genitalia, Oriental Region, East Palearctic Region

Introduction

Stenopsychidae is a family composed of relatively few species (98 species, Morse personal communication) but with the largest body sizes of the suborder Annulipalpia (Holzenthal *et al.* 2007). It is composed of 3 genera (Morse 1997, 2013; Holzenthal *et al.* 2007): *Stenopsyche* McLachlan 1866 (type species *Stenopsyche griseipennis* McLachlan 1866), *Pseudostenopsyche* Döhler 1915 (type species *Pseudostenopsyche sugens* Döhler 1915), and *Stenopsychodes* Ulmer 1916 (type species *Stenopsychodes mjoebergi* Ulmer 1916). *Stenopsyche* is the largest genus, including 91 species, distributed mainly in the Oriental (65 species) and East Palearctic (12 species) Biogeographic Regions (with 12 of these occurring in both regions), but with 1 Afrotropical species and 1 fossil species, and it is the only genus of Stenopsychidae occurring in China (Tian *et al*. 1996; Yang *et al*. 2005; Morse personal communication).

Based on the structure of male genitalia, Schmid (1969) revised the genus *Stenopsyche* and distributed 50 of the then-known species into 6 species groups, not including 1 fossil species and 11 species *incertae sedis*. Weaver (1987) re-described diagnostic characters for each of Schmid's groups and added *S. appendiculata* Hwang 1963 to the *S. apiguna* Group; *S. yunnanensis* Hwang 1963, *S. lanceolata* Hwang 1963 to the *S. marmorata* Group; *S. kodaikanalensis* Swegman & Coffman 1980 to the *S. simplex* group; and *S. paranavasi* Hwang & Tian 1982 to the *S. pubescens* Group. Since then 23 species of the genus were added from China (Kobayashi 1987; Tian & Li 1991; Malicky 2008, 2011, 2012; Xu *et al*. 2013), Laos (Malicky 2008, 2009), Vietnam (Hoang & Bae 2007; Oláh & Malicky, 2010), Korea (Kumanski 1992), and Russia (Nozaki *et al*. 2008). *Stenopsyche yunnanensis* and *S. paranavasi* were synonymized with *S. lanceolata* and *S. ghaikamaidanwalla*, respectively (Tian *et al*. 1996). Thus, the present number of extant *Stenopsyche* species is 90.

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Currently, 58 stenopsychid species have been reported from China (Hua 2002; Yang, *et al.* 2005; Malicky 2008, 2011, 2012; Morse 2013; Xu *et al*. 2013). *Stenopsyche vicina* Navás 1932 was reported from Vietnam based on a female specimen, but Hua (2002) misrecorded this species from China and Japan. Also, because Navás's original description was very simple, Hoang & Bae (2007) treated the name of this species as a *nomen dubium*. Therefore we do not consider it a Chinese species. Of all Chinese species, 39 are distributed in the Oriental Region; 7 in the Palearctic Region; and 12 are eurytopic, occurring in both Oriental and Palearctic Regions.

This paper describes 3 new species of the *S. simplex* Group: *S. ningshanensis* **sp. nov.** belongs to the first subgroup, *S. acanthoclada* **sp. nov.** and *S. jinxiuensis* **sp. nov.** belong to the second one. As a result, the number of world *S. simplex* Group species is brought to 18, and the Chinese number to 16.

Material and methods

This study is mainly based on examination of dry pinned specimens, but some materials is preserved in 80% ethanol. The dry specimens were collected using mercury vapor lights hung in front of white bed sheets set close to streams. Adults landing on a sheet were killed in ethyl-acetate or cyanide vapour jars and then pinned. Alternatively, adult *Stenopsyche* were collected into 80% ethanol by using pan traps with 15-w ultraviolet light bulbs and are now preserved in 80% ethanol.

Wings of each new species were cut from the body, and mounted with 80% glycerin on a slide, covered with another slide to ensure that the wings are fully flattened. For each genitalia preparation, the male abdomen was cut from the body, as close as possible to the basal region of the abdomen. The separated abdomen with the terminal genitalia was cleared using a 10% sodium hydroxide (NaOH) solution at 80°C temperature for about 20 minutes and transferred into distilled water to flush the NaOH from the preparation. Then the abdomen was mounted on a depression slide with 85% ethanol for examination.

Wings and genitalia structures were traced in pencil using a Nikon SMZ800 stereomicroscope equipped with a camera lucida. Original pencil drawings were scanned in Photoshop then placed as a template in Inkscape (Version 0.48) and inked digitally to produce illustrations. Finally, for permanent storage of each specimen, wings and male abdomen were transferred to microvials with 80% ethanol and attached to the pin with the remainder of the pinned specimen; or wings, male abdomen and the remainder of specimen were transferred to a small vial with 80% ethanol and put into a larger jar with similar vials of specimens.

For the distribution maps, the concept of Geographic regionalization of China by Zhang (1999) was adopted, in which the Palearctic realm consists of four regions (Northeast China Region, Inner Mongolia and Xinjiang Region, North China Region, Qinghai and Tibet Region) and the Oriental realm is in 3 regions (Southwest China Region, Central China Region, South China Region) (Fig. 1). Locality coordinates for each species were obtained from locality records of various authors, or were obtained by searching the locality using Google Earth®. Distribution maps were made by GRASS GIS® free version 6 for Windows®.

Terminology of wing venation follows that of Schmid (1969), terminology for male genitalia follows that of Weaver (1987). For simplicity, paired structures are discussed in the singular. Type specimens have been deposited in the Insect Collection, Nanjing Agricultural University.

Systematics

Based mainly on structures of the male genitalia and the diagnoses of various authors, the recently described species, *S. bilobata* Tian & Li 1991, *S. complanata* Tian & Li 1991, *S. trilobata* Tian & Weaver 1988, *S. conthienga* Oláh & Malicky 2010, *S. midian* Malicky 2009 *S. muppin* Malicky 2012 and *S. iahhel* Malicky 2012 are assigned to the *S. martynovi* Group; *S. brevata* Tian & Zheng 1989 and *S. anaximander* Malicky 2011 to the *S. simplex* Group; *S. dakpri* Hoang & Bae 2007, and *S. arodi* Malicky 2008 to the *S. pubescens* Group; *S. lanceolata* Hwang 1963, *S. lotus* Weaver 1987, *S. schmidi* Weaver 1987, *S. taiwanensis* Weaver 1987, *S. pallens* Nozaki, Arefina & Hayashi 2008 and *S. babeana* Oláh & Malicky 2010, *S. jabamiah* Malicky 2012 to the *S. marmorata* Group; *S. kharbinica* Navás 1930 to the *S. sauteri* Group (Navás 1930, 1932; Tian 1985; Tian 1988; Tian & Zheng 1989; Tian & Li 1991; Nozaki et al. 2008; Malicky 2008, 2009, 2011, 2012; Oláh & Malicky 2010).

The coloring of *Stenopsyche formosana* Kobayashi 1987 resembles that of *S. sauteri* Ulmer (Kobayashi 1987), but the male genitalia are similar to those of *S. splendida* Martynov in that segment X in dorsal view is short, reaching to about half of the intermediate appendage, and the intermediate appendage in dorsal view is strong, curved slightly inwards. Thus we assigned it to the second subgroup of the *S. simplex* Species Group.

Stenopsyche dentata Navás 1930 was considered most similar to *S. denticulata* Ulmer, but Schmid (1969) considered it a species *incertae sedis*. Illustrations of *S. dentata* by Navás showed that segment X is large, the intermediate appendage is about half as long as segment X, and the endothecal armature seems to be comprised of many spines. We tentatively assign it to first subgroup of the *S. simplex* Species Group.

Stenopsyche fissa Navás 1932 was originally diagnosed as being similar to *S. griseipennis* McLachlan, but Schmid treated it as "insufficiently known" and, because the type specimen is missing, Hoang & Bae (2007) treated it as a *nomen dubium*. The illustrations of the male genitalia by Navás showed that the dorsum of segment X and intermediate appendage are similar to those of *S. angustata* Martynov 1930, and we therefore assign it to the *S. marmorata* Species Group.

Stenopsyche chagyaba Tian 1985 was originally described based on a female, with its female genitalia similar to those of *S. similis* Ulmer (Tian 1985). Subsequently, the corresponding male was described by Tian (1988). We examined a male from Sichuan, and find that segment X is divided into 2 lobes which are separated from each other widely; therefore we assign it to the *S. martynovi* Species Group.

As a result, the *S. apiguna* Species Group includes 9 species, the *S. marmorata* Species Group 15 species, the *S. sauteri* Species Group 5 species, the *S. martynovi* Species Group 15 species, the *S. simplex* Species Group 15 species, the *S. pubescens* Species Group 16 species, and the remaining 16 are species *incertae sedis*, not assigned to any group in the genus.

The *S. simplex* Group can be diagnosed by the following characters: (1) segment X is large and partially membranous; (2) the intermediate appendage is usually as long as segment X, strong, and spiniform; and (3) the endothecal armature is comprised of many spines. The Group can be divided into two subgroups (Schmid 1969).

First subgroup

This subgroup can be diagnosed by having its intermediate appendage straight and narrow (Weaver 1987). Currently, 9 Chinese species are classified in this subgroup. Among these, *S. anaximander* and *S. simplex* are endemic to the Palearctic realm of China, *S. rotundata* and *S. tienmushanensis* are eurytopic to both Palearctic and Oriental realms, and the remaining 4 species are endemic to the Oriental realm. Of the 4 known Oriental species, *S. brevata* is endemic to the South China region, *S. dentata* is eurytopic to the South China region and the Central China region, and *S. chinensis* and *S. dubia* are endemic to the Central China region. New species *S. ningshanensis* **sp. nov.** belongs to this subgroup and is endemic to the Central China region (Fig. 1).

Stenopsyche anaximander Malicky 2011

Stenopsyche anaximander Malicky 2011: 26, fig. 24; type locality: China (Shaan-xi).

Distribution. China (Shaan-xi).

Stenopsyche brevata Tian & Zheng 1989

Stenopsyche brevata Tian & Zheng 1989: 48, 52, fig. 1; type locality: China (Yun-nan); Malicky 2010: 98.

Distribution. China (Yun-nan), Thailand.

Stenopsyche chinensis Hwang 1957

Stenopsyche chinensis Hwang 1957: 381–382, figs. 39–41; type locality: China (Fu-jian).

Material examined. CHINA: 1 male, Gui-zhou Province, Mt. Fanjingshan, alt. 530 m, 3 June 1995, collected by Wang Bei-xin and Sun Chang-hai; 1 male, Fu-jian province, Miao-wan Village, Jian-xi, alt. 800 m, 30 May 1990, collected by Sun Chang-hai and Pan Quan-min.

Distribution. China (Fu-jian, Gui-zhou).

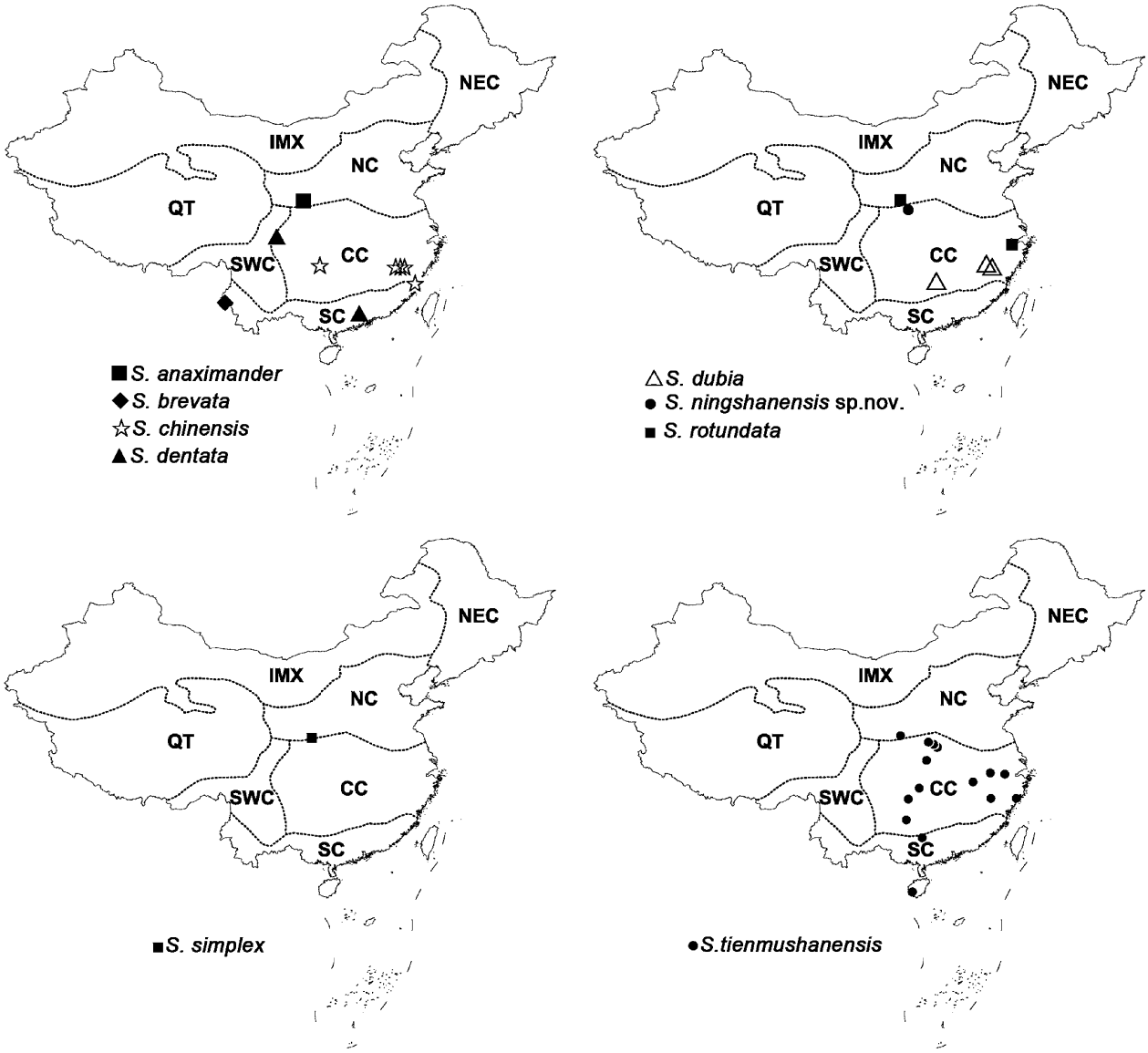

FIGURE 1. Distributions of the first subgroup of the *Stenopsyche simplex* group species in China. NEC = Northeast China Region; IMX = Inner Mongolia and Xin-jiang Region; NC = North China Region; QT = Qing-hai and Tibet Region; SWC = Southwest China Region; CC = Central China Region; SC = South China Region.

Stenopsyche dentata Navás 1930

Stenopsyche dentata Navás 1930: 6–7, figs. 5a–b; type locality: China (Guang-dong).

Distribution. China (Guang-dong, Si-chuan).

Remarks. Schmid (1969) designated this species as *incertae sedis* within the genus. We recognize this species as a member of the first subgroup of the *S. simplex* Group based on the shape of segment X and the straight intermediate appendage illustrated by Navás (1930).

***Stenopsyche dubia* Schmid 1965**

Stenopsyche dubia Schmid 1965: 135, pl. II figs. 5–6; type locality: China (Fu-jian).

Material examined. CHINA: 1 male, Fu-jian Province, Jian-yang County, Ma-sha Town, Wu-fu Stream, 36 km W. of Ma-sha, alt. 620 m, 1 June 1990, collected by John C. Morse and Sun Chang-hai.

Distribution. China (Fu-jian, Hu-nan).

***Stenopsyche ningshanensis* sp. nov.**
(Figs. 2a–f)

Adult (in alcohol). Length of forewing 19.0 mm (n=1). Forewing dark brown, with many irregular light speckles in anterior part, and many large long speckles in posterior part. Hind wing triangular and semi-transparent.

Wing venation (Figs. 2a–b) typical of genus, but in forewing Cu_{1b} curved posterad in middle, crossvein *m-cu* transparent, distance between *m-cu* and *cu* twice as long as length of *cu*.

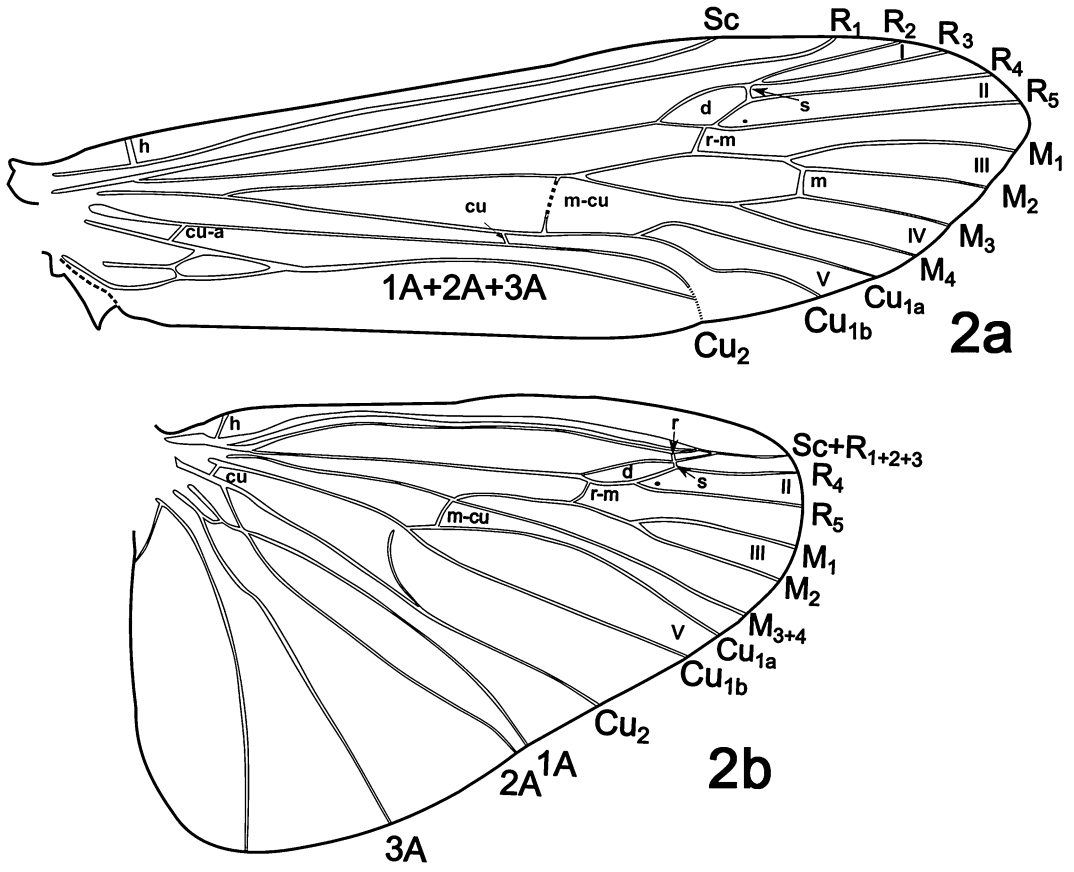

FIGURE 2a–b. *Stenopsyche ningshanensis* **sp. nov**, male. wing venation: **2a**, right forewing, dorsal; **2b**, right hind wing, dorsal.

Male genitalia. Abdominal segment IX annular; in lateral view ventral 1/3rd of pleuron IX strongly produced anterad and posterad with ventral margin about 3.5 times as long as dorsal margin; apicolateral angle acute, about 1/6th as long as preanal appendage; in ventral view anterior margin of sternum IX with broad and shallow excision, posterior margin sinuate with tiny median projection. Preanal appendage long, setose, sinuate slightly in dorsal view. Segment X tongue-like, sclerotized basally and membranous apically, more than half length of preanal appendage; base 4 times as wide as apex in dorsal view. Intermediate appendage sclerotized, broad at base with lanceolate apex nearly reaching middle of preanal appendage in dorsal view. Superior arm long, highly sclerotized,

about half as long as preanal appendage, slightly S-shaped, its distal 1/3rd curled outward and with acute apex. Inferior appendage sub-rectangular, highly depressed in ventral view, about 4 times as long as wide and with apex obliquely truncated in ventral view. Phallus with endothecal armature bearing 4 large spines and many fine spines.

Holotype male: CHINA, Shaan-xi Province, Ning-shan County, Xun-yang Dam, Xiang-tan Ditch, 33.546°N, 108.552°E, alt. 1520 m, 6 June 1998, by black light trap, Ma Yun & Wang Miao.

Diagnosis. The new species belongs to the first subgroup as indicated by having its intermediate appendage straight and narrow. It is very similar to *S. chinensis* Hwang 1957 from Fu-jian, China, but differs from the latter in that (1) the intermediate appendage nearly reaches the distal end of segment X (extending beyond the distal end in *S. chinensis*); (2) the distal end of segment X is rounded in dorsal view (truncate in *S. chinensis*); (3) the lateral margin of the intermediate appendage is sinuate in dorsal view (straight in *S. chinensis*).

Etymology. The specific epithet is from the Chinese name of the type locality, Ning-shan County, Shaan-xi Province.

Distribution. China (Shaan-xi).

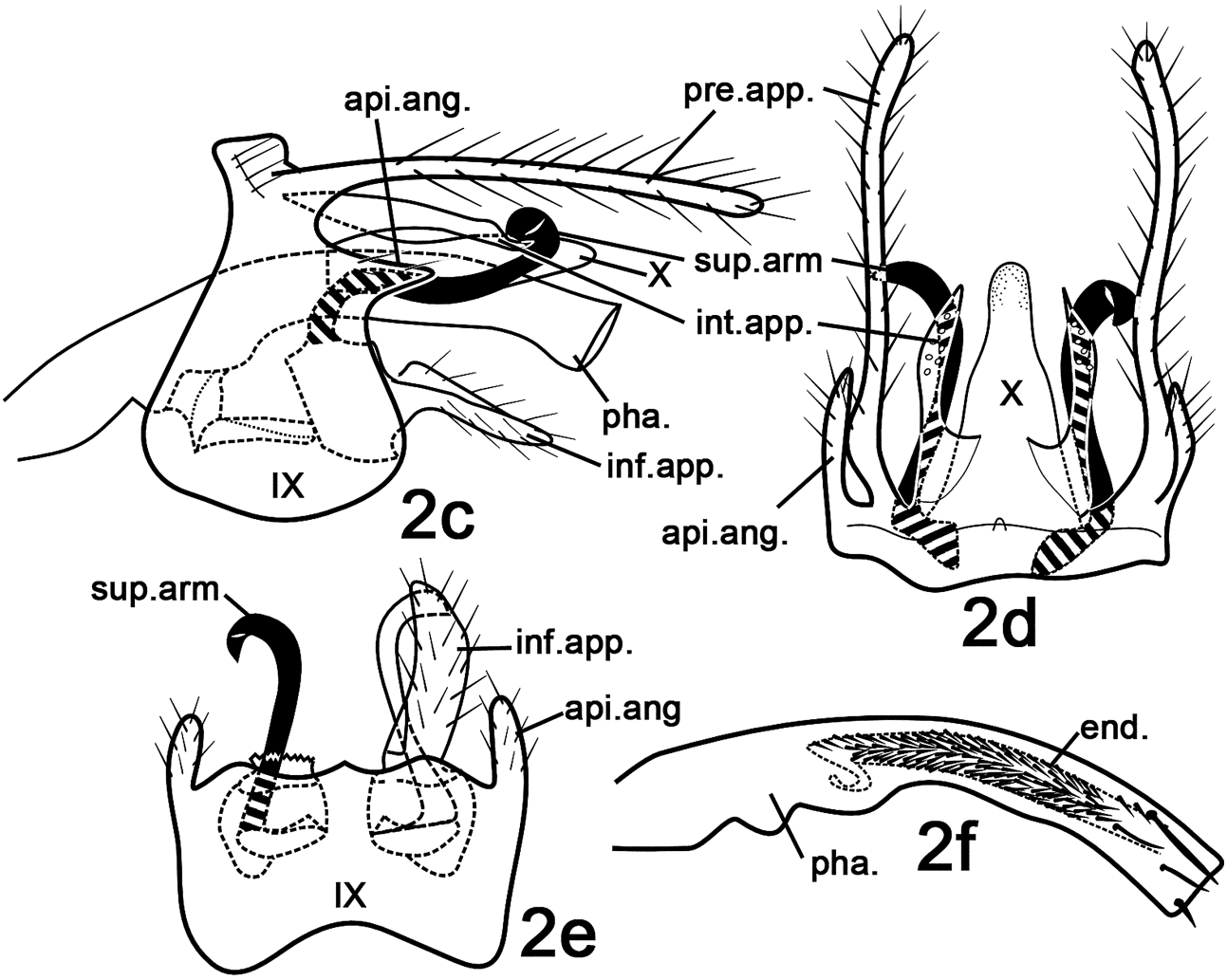

FIGURE 2c–f. *Stenopsyche ningshanensis* **sp. nov**, male. male genitalia: **2c**, left lateral; **2d**, segment IX and X, dorsal; **2e**, inferior appendage, ventral; **2f**, phallus, left lateral. api.ang. = apicolateral angle; end. = endothecal armature; int.app. = intermediate appendage; IX = segment IX; pha. = phallus; pre.app. = preanal appendage; sup.arm = superior arm; X = segment X.

Stenopsyche rotundata Schmid 1965

Stenopsyche rotundata Schmid 1965: 135, pl. II fig. 7, pl. III fig. 1; type locality: China (Shan-dong).

Distribution. China (Shaan-xi, Shan-dong, Zhe-jiang).

Remarks. The type locality of *S. rotundata* Schmid 1969 is "Tsingtau." Now, it is spelled as Qing-dao, in Shan-dong Province (Schmid recorded it as "Chan-tong"). Morse (2013) could not determine whether the place belongs to the Oriental or the Palearctic realm in his Trichoptera World Checklist. We are sure that the type locality of the species is in the Palearctic region, although populations of the species occur in both the Oriental (e.g., Zhe-jiang Province) and the Palearctic (e.g., Shaan-xi Province) realms.

Stenopsyche simplex Schmid 1959

Stenopsyche simplex Schmid 1959: 320–321, pl. II fig. 3; type locality. China (Ta-pai-shan, Shaan-xi).

Distribution. China (Shaan-xi).

Stenopsyche tienmushanensis Hwang 1957
(Figs. 3a–c)

Stenopsyche tienmushanensis Hwang 1957: 382–383, figs. 42–44; type locality: China (Zhe-jiang).
Stenopsyche duplex Schmid 1959, synonymized by Hwang 1963: 486.

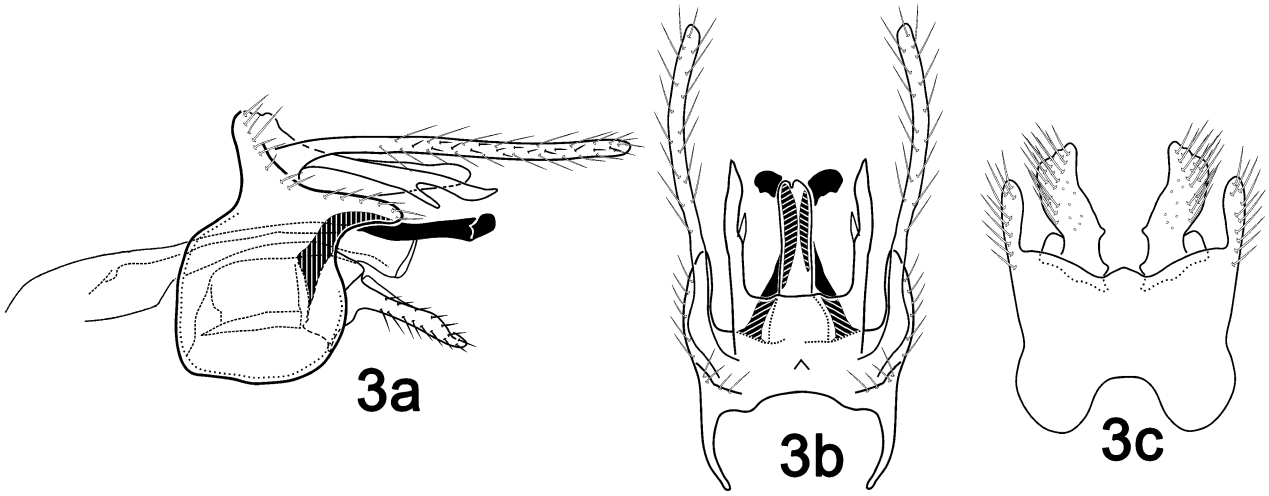

FIGURE 3. *Stenopsyche tienmushanensis* Hwang, male genitalia: 3a, left lateral; 3b, segments IX and X, dorsal; 3c, segment IX and inferior appendages, ventral.

Material examined. CHINA: 5 males, Zhe-jiang Province, Lin-an County, Mt. Tian-mu-shan, 25 June 1985, collected by Wang Hai-kou; 4 males, He-nan Province, Nei-xiang County, Bao-tian-man, Administration Station, northeast tributary, alt. 800 m, 10 July 1998, light trap, collected by Wang Bei-xin; 1 male, Hen-an Province, Nei-xiang County, Xia-guan Town, Da-kuai-di Village, alt. 850 m, 11 July 1998, light trap, collected by Wang Bei-xin; 1 male, He-nan Province, Xi-xia County, Huang-shi-an Forest, alt. 900 m, 17 July 1998, light trap, collected by Du Yu-zhou; 4 males, He-nan Province, Nei-xiang County, Bao-tian-man, alt. 1300 m, 15 August 1998, light trap, collected by Wang Bei-xin; 2 males, Gui-zhou Province, Lei-shan County, Mt. Lei-gong-shan, 28 June 1988, collected Yin Hui-feng; 1 male, Gui-zhou Province, Jiang-kou County, Mt. Fan-jing-shan, alt. 550 m, 12 July 1988, collected by Zhang Xiao-chun; 1 male, Hu-nan Province, Yong-shun County, Shan-mu-he Forest, alt. 600 m, 4 August 1988, light trap, collected by Liu Hong; 1 male, Hai-nan Province, Mt. Jian-feng-ling, 26 February 1982,

collected by Chen Zhen-yue; 1 male, Hai-nan Province, Mt. Jian-feng-ling, 26 February 1982, light trap, unknown collector; 1 male, Si-chuan Province, Guan-xian County (now city of Du-jiang-yan), 12 July 1940, collected by Tsi, C. S.; 1 male, Jiang-xi Province, Wu-yi-shan National Nature Preserve, Lei-gu-ling Stream, 28.004°N, 117.881°E, alt. 344 m, 4 June 2005, collected by Zhou Xin & Zhou Chang-fa.

Distribution. China (Jiang-xi, Gui-zhou, Hai-nan, He-nan, Shaan-xi, Si-chuan, Zhe-jiang).

Second subgroup

The second subgroup can be diagnosed by having the intermediate appendage curved mesad. In China, 7 species including 2 new species belong to this subgroup. All are endemic to the Oriental realm of China, among which *S. stoetzneri* is eurytopic to the Southwest China, the Central China, and the South China regions (Fig. 4).

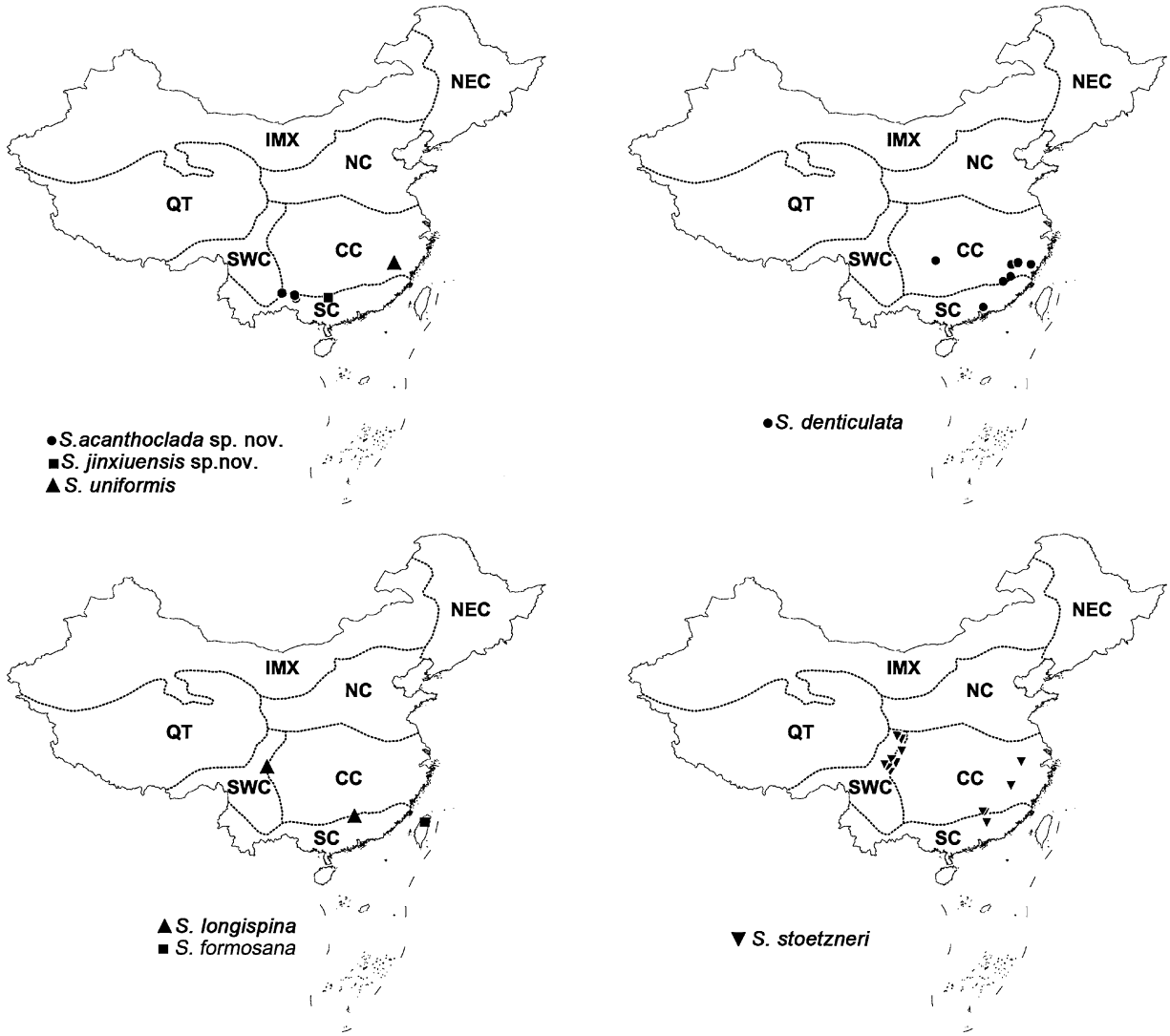

FIGURE 4. Distributions of second subgroup of *Stenopsyche simplex* Group species in China. NEC = Northeast China Region; IMX = Inner Mongolia and Xinjiang Region; NC = North China Region; QT = Qinghai and Tibet Region; SWC = Southwest China Region; CC = Central China Region; SC = South China Region.

***Stenopsyche acanthoclada* sp. nov.**
(Figs. 5a–f)

Adult (in alcohol). Length of forewing 21.3 mm (n=3). Forewing narrow and long, dark brown, with many light speckles. Hind wing triangular, and semi-transparent.

Wing venation (Figs. 5a–b) typical of genus, but in forewing crossveins *r-m* and *m-cu* partly transparent, distance between *m-cu* and *cu* equaling length of *cu*.

Male genitalia. Abdominal segment IX annular; in lateral view anterior margin slightly produced anterad and posterior margin concave at insertion of inferior appendage, ventral margin about 3.5 times as long as dorsal margin; apicolateral angle obtuse, about 1/8 as long as preanal appendage; anterior margin with shallow excision in dorsal view. Preanal appendage elongate, setose. Segment X tongue-like, sclerotized basally and membranous apically, nearly half as long as preanal appendage, in dorsal view tapering from base to apex with distal end rounded. Intermediate appendage about half as long as preanal appendage; basal half broad; distal half narrow, curved ventrad, tapering to apex and curved inward, two intermediate appendages meeting at angle of 90° in dorsal view; lateral margin with acute process curved downward in middle in lateral view. Superior arm elongate, highly sclerotized, about half as long as preanal appendage; S-shaped in lateral view and arched laterad in dorsal view; apex obtuse. Inferior appendage setose; triangular in lateral view; in ventral view sub-rectangular, about 3 times as long as wide, with apex obliquely truncate. Phallus with 12 strong spines, endothecal armature bearing many fine spines.

Holotype male: CHINA, Guang-xi Province, Tian-lin County, Liang-ping, Mt. Li-nao, 24.476°N, 106.361°E, alt. 140 m, 28 May 2002, by black light trap, collected by Jiang Guo-fang. **Paratypes.** CHINA: 1 male, Guang-xi Province, Long-lin County, Jin-zhong-shan Provincial Forest Preserve, Ping-liu Village in Jin-zhong-shan Town, Lou-fang-gou 100 m upstream of Ping-liu River, 24.656°N, 104.918°E, 10 June 2004, alt. 910 m, collected by Yang Lian-fang, Christy Jo Geraci; 1 male, Guang-xi Province, Tian-lin County, Cen-wang-lao-shan Provincial Forest Preserve, Headwaters of Bu-liu river, County Road 794 marker 38.9 km, 24.42°N, 106.383°E, alt. 1247 m, 8 June 2004, collected by Zhou Xin & Karl Kjer.

Diagnosis. The new species belongs to the second subgroup, as indicated by having the intermediate appendage curved mesad, and is similar to *S. stoetzneri* Döhler 1929 from Sichuan, China. This species can be distinguished from the latter by the male genitalia: (1) the dorsum of segment X is much broader than the distal half of the intermediate appendage (they are equal in width in *S. stoetzneri*); (2) the intermediate appendage bears an acute process in the middle of the lateral margin (absent in *S. stoetzneri*).

Etymology. The specific name is derived from the Latin word *acanthocladus*, referring to the tooth of the intermediate appendage in lateral view.

Distribution. China (Guang-xi).

***Stenopsyche denticulata* Ulmer 1926**

Stenopsyche denticulata Ulmer 1926: 35–37, 40, figs. 20–21; type locality: China (Fu-jian).

Distribution. China (Fu-jian, Guang-dong).

***Stenopsyche formosana* Kobayashi 1987**

Stenopsyche formosana Kobayashi 1987: 17, 37–43, figs. 1–5; type locality: China (Tai-wan).

Distribution. China (Tai-wan).

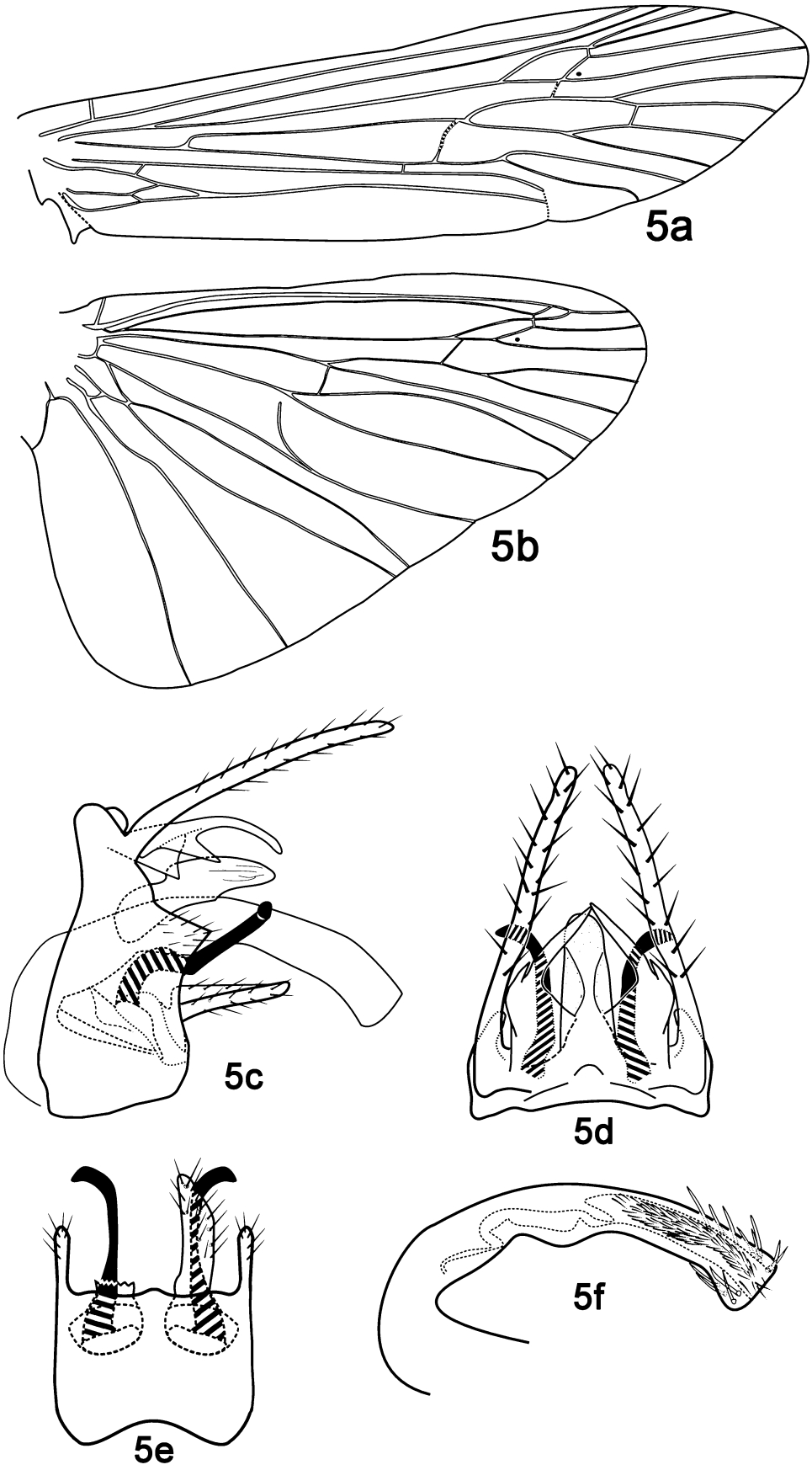

FIGURE 5. *Stenopsyche acanthoclada* **sp. nov.**, male 5a–b, wing venation: 5a, right forewing, dorsal; 5b, right hind wing, dorsal. 5c-f, male genitalia: 5c, left lateral; 5d, segments IX and X, dorsal; 5e, segment IX and inferior appendages, ventral; 5f, phallus, left lateral.

***Stenopsyche jinxiuensis* sp. nov.**
(Figs. 6a–f)

Adult (in alcohol)**.** Length of forewing 22.0 mm (n=1). Forewing narrow and long, dark brown, with many light speckles. Hind wing triangular, semi-transparent. Wing venation (Figs. 6a–b) typical of genus, but in forewing crossveins *r-m* and *m-cu* transparent, distance between *m-cu* and *cu* twice length of *cu*.

Male genitalia. Abdominal segment IX annular, in lateral view shortest at insertion of preanal appendage, ventral 1/3rd of pleuron IX strongly produced anterad and posterad with ventral margin at least 4 times as long as dorsal margin; apicolateral angle long and acute, about 1/4th as long as preanal appendage; in ventral view anterior margin of sternum IX with semicircular indentation. Preanal appendage long, setose. Segment X is tonguelike, membranous with base broad and apex elongate, about 2/3rds as long as preanal appendage, apex incised in dorsal view. Intermediate appendage in dorsal view as long as segment X, curved inward at angle of 90° at 1/4th distance from base, and subapex narrowed abruptly, apex acute; in lateral view sinuate with acute apex. Superior arm long, about 2/3rds as long as preanal appendage, in dorsal view arched laterad, apex thick; in lateral view sinuate. Inferior appendage highly depressed in lateral view, sub-rectangular in ventral view, about 4 times as long as wide. Phallus with large 5 spines, endothecal armature bearing many fine spines.

Holotype male: CHINA, Guang-xi Province, Jin-xiu County, Jin-zhong Road, 24.13°N, 110.189°E, alt. 1100 m, 11 May 1999, by black light trap, collected by Han Hong-xiang.

Diagnosis. The new species belongs to the second subgroup, but differs from other members in that (1) segment X in dorsal view has its basal half broad and its distal half narrow (with lateral margins parallel to each other in *S. stoetzneri*; sagittate in *S. uniformis*; very short in *S. longispina*; triangular in *S. denticulata*; rectangular in *S. acanthoclada* **sp. nov.**); (2) the intermediate appendage is elongate, curved inward at an angle of 90° at 1/4th distance from the base (arched in *S. stoetzneri* and *S. uniformis*; curved inward at an angle of 120° at 1/3rd distance from base in *S. longispina;* short and thick, curved inward at an angle of 120° at half the distance from the base in *S. denticulata* and curved inward at an angle of 100° at half the distance from the base in *S. acanthoclada* **sp. nov.**).

Etymology. This species is named for the type locality, Jin-xiu County in Guang-xi Province, China.

Distribution. China (Guang-xi).

***Stenopsyche longispina* Ulmer 1926**

Stenopsyche longispina Ulmer 1926: 34–35, 40, figs. 17–18; type locality: China (Fu-jian).

Distribution. China (Fu-jian, Guang-dong, Si-chuan).

***Stenopsyche stoetzneri* Döhler 1929**
(Figs. 7a–c)

Stenopsyche stoetzneri Döhler, 1929: 83–86; type locality: China (Si-chuan).

Material examined. CHINA: 1 male, Si-chuan Province, Jiu-zhai-gou Valley, June 2000, collected by Zhou Chang-fa; 2 males, Si-chuan Province, Bao-xing County, Xi-chuan River, alt. 1100 m, 19 June 1996, collected by Yang Lian-fang; 2 males, Si-chuan Province, Jiang-you County, alt. 600 m, 28 June 1990, collected by John C. Morse; 5 males, Gan-su Province, Wen County, Bai-shui-jiang River, alt. 960 m, 12 June 1998, collected by Yang Lian-fang; 5 males, Gan-su Province, Wen County, Shang-dan Town, Dan-bao River at Bai-shui-jiang Tributary, 1140 m, 13 June 1998, collected by Du Yu-zhou; 2 males, Jiang-xi Province, Gui-xi County, Xi-qi-he River, 59 km S. E. of Gui-xi, alt. 210 m, 5 June 1990, collected by Yang Lian-fang; 2 males, Jiang-xi Province, Cong-yi County, Yang-ling, alt. 400 m, 25 July 1996, collected by Leng Ke-ming.

Distribution. China (Fu-jian, Gan-su, Jiang-xi).

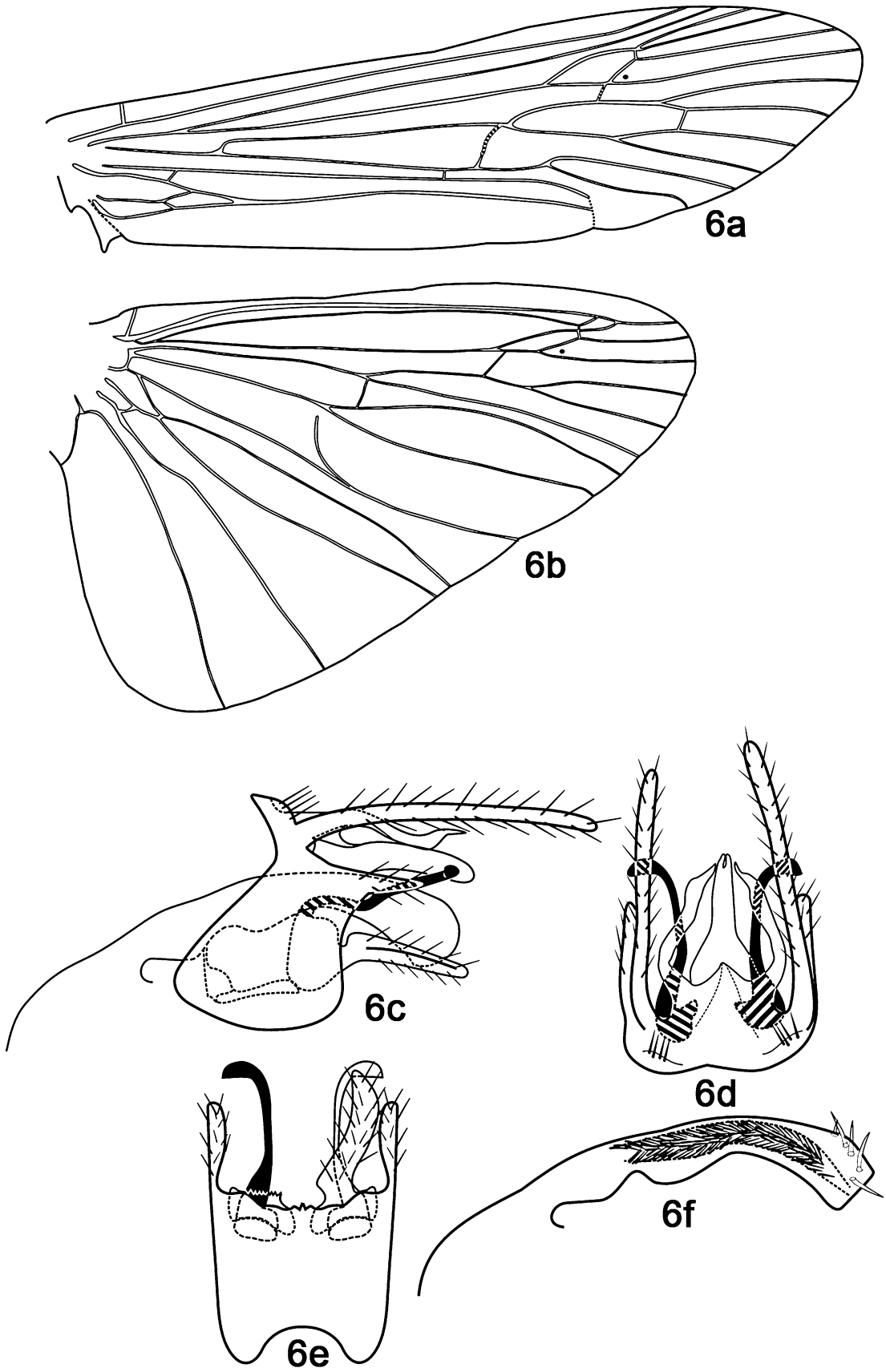

FIGURE 6. *Stenopsyche jinxiuensis* **sp. nov.**, male: 6a–b, wing venation: 6a, right forewing, dorsal; 6b, right hind wing, dorsal. 6c-f, male genitalia: 6c, left lateral; 6d, segments IX and X, dorsal; 6e, segment IX and inferior appendages, ventral; 6f, phallus, left lateral.

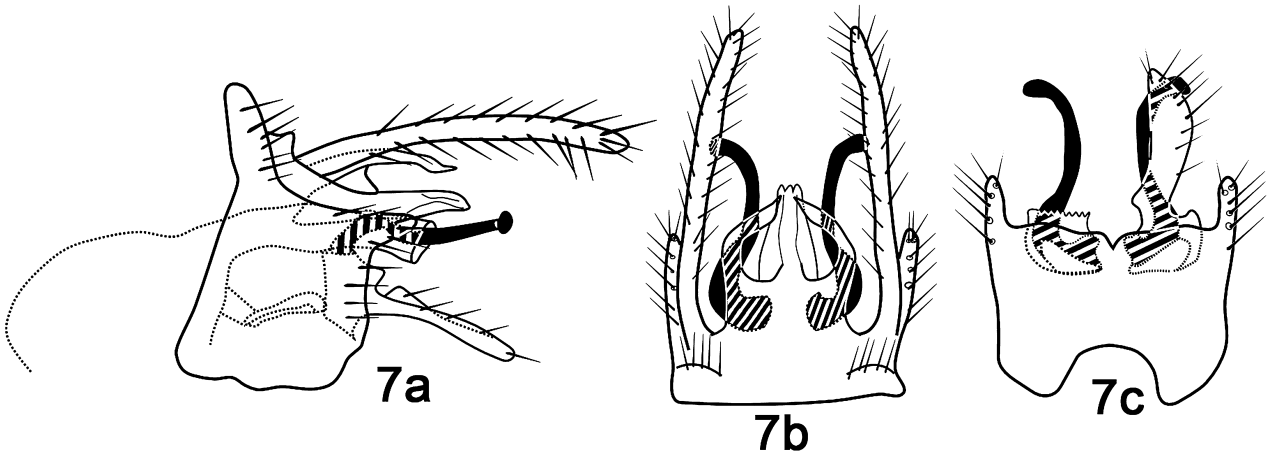

FIGURE 7. *Stenopsyche stoetzneri* Döhler, male genitalia: 7a, left lateral; 7b, segments IX and X, dorsal; 7c, segment IX and inferior appendages, ventral.

Stenopsyche uniformis Schmid 1965

Stenopsyche uniformis Schmid, 1965: 132; type locality: China (Fu-jian).

Distribution. China (Fu-jian).

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