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New species, new records, and new collection data of *Rhyacophila* from China (Trichoptera: Rhyacophilidae)

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Abstract

Four new species of *Rhyacophila*, *R. acanthoida* **n. sp.**, *R. tongmuensis* **n. sp.**, *R. shiliae* **n. sp.**, and *R. bisbifida* **n. sp.**, are diagnosed, described, and illustrated. Two species, *R. inaequalis* DENNING & SCHMID and *R. manicata* KIMMINS are found to be new records for China. Remarks on six Species Groups, to which the four new species and two newly recorded species belong, are presented. New collection data are added for *R. bidens* KIMMINS, *R. claviforma* SUN & YANG, *R. haplostephana* SUN & YANG, *R. quadrifida* SUN & YANG, and *R. tetracantha* SUN & YANG.

Key words: caddisfly, Oriental, Palearctic, Holarctic, species group, male genitalia

Introduction

Rhyacophilidae is one of the most diverse families of caddisflies in the world, with more than 753 species (MORSE 2011, 2016), of which about 93% of the species are in the genus *Rhyacophila* (DE MOOR & IVANOV 2007), constituting the largest genus in Trichoptera (HOLZENTHAL *et al*. 2007).

ROSS (1956) proposed the first phylogenetic scheme for the genus *Rhyacophila*, dividing it into nine main branches and 44 groups. With description of an additional 150 species, SCHMID (1970) considerably modified ROSS' classification, using four main branches and 72 species groups. Compared to the classification of ROSS, SCHMID's system has proved to be a better solution because in most instances *Rhyacophila* larvae can be readily placed in SCHMID's species groups (WOLD 1974). For this and other reasons, it is now widely used by trichopterologists.

The genus is distributed in North American, Europe, and Asia (ROSS 1956; SCHMID 1970; HOLZENTHAL *et al*. 2007; MORSE 2016), but does not occur in the southern Hemisphere (MEY 1999). With its highest diversity in Oriental Asia, SCHMID (1970) considered that region as the center of origin of the genus.

Of the 147 rhyacophilid species reported from China, 120 are included within *Rhyacophila* and 27 in *Himalopsyche* (YANG *et al*. 2016); 95 *Rhyacophila* species are endemic to China, while the other 25 species are distributed both in China and adjacent areas. On the other hand, 98 of the Chinese *Rhyacophila* species are endemic to the Oriental region, 15 species to the Palearctic region, and only 7 species distributed in both regions.

In the recent past, as new species have been reported, new collection data have been added for some known species (KISS 2013, 2014; MALICKY 2014; SUN 2016a, 2016b), and revisions have been made to some species (MALICKY 2013), the total number of Chinese *Rhyacophila* species has been brought to 130. In this article 4 species are described as new to science and 2 species are found to be new records for China. New collection data are added for another 5 species. This contribution brings the total number of Chinese *Rhyacophila* species to 136.

Material and methods

Most of the rhyacophilid caddisflies reported here were collected during collecting expeditions to Guang-dong and Guang-xi Provinces in 2004 and to Jiang-xi Province in 2005 co-organized by Dr. J.C. MORSE (Clemson

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University, USA) and Prof. L-f. YANG (Nanjing Agricultural University, PR China). The specimens of *Rhyacophila shiliae* **n. sp.** were kindly donated by Dr. L. SHI (Inner Mongolia Agricultural University, PR China).

The genitalia preparation procedure follows that used by XU *et al*. (2014). The structures of the male genitalia were traced in pencil using a drawing tube on a Nikon Eclipse 80i microscope. The original pencil templates were traced digitally with Photoshop® (Version 13.0) and a Wacom Intuos tablet-and-pen to produce illustrations. Finally, each male abdomen was transferred to a microvial with 80% ethanol and stored together with the remainder of the specimen in a larger jar.

Terminology for male genitalia follows that of SCHMID (1970). All specimens, including type specimens, have been deposited in the Insect Collection, Nanjing Agricultural University, Nanjing, Jiangsu Province, PR China (NJAU).

Descriptions of new species

Rhyacophila acanthoida n. sp.

(Fig. 1A–1D)

Diagnosis. The new species is similar to *R. annulicornis* KIMMINS 1953 in male genitalia, especially in the shape of the ventral plate of the aedeagus, which is slender and deeply incised mesally into two branches in both species, but the new species can be readily diagnosed by the bulging horizontal part of segment X, strong parameres, and the trapezoidal apical segment of each inferior appendage when viewed laterally.

Description of male. Length of each forewing: 8.0-9.0 mm (n = 4). Body (in alcohol) brown. Head brown, antennae and palpi pale. Thorax brown dorsally, pale laterally and ventrally; wings brown; legs yellowish brown, with spurs dark brown. Abdomen brown.

Male genitalia. Segment IX (IX) in lateral view with anterior margin slightly sinuate, posterior margin strongly incised at middle, upper margin about 1/2 as long as ventral margin; in dorsal view, anterior margin slightly concave and posterior margin shallowly incised. The horizontal part of segment X (h.p.X) in lateral view large, with apex rounded, in dorsal view apex truncate; vertical part (v.p.X) slender, with apex slightly recurved posteroventrad. Anal sclerites (a.s.) small, roots short. Apical band in caudal view with straight bottom and paired curved lateral arms. Tergal band (t.b.) strong, in lateral view tapering from broad base to truncate apex. Inferior appendages strong; each with basal segment (b.i.a.) pentagonal in lateral view and somewhat triangular in ventral view; apical segment (a.i.a.) trapezoidal in lateral view and slender in ventral view. Phallic apparatus complicated: phallotheca (pht.) subrectangular; aedeagus (aed.) slender, tapering from base to acute apex, ventral plate (v.p.a.) very long, about 3 times as long as aedeagus, in ventral view with lateral margins parallel to each other, and apical 1/4 divided into 2 branches, each slender and heavily setose apically; parameres (par.) each very strong, setose apically and subapically, with narrow base, in lateral view basal 1/3 gradually enlarged from base, and remaining 2/3 somewhat rectangular, in ventral view each progressively enlarged from base to incised apex.

Holotype male. P.R. CHINA: Si-chuan Province, Kang-ding County, unnamed waterfall, tributary of Da-du River, 100 m upstream of G318 at 2824.9 km stone marker, 30.066°N, 102.117°E, elev. 1675 m, 29 June 2005, collected by John C. MORSE.

Paratypes. P.R. CHINA, Si-chuan Province: Lu-ding County, Da-ba Village, La-zi-gou stream, tributary of Da-du River, 100 m upstream of G318 at 2788.7 km stone marker, 29.861°N, 102.223°E, elev. 1515 m, 29 June 2005, collected by Chang-hai SUN, 2 males; Bao-xing County, Da-shui-gou Stream, Feng-tong-zhai National Nature Preserve, Da-shui-gou Station, Route S210 at 257.7 km marker, 30.579°N, 102.875°E, elev. 1580 m, 27 June 2005, collected by Chang-hai SUN, 2 males, 1 female.

Etymology. The species is named *R. acanthoida* from the Latin adjective *acanthoidus*, *-a*, *-um*, meaning "like a spine," in reference to each branch of the ventral plate of the aedeagus with the subapical portion having many spine-like hairs.

Distribution. China (Si-chuan).

Remarks. ROSS (1956) created the *R. truncata* Group in his Branch 8 to house *R. annulicornis* and *R. truncata* KIMMINS 1953, both from Myanmar. SCHMID (1970) created the *R. annulicornis* Species Group with 12 species, including the only two members of ROSS' *R. truncata* Group, and expanded the group by reporting 7 species from

India and 1 from Malaysia, and by moving *R. marcida* BANKS 1947 from ROSS' *R. pepingensis* Group and *R. dilatata* MARTYNOV 1935 from "unplaced species" into the group. Then, SUN & YANG (1995), SUN (1997), and MALICKY & SUN (2002) reported 5 additional species for the group. *Rhyacophila brachyblasta* MALICKY & SUN 2002 was original assigned to the group, but it should be included in the *R. wangpo* Species Group instead, thus it is not included among the members of the *R. annulicornis* Species Group. Therefore, the total number of species in the group is 17. With the description of the new species, the number is brought to 18, of which 7 species are now reported from China.

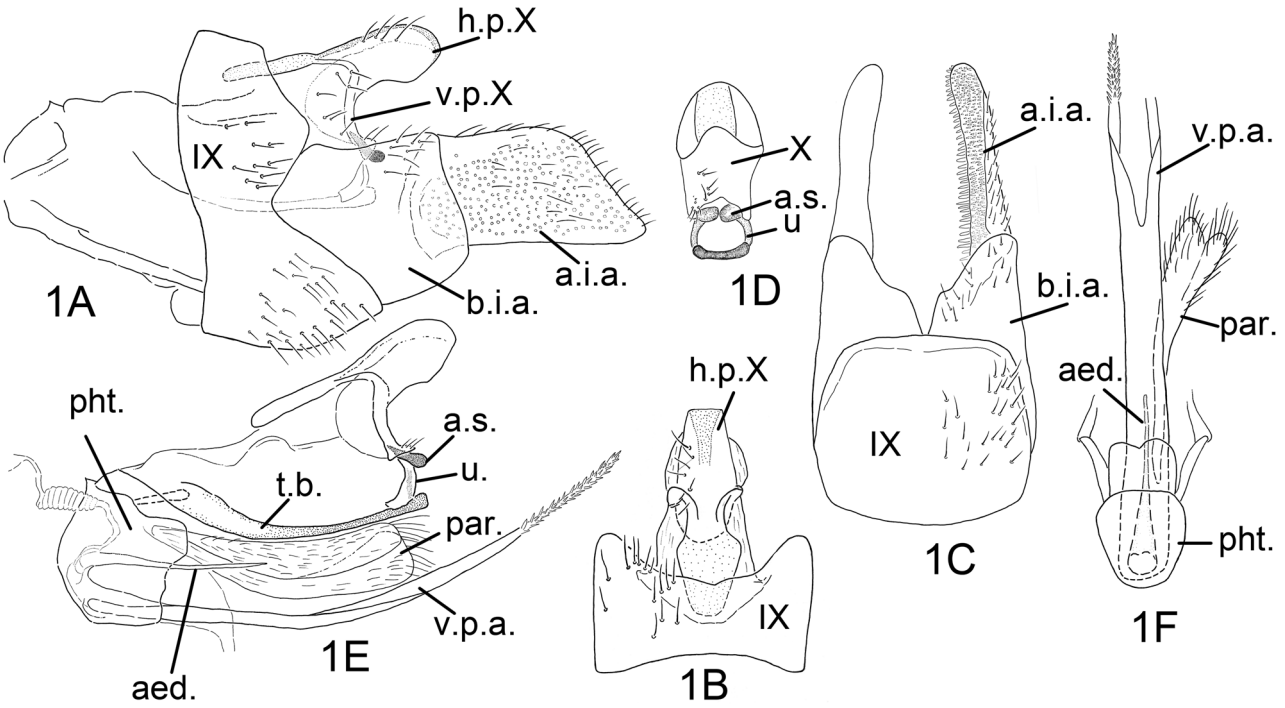

FIGURE 1. *Rhyacophila acanthoida* **n. sp.**, male genitalia. 1A, left lateral; 1B, dorsal; 1C, ventral; 1D, segment X and anal sclerites and apical band, caudal; 1E, phallic apparatus, left lateral; 1F, phallic apparatus, ventral, left paramere omitted. Abbreviations: aed. = aedeagus; a.i.a = apical segment of an inferior appendage (paired); a.s. = anal sclerites; b.i.a. = basal segment of an inferior appendage; h.p.X= horizontal part of segment X; IX = segment IX; par. = paramere (paired); pht. = phallotheca; t.b. = tergal band; u.= apical band; v.p.a = ventral plate of aedeagus; v.p.X = vertical part of segment X; X = segment X.

***Rhyacophila tongmuensis* n. sp.**
(Fig. 2A–2D)

Diagnosis. The new species can be diagnosed from other members of the *R. mishmica* Species Group by the small dorsal process and the bifurcate aedeagus in lateral view. In addition, the trapezoidal apical segments of the inferior appendages and the elongate complex of preanal appendages and segment X is also helpful to separate it from others.

Description. Length of each forewing: 7.0 mm (n = 1). Body (in alcohol) dark brown. Head dark brown, antennae brown, each flagellar segment with pale rings at basal and distal ends; palpi brown. Thorax dark brown dorsally, brown laterally and ventrally; wings brown; legs yellowish brown, with spurs dark brown. Abdomen dark dorsally and yellow ventrally.

Male genitalia. Segment IX (IX) in lateral view subrectangular, with upper margin longer than ventral margin, apicodorsal lobe tiny, triangular in dorsal view. Segment X fused with preanal appendages, forming complex (com.) in lateral view elongate-triangular with apex rounded and in dorsal view tapering from broad base to slightly incised apex. Basal segments of inferior appendages (b.i.a.) slightly shorter than complex of segment X and preanal appendages, each rectangular in lateral view and trapezoidal in ventral view; apical segment (a.i.a.) trapezoidal in lateral view, slender in ventral view, with apex rounded. Phallic apparatus short and simple: phallotheca (pht.)

subrectangular, dorsal process of phallic apparatus (d.p.) roof-shaped in lateral view and subrectangular with apex rounded in dorsal view; aedeagus (aed.) in lateral view with basal 1/3 broader than remainder, subapically bifurcate, in dorsal view tapering from broad base to rounded apex; parameres (par.) each tubular, with the distal half heavily setose.

Holotype male. P.R. CHINA: Jiang-xi Province, Wu-yi-shan National Nature Reserve, unnamed tributary of Tong-mu River, 17 km upstream of Wu-yi-shan Station, 27.834°N, 117.739°E, elev. 1105 m, 2 June 2005, collected by Lian-fang YANG.

Etymology. The species is named *Rhyacophila tongmuensis* with reference to the type locality, the river from which it was collected.

Distribution. China (Jiang-xi).

Remarks. *Rhyacophila mishmica* KIMMINS 1953 was included in *R. curvata* Group in Branch 3 by ROSS (1956). Based on the presence of a dorsal process of the phallic apparatus, SCHMID (1970) created the *R. mishmica* Species Group to accommodate 8 species from India. Then MALICKY (1995) and SUN & YANG (1995) each reported 1 species from Si-chuan, China. Additional collection data expand the distribution ranges of *R. laptsapa* SCHMID 1970 from Sikkim westwards to Nepal (KISS 2013). *Rhyacophila tongmuensis* **n. sp.** is similar to the members of the *R. curvata* Species Group in the overall shape of the male genitalia, but the small dorsal process of the phallic apparatus indicates it is a member of the *R. mishmica* Species Group. Thus, there are now 3 Chinese species in the Species Group.

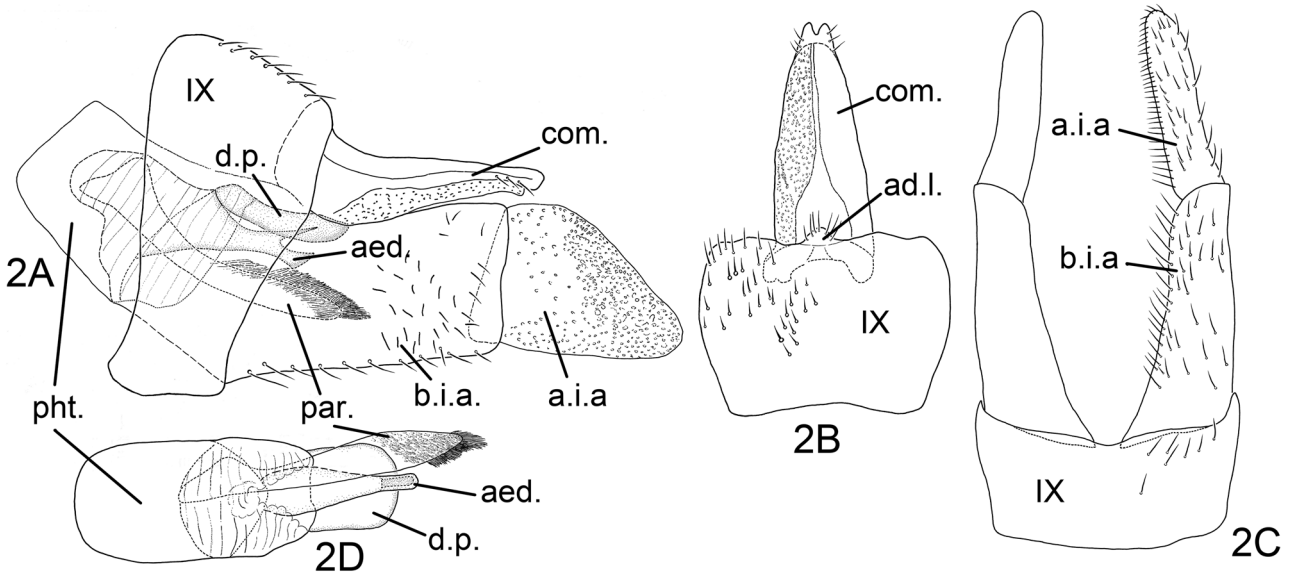

FIGURE 2. *Rhyacophila tongmuensis* **n. sp.**, male genitalia. 2A, left lateral, left inferior appendage omitted; 2B, segment IX and complex of preanal appendages and segment X, dorsal; 2C, segment IX and inferior appendages, ventral; 2D, phallic apparatus, ventral, right paramere omitted. Abbreviations: ad.l. = apicodorsal lobe of segment IX; aed. = aedeagus; a.i.a = apical segment of an inferior appendage (paired); b.i.a. = basal segment of an inferior appendage; com. = complex of preanal appendages and segment X; d.p. = dorsal process of phallic apparatus; IX = segment IX; par. = parameres (paired); pht. = phallotheca.

***Rhyacophila shiliae* n. sp.**
(Fig. 3A–3D)

Diagnosis. This new species is similar to the members of *R. sibirica* Subgroup (*R. sibirica* Species Group, *R. invaria* Twig, *R. philopotamoides* Branch; Schmid 1970; Schmid *et al*. 1993) in male genitalia, but can be diagnosed easily from them by the following combination of characters: (1) segment X, especially the vertical part, is smaller than those of the other species; (2) segment X in dorsal view has the apex truncate; (3) the apex of the ventral lobe of the aedeagus has a deep mesal incision; and (4) the apical segment of each inferior appendage in lateral view is divided apically into a shorter upper lobe and a longer lower lobe.

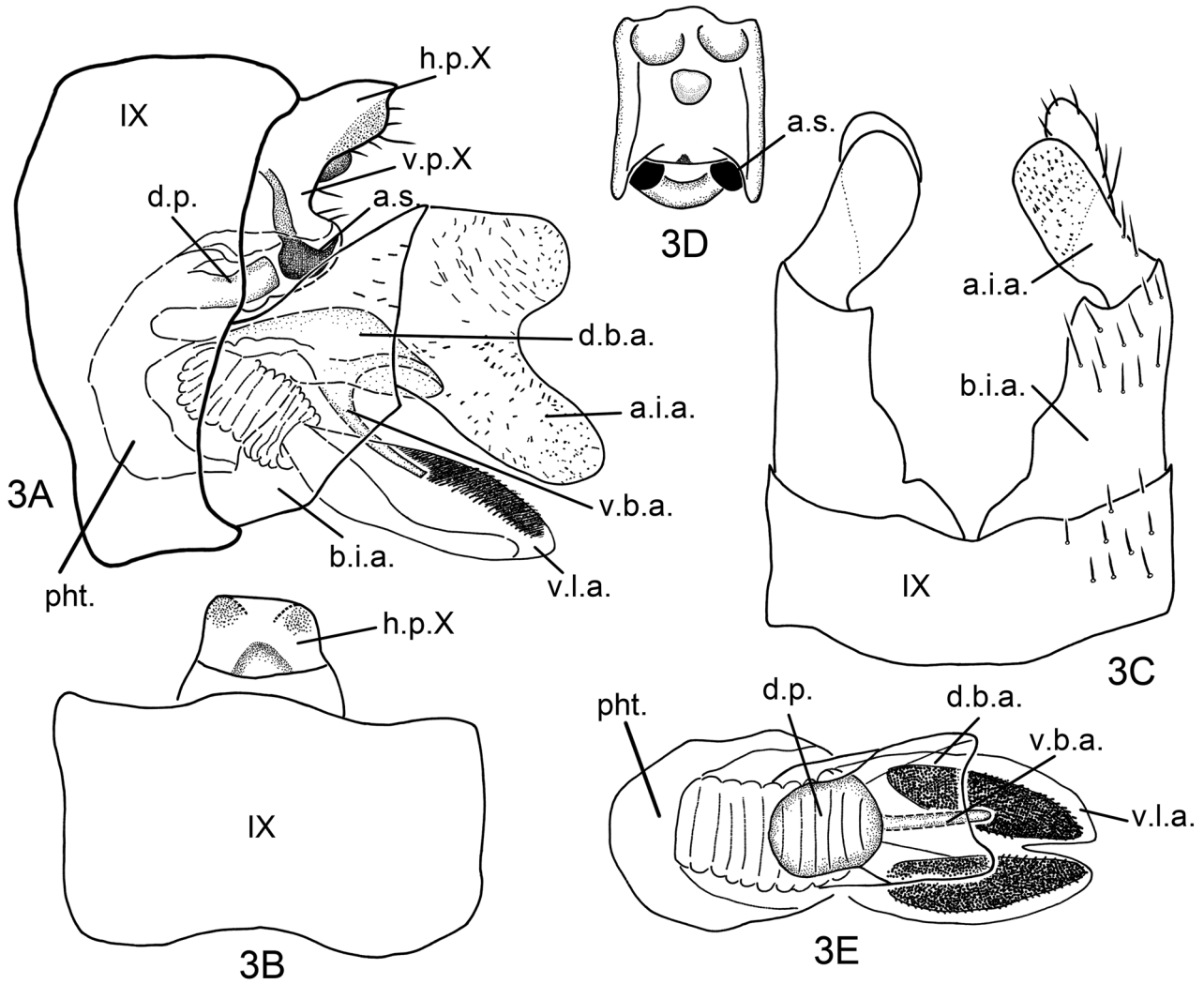

FIGURE 3. *Rhyacophila shiliae* **n. sp.**, male genitalia. 3A, left lateral; 3B, dorsal; 3C, ventral; 3D, segment X and anal sclerites, caudal; 3E, phallic apparatus, dorsal. Abbreviations: a.i.a = apical segment of an inferior appendage (paired); a.s. = anal sclerites; b.i.a. = basal segment of an inferior appendage (paired); d.b.a. = dorsal branch of aedeagus; d.p. = dorsal process of phallic apparatus; h.p.X= horizontal part of segment X; IX = segment IX; pht. = phallotheca; v.b.a. = ventral branch of aedeagus; v.l.a. = ventral lobe of aedeagus; v.p.X = vertical part of segment X.

Description. Length of each forewing: 10.0 mm (n = 11). Body (in alcohol) dark brown. Head dark brown, setal warts yellowish brown; eyes brown; palpi brown; antennae dark brown, scapes strong, each with length about 2 times as long as width, other segments short. Prothorax brown, pterothorax dark brown; legs with all coxae and tibial spurs black, other parts brown; wings yellowish brown. Abdomen dark brown.

Male genitalia. Segment IX (IX) in lateral view subrectangular, with upper portion longer than lower one, rectangular in dorsal view, twice as wide as long, with anterior and posterior margins slightly sinuate. Segment X (X) in lateral view with horizontal part (h.p.X) larger than vertical one (v.p.X), in dorsal view rectangular with apex truncate, in caudal view with well sclerotized tubercle in center of segment. Anal sclerites (a.s.) small, in caudal view button-shaped. Tergal strap reduced. Dorsal process of aedeagus (d.p.) in lateral view short and narrow, bar-shaped, in dorsal view rectangular. Dorsal branch of aedeagus (d.p.a.) in lateral view roof-shaped, in dorsal view subrectangular, with apex slightly concave; ventral branch (v.b.a.) cylindrical, with apex extending slightly beyond apex of dorsal branch. Ventral lobe of aedeagus (v.l.a.) about as long as inferior appendages, with its apex incised mesally. Basal segment of each inferior appendage (b.i.a.) somewhat trapezoidal in lateral view, in ventral view with its inner margin sinuate and outer margin straight; apical segment (a.i.a.) in lateral view with apex incised mesally into two lobes, upper lobe short and lower lobe slightly longer than upper one, in ventral view somewhat rectangular.

Holotype male. P.R. CHINA: **Inner Mongolia**, Gen-he city, Han-ma National Nature Reserve, a stream near the Administrative center, 51.634°N, 122.347°E, elev. 823 m, 30 July 2014, collected by Li SHI, Ming-run TIAN, Yu-xuan ZHU, Xue-feng GAO, Chao CHEN.

Paratypes: Same data as holotype, 10 males.

Etymology. The new species is named after Dr. Li SHI, Inner Mongolia Agricultural University, who donated the type specimens to the NJAU.

Distribution. China (Inner Mongolia).

Remarks. About 40 species are included in the *R. sibirica* Species Group, most of which are Holarctic; the most southern species, to my knowledge, is *R. furva* MALICKY & SUN 2002, which has been reported from Shaan-xi Province, Ning-shan county (33.3°N, 108.3°E), just on the border between the Palearctic and Oriental regions in China. This new species *R. shiliae* **n. sp.** from Inner Mongolia constitutes the second Chinese species of the group.

***Rhyacophila bisbifida* n. sp.**
(Fig. 4A–4E)

Diagnosis. This new species can be diagnosed easily from other species of the *R. wangpo* Species Group by the large anal sclerites which, with their roots, are almost as long as the height of segment X in lateral view, and by the paired style-like processes beneath the ventral plate of the aedeagus which are absent in other members.

Description. Length of each forewing: 7.5 mm (n = 1). Body (in alcohol) brown. Head brown; antennae yellow, each flagellar joint with brown ring at middle; palpi pale. Prothorax yellowish brown, pterothorax dark brown dorsally, brown laterally and ventrally; legs brown, with dark brown spurs; wings brown. Abdomen dark brown dorsally and brown ventrally.

Male genitalia. Segment IX (IX) in lateral view with anterior margin straight, posterior margin sinuate, deeply incised on ventral half; in dorsal view rectangular. Segment X small, in lateral view somewhat Γ-shaped (gamma-shaped), with horizontal part (h.p.X) short and vertical part (v.p.X) oblique; in dorsal view both horizontal and vertical parts incised apicomesally. Anal sclerites (a.s.) large, roots long, elliptical in caudal view. Apical band (u.) with semicircular bottom and two oblique arms; tergal band (t.b.) strong. Inferior appendages strong; in lateral view each with basal segment (b.i.a.) subrectangular and its apex rounded, in ventral view trapezoidal; apical segment about as long as basal segment, in lateral view somewhat in shape of upside-down boot, in ventral view knife-like. Tendons (tend.) of inferior appendages large. Phallic apparatus complicated: phallotheca (pht.) rectangular both in lateral and ventral views; tenons (ten.) slender; aedeagus (aed.) tubular in lateral view, its ventral plate (v.p.a.) in lateral view slender, about 1.5 times as long as aedeagus, in dorsal view with narrow and incised base, gradually widened to subapex, and with apex incised mesally; parameres (par.) each slightly longer than ventral plate of aedeagus, in dorsal view each with lateral margins of basal 2/3 parallel to each other, distal 1/3 narrowed abruptly, with apex acute. Pair of style-like processes (s.l.p.) occurring basally beneath ventral plate of aedeagus.

Holotype male. P.R. CHINA: Si-chuan Province, Bao-xing County, unnamed tributary of Bao-xing River, Route S210 at 240.3 km marker, 30.652°N, 102.765°E, elev. 1985 m, 27 June 2005, collected by Xin ZHOU and John C. MORSE.

Etymology. The species is named *Rhyacophila bisbifida* from the Latin adjective *bisbifidus*, *-a*, *-um*, meaning "twice cut," in reference to segment X of the new species incised mesally at the apices of both the horizontal part and the vertical part.

Distribution. China (Si-chuan).

Remarks. The *R. wangpo* Species Group was established by SCHMID (1970) to include 2 species from Sikkim (*R. wangpo* SCHMID 1970 and *R. tashepa* SCHMID 1970). Afterwards, a species was recognized from Yun-nan, China (*R. complanata* TIAN & LI 1986). *Rhyacophila brachyblasta* MALICKY & SUN 2002 has been reported from Yun-nan, but was placed in the *R. annulicornis* Species Group. According to the overall shape of the male genitalia, I treat *R. brachyblasta* as a member of the *R. wangpo* Species Group. *Rhyacophila fernandi* ARMITAGE & AREFINA 2003 was reported from Vietnam, but is very similar to *R. brachyblasta* in male genitalia. MALICKY (2013) doubted they are synonymous. Here I treat *R. fernandi* as a synonym of *R. brachyblasta*. *Rhyacophila serug* Malicky 2012 from Si-chuan was reported to be similar to *R. brachyblasta*, and should be ascribed to the group. With *R. bisbifida* **n. sp.**, the group now contains 6 species, of which 4 species occur in China.

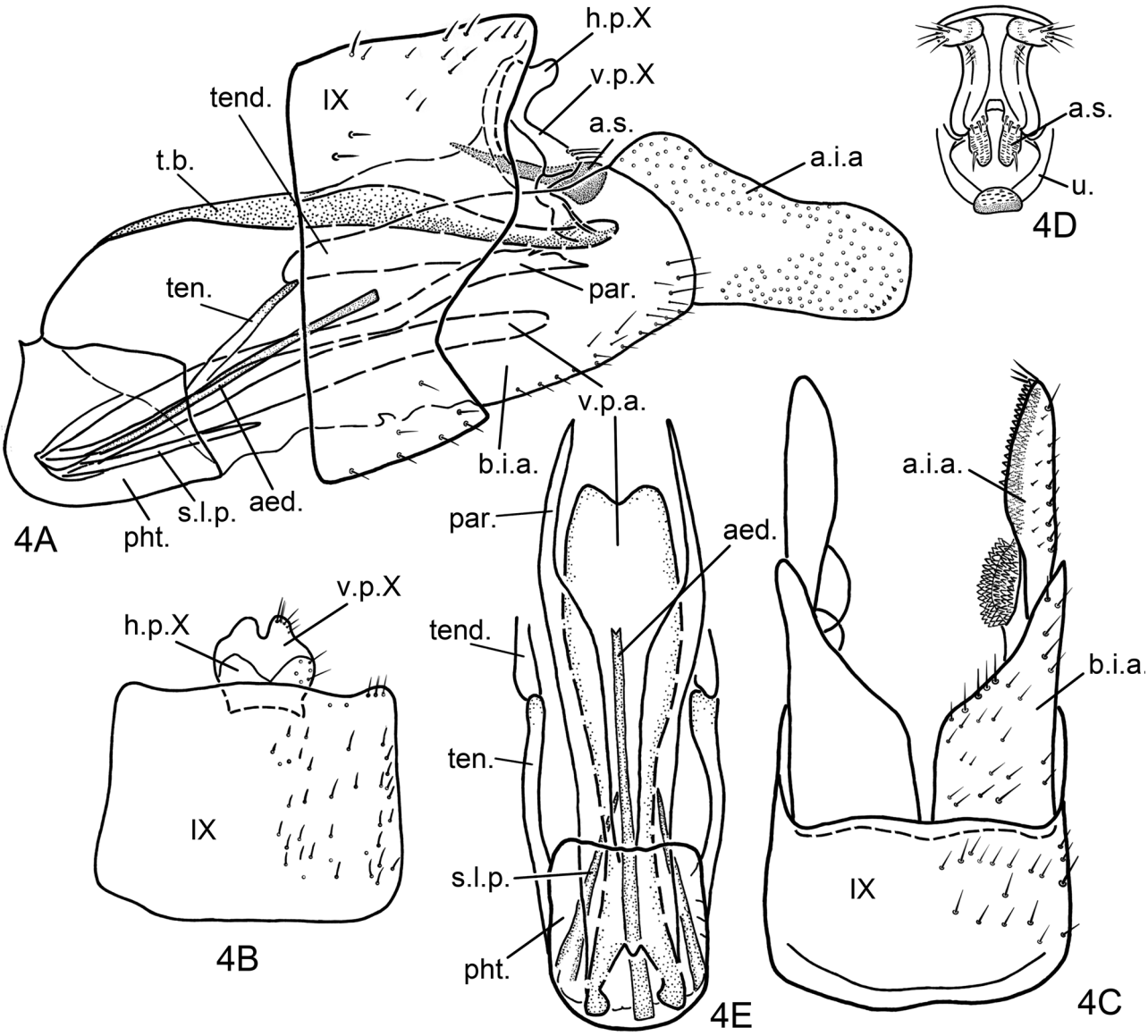

FIGURE 4. *Rhyacophila bisbifida* **n. sp.**, male genitalia. 4A, left lateral; 4B, dorsal; 4C, ventral; 4D, segment X and anal sclerites and apical band, caudal; 4E, phallic apparatus, dorsal. Abbreviations: aed. = aedeagus; a.i.a = apical segment of an inferior appendage (paired); a.s. = anal sclerites; b.i.a. = basal segment of an inferior appendage (paired); h.p.X= horizontal part of segment X; IX = segment IX; par. = paramere (paired); pht. = phallotheca; s.l.p. = style-like process (paired); t.b. = tergal band; ten. = tenons of phallotheca; tend. = tendons of inferior appendages; u. = apical band; v.p.a. = ventral plate of aedeagus; v.p.X = vertical part of segment X.

New records for China

Rhyacophila inaequalis DENNING & SCHMID 1971, new record

Rhyacophila inaequalis DENNING & SCHMID 1971: 1553–1555, fig. 2 (male).

Materials examined. P.R. CHINA: Jiang-xi Province, Jiu-lian-shan National Nature Reserve, Da-shui-keng stream, 500 m upstream of confluence of Huang-niu-shi & Da-shui-keng, 9 June 2005, collected by Xin ZHOU, 2 males, 1 female; **Guang-dong Province**, Yang-chun County, Xin-he village, 16 km NW of Yong-ning town, He-cang stream, 22.328°N, 111.503°E, elev. 393 m, 27 May 2004, collected by Lian-fang YANG, Xin ZHOU, Christy J. GERACI, 2 males; **Guang-xi Province**, Shang-si County, Shi-wan-da-shan National Forest Park, Shi-tou-he at

second tributary, 3.4 km SW of main entrance to Park, 21.892°N, 107.907°E, elev. 392 m, 6 June 2004, collected by Lian-fang YANG and Christy J. GERACI, 4 males, 2 females.

Distribution. China (Guang-dong, Guang-xi, Jiang-xi); Cambodia; Thailand; Vietnam.

Remarks. ROSS (1956) created the *R. castanea* Species Group to accommodate 5 species within his Branch 6. The group then was placed in the *R. philopotamoides* Branch by SCHMID (1970), including 17 species. Afterwards, MALICKY (1978, 1989, 1995, 2009) reported 6 species from Indonesia, Malaysia and Vietnam; ARMITAGE & AREFINA (2003) reported 2 species from Vietnam, and other authors reported 1 species from each of India (KAUR & SAINI 2012), Philippines (MEY 1998), Si-chuan, China (MALICKY & SUN 2002) and Vietnam (OLÁH 2013). Thus, the total number of species in the group is 29.

Rhyacophila inaequalis DENNING & SCHMID was first reported from Thailand, but was reported also from Vietnam (ARMITAGE *et al*. 2005; OLÁH & MALICKY 2010), Thailand (BUNLUE *et al*. 2012), and Cambodia (MALICKY *et al*. 2014). Now we know that it also occurs in China, so that the number of Chinese species in the Group is 5.

Rhyacophila manicata Kimmins 1953, new record

Rhyacophila manicata Kimmins 1953: 531–532, fig. 22 (male).

Materials examined. P.R. CHINA: Si-chuan Province, Kang-ding County, unnamed waterfall, tributary of Da-du River, 100 m upstream of G318 at 2824.9 km stone marker, 30.066°N, 102.117°E, elev. 1675 m, 29 June 2005, collected by John C. MORSE, 1 male; Lu-ding County, Da-ba Village, La-zi-gou stream, tributary of Da-du River, 100 m upstream of G318 at 2788.7 km stone marker, 29.861°N, 102.223°E, elev. 1515 m, 29 June 2005, collected by Chang-hai SUN, 5 males.

Distribution. China (Si-chuan); Myanmar.

Remarks. *Rhyacophila manicata* belongs to the *R. gyamo* Species Group. This species group now contains 7 species. *Rhyacophila gyamo* SCHMID 1970 was first recorded from India, and then was recognized from Thailand (BUNLUE *et al*. 2012; THAPANYA *et al*. 2004). *Rhyacophila immaculata* MEY 1996 and *R. ranga* OLÁH 1987 are Vietnamese endemics. *Rhyacophila orientalis* KIMMINS 1953 and *R. suah* MALICKY & CHANTARAMONGKOL 2009 (in Malicky 2009) are known exclusively from Myanmar and Thailand, respectively. *Rhyacophila manicata*, previously known from Myanmar (KIMMINS 1953), is now also known in China (Si-chuan); together with *R. ligulula* MALICKY & SUN 2002 (Si-chuan), the number of Chinese species in the *R. gyamo* Species Group is brought to 2.

Species with new collection data

Rhyacophila bidens KIMMINS 1953

Rhyacophila bidens KIMMINS 1953: 521–522, fig.13 (male).

Materials examined. P.R. CHINA: Si-chuan Province, Kang-ding County, unnamed waterfall, tributary of Da-du River, 100 m upstream of G318 at 2824.9 km stone marker, 30.066°N, 102.117°E, elev. 1675 m, 29 June 2005, collected by John C. MORSE, 2 males; Lu-ding County, Leng-zhu-guan Village, Leng-zhu-guan Stream, 100-200 m upstream of , G318 at 2815.2 km stone marker, 30.052°N, 102.157°E, elev. 1430 m, 29 June 2005, collected by Chang-fa ZHOU, 6 males; Lu-ding County, Da-ba Village, La-zi-gou stream, tributary of Da-du River, 100 m upstream of G318 at 2788.7 km stone marker, 29.861°N, 102.223°E, elev. 1515 m, 29 June 2005, collected by Chang-hai SUN, 4 males.

Distribution. China (Si-chuan, Tibet, Yun-nan); Bhutan; Myanmar; Nepal; Thailand; Vietnam.

Rhyacophila claviforma SUN & YANG 1998

Rhyacophila claviforma SUN & YANG 1998: 16, fig.5 (males).

Materials examined. P.R. CHINA: Si-chuan Province, Tian-quan County, Zi-shi Town, Da-ren-yan Village, 100 m upstream, Tiao-shui-gou Stream, tributary of Tian-quan River, G318 at 2701.3 km stone marker, 30.00°N, 102.490°E, elev. 1144 m, 28 June 2005, collected by Xin ZHOU & Christy J. GERACI, 2 males.

Distribution. China (Si-chuan, Yun-nan).

Rhyacophila haplostephana SUN & YANG 1998

Rhyacophila haplostephana SUN & YANG 1998: 17, fig. 9 (male).

Materials examined. P.R. CHINA: Jiang-xi Province, Wu-yi-shan National Nature Reserve, Unnamed tributary of Tong-mu River, 18 km upstream of Wu-yi-shan Station, 27.827°N, 117.744°E, elev. 1450 m, 2 June 2005, collected by Chang-hai SUN, 1 male.

Distribution. China (An-hui, Jiang-xi).

Rhyacophila quadrifida SUN & YANG 1995

Rhyacophila quadrifida SUN & YANG 1995: 28, fig. 3 (male).

Materials examined. P.R. CHINA: Beijing city, Song-shan Mt National Nature Reserve, small stream beside Da-zhuang-ke village, elev. ~1000 m, 19 June 2005, collected by Xin ZHOU, 1 male.

Distribution. China (Bei-jing, Shaan-xi, Si-chuan, Xin-jiang); Vietnam.

Rhyacophila tetracantha SUN & YANG 1995

Rhyacophila tetracantha SUN & YANG 1995: 30–31, fig. 11 (male).

Materials examined. P.R. CHINA: Si-chuan Province, Bao-xing County, Unnamed tributary of Bao-xing River, Route S210 at 240.3 km marker, 30.652°N, 102.765°E, elev. 1985 m, 27 June 2005, collected by Xin ZHOU and John C. MORSE, 1 male.

Distribution. China (Si-chuan).

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