

Taxonomic review of *Symplecta* (*Symplecta*) Meigen (Diptera: Limoniidae) from China with description of a new species

Yanli WANG^{1*}, Shuo MA^{1*}, Chang LIU¹, Zehui KANG^{1①}, Ding YANG², Xiao ZHANG^{1①}

1. Shandong Engineering Research Center for Environment-Friendly Agricultural Pest Management, College of Plant Health and Medicine, Qingdao Agricultural University, Qingdao, Shandong 266109, China

2. College of Plant Protection, China Agricultural University, Beijing 100193, China

Abstract: The subgenus *Symplecta* (*Symplecta*) Meigen, 1830 is a small group within the genus *Symplecta*. Eighteen species and subspecies are known worldwide, of which two are known to occur in China. Herein, all known Chinese species in this subgenus are reviewed. In addition, a species from Xizang, China, *Symplecta* (*S.*) *xizangensis* Ma, Wang & Kang **sp. nov.**, is described and illustrated as new to science. A key to all Chinese species in this subgenus is presented.

Key words: *Symplecta*; taxonomy; key

中国合大蚊亚属分类记述并记一新种（双翅目：沼大蚊科）

王彦力^{1*}, 马烁^{1*}, 刘畅¹, 康泽辉^{1①}, 杨定², 张晓^{1①}

1. 青岛农业大学植物医学学院, 山东省植物病虫害综合防控重点实验室, 山东 青岛 266109; 2. 中国农业大学植物保护学院, 北京 100193

摘要: 合大蚊亚属 *Symplecta* (*Symplecta*) Meigen, 1830 是合大蚊属中的较小类群, 世界已知18种及亚种, 此前中国记录2种。本研究对该亚属中国已知种类进行了分类记述, 并描述了采自西藏的1新种——西藏合大蚊 *S.* (*S.*) *xizangensis* Ma, Wang & Kang **sp. nov.**。本研究还提供了合大蚊亚属所有中国种类的分种检索表。

关键词: 合大蚊属; 分类; 检索表

Introduction

Symplecta Meigen, 1830 is a cosmopolitan genus in the family Limoniidae (Diptera) with 88 extant species and subspecies from the Nearctic (35 taxa), Palearctic (34 taxa), Oriental (15 taxa), Afrotropic (nine taxa), Neotropic (six taxa) and Australasian (two taxa) regions (Oosterbroek 2024). Members of this genus usually inhabit wet, open habitats such as margins of lakes, sandy rivers, marshy meadows, marshes and fens, with some species

Accepted 5 March 2025. Published online 11 September 2025.

① Corresponding authors, E-mails: kangzehui1987@163.com; xzhang_cn@163.com

* These authors contributed equally to this work.

preferring soft seaside cliffs (Muñiz Guinea *et al.* 2014; Olsen *et al.* 2018). In the past three decades, taxonomic studies on this genus in the world have mainly focused on European species (Howe & Howe 2000; Chandler & Crossley 2003; Howe *et al.* 2006; Krzemiński & Arillo 2008; Bratton 2013; Kramer 2013; Olsen *et al.* 2018), with a few reports on species in Canada and Kazakhstan (Starý & Brodo 2009; Devyatkov 2023).

This genus is further subdivided into four subgenera, among which the nominotypical subgenus can be distinguished by the wing with a cross-vein in cell r_3 and A_1 being more or less sinuous (Starý & Brodo 2009). Eighteen species and subspecies of *S.* (*Symplecta*) Meigen, 1830 are known worldwide, of which two occur in China (Ren *et al.* 2020; Oosterbroek 2024). In this study, we provide detailed redescriptions and illustrations for both males and females of the two known species. One species from Xizang, *S.* (*S.*) *xizangensis* Ma, Wang & Kang **sp. nov.**, is described and illustrated as new to science. In addition, a key to all Chinese species of this subgenus is given.

Material and methods

Specimens for this study were collected from several locations in China from 2010 to 2023. The type specimens of the new species are deposited in the Entomological Museum of China Agricultural University, Beijing, China. Other specimens are deposited in the Entomological Museum of Qingdao Agricultural University, Shandong, China. The examination of the body coloration details was made by immersing the sample in 75% ethanol. The preparation of the male hypopygium was made by soaking the apical portion of the abdomen in warm lactic acid for 0.5–1.0 hours. Observations and illustrations were made using a ZEISS Stemi 2000-C stereomicroscope. Photographs were taken by a Canon EOS 90D digital camera, equipped with a Canon EF100 mm f/2.8L Macro IS USM lens.

The description of morphology in this study is mainly based on Cumming & Wood (2017) and de Jong (2017). The following abbreviations in figures are used: aa — aedeagus apodeme; aed — aedeagus; cerc — cercus; goncx — gonocoxite; hyp vlv — hypogynial valve; i gonst — inner gonostylus; interb — interbase; o gonst — outer gonostylus; pm — paramere; st — sternite; tg — tergite.

Taxonomy

Key to species of the subgenus *Symplecta* from China

1. Basal section of M_3 more than three times length of m-m (Fig. 4D); outer gonostylus not bifid (Figs 5A, 5B, 5E), tip of interbase serrated (Figs 5C, 5D) *S.* (*Symplecta*) *hybrida* (Meigen)
- Basal section of M_3 less than twice length of m-m; outer gonostylus bifid; tip of interbase acute 2
2. Wing with tip of A_1 short and bent almost at a right angle (Fig. 1D); outer gonostylus with outer spine stouter than inner spine, inner spine with tip hooked (Figs 2A, 2B, 2E); interbase bifid at subtip (Figs 2C, 2D); aedeagus with a slender and long rostral prolongation at subtip (Fig. 2D).....
..... *S.* (*Symplecta*) *chosenensis* (Alexander)
- Wing with tip of A_1 curved in an arch shape (Fig. 8D); outer gonostylus with outer spine more slender than inner spine, inner spine with tip rounded (Figs 9A, 9B, 9E); interbase not bifid at subtip (Figs 9C, 9D);

aedeagus without rostral prolongation at subtip (Fig. 9D)
 *S. (Symplecta) xizangensis* Ma, Wang & Kang **sp. nov.**

1. *Symplecta (Symplecta) chosenensis* (Alexander, 1940) (Figs 1–3)

Erioptera (Symplecta) chosenensis Alexander, 1940: 67. Type locality: North Korea: Seren Mountain.

Helobia mongolica Lackschewitz, 1964: 718. Type locality: Russia.

Description. Male. Body length 5.1–5.6 mm, wing length 5.0–5.4 mm, haltere length 0.8–1.0 mm (Table 1).

Table 1. Lengths (in mm) in *Symplecta (Symplecta) chosenensis* (Alexander, 1940), males ($N = 5$)

	Body lengths	Wing lengths	Haltere lengths
N1	5.1	5.0	0.8
N2	5.1	5.0	0.9
N3	5.2	5.0	0.9
N4	5.3	5.1	1.0
N5	5.6	5.4	1.0
Average lengths	5.3	5.1	0.9
Medians	5.2	5.0	0.9
Sample standard deviations	0.2	0.2	0.1
Ranges	0.5	0.4	0.2

Head (Fig. 1B) dark brown. Hairs on head dark brown. Antenna dark brown. Scape cylindrical, two times as long as wide. Pedicel conical. Flagellomeres 1–3 oval, tip flat; flagellomeres 4–14 long-oval, tapering apically. Hairs on antenna dark brown. Hairs on each flagellomere shorter than corresponding flagellomere. Rostrum yellowish-brown with brown hairs. Palpus dark brown with dark brown hairs.

Thorax (Fig. 1C). Pronotum yellow with middle area brown. Prescutum and presutural scutum brown with lateral margin yellow, middle area with three broad dark brown stripes and median stripe longest. Postsutural scutum yellowish-brown with middle area dark brown anteriorly, each lobe with two dark brown spots and posterior margin yellow. Scutellum yellow with middle area brown anteriorly. Mediotergite brown, gradually blackened posteriorly, bases of both sides yellow. Pleuron (Fig. 1A) brown with one yellow stripe from cervical region to mediotergite, and a yellow region at base of wing; anterior part of this stripe darker. Hairs on thorax dark brown. Mid legs conspicuously shorter than fore and hind legs. Coxae yellow with base darker; trochanters yellow; femora yellowish-brown with wide dark brown tip; tibiae yellowish-brown with base and tip darker; tarsi dark brown with terminal segments darker. Hairs on legs brown. Wing (Fig. 1D) pale brown with brown pattern as follows: tip of Sc, R₁ and R₃; cross-vein sc-r, cord, m-m, m-cu and cross-vein in cell r₃; base of Rs, M₃ and cell m; middle and tip of A₁, and anal lobe. Veins brown, cross-vein darker in patterned areas. Venation: Sc ending close to R₂; sc-r conspicuously beyond base of Rs, opposite about 1/3 of Rs; basal section of M₃ about 1.4–1.8 times length of m-m; m-cu oblique, slightly curved, before fork of M, distance being 0.6–0.8 times its own length; tip 1/3 of A₁ slightly curved downwards and gradually parallel to wing margin, tip suddenly curved downwards, angle between tip of A₁ and wing margin approximately 90 degrees. Haltere pale yellow with base of knob pale brown.

Abdomen (Fig. 1A). Segments 1–5 brown with caudal 1/4 and lateral regions yellowish-brown, segments 6–7 brown with lateral regions yellow, segment 8 reduced. Segment 9 mostly yellowish-brown, tergite 9 with two brown stripes at middle. Hairs on abdomen brown.

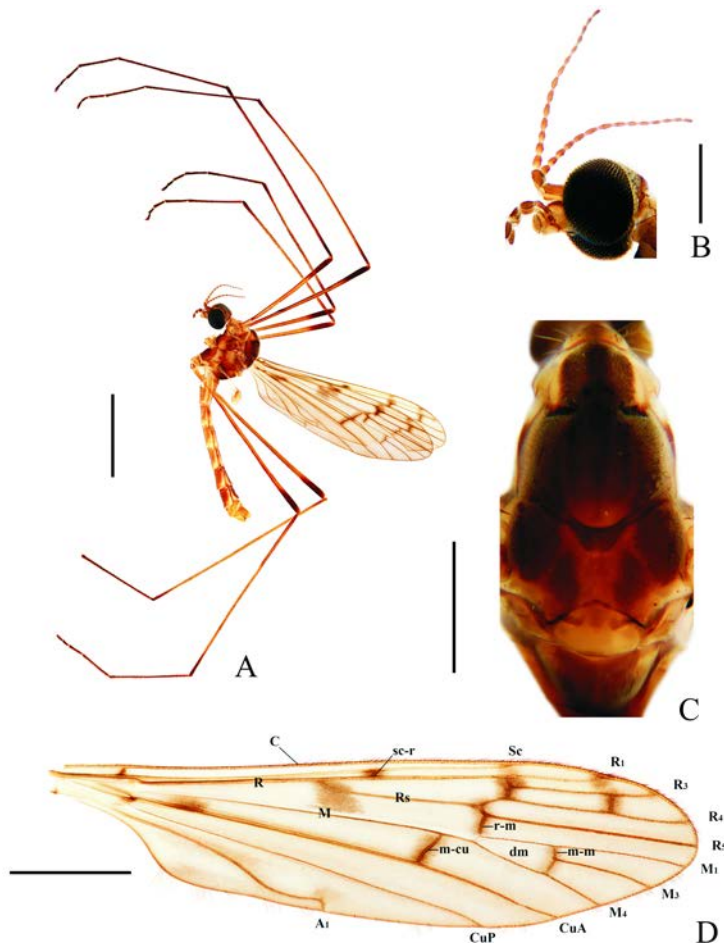


Figure 1. *Symplecta* (*Symplecta*) *chosenensis* (Alexander, 1940). A. Habitus of male, lateral view; B. Head, lateral view; C. Thorax, dorsal view; D. Male wing. Scale bars = 2.0 mm (A); 0.5 mm (B, C); 1.0 mm (D).

Hypopygium (Fig. 2) yellowish-brown. Tergite 9 (Fig. 2A) trapeziform, divided intermediately, posterior margin with a broad inverted U-shaped bulge; tergite 9 with pale brown hairs. Gonocoxite (Figs 2A, 2B) cylindrical, inner side with dense long pale brown hairs. Outer gonostylus (Figs 2A, 2B, 2E) with tip black, sclerotized and bifid; outer spine slightly longer and stouter than inner spine; outer spine straight, tapering apically, inner spine with tip hooked. Inner gonostylus (Figs 2A, 2B, 2E) finger-like with tip round, bent inward and ventrally. Interbase (Figs 2C, 2D) with tip black, sclerotized and acute; subtip bifid. Paramere (Figs 2C, 2D) pale, distally connecting to base of interbase. Aedeagus apodeme (Figs 2C, 2D) yellow with base and tip darker, elongated, widened at base. Aedeagus (Figs 2C, 2D) bifid, sheet-like, subtip of aedeagus with a slender and long rostral prolongation ventrally.

Female. Body length 3.9–5.7 mm, wing length 4.7–5.9 mm, haltere length 0.6–0.8 mm

(Table 2). Generally lighter in color than males. Ovipositor (Fig. 3) with tergite 9 brown, caudal 1/3 yellowish-brown. Tergite 10 yellowish-brown, posterior margin with U-shaped emargination. Cercus yellowish-brown, tip raised and acute. Hypogynial valve yellow, nearly straight and tapering apically, tip reaching approximately 1/2 of cercus.

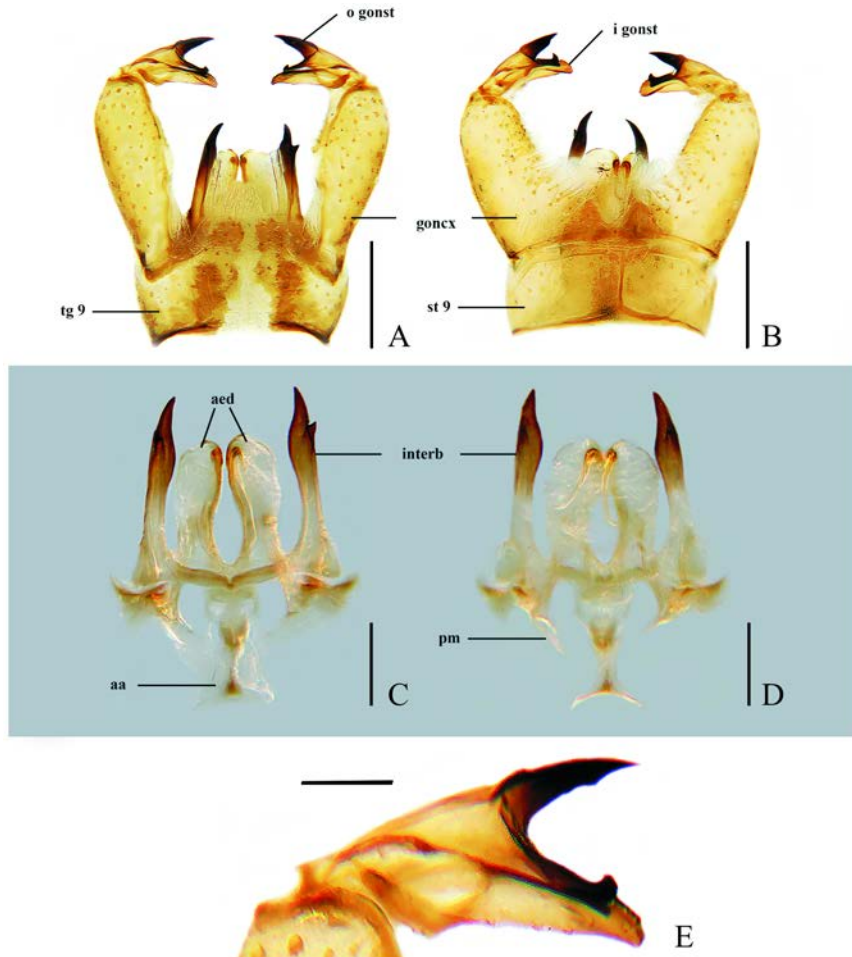


Figure 2. *Symplecta (Symplecta) chosenensis* (Alexander, 1940). A, B. Male hypopygium, dorsal and ventral views; C, D. Aedeagal complex, dorsal and lateral views; E. Gonostyli, dorsal view. Scale bars = 0.2 mm (A, B); 0.1 mm (C, D); 0.05 mm (E).

Table 2. Lengths (in mm) in *Symplecta (Symplecta) chosenensis* (Alexander, 1940), females (N = 2)

	Body lengths	Wing lengths	Haltere lengths
N1	3.9	4.7	0.6
N2	5.7	5.9	0.8
Average lengths	4.8	5.3	0.7
Medians	4.8	5.3	0.7
Sample standard deviations	1.3	0.9	0.1
Ranges	1.8	1.2	0.2

Specimens examined. 1♂, **China**, Beijing, Mentougou District, Xiaolongmen National Forest Park, 1,300 m, 23-VI-2012, Xuankun LI, Light trap; 1♂1♀, **China**, Beijing, Yanqing District, Mount Songshan, 27-VI-2012, Zhenhua ZHANG; 1♂1♀, **China**, Gansu, Ganzhou District, Zhangye Forest Park, 1,530 m, 05-VII-2010, Yajun ZHU; 1♂, **China**, Shanxi, Qinshui County, Zhangma Village, 21-VII-2012, Zhenhua ZHANG; 1♂, **China**, Shaanxi, Zhouzhi County, Laoxiancheng, 1,808 m, 12-VIII-2013, Xuankun LI.

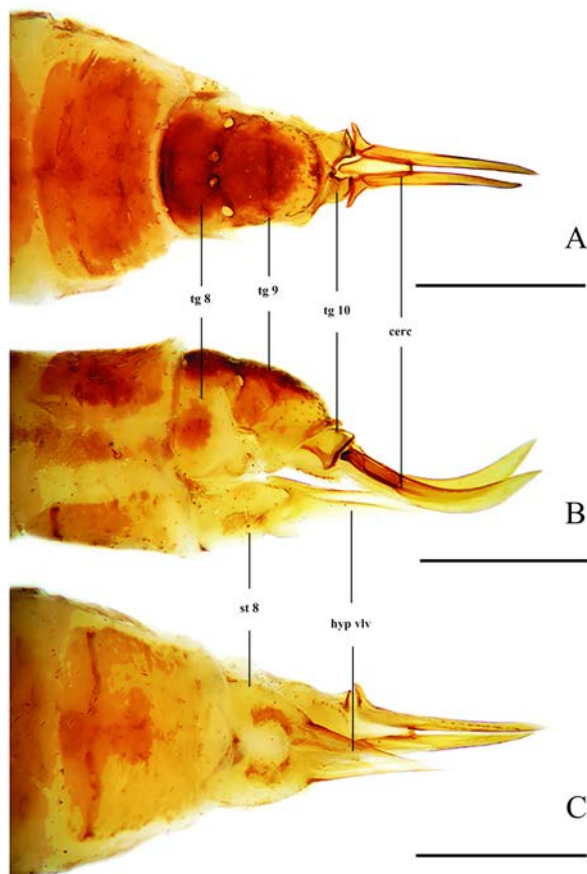


Figure 3. *Symplecta* (*Symplecta*) *chosenensis* (Alexander, 1940). A–C. Female ovipositor, dorsal, lateral and ventral views. Scale bars = 0.5 mm.

Distribution. China (Inner Mongolia, Beijing, Shanxi, Shaanxi, Gansu, Yunnan); Czech Republic; Finland; Great Britain; Lithuania; Norway; Poland; Romania; Slovakia; Russia; Kazakhstan; Uzbekistan; Kyrgyzstan; Mongolia; North Korea (Zhang *et al.* 2017; Oosterbroek 2024).

Diagnosis. Pleuron brown with one yellow stripe from cervical region to mediotergite, and a yellow region at base of wing; anterior part of this stripe darker. Wing pale brown with brown pattern as follows: tip of Sc, R₁ and R₃; cross-vein sc-r, cord, m-m, m-cu and cross-vein in cell r₃; base of Rs, M₃ and cell m; middle and tip of A₁, and anal lobe. Venation: tip 1/3 of A₁ slightly curved downwards and gradually parallel to wing margin, tip suddenly

curved downwards, angle between tip of A_1 and wing margin approximately 90 degrees. Male hypopygium: outer gonostylus with tip black, sclerotized and bifid; outer spine slightly longer and stouter than inner spine; outer spine straight, tapering apically, inner spine with tip hooked. Inner gonostylus finger-like with tip round, bent inward and ventrally. Interbase with tip black, sclerotized and acute, bifid subapically. Aedeagus bifid, sheet-like, subtip of aedeagus with a rostral prolongation ventrally.

Remarks. This species is widespread in the Palearctic and Oriental regions. In this study, this species is recorded in Shanxi, China for the first time.

2. *Symplecta (Symplecta) hybrida* (Meigen, 1804) (Figs 4–7)

Limonia hybrida Meigen, 1804: 57. Type locality: Not given (near Stolberg).

Limnobia punctipennis Meigen, 1818: 147. Type locality: Not given.

Description. Male. Body length 5.4–5.9 mm, wing length 6.0–6.4 mm, haltere length 0.8–1.1 mm (Table 3).

Table 3. Lengths (in mm) in *Symplecta (Symplecta) hybrida* (Meigen, 1804), males ($N = 3$)

	Body lengths	Wing lengths	Haltere lengths
N1	5.6	6.0	0.8
N2	5.4	6.3	1.0
N3	5.9	6.4	1.1
Average lengths	5.6	6.2	1.0
Medians	5.6	6.3	1.0
Sample standard deviations	0.3	0.2	0.2
Ranges	0.5	0.4	0.3

Head (Fig. 4B) brown. Hairs on head brown. Antenna brown. Scape cylindrical, two times as long as wide. Pedicel conical. Flagellomeres 1–7 oval, tip flat; flagellomeres 8–14 long-oval, tapering apically. Hairs on antenna dark brown. Hairs on each flagellomere shorter than corresponding flagellomere. Rostrum brown with dark brown setae. Palpus brown with dark brown hairs.

Thorax (Fig. 4C). Pronotum yellow with middle area brown. Prescutum and presutural scutum brown with lateral margin yellow, middle area with three broad dark brown stripes and median stripe longest. Postsutural scutum yellow with middle area dark brown anteriorly, each lobe with two fused dark brown spots and posterior margin yellow. Scutellum yellowish-brown with middle area brown anteriorly. Mediotergite brown, gradually blackened posteriorly, bases of both sides yellow. Pleuron (Fig. 4A) brown with one pale stripe from cervical region to mediotergite, and a large yellow region at base of wing; anterior part of this stripe darker. Hairs on thorax brown. Mid legs conspicuously shorter than fore and hind legs. Coxae yellowish-brown; trochanters pale; femora yellowish-brown with wide dark brown tip; tibiae brown with base and tip darker; tarsi dark brown with terminal segments darker. Hairs on legs brown. Wing (Fig. 4D) pale brown with brown pattern as follows: tip of Sc , R_1 and R_3 ; cross-vein $sc-r$, cord, $m-m$, $m-cu$ and cross-vein in cell r_3 ; base of Rs , M_3 and cell m ; base, middle and tip of A_1 , and anal lobe. Veins brown, cross-vein darker in patterned areas. Venation: Sc ending beyond R_2 ; $sc-r$ conspicuously beyond base of Rs , opposite about 1/5 of Rs ; basal section of M_3 about 3–5 times length of $m-m$; $m-cu$ conspicuously oblique, slightly curved,

before fork of M, distance being as long as its own length; tip 1/2 of A₁ strongly curved downwards and gradually strongly curved upward, tip curved downwards, angle between tip of A₁ and wing margin approximately 60 degrees. Haltere pale with base of knob brown.

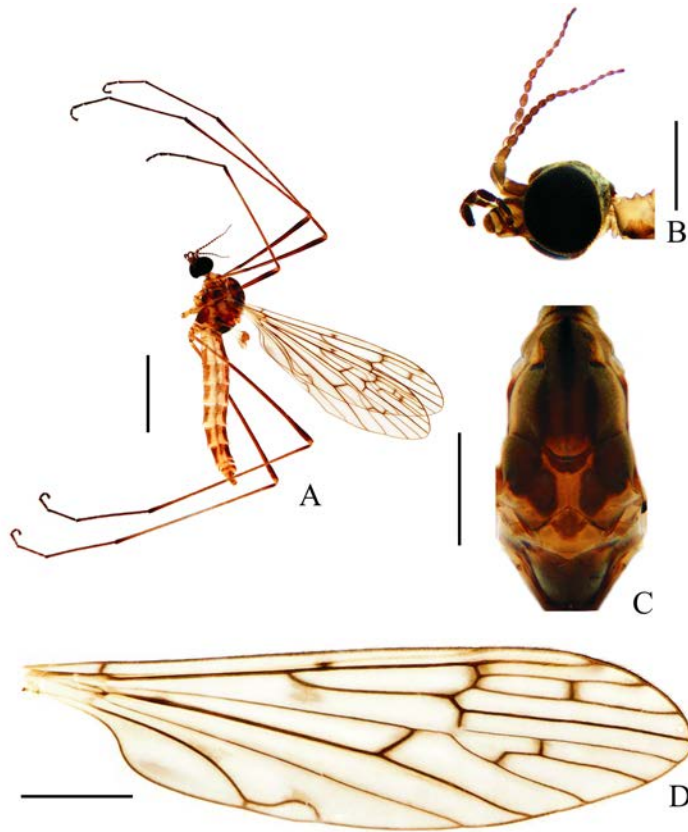


Figure 4. *Symplecta* (*Symplecta*) *hybrida* (Meigen, 1804). A. Habitus of male, lateral view; B. Head, lateral view; C. Thorax, dorsal view; D. Male wing. Scale bars = 2.0 mm (A); 0.5 mm (B, C); 1.0 mm (D).

Abdomen (Fig. 4A). Segments 1–7 dark brown with caudal and lateral regions yellowish-brown, segment 8 reduced. Segment 9 mostly brown with posterior region yellow. Hairs on abdomen brown.

Hypopygium (Fig. 5) brown. Tergite 9 (Fig. 5A) trapeziform, divided intermediately, posterior margin with a broad U-shaped emargination; tergite 9 with pale brown hairs. Gonocoxite (Figs 5A, 5B) cylindrical, inner side with dense long pale brown hairs. Outer gonostylus (Figs 5A, 5B, 5E) with apical half sclerotized and curved, brush-like, tip stout and flat. Inner gonostylus (Figs 5A, 5B, 5E) conical, bent inward and dorsally, tip acute. Interbase (Figs 5C, 5D) sclerotized and brush-like apically, tip with 5–6 serrations; base of interbase with a short outer lobe and a long inner lobe. Paramere (Figs 5C, 5D) slightly sclerotized, distally connecting to base of interbase. Aedeagus apodeme (Figs 5C, 5D) brown with base darker, elongated. Aedeagus (Figs 5C, 5D) bifid, triangular.

Female. Body length 5.8–6.0 mm, wing length 6.8–7.6 mm, haltere length 1.0 mm (Table

4). Generally similar to male by body coloration. Ovipositor (Fig. 6) with tergite 9 brown. Tergite 10 yellow, posterior margin with U-shaped emargination. Cercus yellow apex darker, caudal 1/2 widened and apex blunt. Hypogynial valve yellow, reaching approximately 2/3 of cercus.

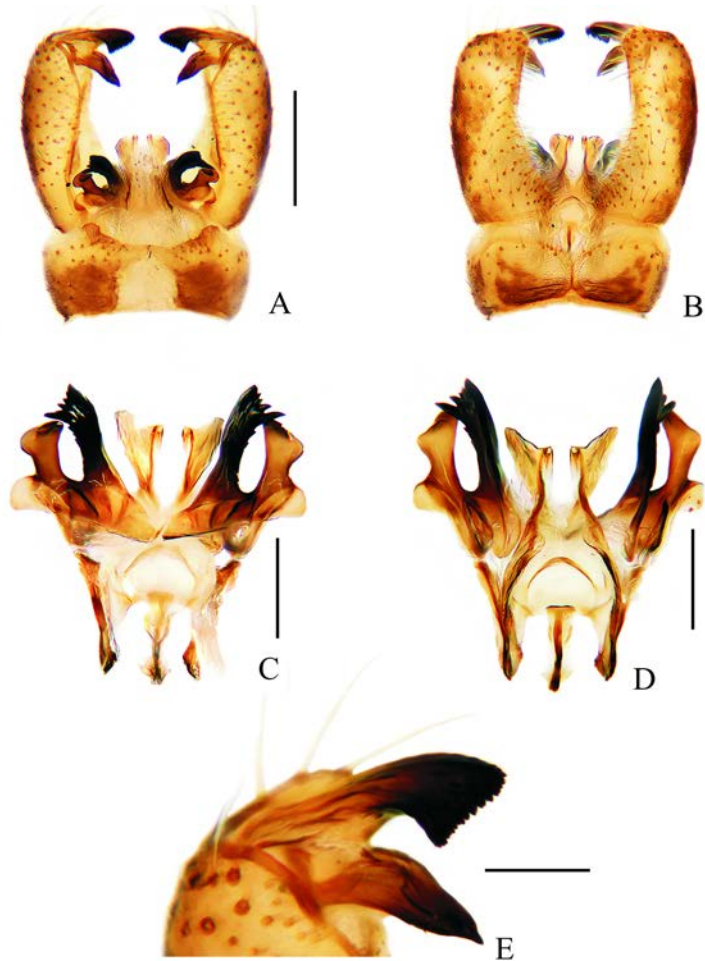


Figure 5. *Symplecta (Symplecta) hybrida* (Meigen, 1804). A, B. Male hypopygium, dorsal and ventral views; C, D. Aedeagal complex, dorsal and ventral views; E. Gonostyli, dorsal view. Scale bars = 0.2 mm (A, B); 0.1 mm (C, D); 0.05 mm (E).

Table 4. Lengths (in mm) in *Symplecta (Symplecta) hybrida* (Meigen, 1804), females ($N = 3$)

	Body lengths	Wing lengths	Haltere lengths
N1	5.8	6.8	1.0
N2	6.0	7.5	1.0
N3	6.0	7.6	1.0
Average lengths	5.9	7.3	1.0
Medians	6.0	7.5	1.0
Sample standard deviations	0.1	0.4	0
Ranges	0.2	0.8	0

Specimens examined. 2♂1♀, **China**, Shandong, Lingcheng District, Qianli Village, 10-III-2023, Yanli WANG, Malaise trap; 1♂1♀, **China**, Shandong, Lingcheng District, Qianli Village, 17-III-2023, Yanli WANG, Malaise trap; 1♀, **China**, Shandong, Lingcheng District, Qianli Village, 24-III-2023, Yanli WANG, Malaise trap.



Figure 6. *Symplecta* (*Symplecta*) *hybrida* (Meigen, 1804). A–C. Female ovipositor, dorsal, lateral and ventral views. Scale bars = 0.5 mm.

Distribution. China (Inner Mongolia, Shandong, Sichuan, Xizang); Canada; USA; Greenland; Austria; Belarus; Belgium; Bosnia-Herzegovina; Bulgaria; Croatia; Czech Republic; Denmark; Finland; France; Germany; Great Britain; Greece; Hungary; Iceland; Ireland; Italy; Latvia; Lithuania; Malta; Montenegro; Netherlands; North Macedonia; Norway; Poland; Portugal; Romania; Serbia; Slovakia; Slovenia; Spain; Sweden; Switzerland; Turkey; Ukraine; Russia; North Caucasus; Morocco; Algeria; Egypt; Georgia; Armenia; Azerbaijan; Turkey; Lebanon; Israel; Iran; United Arab Emirates; Russia; Kazakhstan; Uzbekistan; Turkmenistan; Tajikistan; Kyrgyzstan; Afghanistan; Mongolia; North Korea; Japan; India; Nepal; Pakistan (Zhang *et al.* 2016; Ren *et al.* 2020; Oosterbroek 2024).

Diagnosis. Pleuron brown with one pale stripe from cervical region to mediotergite, and a large yellow region at base of wing. Wing pale brown with brown pattern as follows: tip of Sc, R₁ and R₃; cross-vein sc-r, cord, m-m, m-cu and cross-vein in cell r₃; base of Rs, M₃ and cell m; base, middle and tip of A₁, and anal lobe. Venation: tip 1/2 of A₁ strongly curved downwards and gradually strongly curved upward, tip curved downwards, angle between tip of A₁ and wing margin approximately 60 degrees. Male hypopygium: outer gonostylus with

apical half sclerotized and curved, brush-like, tip stout and flat. Inner gonostylus conical, bent inward and dorsally, tip acute. Interbase sclerotized and brush-like apically, tip with 5–6 serrations; base of interbase with a short outer lobe and a long inner lobe. Aedeagus bifid, triangular.

Remarks. This species is widespread in the Nearctic, Palearctic and Oriental regions. In this study, this species is recorded in Shandong, China for the first time. Specifically, specimens of this species in this study were collected from wheat fields (Fig. 7).



Figure 7. Sampling site and habitat of *Symplecta (Symplecta) hybrida* (Meigen, 1804) in Qianli Village, Lingcheng District, Shandong, China; collected using a Malaise trap.

3. *Symplecta (Symplecta) xizangensis* Ma, Wang & Kang sp. nov. (Figs 8–10)

Description. Male. Body length 5.3–7.0 mm, wing length 6.3–7.6 mm, haltere length 0.9–1.0 mm (Table 5).

Table 5. Lengths (in mm) in *Symplecta (Symplecta) xizangensis* Ma, Wang & Kang sp. nov., males ($N = 4$)

	Body lengths	Wing lengths	Haltere lengths
N1	5.3	6.3	0.9
N2	6.2	6.9	0.9
N3	5.6	7.3	1.0
N4	7.0	7.6	1.0
Average lengths	6.0	7.0	1.0
Medians	5.9	7.1	1.0
Sample standard deviations	0.8	0.6	0.1
Ranges	1.7	1.3	0.1

Head (Fig. 8B) brown. Hairs on head brown. Antenna brown. Scape cylindrical, two times as long as wide. Pedicel conical. Flagellomeres cylindrical, tapering apically. Hairs on antenna brown. Hairs on each flagellomere shorter than corresponding flagellomere. Rostrum pale with brown hairs. Palpus dark brown with dark brown hairs.

Thorax (Fig. 8C). Pronotum pale with middle area brown. Prescutum and presutural scutum brown with lateral margin yellow, middle area with three broad dark brown stripes

and median stripe longest. Postsutural scutum brown with middle area dark brown anteriorly, each lobe with one dark brown spot and one brown spot. Scutellum yellow with middle area brown anteriorly. Mediotergite brown, gradually blackened posteriorly, bases of both sides yellow. Pleuron (Fig. 8A) brown with one yellow stripe from cervical region to mediotergite, and one long yellow stripe at base of wing. Hairs on thorax brown. Mid legs conspicuously shorter than fore and hind legs. Coxae yellowish-brown with base darker; trochanters yellow; femora and tibiae brown; tarsi brown with terminal segments darker. Hairs on legs brown. Wing (Fig. 8D) pale brown with brown pattern as follows: tip of Sc, R₁, R₃ and R₄; cross-vein sc-r, cord, m-m, m-cu and cross-vein in cell r₃; base of Sc, Rs, M₃ and cell m; middle and tip of A₁, and anal lobe; areas along R₅, M₃, M₄ and CuA. Veins brown, cross-vein darker in patterned areas. Venation: Sc ending beyond R₂; sc-r conspicuously beyond base of Rs, opposite about 1/4 of Rs; basal section of M₃ about 1.5–2.0 times length of m-m; m-cu slightly oblique and curved, before fork of M, distance being 0.7–0.9 times of its own length; tip 1/2 of A₁ strongly curved downwards and gradually parallel to wing margin, then curved upward and tip curved downwards, angle between tip of A₁ and wing margin approximately 30 degrees. Haltere pale yellow with base of knob pale brown.

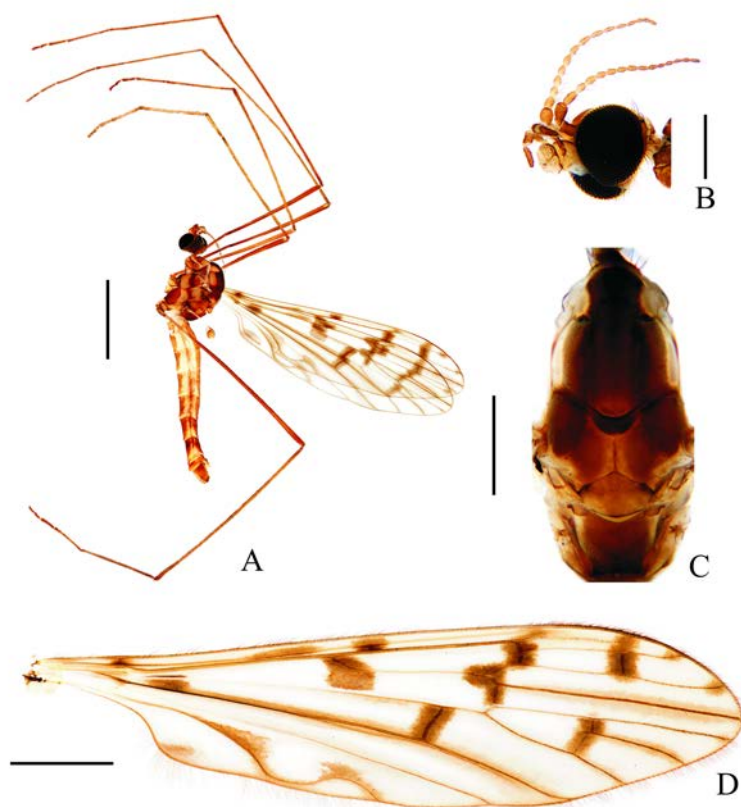


Figure 8. *Symplecta* (*Symplecta*) *xizangensis* Ma, Wang & Kang **sp. nov.** A. Habitus of male, lateral view; B. Head, lateral view; C. Thorax, dorsal view; D. Male wing. Scale bars = 2.0 mm (A); 0.5 mm (B, C); 1.0 mm (D).

Abdomen (Fig. 8A). Segments 1–7 brown with lateral regions pale, segment 8 reduced. Segment 9 brown. Hairs on abdomen pale brown.

Hypopygium (Fig. 9) brown. Tergite 9 (Fig. 9A) trapeziform, divided intermediately, posterior margin with a broad bulge; tergite 9 with pale brown hairs. Gonocoxite (Figs 9A, 9B) cylindrical, base with a short finger-like lobe, inner side with dense long pale brown hairs. Outer gonostylus (Figs 9A, 9B, 9E) with tip black, sclerotized and bifid; outer spine obviously longer and more slender than inner spine; outer spine straight, tapering apically, inner spine with tip round. Inner gonostylus (Figs 9A, 9B, 9E) finger-like with tip round. Interbase (Figs 9C, 9D) with tip black, sclerotized and acute apically, middle with some small serrations laterally, base with a long conical lobe. Paramere (Figs 9C, 9D) slightly sclerotized, distally connecting to base of interbase. Aedeagus apodeme (Figs 9C, 9D) short, widened at base. Aedeagus (Figs 9C, 9D) bifid, finger-like, widened at base.

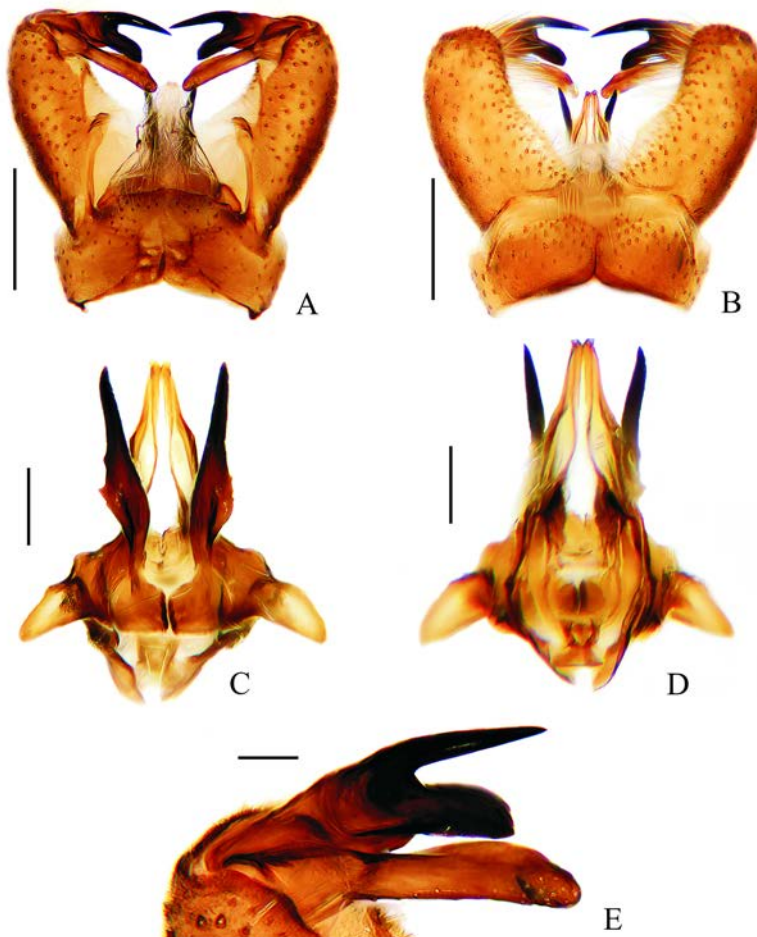


Figure 9. *Symplecta (Symplecta) xizangensis* Ma, Wang & Kang **sp. nov.** A, B. Male hypopygium, dorsal and lateral views; C, D. Aedeagal complex, dorsal and ventral views; E. Gonostyli, dorsal view. Scale bars = 0.2 mm (A, B); 0.1 mm (C, D); 0.05 mm (E).

Female. Body length 6.4–7.5 mm, wing length 8.0–8.8 mm, haltere length 1.1–1.2 mm (Table 6). Generally similar to male by body coloration. Ovipositor (Fig. 10) with tergite 9 dark brown. Tergite 10 brown, posterior margin with U-shaped emargination. Cercus yellowish-brown, apex blunt. Hypogynial valve yellow, tapering apically, tip reaching approximately 1/2 of cercus.

Holotype. ♂, **China**, Xizang, Zayü County, Liudaoban, 4,056 m, 08-VII-2013, Xiaoyan LIU. **Paratypes.** 2♂1♀, same data as holotype; 1♂, **China**, Xizang, Bayi District, Lulang Town, Namai Village, 3,200 m, 04-VIII-2012, Xuankun LI, Light trap; 1♀, **China**, Xizang, Bayi District, Lulang Town, Namai Village, 3,200 m, 05-VIII-2012, Xuankun LI, Light trap.

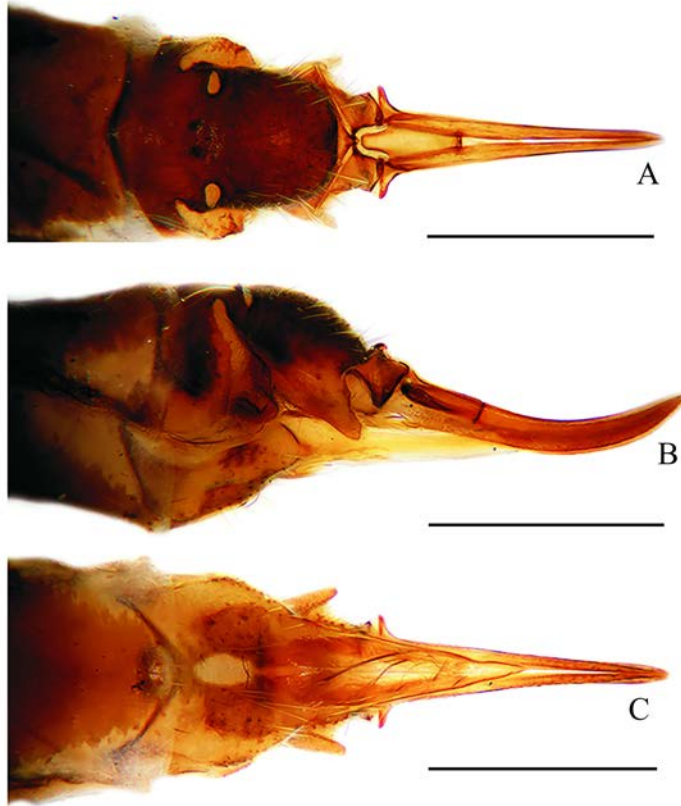


Figure 10. *Symplecta* (*Symplecta*) *xizangensis* Ma, Wang & Kang **sp. nov.** A–C. Female ovipositor, dorsal, lateral and ventral views. Scale bars = 0.5 mm.

Table 6. Lengths (in mm) in *Symplecta* (*Symplecta*) *xizangensis* Ma, Wang & Kang **sp. nov.**, females ($N = 2$)

	Body lengths	Wing lengths	Haltere lengths
N1	6.4	8.0	1.1
N2	7.5	8.8	1.2
Average lengths	7.0	8.4	1.2
Medians	7.0	8.4	1.2
Sample standard deviations	0.8	0.6	0.1
Ranges	1.1	0.8	0.1

Etymology. The specific epithet *xizangensis* (adjective) refers to the type locality Xizang.

Diagnosis. Pleuron brown with one yellow stripe from cervical region to mediotergite, and one long yellow stripe at base of wing. Wing pale brown with brown pattern as follows: tip of Sc, R₁, R₃ and R₄; cross-vein sc-r, cord, m-m, m-cu and cross-vein in cell r₃; base of Sc, Rs, M₃ and cell m; middle and tip of A₁, and anal lobe; areas along R₅, M₃, M₄ and CuA. Venation: tip 1/2 of A₁ strongly curved downwards and gradually parallel to wing margin, then curved upward and tip curved downwards, angle between tip of A₁ and wing margin approximately 30 degrees. Male hypopygium: outer gonostylus with tip black, sclerotized and bifid; outer spine obviously longer and slender than inner spine; outer spine straight, tapering apically, inner spine with tip round. Inner gonostylus finger-like with tip round. Interbase with tip black, sclerotized and acute apically, middle with some small serrations laterally, base with a long conical lobe. Aedeagus bifid, finger-like, widened at base.

Remarks. This new species can be easily distinguished from all other Chinese *Symplecta* crane flies by the darker spots of the wing. In addition, the details of their male hypopygium are also significantly different. This new species is similar to *S. (S.) tripilata* (Alexander, 1957), widely spread in the Palearctic and Oriental regions, in having similar wing venation but can be easily distinguished from the latter by the brown antenna, the wing with darkened areas along R₅, M₃, M₄ and CuA, the wing with tip of A₁ curved in an arch shape, the bifid outer gonostylus without acute spines and the long interbase. In *S. (S.) tripilata*, the antenna is black, the wing does not have darkened areas along around R₅, M₃, M₄ or CuA, the tip of A₁ of wing is short and bent almost at a right angle, the outer gonostylus has three acute spines at and before apex, and the interbase is short and broad.

Acknowledgements

We are very grateful to Xiaoyan LIU, Xuankun LI, Zhenhua ZHANG and Yajun ZHU for collecting the specimens. This work was supported by the Shandong Provincial Natural Science Foundation, China (ZR2018LC006), the High-level Talents Funds of Qingdao Agricultural University, China (663-1119008 and 663-1118015), the National Natural Science Foundation of China (32100356; 32470481) and the National Animal Collection Resource Center, China.

References

- Alexander CP. 1940. New or little-known Tipulidae from eastern Asia (Diptera). XLI. *Philippine Journal of Science*, 71: 39–76.
- Alexander CP. 1957. New or little-known Tipulidae (Diptera). CIV. Oriental-Australasian species. *Annals and Magazine of Natural History* (12), 10: 287–304.
- Bratton JH. 2013. An aberrant *Symplecta stictica* (Limoniidae). *Bulletin of the Dipterists Forum* 75, *Cranefly News*. Dipterists Forum Cranefly Recording Scheme Newsletter, 25: 8.
- Chandler PJ & Crossley R. 2003. *Symplecta chosenensis* (Alexander, 1940) (Diptera, Limoniidae) new to Britain, with comments on the status of *S. scotica* (Edwards, 1938). *Dipterists Digest* (2nd series), 10: 49–54.

- Cumming JM & Wood DM. 2017. Adult morphology and terminology. In: Kirk-Spriggs AH & Sinclair BJ (Eds.), *Manual of Afrotropical Diptera. Vol. 1.* South African National Biodiversity Institute, Pretoria, South Africa, pp. 89–133.
- de Jong H. 2017. Limoniidae and Tipulidae (Crane Flies). In: Kirk-Spriggs AH & Sinclair BJ. (Eds.), *Manual of Afrotropical Diptera. Vol. 2.* South African National Biodiversity Institute, Pretoria, South Africa, pp. 427–477.
- Devyatkov VI. 2023. *Symplecta* (*Psiloconopa*) *kazakhstanica* sp. n., a new species of Limoniidae (Diptera) from East Kazakhstan. *Trudy Institute Zoology RK*, 2(2): 5–8.
- Howe MA & Howe EA. 2000. Two recent records of the crane fly *Symplecta novaezemplae scotica* (Edwards) (Diptera, Limoniidae), including a first for Wales. *Dipterists Digest* (2nd series), 7: 23.
- Howe MA, Knight GT & Mawdsley TH. 2006. The status of *Symplecta chosenensis* in the UK. *Crane fly Recording Scheme Newsletter*, 13: 3–5.
- Kramer J. 2013. Species notes [on British *Symplecta*]. *Crane fly News*, 25: 6–7.
- Krzemiński W & Arillo A. 2008. A new species, *Symplecta* (*Psiloconopa*) *penalveri* n. sp. (Diptera, Limoniidae) from the Miocene of Spain. *Alavesia*, 2: 211–213.
- Lackschewitz P. 1964. New and little-known palaeartic crane-flies of the family Limoniidae (Diptera, Tipuloidea). *Entomologicheskoe Obozrenie*, 43: 710–733.
- Meigen JW. 1804. *Klassifikation und Beschreibung der europäischen zweiflügeligen Insekten (Diptera Linn.). Erster Band. Abt. I & II.* Reichard, Braunschweig, 314 pp.
- Meigen JW. 1818. *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Vol. 1.* F.W. Forstmann, Aachen, 324 pp.
- Meigen JW. 1830. *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Vol. 6.* Schulz, Hamm, 401 pp.
- Muñiz Guinea F, Mángano MG, Buatois LA, Podeniene V, Gámez Vintaned JA & Mayoral Alfaro E. 2014. Compound biogenic structures resulting from ontogenetic variation: An example from a modern dipteran. *Spanish Journal of Palaeontology*, 29: 83–93.
- Olsen KM, Oosterbroek P, Boumans L & de Jong H. 2018. Forty species of limoniid crane flies new to Norway, with an annotated list of Nordic Pediciidae and Limoniidae, including distributional data (Diptera, Tipuloidea). *Norwegian Journal of Entomology*, 65: 127–174.
- Oosterbroek P. 2024. *Catalogue of the Crane flies of the World (Diptera, Tipuloidea: Pediciidae, Limoniidae, Cylindrotomidae, Tipulidae)*. Available from: <http://ccw.naturalis.nl> (accessed 6 June 2024).
- Ren JL, Zhang X, Wang CK, Li Y, Yang D & Oosterbroek P. 2020. Limoniidae. In: Yang D, Li Z & Liu QF (Eds.), *Species Catalog of China. Vol. 2. Animals, Insecta (V), Diptera (I), Nematocera*. Science Press, Beijing, pp. 427–477.
- Starý J & Brodo F. 2009. Arctic species of the subgenus *Symplecta sensu stricto* (Diptera: Limoniidae). *Canadian Entomologist*, 141: 1–30.
- Zhang X, Kang ZH, Mao M, Li XK, Cameron SL, de Jong H, Wang MQ & Yang D. 2016. Comparative Mt genomics of the Tipuloidea (Diptera: Nematocera: Tipulomorpha) and its implications for the phylogeny of the Tipulomorpha. *PLoS ONE*, 11(6): e0158167.
- Zhang X, Kang ZH, Li Y, Mao M & Yang D. 2017. Limoniidae. In: Yang X, Lian Z & Hua B (Eds.), *Insect Fauna of the Qinling Mountains, 10, Diptera*. World Publishing Corporation, Beijing, pp. 71–77.