



New or little-known Diamesinae (Diptera: Chironomidae) from Oriental China

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Abstract

Morphological description for adult male of a new species *Diamesa qiangi* sp. nov. and redescription for adult males of the little-known species *Linevitshia prima* Makarchenko and *Sasayusurika nigatana* (Tokunaga) of subfamily Diamesinae from the Oriental Region of China are given.

Key words: Diptera, Chironomidae, Diamesinae, *Diamesa*, *Linevitshia*, *Sasayusurika*, new species, Oriental China

Introduction

At present subfamily Diamesinae is represented by 22 genera and more than 216 species, about half of which belonging to the genus *Diamesa* Meigen. Most genera (14) and species (139) of this subfamily are common in the Palearctic Region (Ashe & O'Connor 2009). 28 species of 9 genera were registered in the subfamily Diamesinae from China: *Boreoheptagyia* Brundin (2 species), *Diamesa* Meigen (13 species), *Lappodiamesa* Serra-Tosio (2 species), *Linevitshia* Makarchenko (1 species), *Pagastia* Oliver (3 species), *Potthastia* Kieffer (2 species), *Pseudodiamesa* (2 species), *Sympotthastia* Pagast (2 species), *Syndiamesa* Kieffer (1 species) (Wang 2000; Ashe & O'Connor 2009; Liu *et al.* 2016; Makarchenko & Wang 2017).

Below we give a description of a new species *Diamesa qiangi* sp. nov. and a redescription of the little-known species *Linevitshia prima* Makarchenko and *Sasayusurika nigatana* (Tokunaga) of Diamesinae from the Oriental Region of China.

Material and methods

The material was preserved in 70% ethanol for further study of morphology and slide-mounting in Euparal[®], following the procedure outlined by Sæther (1969). The terminology follows Hansen & Cook (1976) and Sæther (1980). The photographs were taken using Olympus BX 53 and Axio Lab. A1 (Karl Zeiss) microscopes.

Holotype and paratypes of a new species and all other used material are deposited in the College of Life Sciences, Nankai University, Tianjin, China (BDN).

Descriptions

Diamesa qiangi Wang et Makarchenko, sp. nov.

(Figs. 1–8)

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Material. Holotype: adult male (BDN No. sun390), China: Tibet, Xizang Autonomous Region, Linzhi County, Lulang Bayi Town, Zhaxigang Village, N 29°44'53.29", E 94°44'34.70", alt. 3400 meter above sea level, 14.VIII.2013, light trap, leg. Qiang Wang. Paratypes: 12 males, same data as holotype.

Derivatio nominis. The species is named in honour of Qiang Wang, who collected type material of a new species.

Adult male (n = 6). Total length 2.90–3.38 mm. Wing length 2.95–3.31 mm. Total length/wing length 0.98–1.12. Wing length/length of profemur 2.36–2.52.

Coloration. Head, thorax, legs and hypopygium dark brown; antenna brown; palpomeres light brown; abdomen light brown to brown; wing veins yellowish brown.

Head. Eyes hairy, i.e., length of eye microtrichia about 1.5 or more times the height of ommatidial lenses and visible along lateral eye margin when head is viewed from front (after: Hansen & Cook 1976). Temporal setae 15–23, including about 7–15 inner verticals, 4–7 outer verticals and 3–5 postorbitals. Clypeus with 9–12 setae. Antenna with 13 flagellomeres and well-developed plume; terminal flagellomere 495–560 µm long, with 1 subapical seta 24–36 µm long. AR 0.79–0.92. Tentorium 195–310 µm long, 50–70 µm wide. Stipes 180–220 µm long, 12–20 µm wide. Palpomeres lengths (in µm): 43–50; 85–110; 125–155; 135–168; 160–234. Palpomere 3 in distal part with sensilla capitata (sunken organ) with diameter 12 µm. Palpomeres 1–5 length/head width 0.80–0.94.

Thorax. Antepnotum with 4–8 lateral setae. Dorsocentrals 14–19, prealars 5–10, scutellars 22–27.

Wing. R with 10–15 setae, R₁ with 7–11 setae; R₄₊₅ with 8–12 setae. Costa extension 105–125 µm long. RM length/MCu length 3.0. Brachiolum with 2–3 setae. Anal lobe well developed. Squama with 26–35 setae. VR 0.88–0.93.

Legs. Spur of fore tibia 60–65 µm long; spurs of mid tibia 50–60 µm and 24–59 µm long; of hind tibia 75–85 µm and 45–60 µm long. Hind tibial comb with 12–15 setae. Width at apex of fore tibia 58–70 µm, of mid tibia 60–65 µm, of hind tibia 75–90 µm. Pseudospurs of ta₃ absent. Lengths and proportions of leg segments as in Table 1.

TABLE 1. Lengths (in µm) and proportions of leg segments of *Diamesa qiangi* sp. nov., male (n=6)

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅
P ₁	1250–1350	1475–1725	1050–1200	490–600	335–388	113–120	145–163
P ₂	1225–1425	1325–1525	650–775	340–410	220–250	100–110	125–143
P ₃	1295–1600	1325–1788	975–1225	500–625	300–325	110–130	150–160

continued

	LR	BV	SV	BR
P ₁	0.66–0.71	2.99–3.55	2.56–2.66	1.7–2.0
P ₂	0.47–0.53	3.94–4.17	3.64–4.08	2.0–2.7
P ₃	0.63–0.74	3.41–3.91	2.69–2.98	2.5–3.3

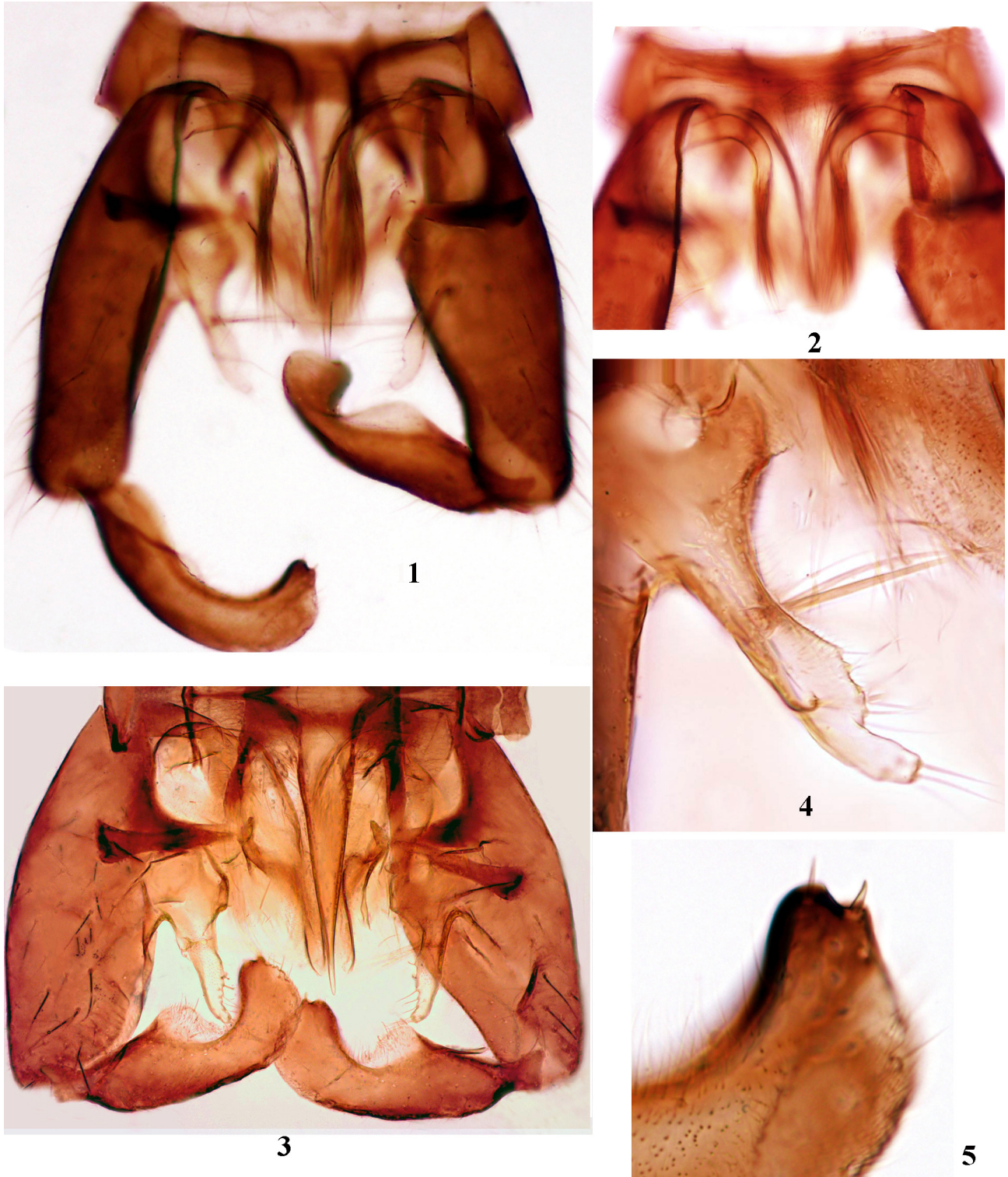
Hypopygium (Figs. 1–8). Tergite IX with 18–22 setae. Laterosternite IX with 4–9 setae. Anal point developed, tapering to pointed apex, 265–290 µm long, 45–75 µm wide at base; 3–5 µm wide at apex. Phallapodeme 93–130 µm long. Transverse sternapodeme 105–150 µm long. Gonocoxite 375–395 µm long. Inferior volsella finger-like, 108–155 µm long; with a projection at basal 1/3, 12–15 µm long, with 2–4 long setae; distal slender, with 9–15 strong setae, and with 2–3 strong setae at the apex. Basimedial setal cluster with numerous long and hair-like setae, located on the long stalks. Gonostylus strong, curved inwardly, with projection of median field and with short megaseta; gonostylus 225–260 µm long; megaseta 10–12 µm long. HR 1.46–1.69. HV 0.83–0.40.

Pupa and larva unknown.

Diagnostic characters. The new species is closely related to *Diamesa insignipes* Kieffer, namely adult male has similar finger-like inferior volsella of hypopygium, which with some long setae in outer part in middle (Figs. 4, 7). It should also be noted that the male of the new species has on the gonocoxite numerous long and hair-like basimedial setal cluster located on the long stalks (Figs. 2, 8). Such kind of the basimedial setal cluster present only in *D. zhiltzovae* Makarchenko (Makarchenko 1989: Fig.1). The male of *D. qiangi* sp. nov. is well distinguished

from both the above species by the shape of the gonostylus, which curved inwardly, with projection of median field and with short megaseta (Figs. 1, 3, 6).

Distribution and biology. The species is known only from the type locality in China, Tibet Autonomous Region. The adult males were collected by light trap near the grass, across which there is a stream, stemming from the melting frazil.



FIGURES 1–5. Adult male of *Diamesa qiangi* sp. nov. 1, 3, hypopygium in dorsal view; 2, basimedial setal cluster in ventral view; 4, inferior volsella; 5, distal part of gonostylus.

Linevitshia prima Makarchenko

(Fig. 9).

Linevitshia prima Makarchenko, 1987: 207, fig. 1; Brundin 1989: 27, fig. 4.3; Sæther *et al.* 2000: 134, fig. 144; Ashe & Connor 2009: 292; Makarchenko & Semchenko, 2014: 357, figs 1–28.

Linevitshia yezoensis Endo in Endo, Makarchenko & Willassen, 2007: 93, figs 1–4, 7–13; Ashe & Connor 2009: 292; Makarchenko & Endo 2009: 65.

Material: 1 adult male (BDN No. A13I53) China: Zhejiang Province, Hangzhou City, Changhua County, Qingliangfeng National Nature Reserve, N 30°17'50", E 119°07'01", alt. 1400 meters above sea level, 16.V–20.VI.2012, Malaise trap, leg. Rui Guo.

Adult male (n = 1). Total length: 3.88 mm. Wing length 2.38 mm. Total length/wing length 1.42. Coloration brown to dark brown.

Head. Antenna with 13 flagellomeres and well-developed plume; ultimate flagellomere 550 µm long, with 1–2 subapical setae 20 µm long. AR 1.20–1.26. Temporal setae composed of 1 weak inner verticals and about 2 postorbitals. Length of palpomeres 1–5 (µm): 50, 75, 158, 168, 260. Palpomeres 1–5 length/head width 1.25.

Thorax. Anteprepronotum with 1 dorsal and 4 lateral setae. Acrostichals 22, dorsocentrals 16, prealars 8, supralars 1, and scutellars 8. Posterior anepisternum II with 6 setae. Epimeron II with 5 setae.

Wing. Width 0.72–0.80 mm. Costa extentiion 80 µm long. Anal lobe developed, round. Brachiolum with 4 setae. R with 24 setae, R₁ with 6 setae, R₄₊₅ with 2 setae subapically. RM length/MCu length 2.2. Alula with 7 setae, 52–60 µm long. Squama with 15 setae. VR 0.91.

Legs. Spurs of fore tibia 80 µm, of middle tibia 75 and 65 µm, of hind tibia 90 and 65 µm long. Hind tibial comb composed of 10 setae 25–43 µm long. Front leg with 1 apical pseudospur on ta₁; mid and hind legs with 2 apical pseudospurs on ta₁ and ta₂. Sensilla chaetica absent. ta₄ cylindrical, ta₅ slightly curved. Pulvilli small. Tip of claws serrate, with 5 teeth. Lengths and proportions of leg segments as in Table 2.

TABLE 2. Lengths (in µm) and proportions of leg segments of *Linevitshia prima* Makarchenko, male (n=1)

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR	BV	SV	BR
P ₁	1125	1300	900	420	270	168	140	0.69	3.33	2.69	2.64
P ₂	1075	1125	480	265	185	115	125	0.43	3.88	4.58	2.00
P ₃	1275	780	780	400	240	150	140	0.52	3.82	3.56	3.36

Hypopygium (Fig. 9). Tergite IX with 7 setae. Laterosternite IX with 9 setae. Transverse sternapodeme broadly arched, 196 µm long and 40 µm wide. Phallapodeme 100 µm long. Gonocoxite 208 µm long; aedeagal lobe large. Gonostylus 112 µm long, in distal part with long (16–24 µm), strong setae and 1 apical megasetae, 6–8 µm long. HR 2.1.

Pupa and **larva** are absent in our material but they are described before by Endo *et al.* (2007), Makarchenko & Endo (2009) and Makarchenko & Semchenko (2014).

Distribution. For the first time recorded for the Oriental Region, it was previously known only from East Palaearctic—Japan, China and the Russian Far East (Kunashir Island, Primorye Territory, Amur River basin) (Wang 2000; Endo *et al.* 2007; Ashe & Connor 2009).

Sasayusurika nigatana (Tokunaga)

(Fig. 10)

Diamesa (*Psilodiamesa*) *nigatana* Tokunaga, 1936: 537.

Sasayusurika aenigmata Makarchenko, 1993: 119–121; Willassen 2007: 316.

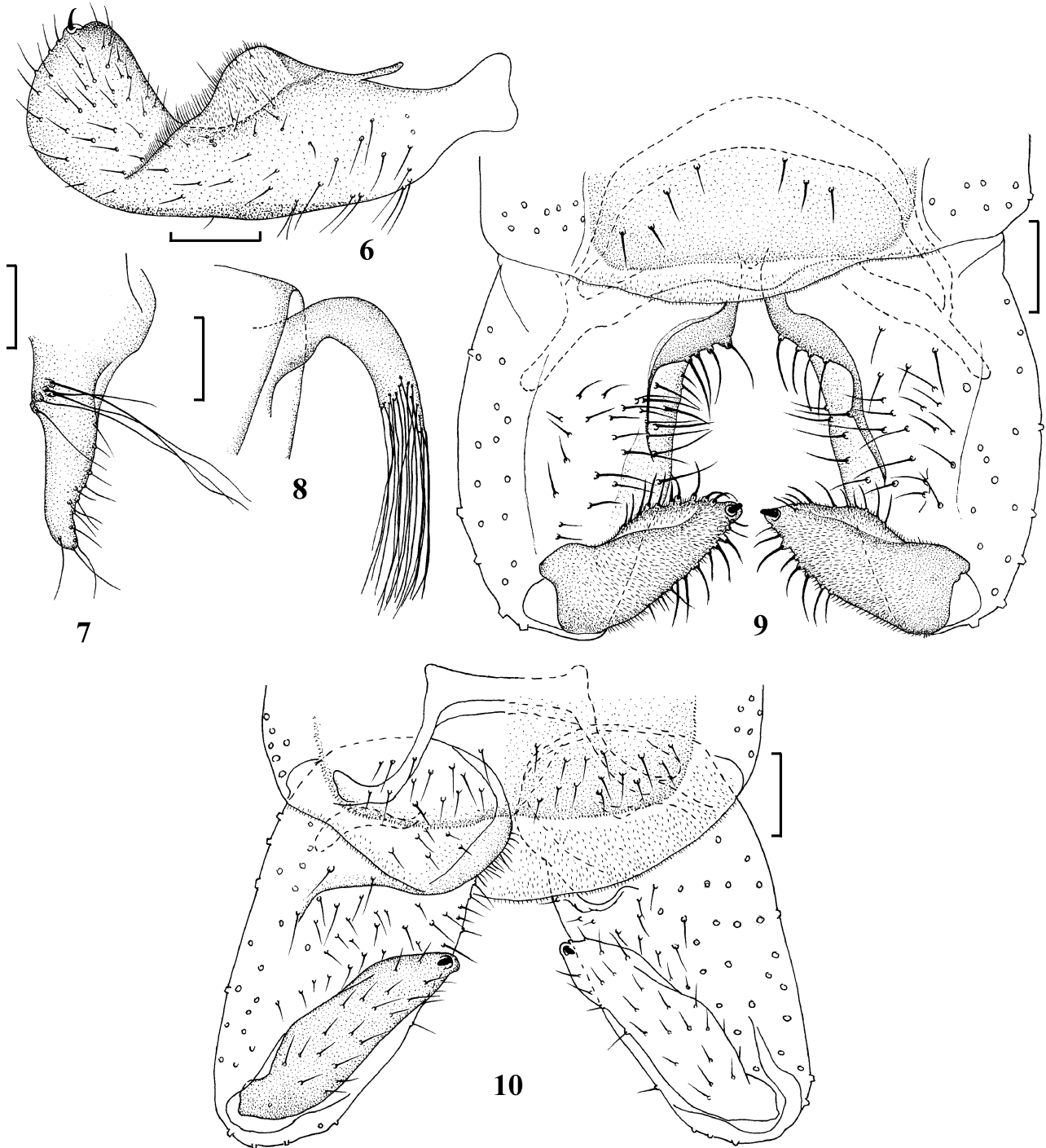
Sasayusurika nigatana (Tokunaga); Makarchenko & Endo 2009: 67–70.

Material: 1 adult male (BDN No. K5B6), China, Zhejiang Province, Taizhou City, Huading Mountain, N 29°15'08.3", E 121°05'26.1", alt. 1000 meters above sea level, 12.IV.2011, sweep net, leg. Xiaolong Lin.

Adult male (n = 1). Total length 6.12 mm. Wing length 4.20 mm. Total length/wing length 1.45. Coloration dark brown, wing greyish.

Head. Eyes nude to very weakly pubescent, moderately extending dorsomedially. Temporal setae 26–29, consisting verticals and postorbitals. Clypeus with 22 setae. Antenna with 13 flagellomeres and well-developed plume; terminal flagellomere with 1 subapical seta 28 μm long. AR 2.52–2.60. Palpomeres lengths (in μm): 64; 124; 224; 320; 312. Palpomere 3 in distal part with sensilla capitata (sunken organ) with diameter 24 μm . Palpomeres 1–5 length/head width 1.16.

Thorax. Anteprepronotum with 9 lateral setae. Acrostichals 12 (36–40 μm), dorsocentrals 21, prealars 10–11, supraalar 1, scutellars ca 50.



FIGURES 6–10. Adult male of *Diamesa qiangi* sp. nov. (6–8), *Linevitshia prima* Makarchenko (9) and *Sasayusurika nigatana* (Tokunaga) (10). 6, gonostylus; 7, inferior volsella; 8, basimedial setal cluster; 9–10, hypopygium in dorsal view. Scale bars 50 μm .

Wing. Wing width 0.96 mm. R and R₁ with 35–37 setae; R₄₊₅ with 4–6 setae. Costa extension 24 µm long. RM length/MCu length 4.5. Anal lobe well developed. Squama with 19 setae. VR 0.90–0.93.

Legs. Spur of fore tibia 128 µm long; spurs of mid tibia 112 µm and 100 µm long; of hind tibia 136 µm and 104 µm long. Hind tibial comb with 21 setae. Tip of claws serrate, with about 6 teeth. Lengths and proportions of leg segments as in Table 3.

TABLE 3. Lengths (in µm) and proportions of leg segments of *Sasayusurika nigatana* (Tokunaga), male (n=1)

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR	BV	SV	BR
P ₁	1680	2040	1360	720	520	260	200	0.67	2.99	2.74	4.7
P ₂	1960	1960	1040	520	360	240	200	0.53	3.76	3.77	2.1
P ₃	2360	2600	1720	820	480	260	200	0.66	2.98	2.88	3.3

Hypopygium (Fig. 10). Tergite IX with 28 setae. Laterosternite IX with 6–7 setae. Transverse sternapodeme 148 µm long and 24 µm wide, with fairly straight anterior margin and anterpronotal projections. Aedeagal lobe apparently large and rounded. Gonocoxite 404 µm long. Inferior volsella absent. Gonostylus long, 244 µm long, with short megaseta *ca* 9 µm long. HR 1.45.

Pupa and *larva* are absent in our material but they are described before by Makarchenko & Endo (2009).

Remarks. From the males of Japan and India, a specimen of *S. nigatana* from Oriental China is distinguished by the presence of setae on the clypeus. The presence of setae on the clypeus is in conflict with the diagnosis of the genus *Sasayusurika* Makarchenko, according to which the representatives of the genus are characterized by their lack. Apparently, diagnosis of the genus in the future should be expanded after studying additional material.

Distribution. For the first time recorded for the Oriental Region, it was previously known only from Palaearctic—Japan and Indian Himalaya (Makarchenko 1993; Willassen 2007; Ashe & Connor 2009; Makarchenko & Endo 2009).

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