

Tipula (Pterelachisus) submitophora sp. nov., a new crane fly species (Diptera: Tipulidae) from South Korea

Tipula (Pterelachisus) submitophora sp. nov., новый вид комара-долгоножки (Diptera: Tipulidae) из Южной Кореи

D.-A. Yi & V.E. Pilipenko*

Д.-А. И, В.Э. Пилипенко

Dae-Am Yi, Yeongwol Insect Museum, 716 Donggang-ro, Yeongwol, Gangwon-do, Republic of Korea. E-mail: 2bigstone@korea.ac.kr

Valentin E. Pilipenko , M.V. Lomonosov Moscow State University, GSP-1, Leninskie Gory, Moscow 119991, Russia. E-mail: vep@mail.ru

Abstract. A new crane fly species from South Korea, *Tipula (Pterelachisus) submitophora* sp. nov. (Diptera: Tipulidae), is described and illustrated. The male and female of the most closely related species, *T. (P.) mitophora* Alexander, 1934, are redescribed and illustrated. In both species, males are full-winged and females are strongly brachypterous.

Резюме. Приведено иллюстрированное описание нового вида комара-долгоножки *Tipula (Pterelachisus) submitophora* sp. nov. (Diptera: Tipulidae) из Южной Кореи, а также переписание самца и самки наиболее близкого вида – *T. (P.) mitophora* Alexander, 1934. У обоих видов самцы с нормально развитыми, а самки – с сильно редуцированными крыльями.

Key words: hypopygium, ovipositor, brachyptery, wing reduction, taxonomy, South Korea, Nematocera, Tipulidae, Tipulinae, *Pterelachisus*, new species

Ключевые слова: гипопигий, яйцеклад, брахиптерность, редукция крыльев, таксономия, Южная Корея, Nematocera, Tipulidae, Tipulinae, *Pterelachisus*, новый вид

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Introduction

The world fauna of the subgenus *Pterelachisus* Rondani, 1842 of the genus *Tipula* Linnaeus, 1758 currently contains 202 recent species and subspecies, with 97 species known from the East Palaearctic (Oosterbroek, 2023). Only four species, *T. (P.) flavocostalis* Alexander, 1921, *T. (P.) taikun* Alexander, 1921, *T. (P.) lanio* Alexan-

der, 1945 and *T. (P.) phryne* Alexander, 1945, are known from the Korean Peninsula (Han, 2021).

Tipula mitophora Alexander, 1934 was described from seven males collected in the Russian Far East near the mouth of the Amur River (Alexander, 1934a), now in the Khabarovsk Territory of Russia. In a subsequent article, Alexander (1934b) described *T. blastoptera* Alexander, 1934 from a single female also from the southern part of the Russian Far East (now Primorskiy Territory of Russia). The habitus of the female is peculiar

* Corresponding author

and Alexander wrote: “In the female sex, the great reduction of the wings should make the identification of this species a very simple matter. No regional species of *Tipula* is known to me in the male sex that could possibly be associated with the present fly”. Savchenko (1964) established the synonymy of these two species names based on a copulating pair from the Primorskiy Territory collected by Grunin in 1941.

Recent studies of Tipulidae in Korea (Baek & Bae, 2016a, 2016b, 2017; Starkevich et al., 2021) did not reveal the presence of *T. (P.) mitophora*. This species was not listed from China by Liu et al. (2020) and Oosterbroek (2023); however, it was recently recorded by Gao (2021).

The first author collected in South Korea a new species closely related to *T. (P.) mitophora*; this new species is described below. The new species is compared with the type specimens of *T. (P.) mitophora*, which are stored at the Zoological Institute, Russian Academy of Sciences (St Petersburg), as well as with specimens from the private collection of the second author and from other collections.

Material and methods

Most specimens of the new species were collected by sweep net. Pinned specimens and specimens kept in ethanol were studied with an Olympus SZ61 stereomicroscope. Inner structures of terminalia were examined after boiling in 10% solution of NaOH for 10 minutes. Cleared terminalia were preserved in microvials filled with glycerol and pinned together with the corresponding specimens. A Nikon d7000 digital camera equipped with a Tamron 70–300 /4–5.6 and a Raynox DCR-250 macro conversion lenses or an EL-Nikkor 50/2.8 enlarger lens were used to capture stacked images, which were then combined using the Helicon Focus software (www.heliconsoft.com/heliconsoft-products/helicon-focus). Field photographs were taken by the first author with a Samsung Galaxy S7 phone camera. All images were adjusted and assembled into plates using Adobe Photoshop CS2.

The distribution of species is given according to Oosterbroek (2023). The coordinates of the geographic points mentioned on the labels are obtained using Google Earth (<https://earth.google.com/web/search>) and given in brackets.

Descriptive terminology generally follows that of Cumming & Wood (2017) and Alexander & Byers (1981). For wing venation, we follow de Jong (2017).

Abbreviations for the collections and institutions used herein are as follows: KU, Korea University Entomological Museum, Department of Environmental Science and Ecological Engineering, College of Life Sciences and Biotechnology, Korea University, Seoul, Republic of Korea; SAU, Shenyang Agricultural University, Shenyang, China; SYNU, Shenyang Normal University, Shenyang, China; VPC, private collection of Valentin E. Pilipenko, Moscow State University, Moscow, Russia; YIM, Yeongwol Insect Museum, Yeongwol, Gangwon-do, Republic of Korea; ZISP, Zoological Institute, Russian Academy of Sciences, St Petersburg, Russia.

Taxonomic part

Order **Diptera**

Family **Tipulidae**

Subfamily **Tipulinae**

Genus ***Tipula*** Linnaeus, 1758

Subgenus ***Pterelachisus*** Rondani, 1842

***Tipula (Pterelachisus) submitophora* sp. nov.**
(Figs 1, 2A–C, 3A–G, 4, 7A–E, 8A)

Holotype. Male, **Republic of Korea**, *Gangwon-do* (= *Gangwon Prov.*), Pyeongchang-gun (= Pyeongchang County), Mt. Balwang-san, Yongpyong-myeon, 37°36'42.03"N 128°40'19.10"E, 1458 m, 27.V.2017, H.Y. Oh leg. (YIM).

Paratypes. **Republic of Korea**, *Gangwon-do* (= *Gangwon Prov.*): 1 male, 1 female, same data as for holotype (KU); 22 males, 2 females, same locality, 30.V.2017, 12.VI.2021, D.A. Yi leg. (YIM); 2 males, 1 female, same locality, 12.VI.2021, D.A. Yi leg. (ZISP); 76 males, 13 females, Jungsun-gun (= Jungsun County), Mt. Baekwoon-san, Sabuk-up, 37°11'17.85"N 128°48'43.98"E, 1156 m, 15.V.2018, 2.VI.2019, 6.V.2022, 5.V.2023, D.A. Yi leg. (YIM); 4 males, 3 females, same locality, 15.VI.2018, 8.VI.2021, 6.V.2022, D.A. Yi leg. (VPC); 6 males, 2 females, Injae-gun (= Injae County), Mt. Jumbong-san, Girin-myeon, 38°02'30.84"N 128°28'23.66"E, 752 m, 15.V.2023, D.A. Yi leg. (YIM); 1 male, 1 female, same data (VPC); 12 males, Mt. Taebaek-san, Taebaek-si, 37°07'13.11"N 128°54'28.87"E, 894 m, 7.VI.2021, D.A. Yi leg. (YIM).

Diagnosis. Yellowish grey crane fly with head and thorax grey, abdomen with basal segments yellow, terminal segments brownish black. Antenna long, reaching second abdominal segment if bent backwards, each flagellomere except first and last with basal enlargement and deeply incised. Wings yellowish grey with vein R_2 completely developed. Tergite 9 with caudal margin oblique and with wide V-shaped median notch with small low tubercle slightly forked at apex. Outer basal lobe of inner gonostylus very narrow and indistinct, without tooth or other elevated structures, with protruding short hairs. Sternite 8 simple.

Description. *Male* (Fig. 1A). Body length about 11–12 mm; wing length 15–16 mm; antenna length 6 mm. General body coloration yellowish grey.

Head (Fig. 2A, B). Coloration mainly grey pruinose; body sparsely covered with dark hairs. Base of rostrum grey pruinose, otherwise dark brown, shining. Nasus distinct, brown. Labellum and palpus dark brown, with setae. Antenna elongate, 13-segmented, if bent backwards, almost reaching posterior margin of second abdominal segment. Scape, pedicel and base of first flagellomere yellowish, other flagellomeres black. Scape cylindrical, pedicel globular. Flagellomeres except first with basal enlargement and deeply incised, covered with silvery, erect, dense pubescence. Last flagellomere small. Basal enlargement of flagellomeres with five black verticils, which shorter than length of respective flagellomere (Fig. 2B).

Thorax (Figs 1A, 2A). Coloration mainly grey pruinose. Pronotum grey with median line darker. Prescutum and presutural scutum grey pruinose with four brownish stripes. Intermediate pair narrowly separated by line of ground colour. Postsutural scutum grey with two brownish stripes. Scutellum grey with darkened anterior margin; mediotergite grey. Pleura grey pruinose. Halter greyish with base of knob light brown. Coxae grey; trochanters yellow; femora brownish yellow, distal part of femora very broadly blackened (Fig. 1A). Tibiae and tarsal segments dark brown. Tarsal claws without tooth. Wing (Fig. 2C) tinged yellowish grey, with very unclear whitish area before brownish stigma and narrow whitish area (lunule) at base of discal cell. Cells *c* and *sc* more yellowish than ground colour; stigma brown, vein R_2 completely developed.

Abdomen (Fig. 1A). Abdominal segments 1–4 yellowish brown; remaining segments dark brown. Tergites dorsally with distinct brown median and lateral stripes.

Hypopygium (Figs 1B, C, 3A–G). Coloration dark brown. Sternite 8 (Fig. 1B) dark brown, its caudal margins very narrowly light brown, simple, without tuft or group of sparse long setae. Tergite 9 (Fig. 3A) yellow with dark brown lateral areas at base; caudal margin of tergite 9 oblique, with wide V-shaped median notch and small low tubercle more visible from behind; apex of tubercle slightly forked (Fig. 1C). Outer gonostylus (Figs 1C, 3B, C) yellow, lanceolate, slightly longer than inner gonostylus. Inner gonostylus (Fig. 3B, C) with lower beak narrowly rounded, black; upper beak elongate in lateral view, with roundish tip and narrow dorsal crest provided with long bristles. Outer basal lobe of inner gonostylus very narrow and indistinct, without tooth or other elevated structures; its margin provided with short setae, with protruding short hairs. Adminiculum (Fig. 3D, E) with gonapophysis elongate, almost equal in length to aedeagus guide (i.e. reaching margin of aedeagus guide), in shape of triangular plates. Semen pump slightly flattened (Fig. 3F), anterior immovable apodemes elongate, posterior apodemes short; aedeagus with preapical portion slightly broadened and apex narrowed (Figs 1C, 3G).

Female (Fig. 4A, B). Different from male in vestigial wings, short antenna and short, thick legs. Body length about 15.5 mm; wing length 0.97–1.27 mm (vestigial); antenna length 1.2–1.5 mm.

Head. Dark brown or brownish grey, pruinose; postgena pale; postgena and area around margin of compound eye with several setae; rostrum yellow with setae; compound eye black. Labellum yellow, with setae; palpus dark brown, with setae. Antenna (Fig. 4E) 12-segmented, short; scape yellowish to dark brown, with several setae; pedicel brown, oval, with 5–7 setae; flagellomeres dark brown, all except last one with several verticils equal in length to or shorter than flagellomeres; basal 4–5 flagellomeres oval, distal segments shorter; last flagellomere long and narrow, without setae.

Thorax. Coloration mainly brown with grey pruinose or yellowish grey; pronotum brown with grey pruinose, darker medially, with yellow setae; postpronotum yellowish brown or brown; proepisternum brown or yellowish brown; pres-

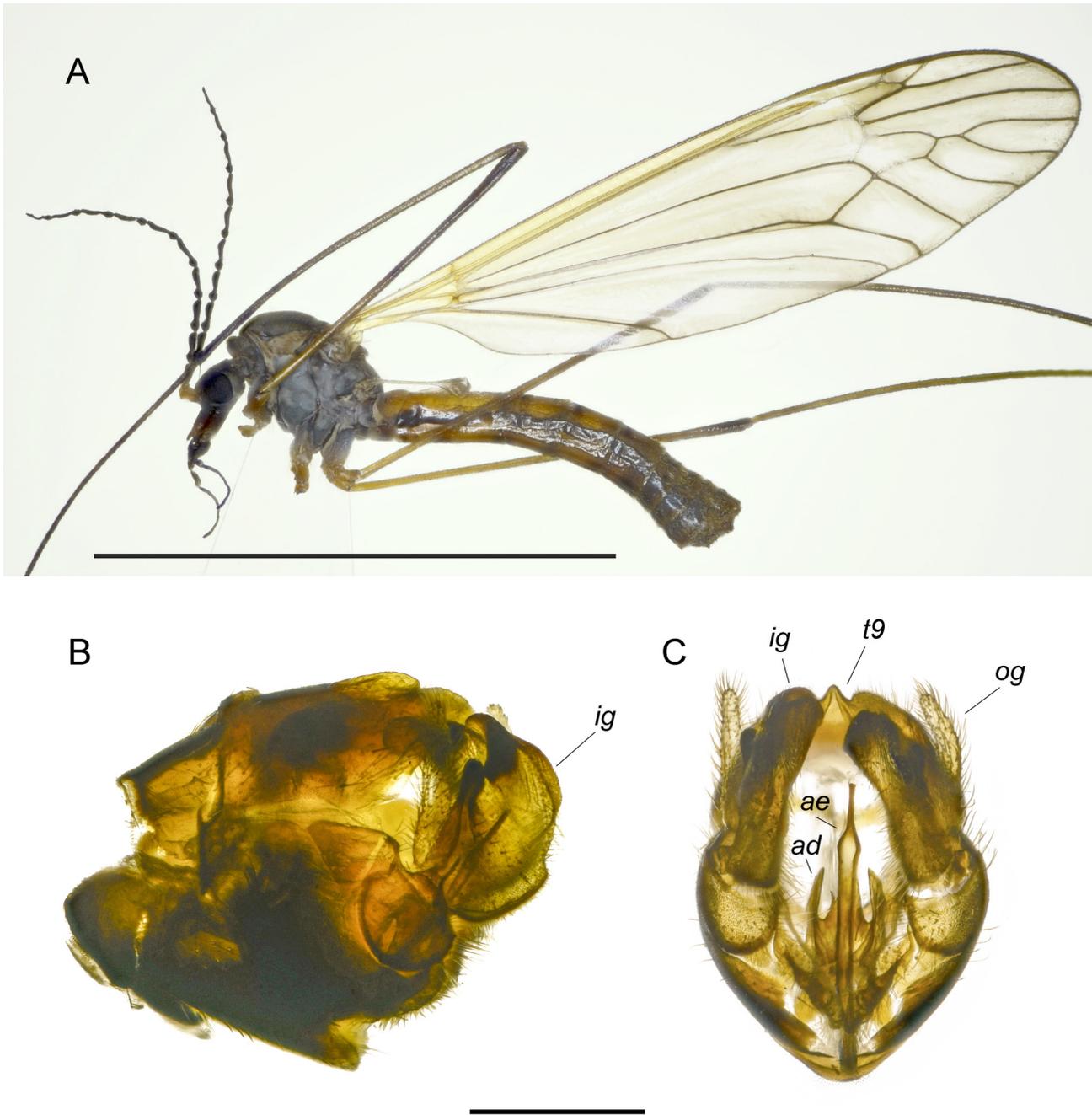


Fig. 1. *Tipula (Pterelachisus) submitophora* sp. nov., male (paratype from Mt. Baekwoon-san, 8.VI.2021). **A**, habitus (dry specimen), left lateral view; **B**, **C**, male genitalia (in glycerol: **B**, lateral view; **C**, caudal view). Scale bars: 10 mm (**A**), 1 mm (**B**, **C**). Abbreviations: *ad* – adminiculum, *ae* – aedeagus, *ig* – inner gonostylus, *og* – outer gonostylus, *t9* – tergite 9.

cutum and scutum dark brown medially, brown to yellowish brown laterally, without distinct stripes; scutellum and mediotergite brown with grey pruinose; pleura brown with grey pruinose. Legs with coxae yellowish brown, trochanters yellow, femora brownish yellow with distal parts

very broadly blackened, tibiae and tarsal segments brown; all legs with short setae; fore leg shorter than others, with enlarged femur. Wings (Fig. 2C) strongly reduced but veins present, although indistinct. Halter 0.30–0.45 mm long, curled and not stretched.

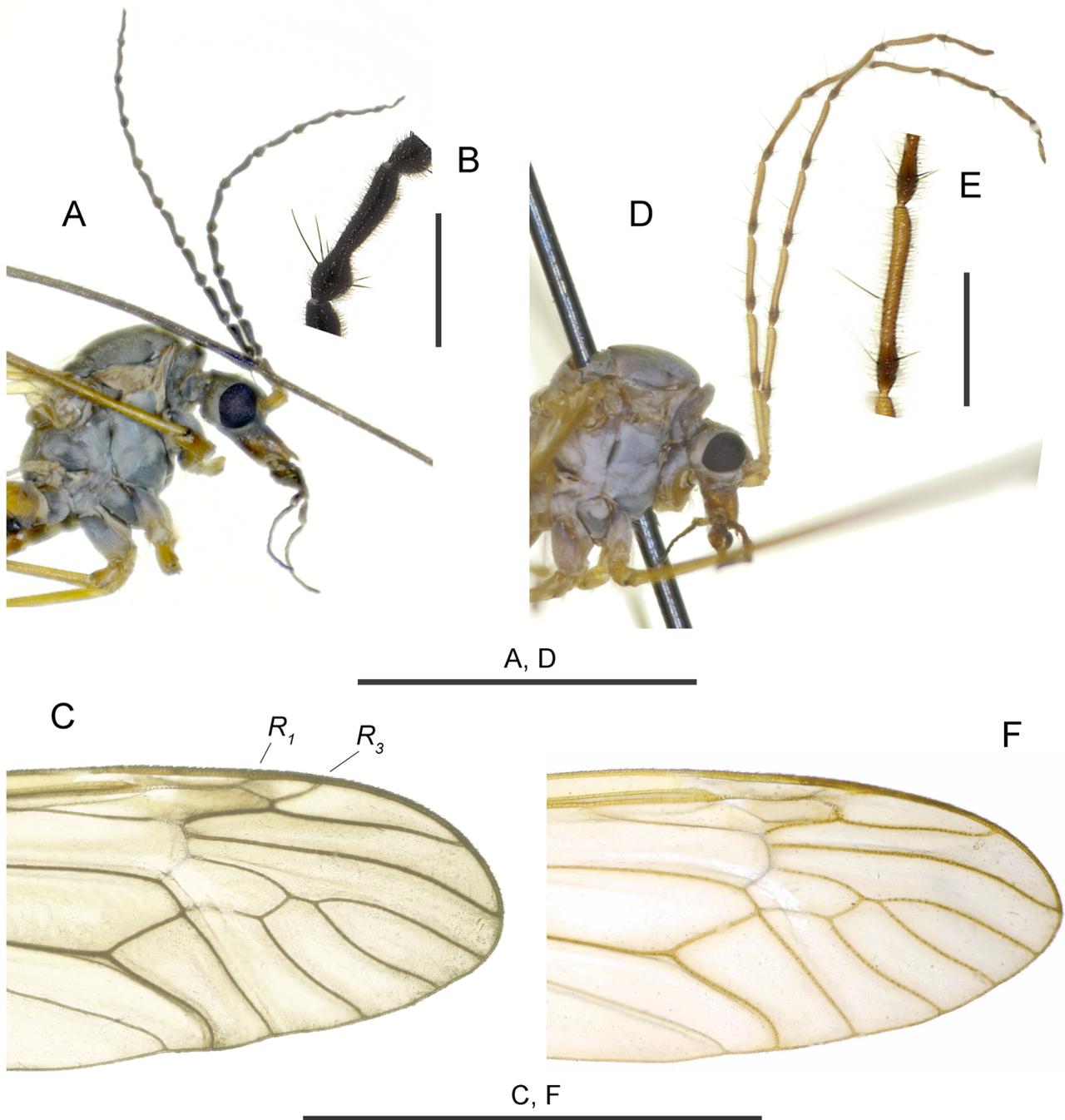


Fig. 2. *Tipula (Pterelachisus)* spp., males (dry specimens). **A–C**, *T. (P.) submitophora* sp. nov. (paratype from Mt. Baekwoon-san, 8.VI.2021); **D–F**, *T. (P.) mitophora* Alexander, 1934 (holotype). **A, D**, head and thorax; **B, E**, flagellomere; **C, F**, apical part of wing. Scale bars: 5 mm (A, D, C, F), 0.5 mm (B, E).

Abdomen dark brown; tergites 2–7 dark brown with yellow stripes along caudal margins; abdominal sternites dark brown with short yellow setae and with yellow band along caudal margins.

Female terminalia (Figs 4C, 7A–E). Tergite 8 dark brown; tergite 9 narrow, dull dark brown;

tergite 10 shining dark brown. Cercus yellowish brown, very narrow and slender, its tip rounded. Sternite 8 dark brown, with shining ventrolateral and yellowish posterolateral margins. Hypogynial valve reaching two thirds of cercus length, shiny dark brown at base, light brown apically, with pale

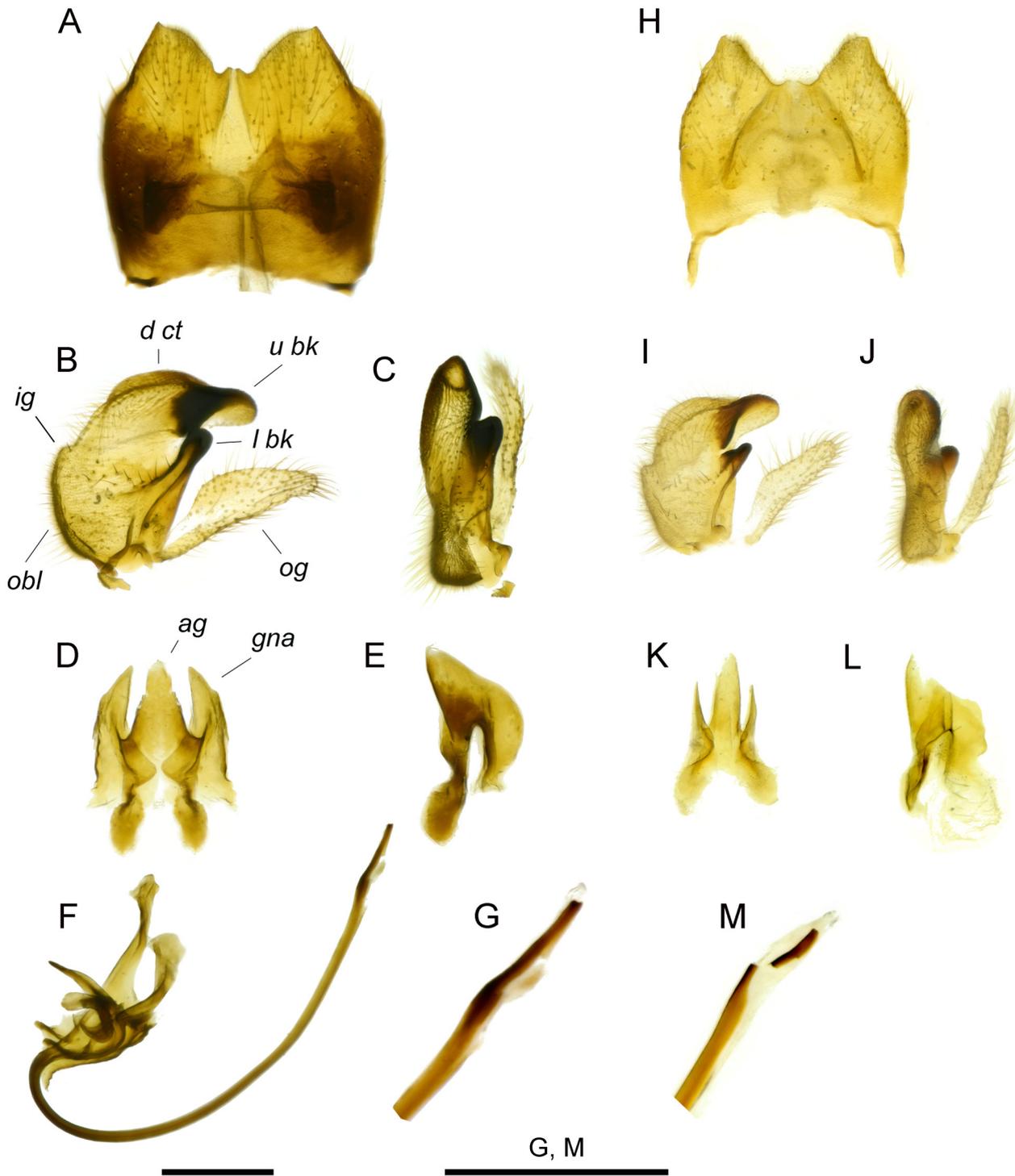


Fig. 3. *Tipula (Pterelachisus)* spp., male terminalia (in glycerol). **A–G**, *T. (P.) submitophora* sp. nov. (paratype from Mt. Baekwoon-san, 8.VI.2021); **H–M**, *T. (P.) mitophora* Alexander, 1934 (specimen from Koreyskaya Pad', Primorskiy Territory, 18–19.V.2007). **A**, **H**, tergite 9, dorsal view; **B**, **I**, inner and outer gonostylus, lateral view; **C**, **J**, inner and outer gonostylus, caudal view; **D**, **K**, adminiculum, caudal view; **E**, **L**, adminiculum, lateral view; **F**, semen pump and aedeagus, lateral view; **G**, **M**, distal part of aedeagus, lateral view. Abbreviations: *ag* – aedeagus guide, *d ct* – dorsal crest, *gna* – gonapophysis, *ig* – inner gonostylus, *l bk* – lower beak, *obl* – outer basal lobe, *og* – outer gonostylus, *u bk* – upper beak. **A–E**, **H–L**: all structures are at the same scale. Scale bars (**F**, **G**, **M**): 1 mm.

Table 1. Comparison of male characters for *Tipula (Pterelachisus) submitophora* sp. nov. and *T. (P.) mitophora*.

<i>Tipula (Pterelachisus) submitophora</i> sp. nov.	<i>Tipula (Pterelachisus) mitophora</i>
Thorax mainly grey pruinose	Thorax yellowish grey
Antenna reaching abdominal segment 2 (Fig. 1A)	Antenna longer, reaching middle of abdomen (Fig. 5A)
Flagellomeres except first and last with basal enlargement, deeply incised (Fig. 2B)	Flagellomeres cylindrical with weak basal enlargement (Fig. 2E)
Wing vein R_3 distinct, usually reaching C (Fig. 2C)	Wing vein R_3 absent, distinct only at base (Fig. 2F)
Tergite 9 yellow with dark brown parts on lateral margins at the base; V-shaped median notch with a small low tubercle on bottom (Fig. 3A)	Tergite 9 entirely pale; V-shaped median notch wider and without noticeable tubercle on bottom (Fig. 3H)
Adminiculum with gonapophyses almost equal in length to aedeagus guide (Fig. 3D, E)	Adminiculum with gonapophyses shorter than aedeagus guide (Fig. 3K, L)

stripe near upper margin. Sternite 9 with posterior part elongated, narrowed and pointed (Fig. 7D). Furca sharply narrowed anteriorly and narrowed posteriorly, with strongly sclerotised black anterior half. Spermatheca black, nearly spherical (Fig. 7E).

Eggs shiny black, 1.1–1.2 mm long, surface without granulation (Fig. 4G).

Remarks. A minor part of males have vein R_3 somewhat reduced apically on both wings. The antennae of some females have more cylindrical flagellomeres (Fig. 4F). Narrow yellow stripes on the caudal margin of the female abdomen may be poorly visible after storage in ethanol; some females have yellow-brown abdomens with a narrow brown median stripe (Fig. 4B).

Comparison. *Tipula (Pterelachisus) submitophora* sp. nov. is the closest species to *T. (P.) mitophora* known from the Russian Far East, based on the shape of the male genitalia and the hard-to-distinguish wingless females. The males of these two species can be easily distinguished by the features given in Table 1.

The females can be reliably diagnosed only by the structure of the ovipositor (Fig. 7). The cerci of *T. (P.) submitophora* sp. nov. are longer and thinner than those of *T. (P.) mitophora*. Sternite 9 of *T. (P.) submitophora* sp. nov. differs in the posterior part elongate, narrowed and pointed (Fig. 7D), in contrast to short and rounded in *T. (P.) mitophora* (Fig. 7I). The furca anteriorly is sharply narrowed, strongly sclerotised, black and posteriorly with elongate narrowed sclerotisation in *T. (P.) submitophora* sp. nov., while in

T. (P.) mitophora it is anteriorly narrow, weakly sclerotised and posteriorly with shortly elongated sclerotisation.

Etymology. The new species is named after the closely related species *T. (P.) mitophora*, with the Latin prefix *sub-* (under, near, etc.) referring to the morphological similarity of the two species.

Distribution. South Korea (Republic of Korea: Gangwon Province).

Habitat and bionomics. The males and females were collected in high mountains covered with shady mixed forests formed by deciduous and conifer trees at altitudes of approximately 750 to 1450 m above sea level. Flying males and wingless females mate mainly on the stems of shrubs or tree trunks (Fig. 8A) and occasionally on the surface of rocks. Mated females lay eggs into the duff of shed leaves.

Tipula (Pterelachisus) mitophora

Alexander, 1934

(Figs 2D–F, 3H–M, 5, 6, 7F–J, 8B)

Tipula mitophora Alexander, 1934a: 327, fig. 13 (Plate 1), figs 42, 43 (Plate 4).

Tipula blastoptera Alexander, 1934b: 439, fig. 64 (Plate 5).

Tipula (Pterelachisus) mitophora: Savchenko, 1964: 80; Savchenko & Kandybina, 1987: 42; Oosterbroek & Theowald, 1992: 136; Pilipenko, 2009: 330; Oosterbroek, 2023.

Type material examined. Holotype of *Tipula mitophora*. Male, with labels “Mys Dzhaore, lim. Amura, Derbek. 19.VI.910.” [Russia, Khabarovsk Terr., Cape Dzhaore, mouth of Amur River, 52°40′29″N 141°15′25″E,

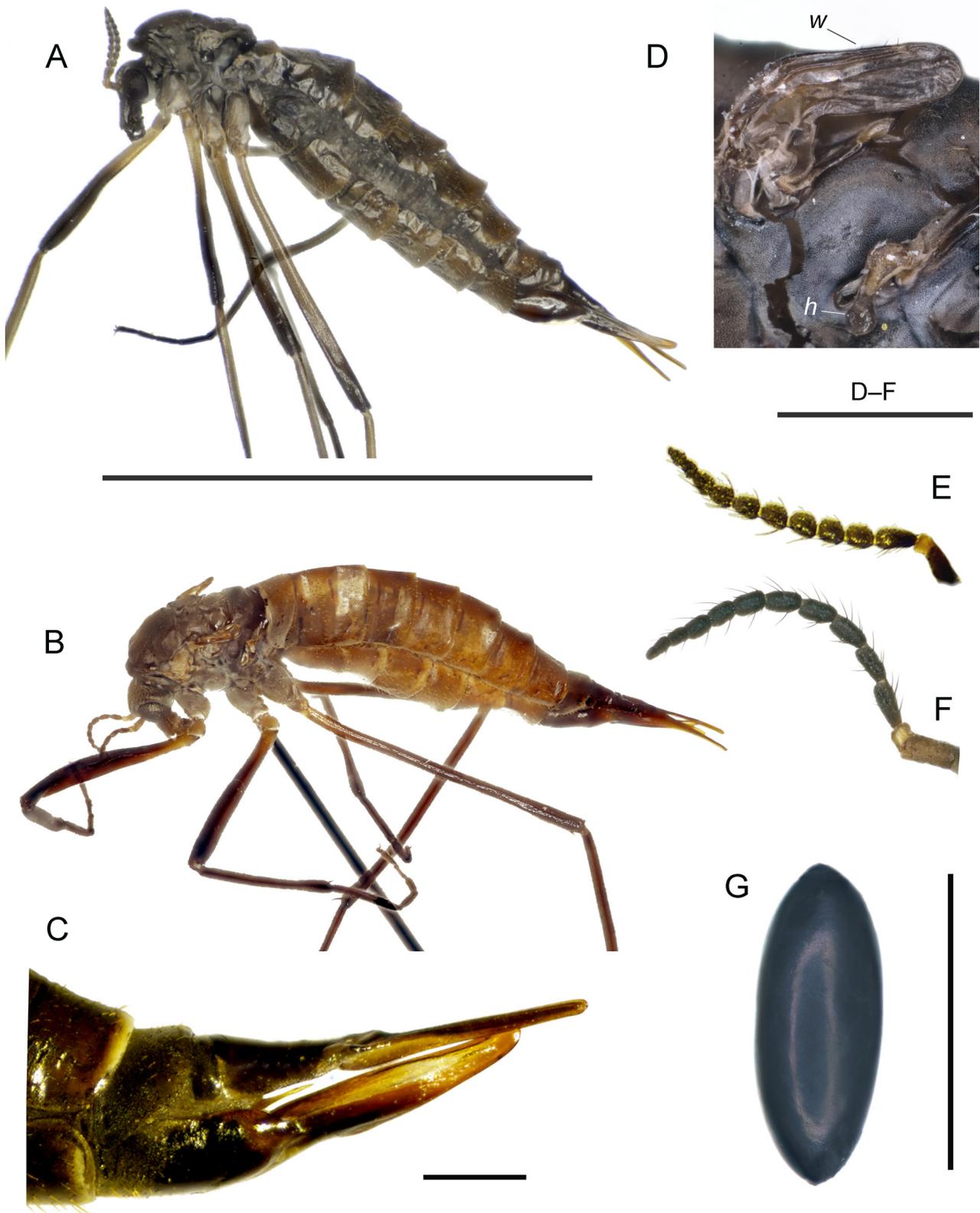


Fig. 4. *Tipula (Pterelachisus) submitophora* sp. nov., females (paratypes). **A, B**, habitus, left lateral view (temporarily dried specimens: **A**, with usual colour of body; **B**, with yellow-brown colour of body); **C**, ovipositor, left lateral view (dry); **D**, part of thorax with wing and halter, left lateral view; **E**, antenna of usual shape; **F**, antenna of unusual shape; **G**, unfertilised egg. Abbreviations: *h* – halter, *w* – wing. Scale bars: 10 mm (**A**, **B**), 1 mm (**C**–**G**).

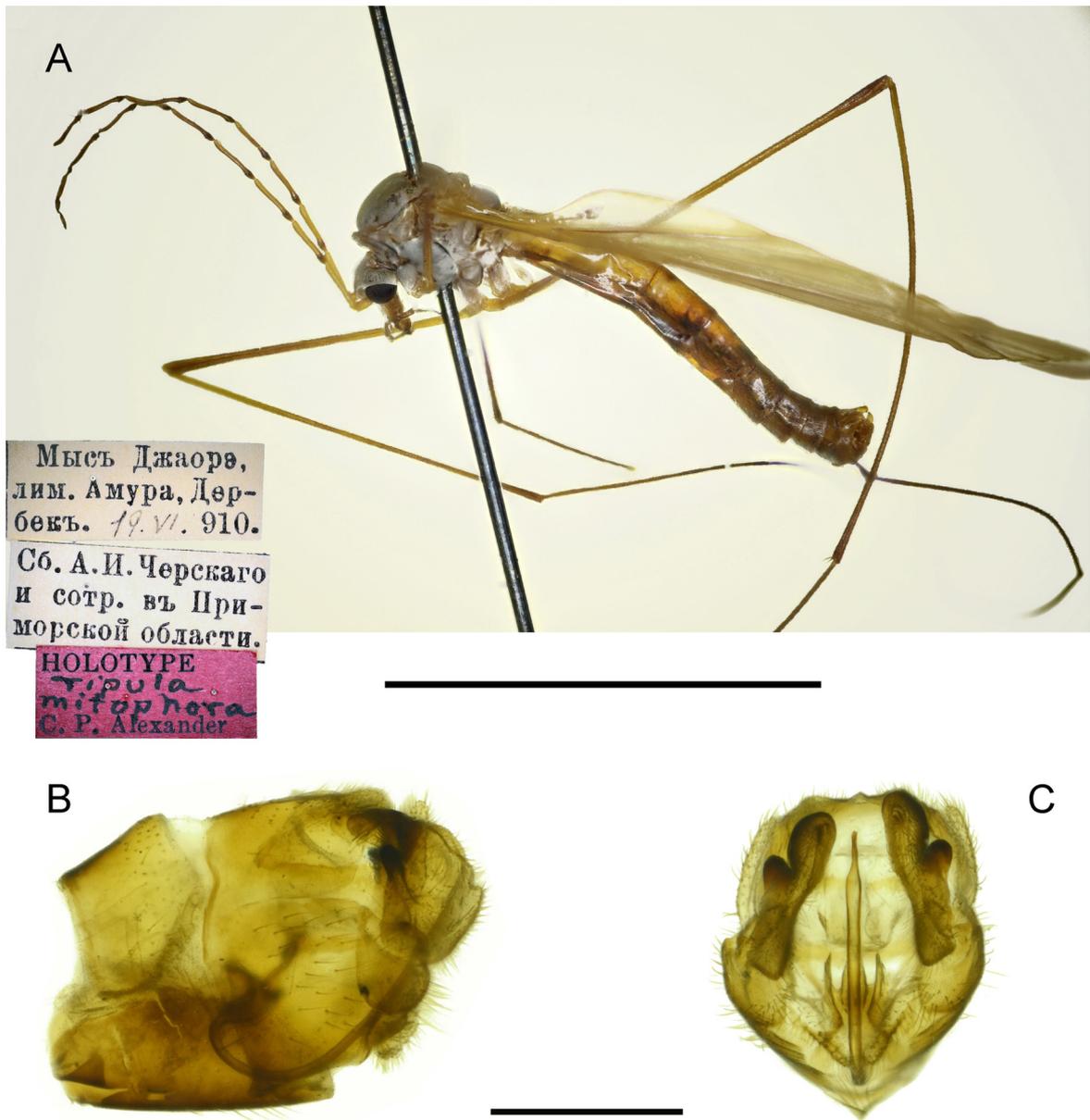


Fig. 5. *Tipula (Pterelachisus) mitophora* Alexander, 1934, males. **A**, habitus (holotype; dry specimen), left lateral view; **B**, **C**, male genitalia (specimens from Koreyskaya Pad', Primorskiy Territory, 18–19.V.2007; in glycerol: B, lateral view; C, caudal view). Scale bars: 10 mm (A), 1 mm (B, C).

19.IV.1910, Derbeck leg. (printed, in Russian)], “Sb. A.I. Cherskago i sotr. v Primorskoj oblasti.” [collected by A.I. Chersky and his team in Primorskaya Province (printed, in Russian)], “HOLOTYPE *Tipula mitophora* C. P. Alexander” [printed, on red paper] (ZISP).

Paratypes of Tipula mitophora. 2 males, same data as for holotype, 17 and 19.IV.1910 (ZISP); 1 male, Nikolaevsk-on-Amur [53°09'N 140°43'31"E; Alexander (1934a: 328) erroneously mentioned 53°30'N 143°30'E, but this point is located in the sea], 14.V.1908, Soldatov leg. (ZISP).

Holotype of Tipula blastoptera. Female, with labels: “st Sitsa, Suchan. rn. Ussur. kr. 15.VI Stakelberg 927” [Russia, Primorskiy Terr. (formerly Ussuri Terr.), Partizansk Distr. (formerly Suchan Distr.), Sitsa Station, 43°07'11.3"N 133°07'23.7"E, 15.VI.1927, Stackelberg leg. (printed, in Russian)], “HOLOTYPE female *Tipula blastoptera* C. P. Alexander” [printed, on red paper] (ZISP).

Additional material. Russia, Primorskiy Terr.: 10 males, middle reach of the Takema [Bolshaya Kema] Riv. [ca. 45°35'35"N 137°00'47"E], 27.V–12.VI.1937,

Grunin leg. (ZISP); same locality, 28–29.VI.1938, Grunin leg., 2 males (ZISP); 23 males, eastern slopes of Sikhote-Alin Mts. [ca. 45°03'12"N 136°36'39"E], 3–25.VI.1941, Grunin leg. (ZISP); 1 male, 1 female, western slopes of Sikhote-Alin Mts. [ca. 46°49'07"N 134°15'18"E], 23.VII.1941, Grunin leg. (ZISP); 1 male, lower reaches of Serebryanka Riv. [ca. 45°08'13"N 136°23'07"E], 20.VI.1937, Grunin leg. (ZISP); 1 male, Terney env. [45°03'12"N 136°36'39"E], 23.VI.1937, Grunin leg. (ZISP); Lazovsky Nature Reserve: 4 males, Koreyskaya Pad' [43°17'30"N 134°12'24"E], 19.VI.2007, Shokhrin leg. (VPC); 8 males, 4 females, same locality, 18–19.V.2007, Sundukov leg. (VPC); 1 male, 1 female, Petrov Bay [42°52'29"N 133°48'07"E], 30.V.2007, Shokhrin leg. (VPC); 4 males, Vtoroy Sobolinny spring, upper reach of Bystrushka Riv. [43°16'10"N 134°11'20"E], 15–17.VII.2007, Sundukov leg. (VPC); 1 male, Proselochnaya Bay [43°01'15"N 134°08'00"E], 24.V.2007, Sundukov leg. (VPC); 1 male, Lazo [43°22'27"N 133°53'59"E], 2.VI.2007, Shokhrin leg. (VPC); 2 males, 3 females, Bolotnikov spring [43°06'04"N 134°04'19"E], 500–550 m, 5–6.VI.2007, Sundukov leg. (VPC); 17 males, 4 females, same date and locality, Shokhrin leg. (VPC); 8 males, Chernaya Mt. [43°13'14"N 134°09'02"E], 28–29.VI.2005, Sundukov leg. (VPC). **China:** *Jilin Prov.*, 1 male, 1 female, Helong-shi, 750 m, 22.V.2018, H.Y. Oh leg. (YIM); *Heilongjiang Prov.*, 1 male, Yicun, Dialing, Niangshui National Nature Reserve, 350–450 m, 27.V.2018, Y. Li & Y. Gao leg. (SAU); *Liaoning Prov.*, 1 male, Benxi, Tanggo, 17.V.2012, H. Fan leg. (SYNU).

Redescription. *Male* (Fig. 5A). Rather small crane fly (body length 10–14 mm, wing length 14–16 mm, antenna length 8–9 mm). General body coloration yellowish grey, with thorax yellowish grey and terminal segments of abdomen darkened.

Head (Fig. 2D) grey, rostrum yellow with distinct nasus. Antenna 13-segmented, elongate, if bent backward reaching middle of abdomen. Scape, pedicel and first flagellomere yellow; succeeding flagellomeres brownish yellow or brown, apically narrowly dark brown, giving indistinct bicolourous appearance; terminal segments dark brown. Each flagellomere cylindrical (Fig. 2E), except first and last, with weak basal enlargement. Verticils much shorter than respective segments; palpus brown.

Thorax (Fig. 2D) yellowish grey. Prescutum and presutural scutum yellowish grey with four brown stripes; intermediate pair separated by line of ground colour. Pleura grey. Coxae yellowish grey; trochanters pale yellow; femora yellowish with narrowly darkened distal parts. Tibiae

light brown; tarsal segments dark brown. Tarsal claws small, simple. Wing (Fig. 2F) tinged with brownish colour; stigma light brown; wing membrane along vein *Cu* and anterior transverse veins slightly darkened with brown; wing with three very vague whitish areas: near outer end of cell *m*, before stigma and a narrow whitish area (lunule) extending to base of discal cell. *R*₃ almost entirely absent, only tiny basal part retaining. Abdominal segments 1–4 yellow; segments 5–9 brownish (Fig. 5A). Tergites dorsally with brown median stripe and narrow indistinct lateral stripes.

Hypopygium (Figs 5B, C, 3H–M). Hypopygium yellowish brown. Gonocoxite and tergite 9 entirely separated from sternite 9. Sternite 8 yellowish brown, simple, without tuft or group of sparse long setae (Fig. 5B). Tergite 9 (Fig. 3H) entirely pale, caudal margin with very wide V-shaped median notch, without noticeable tubercle at bottom. Outer gonostylus (Fig. 3I, J) yellow, narrow lanceolate, about as long as inner gonostylus. Inner gonostylus (Fig. 3I, J) with lower beak narrowly rounded, black, apically with small notch. Upper beak of inner gonostylus with elongate roundish tip; proximal margin of upper beak with narrow yellow dorsal crest of protruding long bristles. Outer basal lobe of inner gonostylus narrow and indistinct, without tooth, with protruding short hairs. Gonapophyses of adminiculum (Fig. 3K, L) shorter than aedeagus guide. Aedeagus narrowed at apex (Figs 3M, 5C).

Female (Fig. 6A, B). Body length about 9.5–10.2 mm, wing length 0.7–0.8 mm, antenna length 1.2–1.3 mm. Similar to female of *T. (P.) submitophora* sp. nov.; different from male in wings greatly reduced in size, general coloration brown, legs short and thick.

Head (Fig. 6C) brownish grey; rostrum brownish grey, short and stout, in alignment with anterior vertex; nasus short and stout; palpi brownish black. Antenna 12-segmented, short; scape dark brown, pedicel obscure yellow; basal flagellomeres brighter brown than more distal ones; four distal flagellomeres short and crowded; basal flagellomeres short cylindrical; verticils equal to or longer than respective segments.

Thorax (Fig. 6C) brownish. Prescutum and presutural scutum dark greyish brown, without distinct stripes; prescutal interspaces indicated by small yellow setae. Prescutum depressed; scute-

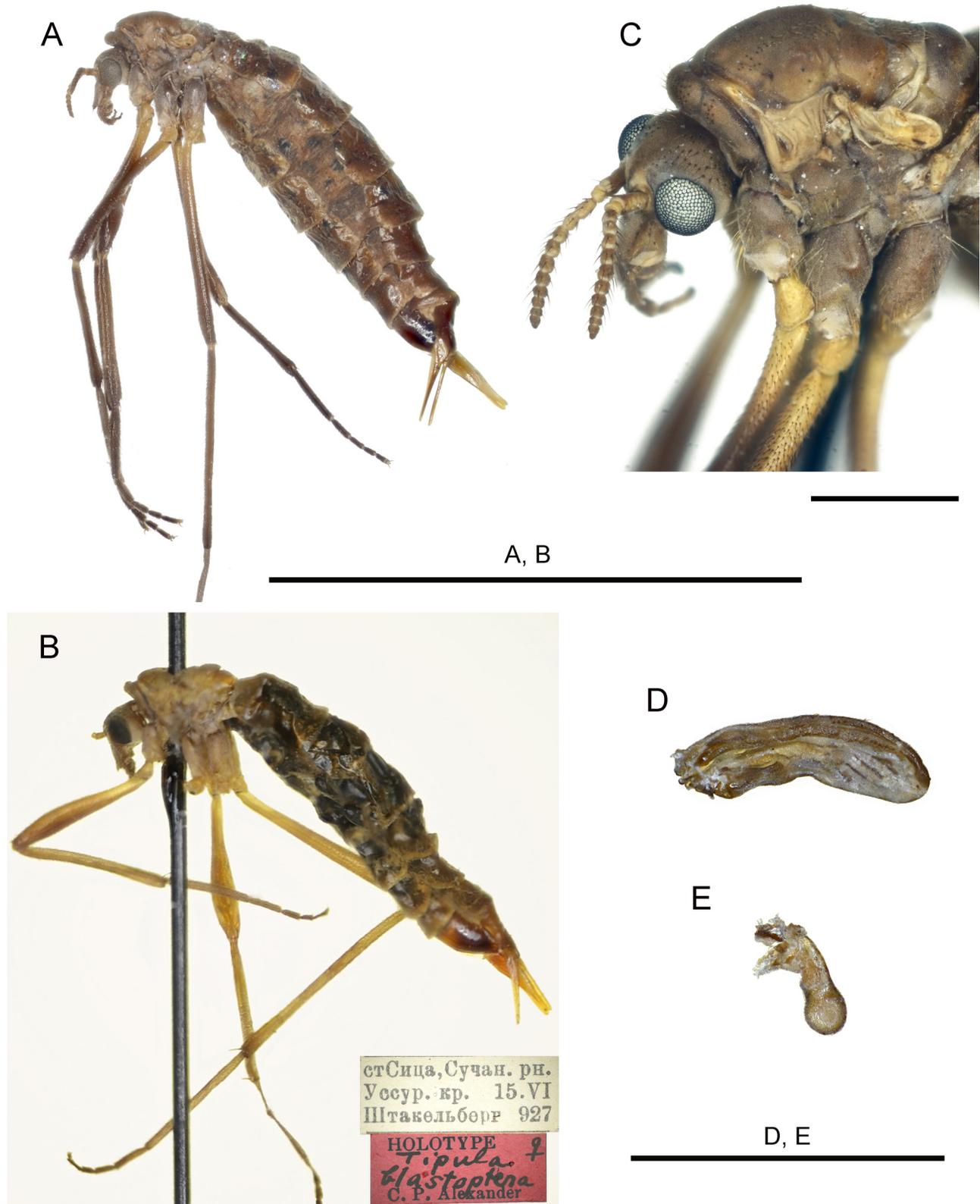


Fig. 6. *Tipula (Pterelachisus) mitophora* Alexander, 1934, females. **A, B**, habitus, left lateral view (dried specimens: A, specimen with usual colour, from Koreyskaya Pad', Primorskiy Territory, 18–19.V.2007; B, holotype); **C**, head and thorax (specimen from Koreyskaya Pad', Primorskiy Territory, 18–19.V.2007); **D**, wing; **E**, halter. Scale bars: 10 mm (A, B), 1 mm (C–E).

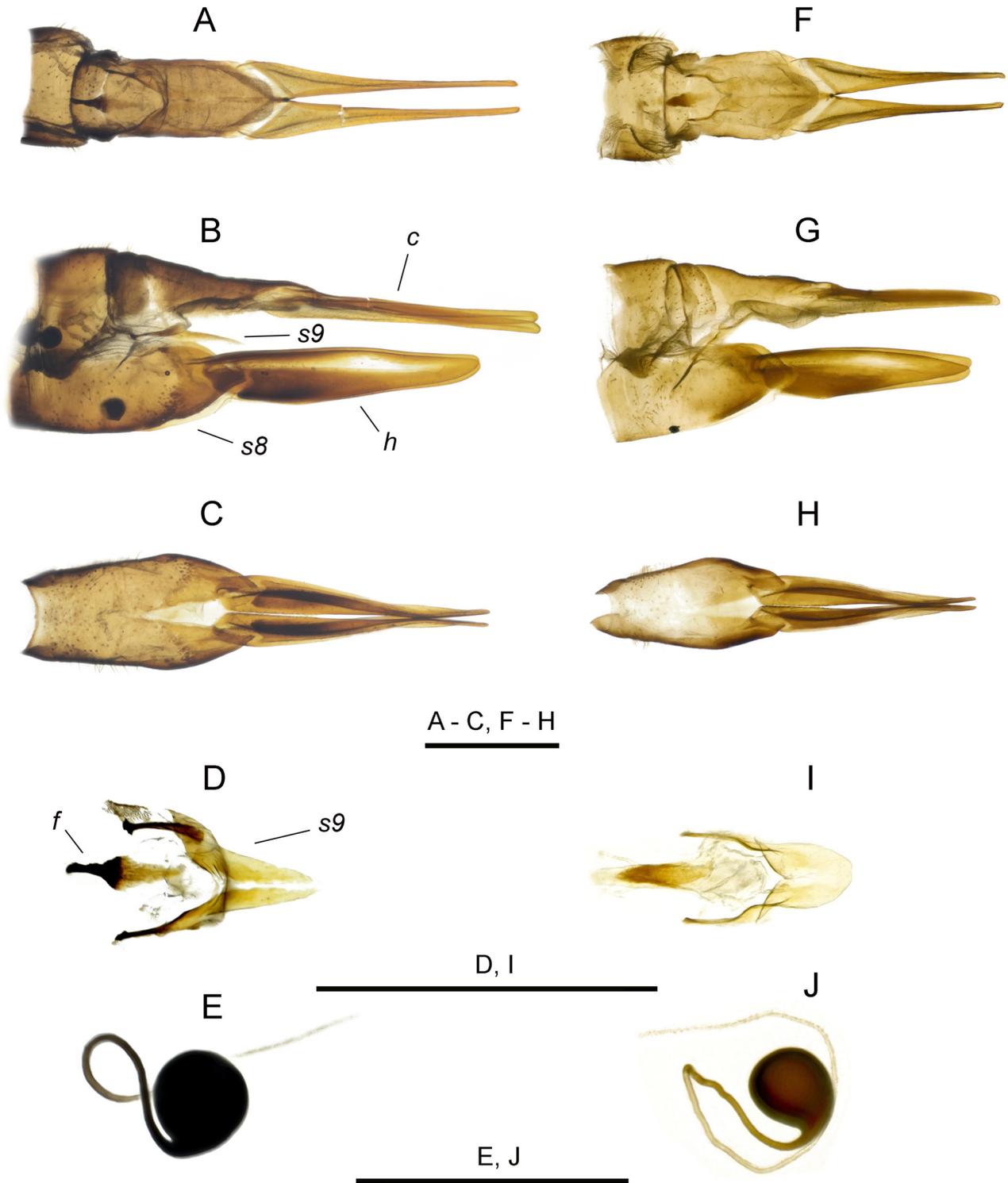


Fig. 7. *Tipula (Pterelachisus)* spp., female terminalia (in glycerol). A–E, *T. (P.) submitophora* sp. nov. (paratype from Mt. Baekwoon-san, 8.VI.2021); F–J, *T. (P.) mitophora* Alexander, 1934 (specimen from Koreyskaya Pad', Primorskiy Territory, 18–19.V.2007). A, F, ovipositor, ventral view; B, G, ovipositor, left lateral view; C, H, sternite 8 with hypovalvae, ventral view; D, I, sternite 9 and furca, dorsal view; E, J, spermathecae. Abbreviations: *c* – cerci, *f* – furca, *h* – hypovalvae, *s8* – sternite 8, *s9* – sternite 9. Scale bars: 1 mm.

llum large. Pleura light brown. Wings (Fig. 6D) reduced to short scales; wing venation reduced, outer radial veins best indicated by rows of strong trichia; costal trichia absent to two or three present on basal half. Halteres (Fig. 6E) pale, reduced in size, bent, with knobs poorly developed. Fore leg shorter than others, with enlarged femur; all legs with coxae brown, trochanters yellow, femora brownish yellow, distal part of femora very broadly blackened, tibiae and tarsomeres brown. Abdomen mostly dark brown, caudal margins of intermediate segments very narrowly brightened.

Female terminalia (Fig. 7F–J). Tergite 8 dark brown; tergite 9 brown with caudal margin brightened; tergite 10 shining dark brown. Cercus yellowish, narrow and slender, its tip rounded. Sternite 8 shining brown with caudal margin darkened. Hypogynial valve reaching three quarters of cercus length, shiny brown at base, light brown at end, with small pale spot in middle, near upper margin. Sternite 9 with posterior part short and rounded (Fig. 7I). Furca anteriorly narrow, weakly sclerotised, posteriorly with shortly elongate sclerotisation. Spermatheca dark brown, nearly oval, broadened at base (Fig. 7J).

Remarks. The males from the Khabarovsk Territory (holotype and paratype; Fig. 2D, E) each has one additional seta in the middle of the flagellomeres, as in the subgenus *Dendrotipula* Savchenko, 1964. The males from the Primorskiy Territory do not have such additional setae. In some females, caudal margins of the intermediate abdominal segments do not have a narrow brightened stripe (Fig. 8B), especially after storage in ethanol.

Distribution. Southern Far East of Russia (Khabarovsk and Primorskiy territories) and north-eastern China (Jilin, Heilongjiang and Liaoning provinces).

Discussion

Savchenko (1983) considered the simple structure of the outer basal lobe of the inner gonostylus, without teeth or other raised structures, to be a primitive feature. A number of East Palaeartic species have a similar simple structure. Savchenko (1964) included *Tipula (Pterelachisus) mitophora* to the *T. carinifrons* species-group, but the species of this group do not have a distinct nasus, and therefore he placed this species in an untitled

mixed species-group. Later, Theowald (1980) revised the European species of the subgenus *Pterelachisus* and established the *T. berteii* species-group for a number of species from the Alps and Italy. The males of *T. berteii* species-group are characterised by the outer basal lobe of the inner gonostylus very narrow and indistinct, without a tooth or other raised structures. The new species and *T. (P.) mitophora* are similar to the West-Palaeartic species *T. (P.) berteii* (Rondani, 1842) known from Italy and southern Switzerland in the structure of the male hypopygium and as well as in the wingless females. At the same time, the males of both East-Palaeartic species have abdominal segments 1–4 yellow or yellowish brown with dorsal median brown stripe and sternite 8 simple, without a tuft or group of sparse long setae. *Tipula berteii* has a brown abdomen with grey pruinosity and without a dorsal brown median stripe and sternite 8 with a group of sparse long setae (Savchenko, 1964; Theowald, 1980). The females of *T. (P.) berteii* have well-developed halteres (Venturi, 1968), while the females of *T. (P.) submitophora* sp. nov. and *T. (P.) mitophora* have strongly reduced halteres. It is possible that both species can be attributed to the *T. berteii* species-group, but it is more likely that their similarity to the West-Palaeartic species is only convergent.

Addenda

Electronic supplementary material. Fig. 8. Mating crane flies in nature. **A**, *Tipula (Pterelachisus) submitophora* sp. nov. from South Korea (Gangwon-do Province); **B**, *T. (P.) mitophora* Alexander, 1934 from north-eastern China. Photos by D.A. Yi. File format: JPEG. Available from: <https://doi.org/10.31610/zsr/2023.32.2.231>

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