A new species of *Trichocera* Meigen with further records of *Metatrichocera* Dahl from Bulgaria, Romania, and Serbia (Diptera, Trichoceridae)

Levente-Péter KOLCSÁR¹*, Andrius PETRAŠIŪNAS², Edina TÖRÖK¹,³, Lujza KERESZTES¹

¹Hungarian Department of Biology and Ecology, Centre of Systems Biology, Biodiversity, and Bioresources, University of Babeș-Bolyai, Cluj-Napoca, Romania
²Department of Zoology, Institute of Biosciences, Vilnius University Life Sciences Center, Vilnius, Lithuania
³Romanian Academy Institute of Biology, Bucharest, Romania

Received: 22.09.2017  •  Accepted/Published Online: 05.12.2017  •  Final Version: 21.03.2018

Abstract: Here we report a new winter crane fly (Trichoceridae) species, belonging to the subgenus *Metatrichocera* Dahl, 1966 from Bulgaria. Further records of *Metatrichocera* Dahl from Bulgaria, Romania, and Serbia are presented with illustrations and taxonomic remarks. The records of *Trichocera* (*Metatrichocera*) *forcipula* Nielsen, 1920 and *Trichocera* (*Metatrichocera*) *ticina* Starý & Podėnas, 1995 represent the first records of Trichoceridae from Serbia.

Key words: New faunistic records, winter crane flies, distribution, illustration

1. Introduction

Trichoceridae or winter crane flies are a relatively small dipteran group. Only two genera have been reported from Western Palearctic so far: *Cladoneura* Scudder, 1894 (formerly *Diazosma* Bergroth, 1913) and *Trichocera* Meigen, 1803. The genus *Trichocera* includes four subgenera: *Trichocera* Meigen, 1803; *Metatrichocera* Dahl, 1966; *Saltrichocera* Krzemińska, 2002; and the recently described *Staryia* Krzemińska & Gorzka, 2016 (Dahl, 1966; Krzemińska, 2002; Krzemińska and Gorzka, 2016). Among these, members of *Metatrichocera* show the most spectacular and complex male genitalia. This subgenus was originally described as a genus (Dahl, 1966); nevertheless, later it was treated as a subgenus of *Trichocera* (Alexander and Alexander, 1973; Dahl and Alexander, 1976). The definition of the subgenus *Metatrichocera* has been discussed and rephrased several times (Dahl, 1971; Dahl and Alexander, 1976; Nakamura and Saigusa, 1997; Starý, 1998; Krzemińska, 2002), with the conclusion that this group is probably paraphyletic and includes several species groups (Krzemińska, 2002).

From a faunistic point of view, Trichoceridae contains rather neglected Diptera taxa, having only sparse data from the Balkan Peninsula. *Trichocera* (*Trichocera*) *hiemalis* (De Geer, 1776) is known from old records from Croatia (Strobl, 1902), Bosnia and Herzegovina (Strobl, 1898, 1900), and Bulgaria (Czerny, 1930). There are also old records for *T. (Saltrichocera) regulationis* (Linnaeus, 1758) from Bosnia and Herzegovina (Strobl, 1898, 1900, 1902) and recent ones from Slovenia (Novak, 2005) as well as from the caves in Bulgaria (Hazelton, 1970; Pavlova, 2009; Beron et al., 2011). *T. (S.) annulata* Meigen, 1818 is known from Croatia (Strobl, 1902) and *T. (S.) maculipennis* Meigen, 1818 from Bosnia and Herzegovina (Strobl, 1898, 1900, 1902) and Slovenia (Novak and Kuštor, 1983; Novak, 2005). *T. (Metatrichocera) forcipula* Nielsen, 1920 was reported from Bulgaria (Dahl, 1992), but no locality data were given. Finally, 16 species were reported from Romania (Ujvárosi and Krzemińska, 2002). Having in mind the number of new species described in Europe in recent years, there might be many new findings in the Balkans as well.

2. Materials and methods

The type material was collected by using sweep net and specimens were stored in 96% ethanol and deposited in the Diptera Collection of the Faculty of Biology and Geology, Babeș-Bolyai University, Cluj-Napoca, Romania (DCBBU). The morphological characteristics of the male and female terminalia were examined after maceration in 10% KOH. The photos were taken using an Olympus SZ61 stereomicroscope and an Optik microscope equipped with a Canon 650D camera and an LM Digital SLR Adapter (Micro Tech Lab, Austria). Layer photos were

* Correspondence: kolcsar.peter@gmail.com

172

3. Results and discussion

3.1. Description of Trichocera (Metatrichocera) unica Kolcsár, sp. nov.

Since the specimens described herein (Figures 1–3) are stored in alcohol, their actual coloration might differ from the specimen stored dry or observed alive.

Diagnosis: Medium-sized species, with relatively simple gonostylus, which is cylindrical in general, with a rounded projection on the interior margin in the middle, the apical end of gonostylus yellowish and finger-like. Gonocoxite cylindrical in dorsal view and the bridge distinctly fused and bent apically, leaving a large rhombus-shaped membranous area over sternite IX in ventral view.

Material: Holotype: male, Bulgaria, Kalòfer (Kalòfer), Stara Planina Mts., tributary of the Tùndzha River (Tùndzha река), 900 m, 42.669285°N, 24.987644°E, 28 October 2016, leg. Kolcsár L.-P. and Török E.

Paratypes: 3 males and 2 females from same location and date, 3 males from Bulgaria, Turiya/Turia (Турия), Sredna Gora Mts., Turiiska River (Турийска река), 620 m, 42.51086°N, 25.20612°E, 30 October 2016, leg. Keresztes L.

Description: Male: Body 5–5.1 mm, wing 6–6.1 mm. Head dark brown. Antennae lighter brown than the head, 16-segmented, 2.5–2.8 mm long. Scape and pedicel a little darker than the remaining flagellomeres. First flagellomere (f1) elongated, 1.2–1.5 times as long as the second one (f2) (Figure 1C). Flagellomeres 2–4 are equal in length, f5–f6 are a little narrower and longer than f4. Starting from f7 and up to f14 the flagellomeres are very narrow and are approximately equal in length (Figure 1D).

Thorax light brown to brown. Legs are unicolored, light brown. Fore fourth tarsomere 1.1× longer than the fifth tarsomere. Fore fifth tarsomere 3.5–4× as long as the tarsal claw (Figure 1B). Half of the fifth tarsomere is densely covered with setae on the ventral side (Figure 1B). Wing venation light brown to brown. A1, cross-veins r-m and m-cu and the basal 1/3 of the M are bare, all other veins with setae on both sides. Stigma is very faint, a small spot is visible on r-m (Figure 1A).

Figure 1. Trichocera (Metatrichocera) unica Kolcsár, sp. nov. male: A- right wing; B- fore fourth and fifth tarsus; C- scape, pedicel, and first five flagellomeres; D- last (f14) flagellomere; E- schematic illustration of tarsal claw, lateral view of aedeagal complex; F- photograph; G- schematic illustration. Scale bars: A- 1 mm, B and C- 0.2 mm, D- 0.1 mm, F and G- 0.1 mm.
Figure 2. Trichocera (Metatrichocera) unica Kolcsár, sp. nov. male genitalia. Dorsal view: A- photograph; B- schematic illustration, ventral view; C- photograph; D- schematic illustration. Lateral view: E- photograph; F- schematic illustration; G- close view of apical part of gonostylus. Scale bars: A–F- 0.5 mm.

Figure 3. Trichocera (Metatrichocera) unica Kolcsár, sp. nov. female genitalia: A- lateral view; B- dorsal view; C- ventral view; D- close lateral view of female genitalia; E- inner genitalia in ventral view; F- spermathecal capsule; H- pattern in the inner side of cercus; I-pattern in the end of cercus. Scale bars: A- 0.5 mm, B and C- 0.25 mm, E and F- 0.2 mm.
Abdomen brown to dark brown. Male genitalia dark brown. Sternite IX and tergite IX fused (Figures 2E, 2F). Gonocoxite cylindrical in dorsal view (Figures 2A, 2B). The bridge distinctly bent apically and fused in middle, leaving a large rhombus-shaped membranous area over sternite IX in ventral view (Figures 2C, 2D). Gonostylus is uniquely shaped within the Trichoceridae. Gonostylus is cylindrical in general, with a small rounded projection on the interior margin in the middle (Figures 2A–2D), with a finger-like narrowing at the end. The finger-like end of the gonostylus is yellowish, with the end covered with setae (Figure 2G). In lateral view the gonostylus is mildly curved ventrally (Figures 2E, 2F). Aedeagal complex (Figures 1F, 1G).

Female. Body 5.1–5.2 mm, wing 5.9–6.1 mm. Female antennae are similar to male antennae, just a little shorter (2.2–2.5 mm). Body coloration is similar to the male body coloration. Wing as in the case of male. Female genitalia light brown (Figure 3). Tergites 9 and 10 fused in middle (Figure 3B). Cercus (ovipositor) is 0.5 mm long, as long as the genital segment (tergites 8–10 and sternite 8) (Figures 3A, 3B). The inner side of the cercus is covered in spike-like setae that are directed apically and probably help the egg-laying (Figure 3H). The tip of cercus is rounded and bears two larger sensilla and a row of smaller ones along the edge (Figure 3I). Genital plate is slightly broadened in the basal part, forming a concave surfaces and bears two bristles (Figure 3E). Genital fork is 1.8× longer than the genital plate (Figure 3E). The three spermathecal capsules are rounded (Figure 3F). Hypogynial valves are rounded both in lateral and ventral view, with small lobes in dorsal parts (Figures 3A, 3C, 3D).

Distribution and ecology: The new species is probably distributed in the Stara Planina Mountains and in the surrounding areas. The species was collected by us around small brooks in hornbeam (Figures 3A, 3B). The bridge distinctly bent apically and fused in middle, leaving a large rhombus-shaped membranous area over sternite IX in ventral view (Figures 2C, 2D). Gonostylus is uniquely shaped within the Trichoceridae. Gonostylus is cylindrical in general, with a small rounded projection on the interior margin in the middle (Figures 2A–2D), with a finger-like narrowing at the end. The finger-like end of the gonostylus is yellowish, with the end covered with setae (Figure 2G). In lateral view the gonostylus is mildly curved ventrally (Figures 2E, 2F). Aedeagal complex (Figures 1F, 1G).

Notes: The species is unique and has relatively simple genitalia within Metatrichocera, probably representing a new species group. We include the species in Metatrichocera based on the relatively narrow anal cell, the gonostylus being not simply shaped and the gonocoxal bridge distinctly bent apically and fused in middle. However, the new species does not match all the features of Metatrichocera highlighted by Krzemińska (2002), as the gonocoxite is cylindrical, longer than wider in dorsal view, the membranous part between the bridge and IX sternite is large and the lateral apodemes of aedeagal complex are relatively dumpy, not three times longer than wide. Until a more thorough revision of subgenus Metatrichocera is made, we include the species in this subgenus.

Etymology: The name of the species refers to its uniquely shaped gonostylus (unica = unique).

3.2. Further records of Metatrichocera

Trichocera (Metatrichocera) forcipula Nielsen, 1920 (Figures 4 and 5)

(Mother illustrations: Nielsen, 1920, figs. 1–3; Dahl, 1966, figs. 2, 6, 11, 35, 39, 43)

Material: Bulgaria, between Shipkovo (Шипково) and Ribaritsa (Рибариса), Stara Planina Mts., mountain pass, 1230 m, 42.851610°N, 24.493634°E, 29 October 2016, 7 males, leg. Kolcsár L.-P. and Török E; Serbia, Crni Vrh (Црни Врх), Stara Planina Mts., near Babin Zub (Бабин зуб), 1220 m, 43.381971°N, 22.611664°E, 30 October 2016, 1 female, leg. Kolcsár L.-P. and Török E.

Comments: This species was described from Denmark (Nielsen, 1920) and later found in many European countries: in France (Krzemińska and Brunhes, 1991) and Belgium (Mortelmans and Dekeukeleire, 2012) in the west; through Switzerland (Bangerter, 1948), Germany (Dahl, 1992; Schacht, 2000), the Czech Republic (Martinovský and Starý, 1988), Poland (Krzemiński, 1983), and the Slovak Republic (Starý, 1997, 2009) to Hungary (Krzemińska, 2001) in the east; and through Lithuania (Podėnas, 1993; Petrašiūnas and Visarčuk, 2007) up to Sweden (Dahl, 1966) and Russia (Stackelberg, 1951) in the north. It was mentioned from Bulgaria by Dahl (1992), but with no locality data. The Bulgarian records are the southernmost known so far. Specimens were collected in temperatures between –1 and 5 °C, in a young hornbeam (Carpinus betulus)-dominated forest in Bulgaria and in a mixed spruce (Picea abies) and beech (Fagus sp.) forest in Serbia. The species is herein reported from Serbia for the first time and we confirm the presence of the species in Bulgaria with locality data.

Trichocera (Metatrichocera) ticina Starý & Podėnas, 1995 (Figure 6)

(Mother illustrations: Starý and Podėnas, 1995, figs. 1–4)

Material: Serbia, Crni Vrh (Црни Врх), Stara Planina Mts., near Babin Zub (Бабин зуб), 1220 m, 43.381971°N, 22.611664°E, 30 October 2016, 1 male, leg. Kolcsár L.-P. and Török E; Serbia, Crni Vrh (Црни Врх), Stara Planina Mts., mountain pass, 1230 m, 42.851610°N, 24.493634°E, 29 October 2016, 7 males, leg. Kolcsár L.-P. and Török E.

Comments: A very rare trichocerid species. Originally described from canton Ticino, Switzerland, close to the Swiss–Italian border (Starý and Podėnas, 1995). Later the species was also reported from Hungary, collected in a boggy meadow near Pellérd (Krzemińska, 2001). The male aedeagal structure of this species closely resembles that of the species in subgenus Saltrichocera, but until a more thorough revision of subgenus Metatrichocera, we leave the species in its original placement.
Figure 4. *Trichocera (Metatrichocera) forcipula* Nielsen, 1920 male: A- wing; B- dorsal view of genitalia; C- ventral view of genitalia; D- lateral view of genitalia; E- lateral view of aedeagal complex. Scale bars: A- 1 mm, B- D- 0.5 mm, E- 0.25 mm.

Figure 5. *Trichocera (Metatrichocera) forcipula* Nielsen, 1920 female genitalia: A- lateral view; B- dorsal view; C- ventral view; D- close lateral view of female genitalia; E- inner genitalia; F- spermathecal capsule; H- pattern in cercus; I- pattern in the inner side of cercus; J- pattern in the end of cercus. Scale bars: A- 0.25 mm, B and C- 0.25 mm, E- 60 µm, F- 0.2 mm.
The biology and ecology of the species is unknown. We collected the specimen in temperatures between –1 and 2 °C, in spruce (Picea abies) and beech (Fagus sp.) mixed forest, near a small brook in Serbia. The Romanian specimen was collected in hornbeam (Carpinus betulus) forest, in temperatures between 5 and 10 °C. The species is reported here for the first time from Romania and Serbia, which together with Trichocera forcipula, represents the first records of Trichoceridae from Serbia.

**Taxonomic remarks:** The specimen stored in alcohol is very black with a little gleam in the prescutum.

**Nomenclatural acts:** This work and the nomenclatural acts it contains have been registered in ZooBank.

The ZooBank Life Science Identifier (LSID) for this publication is: http://zoobank.org/urn:lsid:zoobank.org:pub:81084BB7-2C87-4247-8233-BB71F5C6B41A

**Acknowledgments**

We thank Tamara Szentiványi for the linguistic revision and we appreciate the comments and advice of the anonymous reviewers and the help of the editor. This study was financially supported by a grant of the Romanian Ministry of National Education, CNCS-UEFISCDI - nr. PN-II-ID-PCE-2012-4-0595. During preparation of the manuscript the first and third authors received financial support from Eötvös Loránd University, Hungary.

**References**


