

## The first records of the crane flies *Tipula apicispina* and *T. stenostyla* (Diptera: Tipulidae) from Russian Karelia with new data on their bionomics

### Первые находки комаров-долгоножек *Tipula apicispina* и *T. stenostyla* (Diptera: Tipulidae) в Карелии и новые данные по их биологии

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The rare Palaearctic species *Tipula apicispina* Alexander, 1934 and *T. stenostyla* Savchenko, 1964 are recorded for the first time from Russian Karelia. The new data on their bionomics are given. The adults were collected with trunk eclector set on a recently fallen aspen trunk. The larvae develop under moss growing on fallen trunks, bases of old standing trees and stumps of hardwoods, as well as on the ground near tree bases.

Приводится информация о первых находках редких палеарктических видов *Tipula apicispina* Alexander, 1934 и *T. stenostyla* Savchenko, 1964 в Карелии и новые данные по их биологии. Имаго были собраны с помощью стволового эклктора, установленного на ветровальной осине. Личинки развиваются под слоем мхов на валеже, пнях и в нижней части ствола старых стоящих деревьев лиственных пород, а также на почве вблизи основания стволов.

**Key words:** craneflies, Russia, Karelia, bionomics, larval habitats, Diptera, Tipulidae, *Tipula*, new records

**Ключевые слова:** комары-долгоножки, Россия, Карелия, биология, биотопы развития личинок, Diptera, Tipulidae, *Tipula*, новые находки

## INTRODUCTION

The family Tipulidae is a highly diverse group of nematoceros Diptera, with 4285 recognized species in the world fauna (Oosterbroek, 2015). Being rather well studied in many Palaearctic regions, this family did not receive sufficient attention in northwestern Russia. Eighty-four species of Tipulidae are known from Russian Karelia (Polevoi, 2016), which is ca. 75% of the fauna of neighbouring Finland (Salme-

la, 2012). Species of the Karelian fauna are mentioned in the monographs by Savchenko (1964, 1973, 1983) and in several other entomological publications (Mannheims, 1954; Krogerus, 1939, 1960; Przhiboro, 1999, 2003). Several local lists (Humala & Polevoi, 1999, 2008, 2009, 2012; Jakovlev & Polevoi, 1997; Jakovlev et al., 2000, 2014) and some interesting records (Pilipenko, 2011; Humala & Polevoi, 2015) have been published recently, but no regional compilation is available. In 2015, we used trunk emergence traps to collect insects from fallen logs of various tree species in the Kivach

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State Nature Reserve. Among other insects, two remarkable species of craneflies were collected, *Tipula apicispina* Alexander, 1934 and *T. stenostyla* Savchenko, 1964. Both are rare Palaearctic species not earlier recorded from Karelia. In 1997–2007, the second author collected these species in Moscow Province (Pilipenko, 2009) but the observations on their bionomics remained unpublished. In the present communication, we give the new records of *T. apicispina* and *T. stenostyla* along with the data on their bionomics.

## MATERIAL AND METHODS

The material was collected in the Kivach Nature Reserve situated in central Russian Karelia, 90 km north of Petrozavodsk (62°28'N, 33°55'E). Mature old forests (older than 140 years) occupy over 50% of its territory, providing favourable

conditions for organisms associated with dead wood. This is the only or one of the few known locations for many rare Karelian species (Jakovlev et al., 1995). The collecting site was located in the *Oxalis acetosella* – *Vaccinium myrtillus* type spruce forest, over 150 years old, with admixture of pine, birch and aspen and a large amount of dead wood (Fig. 1). The trap design was similar to that used by Halme et al. (2013), but we utilized a standard Malaise trap, modified so that it could be wrapped around the trunk (Fig. 2). Seventy-percent ethanol was used as a preservative. The traps were installed on 23 June 2015 and kept until 28 September 2015 with monthly checking.

Additional observations were made on larvae collected in spruce and mixed forests of Moscow Province (environs of vill. Chashnikovo). A part of the larvae were kept in the laboratory in containers with bark and moss until the emergence of imago.



**Fig. 1.** The collecting site at the Kivach Nature Reserve (photo by Anna Ruokolainen).





Fig. 2. The trunk emergence trap.

A Leica MZ 9.5 stereomicroscope with a Leica DFC290 digital camera were used to capture series of images of the male hypopygium, which were then z-stacked using Helicon Focus software. The Karelian specimens are stored in the collection of the Forest Research Institute, Petrozavodsk (FRIP) and others, at collection of the Department of Entomology of Moscow State University (MSU).

## RESULTS

### *Tipula (Pterelachisus) apicispina*

Alexander, 1934

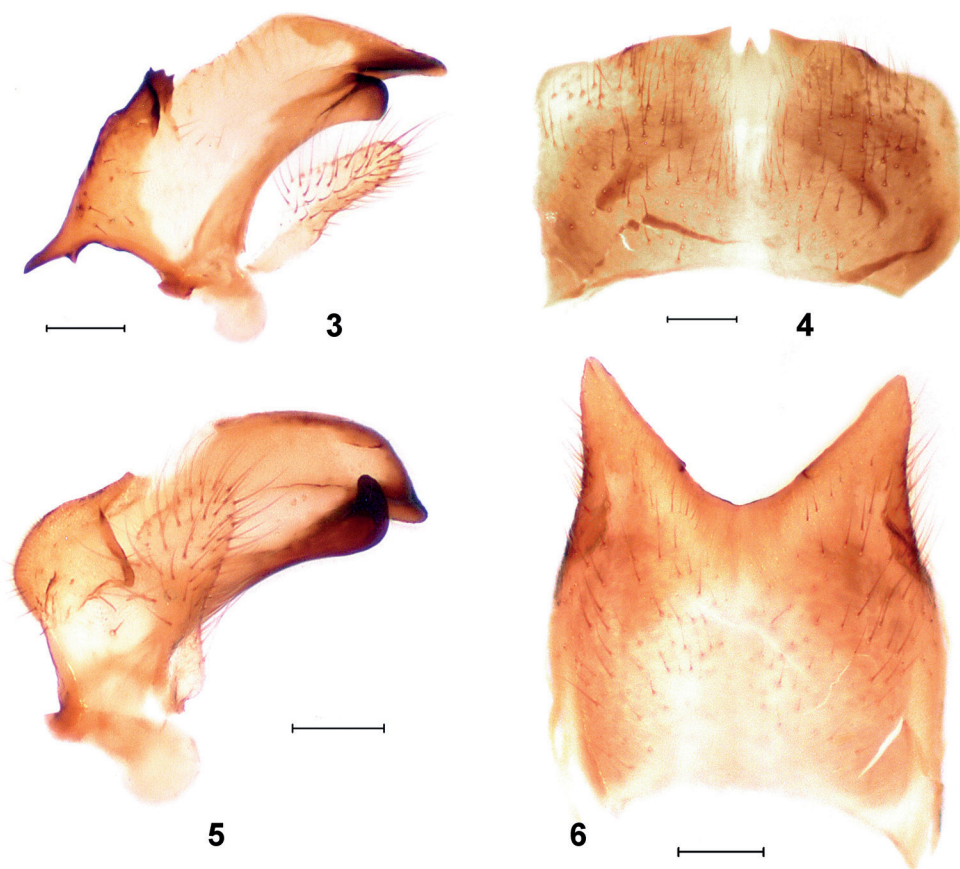
(Figs 3, 4)

**Material.** **Russia, Republic of Karelia:** 5 males, Kivach Nature Reserve, emerged until 22 July 2015 in a trap installed 23 June 2015 (A. Polevoi leg.; FRIP; pinned); **Moscow Prov.:** vill. Chashnikovo, 2 males, 2 females, reared 15 June 1995 and 6 males, 5 females reared 16 June 1995 from larvae collected 7 June 1995; 3 males, 3 females reared 6 June 1996, 2 males reared 10 June 1996, 4 males reared 26 June 1996, 7 males,

1 female reared 20 June 1996, 6 males, 5 females reared 27 June 1996 from larvae collected 1 June 1996; 2 larvae and 2 male pupae, 1 June 1996 (V. Pilipenko leg.; MSU; adults pinned, larvae and pupae in 70% ethanol).

**Distribution.** Palaearctic: recorded from several European countries, Kazakhstan, Central European and southern Far Eastern Russia (Oosterbroek, 2015). The Karelian location is the northernmost known up to now, with nearest sites in Moscow Province and Lithuania.

**Bionomics.** The known habitats of *T. apicispina* include mixed coniferous-broad-leaved forests in Primorskii Territory, Russian Far East (Pilipenko & Sidorenko, 2004), and fen meadows in Germany (Heiss & Merkel-Wallner, 2013). The adults are attracted to light (Savchenko, 1964; Pilipenko & Sidorenko, 2004). The larvae were found in the upper ground layer under mosses (Podėniėne, 2003). The Karelian specimens were collected from a large dead aspen (diameter at breast height, 60 cm) infested by several polypore species (*Phellinus*



**Figs 3–6.** *Tipula*, male. 3–4, *T. apicispina*; 5–6, *T. stenostyla*. Inner and outer gonostylus, lateral view (3, 5); tergite IX, dorsal view (4, 6). Scale bars: 0.2 mm.

*populicola* Niemelä, *Cylindrobasidium laeve* (Pers.) Chamuris, *Oxyporus corticola* (Fr.) Ryvarden) and most probably fallen during the autumn 2014 – spring 2015. The trap was installed approximately 4 m above the tree base in an area with rather rich epixylic vegetation. The dominating lichen and moss species were *Lobaria pulmonaria* (L.) Hoffm., *Parmelia sulcata* Taylor, *Nephroma bellum* (Spreng.) Tuck., *Hylocomium splendens* (Hedw.) Bruch et al., *Dicranum scoparium* Hedw., and *Sanionia uncinata* (Hedw.) Loeske. In Moscow Province the larvae were observed under moss on fallen trunks and stumps of oak (*Quercus robur* L.) and poplar (*Populus nigra* L.). They often occur together with the larvae of *T. irrorata* Mac-

quart, 1826, but pupate later (late July – August in *T. apicispina* vs. May – June in *T. irrorata*). The larvae probably feed on mosses, decaying organic matter and fungal mycelium. We also noticed several cases of cannibalism when rearing the larvae in the laboratory.

***Tipula (Pterelachisus) stenostyla***  
Savchenko, 1964  
(Figs 5, 6)

**Material.** **Russia, Republic of Karelia:** 2 males, Kivach Nature Reserve, emerged until 22 July 2015 in a trap installed 23 June 2015 (A. Polevoi leg.; FRIP; pinned); **Moscow Prov.:** vill. Chashnikovo, 1 male reared 23 May 1992

from larvae collected 10 May 1992; 1 larva and 1 female pupa, 23 May 1992 (V. Pilipenko leg.; MSU; adult pinned, larvae and pupae in 70% ethanol).

**Distribution.** Palaearctic: so far known only from Russia and Finland. In Russia, the species was found in the North and Central European parts and in West Siberia (Pilipenko, 2009) with the northernmost record from vill. Gobzhitsa in Leningrad Province (Savchenko, 1964). In Finland, it occurs in southern parts (Salmela, 2009, 2012).

**Bionomics.** *Tipula stenostyla* is assumed to be an old-growth forest specialist in Finland (Salmela, 2009). Barkalov & Saaya (2014) listed this species among the alpine tundra inhabitants, however this could be erroneous as the specimens originally reported from Altai (Pilipenko, 1999) were collected in low-mountain taiga. *Tipula stenostyla* is known to be saproxylic, associated with birch and aspen (Salmela, 2009). In Central Finland it was collected from different parts of dead aspen trunks — 5–15 years after falling/death, decay stage 2 (Halme et al., 2013). The Karelian specimens were collected with the same trap as the preceding species. In Moscow Province, the larvae were observed under moss on fallen trunks, bases of old standing trees and stumps of oak (*Quercus robur* L.), as well as on the ground near tree bases. They also can penetrate into the upper layer of bark. The species is red-listed in Finland, category VU (Penttinen et al., 2010).

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