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## Subgenus *Trichocera* (*Saltrichocera*) in Scandinavia: a new species and first records from Finland (Diptera, Trichoceridae)

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**Abstract.** From localities in Sweden in Finland in the vicinity of Polar Circle 14 species of the subgenus *Trichocera* (*Saltrichocera*) are recorded; all new to Finland, and 5 – to Sweden. A new species related to *T. (S.) antennata*, *T. (S.) montium* and *T. (S.) thaleri* is described from Finland. A female of *T. (S.) michali* is illustrated.

**Key words:** *Trichocera*, new species, Scandinavia, polar distribution.

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### I. INTRODUCTION

Trichoceridae are a small nematoceran family comprising c. 150 species belonging to two subfamilies: Trichocerinae and Paracladurinae, each with three genera (KRZEMIŃSKA et al. 2009). Within the Trichocerinae, the largest genus is *Trichocera* MEIGEN, 1803, divided into three subgenera: *Trichocera* MEIGEN, 1803, *Metatrachocera* DAHL, 1966 and *Saltrichocera* KRZEMIŃSKA, 2002. The genus has a Holarctic distribution. All species are cool adapted, i.e., the adults appear from autumn to spring and are known from zones of moderate to arctic climate, some reaching beyond the Polar Circle (DAHL 1976).

The northern regions of Europe and North America have been explored for Trichoceridae up to 1970, mostly by Christine DAHL and C. P. ALEXANDER.

In the last few years, several new species have been described from central Europe by STARÝ (1999, 2000; STARÝ & MARTINOVSKÝ 1996) and KRZEMIŃSKA (1999, 2002, 2003) and included in the subgenus *Trichocera* (*Saltrichocera*). Some of them were also found in southern Norway by HÅGVAR (HÅGVAR & KRZEMIŃSKA 2008).

In the present paper new records of the subgenus from Finland are presented; six species have been found so far north for the first time. All species are new to Finland, as no records from this country were made till now. A new species is described from Finland.

## II. MATERIAL AND METHODS

The material described here comes from old collections of Christine DAHL (years: 1971, 1975). The specimens were preserved in 60-70% ethanol, and generally in bad state. Fresh specimens were collected by us in Finland in 2011 and 2012 at the Oulanka Research Station. We also obtained Trichoceridae from the entomological traps Ranta and Emep stored frozen at the Station; these have been transferred by us to ethanol.

Specimens were determined based on morphology of genitalia. Preparations of genitalia were macerated in 10% NaOH overnight and washed in water for c. 2hrs.

The specimens belong to the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences; ul. Sławkowska 17; 31-016 Kraków, Poland (ISEA).

Initials of collectors:

CD – Christine DAHL

DG – Damian GORZKA

EK – Ewa KRZEMIŃSKA

PR & MC – Pia RANNANEN & Mark CORTTI

## III. SYSTEMATIC PART

### *Trichocera (Saltrichocera) antennata* STARÝ, 1999

*Trichocera (Saltrichocera) antennata* STARÝ, 1999 in KRZEMIŃSKA 2002: 157.

*Trichocera (Metatrachocera) antennata* STARÝ, 1999: 6, fig. 16-21.

**Material examined.** Finland: Highway E63 c. Ismila (pine+spruce, peat), 9.09.2011 - 1m (EK). Sweden: Rickleå, Fällstationen, 9. 02. 1971 - 1f (CD).

**Remarks.** Species is remarkable for the first flagellomere greatly expanded in female; in the male this segment is very short, less than twice as long as the pedicel, which makes a unique diagnostic character.

New to Finland and Sweden; the specimen from Rickleå document presence of this species far north, close to the Polar Circle. Recorded from southern Norway (October) by HÄGVAR & KRZEMIŃSKA (2007). Known from central Europe: Czech Republic (STARÝ 1999), Poland, Hungary and Romania (KRZEMIŃSKA 2004; KRZEMIŃSKA & PAPP 2001; UJVÁROSI & KRZEMIŃSKA 2002, resp.).

### *Trichocera (Saltrichocera) annulata* MEIGEN, 1818

*Trichocera (Saltrichocera) annulata* MEIGEN, 1818 in KRZEMIŃSKA 2002: 157.

*Trichocera annulata* MEIGEN 1818: Syst. beschr. bek. Eur. Zweifl. Ins. I (Aachen): 215.

**Material examined.** Sweden: Uppsala, Botanical Garden, 17-19.XI. 1999 – 1m, 1f (EK & CD). Finland: Oulanka Res. St., light trap EMEP, 19.08.2011. (PR & MC).

**Remarks.** New to Finland. Recorded from Sweden by DAHL & ALEXANDER (1976).

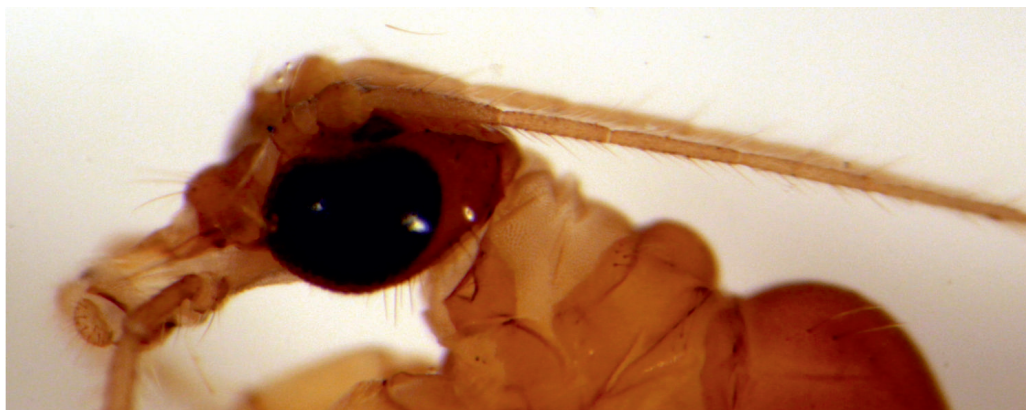
***Trichocera (Saltrichocera) dahlae* MENDL, 1971***Trichocera (Saltrichocera) dahlae* MENDL, 1971 in KRZEMIŃSKA 2002: 158.*Trichocera dahli* MENDL 1971, by original description**Material examined.** Uppsala, Botanical Garden, 17-19.XI. – 19f (EK & CD).**Remarks.** Described from Bayern, Germany (Allgau); known from Poland, Gorce Mts. (MENDL 1982), Czech Republic and Slovakia (STARÝ & MARTINOVSKÝ 1996) and Sweden (DAHL & ALEXANDER 1976).***Trichocera (Saltrichocera) implicata* DAHL, 1976***Trichocera (Saltrichocera) implicata* DAHL, 1976 in Krzemińska 2002: 158.*Trichocera implicata* DAHL, 1976**Material examined.** Sweden: Rickleå, Fällstationen 2. 02. 1971 – 1f; 4.02. 1971 – 1f; 9.02.1971 – 1f; 1.05.1971 – 1f; 1.06. 1971 – 1f; 3.09. 1971 – 1f; 4.09. 1971 – 4f; 2.10. 1971 – 1m; 3.10.1971 – 2f; 2.11. 1971 – 3f. Abisko LF (2), 4-11.08. 1975 – 1f; Messaure: 8-15.10. 1973 – 1f (all CD). Finland: Oulanka Res. St., light trap EMEP, 19.08.2011. – 1m (PR & MC).**Remarks.** New to Finland. Messaure in Sweden is the type localities of this species, whose occurrence reaches beyond the Polar Circle. *T. implicata* is common and widespread also in central and southern Europe (STARÝ & MARTINOVSKÝ 1996; KRZEMIŃSKA 2004).***Trichocera (Saltrichocera) maculipennis* MEIGEN, 1818***Trichocera (Saltrichocera) maculipennis* MEIGEN, 1818 in KRZEMIŃSKA 2002: 158.*Trichocera maculipennis* MEIGEN, 1818: Syst. beschr. bek. Eur. Zwiefl. Ins. I (Aachen): 214.

(Complete list of synonyms in DAHL &amp; ALEXANDER 1976)

**Material examined.** Sweden: Rickleå, Fällstationen, 7.01. 1971 - 1f (CD).**Remarks.** A synanthropic and cave dwelling species known from across Europe; the most northern localities are in Greenland (DAHL 1967).***Trichocera (Saltrichocera) michali* KRZEMIŃSKA 1999**

Fig. 1

*Trichocera (Saltrichocera) michali*: KRZEMIŃSKA E. 2002: 158.*Trichocera (Metatrichocera) michali*: KRZEMIŃSKA E. 1999: 254, fig. 17-20.**Material examined.** Sweden: Abisko LF (2), 4-11.08. 1975 - 1m, 1f (CD). Finland: Oulanka Research Station 19-21.10.2012 - 1m (DG).**Description of a female.** Antennae with thin basal flagellomeres (Fig. 1A). Wing varies from that of *T. (S.) regelationis* (L.) in the cross-vein m-cu not being shifted from the distal anal angle of discal cell and a vein R2+3+4 equal R2+3. Female genitalia: ovipositor of a shape similar to that of *T. (S.) regelationis* (Fig. 1B), and so are the inner genitalia (Fig. 1C): supragenital plate with two bristles, genital plate with distinct, heart-like incision, and the genital fork with very short distal arms.**Remarks.** This species was till now known only from the type locality in Poland (Pieńiny Mts.) and Slovakia (STARÝ 2001); female was not described yet. The species belongs



A



B



C

Fig. 1. *Trichocera (Saltrichocera) michali*, female, photographs. A – head; B – ovipositor; C – inner genitalia (f – genital fork; gp – genital plate; s – spermatheca; sg – supragenital plate).



to the *regelationis* group of species (KRZEMIŃSKA 1999), and differs from *T. regelationis* first of all by clear wings. The brown colour of this female (Fig. 1A) probably is not genuine, but results from a prolonged soak in alcohol; the males were described as blackish. However, great diversity in body colour was described in *T. regelationis* (KRZEMIŃSKA 2000) and the same may be true for *T. michali*.

Species new to Sweden and Finland. The present record stretches its distribution far north, beyond the Polar Circle.

***Trichocera (Saltrichocera) nordica*, n. sp.**

Fig. 2

**D i a g n o s i s.** Antennae with dense, soft pubescence; setae soft. Male: gonostyles almost straight and parallel-sided, apex rounded. Female: ovipositor longer than genital segment, setulose area poorly delimited, reaching almost mid ovipositor. Setate margins of sternite 8 moderately narrow. Plate poorly incised apically. Fork shallow, arms divergent, connected to the plate by short, desclerotized sections. Supragenital plate broad, with two bristles widely set apart. Most similar species are: *T. antennata* and *T. montium* STARÝ, however, the new species is devoid of setae on the pleurae. Male and inner female genitalia of *T. nordica*, n. sp., are similar to those of *T. antennata*, but the first flagellomere of male and female has usual narrow to slightly oval shape. Ovipositor and plate resemble *T. montium* in shape.

**E t y m o l o g y.** New species name refers to the north European region.

Holotype female, Oulanka Research Station (pine forest at lake) 4.09. 2011 (EK). Paratypes: 7m, 19f, same data; all stored in ethanol.

Additional material. Oulanka Research Station 2011: (pine forest at lake), 5.09. – 10f, 3m; 6.09. – 5f, 6m; light trap Ranta, 6.09. – 1f, 7m (PR & MC); 9.09. – 8f, 4m. Highway E63 c. Ismila, pine+spruce, peat, 9.09. – 11m, 17f (all EK, if not otherwise stated).

**D e s c r i p t i o n.** Wing length 5-7 mm. Body colour light brown, however, the specimens are stored in alcohol which makes the colour fade with time.

Antennae (Fig. 2D). First flagellomere slender in male, more oval in female, but not swollen; f1 and f2 frequently fused or almost so. Setae rather soft, 2-3x as long as pubescence, not much erect. Pubescence dense.

Wing: M3 frequently curved to anal margin.

Legs: male hind tarsal claw c. 1/3x tarsomere 5th (Fig. 2E); in female 1/5.

Terminalia, male (Fig. 2A-C). Sternite 9 of medium width; incision deep and broad, so that mostly lateral portions are visible in ventral view. Bridge rounded, halves closely contacting. Gonostylus almost straight and parallel-sided, with round apex; basal tubercle small, but distinct. Aedeagal complex: parameres massive, long, hood hidden between parameres (Fig. 2B).

Female (Fig. 2F-J): ovipositor longer than genital segment, broad at base, narrowing to sharp tip; setulose area poorly delimited, reaching almost mid ovipositor; setulose margin of sternite VIII moderately narrow. Genital plate with incision broad, shallow. Fork stalk long, very narrow basally, distal half abruptly widened; fork shallow, its arms directed outside; remarkable are the short, unsclerotized sections between the fork arms and the genital

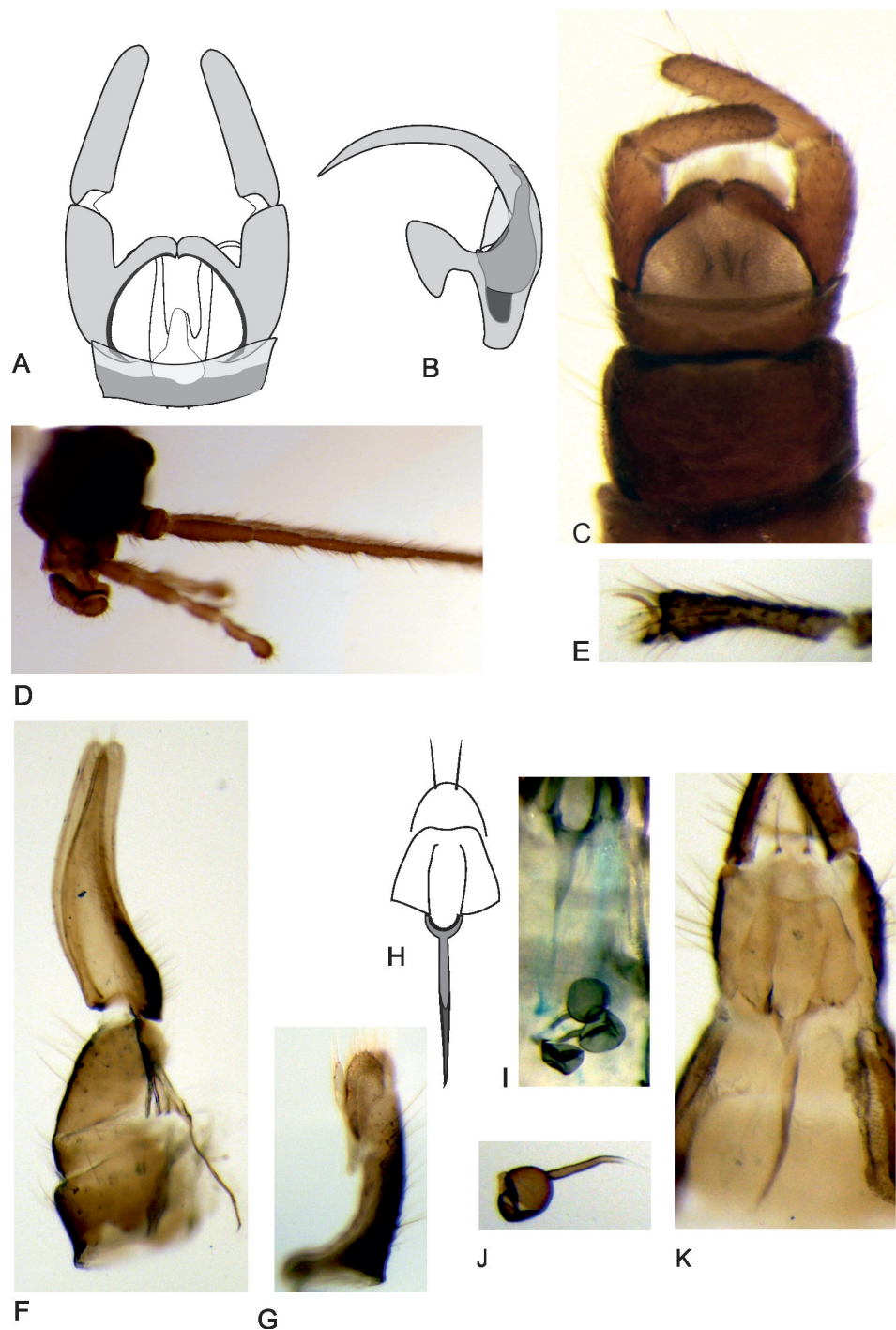


Fig. 2. *Trichocera (Saltrichocera) nordica*, n. sp.: A – male genitalia ventrally, drawing based on preparation; B – aedeagus laterally; C – photo of male genitalia unprepared; D – initial flagellomeres (female); E – hind tarsal claw (male); F – ovipositor; G – spermatheca; H – sternite 8; I–J – genital and supragenital plate, drawing and photo, resp.

plate. Supragenital plate broad, with two bristles widely set apart. Spermathecae with long sclerotized portions of the ducts, c. 1.5x as long as spermathecae diameter.

**Remarks.** *T. nordica*, n. sp., belongs undoubtedly to a cluster of closely related species: *montium* + *antennata* + *thaleri*. Female ovipositor superficially resembles that of *T. (S.) montium* and was at first included in this species. However, the male appeared to differ by the gonostyles, which are parallel-sided, with round tips, and by the sternite 9, which is rather massive and broad, unlike *T. (S.) montium*. *T. (S.) thaleri* STARÝ differs by stiff and scarce setation of the antennae, and bristles on the pleurae.

*Trichocera (Saltrichocera) nordica* was the most common species of the subgenus in September 2011 around the Kuusamo region of Finland.

***Trichocera (Saltrichocera) obtusa* STARÝ & MARTINOVSKÝ 1996**

*Trichocera (Saltrichocera) obtusa* STARÝ & MARTINOVSKÝ 1996 in KRZEMIŃSKA 2002: 158.

*Trichocera obtusa* STARÝ & MARTINOVSKÝ 1996: Cas. Slez. Muz. Opava (A): 99, fig. 7-13

**Material examined.** Sweden: Rickleå, Fällstationen, 7.11. 1971 – 1f (CD).

**Remarks.** The species was till now known only from central and south Europe (STARÝ & MARTINOVSKÝ 1996; STARÝ & KRZEMIŃSKA 1998; UJVAROSI & KRZEMIŃSKA 2002). New to Finland and Sweden. Its distribution is now documented to reach the vicinity of Polar Circle.

***Trichocera (Saltrichocera) parva* MEIGEN, 1804**

*Trichocera (Saltrichocera) parva* MEIGEN, 1804 in Krzemińska 2002: 158.

*Trichocera parva* MEIGEN, 1804: Klass. Beschr. Europ. zweifl. Ins. I (Braunschweig): 49.

**Material examined.** Sweden: Rickleå, Fällstationen, 2.01. 1971 - 2 f (CD). Finland: Oulanka Res. St., 4.09.2011 (pine forest at lake) - 1m (EK).

**Remarks.** New to Finland. Widespread in northern and central Europe and western Russia (DAHL 1976; HÅGVAR & KRZEMIŃSKA 2007).

***Trichocera (Saltrichocera) recondita* STARÝ 2000**

*Trichocera (Saltrichocera) recondita* STARÝ 2000 in KRZEMIŃSKA 2002: 158.

*Trichocera (Metatrichocera) recondita* STARÝ 2000: Čas. Slez. Muz. Opava (A): 99, fig. 7-13.

**Material examined.** Sweden: Uppsala, Botanical Garden, 17-19.XI. – 2m (EK & CD). Finland: Oulanka Res. St. 19-21.10.2012 – 2m (DG).

**Remarks.** The species is known from central Europe (STARÝ 2000; UJVAROSI & KRZEMIŃSKA 2002) and from southern Norway (HÅGVAR & KRZEMIŃSKA 2008). This is the most northern locality hitherto. New to Sweden and Finland.

***Trichocera (Saltrichocera) regelationis* (LINNAEUS, 1758)**

*Trichocera (Saltrichocera) regelationis* (LINNAEUS, 1758) in KRZEMIŃSKA 2002: 158.

*Tipula regelationis* LINNAEUS, 1758, by original description. Syst. Nat. I: 587.

(Complete list of synonyms in DAHL & ALEXANDER 1976)

**Material examined.** Sweden: Rickleå, Fällstationen, 1971: 2.02. – 1f; 4.02. – 2f; 9.02 – 2f; 1.03. – 1f; 2.09. – 2f; 4.09. – 1f; 2.10 – 1m, 1f; 3.10. – 2m; 5.10. – 1f; 6.10. – 3f; 7.10. – 2m, 6f; 2.11. – 1m; 4.11. – 1m. Abisko, 1975: LF (2), 4-11.08. – 35m, 28 f; LF (9), 4-11.08. – 41m (all CD). Uppsala, Botanical Garden, 17-19.11.1999 – 7m (EK & CD). Finland: Oulanka Res. St., light trap Emep, 2.09.2011. – 5m (PR & MC).

***Trichocera (Saltrichocera) rufescens* EDWARDS, 1921**

*Trichocera (Saltrichocera) rufescens* EDWARDS, 1921 in KRZEMIŃSKA 2002: 158.

*Trichocera rufescens* EDWARDS, 1921: Trans. Ent. Soc. Lond. 69: 229, fig. 9

**Material examined.** Finland: Oulanka Res. St.: light trap EMEP, 27.05. 2011. – 1m; 2.09.2011. – 5f; 8.09. 2011. - 1m (all PR & MC); 4.09.2011 (pine forest at lake). – 1f (EK); Highway E63 c. Ismila (pine+spruce, peat), 9.09. 2011 – 1f (EK).

**Remark.** New to Finland; a most northern locality. Noteworthy is its spring and autumn occurrence.

***Trichocera (Saltrichocera) saltator* (HARRIS, 1776)**

*Trichocera (Saltrichocera) saltator* (HARRIS, 1776) in KRZEMIŃSKA 2002: 158.

*Tipula saltator* HARRIS, 1776: An exp. Engl. ins. ed I. (London): 57.

**Material examined.** Sweden: Rickleå, Fällstationen, 2.02. 1971 – 1f (CD). Abisko: LF (9), 4-11.08. 1975 – 1m. Uppsala, Botanical Garden, 17-19.11.1999. – 42m, 8f (EK & CD).

***Trichocera (Saltrichocera) sparsa* STARÝ & MARTINOVSKÝ, 1996**

*Trichocera (Saltrichocera) sparsa* STARÝ & MARTINOVSKÝ, 1996 in KRZEMIŃSKA 2002: 158.

*Trichocera sparsa* STARÝ & MARTINOVSKÝ, 1996: Ent. Prob.: 159, fig. 8, 17, 23, 29, 33.

**Material examined.** Sweden: Rickleå, Fällstationen 1971: 4.02. – 1m; 7.03. – 1m; 2.10. – 1m; 4.10. – 1m; 7.10. – 1m (all CD). Finland: Oulanka Res. St. 2011: 4.09 (pine forest at lake) – 3m, 3f; 6.09. – 4m (EK); light trap Emep, 2.09. – 2m, 1f (PR & MC); Highway E63 c. Ismila (pine+spruce, peat) 9.09.2011 – 3f, 12m (EK).

**Remark.** New to Sweden and Finland; the present localities widen the distribution of this species far north in the Polar Circle region. Apparently this is an element of arctic fauna, regarding its occurrence about the Polar Circle in the midst of winter (beginning of February).

#### IV. CONCLUDING REMARKS

The specimens recorded here come from the far north localities in the vicinity of the Polar Circle. Rickleå Fallstationen in Sweden, and Oulanka Research Station in Finland are located at nearly the same latitude, N64° and N65°, respectively, on opposite sides of the Bothnia Bay. Uppsala is at N62°, Abisko and Messaure are north of the Polar Circle (N68° and N67°, resp.). Six species of the list presented here were till now not recorded so far north.



During our visit to the Oulanka Research Station in Finland in autumn season 2011 the temperature was astonishingly high, reaching 30°C. There was no rainfall. For the cool adapted Trichoceridae these conditions are highly unfavorable, and accordingly, our collections are rather modest. Nevertheless, a new species has been found, predominating in this area.

**A c k n o w l e d g e m e n t s.** Authors are very grateful to the staff of the Oulanka Research Station (Finland) for help and friendly atmosphere, and especially to Pia RATTANEN for getting access to frozen samples of insects collected by traps Emep and Ranta. Christine DAHL (Lund University) and Juha VIRAMO (the former head of the Oulanka Station) are thanked for a deposit of rich material collected during many years in Sweden and Finland.

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