

Description of an unusual Arctic species of dark-winged fungus gnats, *Camptochaeta infissa* sp. n. (Diptera, Sciaridae)

PEKKA VILKAMAA

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Camptochaeta infissa sp. n. from the Arctic tundra is described and illustrated. The species has unusual characters for its genus, such as short antennae and maxillary palpi and a deeply clefted tegmen.

Key words: Diptera, Sciaridae, *Camptochaeta*, new species, Russia, Arctic.

Pekka Vilkamaa, Finnish Museum of Natural History, Zoology Unit, P.O. Box 17, FI-00014 University of Helsinki, Finland. E-mail: pekka.vilkamaa.@helsinki.fi (<https://orcid.org/0000-0003-4366-0108>)

Introduction

Following its original description (Hippa & Vilkamaa 1994), the concept of the almost exclusively Holarctic genus *Camptochaeta* (type-species *Corynoptera camptochaeta* Tuomikoski, 1960) was revised to include only species having an apical tooth of the gonostylus (Menzel & Mohrig 2000). Subsequently, new species from the Palaearctic region were described by Menzel & Heller (2004), Komarova *et al.* (2007), Xu *et al.* (2015) and Weber *et al.* (2016), from the Nearctic region by Vilkamaa *et al.* (2011) and Mohrig & Kauschke (2017), from both those regions by Vilkamaa *et al.* (2013) and Vilkamaa & Menzel (2017) and from the Oriental region by Rudzinski (2008). Before the present study, 65 valid species of *Camptochaeta* have been recognized.

Vilkamaa *et al.* (2023) undertook a phylogenetic analysis in which *Corynoptera spinifera* Tuomikoski, 1960, a species lacking an apical tooth and originally included in the genus *Camptochaeta* (Hippa & Vilkamaa 1994), was inferred as belonging in the *Camptochaeta*

clade, suggesting that the current concept of this genus by Menzel & Mohrig (2000) may need reconsideration after a more comprehensive analysis.

The diversity of *Camptochaeta* is highest in the boreal zone but a fair number of species occur also in the Arctic and Alpine regions, and some species have been described from caves (Hippa & Vilkamaa 1994, Vilkamaa *et al.* 2011, Weber *et al.* 2016 and Vilkamaa & Menzel 2017). The northernmost areas of the Holarctic region are especially poorly studied and further new species can be expected to be found there.

Material and methods

The specimens were mounted on microscope slides in Euparal, after having been dehydrated in absolute ethanol. One specimen was embedded in glycerol. Terminology and measurement methods follow Hippa & Vilkamaa (1994) and Hippa *et al.* (2003). The digital photographs of the slide-mounted specimens were taken with a Leica

MC170 HD camera mounted on a Leica DM 4000 B LED research microscope. The figures were processed with Photoshop version CS5, CorelDraw2017 and CorelPhotopaint2017.

The habitus photo (in glycerol) was taken with a Canon Eos 5Ds with a Canon MP-E 65 mmf/2.8 1-5x Macro lens. The 50 images taken were combined with the Zerene stacker programme (Zerene Systems LCC 2024).

The type material of the new species is

deposited in the Zoological Museum, Finnish Museum of Natural History, Helsinki, Finland (MZH).

***Camptochaeta infissa* sp. n.**

Figures 1–3

Material studied. *Holotype male*. RUSSIA, Krasnoyarsk region, Taimyr Nature Reserve, Aru-Mas, 72.50°N, 101.94°E, pan trap, 9–20.



FIGURE 1. *Camptochaeta infissa* sp. n. Habitus (paratype GE.2021). Scale 1.0 mm.

VII.2010, A. Barkalov (Coll. MZH, <http://id.luomus.fi/GE.2006>). *Paratypes*. Same data as the holotype, 2 males Coll. MZH, <http://id.luomus.fi/GE.2007–2008>; RUSSIA, Krasnoyarsk region, Taimyr Peninsula, on River Zakharova Rassokha, 72.70°N, 101.08°E, pan trap, 1–10.VII.2011, A. Barkalov, 11 males (in MZH, <http://id.luomus.fi/GE.2009–2019>); Taimyr Peninsula, Taimyr Nature Reserve, VII.2010, A. Barkalov, 2 males (1 on slide (Coll. MZH, <http://id.luomus.fi/GE.2020–2021>) the latter in glycerol.

Description. Male. *Head*. Brown, antenna concolorous with face, maxillary palpus pale brown. Eye bridge 2 facets wide. Face with 7–11

scattered dark long and short setae. Clypeus with 1–2 dark setae or non-setose. Antenna (Figures 1, 2 A, B) short, flagellomeres with smooth surface, body of 4th antennal flagellomere 1.3–1.8x as long as wide, the neck shorter than width of flagellomere, longest setae shorter than width of flagellomere. Maxillary palpus (Figure 2 C) with 3 segments; 1st segment longer than 3rd segment, 2nd segment short and subglobular, 3rd segment elongated and nearly as long as 1st, or shortened, shorter than 2nd, or 2nd and 3rd segments partially fused; 1st segment with 1 seta, with a large dorsal pit with sensilla.

Thorax. Unicolorous brown; setae pale.

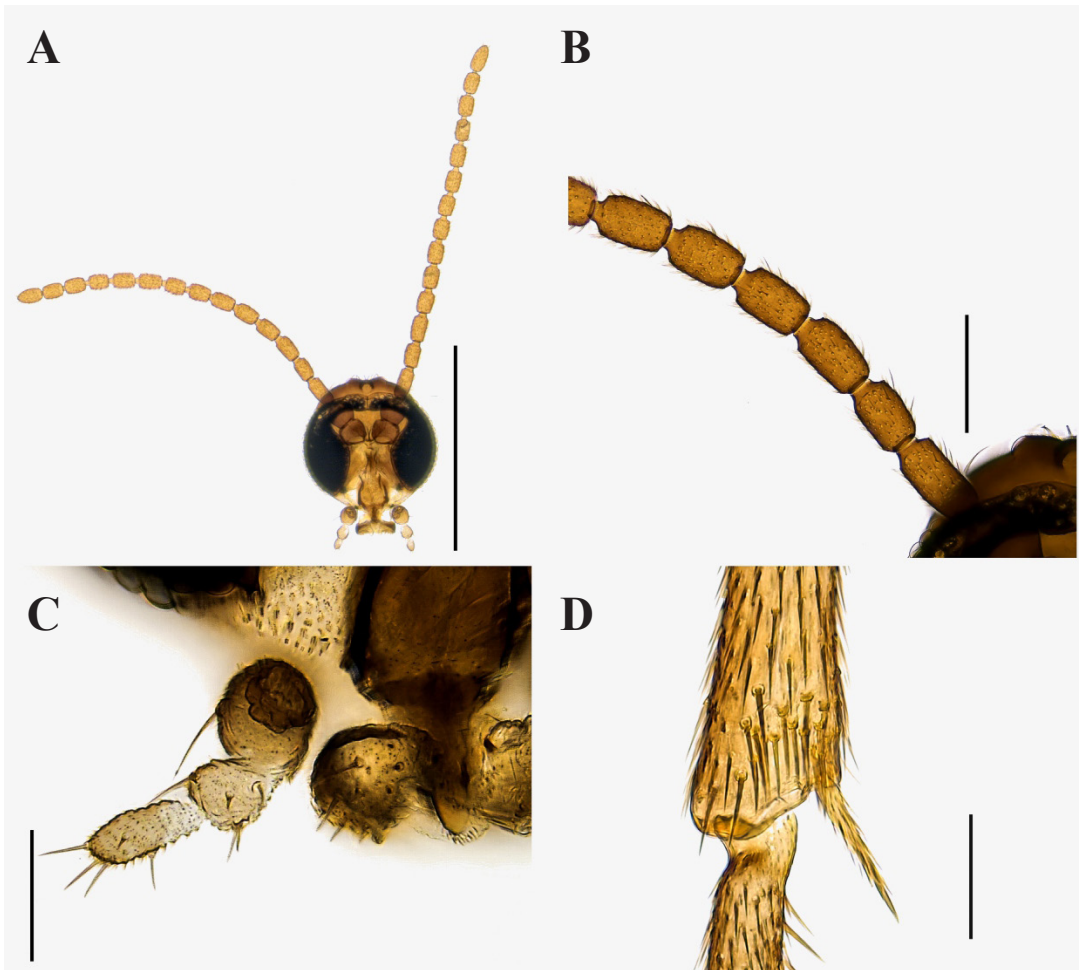


FIGURE 2. *Camptochaeta infissa* sp. n. **A.** Head, frontal (paratype GE.2018). **B.** Part of antenna, frontal (paratype GE.2018). **C.** Maxillary palpus, dorsal (paratype GE.2017). **D.** Apical part of fore tibia, prolateral (holotype GE.2006). Scale for A 0.5 mm, for B and C 0.1 mm, for D 0.05 mm.

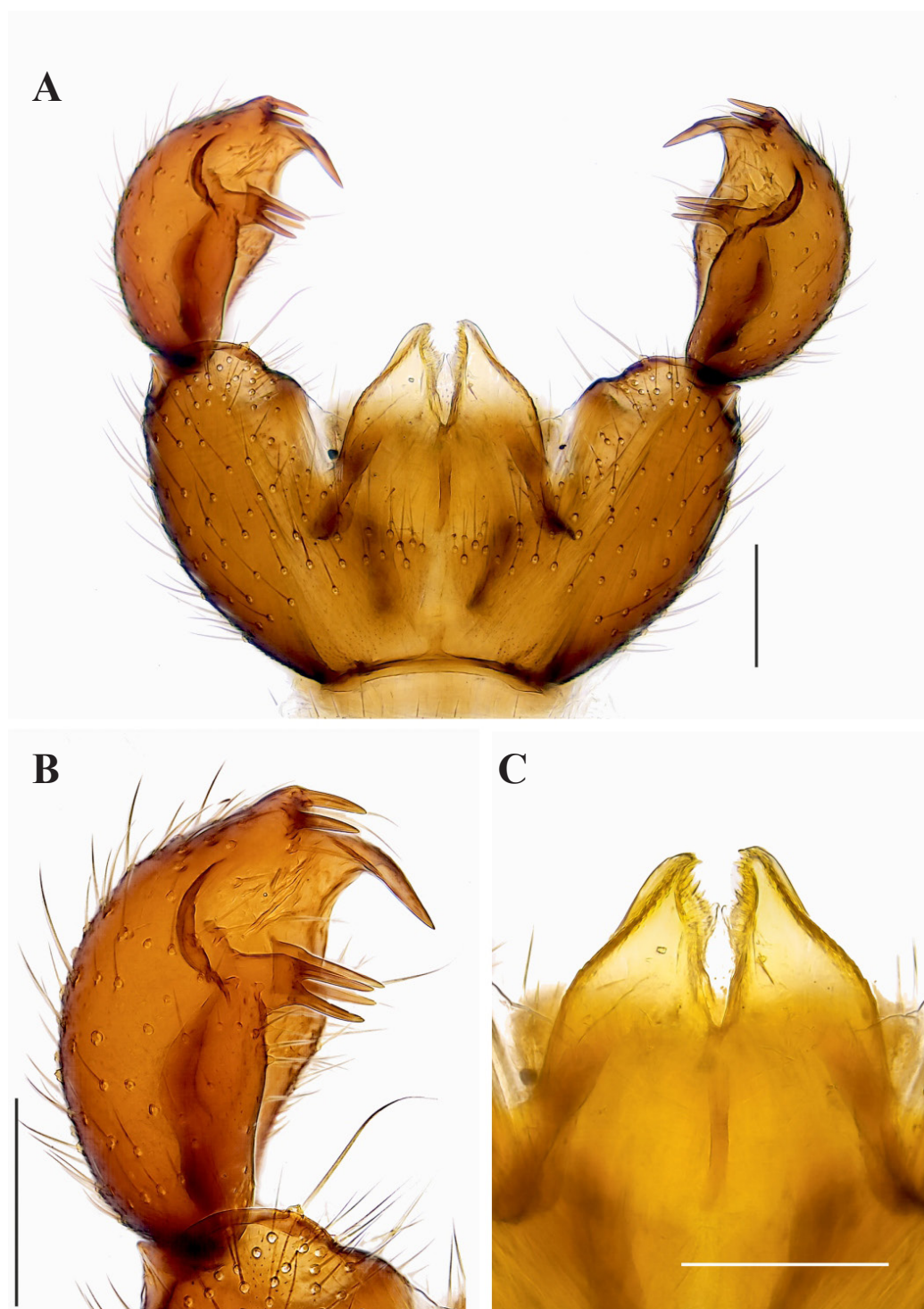


FIGURE 3. *Camptochaeta infissa* sp. n. (holotype GE.2006). **A.** Hypopygium, ventral. **B.** Gonostylus, ventral. **C.** Tegmen, ventral. Scale 0.1 mm.

Anterior pronotum with 3–8 setae. Proepisternum 1 with 3–10 setae.

Wing. Length 1.5–1.7 mm. Width/length 0.40–0.45. Anal lobe small. C ending well before level of base of fork of M. R1/R 0.60–0.85. c/w 0.60–0.70. bM and r-m subequal in length. bM non-setose or with 1–2 setae, r-m with 7–9 setae. Haltere pale brown.

Legs. Pale brown; setae of coxae and femora pale. Fore tibial organ (Figure 2 D) slightly depressed, non-bordered, with dark vestiture forming moderate patch. Fore tibial spur slightly longer than tibial width. Fore tibia with 3–4 dark ventral spinose setae, middle tibia with variable number of dark ventral and some dark retrolateral spinose setae, hind tibia with indistinct long rows of dark dorsal spinose setae, some prolateral and ca. 10 retrolateral dark spinose setae.

Abdomen. Pale brown; setae pale, moderately long and rather fine.

Hypopygium (Figures 3 A–C). Brown, darker than abdomen. Intergonocoxal area moderately long, gonocoxae separated basoventrally. Gonocoxa broad, roundish laterally, slightly longer than gonostylus. The ventral setosity of gonocoxa sparse and short, shorter at medial margin. Gonostylus rather long, roundish laterally, strongly excavated medially from base to apical third, with asymmetric lambda-shaped basomedial sclerotization; with ventromedial margin strongly incised at apical third; with long, flattened apical tooth; with 2 apical megasetae each on separate basal bodies; with two pairs of subapical megasetae, one pair at ventral margin of gonostylus, the other in excavation, both pairs on basal bodies; megasetae strong, straight and shorter than apical tooth; gonostylus with some long setae medially. Tegmen conical, with apodeme of tegmen highly arched towards apex of tegmen medially, apodeme sclerotized at basal half, unsclerotized at apical half; tegmen with lateral slightly sclerotized parameres with scale-like structures at apical half; tegmen deeply divided apically, the cleft with large teeth, basad of the cleft small aedeagal plate with minute aedeagal teeth. Aedeagal apodeme moderate.

Female. Unknown.

DNA. DNA sequences (16S, 18S, 28S, COI) of

the paratype GE.2011 (No. JSSCI87 in Vilkamaa *et al.* (2023)) are deposited in the GenBank database under the codes OQ024863, OQ024851, OQ024872, and OQ024764.

Etymology. The name is Latin, *infissa*, split, referring to the deep cleft of the tegmen.

Discussion

Camptochaeta infissa sp. n. has the common characters of the genus: the maxillary palpus with sensilla in a pit, the rather long intergonocoxal area with separated gonocoxa, the strongly impressed gonostylus with lambda-shaped basomedial sclerotization, the gonostylus with elongated medial seta(e), with a long apical tooth and with strong megasetae on distinct basal bodies. The new species differs from its congeners in having a short antenna, a short maxillary palpus, a laterally roundish gonocoxa and in having a unique tegmen with a toothed apical cleft and with apicolateral scale-like structures. Furthermore, the dorsobasal sclerotized rim (apodeme) of the tegmen is exceptionally strongly arched towards the apex of the tegmen. Although many other species of *Camptochaeta* have a notch at the apex of the tegmen, their notch is shallow and without teeth (Hippa & Vilkamaa 1994). *Camptochaeta propria* Hippa & Vilkamaa, 1994 also has a rather short maxillary palpus and its apical tooth of gonostylus resembles that of *C. infissa* but otherwise the two species are different (see Fig. 24 in Hippa & Vilkamaa (1994)). In the maximum-likelihood phylogenetic hypothesis based on four gene fragments (28S, 18S, 16S and COI) of Vilkamaa *et al.* (2023), *Camptochaeta infissa* (as "*Camptochaeta* sp.") appeared as the sister taxon of *C. pella* Hippa & Vilkamaa, 1994. However, because only a few species of its genus were included in the analysis, the result merely shows the placement of the new species inside the *Camptochaeta* clade.

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