

## Two new species of *Allodia* subgenus *Brachycampta* Winnertz from Norway and Sweden (Diptera: Mycetophilidae)

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*Allodia (Brachycampta) huggerti* sp. n. from Sweden and *Allodia (Brachycampta) rindeni* sp. n. from Norway and Sweden are described based on a few adult males. Detailed illustrations of their terminalia are provided. The *A. (B.) barbata* species group is defined for species of which both dorsal and ventral branches of the male gonostylus are reduced to slender lobes, and the two new species both belong in this species group. They differ from other species in the species group primarily by the structure of the apicoventral corners of the gonocoxite, by the shape of the hypandrial lobe, and in details of the gonostylus. The new species seem to be most closely related with each other and further to *A. (B.) racemosa* Zaitzev, 1992 known from Alaska. The new species are named in memory of their collectors, the late dr. Lars Huggert (1942–2003) and the late Helge Rinden (1967–1999).

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### 1. Introduction

During a review of Nordic fungus gnats of the tribe Exechiini (Kjærandsen & Kurina 2004, Kjærandsen 2005, *in press*, Kjærandsen & Bengtson 2005, Kjærandsen, Kurina & Ólafsson *in press*) financed by the Swedish Taxonomy Initiative (STI, see Miller 2005) large amounts of undetermined museum material deposited at the Nordic museums and new collections are being examined in search of new species. A Swedish checklist will be presented soon (J. Kjærandsen, K. Hedmark, O. Kurina, A. Polevoi, B. Økland & F. Götmark *in prep.*), but a number of recently detected Exechiini species from the Nordic countries still awaits description in order to be included in the STI's planned encyclopedia. In this

paper two new species of *Allodia* Winnertz, 1863 of the subgenus *Brachycampta* Winnertz, 1863 are described. Judging from the sparse material both species seem to be rare or local in distribution.

The genus *Allodia* is mainly Holarctic in distribution and known with about 50 species. Like many other genera of fungus gnats they are particular diverse and abundant in the northern boreal forests. Some species occur also in alpine and subarctic environments. There are 33 species known from the Palaearctic region, 26 of them are so far known from the Nordic countries. The most comprehensive key to Palaearctic species was provided by Zaitzev (2003). Tuomikoski (1966) divided *Allodia* in two subgenera, viz. *Allodia* s. str. and *A. (Brachycampta)*. Zaitzev (1984) re-

viewed the Holarctic fauna of subgenus *Brachycamta* and summarized 26 species. Additional 7 species of subgenus *Brachycamta* have been added to the Palaearctic fauna by Plassmann (1972, 1977), Sasakawa and Ishizaki (2003) and Sevcik (1999, 2004). Zaitzev (1992) described 8 new species of subgenus *Brachycamta* from North America.

## 2. Material and methods

Material of the new species originates from four sources:

- Sweep netted material from Skåne province of Sweden, collected by the late dr. Lars Huggert and deposited at the Museum of Zoology in Lund, Sweden (MZLU).
- A collection of fungus gnats from Finnmark province of Norway (Alta district), collected by Lars Ove Hansen and the late Helge Rinden, and deposited at the Zoological Museum, University of Oslo, Norway (ZMUN).
- A large collection of Diptera from the Messaure area in Lule Lappmark province of Sweden (Jokkmokk district), collected by the late prof. Karl Müller (1920–2005) and colleagues in the years 1965–75. The examined parts of this collection are deposited at the Museum of Zoology in Lund, Sweden (MZLU).
- A collection of fungus gnats from mountains in Sør-Trøndelag province of Norway (Oppdal district), offered the author by the collector dr. J. Skartveit and now deposited at the Museum of Zoology in Lund, Sweden (MZLU).

The general terminology follows Søli (1997), the measurements and ratios follow Kjærandsen & Kurina (2004), and the terminology of the male gonostylus follows Kjærandsen (*in press*).

## 3. Systematics

Tuomikoski (1966) regarded *Brachycamta* as a subgenus of *Allodia* and included a group of species that share the characters of having distinct

discal bristles on anterior half of scutum and pale color, when present, more extensive towards fore margin of abdominal tergites (Søli *et al.* 2000). Species of subgenus *Brachycamta* are further distinguished from *Allodia* s. str. by characters in the male terminalia. Species of *Allodia* s. str. have rather uniformly shaped gonostyli with a prominent, heavy sclerotized dorsal branch, whereas species of subgenus *Brachycamta* have more diversely shaped gonostyli, usually with less elaborate dorsal branch and more elaborate medial and ventral branches. Furthermore, the hypandrial lobe is usually more elaborate in species of subgenus *Brachycamta* than in species of subgenus *Allodia*. Further studies may well lead to the conclusion that subgenus *Brachycamta* deserves status as a separate genus.

The *A. (B.) barbata* species group may be defined for a group of species where both the dorsal and ventral branches of the gonostylus are reduced to slender lobes, while the medial branch forms a distinct club. This group includes 11 known species in the Holarctic region of which three are widespread, five are Western Nearctic, and three are Western Palaearctic (Table 1). The two new species both belong to the *A. (B.) barbata* species group and differ primarily from other species in the group by the structure of the apicoventral corners of the gonocoxite, by the shape of the hypandrial lobe, and in details of the gonostylus. The new species seem to be most closely related with each other and further to *A. (B.) racemosa* Zaitzev, 1992 described from Alaska.

### 3.1. *Allodia (Brachycamta) huggerti* sp. n. (Fig. 1)

Holotype ♂: SWEDEN: SK, Häckeberga Nature Reserve, "Skogkärr", 29.IX.1988, sweep net, leg. L. Huggert (MZLU, SPM-010320, on slide).

*Etymology.* Named in memory of the collector, dr. Lars Huggert (1942–2003), a systematist and devoted specialist on Hymenoptera (see Sörensson 2003) who collected and deposited a large insect material at the Museum of Zoology in Lund from where this new species was discovered.

*Diagnostic characters.* The new species be-

Table 1. Species of the *Allodia* (*Brachycampta*) *barbata* species group and their known distribution.

Species	Distribution	References
<i>A.(B.) adunca</i> Zaitzev, 1992	Holarctic, northern boreal	Zaitzev (1992), Zaitzev (2003), Chandler (2004)
<i>A.(B.) barbata</i> (Lundström, 1909)	Holarctic, widespread	Lundström (1909), Zaitzev (1984), Chandler (2004)
<i>A.(B.) bohemica</i> Sevcik, 2004	Western Palaearctic, Czech Republic	Sevcik (2004), Chandler (2004)
<i>A.(B.) californiensis</i> Zaitzev, 1984	Western Nearctic, California	Zaitzev (1984)
<i>A.(B.) elevata</i> Zaitzev, 1984	Western Nearctic, Alaska & California	Zaitzev (1984)
<i>A.(B.) huggerti</i> sp. n.	Western Palaearctic, Sweden	This paper
<i>A.(B.) idahoensis</i> Zaitzev, 1984	Western Nearctic, Idaho	Zaitzev (1984)
<i>A.(B.) penicillata</i> (Lundström, 1912)	Western Palaearctic, boreal	Lundström (1912), Chandler (2004)
<i>A.(B.) pistillata</i> (Lundström, 1911)	Holarctic, widespread	Lundström (1911), Zaitzev (2003), Chandler (2004)
<i>A.(B.) pseudobarbata</i> Zaitzev, 1992	Western Nearctic, Alaska	Zaitzev (1992)
<i>A.(B.) racemosa</i> Zaitzev, 1992	Western Nearctic, Alaska	Zaitzev (1992)
<i>A.(B.) rindeni</i> sp. n.	Western Palaearctic, Norway & Sweden	This paper
<i>A.(B.) subpistillata</i> Sevcik, 1999	Western Palaearctic, Czech Republic & Russia	Sevcik (1999), Chandler (2004)

longs to the *barbata* species group as defined above. Judged by characters of the male terminalia it is closest to *A. (B.) racemosa* Zaitzev, 1992 and *A. (B.) rindeni* sp. n. It can be separated from the former in having hypandrial lobe with a basal cordate cushion covered with trichia and an apical blunt hook, and from both in having narrow apicoventral projections from the gonocoxite with three strong setae apically. Unlike in *A. (B.) rindeni* sp. n. the second flagellomere is only slightly longer ( $1.17 \times$ ) than wide, the medial branch of gonostylus is apically triangular with strong, stiff setae, and the ventral branch of gonostylus is larger and apically club shaped.

**Description.** Male (n = 1). Total length 3.7 mm. Wing length 2.24 mm, or  $3.39 \times$  as long as profemur. Mesonotum length 0.68 mm, or  $0.3 \times$  as long as wing.

**Coloration** (holotype, moderately paled after 17 years in alcohol). Scape pedicel and first half of first antennal segment yellow, rest of flagellum light reddish brown. Palp and mouth parts pale yellow. Head and clypeus dark brown. Mesonotum reddish brown with large yellow humeral areas extending laterally to beyond wing base, without distinct thoracic stripes. Propleuron yel-

low, rest of pleura light reddish brown. Scutellum and mediotergite reddish brown. Wings pale yellowish tinted, without fascia. Halter pale yellow. Legs all yellow. Abdomen reddish brown with large yellow patches laterally on tergite II–V forming yellow triangles anterolaterally on tergite III–V. Terminalia yellow.

**Head.** Round, width / length to frontal tubercle 1.33. Antenna 1.2 mm long. First flagellomere 1.67 times as long as second flagellomere. Second flagellomere 1.17 times as long as wide. Two ocelli present, set close to compound eyes. Clypeus ovate, length / width 1.24. Antepenultimate segment of maxillary palp 0.1 mm long, palpolmire ratios 1: 1.28: 2.24.

**Thorax.** Proepisternum with two strong bristles. Scutum with strong prealar and postalar bristles, and single row of large dorsocentrals extending entire length of scutum. Otherwise covered with small pale, decumbent setae. Scutellum with one pair of strong bristles.

**Wings.** Stem of radius with dorsal setae only,  $R_1$  and  $R_5$  with both dorsal and ventral setae.  $Rs$ ,  $ta$ ,  $tb$ ,  $M$  and  $Cu$  without setae. Wing length to length of  $R_1$  2.55.  $R_5$  straight, wing length to length of  $R_5$  1.84. Length of  $ta$  to length of  $M$ -pet-

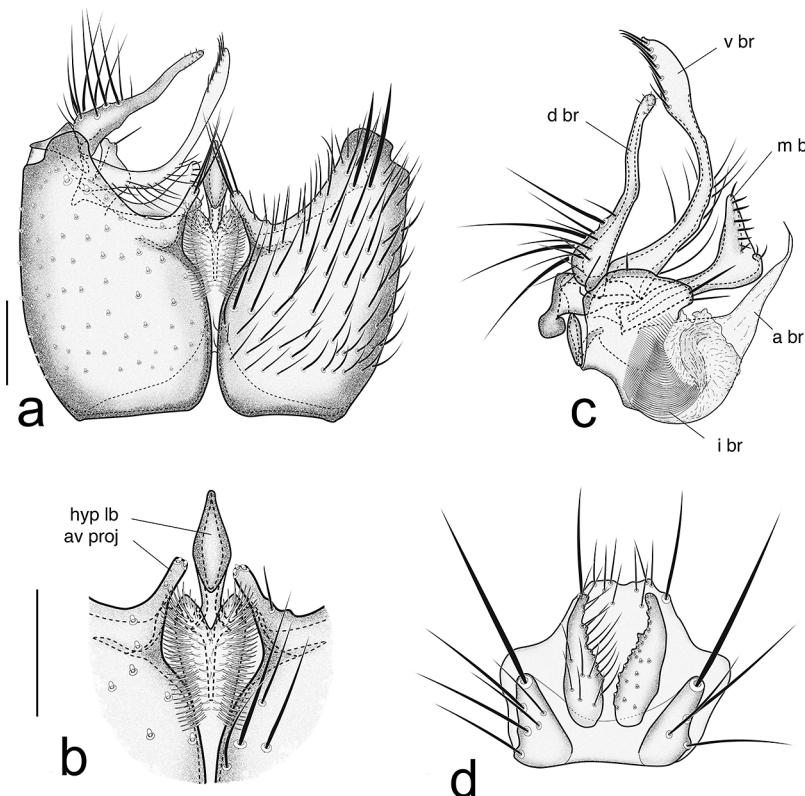


Fig. 1. *Allodia (Brachycampta) huggerti* sp. n (holotype). – a. Male terminalia, ventral view. – b. Apicoventral corners of gonocoxite and hypandrial lobe enlarged, ventral view. – c. Right gonostylus, internal view. – d. Tergite IX, cerci and hypoproc, dorsal view. Abbreviations: a br = anterior branch of gonostylus; av proj = apicoventral projections of gonocoxite; d br = dorsal branch of gonostylus; hyp lb = hypandrial lobe; i br = internal branch of gonostylus; m br = medial branch of gonostylus; v br = ventral branch of gonostylus. Scales = 0.1 mm.

iole 1.25. Fork length ratio (A/B) 1.42. Fork width ratios (C/D and E/F) 1.19 and 0.71. M-ratios 0.65 and 0.7. CuA-ratios 0.48 and 0.6. CuP length to length of wing 0.45. A<sub>1</sub> length to length of wing 0.23.

**Legs.** Mid tibia with 20 anterior, 3 postero-dorsal, 4 posterior, 4 posteroventral bristles, and 3 short, spinules-like setae apicoventrally. Hind tibia with 7 anterior, 4 postero-dorsal bristles, and 4 short, spinules-like setae apicoventrally. Leg ratios given for fore, mid and hind leg: LR 1.09: 1.07: 0.83; SV 1.81: 1.86: 2.34; BV 1.51: 1.97: 2.77; TR 1.68: 2: 2.32.

**Terminalia.** Gonocoxite (Fig. 1a) open dorsally and divided ventrally; with narrow projections apicoventrally, apically with 3 strong setae. Hypandrial lobe (Fig. 1b) prominent, ventro-basally with narrow cordate cushion, covered with strong trichia; apically forming a blunt hook projected ventrad, narrow trapezoid in ventral view. Hypoproc large, medially produced to a bluntly tapered plate with two bristles and some small setae. Gonocoxal apodeme long, narrow,

sclerotized. Accessory copulatory appendages hyaline and difficult to interpret; forms a semicircular plate with a small ejaculatory apodeme and a pair of small parameres. Gonostylus (Fig. 1c) with five branches. Basal half of dorsal branch club shaped covered with dorsal setae; apical half slender, slightly sinusoid, apically with some tiny stiff setae. Dorsointernal branch absent. Medial branch basally slender; apically with a caudally directed triangular projection, bearing row of short, strong, stiff setae. Ventral branch with some long lateral setae; gradually tapered to a long, slender digitus; apically enlarged, club shaped, with row of 8 setae. Internal branch forms a subcircular pouch, partly striated, ventro-apically with two strong setae. Anterior branch present as tapered hyaline lobe, devoid of setae. Tergite IX (Fig. 1d) reduced to medially divided, triangular plates; each with one strong and a few smaller bristles. Cercus small, tapered apically, in dorsal view 3.18 times as long as basally wide.

Female unknown.

**Distribution.** Known only from the type lo-

cality, a nemoral mixed deciduous forest reserve in southern Skåne.

### 3.2. *Allodia (Brachycampta) rindenii* sp. n. (Fig. 2)

Holotype ♂: NORWAY: FV, Alta, Elvestrand, 18.VII.–16.IX.1996, Light trap, leg. H. Rinden (ZMUN, SPM-005829, on slide).

*Paratypes*: NORWAY: STI, Oppdal, Kongsvoll, 940 m a.s.l., "MF no. 1", 19.–26.VII.1995, Malaise trap, leg. J. Skartveit – 1 ♂ (MZLU, SPM-010109, in alcohol). SWEDEN: LU, Jokkmokk, Messaure, 20.–31.VII.1968, air suction trap at loc. 20, 18–20 hours, leg. K. Müller – 1 ♂ (MZLU, SPM-011910, on slide).

*Etymology*. Named in memory of the collector of the holotype, Helge Rinden (1967–1999). Together with Lars Ove Hansen (ZMUN) he contributed considerably to an insect collecting program in the Alta district of northern Norway from

where this new species first was discovered.

*Diagnostic characters*. The new species belongs to the *barbata* species group as defined above. Judged by characters of the male terminalia it is closest to *A. (B.) racemosa* Zaitzev, 1992 and *A. (B.) huggerti* sp. n. It can be separated from the former in having hypandrial lobe with a basal cordate cushion covered with trichia and an apical blunt hook, and from both in having large, setose apicoventral projections from the gonocoxite. Unlike in *A. (B.) huggerti* sp. n. the second flagellomere is distinctly longer (1.67–1.72 ×) than wide, the medial branch of gonostylus is apically club shaped with small, stiff setae, and the ventral branch of gonostylus is smaller and apically tapered.

*Description*. Male (n = 2). Total length 3.5–3.8 mm. Wing length 2.5–2.66 mm, or 3.55–3.57 × as long as profemur. Mesonotum length 0.68–0.75 mm, or 0.27–0.28 × as long as wing.

*Coloration* (paratype, moderately paled after 10 years in alcohol). Scape pedicel and first half

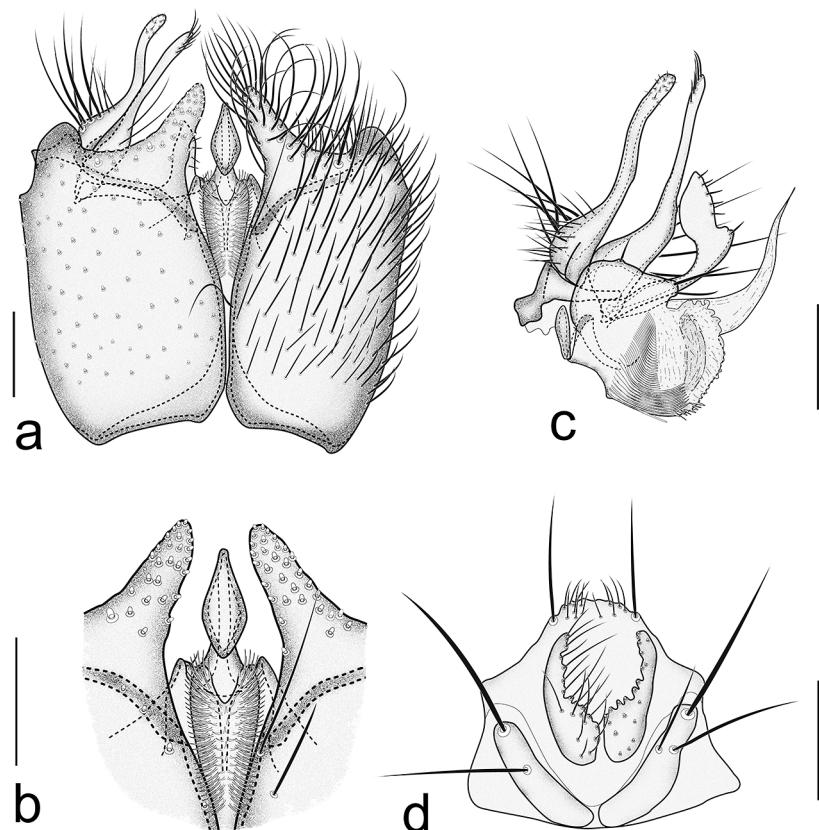


Fig. 2. *Allodia (Brachycampta) rindenii* sp. n. (holotype). – a. Male terminalia, ventral view. – b. Apicoventral corners of gonocoxite and hypandrial lobe enlarged, ventral view. – c. Right gonostylus, internal view. – d. Tergite IX, cerci and hypoproct, dorsal view. Scales = 0.1 mm.

of first antennal segment yellow, rest of flagellum light reddish brown. Palp and mouth parts pale yellow. Head and clypeus dark brown. Mesonotum dark brown without yellow humeral areas and thoracic stripes. Propleuron pale brown, rest of pleura dark brown. Scutellum and mediotergite dark brown. Wings pale yellowish tinted, without fascia. Halteres pale yellow. Legs all yellow. Abdomen reddish brown with large yellow patches laterally on tergite II–V forming yellow triangles anterolaterally on tergite III–IV. Terminalia yellow.

**Head.** Round, width / length to frontal tubercle 1.39–1.44. Antenna 1.22–1.34 mm long. First flagellomere 1.67–1.72 times as long as second flagellomere. Second flagellomere 1.33–1.67 times as long as wide. Two ocelli present, set close to compound eyes. Clypeus ovate, length / width 1.22–1.34. Antepenultimate segment of maxillary palp 0.08–0.1 mm long, palpomere ratios 1: 1.34–1.56: 2.34–2.84.

**Thorax.** Proepisternum with 1–2 strong and one weaker bristles. Scutum with strong prealar and postalar bristles, and single row of large dorsocentrals extending entire length of scutum. Otherwise covered with small pale, decumbent setae. Scutellum with one pair of strong bristles.

**Wings.** Stem of radius with dorsal setae only,  $R_1$  and  $R_s$  with both dorsal and ventral setae.  $Rs$ , ta, tb, M and Cu without setae. Wing length to length of  $R_1$  2.5–2.51.  $R_s$  straight, wing length to length of  $R_s$  1.84–1.85. Length of ta to length of M-petiole 1–1.18. Fork length ratio (A/B) 1.48–1.61. Fork width ratios (C/D and E/F) 1.1–1.15 and 0.62–0.68. M-ratios 0.64–0.66 and 0.7–0.72. CuA-ratios 0.42–0.47 and 0.51–0.52. CuP length to length of wing 0.45–0.48.  $A_1$  length to length of wing 0.24–0.26.

**Legs.** Mid tibia with 14–16 anterior, 3–4 posterodorsal, 3–5 posterior, 5 posteroventral bristles, and 3 short, spinules-like setae apicoventrally. Hind tibia with 5–6 anterior, 4 posterodorsal bristles, and 4 short, spinules-like setae apicoventrally. Leg ratios given for fore, mid and hind leg: LR 1.11–1.13: 1.05–1.09: 0.84–0.85; SV 1.71–1.79: 1.86–1.91: 2.33–2.35; BV 1.47–1.53: 1.88–1.9: 2.6–2.7; TR 1.56–1.67: 1.8–1.89: 2.26–2.3.

**Terminalia.** Gonocoxite (Fig. 2a) open dorsally and divided ventrally; with large, setose

projections apicoventrally. Hypandrial lobe (Fig. 2b) prominent, ventrobasally with narrow cordate cushion, covered with strong trichia; apically forming a blunt hook projected ventrad, narrow trapezoid in ventral view. Hypoproct large, medially produced to a bluntly tapered plate with two bristles and some small setae. Gonocoxal apodeme long, narrow, sclerotized. Accessory copulatory appendages hyaline and difficult to interpret; forms a semicircular plate with a small ejaculatory apodeme and a pair of small parameres. Gonostylus (Fig. 2c) with five branches. Basal half of dorsal branch club shaped covered with dorsal setae; apical half slender, slightly sinusoid, apically with some tiny stiff setae. Dorsointernal branch absent. Medial branch basally slender; apically with a caudally directed club, bearing row of short stiff setae. Ventral branch with some long lateral setae; gradually tapered to a long, slender digitus; apically with row of 6 setae. Internal branch forms a subcircular pouch, partly striated, ventroapically with two strong setae. Anterior branch present as tapered hyaline lobe, devoid of setae. Tergite IX (Fig. 2d) reduced to medially divided, narrow plates; each with two strong bristles. Cercus small, tapered apically, in dorsal view 3.18 – 3.22 times as long as basally wide.

Female unknown.

**Distribution.** The finding of this species in northern Norway, northern Sweden, and mountainous area of southern Norway indicates a boreal-mountainous distribution.

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## References

- Chandler, P. 2004: Fauna Europaea: Mycetophilidae. — In: de Jong, H. (Ed.) Fauna Europaea: Diptera, Nematocera. Fauna Europaea version 1.1. Available from:

- http://www.faunaeur.org (February 2005).
- Kjærandsen, J. 2005: A review of fungus gnats in the tribe Exechiini (Diptera, Mycetophilidae) from the J. W. Zetterstedt collection at the Museum of Zoology in Lund, Sweden. — *Zootaxa* 856: 1–35.
- Kjærandsen, J. (In press): Review of fungus gnats of the genus *Tarnania* Tuomikoski, with a phylogeny of the *Rymosia* s.l. genus group (Diptera: Mycetophilidae). — *Insect Syst. Evol.*
- Kjærandsen, J. & Bengtson, S.-A. 2005: Svampmygggor – artrik insektsgrupp som trivs så i Norden. — *Fauna Flora* (Stockh.) 100(2): 26–34. [in Swedish]
- Kjærandsen, J. & Kurina, O. 2004: A new species of *Cordyla* Meigen from Norway (Diptera: Mycetophilidae). — *Nor. J. Entomol.* 51: 137–143.
- Kjærandsen, J., Kurina, O. & Ólafsson, E. (In press): The fungus gnats of Iceland (Diptera, Keroplatidae & Mycetophilidae). — *Insect Syst. Evol. Suppl.*
- Lundström, C. 1909: Beiträge zur Kenntnis der Dipteren Finlands. IV. Supplement Mycetophilidae. — *Acta Soc. pro Fauna Flora Fenn.* 32: 1–63. [in German]
- Lundström, C. 1911: Neue oder wenig bekannte europäische Mycetophiliden. — *An. Mus. Nat. Hung.* 9: 390–419. [in German]
- Lundström, C. 1912: Beiträge zur Kenntnis der Dipteren Finlands. VIII. Supplement. 2. Mycetophilidae, Tipulidae, Cylindrotomidae, und Limnobiidae. — *Acta Soc. pro Fauna Flora Fenn.* 36: 1–39. [in German]
- Miller, G. 2005: Linnaeus's Legacy Carries On. — *Science* 307: 1038–1039.
- Plassmann, E. 1972: Zwei neue Pilzmückenarten (Diptera: Fungivoridae). — *Senckenb. Biol.* 53: 91–92. [in German]
- Plassmann, E. 1977: Drei neue Mycetophiliden aus dem Allgäu (Insecta: Diptera: Mycetophilidae). — *Senckenb. Biol.* 57(1976): 285–287. [in German]
- Sasakawa, M. & Ishizaki, H. 2003: Fungus gnats of the genera *Anatella*, *Allodia* and *Cordyla* in Japan (Diptera: Mycetophilidae). — *Entomol. Sci.* 6: 97–109.
- Sevcík, J. 1999: Fifty species of fungus gnats (Diptera: Mycetophilidae) new for the Czech Republic and/or Slovakia, including a new species of *Allodia* Winternitz. — *Casopis Slezske Museum, Opava* (A) 48: 97–105.
- Sevcík, J. 2004: New data on Sciaroidea (Diptera) from the Czech and Slovak Republics with descriptions of seven new species of Mycetophilidae. — *Cas. Slezske Museum, Opava* (A) 53: 49–74.
- Søli, G. E. E. 1997: The adult morphology of Mycetophilidae (s.str.), with a tentative phylogeny of the family (Diptera, Sciaroidea). — *Entomol. Scand. Suppl.* 50: 5–55.
- Søli, G. E. E., Vockeroth, J. R. & Matile, L. 2000: Chapter A4: Families of Sciaroidea. — In: Papp, L. & Darvas, B. (Eds), Contributions to a manual of Palaearctic Diptera: 49–92. Appendix. Science Herald, Budapest.
- Sörensson, M. 2003: Lars Huggert in memoriam. — *Entomol. Tidskr.* 124: 253–257. [in Swedish]
- Tuomikoski, R. 1966: Generic taxonomy of the Exechiini (Dipt., Mycetophilidae). — *Ann. Entomol. Fenn.* 32: 159–194.
- Zaitzev, A. I. 1984: A review of species of the subgenus *Brachycampta* (Diptera, Mycetophilidae) of the Holarctic fauna. — *Zool. Zh.* 63: 1504–1515. [in Russian with English summary]
- Zaitzev, A. I. 1992: New Fungus Gnat Species of the genera *Allodia* and *Brevicornu* (Diptera, Mycetophilidae) from North America. — *Vestn. Zool.* 1992 (1): 9–15. [in Russian with English summary]
- Zaitzev, A. I. 2003: Fungus gnats (Diptera, Sciaroidea) of the fauna of Russia and adjacent regions. Part II. — *Int. J. Dipterol. Res.* 14: 77–386.