A Second Nearctic Species of the Fungus Gnat Genus *Acomopterella* Zaitzev (Diptera: Mycetophilidae)

Author(s): Stephen W. Taber
Source: Southwestern Entomologist, 40(2):323-331.
Published By: Society of Southwestern Entomologists
https://doi.org/10.3958/059.040.0208
URL: http://www.bioone.org/doi/full/10.3958/059.040.0208

A Second Nearctic Species of the Fungus Gnat Genus *Acomopterella* Zaitzev (Diptera: Mycetophilidae)

Stephen W. Taber

Biology Department, Saginaw Valley State University, 7400 Bay Road, University Center, MI 48710

Abstract. A second Nearctic species of the recently erected fungus gnat genus *Acomopterella* Zaitzev was discovered in the eastern United States. The only currently recognized Nearctic congener of the new species occurs in the far western United States and Canada. One adult male flew to a Malaise trap in an ecotone between swamp and second-growth forest dominated by black ash (*Fraxinus nigra* Marshall), paper birch (*Betula papyrifera* Marshall), red maple (*Acer rubrum* L.), and black cherry (*Prunus serotina* Ehrhart).

Introduction

The mycetophilid fly genus *Acomopterella* Zaitzev was recently erected for a single western Nearctic species (*Acomopterella fallax* (Sherman)) that occurs in California, Alaska, British Columbia, and Northwestern Territory (Sherman 1921, Zaitsev 1989, Ŝevčík and Chandler 2008, Kallweit 2013). The new species described here is the second *Acomopterella* species discovered in the Nearctic. Two species (*Acomopterella martinovskyi* Ŝevčík and Chandler, and *Acomopterella yoshiwae* Kallweit) are known from the Palearctic. Several western Nearctic species [*Ectrepesthoneura marceda* (Sherman), *Tetragoneura arcuata* Sherman, and *Tetragoneura atra* Sherman] might be transferred to the genus after further research. With the inclusion of the new species, a total of four *Acomopterella* species is currently recognized worldwide -- two from the Palearctic and two from the Nearctic.

Materials and Methods

The type locality is a narrow ecotone between mostly deciduous second-growth forest and wetland at a site known as “Oxford Swamp”, with GPS coordinates of 43.41° N, 85.44° W, in Manistee National Forest, 7 km east of Brohman in Newaygo County, Michigan. Forest trees include paper birch (*Betula papyrifera* Marshall), red maple (*Acer rubrum* L.), and black cherry (*Prunus serotina* Ehrhart), whereas the swamp trees are mostly black ash (*Fraxinus nigra* Marshall). Nearby is a marsh dominated by common cattail (*Typha latifolia* L.).

Mycetophilids and other insects of all available orders were collected with a large Malaise trap erected each year beginning in March 2006 when snow melt allowed access to the site and continuing until early October with material retrieved almost every week for half of each year to the present. A second trap was added in

2013 in a slightly more open area about 50 m closer to the marsh, but it is unclear if the new species was retrieved from that addition or from the original trap operated deeper in the swamp.

The single male specimen was found in a Petri dish among other insects when stored frozen samples were examined with a stereomicroscope. To retain natural colors as much as possible, the entire body was macerated in weak KOH clearing solution in a small tissue-culture dish for about 2 hours instead of overnight. The entire fly was mounted in polyvinyl alcohol (PVA) on a microscope slide, the distal abdominal segments were removed, and all parts were examined at total magnifications of 40, 100, and 200X. Cover slips were not used because it is important to reposition material for examination from different angles and for further dissection by applying additional mounting medium and waiting a few minutes for the previous application to reliquefy. Photographs were taken with stereoscopic and high-power compound microscopes (Olympus SZ40 Zoom and Olympus BH-2, Tokyo, Japan), provided with a digital SPOT idea camera. Stacking software was used to combine series of images differing only in the chosen plane of focus into a single merged image with improved clarity (Zerene Stacker Version 1.04), thus overcoming depth-of-focus problems with thick specimens. The description followed those of the two recently discovered Palearctic *Acomopterella* species (Ševčík and Chandler 2008, Kallweit 2013), with the aid of other standard references (Vockeroth 1981, Söli 1997).

Results

Acomopterella fasciata Taber new species

Diagnosis. Banded abdominal segments and forked spines of the gonostylus distinguish this fly from its congeners.

Type Material. ***Holotype.*** Adult male, Manistee National Forest, 7 km east of Brohman, Newaygo Co., MI, 28 September 2014, S. W. Taber, Saginaw Valley State University Insect Collection, University Center, MI.

Description. ***Holotype.*** Adult male (Fig. 1). Total length in PVA = 5.3 mm (realistic approximation of length in life). Body color a mixture of yellow and brown: palps yellow, head sclerites dark brown to black, antennae brown except for yellow basal 1/3 of first flagellomere; scutum, scutellum, and laterotergite almost entirely brown, mediotergite dorsally brown, coxae pale yellow, trochanters dark brown, femora yellowish brown, tibiae and tarsi yellow but appearing darker distally because of crowded setae and bristles; halteres yellow, wing hyaline without bands or spots; first abdominal tergite brown, second, third and fourth tergites brown except for distal lateral yellow areas, fifth tergite almost entirely brown, sixth tergite with a distal yellow band, seventh and eighth tergites yellow, remaining tergites brown. Setae of antennae and head yellow except for the stoutest setae on the dorsal part of the head which are brownish; thoracic setae yellow but all visible bristles brown (many broken off while the specimen was in the field), setae of coxae, trochanters, and femora mostly brown but some smaller setae pale, setae of tibiae and tarsi black; setae of first eight abdominal segments mostly brown but small setae paler, setae of segment 9 and terminalia dark brown.

Dorsal setose organ of mid-tibia present (Fig. 2), located 1/5 of the length of the tibia from the base of the tibia. Fore basitarsus length = 1.25X fore tibia length. Wing (Fig. 3): Length = 4.3 mm, veins A1 and CuP distinct, Sc long, intersecting R

Fig. 1. *Acomopterella fasciata*, male holotype.

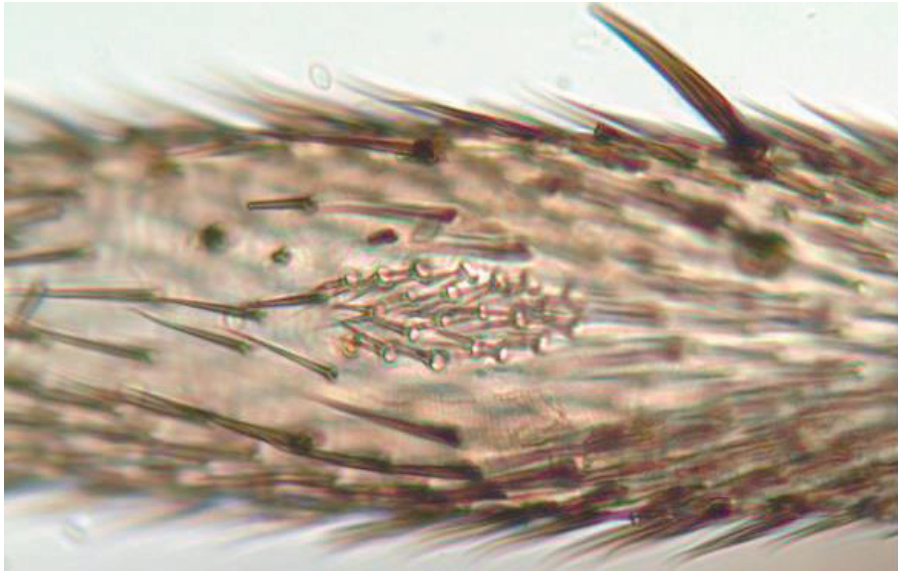

Fig. 2. *Acomopterella fasciata*, holotype mid-tibia dorsal setose organ; L = 0.06 mm.

Fig. 3. *Acomopterella fasciata*, male holotype wing.

just above the fork of tb, fork of CuA present and slightly distal to fork of tb, r-m a little shorter than Mp (petiole of fork M1/M2), Rs a little basal to fork of M, a little longer than R4 and forming a cell with R4, fork of M distal to Rs but basal to R4, length of R1 = 1.8X length of r-m, C extends past R5 toward M1 by a little less than half the distance between.

Terminalia: A transverse pair of flaps that might represent the 10th tergite lies above the distal region of the gonocoxites and the presumed parameres (Fig. 4), each flap with a patch of setae of various sizes on the antero-mesal corner, a glabrous region just posterior to the patch and with bristles beyond, this pair of flaps suggestive of the divided 9th tergite of some tipulid (crane fly) species; the 9th tergite of the specimen also a pair of flaps, more complicated than those of the presumed 10th tergite, each with a stout dark spine at the dorsal lateral corner and two much smaller contiguous spines on a projection about halfway between the dorsal lateral spine and the junction of the flap with the gonocoxite (Fig. 5), each of the paired flaps bearing several internal rows of mixed dark and pale spines and setae, the dorsal surface of each flap bearing numerous long dark setae. Gonocoxites separated ventrally by a long cleft (Fig. 6), each gonocoxite venter with a diagonal group of long, light-brown bristles surrounded by very small setulae but the ventral base of each gonocoxite glabrous, the ventral edge of each gonocoxite diverging distally from the cleft to form a pointed lobe; the dorsal lobe of the gonostylus (Fig. 7) reddish brown with a rectangular base bearing a median groove with several setae inside and a slender, curved process, also bearing a groove, extending from one corner and bearing one pale mesially-directed seta at about one third the distance from the base of the process to its apex; the ventral part of the gonostylus a curved, black process branching distally from an origin near that of the dorsal part to form three curved points at the apex; a pair of long, stout, outwardly curving black processes that might be parameres flanking the aedeagus at their base and extending posteriorly farther than the remainder of the terminalia (Fig. 8), each process bearing many fine setulae on the basal half; the aedeagus complex in dorsal view bearing a bilobed plate with a median fissure and suggesting a ginkgo leaf (Fig. 9), length and width of aedeagus complex as estimated *in situ* = 0.18 mm, width = 0.2 mm.

Distribution. The new species is known only from its type locality.

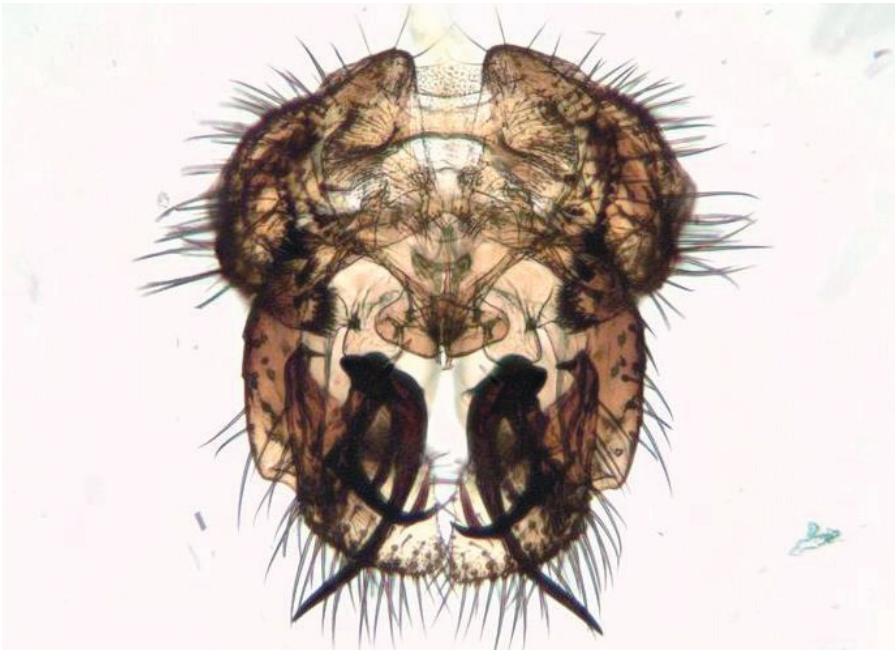

Fig. 4. *Acomopterella fasciata*, male holotype terminalia; internal view.

Fig. 5. *Acomopterella fasciata*, male holotype terminalia; lateral view.

Fig. 6. *Acomopterella fasciata*, male holotype terminalia; gonocoxite cleft (above), dorsum of 9th tergite (below).

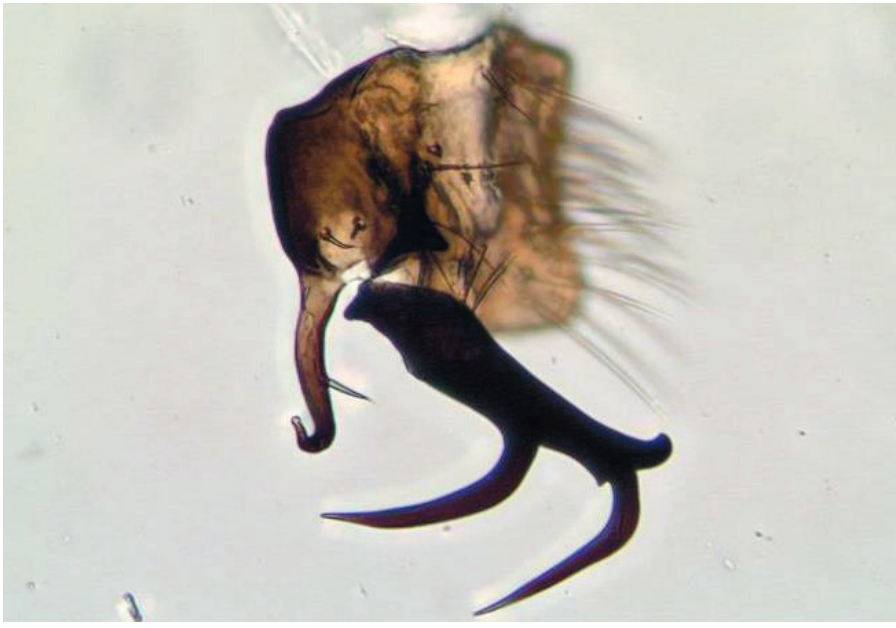

Fig. 7. *Acomopterella fasciata*, male holotype; gonostylus.

Fig. 8. *Acomopterella fasciata*, male holotype terminalia; internal view.

Fig. 9. *Acomopterella fasciata*, male holotype aedeagus complex; ventral view.

Etymology. The fly is named for the banded abdomen that distinguishes this species from its three currently recognized congeners.

Remarks. The specimen was identified with the Nearctic guide to mycetophilid genera (Vockeroth 1981) and with the corresponding guide to Palearctic genera (Söli et al. 2000) as belonging to genus *Ectrepesthoneura* Enderlein, but slender body and legs and contradictory wing venation indicated a different genus. This was confirmed by consultation (Peter J. Chandler and Uwe Kallweit, personal communication), and the first identification as *Ectrepesthoneura* was explained by the erection of *Acomopterella* almost 10 years after the Nearctic manual was published and by the discovery of the first Palearctic congener of the new species (Ŝevčík and Chandler 2008) almost 10 years after the Palearctic manual was published. For those reasons *Acomopterella* was not in either key.

Discussion

The specimen could not be identified with the illustrated key to all known species of *Acomopterella* (Kallweit 2013, p. 18) because the ventral antler-like portion of its gonostylus did not resemble any part of the gonostylus of any conspecific. However, the dorsal part did resemble the entire gonostylus of the only other Nearctic species *A. fallax* (Zaitsev 1989, p. 135, as the junior synonym *Acomopterella arnaudi* Zaitzev) more than the gonostylus of the Palearctic species *A. martinovskyi* and *A. yoshiwae* (Kallweit 2013, pp. 24 and 26). The new species *A. fasciata* is further distinguished by its banded abdomen in contrast to the solid coloration reported for its three congeners.

Acknowledgment

I thank Peter J. Chandler and Uwe Kallweit for examining images of the new species. This research was funded by a Ruth and Ted Braun Fellowship awarded to the author at Saginaw Valley State University by the Saginaw Community Foundation and the Harvey Randall Wickes Foundation of Saginaw, MI, and by an Earl L. Warrick Award for Excellence in Research from Saginaw Valley State University.

References Cited

Kallweit, U. 2013. Review of the Palaearctic *Acomopterella* Zaitzev (Diptera, Sciaroidea, Mycetophilidae). ZooKeys 269: 11-32.

Ŝevčík, J., and P. J. Chandler. 2008. *Acomopterella martinovskyi* sp. n., the first Palaearctic record of the genus *Acomopterella* Zaitzev (Diptera: Mycetophilidae). Zootaxa 1968: 58-64.

Sherman, R. S. 1921. New species of Mycetophilidae. Proc. Entomol. Soc. British Columbia 16: 16-21.

Söli, G. E. E. 1997. On the morphology and phylogeny of Mycetophilidae, with a revision of *Coelosia* Winnertz (Diptera, Sciaroidea). Entomologica Scandinavica Suppl. 50.

Söli, G. E. E., Vockeroth, J. R., and L. Matile. 2000. Families of Sciaroidea, pp. 49-92. *In* L. Papp and B. Darvas [eds.], Contributions to a Manual of Palaearctic Diptera. Appendix. Science Herald, Budapest.

Vockeroth, J. R. 1981. Mycetophilidae, pp. 223-246. *In* J. F. McAlpine, B. V. Peterson, G. E. Shewell, H. J. Teskey, J. R. Vockeroth, and D. M. Wood [coords.], Manual of Nearctic Diptera. Vol. 1. Research Branch, Agriculture Canada, Biosystematics Research Centre, Ottawa, Ontario. Monograph 27.
Zaitsev [sic], A. I. 1989. New data on taxonomy of Diptera, Mycetophalidae [sic] of North America. Zoologischeskii Zhurnal 68: 134-137.