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A new brachypterous species of *Elachiptera* Becker (Diptera: Chloropidae) from freshwater wetlands in eastern Canada

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Abstract

Elachiptera aquila sp. nov. is described from freshwater wetlands in Ontario and Quebec, Canada. Its apparent sister species is *Elachiptera salinaria* Sabrosky and Valley, known from coastal salt marshes in the eastern United States. Although there are Palearctic *Elachiptera* that are polymorphic for wing length, this is the first brachypterous species of the genus described from North America.

Key Words: Chloropidae, Diptera, *Elachiptera*, Nearctic, brachypterous, systematics

Introduction

Elachiptera Becker is one of the more easily recognized genera of Nearctic Chloropidae, primarily because of the broad, strap-like arista that characterizes most included species. Below the generic level, however, many species of *Elachiptera* are morphologically uniform. One of the exceptions is *Elachiptera salinaria* Sabrosky and Valley, a salt marsh species from the eastern United States that can be easily distinguished from other Nearctic *Elachiptera* species by the broadly rounded occipital margin of the head (Sabrosky and Valley 1987). A new species, apparently closely related to *E. salinaria*, is described here from freshwater wetland habitats in eastern Canada. This is the first brachypterous species of Nearctic *Elachiptera*.

Materials and Methods

Specimens were initially preserved in 70% ethanol and subsequently prepared using a critical-point dryer or chemically dried using hexamethyldisilazane. Type specimens of the

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new species are in the Lyman Entomological Museum, McGill University, Ste-Anne-de-Bellevue, QC, Canada (LEM), the University of Guelph Insect Collection, Guelph, ON, Canada (DEBU), and the Canadian National Collection of Insects, Ottawa, ON, Canada (CNC). The holotype and most paratypes of *E. salinaria* are in the National Museum of Natural History, Smithsonian Institution, Washington DC (USNM).

Preparations of genitalia were made by removing abdomens from specimens and heating them in 85% lactic acid in a microwave oven for 1–2 intervals of 30 seconds each, separated by a cooling period of 1–2 minutes. Cleared abdomens were then transferred to glycerine for further dissection and examination. Abdomens and genitalia were stored in glycerine in plastic microvials pinned below the source specimen.

Descriptive Taxonomy

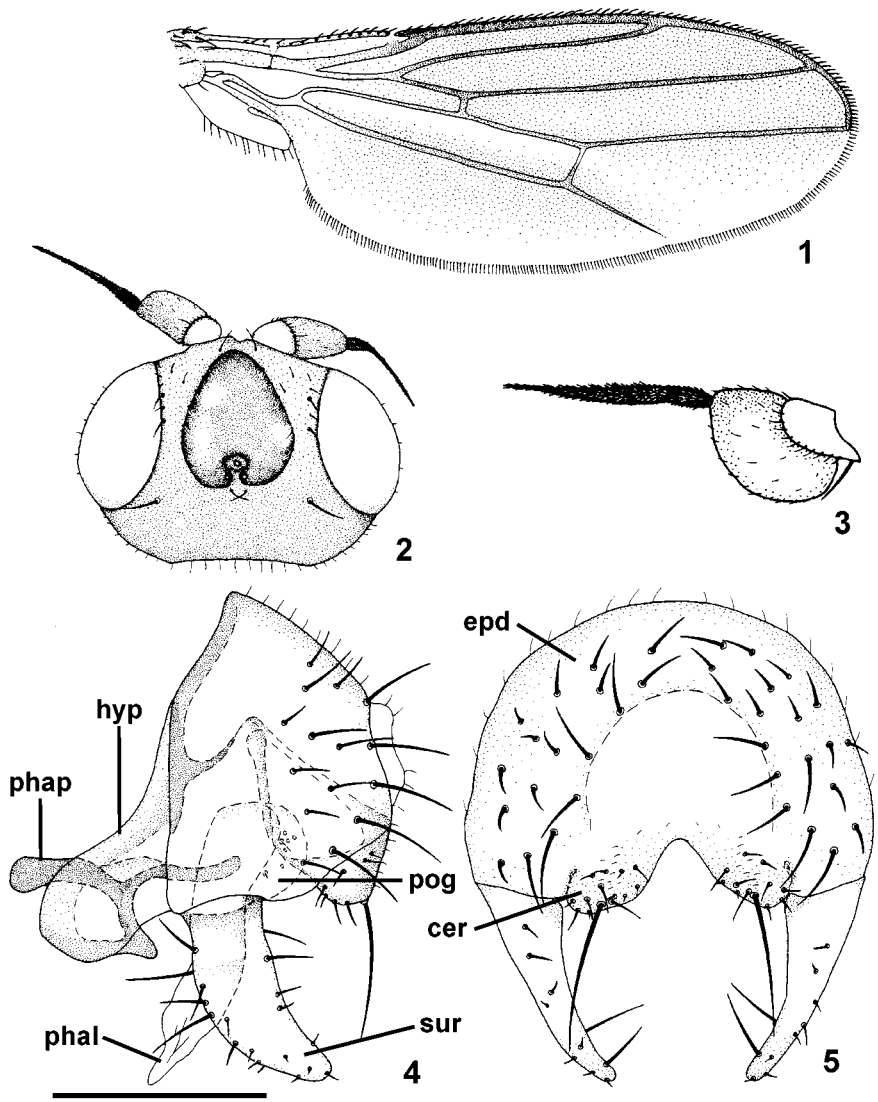
Elachiptera aquila Wheeler, sp. nov.

(Figs. 1–5)

Diagnosis.— *Elachiptera aquila* can be distinguished from other described Nearctic species of *Elachiptera* by the combination of broadly rounded occipital margin, the medially microtomentose scutum and infuscated wings not extending to the apex of the abdomen. See also the revised key couplets in Comments.

Description.— Total length 2.5–3.3 mm. Posterior margin of head broadly rounded in dorsal view (Fig. 2); frons dark yellow-brown, paler anteriorly, frontal triangle shining black, ocellar tubercle microtomentose; antenna dark yellow, arista black, straplike basally, but not as broad as in some other species of the genus, narrowing evenly at apex (Fig. 3); face black, gena black, with oblique striations ventral to eye, genal height 0.3–0.35 x eye height, long axis of eye oblique; postgena broad, convex, postgena and occiput densely microtomentose; palps yellow.

Scutum black, densely microtomentose medially between dorsocentral lines, shining laterally except for notopleuron, scutum without incised longitudinal lines, but setulae apparently arising from small tubercles, especially medially; scutellum rounded posteriorly, densely microtomentose, flat and rugose dorsally, apical and subapical setae arising from short tubercles; thoracic pleurites polished black except along dorsal margin from notopleuron to laterotergite and posterior half of meron. Legs, including coxae, mostly bright yellow, fore tibia and fore tarsus dark brown, apical half to two-thirds of hind femur and entire hind tibia brown, mid tibia sometimes dark yellow. Wing length 1.4–2.0 mm, extending to posterior margin of abdominal tergite 4 in most specimens, as far as posterior margin of tergite 5 in two specimens; kink in CuA_1 not as evident as in other Chloropidae, wing membrane fuscous anterior to M_{1+2} and distal to R_1, and around CuA_1 (Fig. 1). Halter yellow.



FIGURES 1–5. *Elachiptera aquila*. 1. Wing; 2. Head (dorsal); 3. Antenna (lateral); 4. Male genitalia (lateral); 5. Male genitalia (posterior). Abbreviations: cer — cercus; epd — epandrium; hyp - hypandrium; phap — phallapodeme; phal — phallus; pog — postgonite; sur — surstylus. Scale bar = 0.1mm (Figs. 4-5)

Abdomen dark, syntergite 1+2 approximately twice as long as tergite 3.

Male genitalia: Epandrium dark brown with short bristles; surstylus widest in basal third, evenly narrowed distally, recurved (Fig. 4); hypandrium relatively broad and short in lateral view; postgonite broadly triangular in ventral view, broadly rounded in lateral view, with sensillae and scattered setulae (Fig. 4); phallapodeme short, curved, phallus long, membranous (Fig. 4); cercus broad, rounded, with single long ventral bristle, cerci separated by wide, V-shaped median cleft (Fig. 5).

Type material.— Holotype ♂. CANADA: Quebec: Lac St-Francois Nat. Wildl. Area, Marais Fraser (45°02.37'N, 74°27.73'W), *Carex* meadow, pan trap, 14–20.v.1999, F. Beaulieu (LEM). Paratypes: 1 ♂, same data as holotype except 26.v–03.vi.1999 (LEM); 1 ♀, same except 03–11.vi.1999 (LEM); 1 ♀, same except 45°02.40'N, 74°28.03'W, 21–28.viii.1999 (LEM); 1 ♀, Ontario: Crieff Bog, 3 km W Puslinch, 20–26.vi.1987, pantrap, sedge meadow, D. Blades (DEBU); 1 ♀, Crieff Bog, 3 km W Puslinch, 21–27.v.1987, pantrap, sedge island, D. Blades (DEBU); 1 ♀, Wylde Lake Bog, 8 km E Arthur, 7–25.v.1988, pantrap, sedge meadow hollow, D. Blades (DEBU); 1 ♀, Gibson Lake, 6mi E Go Home Bay, 06.v.1959, J.G. Chillcott (CNC).

Etymology.— The species name is from the Latin *aquila* (dark) referring to the appearance of the wings.

Comments.— This species was referred to as *Elachiptera* sp. nr. *salinaria* by Blades and Marshall (1994) and Beaulieu and Wheeler (2001).

The only other described Nearctic species of *Elachiptera* with a broadly rounded occipital margin is *E. salinaria*. Sabrosky and Valley (1987) revised Sabrosky's (1948) key to Nearctic *Elachiptera* to accommodate *E. salinaria*, and *E. aquila* can be included in that revised key by replacing their couplet 20 with the following:

20. Occiput convexly developed, back of head well rounded in dorsal view 20a
- Occiput not convexly developed, back of head straight or barely rounded in dorsal view 21

20a. Scutum shining medially with three rows of distinct punctures, microtomentose along dorsocentral lines, lateral and posterior margins. Wing hyaline to pale fuscous, fully developed. Epandrium yellow. Salt marsh species ..... *Elachiptera salinaria*
- Scutum evenly microtomentose medially. Wing dark fuscous anteriorly, short, not extending to apex of abdomen. Epandrium brown. Freshwater wetland species .... *Elachiptera aquila*

Discussion

There are few published records of Nearctic brachypterous Chloropidae (Wheeler 1994); none of these are in the genus *Elachiptera*. Two Palaearctic species of *Elachiptera* are polymorphic for wing length: *E. brevipennis* (Meigen) has brachypterous and micropterous individuals; and *E. viator* Nartshuk has subapterous and apterous individuals (Nartshuk 1987). Wheeler (1994) also documented wing polymorphism in Nearctic species of *Conioscinella* Duda and *Lasiosina* Becker. Although *E. aquila* is so far known only from brachypterous individuals, the sample size is small and some variation in wing length might be expected, given the occurrence of wing polymorphism in other species of Holarctic Chloropidae. All but one of the type specimens of *E. aquila* were collected using pan traps and the increased use of this collecting method in appropriate habitats has been a

major factor in documenting the diversity and abundance of brachypterous Chloropidae in North America.

The broadly rounded occipital margin is apparently an apomorphy supporting a sister group relationship between *E. aquila* and *E. salinaria*. Despite their apparent close relationship, the two species are known from distinctly different habitats. *Elachiptera salinaria* is known only from coastal salt marshes from Massachusetts to Florida, where it is apparently saprophagous on salt water cord grass, *Spartina alterniflora* Loisel (Sabrosky and Valley 1987). In contrast, *Elachiptera aquila* is known from inland freshwater wetlands. The Quebec specimens were collected in seasonally flooded lakeside marshes dominated by *Carex aquatilis* Wahlenb., *Carex lacustris* Willd. (Cyperaceae) and *Calamagrostis canadensis* (Michx.) P. Beauv. (Poaceae) (Beaulieu and Wheeler 2001); most Ontario specimens were collected in association with *Carex* spp. in a transitional fen (Crieff bog) or with unidentified sedges in a sphagnum bog (Wylde Lake bog) (Blades and Marshall 1994). Given what is known of the biology of *E. salinaria* and other Nearctic species of *Elachiptera* (Sabrosky and Valley 1987, Beaulieu and Wheeler 2002), larvae of *E. aquila* are probably secondary invaders of sedges or grasses in these habitats. This division of preferred habitats between saline and freshwater environments may have been an ecological event leading to speciation of the common ancestor of *E. salinaria* and *E. aquila*.

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