Revision of the Nearctic species of *Cerodontha* (*Icteromyza*) (Diptera: Agromyzidae)

Stéphanie Boucher

Abstract—Nine species of *Icteromyza* Hendel, a subgenus of *Cerodontha* Rondani, were previously known in the Nearctic: *Cerodontha* (*Icteromyza*) *atrissima* Spencer, *Cerodontha* (*Icteromyza*) *capitata* (Zetterstedt), *Cerodontha* (*Icteromyza*) *churchillensis* Spencer, *Cerodontha* (*Icteromyza*) *fuscifrons* Spencer, *Cerodontha* (*Icteromyza*) *lineella* (Zetterstedt), *Cerodontha* (*Icteromyza*) *longipennis* (Loew), *Cerodontha* (*Icteromyza*) *montanoides* Spencer, *Cerodontha* (*Icteromyza*) *pilosa* Boucher, and *Cerodontha* (*Icteromyza*) *temeculensis* Spencer. Three new species are here described for this region: *Cerodontha* (*Icteromyza*) *griffonensis* **sp. nov.**; *Cerodontha* (*Icteromyza*) *vockerothi* **sp. nov.**; *Cerodontha* (*Icteromyza*) *woodi* **sp. nov.** Species descriptions and illustrations, additional notes, and a new identification key for the Nearctic species of *Cerodontha* (*Icteromyza*) are provided.

Résumé—Neuf espèces d'*Icteromyza* Hendel, un sous-genre de *Cerodontha* Rondani, étaient antérieurement connues dans la région Néarctique: *Cerodontha* (*Icteromyza*) *atrissima* Spencer, *Cerodontha* (*Icteromyza*) *capitata* (Zetterstedt), *Cerodontha* (*Icteromyza*) *churchillensis* Spencer, *Cerodontha* (*Icteromyza*) *fuscifrons* Spencer, *Cerodontha* (*Icteromyza*) *lineella* (Zetterstedt), *Cerodontha* (*Icteromyza*) *longipennis* (Loew), *Cerodontha* (*Icteromyza*) *montanoides* Spencer, *Cerodontha* (*Icteromyza*) *pilosa* Boucher, et *Cerodontha* (*Icteromyza*) *temeculensis* Spencer. Trois nouvelles espèces sont reconnues pour cette région: *Cerodontha* (*Icteromyza*) *griffonensis* **sp. nov.**; *Cerodontha* (*Icteromyza*) *vockerothi* **sp. nov.**; *Cerodontha* (*Icteromyza*) *woodi* **sp. nov.** Toutes les espèces sont décrites et illustrées, et des notes additionnelles ainsi qu'une nouvelle clé d'identification pour les espèces sont données.

Introduction

Cerodontha Rondani (Diptera: Agromyzidae) is a worldwide genus with approximately 285 species distributed among seven subgenera. Subgenus *Icteromyza* was proposed by Hendel (1931) to include species with a large, yellow, semicircular lunule, widely spaced antennae, and elongated frontal triangle often reaching the upper margin of the lunule. The shape and colour of the lunule (normally bright yellow, but slightly darker in some specimens) is still a key diagnostic character for *Icteromyza*, but although large, the lunule is often higher than a semicircle. Furthermore, the antennae are not always widely spaced and the frontal triangle is sometimes short or not well defined. Among other agromyzid genera, some *Phytomyza* Fallén have very similar body colour and shape and sometimes a similar lunule, but have proclinate orbital setulae (reclinate in *Icteromyza*) and the costa ends at vein R_{4+5} (M_{1+2} in *Icteromyza*). Subgenus *Dizygomyza* Hendel also has a wide semicircular lunule, but the lunule is brown and the first flagellomere is normally enlarged in males (not in *Icteromyza*).

All Nearctic *Icteromyza* have similar dark brown or greyish body colour, including the pleurites, with the anepisternum at most narrowly yellow at the upper margin. Diagnostic characters to differentiate species are often based on the colour of the frons and palps (brown or yellow).

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The legs are brown with the femora narrowly to broadly yellow. All Nearctic *Icteromyza* also have 3 + 1 well-developed dorsocentral bristles (dc), with the anterior two shorter (approximately 0.6–0.7 times the length of posterior 2 dc), the acrostichal setulae in about four rows at the level of the anterior postsutural dc, and no prescutellar bristles. As in all *Cerodontha*, subgenus *Icteromyza* has well-developed subepandrial sclerites (a pair of large, dark L-shaped structures inside the epandrium), which are quite uniform in morphology across the subgenus (Fig. 74). The surstyli are also mostly uniform among Nearctic species and consist of small plate-like sclerites separated from the epandrium and bearing a few setae (Fig. 88). The epandrium always has a few small spines (about three to eight) on the anteroventral margin. The size of the anal projection and the shape of the hypandrium, phallus, and ejaculatory apodeme are probably the most valuable genitalic characters for identification. The phallus is divided into three main regions: the distiphallus (consisting of the distal tubules), the mesophallus (fused to distiphallus in *Icteromyza*, or sometimes with a small membranous gap), and the basiphallus (attached to the aedeagal apodeme).

Known larvae of *Icteromyza* are leaf or stem miners on Cyperaceae and Juncaceae. Spencer (1990) also suggested that some species (*e.g.*, *Cerodontha* (*Icteromyza*) *capitata* (Zetterstedt)) may feed in roots. Host plants have been confirmed for only three species of *Icteromyza* (*Cerodontha* (*Icteromyza*) *geniculata* (Fallén) on *Eriophorum* L. (Cyperaceae); *Cerodontha* (*Icteromyza*) *longipennis* and *Cerodontha* (*Icteromyza*) *triplicata* Spencer on *Juncus* L. (Juncaceae)). Literature records of *Cerodontha* (*Icteromyza*) *piliseta* (Becker) on *Fimbristylis* Vahl (Cyperaceae) and *Cerodontha* (*Icteromyza*) *duplicata* Spencer and *C.* (*I.*) *capitata* on *Juncus* are unconfirmed as no specimens have been reared (Spencer 1990). One additional undescribed species of *Icteromyza* from the isle of Rhodes (Greece) has also been reared from *Juncus* leaves (M. von Tschirnhaus, Bielefeld University, Germany, personal communication).

In North America, nine species of *C.* (*Icteromyza*) were previously recognized: *C. atrissima* Spencer; *C. capitata* (Zetterstedt); *C. churchillensis* Spencer; *C. fuscifrons* Spencer; *C. lineella* (Zetterstedt); *C. longipennis* (Loew); *C. montanoides* Spencer; *C. pilosa* Boucher, and *C. temeculensis* Spencer. Most of these species are restricted to the Nearctic region, although *C. capitata*, *C. churchillensis*, and *C. lineella* are Holarctic. Specimens from Alaska identified as *Cerodontha* (*Icteromyza*) *calosoma* (Hendel) (Spencer 1969b) represent *Cerodontha* (*Poemyza* Hendel) *cingulata* (Zetterstedt) (Spencer 1976).

In this paper, three new Nearctic species are described: *Cerodontha* (*Icteromyza*) *griffonensis* **sp. nov.**, *Cerodontha* (*Icteromyza*) *vockerothi* **sp. nov.**, and *Cerodontha* (*Icteromyza*) *woodi* **sp. nov.** A new identification key for the Nearctic fauna of *Cerodontha* (*Icteromyza*) is provided.

Icteromyza now includes 31 valid species distributed in all major biogeographic realms, but with the highest diversity in the Palaearctic, Nearctic, and Oriental regions. Zlobin (2000) listed 22 species of *Icteromyza*. According to published data the following additions should be made: *C.* (*I.*) *alishana* Sasakawa; *C.* (*I.*) *braziliana* Spencer; *C.* (*I.*) *ecaudata* Sasakawa; *C.* (*I.*) *griffonensis* **sp. nov.**; *C.* (*I.*) *mitsuhiroi* Zlobin; *C.* (*I.*) *pilosa* Boucher; *C.* (*I.*) *rozkosnyi* Cerny; *C.* (*I.*) *taipingensis* (Shiao and Wu); *C.* (*I.*) *vockerothi* **sp. nov.**; and *C.* (*I.*) *woodi* **sp. nov.** *Cerodontha* (*I.*) *pollinosa* (Melander) was recently synonymized with *C.* (*I.*) *lineella* (Boucher 2008). *Cerodontha* (*I.*) *floresensis* Spencer, a synonym of *C.* (*I.*) *duplicata* (Sasakawa 1972; Spencer 1986) but listed as distinct in Sasakawa (1996, 2004) and Zlobin (2000), should probably be accepted as a valid species based on examination of specimens of both species by M. von Tschirnhaus (personal communication). *Cerodontha* (*I.*) *hirsuta* Sasakawa, a synonym of *piliseta* (Spencer 1986; Zlobin 2000) and *C.* (*I.*) *hardyi* Sasakawa, a synonym of *C.* (*I.*) *duplicata* (Spencer 1986) should still be treated as a synonyms as they were never formally resurrected, although both species were mentioned in Sasakawa (2008).

Material and methods

Morphological terminology follows McAlpine (1981) except that fronto-orbital bristles are divided into superior bristles (ors) and inferior bristles (ori), based on orientation. The ocellar triangle (raised black triangle containing the

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ocelli) is here referred to as the ocellar tubercle, and the outer pale triangle that often surrounds the ocellar tubercle and extends forwards sometimes as far as the lunule is here referred to as the frontal triangle. The clypeus is ∩-shaped and the thickness refers to its width between outer and inner margins. Characters mentioned in the introduction that are uniform among the Nearctic species will not be repeated for individual species. This study was based on over a thousand specimens housed in the Lyman Entomological Museum, McGill University, Ste-Anne-de-Bellevue, Québec, Canada (LEM); the Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada (CNC); the National Museum of Natural History, Washington, District of Columbia, United States of America (NMNH); the University of Guelph insect collection, Guelph, Ontario (DEBU); the Museum of Zoology, Lund University, Lund, Sweden (MZLU); and the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZISP).

Results

Cerodontha (*Icteromyza*) Hendel

Dizygomyza (*Icteromyza*) Hendel, 1931: 51.
Phytobia (*Icteromyza*), Frick 1952: 389.
Cerodontha (*Icteromyza*), Nowakowski 1962: 102; Spencer 1969b: 137; Spencer and Steyskal 1986: 88; Zlobin 2000: 52; Boucher 2008: 557.

Key to the Nearctic Species of *Cerodontha* (*Icteromyza*)

1 Palpus black or dark brown 2
— Palpus yellow 6

2 Frons and usually orbit completely brown, lunule contrasting bright yellow (Figs. 1, 8, 11) 3
— Frons and lunule yellow, or sometimes orange. Colour of orbit variable. If frons slightly darker, usually concolorous with lunule and often with at least three ori. 5

3 Usually only two ori present. Other characters variable. Western United States or Mexico 4
— Three ori present. Clypeus moderately thick (Fig. 19) and completely black. Male phallus as in Fig. 83. Eastern Nearctic . . . . . *C. vockerothi* **sp. nov.**

4 Clypeus medium-thick and often slightly or widely yellow centrally (Fig. 18). Distance between upper ori and lower ors usually less than 1.5 times the distance between both ori. Male phallus as in Fig. 71. Western United States . . . . . *C. montanoides* Spencer
— Clypeus narrower, completely brown (Fig. 13). Distance between upper ori and lower ors usually almost twice as long as between both ori. Male phallus as in Fig. 25. Mexico . . . . . *C. atrissima* Spencer

5 Usually three or more inclinate ori (rarely only two). Clypeus thick and dark brown (Fig. 14) or sometimes slightly paler centrally. Wing length usually 2.4–3.0 mm (males), 2.7–3.7 mm (females) . . . . . *C. capitata* (Zetterstedt)
— Two inclinate ori. Clypeus narrower, dark brown with narrow yellow bottom margin (Fig. 16). Wing length 2.2 mm (male; female unknown) . . . . . *C. griffonensis* **sp. nov.**

6 Eye conspicuously pilose (Figs. 6, 9) 7
— Eye bare or at most with short scattered hairs 9

7 Frons completely yellow. Other characters variable. 8
— Frons brown, at least partially. Fore femora yellow for approximately 0.20–0.23 times the length of femora; orbit only slightly projecting anterodorsally . . . . . *C. fuscifrons* Spencer

8 Orbit strongly projecting anterodorsally (Boucher 2008: Fig. 1). Fore femora yellow distally for about 0.2–0.4 times the length of femora; gena at midpoint, 0.25–0.37 times the maximum eye height. . . . . *C. lineella* (Zetterstedt)

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— Orbit only slightly projecting anterodorsally (Boucher 2008: Fig. 3). Fore femora yellow distally for about 0.5 times the length of femora; gena at midpoint, 0.23 times maximum eye height . . . . . *C. pilosa* Boucher

9 Fore femora yellow distally for about 0.35–0.5 times the length of femora; frons (excluding orbit) usually completely yellow; clypeus narrow and often completely yellowish (Fig. 17), or pale brown and sometimes yellow centrally . . . . . *C. longipennis* (Loew)

— Fore femora yellow distally for less than 0.30 times the length of femora; frons yellow or partially brown; clypeus usually slightly thicker and completely brown (Figs. 15, 20) or yellow centrally 10

10 Frons brown posteriorly, at least at level of ocellar tubercle (Fig. 3); wing length 1.7–2.1 mm (males) and 2.2–2.5 mm (females) . . . . . *C. churchillensis* Spencer

— Frons usually yellow or sometimes brown anteriorly adjacent to lunule (lunule also sometimes darker, brownish); wing length over 2.3 mm (males) and over 2.75 mm (females) 11

11 Femora distally yellow for about 0.2–0.3 times the length of femora. Postocellar bristles arising on a yellow or orange background. Wing length 2.3–2.8 mm (male) and 2.75–3.2 mm (female). Lunule completely yellow (without blackish upper margin). Male phallus as in Fig. 78. . . . . *C. temeculensis* Spencer

— Femora yellow only for 0.15 times the length of femora. Postocellar bristles arising on a dark background. Wing length 2.8–3.4 mm (male) and 3.2 mm (females); upper margin of lunule narrowly black. Male phallus as in Fig. 87 . . . . . *C. woodi* **sp. nov.**

Cerodontha (*Icteromyza*) *atrissima* Spencer

(Figs. 1, 13, 21, 25–28)

Cerodontha (*Icteromyza*) *atrissima* Spencer, 1977: 244

Specimens examined: MEXICO. Durango: 10 mi. W. El Salto, 9000′, 8.vi.1964, J.F. McAlpine (2 ♂: CNC); same except 21.vi.1964, (2 ♂, 1 ♀: CNC).

Diagnosis. The brown palps, brown frons, completely black clypeus, the long distance between the upper ori and the lower ors, and the male genitalia differentiate this species from other Nearctic *Icteromyza*.

Description. Frons width 0.30–0.40 mm; ratio of frons width to eye width 1.5–1.9; orbit approximately 0.18–0.21 times the width of frons at level of lower ors; lunule large, semicircular (Fig. 1) or slightly higher; frontal triangle extending anteriorly at most to lower ors; length between ocellar tubercle and margin of lunule 0.16–0.18 mm; base of antennae separated by narrow and slightly elevated keel; clypeus with a medium thickness and with upper margin rounded (Fig. 13); in profile, orbit strongly projecting anterodorsally (Fig. 21) (less so in the female specimen); parafacial absent or moderately projecting, usually not forming a distinct ring (cheek) below eye; two inclinate ori and two reclinate ors; distance between upper ori and lower ors is approximately 1.5–2.0 times the distance between both ori (Fig. 1); gena height at midpoint 0.20–0.22 times the maximum eye height; gena approximately 1.5 times deeper at hind corner than at midpoint; eye bare. Wing length 2.3–2.6 mm in males and 2.9–3.1 mm in females; distance between r-m and dm-cu 1.4–1.6 times the length of vein dm–cu.

Colour: Frons and orbit completely dark brown (Fig. 1); frontal triangle slightly paler than frons; lunule bright yellow (Fig. 1); face and gena usually yellow (antennal foveae sometimes darker and one female specimen with gena brownish near eye margin); antennae brown, except scape yellow; palpus brown; clypeus completely black (Fig. 13). Thorax and abdomen greyish-brown. Legs brown, except all knees narrowly yellow; fore femora yellow for a distance of approximately 0.12–0.15 times the length of femora. Calypter, including margin and fringe dark brown.

Male genitalia. Distal tubules of phallus strongly diverging in ventral view (Fig. 26). Anal projection of epandrium prominent. Cerci small, not extending beyond ventral margin of epandrium in lateral view. Inner margin of epandrium with four to five spines. Hypandrium moderately broad (Fig. 27). Ejaculatory apodeme not greatly

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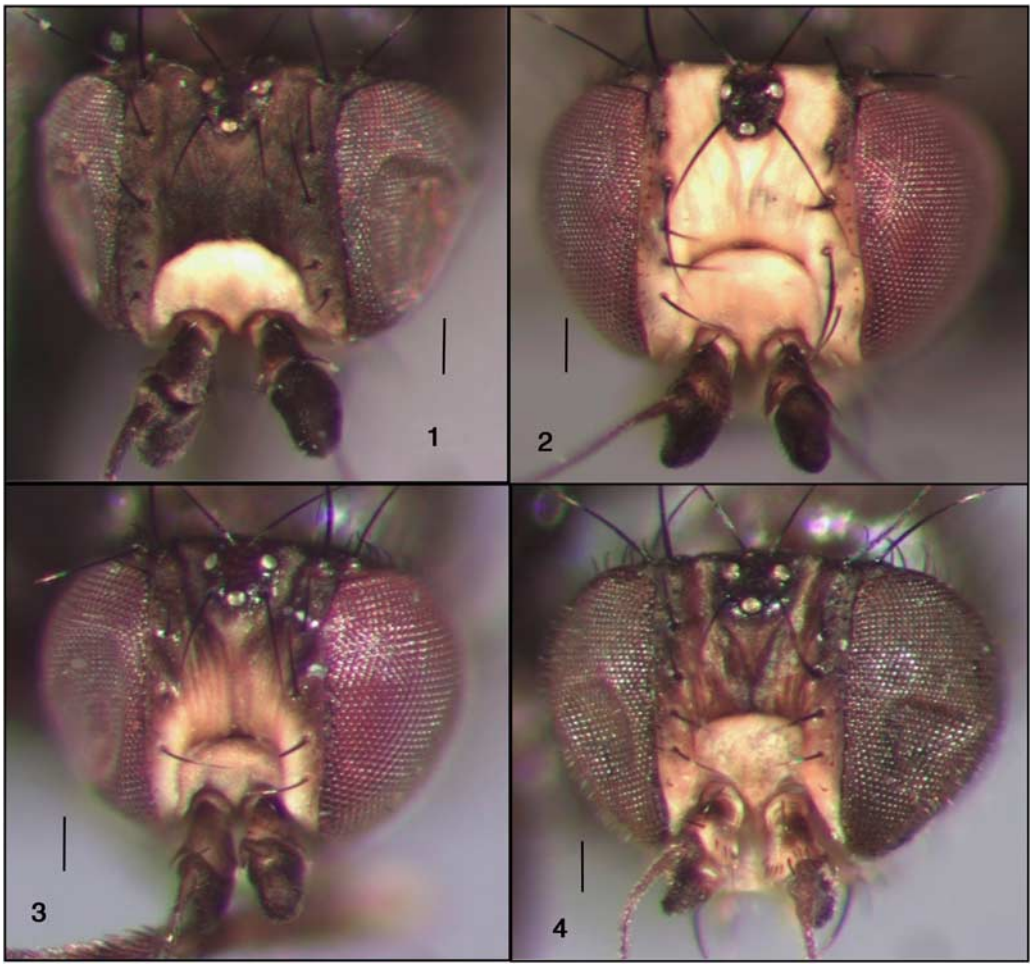
Figs. 1–4. Heads dorsal view: 1, *Cerodontha* (*Icteromyza*) *atrissima* Spencer; 2, *Cerodontha* (*Icteromyza*) *capitata* (Zetterstedt); 3, *Cerodontha* (*Icteromyza*) *churchillensis* Spencer; 4, *Cerodontha* (*Icteromyza*) *fuscifrons* Spencer. Scale bar = 0.1 mm.



expanded, asymmetrical with one side almost straight (Fig. 28).

Geographic distribution: Mexico.

Host plant: Unknown.

Comments: This species is so far known only from the state of Durango in Nearctic Mexico. Three specimens were part of the type series (Spencer 1977). Five additional specimens from the same type locality were examined (see above). Externally this species is very similar to *C. montanoides*. The colour of the clypeus and the distance between the orbital bristles can usually be used to differentiate both species, but the shape of the distiphallus is most reliable for diagnosis.

Cerodontha (*Icteromyza*) *capitata* (Zetterstedt)

(Figs. 2, 14, 29–40)

Agromyza capitata Zetterstedt, 1848: 2750

Agromyza genualis Melander, 1913: 261. Syn. Frick 1957: 202

Agromyza coloradensis Malloch, 1913: 297. Syn. Frick 1957: 202

Dizygomyza capitata, Hendel 1920: 132

Dizygomyza (*Icteromyza*) *capitata*, Hendel 1931: 52

Phytobia (*Icteromyza*) *capitata*, Frick 1959: 386

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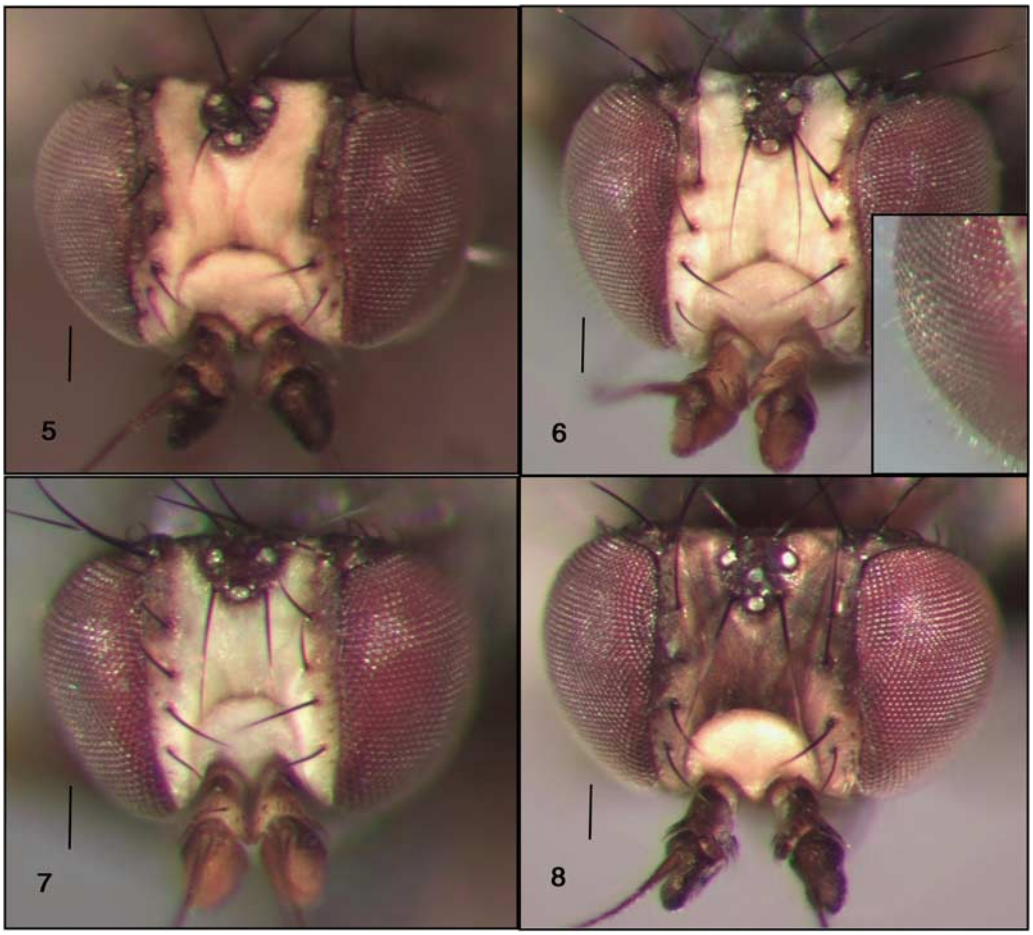
Figs. 5–8. Heads dorsal view: 5, *Cerodontha* (*Icteromyza*) *griffonensis* **sp. nov.**; 6, *Cerodontha* (*Icteromyza*) *lineella* (Zetterstedt) (inset shows pilosity of eye); 7, *Cerodontha* (*Icteromyza*) *longipennis* (Loew); 8, *Cerodontha* (*Icteromyza*) *montanoides* Spencer. Scale bar = 0.1 mm.



Cerodontha (*Icteromyza*) *capitata*, Nowakowski 1967: 654; 1973: 33; Spencer 1969b: 138; 1976: 171; 1981: 167; 1990: 346, 351; Sehgal 1971: 323; Spencer and Steyskal 1986: 89; Zlobin 2000: 53

Specimens examined: 743 specimens (CNC, LEM, NMNH, DEBU) from all Canadian provinces and territories, except NT and NU, and from many western states (AK, AZ, CA, CO, ID, MT, ND, NM, NV, OR, UT, WA, WY), and a few eastern states (MI, ME) were examined. Additional material (27 specimens) from Europe was also examined (Appendix 1).

Diagnosis. This species can be recognized by the combination of its black palps, yellow frons, femora that are narrowly yellow at the knees, and the shape of the male genitalia. Other characters such as its larger size and the presence of numerous ori can also be helpful, although variable (see comments).

Description. Frons width 0.35–0.50 mm; ratio of frons width to eye width 1.5–1.9; orbit, each approximately 0.20–0.25 times the width of frons at level of lower ors; lunule large, higher than a semicircle (Fig. 2); frontal triangle hardly differentiated from frons, reaching margin of lunule as a narrow extension (Fig. 2); length between ocellar tubercle and margin of lunule 0.16–0.23 mm; base of antennae separated by narrow and slightly to more strongly elevated keel; clypeus usually thick with upper margin rounded (Fig. 14), rarely thinner,

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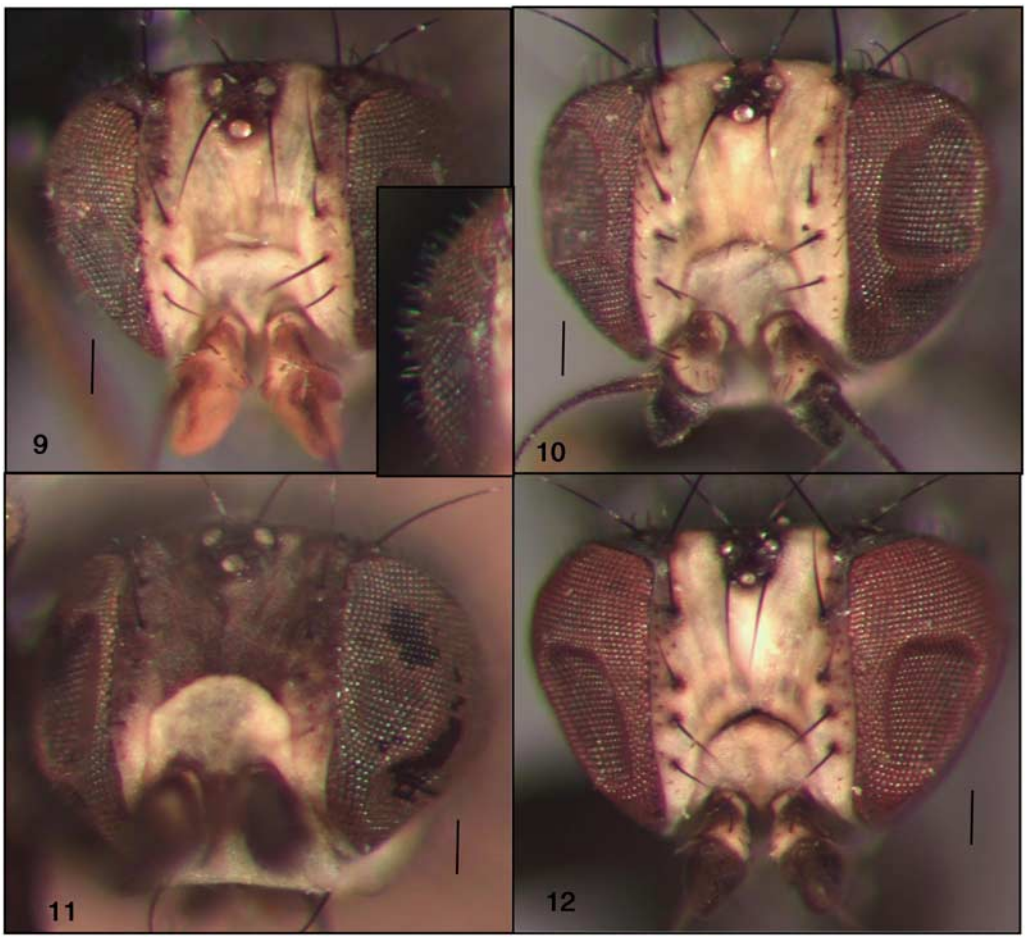
Figs. 9–12. Heads dorsal view (except [11] anterodorsal): 9, *Cerodontha* (*Icteromyza*) *pilosa* Boucher (inset shows pilosity of eye); 10, *Cerodontha* (*Icteromyza*) *temeculensis* Spencer; 11, *Cerodontha* (*Icteromyza*) *vockerothi* **sp. nov.**; 12, *Cerodontha* (*Icteromyza*) *woodi* **sp. nov.** Scale bar = 0.1 mm.



or upper margin more triangular; in profile, orbit strongly projecting anterodorsally; parafacial well developed usually forming a distinct ring (cheek) below eye; usually three (sometimes two, four or five) inclinate ori and two reclinate ors; gena height at midpoint, 0.20–0.30 times the maximum eye height; gena 1.2–1.6 times deeper at hind corner than at midpoint; eye bare. Large species: wing length usually from 2.4–3.0 mm in males (one male specimen with wing length of 2.1 mm), and 2.7–3.7 mm in females (one female with wing length 2.4 mm); distance between r-m and dm-cu 0.8–1.4 times the length of vein dm-cu.

Colour: Frons and lunule bright yellow (Fig. 2). Frons rarely darker (a few female specimens with darker orange or brownish frons, in these cases, lunule and gena are also darker); orbit varying from almost completely yellow (often with only dark spot at base of upper ors) to almost completely black; face yellow; antennae dark brown except scape yellow and sometimes anterior margin of pedicel yellow medially; gena yellow; palpus brown or black; clypeus completely brown (Fig. 14) or narrowly paler centrally. Thorax and abdomen greyish-brown; legs (including coxae) brown, except all knees bright yellow: fore femora yellow for a distance of approximately 0.20 times the length of femora. Calypter yellow, margin and fringe normally dark brown, but sometimes yellowish to pale brown.

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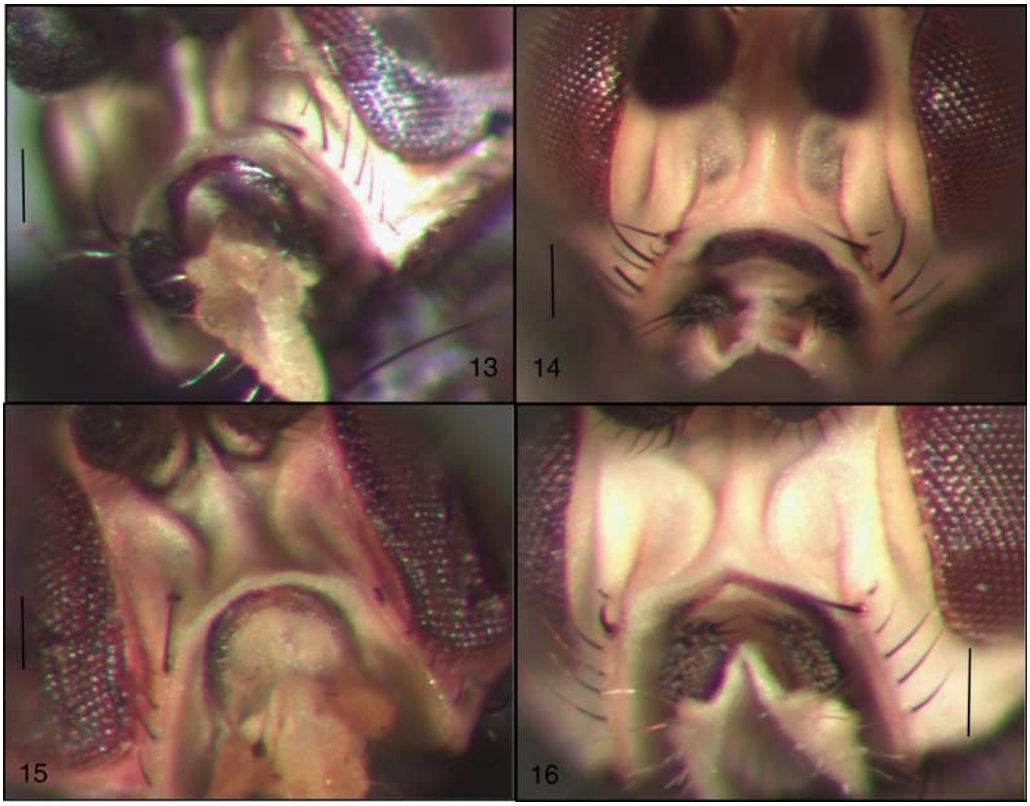
Figs. 13–16. Clypeus of 13, *Cerodontha* (*Icteromyza*) *atrissima* Spencer; 14, *Cerodontha* (*Icteromyza*) *capitata* (Zetterstedt); 15, *Cerodontha* (*Icteromyza*) *churchillensis* Spencer; 16, *Cerodontha* (*Icteromyza*) *griffonensis* **sp. nov.** Scale bar = 0.1 mm.



Genitalia: Phallus with distiphallus moderately long (see comments), with a smooth curvature bringing the distal part of tubules more or less perpendicular to mesophallus. Distal end of tubules separated from the rest of tubules by a membranous connection, generally short (Fig. 29) but sometimes slightly longer (Fig. 31), in ventral view are normally parallel or slightly diverging but sometimes strongly diverging. Distal end of tubules is somewhat variable (see comments). Anal projection usually prominent but sometimes much reduced. Cerci normal, reaching or almost reaching lower margin of epandrium. Inner margin of epandrium well sclerotized with seven spines, anterior spine slightly larger (Fig. 40). Hypandrium with a constriction a little above midpoint (Fig. 38). Sperm pump with blade well expanded.

Geographic distribution: Widespread in Nearctic and Palaearctic Regions (Zlobin 2000).

Host plant: Although the records suggest that this species feeds in the stem (Spencer 1969b) or roots (Spencer 1990) of *Juncus* spp., this is unconfirmed as no larvae or puparia have been found despite extensive searching (Nowakowski 1973; Spencer 1990; von Tschirnhaus, 1991).

Comments: This is a very common and widespread species, second only to *C.* (*I.*) *longipennis* for number of Nearctic records (Appendix 1). Externally, this species is generally distinguished, among other characters, by its large size and numerous orbital bristles (usually five or more), but a few exceptions exist: for example, a male specimen from Scandia, Alberta, has a wing length of 2.1 mm and only four orbital bristles. Most western Nearctic male specimens have a typical *C.* (*I.*) *capitata* phallus (as illustrated by Spencer 1969b, 1976), best represented here by Figures 29 and 31, with the distal end of tubules small

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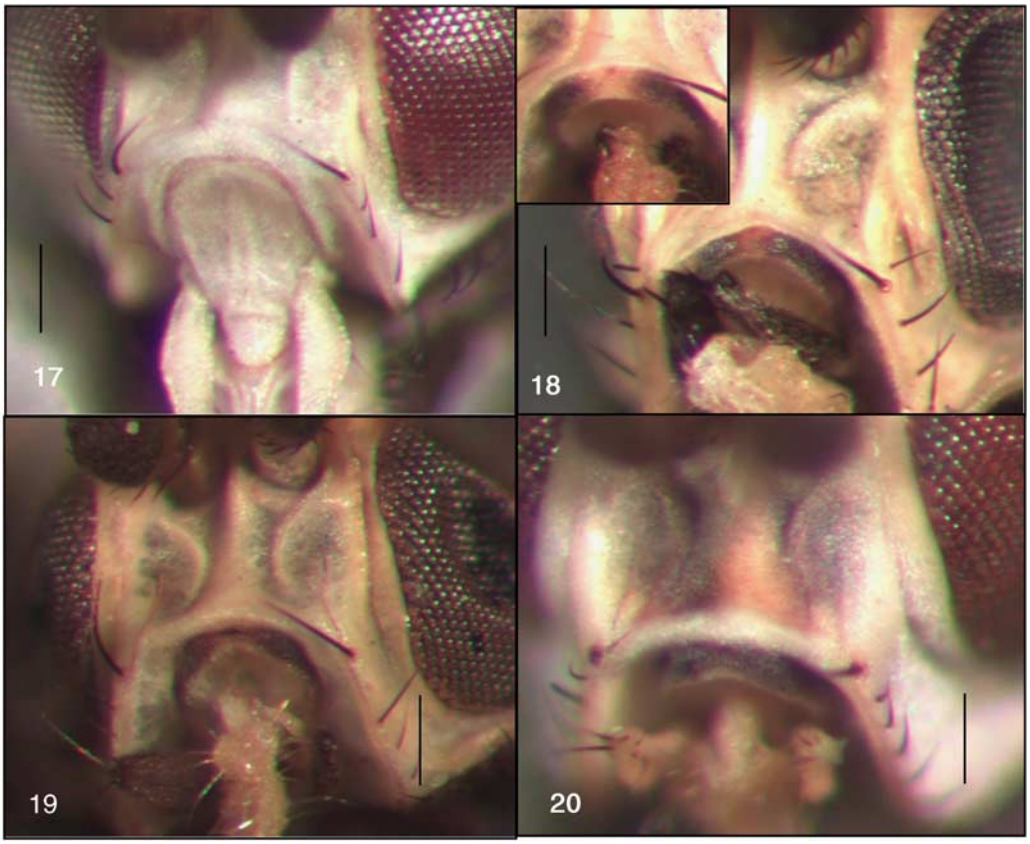
Figs. 17–20. Clypeus of 17, *Cerodontha* (*Icteromyza*) *longipennis* (Loew); 18, *Cerodontha* (*Icteromyza*) *montanoides* Spencer (inset showing variation); 19, *Cerodontha* (*Icteromyza*) *vockerothi* **sp. nov.**; 20, *Cerodontha* (*Icteromyza*) *woodi* **sp. nov.** Scale bar = 0.1 mm.



and curved down to an angle of approximately 45–70°. In these specimens the distal tubules measure about 0.20–0.25 mm long (taken vertically from lowest point to highest point, Fig. 29, arrow) and the anterior part of the mesophallus is about 0.12–0.14 mm long. Many eastern Nearctic specimens (*e.g.*, Maine, Iles-de-la-Madeleine, Manitoba, Prince Edward Island, Newfoundland) have the distal end of the tubules slightly bulkier and bent at a 90° angle (Figs. 33, 35), showing some similarities to the illustration provided in Nowakowski (1973: fig. 105). These specimens also have the distal end of tubules more dilated, being most visible in dorsolateral view or ventral view (Fig. 36: width of 0.05 mm, compared with Fig. 30: 0.025 mm in "typical western *capitata*"), and the tubules are slightly longer with a length of approximately 0.28 mm (Fig. 33, arrow); the anterior part of mesophallus is also longer, measuring normally at least 0.16 mm. Palaearctic specimens of *C.* (*I.*) *capitata* that were examined (see Appendix 1) have the distal tubules matching more closely to Spencer's illustration ("typical western *capitata*") than to Nowakowski's. However, these western/eastern differences cannot be applied to all specimens. For example, specimens examined from Ontario, exhibit typical "western phallus" (as illustrated in Figs. 29, 31), and other specimens from various localities exhibit intermediate forms. For this reason, all specimens are here referred to *C.* (*I.*) *capitata* until further evidence is found to suggest that these varied differences are indicative of species-level boundaries.

Although multiple specimens of *C. capitata* were examined from eastern Canada, records are

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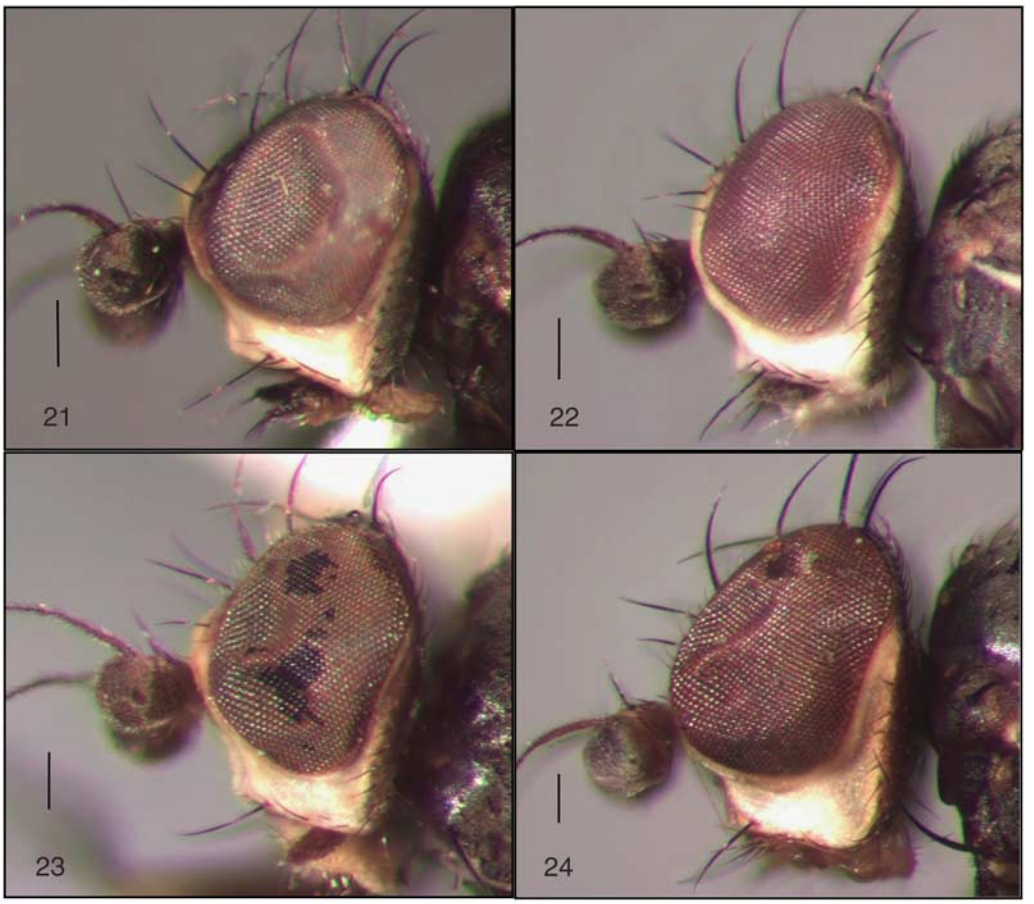
Figs. 21–24. Heads lateral view: 21, *Cerodontha* (*Icteromyza*) *atrissima* Spencer; 22, *Cerodontha* (*Icteromyza*) *griffonensis* **sp. nov.**; 23, *Cerodontha* (*Icteromyza*) *vockerothi* **sp. nov.**; 24, *Cerodontha* (*Icteromyza*) *woodi* **sp. nov.** Scale bar = 0.1 mm.



less frequent towards the south, with specimens examined from only Maine and Massachusetts. Additional eastern localities recorded in previous studies include Illinois (Frick 1959), Mississippi and North Carolina (Spencer and Steyskal 1986).

Cerodontha (*Icteromyza*) *churchillensis* Spencer

(Figs. 3, 15, 41–47)

Cerodontha (*Icteromyza*) *churchillensis* Spencer, 1969b: 138; 1976: 172; 1981: 169; Nowakowski 1973: 41; Spencer and Steyskal 1986: 90; Zlobin 2000: 55

Types examined: Paratypes. CANADA. Manitoba: Fort Churchill, 31.vii.1952, J.G. Chillcott (1 ♂; 1 ♀: CNC); same except 1.viii.1952 (1 ♂; 3 ♀: CNC); 505 mi, Hudson Bay Ry, 16.vii.1952, J.G. Chillcott (1 ♂: CNC). **UNITED STATES. Alaska:** King Salmon, Naknek R., 1.viii.1952, W.R. Mason (1 ♂: CNC).

Other specimens examined: CANADA. Ontario: Luther Marsh Bog, 27.vi.1985. KN. Barber, sweeps (2 ♂; 2 ♀: DEBU); Wylde Lk. Bog, 8k E. Arthur, 7–13.vii.1987, David Blades (1 ♀: DEBU); **Québec:** Gatineau Co., Masham Township, 27.vii.1995, E. Ikeda (1 ♀: LEM); Johnville Bog and Forest Park (45°20.7′N, 71°44.5′W), sweeping vegetation, 4.vii.2005, J. Kuchta (2 ♂; 2 ♀: LEM); same except 8.vii.2005

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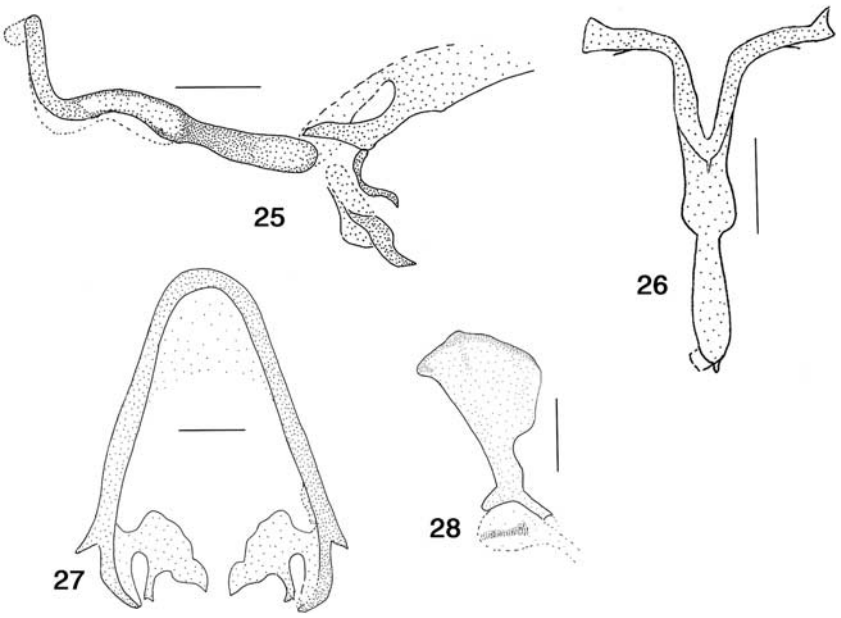
Figs. 25–28. *Cerodontha* (*Icteromyza*) *atrissima* Spencer: 25, phallus lateral; 26, phallus ventral view; 27, hypandrium; 28, ejaculatory apodeme. Scale bar = 0.1 mm.



(3 ♂; 2 ♀: LEM); same except 11.vii.2005 (1 ♂; 2 ♀: LEM); same except 13.vii.2005 (1 ♀; 1 ♂: LEM); same except 15.vii.2005 (1 ♂; 3 ♀: LEM); same except 26.vii.2005 (2 ♀: LEM); same except (45°59.8′N, 73°18.0′W), 26.vii.2006, A. Moore (1 ♀; 1 ♂: LEM); Percé, Bridgeville (48°36′N, 64°19′W), sweep vegetation in peat bog, 08.viii.2000, H. Varady-Szabo (3 ♀: LEM). **Northwest Territories:** Exmouth L. (65°02′N, 115°54′W), 22.viii.1966, G.E. Shewell (3 ♀: CNC); same except 24.viii.1966 (4 ♂; 3 ♀: CNC); same except 25.viii.1966 (1 ♀: CNC). **UNITED STATES. Idaho:** Priest L., Lookout Mt., 20.viii.1919, A.L. Melander (1 ♀: NMNH). **EUROPE. Sweden:** Dlr. Floda Sångtorpet Tord Tjeder (1 ♀: MZLU); Hall. Enslöv, 30.vii–4.viii.1957, Fattigkärr, H. Andersson (1 ♂: CNC); Nb. Pajala, Jupukka, 28.vii. starrmyr nr 93. (1 ♀: CNC); Nb. Råneå, Högsön, 10.7.1975, H. Anderson (1 ♀: MZLU).

Diagnosis. The yellow palpus, dark upper frons, bare eyes, narrowly yellow knees, and male genitalia differentiate this species from other Nearctic *Icteromyza*.

Description. Frons width 0.25–0.35 mm; ratio of frons width to eye width 1.5–2.0; orbit, each approximately 0.20–0.22 times the width of frons at level of lower ors; lunule small (smaller than other *Icteromyza* species), nearly semicircular or higher; frontal triangle well differentiated from frons, slightly elevated, and apparently extending to margin of lunule as a narrow line; length between ocellar tubercle and margin of lunule 0.14–0.18; base of antennae separated by narrow and sometimes slightly elevated keel; clypeus of medium thickness with upper margin rounded (Fig. 15); orbit slightly projecting anterodorsally; parafacial and cheek absent; normally two inclinate ori (sometimes three) and two reclinate ors; distance between upper ori and lower ors about the same as the distance between both ori; gena narrow: at midpoint 0.14–0.20 times the maximum eye height; gena only slightly deeper at rear; eye bare. Wing length 1.7–2.1 mm in males and 2.2–2.5 mm in females; distance between r-m and dm-cu 1–1.6 times the length of vein dm-cu.

Colour: Frons brown posteriorly, at least at the level of ocellar tubercle (Fig. 3), but sometimes more extensively brown, and yellow (or sometimes orange or yellowish-brown) below; orbit brown posteriorly (to level of anterior or posterior ori,

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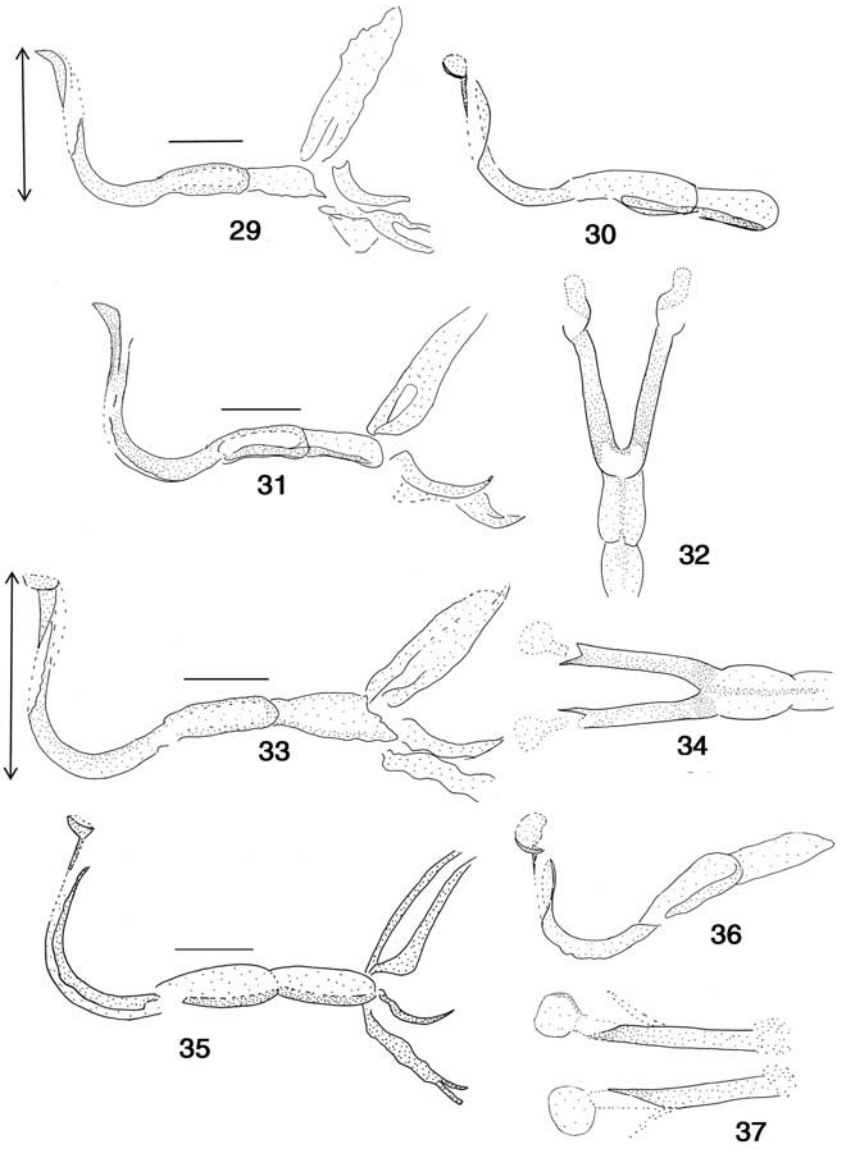
Figs. 29–37. *Cerodontha* (*Icteromyza*) *capitata* (Zetterstedt): 29, phallus lateral, Alaska, 240 mi, Richard Hwy; 30, same in dorsolateral view; 31, phallus lateral, California, Nevada Co.,15 km N. of Truckee; 32, same, in anteroventral view; 33, phallus lateral, Québec, Gaspésie; 34, same, in anteroventral view; 35, phallus, lateral, Newfoundland, St-Johns; 36, same in dorsolateral view; 37, same in anteroventral view. Scale bar = 0.1 mm.



at least narrowly along eye margin) and yellow below; frontal triangle variable, yellowish to darker brown; lunule normally yellow, but sometimes slightly darker if frons darker anteriorly; face, palpus, and gena yellow (face sometimes infuscated with blackish spots); antennae brown except for yellow scape, and pedicel sometimes yellow medially at apex; clypeus completely brown to variably yellow centrally. Thorax and abdomen brown. Legs completely brown with knees yellow: fore femora yellow for about 0.16–0.23 times the length of femora, and sometimes fore coxa narrowly yellowish at apex. Calypter, including margin and fringe, pale brown.

Genitalia: Distiphallus short, S-shaped in lateral view, with weak curvatures (Figs. 41–43).

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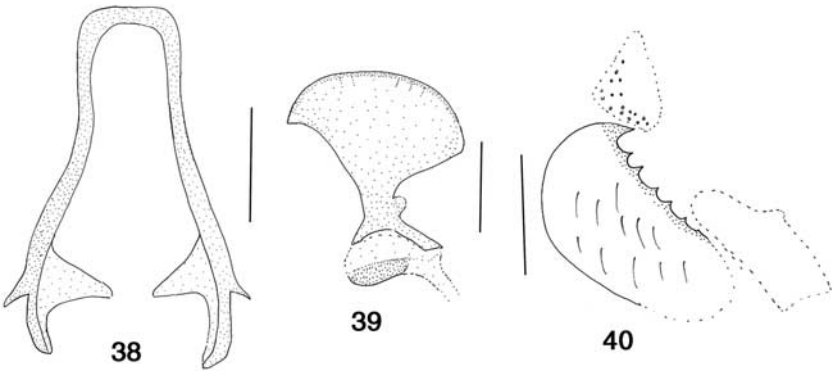
Figs. 38–40. *Cerodontha* (*Icteromyza*) *capitata* (Zetterstedt); 38, hypandrium, California, 13 km N. Truckee; 39, ejaculatory apodeme, California, Sagehen Creek; 40, epandrium, surstylus (above) and cercus (below) in posteroventral view (left side), Québec, Îles de la Madeleine. Scale bar = 0.1 mm.



Distal tubules diverging in ventral view with apices converging (Fig. 44). Mesophallus approximately same length as distiphallus, mostly parallel sided. Cerci large and long, extending beyond ventral margin of epandrium (Fig. 45). Inner margin of epandrium with three spines. Anal projection of epandrium prominent. Hypandrium (Fig. 46) narrow, sometimes with a more pronounced constriction above midpoint. Ejaculatory apodeme variable: wide and asymmetrical or narrower and almost symmetrical (Fig. 47A, 47B).

Geographic distribution: Palaearctic region (Zlobin 2000), Canada (Manitoba, Québec, Northwest Territories), and United States of America (Alaska, Idaho).

Host plant: Unknown.

Comments: In the Nearctic region, this species was previously known only from Alaska and Manitoba. The Californian record (male paratype) listed in Spencer (1969b, 1981) and Spencer and Steyskal (1986) represents *C.* (*I.*) *temeculensis*.

Cerodontha (*Icteromyza*) *fuscifrons* Spencer

(Figs. 4, 48–51)

Cerodontha (*Icteromyza*) *fuscifrons* Spencer, 1969b: 138

Type examined: Paratype. CANADA. Québec: Perkins Mills, 14.viii.1938. G.E. Shewell, 1938 (1 ♀: CNC).

Other specimens examined: CANADA. British Columbia: Revelstoke, 2.vii.1973, H.J. Teskey (1 ♀: CNC). **Ontario:** 75 km NE Sault Ste.Marie, Witchdoctor Lake, 29.viii.1992, gravel bar in river, T.A. Wheeler (1 ♂: LEM). **Québec:** Beech Grove, 27.vi.1984, B.M. Bissett (1 ♂: CNC). **Saskatchewan:** Cypress Hills Prov. Pk., East Block. Grass/sedge on lakeshore. 10.vii.2005. J.R. Vockeroth (1 ♀: LEM).

Diagnosis. This species can be distinguished from other Nearctic *Icteromyza* by the combination of its hairy eyes, brownish frons (at least above), yellow palpus, and femora narrowly yellow apically.

Description. Frons width 0.25–0.35 mm; ratio of frons width to eye width 1.4–1.8; orbit, each approximately 0.20 times the width of frons at level of lower ors; lunule large, slightly higher than a semicircle (Fig. 4); frontal triangle extending to margin of lunule as a narrow extension; length between ocellar tubercle and margin of lunule 0.15–0.17 mm; base of antennae separated by narrow and slightly elevated keel; clypeus normal, medium thickness with upper margin rounded; orbit with very slight projection anterodorsally; parafacial reduced, sometimes forming narrow ring (cheek) below eye; two inclinate ori and two reclinate ors; distance between upper ori and lower ors shorter than or equal to the distance between both ori; gena at midpoint, 0.18–0.20 times the maximum eye height; gena 1.3–1.5 times deeper at hind corner than at midpoint; eye conspicuously

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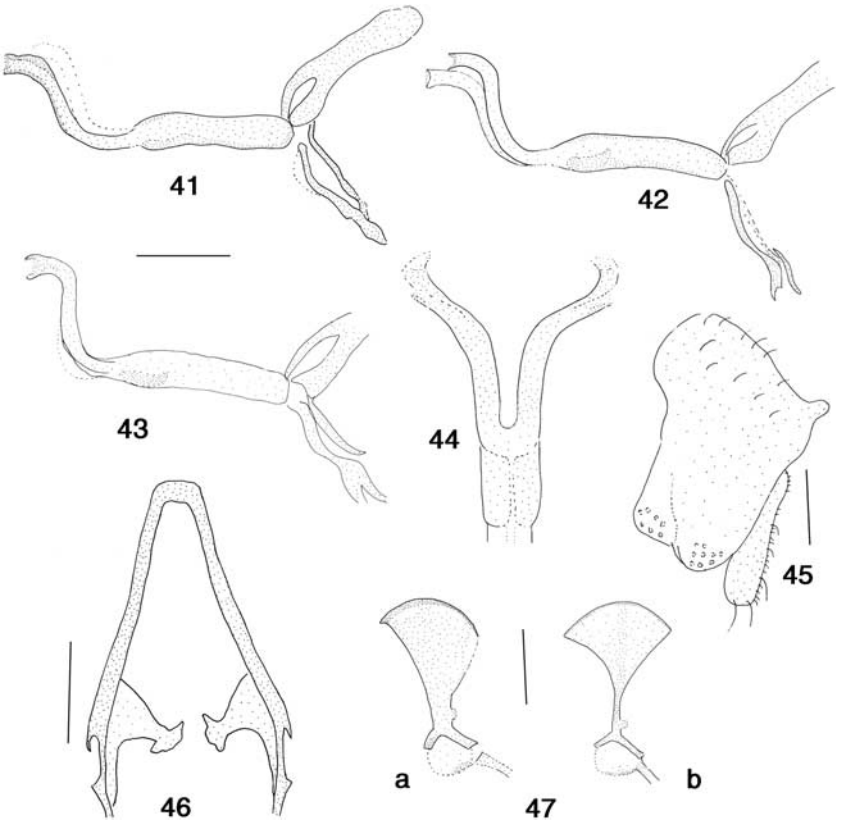
Figs. 41–47. *Cerodontha* (*Icteromyza*) *churchillensis* Spencer: 41, phallus lateral, Alaska, King Salmon; 42, phallus lateral, Ontario, Luther Marsh; 43, phallus lateral, Québec, Johnville bog and Forest Park; 44, same in ventral view; 45, epandrium in lateral view; 46, hypandrium; 47A, B. ejaculatory apodemes. Scale bar = 0.1 mm.



pilose. Wing length approximately 2.3 in males (difficult to measure, wings bent), 2.8 mm in females; distance between r-m and dm-cu 1.4–1.7 times the length of vein dm-cu.

Colour: Frons brown or brownish-orange (Fig. 4), sometimes bright yellow in front; orbit brown for most of its length, yellow anterior to lower ori; frontal triangle yellowish to brown; lunule, face, palpus, and gena yellow (antennal foveae sometimes darker); scape yellow, pedicel brown at base and yellow distally, especially on medial surface (Fig. 4), first flagellomere brown (sometimes narrowly yellow posteriorly on medial surface); clypeus pale, yellowish-brown or dark brown. Thorax and abdomen brown. Legs (including coxae), brown, except all knees yellow: fore femora yellow for about 0.20–0.23 times the length of femora. Calypter yellowish to pale brown, margin and fringe brown.

Genitalia: Distiphallus very long, curving back over mesophallus (Fig. 48). Mesophallus long (0.4 mm in its original bent position) with a distinct sharp curvature near midpoint. Inner margin of epandrium with three spines, including a larger one anteriorly (Fig. 51). Anal projection well developed. Cerci normal, extending slightly beyond ventral margin of epandrium in lateral view. Hypandrium low and broad (Fig. 50). Ejaculatory apodeme with blade slightly expanded (Fig. 49).

Geographic distribution: Canada (British Columbia, Ontario, Québec, and Saskatchewan).

Host plant: Unknown.

Comments: This species was previously known from a single locality in Québec. New localities in British Columbia, Ontario, Québec, and Saskatchewan are here recorded but the species remains rare, with only five specimens known.

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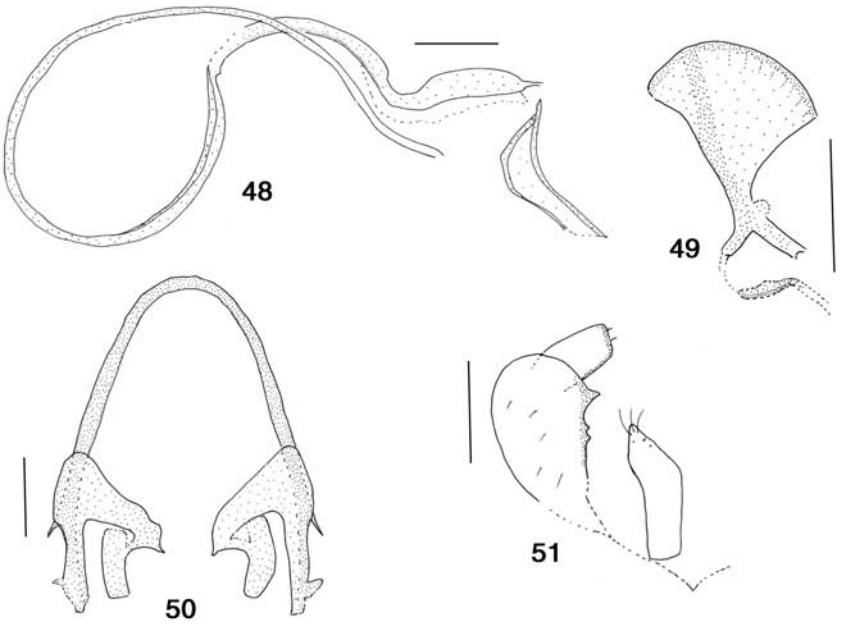
Figs. 48–51. *Cerodontha* (*Icteromyza*) *fuscifrons* Spencer: 48, phallus lateral; 49, ejaculatory apodeme; 50, hypandrium; 51, epandrium, surstylus (above), and cercus in posteroventral view (left side). Scale bar = 0.1 mm.



Cerodontha (*Icteromyza*) *griffonensis* Boucher, sp. nov.

(Figs. 5, 16, 22, 52–56)

Type material. Holotype: ♂. **CANADA. Québec:** Gaspésie, l'Anse-au-Griffon, nr. Parc Forillon (48°55′N, 64°19′W), sweep. 31.vii.2001, S. Boucher (LEM).

Etymology: The species name is derived from the type locality L'Anse-au-Griffon and also refers to the morphology of the male genitalia that somewhat resembles a gryphon, a mythological creature with an eagle head.

Diagnosis. The combination of its small size (wing length 2.2 mm in male), bare eyes, yellow frons, brown palpus, presence of only two ori, and the shape of the male genitalia differentiate this species from other Nearctic *Icteromyza.*

Description. Frons width 0.35 mm; ratio of frons width to eye width 1.8; orbit, each approximately 0.24 times the width of frons at level of lower ors; lunule large, in the form of a semicircle (or slightly higher); frontal triangle narrow, and reaching margin of lunule as a narrow extension (Fig. 5); length between ocellar tubercle and margin of lunule 0.16 mm; base of antennae separated by narrow and slightly elevated keel; clypeus narrow (Fig. 16) with upper margin rounded (but brown pigmentation makes it appear triangular); orbit slightly projecting anterodorsally (Fig. 22); parafacial reduced; cheek absent; two inclinate ori and two reclinate ors; gena at midpoint, 0.20 times the maximum eye height; gena 1.4 times deeper at hind corner than at midpoint; eye bare. Wing length 2.2 mm in male; distance between r-m and dm-cu 1.3 times the length of vein dm-cu.

Colour: Frons bright yellow; orbit pale brown above and yellow at level of ori (Fig. 5); frontal triangle same colour as frons; lunule and face yellow; antennae brown except scape and medial tip of pedicel yellow; gena yellow; palpus brown; clypeus mostly brown but narrowly bordered by yellow ventrally (Fig. 16). Thorax and abdomen greyish-brown. Legs brown (including fore and mid-coxae) with all knees yellow: fore femora yellow for a distance of 0.20 times the length of femora. Calypter, including margin and fringe, pale brown.

Genitalia: Distal tubules of phallus short, immediately curving up from mesophallus at an obtuse angle of about 120° (Fig. 52), permitting a full view of phallus in ventral view (Fig. 53).

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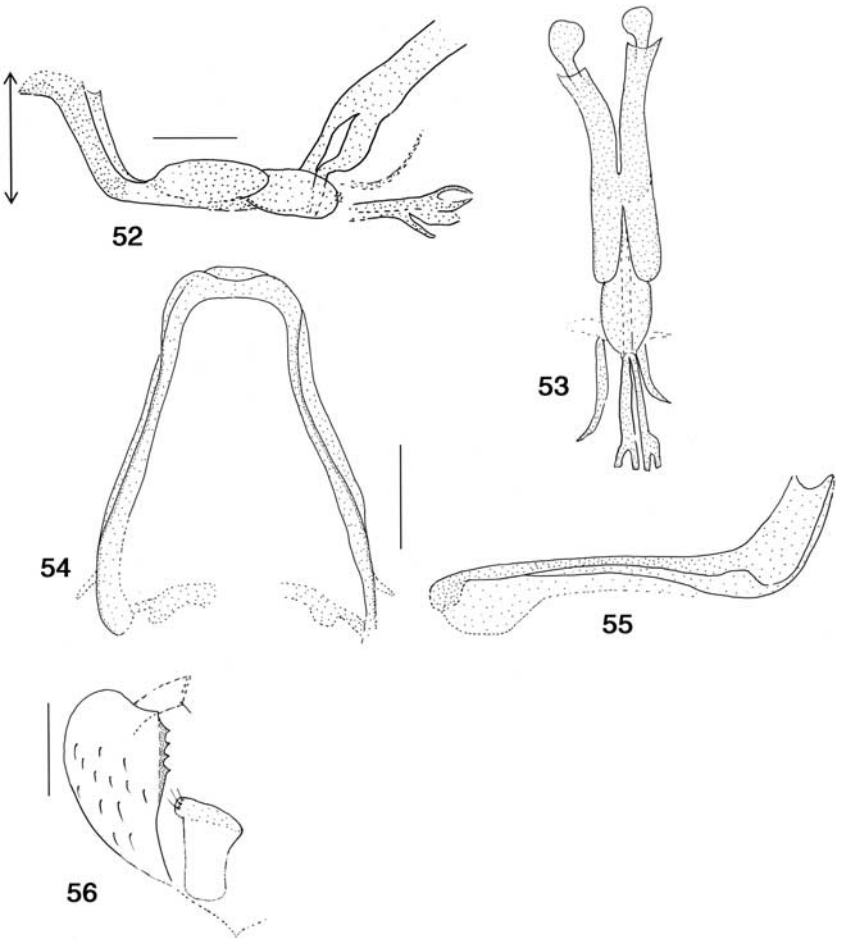
Figs. 52–56. *Cerodontha* (*Icteromyza*) *griffonensis* **sp. nov.**; 52, phallus lateral; 53, phallus ventral; 54, hypandrium; 55, hypandrium lateral; 56, epandrium, surstylus (above) and cercus (left side). Scale bar = 0.1 mm.



Distal end of distiphallus flaring in lateral view. Distal tubules with a length of approximately 0.18 mm (taken vertically from lowest point to highest point, Fig. 52, arrow). Distal tubules slightly diverging in ventral view (Fig. 53). Inner margin of epandrium with four to six small spines (Fig. 56) (apparently four on one side, but six on opposite side). Hypandrium with a bulbous swelling anteriorly, visible in lateral view (Fig. 55). Cerci short, not reaching ventral margin of epandrium. Ejaculatory apodeme lost.

Geographic distribution: Eastern Canada (Québec).

Host plant: Unknown.

Comments: This new species is externally most similar to *C.* (*I.*) *capitata* and *C.* (*I.*) *montanoides* but can be differentiated from the former by a combination of characters, including its smaller size, number of ori, and male genitalia. The bright yellow frons, the frontal triangle extending to the lunule, and the shape of the clypeus differentiates this species from *C.* (*I.*) *montanoides*. The genitalia of *C. montanoides* are very similar to the genitalia of *C. griffonensis* and suggest a close phylogenetic relationship between these species. *Cerodontha* (*I.*) *griffonensis* has slightly shorter distal tubules with an obtuse angle relative to the mesophallus (right angle in *C.* (*I.*) *montanoides*) and the distal ends of the tubules are slightly more flaring. A second visit to the type locality in mid August 2006, failed to collect additional specimens of *C.* (*I.*) *griffonensis*. The species is apparently present earlier in the season.

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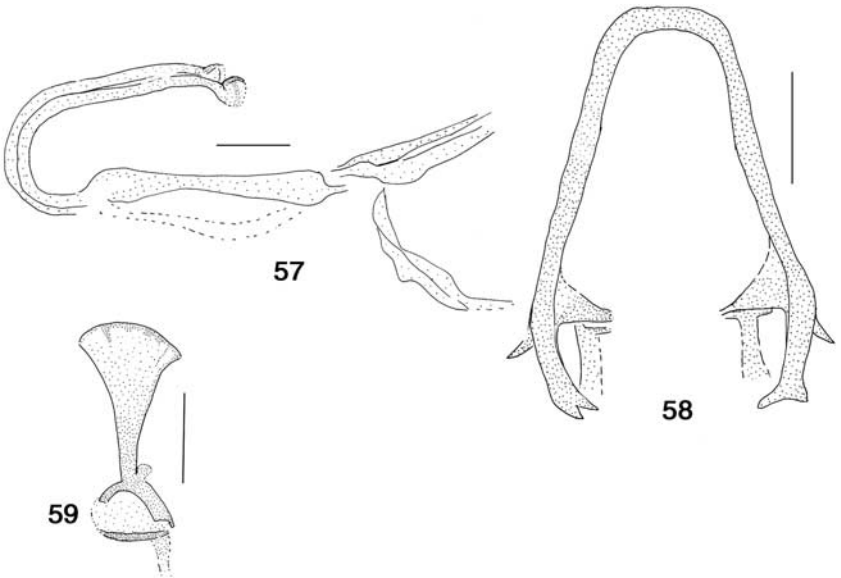
Figs. 57–59. *Cerodontha* (*Icteromyza*) *lineella* (Zetterstedt): 57, phallus lateral; 58, hypandrium; 59, ejaculatory apodeme. Scale bar = 0.1 mm.



Cerodontha (*Icteromyza*) *lineella* (Zetterstedt)

(Figs. 6, 57–59)

Agromyza lineella Zetterstedt, 1838: 790
Dizygomyza lineella, Hendel 1920: 132
Dizygomyza hirticep, Hendel, 1920: 132. Syn. Rydén 1951: 176
Agromyza pollinosa Melander, 1913: 263. Syn. Boucher 2008: 557
Cerodontha (*Icteromyza*) *pollinosa*, Frick 1957: 202; 1959: 387; Spencer 1969b: 140
Cerodontha (*Icteromyza*) *lineella*, Nowakowski 1967: 654; 1973: 35; Spencer 1976: 174; Zlobin 2000: 59; Boucher 2008: 557

Specimens examined: CANADA. Alberta: Sibbald Flats Rec. Area, 08.viii.1980. S. Marshall, Creek (1 ♂: DEBU); Waterton Lakes Nat. Pk., 07–12.vii.1980, H.J. Teskey (1 ♀: CNC). **British Columbia:** Nancy Greene Park, viii.1980, sweep. S. Marshall (1 ♀: DEBU). **Manitoba:** Churchill, 25.vi.1930, O. Bryant (1 ♀: NMNH); Farnworth L. nr. Churchill, 22.vii.1952, J.G. Chillcott (1 ♀: CNC); same except 23.vii.1952 (1 ♀: CNC); Fort Churchill, 31.vii.1952, J.G. Chillcott (1 ♀: CNC); same except 4.viii.1952 (4 ♀: CNC); same except 6.viii.1963, J.R. Vockeroth (2 ♀: CNC). **Northwest Territories:** Aklavik, 25.vii.1931, O. Bryant (1 ♂; 2 ♀: NMNH); Exmouth L., (65°02′N, 115°54′W), 22.viii.1966, G.E. Shewell (4 ♂: CNC); same except 23.viii.1966 (13 ♂; 4 ♀: CNC); same except 24.viii.1966 (30 ♂; 16 ♀: CNC); same except 26.viii.1966 (1 ♂; 1 ♀: CNC); Good Hope, 23.viii.1929, O. Bryant (2 ♂; 1 ♀: NMNH); Hyndman L., (68°15′N, 131°03′W), 1.viii.1969, G.E. Shewell (1 ♂; 5 ♀: CNC). **Québec:** James Bay Rte, 570.3 km, 53°29′39″N, 77°37′15″W, black spruce nr. lake shore, malaise, 9–15 July 2001, M. & B. Buck, debu00182359 (1 ♂: DEBU). **Yukon Territory:** Klondike Hwy, 15 km S. Carmacks, Bushy Mt. (61°58.2′N, 136°12.2′W), sweep sedges at parking area near river, 25.vii.1998, T.A. Wheeler (1 ♂: LEM); Klondike Hwy, 8.8 km S Twin Lakes, Conglomerate Mt. (61°37.9′N, 135°53.1′W), sweep sedges along Nordenskiold R. 08.vii.1997, T.A. Wheeler (1 ♂; 6 ♀: LEM); same except 15.vii.1998 (2 ♀: LEM); same except 25.vii.1998 (1 ♀: LEM); Klondike Hwy, Emerald Lake (60°15.8′N, 134°45.1′W), sweep veg. at south end of lake, 20.vii.1998, T.A. Wheeler (3 ♀: LEM); Whitehorse, 7.vii.1950, R.H. Robertson (1 ♀: CNC); Whitehorse, Miles Canyon (60°40′N, 135°01.8′W), sweep

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grass/sedges at Yukon R., 27.vii.1998, T.A. Wheeler (3 ♂; 1 ♀: LEM); Whitehorse, Robert Service C.G. (60°42.1′N, 135°02.7′W), sweep grass and sedges along Yukon R., 11.vii.1998, T.A. Wheeler (1 ♂: LEM); **UNITED STATES. Alaska:** King Salmon, Naknek R., 11.viii.1952, W.R. Mason (1 ♂: CNC); Sitka, 16.vii.1907, W.T. Shaw (2 ♂: NMNH; previously labelled as cotype and holotype of *C.* (*I.*) *pollinosa*, see Boucher 2008). **Wyoming:** Yellowstone Park, Yellowstone Lake, 23.vii.1934, A.L. Melander (1 ♀: NMNH). **Palaearctic region: ESTONIA:** Saaremaa, Viidumäe Nature Reserve, sedge marsh, Nartshuk, 30.vii.1987 (1 ♂: ZISP); **SWEDEN:** Nb. Pajala, 28.vii. starr, dyig åkant nr 95 (1 ♂: MZLU); Nb. Råneå, Högsön Högsöfjärden, 6.9.1965, H. Anderson (1 ♂: MZLU); Vmld. Ekshärad, 21.vii.1960, W.R.M. Mason (1 ♂: CNC). **RUSSIA:** Kolskii, Krasnoshchel'ye: shore of Ponoy River, sedge marsh, Gorodkov, 18.viii.1981 (1 ♀: ZISP).

Diagnosis. This species can be recognized from other Nearctic species of *Icteromyza* by the combination of yellow palps, a yellow frons, strongly projecting orbits, a high gena (0.26–0.33 times the maximum eye height), eyes conspicuously hairy (Fig. 6) and much oblique, femora yellow distally for a distance of about 0.2–0.4 times the length of femora, and the shape of the male genitalia.

Description. This species was redescribed by Boucher (2008). Additional characters are as follows: clypeus thick with upper margin rounded (similar to *capitata*, Fig. 14), pale yellowish-brown to dark brown but usually slightly paler centrally. Mid-coxa yellow ventrally for half of its length. Wing length 2.4–3.1 mm in males, and normally 2.8–3.6 mm in females (two female specimens smaller: 2.5 and 2.6 mm).

Genitalia: Distal tubules curving back over mesophallus, normally resting over mesophallus in a position almost parallel to it and reaching at least to midpoint of mesophallus (Fig. 57). Mesophallus long, usually between 0.3 and 0.4 mm and constricted medially. Distal tubules diverging. Cerci long, extending slightly beyond ventral margin of epandrium. Inner margin of epandrium with three to four small spines. Anal projection weakly developed, in the form of a small, wide tubercle. Ejaculatory apodeme narrow, blade only slightly expanding (Fig. 59). Hypandrium large (Fig. 58).

Geographic distribution: Palaearctic region (Zlobin 2000), Canada (Alberta, British Columbia, Manitoba, Northwest Territories, Québec, and Yukon Territory); United States of America (Alaska, Wyoming).

Host plant. Unknown.

Comments: *Cerodontha* (*I.*) *lineella* was previously known from the Palaearctic region, but was recently recorded in North America (Boucher 2008). Spencer (1976) used the dark coxae of *C.* (*I.*) *lineella* to differentiate it from *Cerodontha* (*Icteromyza*) *bohemani* (Rydén), but both species are described in a key (Nowakowski 1973) as having partially yellow coxae. In the specimens examined for the present study, the colour of the fore coxae of *C.* (*I.*) *lineella* was sometimes completely brown, but more frequently partially yellow apically.

Cerodontha (*Icteromyza*) *longipennis* (Loew)

(Figs. 7, 17, 60–70)

Agromyza longipennis Loew, 1869: 48
Phytobia (*Icteromyza*) *longipennis*, Frick 1959: 386
Cerodontha (*Icteromyza*) *longipennis*, Spencer 1969b: 140; 1981: 170; 1990: 346, 351; Sehgal 1971: 324; Spencer and Steyskal 1986: 89

Specimens examined: 449 specimens (CNC, LEM, NMNH, DEBU) from across Canada (except Nunavut) and from most American states (Appendix 2).

Diagnosis. This species can be differentiated from other North American *Icteromyza* by the bare eyes (at most only scattered short hairs), yellow palpus and frons, dark upper orbits, narrow gena, narrow and pale clypeus, yellow femora for at least 0.35 times of its length (measurement taken on fore femora), and the male genitalia.

Description. Frons width 0.25–0.35 mm; ratio of frons width to eye width 1.4–1.8; orbit, each approximately 0.20–0.24 times the width of frons at level of lower ors; lunule moderately large, higher than a semicircle (Fig. 7); frontal triangle reaching margin of lunule as a narrow extension (sometimes hardly differentiated from frons and difficult to see); length between ocellar tubercle and margin of lunule short: 0.11–0.14 mm; base of antennae approximate; clypeus narrow with

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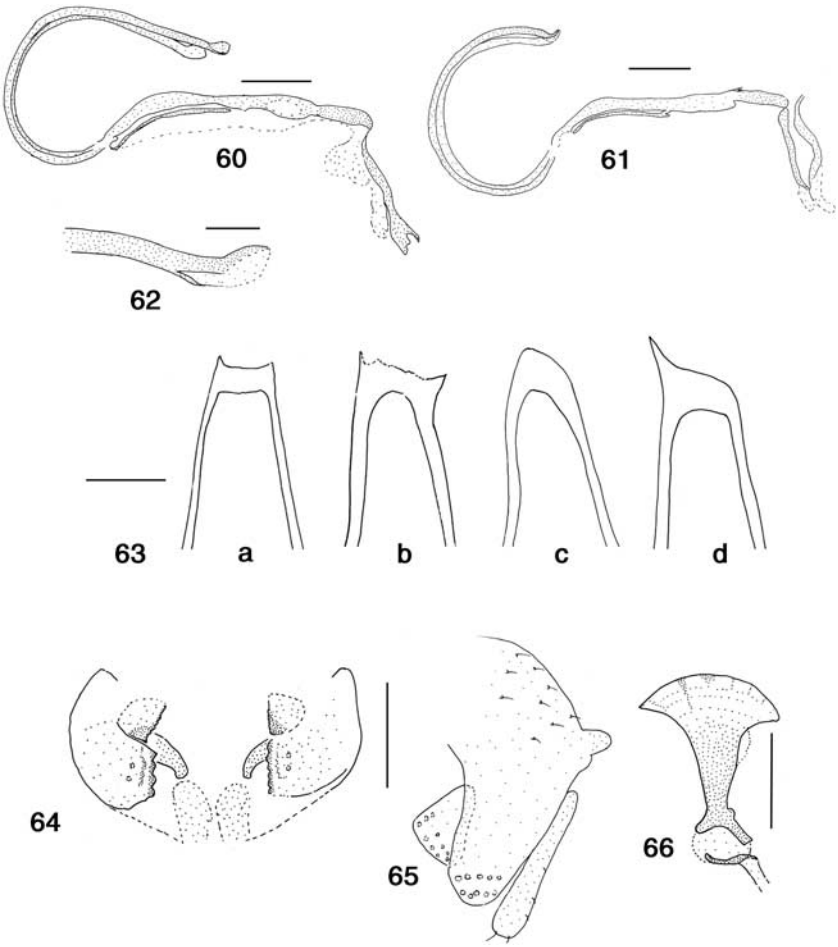
Figs. 60–66. *Cerodontha* (*Icteromyza*) *longipennis* (Loew): 60, phallus lateral, California, Donner Summit; 61, same except, Ontario, Metcalfe; 62, phallus, distal end; 63A–D, hypandrium, distal half; 64, epandrium and associated structures (surstyli, subepandrial sclerites and cerci) in posteroventral view; 65, epandrium, surstylus and cercus, lateral view; 66, ejaculatory apodeme. Scale bar = 0.1 mm, except Fig. 62 = 0.025 mm.



upper margin rounded (Fig. 17); in profile, frons only slightly projecting anterodorsally; parafacial and cheek absent; two inclinate ori (a few specimens with only one ori), two reclinate ors; distance between upper ori and lower ors about the same as the distance between both ori; gena narrow, at midpoint 0.13–0.18 times the maximum eye height (rarely 0.20); gena straight or slightly deeper at rear (up to 1.5 times deeper at rear than at midpoint); eye bare or at most with short scattered hairs. Wing length usually (see Variation below) between 1.9 and 2.5 mm in males (rarely up to 2.6 mm), and usually between 2.5 and 2.7 mm in females (rarely up to 2.9 mm; two female specimens smaller: 1.9 and 2.2 mm); distance between r-m and dm-cu 1.2–1.8 times the length of vein dm-cu.

Colour: Frons yellow or orange; orbit brown above, usually as far as upper ors (Fig. 7), but sometimes as far as lower ors, yellow below; frontal triangle same colour as frons; lunule, face, palpus, and gena yellow (antennal foveae sometimes darker); scape yellow, pedicel usually brown basally, yellow apically, first flagellomere mostly yellow (at least medially) in male specimens, and dark brown in females; clypeus yellow to pale yellowish-brown (Fig. 17), sometimes brownish laterally and paler yellow centrally.

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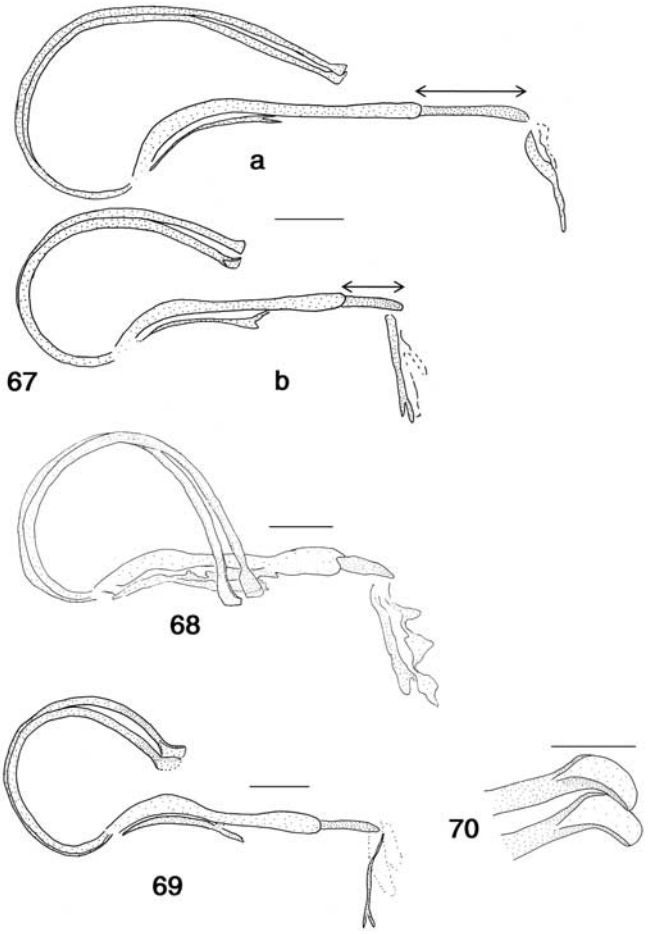
Figs. 67–70. *Cerodontha* (*Icteromyza*) *longipennis* (Loew) (variations): 67A, phallus lateral, California, Donner Summit; 67B, phallus lateral, typical *C.* (*I.*) *longipennis*, Manitoba, Aweme; 68, phallus lateral, Northwest Territories, Exmouth L.; 69, same except Yukon Territory, Klondike Hwy; 70, same except distal end. Scale bar = 0.1 mm, except Fig. 70 = 0.05 mm.



Thorax and abdomen greyish-brown; legs mostly brown except femora yellow distally for a distance of about 0.35–0.50 times the length of femora (measurement taken on fore femora), fore coxa sometimes yellowish apically and mid-coxa partially yellow. Calypter, margin and fringe usually yellow (rarely yellowish-brown).

Genitalia (see Variation below): Distal tubules long, recurved towards mesophallus, usually reaching close to midpoint of mesophallus (Fig. 60) or more rarely, forming a wider loop and finishing far from mesophallus (Fig. 61). Distal end of distiphallus usually only slightly enlarged and scoop shaped (Fig. 62). Mesophallus long, but usually less than 0.35 mm, narrow and tubular, slightly constricted in the middle. Narrow basal tubular projection of mesophallus (Fig. 67B, arrow) usually approximately 0.25 times the length of mesophallus (sometimes longer, Fig. 67A, see Variation section below). Inner margin of epandrium with approximately four to seven spines (Fig. 64), often in an irregular row (sometimes appearing as two rows). Hypandrium with narrow side arms and with usually one or two apodemes, but sometimes none (Fig. 63A–63D). Anal projection well developed. Cerci longer than ventral margin of epandrium in lateral view (Fig. 65).

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Variation 1: The phallus of four male specimens (see Appendix 2: Variation 1) is slightly different, with the distal end of the distiphallus distinctly enlarged (about twice the size of *C. longipennis*) (Figs. 68–70). These specimens, although somewhat similar to *C. longipennis*, are all slightly different in external appearance. For example, the BC specimen has a wing length of 2.9 mm and has a larger and darker clypeus. The CA specimen has darker orbit and 5 orbital bristles on both sides; YT specimens (one male and one female) have a darker yellowish-orange frons and finally NT specimen is most identical to *C.* (*I.*) *longipennis*; although the status of these specimens is unclear, they are here tentatively identified as *C.* (*I.*) *longipennis* until further material becomes available for study.

Variation 2: A few western Nearctic specimens (see Appendix 2: Variation 2) externally similar to *C.* (*I.*) *longipennis*, except slightly larger: wing length 2.3–2.8 mm in males and 2.8–3.1 mm in females, had the phallus overall significantly longer (Fig. 67A) than typical *C.* (*I.*) *longipennis* (Fig. 67B). The distal tubules are unusually long, recurved towards mesophallus, almost reaching its base. Mesophallus long and narrow, measuring at least 0.38 mm. Narrow basal tubular projection of mesophallus (Fig. 67A, arrow), 0.33–0.40 times the length of mesophallus.

Geographic distribution: Widespread Nearctic.

Host plant: Reared from *Juncus xiphioides* E. Mey. in California (Frick 1959; Spencer 1981).

Comments: *Cerodontha* (*I.*) *longipennis* is very common and the most widespread Nearctic species of *Icteromyza*, occurring in almost all Canadian provinces and American states (Appendix 2). *Cerodontha* (*I.*) *longipennis* is externally similar to the Palearctic species *C.* (*I.*) *bohemani*. *Cerodontha* (*I.*) *bohemani* has a wing length of 2.5–3.0 mm (Nowakowski 1973; Spencer 1976) and a phallus characterized by a slightly enlarged and strongly chitinized distal end of tubules as illustrated in Spencer (1969a) (lectotype). Spencer (1976) and Nowakowski (1973) also illustrated the phallus of *C.* (*I.*) *bohemani* but with different distal end (not as enlarged nor chitinized), similar to the distal end found in *C.* (*I.*) *longipennis*. One specimen of *C.* (*I.*) *bohemani* from Sweden (Sk. Kullaberg, 9.8.1969, H. Andersson, 1 ♂: MZLU) was examined and the distal end of the tubules is slightly enlarged and conspicuously chitinized, as illustrated for the lectotype (Spencer 1969a), the mesophallus is long (0.4 mm), and the narrow basal tubular projection is 0.27 times the length of the mesophallus. *Cerodontha* (*I.*) *bohemani* also differs from *C.* (*I.*) *longipennis* by the darker fringe and margin of the calypter and fore coxae more extensively yellow (head missing in specimen examined).

Cerodontha (*Icteromyza*) *montanoides* Spencer

(Figs. 8, 18, 71–75)

Cerodontha (*Icteromyza*) *montanoides* Spencer, 1981: 171; Spencer and Steyskal 1986: 89

Type examined: Paratype. UNITED STATES: California: Sagehen Crk, Nevada Co., 11.vii.1975, B. Villegas (1 ♂: NMNH).

Other specimens examined: UNITED STATES: California: Lake Tahoe, 15.viii.1959, A.L. Melander (1 ♂: NMNH); Napa Co., Pope Beach Lk. Berryessa, 16.viii.1957, Mel (1 ♂: NMNH); Prosser Creek, near Hobart Mills, 6300′, 13.vii.1961. J.G. Chillcott (1 ♂; 2 ♀: CNC); Truckee, Nevada Co., 25.vi.1943, P.H. Arnaud (1 ♀: NMNH); 13 km N Truckee, Hwy. 89 at Sagehen Creek (39°26.07′N, 120°12.22′W), 1769 m, sweep vegetation, 15.viii.1999, S.E. Brooks (1 ♀: LEM). **Utah:** Cedar Brakes, 22.vii.1956, A.L. Melander (1 ♀: NMNH). **Wyoming:** Yellowstone Park, Dunraven Pass, 28.vii.1934, A.L. Melander (2 ♀: NMNH).

Diagnosis. The brown palpus, brown frons, often medially yellow clypeus, and the male genitalia differentiate this species from other Nearctic *Icteromyza*.

Description. Frons width 0.38–0.40 mm; ratio of frons width to eye width 1.5–1.6; orbit, each approximately 0.20–0.23 times the width of frons at level of lower ors; lunule large, in the form of a semicircle or slightly higher; frontal triangle apparently extending not further than lower ors; length between ocellar tubercle and margin of lunule 0.15–0.17 mm; base of antennae separated by narrow and slightly elevated keel; clypeus medium-thick with upper margin rounded (Fig. 18); in profile, orbit slightly projecting anterodorsally; parafacial absent or slightly projecting, sometimes forming narrow

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cheek; usually two inclinate ori (one specimen with three on both sides) and two reclinate ors; distance between upper ori and lower ors usually less than 1.5 times the distance between both ori; gena at midpoint, 0.20–0.26 times the maximum eye height; gena 1.2–1.5 times deeper at hind corner than at midpoint; eye bare. Wing length 2.15–2.5 mm in male and 2.6–2.9 mm in females; distance between r-m and dm-cu 1–1.7 times the length of vein dm-cu.

Colour: Frons yellowish-brown to dark brown, sometimes slightly paler above; orbit brown, sometimes a mixture of pale brown and black (along eye margin and below both ors) (Fig. 8); orbit becoming yellowish at level of ori or below ori; frontal triangle only slightly paler than frons; lunule, face, and gena yellow (antennal foveae sometimes darker); antennae brown except for partly yellow scape (anteriorly); palpus brown; clypeus completely black or narrowly to widely yellow centrally (Fig. 18). Thorax and abdomen greyish-brown; legs brown (including fore and mid-coxae), except all knees narrowly yellow: fore femora yellow for a distance of 0.13–0.20 times the length of femora. Calypter, including margin and fringe, brown.

Genitalia. Distal tubules curving dorsally at an angle of 90° to mesophallus. Distal tubules with a length of about 0.22–0.24 mm (taken vertically from lowest point to highest point). Distal tubules slightly to strongly diverging in ventral view (Fig. 72). Hypandrium in lateral view with a bulbous ventral projection as illustrated for *C.* (*I.*) *griffonensis* (Fig. 55). Inner margin of epandrium with approximately six spines (not all visible in ventral view) (Fig. 74). Anal projection well developed and cerci shorter than ventral margin of epandrium in lateral view (Fig. 75). Ejaculatory apodeme with broad blade (Fig. 73).

Geographic distribution: Western United States (California, Utah, Wyoming).

Host plant: Unknown.

Comments: This species is so far restricted to the western part of the United States of America. It was previously known only from California. New localities include Utah and Wyoming.

Cerodontha (*Icteromyza*) *pilosa* Boucher

(Figs. 9, 76–77)

Cerodontha (*Icteromyza*) *pilosa* Boucher, 2008: 560

Type examined: Holotype. CANADA. Yukon Territory: Firth River, 30.vii.1956, E.F. Cashman (1 ♂: CNC).

Diagnosis. The yellow palpus, yellow frons, conspicuously hairy eyes (Fig. 9), and extensively yellow knees (approximately for half the length of femora) differentiate this species from other Nearctic *Icteromyza*.

Description. This species was described by Boucher (2008), but additional characters recognized here are as follows: clypeus narrow with upper margin rounded, pale brown laterally and yellow centrally. Fore coxae yellowish apically and mid-coxae partially yellow.

Genitalia. Distal tubules long, recurved towards mesophallus, reaching about midpoint of mesophallus (Fig. 76); apex slightly enlarged and flared. Mesophallus long and narrow, measuring 0.43 mm. Narrow basal tubular projection of mesophallus measuring 0.27 times the length of mesophallus. Hypandrium with two apodemes (as in some *longipennis*, Fig. 63A). Anal projection well developed. Cerci longer than ventral margin of epandrium in lateral view. Ejaculatory apodeme with blade slightly expanded (Fig. 77).

Geographic distribution. Northwestern Canada (YT).

Host plant. Unknown.

Comments. *Cerodontha* (*I.*) *pilosa* has the eyes conspicuously pilose as in *C.* (*I.*) *lineella*, but the former can be differentiated by having a less pronounced projection of the frons, a narrower gena, a less oblique eye, and more extensively yellow knees. *Cerodontha* (*I.*) *pilosa* is also very similar to *C.* (*I.*) *longipennis* but can be distinguished by its conspicuously hairy eyes, larger size, and longer mesophallus. Only one specimen of *C.* (*I.*) *pilosa* is so far known; its genitalia are on a permanent mount, making it difficult to see potentially diagnostic details such as the spines on the inner margin of epandrium.

Cerodontha (*Icteromyza*) *temeculensis* Spencer

(Figs. 10, 78–82)

Cerodontha (*Icteromyza*) *temeculensis* Spencer, 1981: 173; Spencer and Steyskal 1986: 90

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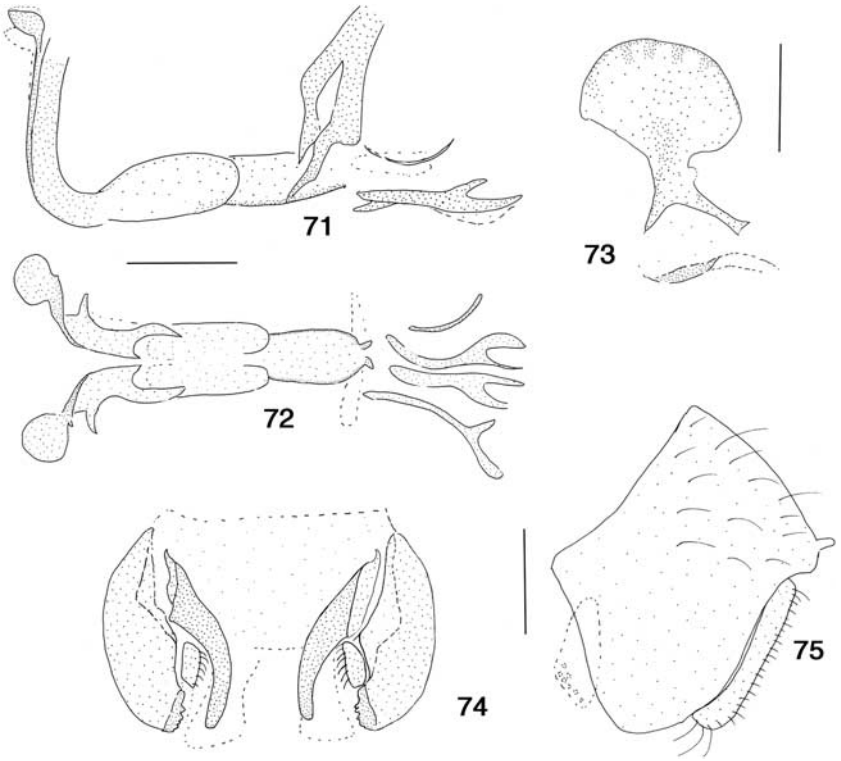
Figs. 71–75. *Cerodontha* (*Icteromyza*) *montanoides* Spencer: 71, phallus lateral; 72, phallus anteroventral; 73, ejaculatory apodeme; 74, epandrium, surstyli, and subepandrial sclerites, ventral view; 75, epandrium, surstylus, and cercus, lateral view. Scale bar = 0.1 mm.



Specimens examined: UNITED STATES: California: Alamos Creek, S.L. Obispo Co., 22.vi.1948, W.W. Wirth (1 ♂: NMNH); Deep Creek, 25.i.1953, A.L. Melander (1 ♀: NMNH); Palm Springs, 11.iv.1955, W.R.M. Mason (9 ♂; 8 ♀: CNC); Palm Canyon, Palm Springs, 15.iii.1955, W.R. Richards (2 ♂ [including one paratype of *C.* (*I.*) *churchillensis*]; 1 ♀: CNC); Palm Canyon, Palm Springs, 16.iii.1955 (2 ♂; 1 ♀: CNC); 1000 Palms Oasis, Thousand Palms, 26.vii.1955, W.R.M. Mason (1 ♂: CNC); Riverside, 24.ii.1935, A.L. Melander (1 ♂; 1 ♀: NMNH).

Diagnosis. The yellow palpus and frons, the bare eyes, the narrowly yellow femora, the postocellar bristles arising on a yellowish background, a male wing length of less than 2.8 mm, and the male genitalia differentiate this species from other Nearctic *Icteromyza*.

Description. Frons width 0.30–0.40 mm; ratio of frons width to eye width 1.4–1.6; orbit, each approximately 0.20–0.25 times the width of frons at level of lower ors; lunule moderately large, higher than a semicircle (Fig. 10); frontal triangle sometimes clearly reaching margin of lunule but in some specimens hardly differentiated from frons; length between ocellar tubercle and margin of lunule 0.17–0.20; base of antennae separated by narrow keel; clypeus medium thickness, with upper margin rounded; in profile, orbit slightly projecting anterodorsally; parafacial much reduced; cheek narrow; two inclinate ori, two reclinate ors; distance between upper ori and lower ors about 1.2–1.5 times the distance between both ori; gena deep: at midpoint 0.22–0.30 times the maximum eye height; gena slightly deepest at rear, up to 1.4 times deeper than at midpoint; eye bare or with short scattered hairs; long axis of eye slightly to strongly oblique. Wing length 2.3–2.8 mm in males, 2.75–3.2 mm in females; distance between r-m and dm-cu 1.4–1.8 times the length of vein dm-cu.

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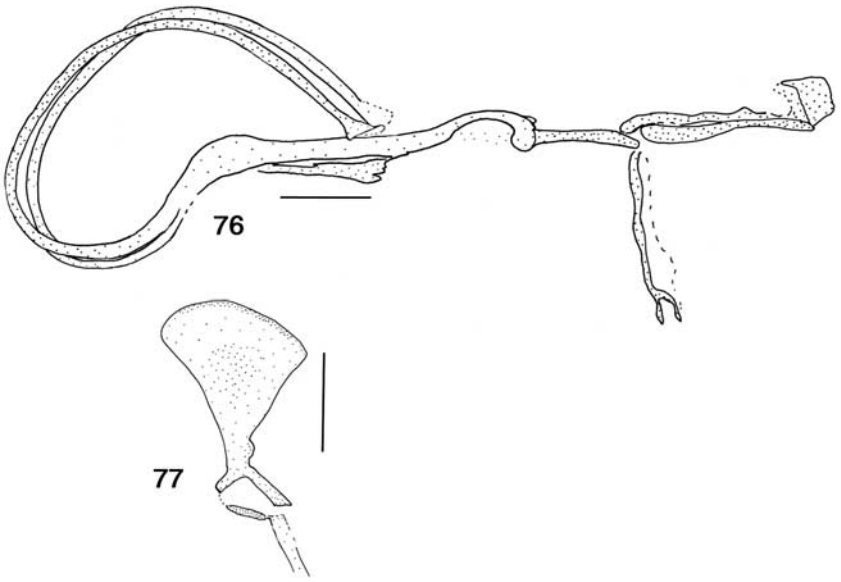
Figs. 76–77. *Cerodontha* (*Icteromyza*) *pilosa* Boucher: 76, phallus lateral; 77, ejaculatory apodeme. Scale bar = 0.1 mm.



Colour: Frons yellow, sometimes slightly brownish anteriorly; orbit, frontal triangle and lunule usually uniformly yellow (Fig. 10) (a few specimens with part of the orbit pale brown at the level of the posterior ors, or at most to the level of the anterior ors); postocellar bristles arising on dark yellow or orange background; face, palpus, and gena yellow (antennal foveae sometimes darker); antennae mostly brown, except scape yellow, and pedicel partly yellow medially especially apically (Fig. 10); clypeus brown, sometimes narrowly yellowish centrally. Thorax and abdomen greyish-brown; legs mostly brown (including fore coxa, which is at most only slightly yellowish apically), but femora yellow distally for about 0.2–0.3 times the length (measurement taken on fore femora), and mid-coxa partially yellow. Calypter yellowish, margin and fringe pale brown to dark brown.

Genitalia: Phallus not strongly curved in lateral view, almost in line with mesophallus (Fig. 78). Distal tubules approximately as long as mesophallus. In ventral view, distal tubules strongly diverging on distal half (Fig. 79). Ejaculatory apodeme with narrow blade (82). Anal projection conspicuously prominent and covered with short pilosity (Fig. 81). Cerci in lateral view extend past the distal margin of the epandrium (Fig. 81). Hypandrium moderately large (Fig. 82).

Geographic distribution: Western United States (California).

Host plant: Unknown.

Comments: This species is very similar externally to the newly described species *C.* (*I.*) *woodi* and to the palaearctic species *C.* (*I.*) *geniculata* but differs mainly in the shape of the phallus.

Cerodontha (*Icteromyza*) *vockerothi* Boucher, sp. nov.

(Figs. 11, 19, 23, 83–86)

Type material. Holotype: ♂. **UNITED STATES. Virginia:** Arlington, vi.1938, J.R. Malloch (NMNH). **Paratype: CANADA. Ontario:** Mer Bleue, 19.vii.1963, J.R. Vockeroth (1 ♀: CNC).

Etymology: This species is named in honour of J.R. Vockeroth to acknowledge his great contribution in building up the Agromyzidae collection (and other Diptera) of the CNC, and also to thank him for sharing little bits of interesting Diptera stories during my visits to the collection.

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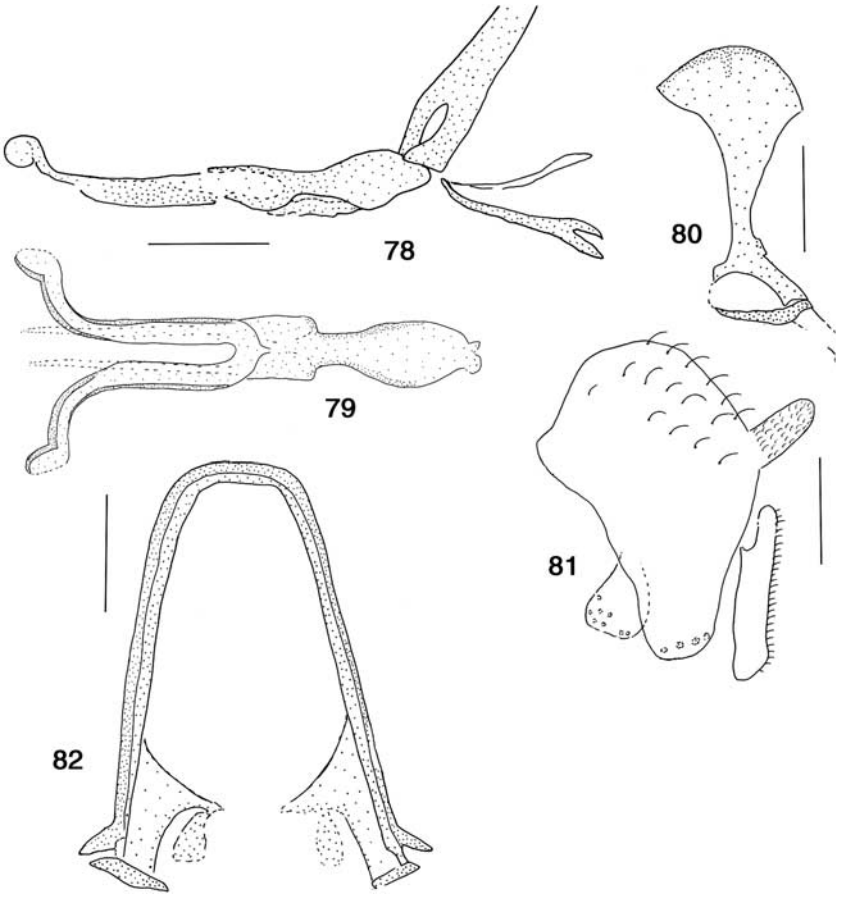
Figs. 78–82. *Cerodontha* (*Icteromyza*) *temeculensis* Spencer: 78, phallus lateral; 79, phalus ventral; 80, ejaculatory apodeme; 81, epandrium (with prominent anal projection), surstylus, and cercus, lateral; 82, hypandrium. Scale bar = 0.1 mm.



Diagnosis: The brown palpus, brown frons, bright yellow lunule, three ori, and the shape of the male genitalia differentiate this species from other Nearctic *Icteromyza*.

Description. Frons width 0.35–0.40 mm; ratio of frons width to eye width approximately 2.2; orbit, each approximately 0.18 times the width of frons at level of lower ors; lunule large, higher than a semicircle (Fig. 11); frontal triangle hardly differentiated from frons and apparently not reaching margin of lunule; length between ocellar tubercle and margin of lunule 0.15 mm; base of antennae separated by narrow and slightly elevated keel; clypeus moderately thick with upper margin rounded (Fig. 19); orbit moderately projecting anterodorsally (Fig. 23); parafacial reduced; cheek absent; three inclinate ori (one missing on one side in the holotype, but socket present) and two reclinate ors; gena at midpoint, 0.15–0.20 times the maximum eye height; gena only 1.2 times deeper at hind corner than at midpoint; eye bare. Wing length 2.2 mm in male, approximately 2.6 mm in female (wing bent); distance between r-m and dm-cu 1.2–1.5 times the length of vein dm-cu.

Colour: Frons completely brown (Fig. 11); orbit mostly brown but with darker blackish patch below ors and paler yellowish anterior to ori; frontal triangle brown, only slightly paler than frons; lunule, face, and gena yellow (antennal foveae darker); antennae brown except scape and pedicel sometimes partly yellowish anteriorly; palpus brown; clypeus completely brown (Fig. 19). Thorax and abdomen brown;

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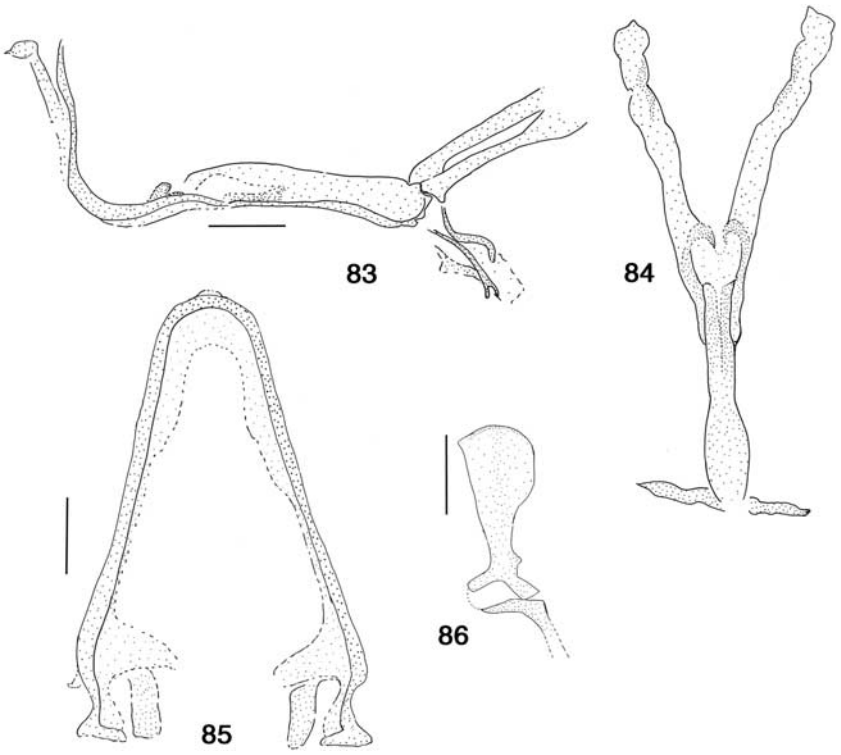
Figs. 83–86. *Cerodontha* (*Icteromyza*) *vockerothi* **sp. nov.**: 83, phallus lateral; 84, phallus ventral; 85, hypandrium; 86, ejaculatory apodeme. Scale bar = 0.1 mm.



legs brown, except all knees yellow: fore femora yellow for a distance of approximately 0.20–0.23 times the length of femora. Calypter, including margin and fringe, pale brown.

Genitalia. Distal tubules curving dorsally at an angle of approximately 90° to mesophallus (Fig. 83). Distal end of distiphallus with a small pointy projection (Fig. 83). Mesophallus long and narrow. Distal tubules diverging in ventral view (Fig. 84). Hypandrium narrow (Fig. 85), in lateral view with a small bulbous ventral projection. Anal projection small (about half the size of *C.* (*I.*) *montanoides*, Fig. 75). Cerci small, not reaching ventral margin of epandrium. Ejaculatory apodeme with narrow blade (Fig. 86).

Geographic distribution: Eastern Nearctic (Ontario, Virginia).

Host plant: Unknown.

Comments: Externally, this species is most similar to *C.* (*I.*) *montanoides*. The completely black clypeus and presence of three ori of this new species are useful characters to differentiate both species. Their geographical range is also different with the new species known from Virginia and Ontario, while *C.* (*I.*) *montanoides* is restricted to the western United States.

Cerodontha (*Icteromyza*) *woodi* Boucher, sp. nov.

(Figs. 12, 20, 24, 87–90)

Type material: Holotype: ♂. **UNITED STATES. California:** Muir Woods, 7.viii.1915, A.L. Melander (NMNH). **Paratypes: UNITED STATES. California:** Big Bear Lake, 24.v.1955, A.L. Melander (1 ♀: NMNH); Julian, 10.iv.1980, S.A. Marshall (1 ♀: DEBU). **Michigan:** Cheboygan Co., Marl Bay, 29.vii.1931, emerged 14.viii.1931, E. Kauffman (1 ♂: NMNH). **Washington:** Mt. Rainier, Berkeyley Park, 23.viii.1934, A.L. Melander (1 ♂: NMNH).

Etymology: The new species is named in honour of D. Monty Wood to underline his

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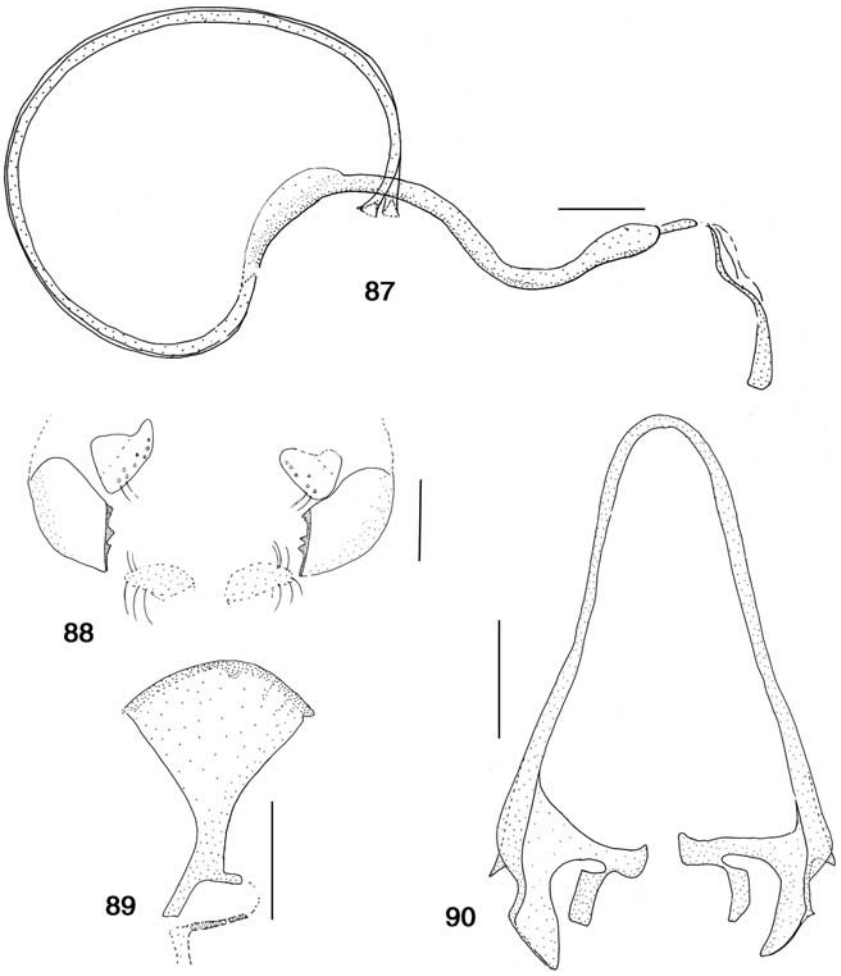
Figs. 87–90. *Cerodontha* (*Icteromyza*) *woodi* **sp. nov.**: 87, phallus lateral; 88, epandrium, surstyli (above), and cerci (below), ventral; 89, ejaculatory apodeme; 90, hypandrium. Scale bar = 0.1 mm.



contribution as editor of two large and important works on New World Diptera: the *Manual of Nearctic Diptera* and the *Manual of Central American Diptera*. The name of this new species also alludes to the type locality, Muir Woods.

Diagnosis: The yellow palpus and frons, slightly darkened orbit, bare eyes, narrowly yellow femora, a male wing length of over 2.8 mm and the male genitalia differentiate this species from other Nearctic *Icteromyza.*

Description. Externally very similar to *C.* (*I.*) *temeculensis*, except for the following differences: distance between ocellar tubercle and margin of lunule longer (0.25–0.27); distance between upper ori and lower ors about the same distance or a little shorter than the distance between both ori; in profile, orbit not projecting anterodorsally (orbital plate not visible in front of eye in profile) (Fig. 24), but narrow ring (cheek) present below eye (as in *temeculensis*); clypeus slightly thicker (shining in holotype, matte in paratypes) (Fig. 20); and slightly larger species (wing length of 2.8–3.4 mm in males, 3.2 mm in females).

Colour: As *C.* (*I.*) *temeculensis*, except lower frons and lunule sometimes brownish; if frons yellow, lunule with upper margin narrowly black; orbit always at least slightly darkened (Fig. 12), usually posteriorly at level of ors, but in one female specimen almost completely brown; postocellar bristles arising on black background; antennal foveae sometimes more extensively

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brown; clypeus completely dark brown (Fig. 20); femora narrowly yellow: only 0.15 times the length of femora (measurement taken on fore femora). Mid-coxa completely brown.

Genitalia: Overall shape of phallus very similar to that of *C.* (*I.*) *fuscifrons*, with distal tubules forming a big loop and with a distinct smooth curvature near the base of mesophallus (Fig. 87), however, distiphallus and mesophallus longer than in *C.* (*I.*) *fuscifrons*: mesophallus measuring 0.5 mm (in its original bent position). Ejaculatory apodeme with blade slightly expanded (Fig. 89). Hypandrium narrow (Fig. 90). Inner margin of epandrium with three to four spines (Fig. 88). Anal projection, prominent. Cerci extending slightly beyond ventral margin of epandrium in lateral view.

Geographic distribution: United States (California, Michigan, Washington).

Host plant: Unknown.

Comments: This species is externally very similar to *C.* (*I.*) *temeculensis* but the genitalia are distinct, resembling more closely the genitalia of *C.* (*I.*) *fuscifrons*. This similarity is shown by the long recurved distiphallus and the distinct shape of the mesophallus, with a curve at the centre. This is also characteristic of a few Oriental species such as *C.* (*I.*) *duplicata*. Although one specimen was apparently reared (Michigan, emerged 14.viii.1931), no host plant was recorded on the label.

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Appendix 1

Specimens examined of *Cerodontha* (*Icteromyza*) *capitata*.

CANADA. Alberta: Banff, 1.vi.1922, C.B.D. Garrett (2 ♂: CNC); same except 25.viii.1924, E. Hearle (1 ♂: CNC); same except 4.vii.1925, O. Bryant (1 ♂: NMNH); Banff Nat. Park, 11.viii.1955, G.E. Shewell (4 ♂: CNC); same except 13.vii.1955, R. Coyles (2 ♂; 1 ♀: CNC); 13 mi N. of Banff, Banff-Jasper Hwy, 4500′, 26.vii.1955, R. Coyles (2 ♂; 3 ♀: CNC); same except 25.vii.1955 (1 ♀: CNC); 14 mi West of Banff, 5.viii.1955, J.R.W. McGillis (1 ♂: CNC); same except 11.viii.1955 (2 ♂: CNC); M. 14 Banff, 2.viii.1955, R. Coyles (1 ♀: CNC); Eisenhr Lookoot, 4600′ Banff, 7.vii.1962, K.C. Hermann (1 ♂: CNC); Johnston Canyon, 4700′ Banff, 6.viii.1962, K.C. Hermann (1 ♀: CNC); Cadomin base Prospect Mt. 18.vii.1987, S.A. Marshall (1 ♂; 1 ♀: DEBU); Carmangay, Little Bow R. 27.vi.1968, W.W.Wirth (1 ♀: NMNH); Dunvegan, n. shore of Peace River, sweep grasses at edge of agricultural field, 13.vii.1997, T.A. Wheeler (6 ♂; 8 ♀: LEM); Edmonton, Lot 301, 1932 (1 ♀: NMNH); Kananaskis, 26.vi.1928, O. Bryant (3 ♂; 3 ♀: NMNH); Kananaskis, Sheep River Wildlife Sanctuary, 3 km W Sandy McNabb camp (50°39.1′N, 114°33.8′W), sweep grass at road side, 28.vii.2003, S. Boucher (1 ♀: LEM); LK Louise, 29.vii.1935, A.L. Melander (3 ♂; 1 ♀); Laggan, 16.vii.1928, O. Bryant (1 ♂: NMNH); Lethbridge, 7.viii.1956, O. Peck (1 ♂: CNC); McMurray, 6.viii.1953, G.E. Ball (1 ♂: CNC); same except 14.vii.1953 (2 ♀: CNC); Nordegg, 5.vii.1921, J. McDunnough (1 ♂: CNC); Okotoks, Sheep River, 27.vi.1968, W.W. Wirth (1 ♀: NMNH); Onefour, 930 m, 49°2′14″N, 110°28′15″W, creek bed, sweep, 29.vi.2001, S.A. Marshall, debu00170175 (1 ♂: DEBU); Scandia, 26.vi.1956, E.E. Sterns (1 ♀: CNC); Scandia, 9.vii.1956, O. Peck (5 ♂;4 ♀: CNC); Waterton Lakes Nat. Pk., 7–12.vii.1980, H.J. Teskey (3 ♀: CNC); 5 mi E. Writing-on-Stone Prov. Pk., Milk River Valley, 1.viii.1980, G. Gibson, sweeping (1 ♂: DEBU). **British Columbia:** Cathedral Mt., Cathedral Glacier, 25.vii.1955, R. Coyles (1 ♀: CNC); Keremeos, 21.vi.1923, C.B. Garrett (1 ♀: CNC); Minnie Lake, 27.vii.1925, H.G. Crawford, (1 ♀: CNC); Okanagan falls, 2000′, 16.vi.1953, J.R. McGillis (1 ♂; 2 ♀: CNC); Summerland, 10.vi.1959, L.A. Kelton (1 ♀: CNC). **Manitoba:** Churchill, 6.viii.1952, J.G. Chillcott, (1 ♂: CNC); same except 11.viii.1944, L.A. Miller (3 ♀: CNC);

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Deer R., Hudson Bay rail wy, 473 mi, 3.viii.1952, J.G. Chillcott (1 ♂; 1 ♀: CNC); 9 mi N. Forrest, 19.vii.1958, J.G. Chillcott, (1 ♀: CNC); Fort Churchill, 21.vii.1952, J.G. Chillcott (2 ♂; 2 ♀: CNC); same except 27.viii.1950, J.G. Chillcott (1 ♀: CNC); 5 km N. Gardenton, Tallgrass Prairie Preserve (49°10.71′N, 96°40.76′W), sweep, 12.vi.1999, J. Perusse (2 ♂: LEM); same except 17.vi.1999 (1 ♂; 1 ♀: LEM); same except 20.vi.1999 (2 ♂; 2 ♀: LEM); same except 17.vi.1999, V. Crecco (1 ♂: LEM); same except 20.vi.1999 (2 ♂; 3 ♀: LEM); same except 6.vii.2000 (5 ♂: LEM); same except 17.vi.1999, T.A. Wheeler (1 ♂: LEM); same except 20.vi.1999 (2 ♂: LEM); same except 13.vii.2000 (1 ♂: LEM); same except 17.vi.1999, S. Boucher (1 ♂; 3 ♀: LEM); 5 mi N. Minnedosa, 8.vii.1958, R.L. Hurley (2 ♂; 2 ♀: CNC); Ninette, 14.vi.1958, R.L. Hurley, J.F. McAlpine (1 ♂; 1 ♀: CNC); same except 15.vii.1958, R.L. Hurley (1 ♂: CNC); 1 km E Stuartburn (49°08′N, 96°44.7′W), sweep vegetation along roadside 12.vi.1999, T.A. Wheeler (2 ♂: LEM); same except S. Boucher (1 ♀: LEM); Winnipeg, St. Charles Rifle Range. **Newfoundland:** Agric. Exp. Sta. St. John's, 26.vii.1967, J.F. McAlpine (2 ♂: CNC); Black Head, 21.vii.1967, J.F. McAlpine (1 ♀: CNC); Labrador, Cartwright, 17.vii.1955, E.E. Sterns (1 ♂: CNC); same except 23.vii.1955, E.F. Cashman (1 ♀: CNC); St. Georgels, 30.vii.1961, C.P. Alexander (1 ♀: NMNH). **Nova Scotia:** Cranberry I. Lockeport, 9.viii.1958. J.R. Vockeroth (1 ♀: CNC); Lockeport, 18.viii.1958, J.R. Vockeroth (10 ♂; 10 ♀: CNC); East end Sable Is., 9.vii.1967, D.M. Wood (1 ♂: CNC). **New Brunswick:** Kouchibouguac Nat. Park, 7.vii.1977, J.F. McAlpine (2 ♀: CNC); Shippigan, 14.vii.1931 (1 ♂; 1 ♀: NMNH). **Ontario:** Bruce Co., Inverhuron Provincial Park, sweep rocky stream bank and vegetation, 5.vii.2001, M. Pollet (1 ♀: LEM); Bruce Peninsula National Park, Dorcas Bay, Singing Sands (45°11′N, 81°35′W), sweep beach vegetation, 2.vii.2001, S.E. Brooks (1 ♂; 1 ♀: LEM); same except sweep shore, M. Pollet (1 ♀: LEM); Grand Bend, 4.vii.1939, G.E. Shewell (1 ♀: CNC); Manitoulin I. Sand Bay, 45°48′6″N, 82°47′36″W, beach, sweeps in *Juncus*, 25.vi.2003, M. Buck (18 ♂; 22 ♀: DEBU); Midland, 30.vii.1956, J.G. Chillcott (2 ♂; 1 ♀: CNC); Sandbanks Pk. Near Picton, 7.vii.1970, J.F. McAlpine (3 ♀: CNC). **Prince Edward Island:** Brackley Beach, Can. Nat. Park, 16.vii.1940, G.S. Walley (1 ♀: CNC); Dalvay house, Can. Nat. Park, 22.vii.1940, J. McDunough (1 ♀: CNC); Eglington Bay, sweep vegetation, 20.vii.1996, N. de Ville (3 ♂; 4 ♀: LEM). **Québec:** Gaspésie, near Percé (48°37′N, 64°11′W), sweep, 1.viii.2001, V. Dion & S. Boucher (2 ♂; 2 ♀: LEM); Gaspé, Haldiman St. Jean R. (48°47′N, 64°22′W), sweep salt marsh vegetation, 31.vii.2000, H. Varady-Szabo (1 ♂: LEM); Iles-de-la-Madeleine, Cap-aux-Meules, Chemin du rivage (47°21.54′N, 61°57.19′W), sweep grass near marsh, 6.viii.2004, S.Boucher (7 ♂; 10 ♀: LEM), same except V. Dion (1 ♂; 2 ♀: LEM); Lauzon, 29.vi.1919, J. Ouellet (1 ♀: CNC); Natashquan, 23.vii.1930, W.J. Brown (1 ♂; 1 ♀: CNC); same except 1.viii.1929 (1 ♀: CNC), same except 8.viii.1929 (1 ♀: CNC). **Saskatchewan:** 1.vii.1926, Eric Hearle (1 ♂: CNC); Cowan Dam Provincial Recreation Site (54°11′48″N, 107°27′′W), sweep vegetation near road, 22,vii.2003, T.A. Wheeler (1 ♂: LEM); Lisieux, (49°16′, 105°59′), 21.vi.1955, J.R. Vockeroth (1 ♀: CNC); Saskatoon, S. Sask. R. Valley, off Central Ave., 18.vii.1999, K.N. Barber, sweeps, river-side graminoids 52°10.9′N, 106°36.0′W (3 ♂; 2 ♀: DEBU). **Yukon Territory:** Klondike hwy, Emerald Lake (60°15.8′N, 134°45.1′W) sweep veg. at south end of lake, 20.vii.1998, T.A. Wheeler (1 ♀: LEM); Alaska Hwy at Marshall Creek (60°50.1′N, 137°19.9′W), sweep grass/veg. at turnout, 18.vii.1998, T.A. Wheeler (1 ♀: LEM).

UNITED STATES. Alaska: Unalakleet, 18.vii.1961, B.S. Heming (5 ♂; 3 ♀: CNC); same except 14.vii.1961 (1 ♀: CNC); same except 5.viii.1961 (3 ♂; 5 ♀: CNC); same except 11. viii.1961 (1 ♀: CNC); same except 12.viii.1961 (1 ♂; 3 ♀: CNC); 240 mi, Richardson Hwy, 21.vii.1951, W.R.M. Mason (9 ♂; 8 ♀: CNC). **Arizona:** Alpine, 23.vi.1947, J.L. Sperry (1 ♂: NMNH); South Fork Camp, White Mts., same except 19.vi.1947 (2 ♂: NMNH); **California:** 1000 Springs, 15.viii.1953, A.L. Melander (2 ♂; 2 ♀: NMNH); same except 31.viii.1935, A.L. Melander (2 ♂: NMNH); Barton Flats, 3.viii.1942, A.L. Melander (4 ♂; 3 ♀: NMNH); same except SF Meadows, 8.ix.1944 (1 ♂: NMNH); Barton

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Store, 20.vi.1945, A.L. Melander (2 ♂; 9 ♀: NMNH); same except 4.vii.1946, A.L. Melander (2 ♂; 7 ♀: NMNH); Bridgeport, 7000′, 18.vi.1954, A.H. Sturtevant (3 ♀: NMNH); Cottonwood Cr. 9300′, Mono Co., 10.vii.1961, D.R. Miller (1 ♂: NMNH); Crest Line, 4.vii.1942, A.L. Melander (1 ♀: NMNH); same except 13.vii.1944 (1 ♀: NMNH); Fales Hot Springs, Mono Co., 7.vi.1948 (2 ♂; 1 ♀: NMNH); Fallen Leaf, Eldorado Co., 13.vii.1961, 6500′, J.G. Chillcott (1 ♂; 1 ♀: CNC); Helendale, 18.v.1955, W.R. Richards (1 ♂; 5 ♀: CNC); same except W.R.M. Mason (6 ♂; 2 ♀: CNC); Host Lake, 24.viii1957, A.L. Melander (1 ♀: NMNH); same except 24.viii. 1959 (2 ♀: NMNH); Idylwild, 7.vii.1940, A.L. Melander (1 ♂: NMNH); Jenks Lake, 3.viii.1942, A.L. Melander (1 ♀: NMNH); Keen Camp, 7.vi.1942, A.L. Melander (3 ♂; 2 ♀: NMNH); Lake Henshaw, 7.v.1945, A.L. Melander (3 ♀: NMNH); Live Oak Park, 6.vi.1945, A.L. Melander (5 ♂; 3 ♀: NMNH); Marin Co., Point Reyes, 10.iv.1980, S.A. Marshall (1 ♂: DEBU); Mojave desert, Love Joy Spring, 10.v.1944, A.L. Melander (1 ♂: NMNH); Mountain Home, 4.viii.1955, A.L. Melander (1 ♀: NMNH); North Lk., nr. Camp Sabrina, Inyo Co., 30.vi.1961, G.I. Stage (1 ♀: NMNH); Oak Grove, 9.v.1948, A.L. Melander (1 ♀; 1 ♂: NMNH); Pacific Grove, 13–30.vi.1920 (1 ♀: NMNH); Pine Lake So Johnson (1 ♂: NMNH); Prosser Creek, near Hobart Mills, 6300′, 13.vii.1961, J.G. Chillcott (1 ♂; 2 ♀: CNC); Sagehen Cr., near Hobart Mills, 13.vii.1961, 6500′ J.G. Chillcott (4 ♂; 4 ♀: CNC); same except B.H. Poole (1 ♀: CNC); same except 14.vii.1962, C.G. Moore (1 ♂: NMNH); same except 15.vii.1964, W.G. Litis (1 ♂: NMNH); same except R.M. Bohart (1 ♂: NMNH); Sagehen Creek Field Stn. 15 km N Truckee (39°25.89′N, 120°14.61′W), 2137 m, sweep sedge meadow, 16.viii.1999, S.E. Brooks (2 ♂; 4 ♀: CNC); same except J. Savage (2 ♂; 2 ♀: LEM); same except sweep forest edge & fen, 16.viii.1999, J. Savage (2 ♂; 1 ♀: LEM); same except sweep marsh, 17.viii.1999 (1 ♀: LEM); San Francisco, 12.v.1915, M.C. Van Duzee (2 ♂: NMNH); Sierraville, Sierra Co., 28.vi.1966, R.L. Brumiey (1 ♂: NMNH); South Fork Santa Ana River, 18.vi.1945, A.L. Melander (1 ♂; 3 ♀: NMNH); same except 31.vii.1942 (2 ♀: NMNH); same except 4.viii.1945, (2 ♂: NMNH); Up Santa Ana River, 28.v.1948, J.L. Sperry (4 ♀: NMNH); same except 9.vi.1955, A.L. Melander (3 ♂: NMNH); same except 14.vi.1948 (1 ♂: NMNH); same except 18.vi.1950 (1 ♀: NMNH); same except 2.vii.1948 (1 ♂: NMNH); same except 2.vii.1950 (1 ♀: NMNH); same except 5.vii.1954 (2 ♀: NMNH); same except 6.vii.1949 (1 ♀: NMNH); same except 6.vii.1958 (1 ♂: NMNH); same except 19.vii.1953 (2 ♂; 1 ♀: NMNH); same except 17.vii.1955 (1 ♂; 1 ♀: NMNH); same except 20.vii.1958 (1 ♂: NMNH); same except 26.vii.1952 (1 ♂: NMNH); same except 1.viii.1953 (2 ♀: NMNH); same except 1.viii.1963 (1 ♂: NMNH); same except 8.viii.1958 (1 ♂: NMNH); Up Santa Ana River, Cienaga, 28.v.1948, J.L. Sperry, (1 ♂: NMNH); same except 31.v.1948 (3 ♀: NMNH); same except 14.vii.1948 (2 ♂: NMNH); Seven Oaks, 27.iv.1955 (1 ♂: NMNH); Sugar Loaf Mt., Cienaga, 11.v.1947, J.L. Sperry (1 ♂: NMNH); Sugar loaf Mt., 11.v.1947, J.L. Sperry (2 ♂; 2 ♀: NMNH); same except 30.v.1947 (1 ♂; 6 ♀: NMNH); same except 6.vii.1954, A.L. Melander (3 ♂; 3 ♀: NMNH); same except 15.vii.1946 (2 ♂; 10 ♀: NMNH); same except J.L. Sperry (4 ♀: NMNH); 13 km N Truckee, Hwy 89 at Sagehen Creek (39°26.07′N, 120°12.22′W), 1769 m, sweep vegetation 15.viii.1999, J. Savage (1 ♂: LEM); 15 km N Truckee, Nevada Co., Sagehen Creek Field Station (39°25.8′N, 120°14.6′W), sweep marsh behind lab, 17.viii.1999, S.E. Brooks (2 ♂; 2 ♀: LEM); Truckee, 6000′ Tahoe Co., 14.vii.1961, B.H. Poole (1 ♀: CNC); Truckee, Nevada Co., 25.vi.1943, P.H. Arnaud (1 ♀: NMNH); Tuolumne Meadows, Soda Springs, 8.viii.1916, 8600′, G.R. Pilate (2 ♂; 1 ♀: NMNH); Yuba Pass, Sierra C., 5.vii.1966, R.L. Brumley (2 ♂: NMNH). **Colorado:** Boulder, 4.5 mi N, 5500′, 13.vi.1961, C.H. Mann (2 ♀: CNC); same except 20.vi.1961 (1 ♂: CNC); Boulder, 5 mi S., 5800′, 16.vi.1961, C.H. Mann (1 ♀: CNC); Buena Vista, 7800′, 22–23.vi.1961, C.H. Mann (2 ♂; 1 ♀: CNC); Cameron Pass, 19–22.viii.1940, Sabrosky (1 ♀: NMNH); Doolittle Ranch, 9800′ Mt. Evan, 8.vii.1961, C.H. Mann (1 ♀: CNC); same except 23.vii.1961 (3 ♂; 2 ♀: CNC); same except 27.vii.1961, J.G. Chillcott (3 ♂: CNC); Echo Lake, 10,600′ Mt. Evans, 11.viii.1961, C.H. Mann (1 ♂: CNC); Estes Park, 7500′,

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2.vii.1961, C.H. Mann (23 ♂; 23 ♀: CNC); same except S.M. Clark (1 ♂: CNC); same except B.H. Poole (2 ♀: CNC); Florissant 21.vi.1907, S.A. Rohwer (2 ♂; 3 ♀: NMNH); Hartsel, 20.vi.1940, A.L. Melander (7 ♂; 4 ♀: NMNH); Idaho springs, 6 mi S.W., 27.vii.1961, J.G. Chillcott (2 ♂: CNC); Jefferson, 9400′, 14.vii.1961, S.M. Clark (2 ♀: CNC); Monarch Pass, 21.vi.1940, A.L. Melander, 8000′ (1 ♂: NMNH); Nederland, 8300′, 5.vii.1961, J.G. Chillcott (1 ♂; 1 ♀: CNC); Loveland Pass, W. slope 9850′, 28.vii.1961, 28.vii.1961, J.G. Chillcott (1 ♀: CNC); Nederland, 5 mi E. 7500′, 2.vii.1961, J.G. Chillcott (2 ♂; 3 ♀: CNC); Rio Grande Co., 8000′, South Fork, 20.vi.1972, W.W. Wirth, Malaise trap (1 ♀: NMNH); Rocky Mountain National Park, viii.1955, H.D. Stalker (1 ♀: NMNH); State Bridge, 7000′, nr. Bond, 24–25.vi.1961, C.H. Mann (1 ♂; 3 ♀: CNC); Tenn. Pass., 17.vii.1930 (1 ♀: NMNH); Tenn. Pass, 24.vii.1917, JM. Aldrich (2 ♂; 3 ♀: NMNH); same except 23.vii.1917 (1 ♂; 1 ♀: NMNH); same except 25.vii.1917 (1 ♀: NMNH); Tennessee Pass, 10,240 ft, 8.vii (3 ♂: NMNH); Ute Creek, Sage Flats, 7.viii., R.W. Dawson (1 ♀: NMNH); Vallejos cr., Costilla Co., B. Rotger C.R., 27.vi.1944 (1 ♂: NMNH). **Idaho:** Bear Lake, 18.vi.1962 (1 ♂: NMNH); 3 mi NE, Carey, Blaine Co., 6.vii.1965 (1 ♂: NMNH); Galena, Blaine Co., 7600′, 15.vii.1961, B.H. Poole (1 ♀: CNC); Gannett, 4 mi E, Blaine Co., 16.viii.1965 (1 ♀: NMNH); Moscow, 14.vi.1895 (1 ♂: NMNH); Moscow (1 ♂: 6 ♀: NMNH); Priest Lk, 22.viii.1919, A.L. Melander (1 ♂: NMNH). **Maine:** Hancock, Schoodic Peninsula (44°20.6′N, 68°03.6′W), lot 94, 16.viii, 2006, D. & W.N. Mathis (3 ♂; 2 ♀: LEM); SW Harbor, 15.vii.1918 (1 ♂; 1♀: NMNH. **Michigan:** Beulah, 9.vii.1936 (1 ♀: NMNH); 14.vi.1941, C.W. Sabrosky (1 ♂: NMNH); Mackinaw city, 21.vii.1940 (1 ♀: NMNH); Mackinac Co., 18.vi.1955, R.R. Dreisbach (1 ♂: NMNH); same except 5.vii.1947, (1 ♂: NMNH); Manistee, 20.vi.1940 (1 ♀: NMNH); Silver L. 19.vi.1940, Oceana Co. (6 ♂; 5 ♀: NMNH); Traverse City, 17.vi.1943 (2 ♀: NMNH); **Montana:** 2 mi E. Babb, 19.vii.1967 (1 ♂: NMNH); 1 mi W. Big Fork, 8.viii.1967 (2 ♂: 1 ♀: NMNH); 5 mi W. Browning, 19.vii.1967 (1 ♀: NMNH); Jefferson Isl, 29.vi.1923, A.L. Melander (1 ♀: NMNH); Georgestown Lake, 31.vii.1923, A.L. Melander (6 ♀: NMNH); Missoula, 6.vii.1917 (1 ♀: NMNH). **Nevada:** Wells, 30.vii.1927 (2 ♂; 1 ♀: NMNH). **New Mexico:** Montezuma Hot Spring, Las Vegas, 24.v.1969, W.W. Wirth (2 ♂: NMNH). **North Dakota:** Bismarck, 14.vi.1918 (1 ♀: NMNH). **Oregon:** Deschutes Co., Paulina Lake, 10.vii.1972, G. Steyskal (2 ♂: NMNH); Harney Co., 29.vi.1953, AB. Gurney (1 ♂: NMNH); Klamath Co., 19 mi SE Lapine, 3.vii.1971, G. Steyskal (1 ♂: NMNH). **Utah:** Allen Canyon, 16.vii.1955, S.L. Wood (1 ♂: CNC); Big brush Cr., 22 mi N. of Vernal, 8000′, 8.vii.1961, J.G. Chilcott (1 ♀: CNC); Cedar Brakes, 22.vii.1956, A.L. Melander (1 ♂: NMNH); Daniels Pass, 2 mi S. Wasatch Co., 8500′, 9.vii.1961, J.G. Chillcott (1 ♀: CNC); Grizzly Ridge Camp, 30 mi N. Vernal, 8400′, 8.vii.1961, J.G. Chillcott (2 ♀; 1 ♂: CNC); Laketown, Rich Co., 6000′, 16.vii.1955, S.L. Wood (2 ♀: CNC); Strawberry Valley, Wasatch Co., 7800′, 9.vii.1961, J.G. Chillcott (1 ♀: CNC). **Washington:** Whitman Co., Almota, 14.vi.1980, G.C. Steyskal (1 ♂: NMNH); Longmire, 27.vi.1935, A.L. Melander (1 ♂: NMNH); Mt. Constitution, 17.vii.1909 (1 ♂: NMNH); 22.vii.1909 (1 ♂: NMNH); Mt. Constitution, Orcas Id., 7.vii.1905 (2 ♂: 1 ♀: NMNH); Mt. Rainier Longmire, 20.vii.1922, A.L. Melander (1 ♀: NMNH); 30.vii.1922 (4 ♂, 3 ♀: NMNH); same except 14.viii.1917 (3 ♀: NMNH); Pullman, 6.vi.1918, A.L. Melander (2 ♂; 2 ♀: NMNH); same except 4.vi.1922 (2 ♀: NMNH); same except 15.vi.1918 (3 ♂; 2 ♀: NMNH); Pullman, Saints Rest, 3.vi.1922, A.L. Melander (9 ♂; 1 ♀: NMNH); Uniontown, 26.vi.1932 (3 ♀: NMNH). **Wyoming:** 50 mi N. Pinedale, 25.viii.1967 (2 ♂; 1 ♀: NMNH); Union Pass Road, Fremont Co., 17.vii.1961, J.G. Chillcott (7 ♂; 2 ♀: CNC); Yellowstone Park, Canyon Village, 21.vii.1971, G.C. Steyskal (1 ♂; NMNH); Yellostone Park, Old Faithful, 14.vii.1925, A.L. Melander (1 ♂; 1 ♀: NMNH); same except Mid Geys Basin, 12.vii.1923 (1 ♀: NMNH); same except U. Geyser Basin, 7.viii.1918 (1 ♀: NMNH); same except Biscuit Basin, 2. viii.1934, A.L. Melander (1 ♂: NMNH); same except Firehole R., 5.viii.1918, A.L. Melander (1 ♀: NMNH); same except Apollinaris, 8.vii.1923 (1 ♂: NMNH).

EUROPE: Belgium: Limburg: Zorhoven De Teut N.R. sweep edge of fen/woodland path,

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09.vi.2003, M. Pollet (4 ♂; 3 ♀: LEM); same except, sweep, 07–09.vi.2003 (3 ♂; 4 ♀: LEM). **England:** Lyme Regis, Dorset, 18.vi.1958 (1 ♀: CNC); Haytor, Dartmoor, Devon 1300′, 22.vi.1960, J.R. Vockeroth (4 ♂; 4 ♀: CNC); Torquay, Devon, 29.vi.1960, J.R. Vockeroth (2 ♂; 2 ♀: CNC).

Appendix 2

Specimens examined of *Cerodontha* (*Icteromyza*) *longipennis* (see label data for *C.* (*I.*) *longipennis* Variation 1 and 2, below).

CANADA. Alberta: 10 km NW Whitecourt, Hwy 32 at Sakwatamau River (54°10′N, 115°42′W), sweep vegetation at river edge, 15.vii.1997, T.A. Wheeler (1 ♂: LEM); Lethbridge, 5.vi.1929, J.H. Pepper (1 ♂: CNC); McMurray, 6.viii.1963, G.E. Ball (1 ♀: CNC). **British Columbia:** 7 mi N. Lions Bay, North of Vancouver, 18.v.1979, G.F. Hevel (1 ♂: NMNH); 10 mi N. of Terrace, 16.vii.1960. B. Heming (1 ♀: CNC). **Manitoba:** Aweme, 24.viii.1916, N. Criddle (1 ♂: CNC); same except 27.viii.1917 (2 ♂; 1 ♀: CNC); same except 28.viii.1917 (1 ♀: CNC); same except 4.ix.1916 (2 ♂: NMNH); same except 29.vii.1916 (1 ♂: NMNH); same except 9.x.1915 (1 ♂: NMNH); same except 4.ix.1922, H.A. Robertson (1 ♂: CNC); Near LaSalle, La Barriere Park, (49°43.2′N, 97°10.7′W), sweep in oak savanna near river, 15.vi.1999, T.A. Wheeler (9 ♂; 9 ♀: LEM); same except S. Boucher (1 ♂; 1 ♀: LEM); same except 13.viii.1999, T.A. Wheeler (6 ♂; 2 ♀: LEM); Near LaSalle, La Barriere Park, (49°43.2′N, 97°10.7′W), sweep along river, 15.vi.1999, T.A. Wheeler (7 ♂; 3 ♀: LEM); same except S. Boucher (4 ♀: LEM); Treesbank, 18.x.1927, N. Criddle (1 ♀: CNC); Winnipeg, Beaudry Prov. Pk. (49°51.5′N, 97°28.6′W), swp along Assiniboine River, 18.vi.1999, T.A. Wheeler (1 ♂; 2 ♀: LEM); same except 08.vii.1992 (1 ♂: LEM); 20 km E Anola, Brokenhead R. (49°53.1′N, 96°22′W), sweep along river edge, 10.vi.1999, T.A. Wheeler (1 ♀: LEM); 4 km E. Ste. Rita, Hwy 15 at Brokenhead R., sweeping sedge and grass along shore, 9.vii.1992, T.A. Wheeler (1 ♂: LEM); Spruce Woods Prov. Pk., Marsh Lake, sweeping path in deciduous forest, 08.vii.1992, T.A. Wheeler (5 ♂: LEM). **Northwest Territories:** Yellowknife, Kam Lake, 20.vi.1966, G.E. Shewell (1 ♂: CNC). **Nova Scotia:** Crescent Beach (44°13.8′N, 64°23.2′W), sweep undergrowth in open spruce forest, 24.vii.2002, J. Forrest & T. Wheeler (1 ♀: LEM). **Ontario:** 1 ♀: CNC); 1.2 km W Camperdown nr. Reasemarsh, swp beach & shoreline marsh, 01.vii.2001, S.E. Brooks & C. Chenard (2 ♂; 2 ♀: LEM); 1 km S Ouimet Canyon, sweeping grass/sedge along river, 01.vii.1992, T.A. Wheeler (1 ♂: LEM); Bells Corners, 28.vi.1971, H.J. Teskey (1 ♂: CNC); Bruce Co., 5 km N. Dyer's Bay, waterfall at mouth of marble bedded lake, 2.vii.2001, M. Pollet (1 ♀: LEM); Grey Co., Eugenia Lake, sweep in marsh and forest, 30.vi.2001, M. Pollet (1 ♀: LEM); Eugenia, Eugenia Falls, sweep along river, 30.vi.2001, S.E. Brooks (3 ♂: 1 ♀: LEM); Grand bend, 15.vii.1939, G.E. Shewell (1 ♀: CNC); Harwood plains, Constance Bay Rd, 19.vii.1967, G.E. Shewell (2 ♀: CNC); Kent, 3.5 mi, 23.v.1967, K. Valley (4 ♂: NMNH); same except 4.5 mi E., 14.iv.1967 (1 ♂: NMNH); Kent, 1.0 mi W, T. Krystowski (1 ♂: NMNH); Lancaster, Cooper Marsh Cons. Area, swp vegetation, 16.vi.2001, S.E. Brooks (1 ♀: LEM); Lake Simcoe, Sibbald Point Prov. Pk., swp humid forest along stream, 29.vi.2001, S.E. Brooks (5 ♂: LEM); Marmora, 12.viii.1952, J.F. McAlpine (2 ♀: CNC); Mattawa, 16.vi.1987, J.R. Vockeroth (1 ♂: CNC); Metcalfe, 20.vii.1983, B.E. Cooper (1 ♂: CNC); Midland, 20.v.1959, J.G. Chillcott (1 ♂: CNC); same except 20.viii.1955 (1 ♀: CNC); Miners B., 26.v.1939, G.E. Shewell (1 ♂; 3 ♀: CNC); N of McCreary's Shore Mississippi Lake Nat. Wildlife Area, swp sedges, rocky stream, 28.vi.2001, S.E. Brooks (2 ♂: LEM), same except M. Pollet (2 ♂: LEM); Newtonville, 26.ix.1983, J.R. Vockeropth (1 ♀: CNC); Normandale, 2.vi.1956, 42°42′, 80°19′, J.R. Vockeroth (2 ♀: CNC); Ottawa, black rapids, 28.vi.1959, J.R. Vockeroth (1 ♀: CNC); Outlet Beach, Pr. Edward Co., 14.viii.1968, J.R. Vockeroth (1 ♂: CNC); Penetanguishene, Awenda Prov. Pk., sweep in kettle march, 3.vii.2001, M. Pollet (1 ♂: LEM); 10 km NW Penetanguishene, Awenda Prov. Pk. Second Lake, sweep sedge at shoreline, 13.vii.1992, T.A. Wheeler (4 ♂: LEM); Petawawa, 4.vii.1938, A.L. Melander (1 ♀: NMNH);

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Pt. Pelee Nat. Pk., dry malaise, ix.1983 (1 ♂); Point Pelee, 9.ix.1954, W.R. Mason (2 ♂; 3 ♀: CNC); Port Severn, 3 mi N, Black Spruce bog, 15.v.1959, J.G. Chillcott (2 ♂; 1 ♀: CNC); Rockport, 12.v.1959, J.R. Vockeroth (1 ♀: CNC); Rondeau Park, 7.ix.1954, W.R. Mason (3 ♂: CNC); Simcoe, 30.v.1939, G.E. Shewell (2 ♂: CNC); same except 29.v.1939 (1 ♂: CNC); same except 6.vi.1939 (1 ♀: CNC); same except 13.vi.1939 (1 ♂: CNC); same except 24.vi.1939 (1 ♀: CNC); St. Williams, 23.v.1956, 42°40′ 80°25′, J.R. Vockeroth (1 ♂: CNC); Sudbury, Twin Forks Park, sweep along Junction Creek, 06.vii.2001, S.E. Brooks (7 ♂; 7 ♀: LEM); Thornhill, 30.v.1964, J.R. Vockeroth (1 ♂: CNC); Victoria Co., Emily Prov. Park, Pigeon River, swp bank and stream bed, 28–29.vi.2001, M. Pollet (1 ♀: LEM); same except sweep in *Typha* marsh (1 ♀: LEM). **Québec:** Beechgrove, (45°39′N, 76°8′W), 5.vii.1984, J.R. Vockeroth (1 ♂; 1 ♀: CNC); Gaspé, Forillon N.P. (48°54′N, 64°21′W), Ruisseau Castor, sweep beaver dam, 06.viii.2000, H. Varady-Szabo (4 ♂; 9 ♀: LEM); Johnville Bog and Forest Park (45°20.7′N, 71°44.5′W), sweeping vegetation, 13.vii.2005, J. Kuchta (1 ♂: LEM); Lac St. François Nat. Wildl. Area, N-W of Aménag. Therrien, close ruisseau Th. (45°00.39′N, 74°30.99′W), *Carex* meadow, sweeping T1b, 24.ix.1999, F. Beaulieu (1 ♀: LEM); Mont St. Hilaire, ditch along ch. De la Montagne (45°32′N, 74°0′W), sweep on *Carex*, 24.vii.1998, F. Beaulieu (1 ♂: LEM); Mont St. Hilaire, Pain de Sucre trail, sweep at brook, 27.vi.2001, M. Pollet (1 ♀: LEM); Québec, 5.viii.1930, A.L. Melander (1 ♀: NMNH); Rigaud, Parc De-Lery-Macdonald (45°27′N, 74°09′W), sweep near stream, 03.vi.2000, S.E. Brooks (1 ♂; 1 ♀: LEM); same except 15.vi.2001 (1 ♂; 2 ♀: LEM); same except 26.vi.2001, J. Forrest (1 ♀: LEM); same except S.E. Brooks (3 ♂: LEM); same except 6.viii.2000, S.E. Brooks (3 ♂; 3 ♀: LEM); same except 01.vii.2002, S.E. Brooks & C. Chenard (7 ♂; 4 ♀: LEM); Ste-Anne-de-Bellevue, Stoneycroft pond (45°25.8′N, 73°56.4′W), sweep on *Scirpus*, 27.vii.1998, 4.viii.1998, F. Beaulieu (2 ♀: LEM); Wakefield, 9.vii.1946, G.E. Shewell (1 ♂: CNC). **Saskatchewan:** Hudson Bay, 15.ix.1959, J.R. Vockeroth (1 ♀: CNC); Waskesiu Lake, 13.vii.1939, A.R. Brooks; Yorkton, 15.ix.1959, J.R. Vockeroth (1 ♀: CNC). **UNITED STATES: Alaska:** Anchorage, 19.vi.1921, J.M. Aldrich (1 ♀: NMNH). **Arkansas:** 15 mi W Hot Springs, 14–19.v.1979, K.A. Spencer, G.C. Steyskal (3 ♂: NMNH). **California:** Clear Lake, 18.vi.1935, A.L. Melander (1 ♂: NMNH); Crestline, 19.vi.1944, A.L. Melander (1 ♀: NMNH); Donner Summit (39°20.55′N, 120°20.44′W), 2230 m, sweep, 16.viii.1999, S.E. Brooks (2 ♂: LEM); same except 18.viii.1999 (1 ♂: LEM); Grass Lake, 7000 ft, nr. Tahoe, 15.vii.1917, J.M. Aldrich (1 ♂: NMNH); Jenks Lk. 16.vii.1968, A.L. Melander (1 ♂: NMNH); Laguna Puerca, San Francisco, 6.ix.1963, P.H. Arnaud, Jr. (1 ♂: NMNH); Lake County, Lakeport, 15.viii.1953, P.H. Arnaud, Jr. (1 ♂: NMNH); Live Oak Park, 24.v.1944, A.L. Melander (4 ♂; 1 ♀: NMNH); same except 7.vi.1945 (2 ♂: NMNH); Morro Bay, 27.vii.1940, A.L. Melander (8 ♂: NMNH); Palm Springs, 19.xi.1945, A.L. Melander (1 ♂: NMNH); Oak Grove, 8.v.1945, A.L. Melander (1 ♂: NMNH); Redwood city, 3.xi.1957, P.H. Arnaud (3 ♂: NMNH); Rincon, 6.vi.1945, A.L. Melander (2 ♂: NMNH); Riverside, 10.iv.1944, A.L. Melander (1 ♀: NMNH); same except 5.v.1935 (1 ♂; 1 ♀: NMNH); same except 19.v.1935 (1 ♂: NMNH); San. Bernardino Mts., Up Santa Ana River, 15.vi.1955, Mel (1 ♀: NMNH); Santa Clara Co., Del Peurto Rd (Rd. 130), 28.v.1992, Malaise, J. Skevington (1 ♀: LEM); Smith River, vii.1917, J.M. Aldrich (1 ♂: NMNH); Willits, 19.vi.1935, A.L. Melander (1 ♀: NMNH). **Connecticut:** Redding, 27.v.1933, A.L. Melander (1 ♀: NMNH); same except 12.viii.1930, A.L. Melander (1 ♂: NMNH). **Florida:** Alachua Co., Chantilly Acres, 25.iv.1970, W.W. Wirth, Malaise trap (2 ♂: NMNH); Jackson Co., Florida caverns, St.Park, 26.v.1973, W.W. Wirth, Malaise trap (1 ♀: NMNH). Georgia: Echols Co., Statenville, at Alapaha River, 11.iv.1987, W.E. Steiner & J.M. Swearingen (1 ♀: NMNH). **Idaho:** Priest Lake, viii.1910, A.L. Melander (1 ♂: NMNH). **Illinois:** 5 mi S. Bath, 21.v.1953, J.F. McAlpine (1 ♂: CNC); Algonquin, 17.ix.1895 (1 ♂: NMNH); same except 30.ix.1895 (1 ♂: NMNH); Champaign, 2.x.1956, J.F. McAlpine (1 ♂: CNC); same except 3.x.1956 (3 ♀: CNC); Champaign Co., 26.iv.1926, J.R. Savage (1 ♀: CNC); Cook Co., 13.v.1952 (1 ♂: NMNH);

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Des Plaines, 22.viii.1927, A.L. Melander (1 ♂: NMNH); nr. Forest City, 21.v.1953, J.F. McAlpine (1 ♂; 1 ♀: CNC). **Indiana:** Dune Park, 10.vi.1940, A.L. Melander (2 ♂: NMNH); Lafayette, 25.iv.1916, J.M. Aldrich (1 ♀: NMNH); same except 15.iv.1916 (1 ♀: NMNH); iv.1926 (1 ♂: NMNH); iv.1928 (1 ♂: NMNH); 1.v.1918 (1 ♂: NMNH); 21.v.1917 (1 ♂: NMNH); 24.v.1915 (1 ♂: NMNH); viii.1915 (2 ♂: NMNH); 18.viii.1916 (1 ♂: NMNH). **Iowa:** Ames, Pammel Woods, 11.iv.1970, R.R. Pinger (1 ♂: NMNH); Des Moines, 15.v.1951 (1 ♂: NMNH); Ledges State Park, 7.v.1948, J. Laffoon (1 ♂: NMNH). **Kansas:** Douglas Co., Breidenthal Reserve, 15 mi SE Lawrence, 14.v.1979, R.J. McGinley (1 ♂; 1 ♀: NMNH); Nat. Hist. Res. Lawrence, 28.iv.1956, J.G. Chillcott (1 ♂: CNC). **Louisiana:** Opelousas, iv.1897 (1 ♂: NMNH). **Maine:** Covatunk, 2.viii.1950 (1 ♂: NMNH). **Maryland:** Catcoctin Furnace, 9.viii.1920, J.M. Aldrich (4 ♂: NMNH); Chain Bridge, 8.v.1928, J.M. Aldrich (1 ♂: NMNH); Glen Echo, 10.vi.1923, J.R. Malloch (1 ♂: NMNH); Montg'y Co., Bethesda, 3.vi.1972, G.C. Steyskal (1 ♂: NMNH); Lavale, 9.v.1970, G. Steyskal (1 ♂: NMNH). **Massachusetts:** Bedford, 20.vii.1961, swamp, W.W. Wirth (1 ♂; 4 ♀: NMNH); Middleboro, 28.vii.1922 (1 ♂: NMNH); Provincetown, 15.viii.1950 (1 ♂: NMNH); Walden Pond, Concord, 26.vii.1961, W.W. Wirth (2 ♂: NMNH). **Michigan:** Cheboygan Co., 2.viii.1935, H.B. Hungerford (1 ♂: NMNH); Keweenaw Co., Isle Royale, 8.vii.1938, G. Steyskal (1 ♂: NMNH); Presque Isle Co., 19.vii.1942, C.W. Sabrosky (1 ♂: NMNH); Wayne Co., Grosse Ile, 14.iv.1954, G.C. Steyskal (1 ♀: NMNH). **Minnesota:** Crookston, river valley, 21.v.1960, J.G. Chillcott (1 ♀: CNC). **Mississippi:** Tunica Co., 13 mi N Tunica, 9–13.v.1979, K.A. Spencer, G.C. Steyskal (1 ♂: NMNH); Wash'ton Co., 3 mi N. Leland, 9–13.v.1979, K.A. Spencer, G.C. Steyskal (1 ♂: NMNH); same except 10 mi S. Leland (1 ♂: NMNH). **Montana:** 1 mi W. Big Fork, 8.viii.1967, D. Allen (1 ♂: NMNH). **Nebraska:** South Bend, Cass Co., 8.v.1952, L.W. Quate (2 ♂; 1 ♀: NMNH). **Nevada:** Reno, 9.ix.1916, H.G. Dyar (1 ♀: NMNH). **New Hampshire:** Coos Co., 1 km E Stark (44°36′N, 71°24′W), swp along Ammonoosuc River, 08.viii.2000, T.A. Wheeler (1 ♂; 1 ♀: LEM); same except J. Forrest (1 ♀: LEM); Franconia Ftch, 8.vii.1951, A.L. Melander (1 ♂: NMNH); White Mts., Dolly Copp, 29.viii.1937, A.L. Melander (1 ♂: NMNH); White Mts., Stinson Lake, 23.vii.1961, W.W. Wirth (2 ♂; 1 ♀: NMNH). **New Jersey:** Morristown, 24.ix.1922, A.H. Sturtevant (1 ♀: NMNH); Riverton, 5.ix.1927, C.H. Ballon (1 ♂: NMNH). **New York:** Adirondacks, Connery Pond, 15.vii.1938, A.L. Melander (1 ♀: NMNH); Adirondack, Wilmington Notch, 3.vii, J.M. Aldrich (2 ♀: NMNH); Albion, Orleans Co., 11.vi.1963, W.W. Wirth, Burma woods (4 ♂: NMNH); Letchworth Sa. Park, 13.vi.1963, W.W. Wirth, Pond margin (2 ♂: NMNH); Portageville, Genesee R., 13.vi.1963, W.W. Wirth (1 ♀: NMNH); Ringwood Res. Tompkins Co., 16–17.vi.1963, W.W. Wirth, swamp (1 ♂: NMNH); Turedo, 29.v.1926, A.L. Melander. **North Carolina:** Highlands, 3800′, 5.v.1957, J.R. Vockeroth (2 ♂; 5 ♀: CNC); same except 6.v.1957 (1 ♂: CNC); same except 10.v.1957 (1 ♂: CNC); same except 16.vi.1957 (1 ♀: CNC); same except 8.vii.1957 (1 ♂; 2 ♀: CNC); same except 23.viii.1957, J.G. Chillcott (1 ♀: CNC); same except 27.viii.1957 (1 ♀: CNC). **Ohio:** Maumee River, Paulding Co., (41°13.9′N, 84°35.6′W), 11.ix.1976, B.A. Steinly (2 ♂: NMNH); Old Spring, Amherst Lorain Co., (41°23.9′N, 82°13.7′W), 22.ix.1976, B.A. Steinly (1 ♂: NMNH); Sandusky river, Wyandot Co., (40°48.4′N, 82°48.8′W), 14.vii.1976, B.A. Steinly (1 ♂: NMNH); Vermillon River, Mill Hollow C.P. Lorain Co., (41°22.9′N, 82°19.0′W), 22.ix.1976, B.A. Steinly (2 ♂: NMNH). **Oklahoma:** Mayes Co., Spavinaw (Rec. area), 9.v.1984, G.F. & J.F. Hevel (3 ♀: NMNH). **Oregon:** Humbug St. Park, 7.viii.1940, A.L. Melander (1 ♂: NMNH). **Pennsylvania:** Lewisburg, Union Co., 26.viii.1981, J.R. Vockeroth (2 ♂: CNC); Presque Isle S.P. Lake Erie Co., 42°8.3′N, 80°8.5′W, 6.v.1977, B.A. Steinly (1 ♂: NMNH). **South Dakota:** Waubay, 6.vi.1918, J.M. Aldrich (1 ♂: NMNH). **Tennessee:** Cedars Leb. St. Park, Wilson Co., 19.v.1979, G.C. Steyskal (1 ♂: NMNH); East Ridge, 9.v.1952, G.S. Walley (1 ♂; 2 ♀: CNC); Humphreys Co., Buffalo, 19.v.1979, G.C. Steyskal (4 ♂: NMNH). **Texas:** College Station, 16.iii.1908, E.S. Tucker (1 ♀: NMNH); Comal River, 24.iii.1942, A.L. Melander, (1 ♂: NMNH);

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Kerrville, 1.iv.1959, J.F. McAlpine (5 ♂; 2 ♀: CNC); same except xi.1953, L.J. Bottimer (1 ♂: NMNH); Pedernales R. Gillespie Co., 19.iv.1955, W.W. Wirth (2 ♂; 2 ♀: NMNH). **Vermont:** 12 km SW Waterbury (44.3 °N, 72.7°W), Camel's Hump Trail, sweep, 26.viii.2001, S.E. Brooks (1 ♀: LEM). **Virginia:** Chain Bridge, 23.iv.1922, J.R. Malloch (1 ♂: NMNH); Glencarlyn, 23.v.1925, J.R. Malloch (1 ♂: NMNH); Great Falls, 4.v.1963, G.C. Steyskal (1 ♂: NMNH); Stony Creek, Giles Co., 2000′, 26.v.1962, J.R. Vockeroth (1 ♂: NMNH). **Washington:** Cusick, 14.vii.1960, W.F. Rapp (2 ♂: NMNH). **West Virginia:** Grafton, 25.vi.1970, G. Steyskal (1 ♀: NMNH). **Wisconsin:** Milwaukee, 31.v.1964 (1 ♂: NMNH); Washburn Co., T39N R12W B32, 6.vii.1953, R.H. Jones (3 ♀: NMNH). **Wyoming:** Yellowstone Pk., Yellowstone Lake, 23.vii.1934, A.L. Melander (1 ♀: NMNH).

Variation 1: CANADA. British Columbia: Kitimat, 4.viii.1960, C.H. Mann (1 ♂: CNC). **California:** Donner Summit, (39°20.55′N, 120°20.44′W), 2230 m, sweep, 16.viii.1999, S.E. Brooks (1 ♂: LEM). **Northwest Territories:** Exmouth L. 65°02′N, 115°54′W, 22.viii.1966, G.E. Shewell (1 ♂: CNC). **Yukon Territory:** Klondike Hwy, 15 km S Carmacks, Bushy Mt. (61°58.2′N, 136°12.2′W), sweep sedges at parking area near river, 15.vii.1998, T.A. Wheeler (1 ♂; 1 ♀: LEM).

Variation 2: CANADA: Alberta: Banff, 19.viii.1925, Loop 4500′, (warm & dry), AC Lake, O. Bryant (1 ♀: NMNH); Banff, 20.viii.1925, O. Bryant (2 ♂: NMNH). **UNITED STATES: California:** Donner Summit (39°20.55′N, 120°20.44′W), 2230 m, sweep, 16.viii.1999, S.E. Brooks (11 ♂; 18 ♀: LEM); same except 18.viii.1999 (1 ♂: LEM); **Idaho:** Chatcolet, viii.1915, A.L. Melander (2 ♂; 1 ♀: NMNH). **Wyoming:** Yellowstone Pk., Yellowstone Lake, 1.viii.1973, L.V. Knutson (3 ♂; 1 ♀: NMNH).

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