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Jacobus

PROVANCHER'S *QUEBECENSIS* MAYFLY SPECIES
(EPHEMEROPTERA: LEPTOPHLEBIIDAE,
SIPHONURIDAE)¹

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ABSTRACT: Examination of the lectotype of *Ephemerella quebecensis* shows it to be a junior synonym of *Leptophlebia cupida* [= *E. quebecensis*, n. syn.]. Historical confusion and mistakes with respect to the dates of names and the possible equivalency of *Ephemerella quebecensis* and *Siphonurus quebecensis* are discussed. *Siphonurus quebecensis* is a valid species that was named in 1878. Updated synonymies are provided for *L. cupida* and *S. quebecensis*.

As part of our study of the systematics of ephemere-line mayflies (Ephemeroptera: Ephemerellidae), we recently obtained and studied the female adult lectotype of the poorly known species, *Ephemerella quebecensis* (Provancher). Provancher (1876) originally described this species from Quebec as *Cloe quebecensis*, and he later (Provancher 1878) transferred it to the genus *Heptagenia* Walsh. Burks (1953) examined the lectotype of this species and placed it in the genus *Ephemerella* Walsh, where it has resided since that time (Edmunds and Allen 1957, Edmunds 1962, McCafferty 1996, McCafferty and Randolph 1998). Edmunds and Allen (1957) regarded *E. quebecensis* as a *nomen dubium*, because the lectotype was, at that time, not identifiable to the species level. Thus, the species was not assigned to a subgenus by Edmunds (1959, 1962), nor was it treated in the revision of North American *Ephemerella*, *sensu stricto*, by Allen and Edmunds (1965).

Our examination of the lectotype of *E. quebecensis* revealed characters associated with the wings and abdomen that indicate the species belongs to the genus *Leptophlebia* Westwood (Leptophlebiidae). A recent study of Nearctic *Leptophlebia* species by Burian (2001) included for the first time comparative descriptions of female adults and eggs. Comparison of the lectotype of *E. quebecensis* to these descriptions and to material identified by S. K. Burian suggested to us that *E. quebecensis* is conspecific with the common eastern species *L. cupida* (Say). We dissected the abdomen of the pinned, dry lectotype of *E. quebecensis* and removed eggs for examination. Microscopic comparison of the chorionic structure of these eggs, which we rehydrated, with that of eggs dissected from *L. cupida*, showed no differences between them and confirmed the equivalency of the two species. Therefore, we formally place *E. quebecensis* as a subjective junior synonym of *L. cupida*: *Leptophlebia cupida* (Say), 1823 [= *Ephemerella quebecensis* (Provancher), 1876, NEW SYNONYM].

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An up-to-date alphabetical synonymy of *L. cupida* is as follows:

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| <i>Leptophlebia cupida</i> (Say) 1823 | <i>Heptagenia quebecensis</i> (Provancher), 1876, n. syn. |
| <i>Baetis ignava</i> Hagen, 1861 | <i>Leptophlebia austrina</i> (Traver), 1932 |
| <i>Blasturus austrinus</i> Traver, 1932 | <i>Leptophlebia collina</i> (Traver), 1932 |
| <i>Blasturus collinus</i> Traver, 1932 | <i>Leptophlebia concinna</i> (Walker), 1853 |
| <i>Blasturus concinnus</i> (Walker), 1853 | <i>Leptophlebia gravastella</i> (Eaton), 1884 |
| <i>Blasturus cupidus</i> (Say), 1823 | <i>Leptophlebia hebes</i> (Walker), 1853 |
| <i>Blasturus gravastellus</i> Eaton, 1884 | <i>Leptophlebia ignava</i> (Hagen), 1861 |
| <i>Cloe quebecensis</i> Provancher, 1876, n. syn. | <i>Leptophlebia pallipes</i> (Walker), 1853 |
| <i>Ephemerella quebecensis</i> (Provancher), 1876, n. syn. | <i>Palingenia concinna</i> Walker, 1853 |
| <i>Ephemerella cupida</i> Say, 1823 | <i>Palingenia pallipes</i> Walker, 1853 |
| <i>Ephemerella hebes</i> Walker, 1853 | <i>Potamanthus concinnus</i> (Walker), 1853 |
| | <i>Potamanthus cupidus</i> (Say), 1823 |

Provancher (1876) also described another species, *Baetis canadensis*. This name was preoccupied by *Baetis canadensis* Walker (1853), and Provancher (1878) renamed the species *Siphonurus quebecensis*, which was later emended to *Siphonurus quebecensis* (Provancher). The 1878 naming of *S. quebecensis* subsequently appeared verbatim in Provancher's (1883) second volume of "Petite Faune Entomologique du Canada." The first volume (Provancher 1877) was published six years before the second volume, and Eaton (1886) and Traver (1935), in synonymies of *S. quebecensis*, incorrectly assigned this earlier date to the second volume. Thus, we reiterate that 1878 is the year in which the name *S. quebecensis* first appeared, not 1877.

McDunnough (1925) and Traver (1935) (following McDunnough) incorrectly considered *Cloe quebecensis* to be a synonym of *Siphonurus quebecensis*. McDunnough (1925) had examined a specimen of Provancher's material with a blue "38" label that was identified as *Heptagenia quebecensis* (the species named as *Cloe quebecensis* in 1876 and herein considered a synonym of *L. cupida*) and another specimen with a blue "39" label that was identified as *Siphonurus quebecensis* (the species named in 1878). McDunnough then determined that both specimens were *Siphonurus quebecensis* and thus concluded that Provancher's 1876 *quebecensis* and 1878 *quebecensis* were the same species. The true *Cloe quebecensis* (= *Heptagenia quebecensis* = *Ephemerella quebecensis* = *L. cupida*), however, is not represented by the "38" specimen, but by the lectotype noted by Burks (1953) which has a blue "34" label. McDunnough's (1925) synonymy was based on the misidentified or mislabeled Provancher specimen "38."

An up-to-date alphabetical synonymy of *S. quebecensis* is as follows:

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| <i>Siphonurus quebecensis</i> (Provancher), 1878 |
| <i>Baetis canadensis</i> Provancher, 1876, nec <i>B. canadensis</i> Walker, 1853 |
| <i>Siphonurus quebecensis</i> Provancher, 1878 |
| <i>Siphonurus triangularis</i> Clemens, 1915 |

Material examined.—*Ephemerella quebecensis*: LECTOTYPE, female adult (wing and parts of abdomen in capsule), "34," no other data [Provincial Museum, Laval University, Laval, Quebec].

Leptophlebia cupida: seven female adults (eggs dissected from one specimen), three male adults, associated exuviae, lab reared 29-IV/4-V-1978, Indiana, Brown Co., pond on road to Yellowwood State Forest from IN46, 29-IV-1978, M. Minno, B. Stiles; one female adult, associated exuviae, one male larva, Indiana, Fountain Co., Bear Cr. at the Portland Arch, 19-IV-1979, D. Bloodgood; two female adults, Montana, Lake Co., Swan R., Big Fork, 23-VI-1963, A. R. Gaufrin; one female adult, one male adult, one male subimago, two sets larval exuviae, New York, Hamilton Co., Lake on Sacandaga R. at Wells, emerged in lab on 2/3-VI-1970, R. W. Koss [Purdue University Entomological Research Collection, West Lafayette, Indiana].

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