



DISTRIBUTION OF *MOSELIA INFUSCATA* (CLAASSEN, 1923) (PLECOPTERA: LEUCTRIDAE) IN CANADA

David K. Burton^{1,2}

¹ Faculty of Education, University of Ottawa, Ottawa, Ontario, Canada K1N 6N5
E-mail: dburton@uottawa.ca

² Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture Canada, Central
Experimental Farm, Ottawa, Ontario, Canada K1A 0C6

ABSTRACT

The distribution of *Moselia infuscata* (Claassen, 1923) in Canada is examined based on the examination of specimens in the Canadian National Collection of Insects, Arachnids and Nematodes, the University of Guelph Barcode of Life Data Systems, the Royal British Columbia Museum and distribution records presented in previously published research.

Keywords: *Moselia*, Leuctridae, Plecoptera, Canada

INTRODUCTION

Stark & Harrison (2016) studied the stonefly genus *Moselia* Ricker, 1943 in the Pacific Northwest of the United States, describing a new species and giving United States distribution records for both *M. infuscata* (Claassen, 1923) and *M. zonata* Stark & Harrison, 2016. Ricker & Scudder (1975) and Stewart & Oswood (2006) gave distribution records for *M. infuscata* in British Columbia.

This study looks at the distribution of *M. infuscata* in Canada based on those specimens in the Canadian National Collection of Insects, Arachnids and Nematodes (CNCI), in the University of Guelph Barcode of Life Data Systems (BOLD <http://www.boldsystems.org/>) website (UOG), from the Royal British Columbia Museum (RBCM) and from previously published records.

The systematic arrangement used is that of Illies (1966) and DeWalt *et al.* (2019). Abbreviations of Canadian provinces and American states are from the Canadian Endangered Species

Conservation Council (2016) and Stark *et al.* (1986).

MATERIALS AND METHODS

Specimens from the CNCI, UOG and RBCM were examined to verify their species identification. Binomials found on the specimens were compared to Plecoptera Species File (DeWalt *et al.* 2019). A large collection of unidentified Plecoptera from western Canada in the CNCI were examined for the presence of *Moselia* specimens. All specimens were examined using a Leica MZ6 stereomicroscope and any *Moselia* specimens present were identified to species and deposited in the CNCI.

A distribution map (Fig. 1) was generated using decimal GPS coordinates and plotted using an Excel Mapcite software program. Detailed collection data and photographs for specimens at the CNCI are available in their online database (<https://cnc.agr.gc.ca/taxonomy/TaxonMain.php>). These specimens are indicated using black pins on

the distribution map. Detailed collection data and photographs for specimens examined from the University of Guelph as part of the BOLD website (UOG) are available online at <http://www.boldsystems.org> (Ratnasingham and Hebert 2007). These specimens are indicated using green pins on the distribution map. Specimens from

RBCM are indicated by blue pins on the distribution map. Other specimens are included from data available from previous published research and are indicated by red pins on the distribution map. The distribution map only includes literature records where specific collection data were given or a map was provided.

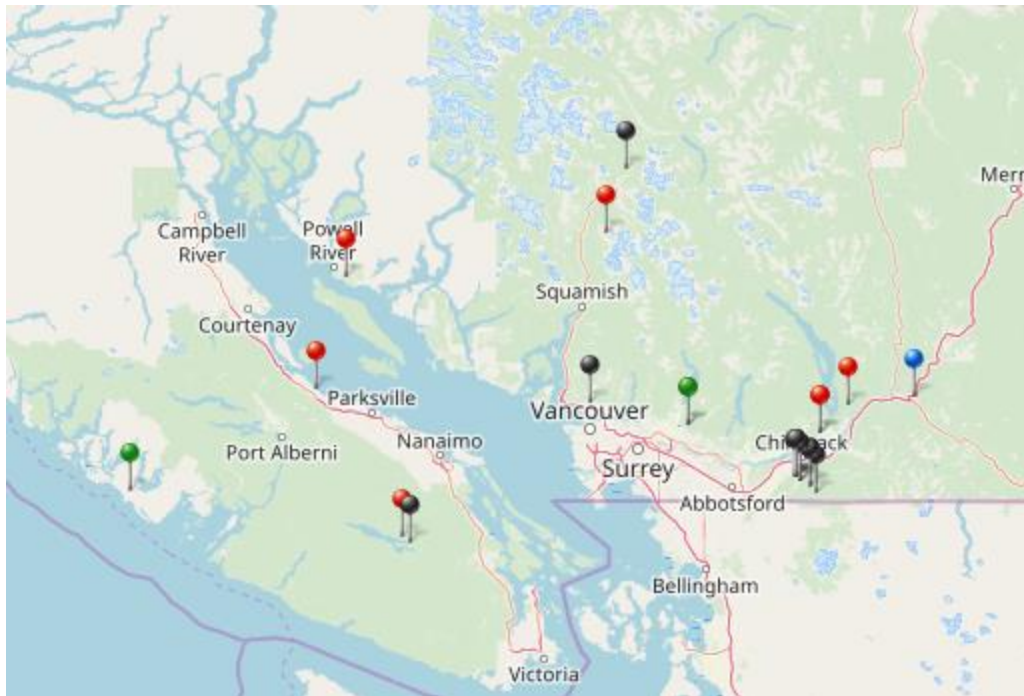


Fig. 1. Distribution of *Moselia infuscata* in Canada (Black Pins - CNCI; Red Pins - Ricker 1943, Ricker & Scudder 1975; Stewart & Oswood 2006); Green Pin - UOG; Blue Pin - RBCM).

RESULTS AND DISCUSSION

Moselia infuscata (Claassen)

Hairy Needelfly

<http://sid.speciesfile.org/urn:lsid:Plecoptera.speciesfile.org:TaxonName:431>

Leuctra infuscata Claassen, 1923:262. Holotype ♂ (Cornell University Collection), Seattle, Washington (Fig. 13 holotype ♂, Fig. 14 ♀)
Leuctra infuscata: Needham & Claassen, 1925:230., (Plate 43, Figs. 3, 5 holotype ♂, Fig 4 ♀)
Leuctra infuscata: Ricker 1939:22.
Leuctra (Moselia) infuscata: Ricker, 1943:81.
Moselia infuscata: Illies, 1966:112.

Moselia infuscata: Ricker & Scudder 1975: 337.

Moselia infuscata: Stewart & Oswood 2006: 58.

Moselia infuscata: Stark & Harrison 2016: 262.

Distribution: CAN: BC. USA: CA, OR, WA (Stark & Harrison 2016, DeWalt et al. 2019).

Material Examined: CAN: BC. USA: CA, OR, WA.

Distribution Analysis: Examination of Canadian specimens of the genus *Moselia* from the CNCI, UOG and RBCM showed that all specimens were of the species *M. infuscata*. Specimens from Washington and Oregon in the CNCI were also confirmed as *M. infuscata*. Specimens from California previously identified as *M. infuscata*

were found to be *M. zonata* based on the criteria Stark & Harrison (2016) used to separate the two species.

The BOLD database contains three Barcode Index Numbers (BINs) for *Moselia*. BIN BOLD:ACB0944 contains specimens from Washington State and British Columbia that were shown to be consistent with the species *M. infuscata* based on the criteria Stark & Harrison (2016) used to separate the two species. The other two Bins contain specimens of *Moselia* from California and were not available for study. However, the presence of a banded wing pattern in the photograph of the male specimen representing BIN BOLD:ACP2540 suggests that it is the species *M. zonata*. The specimen represented by BIN BOLD:ACP2547 lacks a banded wing pattern and is a female. The species determination for this BIN cannot be made at this time.

Stark and Harrison (2016) have shown that the distribution of *M. infuscata* is restricted in the United States to the Coastal Range of Oregon and Washington with one isolated population in the Sierra Nevada Range of California. *Moselia zonata* replaces *M. infuscata* in the Coastal Range of California, the Sierra Nevada Range of California and in scattered locations in Nevada (Stark & Harrison 2016). Specimens in this study show that in Canada *M. infuscata* is restricted to the southwestern Coastal Range of British Columbia. Re-examination of a female specimen reported from Summit Lake, Alaska Highway (Stewart & Oswood 2006) shows that it is a female of *Perlomyia utahensis* based on wing venation and sub-genital plate structure.

Additional collecting in the Coastal Range of British Columbia will be needed to determine the northern extent of the *M. infuscata* population in Canada.

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