

FIRST CANADIAN RECORD OF THE BERMUDA GRASS STEM MAGGOT, *ATHERIGONA REVERSURA* (DIPTERA: MUSCIDAE)

J. SAVAGE

Department of Biological Sciences, Bishop's University,
Sherbrooke, Quebec, Canada J1M 1Z7
email, jsavage@ubishops.ca

Scientific Note

The large muscid genus *Atherigona* Rondani (Diptera) includes over 230 species, most of which are found in the tropical and subtropical regions of the Old World (Pont and Magpayo 1995). The group is divided into two subgenera: *Acritochaeta* Grimshaw, which contains mostly saprophagous taxa, and *Atherigona* Rondani, whose phytophagous larvae are shoot-flies that feed on a variety of wild and cultivated grasses (Poaceae) (Pont and Magpayo 1995).

Only two species of *Atherigona* are currently found in North America. The cosmopolitan *Atherigona orientalis* Schiner (Diptera: Muscidae) has long been known from the southern United States (Malloch 1921; Hockett 1936) and has not, so far, been recorded in Canada. *Atherigona reversura* Villeneuve (Diptera: Muscidae), a widespread species in the Oriental, Australasian and Palaearctic regions (Pont and Magpayo 1995), is a much more recent introduction: it was documented from the United States less than a decade ago (Hudson 2010) and is recorded here for the first time from Canada. The species was found to rapidly infest and damage Bermuda grass, *Cynodon dactylon* (Linnaeus) Persoon, from hayfields, pastures and turf in the southern United States (Baxter *et al* 2014), a habit that has resulted in the recent attribution of the common name Bermuda grass stem maggot (BSM).

The BSM is a small yellowish fly measuring 3.0–3.5 mm with a remarkably angular dichoptic head in both sexes and long antennae (Fig. 1A). It can be separated from *A. orientalis* and other members of the subgenus *Acritochaeta* Grimshaw based on the presence of very short basal lateral setae on the scutellum (these are almost as long as subbasal lateral setae in *A. orientalis*), 2–3 rows of presutural acrostical setae (4–5 rows in *A. orientalis*), and a clubbed palpus in the male (Fig. 1A) (male palpus elongate in *A. orientalis*). The combination of yellow palps (Fig. 1A), a bicoloured frontal vitta (Fig. 1B), and a moderately ornamented fore tarsus in the male (Figs. 95–96 of Pont and Magpayo 1995) will distinguish *A. reversura* from other species belonging to the subgenus *Atherigona sensu stricto*. The immature stages have been extensively described by Grzywacz *et al.* (2013). In addition to Bermuda grass, *A. reversura* has been reared from a variety of host-plants (see Pont and Magpayo 1995 for complete list) including some cultivated in Canada such as maize, *Zea mays* Linnaeus, and, only recently, sweet sorghum, *Sorghum bicolor* (Linnaeus) Moench, (Thivierge *et al.* 2015).

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The presence of the BSM in Southern Ontario represents new Canadian records at both the generic and species levels. While this species was first noticed in the United States of America due to the damage it caused to Bermuda grass, the Canadian specimens were discovered through an ongoing project on the DNA barcoding of the Muscidae of Canada based on a large database of COI Muscidae sequences from all over Canada (Savage *et al.* 2015). Eight sequences from that data set belonged to the Barcode Index Number (Ratnasingham and Hebert 2013) AAN8579 and were assigned to the genus *Atherigona* by the automated identification engine of the Barcode of Life Data System (BOLD, Ratnasingham and Hebert 2007). Upon further examination and genitalic dissections of the barcoded specimens, the material was identified as *A. reversura* (2 males, 6 females). All Canadian records reported here (Table 1) are from Ontario, with the oldest dating back to 2010. Collection details and individual sequences for the specimens listed here can be retrieved from BOLD in the public dataset: *Atherigona* of Canada (dx.doi.org/10.5883/DS-ATOC).

Additional North American specimens of *A. reversura* housed in the Biodiversity Institute of Ontario (Guelph, Ontario) were also seen in the course of this work, including material from Florida and California, as well as one male and two females collected in late September 2010 from Barnstable County, Massachusetts, representing the most northern record in the United States to date for the BSM. All Canadian specimens are adults collected by Malaise trap and therefore no information related to host-plant is currently available.

It is not possible at present to determine if the Canadian records reported here represent multiple punctual introductions of the BSM rather than the establishment of the species in Canada and no information is available on the cold-hardiness of the species.

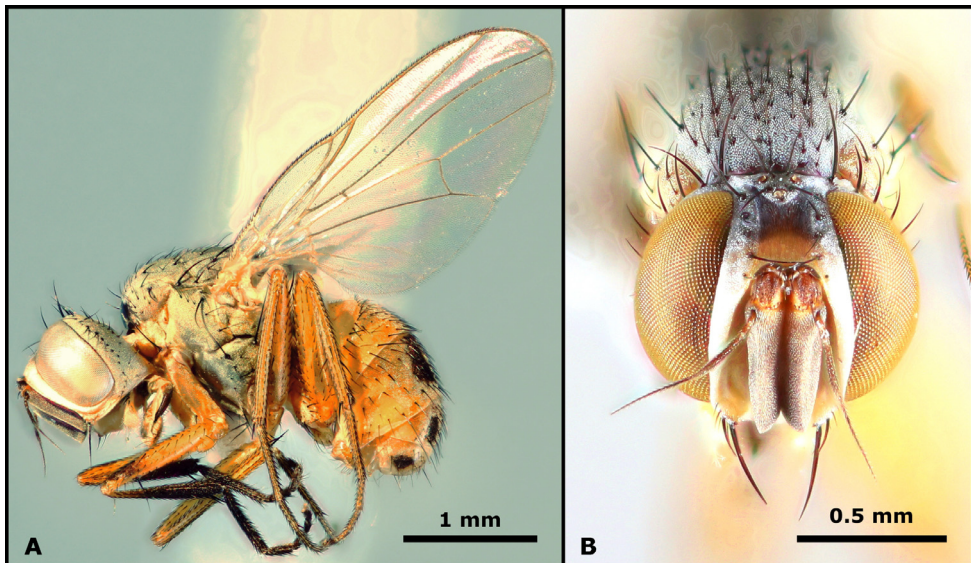


FIGURE 1: *Atherigona reversura*, male. A. habitus, lateral view; B. head, anterodorsal view.

Bermuda grass is considered an exotic weed in Canada, where it is found in Ontario and British Columbia (Plants of Canada Database 2011). However, since *A. reversura* is capable of completing its development in a wide range of other hosts, including some that are cultivated in Canada, the distribution of this species should be monitored in the future.

Table 1. Collection date, locality, number and sex of specimens and collection repository for specimens of *Atherigona reversura* from Canada; all localities are from Ontario. BIO = Biodiversity Institute of Ontario.

Date	Locality	Lat/Long	Specimen #	Collection repository
05.ix.2010	Leeds and Grenville, Elizabethtown-Kitley	44.621, -75.773	1♂	BIO, general collection
19.ix.2010	Haldimond-Dunn Townline, Windy Bluff	42.861, -79.703	1♂, 2♀	BIO, research collection of M. A. Smith
21.xi.2010	Haldimond-Dunn Townline, Windy Bluff	42.861, -79.703	1♀	BIO, research collection of M. A. Smith
12.ix.2012	Point Pelee National Park	41.939, -82.516	1♀	BIO, general collection
28.ix.2014	Walkerton, Sacred Heart High School	44.127, -81.144	1♀	BIO, general collection
28.ix.2014	London, Jack Chambers Public School	43.030, -81.271	1♀	BIO, general collection

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