



The Throscidae (Coleoptera) of Atlantic Canada

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ABSTRACT

An examination of specimens of Throscidae in collections in Atlantic Canada indicates that three species occur in the region: *Aulonothroscus constrictor*, *Trixagus carinicollis*, and *Trixagus chevrolati*. Three new provincial records are reported herein. A key to the identification of species found in the region is provided, as are distribution maps and colour habitus photographs. The distribution, phenology, and bionomics of all three species are briefly discussed.

RÉSUMÉ

L'examen des spécimens de Throscidae des collections du Canada Atlantique indique que trois espèces sont présentes dans la région: *Aulonothroscus constrictor*, *Trixagus carinicollis* et *Trixagus chevrolati*. Trois additions à la faune provinciale sont rapportées. Une clé d'identification des espèces retrouvées dans la région est présentée, de même que des cartes de distribution et des photographies couleurs de l'habitus. La distribution, la phénologie et la bionomie des trois espèces sont brièvement discutées.

INTRODUCTION

The Throscidae (throscid beetles) is a small family (152 species known worldwide) of saproxylic beetles related to the click beetles (Elateridae). They share, with the Elateridae and Eucnemidae, the ability to “click” by articulating the pro and mesothorax against a substrate (Yensen 1975; Johnson 2002). Twenty species in three genera (*Aulonothroscus*, *Pactopus*, and *Trixagus*) are known in North America, eight of which have been recorded in Canada (Bousquet 1991; Johnson 2002). Relatively little is known about the bionomics of throscids. Adults may be generalist pollen and mould feeders often found on flowers, in decaying leaves, conifer needles, sawdust, leaf litter, in rotten wood, under bark, in moss and lichens, and on various kinds of foliage (Yensen 1975; Johnson 2002). Adults appear to overwinter in litter, amongst grass roots, or under bark (Yensen 1975). Larvae have been found in red-rotten portions of logs, in fungous soil samples, and in grass tussocks (Johnson 2002). Larvae are liquid feeders on outer portions of ectotrophic mycorrhizal roots (Burakowski 1975). The present study, one of a series of studies on the biodiversity of Atlantic Canadian Coleoptera, was based on an examination of specimens in collections in Atlantic Canada, and surveys the Throscidae fauna of the region.

IDENTIFICATION

A key to species of Throscidae found in Atlantic Canada (adapted from Yensen 1975, 1980 and Johnson 2002) is provided below.

Received 3 February 2011. Accepted for publication 20 February. Published on the Acadian Entomological Society website at www.acadianes.ca/journal.html on 23 March 2011.

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1. Eyes entire, metasternum with a deep, oblique sulcus for the reception of tarsi (*Aulonothroscus*)
 *Aulonothroscus constrictor* (Say)
 – Eyes with narrow emargination that nearly divides them; metasternum without a deep, oblique sulcus;
 a shallow depression sometimes present (*Trixagus*)2
- 2(1). Elytra widest at middle; pronotum less than twice as wide as long; scutellum as long as wide
 *Trixagus chevrolati* (Bonvouloir)
 – Elytra widest at base; pronotum twice as wide as long; scutellum longer than wide
 *Trixagus carinicornis* (Schaeffer)

METHODS AND CONVENTIONS

Specimens of Throscidae originating in Atlantic Canada from a variety of collections were examined and identified. These yielded 307 specimens; 280 from Nova Scotia, 7 from New Brunswick, 18 from Prince Edward Island, and 2 from Newfoundland and Labrador. Abbreviations of collections in which specimens were found that contributed to the study are:

ACNS	Agriculture and Agri-Food Canada, Kentville, Nova Scotia, Canada
CBU	Cape Breton University, Sydney, Nova Scotia, Canada
CGMC	Christopher G Majka Collection, Halifax, Nova Scotia, Canada
CNC	Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Ontario, Canada
DAL	Dalhousie University Collection, Halifax, Nova Scotia, Canada
DHWC	David H. Webster Collection, Kentville, Nova Scotia, Canada
EBC	Erica Burke Collection, Saint John's, Newfoundland and Labrador, Canada
JCC	Joyce Cook Collection, now at the New Brunswick Museum, Saint John, New Brunswick, Canada
JOC	Jeffrey Ogden Collection, Truro, Nova Scotia, Canada
MTC	Martin Turgeon Collection, Saint-Basile, New Brunswick, Canada
NSMC	Nova Scotia Museum, Halifax, Nova Scotia, Canada
NSNR	Nova Scotia Department of Natural Resources, Shubenacadie, Nova Scotia, Canada
SMU	Saint Mary's University, Halifax, Nova Scotia, Canada
UMNB	Université de Moncton, Moncton, New Brunswick, Canada

RESULTS

As a result of an examination of specimens of Throscidae, three new provincial records are reported (Table 1). *Aulonothroscus constrictor* is newly recorded from Prince Edward Island and *Trixagus carinicornis* is newly recorded in Nova Scotia and Prince Edward Island.

Aulonothroscus constrictor (Say, 1839)

PRINCE EDWARD ISLAND: Queens County: Millvale, 25 June 2003, C.G. Majka, deciduous forest (2, CGMC); St Patricks, 17 July 2001, 21 July 2001, 14 July 2002, 27 June 2003, C.G. Majka, old field ecosystem (10, CGMC); St Patricks, 25 June 2003, C.G. Majka, mixed forest (2, CGMC).

Aulonothroscus constrictor (Figure 1) is newly recorded from Prince Edward Island. It was recorded from New Brunswick and Nova Scotia by Bousquet (1991). It appears to be widely distributed in the Maritime Provinces (New Brunswick, Nova Scotia, and Prince Edward Island) although records from most of New Brunswick are lacking (Figure 2). Its distribution in North America is eastern, from the Maritime Provinces south to Georgia and Florida, and west to Manitoba and Arkansas (Bousquet 1991; Downie and Arnett 1996). The majority of specimens (76%) from the Maritimes for which habitat data is available were collected in coniferous forests, chiefly in red spruce (*Picea rubens* Sarg.) stands, with lesser numbers in black spruce (*Picea mariana* (Mill.) BSP.), eastern hemlock (*Tsuga canadensis* (L.) Carr.), white pine (*Pinus strobus* L.) (Pinaceae), and mixed red spruce-hemlock stands. The remaining 23% were collected in a variety of habitats such as deciduous forests, mixed forests, coastal forests, boggy areas, meadows, old fields, and the seashore. Many were collected with flight-intercept traps or sweep nets. Adults (n = 127) have been collected between 2 June and 5 August with numbers reaching a peak in the first two weeks of July (Figure 3).

Trixagus carinicornis (Schaeffer, 1916)

PRINCE EDWARD ISLAND: Queens County: Millvale, 25 June 2003, C.G. Majka, along river (1, CGMC); St Patricks, 13 July 2002, C.G. Majka, old field ecosystem (1, CGMC); St Patricks, 14 July 2002, C.G. Majka, in

Table 1. The Throscidae fauna of Atlantic Canada

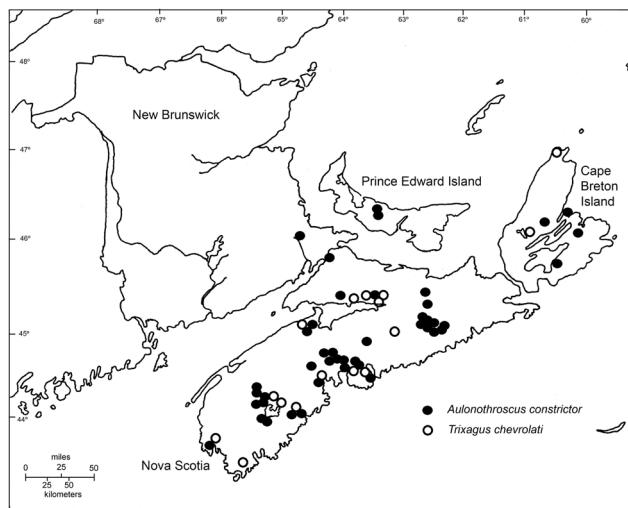
	NB	NS	PE	NF	Distribution in NE North America
<i>Aulonothroscus constrictor</i> (Say)	1	1	1		MA, ME, NB, NH, NS, NY, ON, PE, QC, VT
<i>Trixagus carinicollis</i> (Schaeffer)	1	1	1	1	CT, MA, ME, NB, NF, NH, NS, NY, ON, PE, QC, RI, VT
<i>Trixagus chevrolati</i> (Bonvouloir)		1			CT, MA, ME, NH, NS, NY, ON, QC, RI
Total	2	3	2	1	

NOTE: NB = New Brunswick; NS = Nova Scotia; PE = Prince Edward Island; NF = insular Newfoundland; LB = Labrador; ON = Ontario; QC = Québec; PM = Saint-Pierre et Miquelon; CT = Connecticut; MA = Massachusetts; ME = Maine; NH = New Hampshire; NY = New York; RI = Rhode Island; and VT = Vermont.

Figure 1. Dorsal habitus photograph of *Aulonothroscus constrictor* (Say). **Photo credit:** Tom Murray, Groton, Massachusetts.



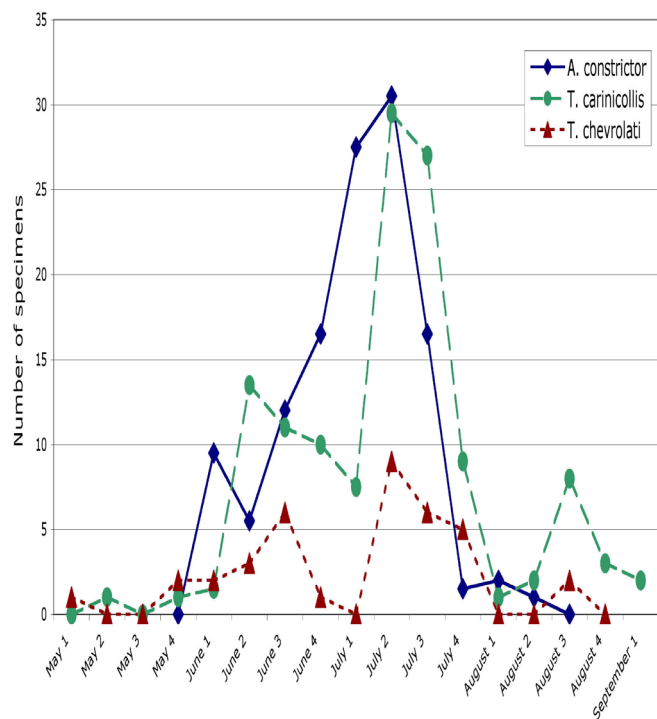
Figure 2. Distribution of *Aulonothroscus constrictor* (Say) and *Trixagus chevrolati* (Bonvouloir) in Atlantic Canada.



moss along small stream (1, CGMC); St Patricks, 25 June 2003, C.G. Majka, mixed forest (1, CGMC). **NOVA SCOTIA:** 134 specimens examined from **Annapolis, Colchester, Cumberland, Guysborough, Halifax, Hants, Inverness, Kings, Lunenburg, Pictou, Queens, Richmond, Shelburne,** and **Yarmouth Counties.** The earliest records are from 1950 [**Kings County:** East Halls Harbour, 22 June 1950, H.B. Specht (2, ACNS); Kentville, 12 July 1950, H.B. Specht (1, ACNS)]. *Trixagus carinicollis* (Figure 4) is newly recorded from Nova Scotia and Prince Edward Island. It has been

recorded from New Brunswick (Bousquet 1991) and insular Newfoundland (Yensen 1975; Bousquet 1991). It appears to be widely distributed in Atlantic Canada (Figure 5) although records from New Brunswick and insular Newfoundland are sparse. Its distribution in North America is primarily northeastern, from Newfoundland south to Virginia and Kentucky and west to Ontario, Michigan and Iowa, although there are collections from southern Mississippi. In northwestern portion of the continent it has been found in British Columbia, Oregon, Washington, and Idaho (Yensen 1975).

Figure 3. The phenology of adult Throscidae in Atlantic Canada. **NOTE:** The horizontal axis indicates successive weeks of the year, from the first week of May to the first week of September.

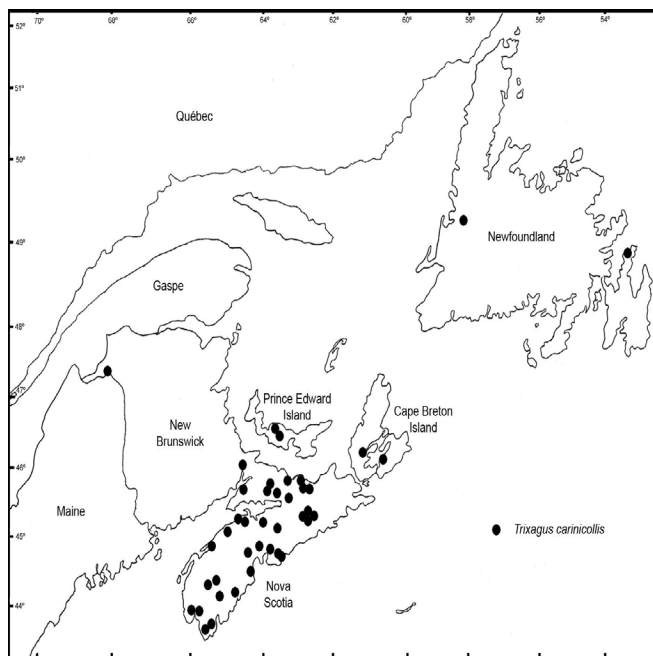


Almost half (48%) of specimens from the region for which habitat information was recorded on the label data (n = 75), were collected in coniferous forests including red spruce (*Picea rubens*), black spruce (*Picea mariana*), eastern hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus*) stands. The remainder was collected in deciduous,

Figure 4. Dorsal habitus photograph of male *Trixagus carinicollis* (Schaeffer). **Photo credit:** Tim Moyer, Medford, New Jersey.



Figure 5. Distribution of *Trixagus carinicollis* (Schaeffer) in Atlantic Canada.



mixed, and coastal scrub forests, old fields, heaths, marshlands, and along rivers and streams. Many specimens were collected with flight-intercept traps, car nets, UV light traps, and sweep nets. Adults (n = 142) were collected between 8 May and 25 September with numbers reaching a peak in the second and third weeks of July (Figure 3).

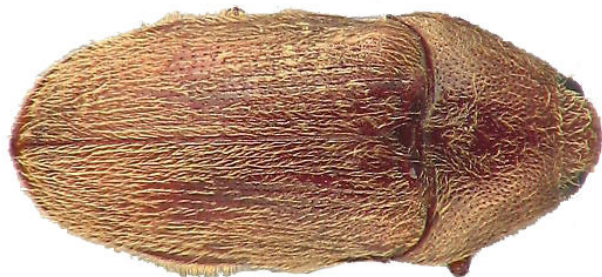
***Trixagus chevrolati* (Bonvouloir, 1859)**

Trixagus chevrolati (Figure 6) was recorded from Nova Scotia (Yensen 1975; Bousquet 1991). To date, this is the only province in Atlantic Canada where it has been found. As it has also been recorded in Maine and Québec (Table 1), it is probable that further collecting in New Brunswick will reveal its presence. It is widely distributed in Nova Scotia (Figure 2). It ranges from southern Canada throughout most of the United States as far south as Sonora in Mexico (Yensen 1975). Habitat data from collections in Nova Scotia is relatively sparse and includes a forest road, a forest trail, a mixed forest, and an open area. Fifty percent of specimens were collected with a car net. Adults (n = 38) have been collected between 7 May and 22 August with numbers reaching a peak in the middle of July (Figure 3).

DISCUSSION

As a result of the present investigation, *Aulonothroscus*

Figure 6. Dorsal habitus photograph of male *Trixagus chevrolati* (Bonvouloir). **Photo credit:** Tim Moyer, Medford, New Jersey.



constrictor is newly recorded in Prince Edward Island and *Trixagus carinicollis* is newly recorded in Prince Edward Island and Nova Scotia. The former appears to be widely distributed in the Maritime Provinces while the latter appears to occur widely throughout Atlantic Canada. *Trixagus chevrolati* has only been recorded in Nova Scotia in the region, although it is probable that additional fieldwork in New Brunswick will reveal its presence there. Of the three species of Throscidae found in Atlantic Canada, *Aulonothroscus constrictor* appears to be most closely associated with coniferous forests (76%). *Trixagus carinicollis* is also found in coniferous forests (48%) although it has been collected in a variety of other habitats as well. Habitat information for *Trixagus chevrolati* is meager, although it does indicate that most specimens are collected in forested habitats. All three species appear to reach a peak in numbers in the first three weeks of July, decreasing in abundance rapidly towards the end of July and early August, although small numbers persist until early September (Figure 3). Small numbers of both species of *Trixagus* have been found in May while collections of *Aulonothroscus constrictor* commence in early June (Figure 3).

While the throscid fauna of Nova Scotia is relatively well documented, the same cannot be said of New Brunswick, Prince Edward Island, and insular Newfoundland for which only a comparatively small number of records exist. Clearly more fieldwork should be undertaken in these latter provinces to better determine their fauna and its distribution and bionomics.

ACKNOWLEDGEMENTS

Sincere thanks are extended to Susan Westby (formerly with Agriculture and Agri-Food Canada, Kentville, NS), David McCorquodale (Cape Breton University), Yves Bousquet (Canadian National Collection of Insects,

Arachnids, and Nematodes), Joyce Cook and DeLancey Bishop (Carleton University), Phillana Dollin and Tatiana Rossolimo (Dalhousie University), Jeff Ogden (Nova Scotia Department of Natural Resources), Scott McIvor (Saint Mary's University), Gaétan Moreau and Pauline Duerr (Université de Moncton), Erica Burke, Fritz McEvoy, Martin Turgeon, and David Webster for providing specimens and information that contributed to this study. Sincere thanks to Tim Moyer and Tom Murray for contributing photographs of throscids and to Eric Yensen for his assistance. Thanks to two reviewers who read an earlier version of this paper and made many constructive suggestions. Sincere thanks to David Christianson, Calum Ewing, and Andrew Hebda at the Nova Scotia Museum for continuing support and encouragement. This work has been assisted by the Board of Governors of the Nova Scotia Museum.

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