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The Leiodidae (Coleoptera) of Atlantic Canada: new records, faunal composition, and zoogeography

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Abstract

The Leiodidae (the round fungus beetles, the small carrion beetles, and the mammal nest beetles) of Atlantic Canada (New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island) are surveyed. Twenty five species, including *Colon* (*Colon*) *politum* Peck and Stephan, *Colon* (*Myloechus*) *forceps* Hatch, *Colon* (*Myloechus*) *incisum* Peck and Stephan, *Colon* (*Myloechus*) *schwarzi* Hatch, *Hydnobius arizonensis* Horn, *Anogdus dissimilis* Blatchley, *Anogdus potens* (Brown), *Cyrtusa subtestacea* (Gyllenhal), *Leiodes puncticollis* (Thompson), *Leiodes rufipes* (Gebler), *Agathidium atronitens* Fall, *Agathidium depressum* Fall, *Agathidium difforme* (LeConte), *Agathidium mollinum* Fall, *Agathidium oniscoides* Palisot de Beauvois, *Agathidium pulchrum* LeConte, *Agathidium repentinum* Horn, *Agathidium rusticum* Fall, *Gelae parile* (Fall), *Anisotoma blanchardi* (Horn), *Anisotoma discolor* (Melsheimer), *Anisotoma geminata* (Horn), *Anisotoma globososa* Hatch, and *Prionochaeta opaca* (Say) are newly recorded in Atlantic Canada. One of these, *Hydnobius arizonensis*, is newly recorded in Canada. *Colon* (*Myloechus*) *hubbardi* Horn is newly recorded in the Maritime Provinces. Eight species are newly recorded in New Brunswick, 29 in Nova Scotia, two on Prince Edward Island, 12 on insular Newfoundland, and five in Labrador for a total of 56 new jurisdictional records. *Catops paramericanus* Peck and Cook and *Catops simplex* Say are newly recorded from mainland Nova Scotia, and records are provided to verify the occurrence of *Leiodes impersonata* Brown and *Leiodes punctostriata* Kirby in Nova Scotia, and *Leptinillus validus* (Horn) in insular Newfoundland. Three species, *Agathidium hatchi* Wheeler, *Catops americanus* Hatch, and *Sciodrepoides watsoni* (Spence), are removed from the faunal list of New Brunswick. As a result, 66 species of Leiodidae have now been recorded from Atlantic Canada. The name *Anisotoma obsoleta* (Horn) is revalidated while the name *Anisotoma horni* Wheeler is newly designated a synonym of *A. obsoleta*.

The regional composition and zoogeography of the Leiodidae in Atlantic Canada are examined and species are grouped in six main categories, reflecting their distribution in the region. Island faunas are examined, particularly in regard to the similarities and differences of the faunas of Cape Breton Island, insular Newfoundland, and Prince Edward Island. Lone Shieling, in Cape Breton Highlands National

Park, is highlighted as an apparent biodiversity "hot spot" for this family within the region. Finally, the saproxylic component of the fauna (19 species in the Agathiidini) is briefly discussed, particularly in regard to potentially rare species, and the importance of monitoring populations of saproxylic beetles.

Keywords
Coleoptera, Leiodidae, Coloninae, Leiodinae, Cholevinae, Platypsyllinae, Atlantic Canada, New Brunswick, Nova Scotia, Newfoundland, Labrador, Prince Edward Island, zoogeography, biodiversity, saproxylic, new records

Introduction

The Leiodidae (the round fungus beetles, the small carrion beetles, and the mammal nest beetles) is a diverse family of beetles that includes species at one time placed in as many as eight separate families. The family is ecologically diverse. For example, in Atlantic Canada it includes *Agathidium* Panzer 1797*,* *Anisotoma* Panzer 1797*,* and *Gelae* Miller and Wheeler, 2004 that feed on the plasmodia and fruiting bodies of slime molds (and to a lesser degree on certain fungi); *Colon* Herbst 1797*, Hydnobius* Schmidt 1847, *Leiodes* Latreille 1796*,* and *Liocyrtusa* Daffner 1982 that are known or believed to be associated with subterranean fungi; *Colenis* Erichson 1845 which is associated with decaying soft fungi; *Catops* Paykull 1798*, Prionochaeta* Horn 1880, and *Sciodrepoides* Hatch 1933 that are scavengers found in various kinds of moist decaying matter, particularly carrion; *Leptinus* Müller 1817 and *Platypsyllus* Ritsema 1869 that are scavengers and ectoparasites associated with aquatic mammals (particularly beavers); and *Nemadus* Thompson 1867 which is a scavenger associated with the nests of harvester ants.

In North America Peck (2001) reported 324 species of Leiodidae. Subsequently Miller and Wheeler (2004, 2005), Peck and Cook (2002, 2007), and Wheeler and Miller (2005) described 32 additional North American species, increasing the total to 356. Peck (1991) recorded 121 species in Canada, 27 of which were known from Atlantic Canada (New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island). Since then Baranowski (1993), Miller and Wheeler (2005), Peck and Cook (2002, 2007), and Peck and Stephan (1996) have added additional records, increasing the known fauna of Atlantic Canada to 42 species. Recent studies on forest beetles in the region, and an examination of reference collections, have made it apparent that the fauna of the Atlantic Provinces is considerably more diverse than has hitherto been known. The present study adds 56 new jurisdictional records to the regional fauna. Twenty-five species are added to the fauna overall, one of which is newly recorded in Canada.

Methods and Conventions

A total of 2,971 specimens of Leiodidae from Atlantic Canada were examined; 86 from Labrador, 1,211 from insular Newfoundland, 183 from New Brunswick, 1,488 from

Nova Scotia, and 3 from Prince Edward Island. Codens (following Evenhuis 2007) of collections referred to in this study are:

CBU Cape Breton University, Sydney, Nova Scotia, Canada
CFNL Canadian Forest Service, Corner Brook, Newfoundland and Labrador, Canada
CGMC Christopher G. Majka collection, Halifax, Nova Scotia, Canada
CMN Canadian Museum of Nature, Ottawa, Ontario, Canada
CNC Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Ontario, Canada
DHWC David H. Webster collection, Kentville, Nova Scotia, Canada
JCC Joyce Cook Collection, North Augusta, Ontario, Canada
MUN Memorial University of Newfoundland collection, Saint John's, Newfoundland and Labrador, Canada (currently on long term loan to the Canadian Forest Service, Edmonton, Alberta)
MZHF Zoological Museum, University of Helsinki, Helsinki, Finland
NBM New Brunswick Museum, Saint John, New Brunswick, Canada
NSMC Nova Scotia Museum, Halifax, Nova Scotia, Canada
NSNR Nova Scotia Department of Natural Resources, Shubenacadie, Nova Scotia, Canada
RWC Reginald Webster Collection, Charters Settlement, New Brunswick, Canada
SBP Stewart B. Peck collection, Ottawa, Ontario, Canada
SMU Saint Mary's University, Halifax, Nova Scotia, Canada
STFX Saint Francis Xavier University, Antigonish, Nova Scotia, Canada
UMNB Université de Moncton, Moncton, New Brunswick, Canada
UPEI University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada

Where there are fewer than 40 specimen records, all are given. Where there are more than 40 specimen records, a summary of specimens is provided and the earliest record is given. Where more recent generic treatments and revisions (i.e., Baranowski 1993) for *Leiodes*; Miller and Wheeler (2005) and Wheeler and Miller (2005) for *Agathidium*; Peck and Cook (2002) for *Catops* and *Sciodrepoides*; and Wheeler (1979) for *Anisotoma*) have provided detailed distribution maps and specimen records, except for noteworthy specimens, only new records are listed herein. In the case of the genus *Colon*, Peck and Stephan (1996) did not include range maps and listed specimen records only for newly described species. Similarly for *Colenis,* specimen records were not provided by Peck (1998) and the distribution map for *C. impunctata* did not include most of Nova Scotia. For these two genera, records of all specimens examined are provided since almost all are hitherto unpublished. The distribution of species in New Brunswick, insular Newfoundland, Nova Scotia, and Prince Edward Island (and occasionally surrounding areas) is shown in the accompanying distribution maps. Records from Labrador (except from the southernmost points) are not shown. Labrador records for most species are shown in the distribution maps in Baranowski

(1993) and Peck and Cook (2002). The nomenclature, classification, and taxonomy employed follow Peck (2002).

Results

Sixty-six species of Leiodidae have now been recorded as occurring in Atlantic Canada (Table 1); 51 in Nova Scotia, 33 in New Brunswick, 25 in insular Newfoundland, 14 in Labrador, and 2 on Prince Edward Island. Of the 51 species recorded in Nova Scotia, 38 were recorded on Cape Breton Island and 40 on the Nova Scotia mainland. Twenty five species including *Colon* (*Colon*) *politum* Peck and Stephan, *Colon* (*Myloechus*) *forceps* Hatch, *Colon* (*Myloechus*) *incisum* Peck and Stephan, *Colon* (*Myloechus*) *schwarzi* Hatch, *Hydnobius arizonensis* Horn, *Anogdus dissimilis* Blatchley, *Anogdus potens* (Brown), *Cyrtusa subtestacea* (Gyllenhal), *Leiodes puncticollis* (Thompson), *Leiodes rufipes* (Gebler), *Agathidium atronitens* Fall, *Agathidium depressum* Fall, *Agathidium difforme* (LeConte), *Agathidium mollinum* Fall, *Agathidium oniscoides* Palisot de Beauvois, *Agathidium pulchrum* LeConte, *Agathidium repentinum* Horn, *Agathidium rusticum* Fall, *Gelae parile* (Fall), *Anisotoma blanchardi* (Horn), *Anisotoma discolor* (Melsheimer), *Anisotoma geminata* (Horn), *Anisotoma globososa* Hatch, and *Prionochaeta opaca* (Say) are newly recorded in Atlantic Canada. One, *Hydnobius arizonensis*, is newly recorded in Canada. *Colon* (*Myloechus*) *hubbardi* Horn is newly recorded in the Maritime Provinces (New Brunswick, Nova Scotia, Prince Edward Island). Eight species are newly recorded in New Brunswick, 29 in Nova Scotia, two on Prince Edward Island, 12 on insular Newfoundland, and five in Labrador for a total of 56 new jurisdictional records. *Catops paramericanus* Peck and Cook and *Catops simplex* Say are newly recorded from mainland Nova Scotia, and records are provided to verify the occurrence of *Leiodes impersonata* Brown and *Leiodes punctostriata* Kirby in Nova Scotia, and *Leptinillus validus* (Horn) in insular Newfoundland. Three species, *Agathidium hatchi* Wheeler, *Catops americanus* Hatch and *Sciodrepoides watsoni* (Spence), are removed from the faunal list of New Brunswick,. As a result, 66 species of Leiodidae are now recorded from Atlantic Canada. Specific details follow below.

Coloninae

Colon (Colon) arcum Peck and Stephan, 1996

NOVA SCOTIA: Inverness Co.: Lone Shieling, Cape Breton Highlands National Park, VII.1983, R.J. Vockeroth, malaise trap, (1, CMN).

Colon arcum was recorded from Nova Scotia by Peck and Stephan 1996) based on the above record (Fig. 1). It was collected in mixed forests between June and August. In general, very little is known about the bionomics of species in the genus *Colon*. They are believed to be associated with subterranean fungi (Peck and Stephan 1996).

Table 1. Leiodidae of the Atlantic Provinces of Canada

	NS	NB	PE	NF	LB	Atlantic distribution	Regional distribution in northeastern North America
Coloninae							
Colon (Colon) arcum Peck & Stephan	1					CB	NH
Colon (Colon) asperatum Horn	1	1				MP?	MA, ME, NH, ON, QC, VT
Colon (Colon) bidentatum Sahlberg*	5	3		1		M-NS	MA, ME, NH, NY, ON, QC
Colon (Colon) horni Szymaczakowski	4	3				NS	MA, ME, NH, NY, ON, QC, VT
Colon (Colon) politum Peck & Stephan*					1	LB	
Colon (Eurycolon) magnicolle Mannerheim	3	2		1	1	W	ME, NH, ON, QC, VT
Colon (Eurycolon) oblongum Blatchley	3					M-NS	MA, NH, NY, ON, QC, VT
Colon (Myloechus) boreale Peck & Stephan	1	1				MP?	ME, NH, ON, QC
Colon (Myloechus) forceps Hatch	1					CB	ME, NH, ON, QC
Colon (Myloechus) hubbardi Horn	5			1		W ?	MA, ME, NH, ON, QC, VT
Colon (Myloechus) incisum Peck & Stephan	3					NS	ON, QC
Colon (Myloechus) schwarzi Hatch	1					CB	NH, ON, QC
Leiodinae							
Sogdini							
Hydnobius arizonensis Horn	1					CB	
Hydnobius substriatus LeConte	5			1		W?	NY, QC
Leiodini							
Anogdus dissimilis Blatchley	2			1	1	S-NS	
Anogdus potens (Brown)		1				N-NB	ME, ON
Cyrtusa subtestacea (Gyllenhal)*	3					S-NS	MA, ME, ON, QC
Leiodes assimilis (LeConte)	11	3		1		W	MA, ME, NH, NY, ON, QC, VT

	NS	NB	PE	NF	LB	Atlantic distribution	Regional distribution in northeastern North America
Leiodes collaris (LeConte)		3		1	1	W (not in NS)	MA, ME, NH, ON, QC
Leiodes contaminabilis Baranowski		1				N-NB	CT, MA, ME, NY, ON
Leiodes impersonata Brown	1	1				MP?	MA, ME, NH, ON, QC
Leiodes neglecta Baranowski	1	1				MP?	ME, ON, QC
Leiodes puncticollis (Thompson)*	1					S-NS	NH, ON, QC
Leiodes punctostriata Kirby	3	1		1	1	W	ME, NH, ON, QC, RI
Leiodes rufipes (Gebler)*	1					CB	ON
Leiodes strigata LeConte		1		1	1	N (NB, NF, LB)	MA, NH, NY, ON
Leiodes triepkei (Schmidt)*		1				N-NB	MA, NH, ON, QC, VT
Leiodes valida (Horn)	1	2		1	1	W	ON, QC
Liocyrtusa luggeri (Hatch)		1				N-NB	ON, QC
Pseudoliodini							
Colenis impunctata LeConte	4	1				MP?	CT, MA, ME, NH, NY, ON, QC, VT
Agathiidini							
Agathidium atronitens Fall	1	1				MP?	NH, NY, ON
Agathidium depressum Fall	1					CB	QC
Agathidium difforme (LeConte)	2	1				MP?	NH, ON, QC
Agathidium fawcettae Miller & Wheeler	12	3				MP	MA, NH, ON, QC
Agathidium mollinum Fall	2	1		1		W	ME, NH, ON
Agathidium oniscoides Palisot de Beauvois	2					MP?	MA, ME, NH, ON, QC
Agathidium pulchrum LeConte	1			1		W?	NH, ON, QC
Agathidium repentinum Horn				1		NF	NH
Agathidium rubellum Fall	6	1				MP	MA, NH
Agathidium rusticum Fall	4					NS	NH, NY, ON

	NS	NB	PE	NF	LB	Atlantic distribution	Regional distribution in northeastern North America
Gelae parile (Fall)	2			1		NS	NH, ON, VT
Anisotoma basalis (LeConte)	5	1		1		W	MA, ME, NH, ON, QC, RI
Anisotoma blanchardi (Horn)	8					NS	MA, NH, ON, QC
Anisotoma discolor (Melsheimer)	5					NS	MA, ME, NH, ON, QC, RI
Anisotoma errans Brown	1			1		N (NF & NS)	NH, ON, QC
Anisotoma geminata (Horn)	5					NS	ME, ON, QC, RI
Anisotoma globososa Hatch				1		NF	MA, NH, NY, ON, QC
Anisotoma inops Brown	11	1		1		W	NH, ON, QC
Anisotoma obsoleta (Horn)	7	2		1		W	ME, NH, ON, QC
Cholevinae							
Anemadini							
Nemadus brachyderus (LeConte)	1	1				MP?	MA, ME, NH, NY, ON, QC, VT
Nemadus integer Fall	1					CB	MA, ME, NH
Nemadus triangulum Jeannel	1					M-NS	CT, MA, ME, NH, NY, ON, QC
Cholevini							
Catops alsiosus alsiosus (Horn)	4	1			1	W	MA, ME, NH, NY, ON, QC
Catops americanus Hatch	8					NS	MA, NH, NY, ON, QC
Catops basilaris Say	13	6		1	1	W	MA, ME, NH, NY, ON, QC, RI
Catops egenus (Horn)					1	LB	
Catops gratiosus (Blanchard)	4					NS	ME, NH, ON, QC
Catops luridipennis Mannerheim*					1	LB	ON, QC
Catops luteipes Thomson*					1	LB	
Catops paramericanus Peck & Cook	8	3				MP	ME, NY, ON, QC
Catops simplex Say	5	3		1	1	W	CT, MA, ME, NH, NY, ON, QC, RI, VT

	NS	NB	PE	NF	LB	Atlantic distribution	Regional distribution in northeastern North America
Prionochaeta opaca (Say)	6	1	1			MP	CT, MA, ME, NH, NY, ON, QC, RI
Sciodrepoides terminans (LeConte)	10	7	1	1	1	W	CT, MA, ME, NH, NY, ON, QC, RI, VT
Sciodrepoides watsoni (Spence)*				1		NF	CT, MA, ME, NH, NY, ON, QC, RI, VT
Platypsyllinae							
Leptinillus validus (Horn)		2		1		W (not in NS)	NH, ON, QC
Platypsyllus castoris Ritsema*				1		NF	ON, QC
County Totals	198	62	2	25	14		
Species Totals	51	33	2	25	14		

Notes: Nova Scotia regions: N, Northern Shore; CB, Cape Breton; E, Eastern Shore; S, South Shore; BF, Bay of Fundy; NS, Nova Scotia; NB, New Brunswick; NF, insular Newfoundland; and LB, Labrador.*, Holarctic species.

Numbers in the table refer to the number of county records, except in the case of Newfoundland and Labrador (where counties are not employed) where they simply indicate presence. There are 18 counties in Nova Scotia (NS), 15 counties in New Brunswick (NB), and 3 counties on Prince Edward Island (PEI).

Atlantic Canada distribution: CB, Cape Breton; LB, Labrador; MP, Maritime Provinces; M-NS, Mainland Nova Scotia; N, Northern; N-NB, Northern New Brunswick; NF, Newfoundland; NS, Nova Scotia; S-NS, Southern New Brunswick; W, widespread in Atlantic Canada.

Regional distribution in northeastern North America: for the purposes of this treatment, northeastern North America is taken to consist of the following jurisdictions in addition to the Atlantic Provinces: CT, Connecticut; MA, Massachusetts; ME, Maine; NH, New Hampshire; NY, New York; ON; Ontario; QC, Québec; RI Rhode Island; PM, Saint-Pierre et Miquelon; and VT, Vermont. Only jurisdictions outside of Atlantic Canada are listed in this column.

Regional distributional information is derived from Baranowski (1993), Chandler (2001), Daffner (1988), Downie and Arnett (1996), Miller and Wheeler (2005), Peck (1991), Peck and Cook (2002, 2007), Peck and Stephan (1996), Sikes (2004), Wheeler (1979), Wheeler and Miller (2005), as well as the present study.

Colon (Colon) asperatum Horn, 1880

NEW BRUNSWICK: Kent Co.: northwest of Moncton on Rte. 116, 21.VII.1992, S. and J. Peck, car net, (1, CNC); **Westmorland Co.:** Shediac, 29.VI.1939, W.J. Brown, (1, CNC). **NOVA SCOTIA: Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 1.VII.1983, J.R. Vockeroth, malaise trap, (1, CNC); MacKenzies Mountain, Cape Breton Highlands National Park, 19.VII.1983, Y. Bousquet, pan trap, (1, CNC).

Colon asperatum was recorded from New Brunswick and Nova Scotia by Peck and Stephan (1996) (Fig. 1). It is frequents bogs and other wet places. Collections have been made between May and October (Peck and Stephan 1996).

Colon (Colon) bidentatum Sahlberg, 1834

NEW BRUNSWICK: Gloucester Co.: 7.VII.1939, 11.VII.1939, and 9.VII.1939, W.J. Brown, (4, CNC); **Kent Co.:** 60 km northwest of Moncton, Rte. 116, 21.VII.1992, S. and J. Peck, forest road, car net, (15, SBP); **York Co.:** Fredericton, 30.V.1931, R.P. Gorham, (1, CNC). **NEWFOUNDLAND:** Gander, 29.VI.1949, W.J. Brown, (5, CNC). **NOVA SCOTIA: Guysborough Co.:** Trafalgar, 19.VII.1992, S. and J. Peck, forest, car net, (1, SBP); **Halifax Co.:** Indian Lake Rd., northwest of Tantallon, 17.VII.1992, S. and J. Peck, car net, (1, SBP); **Queens Co.:** Caledonia, 25.VII.1992, J. and F. Cook, mixed forest, car net, (2, JCC); Medway River, 13.VII.1993, J. and T. Cook, car net, (1, JCC); **Shelburne Co.:** Clyde River, 16.VII.1992, S. and J. Peck, forest, car net, (1, SBP); **Yarmouth Co.:** North Kemptville, 23.VIII.1992, J. and F. Cook, car net, (1, JCC); Quinan, Coldstream Rd., 19.VII.1993, J. and T. Cook, car net, (1, JCC).

This Holarctic species was recorded from New Brunswick, Newfoundland, and Nova Scotia by Peck and Stephan 1996) (Fig. 1). It is found in northern mixed and coniferous forests and at higher elevation forests in mountains (Peck and Stephan 1996).

Colon (Colon) horni Szymaczakowski, 1981

NEW BRUNSWICK: Carleton Co.: 40 km east of Bristol, Rte. 107, 22.VII.1992, S. and J. Peck, forest road, car net, (3, SBP); **Gloucester Co.:** Bathurst, 7.VII.1939, 9.VII.1939, 11.VII.1939, W.J. Brown, (21, CNC); **Kent Co.:** Kouchibouguac National Park, 21.IX.1977, D.B. Lyons, CNC; 60 km northwest of Moncton, Rte. 116, 21.VII.1992, S. and J. Peck, forest road, car net, (31, SBP). **NOVA SCOTIA: Cumberland Co.:** Wentworth Park, 12.VII.1993, J. and T. Cook, car net, JCC; Westchester-Londonderry Rd., 20.VII.1992, S. and J. Peck, forest, car net, (1, SBP); **Guysborough Co.:** Trafalgar, 19.VII.1992, S. and J. Peck, forest, car net, (1, SBP); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, vii.1983, J.R. Vockeroth, malaise trap, (1, CNC); **Queens Co.:** Medway River, 13.VII.1993, J. and T. Cook,

car net, (5, JCC); **Victoria Co.:** North Mountain, Cape Breton Highlands National Park, 1.VII.1983, 7.VII.1983 and 11.VII.1983, pan and malaise traps, (6, CNC). **Yarmouth Co.:** Carleton, Perry Rd., 18.VII.1993, J. and T. Cook, car net, (5, JCC); Coldstream Rd. east of Quinan, 19.VII.1993, J. and F. Cook, car net, (1, JCC).

This Holarctic species was recorded from New Brunswick and Nova Scotia by Peck and Stephan (1996) (Fig. 1). It was collected in forests and forested sphagnum bogs between June and August (Peck and Stephan 1996).

Colon (Colon) politum Peck and Stephan, 1996

LABRADOR: Churchill Falls, 18-26.VII.1996, R.J. Penney, pan trap, (1, CBU).

Colon politum is newly recorded in Labrador and in Atlantic Canada. It is a Holarctic species previously recorded from Alaska east to Saskatchewan (Peck and Stephan 1996). This record represents a range extension of 2,700 km to the east within North America. No specific information is available on the bionomics of this species. Many species of *Colon* are believed to be associated with subterranean fungi (Peck and Stephan 1996).

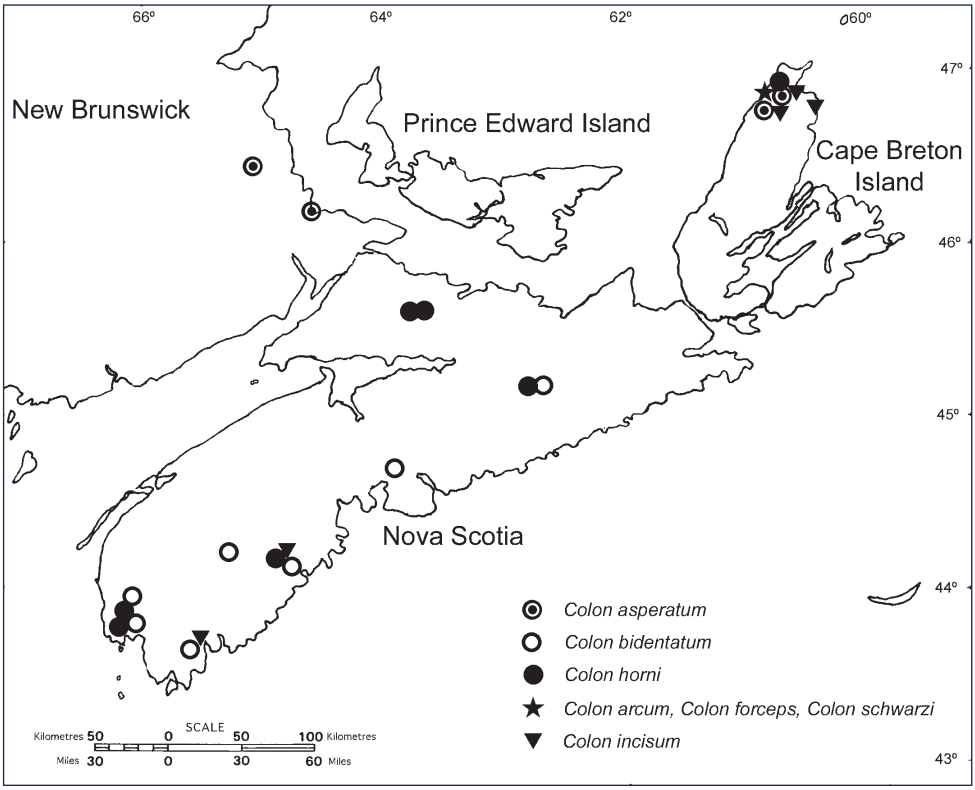

Fig. 1. Distribution of *Colon asperatum, Colon bidentatum*, *Colon horni, Colon arcum, Colon forceps, Colon schwarzi* and *Colon incisum* in Atlantic Canada.

Colon (Eurycolon) magnicolle Mannerheim, 1853

LABRADOR: Wahnahnish Lake near Wabush, 15-17.VII.1981, M. Colbo and D.J. Larson, (1, MUN). **NEW BRUNSWICK: Gloucester Co.**: Bathurst, 7.VII.1939, W.J. Brown, (1, CNC); **Kent Co.:** Route 116, 21.VII.1992, S. and J. Peck, forest, car net, (7, SBP). **NEWFOUNDLAND:** One hundred and fifty-eight specimens were examined from Corner Brook, Gander, Glide Lake, and St. John's. The earliest records are from 1949 (Gander, 29.VI.1949, W.J. Brown, (16, CNC); St. John's, 12.VII.1949, W.J. Brown, (1, CNC)). **NOVA SCOTIA: Cumberland Co.:** Westchester-Londonderry Rd., 20.VII.1992, S. and J. Peck, forest, car net, (1, SBP); **Guysborough Co.:** Trafalgar, 19.VII.1992, S. and J. Peck, forest, car net, (1, SBP); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 19.VI.1983, 22.VI.1983, 25.VI.1983, 28.VI.1983, VII.1983, 7.VII.1983, 11.VII.1983, 21-28.VII.1983, and 8.VI.1984, Y. Bousquet, R. Vockeroth, L. Masner, and A. Smetana, pan and malaise traps, (16, CNC).

Colon magnicolle is newly recorded from Labrador. It was previously reported from New Brunswick, insular Newfoundland, and Nova Scotia by Peck and Stephan (1996) (Fig. 2). It was found in mixed and coniferous forests and forest borders, and in leaf litter and moss between May and October (Peck and Stephan 1996).

Colon (Eurycolon) oblongum Blatchley, 1910

NOVA SCOTIA: Cumberland Co.: Wentworth Park, 12.VII.1993, J. and T. Cook, car net, (1, JCC); Westchester-Londonderry Rd., 20.VII.1992, S. and J. Peck, forest, car net, (1, SBP); **Queens Co.:** Medway River, 13.VII.1993, J. and T. Cook, car net, (6, JCC); **Yarmouth Co.:** Carleton, Perry Rd., 18.VII.1993, J. and T. Cook, car net, (2, JCC).

Colon oblongum was recorded from Nova Scotia by Peck and Stephan 1996) (Fig. 2). It was collected in mixed and deciduous forests and forest edges between January and October (Peck and Stephan 1996).

Colon (Myloechus) boreale Peck and Stephan, 1996

NEW BRUNSWICK: Kent Co.: Kouchibouguac National Park, 13.IX.1977, J.M. Campbell, CNC. **NOVA SCOTIA: Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 18-21.VII.1983, D.E. and J.E. Bright, flight-intercept trap, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 19.VIII.1983, M. Sharkey, (3, CNC); Lone Shieling, Cape Breton Highlands National Park, 8.VI.1984, A. Smetana, (2, CNC).

Colon boreale is newly recorded in Nova Scotia (Fig.2). It was reported from New Brunswick by Peck and Stephan (1996). It was found in deciduous and coniferous forests between May and December (Peck and Stephan 1996).

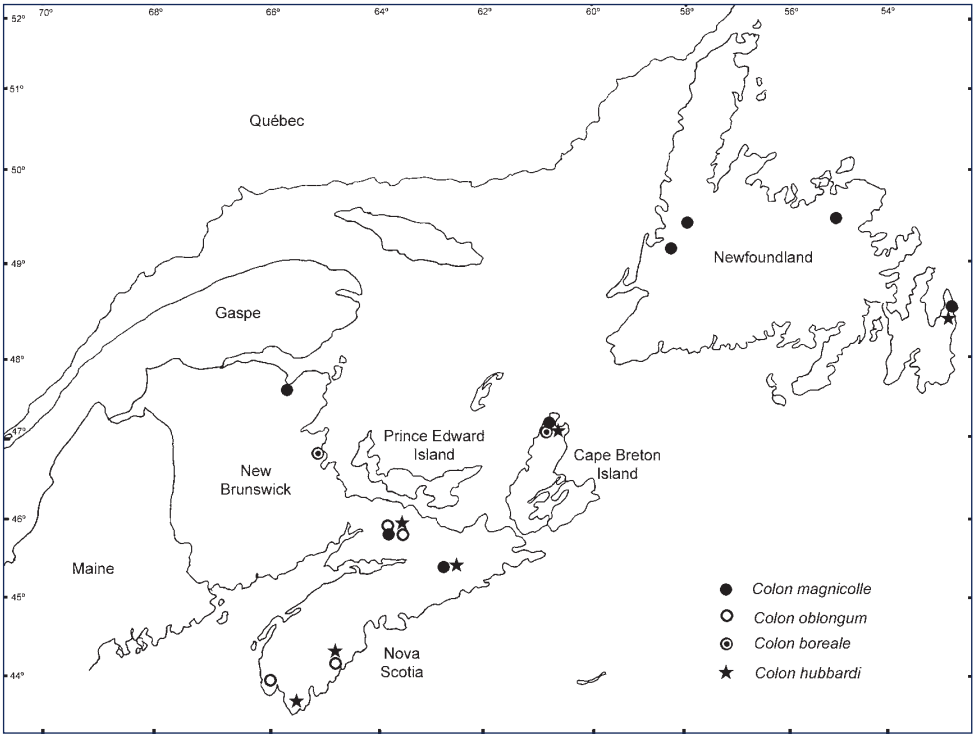

Fig. 2. Distribution of *Colon magnicolle, Colon oblongum, Colon boreale,* and *Colon hubbardi* in Atlantic Canada. Locations in Labrador are not shown.

Colon (Myloechus) forceps Hatch, 1957

NOVA SCOTIA: Inverness Co.: Lone Shieling, Cape Breton Highlands National Park, 29-31.V.1983, L. Masner and H. Goulet, (4, CNC); Lone Shieling, Cape Breton Highlands National Park, 19.VI.193, 22.VI.1983, and 25.VI.1983, pan and malaise traps, (3, CNC); Lone Shieling, Cape Breton Highlands National Park, 28.VI.1983 and 4.VII.1983, J.R. Vockeroth, pan and malaise traps, (2, CNC); Lone Shieling, Cape Breton Highlands National Park, 6-7.VI.1983 and 11-13.VI.1983, H. Goulet, forest, malaise traps, (3, CNC).

Colon forceps is newly recorded in Nova Scotia and Atlantic Canada (Fig 1.). It is found in mixed and coniferous forests between May and November (Peck and Stephan 1996).

Colon (Myloechus) hubbardi Horn, 1880

NEWFOUNDLAND: St. John's, 12.VII.1949, W.J. Brown, (1, CNC). **NOVA SCOTIA: Cumberland Co.:** Wentworth Park, 12.VII.1993, J. and T. Cook, car net, (1, JCC); **Guysborough Co.:** Trafalgar, 19.VII.1992, S. and J. Peck, forest, car net, (1, CUC); **Inverness**

Co.: Lone Shieling, Cape Breton Highlands National Park, 4.VII.1983, J.R. Vockeroth, malaise trap, (1, CNC); **Queens Co.:** Medway River, 13.VII.1993, J. and T. Cook, car net, (1, JCC); **Shelburne Co.:** Clyde River, 16.VII.1992, S. and J. Peck, car net, (1, SBP).

Colon hubbardi is newly recorded in Nova Scotia and Atlantic Canada (Fig. 2). It was collected in a variety of open and forested habitats between March and October (Peck and Stephan 1996).

Colon (Myloechus) incisum Peck and Stephens, 1996

NOVA SCOTIA: Inverness Co.: Lone Shieling, Cape Breton Highlands National Park, vii.1983 and 4.VII.1983, J.R. Vockeroth, malaise trap, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 25.VI.1983, Y. Bousquet, pan trap, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 5.VII.1983, L. LeSage, temporary stream in spruce forest, (1, CNC); **Yarmouth Co.:** Carleton, Perry Road, 18.VII.1993, J. and T. Cook, car net, (1, JCC).

Colon incisum is newly recorded in Nova Scotia and in Atlantic Canada (Fig. 1). It was collected in mixed and coniferous forests between June and September (Peck and Stephan 1996).

Colon (Myloechus) schwarzi Hatch, 1933

NOVA SCOTIA: Inverness Co.: MacKenzies Mt., Cape Breton Highlands National Park, 7.VII.1983, J.R. Vockeroth, malaise trap, (1, CNC); MacKenzies Mt., Cape Breton Highlands National Park, 20.VIII.1983, M. Sharkey, pan trap, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 5.VIII.1983, D.E. and J.E. Bright, flight-intercept trap, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 19.VIII.1983 and 18-26.VIII.1983, M. Sharkey, malaise and pan traps, (2, CNC).

Colon schwarzi is newly recorded in Nova Scotia and in Atlantic Canada (Fig. 1). It was collected in deciduous and coniferous forests and open sites between May and September (Peck and Stephan 1996).

Leiodinae

Hydnobius arizonensis Horn, 1885

NOVA SCOTIA: Inverness Co.: Lone Shieling, Cape Breton Highlands National Park, 1.VII.1983 and 4.VII.1983, J.R. Vockeroth, malaise trap, (3, CNC); Lone Shieling, Cape Breton Highlands National Park, 18-21.VII.1983, D.E. and J.E. Bright, flight-intercept trap, (1, CNC).

Hydnobius arizonensis is reported for the first time in Canada (Fig. 3). Species of *Hydnobius* feed on subterranean fungi (Hatch 1957).

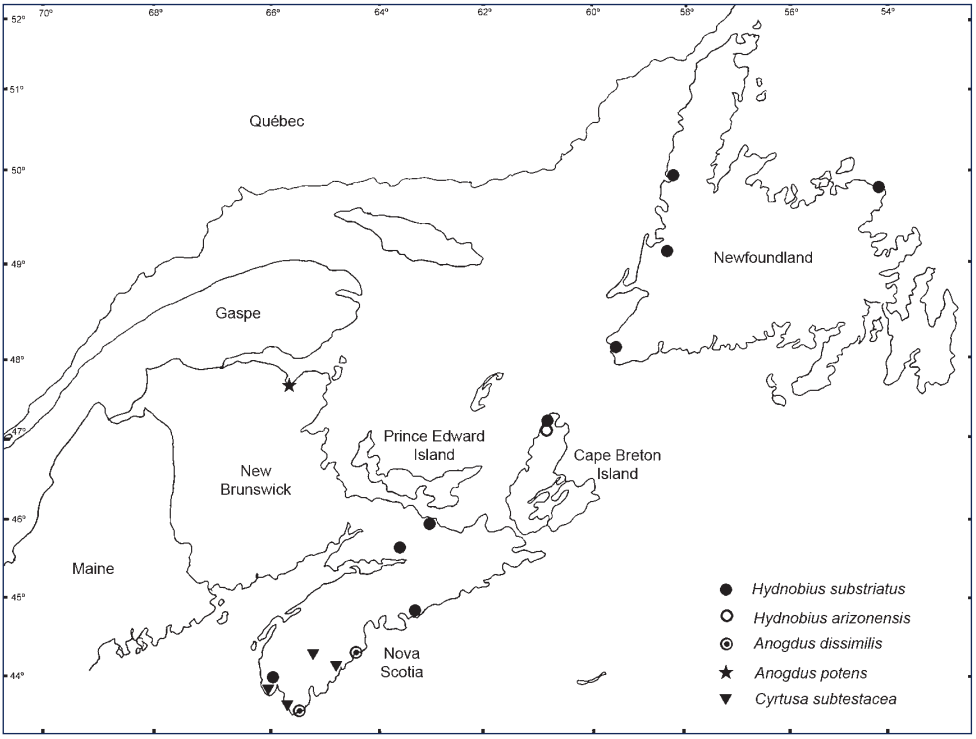

Fig. 3. Distribution of *Hydnobius substriatus, Hydnobius arizonensis, Anogdus dissimilis, Anogdus potens,* and *Cyrtusa subtestacea* in Atlantic Canada. Locations in Labrador are not shown.

Hydnobius substriatus LeConte, 1863

NEWFOUNDLAND: Corner Brook, 16.VIII.1949, E. Palmen, MZHF; Grand Codroy Provincial Park, 15.VI.1979, D.J. Larson and D. Swales, (1, MUN); Rocky Harbour, Gros Morne National Park, 3.VIII-1.IX.2001, W. Coffee, (4, MUN); NE Lumsden, Shalloway Bay, VII-VIII.2001, S.A. Pardy, (1, MUN). **NOVA SCOTIA: Colchester Co.:** Debert, 10.VI.1996, J. Ogden, (1, NSNR); **Halifax Co.:** Porter's Lake, 12.VIII.1987, B. Wright, bog, sweep net, (1, NSMC); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 28.VI.1983, 1.VII.1983, 4.VII.1983, and 11.VII.1983, J.R. Vockeroth, malaise and pan traps, (6, CNC); Lone Shieling, Cape Breton Highlands National Park, 16.VI.1983, 22.VI.1983, and 25.VI.193, Y. Bousquet, pan and flight-intercept traps, (5, CNC). **Pictou Co.:** Lyons Brook, 9.VI.1989, E. Georgeson, light trap, (1, NSNR); **Yarmouth Co.:** North Kemptville, 23.VIII.1992, J. and F. Cook, car net, (1, JCC).

Hydnobius substriatus is newly recorded in Newfoundland. It was recorded from Nova Scotia by Baranowski (1993) (Fig. 3). Species of *Hydnobius* feed on subterranean fungi (Hatch 1957).

Anogdus dissimilis Blatchley, 1916

LABRADOR: Goose Bay, 29-30.VII.1984, D.J. Larson and Morris, MUN. **NEWFOUNDLAND:** Stephenville Crossing, 6.VII.1949, E. Palmen, (1, MZHF); Lumsden, 11.VII.2001 and VII-VIII.2001, S.A. Pardy, sand dunes, (2, MUN); Grand Bay West, VII-VIII.2001, 2.VIII.2002, 4.VIII.2002, 7.VIII.2002, and 14.VIII.2002, S.A. Pardy, sand dunes, (5, MUN); Cape Freels, VII-VIII.2001, 10.VII.2001, 12.VII.2001, 15.VIII.2001, S.A. Pardy, sand dunes, (5, MUN). **NOVA SCOTIA: Lunenburg Co.:** Crescent Beach, 20.VII.1956, E.L. Bousfield, (1, CNC); **Shelburne Co.:** Sebim Beach, 19.VII.1993, J. and T. Cook, (1, JCC).

Anogdus dissimilis is newly recorded in Labrador, Newfoundland, Nova Scotia, and Atlantic Canada (Fig. 3). Little is known about the fungal associations of this genus (Zeran et al. 2007). All the specimens collected in this region were found in sand dunes and other coastal habitats.

Anogdus potens (Brown, 1932)

NEW BRUNSWICK: Gloucester Co.: Bathurst, 7-11.VII.1939, W.J. Brown, (42, CNC).

Anogdus potens is newly recorded in New Brunswick and Atlantic Canada (Fig. 3). These specimens were reported by Daffner (1988), however, the records were erroneously ascribed to Ontario rather than New Brunswick.

Cyrtusa subtestacea (Gyllenhal, 1813)

NOVA SCOTIA: Queens Co.: Caledonia, 25.VII.1992, J. and F. Cook, mixed forest, car net, (1, JCC); Medway River, 13.VII.1993, J. and T. Cook, car net, (14, JCC); Yarmouth Co.: Carleton, Perry Road, 18.VII.1993, J. and T. Cook, car net, (1, JCC); Carleton, Perry Road, 22.VIII.1992, J. and F. Cook, car net, (1, JCC); Yarmouth-Shelburne Co.: Oak Park Road, 27.VIII.1992, J. and F. Cook, car net, (1, JCC).

This Holarctic is species newly recorded in Nova Scotia and Atlantic Canada (Fig. 3). No information on bionomics of this species is available.

Leiodes assimilis (LeConte, 1850)

NEWFOUNDLAND: Cow Head, 9.VIII.1949, E. Palmen, (1, MZHF); Corner Brook, 16.VII.1949, E. Palmen, (1, MZHF); Humber, Steady Brook, 10.VII.1949, E. Palmen, (1, MZHF); Glide Lake, 8.IX.1993, 10.VIII.1994, 23.VIII.1994, 15.IX.1994, W. Bowers, balsam fir burn, (4, CFNL). **NOVA SCOTIA: Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 12.VIII.1983, 11-19.VII.1983, 28.VI.1983, 1.VII.1983, 16.VI.1983, 19,VI.1983, 22.VI.1983, 25.VI.1983, J.E.H.

and R.J. Martin, L. Masner, J.R. Vockeroth, and Y. Bousquet, malaise and pan traps, (15, CNC); MacKenzies Mt., Cape Breton Highlands National Park, 29.VII.1983, 2.VIII.1983, 18-21.VII.1983, and 28.VI.1983, D.E. and J.E. Bright, J.R. Vockeroth, malaise and pan traps, (10, CNC); North Mt., Cape Breton Highlands National Park, 11.VII.1983, J.R. Vockeroth, pan trap, (1, CNC). **Victoria Co.:** North Paquets Lake, Cape Breton Highlands National Park, 25.VI.1983, Y. Bousquet, pan trap, (1, CNC).

Leiodes assimilis was recorded from New Brunswick, Newfoundland, Labrador, and Nova Scotia by Baranowski (1993) (Fig. 4). It is found in open country and forests, especially relatively open deciduous forests, and is a good flyer (Baranowski 1993). In Nova Scotia, it is found in both coniferous and mixed coastal forests. Of particular note is an isolated population on Sable Island that occurs in sand-dune environments (Howden 1970).

Leiodes collaris (LeConte, 1850)

LABRADOR: Wahnahnish Lake near Wabush, 15-17.VII.1981, M. Colbo and D.J. Larson, (11, MUN). **NEWFOUNDLAND:** Gambo, 25.VIII.1949, E. Palmen, (1, MZHF); Kitty's Brook, 18.VIII.1949, E. Palmen, MZHF; Come-by-Chance, 27.VIII.1949, E. Palmen, (1, MZHF).

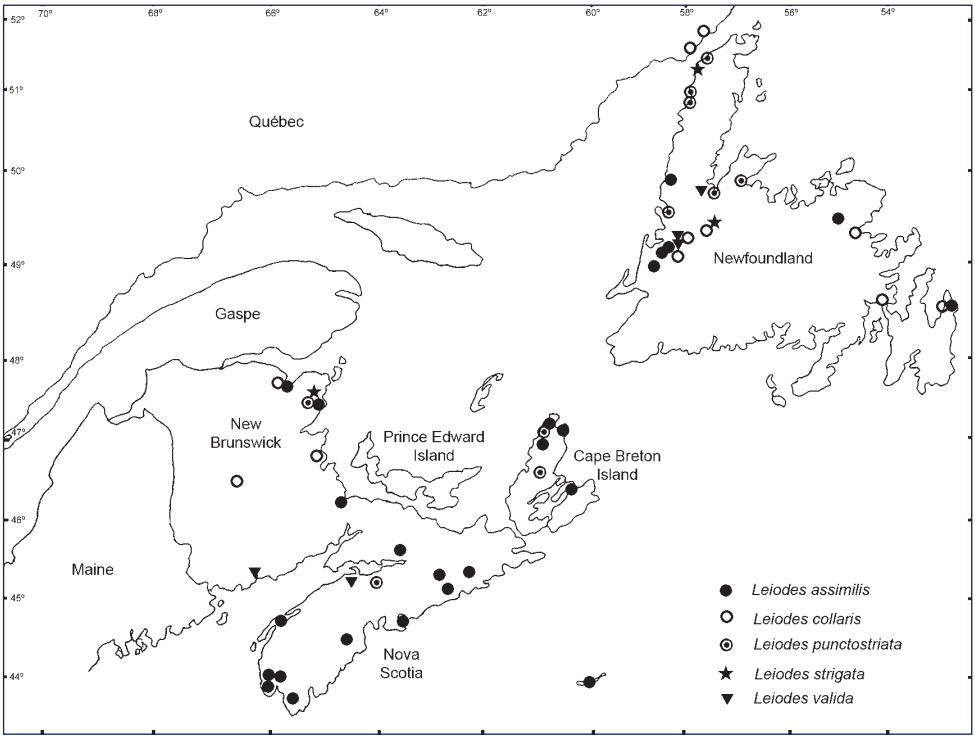

Fig. 4. Distribution of *Leiodes assimilis, Leiodes collaris, Leiodes punctostriata. Leiodes strigata,* and *Leiodes valida* in the Atlantic Provinces. Some locations in Labrador are not shown.

Leiodes collaris was recorded from Labrador, New Brunswick, and Newfoundland by Baranowski (1993) (Fig. 4). It is found in open country, especially on sandy or gravelly soils with low vegetation (Baranowski 1993).

Leiodes contaminabilis Baranowski, 1993

NEW BRUNSWICK: Northumberland Co.: Tabusintac, 20.VI.1939, W.J. Brown, (1, CNC).

Leiodes contaminabilis was recorded from New Brunswick by Baranowski (1993) based on the above record (Fig. 5). The bionomics of the species are completely unknown (Baranowski 1993).

Leiodes impersonata Brown, 1932

NOVA SCOTIA: Victoria Co.: 3 km west of Paquets Lake, Cape Breton Highlands National Park, 17.IX.1984, J.M. Campbell and A. Davies, sifting moss, (3, CNC).

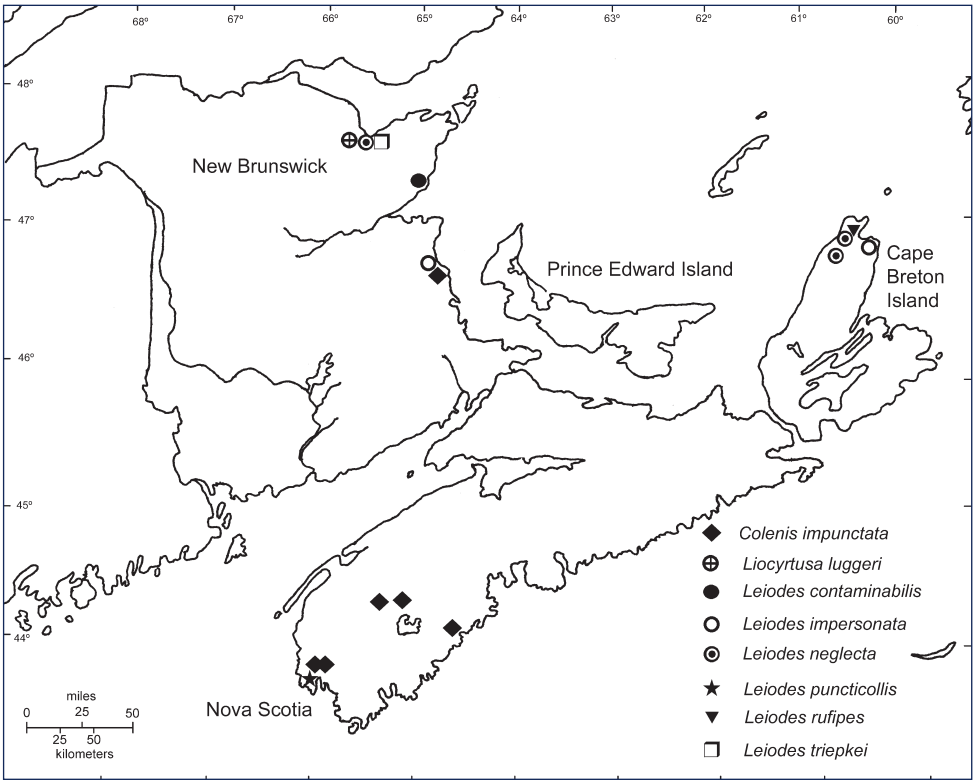

Fig. 5. Distribution of *Colenis impunctata, Liocyrtusa luggeri, Leiodes contaminabilis, Leiodes impersonata, Leiodes neglecta, Leiodes puncticollis, Leiodes rufipes,* and *Leiodes triepkei* in Atlantic Canada.

Although *Leiodes impersonata* was reported for Nova Scotia by Peck (1991), it was not recorded from the province by Baranowski (1993) in his revision of the genus *Leiodes*. The above record establishes the presence of the species in Nova Scotia. It was recorded from New Brunswick by Baranowski (1993) (Fig. 5). Most species of *Leiodes* are believed to feed on subterranean fungi. The identity of these fungi is unknown (Baranowski 1993). It is found along small roads or trails in deciduous forests, especially with rather sandy (but not dry) soil and rich vegetation (Baranowski 1993).

Leiodes neglecta Baranowski, 1993

NOVA SCOTIA: Inverness Co.: Lone Shieling, Cape Breton Highlands National Park, 19.VIII.1983, M. Sharkey, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 21-28.VII.1983, L. Masner, pan trap, (1, CNC); MacKenzies Mt., Cape Breton Highlands National Park, 9.VIII.1983 and 15.VIII.1983, J.E.H. and R.J. Martin, (2, CNC); MacKenzies Mt., Cape Breton Highlands National Park, 20.VIII.1983, M. Sharkey, pan trap, (1, CNC).

Leiodes neglecta is newly recorded from Nova Scotia. It was recorded from New Brunswick by Baranowski (1993) (Fig. 5). A few specimens have been collected in deciduous or mixed forests; otherwise, the bionomics are completely unknown (Baranowski 1993).

Leiodes puncticollis (Thompson, 1862)

NOVA SCOTIA: Yarmouth Co.: Wellington, 12-20.VIII.1991, J. Cook, coastal forest, flight intercept trap, (2, JCC); Wellington, 15-24.VII.1993, J. and T. Cook, mixed coastal forest, (2, JCC).

This Holarctic species is newly recorded in Nova Scotia and Atlantic Canada (Fig. 5). It is predominantly found in mixed forests, in moss and dead leaves. It is an excellent flyer and many have been collected in malaise and flight-intercept traps (Baranowski 1993).

Leiodes punctostriata Kirby, 1837

NEWFOUNDLAND: Daniels Harbour, 22-23.VII.1949, E. Palmen, (4, MZHF); Eddies Cove West, 28.VII.1949, E. Palmen, (3, MZHF); Port au Choix, 4-5.VIII.1949, E. Palmen, MZHF; Port Saunders, 5.VIII.1949, E. Palmen, (10, MZHF); Bonne Bay, Lomond, 15.VII.1949, E. Palmen, (1, MZHF). **NOVA SCOTIA: Hants Co.:** Smiley's Park, 6.VII.2005, J. Ogden, flight-intercept trap, NSNR; Inverness Co.: Lone Shieling, Cape Breton Highlands National Park, 11-18.VII.1983, 19.VI.1983, 18-21.VII.1983, 27-29.VIII.1983, 16.VI.1983, and 11.VII.1983, L. Masner, Y. Bousquet,

D.E. and J.E. Bright, M. Sharkey, and J.R. Vockeroth, pan, malaise, and flight-intercept traps, (9, CNC); **Victoria Co.:** Cape Breton Highlands: Kelly Rd., 10.VII.2005, J. Ogden and K. Godwin, (1, NSNR).

Leiodes punctostriata was recorded from Labrador, New Brunswick, and Newfoundland by Baranowski (1993) (Fig. 4). Although it was reported for Nova Scotia by Peck (1991), it was not recorded from the province by Baranowski (1993). The above records establish its presence in Nova Scotia. It is probably a forest species found in deciduous forests (Baranowski 1993).

Leiodes rufipes (Gebler, 1833)

NOVA SCOTIA: Inverness Co.: Lone Shieling, Cape Breton Highlands National Park, 4.VII.1983, R. Vockeroth, pan trap, (1, CNC).

This Holarctic species is newly recorded in Nova Scotia and in Atlantic Canada (Fig. 5). It is found mainly in woodland sites such as forest meadows, along trails and small forest roads, and in shrubbery along riverbanks (Baranowski 1993).

Leiodes strigata LeConte, 1850

LABRADOR: Wahnahnish Lake near Wabush, 15-17.VII.1981, M. Colbo and D.J. Larson, (1, MUN). **NEWFOUNDLAND:** Kittys Brook, 18.VIII.1949, E. Palmen, (1, MZHF); St. Barbe, 26.VII.1949, E. Palmen, (1, MZHF).

Leiodes strigata is newly recorded in Labrador and Newfoundland (Fig. 4). It was found in meadows along small roads or trails in deciduous forests and also in litter along a creek in a mixed forest (Baranowski 1993).

Leiodes triepkei (Schmidt, 1841)

NEW BRUNSWICK: Gloucester Co.: Bathurst, 9-11.VII.1939, W.J. Brown, (4, CNC).

This Holarctic species was recorded from New Brunswick by Baranowski (1993) based on the above record (Fig. 5). It apparently prefers rather sandy habitats, e.g., sandy meadows with low vegetation, clearing, forest plantations, or other open country, and is rarely found in forests (Baranowski 1993).

Leiodes valida (Horn, 1880)

LABRADOR: Otter Creek, 27.VII.1986, K.E. Pardy, (1, CFNL). **NEWFOUNDLAND:** Daniels Harbour, 22-23.VII.1949, E. Palmen, (1, MZHF); Pasedena, 20.VIII.1980, F. Walsh, (1, CFNL); Glide Lake, 31.VIII.1993, 29.IX.1993, 23.VII.1994, 3.VIII.1994,

23.VIII.1994, W. Bowers, balsam fir burn, (11, CFNL). **NOVA SCOTIA:** Kings Co.: Kentville, 25.IX.2002, D.H. Webster, flying in yard, (1, DHWC).

Leiodes valida is newly recorded in Labrador, Newfoundland, and Nova Scotia. It was recorded from New Brunswick by Baranowski (1993) (Fig. 4). It is the largest North American species in the genus *Leiodes*. Nothing is known of its bionomics (Baranowski 1993).

Liocyrtusa luggeri (Hatch, 1927)

NEW BRUNSWICK: Gloucester Co.: Bathurst, 9.VII.1939 and 11.VII.1939, W.J. Brown, (3, CNC).

Liocyrtusa luggeri was reported from New Brunswick by Peck (1991) (Fig. 5). Species of *Liocyrtusa* are found in forest litter but not on fungi on fallen trees. They may be associated with subterranean fungi (Hoshina and Kanno 2002; H. Hoshino, pers. comm.).

Colenis impunctata LeConte, 1853

NEW BRUNSWICK: Kent Co.: Kouchibouguac National Park, 20.IX.1977, J.M. Campbell and A. Smetana, (6, CNC); Kouchibouguac National Park, 21.IX.1977, A. Smetana, (1, CNC). **NOVA SCOTIA: Annapolis Co.:** Big Dam Lake, Cape Breton Highlands National Park, 27.VI-7.VII.2004, H. Love, hemlock forest, pitfall trap, (1, CGMC); **Queens Co.:** Caledonia, 25.VII.1992, J. and F. Cook, mixed forest, car net, (2, JCC); Medway River, 13.VII.1993, J. and T. Cook, mixed forest, car net, (7, JCC); **Yarmouth Co.:** Carleton, Perry Rd., 22.VIII.1992, J. and T. Cook, mixed forest, car net, (2, JCC); Carleton, Perry Rd., 18.VII.1992, J. and T. Cook, mixed forest, car net, (4, JCC); North Kemptville, 23.VIII.1992, J. and F. Cook, mixed forest, car net, (1, JCC).

Colenis impunctata was reported from Nova Scotia and New Brunswick by Peck (1998) (Fig. 5). It is found in forested habitats in leaf or log litter, especially in association with rotting soft fungi. It was collected between March and October (Peck 1998).

Agathidium atronitens Fall, 1934

NEW BRUNSWICK: Kent Co.: Kouchibouguac National Park, 20.IX.1977, J.M. Campbell and A. Smetana, (6, CNC); Kouchibouguac National Park, 21.IX.1977, J.M. Campbell, (1, CNC). **NOVA SCOTIA: Inverness Co.:** MacKenzies Mountain, 25.VI.1983, Y. Bousquet, pan trap, (1, CNC).

Agathidium atronitens is newly recorded in New Brunswick, Nova Scotia, and Atlantic Canada (Fig. 6). It was recorded from both deciduous and coniferous forests. There is a single host record from *Trametes versicolor* (Fr.) Pil. (Polyporaceae) (Miller and Wheeler 2005).

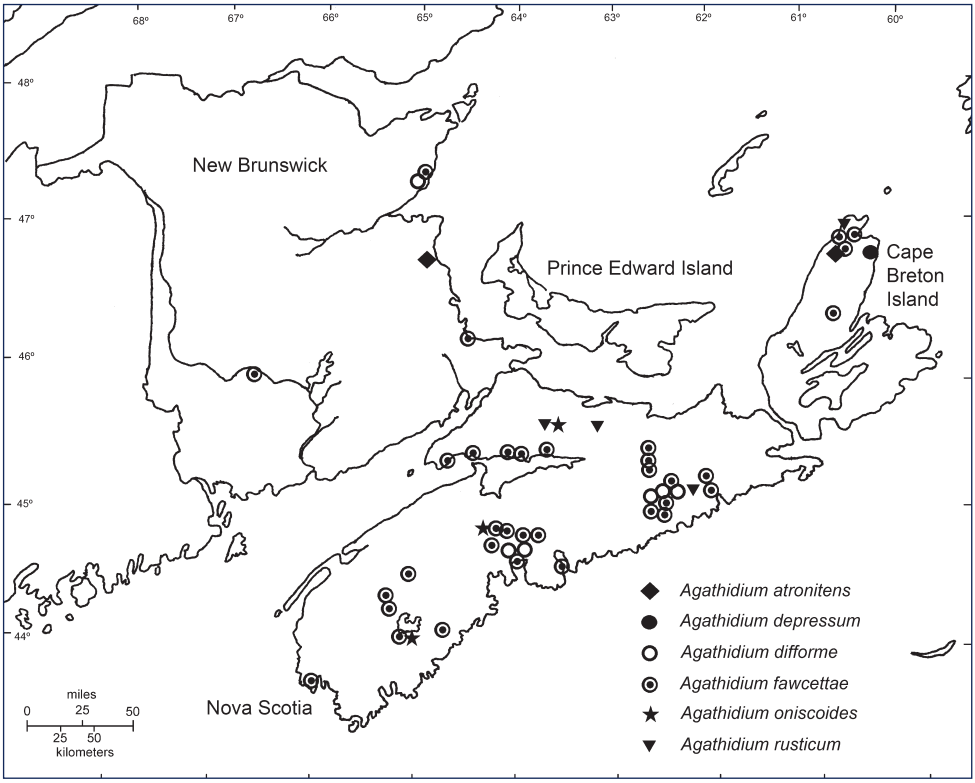

Fig. 6. Distribution of *Agathidium atronitens, Agathidium depressum, Agathidium difforme, Agathidium fawcettae, Agathidium oniscoides,* and *Agathidium rusticum* in Atlantic Canada.

Agathidium depressum Fall, 1934

NOVA SCOTIA: Victoria Co.: Still Brook, Cape Breton Highlands National Park, 5.VII.1983, L. LeSage, temporary stream in spruce forest, (1, CNC).

Agathidium depressum is newly recorded in Nova Scotia and in Atlantic Canada (Fig. 6). It was collected from a variety of litter sources including rotten logs and pine duff. In Alaska, it was collected on the slime molds (myxomycetes) *Stemonitis fusca* Roth and *Badhamia* sp. (Wheeler and Miller 2005).

Agathidium difforme (LeConte, 1850)

NEW BRUNSWICK: Northumberland Co.: Tabusintac, 18.VI.1939, W.J. Brown, (1, CNC). **NOVA SCOTIA: Guysborough Co.:** George Lake, 15-30.VI.1997, D.J. Bishop, red spruce forest, (1, NSMC); **Halifax Co.:** Big St. Margarets Bay, 1-16. VII.1997, D.J. Bishop, red spruce forest, (1, NSMC); Moser Lake, 2-15.VI.1997, D.J. Bishop, red spruce forest, (1, NSMC); Pogwa Lake, 15-30.VI.1987, D.J. Bishop,

red spruce forest, (1, NSMC); Ten Mile Lake, 15-30.VI.1997, D.J. Bishop, red spruce forest, (2, NSMC).

Agathidium difforme is newly recorded in New Brunswick, Nova Scotia, and in Atlantic Canada (Fig. 6). It was collected in fir, pine, spruce, birch, maple, and poplar forests. Host records include the slime molds *Stemonitis* sp. and a "red, tubular slime mold" (Miller and Wheeler 2005). All the specimens collected in Nova Scotia were found in red spruce forests.

Agathidium fawcettae Miller and Wheeler, 2005

NEW BRUNSWICK: Northumberland Co.: Tabusintac, 19.VI.1939, 20.VI.1939, W.J. Brown, (2, CNC); **York Co.:** Fredericton, 2.VII.1928, W.J. Brown, (1, CNC); **Westmorland Co.:** Shediac, 4.VII, 1939, W.J. Brown, (1, CNC). **NOVA SCOTIA:** One hundred and forty specimens were examined from Annapolis, Colchester, Cumberland, Guysborough, Halifax, Inverness, Lunenburg, Pictou, Queens, Victoria, and Yarmouth counties. The earliest record is from 1929 (**Colchester Co.:** Portapique, 25.VIII.1929, C.A. Frost, (1, CNC)).

Agathidium fawcettae is newly recorded in New Brunswick. It was reported from Nova Scotia by Miller and Wheeler (2005) (Fig. 6). It was collected throughout the year in coniferous and deciduous forests from a wide variety of litter types. In Nova Scotia, it was found in variously aged deciduous forests (red maple, red oak, birch), in coniferous forests (red spruce, black spruce, hemlock, balsam fir), and in mixed and coastal forests. It was collected with flight-intercept traps, pitfall traps, and by hand collecting. There is one record from leaf litter, and one specimen found in a decomposing red spruce log. Recorded hosts include the slime molds *Fulgio septica* (L.) Wigg., *Physarum viride* (Bull.) Pers., *Leocarpus fragilis* (Dicks.) Rost., *Hemitrichia clavata* (Pers.) Rostaf., and *Badhamia* sp. (Miller and Wheeler 2005).

Prior to the description of this species, several specimens in this series had been identified as *Agathidium exiguum* Melsheimer. These two species can only be reliably separated on the basis of the features of male genitalia. All the males examined and micro-dissected as part of this study proved to be *A. fawcettae*. Accordingly, the present authors conclude that there is no evidence that *A. exiguum* occurs in the region. Miller and Wheeler (2005) reported *A. exiguum* in North America east to Ontario and north to New Hampshire.

Agathidium hatchi Wheeler, 1977

Agathidium hatchi was reported by Miller and Wheeler (2005) from a series of female specimens collected in northwestern Oregon and a single male specimen apparently collected in Frederickton (sic), New Brunswick (20.III.1961, R.C. Clark, Utah State University). Miller and Wheeler (2005: 21) wrote, that "The distribution of the species

is unusual in that specimens are known from Oregon and New Brunswick, but from nowhere in between. The Oregon specimens (including the type) are females and the New Brunswick specimen is a male. Therefore, there is some possibility the specimens represent different species ...," and "It is also possible that the New Brunswick specimen is mislabeled."

The preponderance of evidence indicates that the record from New Brunswick is erroneous and resulted from a mislabeled specimen. Several reasons indicate this:

a) for most of his career R.C. Clark worked on control of balsam wooly adelgid [*Adelges piceae* (Ratzeburg)] and he never conducted research on Coleoptera (W. Varty, pers. comm.);

b) the weather conditions on 20 March, 1961 Fredericton were fully winter-like. Temperatures ranged from -12.8°C (low) to -2.2°C (high) and there was 64 cm of snow on the ground (National Climate Archive 2007), highly improbable circumstances in which to find a slime mold beetle such as *Agathidium*;

c) if R.C. Clark (who worked for the Canadian Forestry Service) had collected any *Agathidium* specimens incidentally as part of his research, some specimens would have been deposited in the Atlantic Forestry Centre research collection in Fredericton. There are no such specimens in the collection (G. Smith and J. Sweeney, pers. comm.);

d) R.C. Clark lived in Fredericton for over three decades and it is highly unlikely that he would misspell the name of the capital city of New Brunswick as "Frederickton";

e) in the 1960s there were no scientific exchanges or research programs between Atlantic Forestry Centre and Utah State University (W. Varty, pers. comm.).

Thus, there is no evidence that would indicate that this specimen was actually collected in New Brunswick. Accordingly, we remove this species form the New Brunswick faunal list.

Agathidium mollinum Fall, 1934

NEW BRUNSWICK: Kent Co.: Kouchibouguac National Park, 13.IX.1977, J.M. Campbell, CNC. **NEWFOUNDLAND:** Little Grand Lake, 2 km east of Martin Pond, 15.VII-25.VIII.1992, old fir forest, pitfall trap, (1, MUN). **NOVA SCOTIA: Guysborough Co.:** Seloam Lake, 2-15.VI.1997, D.J. Bishop, red spruce forest, flight-intercept trap, (1, NSMC); **Inverness Co.:** MacKenzies Mtn., 4.VI.1983, R. Vockeroth, pan trap, (1, CNC); MacKenzies Mtn., 27-29.VIII.1983, M. Sharkey, (1, CNC); MacKenzies Mtn., 18.IX.1983, J.M. Campbell and A. Davies, sifting mosses, (1, CNC); **Victoria Co.:** North Mtn., VIII.1983, D.E. and J.E. Bright, (1, CNC); **Yarmouth Co.:** Wellington, 12-20.VIII.1991, J. Cook, coastal forest, flight-intercept trap, (1, JCC).

Agathidium mollinum is newly recorded in New Brunswick, Newfoundland, Nova Scotia, and in Atlantic Canada (Fig. 7). It was recorded from birch, fir, maple, and conifer litter and from a fern rhizome. Host records include the slime molds *Cribraria purpurea* Schrad., *Diderma floriforme* (Bull.) Pers., and *Stemonitis axifera* (Bull.) T. Macabr. (Miller and Wheeler 2005).

Agathidium oniscoides Palisot de Beauvois, 1817

NOVA SCOTIA: Cumberland Co.: Wentworth, 21.V.1965, B. Wright, (1, NSMC); **Queens Co.:** Sixth Lake, 18.VI.2003, P. Dollin, old-growth hemlock forest, pitfall trap, (1, NSMC).

Agathidium oniscoides is newly recorded in Nova Scotia and in Atlantic Canada as a whole (Fig. 6). This species was collected throughout the year (except for January) in various deciduous forest habitats in leaf and log litter samples. Host records include the fungi *Bjerkandera adusta* (Fr.) Kar., and "fleshy fungi," and the slime molds *Fulgio septica*, *Ceratiomyxa fruticulosa* (Müll.) Mac., and other myxomycetes (Miller and Wheeler 2005). The Nova Scotia record in an old-growth hemlock forest is noteworthy.

Agathidium pulchrum LeConte, 1853

NEWFOUNDLAND: Burgeo, Grandy Brook, 24.VI.1949, E. Palmen, (1, MZHF); Stephenville: Barachois Pond Park, 23.VII-19.VIII.1997, S. and J. Peck, fir-deciduous forest, flight-intercept trap, (1, MUN). **NOVA SCOTIA: Yarmouth Co.:** Cape Forchu, West Cape, 28.VI-4.VII.1995, J. and F. Cook, flight-intercept trap, (1, JCC).

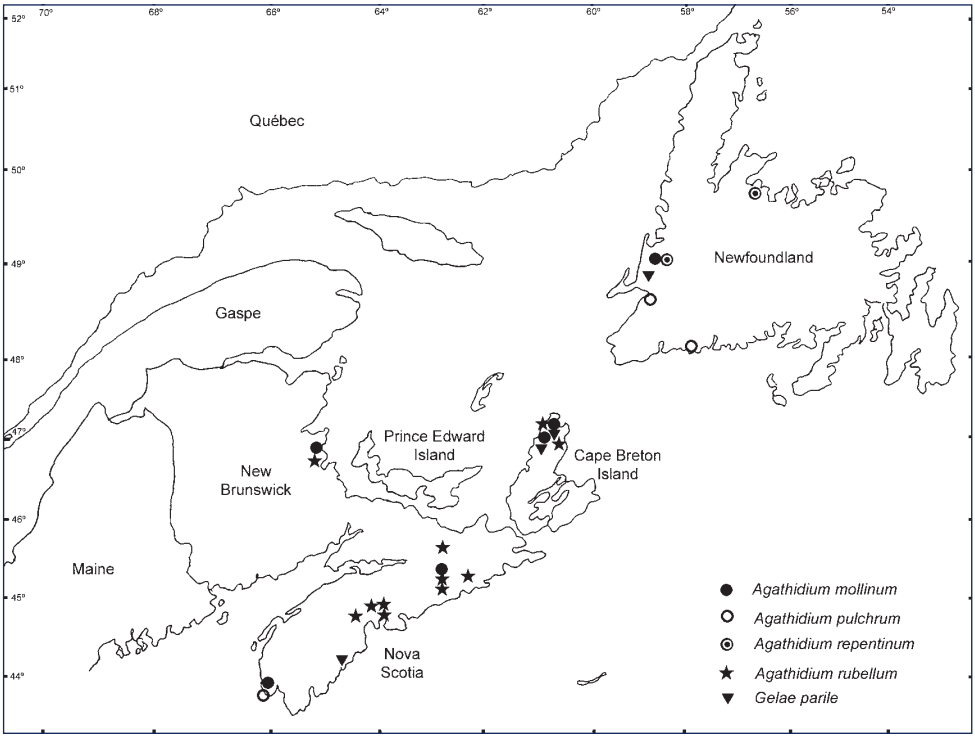

Fig. 7. Distribution of *Agathidium mollinum, Agathidium pulchrum, Agathidium repentinum, Agathidium rubellum,* and *Gelae parile* in Atlantic Canada.

Agathidium pulchrum is newly recorded in Newfoundland, Nova Scotia, and in Atlantic Canada as a whole (Fig. 7). It has been collected in many different coniferous and deciduous forests, from moss duff, and in riparian areas between May and September. Host records include the slime molds *Arcyria nutans* (Bull.) Grev., *Comatrichia* sp., *Stemonitis flavogenita* E. Jahn, *Trichia decipiens* (Meyl.) Y. Yamam, and *Tubifera ferruginosa* (Batsch) J.F. Gmelin, and the fungi *Lenzites betulina* (Fr.) Fr., *Tramates versicolor* (Fr.) Pil., and *Stereum* sp. (Miller and Wheeler 2005).

Agathidium repentinum Horn, 1880

NEWFOUNDLAND: Little Grand Lake, 2 km east of Martin Pond, 24.VI-15.VII.1992 and 15.VII-25.VIII.1992, old fir forest, pitfall trap, (3, MUN); Little Grand Lake, Bakeapple Brook, 24.VI-15.VII.1992 and 15.VII-25.VIII.1992, old fir forest, pitfall trap, (2, MUN); South Pond near South Brook, 11.VI.1979, D.J. Larson and D. Swales, (2, MUN).

Agathidium repentinum is newly recorded in Newfoundland and in Atlantic Canada (Fig. 7). This northern species was collected in conifer, poplar, and taiga-willow forests in leaf litter, *Sphagnum* moss, and on moose dung (Miller and Wheeler 2005).

Agathidium rubellum Fall, 1934

NEW BRUNSWICK: Kent Co.: Kouchibouguac National Park, 16.VII.1977, I. Smith, (1, CNC). **NOVA SCOTIA: Guysborough Co.:** George Lake, 1-16.VII.1997, D.J. Bishop, red spruce forest (2, NSMC); **Halifax Co.:** Big St. Margarets Bay, 15-30.VII.1997, D.J. Bishop, old-growth red spruce forest, (2, NSMC); Campbell Hill, 15-30.VI.1997 and 1-16.VII.1997, D.J. Bishop, mature red spruce forest, (2, NSMC); Lake Little, 1-16.VII.1997, D.J. Bishop, red spruce forest, (2, NSMC); Pockwock Lake, 1-16.VII.1997, D.J. Bishop, mature red spruce forest, (2, NSMC); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 20.VII.1983, D.E. and J.E. Bright, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 19.VI.1983, Y. Bousquet, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 19.VIII.1983, M. Sharkey, (1, CNC); **Lunenburg Co.:** Card Lake, 15-30.VI.1997 and 1-16.VII.1997, D.J. Bishop, old-growth red spruce/hemlock forest, (2, NSMC); Pictou Co.: 1-16.VII.1997, D.J. Bishop, mature red spruce/hemlock forest, (1, NSMC); **Victoria Co.:** Beulach Ban Falls, Cape Breton Highlands National Park, 13.VI.1983, A. Smetana, (1, CNC).

Agathidium rubellum is newly recorded in New Brunswick. It was reported from Nova Scotia by Miller and Wheeler (2005) (Fig. 7). It was found in eastern hardwood forests in leaf and log litter. There are host records from *Tubifera ferruginea* (Miller and Wheeler 2005). Specimens in Nova Scotia were collected in red spruce, eastern hemlock, and deciduous forests.

Agathidium rusticum Fall, 1934

NOVA SCOTIA: Colchester Co.: Nuttby Mt., 1.VI.1995, C. Corkum, old deciduous forest, flight-intercept trap, (1, NSMC); **Cumberland Co.:** Wentworth, 21.V.1965, B. Wright, (1, NSMC); **Guysborough Co.:** George Lake, 14.V-2.VII.1997, D.J. Bishop, young red spruce forest, flight-intercept trap, (1, NSMC); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 11-18.VII.1983, L. Masner, flight-intercept trap, (1, CNC).

Agathidium rusticum is newly recorded in Nova Scotia, and the Atlantic Provinces (Fig. 6). In Nova Scotia, it was collected in both coniferous and deciduous forests. No other information on the bionomics of the species is available.

Gelae parile (Fall, 1934)

NEWFOUNDLAND: Spruce Brook, 9.VII.1949, E. Palmen, (2, MZHF). **NOVA SCOTIA: Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, vii.1983, R. Vockeroth, malaise trap, (2, CNC); MacKenzies Mtn., Cape Breton Highlands National Park, 11-18.VII.1983, R. Vockeroth, pan trap, (2, CNC); **Queens Co.:** Medway River, 13.VII.1993, J and T. Cook, car net, (2, JCC).

Gelae parile is newly recorded in Newfoundland, Nova Scotia, and in Atlantic Canada as a whole (Fig. 7). It was collected in hemlock, pine, aspen, fir, maple, and other forests from a variety of litter sources such as rotting stumps, and leaf litter. There are host records from the slime molds *Cribraria* sp. and *Dictydium cancellatum* (Batch) McBride (Miller and Wheeler 2004).

Anisotoma basalis (LeConte, 1853)

NEW BRUNSWICK: Charlotte Co.: St. George, 5.VII.1963, R.C. Clarke, window trap, (1, CFNL). **NEWFOUNDLAND:** 30 miles south of Glenwood, 22.VI.1988, (1, MUN); Baie Verte, 20.VI.1988 and 22.VI.1988, P. Dixon, malaise trap, (2, CFNL). **NOVA SCOTIA: Halifax Co.:** Abraham Lake, 16-29.VII.1997, D.J. Bishop, old-growth red spruce forest, flight-intercept trap, (1, NSMC); Pockwock Lake, 15-30. VI.1997, D.J. Bishop, red spruce forest, flight-intercept trap, (1, NSMC); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 11-13.VI.1983, H. Goulet, forest, malaise trap, (1, CNC); Lone Shieling, Cape Breton Highlands National Park, 11.VII.1983, J.R. Vockeroth, forest, malaise trap, (1, CNC); MacKenzies Mountain, Cape Breton Highlands National Park, 19.VI.1983, Y. Bousquet, pan trap, (1, CNC); MacKenzies Mountain, Cape Breton Highlands National Park, 7.VII.1983, J.R. Vockeroth, malaise trap, (3, CNC); **Lunenburg Co.:** Card Lake, 16-29.VII.1997, D.J. Bishop, old-growth red spruce-hemlock forest, flight-intercept trap, (1, NSMC); **Queens Co.:** Medway River, 13.VII.1993, J. and T. Cook, car net, (1, JCC); **Yar-**

mouth Co.: Wellington, 15-24.VII.1993, J. and T. Cook, flight-intercept trap, (1, JCC); Wellington, 1-7.VI.1993, J. and T. Cook, mixed coastal forest, flight-intercept trap, (2, JCC).

Anisotoma basalis is newly recorded in New Brunswick and Newfoundland (Fig. 8). It is listed as occurring in Nova Scotia by Peck (1991). Adults have been found between April and September. Slime mold hosts include *Stemonitis axifera, S. fusca, Stemonitis splendens* Rostaf, and *Fuligo* sp. (Wheeler 1979).

Anisotoma blanchardi (Horn, 1880)

NOVA SCOTIA: Annapolis Co.: Channel Lake, 6-17.VII.2005, S. Poirier, maple-oak-birch forest, (1, CGMC); **Colchester Co.:** Debert, 17.VI.1993, E. Georgeson, (1, NSNR); **Cumberland Co.:** Spencer's Island, 29.VI.1995, C. Corkum, old coniferous forest, flight-intercept trap, (1, NSMC); Westchester-Londonderry, 20.VII.1992, S. and J. Peck, forest road, car net, (1, JCC); **Guysborough Co.:** George Lake, 1-16. VII.1997, D.J. Bishop, red spruce forest, flight-intercept trap, (1, NSMC); **Halifax Co.:** Abraham's Lake, 1-16.VII.1997, D.J. Bishop, old-growth red spruce forest, flight-

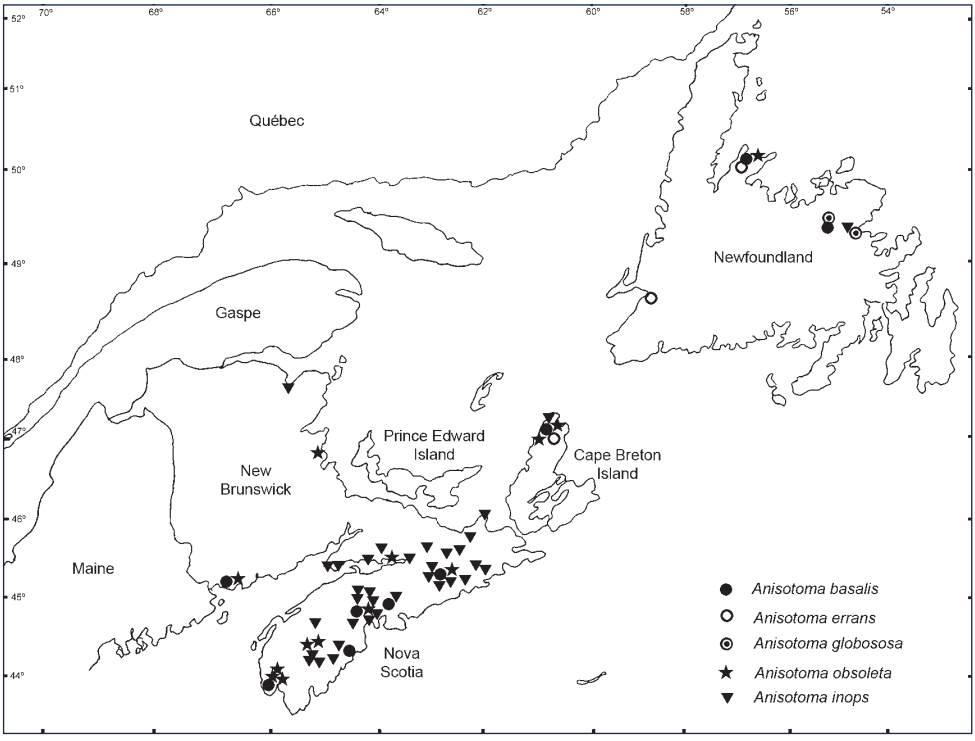

Fig. 8. Distribution of *Anisotoma basalis, Anisotoma errans, Anisotoma globososa, Anisotoma obsoleta,* and *Anisotoma inops* in Atlantic Canada.

intercept trap, (1, NSMC); Pockwock Lake, 20.VII.1970, P. Doleman, in moss in decaying stump, (1, NSMC); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 1.VII.1983, 4.VII.1983, 11.VII.1983, and VII.1983, J.R. Vockeroth, forest, malaise trap, (6, CNC); **Queens Co.:** Medway River, 13.VII.1993, J. and T. Cook, car net, (4, JCC); **Yarmouth Co.:** Wellington, 1-7.VI.1999, J. Cook, mixed coastal forest, flight-intercept trap, (1, JCC).

Anisotoma blanchardi is newly recorded in Nova Scotia and in Atlantic Canada (Fig. 9). It was collected between May and September in log and forest floor litter. Slime mold hosts include *Stemonitis fusca*, *Metatricha* sp., and *Lycogola* sp. (Wheeler 1979).

Anisotoma discolor (Melsheimer, 1844)

NOVA SCOTIA: Annapolis Co.: Channel Lake, Kejimkujik National Park, 13-21. VIII.2005, R. Ewing, maple-oak-birch forest, pitfall trap, (1, CGMC); Channel Lake, Kejimkujik National Park, 6-17.VII.2005, S. Poirier, maple-oak-birch forest, pitfall trap, (1, CGMC); Durland Lake, 3.VIII.2003, P. Dollin, hemlock-black spruce-balsam fir forest, in decaying red maple log, (1, NSMC); **Digby Co.:** Kejimkujik National Park: Pebbleloggitch Lake, 28.VI-7.VII.2004, H. Love, maple-oak-birch forest, pitfall trap, (1, CGMC); **Inverness Co.:** MacKenzies Mountain, Cape Breton Highlands National Park, 19-21.VII.1983, D.E. and J.E. Bright, pan trap, (1, CNC); **Queens Co.:** Black Duck Lake, 18.VI.2003, P. Dollin, white pine forest, polypore fungus, (2, NSMC); Black Duck Lake, 1.VIII.2003, P. Dollin, white pine-red spruce forest, *Lycoperdon* sp., (2, NSMC); Sixth Lake, 20.VI.2003, P. Dollin, old-growth hemlock forest, "orange ball fungus", (3, NSMC); Tobeatic Lake, 17.VI.2003, P. Dollin, red spruce forest, decomposing red maple log, (2, NSMC); Medway River, 13.VII.1993, J. and T. Cook, car net, (7, JCC).

Anisotoma discolor is newly recorded in Nova Scotia and in Atlantic Canada (Fig. 9). Adults have been collected between February and October from oak and pine bark and in leaf litter. Slime mold hosts include *Stemonitis axifera, S. fusca, S. splendens*, *Fuligo septica*, and *Comatricha nigra* (Pers.) J. Schroet. (Wheeler 1979).

Anisotoma errans Brown, 1937

NEWFOUNDLAND: Lake Ambrose, 23.VI.1988, P. Dixon, malaise trap, (2, CFNL); Baie Verte, 20.VI.1988, P. Dixon, malaise trap, (2, CFNL); Stephenville: Barachois Pond Park, 23.VII-19.VIII.1997, S. and J. Peck, fir-deciduous forest, flight-intercept trap, (3, MUN). **NOVA SCOTIA: Inverness Co.:** MacKenzies Mountain, Cape Breton Highlands National Park, 19.VI.1983, Y. Bousquet, pan trap, (1, CNC).

Anisotoma errans is newly recorded from Newfoundland (Fig. 8). It was reported from Nova Scotia by Peck (1991). Adults have been found between April and July in association with hemlock moss, willow and mixed conifer litter, and on conifer bark. Slime mold hosts include *Stemonitis* sp. and *Fuligo septica* (Wheeler 1979).

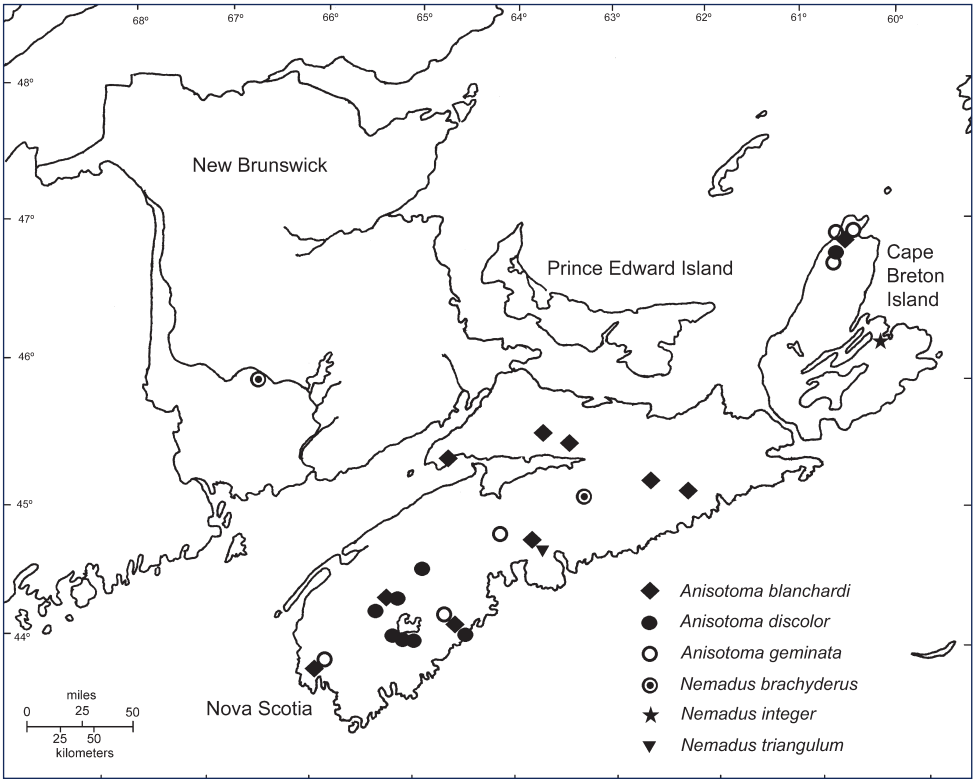

Fig. 9. Distribution of *Anisotoma blanchardi, Anisotoma discolor, Anisotoma geminata, Nemadus brachyderus, Nemadus integer,* and *Nemadus triangulum* in Atlantic Canada.

Anisotoma geminata (Horn, 1880)

NOVA SCOTIA: Hants Co.: Panuke Lake, 16-29.1997, D.J. Bishop, red spruce forest, flight-intercept trap, (1, NSMC); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 19.VI-9.VIII.1983, various collectors, (10 CNC); MacKenzies Mountain, Cape Breton Highlands National Park, 19.VI-9.VIII.1983, various collectors, (9, CNC); MacKenzies Mountain, Cape Breton Highlands National Park, 25.VI.1983, Y. Bousquet, pan trap, (2, CNC); **Queens Co.:** Medway River, 13.VII.1993, J. and T. Cook, car net, (1, JCC); **Victoria Co.:** North Mountain, 19.VI-9.VIII.1983, (1, CNC); **Yarmouth Co.:** Wellington, 12-20.VIII.1991, J. Cook, flight-intercept trap, (1, JCC); Wellington, 25.VI-3.VII.1995, J. and F. Cook, mixed forest, flight-intercept trap, (1, JCC); Wellington, 15-24.VII.1993, J. and T. Cook, flight-intercept trap, (3, JCC).

Anisotoma geminata is newly recorded in Nova Scotia and in Atlantic Canada (Fig. 9). Adults have been found between April and December in stump and forest litter. Slime mold hosts include *Stemonitis axifera, S. fusca,* and *Tubifera ferruginosa* (Wheeler 1979).

Anisotoma globososa Hatch, 1929

NEWFOUNDLAND: 3 km east of Gambo, 1.VI.1982, D. Langor and A. Raske, under bark of red pine, (3, MUN); 20 mi south of Glenwood, 22.VI.1988, (1, MUN).

Anisotoma globososa is newly recorded in Newfoundland and in Atlantic Canada (Fig. 8). Adults have been found between March and September on bark, fungi, and slime molds on trees (Wheeler 1979).

Anisotoma inops Brown, 1937

NEW BRUNSWICK: Gloucester Co.: Bathurst, VII.1925, J.N. Knull, (1, CNC). **NEWFOUNDLAND:** 3 km east of Gambo, 1.VI.1982, D. Langor and A. Raske, under bark of red pine, (3, MUN). **NOVA SCOTIA:** One hundred and eighteen specimens from Annapolis, Antigonish, Colchester, Cumberland, Guysborough, Halifax, Hants, Inverness, Lunenburg, Pictou, and Queens counties. The earliest record is from 1993 (**Queens Co.:** Medway River, 13.VII.1993, J. and T. Cook, car net, (1, JCC)).

Anisotoma inops is newly recorded from Newfoundland and Nova Scotia (Fig. 8). It was listed as occurring in New Brunswick by Peck (1991). Adults have been found between May and September (Wheeler 1979). In Nova Scotia, it was found almost exclusively in coniferous forests in red spruce, black spruce, hemlock, white pine, and balsam fir stands. Specimens were found in a decaying red maple log, in polypore fungi on a red spruce log, in polypore fungi on white birch and balsam fir, in decaying gill fungi, in *Lycoperdon* sp. fungi, in a decaying red spruce, and in an "orange ball mushroom." In Newfoundland, it was found associated with decaying red pine.

Anisotoma obsoleta (Horn, 1880) – **revalidated name**
[syn. nov. *Anisotoma horni* Wheeler, 1979]

NEW BRUNSWICK: Charlotte Co.: St. George, 5.VII.1963, R.C. Clarke, window trap, (1, CFNL); **Kent Co.:** Kouchibouguac National Park, 16.IX.1977, A. Smetana, (1, CNC); Kouchibouguac National Park, 7.VI.1977, J.R. Vockeroth, (1, CNC). **NEWFOUNDLAND:** Baie Verte, 7.IX.1988, P. Dixon, malaise trap, (1, CFNL). **NOVA SCOTIA:** One hundred and sixty-five specimens from Colchester, Guysborough, Halifax, Inverness, Queens, Victoria, and Yarmouth counties were examined. The earliest record is from 1970 (**Colchester Co.:** Glenholm, 3.VI.1970, P. Doleman, (1, NSMC)).

Anisotoma obsoleta is newly recorded from Newfoundland and Nova Scotia (Fig. 8). It was listed as occurring in New Brunswick by Peck (1991). Adults have been found between April and December in stumps and forest litter. Slime mold hosts include *Stemonitis axifera, S. fusca, S. splendens*, *Fuligo septica*, and *Comatricha nigra* (Wheeler 1979). In Nova Scotia, it was collected in red spruce, hemlock, red maple/red oak/birch, and mixed coastal forests.

Wheeler (1979) proposed the name *Anisotoma horni* for *A. obsoleta* (Horn) [described by Horn (1880) in the genus *Leiodes* and later transferred to *Anisotoma* by Brown (1937b)] in the belief that the name was preoccupied by "*Leiodes obsoletus*" (Melsheimer, 1844). Melsheimer (1844), however, described the species as *Pallodes obsoletus* [which was later transferred to *Neocyrtusa* by Brown (1937a) and then to *Anogdus* by Daffner (1988)]. *Pallodes* Melsheimer, 1844, was in turn preoccupied by *Pallodes* Erichson 1843, a genus in the Nitidulidae. Consequently, the two names were not then, and are not now, in the same genus, hence there is no need for a replacement name. Therefore the original name, *Anisotoma obsoleta* (Horn), must be reinstated as per Article 59.4 of the Code of Zoological Nomenclature (ICZN 1999). Consequently *Anisotoma horni* Wheeler is designated as a synonym of *A. obsoleta*.

Cholevinae

Nemadus brachyderus (LeConte, 1863)

In his description of the species, LeConte (1863: 25) published the only locality known to him as "Nova Scotia." There is however, no specimen with this locality in the LeConte Collection in Cambridge, Massachusetts. This prompted Peck and Cook (2006) to designate a lectotype. Sanders (1964) also reported the species to be common in over-wintering nests of *Camponotus herculeanus* (Linnaeus) in New Brunswick. However, Peck and Cook (2006) were unable to examine specimens to confirm these records. Consequently, the status of this species in both New Brunswick and Nova Scotia should be further investigated. It is a myrmecophile associated with nests of *Camponotus noveboracensis* (Fitch) and *Camponotus herculeanus* (Peck and Cook 2006).

Nemadus integer Fall, 1937

NOVA SCOTIA: Cape Breton Co.: Sydney, UCCB campus, 15.IX.1996, J. N. MacGillivray, (1, NSMC).

Nemadus integer was recorded from Nova Scotia by Peck and Cook (2006) based on the above record (Fig. 9). It is a myrmecophile associated with nests of *Formica integra* Nylander (Peck and Cook 2006).

Nemadus triangulum Jeannel, 1936

NOVA SCOTIA: Halifax Co.: Pockwock Lake, 15-30.VI.1997, D.J. Bishop, red spruce forest, flight-intercept trap, (1, NSMC).

Nemadus triangulum was recorded from Nova Scotia by Peck and Cook (2006) based on the above record (Fig. 9). It is a myrmecophile associated with nests of *Camponotus noveboracensis, Camponotus pennsylvanicus* (DeGeer), *Camponotus chromaiodes* Bolton, *Formica exsectoides* Forel, and *Formica nitidiventris* Emery. It is found in litter of logs, stumps, and leaves, and in tree holes (Peck and Cook 2006).

Catops alsiosus alsiosus (Horn, 1885)

NOVA SCOTIA: Annapolis Co.: Big Dam Lake, Kejimkujik National Park, 27.VI-7.VII.2004, H. Love, hemlock forest, pitfall trap, (1, CGMC); **Queens Co.:** Medway River, 13.VII.1993, J. and T. Cook, car net, (2, JCC).

This is a northern, boreal species reported by Peck and Cook (2002) from Labrador, New Brunswick, and Nova Scotia (Fig. 10). It is a rarely collected species, most frequently found in sphagnum bogs, boreal spruce forests, or open-tundra vegetation but occasionally in tall grass prairie, mixed deciduous, and aspen forests It is found at carrion, rotting mushrooms, and in mammal nests (Peck and Cook 2002).

Catops americanus Hatch, 1928

NOVA SCOTIA: Annapolis Co.: Channel Lake, Kejimkujik National Park, 18.IX-2.X.2004, H. Love, red maple-red oak-birch forest, pitfall trap, (1, CGMC); **Antigonish Co.:** Antigonish, 26.V-2.VII.1984, McMillan, flight-intercept trap, (8, CMN); Morar, 29.IV.1993, M. LeBlanc, (1, NSNR); **Halifax Co.:** Burnside, 12.V.2003, 7.V.2004, 10.V.2004, C. Cormier, on dead pig, (4, SMU); **Hants Co.:** Little Armstrong Lake, 14.V-2.VI.1997, D.J. Bishop, red spruce forest, flight-intercept trap, (1, NSMC); **Inverness Co.:** MacKenzies Mountain, Cape Breton Highlands National Park, 17.VI.1983, Y. Bousquet, forest, (1, CNC); **Kings Co.:** Kentville, 12.V.1961, D.H. Webster, on decaying fox, (1, DHWC); **Pictou Co.:** French River, 19-21.VII.1997, S. and J. Peck, flight-intercept trap, (1, SBP); **Queens Co.:** Canning Field, Kejimkujik National Park, 13-21.VIII.2005, R. Ewing, hemlock forest, pitfall trap, (1, CGMC); Cobreille Lake, Kejimkujik National Park, 27.VI-6.VII.2004, H. Love, red maple-red oak-birch forest, pitfall trap, (7, CGMC); Kejimkujik National Park, 26.IX-19.X.1994, B. Wright, hemlock forest, (1, NSMC).

Catops americanus was reported by Peck and Cook (2002) from Nova Scotia, but not from New Brunswick (Fig 10). It was formerly listed as occurring in New Brunswick in Peck (1991), however, this was prior to the description of the very similar *C. paramericanus* (Peck and Cook 2002), which is recorded as occurring in New Brunswick. Presumably, earlier reports of *C. americanus* from New Brunswick are now ascribable to *C. paramericanus*. It is found at carrion and by sifting litter in deciduous forests and in mammal nests (Peck and Cook 2002).

Catops basilaris Say, 1823

LABRADOR: Grand Lake Rd, km 39.7, 24.VII.1992, K. Perrault, (1, CFNL). **NEWFOUNDLAND:** Eight hundred and thirty specimens were examined. The earliest record is from 1977 (Windsor Lake, 30.VIII.1977, D.J. Larson, (1, MUN)). **NOVA SCOTIA:** One hundred and eighty-three specimens were examined from Annapolis, Antigonish, Colchester, Cumberland, Guysborough, Halifax, Inverness, Lunenburg, Pictou, Queens, Shelburne, Victoria, and Yarmouth counties. The earliest record is from 1965 (**Lunenburg Co.:** Bridgewater, 1-16.VII.1965, B. Wright, red oak forest, pitfall trap, (1, NSMC)).

Catops basilaris was reported by Peck and Cook (2002) from Labrador, Newfoundland, New Brunswick, and Nova Scotia including Cape Breton Island (Fig. 11). It is the most widespread and frequently collected species of *Catops* in North America, primarily collected in forested environments at carrion, but also occasionally on decaying mushrooms, in forest litter, in mammal and wasp nests, and on owl pellets. It is found in deciduous, mixed, and coniferous forests and *Sphagnum* bog habitats (Peck and Cook 2002). In Nova Scotia, specimens have been collected in coniferous, deciduous, mixed, and coastal forests.

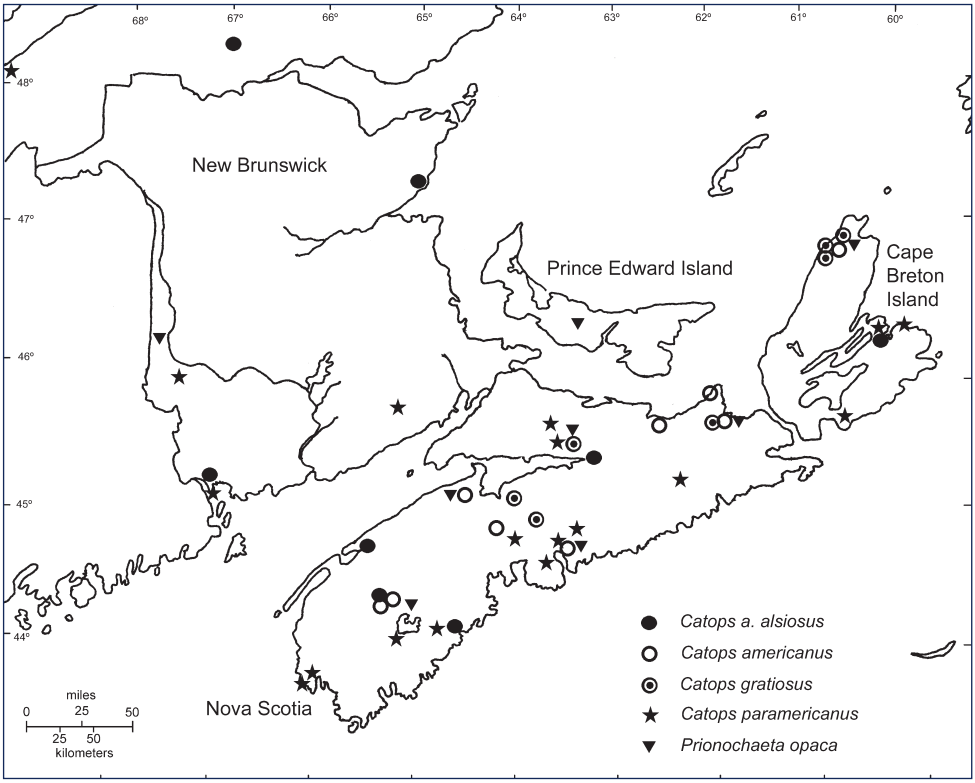

Fig. 10. Distribution of *Catops a. alsiosus, Catops americanus, Catops gratiosus, Catops paramericanus,* and *Prionochaeta opaca* in Atlantic Canada. Locations in Labrador are not shown.

Catops egenus (Horn, 1880)

Catops egenus was reported from central Labrador by Peck and Cook (2002). It was collected at animal carcasses, on dung, and on decaying mushrooms in coniferous or mixed forests (Peck and Cook 2002).

Catops gratiosus (Blanchard, 1915)

NOVA SCOTIA: Antigonish Co.: Antigonish, 28.IV.1997, R. Lauff, (1, NSNR); **Colchester Co.:** Debert, 6.VI.1994, J. Ogden, (1, NSNR); **Hants Co.:** Mount Uniake, 8.V.1979, B. Wright, (1, NSMC); **Inverness Co.:** 1 km west of Lone Shieling, Cape Breton Highlands National Park, 19.IX.1984, J.M. Campbell and A. Davies, sifting *Fagus* litter, (1, CNC); MacKenzies Mountain, Cape Breton Highlands National Park, 4.VII.1983, J.R. Vockeroth, pan trap, (1, CNC); Cheticamp River Trail, Cape Breton Highlands National Park, 22.IX.1984, J.M. Campbell and A. Davies, ex mushrooms, (2, CNC).

Catops gratiosus was reported from mainland Nova Scotia and Cape Breton Island by Peck and Cook (2002) (Fig 10). It is an infrequently collected species. Most of the collections in the southeastern United States are from caves. Specimens collected from northern or upper elevation areas are from deciduous forests and, in smaller numbers, from coniferous forests and old fields where they are found on carrion, decaying fungi, and on mammal dung (Peck and Cook 2002).

Catops luridipennis Mannerheim, 1853

This Holarctic species was reported from central Labrador by Peck and Cook (2002). It has been collected on animal carcasses and dung in coniferous forests (Peck and Cook 2002).

Catops luteipes Thomson, 1884

This Holarctic species was reported from northern Labrador by Peck and Cook (2002). It was collected on animal carcasses and dung in aspen-spruce parkland, tundra, willow-spruce, and taiga habitats (Peck and Cook 2002).

Catops paramericanus Peck and Cook, 2002

NOVA SCOTIA: Cape Breton Co.: New Waterford, 17.V.1996, C.A. Stapleton, (1, CBU); Sydney, 30.V.1996, D.W. Forbes, (2, CBU); Westmount, 2.VI.1996,

D.W. Forbes, (1, CBU); **Colchester Co.:** 20.VII.1995, E. Georgeson, (1, NSNR); **Cumberland Co.:** Wentworth, VIII.1965, B. Wright, sugar maple forest, pitfall trap, (1, NSMC); **Guysborough Co.:** Liscomb Game Sanctuary, 24.VI.1998, J. Ogden, malaise trap, (1, NSNR); **Halifax Co.:** Antrim, 2.V.2005, J. Ogden, (1, NSNR); Big Indian Lake, 9.VIII.2003, P. Dollin, pitfall trap, (1, NSMC); Burnside, 8.V.2003, 7.V.2004, 10.V.2004, 12.V.2004, 14.V.2004, C. Cormier, on dead pig, (5, SMU); Halifax Watershed area, 14.IV.1958, J. McDunnough, (1, NSMC); **Queens Co.:** Black Duck Lake, 1.VIII.2003, P. Dollin, white pine forest, pitfall trap, (2, NSMC); Eight Mile Lake, 31.VII.2003, P. Dollin red spruce forest, pitfall trap, (6, NSMC); Fifth Lake, 17.VI.2003, P. Dollin, old-growth hemlock forest, (1, NSMC); **Yarmouth Co.:** Cape Forchu, 28.VI-4.VII.1995, J. and F. Cook, flight-intercept trap, (3, JCC); Wellington, 15-24.VII.1993, J. and T. Cook, mixed coastal forest, flight-intercept trap, (1, JCC); Wellington, 12-20.VIII.1991, J. Cook, coastal forest, flight-intercept trap, (1, JCC).

Catops paramericanus was reported from New Brunswick and two sites on Cape Breton Island, Nova Scotia by Peck and Cook (2002). It is newly reported herein from the mainland of Nova Scotia (Fig 10). It is an abundant and widespread species in boreal forests, primarily collected from animal carrion and occasionally from owl pellets, decaying fungi, and in forest litter (Peck and Cook 2002).

Catops simplex Say, 1825

LABRADOR: Fifty specimens were examined. The earliest record is from 1992 (Grand Lake Road, 39.7 km, 24.VII.1992, I.L. Perrault, field, pan trap, (1, CFNL)). **NEWFOUNDLAND:** Fifty-nine specimens examined. The earliest record is from 1979 (Windsor, 30.VIII.1979, D.J. Larson, (1, MUN)). **NOVA SCOTIA: Annapolis Co.**: Channel Lake, Kejimkujik National Park, 18.IX-2.X.2004, H. Love, red maple-red oak-birch forest, pitfall trap, (1, CGMC); **Antigonish Co.:** Beech Hill, 13.VII.1985, J. Veinot, (1, NSMC); Cape Breton Co.: George's River, 10.VI.1998, D.B. McCorquodale, poplar log, (1, CBU); **Halifax Co.:** Burnside, 31.VII.2003, 26.VI.2003, 29.VI.2003, 12.VII.2003, 14.VII.2003, 10.X.2003, 14.X.2003, 15.X.2003, 17.X.2003, 20.X.2003, 22.X.2003, 24.X.2003, 29.X.2003, C. Cormier, on dead pig, mixed forest and open areas, (32, SMU); York Redoubt, 31.VII.2003, C. Staicer, *Sphagnum* bog, pitfall trap, (1, CGMC); **Victoria Co.:** Baddeck, 16-20.VII.1979, G. Fairchild, flight trap, (1, NSMC).

Catops simplex was reported by Peck and Cook (2002) from Labrador, insular Newfoundland, New Brunswick, and Cape Breton Island in Nova Scotia. The above records newly establish its presence on the mainland of Nova Scotia (Fig. 11). It is frequently collected at carrion in deciduous or mixed forests; also in litter, at bear dung, in mammal nests, in rotten mushrooms, and on dead snails. It was found in coniferous forests and *Sphagnum* bogs (Peck and Cook 2002).

Prionochaeta opaca (Say, 1825)

NEW BRUNSWICK: Carleton Co.: Meduxnekeeg Valley Preserve, 46.19°N, 67.68°W, 7.IX.2004, R.P. Webster, mixed forest, rotting fungi, (1, RWC). **NOVA SCOTIA: Antigonish Co.:** Pomquet, 10-17.VII,1998, R.F. Lauff, malaise trap, (1, STFX); **Colchester Co.:** Debert, 15.VI.1993, 9.VII.1993, 10.V.1994, 21.V.1996, 21.V.1996, J. Ogden, malaise trap, (5, NSNR); Debert, 6.VI.1996, E. Georgeson, malaise trap, (1, NSNR); **Halifax Co.:** Burnside, 22.V.2003, 23.V.2003, 15.VII.2003, C. Cormier, on dead pig, mixed forest and open areas, (3, SMU); **Inverness Co.:** Lone Shieling, Cape Breton Highlands National Park, 18-21.VII.1983, D.E. and J.E. Bright, flight-intercept trap, (1, CNC); **Kings Co.:** Kentville, 11.V.1961, D.H. Webster, on decaying fox, (3, DHWC); **Queens Co.:** Caledonia, 15.V.2002, P. Colp, flight-intercept trap, (1, NSNR). **PRINCE EDWARD ISLAND:** locality information lost, 1974-1983, collector information lost, (2, UPEI).

Prionochaeta opaca is newly recorded in New Brunswick, Nova Scotia, Cape Breton Island, Prince Edward Island, and Atlantic Canada (Fig. 11). In many southern localities in the United States this species is found in caves where adults and larvae feed on the guano of insectivorous bats. In more northern regions, it is found in forested habitats (Peck and Cook 2002). In Nova Scotia, it has been collected on rotten fungi and mammal carrion.

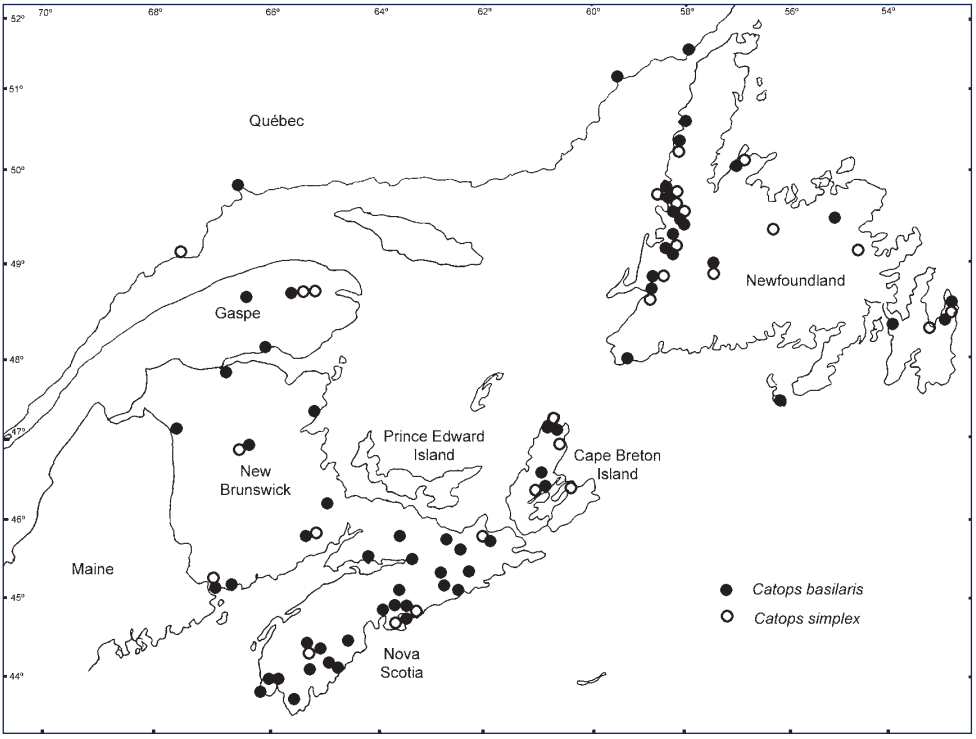

Fig. 11. Distribution of *Catops basilaris* and *Catops simplex* in Atlantic Canada. Some locations in Labrador are not shown.

Sciodrepoides terminans (LeConte, 1850)

NEWFOUNDLAND: St. John's, 16.VII.1981, 20.VII.1981, and 21.IX.1996, (3, MUN); Portugal Cove, 26.VI.1981 and 21.VII.1982, (2, MUN); Gander, VII.1979, (1, MUN). **NEW BRUNSWICK: Saint John Co.**: Saint John, 20.VI.1898, P.R. McIntosh, (1, NBM); Saint John, VI.190?, W. McIntosh, (3, NBM); **Westmorland Co.:** Moncton, 15.X.1982, L. Dorion, (1, UMNB). **NOVA SCOTIA**: Two hundred and eighty-two specimens were examined from Annapolis, Antigonish, Colchester, Cumberland, Guysborough, Halifax, Inverness, Kings, Lunenburg, Queens, Victoria, and Yarmouth counties. The earliest record is from 1961 (**Kings Co.:** Kentville, 28.V.1961, D.H. Webster, on dead fox, (1, DHWC)). **PRINCE EDWARD ISLAND:** locality information lost, 1974-1983, collector information lost, (1, UPEI).

Sciodrepoides terminans is newly recorded from Prince Edward Island. It was reported by Peck and Cook (2002) from Labrador, Newfoundland, New Brunswick, Nova Scotia, and Cape Breton Island (Fig. 12). It has mostly been collected in forested habitats but also in open shrub and grassland sites, in riverside forests, and grassland. It is found primarily on mammal carrion, but also on decaying fish and fungi and in mammal and bird nests (Peck and Cook 2002). Majka et al. (2006) reported it from a

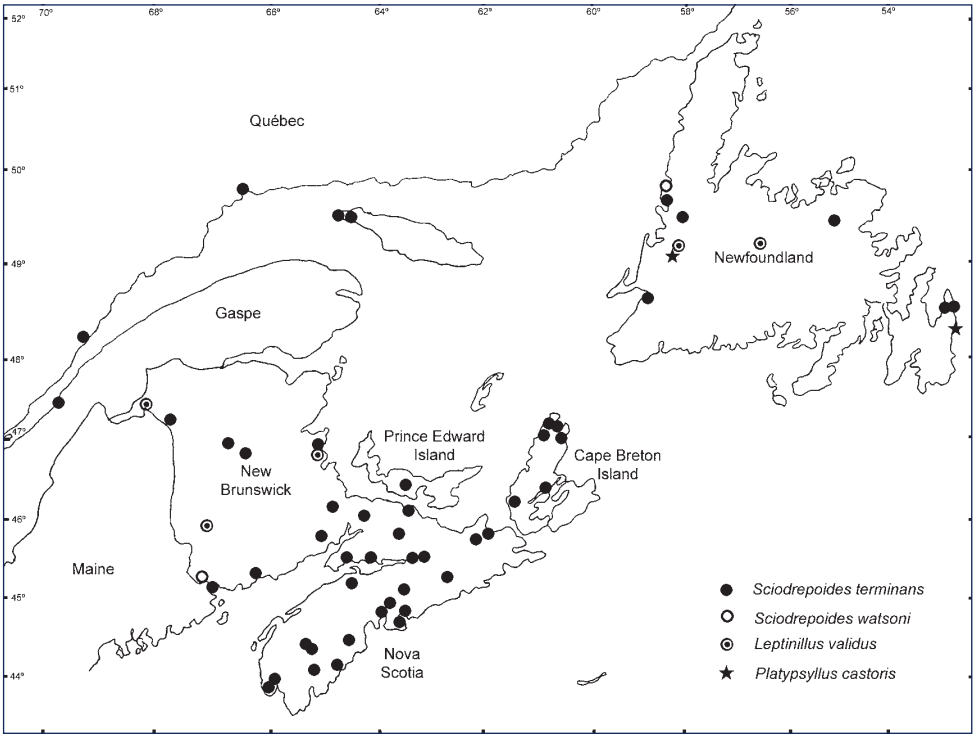

Fig. 12. Distribution of *Sciodrepoides terminans, Sciodrepoides watsoni, Leptinillus validus,* and *Platypsyllus castoris* in Atlantic Canada. Locations in Labrador are not shown.

Boreal Owl [*Aegolius acadicus acadicus* (Gmelin)] nest in Nova Scotia. In Nova Scotia, it was collected on carrion in deciduous, coniferous, and mixed forests.

Sciodrepoides watsoni (Spence, 1815)

NEWFOUNDLAND: Western Brook Pond, Gros Morne National Park, 15-17. VIII.1969, M.J.D. Brendell, secondary forest, (6, BMNH).

This Holarctic species was reported by Peck and Cook (2002) from Newfoundland and New Brunswick (Fig. 12). The source of the New Brunswick record (from the Charlotte County area) could not be determined (S. Peck, pers. comm.), nor were vouchers specimens found in any collection consulted. Consequently it is removed from the New Brunswick faunal list. Its status in Newfoundland should also be further investigated since there are no records in the province apart from the specimens listed above. *Sciodrepoides watsoni* has primarily been collected in forested habitats but it is also tolerant of open old fields and grasslands where it is found on carrion and in mammal nests (Peck and Cook 2002).

Platypsyllinae

Leptinillus validus (Horn, 1872)

NEW BRUNSWICK: Kent Co.: Kouchibouguac National Park, (1, CNC); **Madawaska Co.:** Edmundston, 13.XI.1994, J Bourque, on beaver, (1, UMNB). **York Co.:** Lake George, (1, CNC). **NEWFOUNDLAND**: Pasadena, 15.X.1989, M. Bennett, beaver carcass, (1, MUN); Grand Falls, Island Pond, 12.X.2002, Biology 4150, (1, MUN).

Peck (2007) indicated *Leptinillus validus* as occurring in New Brunswick. Peck (1991) also listed it from Newfoundland, but it is not so indicated in Peck (2007). The above records confirm its presence in insular Newfoundland (Fig. 12). Adults and larvae are ectoparasites of beaver (*Castor canadensis* Kuhl) in the northern part of their range in North America. They are occasionally, and apparently accidentally, also found on muskrats (*Ondatra zibethicus* (Linnaeus)) (Peck 2007).

Platypsyllus castoris Ritsema, 1869

NEWFOUNDLAND: Pasadena, 15.X.1989, M. Bennett, beaver carcass, (4, MUN); Bay Bulls, IX-XI.1999, D. Puddister, (1, MUN).

This Holarctic species is listed as occurring in Newfoundland by Peck (1991) (Fig. 12). It is associated with beaver as an ectoparasite through their range in North America and Eurasia (Wood 1965).

Discussion

Regional Composition and Zoogeography

With 25 species of leiodids being newly recorded in Atlantic Canada, and 56 new jurisdictional records reported, it is clear that the knowledge of the composition of the fauna in the region is still incomplete. In particular, few leiodids have been recorded in Prince Edward Island and the leiodid fauna of northern New Brunswick is still poorly known. Nonetheless, some observations on the zoogeography of the fauna in the region are possible, and some distributional patterns are evident.

1) **Widespread** – There are 17 species that are apparently relatively widespread throughout Atlantic Canada. These include *Colon magnicolle, C. hubbardi, Hydnobius substriatus, Leiodes assimilis, L. collaris, L. punctostriata, L. valida, Agathidium mollinum, A. pulchrum, Anisotoma basalis, A. inops, A. obsoleta, Catops a. alsiosus, C. basilaris, C. simplex, Sciodrepoides terminans,* and *Leptinillus validus*. Records from Prince Edward Island are lacking for most of these species; *L. collaris* and *L. validus* have not been recorded in Nova Scotia; *C. hubbardi* and *H. substriatus* have not been recorded in New Brunswick; and three species (*L. valida, A. pulchrum,* and *L. validus*) have only been recorded from a small number of localities. All the species, however, have been found in both the Maritime Provinces and (except for *Catops a. alsiosus*) insular Newfoundland, and eight have been recorded from Labrador.

2) **Maritime Provinces** – Thirteen species have been found in the Maritime Provinces that have not been recorded from insular Newfoundland or Labrador. These include *Colon asperatum, C. boreale, Leiodes impersonata, L. neglecta, Colenis impunctata, Agathidium atronitens, A. difforme, A. fawcettae, A. oniscoides, A. rubellum, Nemadus brachyderus, Catops paramericanus,* and *Prionochaeta opaca*. Most of these species have not been found on Prince Edward Island; three species (*L. impersonata, C. impunctata,* and *A. difforme*) have not been recorded on Cape Breton Island; and six species (*C. boreale, L. impersonata, L. neglecta, A. atronitens, A. oniscoides,* and *N. brachyderus*) have only been recorded from a small number of localities. The pattern of their distribution in the Maritimes appears to be relatively widespread.

3) **Newfoundland** – Three species have been recorded in the region solely from insular Newfoundland: *Agathidium repentinum, Platypsyllus castoris,* and *Anisotoma globosa. Agathidium repentinum* and *P. castoris* (a Holarctic species) are broadly distributed boreal species in Canada and Alaska (Miller and Wheeler 2005; Peck 1991) that may not be present in the Maritime Provinces. *Anisotoma globosa* is widely distributed in southern Ontario and Quebec and the northern United States from Wisconsin to New Hampshire (Wheeler 1979) and may be present in the Maritime Provinces. Additionally, *Sciodrepoides watsoni* has only been recorded from Newfoundland (and possibly New Brunswick). The status of this species in the region requires further verification and investigation.

4) **Labrador** – Four species have only been recorded in Labrador: *Colon politum, Catops egenus, C. luridipennis,* and *C. luteipes.* Except for *C. egenus,* the other three are

Holarctic species with northern boreal distributions (*C. luridipennis* ranges south in the Rocky Mountains). *Catops egenus* is a western North American species (found from Saskatchewan west to the Pacific in Canada), except for an apparently isolated (and perhaps relict) population in southern Labrador (Peck and Cook 2002).

5) **Northern New Brunswick** – Four species, *Anogdus potens, Leiodes contaminabilis, L. triepkei,* and *Liocyrtusa luggeri,* have been recorded only from northern New Brunswick. Additionally, *Leiodes strigata* was recorded from northern New Brunswick and Newfoundland. Three of these (*L. contaminabilis, L. strigata,* and *L. triepkei*) are widespread in northern New England. All these species warrant further investigation to determine if they occur more widely in the region or if they represent species whose distribution in the region has been attenuated by climatic or geographic factors.

6) **Nova Scotia** – A substantial number of species have been recorded from Nova Scotia only. These include:

a) **Province-wide:** *Colon horni, C. incisum, Agathidium rusticum, Gelae parile, Anisotoma blanchardi, A. discolor, A. geminata, Catops americanus,* and *C. gratiosus*;

b) **Cape Breton:** *Colon arcum, C. forceps, C. schwarzi, Hydnobius arizonensis, Leiodes rufipes, Agathidium depressum,* and *Nemadus integer,* recorded only from Cape Breton Island, and *Anisotoma errans* recorded from Cape Breton Island and insular Newfoundland;

c) **Mainland Nova Scotia:** *Colon bidentatum, C. oblongum,* and *Nemadus triangulum* recorded from mainland Nova Scotia;

d) **Southern Nova Scotia:** *Anogdus dissimilis, Cyrtusa subtestacea,* and *Leiodes puncticollis* recorded from southern Nova Scotia.

It is to be expected that many of species recorded to date only in Nova Scotia occur more widely in the region, particularly in the Maritime Provinces, and that the limited distribution which has been thus far been documented is attributable to limited collection effort. Some may be species that have spread into the region from New England and the George's Bank glacial refugium, via island chains and land bridges following the Wisconsinian Glaciation. This applies particularly to species such as *C. arcum, C. schwarzi, H. arizonensis, L. puncticollis, L. rufipes, A. rusticum, G. parile, A. blanchardi, A. errans,* and *C. americanus* found in New England, and which are unrecorded elsewhere in Atlantic Canada and Maine (see Klimaszewski et al. 2006 for a discussion of this topic). *Leiodes assimilis,* which occurs on Sable Island, a 45 kilometre long sand bar located near the edge of the continental shelf, 160 km from the nearest point of land, an unusual biotype for the species (Howden 1970), is another potential candidate species that has dispersed into the region via this pathway.

Little information is available on many species of Leiodidae and taxonomic revisions of many of the genera found in this region have been published only recently Thus observed distributional patterns are likely incomplete and considerable additional collecting is required.

Island Biogeography

The number of species of leiodids recorded on Prince Edward Island (two, or 3% of the regional fauna) is extraordinarily low. In comparison, 140 of the 332 native species (42%) of Carabidae (perhaps the best-studied family of Coleoptera in Atlantic Canada) are known from Prince Edward Island (Table 2; Majka et al. 2007b). Although the proportion of native species found on Prince Edward Island varies from family to family, it nonetheless appears that either the leiodid fauna of the island is comparatively much smaller than expected, or that collection effort on Prince Edward Island has been insufficient to fully determine its leiodid composition, or a combination of both factors. In further comparison, the proportional composition of native leiodids and carabids are similar in the case of Cape Breton Island, Labrador, Nova Scotia, and the Maritime Provinces as a whole (Table 2). The proportional composition of leiodids known to occur on insular Newfoundland (37.9%), and in New Brunswick (50.0%) are somewhat smaller in comparison to the proportional representation of carabids in these two jurisdictions (44.6% and 75.0% respectively). This is likely also due to insufficient collecting effort in both areas. The proportion of leiodids known from the mainland of Nova Scotia (60.6%) is also somewhat lower.

In the Maritime Provinces the proportion of the leiodid fauna that is Holarctic varies between 8-9% [7-8% in the case of the Carabidae (Majka et al. 2007b)], but on insular Newfoundland the proportion is 13.6% [21.2% in the case of the Carabidae (Majka et al. 2007b)], and in Labrador is 27.3% [36.2% in the case of the Carabidae (Bousquet and Larochelle 1993)]. The greater proportion of Holarctic species, particularly in Labrador, clearly reflects its greater proximity to circumboreal environments and landmasses such as the Canadian arctic, Greenland, and Iceland. The low proportion of Holarctic leiodids recorded on Cape Breton Island (2.7%) is notable given that the corresponding proportion of Holarctic Carabidae is 12.4% (Table 2 and Majka et

Table 2. Geographic composition of Atlantic Canada Leiodidae: number and proportion of species

	Nearctic	%	Holarctic	%	Total	% of fauna	% of native carabid fauna[1]
Prince Edward Island	2	100.0	0	0.0	2	3.0	42.2
Cape Breton Island	37	97.4	1	2.7	38	57.6	51.2
Newfoundland	22	88.0	3	13.6	25	37.9	44.6
Labrador	11	78.6	3	27.3	14	21.2	27.1
Nova Scotia mainland	37	92.5	3	8.1	40	60.6	70.5
Nova Scotia	47	92.2	4	8.5	51	77.3	76.2
New Brunswick	30	90.9	3	10.0	33	50.0	75.0
Maritime Provinces	54	91.5	5	9.3	59	89.4	89.5
Atlantic Canada	57	86.4	9	15.8	66	100.0	100.0

1, Carabidae numbers adapted from Majka et al. (2007) by the inclusion of Labrador data.

al. 2007b). As the Leiodidae of Cape Breton Island is relatively well surveyed, the low proportion of Holarctic species would appear to be real rather than a collecting artifact. The reason for this pattern is unknown.

Several studies of Coleoptera in Atlantic Canada have noted an island-related diminution of fauna on Prince Edward Island, Cape Breton Island, and insular Newfoundland (Majka and McCorquodale 2006; Majka et al. 2007a, 2007b). In the case of the Leiodidae, the comparative lack of attention with respect to this family in general, their secretive habits, the specialized habitats that some species occupy, and the dearth of collection efforts in some areas, means that any conclusions about island faunas in the region are premature.

Biodiversity "Hot Spots"

Particularly noteworthy for the region are the large number of species of leiodids collected at Lone Shieling in Cape Breton Highlands National Park, an apparent biodiversity "hot spot" for this family in the region. Twenty-nine species (57% of the Nova Scotia fauna) were collected there, and 36 species (71% of the Nova Scotia fauna) have been found in the Park as a whole, thanks to survey efforts summarized by Lafontaine et al. (1987). Although the collecting effort at this site was outstanding (a dozen experienced researchers from the Biosystematics Research Center in Ottawa, Canada participated over the course of the 1983-1984 field seasons) the site also happens to be within a 350+ year old sugar maple stand which is one of the largest and most pristine old-growth forest stands in the Maritime Provinces (Greenidge 1961). Other rarely collected species of Coleoptera such as *Acrotrichis cognata* (Matthews) (Ptiliidae) (Majka and Sörensson 2007) and *Epuraea parsoni* Connell (Nitidulidae) (Majka and Cline (2006) have been collected at this site as have several species of rare, localized, and disjunct small mammals (Roscoe and Majka 1976). It is possible that the undisturbed old-growth conditions at this site support a large diversity of species that have otherwise been reduced in many areas of Atlantic Canada by the history of forest management practices (Majka 2007).

In comparison, a similar research program in Kouchibouguac National Park in New Brunswick in 1977 recorded only 10 species of leiodids and a more limited survey in 2004-2005 in Kejimkujiuk National Park in Nova Scotia found only seven species of leiodids (C.G. Majka and T. Rossolimo, unpublished data). Thus, the species diversity of the Leiodidae in Cape Breton Highlands National Park appears to be very high, a topic deserving further research. In this regard, it is fortunate that the Lone Shieling site lies within Cape Breton Highlands National Park where it is afforded a high degree of protection.

Saproxylic Species Diversity and Forest Management

The 19 species of leiodids in the Agathiidini are all forest species associated with fungi and/or slime molds and members of the saproxylic invertebrate community, i.e., those

organisms that are dependent during some portion of their life cycle upon the dead or dying wood of moribund or dead trees (standing or fallen), upon wood-inhabiting fungi or upon the presence of other saproxylics (Speight 1989).

Speight (1989), Grove (2002), and Dudley and Vallauri (2004) are three of many studies that have examined the importance of saproxylic insects in the dynamics of forest ecosystems. In general, upwards of 30% of plant biomass produced annually in forests is in the form of woody tissue and the quantity of plant nutrients recycled annually by saproxylics in forests is roughly 50% of that recycled from the annual leaf fall (Speight 1989). A number of studies have drawn attention to the importance of this group in the trophic dynamics of forests. Siitonen (2001) found that 20-25% of all forest-dwelling invertebrates in Fennoscandia were saproxylic; Martikainen et al. (2000) found that 42% of the 553 species of beetles collected in a spruce forest in Finland were saproxylic; and Köhler (2000) considered 56% of all forest-dwelling beetle species in forests in the north Rhineland to be saproxylic.

Majka (2007) identified 59 "apparently rare" species of saproxylic beetles (collected from ≤ 5 specimens representing ≤ 0.005% of specimens examined in the region.) This represented 21% of the 283 species in the 18 saproxylic families, subfamilies, and tribes that were investigated. On that basis, six of the 19 species (32%) including *Agathidium depressum, A. oniscoides, A. pulchrum, A. rusticum, Anisotoma errans,* and *A. globososa* would qualify as "apparently rare" (i.e., ≤ 5 specimens have been collected in the region). This result is, in all probability due in large measure to the dearth of collecting for many species of leiodids. An increased collecting effort is required to discern if some of these species are actually rare, and hence in need of special attention or conservation measures.

Summary

Sixty-six species of Leiodidae are now known from Atlantic Canada, substantially more than the 27 recorded by Peck (1991). Others, undoubtedly, remain to be discovered since many species are secretive, small and inconspicuous, and are poorly sampled by conventional collecting techniques. A better understanding of this family and other forest and saproxylic beetles will add to our understanding of the ecological well-being of our forests. Such baseline faunistic knowledge will, in turn, help us understand how forests and beetles have been affected by historical forest management practices, and will help us monitor potential future changes in response to anthropogenic factors such as climate change.

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