

The Elateridae (Coleoptera) of the Maritime Provinces of Canada: faunal composition, new records, and taxonomic changes

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Abstract

The Elateridae in the Maritime Provinces of Canada is surveyed. One hundred and twenty-five species have been recorded, 110 in Nova Scotia, 98 in New Brunswick, and 48 on Prince Edward Island. Of these, 117 are Nearctic, four are Holarctic, and four are introduced Palaeartic species. Twenty-four species are newly recorded in Nova Scotia, 13 in New Brunswick, and 27 on Prince Edward Island, for a total of 64 new provincial records. Fourteen species including *Dalopius gentilis* Brown, *Dalopius pennsylvanicus* Brown, *Ampedus areolatus* (Say), *Ampedus laesus* (LeConte), *Ampedus nigricollis* (Herbst), two undescribed species of *Ampedus*, *Aeolus mellillus* (Say), *Athous posticus* (Melsheimer), *Athous productus* (Randall), *Athous scapularis* (Say), *Hypoganus sulcicollis* (Say), *Sylvanelater mendax* (LeConte), and *Negastrius exiguus* (Randall) are newly recorded in the Maritime Provinces as a whole, and one species, *Dalopius pennsylvanicus*, is newly recorded in Canada. Two species are removed from the faunal list of New Brunswick and two from the faunal list of Nova Scotia.

Taxonomic changes proposed are: *Anostirus vernalis* (Hentz), **new combination**; *Anostirus bipunctatus* (Brown), **new combination**; *Anostirus exclamationis* (Fall), **new combination**; *Beckerus* **new genus**; *Beckerus appressus* (Randall), **new combination**; *Beckerus barri* (Lane), **new combination**; *Corymbitodes dorothyae* (Knull), **new combina-**

tion; *Corymbitodes elongaticollis* (Hamilton), **new combination**; *Corymbitodes moerens* (LeConte), **new combination**; *Corymbitodes pygmaeus* (Van Dyke), **new combination**; *Corymbitodes tarsalis* (Melsheimer), **new combination**; *Corymbitodes xanthomus* (Horn), **new combination**; *Metanomus blaisdelli* (Van Dyke), **new combination**; *Metanomus insidiosus* (LeConte), **new combination**; *Metanomus shastensis* (Van Dyke), **new combination**; *Nitidolimonius* **new genus**; *Nitidolimonius appalachius* (Van Dyke), **new combination**; *Nitidolimonius breweri* (Horn), **new combination**; *Nitidolimonius resplendens* (Eschscholtz), **new combination**; *Nitidolimonius weidtii* (Angell), **new combination**; *Paractenicera* **new genus**; *Paractenicera exilis* (Notman), **new combination**; *Paractenicera fulvipes* (Bland), **new combination**; *Pseudanostirus hamatus* (Say), **new combination**; *Sylvanelater*, **new genus**; *Sylvanelater cylindriciformis* (Herbst), **new combination**; *Sylvanelater furtivus* (LeConte), **new combination**; *Sylvanelater limoniiiformis* (Horn), **new combination**; *Sylvanelater mendax* (LeConte), **new combination**; and *Elater viridis* Say is regarded as a *nomen dubium*.

Key words: Coleoptera, Elateridae, *Actenicerus*, *Anostirus*, *Beckerus*, *Corymbitoides*, *Metanomus*, *Nitidolimonius*, *Paractenicera*, *Pseudanostirus*, *Sylvanelater*, new genus, New Brunswick, Nova Scotia, Prince Edward Island, Maritime Provinces, Canada, biodiversity, biogeography, saproxylic insects, rare species, forest management impacts, taxonomic revision.

Introduction

The Elateridae (click beetles) constitute a diverse and species-rich family of beetles. According to Johnson (2002) it is the ninth most taxonomically diverse beetle family globally with about 965 valid species in North America, a number that Marske & Ivie (2003) used to rank it as the seventh-most species rich family in North America. The larvae of some elaterids are important in agriculture as rhizophagous species that feed on underground parts of a variety of plants, and in silvicultural contexts as saproxylic species that feed on wood decaying organisms or as predators in woodland environments. Despite this much remains to be learned about the Elateridae. Diverse genera such as *Ampedus*, *Limonius*, *Cardiophorus*, and *Dalopius* are still in need of revisionary study, and phylogenetic study for most taxa is lacking (Johnson 2002). The bionomics of many species are little, if at all known, with fewer than 20% of the known North American species having descriptions of associated larvae. The fauna of the Maritime Provinces of Canada (New Brunswick, Nova Scotia, and Prince Edward Island) has received some past attention, however, its composition is still imperfectly known. In the present study we examine recent collections of Elateridae as well as historical specimens in collections in the region with the intent of improving our understanding of this family in the Maritime Provinces.

Historical Review

In the first account of beetles in the Maritime Provinces, Kirby (1837) described two species, *Pedetes brightwelli* (= *Athous*) and *Pedetes ruficornis* (= *Hemicrepidius memnonius* (Herbst)) from Nova Scotia based on specimens collected by Captain Basil Hall (circa 1827). Subsequently Jones (1869) recorded *Ampedus nigricollis* (Herbst), *Melanotus castanipes* (Paykull), *Pseudanostirus hieroglyphicus* (Say), *Hemicrepidius memnonius*, *Selatosomus appropinquans* (Randall), and "four or five other species (of Elateridae) of small size, undetermined," from Nova Scotia. Evans (1899) recorded *Conoderus auritus* (Herbst), *Agriotes mancus* (Say), *Agriotes limosus* (LeConte), *Agriotella bigeminata* (Randall), *Melanotus similis* (Kirby), *Liotrichus spinosus* (LeConte), *Sylvanelater cylindriciformis* (Herbst), and a species of *Dalopius* (reported as *D. lateralis* Eschscholtz prior to Brown's (1934) revision of the genus, and thus doubtless another species in this genus) from Halifax, Nova Scotia.

In the twentieth Century Gorham (1924), Brown (1933a, 1933b, 1934, 1935a, 1935b, 1936a, 1936b, 1936c, 1940), Eidt (1953, 1954), Becker (1956, 1971, 1974), Stibick (1990), Wells (1996), and Douglas

(2003) all included records of species from the region. Bousquet's (1991) checklist included a total of 109 species from the Maritime Provinces, 81 recorded from New Brunswick, 87 from Nova Scotia, and 21 from Prince Edward Island.

In Nova Scotia collectors such as D.C. Eidt, C.J.S. Fox, H.B. Specht, H.T. Stultz, V.R. Vickery, and others at the Agriculture Canada research station in Kentville (presently the Atlantic Food and Horticulture Research Centre) began collecting elaterids as early as 1909 and continued into the mid 1970s. Eidt (1953, 1954) conducted research on introduced elaterids, their impact on food crops, and how to differentiate their larval stages. During the 1930s, 1940s, and 1950s W.J. Brown with the Entomology Research Institute in Ottawa, Ontario (presently the Canadian National Collection of Insects, Arachnids, and Nematodes) made periodic visits, collecting material and contributing to collections in the region. At the Nova Scotia Agricultural College in Bible Hill, D.C. Eidt, R.E. Moorehouse, P.N. Grainger, and others began collecting elaterids in 1947 continuing until the early 1980s. At the Nova Scotia Museum, D.C. Ferguson, assisted by other contributors, began collecting insects including elaterids in 1942, a program that was continued by B. Wright from 1965 to 1993 and continues to the present spearheaded by the first author. In the mid-1980s the Nova Scotia Department of Natural Resources began collecting large quantities of beetles including Elateridae, first under E. Georgeson, later under J. Ogden, and with the assistance of many field technicians. In the mid-1980s collecting began at Cape Breton University in Sydney by D.B. McCorquodale and the many students that have worked with him, and at St Francis Xavier University R.F. Lauff began collecting in the mid-1990s. Students such as C. Corkum and D. Kehler at Acadia University in Wolfville working under S. Bondrup-Nielsen; P. Dollin at Dalhousie University working under P. Duinker; and D. Bishop at Carleton University in Ottawa, Ontario working under S. Peck, have all made important contributions to the knowledge of the elaterid fauna of the province, as have private collectors such as J. Cook, G. Selig, and D.H. Webster.

In New Brunswick W. McIntosh, P.R. McIntosh, A.G. Leavitt, and G. Morrissey at the New Brunswick Natural History Society in Saint John carried out extensive collecting of insects between 1898 and 1907 that included specimens of 41 species of elaterids. In 1927 J.N. Knull, a prolific author and collector of beetles at Ohio State University, visited Bathurst and collected beetles, including elaterids. From 1926–1930 C.A. Frost of the Cambridge Entomological Club in Massachusetts collected insects in Penobscuis including specimens of elaterids. From 1926–1943 W.J. Brown (above) visited various areas in northern and eastern New Brunswick collecting a broad spectrum of beetles in his travels. In the 1920s, 1930s, and 1940s R.P. Gorham of the Dominion Entomological Laboratories collected insects (including elaterids) in both New Brunswick and Nova Scotia. In 1965 C.G. Majka began collecting insects in Albert County, an area where he has continued to work to the present day, and where 14 species of elaterids have been recorded.

In the late 1970s and early 1980s researchers in Ottawa at the Biosystematics Research Centre (presently the Centre for Biodiversity-Invertebrate Taxonomy of Agriculture and Agri-food Canada) collected Coleoptera including elaterids as part of a study of the invertebrate fauna of Kouchibouguac National Park. Commencing in the mid-1970s and continuing to the present, students at the Université de Moncton have collected beetles, including specimens of 15 species of elaterids, primarily in the eastern portions of the province. In the early 1990s D.F. McAlpine at the New Brunswick Museum (the successor institution of the Natural History Society) began collecting beetles including elaterids, primarily at Grand Bay. R.P. Webster began research on insects in the province in the mid-1990s and in recent years, has collected a large spectrum of beetles, particularly in western portions of the province. In a major study conducted between 1992 and 1995 in potato fields in Fredericton, Boiteau *et al.* (2000) collected 46 species of elaterids. This study contributed four new species to the New Brunswick faunal list. Finally, in 2003 A.-S. Bertrand collected elaterids incidentally in the course of research on Carabidae in northwestern areas of the province.

On Prince Edward Island D.C. Read and F.M. Cannon at the Agriculture Canada research station in Charlottetown (presently the Crops and Livestock Research Centre) collected elaterids in the 1950s; in the 1980s J.G. Stewart and L.S. Thompson continued these collections, followed by M.E. Smith and C. Noronha from

the 1990's to the present day. In the 1940s researchers such as G.S. Walley and J.M. McDunnough at the Entomology Research Institute visited the island and conducted sporadic collecting for beetles including elaterids. At the University of Prince Edward Island between the early 1970s and the early 1980s variety of students collected insects, including 22 species of elaterids, as part of biodiversity research on the island. Commencing in 2001, C.G. Majka began to collect Coleoptera on Prince Edward Island and to date has found 29 species of Elateridae there.

Methods and Conventions

Specimens and published records of Elateridae originating in New Brunswick (1,239 specimens), Nova Scotia (5,881 specimens) and Prince Edward Island (245 specimens) were examined (total = 7,365). Codens of collections (following Evenhuis 2007) referred to in the text are:

ACNS	Agriculture and Agri-food Canada, Kentville, Nova Scotia, Canada
ACPE	Agriculture and Agri-food Canada, Charlottetown, Prince Edward Island, Canada
CBU	Cape Breton University, Sydney, Nova Scotia, Canada
CGMC	Christopher G. Majka collection, Halifax, Nova Scotia, Canada
CNC	Canadian National Collection of Insects, Arachnids, and Nematodes, Agriculture and Agri-food Canada, Ottawa, Ontario, Canada
DHWC	David H. Webster collection, Kentville, Nova Scotia, Canada
NBM	New Brunswick Museum, Saint John, New Brunswick, Canada
NSAC	Nova Scotia Agricultural College, Bible Hill, Nova Scotia, Canada
NSMC	Nova Scotia Museum collection, Halifax, Nova Scotia, Canada
NSNR	Nova Scotia Department of Natural Resources, Shubenacadie, Nova Scotia, Canada
QMOR	Collection Entomologique Ouellet-Robert, Université de Montréal, Montréal, Québec, Canada
RWC	Reginald P. Webster collection, Charters Settlement, New Brunswick, Canada
UMNB	Université de Moncton, Moncton, New Brunswick, Canada
UPEI	University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada

The number of specimens examined for species listed below is indicated in parentheses. If not specified it is assumed to be one. For species where there were fewer than 20 specimens, all records are reported. For species where there were more than 20 specimens, a summary of specimens examined is given.

The general classification used here follows Johnson (2002). Genera and species are in alphabetical sequence within each subfamily. In this regard it is worth drawing attention to the genus *Ctenicera* Latreille 1829 (*sensu lato*). In North America the many species formerly placed in this genus are in the process of taxonomic review and generic re-assignment. Some species have been, or are here, reassigned to *Actenicerus* Kiesenwetter 1858, *Anostirus* Thompson 1859, *Beckerus* n. gen., *Corymbitodes* Buysson 1904, *Hypoganus* Kiesenwetter 1858, *Liotrichus* Kiesenwetter 1858, *Metanomus* Buysson 1857, *Paractenicera* n. gen., *Prosteron* Latreille 1834, *Pseudanostirus* Dolin 1964, *Selatosomus* Stephens 1830, *Setasomus* Gurjeva 1985, and *Sylvanelater* n. gen. In North America only *Ctenicera kendalli* (Kirby) is properly attributable to this genus as defined by Binaghi (1940), Leseigneur (1972), Gurjeva (1989), and Platia).

Another genus in need of taxonomic revision and containing a number of undescribed species is *Ampedus* Dejean 1833. Such a review is currently in progress by F. Ramberg (pers. comm.) based on his previously unpublished doctoral thesis (Ramberg 1979). Pending the publication of this revision we treat the species within *Ampedus* according to present taxonomy and systematics while making note of two undescribed species that will be described in Ramberg's anticipated revision.

Results

As a result of the present investigations 125 species of Elateridae have been recorded in the Maritime Provinces of Canada; 110 in Nova Scotia (NS), 98 in New Brunswick (NB), and 48 on Prince Edward Island (PEI) (Table 1). Zoogeographically, 117 species are Nearctic, four are Holarctic, and four are introduced Palearctic species. Twenty-four species are newly recorded in Nova Scotia, 13 in New Brunswick, and 27 on Prince Edward Island for a total of 64 new provincial records. Fourteen species including *Dalopius gentilis* Brown, *Dalopius pennsylvanicus* Brown, *Ampedus areolatus* (Say), *Ampedus laesus* (LeConte), *Ampedus nigricollis* (Herbst), two undescribed species of *Ampedus*, *Aeolus mellillus* (Say), *Athous posticus* (Melsheimer), *Athous productus* (Randall), *Athous scapularis* (Say), *Hypogonus sulcicollis* (Say), *Sylvanelater mendax* (LeConte), and *Negastris exiguus* (Randall) are newly recorded in the Maritime Provinces as a whole, and one species, *Dalopius pennsylvanicus*, is newly recorded in Canada.

Two species, *Agriotes pubescens* Melsheimer, and *Athous campyloides* Newman are removed from the faunal list of New Brunswick, and two species, *Selatosomus splendens* (Ziegler) and *Danosoma obtectum* (Say), are removed from the faunal list of Nova Scotia. Additionally previous records of *Cardiophorus cardisce* (Say) (in NB and NS) and *Paradonus obliquatus* (Melsheimer) (in NS) are now attributable to *Cardiophorus propinquus* Lanchester and *Paradonus oliverea* Stibick respectively.

Specific details of new records, new combinations, and generic reassignments follow. Species listed in Table 1 but not discussed below are ones for which there are previous records from their respective jurisdictions.

TABLE 1. Maritime Provinces Elateridae.

	Nova Scotia				NS	NB	PEI	Regional Distribution		
	Northern County	Cape Shore	Eastern Breton Shore	South Shore					Bay of Fundy	
<i>Elaterinae</i>										
<i>Elaterini</i>										
<i>Elater abruptus</i> Say		1				1		CT, MA, ME, NH, NY, ON, QC, RI		
<i>Sericus honestus</i> (Randall)		2	2	2	1	1	8	3	ME, NH, NY, ON, QC, VT	
<i>Sericus incongruus</i> (LeConte)		3	1	2	2	4	12	2	1	LB, ME, NF, NH, NY, ON, QC
<i>Sericus viridanus</i> (Say)				2	1	2	5			LB, ME, NF, NY, ON, QC, RI
<i>Megapenthini</i>										
<i>Megapenthes rogersi</i> Horn									1	NY, ON, QC
<i>Megapenthes stigmus</i> (LeConte)						1	1	5		ME, NY, ON, QC
<i>Agriotini</i>										
<i>Agriotina</i>										
<i>Agriotes collaris</i> (LeConte)		4	4	2	3	4	17	6	2	CT, MA, ME, NH, NY, ON, QC, RI, VT
<i>Agriotes fucus</i> (LeConte)			2	1		1	4	3		ME, NF, NH, ON, QC, RI, VT
<i>Agriotes limosus</i> (LeConte)		4	3	2	3	4	16	9	2	LB, MA, ME, NF, NH, NY, ON, QC, VT
<i>Agriotes lineatus</i> (Linnaeus) †		1	1		2	1	5			NF
<i>Agriotes mancus</i> (Say)		3		1	4	4	12	5	2	CT, LB, MA, ME, NH, NY, ON, QC, RI, VT
<i>Agriotes obscurus</i> (Linnaeus) †		1	2	1	2	3	9			ME, NF
<i>Agriotes quebecensis</i> Brown		1	1			2	4		1	MA, ME, NH, NY, ON, QC
<i>Agriotes sputator</i> (Linnaeus) †		2	2	1	2	4	11	4	1	

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TABLE 1 (continued)

	Nova Scotia					NS	NB	PEI	Regional Distribution
	Northern	Cape	Eastern	South	Bay of				
	County	Shore	Breton	Shore	Shore				
<i>Agriotes stabilis</i> (LeConte)	2	1	2	3	2	10	4	1	CT, MA, ME, NH, NY, ON, QC, VT
<i>Dalopius agnellus</i> Brown								3	ME, QC
<i>Dalopius cognatus</i> Brown	3	1	2	3	3	12	1		ME, NH, NY, ON, QC
<i>Dalopius fuscipes</i> Brown	4	2	2	3	2	13	2		ME, NY, QC
<i>Dalopius gentilis</i> Brown	2	1	1	2	2	8	1	1	NY, ON, QC, RI
<i>Dalopius pallidus</i> Brown			1		1	2	1	3	NF, NH, NY, ON, QC
<i>Dalopius pennsylvanicus</i> Brown			1			1			
<i>Dalopius vagus</i> Brown	4	4	2	4	4	18	8	3	ME, NH, NY, ON, QC, RI
Pomachiliina									
<i>Agriotella bigeminata</i> (Randall)	1		1		1	3	3		MA, ME, NH, NY, ON, QC, RI
<i>Agriotella debilis</i> (LeConte)	3		2	3	2	10	1		LB, MA, ME, NF, NH, NY, ON, QC
Ampedini									
Ampedina									
<i>Ampedus apicatus</i> (Say)	2	1	1	1	1	6	5	1	ME, NF, NH, ON, QC
<i>Ampedus areolatus</i> (Say)						1	1		MA, ME, NH, NY, ON, QC, RI
<i>Ampedus collaris</i> (Say)	1						1	1	CT, MA, ME, NY, QC, RI
<i>Ampedus deletus</i> (LeConte)	3		2	1	2	8	1		LB, NF, ON, QC
<i>Ampedus evansi</i> Brown	2		2	3	2	9	2		ME, ON, QC
<i>Ampedus fuscus</i> (LeConte)	3		2			1	6	1	LB, ME, NF, NH, ON, QC
<i>Ampedus laesus</i> (LeConte)			1				1		MA, ME, NH, NY, ON
<i>Ampedus laurentinus</i> Brown	2	1	1	1		5	3	1	ME, NY, ON, QC
<i>Ampedus</i> species 1			1	1		2			ON, QC
<i>Ampedus luctuosus</i> (LeConte)	1	1	2	1	2	7	1	2	LB, ME, NF, NH, NY, ON, QC, RI
<i>Ampedus</i> species 2			1	2	1	4		1	ON, QC
<i>Ampedus melsheimeri</i> (Leng)	1			1	1	3			ME, NH, NY, ON, QC, RI
<i>Ampedus miniipennis</i> (LeConte)								1	LB, ME, NF, ON, QC
<i>Ampedus mixtus</i> (Herbst)	3	2	2	2	1	10	3	2	MA, ME, NH, NY, ON, QC, RI, VT
<i>Ampedus molestus</i> (LeConte)		1					1	2	ON, QC
<i>Ampedus nigricans</i> (Germar)	2		1	1	1	5	1		CT, MA, ME, NH, NY, ON, QC, RI
<i>Ampedus nigricollis</i> (Herbst)			1	1	2	4			MA, ME, NH, NY, ON, QC, RI, VT
<i>Ampedus nigrinus</i> (Herbst) *								1	ME, NF
<i>Ampedus protervus</i> (LeConte)			2	2		4			MA, ME, NH, NY, ON, QC, RI
<i>Ampedus pullus</i> Germar	4	2	2	1	3	12	1	1	ME, NF, NH, NY, ON, QC
<i>Ampedus rubricus</i> (Say)	3	1	2	2	3	11	2	1	MA, ME, NH, NY, ON, QC
<i>Ampedus sanguinipennis</i> (Say)	3	1				2	6	3	1 MA, ME, NH, NY, ON, QC, RI
<i>Ampedus sayi</i> (LeConte)					1	1	1		NY, ON
<i>Ampedus semicinctus</i> (Randall)	2	2	1	2	3	10	1	2	MA, ME, NY, ON, QC, RI
<i>Ampedus "subtilis"</i> (LeConte)			2	1	3	6	2		ME, NH, NY, ON, QC
<i>Ampedus vitiosus</i> (LeConte)								1	MA, ME, NH, NY, ON, QC, RI

..... continued

TABLE 1 (continued)

	Nova Scotia					NS	NB	PEI	Regional Distribution
	Northern County	Cape Shore	Eastern Breton	South Shore	Bay of Fundy				
	Melanotina								
<i>Melanotus castanipes</i> (Paykull) *	4	4	2	3	4	17	11	1	MA, ME, NF, NH, NY, ON, QC, RI, VT
<i>Melanotus decumanus</i> (Erichson)	3	3	1	2	3	12	1	1	CT, MA, NH, NY, ON, QC, RI
<i>Melanotus similis</i> (Kirby)	4	1	2	3	4	14	1	2	CT, MA, ME, NH, NY, ON, QC, RI, VT
Cardiophorinae									
<i>Cardiophorus convexulus</i> LeConte	1	1			1	3	1	2	MA, ME, NH, NY, ON, QC, RI, VT
<i>Cardiophorus gagates</i> Erichson	2		1	2	4	9	2	1	CT, MA, ME, NH, NY, ON, QC, RI, VT
<i>Cardiophorus propinquus</i> Lanchester	2	2				4	1		NH, NY, ON, QC
Lissominae									
<u>Oestodini</u>									
<i>Oestodes tenuicollis</i> (Randall)	3	2	2		1	8	5	1	MA, ME, NH, ON, QC, RI, VT
Agrypninae									
<u>Agrypnini</u>									
<i>Danosoma brevicornis</i> (LeConte)	4		2	4	2	12	2	1	MA, ME, NH, NY, ON, QC
<i>Lacon auroratus</i> (Say)								1	MA, ME, NH, NY, QC, RI
<u>Oophorini</u>									
<i>Aeolus mellillus</i> (Say)			1		1	2			LB, NF, NH, ON, QC, RI
<i>Conoderus auritus</i> (Herbst)			1			1			CT, NH, NY, ON, QC, RI
Prosterninae									
<u>Athoini</u>									
<i>Athous acanthus</i> (Say)	2		2	3		7			ME, NH, ON, QC, RI
<i>Athous brightwelli</i> (Kirby)			1	1	2	4	1		MA, ME, NH, NY, ON, QC, RI
<i>Athous campyloides</i> Newman †					3	3		1	MA, QC
<i>Athous cucullatus</i> (Say)			1			1		1	ME, NH, ON, QC, RI
<i>Athous fossularis</i> (LeConte)								1	CT, MA, ME, NH, ON, QC
<i>Athous orvus</i> Becker	2		1	2	4	9	2	1	LB, MA, ME, NF, NH, NY, ON, QC
<i>Athous posticus</i> (Melsheimer)	1					1			NY, ON, QC, RI
<i>Athous productus</i> (Randall)	2		1			3	1		NF, NY, ON, QC
<i>Athous rufifrons</i> (Randall)	3	3	2	2	3	13	1	1	CT, MA, ME, NF, NH, NY, ON, QC, RI, VT
<i>Athous scapularis</i> (Say)		1			1	2			MA, ME, NH, ON, QC, VT
<i>Denticollis denticornis</i> (Kirby)	4	2	2	1	4	13	2	1	ME, NF, NH, NY, ON, QC
<i>Elathous discalceatus</i> (Say)			1		1	2			NH, NY, ON, QC
<i>Hemicrepidius brevicollis</i> (Candèze)	1	1	2	1	3	8	3	2	ME, ON, QC
<i>Hemicrepidius hemipodus</i> (Say)			1			1	1		ME, NY, ON, QC
<i>Hemicrepidius memnonius</i> (Herbst)	3		2	3	4	12		1	MA, ME, NH, NY, ON, QC, RI, VT
<i>Limonius aeger</i> LeConte	4	2	2	3	3	14	6	2	LB, ME, NF, NH, NY, ON, QC, RI
<i>Limonius anceps</i> LeConte								2	ME, NY, ON, QC

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TABLE 1 (continued)

	Nova Scotia					NS	NB	PEI	Regional Distribution	
	Northern	Cape	Eastern	South	Bay of					
	County	Shore	Breton	Shore	Shore					Fundy
<i>Limonius confusus</i> LeConte		3	2	1	3	4	13	2	MA, ME, NH, NY, ON, QC, RI	
<i>Limonius pectoralis</i> LeConte								1	LB, ME, NF, NH, NY, ON, QC	
<u>Pityobiini</u>										
<i>Pityobius anguinus</i> LeConte		4	2	1	2	2	11	4	1	ME, NH, NY, ON, QC
<u>Prosternini</u>										
<i>Actenicerus cuprascens</i> (LeConte) *								2		MA, NH, NY, ON, QC, VT, RI
<i>Anostirus vernalis</i> (Hentz)		1		1		1	3	2		ME, NH, NY, ON, QC
<i>Beckerus appressus</i> (Randall)			1	1			2	3		ME, NF, NH, NY, ON, QC
<i>Corymbitodes elongaticollis</i> (Hamilton)			2	2			4	2		MA, ME, NH, NY, QC
<i>Corymbitodes pygmaeus</i> (Van Dyke)			4		1		5	6		ME, NF, NH, NY, ON, QC
<i>Corymbitodes tarsalis</i> (Melsheimer)		4	4	1	3	4	16	5	1	ME, NH, NY, ON, QC, RI
<i>Ctenicera kendalli</i> (Kirby)								1		ME, NF, NY, ON, QC
<i>Eanus estriatus</i> (LeConte)		1		1			2	1		LB, ME, NF, NY, ON, QC
<i>Eanus maculipennis</i> LeConte			1	2			3	3		LB, ME, NF, NH, NY, ON, QC
<i>Hypoganus sulcicollis</i> (Say)				1	1		2			CT, ME, NH, NY, ON, QC, RI
<i>Liotrichus falsificus</i> (LeConte)		2	1	2	1	2	8	1		ME, NF, NH, NY, ON, QC
<i>Liotrichus spinosus</i> (LeConte)		3	4	2	2	4	15	6	1	ME, NF, NH, NY, ON, QC
<i>Liotrichus vulneratus</i> (LeConte)		3	1	1	2	1	8	6		ME, NY, QC
<i>Metanomus insidiosus</i> (LeConte)		3	2	2	1	2	10	2		ME, NH, NY, ON, QC
<i>Nitidolimonius resplendens</i> (Eschscholtz)		2	1	2		1	6	3	1	LB, ME, NF, NH, NY, ON, QC, RI
<i>Oxygonus montanus</i> Schaeffer		3	2	2	1		8	2		ME, NH, NY, QC
<i>Paractenicera fulvipes</i> (Bland)		2	1	2	1		6	1		ME, NH, NY, ON, QC
<i>Prosternon fallax</i> (Say)			1			1	2			NH, NY, ON, QC
<i>Prosternon medianum</i> (Germar)		3		1	2	1	7	3		MA, ME, NH, NY, ON, QC, RI
<i>Pseudanostirus hamatus</i> (Say)				2	1		3	1		MA, ME, NH, NY, ON, QC, RI
<i>Pseudanostirus hieroglyphicus</i> (Say)		2		2	2	2	8	3	2	MA, ME, NH, NY, ON, QC, RI
<i>Pseudanostirus p. propolis</i> (LeConte)		2	1	1	2	2	8	3	1	MA, ME, NH, NY, ON, QC, RI
<i>Pseudanostirus triundulatus</i> (Randall)		4	4	2	3	4	17	5	2	LB, ME, NF, NH, NY, ON, QC, RI
<i>Selatosomus appropinquans</i> (Randall)		3	1	1	2	2	9	10	2	MA, ME, NF, NH, NY, ON, QC
<i>Selatosomus pulcher</i> (LeConte)		4	4	2	1	3	14	9	2	ME, NH, NY, ON, QC
<i>Selatosomus splendens</i> (Ziegler)								2		ME, NH, NY, ON, QC, RI
<i>Setasomus aratus</i> (LeConte)		3	1	2	3		9	5		ME, NF, NY, ON, QC
<i>Setasomus nitidulus</i> (LeConte)		3	4	2	3	2	14	2	1	LB, ME, NF, NH, NY, ON, QC
<i>Setasomus rufopleuralis</i> (Fall)		1		1	2	2	6	1	1	ME, NH, NY, ON, QC
<i>Sylvanelater cylindriciformis</i> (Herbst)		3	2	2		2	9	5	3	CT, MA, ME, NF, NH, ON, QC, RI
<i>Sylvanelater mendax</i> (LeConte)		1	1	1			3			NF, NY, ON, QC
<u>Hypnoidini</u>										
<i>Hypnoidus abbreviatus</i> (Say)		2	1		1	2	6	4	2	CT, MA, ME, NF, NH, NY, ON, QC, RI, VT
<i>Hypnoidus bicolor</i> (Eschscholtz) *			1	1		1	3	2		LB, ME, NF, NH, NY, ON, QC

..... continued

TABLE 1 (continued)

	Nova Scotia					NS	NB	PEI	Regional Distribution
	Northern	Cape	Eastern	South	Bay of				
	County	Shore	Breton	Shore	Shore				
<i>Ligmargus lecontei</i> (Leng)		1	1			2	4		NH, NY, ON, QC
<i>Margaiostus grandicollis</i> (LeConte)		1	1				2	2	ON, QC
<i>Negastrinae</i>									
<i>Microhyphnus striatulus</i> (LeConte)		2					2	1	NY, ON, QC
<i>Negastrius arnetti</i> Stibick								3	MA, ME, NH, NY, ON
<i>Negastrius delumbis</i> (Horn)		1	1	1		1	4	1	2 MA, NH, NY
<i>Negastrius exiguus</i> (Randall)								1	MA, ME, NH, NY, ON
<i>Neohypdonus tumescens</i> (LeConte)		2	1	1	2	1	7	4	ME, NH, ON, QC
<i>Oedostethus femoralis</i> LeConte								4	ME, NY, ON, QC
<i>Paradonus oliverae</i> Stibick		1		1			2	1	NY, QC, VT
<i>Paradonus pectoralis</i> (Say)					1		1		ME, NH, NY, ON, QC
<i>Zorochros melsheimeri</i> (Horn)		1					1	2	NY, QC
Total	189	114	131	134	175	743	267	70	
Number of Species	78	64	86	67	79	110	98	48	

Notes: Figures indicate the number of county records. †, Introduced Palaearctic species; *, Holarctic species.

Numbers indicate the number of county records in each province or region. For the purposes of this treatment, northeastern North America is taken to consist of the following jurisdictions: Connecticut (CT), Labrador (LB), Massachusetts (MA), Maine (ME), New Brunswick (NB), Newfoundland (NF), New Hampshire (NH), Nova Scotia (NS), New York (NY), Ontario (ON), Prince Edward Island (PE), Québec (QC), Rhode Island (RI), Saint-Pierre et Miquelon (PM), and Vermont (VT).

Districts in Nova Scotia consist of the following 18 counties: **Northern Shore:** Antigonish, Cumberland, Colchester, Pictou; **Cape Breton:** Cape Breton, Inverness, Richmond, Victoria; **Eastern Shore:** Guysborough, Halifax; **South Shore:** Lunenburg, Queens, Shelburne, Yarmouth; **Bay of Fundy:** Annapolis, Digby, Hants, Kings. There are 3 counties on Prince Edward Island and 15 counties in New Brunswick.

Regional distributional information is derived from Bousquet (1991), Downie & Arnett (1996), Chandler (2001), Sikes (2004), and the present study. Only jurisdictions in northeastern North America in addition to the Maritime Provinces are listed.

Elaterinae

Sericus honestus (Randall, 1838)

NOVA SCOTIA: 65 specimens examined from Colchester, Cumberland, Halifax, Hants, Inverness, and Richmond counties. The earliest record is from 1995 (**Colchester Co.:** Kemptown, 14.vi.1995, C. Corkum, deciduous forest, flight-intercept trap, NSMC; Nuttby Mt., 14.vi.1995, C. Corkum, deciduous forest, flight-intercept trap, NSMC).

Newly recorded in Nova Scotia. Collected in both coniferous and deciduous forests of all ages.

Sericus incongruus (LeConte, 1853)

PRINCE EDWARD ISLAND: Queens Co.: Pinette, 24.vi.2003, C.G. Majka, coastal forest, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia collected in red spruce (*Picea rubens* Sarg.) and eastern hemlock (*Tsuga canadensis* (L.) Carr.) forests of all ages. Reported from forested areas in western Canada by Brooks (1960). In some studies (i.e., Boiteau *et al.* 2000) the Palaearctic species, *Sericus brunneus* (Linnaeus, 1758), has also been reported in the region. There is continuing uncertainty as to whether *S. incon-*

gruus and *S. brunneus* represent distinct species or a single Holarctic species. Pending further investigation we treat all the specimens from the region as the Nearctic *S. incongruus*.

Megapenthes stigmosus (LeConte, 1853)

NOVA SCOTIA: Hants Co.: Mount Uniacke, 27.viii.2004, D. MacDonald, NSNR.

Newly recorded in Nova Scotia. A boreal forest species (Becker 1971); predominantly found in poplar forests and parklands; usually collected on dense undergrowth (Brooks 1960).

Agriotes pubescens Melsheimer, 1845

This species was reported from New Brunswick by Bousquet (1991), however, no voucher specimens were located in any collection, nor are there published records from the province. Becker (1956, pp. 69) writes that, "in many collections *pubescens* is confused with *quebecensis*" and his accompanying range map shows it occurring east only to southern Québec and western Maine. Accordingly, the species is removed from the faunal list of Nova Scotia.

Agriotes quebecensis Brown, 1933

PRINCE EDWARD ISLAND: Queens Co.: Wheatly River, 2.vi.1971, J. MacLeod, on alder, UPEI.

Newly recorded from Prince Edward Island. No additional information on bionomics is available.

Agriotes sputator (Linnaeus, 1758)

NOVA SCOTIA: Digby Co.: Marshalltown, 16.vi.1952, 9.ix.1952, C.J.S. Fox, (4), NSAC. **PRINCE EDWARD ISLAND: Queens Co.:** Pownal, 19.vi.1997, J.G. Stewart, ACPE; Pownal, 18.vi.2001, M.E. Smith, (8), ACPE.

This introduced and invasive Palaearctic species is newly recorded from Prince Edward Island. It was first recorded in North America in New Brunswick in 1939 (Brown 1940). The earliest records from Nova Scotia are from 1952 (see above). Adults are frequently found in pastures and grasslands where the larvae (wireworms) feed on the roots of various species of grasses (Brian 1947). In Nova Scotia the species has attained very high population densities (3 million/acre) in wheat fields; the larvae prefer slightly drier and lighter soils than *A. mancus* (Say) (Becker 1956).

Agriotes stabilis (LeConte, 1853)

NOVA SCOTIA: 60 specimens examined from Cape Breton, Colchester, Cumberland, Digby, Guysborough, Halifax, Hants, Lunenburg, Queens, Richmond, and Shelburne counties. The earliest record is from 1945 (**Lunenburg Co.:** Bridgewater, 30.vi.1945, collector not recorded, NSMC). **PRINCE EDWARD ISLAND: Queens Co.:** Cavendish, 14.vii.2002, C.G. Majka, coastal lagoon, (4), CGMC; St. Patricks, 17.viii.2002, C.G. Majka, old field, CGMC; Wood Islands, 30.vi.2003, C.G. Majka, coastal forest, CGMC.

Newly recorded from Nova Scotia and Prince Edward Island. Usually collected on hazel, dogwood, and willow near small ponds within larger deciduous forests (Brooks 1960). In Nova Scotia found in deciduous, coniferous, mixed forests, and adjacent clearings. Common on undergrowth (especially on wood fern) in birch-poplar stands; the larvae prefer sandy soils where they are predators in the humus layer (Becker 1956).

Dalopius fuscipes Brown, 1934

NEW BRUNSWICK: Kings Co.: Grand Bay, 28.vi.1990, D.F. McAlpine, NBM; **Saint John Co.:** Saint John, 7.vi.1990, Jarvis and Bedell, NBM.

Newly recorded in New Brunswick. In Nova Scotia found predominantly in deciduous forests of various ages; occasionally in coniferous forests.

Dalopius gentilis Brown, 1934

NOVA SCOTIA: 45 specimens examined from Colchester, Guysborough, Halifax, Hants, Kings, Lunenburg, Pictou, Queens, and Richmond counties. The earliest record is from 1989 (**Richmond Co.:** St. Peters, 3.vi.1989, E. Georgeson, NSNR). **PRINCE EDWARD ISLAND: Queens Co.:** Millvale, 25.vi.2003, C.G. Majka, deciduous forest, (5), CGMC.

Newly recorded from Nova Scotia, Prince Edward Island, and the Maritime Provinces as a whole. In New Brunswick Boiteau *et al.* (2000) reported 4 specimens of *Dalopius* prob. *gentilis*. In Nova Scotia found in red spruce (*Picea rubens*), hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus* L.) stands, frequently in mature or old-growth forests.

Dalopius pennsylvanicus Brown, 1934

NOVA SCOTIA: Guysborough Co.: Malay Lake, 15–30.vi.1997, D.J. Bishop, red spruce forest, flight-intercept trap, NSMC.

Newly recorded in Nova Scotia and in Canada. Found most commonly in ecotones or in open areas of mixed deciduous and coniferous forest (unpublished data).

Dalopius vagus Brown, 1934

PRINCE EDWARD ISLAND: 43 specimens examined from Kings, Prince, and Queens counties. The earliest record is from 1971 (**Queens Co.:** Wheatley River, 2.vi.1971, J. MacLeod, on alder, UPEI).

Newly recorded from Prince Edward Island. In Nova Scotia found in coniferous and deciduous forests of every age as well as in adjacent open areas. In the Prairie Provinces found in grassy pastures (Brooks 1960).

Ampedus areolatus (Say, 1823)

NOVA SCOTIA: Kings Co.: Kentville, 7.vi.1996, D.H. Webster, DHWC.

Newly recorded from Nova Scotia and in the Maritime Provinces as a whole. In the United States found associated with many deciduous and coniferous trees.

Ampedus collaris (Say, 1825)

NEW BRUNSWICK: Kings Co.: Penobsquis, 26.vii.1926, C.A. Frost, CNC.

Newly recorded from New Brunswick. Recorded from hickory (*Carya* sp.), red spruce (*Picea glauca* (Moench) Voss), and white pine (*Pinus strobus* L.) (Ramberg 1979). In Nova Scotia reared from white spruce (unpublished data).

Ampedus fuscus (LeConte, 1853)

NOVA SCOTIA: 23 specimens examined from Antigonish, Colchester, Cumberland, Guysborough, Halifax, and Hants counties. The earliest record is from 1990 (**Colchester Co.:** Masstown, 15.vi.1990, T.D. Smith, NSNR).

Newly recorded from Nova Scotia. In Nova Scotia found in red (*Picea rubens*) and black spruce (*Picea mariana* (Mill.) BSP.) forests. Beaten from spruce (Ramberg 1979).

Ampedus laesus (LeConte, 1853)

NOVA SCOTIA: Halifax Co.: Pockwock Lake, 1–16.vii.1997, D.J. Bishop, red-spruce forest, flight-intercept trap, NSMC.

Newly recorded from Nova Scotia and in the Maritime Provinces as a whole. Collected from rotting wood of white pine (*Pinus strobus*) (Ramberg 1979).

Ampedus laurentinus Brown, 1933

PRINCE EDWARD ISLAND: Queens Co.: Wood Islands, 29.viii.2003, C.G. Majka, seashore, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia found in coniferous forests. In boreal forests on aspen and poplar (*Populus* sp.) (Brooks 1960).

Ampedus luctuosus (LeConte, 1853)

PRINCE EDWARD ISLAND: Kings Co.: Greenwich, 11.vi.1971, A. Joshi, rotten wood, (2), UPEI; **Queens Co.:** Brackley Beach, 13.vii.1971, A. Joshi, on sand, UPEI.

Newly recorded from Prince Edward Island. In Nova Scotia found in red spruce (*Picea rubens*), black spruce (*Picea mariana*), and hemlock (*Tsuga canadensis*) forests of various ages; occasionally in deciduous forests. Beaten from fir (*Abies* sp.) (Ramberg 1979).

Ampedus nigricollis (Herbst, 1806)

NOVA SCOTIA: Halifax Co.: Lawrencetown, 13.ix.1964, C.J.S. Fox, ACNS; **Hants Co.:** Quarry Lake, 14.vi.2005, C. Sheffield and S. Westby, malaise trap, ACNS; **Kings Co.:** Aldershot, 6.vi.1952, H.T. Stultz, on apple, ACNS; Cambridge Station, 26.v.1960, D.H. Webster, on rotting polar stump, DHWC; Hall's Harbour, 16.xii.1956, C.J.S. Fox, in rotten spruce stump, ACNS; Kentville, 16.x.1965 & 2.vi.1966, C.J.S. Fox, ACNS; Kentville, 25.v.1966, C.J.S. Fox, reared from rotten apple wood, tenereal, ACNS; Sheffield Mills, 2.xii.1966, C.J.S. Fox, ACNS.

Newly recorded from Nova Scotia and the Maritime Provinces as a whole. Found under loose bark or other cover (Dietrich 1945). Collected from rotting wood of sweet birch (*Betula lenta* L.), chestnut (*Carya* sp.), maple (*Acer* sp.), tupelo (*Nyssa* sp.), trembling aspen (*Populus tremuloides* Michx.), pine (*Pinus* sp.), oak (*Quercus* sp.), willow (*Salix* sp.), hemlock (*Tsuga* sp.), elm (*Ulmus americana* L.), and on flowers of purple angelica (*Angelica atropurpurea* L.) and from fungus (Ramberg 1979).

Ampedus pullus Germar, 1844

PRINCE EDWARD ISLAND: no locality noted, 1973–1984, UPEI; **Queens Co.:** Churchill, 2.vi.1982, R. Wenn, meadow, UPEI; Pownal or Belle River, 10.vi.1993, M.E. Smith, on blueberry, ACPE; St. Patricks, 22.vii.2001, C.G. Majka, old field, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia found in coniferous forests on red spruce (*Picea rubens*), black spruce (*Picea mariana*), and jack pine (*Pinus banksiana*). On pine and spruce (Brooks 1960). Recorded from jack pine (*Pinus banksiana*), ponderosa pine (*Pinus ponderosa* P. & C. Lawson), white pine (*Pinus strobus*), and douglas-fir (*Pseudotsuga menziesii* (Mirbel) Franco) (Ramberg 1979).

Ampedus rubricus (Say, 1825)

NEW BRUNSWICK: Saint John Co.: Saint John, 6.viii.1902, W. McIntosh, NBM; **York Co.:** Charters Settlement, 45.84°N, 66.72°W, 29.iv.2000, R.P. Webster, RWC. **PRINCE EDWARD ISLAND: Queens Co.:** Strathgartney, 9.vi.1982, V. Bryanthon, woods' edge, UPEI.

Newly recorded from New Brunswick and Prince Edward Island. In Nova Scotia found in deciduous forests; in rotten red oak (*Quercus rubra* L.) and apple (*Pyrus malus* L.) wood. Downie & Arnett (1996) say that adults are locally common on *Crataegus* sp. and *Prunus* sp. blossoms.

Ampedus sanguinipennis (Say, 1823)

PRINCE EDWARD ISLAND: Queens Co.: Cavendish, 19.vii.2001, C.G. Majka, coastal vegetation, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia adults found on apple (*Pyrus malus*) and yellow birch (*Betula alleghaniensis* Britt.) (unpublished data). Recorded from cypress (*Cupressus* sp.), pine (*Pinus* sp.), oak (*Quercus* sp.), and willow (*Salix* sp.) (Ramberg 1979).

Ampedus sayi (LeConte, 1853)

NOVA SCOTIA: Kings Co.: Hall's Harbour, 16.xii.1956, C.J.S. Fox, in birch, ACNS; Kentville, 6.v.1949, R.E. Morehouse, NSAC.

Newly recorded from Nova Scotia, where one specimen was found in a decomposing birch.

Ampedus semicinctus (Randall, 1838)

NEW BRUNSWICK: Saint John Co.: Saint John, 23.vii.1902, W. McIntosh, NBM; **York Co.:** Fredericton, 1992–1995, (2), Boiteau *et al.* (2000). **PRINCE EDWARD ISLAND: Kings Co.:** Woodville Mills, 20.viii.2007, C.G. Majka, along small brook, CGMC; **Queens Co.:** St. Patricks, 25.vi.2003, C.G. Majka, mixed forest, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia found in mixed red spruce (*Picea rubens*), white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), and balsam fir (*Abies balsamea* (L.) Mill.) forests. Found under loose pine (*Pinus* sp.) bark and beating chestnut oak (*Quercus prinus* L.) (Ramberg 1979).

Ampedus "subtilis" (LeConte, 1884)

NEW BRUNSWICK: Kings Co.: Canaan, 11.v.1978, Y. Bossé, UMNB; **Saint John Co.:** Saint John, 21.v.1898, W. McIntosh, NBM. **NOVA SCOTIA: Annapolis Co.:** Falkland Ridge, 29.iv.1961, D.H. Webster, under bark, pine stump, DHWC; Paradise, 3.v.2004, K. Webster, flight-intercept trap, NSNR; **Guysborough Co.:** Melopseketch Lake, 15.vi.1995, C. Corkum, young deciduous forest, flight-intercept trap, NSMC; **Hali-fax Co.:** 9.viii.2003, P. Dollin, red spruce forest, funnel trap, NSMC; Herring Cove, 28.vii.2002, coastal barren, C.G. Majka, CGMC; Point Pleasant Park, 9.vi.2002, 15.vii.2001, C.G. Majka, coniferous forest, (2), CGMC; **Hants Co.:** Mount Uniake, 5.vii.2004, D. MacDonald, flight-intercept trap, NSNR; Smiley's Park, 16.vii.2004, D. MacDonald, flight-intercept trap, NSNR; **Queens Co.:** Butler Rd., 28.vi.2006, J. Brown,

flight-intercept trap, NSNR; Eight Mile Lake, 10.vi.2003, P. Dollin, hemlock-red spruce forest, (2), NSMC; Sixth Lake, 20.vi.2003, P. Dollin, old-growth hemlock forest, NSMC; **Lunenburg Co.:** Bridgewater, 19.vii.1971, B. Wright, NSMC; **Victoria Co.:** Big Barren, 14.vi.1983, B. Wright, NSMC.

Newly recorded from New Brunswick. In Nova Scotia found in red spruce (*Picea rubens*) and hemlock (*Tsuga canadensis*) stands, under pine (*Pinus* sp.) bark, and also in coastal barrens, marshes, and around buildings (unpublished data).

Ampedus "subtilis" was recorded from Sable Island, NS by Wright (1989). Additional records are given above. *Ampedus subtilis* is, however, in the process of revision by F. Ramberg (pers. comm.) and it appears that the species known under this name in the Maritime Provinces is actually an undescribed one. We provisionally refer to it as *Ampedus "subtilis"* in the expectation that forthcoming revisionary work will clarify and alter its status.

Ampedus 1 undescribed [Ramberg, manuscript species]

NOVA SCOTIA: Guysborough Co.: Dayspring Lake, 1–16.vii.1997, D.J. Bishop, red spruce forest, flight-intercept trap, NSMC; **Lunenburg Co.:** Card Lake, 2–15.vi.1997, D.J. Bishop, old-growth red spruce/hemlock forest, flight-intercept trap, NSMC.

Newly recorded in Nova Scotia and in the Maritime Provinces as a whole. This species has been confused with *A. luctuosus* (LeConte) in collections.

Ampedus 2 undescribed [Ramberg, manuscript species]

NOVA SCOTIA: Annapolis Co.: Paradise, 30.vi.2004, K. Webster, flight-intercept trap, NSNR; **Halifax Co.:** Soldier Lake, 5.vii.2004, D. MacDonald, flight-intercept trap, NSNR; **Lunenburg Co.:** Bridgewater, 30.vi.1965, B. Wright, (5), NSMC; **Queens Co.:** no locality specified, 11.vii.1965, C.J.S. Fox, (2), ACNS; no locality specified, 17.vii.1967, C.J.S. Fox, ACNS. **PRINCE EDWARD ISLAND:** no locality specified, 1974–1983, (2), UPEI.

Newly recorded from Nova Scotia, Prince Edward Island, and the Maritime Provinces as a whole. Collected from rotting wood of chestnut (*Castanea* sp.) and jack pine (*Pinus banksiana* Lamb.) (Ramberg 1979). This species has often been determined as *A. melsheimeri* (Leng) in collections.

Melanotus decumanus (Erichson, 1841)

NEW BRUNSWICK: York Co.: Fredericton, 1992–1995, potato field, Boiteau *et al.* (2000). **PRINCE EDWARD ISLAND: Queens Co.:** Pinette, 24.vi.2003, C.G. Majka, coastal forest, CGMC.

Newly recorded from Prince Edward Island. Worthy of attention is Boiteau *et al.*'s (2000) record of this species from New Brunswick. Although not indicated as such in the paper, this was a new record for this species in New Brunswick. Larvae are subcortical in decaying snags, logs, and stumps, especially at ground-level or in underground portions, where they are predators on other invertebrates. Collected throughout its range in mixed coniferous and deciduous forests of late second growth or older ages (unpublished data).

Melanotus similis (Kirby, 1837)

PRINCE EDWARD ISLAND: Kings Co.: Launching, 23.vii.2001, C.G. Majka, coniferous forest, CGMC; **Queens Co.:** St. Patricks, 27.vi.2003, C.G. Majka, coniferous forest, funnel trap, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia generally found in open habitats. In Québec collected in raspberry plantations and pine woods (Levesque & Levesque 1993). This is the so-called "corn

wireworm” of southern regions. The larva is a soil predator in meadow, field, and ecotonal areas, and facultatively feeds on sprouting corn and other seeds in agricultural situations (P. Johnson, unpublished data).

Cardiophorinae

Cardiophorus cardisce (Say, 1834)

This species was reported from New Brunswick and Nova Scotia by Bousquet (1991), however, since that time Douglas (2003) has re-evaluated the *C. cardisce* and *Cardiophorus propinquus* Lanchester (previously regarded as a western North American species) in eastern North America. In his examination of specimens he found that *C. cardisce* occurred in Canada from Alberta east to Québec and *C. propinquus* from Alberta east to Nova Scotia. Amongst the specimens included as part of the present study (17 from New Brunswick and 14 from Nova Scotia), all were *C. propinquus*. Accordingly *C. cardisce* is removed from the faunal lists of New Brunswick and Nova Scotia. This species tends to toward riparian habitats and larvae are predators in moist sandy soils (Douglas 2003).

Cardiophorus convexulus LeConte, 1853

PRINCE EDWARD ISLAND: Prince Co.: Tignish, 2.vi.1996, M.E. Smith, on blueberry, ACPE; **Queens Co.:** Cavendish Sandspit, 27.vi.2003, C.G. Majka, seashore, (3), CGMC.

Newly recorded from Prince Edward Island. Found on sand dunes and barrens; adults have been found on polleniferous branches of Scotch pine (*Pinus sylvestris* L.), eastern white cedar (*Thuja occidentalis* L.), common buckthorn (*Rhamnus cathartica* L.), and red osier dogwood (*Cornus sericea* L.) (Douglas 2003).

Cardiophorus gagates Erichson, 1840

PRINCE EDWARD ISLAND: Kings Co.: Lakeside Beach, 3.viii.1997, D.B. McCorquodale, CBU; Souris, 25.vi.1993, M.E. Smith, ACPE; Souris, 6.vii.1993, M.E. Smith, ACPE.

Newly recorded from Prince Edward Island. Found in sandy habitats such as beach dunes, scrub, barrens, sandy old fields, and sand-spits; adults are found on the foliage and flowers of a variety of coniferous and deciduous trees, shrubs, heaths, and herbaceous plants (Douglas 2003); larvae are predators in moist sandy soils.

Cardiophorus propinquus Lanchester, 1971

NEW BRUNSWICK: Kent Co.: Kouchibouguac National Park, 19.v.1981, 9.vi.191, 30.vii.1981, 23.vi.1982, 5.vii.1982, 10.vii.1982, 12.vii.1982, 20.vii.1982, G.A. Calderwood, H. Goulet, D.B. Lyons, S.J. Miller, and J.H. Redner, (16), CNC; **York Co.:** Scotchtown, 17.vii.1997, R.P. Webster, RWC. **NOVA SCOTIA: Antigonish Co.:** Pomquet, 9.v.1996, I. Bryson, NSNR; **Cumberland Co.:** Wasson Bluff, 27.vii.2006, J. Ogden & K. Goodwin, on cliff face, NSNR; **Inverness Co.:** 1 km S of Pillar Rock, Cape Breton Highlands National Park, 10.vii.1987, Y. Bousquet, (2), CNC; Margaree, 18.vi.1987, P.P. Harper, QMOR; Pleasant Bay, 10.vi.1987, Y. Bousquet, (2), CNC; **Victoria Co.:** Clyburn Brook, Cape Breton Highlands National Park, 21.vi.1987, 1.vii.1987, Y. Bousquet, (4), CNC; Ingonish: North Bay Beach, 28.v.1996, L.A. Hudson & P.A. Rankin, beach area, (3), CBU.

Recorded from New Brunswick and Nova Scotia by Douglas (2003) (see account under *C. cardise* above). Found under *Taraxacum* sp. (Asteraceae), on *Populus balsamifera* L. (Salicaceae), and in a sand pit Douglas (2003).

Agrypninae

Danosoma brevicornis (LeConte, 1853)

NOVA SCOTIA: 25 specimens examined from Annapolis, Antigonish, Colchester, Cumberland, Guysborough, Halifax, Hants, Kings, Lunenburg, Pictou, Queens, and Yarmouth counties. The earliest record is from 1958 (**Queens Co.:** Lake Kejimkujik, 12.vi.1958, D.C. Ferguson, NSMC). **PRINCE EDWARD ISLAND:** **Kings Co.:** Greenwich, 14.vi.1971, J. Furrvolo, on sand, UPEI.

Newly recorded from Nova Scotia and Prince Edward Island. In Nova Scotia found in coniferous, deciduous, and mixed forests where larvae are subcortical predators.

Danosoma obtectum (Say, 1839)

This species was reported from Nova Scotia by Bousquet (1991), however, there are no voucher specimens in any collection examined, nor are there published records from the province. Accordingly, the species is removed from the faunal list of Nova Scotia.

Aeolus mellillus (Say, 1834)

NOVA SCOTIA: Halifax Co.: York Redoubt, 27.ix.2005, B. Mrezar, rocky area, CGMC; **Kings Co.:** Kentville, 19.xi.1960, D.H. Webster, under board near edge of meadow, DHWC.

Newly recorded in Nova Scotia. In the prairie provinces found in grasslands and other sandy areas, usually under stones, sticks, or dry manure (Brooks 1960). Larvae are predators in sandy to loamy soils on immature insects.

Prosterninae

Athous campyloides Newman, 1833

This adventive, Palaearctic species was reported from New Brunswick by Bousquet (1991), however, there are no voucher specimens in any collection examined, nor does Becker (1974) list it from the province. Accordingly, the species is removed from the faunal list of New Brunswick.

Athous cucullatus (Say, 1825)

PRINCE EDWARD ISLAND: Prince Co.: Conway Narrows, 12.viii.1970, U. Grigg, NSMC.

Newly recorded from Prince Edward Island. Larvae of species of *Athous* are found in forest litter or decaying logs (Becker 1974) where they are predators.

Athous fossularis (LeConte, 1853)

NEW BRUNSWICK: York Co.: Fredericton, 1992–1995, potato field, Boiteau *et al.* (2000).

Worthy of attention is Boiteau *et al.*'s (2000) record of this species from New Brunswick. Although not indicated as such in the paper, this was a new record for this species not only in New Brunswick but in the Maritime Provinces as a whole.

Athous posticus (Melsheimer, 1846)

NOVA SCOTIA: Cumberland Co.: Little River, 22.vii.2004, D. McDonald, flight intercept trap, (3), NSNR.

Newly recorded in Nova Scotia and the Maritime Provinces as a whole. Larvae of species of *Athous* are found in forest litter or decaying logs (Becker 1974) where they are predators.

Athous productus (Randall, 1838)

NEW BRUNSWICK: York Co.: Fredericton, 1992–1995, potato field, Boiteau *et al.* (2000). **NOVA SCOTIA: Colchester Co.:** Debert, 20.vi.1991, E. Georgeson, NSNR; **Cumberland Co.:** Diligent River, 23.vi.1988, E. Georgeson, ultra-violet light trap, NSNR; **Halifax Co.:** Boulderwood, 24.vi.1959, D.C. Ferguson, NSMC.

Newly recorded in Nova Scotia. Worthy of attention is Boiteau *et al.*'s (2000) record of this species from New Brunswick. Although not indicated as such in the paper, this was a new record for this species in New Brunswick. Larvae of species of *Athous* are found in forest litter or decaying logs (Becker 1974) where they are predators.

Athous rufifrons (Randall, 1838)

PRINCE EDWARD ISLAND: Queens Co.: St. Patricks, 14.vii.2002, C.G. Majka, in vegetation along small stream, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia commonly found in red spruce (*Picea rubens*) forests; occasionally in hemlock (*Tsuga canadensis*) stands. Larvae of species of *Athous* are found in forest litter or decaying logs (Becker 1974) where they are predators.

Athous scapularis (Say, 1839)

NOVA SCOTIA: Hants Co.: Leminister, 16–29.vii.1997, D.J. Bishop, red spruce-hemlock forest, flight-intercept trap, NSMC; **Richmond Co.:** Irish Cove, 30.vii.2004, C. D'Orsay, on striped maple (*Acer pensylvanicum* L.), CBU.

Newly recorded in Nova Scotia and the Maritime Provinces as a whole. Larvae of species of *Athous* are found in forest litter or decaying logs (Becker 1974) where they are predators.

Denticollis denticornis (Kirby, 1837)

PRINCE EDWARD ISLAND: Queens Co.: Bethyl, 22.vi.1981, L.S. Thompson, ACPE; North Rustico, 23.vi.2003, C.G. Majka, seashore, CGMC; West Royalty, 5.vii.1983, L.S. Thompson, ACPE.

Newly recorded from Prince Edward Island. In Nova Scotia frequently collected in coniferous forests, particularly red (*Picea rubens*) and black (*Picea mariana*) spruce; occasionally in young deciduous forests

and once on a decaying poplar (*Populus* sp.) log. Found in boreal forests (Brooks 1960). Larvae are predators found in forest litter and decaying wood (unpublished data).

Hemicrepidius brevicollis (Candèze, 1863)

PRINCE EDWARD ISLAND: Kings Co.: Launching, 23.vii.2001, C.G. Majka, coniferous coastal forest, CGMC; **Queens Co.:** St. Patricks, 17.viii.2002, C.G. Majka, coniferous coastal forest, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia found in both coniferous and deciduous forests. In the prairie provinces found in parklands (Brooks 1960).

Hemicrepidius hemipodus (Say, 1825)

NEW BRUNSWICK: Carleton Co.: Meduxnekeeg Valley Preserve, 46.20°N, 67.83°W, 13.vii.2004, K. Bredin, J. Edsall, and R.P. Webster, foliage on river margin, RWC. **NOVA SCOTIA: Halifax Co.:** Halifax, 18.vi.1979, F.W. Scott, NSMC; Halifax, 15.vi.1992, no collector indicated, CGMC; south-end Halifax, 19.vi.2001, 29.vi.2001, 30.vi.2001, 2.vii.2001, 27.vi.2002, and 19.vii.2002, C.G. Majka, garden, (7), CGMC; south-end Halifax, 21.vi.2002, C.G. Majka, railway ravine, CGMC.

Newly recorded from New Brunswick, Nova Scotia and the Maritime Provinces as a whole. Collected in a raspberry plantation in Québec (Levesque & Levesque 1993).

Limoniuss confusus LeConte, 1853

NEW BRUNSWICK: Saint John Co.: Saint John, 7.vi.1902, W. McIntosh, (2), NBM; **York Co.:** Canterbury, 45.8841°N, 67.8428°W, 8.vi.2004, D. Sabine and R.P. Webster, deciduous forest, RWC.

Newly recorded from New Brunswick. In Nova Scotia found in red spruce (*Picea rubens*), hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), and balsam fir (*Abies balsamea*) of all ages; also in mixed forests and on lakeshore. Found in meadows (Dietrich 1945). Commonly swept from grasses and weeds (Downie & Arnett 1996).

Pityobius anguinus LeConte, 1853

PRINCE EDWARD ISLAND: Queens Co.: Flat River, 6.viii.1966, A. MacKenzie, UPEI.

Newly recorded from Prince Edward Island. Usually collected under spruce (*Picea* sp.) and pine (*Pinus* sp.) bark (Brooks 1960). Larvae are in underground portions of decaying logs, stumps and snags, and are voracious predators on immature Buprestidae, Cerambycidae, Tenebrionidae, Scarabaeidae, and probably other insects (unpublished data).

Melanactes puncticollis (LeConte, 1852)

NOVA SCOTIA: Kings Co.: Kentville, 26.vii.1972, D.H. Webster, near greenhouse, DHWC.

This specimen was collected outdoors near a greenhouse on the grounds of the Atlantic Food and Horticulture Research Centre in Kentville, Nova Scotia. This species is not found naturally in Canada and occurs no closer to the region than New York (Dietrich 1945). It doubtless represents an imported specimen that somehow escaped. There is no evidence that the species has established itself in Nova Scotia.

***Actenicerus* Kiesenwetter, 1858**

The North American species of *Actenicerus* Kiesenwetter are in need of taxonomic revision. They were last treated as separate species by LeConte (1853), but he was unable to place *Elater viridis* Say, 1825, the Say specimen of which was apparently lost earlier. Later, LeConte (1883) interpreted *E. viridis* to be the female of *Corymbites appressifrons* Say, a synonym of *Ctenicera cylindriformis* (Herbst) (see *Sylvanelater* below). Say's *E. viridis* seems to have been largely overlooked after LeConte (1853) until its listing as a synonym of *Ludius sjaelandicus* by Schwarz (1906). Leng (1920) listed Say's species as a variety of *Ludius resplendens* Eschscholtz, but this is a confusion with *Corymbites viridis* Germar (Candèze 1863), that was continued by Gurjeva (1989). Schenkling (1927) listed *E. viridis* in *Actenicerus* as a synonym of *A. sjaelandicus*, along with *Co. micans* and *Co. cuprascens*. Van Dyke (1932) treated *E. viridis* and *Co. cuprascens* as synonyms of *L. sjaelandicus*, but did not mention *Co. micans*. Subsequent taxonomists largely ignored *E. viridis* and *Co. micans* and presented inconsistent treatments. For example, Dietrich (1945) used only *Ct. sjaelandica*, Brooks (1960) used *Ct. cuprascens*, Gurjeva (1989) listed *Co. micans* as a synonym of *A. sjaelandicus* without mention of the other species, Tarnawski (1996) listed *Co. micans* and *Co. cuprascens* as synonyms of *A. "sjaelandicus"*, Downie and Arnett (1996) used the combination *Ct. cuprascens*, and Johnson (2002) noted only *A. viridis* and *A. cuprascens*. Catt (2007) followed the traditional usage of treating all these names as synonyms of *A. sjaelandicus*.

The female type of *Co. cuprascens* was studied and specimens of both sexes were compared with the type. A male specimen was compared with the type of *Co. micans* by M.C. Lane and his comments on the type (unpubl. notebook at USNM), specimens representing *A. sjaelandicus* from various European localities, and numerous specimens attributable to *A. viridis* and *A. cuprascens* from various North American localities were re-examined for this study. These examinations reveal that *Co. micans* and *Co. cuprascens* are very similar externally, and quite similar to several Eurasian species on sculptural and pubescence pattern characteristics, but the males of each nominal species possess distinctive aedeagal morphology. The aedeagus of *Co. micans* has the median lobe very narrow throughout its length and possesses a deflexed apex, and the apex of the lateral lobe is broadly obtuse and laterally hooked. In contrast, the aedeagus of *Co. cuprascens* has the median lobe planar throughout its length, and the lateral lobes are sagittate, with extended apices. Unfortunately, Say's (1925) description of *E. viridis* cannot be unequivocally applied to any recognized species.

Our conclusion is that pending further revisionary efforts *Elater viridis* Say is not satisfactorily referable to *Actenicerus*, nor to *Ct. cylindriformis*, and is best treated as a *nomen dubium* (ICZN 1999). As such *A. cuprascens* and *A. micans* remain for now the only names available for native North American species.

***Actenicerus cuprascens* (LeConte, 1853)**

Corymbites cuprascens LeConte, 1853: 444

Ludius sjaelandicus; Schwarz, 1906, in part, Van Dyke, 1932, in part

Actenicerus sjaelandicus (O.F. Müller); Schenkling, 1927, in part

Ctenicera sjaelandica; Dietrich, 1945, in part

Based on primary type comparison information and aedeagal morphology, the New Brunswick specimens included in this study are considered to be *A. cuprascens*.

***Anostirus vernalis* (Hentz, 1827) New Combination**

Elater vernalis Hentz, 1827

Corymbites vernalis; Germar, 1843; LeConte, 1853

Ludius vernalis; Van Dyke, 1932

Ctenicera vernalis; Dietrich, 1945

Anostirus vernalis (Hentz) is a readily recognized species in the northeastern quarter of the United States and southeastern Canada. The weakly convex body, shiny black body with elytra yellow to orange-yellow with black macula, strongly serrate antennae, and ecarinate pronotal hind angles, are diagnostic within the North American elaterid fauna and help place this species generically. Reviews and catalogs of *Anostirus* Binaghi by Gurjeva (1989) and Tarnawski (1996) overlooked this species. We take this opportunity to clarify the taxonomy of this species. Two other species attributable to *Anostirus* are known from North America, *A. bipunctatus* (Brown, 1936), **new combination**, and *A. exclamationis* (Fall, 1910), **new combination**, both from California; all other species are Palearctic. *Anostirus* species are often found on flowers of various early spring Rosaceae and Umbelliferae.

NEW BRUNSWICK: Saint John Co.: Saint John, 26.v.1901, W. McIntosh, (2), NBM; Saint John, 26.v.1901, W. McIntosh, (2), NBM; **York Co.:** Charters Settlement, 45.84°N, 66.72°W, 29.iv.2000, R.P. Webster, RWC.

Newly recorded from New Brunswick. In Nova Scotia collected in apple (*Pyrus malus* L.) orchards and deciduous forests (unpublished data).

***Beckerus* Johnson, New Genus**

Type species. *Elater appressus* Randall, 1838; here designated

Description: Body short, broadly arcuate laterally, weakly convex, broadened posteriorly. Integument shining, sparsely punctured; pubescence sparse, pallid, short and recumbent. Head with frons depressed to slightly concave; supra-antennal ridge transverse, widely separated on frons. Antenna serrate to subpectinate, exceeding pronotal hind angles by 2–4 segments; segment 3 serrate, coarsely and sparsely punctured. Thorax with pronotum length 0.74X width; disc slightly convex, broadly deplanate laterally; hind angle with evanescent dorsal carina, apex rounded; basal incisures short. Prosternum with anterior lobe short, 0.25 X width, strongly deflexed; intercoxal process strongly arched; pronotopleural sutures closed anteriorly. Hypomerion with medial margin simple; posterior margin broadly emarginate. Scutellum quadrate to subpentagonal. Mesepimeron broadly adjacent to coxal cavity. Metaventricle with anterior intercoxal process narrowly rounded. Elytral striae weakly striatopunctate; intervals flat with large punctures; costal margin broadly explanate, reflexed. Aedeagus with median lobe deflexed apically; lateral lobe hooked apically, apex desclerotized mesally and setose at tip. Gonocoxites moderately scleroized; ovipositor rods longer than ventrites 1–5; bursa copulatrix expanded, colleterial glands and lateral swellings with small moderately sclerotized plate dorsally; spermatheca tubular, distal; spermathecal reservoir similar and near to spermatheca.

Name derivation. This genus is named in honor of the late Edward C. Becker (1923–2008), longtime elaterid specialist, friend, and mentor.

Species included. *Beckerus appressus* (Randall, 1838), **new combination**; *Beckerus barri* (Lane, 1965), **new combination**.

Beckerus appressus (Randall, 1838)

NOVA SCOTIA: Halifax Co.: Grassy Lake, 1–16.vii.1997, D.J. Bishop, red spruce forest, flight-intercept trap, NSMC; **Victoria Co.:** Sunday Lake, Cape Breton Highlands National Park, 14.vi.1996, R.F. Lauff, regenerating coniferous forest, NSMC.

Newly recorded in Nova Scotia. In New Brunswick collected in old-growth spruce (*Picea* sp.)-balsam fir (*Abies balsamea*) forest. In New York found at higher elevations on ferns growing in *Sphagnum* moss; larvae are found in the *Sphagnum* (Dietrich 1945).

***Corymbitodes* Buysson, 1904**

Corymbitodes is a widely recognized genus with species widespread across northern Eurasia, including Japan. A review of the Russian *Corymbitodes* Buysson by Gurjeva (1989) included the North American *C. pygmaeus* (Van Dyke) and *C. caricinus* (Germar) [misspelled by Gurjeva as “*coricinus*”]. Tarnawski (1996) also included *C. pygmaeus* and gave “*Ludius coracinus* Germar” (1843: 47) as a second species. The latter may be a misspelling as Germar’s *Ludius coracinus* is a long-standing synonym of *Elater abruptus* Say. An additional point of confusion is that *Corymbites caricinus* (Germar 1843: 63) is a synonym of *Elater lobatus* Eschscholtz, the latter regarded as a subspecies of *C. pygmaea* by Tarnawski (1996).

Both Gurjeva and Tarnawski overlooked *Ctenicera tarsalis* (Melsheimer), *Ctenicera elongaticollis* (Hamilton), *Ctenicera moerens* (LeConte), *Ctenicera xanthoma* (Horn), and *Ctenicera dorotheae* Knull, all of which are more closely related to *C. pygmaeus* and *C. caricinus* than to any species of *Ctenicera*. As such, we take this opportunity to transfer these latter five species to *Corymbitodes* to await generic review: *Corymbitodes dorotheae* (Knull, 1959), **new combination**; *Corymbitodes elongaticollis* (Hamilton, 1893), **new combination**; *Corymbitodes moerens* (LeConte, 1866), **new combination**; *Corymbitodes pygmaeus* (Van Dyke, 1932), **new combination**; *Corymbitodes tarsalis* (Melsheimer, 1846), **new combination**; and *Corymbitodes xanthomus* (Horn, 1871), **new combination**. These changes are made with the recognition that not all these species may be subsequently regarded as congeneric, but that their retention in *Ctenicera* is clearly untenable. Further, morphological data across the broad geographic span of both *C. tarsalis*, *C. pygmaeus*, and *C. dorotheae* indicate that the distinctiveness between these species is questionable, and that Van Dyke’s (1932) original observation that *C. pygmaeus* was only a “depauperized form” of *C. tarsalis* (as *C. lobatus*) could be correct. At this time we do not wish to address the question of relationship of the eastern *C. tarsalis* and the western *C. lobatus* as that is a more significant problem best treated in a generic review.

Corymbitodes tarsalis (Melsheimer, 1846)

Athous tarsalis Melsheimer, 1846

Corymbites tarsalis; Germar, 1843; LeConte, 1853

Ludius lobatus tarsalis; Van Dyke, 1932

Ctenicera tarsalis; Dietrich, 1945

PRINCE EDWARD ISLAND: locality not recorded, 1983, collector not recorded, (3), UPEI; **Queens Co.:** Aldberry Plains, 17.vi.1971, J. MacLeod, UPEI; Wood Islands, 29.viii.2003, C.G. Majka, seashore, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia collected on apple (*Pyrus malus*), pear (*Pyrus communis* L.), beaked willow (*Salix bebbiana* Sarg.), pussy willow (*Salix discolor* Muhl.), and speckled alder (*Alnus incana* (L.) Moench).

Corymbitodes tarsalis is a common spring to early summer species in eastern North America. Larvae are predators, and possibly facultative rhizophages, in moist peaty soils adjacent to wetlands and drainages. Adult males fly readily and are commonly found perched on graminoids and other plants, where they await pheromone scents of the more edaphic females. Mass flights of hundreds of males in a small area seeking a female can be encountered (unpublished data).

Corymbitodes pygmaeus (Van Dyke, 1932)

Ludius lobatus pygmaeus Van Dyke, 1932

Ctenicera lobatus pygmaeus; Dietrich, 1945

Ctenicera pygmaea; Lane, 1952; Brookes, 1960

NEW BRUNSWICK: Twenty specimens were examined from Gloucester, Kent, Northumberland, Saint

John, Westmoreland, and York counties. The earliest record is from 1898 (Saint John Co.: Saint John, 20.vi.1898, W. McIntosh, NBM). **NOVA SCOTIA:** Twenty-seven specimens examined from Cape Breton, Inverness, Queens, Richmond, and Victoria counties. The earliest record is from 1968 (Queens County: Lake Kejimkujik, Kejimkujik National Park, 11.vi.1968, D.C. Ferguson, (2), NSMC).

This species was reported from New Brunswick and Nova Scotia by (Bousquet 1991). Except for the two specimens collected at Lake Kejimkujik (noted above) on the Nova Scotia mainland, all the other records of this species are from Cape Breton Island. Very abundant in long grass in low, moist places around poplar-willow groves and nearly dry ponds (Brooks 1960). In Nova Scotia found in flood plains, along lakes, and associated with vegetation in low, moist areas (unpublished data).

Eanus maculipennis LeConte, 1866

NOVA SCOTIA: Guysborough Co.: Borneo, 1995, C. Corkum, young deciduous forest, flight-intercept trap, NSMC; Malay Lake, 15–30.vi.1997, D.J. Bishop, red spruce forest, flight-intercept trap, (2), NSMC; **Halifax Co.:** Pockwock Lake, 15–30.vi.1997, D.J. Bishop, red spruce forest, flight-intercept trap, NSMC; Pockwock Lake, 1–15.vii.1997, D.J. Bishop, red spruce forest, flight-intercept trap, NSMC; Prospect, 11.vi.1979, B. Wright and D. LeBarr, NSMC; **Victoria Co.:** Sunday Lake, Cape Breton Highlands National Park, 14.vi.1996, R.F. Lauff, regenerating coniferous forest, (2), NSMC.

Newly recorded in Nova Scotia. In New Brunswick collected in a mature spruce (*Picea* sp.)-balsam fir (*Abies balsamea*) forest. Adults are often found on the spring growth of conifers and adjacent shrubbery.

Hypoganus sulcicollis (Say, 1834)

NOVA SCOTIA: Halifax Co.: Sandy Lake, 29.vii–13.viii.1997, D.J. Bishop, old-growth red spruce forest, flight-intercept trap; **Queens Co.:** Tobeatic Lake, 15.v.2003, P. Dollin, on red spruce snag in red spruce forest, NSMC.

Newly recorded in Nova Scotia and in the Maritime Provinces as a whole. A subcortical species in deciduous forests where the larvae are predators (unpublished data).

Liotrichus spinosus (LeConte, 1853)

PRINCE EDWARD ISLAND: Queens Co.: North Rustico, 26.vi.2003, seashore, C.G. Majka, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia collected from a wide variety of deciduous and coniferous forest stands of various ages including in red (*Picea rubens*) and black spruce (*Picea mariana*), white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), and balsam fir (*Abies balsamea*).

Liotrichus vulneratus (LeConte, 1853)

NEW BRUNSWICK: Gloucester Co.: Bathurst, 15.vii.1998, Daley, McLean, Devereaux, and Comeau, NBM; Bathurst, 10–27.vi.1994, R.P. Webster, NBM; **Kings Co.:** Grand Bay, 19.vi.1989, 6.x.1992, and 13.vi.2001, D.F. McAlpine, NBM; **Madawaska Co.:** Saint Leonard, 28.vi.2003, A.-S. Bertrand, old-growth spruce-fir forest, RWC; **Queens Co.:** 3.5 km SW of Scotchtown, 8.iii.1997, R.P. Webster, NBM; **Saint John Co.:** Saint John, 19.v.190?, 7.vi.1902, W. McIntosh, (2), NBM; **York Co.:** Charters Settlement, 45.84°N, 66.72°W, 2.v.2000, R.P. Webster, bare soil in garden, RWC.

Newly recorded from New Brunswick. In Nova Scotia collected from both deciduous and coniferous (red spruce (*Picea rubens*) and hemlock (*Tsuga canadensis*) forest stands of various ages.

Metanomus insidiosus (LeConte, 1853), **new combination***Ludius insidiosus* LeConte, 1853*Corymbites lutescens* Fall, 1910*Ludius insidiosus* var. *lutescens*, of Van Dyke, 1932*Ctenicera insidiosa*; Dietrich, 1945*Ctenicera lutescens*; Brooks, 1960*Ctenicera insidiosa* var. *lutescens*; Lane, 1971

Metanomus Buysson, 1887 is a genus with one species, *M. infuscatus* (Eschscholtz) widespread in the mountains and boreal forests across northern Eurasia. The type species, *Corymbites montivagus* Rosenhauer, is a synonym of *M. infuscatus* and the two species are considered congeneric. One of us (Johnson) has compared numerous specimens of *Ctenicera insidiosa* from locations across North America with specimens of *M. infuscatus* of European provenance and found them nearly indistinguishable on external anatomy and genital morphology. Further, two species from the mountains of northern California are also regarded as congeneric with *M. insidiosa* and the opportunity is taken here to formalize their transfer from *Ctenicera*: *Metanomus blaisdelli* (Van Dyke, 1932), **new combination**; and *Metanomus shastensis* (Van Dyke, 1932), **new combination**.

Nitidolimonius Johnson, New Genus

Type species. *Limonius resplendens* Eschscholtz, 1829; here designated

Description. Body narrow, elongate, subparallel at mid-length, slightly to moderately convex. Integument shining, usually with strong metallic viridescence; punctures simple and sparse, to moderately dense and umbilicate on head and prothorax; pubescence fine, decumbent, pallid. Head with frons depressed to slightly convex with shallow longitudinal impressions; supra-antennal ridge obtusely carinate, transverse. Antenna short, extending from base to apex of hind angle; segments 4–10 strongly serrate; segment 3 subcylindrical, coarsely, sparsely punctured. Pronotum with length 0.91–1.00X width; slightly convex, narrowly deplanate laterally, occasionally with shallow linear impression or polished median line on posterior declivity; hind angle in ventrolateral aspect with apex subtruncate to broadly rounded; dorsal carina strong and elevated; basal incisures deep. Prosternum with anterior lobe short, 0.32X width, moderately deflexed; intercoxal process weakly deflexed. Hypomeron with medial margin with flat, polished, sparsely punctured bead; anterior portion excavate, with strongly reflexed lateral carina; posterior margin deeply emarginate. Scutellum subpentagonal. Mesepimeron narrowly adjacent to coxal cavity. Metaventrite with anterior intercoxal process broad, truncate. Elytral striae finely impressed and punctured; intervals flat to slightly convex, finely and sparsely punctured in 2–3 irregular series. Aedeagus with median lobe attenuate, slightly deflexed apically; lateral lobe broadly sagittate apically and ventrally setose on sclerotized apex. Gonocoxites lightly sclerotized; ovipositor rods relatively short, less than 0.5X length of ventrites 1–5; bursa copulatrix narrow, slightly dilated; spermathecal receptacle saccate, with pair of lightly sclerotized plates and transverse striations; spermatheca basal, short, tubular; spermathecal reservoir basal, tubular, near base of thin accessory gland duct; a pair of saccate colleterial glands between insertion of spermathecal reservoir and accessory gland duct.

Name derivation. The genus name is a combination of "nitido-" from the Latin "nitidus" meaning "shiny," referring to the shiny integument of included species, and "Limonius" the original genus name of the type species.

Species included. *Nitidolimonius appalachius* (Van Dyke, 1932), **new combination**; *Nitidolimonius breweri* (Horn, 1871), **new combination**; *Nitidolimonius resplendens* (Eschscholtz, 1829), **new combination**; and *Nitidolimonius weidtii* (Angell, 1892), **new combination**.

Nitidolimonius resplendens (Eschscholtz, 1829)

PRINCE EDWARD ISLAND: Kings Co.: Launching, 26.viii.2001, C.G. Majka, seashore, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia collected in variously-aged coniferous, deciduous, and mixed forests. In wooded areas on poplar (*Populus* sp.), willow (*Salix* sp.), or on shrubs (Brooks 1960). Larvae are predators in peat and moist, loamy soils. Adults are often found on the spring growth of conifers in and along margins of wetlands and drainages (unpublished data).

Paractenicera Johnson, New Genus

Type species. *Corymbites fulvipes* Bland, 1863; here designated

Description. Body elongate, narrow, subparallel at mid-length, depressed. Integument shining, moderately to densely punctured, umbilicate on head and pronotum; pubescence short, cinereous. Head with frons weakly concave; supra-antennal ridge directed antero-medially. Antenna strongly serrate; short, reaching only to apex of hind angle; segment 3 serrate, coarsely punctate. Pronotum with length 1.35 X width; disc slightly convex, with shallow median canaliculation; hind angle truncate at apex; dorsal carina moderately strong; basal incisions distinct. Prosternum with anterior lobe extended, 0.35 X width, slightly deflexed; intercoxal process planar. Hypomeron with mesal margin simple or with narrow, flattened, punctate bead; posterior margin deeply emarginated. Scutellum triangular. Mesepimeron narrowly adjacent to coxal cavity. Metaventricle with anterior intercoxal process quadrangular. Elytral striae striatopunctate, subsulcate; intervals flat to weakly convex, punctures adjacent to stria; apex briefly mucronate at suture. Aedeagus with median lobe deflexed apically; lateral lobe hooked apically, apex membranous and setose. Gonocoxites lightly sclerotized; ovipositor rods longer than 0.5 X length of ventrites 1–5; bursa copulatrix expanded, without saccate colleterial glands, with opaque collar at constriction; spermathecal receptacle saccate, arcuate, wall corrugated and lightly sclerotized; spermatheca short, saccate; spermathecal reservoir short, tubular; accessory gland duct thick basally, gradually narrowing from spermathecal receptacle.

Name derivation. The genus name is based on *Ctenicera*, with the prefix “para-” from the Greek prefix “παρά”, indicating close position, to indicate the close affinity with the former genus.

Species included. *Paractenicera exilis* (Notman, 1920), **new combination**; *Paractenicera fulvipes* (Bland, 1863), **new combination**.

Paractenicera fulvipes (Bland, 1863)

NEW BRUNSWICK: Kings Co.: Grand Bay, 24.vi.1990, D.F. McAlpine, NBM.

Newly recorded from New Brunswick. In Nova Scotia collected almost exclusively in deciduous forests of various ages; very occasionally in coniferous forests.

Pseudanostirus hamatus (Say, 1834), **New Combination**

Elater hamatus Say, 1834

Corymbites hamatus; LeConte, 1853

Ludius hamatus; Van Dyke, 1932

Ctenicera hamata; Dietrich, 1945

This species has been previously recorded from both New Brunswick and Nova Scotia (Table 1). Most species closely related to *P. hamatus* were already transferred to *Pseudanostirus* by Gurjeva (1989) and Tarnawski

(1996). Adults of this species fit the description of *Pseudanostirus* given by Gurjeva (1989).

Pseudanostirus hieroglyphicus (Say, 1834)

PRINCE EDWARD ISLAND: Kings Co.: Woodville Mills, 23.vii.2001, C.G. Majka, mixed forest, CGMC; **Queens Co.:** St Patricks, 13.vii.2002, C.G. Majka, coniferous forest on *Picea rubens*, CGMC; St Patricks, 25.vi.2003, C.G. Majka, mixed forest, CGMC.

Newly recorded from Prince Edward Island. In Nova Scotia collected from both deciduous and coniferous (red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) forest stands of various ages. In parklands on undergrowth (Brooks 1960).

Selatosomus splendens (Ziegler, 1844)

This species was reported from Nova Scotia by Bousquet (1991), however, there are no vouchers specimens in any collection examined, nor are there published records from the province. Accordingly, the species is removed from the faunal list of Nova Scotia. It does occur in neighbouring New Brunswick and should be looked for in Nova Scotia since it could plausibly occur there.

Sylvanelater Johnson, New Genus

Type species. *Elater cylindriformis* Herbst, 1806, here designated

Description. Body elongate, subparallel, convex. Integument piceous with metallic reflections; finely to moderately punctured, punctures umbilicate on lateral portions of head and pronotum; pubescence moderately long, pallid to cinereous. Head with frons flat to slightly convex; supra-antennal ridge directed medially. Antenna moderately serrate; male antenna long, reaching 2–4 segments beyond apex of pronotal hind angle, female antenna reaching half length of pronotum; segment 3 broadened, subserrate. Pronotum with length 1.1–1.2 X width; disc slightly to moderately convex, with shallow median canaliculation posteriorly; hind angle oblique at apex; dorsal carina absent to weakly defined; basal incisures short, indistinct. Prosternum with anterior lobe extended, length 0.11 X width (female) to 0.33 X width (male), moderately deflexed; intercoxal process slightly arcuate. Hypomeron with mesal margin with narrow, flattened, sparsely punctate bead that becomes a slightly elevated carina near anterior angle; posterior margin slightly emarginate near hind angle. Scutellum subpentagonal, flat dorsally. Mesepimeron narrowly adjacent to coxal cavity. Metaventre with anterior intercoxal process subtriangular. Elytral striae striatopunctate, shallowly sulcate; intervals flat to slightly convex, punctures moderately sparse, shallow; apex rounded. Aedeagus with median lobe slightly deflexed apically; lateral lobe dentate latero-apically, apex membranous, asetose. Gonocoxites lightly sclerotized; ovipositor rods longer than 0.5 X length of ventrites 1–5; bursa copulatrix expanded, with two saccate colleterial glands, with opaque collar at constriction; spermathecal receptacle saccate, arcuate, wall corrugated and lightly sclerotized; spermatheca short, elongate-saccate; spermathecal reservoir long, tubular; accessory gland duct thick basally, gradually narrowing from spermathecal receptacle. Sexes dimorphic, exceptionally so in *S. cylindriformis*.

Name derivation. Based on “Sylvanus” the Roman fertility god of forests, groves and wild fields; combined with “Elater” from the Greek ελωτηρ, meaning a charioteer.

Species included. *Sylvanelater cylindriformis* (Herbst, 1806) **new combination**; *Sylvanelater furtivus* (LeConte, 1853) **new combination**; *Sylvanelater limoniiformis* (Horn, 1871), **new combination**; and *Sylvanelater mendax* (LeConte, 1853), **new combination**.

Sylvanelater mendax (LeConte, 1853), **New Combination**

NOVA SCOTIA: Colchester Co.: Five Islands Provincial Park, 27.vi.1983, D.S. Davis, NSMC; Lornevale, 3.vi.1995, C. Corkum, old coniferous forest, flight-intercept trap, NSMC; **Halifax Co.:** Martinique Beach, 9.vi.1993, B. Wright, NSMC; **Victoria Co.:** Sunday Lake, Cape Breton Highlands National Park, 24.vi.1996, R.F. Lauff, NSMC.

Newly recorded from Nova Scotia and the Maritime provinces as a whole. Found in montane, subalpine, and boreal forests; on spruce (*Picea* sp.), pine (*Pinus* sp.), and larch (*Larix* sp.) (Brooks 1960).

Margaiostus grandicollis (LeConte, 1863)

NOVA SCOTIA: Antigonish Co.: Beaver Mt., 5.v.1997, S.B. McKay, NSNR; **Inverness Co.:** Bornish Hills, 10–14.vii.1995, G.R. MacPherson, CBU.

Newly recorded from Nova Scotia. In New Brunswick collected in a mature hardwood forest. In Québec collected in pine woods (Levesque & Levesque 1993).

Negastriinae*Negastrius exiguus* (Randall, 1838)

NEW BRUNSWICK: Restigouche Co.: Restigouche River and Stillwater Brook, 26.vi.2000, R.P. Webster, gravel on river margin, RWC.

Newly recorded from New Brunswick and the Maritime Provinces as a whole. Collected from a farm creek, drift from a lake, and on a fern (Stibick 1990). Common on sandy shores of streams (Downie & Arnett 1996). *Negastrius* (*sensu lato*) species have been reported only in association with riparian habitats (Wells 1996).

Paradonus oliverea Stibick, 1991

NEW BRUNSWICK: Restigouche Co.: Restigouche River and Stillwater Brook, 26.vi.2000, R.P. Webster, gravel on river margin, (2), RWC. **NOVA SCOTIA: Colchester Co.:** Portapique, 28.vii.1927, C.A. Frost, CNC; **Guysborough Co.:** Trafalgar, 19.vii.1992, S. and J. Peck, car net, JCC.

Newly recorded from New Brunswick. Several localities along a creek, a lake, and falls suggest waterside habitats (Stibick 1991). Larvae of closely related species are found in sandy soils along waterways where they are predators on small invertebrates (unpublished data). Prior to Stibick's description of *P. oliverea*, Bousquet (1991) reported *Paradonus obliquatulus* (Melsheimer) from Nova Scotia based on the above specimen from Portapique. Consequently *P. obliquatulus* is removed from the faunal list for Nova Scotia.

Discussion

As a result of the present investigation, 125 species of Elateridae are now known to occur in the Maritime Provinces of Canada; 110 in Nova Scotia, 98 in New Brunswick, and 48 on Prince Edward Island (Table 1). Of these, 117 species are Nearctic, four are Holarctic, and four are introduced Palearctic species (Table 1). Twenty-four species are newly recorded in Nova Scotia, 13 in New Brunswick, and 27 on Prince Edward Island for total of 64 new provincial records. Of these, 14 species are newly recorded in the Maritime Prov-

inces as a whole, and one species, *Dalopius pennsylvanicus*, is newly recorded in Canada. Two species are removed from the faunal list of New Brunswick and two are removed from the faunal list of Nova Scotia. Species listed in Table 1 but not discussed in the above accounts are ones for which there are previous records from their respective jurisdictions. The combined Maritime Provinces fauna is larger than that of the state of Maine (106 species) (Dearborn & Donahue 1993), although substantially smaller than that of Québec (165 species) (Bousquet 1991).

There are 15 species (12.4% of the native fauna) recorded in New Brunswick which have not been found in Nova Scotia including *Megapenthes rogersi*, *Dalopius agnellus* Brown, *Ampedus miniipennis* (LeConte), *Ampedus nigrinus* (Herbst), *Ampedus vitiosus* (LeConte), *Lacon auroratus* (Say), *Athous fossularis* (LeConte), *Limonius anceps* LeConte, *Limonius pectoralis* LeConte, *Actenicerus cuprascens* (LeConte), *Ctenicera kendalli* Kirby, *Selatosomus splendens* (Ziegler), *Negastrius arnetti* Stibick, *Negastrius exiguus* (Randall), and *Oedostethus femoralis* LeConte. These are candidates for species that have, for climatic or other environmental reasons, reached the limit of their distribution in New Brunswick; or which have found the Northumberland Strait and/or the isthmus of Chignecto obstacles to geographical dispersal. This is similar to the proportion (13.5%) of native Carabidae found in New Brunswick but not recorded in Nova Scotia (Majka *et al.* 2007b). Some may, of course, occur in Nova Scotia and have remained un-detected there.

Conversely there are 26 species of elaterids that have been recorded in Nova Scotia and not in New Brunswick (Table 1). It is probable that many of these species occur in New Brunswick but have not been detected there as a result of the comparative lack of collecting effort in that province. Three of these (*Agriotes lineatus* (Linnaeus), *Agriotes obscurus* (Linnaeus), and *Athous campyloides*) are introduced species. Sixteen of the native species including *Sericus viridanus* (Say), *Agriotes quebecensis*, *Ampedus areolatus*, *Ampedus laesus*, *Ampedus melsheimeri* (Leng), *Ampedus nigricollis*, *Ampedus protervus* (LeConte), *Ampedus* species 2 [undescribed], *Aeolus mellillus*, *Athous acanthus* (Say), *Athous cucullatus*, *Athous scapularis*, *Hemicrepidius memnonius* (Herbst), *Hypoganus sulcicollis*, *Sylvanelater mendax*, and *Paradonus pectoralis* (Say), have been collected in neighbouring areas in Maine, Québec, and Prince Edward Island, a likely indication that they are present in New Brunswick as well.

It is possible that some species may have colonized Nova Scotia from the New England states (northeastern U.S.A.) across post-glacial, emergent land-bridges and island chains that existed between Cape Cod, Georges Bank, and the continental shelf of Nova Scotia from circa 14,500 to 8,000 years BP (King 1996). This mechanism is well documented in the case of Nova Scotia's coastal-plain flora (Keddy & Wisheu 1989) and might be applicable to certain elaterids (see Klimaszewski *et al.* (2006, pp 69–72) for a discussion of this topic). Species such as *Dalopius pennsylvanicus*, *Ampedus* species 1 [undescribed], *Conoderus auritus* (Herbst), *Athous posticus* (Melsheimer), *Elathous discalceatus* (Say), *Prosternon fallax* (Say), and *Ligmargus lecontei* (Leng), which are present in Nova Scotia but which have otherwise not been recorded in Atlantic Canada or Maine, would appear to be potential candidates for this pathway of historical colonization. Although there is considerable fossil evidence with respect to the post-glacial colonization of Nova Scotia by Coleoptera from the research of Miller (1995, 1996, 1997), the only elaterids found in his study were members of the genus *Hypnoidus* (*H. abbreviatus* (Say)/ *H. bicolor* (Eschscholtz)/ *H. impressicollis* (Mannerheim)/ *H. rivularis* (Gyllenhal)) found in peat deposits aged between 14,800–13,160 BP.

It is also instructive to compare the native elaterid faunas of Cape Breton Island (with a land area of 10,311 km² and 1.5 km from the mainland), Prince Edward Island (with a land area of 5,660 km² and 13 km from the mainland), and insular Newfoundland (including Saint-Pierre et Miquelon) (with a land area of 111,390 km², 18 km distant from Labrador and 110 km from Cape Breton Island). Despite their very different sizes Prince Edward Island (with 46 native species) and insular Newfoundland (with 44 native species) (Bousquet 1991) have an almost identical-sized elaterid fauna. This parallels the situation of the Carabidae in which the native fauna of Prince Edward Island (144 species) is almost equal to that of Newfoundland (148 species) (Majka *et al.* 2007b). The native carabid fauna of Cape Breton Island (170 species) is ~ 16% larger, a

situation paralleled by that of the native elaterid fauna (61 species) which is ~ 36% greater than that of Prince Edward Island or Newfoundland.

As is typically the case with islands, the elaterid faunas of Prince Edward Island and Cape Breton Island are diminished in comparison with that of the neighbouring mainland. The native fauna of Prince Edward Island is only 38.0% that of the combined Maritime Provinces fauna, whereas that of Cape Breton Island is 50.4%. These figures may represent island-associated diminutions, an area effect, a paucity of collecting, or a combination of all these factors. Table 2 illustrates proportions of native species of 29 families of Coleoptera from a number of studies of the region. The overall mean derived from the numbers of species in these studies is $35.4 \pm 18.4\%$ for the Prince Edward Island fauna and $41.4 \pm 16.8\%$ for the Cape Breton Island fauna. On this basis, the proportion of elaterids found on Cape Breton is somewhat greater than the overall proportion of native Maritime Provinces species found there.

TABLE 2. Proportion of native faunas found on Cape Breton and Prince Edward Islands.

Family	Cape Breton Island	Prince Edward Island	Source
Elateridae	50%	38%	present study
Carabidae	58%	47%	Majka <i>et al.</i> (2007b)
Coccinellidae	41%	39%	Majka & McCorquodale (2006)
Mordellidae	41%	40%	Majka & Jackman (2006)
Tetramoridae, Melandryidae, Synchronidae, Scraphiidae	32%	27%	Majka & Pollock (2006)
Mycteridae, Boridae, Pythidae, Pyrochroidae, Salpingidae	53%	33%	Majka (2006a)
Nemonychidae, Anthribidae, Attelabidae, Apionidae, Curculionidae	30%	24%	Majka <i>et al.</i> (2007a)
Ptiliidae	14%	10%	Majka & Sörensson (2007)
Kateretidae, Nitidulidae	42%	24%	Majka & Cline (2006a)
Derodontidae, Dermestidae, Bostrichidae, Anobiidae	20%	26%	Majka (2007a)
Corylophidae	11%	11%	Majka & Cline (2006b)
Cleridae	43%	50%	Majka (2006b)
Erotylidae, Endomychidae	29%	21%	Majka (2007b)
Eucnemidae	45%	36%	Majka (2007c)
Mean	41.4%	35.4%	

Noteworthy in the context of Nova Scotia are *Ampedus molestus* (LeConte) and *Corymbitodes pygmaeus* (Van Dyke) which have only been collected in the province on Cape Breton Island. In addition to being an island, portions of Cape Breton (particularly the highlands) have a climate and physiography that supports a taiga and boreal forest community distinct from that of mainland Nova Scotia (Davis & Browne 1996). *Conoderus auritus* (Herbst) has only been recorded once, in 1897 in Nova Scotia, and *Elater abruptus* Say, has been recorded only once, from an undated specimen in Nova Scotia. Both records could represent stray specimens, or species that have become extirpated in the region, or these species could still be present in the province in relict habitats (see below). It would be useful to monitor elaterids and other taxa as possible indicators of regional climate change impact, particularly in the Maritimes Provinces, since there is a long history of anthropogenic modifications to the environment in the region.

There are four species of introduced elaterids found in the region including *Agriotes lineatus*, *Agriotes obscurus*, *Agriotes sputator* (Linnaeus), and *Athous campyloides*. The three *Agriotes* species are invasive in suburban and rural areas of southeastern Canada and northeastern United States, and across the continent in southwestern British Columbia and western Washington. Table 3 shows the dates of first detection of these species in each of the Maritime Provinces and in North America in general. Note that three of these species were first found on the continent in the Atlantic Provinces, a finding in keeping with the important role this

region has played in the introduction of adventive species in North America (Lindroth 1957). Species in the genus *Agriotes* are terricolous and rhizophagous, and could potentially be readily transported to North America via the dry-ballast mechanisms proposed by Lindroth (1957) and Brown (1950). Indeed, *A. lineatus* was found by Lindroth (1957) at Barnstaple in North Devon, England, one of the eight principal quarries in south-western England where dry-ballast for ships destined for Atlantic Canada originated. All four introduced species are found in Great Britain. Only 3.2% of the Maritime elaterid fauna consist of introduced species, a relatively low proportion. Overall, 15.3% of the Nova Scotia beetle fauna consists of introduced species while the proportion on Prince Edward Island is 22.0 % (unpublished data).

TABLE 3. Dates of first detection of introduced Elateridae in the Maritime Provinces.

Species	NB	NS	PEI	North	
				America	Source
<i>Agriotes lineatus</i> (Linnaeus)		1947		1840 - NF	Lindroth (1957)
<i>Agriotes obscurus</i> (Linnaeus)		1859		1859 - NS	Brown (1940)
<i>Agriotes sputator</i> (Linnaeus)	1939	1949	1997	1939 - NB	Brown (1940)
<i>Athous campyloides</i> Newman		1937	1958	1865 - QC	Becker (1974)

Notes: New Brunswick (NB), Newfoundland (NF), Nova Scotia (NS) Prince Edward Island (PE), Québec (QC).

Collecting effort for elaterids in the region has been quite variable (Table 1). In Nova Scotia, where collecting effort has been the greatest, and 110 elaterids have been recorded, there are a total of 745 county records, an average of 41.2 ± 16.3 species/county. These range from a high of 79 species recorded in Halifax County (where collecting effort has been greatest) to 14 species in Shelburne, 20 species in Yarmouth, and 21 species in Richmond counties (where collecting effort has been least). For example, if the 79 species recorded in Halifax County are taken as a baseline of biodiversity (recognizing, of course, that biodiversity is not constant throughout all portions of the province), this would indicate that only approximately 52% of the elaterid biodiversity of Nova Scotia (at the county level) has been documented to date.

On Prince Edward Island, where 48 species have been recorded, there are a total of 70 county records, and an average of 23.3 ± 12.1 species/county. Forty-one species have been recorded in Queens, 19 in Kings, and 9 in Prince counties. If the 41 Queens County species are taken as a minimum baseline of biodiversity this would indicate that approximately 57% of the elaterid biodiversity of Prince Edward Island (at the county level) has been documented to date.

In New Brunswick, where 98 species have been recorded, there are 266 county records, and an average of 17.9 ± 13.3 species/county. These range from a high of 60 species recorded in York and 48 in Saint John counties (where collecting effort has been greatest) to 1 species in Victoria, 4 species in Sunbury, 5 species in Carleton and Queens, 6 species in Charlotte and Madawaska, and 8 species in Restigouche counties (where collecting effort has been least). If the 60 species recorded in York County are taken as a minimum baseline of biodiversity this would indicate that only approximately 30% of the elaterid biodiversity of New Brunswick (at the county level) has been documented to date. Due to under-collecting in New Brunswick it is probable that the minimum baseline of biodiversity in NB is nearer to 79 species (as in Nova Scotia), in which case only approximately 23% of elaterid biodiversity has been documented to date. The above statistics are clearly minimum estimates since sampling effort, particularly in Prince Edward Island and New Brunswick, has been low and further fieldwork is almost certain to reveal additional species.

Elaterids are important components of many ecosystems and appear to be useful in analyzing the effects of ecological change. However, to date there have been few studies to examine the role they play within the Maritime Provinces. Boiteau *et al.* (2000) examined dispersal of beetles in areas adjacent to potato fields in New Brunswick. Over a span of four years collected 46 species of elaterids, of which certain species in genera

such as *Agriotes*, *Limonius*, and *Melanotus* can be significant pests of agricultural crops. In a study of saproxylic forest beetles in Nova Scotia, Bishop (1998) recorded 44 species of elaterids in 30 coniferous forest stands of a variety of disturbance classes. In a study of saproxylic beetles in 11 coniferous stands ranging from old-growth to recently thinned, Dollin (2004) found 30 species of elaterids. Kehler *et al.* (1996) examined forest beetle communities in Nova Scotia in 10 coniferous and 10 deciduous stands ranging in age from young to old and found 41 species of elaterids. Species in genera associated with decaying wood such as *Megapenthes*, *Dalopius*, *Ampedus*, and *Melanotus* are predatory, xylophagous and/or mycetophagous and are important components of the decomposition communities found in woody coarse debris. Species in the genera *Athous*, *Beckerus*, *Denticollis*, *Pityobius*, *Prosternon*, *Pseudanostirus*, *Selatosomus*, and others are predators of insects and other invertebrates, are frequently found in saproxylic or forest-floor situations (Morris 1951), and have roles in the regulation of forest pest populations. While the contribution of such species to the ecological dynamics of saproxylic habitats is apt to be sizeable, these processes have not been investigated in detail in forests of the region.

Forty-three species (one third of the fauna) are known from five or fewer specimens, 28 of which are saproxylic species. Nineteen species have been recorded from single specimens only. Several studies (Majka 2006a, 2006b, 2007a, 2007b, 2007c) have noted that the apparent scarcity of many saproxylic species could be indicative of a diminution of habitat as a result of forest management practices. For instance, in Nova Scotia although 73% of the land base is forested, no more than 0.6% of that land is comprised of old-growth forests, much of which is in a highly fragmented condition (McMahon 1989; Loo & Ives 2003). Of the 180 species of Coleoptera selected by Alexander (2004) for use in the calculation of the Index of Ecological Continuity (an inverse of disturbance) in Great Britain, 16 species are elaterids, including several in genera such as *Lacon*, *Ampedus*, *Megapenthes*, and *Elater* that are also present in the forests of the Maritime Provinces. Thus, despite the sizeable number of new records reported in this study, there is still much to be learned about the elaterid fauna of the region.

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