

The Mordellidae (Coleoptera) of the Maritime provinces of Canada

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Abstract—The Mordellidae of the Maritime provinces of Canada is surveyed. Thirty species have now been recorded from the region. Of these, 17 are newly recorded for Nova Scotia, 11 are newly recorded for Prince Edward Island, and 7 are newly recorded for New Brunswick, for a total of 35 new provincial records. Three species, *Mordellistena indistincta* Smith, *Mordellistena rubrifascia* Liljeblad, and *Mordellistena rubrilabris* Helmuth, are newly recorded for Canada, while a further 11 species, *Mordella melaena* Germar, *Mordellistena aspersa* (Melsheimer), *Mordellistena errans* Fall, *Mordellistena morula* LeConte, *Mordellistena picilabris* Helmuth, *Mordellistena sericans* Fall, *Mordellistena vilis* (LeConte), *Mordellina ancilla* (LeConte), *Mordellina nigricans* (Melsheimer), *Mordellina pustulata* (Melsheimer), and *Glipostenoda ambusta* (LeConte), are newly recorded for Atlantic Canada. One subspecies, *Mordella atrata lecontei* Csiki, is removed from the region's faunal listing. The composition of the region's fauna as a whole, and related biogeographic questions, are briefly discussed. The Mordellidae are also discussed in the context of forest beetle communities in the region and the impact of historical forest management practices on old-growth specialist species.

Résumé—Cet article examine le Mordellidae des provinces maritimes du Canada. À date, on a recensé trente espèces dans la région. De ces dernières, 17 ont été recensées pour la première fois en Nouvelle-Écosse, 11 à l'Île-du-Prince-Édouard et 7 au Nouveau Brunswick, pour un total de 35 espèces nouvellement recensées dans ces provinces. Trois de ces espèces, *Mordellistena indistincta* Smith, *Mordellistena rubrifascia* Liljeblad et *Mordellistena rubrilabris* Helmuth, ont été recensées pour la première fois au Canada, alors que 11 autres espèces, *Mordella melaena* Germar, *Mordellistena aspersa* (Melsheimer), *Mordellistena errans* Fall, *Mordellistena morula* LeConte, *Mordellistena picilabris* Helmuth, *Mordellistena sericans* Fall, *Mordellistena vilis* (LeConte), *Mordellina ancilla* (LeConte), *Mordellina nigricans* (Melsheimer), *Mordellina pustulata* (Melsheimer) et *Glipostenoda ambusta* (LeConte), ont été recensées pour la première fois dans les provinces atlantiques du Canada. Une sous-espèce, *Mordella atrata lecontei* Csiki, n'apparaît pas à la liste faunique de la région. L'article aborde brièvement l'ensemble de la composition faunique de la région et les thèmes biogéographiques sous-jacents. On aborde également le Mordellidae dans le contexte des communautés de coléoptères forestiers de la région et l'impact historique des pratiques de gestion forestière sur des espèces spécialisées qui vivent dans les forêts de peuplement mature.

Introduction

The Mordellidae (tumbling flower beetles) are a diverse and widely distributed family of beetles in North America. Adults are floricolous and are found on many species of plants, especially those in the Apiaceae and Asteraceae. The larvae are either herbivorous, feeding in living herbaceous stems (Mordellistenini), or saproxylic,

feeding on decaying wood and fungi (Mordellini). Although around 1500 species are known worldwide, all the North American species are believed to be native (Ford and Jackman 1996; Jackman and Lu 2002). Liljeblad (1945) provided a comprehensive treatment of the family.

Jackman and Lu (2002) indicated that 12 genera and 203 species are known from North America, and McNamara (1991) listed 70 species

Received 20 September 2005. Accepted 9 May 2006.

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from Canada. The Mordellidae of the Maritime provinces of Canada, however, have been very little investigated. McNamara (1991) reported only 13 species from New Brunswick, 7 from Nova Scotia, and 1 from Prince Edward Island, for a combined regional fauna of 16 species.

Recent research and fieldwork, particularly in relation to studies of saproxylic beetles, have contributed many additional records. As well, existing collections in the Maritime provinces have mordellid specimens that have hitherto remained unexamined and unidentified. Bearing this in mind, the authors decided to review the status of the family in this area, which is roughly coincident with the Acadian forest region of Canada (Rowe 1972).

Methods and conventions

In the course of ongoing research on the Coleoptera fauna of the Maritime provinces of Canada, 366 specimens of Mordellidae originating in the Maritime provinces (289 in Nova Scotia, 55 in New Brunswick, and 22 on Prince Edward Island) were examined and identified. Additional published records were also integrated. Abbreviations of collections referred to in this study are as follows:

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, Ottawa, Ontario, Canada
CUIC	Cornell University Insect Collection, Ithaca, New York, United States of America
DHWC	David H. Webster Collection, Kentville, Nova Scotia, Canada
GSC	Gary Selig Collection, Bridgewater, Nova Scotia, Canada
JCC	Joyce Cook Collection, North Augusta, Ontario, Canada
NBM	New Brunswick Museum, Saint John, New Brunswick, Canada
NSMC	Nova Scotia Museum, Halifax, Nova Scotia, Canada

NSNR	Nova Scotia Department of Natural Resources, Shubenacadie, Nova Scotia, Canada
PADA	Pennsylvania Department of Agriculture, Harrisburg, Pennsylvania, United States of America
RPWC	Reginald P. Webster Collection, Charter's Settlement, New Brunswick, Canada
SMU	Saint Mary's University, Halifax, Nova Scotia, Canada
UPEI	University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada

Where there are fewer than 10 records, all are reported. Where there are more than 10 records, a summary of specimens examined is given and the earliest collections are noted. The number of specimens is indicated in parentheses. Where the number is not specified, it is assumed to be one.

To illustrate a finer level of detail with respect to the distribution of species, Nova Scotia (where 90% of the records originate) has been partitioned (on a county-by-county basis) into smaller subregions. These subregions are **North Shore** (Cumberland, Colchester, Pictou, and Antigonish counties), **Cape Breton** (Inverness, Victoria, Cape Breton, and Richmond counties), **Eastern Shore** (Guysborough and Halifax counties), **South Shore** (Lunenburg, Queens, Shelburne, and Yarmouth counties), and **Bay of Fundy** (Digby, Annapolis, Kings, and Hants counties). While these are simple approximations, they do allow for a ready way to represent distributions that mirror (albeit imperfectly) some of the physiographic ecodistricts within the province. Records from New Brunswick and Prince Edward Island are too few to warrant similar treatment.

To obtain some insight into the biogeographic composition of the fauna of the Maritime provinces, a rough characterization of the distribution of each species within North America is provided in the "Continental distribution" column in Table 1. These characterizations indicate the approximate range of each species within the continent. In the context of this paper, the term "boreal" simply indicates a northern United States – southern Canadian distribution. Data employed for this purpose are from Bright (1986) and McNamara (1991).

Adult mordellids are phytophagous and are commonly collected on the blossoms of many plants, with no necessary association between

Table 1. The Mordellidae of the Maritime provinces of Canada.

Species	NB	PEI	NS	Nova Scotia							
				North Shore				Cape Breton			
				CU	CO	PI	AT	IN	VI	CB	RI
Mordellini											
<i>Tomoxia lineella</i> LeConte	•		*	1							
<i>Mordellaria borealis</i> (LeConte)	•	*	*		1						
<i>M. serval</i> Say	•	*	•		1						
<i>Mordella a. atrata</i> Melsheimer	•		*		1	1	1				
<i>M. m. marginata</i> Melsheimer	•	*	•		1	1	1		1		
<i>M. melaena</i> Germar [†]	*										
Mordellestenini											
<i>Mordellistena aspersa</i> (Melsheimer) [†]	*	*	*					1		1	
<i>M. cervicalis</i> LeConte	•		*								
<i>M. convicta</i> LeConte			•		1						
<i>M. errans</i> Fall [†]	*		*	1							
<i>M. frosti</i> Liljeblad	•		*	1	1						
<i>M. fuscipennis</i> (Melsheimer)		•	•	1	1	1	1				
<i>M. indistincta</i> Smith [‡]	*										
<i>M. limbalis</i> (Melsheimer)	*	*	•		1	1	1				
<i>M. marginalis</i> (Say)	•		*			1			1		
<i>M. morula</i> LeConte [†]			*	1							
<i>M. picilabris</i> Helmuth [†]	*	*	*		1	1			1	1	
<i>M. rubrifascia</i> Liljeblad [‡]		*									
<i>M. rubrilabris</i> Helmuth [‡]			*		1	1					
<i>M. sericans</i> Fall [†]		*	*	1	1	1					
<i>M. syntaenia</i> Liljeblad	•		*	1	1						
<i>M. tosta</i> LeConte	•		*		1	1					
<i>M. trifasciata</i> (Say)	•		*	1	1						
<i>M. vilis</i> (LeConte) [†]		*									
<i>Mordellina ancilla</i> (LeConte) [†]			*								
<i>M. infima</i> (LeConte)	•	*	*		1	1					
<i>M. nigricans</i> (Melsheimer) [†]	*	*									
<i>M. pustulata</i> (Melsheimer) [†]			*	1	1	1				1	
<i>Mordellochroa scapularis</i> (Say)	•		•	1	1	1		1			
<i>Glipostenoda ambusta</i> (LeConte) [†]			*								
Totals	20	12	24	9	17	12	4	2	3	3	0

Note: •, previously recorded; *, newly recorded. Counties of Nova Scotia: CU, Cumberland; CO, Colchester; PI, Pictou; AT, Antigonish; IN, Inverness; VI, Victoria; CB, Cape Breton; RI, Richmond; GU, Guysborough; HX, Halifax; LU, Lunenburg; QU, Queens; SH, Shelburne; YA, Yarmouth; DI, Digby; AN, Annapolis; KI, Kings; and HA, Hants.

[†]Newly recorded for Atlantic Canada.

[‡]Newly recorded for Canada.

adult food plants and larval host plants (Jackman and Lu 2002). Consequently, in this treatment we do not report the large number of records of plants on which adult mordellids have been collected.

Results

The mordellid fauna of the Maritime provinces is summarized in Table 1. Thirty species are now known from the region. Of these, 17

Nova Scotia										Continental distribution
Eastern Shore		South Shore				Bay of Fundy				
GU	HX	LU	QU	SH	YA	DI	AN	KI	HA	
										Eastern/central
1										Boreal/eastern/central
1	1	1			1		1			Eastern/central
						1		1		Transcontinental
1	1	1				1	1	1		Transcontinental
										Southern/eastern/central
										Transcontinental
										Eastern/central
										Southern/eastern/central
	1									Northeastern
	1									Boreal
1	1		1				1		1	Northeastern
										Insufficient data
										Eastern/central
1	1									Eastern/central
										Boreal
						1			1	Northeastern
										Insufficient data
1	1							1		Insufficient data
1	1		1							Southern
1										Northeastern
1	1	1								Eastern/central
		1	1						1	Eastern/central
										Western/central
1										Southern/eastern
										Eastern
										Transcontinental
										Transcontinental
1	1							1		Boreal
1		1								Transcontinental
12	13	5	3	0	1	3	3	4	3	

are newly recorded for Nova Scotia, 11 are new for Prince Edward Island, and 7 are new for New Brunswick, for a total of 35 new provincial records. Fourteen species are newly recorded for Atlantic Canada, 3 of which are newly

recorded for Canada as a whole. One subspecies, *Mordella atrata lecontei* Csiki, 1915, is removed from the region's fauna, the specimens in question having been misidentified. Ninety-four county records from Nova Scotia

are reported. Specific accounts of newly recorded taxa follow.

Mordellini

***Tomoxia lineella* LeConte, 1862**

NEW BRUNSWICK. Gloucester Co.: Bathurst, 9.vii.190?, J.N. Knull, PADA. **NOVA SCOTIA.** Cumberland Co.: Parrsboro, 26.vii.1996, J. Ogden, NSNR.

In the United States, recorded from Iowa east to Maine (Bright 1986); in Canada, recorded from Ontario, Quebec, and New Brunswick (McNamara 1991). Newly recorded in Nova Scotia. Associated with dead sugar maple (*Acer saccharum* Marsh.) (Aceraceae) (Downie and Arnett 1996); in Wisconsin, bred from large-toothed poplar (*Populus grandidentata* Michx.) (Salicaceae) (Lisberg and Young 2003b).

***Mordellaria borealis* (LeConte, 1862)**

NEW BRUNSWICK. Gloucester Co.: Bathurst, 21.vi.190?, J.N. Knull, PADA. **Saint John Co.:** Saint John, 9.vi.1901, W. McIntosh, NBM. **NOVA SCOTIA.** Colchester Co.: Debert, 7.vii.1995, E. Georgeson, NSNR; Shubenacadie, 11.viii.1997, J. Ogden, NSNR. **Guysborough Co.:** Borneo, summer, 1995, C. Corkum, NSMC; Seloam Lake, 29.vii.–13.viii.1997, D.J. Bishop, NSMC; Malay Lake, 1–16.vii.1997 and 29.vii.–13.viii.1997, D.J. Bishop, (2), NSMC. **PRINCE EDWARD ISLAND.** Kings Co.: 25.viii.2003, Woodville Mills, C.G. Majka, CGMC.

Recorded across the northern United States from Washington and Oregon east to Maine (Bright 1986) and in Canada from the Yukon and British Columbia east to New Brunswick (McNamara 1991). Newly recorded in Nova Scotia and Prince Edward Island. Associated with eastern hemlock, *Tsuga canadensis* (L.) Carr. (Pinaceae) (Downie and Arnett 1996). In Nova Scotia, collected in young red spruce, *Picea rubens* Sarg. (Pinaceae), and deciduous forests.

***Mordellaria serval* Say, 1835**

NEW BRUNSWICK. Saint John Co.: Saint John, 24.vi.1907, W. McIntosh, NBM. **NOVA SCOTIA.** Colchester Co.: Shubenacadie,

11.viii.1997, J. Ogden, NSNR. **Guysborough Co.:** Liscomb Game Sanctuary, 15.vii.1998, J. Ogden, NSNR. **Halifax Co.:** Halifax, 1.ix.1945, J. McDunnough, (3), NSMC. **Lunenburg Co.:** Bridgewater, 30.vi.1965, B. Wright, NSMC. **Yarmouth Co.:** Port Maitland, 30.vi.1987, J. Cook, JCC. **PRINCE EDWARD ISLAND:** summer 1974–1983, UPEI.

In the United States, recorded from Indiana east to Maine (Bright 1986); in Canada, recorded from Manitoba east to Nova Scotia (McNamara 1991). Newly recorded on Prince Edward Island. Beaten from dead branches of linden, *Tilia europea* L. (Tiliaceae) (Downie and Arnett 1996). In Wisconsin, found in mixed oak (*Quercus* spp.), basswood (*Tilia* spp.), pine (*Pinus* spp.), and poplar (*Populus* spp.) forests and on *Pinus banksiana* Lamb. (Pinaceae) (Lisberg and Young 2003a). In Nova Scotia, found on red oak, *Quercus rubra* L. (Fagaceae).

***Mordella atrata atrata* Melsheimer, 1845**

NOVA SCOTIA. Antigonish Co.: Beech Hill Road, 2.vii.1952, D.C. Ferguson, NSMC. **Colchester Co.:** Debert, 2.vii.1996, J. Ogden, NSNR. **Kings Co.:** Waterville, 12.v.1942, H.T. Stultz, NSNR. **Digby Co.:** Hectanooga, 5.vi.1999, J. Cook, JCC; Porter's Lake, 23.vii.2000, G. Selig, GSC. **Pictou Co.:** Caribou, 12.vii.2002, C.G. Majka, CGMC.

Recorded throughout much of the United States (Bright 1986); recorded in Canada from the Northwest Territories and British Columbia east to New Brunswick (McNamara 1991). Newly recorded in Nova Scotia. Although McNamara (1991) recorded *M. atrata lecontei* from Nova Scotia, all the specimens we examined are *M. a. atrata*. Furthermore, S. Laplante (personal communication) has informed us that all the specimens from New Brunswick and Nova Scotia identified as *M. a. lecontei* at the CNC and examined by McNamara are actually misidentified specimens of *M. marginata marginata*. Consequently, *M. a. lecontei* is removed from the Maritime faunal list.

***Mordella marginata marginata* Melsheimer, 1845**

NEW BRUNSWICK. Saint John Co.: Saint John, 24.vii.1902, W. McIntosh, NBM; Saint John, viii.190?, W. McIntosh, NBM. **NOVA**

SCOTIA. 55 specimens were examined from Annapolis, Antigonish, Colchester, Guysborough, Halifax, Kings, Lunenburg, Pictou, and Victoria counties. The earliest records are from 1945 (**Halifax Co.:** Halifax, 2.viii.1958, D.C. Ferguson, NSMC; Grand Lake, 18.viii.1945, D.C. Ferguson, NSMC). **PRINCE EDWARD ISLAND.** **Kings Co.:** Woodville Mills, 23.vii.2001, C.G. Majka, CGMC. **Queens Co.:** Mermaid, 10.viii.1953, F.M. Cannon, ACPE; Wood Islands, 23.vii.2001, C.G. Majka, CGMC.

Recorded throughout much of the United States (Bright 1986); recorded in Canada from the Northwest Territories and British Columbia east to Nova Scotia (McNamara 1991). Newly recorded on Prince Edward Island. Reared from *Quercus macrocarpa* Michx., *Sapindus drummondi* Hook. & Arn. (Sapindaceae), and *Carya* sp. (Juglandaceae) (Ford and Jackman 1996). In Nova Scotia, found in many open, boggy, coastal, and forested (deciduous and coniferous) habitats.

***Mordella melaena* Germar, 1824**

NEW BRUNSWICK. **Saint John Co.:** Saint John, 31.vii.1900, W. McIntosh, NBM.

Recorded throughout much of the United States except for the southwest and the Pacific coast (Bright 1986); recorded in Canada from the Northwest Territories and Alberta east to Quebec (McNamara 1991). Newly recorded in New Brunswick and Atlantic Canada as a whole. In Wisconsin, collected in oak (*Quercus* spp.) savannas and barrens and prairies (Lisberg and Young 2003a).

Mordellestenini

***Mordellistena aspersa* (Melsheimer, 1845)**

NEW BRUNSWICK. **Albert Co.:** Mary's Point, 21.viii.2005, C.G. Majka, (6), CGMC. **NOVA SCOTIA.** **Cape Breton Co.:** Sydney Tar Ponds, 24.vi.1996, L.A. Hudson, CBU. **Guysborough Co.:** Country Harbour, 19.vii.1994, D. Kehler, NSMC. **Victoria Co.:** Beinn Bhreagh: Baddeck, 16.vii.1979, G.B. Fairchild, NSMC. **PRINCE EDWARD ISLAND:** summer 1974–1983, UPEI. **Queens Co.:** Cavendish, 19.vii.2001, C.G. Majka, CGMC; St. Patricks, 14.vii.2002, C.G. Majka,

CGMC; Millvale: Trout River, 25.vi.2003, C.G. Majka, (2), CGMC.

Recorded throughout the United States (Liljeblad 1945); recorded in Canada from British Columbia east to Quebec (McNamara 1991). Newly recorded in New Brunswick, Nova Scotia, Prince Edward Island, and Atlantic Canada as a whole. Reared from *Cirsium vulgare* Savi (Ten.), *Actinomeris alternifolia* (L.) DC., *Ambrosia artemisiifolia* L., *Ambrosia trifida* L., *Aster vimineus* Lam., *Eupatorium serotinum* Michx., *Iva ciliata* Willd., *Solidago canadensis* L., and *Ambrosia trifida* L. (all in the Asteraceae) (Ford and Jackman 1996). In Wisconsin, common in dry, dry mesic, and sand prairies (Lisberg and Young 2003a). On Prince Edward Island, adults found in coastal vegetation and along a small stream; in Nova Scotia, found in an old-growth deciduous forest; in New Brunswick, found in a coastal marsh.

We concur with Liljeblad (1945) that *M. aspersa* probably consists of more than one species. Systematic work to discern the nature of this complex is required.

***Mordellistena cervicalis* LeConte, 1862**

NEW BRUNSWICK. **Kent Co.:** Kouchibouguac National Park, 9.viii.1977, 16.viii.1977, and 23.viii.1977, S.J. Miller, (5), CNC. **York Co.:** Hawkshaw, 26.vi.1985, L. LeSage, (8), CNC. **NOVA SCOTIA.** **Halifax Co.:** French Village, 8.ix.1945, D.C. Ferguson, (2), NSMC. **Pictou Co.:** Lyons Brook, 29.viii.2002, E. Georgeson, NSNR. **Victoria Co.:** Black Rock, 14.vi.1994, V. Jessome, CBU.

In the United States, recorded from Minnesota, Nebraska, and Kansas east through Michigan and Kentucky to Maine and south to Virginia (Bright 1986); in Canada, recorded from Manitoba east to New Brunswick (McNamara 1991). Newly recorded in Nova Scotia. In Wisconsin, reared from *Achillea millefolium* L. and *Erigeron* sp. (Asteraceae) (Lisberg and Young 2003a). This species may be conspecific with *M. marginalis* (Say) (see account below).

***Mordellistena convicta* LeConte, 1862**

NOVA SCOTIA. **Colchester Co.:** Truro, 5.viii.1918–1929, C.A. Frost, Liljeblad (1945).

In the United States, recorded from Kansas east to Maryland and north to Michigan and Maine and in Alabama and New Mexico (Bright 1986); in Canada, recorded from Manitoba to Quebec and in Nova Scotia (McNamara 1991). Liljeblad reported the record from Nova Scotia (above); unfortunately, the collection is not indicated. The year of collection is also not specified, but it would have been between 1918 (when Frost began collecting in Nova Scotia) and 1929 (when Liljeblad completed his manuscript). It would be desirable to locate and re-examine this specimen, since no other specimens of the species have been collected in the Maritime provinces. In Wisconsin, reared from *Helenium autumnale* L., *Silphium perfoliatum* L., and *Solidago gigantea* Ait. (all in the Asteraceae) (Lisberg and Young 2003a).

***Mordellistena errans* Fall, 1907**

NEW BRUNSWICK. Albert Co.: Mary's Point, 23.viii.2003, C.G. Majka, CGMC. **NOVA SCOTIA. Cumberland Co.:** Wentworth, 21.v.–5.vii.1965, B. Wright, (2), NSMC. **Halifax Co.:** Campbell Hill, 29.vii.–13.viii.1997, D.J. Bishop, NSMC.

In the United States, recorded in Massachusetts (Bright 1986), New Hampshire, and Maine (Chandler 2001); in Canada, recorded in Quebec (McNamara 1991). Newly recorded in New Brunswick, Nova Scotia, and Atlantic Canada as a whole. In Nova Scotia, collected in flight-intercept traps in sugar maple (*Acer saccharum*) in a deciduous forest and in a red spruce (*Picea rubens*) stand; in New Brunswick, collected in a coastal marsh.

***Mordellistena frosti* Liljeblad, 1918**

NEW BRUNSWICK. Gloucester Co.: Bathurst, 2.vi.190?, J.N. Knull, PADA. **NOVA SCOTIA. Colchester Co.:** Kempton, 14.vi.1995, C. Corkum, NSMC. **Cumberland Co.:** Harrington River, 16.vi.1995, C. Corkum, (4), NSMC; Moose River, 16.vi.1995, C. Corkum, (3), NSMC. **Guysborough Co.:** Stillwater, 29.vi.1995, C. Corkum, NSMC. **Halifax Co.:** Anti Dam Lake, 1–16.vii.1997, D.J. Bishop, NSMC.

In the United States, recorded from Minnesota, Maine, and New Hampshire (Bright 1986); in Canada, recorded from Alberta, Manitoba,

Quebec, and New Brunswick (McNamara 1991). Newly recorded in Nova Scotia. In Nova Scotia, most specimens collected with flight-intercept traps in deciduous forests; one specimen (Anti Dam Lake) from a 90-year-old black spruce (*Picea mariana* (P. Mill.) B.S.P.; Pinaceae) stand.

***Mordellistena fuscipennis* (Melsheimer, 1845)**

NOVA SCOTIA: 19 specimens were examined from Annapolis, Antigonish, Colchester, Cumberland, Guysborough, Halifax, Hants, and Pictou counties. The earliest record is from 1993 (**Colchester Co.:** Debert, 4.viii.1993, J. Ogden, NSNR). **PRINCE EDWARD ISLAND. Queens Co.:** St. Patricks, 19.vii.2001, CGMC.

In the United States, recorded from Michigan east to Maine and south to Virginia and Kentucky (Bright 1986); in Canada, recorded from Ontario, Quebec, Prince Edward Island, and Nova Scotia (McNamara 1991). In Wisconsin, collected in oak (*Quercus* spp.) barrens and other hardwood habitats (Lisberg and Young 2003a). In Nova Scotia, collected in both deciduous and mixed coniferous (*Picea rubens* and *Tsuga canadensis*) forests.

***Mordellistena indistincta* Smith, 1882**

NEW BRUNSWICK. Carleton Co.: Bell Forest Preserve: Wakefield, 2.viii.2004, R.P. Webster, RPWC.

Described by Smith (1882) solely on the basis of specimens from the Adirondack Mountains of New York. Also reported by Downie and Arnett (1996) from Indiana, New Hampshire, and Quebec and by Chandler (2001) in New Hampshire and Maine. The source of Downie and Arnett's (1996) Quebec record is unclear, since neither McNamara (1991) nor Laplante *et al.* (1991) indicated records from this jurisdiction. S. Laplante (personal communication) has informed us that there are no specimens or published records of *M. indistincta* from Quebec. Consequently, this record of this species from New Brunswick constitutes the first verified record from Canada. Collected in a deciduous forest. This is a rare and consequently poorly understood species.

***Mordellistena limbalis*
(Melsheimer, 1845)**

NEW BRUNSWICK. Carleton Co.: Bell Forest Preserve: Wakefield, 22.vii.2004, R.P. Webster, RPWC. **NOVA SCOTIA. Antigonish Co.:** Beaver Mountain, 6.vii.1994, D. Kehler, NSMC. **Colchester Co.:** Truro, 4.vii.19??, R. Matheson, CUI. **Cumberland Co.:** Lower Greenville, 28.vii.1995, C. Corkum, NSMC. **Guysborough Co.:** Archibald Mills, 7.vii.1994 and 19.vii.1994, D. Kehler, (2), NSMC. **Pictou Co.:** Sutherlands Mountain, 28.vii.1994, D. Kehler, NSMC. **PRINCE EDWARD ISLAND. Queens Co.:** St. Patricks, 21.vii.2001, C.G. Majka, CGMC.

In the United States, recorded from Minnesota, Iowa, and Kansas east to Virginia and north to Maine (Bright 1986); in Canada, found from Saskatchewan east to Nova Scotia (McNamara 1991). Newly recorded in New Brunswick and on Prince Edward Island. Frequently found by beating dead hardwood limbs (Downie and Arnett 1996). In Wisconsin, found in mixed deciduous hardwoods and in an oak (*Quercus* spp.) savanna (Lisberg and Young 2003a). In the Maritime provinces, found in both deciduous and coniferous forests.

***Mordellistena marginalis*
(Say, 1824)**

NEW BRUNSWICK. Albert Co.: Mary's Pt., 23.viii.2003, C.G. Majka, CGMC; Mary's Pt., 21.viii.2005, C.G. Majka, (2), CGMC. **Kings Co.:** Penobsquis, 29.vii.1926–1927, C.A. Frost, Liljeblad (1945). **NOVA SCOTIA. Halifax Co.:** French Village, 8.ix.1945, D.C. Ferguson, (2), NSMC. **Guysborough Co.:** Liscomb Game Sanctuary, 31.vii.1998, J. Ogden, (2), NSNR. **Pictou Co.:** Lyon's Brook, 29.viii.2002, E. Georgeson, malaise trap, NSNR. **Victoria Co.:** Black Rock, 14.vii.1994, V. Jessome, CBU.

Broadly distributed throughout the eastern and central United States (Bright 1986); in Canada, recorded from the Northwest Territories and Manitoba east to New Brunswick (McNamara 1991). Newly recorded in Nova Scotia. In New Brunswick, found in a coastal marsh.

Liljeblad (1945) wrote of *M. marginalis* that, "This species is perhaps most nearly allied to *Mordellistena cervicalis* LeConte, 1862, which may be only a variation of the present species, as the ridges and a slight variation in color appear to be the only differences. Say did not

mention any ridges, which were added to the description by LeConte thirty-eight years later...". The type specimens of these species should be examined to ascertain whether they are conspecific as suggested by Liljeblad (1945).

***Mordellistena morula*
LeConte, 1862**

NOVA SCOTIA. Cumberland Co.: Oxford, 12.vii.1988, E. Georgeson, NSNR.

Recorded across the northern United States from Washington and Oregon east through Colorado, Minnesota, Indiana, and the District of Columbia, north to New York (Bright 1986); in Canada, recorded from British Columbia and Saskatchewan (McNamara 1991). Newly recorded in Nova Scotia and in Atlantic Canada as a whole. In Nova Scotia, collected at an ultraviolet light.

***Mordellistena picilabris*
Helmuth, 1864**

NOVA SCOTIA: 23 specimens were examined from Colchester, Pictou, Victoria, Cape Breton, Halifax, Hants, and Digby counties. The earliest record is from 1994 (**Digby Co.:** Brier Island, 3.ix.1994, J. Ogden, NSNR). **PRINCE EDWARD ISLAND. Kings Co.:** Woodville Mills, 16.viii.2002, C.G. Majka, CGMC. **Queens Co.:** St. Patricks, 21.vii.2001, C.G. Majka, CGMC; St. Patricks, 14.vii.2002, C.G. Majka, CGMC.

In the United States, recorded from Illinois east to Massachusetts and north to Maine (Bright 1986); in Canada, recorded in Manitoba (McNamara 1991). Newly recorded in Nova Scotia, Prince Edward Island, and Atlantic Canada as a whole. Frequently found in open areas, particularly near streams and ponds.

***Mordellistena rubrifascia*
Liljeblad, 1945**

PRINCE EDWARD ISLAND. Queens Co.: New Glasgow, 13.vii.2002, C.G. Majka, CGMC; Cavendish, 14.vii.2002, C.G. Majka, CGMC.

In the United States, recorded from Illinois, Indiana, and Ohio by Liljeblad (1945). Newly recorded in Canada. Both Prince Edward Island specimens were taken from wet areas, in one case in a coastal lagoon, in the second case from a damp meadow at the edge of a river.

Mordellistena rubrifascia and *M. rubrilabris* Helmuth (below) are part of a species group in need of systematic revision. Until such a revision is undertaken, determinations can be made only provisionally.

***Mordellistena rubrilabris*
Helmuth, 1864**

NOVA SCOTIA. Colchester Co.: Debert, 13.vii.1994, J. Ogden, NSNR; Shubenacadie, 1.viii.1997, J. Ogden, NSNR. **Halifax Co.:** French Village, 8.ix.1945, D.C. Ferguson, (3), NSMC. **Kings Co.:** Greenwich, 12.viii.1945, D.C. Ferguson, NSMC. **Guysborough Co.:** Liscomb Game Sanctuary, 31.vii.1998, J. Ogden, NSNR. **Pictou Co.:** Lyons Brook, 26.viii.2002, E. Georgeson, NSNR.

In the United States, recorded from Illinois (Bright 1986) and Wisconsin (Lisberg and Young 2003a). Newly recorded in Canada. The French Village specimens were collected near a water reservoir. In Wisconsin, collected in oak and sand barrens (Lisberg and Young 2003a). As noted above, *M. rubrilabris* is part of a species group in need of taxonomic revision.

***Mordellistena sericans* Fall, 1907**

NOVA SCOTIA: 15 specimens were examined from Cumberland, Colchester, Pictou, Guysborough, Halifax, and Queens counties. The earliest records are from 1992 (**Cumberland Co.:** Westchester–Londonderry, 22.viii.1992, S. and J. Peck, (2), JCC; **Guysborough Co.:** Trafalgar, 19.vii.1992, S. and J. Peck, JCC; **Queens Co.:** Caledonia, 25.vii.1992, J. and F. Cook, JCC). **PRINCE EDWARD ISLAND. Queens Co.:** St. Patricks, 19.vii.2002, C.G. Majka, CGMC.

Generally a more southern species; in the United States, recorded from Washington, Oregon, and California, east through Idaho, Colorado, New Mexico, Kansas, Texas, and Tennessee to Florida, and north to Illinois and North Carolina (Bright 1986); in Canada, recorded from Saskatchewan and Manitoba (McNamara 1991). Newly recorded in Nova Scotia, on Prince Edward Island, and in Atlantic Canada as a whole. Frequently found in mixed forests and old fields.

***Mordellistena syntaenia*
Liljeblad, 1921**

NEW BRUNSWICK. Kent Co.: Kouchibouguac National Park, 13.vii.1977, S.J. Miller, CNC. **NOVA SCOTIA. Colchester Co.:** Debert, 8.vii.1994, J. Ogden, NSNR. **Cumberland Co.:** Lower Greenville, 28.vii.1995, C. Corkum, NSMC. **Guysborough Co.:** Bonnet Lake Barren, 15–22.vii.1999, R. Lauff, NSNR.

In the United States, recorded in New Hampshire, Vermont, and Massachusetts (Bright 1986); in Canada, recorded from Manitoba and New Brunswick (McNamara 1991). Newly recorded in Nova Scotia. In Wisconsin, collected primarily in oak (*Quercus* spp.) savannas but also from mesic oak and deciduous forests (Lisberg and Young 2003a). In Nova Scotia, collected in a coniferous forest.

***Mordellistena tosta*
LeConte, 1862**

NEW BRUNSWICK. Northumberland Co.: Boiestown, 11.vii.1928, W.J. Brown, CNC. **NOVA SCOTIA:** 27 specimens were examined from Colchester, Pictou, Guysborough, Halifax, and Lunenburg counties. The earliest record is from 1987 (**Colchester Co.:** Shubenacadie, 31.vii.1987, J. Ogden, NSNR).

Broadly distributed in the United States from North Dakota south to Texas, east to Georgia and north to Maine (Bright 1986); in Canada, distributed from Manitoba east to New Brunswick (McNamara 1991). Newly recorded in Nova Scotia. In Wisconsin, collected in a mixed deciduous forest (Lisberg and Young 2003a). In Nova Scotia, found in deciduous, coniferous (*Tsuga canadensis* and *Picea rubens*), and mixed forests ranging from young to old growth; also in open areas.

***Mordellistena trifasciata*
(Say, 1826)**

NEW BRUNSWICK. Kent Co.: Kouchibouguac National Park, 10.viii.1978 and 11.viii.1978, D.B. Lyons, (3), CNC; Kouchibouguac National Park, 11.ix.1978, S.J. Miller, (2), CNC. **NOVA SCOTIA. Colchester Co.:** Debert, 23.vii.1996, J. Ogden, NSNR; Shubenacadie, 14.viii.1997 and 28.viii.1997, J.

Ogden, (4), NSNR. **Cumberland Co.:** Lower Greenville, 13.vii.1995 and 28.vii.1995, C. Corkum, (5), NSMC. **Halifax Co.:** Anti Dam Lake, 29.vii.–13.viii.1997, D.J. Bishop, NSMC; Herring Cove, Halifax, 28.vii.2002, C.G. Majka, CGMC. **Lunenburg Co.:** New Ross, 31.vii.1984, B. Wright and L. Morris, NSMC. **Queens Co.:** Black Duck Lake, 10.vii.2003, P. Dollin, NSMC.

In the United States, recorded from Wisconsin and Kansas south to Alabama and north through Virginia to Maine (Bright 1986; Lisberg and Young 2003a); in Canada, recorded from Saskatchewan east to New Brunswick (McNamara 1991). Newly recorded in Nova Scotia. In Wisconsin, collected in oak (*Quercus* spp.) barrens and savannas and mixed deciduous forests (Lisberg and Young 2003a). In Nova Scotia, found in young red spruce (*Picea rubens*), black spruce (*Picea mariana*), and white pine (*Pinus strobus* L.; Pinaceae) forests as well as on coastal barrens.

***Mordellistena vilis* (LeConte, 1858)**

PRINCE EDWARD ISLAND. Queens Co.: Princeton–Warburton Road, 27.vi.2003, C.G. Majka, CGMC.

In the United States, recorded from California, Colorado, Texas, Ohio (Bright 1986), and Wisconsin (Lisberg and Young 2003a); in Canada, recorded from British Columbia, Manitoba, and Ontario (McNamara 1991). Newly recorded on Prince Edward Island and in Atlantic Canada as a whole. In Wisconsin, collected in a dry mesic hill prairie (Lisberg and Young 2003a).

***Mordellina ancilla* (LeConte, 1862)**

NOVA SCOTIA. Guysborough Co.: Liscomb Game Sanctuary, 15.vii.1998, J. Ogden, NSNR.

In the United States, recorded from Wisconsin and Illinois south to Alabama and Georgia, north to Massachusetts and New York (Bright 1986; Lisberg and Young 2003a); in Canada, recorded in Ontario (McNamara 1991). Newly recorded in Nova Scotia and in Atlantic Canada as a whole. In Wisconsin, collected from a mixed deciduous forest (Lisberg and Young 2003a).

***Mordellina infima* (LeConte, 1862)**

NEW BRUNSWICK. Kent Co.: Kouchibouguac National Park, 23.viii.1977 and

30.viii.1977, D.B. Lyons, (6), CNC. **NOVA SCOTIA. Colchester Co.:** Debert, 21.vii.1995, J. Ogden, NSNR; Kemptown, 5.viii.1999, J. Ogden, (8), NSNR. **Halifax Co.:** south-end Halifax, 26.vi.2001 and 12.viii.2001, C.G. Majka, CGMC; Burnside, 16.vii.2003 and 29.vii.2003, C. Cormier, (2), SMU. **Pictou Co.:** Waterside Park, 11.viii.1995, J. Ogden, NSNR. **PRINCE EDWARD ISLAND. Queens Co.:** Cavendish, 14.vii.2002, C.G. Majka, CGMC.

In the United States, recorded from Minnesota, south to Alabama and Florida, and north to Maine (Bright 1986); in Canada, found from Saskatchewan east to New Brunswick (McNamara 1991). Newly recorded in Nova Scotia and Prince Edward Island. In Wisconsin, collected in sand prairies, sand and oak barrens, and oak savannas (Lisberg and Young 2003a). In Nova Scotia, found in both open and partially forested habitats; on Prince Edward Island, found along a coastal lagoon.

***Mordellina nigricans* (Melsheimer, 1845)**

PRINCE EDWARD ISLAND. Queens Co.: Millvale, 13.vii.2002, C.G. Majka, CGMC.

Broadly distributed in the United States except for the southwest (Bright 1986); in Canada, found from Manitoba east to Quebec (McNamara 1991). Newly recorded on Prince Edward Island and in Atlantic Canada as a whole. Reared from *Desmodium canescens* (L.) DC. (Fabaceae) (Ford and Jackman 1996). In Wisconsin, associated with sand prairies, dry mesic prairies, prairie – hardwood forests, ecotones, and sandy oak (*Quercus* spp.) barrens (Lisberg and Young 2003a). On Prince Edward Island, found in a brackish marsh along a tidal creek.

***Mordellina pustulata* (Melsheimer, 1845)**

NOVA SCOTIA. Cape Breton Co.: Sydney Tar Ponds, 26.vii.1995, G.R. MacPherson, CBU; Sydney Tar Ponds, 28.vi.1996, P.A. Rankin, CBU. **Colchester Co.:** Shubenacadie, 1.viii.1997, J. Ogden, NSNR. **Cumberland Co.:** Parrsboro, 20.viii.1995, J. Ogden, NS, (2), NSNR. **Pictou Co.:** Pictou Island, 14.vii.1998, J. Ogden, NSNR; Lyons Brook, 31.viii.2002, E. Georgeson, NSNR.

Recorded throughout the United States (Bright 1986); in Canada, recorded from British Columbia to Quebec (McNamara 1991). Newly recorded in Nova Scotia and in Atlantic Canada as a whole. Reared from *Achillea millefolium*, *Ambrosia trifida*, *Aster vimineus*, *Chrysopsis* sp., *Cirsium vulgare*, *Elephantopus carolinianus* Raeusch., *Erigeron canadensis* L., *Eupatorium serotinum*, *Eupatorium maculatum* L., *Eupatorium perfoliatum* L., *Helenium autumnale*, *Helianthus tuberosus* L., *Heliopsis helianthoides* (L.) Sweet, *Iva ciliata*, *Rudbeckia laciniata* L., *Solidago canadensis*, *Solidago gigantea*, *Vernonia fasciculata* Michx., *Xanthium strumarium* L. (all in the Asteraceae), *Gentiana andrewsii* Griseb. (Gentianaceae), and *Vernonia altissima* Nutt. (Scrophulariaceae) (Ford and Jackman 1996; Lisberg and Young 2003a). The presence of this species on Pictou Island, 7.5 km from the nearest point of the mainland, is noteworthy.

***Mordellochroa scapularis*
(Say, 1824)**

NEW BRUNSWICK. Gloucester Co.: Bathurst, 25.vi.190?, J.N. Knull, PADA. **Saint John Co.:** Saint John, ~1900, W. McIntosh, NBM. **NOVA SCOTIA:** 48 specimens were examined from Colchester, Cumberland, Guysborough, Halifax, Inverness, Kings, and Pictou counties. The earliest record is from 1968 (**Kings Co.:** Kentville, 6.vi.1968, D.H. Webster, DHWC).

Recorded in the United States from Minnesota and Illinois east to Maine and Maryland (Bright 1986), in Canada from British Columbia to Nova Scotia (McNamara 1991). In Wisconsin, found in oak (*Quercus* spp.) and other mesic forests (Lisberg and Young 2003a). In Nova Scotia, collected primarily in deciduous forests but also in red spruce (*Picea rubens*) stands.

***Glipostenoda ambusta*
(LeConte, 1862)**

NOVA SCOTIA. Guysborough Co.: Aspen, 7.vii.1994, D. Kehler, NSMC. **Lunenburg Co.:** Bridgewater, 30.vi.1965, NSMC.

In the United States, recorded from Washington and Oregon east through Kansas to Virginia, and north to Wisconsin, New York (Bright 1986; Lisberg and Young 2003a), New

Hampshire, and Maine (Chandler 2001); in Canada, recorded from British Columbia, Ontario, and Quebec (McNamara 1991). Newly recorded in Nova Scotia and in Atlantic Canada as a whole. In Wisconsin, found in oak (*Quercus* spp.) and sand barrens (Lisberg and Young 2003a). In Nova Scotia, found in an old-growth deciduous forest.

Discussion

The many new provincial, regional, and Canadian records significantly increase our understanding of the mordellid fauna of the Maritime provinces. Thirty species are now known from the region, 14 of which are newly recorded for Atlantic Canada and 3 of which are newly recorded for Canada. This is a small step towards alleviating some of the historical neglect that this family has experienced. While research on Coleoptera in the Maritimes began with Kirby (1837), only a handful of specimens (1900–1907, Saint John, New Brunswick, William McIntosh, NBM) were collected in the region before the mid-1940s.

Knowledge of the Mordellidae in the Maritimes is in its infancy. There are only a small number of records from both New Brunswick and Prince Edward Island. In New Brunswick, in particular, there are many areas of the province that have hardly, if at all, been investigated from the standpoint of their Coleoptera fauna. On Prince Edward Island, almost all of the records are from Queens Co., and no specimens have been collected in Prince Co.

Even in Nova Scotia, where 85% of the specimens in this study originated, there are still very large gaps in our knowledge of the distribution of mordellids. More extensive collecting has taken place in Cumberland, Colchester, Pictou, Guysborough, and Halifax counties, but the other 13 counties in the province have records of only a handful of species. Indeed, there are no records from Richmond and Shelburne counties. Only one species, *Mordella m. marginata*, is recorded from more than half of Nova Scotia's 18 counties (Table 1).

Much ecological work also remains to be done. The host plant associations are known for only a small fraction of mordellids. The role of the saproxylic species in the processes of decay and decomposition of wood in the Acadian forest region has been little investigated even though several recent studies of saproxylic

beetles (Bishop 1998; Dollin 2004; Kehler *et al.* 2004) have found substantial numbers of mordellids in forested areas of Nova Scotia.

The relatively small number of species recorded on Cape Breton Island (six species, *i.e.*, 20% of the regional fauna) and on Prince Edward Island (12 species, *i.e.*, 40% of the regional fauna) may reflect an island-related diminution of species, a comparative lack of collection effort, or a combination of both. In comparison, for the more extensively studied and collected Coccinellidae, the native Cape Breton and Prince Edward Island faunas represent 41% and 39%, respectively, of the mainland fauna (Majka and McCorquodale 2006). This would appear to indicate that the collection effort for Mordellidae on Cape Breton Island has been less than adequate.

From a biogeographic perspective, the largest numbers of species are in the transcontinental (six), eastern/central (six), northeastern (four), and boreal (three) categories (Table 1). *Mordellistena indistincta*, *M. rubrifascia*, and *M. rubrilabris* in the Maritime provinces are significantly disjunct from other areas where the species have been reported. However, distributional data for these species are insufficient to properly ascertain their ranges and hence the larger significance of these records.

Mordellistena morula is found across the continent; however, previous east-coast records are more southerly (New York and the District of Columbia). More work is required to determine whether the species is present in intervening areas or whether the Nova Scotia population is disjunct from the main population. Similarly, *Mordellina ancilla* is generally more southern in its distribution, having previously been recorded only north to Ontario and Massachusetts. *Glipostenoda ambusta*, while transcontinental in distribution, has not been recorded in New England. Further research on all these species is needed to determine whether the Nova Scotia populations are disjunct or contiguous with other populations.

There is a sizeable number of species of Mordellidae in the Maritime provinces about which we know very little. Eleven species — *Glipostenoda ambusta*, *Mordella melaena*, *Mordellina ancilla*, *M. nigricans*, *Mordellistena convicta*, *M. errans*, *M. indistincta*, *M. morula*, *M. rubrifascia*, *M. syntaenia*, and *Tomoxia lineella* — are known from fewer than five specimens. *Mordella melaena* was last collected in 1900 and *M. convicta* was last collected between

1918 and 1929. While this at least in part reflects the rather meagre collection effort in the region, it is also possible that some of these species may actually be rare.

While host plant associations are imperfectly known, some mordellids are known to be associated with old-growth forests. In Great Britain, Alexander (2004) included two mordellids, *Tomoxia bucephala* Costa, 1854 and *Mordellistena neuwaldeggiana* (Panzer, 1796), in the 180 species of saproxylic beetles used in calculating the Index of Ecological Continuity, an indicator of the degree of continuity (an inverse of disturbance) in forested habitats. In Nova Scotia, *Glipostenoda ambusta*, *Mordellistena aspersa*, *M. frosti*, *M. fuscipennis*, *M. limbalis*, *M. tosta*, and *Mordellochroa scapularis* have all been recorded from old-growth forests. Majka and Pollock (2006) and Majka (2006) drew attention to 11 species of saproxylic beetles in the Maritime provinces in the families Tetratomidae, Melandryidae, Boridae, Mycteridae, Pyrochroidae, Pythidae, and Salpingidae that are known from a very small number of specimens at a limited number of sites. In Nova Scotia, although 78% of the land base is forested, less than 1% of that land comprises old-growth forests (Loo and Ives 2003). Consequently, historical patterns of land use in the region may have had a significant impact on species that are old-growth specialists. It is possible that some of the infrequently collected Mordellidae may also fall into this category. Further research on this group in the region is needed to help answer this and many other remaining questions about the distribution, abundance, and bionomics of the region's fauna.

Acknowledgements

Many thanks to S. Rigby and C. Sheffield (Agriculture and Agri-Food Canada, Kentville, Nova Scotia), C. Noronha and M. Smith (Agriculture and Agri-Food Canada, Charlottetown, Prince Edward Island), D. McCorquodale (Cape Breton University), D.H. Webster, G. Selig (DeBrisay Museum), J. Cook (Carleton University), D. McAlpine and R. Webster (New Brunswick Museum), J. Ogden (Nova Scotia Department of Natural Resources), C. Cormier (Saint Mary's University), S.J. Krauth (University of Wisconsin–Madison), and D. Giberson (University of Prince Edward Island) for making specimens and records available. Thanks to

J. Cameron and M. Cameron for translation assistance. Particular thanks to S. Laplante (Canadian National Collection of Insects) for all his assistance. D. Young (University of Wisconsin) and an anonymous reviewer read an earlier version of the manuscript and made many constructive suggestions. The first author thanks his colleagues at the Nova Scotia Museum, C. Ewing and A. Hebda, for continuing support and encouragement. This work has been assisted by a research grant from the Nova Scotia Museum of Natural History.

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