

Nitidulidae and Kateretidae (Coleoptera: Cucujoidea) of the Maritime provinces of Canada. I. New records from Nova Scotia and Prince Edward Island

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Abstract—The Nitidulidae and Kateretidae of the Maritime provinces of Canada are surveyed. Forty-eight species are now known to occur in the region. Twenty-six are newly recorded in Nova Scotia and nine are newly recorded on Prince Edward Island. One Palearctic species, *Soronia grisea* (L.), is reported for only the second time in North America. Six other nonnative species have been intercepted. One new synonym, *Glischrochilus sanguinolentus sanguinolentus* (Olivier, 1790) (= *Glischrochilus sanguinolentus rubromaculatus* (Reitter, 1873) **syn. nov.**), is designated. Cape Breton and Prince Edward Island appear to have a depauperate fauna, perhaps reflecting an island-related diminution of species, a comparative lack of collection effort, or a combination of both. An examination of the Nova Scotia fauna indicates several distribution patterns within the province. Introduced species constitute a sizeable component of the region's fauna, with four new introductions being reported here.

Résumé—Cet article examine le Nitidulidae et le Kateretidae des provinces maritimes du Canada. Jusqu'à présent, on a dénoté la présence de 48 espèces dans la région. Vingt-six espèces sont nouvellement recensées en Nouvelle-Écosse et neuf à l'Île-du-Prince-Édouard. Une espèce paléarctique, le *Soronia grisea* (L.), a été rapportée pour seulement la deuxième fois en Amérique du Nord. On a identifié six autres espèces non indigènes. On désigne un nouveau synonyme, *Glischrochilus sanguinolentus sanguinolentus* (Olivier, 1790) (= *Glischrochilus sanguinolentus rubromaculatus* (Reitter, 1873) **syn. nov.**). Le Cap Breton et l'Île-du-Prince-Édouard semblent avoir une faune appauvrie, dont la diminution des espèces pourrait être attribuable aux fait que ces territoires sont des îles, à un manque d'échantillonnage une fois comparé à d'autres régions, ou à un mélange des deux. Un examen de la faune de la Nouvelle-Écosse présente plusieurs modèles de distribution à travers la province. Les espèces présentées, dont quatre nouvellement rapportées, constituent un important composant de la faune de la région.

Introduction

Despite considerable economic importance and diversity, the Nitidulidae and Kateretidae (Coleoptera: Cucujoidea) have received comparatively little scientific attention. The last monograph on the Nitidulidae in North America (in which Kateretidae were considered a subfamily of Nitidulidae) was published in 1943 (Parsons 1943), and research since then has been sporadic. In the Maritime provinces of

Canada there is a particular dearth of recorded information. McNamara (1991) recorded only 15 species from Nova Scotia, 3 from Prince Edward Island, and 13 from New Brunswick, a small fraction of the ~100 species then known in Canada.

In North America, 173 species of Nitidulidae and 11 species of Kateretidae are known (Marske and Ivie 2003). Many are important components of forests, either as part of the saproxylic fauna (Alexander 2004) or as vectors of forest

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diseases (Cease and Juzwik 2001). Species of *Meligethes* are potential pests of agricultural crops (Mason *et al.* 2003), while *Nitidula*, *Omosita*, and *Carpophilus* spp. are found on carrion and can be of utility in forensic entomology (Smith 1986). Some species of *Carpophilus* are pests of stored dried products or commercial field crops (Hinton 1945; Dobson 1954).

Due to the economic and ecological importance of these families, and as part of continuing efforts to document the beetle biodiversity of the Maritime provinces, a survey of the nitidulid and kateretid faunas of the region was undertaken. The present work reports new records from Nova Scotia and Prince Edward Island and examines the region's fauna in general. New nitidulid and kateretid records from New Brunswick will be reported in a forthcoming paper. Also in a forthcoming paper, two new species of *Eपुरaea* from Nova Scotia will be described.

Methods and conventions

During ongoing research on the Coleoptera fauna of the Maritime provinces of Canada, 2262 specimens of Nitidulidae and Kateretidae originating in Nova Scotia and 245 from Prince Edward Island were examined and identified. Additional published records were also integrated. Abbreviations of collections referred to in this study are as follows:

ACNS	Agriculture and Agri-Food Canada, Kentville, Nova Scotia
ACPE	Agriculture and Agri-Food Canada, Charlottetown, Prince Edward Island
CBU	Cape Breton University, Sydney, Nova Scotia
CGMC	Christopher G. Majka collection, Halifax, Nova Scotia
CNC	Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario
DAL	Biology Department, Dalhousie University, Halifax, Nova Scotia
DHWC	David H. Webster collection, Kentville, Nova Scotia
GSC	Gary Selig collection, Bridgewater, Nova Scotia

JCC	Joyce Cook collection, North Augusta, Ontario
JOC	Jeffrey Ogden collection, Truro, Nova Scotia
MZHF	Finnish Museum of Natural History, Helsinki, Finland
NSAC	Nova Scotia Agricultural College, Bible Hill, Nova Scotia
NSMC	Nova Scotia Museum, Halifax, Nova Scotia
NSNR	Nova Scotia Department of Natural Resources, Shubenacadie, Nova Scotia
SMU	Saint Mary's University, Halifax, Nova Scotia
STFX	St. Francis Xavier University, Antigonish, Nova Scotia
UPEI	University of Prince Edward Island, Charlottetown, Prince Edward Island

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

Distribution is reported on a county-by-county basis with counties grouped into subregions, which are **Northern NS** (consisting of Cumberland, Colchester, Pictou, and Antigonish counties), **Cape Breton** (consisting of Inverness, Victoria, Cape Breton, and Richmond counties), **Eastern Shore** (consisting of Guysborough and Halifax counties and Sable Island²), **South Shore** (consisting of Lunenburg, Queens, Shelburne, and Yarmouth counties), **Bay of Fundy** (consisting of Digby, Annapolis, Kings, and Hants counties), and **Prince Edward Island** (consisting of Prince, Queens, and Kings counties). While these are approximations, they allow for a ready way to represent distributions that mirror (albeit imperfectly) the physiographic ecodistricts of the provinces. The "NS distribution" column (Table 1) indicates possible distribution patterns in Nova Scotia.

In this publication we employ the name Kateretidae, in lieu of Brachypteridae (Lawrence and Newton 1995) or Cateretidae, based on the ruling by the International Commission on Zoological Nomenclature (ICZN 1999). A forthcoming publication by A.R. Cline will

²Sable Island is formally part of Halifax Co.; however, it is treated separately herein because geographically and faunistically it is distinct from other parts of the county and province.

Table 1. Kataretidae and Nitidulidae of the Maritime provinces (New Brunswick (NB), Prince Edward Island (PEI), and Nova Scotia): native and established introduced species.

Species	Nova Scotia											
	NB	PEI			Northern NS				Cape Breton			
		PR	QU	KI	CU	CO	PI	AT	IN	VI	CB	RI
KATERETIDAE												
<i>Brachypterolus pulicarius</i> (L.)*	1	1	1	1	1	1	1		1		1	
<i>Brachypterus urticae</i> (Fabr.)*	1				1							
<i>Heterhelus sericans</i> (LeConte)					1	1	1				1	
NITIDULIDAE												
Cillaeinae												
<i>Conotelus obscurus</i> Erichson	1		1	1			1				1	
<i>Colopterus truncatus</i> (Randall)	1				1	1					1	
Carpophilinae												
<i>Carpophilus brachypterus</i> (Say)						1						
<i>C. marginellus</i> Motschulsky†			1								1	
<i>C. sayi</i> Parsons	1											
Epuraeinae												
<i>Epuraea adumbrata</i> Mannerheim												
<i>E. aestiva</i> (L.)‡			1		1				1			1
<i>E. avara</i> (Randall)	1											
<i>E. erichsoni</i> Reitter						1	1	1				
<i>E. flavomaculata</i> Mäklin	1		1					1				
<i>E. helvola</i> Erichson	1											
<i>E. labilis</i> Erichson					1	1	1	1	1		1	
<i>E. obliquus</i> Hatch	1											
<i>E. parsonsi</i> Connell									1			
<i>E. peltoides</i> Horn	1				1							
<i>E. planulata</i> Erichson	1											
<i>E. rufida</i> (Melsheimer)	1											
<i>E. rufomarginata</i> Stephens‡	1											
<i>E. terminalis</i> Mannerheim‡	1						1	1	1			
<i>E. truncatella</i> Mannerheim					1	1	1	1			1	
<i>E. umbrosa</i> Horn	1				1							
<i>Epuraea</i> sp. 1 (undescribed)												
<i>Epuraea</i> sp. 2 (undescribed)												
Nitidulinae												
<i>Stelidota octomaculata</i> (Say)												1
<i>Omosita colon</i> (L.)*	1		1		1	1		1		1	1	
<i>O. discoidea</i> (Fabr.)*												
<i>Nitidula bipunctata</i> (L.)*												
<i>N. carnaria</i> (Schaller)*												1
<i>N. rufipes</i> (L.)*	1				1		1	1		1	1	
<i>Lobiopa undulata</i> (Say)	1											
<i>Soronia grisea</i> (L.)*												1
<i>Phenolia grossa</i> (Fabr.)												

Nova Scotia											NS distribution	
Eastern Shore			South Shore				Bay of Fundy					
GU	HX	SI	LU	QU	SH	YA	DI	AN	KI	HA		
	1							1	1		Widespread	
	1									1	Western NS Widespread	
1	1		1	1		1				1	Coastal Widespread	
	1			1						1		
			1							1		
1	1			1		1				1	1	Widespread
	1		1				1	1	1			Mainland NS
	1		1									
1	1		1	1	1	1	1	1	1	1		Widespread
					1							
	1			1					1			
	1			1		1						Southwestern NS
1				1						1	1	
1	1			1					1	1	1	Widespread Western NS
1			1			1						
	1			1								
	1	1	1	1			1					Widespread Halifax
	1									1		
	1									1		
	1											
1	1			1			1	1				Sydney area

Table 1 (concluded).

Species	Nova Scotia											
	PEI				Northern NS				Cape Breton			
	NB	PR	QU	KI	CU	CO	PI	AT	IN	VI	CB	RI
Meligethinae												
<i>Meligethes canadensis</i> Easton					1		1					
<i>M. nigrescens</i> Stephens [‡]		1	1	1	1	1	1				1	1
<i>M. simplipes</i> Easton	1		1			1					1	
<i>M. viridescens</i> (Fabr.)*		1	1	1		1	1				1	
Cryptarchinae												
<i>Cryptarcha ampla</i> Erichson	1				1							
<i>C. concinna</i> Melsheimer					1							
<i>Glischrochilus confluentus</i> (Say)												
<i>G. fasciatus</i> (Olivier)	1	1	1	1	1	1		1			1	
<i>G. moratus</i> Brown					1							
<i>G. quadrisignatus</i> (Say)	1		1		1	1		1			1	
<i>G. sanguinolentus</i> (Olivier)	1		1		1	1	1	1	1		1	
<i>G. siepmanni</i> Brown	1		1		1	1		1			1	
<i>G. vittatus</i> (Say)						1						
County totals	24	3	12	4	17	15	10	11	4	2	17	2
Regional totals					53				25			

Note: New Brunswick data are from Majka *et al.* (unpublished data). 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; SI, Sable Island; LU, Lunenburg; QU, Queens; SH, Shelburne; YA, Yarmouth; DI, Digby; AN, Annapolis; KI, Kings; and HA, Hants. Counties of Prince Edward Island: PR, Prince; QU, Queens; and KI, Kings.

*Palearctic.

†Oriental.

‡Holarctic.

elaborate further the reasons for adopting this usage.

Results

The established (native and introduced) nitidulid and kateretid faunas of the Maritime provinces are summarized in Table 1. Three species of Kateretidae and 45 species of Nitidulidae have been recorded. Of these, 27 are newly recorded in Nova Scotia and 9 are newly recorded on Prince Edward Island. Overall, 42 species have been found in Nova Scotia and 13 have been found on Prince Edward Island. The Palearctic species *Soronia grisea* (L.) is reported for only the second time in North America, representing the first record beyond the island of Newfoundland. Additionally, six other species of Nitidulidae have been intercepted in the region. In Nova Scotia there are 203 separate county records, while on Prince Edward Island the total is 19 (Table 1). In a forthcoming paper, we will describe two new species of

Epuraea based on specimens collected in Nova Scotia. Their distributions are indicated in Table 1. Specific accounts of species follow.

Native and established introduced species

Kateretidae

Brachypterolus pulicarius (L., 1758)

NOVA SCOTIA: 62 specimens examined from Annapolis, Cape Breton, Colchester, Cumberland, Halifax, Hants, Inverness, Kings, and Pictou counties (Table 1). The earliest record is from 1951 (**Cape Breton Co.:** North Sydney, 27.v.1951, C.H. Lindroth, MZHF). **PRINCE EDWARD ISLAND:** 23 specimens examined from Kings, Prince, and Queens counties (Table 1). The earliest record is from 1966 (**Prince Co.:** Kildare, 18.vii.1966, F.M. Cannon, ACPE).

Nova Scotia											
Eastern Shore			South Shore				Bay of Fundy				NS distribution
GU	HX	SI	LU	QU	SH	YA	DI	AN	KI	HA	
	1					1	1	1	1	1	Western NS
	1		1				1		1		Widespread
	1		1					1	1		Widespread
			1	1						1	
			1						1		
	1		1			1	1	1	1	1	Widespread
	1		1	1				1	1	1	Western NS
1	1		1	1				1	1	1	Widespread
	1		1	1		1		1	1	1	Widespread
									1		
8	25	1	15	16	3	7	7	12	22	9	
34			41				50				

An introduced Palearctic species first found in North America in 1918 in New York (Parsons 1943). Recorded across Canada from Alberta west to Newfoundland (McNamara 1991); in the United States, recorded south to Pennsylvania and west to Iowa and Wisconsin (Parsons 1943). Associated with *Linaria* (Scrophulariaceae) and *Fragaria* (Rosaceae) spp. (Parsons 1943). In the Maritime provinces, found on herbaceous vegetation in many different open habitats.

***Brachypterus urticae* (Fabr., 1792)**

NOVA SCOTIA. Cumberland Co.: Amherst, 24.vi.1994, J. Ogden, NSNR.

Newly recorded in Nova Scotia. An introduced Palearctic species recorded across Canada from British Columbia west to Quebec and in Newfoundland (McNamara 1991); in the United States, recorded along the Atlantic seaboard south to the Smoky Mountains National Park in North Carolina and Tennessee and west

to Missouri, Iowa, and Wisconsin. Also in Colorado, Washington, and California (Parsons 1943). In Europe, found throughout much of the continent, including Great Britain, south to Greece and east to Russia. Introduced in North America prior to 1879 (Horn 1879; Parsons 1943). Associated with nettle (*Urtica dioica* L.) (Urticaceae) (Hamilton 1894).

***Heterhelus sericans* (LeConte, 1869)**

NOVA SCOTIA: 113 specimens examined from Cumberland, Colchester, Pictou, Cape Breton, Halifax, and Kings counties (Table 1). The earliest records are from 1961 (**Kings Co.:** North Alton, 28.v.1961, D.H. Webster, (13), DHWC; Cloud Lake, 3.vi.1961, D.H. Webster, (3), DHWC; Cambridge Station, 9.vi.1961, D.H. Webster, (3), DHWC).

Newly recorded in Nova Scotia. Recorded in Canada from British Columbia, Ontario,

Quebec, and Newfoundland (McNamara 1991); recorded in the United States south to North Carolina and Tennessee and west to Kansas (Parsons 1943). Specimens were principally collected in deciduous forests, with individuals frequently associated with blossoms of *Sambucus racemosa* L. (Caprifoliaceae), *Diervilla lonicera* P. Mill. (Caprifoliaceae), *Prunus virginiana* L. (Rosaceae), *Crataegus* spp. (Rosaceae), and *Cornus alterniflora* L.f. (Cornaceae).

Nitidulidae: Cillaeinae

***Conotelus obscurus* Erichson, 1843**

NOVA SCOTIA. Cape Breton Co.: George's River, 31.vii.1996, D.B. McCorquodale, CBU. **Halifax Co.:** Halifax, 26.xi.1990, NSMC. **Pictou Co.:** Caribou, 23.vii.2005, C.G. Majka, CGMC. **PRINCE EDWARD ISLAND:** 1974–1983, UPEI. **Kings Co.:** Lakeside Beach, 3.viii.1997, D.B. McCorquodale, CBU. **Queens Co.:** Millvale, 21.vii.2001, C.G. Majka, CGMC.

Newly recorded in Nova Scotia and on Prince Edward Island. Recorded in Canada from Manitoba east to New Brunswick (McNamara 1991). Recorded in the United States south to Alabama, Louisiana, South Carolina, and Georgia, west to Arkansas, Kansas, Missouri, and Iowa; also in Colorado (Parsons 1943). Associated with *Althea rosea* L. (Malvaceae), *Convolvulus arvensis* L. (Convolvulaceae), and *Calystegia sepium* (L.) R. Br. (Convolvulaceae). On Prince Edward Island and in Nova Scotia, found on *C. sepium*. McNamara (1991) recorded this species from Nova Scotia; however, no specimens examined by McNamara could be located, nor are there published records from the province. The records reported above thus establish the presence of this species in Nova Scotia.

***Colopterus truncatus* (Randall, 1838)**

NOVA SCOTIA: 124 specimens examined from Cape Breton, Colchester, Cumberland, Guysborough, Halifax, Kings, Lunenburg, Queens, Victoria, and Yarmouth counties (Table 1). The earliest record is from 1945 (**Lunenburg Co.:** Bridgewater, 19.vi.1945, Department of Forestry, NSMC).

Recorded in Canada from the Yukon and British Columbia east to Nova Scotia (McNamara 1991); found throughout the United States south through central America to Brazil and in the West Indies from Puerto Rico and Guadeloupe (Parsons 1943). In Nova Scotia, found in many different habitats: on flowers and vegetation and at sap on both deciduous and coniferous trees.

Nitidulidae: Carpophilinae

***Carpophilus brachypterus* (Say, 1825)**

NOVA SCOTIA. Colchester Co.: Debert, 23.v.1995, J. Ogden, NSNR; Kempton, 1.vi.1995, C. Corkum, (2), NSMC; Nutty Mountain, 1.vi.1995, C. Corkum, NSMC; Shubenacadie, 17.ix.1997, J. Ogden, NSNR. **Halifax Co.:** Anti Dam Lake, 2–15.vi.1997, D.J. Bishop, NSMC. **Kings Co.:** North Alton, 2.vi.2005, D.H. Webster, DHWC. **Queens Co.:** Medway River, 13.vii.1993, J. and T. Cook, JCC.

Newly recorded in Nova Scotia. Recorded in Canada from Manitoba east to Quebec (McNamara 1991) and in the United States south to North Carolina and west to Texas, Nebraska, Kansas, Iowa, and South Dakota (Parsons 1943). Found on flowers and at sap (Downie and Arnett 1996). In Nova Scotia, primarily found in deciduous forests except for one specimen (Anti Dam Lake) in a stand of black spruce (*Picea mariana* (Mill.) B.S.P.) (Pinaceae). In North Alton, found under *Populus tremuloides* Michx. (Salicaceae) bark in association with *Carpophilus sayi* Parsons.

***Carpophilus marginellus* Motschulsky, 1858**

NOVA SCOTIA. Cape Breton Co.: Sydney, 17.iii.2006, (24), D. Holland, NSMC. **PRINCE EDWARD ISLAND. Queens Co.:** Charlottetown, 7.viii.1998, (2), M.E.M. Smith, ACPE; Charlottetown, 15.v.2001, (6), M.E.M. Smith, ACPE.

Newly recorded from Prince Edward Island and Nova Scotia. This adventive species originates in Southeast Asia and is often associated with dried stored products. In Canada, recorded from Manitoba east to Quebec (McNamara 1991). In the United States, recorded from New

Hampshire, Vermont (Chandler 2001), New Jersey, Ohio, Georgia, and California; also in Florida and Nevada (Downie and Arnett 1996). In Great Britain and Scandinavia it has moved and successfully adapted from dried products to outdoor environments such as compost heaps (Hammond 1974; Ødegaard and Tømmerås 2000), while in Australia it has colonized peach and nectarine orchards (James *et al.* 2000). The specimens from Prince Edward Island were found in storerooms of hotels where foodstuffs are kept, indicating their arrival in association with these items. The specimens from Nova Scotia are established in a food-processing facility. Described by Fall (1910) as *Carpophilus nitens* from the vicinity of Mobile, Alabama, suggesting a likely introduction at the port there.

***Carpophilus sayi* Parsons, 1943**

NOVA SCOTIA. Kings Co.: North Alton, 9.v.2001, 17.v.2003, and v–vi.2005, (38), D.H. Webster, DHWC. **Lunenburg Co.:** Bridgewater, 30.vi.1965, B. Wright, NSMC.

Newly recorded in Nova Scotia. In Canada, recorded from Manitoba and Quebec (McNamara 1991). In the United States, recorded south to Georgia, west to Texas and New Mexico, and north to Iowa; also from North Carolina, Tennessee, and California (Parsons 1943). Frequently taken at sap (Downie and Arnett 1996) and associated with oak wilt fungus mats (Cease and Juzwik 2001). In Nova Scotia, most specimens were collected on freshly split trembling aspen (*Populus tremuloides*) except one (Bridgewater) collected on a red oak (*Quercus rubra* L.) (Fagaceae).

Nitidulidae: Epuraeinae

***Epuraea adumbrata* Mannerheim, 1852**

NOVA SCOTIA. Halifax Co.: Point Pleasant Park, 6.vi.1990, S. Robertson, NSMC; Point Pleasant Park, 21.ix.2002, C.G. Majka, CGMC. **Kings Co.:** North Alton, 9.v.2001, D.H. Webster, DHWC.

Newly recorded in Nova Scotia. In Canada, recorded from Northwest Territories, British Columbia, Alberta, and Quebec (McNamara 1991); in the United States, primarily a northern species found from Alaska south to Washington

and Colorado and on the eastern seaboard from New York south to North Carolina (Parsons 1943). In Nova Scotia, found at sap of trembling aspen (*Populus tremuloides*) and linden (*Tilia europea* L.) (Tiliaceae).

***Epuraea aestiva* (L., 1758)**

NOVA SCOTIA: 69 specimens examined from Cumberland, Guysborough, Kings, Halifax, Hants, Inverness, Queens, Richmond, and Yarmouth counties (Table 1). The earliest record is from 1960 (**Kings Co.:** Cambridge Station, 14.v.1960, D.H. Webster, DHWC). **PRINCE EDWARD ISLAND:** 1974–1983, (22), UPEI. **Queens Co.:** Meadow Bank, 25.vi.1971, Lawson Drake, light trap, UPEI; St. Patricks, 25.vi.2003, C.G. Majka, (2), CGMC.

Newly recorded in Nova Scotia and on Prince Edward Island. This Holarctic species is widely distributed in Europe, northern Asia, and many parts of the United States (Parsons 1943; Downie and Arnett 1996); in Canada, recorded from British Columbia east to Quebec. In Nova Scotia, found in a great variety of forested and open environments on flowers of trees and shrubs, in compost piles, and attracted to sap.

***Epuraea avara* (Randall, 1838)**

NOVA SCOTIA. Annapolis Co.: Annapolis Royal, 26.vii.1928, W.J. Brown, CNC.

Recorded from Alaska, the Yukon, and British Columbia east to Nova Scotia and Newfoundland, south to California, Nevada, New Mexico and South Carolina (Parsons 1943; McNamara 1991). Found at sap of *Acer* (Aceraceae) and *Betula* (Betulaceae) spp. (Parsons 1943).

***Epuraea erichsoni* Reitter, 1873**

NOVA SCOTIA: 29 specimens examined from Annapolis, Antigonish, Colchester, Digby, Halifax, Kings, Lunenburg, and Pictou counties (Table 1). The earliest record is from 1990 (**Colchester Co.:** Masstown, 15.vi.1990, T.D. Smith, NSNR).

Newly recorded in Nova Scotia. In Canada, recorded from British Columbia and the Northwest Territories east to Quebec (McNamara 1991); in the United States, recorded south to Florida and west to Texas and Nebraska (Parsons 1943). Found at sap, under bark, and later

in the season on flowering trees, shrubs, and plants (Parsons 1943). Associated with old-growth forest stands (Zeran *et al.* 2006). In Nova Scotia found at sap, primarily in deciduous forests.

***Epuraea flavomaculata*
Mäklin, 1853**

NOVA SCOTIA. Antigonish Co.: Crystal Cliffs, 4.vi.1969, (4), B. Wright, NSMC. **Halifax Co.:** Burnside, 21.iv.2003, C. Cormier, SMU. **Lunenburg Co.:** Bridgewater, 9.ix.2005, G.D. Selig, GSC. **PRINCE EDWARD ISLAND. Queens Co.:** St. Patricks, 25.vi.2003, C.G. Majka, CGMC.

Newly recorded in Nova Scotia and on Prince Edward Island. Recorded from Alaska and Alberta east to New Brunswick (McNamara 1991), south to New Hampshire and west to Michigan, and in New Mexico (Parsons 1943). In Nova Scotia, found attracted to fluids associated with a decomposing pig (*Sus scrofa* L.) and at sap on trembling aspen (*Populus tremuloides*).

***Epuraea labilis* Erichson, 1843**

NOVA SCOTIA: 269 specimens examined from Annapolis, Antigonish, Cape Breton, Colchester, Cumberland, Digby, Guysborough, Halifax, Hants, Inverness, Kings, Lunenburg, Pictou, Queens, Shelburne, and Yarmouth counties (Table 1). The earliest records are from 1965 (**Lunenburg Co.:** Bridgewater, 10.v.–30.vi.1965, B. Wright, (46), NSMC).

In Canada, recorded in British Columbia, Manitoba, Ontario, Quebec, and Nova Scotia (McNamara 1991); in the United States, recorded south to California, Nevada, New Mexico, Texas, and Florida (Parsons 1943). In Nova Scotia, found on flowers and at sap on many species of deciduous and coniferous trees.

***Epuraea parsonsi* Connell, 1981**

NOVA SCOTIA. Inverness Co.: Lone Sheiling, 28.vi.1983, R. Vockeroth, CNC; Lone Sheiling, 4.vii.1983, R. Vockeroth, (7), CNC. **Shelburne Co.:** Lockport, 28.vii.1958, R. Vockeroth, CNC.

In Canada, recorded from the Yukon, British Columbia, Alberta, Saskatchewan, Quebec, Nova Scotia, and Newfoundland (McNamara 1991); in the United States, recorded from

Maine, New York, and Vermont (Connell 1981). Collected on fresh-cut spruce (Connell 1981).

***Epuraea peltoidea* Horn, 1879**

NOVA SCOTIA. Queens Co.: Medway River, 13.vii.1993, J. and T. Cook, JCC.

Newly recorded in Nova Scotia. In Canada, recorded from Alberta east to Quebec (McNamara 1991); in the United States, recorded south to Virginia and west to Indiana and Wisconsin (Parsons 1943). Bionomics not recorded; specimens collected in the United States are from fruit traps and brown sugar / molasses traps. Likely to frequent sap flows and decaying vegetable matter.

***Epuraea planulata* Erichson, 1843**

NOVA SCOTIA. Annapolis Co.: Alma Lake, 21.vi.2003, P. Dollin, red spruce – white pine – balsam fir forest: on spruce log, NSMC. **Halifax Co.:** Halifax, 26.vii.2002, C.G. Majka, compost heap, CGMC; Big Indian Lake, 16.vii.2003, P. Dollin, red spruce forest, NSMC.

Newly recorded in Nova Scotia. Recorded from Alaska and British Columbia east to New Brunswick (McNamara 1991), south to Washington, Nevada, and Colorado, and in North Carolina (Parsons 1943). Bionomics not recorded. In Nova Scotia, found in both coniferous forests and a compost heap.

***Epuraea rufida* (Melsheimer, 1846)**

NOVA SCOTIA. Kings Co.: Cambridge Station, 6.v.1961, D.H. Webster, rotting apples, DHWC. **Halifax Co.:** Anti Dam Lake, 2–15.vi.1997, D.J. Bishop, black spruce, NSMC; Point Pleasant Park, 7.vi.2001, C.G. Majka, sphagnum bog, CGMC. **Queens Co.:** Tobetic Lake, 13.vii.2003 P. Dollin, red spruce, NSMC.

Newly recorded in Nova Scotia. In Canada, recorded from Ontario and Quebec (McNamara 1991); in the United States, recorded south to New York, Pennsylvania, Ohio, Massachusetts, North Carolina, Alabama (Parsons 1969), and Maine (Chandler 2001). Larvae and adults probably feed on fungal spores that are parasitic on trees (Parsons 1969). Specimens in the United States collected under bark and in fermenting traps.

***Epuraea rufomarginata*
Stephens, 1830**

= *Epuraea boreades* Parsons, 1967

NOVA SCOTIA. Queens Co.: Medway River, 13.vii.1993, J. and T. Cook, car net, JCC. **Shelburne Co.:** Clyde River Road, 16.vii.1992, (2), S. and J. Peck, car net, JCC.

Newly recorded in Nova Scotia. Recorded from Maine, New Hampshire, and Wisconsin in the United States, and Ontario, Quebec, and New Brunswick in Canada (Parsons 1967); also in British Columbia (McNamara 1991). Found on balsam fir (*Abies balsamea* (L.) Mill.) (Pinaceae), western larch (*Larix occidentalis* Nutt.) (Pinaceae), and shore pine (*Pinus contorta* Dougl.) (Pinaceae) (Parsons 1967).

The Nearctic species *E. boreades* was placed in synonymy with the Palearctic species *E. rufomarginata* by Audisio (1993), who now regards the species as Holarctic in distribution. In Europe it is associated with *Uredinales* (Basidiomycetes) fungi. Larvae have been found in *Daldinia concentrica* (Bolton: Fr.) Ces. & De Not. (Xylariaceae) in forests of *Abies*, *Pinus*, *Picea*, and *Larix* spp. (Audisio 1993).

***Epuraea terminalis*
Mannerheim, 1843**

NOVA SCOTIA. Antigonish Co.: Fairmont Tower, 22.vi.1995, M. LeBlanc, NSNR. **Colchester Co.:** Masstown, 7.vi.1990, T.D. Smith, (2), NSNR; Masstown, 18.vi.1993, J. Macphee, NSNR; Five Island Park, 21.vi.2004, J. Ogden, NSNR. **Guysborough Co.:** Dayspring Lake, 2–15.vi.1997, D.J. Bishop, NSMC. **Hants Co.:** Smiley's Park, 10.vi.2004, J. Ogden, NSNR. **Kings Co.:** North Alton, 12.v.2001 and 17.v.2003, D.H. Webster, (3), DHWC. **Pictou Co.:** Shepherder's Junction, 15.vi.2004, J. Ogden, (2), NSNR.

Newly recorded in Nova Scotia. A Holarctic species found across Europe east to Siberia. In North America from Alaska, British Columbia, and the Yukon east to New Brunswick (McNamara 1991) and south to Colorado, Wisconsin, and Maine (Parsons 1943). In Finland, found at sap on birch (*Betula* spp.) and associated with oak wilt fungus mats (Parsons 1967). In Nova Scotia, found at sap on trembling aspen (*Populus tremuloides*).

***Epuraea truncatella*
Mannerheim, 1846**

NOVA SCOTIA: 81 specimens examined from Annapolis, Antigonish, Cape Breton, Colchester, Cumberland, Guysborough, Halifax, Hants, Kings, Pictou, and Queens counties (Table 1). The earliest record is from 1988 (**Cumberland Co.:** Wentworth, 29.viii.1988, B. Wright, NSMC).

Newly recorded in Nova Scotia. In Canada, recorded from the west coast east to Quebec and in Newfoundland and Labrador (McNamara 1991); in the United States, recorded in Alaska and south to California, Nevada, Colorado, and New Mexico and east to Indiana, West Virginia, Virginia (Parsons 1943), New Hampshire, and Maine (Chandler 2001). In Nova Scotia, found at sap on trembling aspen (*Populus tremuloides*) and under bark of fallen white pine (*Pinus strobus* L.) (Pinaceae).

***Epuraea umbrosa* Horn, 1879**

NOVA SCOTIA. Cumberland Co.: New Yarmouth, 17.vii.1994, D. Kehler, NSMC.

Newly recorded in Nova Scotia. A southern species found from Texas through Oklahoma, Arkansas, and Georgia north to North Carolina and New York (Parsons 1943); in Canada, recorded in Quebec and New Brunswick (McNamara 1991). In Nova Scotia, collected in an old coniferous forest.

Nitidulidae: Nitidulinae

***Stelidota octomaculata* (Say, 1825)**

NOVA SCOTIA. Cape Breton Co.: East Bay, 12.ix.2001, N.G. Donovan, CBU. **Halifax Co.:** Halifax, 15.v.1979, J. Ripley, NSMC; Point Pleasant Park, 20.vii.2002, C.G. Majka, CGMC; Burnside, 23.v.2003, C. Cormier, SMU. **Queens Co.:** Kejimkujik National Park, 13.vii.–19.x.1994, B. Wright, (8), NSMC.

Newly recorded in Nova Scotia. Found from Ontario and Quebec south to Florida, west to New Mexico and Arizona, and north to Nebraska, Michigan, Wisconsin (Parsons 1943), New Hampshire, and Maine (Chandler 2001). Found on decaying fruit and fungi; also on coral fungi (*Clavaria* sp.) (Clavariaceae) (Downie and Arnett 1996). In Nova Scotia, found on gilled fungi growing on white pine (*Pinus strobus*) and associated with decomposing pigs (*Sus*

scrofa). Frequent in pitfall traps set in maple, oak, and birch forest in Kejimikujik National Park; in the United States, numerous in leaf litter.

***Omosita colon* (L., 1758)**

NOVA SCOTIA: 476 specimens examined from Cape Breton, Colchester, Cumberland, Digby, Halifax, Kings, Lunenburg, Queens, and Victoria counties (Table 1). The earliest record is from 1920 (**Colchester Co.:** Truro, 8.ix.1920, NSAC). **PRINCE EDWARD ISLAND. Queens Co.:** North Rustico, 26.vi.2003, C.G. Majka, CGMC.

Newly recorded in Prince Edward Island. This is an introduced Palearctic species. In Canada, recorded from British Columbia east to Newfoundland (McNamara 1991); recorded throughout much of the United States south to Mexico (Parsons 1943). Found on dry carrion, bones, hides, fungi, and decaying material (Downie and Arnett 1996).

***Omosita discoidea* (Fabr., 1775)**

NOVA SCOTIA. Halifax Co.: Lake Micmac, 30.v.1991, R. Sircom, (7), NSMC; Burnside, 16.vi.2003, C. Cormier, (2), SMU.

McNamara (1991) included this species in the reported Nova Scotia fauna apparently on the basis of a specimen collected on 14.vi.1977 at West Light on Sable Island, Nova Scotia, by Barry Wright (NSMC), which was determined as *O. discoidea* by E. Becker and published in Wright (1989). Subsequent examination indicates that this specimen is *O. colon* (L.), a very abundant species on Sable Island (279 specimens examined). Hence this earlier report must be considered erroneous. The present records, however, establish the presence of *O. discoidea* in Nova Scotia. This adventive Palearctic species is widely distributed in Europe and was imported to the Pacific coast of North America prior to 1879 (Horn 1879). Parsons (1943) speculated that it may also have been introduced in New Jersey and Maryland. It is now widely distributed in the United States (Parsons 1943) and in Canada from British Columbia west to Newfoundland (McNamara 1991). Feeds on dry carrion, bones, hides, fungi, and decaying vegetation (Downie and Arnett 1996). In Nova Scotia, found on decaying pigs (*Sus scrofa*) and bones of white-tailed deer (*Odocoileus virginianus* (Zimmerman)).

***Nitidula bipunctata* (L., 1758)**

NOVA SCOTIA. Halifax Co.: Burnside, 22.v.2003, 24.v.2003, 18.vi.2003, and 4.vii.2003, C. Cormier, SMU. **Kings Co.:** Kentville, 25.v.2002, D.H. Webster, DHWC.

Newly recorded in Nova Scotia. This species has been considered an introduced Palearctic taxon. It is broadly distributed in Europe and found in North America from Quebec south to Virginia and Kentucky west to Texas and north to Michigan, Kansas, Iowa, and Minnesota; on the Pacific coast from Alaska south to Oregon and Idaho (Parsons 1943; Hatch 1962); and in Canada from the Yukon and British Columbia east to Quebec (McNamara 1991). The earliest reports, however, are by LeConte (1878) from Idaho in an isolated range of the Rocky Mountains at an altitude of 2380 m. This early record from such a remote location raises the possibility that this species might be Holarctic. It is found on dry carrion (Downie and Arnett 1996). In Nova Scotia most specimens have been found in association with decomposing pigs (*Sus scrofa*).

***Nitidula carnaria* (Schaller, 1783)**

NOVA SCOTIA. Cape Breton Co.: Sydney Tar Ponds, 26.v.1995, J.M. Francis, CBU; Sydney Tar Ponds, 3.vi.1996 and 28.vi.1996, P.A. Rankin, (2), CBU. **Halifax Co.:** Burnside, 21.v.2004, 9.vi.2004, and 30.vi.2004, C. Cormier, (3), SMU.

This is an introduced Palearctic species first recorded in New York in 1894 (Parsons 1943). In Canada, recorded from British Columbia, Ontario, Quebec, and Nova Scotia (McNamara 1991); in the United States, recorded in Massachusetts, New York, New Jersey, and Pennsylvania west to Michigan and Wisconsin and in California (Parsons 1943). In Nova Scotia, found in association with decomposing pigs (*Sus scrofa*).

***Nitidula rufipes* (L., 1767)**

NOVA SCOTIA: 23 specimens recorded from Annapolis, Antigonish, Cape Breton, Colchester, Cumberland, Halifax, Kings, Pictou, and Victoria counties (Table 1). The earliest record is from 1961 (**Kings Co.:** Kentville, 12.vii.1961, D.H. Webster, under old cow bone, (2), DHWC).

This is an introduced Palearctic species. In Canada, recorded from British Columbia east to Newfoundland; in the United States, recorded south to Pennsylvania and west to Kansas, Wisconsin, and Montana (Parsons 1943). Associated with bones and carrion (Downie and Arnett 1996). In Nova Scotia, found in association with decomposing pigs (*Sus scrofa*) and cows (*Bos taurus* L.).

***Soronia grisea* (L., 1758)**

NOVA SCOTIA. Cape Breton Co.: Sydney, 14.ix.2000, J. Ongo, NSNR; Sydney Mines, 29.v.2003, P. Finney, on Japanese walnut, NSNR; Dominion, 5.vi.2003, A. Mazzocca, CBU.

Newly recorded in Nova Scotia. This adventive Palearctic species is broadly distributed in Europe east to Korea (Kim et al. 1994; Kim 2005). It was first recorded in North America by McNamara (1992) from collections in St. John's, Corner Brook, and Pasadena, Newfoundland, in 1989 and 1990. This species is found feeding on sap and other fermented substances, under bark of deciduous trees, and on blossoms of trees (McNamara 1992). The above records represent only the second report of this species in North America.

McNamara (1992, p. 358) wrote of *S. grisea* that it "apparently represent(s) a recent introduction; the species seems to be now established in Newfoundland". Brown (1967) collected extensively in Sydney, Nova Scotia, in 1965, where he found the introduced species *Brachypterolus pulicarius*, *Omosita colon*, and *Meligethes viridescens* (Fabr.), but not *S. grisea*, a possible indication that the latter species may have been recently introduced in the province.

In Nova Scotia, one of the specimens was found associated with Japanese walnut (*Juglans ailanthifolia* Carr.) (Juglandaceae). This East Asian and Japanese tree was first introduced into North America in 1870 and is now widely distributed across the continent, including New Brunswick, Nova Scotia, and Prince Edward Island in the Maritime provinces (Neilson 1930). This raises the possibility that *S. grisea* (which co-occurs with *J. ailanthifolia* in Korea) may have been introduced with the importation of nursery stock. Spence and Spence (1988) discussed the role of nursery stock importation with respect to Carabidae in British Columbia and Majka and Klimaszewski (2004) proposed

that *Phloeocharis subtilissima* Mannerheim, 1830 (Staphylinidae), *Cephennium gallicum* Ganglbauer, 1899 (Scydmaenidae), and *Dromius fenestratus* (Fabr., 1794) (Carabidae) were all introduced to Nova Scotia via nursery stock.

***Phenolia grossa* (Fabr., 1801)**

NOVA SCOTIA. Annapolis Co.: Durland Lake, 3.viii.2003, P. Dollin, NSMC. **Digby Co.:** Pebbleloggitch Lake, 13–24.viii.2004, H. Love, (2), DAL. **Guysborough Co.:** Indian Man Lake, 1.vi.1978, B. Wright, NSMC. **Halifax Co.:** Armdale, 15.viii.1974, K. Neil, NSMC; Point Pleasant Park, 28.vii.2001, C.G. Majka, CGMC; St. Margaret's Bay, 1–16.vii.1997, L. Parriage, NSMC. **Queens Co.:** Eight Mile Lake, 9.vii.2003, P. Dollin, NSMC; Fifth Lake Bay, 13.vii.2003, P. Dollin, NSMC; Cobreille Lake, 6–17.vii.2005, S. Poirier, NSMC.

Newly recorded in Nova Scotia. In Canada, recorded in Ontario and Quebec (McNamara 1992); in the United States, recorded from Maine south to North Carolina and Alabama, west to Louisiana, Texas, Arkansas, and Missouri, north to Iowa and Minnesota, and in Wyoming (Parsons 1943). Found beneath bark and in fungi (Parsons 1943) and in oak wilt fungus mats (Cease and Juzwik 2001). In Nova Scotia, collected in coniferous forests (eastern hemlock (*Tsuga canadensis* (L.) Carr.) (Pinaceae), red spruce (*Picea rubens* Sarg.) (Pinaceae), black spruce (*Picea mariana*), and balsam fir (*Abies balsamea*)). Specimens from Eight Mile and Durland lakes were in decomposing fungi and those at Fifth Lake Bay were in decomposing red maple (*Acer rubrum* L.) (Aceraceae) in an old-growth hemlock forest. At Cobreille Lake, specimens were in a mixed *Acer* spp., *Quercus rubra*, and *Betula* spp. forest.

Nitidulidae: Meligethinae

***Meligethes canadensis* Easton, 1955**

NOVA SCOTIA. Cumberland Co.: Oxford, 5.vi.1988, E. Georgeson, NSNR. **Pictou Co.:** McLellan's Brook, 8.vi.1988, E. Georgeson, NSNR.

Newly recorded in Nova Scotia. In Canada, recorded from the Yukon and British Columbia east to Quebec (McNamara 1991); in the United States, recorded in Alaska, California, Colorado, and Utah (Easton 1955). No bionomic information is

available. In Nova Scotia, specimens were captured with an ultraviolet light trap.

***Meligethes nigrescens*
Stephens, 1830**

NOVA SCOTIA: 44 specimens examined from Annapolis, Cape Breton, Colchester, Cumberland, Digby, Halifax, Hants, Kings, Pictou, Richmond, and Yarmouth counties (Table 1). The earliest record is from 1987 (**Digby Co.:** Bartletts Beach, 2.viii.1987, J. Cook, JCC). **PRINCE EDWARD ISLAND:** 66 specimens examined from Kings, Prince, and Queens counties (Table 1). The earliest record is from 1976 (**Queens Co.:** Kingston, vii.1976, L.S. Thompson, (2), ACPE).

This Holarctic species is found in the Old World in the British Isles, throughout Europe, North Africa, the Caucasus, and Arabia, east to central Siberia (Easton 1955; Hatch 1957). In Canada, recorded from the Yukon and British Columbia east to Nova Scotia; in the United States, found in the northeast, south to Maryland and Ohio, and in Oregon (Easton 1955). Found on a wide variety of plants, particularly *Trifolium pratense* L. (Fabaceae) (Easton 1955). On Prince Edward Island, found in a wide variety of open habitats including coastal dunes, blueberry barrens, old fields, pastures, and on barley (*Hordeum vulgare* L. (Poaceae)) in agricultural fields.

***Meligethes simplipes* Easton, 1947**

NOVA SCOTIA: 34 specimens examined from Annapolis, Cape Breton, Cumberland, Digby, Halifax, Kings, Lunenburg, and Pictou counties (Table 1). The earliest record is from 1958 (**Kings Co.:** Greenwich, 27.v.1958, H.T. Stultz, (4), ACNS). **PRINCE EDWARD ISLAND:** 29 specimens examined from Queens County (Table 1). The earliest records are from 1960 (**Queens Co.:** Charlottetown, 30.vi.1960, F.M. Cannon, ACPE; Charlottetown, 6.vii.1960, L.S. Thompson, ACPE).

In Canada, recorded from Ontario, Quebec, Nova Scotia, and Prince Edward Island (McNamara 1991); in the United States, recorded south to Ohio and Tennessee (Easton 1955). Found on the flowers of *Rubus canadensis* L. (Rosaceae) and *Syringa vulgaris* L. (Oleaceae) (Easton 1955). In Nova Scotia, recorded in open habitats and coniferous and deciduous forests; swept from the flowers and foliage of

Amelanchier laevis Wieg. (Rosaceae), *Prunus virginiana* L. (Rosaceae), *Dactylus glomerata* L. (Poaceae), and *Hypericum perforatum* L. (Clusiaceae).

***Meligethes viridescens*
(Fabr., 1787)**

NOVA SCOTIA: 91 specimens examined from Annapolis, Colchester, Halifax, Kings, Lunenburg, and Pictou counties (Table 1). The earliest record is from 1945 (**Halifax Co.:** Halifax, 1.ix.1945, D.C. Ferguson, (2), NSMC). **PRINCE EDWARD ISLAND:** reported from collections made in 1995 in Kings, Prince, and Queens counties by Hoebeke and Wheeler (1996a).

Although Brown (1967) reported this introduced Palearctic species from collections made in Nova Scotia in 1965, McNamara (1991) failed to include this species in the Canadian fauna. Hoebeke and Wheeler (1996a) brought wider attention to the presence of the species in the Maritime provinces and Majka and Klimaszewski (2004) subsequently demonstrated its presence in Nova Scotia since at least 1945. Mason *et al.* (2003) documented the species in Nova Scotia and on Prince Edward Island. In the Old World, found throughout most of Europe, western North Africa, Turkey, the northern Middle East, the Caucasus, and northern Iran east to western Kazakhstan. Larvae feed on many genera of Brassicaceae, particularly *Brassica* spp., *Sinapis* spp., *Cardamine* spp., *Arabis* spp., and *Erucastrum* spp. In Europe, a widespread and common pest of oilseed rape (*Brassica napus* L. and *Brassica rapa* L.) (Mason *et al.* 2003). In Nova Scotia, frequently found on *Raphanus raphanistrum* L. (Brassicaceae).

Nitidulidae: Cryptarchinae

***Cryptarcha ampla* Erichson, 1843**

NOVA SCOTIA: 26 specimens examined from Cumberland, Kings, Lunenburg, and Queens counties (Table 1). The earliest records are from 1949 (**Kings Co.:** South Sawler, 14.v.1949 and 3.vi.1949, C.R. MacLellan, (3), ACNS).

Newly recorded in Nova Scotia. In Canada, recorded from British Columbia east to Quebec (McNamara 1991). In the United States, recorded south to Florida and Alabama, west to Texas, Missouri, Kansas, Iowa, Colorado, and California; not found in the southwest (Parsons 1943).

Found at sap of maple and willow (Parsons 1943), at sap flows of oaks and hickories, in fungi, and at lights (Downie and Arnett 1996). Associated with oak wilt fungus mats (Cease and Juzwik 2001). In Nova Scotia, collected on red oak (*Quercus rubra*).

Cryptarcha concinna
Melsheimer, 1853

NOVA SCOTIA. Cumberland Co.: Wentworth, 21.v.–5.vii.1965, B. Wright, (2), NSMC. **Lunenburg Co.:** Bridgewater, 21.v.–30.vi.1965, B. Wright, (25), NSMC.

Newly recorded in Nova Scotia. In Canada, recorded from British Columbia east to Quebec (McNamara 1991); in the United States, recorded from Massachusetts south to Florida and west to California and Oregon (Parsons 1943). In Nova Scotia, collected in window traps placed in red oak (*Quercus rubra*) and red maple (*Acer rubrum*); known from sap flows.

Glischrochilus confluentus
(Say, 1823)

NOVA SCOTIA. Kings Co.: Kentville, 22.x.2000, D.H. Webster, DHWC; North Alton, 17.vi.2004, D.H. Webster, DHWC.

Newly recorded in Nova Scotia. In Canada, recorded from Ontario and Quebec (McNamara 1991); in the United States, recorded south to Georgia, west through Missouri and Michigan, to Colorado and Nevada (Parsons 1943). In Nova Scotia, found on bark of dying trembling aspen (*Populus tremuloides*).

Glischrochilus fasciatus
(Olivier, 1790)

NOVA SCOTIA: 228 specimens examined from Annapolis, Cape Breton, Colchester, Cumberland, Digby, Halifax, Hants, Kings, Lunenburg, and Yarmouth counties (Table 1). The earliest record is from 1913 (**Colchester Co.:** Truro, 19.ix.1913, H.G. Payne, NSAC). **PRINCE EDWARD ISLAND:** 49 specimens examined from Prince, Queens, and Kings counties (Table 1). The earliest records date from 1953 (**Kings Co.:** Upton, 11.vi.1953, L.S. Thompson and F.M. Cannon, (3), ACPE).

Newly recorded on Prince Edward Island. In Canada, recorded from British Columbia, Manitoba, Ontario, Quebec, and Nova Scotia (McNamara 1991); in the United States,

recorded south to Florida, west through Missouri, Kansas, and Iowa to Oregon, and in New Mexico (Parsons 1943). Common on fungi, flowers, and decaying or ripe fruit (Downie and Arnett 1996) and associated with oak wilt fungus mats (Cease and Juzwik 2001).

Glischrochilus moratus
Brown, 1932

NOVA SCOTIA. Cumberland Co.: Wentworth, 21.v.–5.vii.1965, B. Wright, (2), NSMC.

Newly recorded in Nova Scotia. Recorded in Canada from British Columbia east to Quebec (McNamara 1991). In Nova Scotia, found on red (*Acer rubrum*) and sugar maple (*Acer saccharum* Marsh.) (Aceraceae).

Glischrochilus quadrisignatus
(Say, 1835)

NOVA SCOTIA: 36 specimens examined from Annapolis, Colchester, Cumberland, Halifax, Hants, Kings, Lunenburg, and Queens counties (Table 1). The earliest record is from 1942 (**Halifax Co.:** Armdale, 10.v.1942, D.C. Ferguson, NSMC). **PRINCE EDWARD ISLAND. Queens Co.:** Harrington, 14.vi.2004, 28.vi.2004, 12.vii.2004, and 9.viii.2004, C. Noronha, (22), ACPE.

Newly recorded on Prince Edward Island. In Canada, recorded from British Columbia east to Newfoundland (McNamara 1991); in the United States, recorded from Maine, New Hampshire, and Massachusetts (Chandler 2001) south to Florida and west through Kansas to Utah and Wyoming (Parsons 1943). An abundant species throughout the Maritime provinces. Attracted to decaying fruit, vegetables, and the odor of anything sweet (Downie and Arnett 1996). Strongly associated with managed forest stands (Zeran *et al.* 2006).

Glischrochilus sanguinolentus
***sanguinolentus* (Olivier, 1790)**

= *Glischrochilus sanguinolentus rubromaculatus* (Reitter, 1873) **syn. nov.**

NOVA SCOTIA: 318 specimens examined from Annapolis, Antigonish, Cape Breton, Colchester, Cumberland, Guysborough, Halifax, Hants, Inverness, Kings, Lunenburg, Pictou, and Queens counties (Table 1). The earliest record is from 1951 (**Kings Co.:** Hall's Harbour,

6.vi.1951, C.J.S. Fox, (2), ACNS). **PRINCE EDWARD ISLAND. Queens Co.:** St. Patricks, 27.vi.2003, C.G. Majka, CGMC; Princeton-Warburton Road, 27.vi.2003, C.G. Majka, (2), CGMC.

Newly recorded on Prince Edward Island. In Canada from British Columbia to Nova Scotia; in the United States south to Florida, west to Texas, and north through Iowa to Wisconsin (Parsons 1943). Parsons (1943, p. 267) distinguished between *Glischrochilus s. sanguinolentus* and *G. s. rubromaculatus*; however, he wrote, "Although intergradations rarely occur, this variation is usually constant. It is hardly worth a name, however." We agree that the distinction is unwarranted. Both "subspecies" are sympatric and there is gradation in the amount of dark and red pigmentation between the two forms. Although it has not been possible to examine the type specimens, we have examined the genitalia of representatives of both subspecies and have found absolutely no differences in shape and composition of the tegmen, median lobe, and internal sac sclerites. We therefore feel confident that there are no differences between these "subspecies" that warrant subspecific status and consequently designate *G. s. rubromaculatus* (Reitter, 1873) **syn. nov.** as a junior synonym of *G. s. sanguinolentus* (Olivier, 1790).

The nominate form may simply represent a recessive colour variant. In Nova Scotia, 22% of specimens ($n = 315$) are of the "sanguinolentus" form, similar to the proportion that might be expected if this form was homozygous for a recessive allele. Genetic research could help resolve this question.

In Nova Scotia, both forms are abundant in coniferous forests and are attracted to sap from broken limbs, stumps, and fallen logs of spruce (*Picea* spp.) and pine (*Pinus* spp.). Also found on polypore fungi (Polyporaceae) on conifers and occasionally at sap from deciduous trees (*Populus tremuloides* and *Quercus rubra*). Frequently found on *Fomes fomentarius* (L. ex Fr.) Kickx (Polyporaceae) (Matthewman and Pielou 1971) and associated with old-growth forest stands (Zeran *et al.* 2006) and oak wilt fungus mats (Cease and Juzwik 2001).

***Glischrochilus siepmanni* Brown, 1932**

NOVA SCOTIA: 32 specimens examined from Annapolis, Antigonish, Cumberland,

Colchester, Cape Breton, Halifax, Lunenburg, Queens, Yarmouth, Kings, and Hants counties (Table 1). The earliest record is from 1961 (**Kings Co.:** Kentville, 21.vi.1961, D.H. Webster, DHWC). **PRINCE EDWARD ISLAND. Queens Co.:** St. Patricks, 27.vi.2003, C.G. Majka, (10), CGMC.

Newly recorded in Nova Scotia and on Prince Edward Island. In Canada, recorded from British Columbia to New Brunswick (McNamara 1991); in the United States, recorded south to New York, west through Michigan, Kansas, and Iowa and in Oregon (Parsons 1943). Found in coniferous stands (eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), red spruce (*Picea rubens*), black spruce (*Picea mariana*), and balsam fir (*Abies balsamea*)), on deciduous trees (trembling aspen (*Populus tremuloides*), white birch (*Betula papyrifera* Marsh.) (Betulaceae), and red oak (*Quercus rubra*)), and in open areas (meadow, hayfield, back yard). Also found on polypore fungi on white birch, on a dead cow (*Bos taurus*), and attracted to black bear (*Ursus americanus* Pallas) dung. Associated with oak wilt fungus mats (Cease and Juzwik 2001).

***Glischrochilus vittatus* (Say, 1835)**

NOVA SCOTIA. Colchester Co.: Debert, 6.v.1993, J. Ogden, JOC. **Kings Co.:** Kentville, 19.x.1956, C.D. Dondale, ACNS.

Newly recorded in Nova Scotia. In Canada, recorded from British Columbia to Quebec (McNamara 1991); in the United States, recorded south to California, Nevada, Utah, and Colorado and in North Carolina (Parsons 1943), New Hampshire, and Maine (Chandler 2001). Under the bark of *Pinus* spp. (Downie and Arnett 1996).

Intercepted species

In Nova Scotia, specimens of *Carpophilus dimidiatus* (Fabr., 1792), *Carpophilus hemipterus* (L., 1758), and *Carpophilus lugubris* Murray, 1864 have been found in grocery stores on corn, *Zea mays* L. (Poaceae), imported from the United States. *Carpophilus corticinus* Erichson, 1843 and *Carpophilus antiquus* (Melsheimer, 1844) have also been found infesting stored food products in eating establishments. On Prince Edward Island, a specimen of *Carpophilus humeralis* (Fabr., 1758) was found

on pineapple, *Ananas comosus* (L.) (Bromeliaceae). None of these species occur naturally in the Maritime provinces, nor is there evidence that they have become established.

Discussion

Results indicate that the Maritime provinces support a more robust nitidulid and kateretid fauna (48 species) than hitherto reported. Although the earliest records date from 1913, many specimens in regional collections had hitherto been undetermined. Contemporary studies employing mass collection techniques such as flight intercept traps, Lindgren funnel traps, and car nets have dramatically increased the number of specimens available for study, particularly in Nova Scotia, which has over nine times the number of specimens collected on Prince Edward Island.

Three species, *Epuraea helvola* Erichson, 1843, *Epuraea obliquus* Hatch, 1962, and *Lobiopa undulata* (Say, 1825), have been recorded in New Brunswick but not in Nova Scotia. Details of these records will be provided in a future publication. These species should be looked for in Nova Scotia to ascertain whether New Brunswick is really the eastward extent of their distribution. Eighteen native species have been recorded in Nova Scotia and not in New Brunswick. The absence of records of the majority of these species is in all probability due to a dearth of collecting in New Brunswick.

Only 12 native species have been recorded on Cape Breton Island (33% of the mainland fauna), while on Prince Edward Island 8 species have been found (22% of the neighbouring mainland fauna). This 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 Coccinellidae, the Cape Breton Island and Prince Edward Island faunas represent (respectively) 41% and 39% of the native mainland fauna (Majka and McCorquodale 2006), perhaps indicating that collection efforts for sap beetles on Cape Breton and Prince Edward islands have been less than adequate.

The examination of species distributions within Nova Scotia is a first step towards understanding how faunal distributions may reflect underlying geographic, phytogeographic, physiographic, climatic, historical, and other factors that help structure the detailed distribution of a

species. In the case of some species (see the "NS distribution" column in Table 1), there are sufficient data that provisional interpretations can be proposed. There are 24 species that are (i) widespread (*i.e.*, found in all principal areas of the province); (ii) confined to mainland Nova Scotia (*i.e.*, not found on Cape Breton Island); (iii) found in western portions of the province, west of the Cobequid highlands; (iv) found in southwestern portions of the province; (v) distributed along the coast (reflecting the primarily coastal distribution of food plants); and (vi) confined to specific localities (Halifax or Sydney) reflecting an anthropochorous history. These distributions, and the environmental and other factors they reflect, should be investigated to test these hypotheses. In the case of the remaining 19 species, the current data are insufficient to ascertain distribution patterns.

The county and regional totals in Table 1 give some indication of the adequacy of the collection effort. At the upper end of the spectrum are counties such as Halifax (26 species), Kings (22 species), and Cumberland counties (18 species), while Victoria (2 species), Richmond (2 species), Shelburne (3 species), and Inverness counties (4 species) are at the lower end.

Nonnative species are an important component of the fauna of the Maritime provinces. Of the 47 Nitidulidae and Kateretidae found in the region, 9 species (19%) are introduced. In Nova Scotia, 14.6% of the overall beetle fauna consists of introduced species, while on Prince Edward Island the figure is 18.5% (C.G. Majka, unpublished data). We newly report *Brachypterus urticae*, *Carpophilus marginellus*, *Omosita discoidea*, and *Soronia grisea* as established in the region. As illustrated by the six exotic species that have not become established, others continue to arrive.

The Atlantic provinces of Canada have played a particularly prominent role with regard to the establishment of introduced species in North America. Studies by Brown (1940, 1950, 1967), Lindroth (1957), Hoebeke and Wheeler (1996a, 1996b, 2000, 2003), and Majka and Klimaszewski (2004) are just some that have contributed to this discussion. Majka and Klimaszewski (2004) discussed the introduction of *Meligethes viridescens* in Nova Scotia and Mason *et al.* (2003) drew attention to the threat that it poses to oilseed rape (*Brassica* spp.) in Canada. McCorquodale *et al.* (2005) and Majka *et al.* (2006) discussed the need for monitoring

of invertebrate populations to detect introduced species.

The bionomics of many species, particularly those in the species-rich genus *Epuraea*, are poorly known. Zeran *et al.* (2006) drew attention to the fact that members of this genus have often not been identified to species in previous ecological studies and that species-level identifications are necessary to understand how sap beetles (particularly rare species) respond to environmental variables. Otherwise, possibly important ecological patterns may be obscured.

A number of nitidulids found in the Maritimes (*Colopterus truncatus*, *Carpophilus sayi*, *Epuraea avara*, *E. terminalis*, *Glischrochilus sanguinolentus*, *G. fasciatus*, *G. quadrisignatus*, *G. siepmanni*, and *Phenolia grossa*) are associated with oak wilt mats (*Ceratocystis fagacearum* (Bretz) Hunt) (Parsons 1967; Cease and Juzwik 2001). Nitidulids are the primary vectors of this disease and Cease and Juzwik (2001) identified the larger-bodied species (*i.e.*, *Glischrochilus* spp.) as particularly important in potential dispersal. This dispersal phenomenon has not been investigated in the Maritime provinces but illustrates the importance of developing a knowledge of the bionomics of nitidulids and their kin found in this region.

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