

The Cerambycidae (Coleoptera) of Prince Edward Island: new records and further lessons in biodiversity

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Abstract—The long-horned beetles (Cerambycidae) of Prince Edward Island are surveyed. Records of 28 species of cerambycids new to the province are provided, increasing the known fauna of this family on the island to 38 species. One species, *Pogonocherus penicillatus* LeConte, is removed from the list of the province's fauna. Additionally, one exotic species, *Rhopalophora tenuis* (Chevrolat), is reported as intercepted from merchandise imported from Mexico. This fauna is examined in relation to its distribution within the province, biogeographical components, island biogeography, the composition of the regional fauna, the impact of anthropogenic activities, and adventive species. All these provide lessons to improve our understanding of the biodiversity of the province.

Résumé—Cet article traite des longicornes (Cerambycidae) de l'Île-du-Prince-Édouard et signale pour la première fois la présence de 28 espèces de Cerambycidae dans cette province. Ceci augmente à 38 espèces la faune connue qui appartient à cette famille et que l'on peut trouver sur l'Île. Une de ces espèces, le *Pogonocherus penicillatus* LeConte, ne figure pas sur la liste faunique de la province. L'article mentionne une espèce non indigène, *Rhopalophora tenuis* (Chevrolat), trouvée dans des marchandises importées du Mexique. On examine cette faune dans le contexte de sa distribution à travers la province, des éléments biogéographiques, de la biogéographie des îles, de la composition de la faune régionale, de l'effet des activités anthropogènes ainsi que des espèces adventives. Ces éléments contribuent tous à améliorer notre compréhension de la biodiversité de la province.

Introduction

In "Do we know beetles? Lessons from new records of Cerambycidae (Coleoptera) for Nova Scotia", McCorquodale and Bondrup-Nielsen (2004) drew attention to the large gaps in our knowledge of the basic biodiversity of even conspicuous, extensively collected, and taxonomically well-known groups of beetles such as the Cerambycidae. Opportunities for employing this group for forest biomonitoring are possible only with a good baseline of information, something that has been conspicuously lacking

in the Maritime Provinces of Canada. In particular, they indicated that even such resources as do exist, such as regional collections that contain pertinent information, have been poorly utilized. Broad treatments, whether of taxonomic groups or geographical regions, can only be as thorough as the detailed regional information available. It is incumbent on researchers and managers of regional collections to bring their information into the public domain.

Prince Edward Island (PEI) is the smallest province in Canada. It has also been the least

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investigated in terms of its beetle fauna. Bousquet (1991) reported only 340 species from the island, only 4.5% of the 7447 species of Coleoptera then known to occur in Canada. The Cerambycidae fit the overall pattern. Of the 354 species recorded in Canada by McNamara (1991), only 84 species were recorded in the Maritime Provinces, of which only 11 (3.1%) were recorded from PEI. In neighbouring Nova Scotia, McCorquodale and Bondrup-Nielsen (2004) found that while 51 species had been reported from the province by McNamara (1991), an examination of regional collections revealed 87 species. More recently, McCorquodale (2007) recorded 93 species in the Nova Scotia fauna and Smith and Hurley (2005) added one more.

Continuing the initiative of McCorquodale and Bondrup-Nielsen (2004), we surveyed the present state of knowledge of the Cerambycidae on Prince Edward Island. Although McCorquodale (2007) provided an overview of the cerambycid fauna of the Atlantic Maritime Ecozone as a whole, new species records were not provided. In the present account we report on existing collections and provide new records for 29 species of cerambycids new to PEI.

Methods and conventions

Codens (following Evenhuis and Samuelson 2006) of collections referred to in this study are as follows:

| | |
|------|---|
| ACPE | Agriculture and Agri-Food Canada, Charlottetown, Prince Edward Island |
| AFC | Atlantic Forestry Centre, Canadian Forest Service, Fredericton, New Brunswick |
| 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 |
| 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 |
| 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.

Results

As a result of our investigations, 38 species of Cerambycidae are now known to occur on Prince Edward Island (Table 1), a substantial increase from the 11 reported by McNamara (1991). Species indicated with an asterisk are newly reported on Prince Edward Island. Specific records of cerambycids from PEI follow.

Aseminae

Asemini

**Arhopalus foveicollis* (Haldeman, 1847)

Kings Co.: Montague, 15.viii.1995, M.E.M. Smith, ACPE.

**Tetropium cinnamopterum* Kirby, 1837

Prince Co.: Tignish, 4.i.1999, M.E.M. Smith, emerged from firewood, ACPE.

Lepturinae

Lepturini

**Acmaeops proteus proteus* (Kirby, 1837)

Queens Co.: Vernon River, 3.vi.1970, R. Wenn, ACPE.

**Analeptura lineola* Linsley and Chemsak, 1972

Prince Co.: Miscouche, 12.vii.1993, M.E.M. Smith, ACPE.

**Anthophylax viridis* LeConte, 1850

Queens Co.: Crapaud, 26.vii.1991, M.E.M. Smith, ACPE.

**Bellamira scalaris* (Say, 1873)

Prince Co.: St. Nicholas, viii.2003, D.B. McCorquodale, CBU.

Brachyleptura champlaini Casey, 1913

Prince Co.: 5 km west of Miscouche, 30.vii.2003, D.B. McCorquodale, CBU; 4.3 km west of Miscouche, 31.vii.2003, D.B. McCorquodale, CBU. **Queens Co.:** Brackley Beach, 25.vii.1940, G.S. Walley, CNC.

Cosmosalia chrysocoma (Kirby, 1837)

Kings Co.: St. Peters, 8.vii.1993, J.G. Stewart, ACPE; Souris, 22.vii.1995, J. Ogden, NSNR; Woodville Mills, 6.ix.2001, C.G. Majka, (2), CGMC. **Prince Co.:** Augustine Cove, 21.vi.1954, F.M. Cannon, ACPE; Kinkora, 4.vii.1983, L.S. Thompson, ACPE; Miscouche, 12.vii.1993,

- M.E.M. Smith, ACPE; Mt. Carmal, 26.vi.1964, (2), CNC. **Queens Co.:** Brackley Beach, 2.vii.1940, 3.vii.1940, 21.vii.1940, 28.vii.1940, and 29.vii.1940, G.S. Walley, (11), CNC; Charlottetown, 7.vii.1989 and 24.vi.1994, M.E.M. Smith, (2), ACPE; Charlottetown, 15.vii.1983, L.S. Thompson, ACPE; Charlottetown, 8.vi.1974, 12.vi.1974, and 22.vii.1974, S. Favier, (3), UPEI; Harrington, 19.viii.1993, M.E.M. Smith, ACPE; St. Patricks, 20.vi.2003, C.G. Majka, (2), mixed forest, CGMC; Uigg, 6.vi.1971, J. MacLeod, UPEI; West Royalty, 5.vii.1970, R. Wenn, UPEI.
- **Evodinus monticola monticola* (Randall, 1838)
Queens Co.: Uigg, 6.vii.1971, Anil Joshi, UPEI; St. Patricks, 25.vi.2003, C.G. Majka, CGMC; Harrington, 14.vi.2004, C. Noronha, ACPE.
- **Grammoptera subargentata* (Kirby, 1837)
Prince Co.: Enmore, 8.vi.1981, V. Friesen, UPEI.
- **Pidonia ruficollis* (Say, 1823)
Prince Co.: Unionvale, 23.vi.1983, L.S. Thompson, ACPE; Summerside, 24.vi.1992, M.E.M. Smith, ACPE. **Queens Co.:** Crapaud, 26.vi.1991, M.E.M. Smith, ACPE; Cavendish, 17.vii.1997, D.B. McCorquodale, CBU; St. Patricks, 27.vi.2003, C.G. Majka, (2), CGMC.
- **Pygoleptura nigrella nigrella* (Say, 1826)
Kings Co.: Lakeside Beach, 3.viii.1997, D.B. McCorquodale, CBU. **Queens Co.:** Stanhope, 3.vii.1937, UPEI; St. Patricks, 13.vi.2002, C.G. Majka, CGMC. **PEI:** no location data, 1967, J.E.H. Martin, CNC.
- **Rhagium inquisitor* (Linné, 1758)
Kings Co.: Georgetown, 5.vi.1998, AFC. **Queens Co.:** Stanhope, 21.vii.1937, UPEI; Charlottetown, 23.vi.1978, L.S. Thompson, ACPE; Charlottetown, iii.1982, L.S. Thompson, ACPE; Charlottetown, 10.v.1990, B. Craig, ACPE; Iona, 26.xi.1981, reared from *Pinus resinosa* Ait. (Pinaceae), AFC.
- Stictoleptura canadensis canadensis* (Olivier, 1795)
Prince Co.: Fortune, 4.viii.1984, A. Larochelle and M.C. Larivière, CNC; Lakeside Beach, 2.viii.1997, D.B. McCorquodale, CBU; St. Peters, no date specified, J. Waye, NSAC. **Queens Co.:** Charlottetown, mid-vii.1992, J.G. Stewart, ACPE; Charlottetown, 3.viii.1973 and 18.viii.1980, L.S. Thompson, (2), ACPE; Cornwall, 3.vii.1984, 13.vi.1993, summer 1990 and summer 1995, M.E.M. Smith, (5), ACPE; Dalvay House, 15.viii.1940 and 19.viii.1940, G.S. Walley, (4), CNC; Millvale, 15.viii.2004, C.G. Majka, CGMC; St. Patricks, 19.vii.2001, C.G. Majka, on *Picea rubens* Sarg. (Pinaceae), CGMC; Stanhope, 11.viii.1957, R. Haven Wigmore, CNC.
- **Strangalepta abbreviata* (Germar, 1824)
Kings Co.: Woodville Mills, 6.ix.2001, C.G. Majka, (2), on *Tilia × europea* L. (Tiliaceae), CGMC. **Prince Co.:** 5 km west of Miscouche, 30.vii.2003, D.B. McCorquodale, CBU; St. Nicholas, 31.vii.2003, D.B. McCorquodale, CBU. **Queens Co.:** Brackley Beach, 12.vii.1940, G.S. Walley, CNC; Charlottetown, 22.vii.1974, S. Favier, UPEI; Cornwall, summer 1995, M.E.M. Smith, ACPE; St. Patricks, 17.vii.2001, C.G. Majka, (2), CGMC; St. Patricks, 21.vii.2001, C.G. Majka, CGMC; St. Patricks, 22.vii.2001, C.G. Majka, CGMC; St. Patricks, 13.vii.2002, C.G. Majka, CGMC; St. Patricks, 14.vii.2002, C.G. Majka, CGMC. **PEI:** no location data, 1974–1983, UPEI.
- **Strophiona nitens* (Forster, 1771)
Queens Co.: Harrington, 29.vii.1992, M.E.M. Smith, ACPE.
- **Trachysida mutabilis* (Newman, 1841)
Prince Co.: Scales Pond, 20.vi.1972, N. Christopher, UPEI; Miscouche, 2.vii.1993, M.E.M. Smith, (2), ACPE. **Queens Co.:** Charlottetown, 21.xii.1982, L.S. Thompson, ACPE; East Royalty, 8.vii.1986, M.E.M. Smith, (2), ACPE; Crapaud, 26.vii.1991, M.E.M. Smith, ACPE; Victoria, 14–20.vii.1994, M.E.M. Smith, ACPE; St. Patricks, 19.vii.2001, C.G. Majka, in *Prunus pensylvanica* L. f. (Rosaceae), CGMC.
- **Trigonarthris minnesotana* (Casey, 1913)
Prince Co.: 5 km west of Miscouche, 30.vii.2003, D.B. McCorquodale, (2), CBU.
- **Typocerus velutinus velutinus* (Olivier, 1795)
Prince Co.: 5 km west of Miscouche, 30.vii.2003, D.B. McCorquodale, (4), CBU; 5 km west of Miscouche, 1.viii.2003, D.B. McCorquodale, CBU.

Cerambycinae

Callidini

**Callidium violaceum* (Linné, 1775)

Kings Co.: Murray Harbour, 9.vi.1953, F.M. Cannon, ACPE. **Prince Co.:** Conway Narrows, 30.vi.1970, U. Grigg, NSMC. **Queens Co.:** Charlottetown, vii.1957, F.M. Cannon, ACPE; Charlottetown, 1961, D.C. Read, ACPE; Charlottetown, xi.1964, L.S. Thompson, ACPE; Charlottetown, 6.vii.1982, L.S. Thompson, ACPE; Charlottetown, 2.vi.1985, L.S. Thompson, ACPE; Charlottetown, 11.vi.1985, L.S. Thompson, ACPE; Pownall, 9.vi.1999, M.E.M. Smith, (2), ACPE. **PEI:** no location data, 1974–1983, UPEI.

**Phymatodes dimidiatus* (Kirby, 1837)

Queens Co.: Borden, 6.vi.1999, M.E.M. Smith, (2), ACPE.

**Pronocera collaris collaris* (Kirby, 1837)

Prince Co.: Tryon, 28.vii.1988, M.E.M. Smith, (2), ACPE. **Queens Co.:** Cornwall, summer 1990, M.E.M. Smith, ACPE.

**Ropalopus sanguinicollis* (Horn, 1860)

Kings Co.: 48 Road, 2.vi.1969, cherry, AFC.

Clytini

**Clytus ruricola* (Olivier, 1795)

Prince Co.: 4.3 km west of Miscouche, 31.vii.2003, D.B. McCorquodale, CBU; St. Nicholas, 31.vii.2003, D.B. McCorquodale, (4), CBU. **Queens Co.:** Charlottetown, 1993, M.E.M. Smith, ACPE; Cornwall, 4.viii.1985, M.E.M. Smith, ACPE; Harrington, 21.vii.1993, M.E.M. Smith, ACPE. **PEI:** no location data, 1974–1983, UPEI.

**Glycobius speciosus* (Say, 1824)

Queens Co.: Charlottetown, 27.vi.1987, L.S. Thompson, ACPE; Charlottetown, 26.i.1998, J.G. Stewart, ACPE.

**Megacyllene robiniae* (Forster, 1771)

Queens Co.: Charlottetown, 31.vii.1984, L.S. Thompson, ACPE.

Neoclytus leucozonus leucozonus (Castelnau and Gory, 1988)

Prince Co.: Alberton, 16.vii.1940, G.S. Walley, CNC.

**Xylotrechus colonus* (Fabricius, 1775)

Queens Co.: Hunter River, 2.iv.2004, D. Chandler, woodpile, ACPE.

Xylotrechus integer (Haldeman, 1847)

Queens Co.: Harrington, 13.vii.1989, M.E.M. Smith, ACPE; Stanhope, 3.vii.1937, UPEI.

Xylotrechus undulatus (Say, 1824)

Queens Co.: Charlottetown, summer 1998, M.E.M. Smith, ACPE; Rustico Beach, 24.vii.1967, J.E.H. Martin, CNC.

Lamiinae

Lamini

Monochamus notatus (Drury, 1773)

Prince Co.: Conway Narrows, 20.vii.1970 and 30.vii.1970, U. Grigg, (2), NSMC; Lot 65, 27.vii.1970, D. Laughlin, (3), UPEI; Summerside, 13.viii.2001, C. Noronha, ACPE. **Queens Co.:** Bonshaw, summer 1993, J.G. Stewart, ACPE; Charlottetown, 4.viii.1948, R. Haven Wigmore, CNC; Charlottetown, x.1984, L.S. Thompson, ACPE; Charlottetown, 2.vi.1995, J.G. Smith, ACPE; Charlottetown, 10.viii.1982, Dept. of Agriculture, NSMC; Harrington, summer 1994, M.E.M. Smith, ACPE; Stanhope, 8.ix.1948, R. Haven Wigmore, CNC; Tea Hill, vii.1982, L.S. Thompson, ACPE; York, 14.vii.1961, ACPE.

Monochamus scutellatus scutellatus (Say, 1824)

Kings Co.: Gladstone, 31.viii.1982, L.S. Thompson, on spruce, ACPE; Launching, 26.viii.2003, C.G. Majka, CGMC; Murray Harbour, 15.vii.1953, F.M. Cannon, ACPE; Murray River, 1.vii.1963, Forest Insect Survey, on *Pinus strobus* L. (Pinaceae), AFC; St. Peters, 31.vii.1949, J. Wayne, NSAC. **Queens Co.:** Charlottetown, i.1953 and ix.1984, L.S. Thompson, (3), ACPE; Charlottetown, 14.viii.1987, J.G. Stewart, ACPE; Charlottetown, 25.vii.2000, M.E.M. Smith, ACPE; Cornwall, 27.vi.1984, M.E.M. Smith, ACPE; Cornwall, 2.vii.1984, G.M. Smith, ACPE; Crossroads, 21.vii.1985, L.S. Thompson, ACPE; Harrington, 23.vii.2001, E. Doyle, ACPE; Harrington, 13.vii.1987, M.E.M. Smith, ACPE; Rice Pt., 26.ix.1982, L.S. Thompson, ACPE; St. Patricks, 13.vii.2002 and 25.vi.2003, C.G. Majka, mixed forest, CGMC; Victoria, 16.vii.1981, J.R. Friesan, UPEI. **PEI:** (no location data) 22.vii.2001, M. Carruthers, ACPE; late July to early August 2001, E. Doyle, ACPE; 14.vi.1993, B. Craig, ACPE; 1974–1983, (5), UPEI.

Pogoncherini

Pogonocherus penicillatus LeConte, 1850

This species was recorded for Prince Edward Island by McNamara (1991). However, no specimens were located in any collection examined in eastern Canada, including the Canadian National Collection, and there are no published records of its occurrence on Prince Edward Island. Consequently we regard the record in McNamara (1991) as unsubstantiated and we remove *P. penicillatus* from the list of Prince Edward Island fauna.

Acanthocinini

**Acanthocinus pusillus* (Kirby, 1837)

Queens Co.: Cornwall, 13.vii.1982, L.S. Thompson, ACPE.

**Hyperplatys aspersa* (Say, 1824)

Prince Co.: Miscouche, 21.vi.1993, M.E.M. Smith, ACPE. **PEI:** 1974–1983, UPEI.

Saperdini

Saperda calcarata Say, 1823

Queens Co.: Charlottetown, 27.vii.1948 and 31.vii.1948, R. Haven Wigmore, (2), CNC; Charlottetown, x.1989, L.S. Thompson, ACPE; Cornwall, 6.viii.2001, M.E.M. Smith, ACPE; Earncliffe, 14.vii.1972, J. MacLeod, UPEI; Stanhope, 7.vii.1948, R. Haven Wigmore, CNC; West Royalty, 22.vii.1970, R. Wenn, ACPE.

**Saperda inornata* (Say, 1823)

Prince Co.: Linkletter, 2.vii.1982, M.E.M. Smith, ACPE; Wellington, 22.ii.1984 [emergence date], *Populus tremuloides* Michx. (Salicaceae), AFC. **Queens Co.:** Roseberry, 12.vi.1984 [emergence date], *Populus tremuloides*, AFC.

**Saperda lateralis* Fabricius, 1775

Prince Co.: Scales Pond, 20.vi.1972, N. Christopher, UPEI. **Queens Co.:** Crapaud, 10.vii.1991, M.E.M. Smith, ACPE; St. Patricks, 29.vi.2003, C.G. Majka, CGMC.

Saperda obliqua Say, 1827

Queens Co.: Charlottetown, 31.vii.1948, R. Haven Wigmore, CNC; Stanhope, 7.viii.1948, R. Haven Wigmore, CNC.

Intercepted species

Cerambycinae: Rhopalophorini

**Rhopalophora tenuis* (Chevrolat, 1855)

Queens Co.: Charlottetown, 31.vii.1974, L.S. Thompson, intercepted in wooden crate from Mexico, ACPE.

This adventive species, intercepted from Mexico, is not established on Prince Edward Island. It is widely distributed in Mexico, particularly in the central plateau and western highlands, and is also recorded from Guatemala and Costa Rica (Giesbert and Chemsak 1993).

Discussion

Twenty-eight species of Cerambycidae are newly recorded as occurring on Prince Edward Island. One species, *Pogonocherus penicillatus*, is removed from the list of the province's fauna. Together with the 11 previously reported species for the island, this increases the known fauna of Prince Edward Island to 38 species. Additionally, *Rhopalophora tenuis* is reported as a non-established exotic species intercepted in merchandise imported from Mexico.

Table 1 summarizes the cerambycid fauna of Prince Edward Island. Records for Prince, Queens, and Kings counties (which roughly represent the western, central, and eastern thirds of the island) are indicated. Queens County, in the center of the province where Charlottetown is located, has the largest number of recorded species (27). Charlottetown is where most researchers have been based and hence collecting efforts have been focused on this portion of the island. In Prince County, where Summerside (the other main centre on the island) is located, there are records of 20 species. In comparison, Kings County (the eastern third of the island) has been comparatively less investigated, with records of only 9 species.

Also summarized in Table 1 are known host plant associations, primarily drawn from Yanega (1996). Seventeen species are associated with coniferous trees, 14 are known principally from deciduous hosts, and 7 are recorded from both.

The biogeographical distribution of these species in North America (adapted from McCorquodale 2007 and based on Yanega 1996) is also indicated in Table 1. In terms of the biogeographic composition of the fauna, an examination of Table 2 indicates that the proportional composition of species on Prince Edward Island is similar to that of the entire cerambycid fauna of the Atlantic Maritime Ecozone (AME). The two most species-rich categories are Eastern-S (east of 100°W, Atlantic Canada and south) and Widespread-B (east and west of 100°W, north of the AME into the boreal forest). There is a slightly larger proportion of Widespread species in comparison with

Widespread-S species (east and west of 100°W, south of Atlantic Canada) on Prince Edward Island than in the AME as a whole; otherwise, all other categories are in the same proportional sequence in both areas. There is one Holarctic species, *Rhagium inquisitor*, and one introduced Palearctic species, *Callidium violaceum*.

An examination of McCorquodale (2007) and Dearborn and Donahue (1993) indicated that all species found on Prince Edward Island are also found in the neighbouring jurisdictions of Quebec, New Brunswick, Nova Scotia, and Maine, except for two species:

(1) *Strophiona nitens*, which has not been found in New Brunswick. In all probability this simply reflects a collecting oversight in this relatively poorly collected province.

(2) *Ropalopus sangunicollis*, which has not been collected in Nova Scotia. Nova Scotia has been better investigated than any other province in Atlantic Canada in terms of its cerambycid fauna, and it appears that this species may not be found in the province. Consequently its presence on Prince Edward Island is noteworthy and may indicate an ancestral colonization of the island. This may have occurred circa 10 000 – 6 000 years BP, when the Northumberland Strait was emergent land and Prince Edward Island was broadly contiguous with New Brunswick (Shaw and Gareau 2002).

Miller and Elias (2000) found that boreal forest beetles, such as various Scolytinae, make their appearance in the Maritime Provinces in deposits from circa 11 800 – 10 800 years BP. No Cerambycidae were found by these authors, and they did not investigate sites on Prince Edward Island, so little more can presently be said about the historical genesis of Prince Edward Island's cerambycid fauna. Presumably cerambycids began to colonize forests in the region at about the same time as bark beetles, indicating the development of the boreal forest. Earlier assemblages of fossil beetles were characteristic of tree line or tundra conditions (Miller and Elias 2000).

The number of cerambycid species on Prince Edward Island is typically diminished (32%) in relation to the number on the neighboring mainland. This may reflect an island-related diminution of species, a comparative lack of collection effort, or a combination of both. The native Coccinellidae on Prince Edward Island, a somewhat more extensively sampled group, comprise 39% of the neighbouring mainland fauna (Majka and McCorquodale 2006). Cape Breton

Island has a land area slightly more than twice that of Prince Edward Island (10 311 km² vs. 5660 km²) and is separated from the mainland by only 1.5 km, in contrast to the 13 km that separate New Brunswick and Prince Edward Island. Nonetheless, these islands have identical-sized faunas (40 species) (Majka and McCorquodale 2006; unpublished data). Newfoundland, to the northeast of the region and within the Canadian Boreal Shield Ecozone, has a land area of 111 390 km², but only 24 species of cerambycids have been recorded there (McNamara 1991). Only one, *Pachyta lamed liturata* Kirby, 1837, has not been found in the Maritime Provinces.

An unanswered question is the degree to which the history of land use on Prince Edward Island may have affected the native cerambycid fauna. Both the boreal and the northern deciduous elements of the Acadian Forest on Prince Edward Island are well represented and show the full quota of tree species (Erskine 1960). By early in the 18th century, significant cutting of the forest had started and large areas of the island were burnt. Seventy percent of the island's forests were cleared during the 20th century (Loo and Ives 2003). In 1960, 60% of the land on the island was devoted to agriculture and a further 8% was otherwise open (unimproved waste land, marsh, barren, *etc.*), leaving only 32% as forest (Erskine 1960). Since then, farm abandonment has led to some regrowth so that by 1992, 57% of the land was forested (Anonymus 1992). Where land has not been completely cleared, the best trees have been removed for generations, leaving a generally impoverished forest in terms of both genetic quality and species diversity (Loo and Ives 2003). Only small relicts of the original vegetation of the island still exist. A projection by Sobey and Glen (2004) of the pre-European settlement forest of Prince Edward Island indicates that the island was mostly covered by upland hardwood forest, a stand type that occurs on only 21.7% of the forested area of the island today.

It seems plausible that this extensive and long history of anthropogenic activities (which also in the past 60 years has included the extensive use of insecticides and other biocides) on PEI may have had a significant impact on the island's cerambycid fauna. Detailed research on such matters in this region is lacking. In Great Britain, Alexander (2004) identified 12 species of Cerambycidae as indicators of "ecological

Table 1. The Cerambycidae of Prince Edward Island.

| Cerambycidae | County | | | | Distribution | Host plants |
|---|--------|--------|-------|--------|---------------|---|
| | Prince | Queens | Kings | Queens | | |
| Aseminae | | | | | | |
| <i>Asemmini</i> | | | | | | |
| <i>Arhopalus foveicollis</i> (Haldeman) | | | 1 | | Widespread | Conifers: <i>Pinus, Picea</i> |
| <i>Tetropium cinnamopterum</i> Kirby | 1 | | | | Widespread-B | Conifers: <i>Pinus</i> |
| Lepturinae | | | | | | |
| <i>Lepturini</i> | | | | | | |
| <i>Acmaeops p. proteus</i> (Kirby) | | 1 | | | Widespread | Conifers |
| <i>Analeptura lineola</i> Linsley and Chemsak | 1 | | | | Eastern-S | Deciduous, conifers: <i>Betula, Pinus</i> |
| <i>Anthophylax viridis</i> LeConte | | 1 | | | Eastern-S | Deciduous: <i>Betula, Acer, Fagus</i> |
| <i>Bellamira scalaris</i> (Say) | 1 | | | | Eastern-S | Deciduous, conifers (<i>Pinus</i>) |
| <i>Brachyleptura champlaini</i> Casey | 1 | 1 | | | Eastern-S | Conifers: <i>Pinus</i> |
| <i>Cosmosalia chrysocoma</i> (Kirby) | 1 | 1 | 1 | | Widespread | Conifers, deciduous |
| <i>Evodinus m. monticola</i> (Randall) | | 1 | | | Eastern-B | Conifers |
| <i>Grammoptera subargentina</i> (Kirby) | 1 | | | | Widespread-B | Deciduous: <i>Rhus, Populus, Quercus</i> |
| <i>Pidonia ruficollis</i> (Say) | 1 | 1 | | | Eastern-S | Deciduous |
| <i>Pygoleptura n. nigrella</i> (Say) | | 1 | 1 | | Widespread-B | Conifers |
| <i>Rhagium inquisitor</i> (Linné) | | 1 | 1 | | Holarctic | Conifers |
| <i>Stictoleptura c. canadensis</i> (Olivier) | | 1 | 1 | | Eastern | Conifers |
| <i>Strangalepta abbreviata</i> (Germar) | 1 | 1 | 1 | | Eastern-S | Deciduous, conifers |
| <i>Strophiona nitens</i> (Forster) | | 1 | | | Widespread-E | Deciduous: <i>Castanea, Quercus</i> |
| <i>Trachysida mutabilis</i> (Newman) | 1 | 1 | | | Widespread-E | Deciduous |
| <i>Trigonarthris minnesotana</i> (Casey) | 1 | | | | Eastern-S | Deciduous, conifers (<i>Pinus</i>) |
| <i>Typocerus v. velutinus</i> (Olivier) | 1 | | | | Eastern-S | Deciduous: <i>Quercus</i> |
| Cerambycinae | | | | | | |
| <i>Callidini</i> | | | | | | |
| <i>Callidium violaceum</i> (Linné) | 1 | 1 | 1 | | Palaearctic-I | Conifers: <i>Pinus, Larix, Picea</i> |
| <i>Phymatodes dimidiatus</i> (Kirby) | 1 | | | | Widespread-W | Conifers |
| <i>Pronocera c. collaris</i> (Kirby) | 1 | 1 | | | Widespread-B | Conifers: <i>Pinus, Picea</i> |
| <i>Ropalopus sangunicollis</i> (Horn) | | | 1 | | Eastern-S | Deciduous: <i>Prunus</i> |

Table 1 (concluded).

| | County | | | Distribution | Host plants |
|---|--------|--------|-------|--------------|--|
| | Prince | Queens | Kings | | |
| Cerambycidae | | | | | |
| Clytini | | | | | |
| <i>Clytus ruricola</i> (Olivier) | 1 | 1 | | Eastern-S | Deciduous: <i>Acer</i> |
| <i>Glycobius speciosus</i> (Say) | | 1 | | Eastern-S | Deciduous: <i>Acer saccharum</i> |
| <i>Megacyllene robiniae</i> (Forster) | | 1 | | Eastern-S | Deciduous: <i>Robinia pseudoacacia</i> and <i>R. viscosa</i> |
| <i>Neoclytus l. leucozonus</i> (Castelnau and Gory) | 1 | | | Widespread-B | Conifers |
| <i>Xylotrechus colonus</i> (Fabricius) | | 1 | | Eastern-S | Deciduous, conifers (<i>Pinus</i>) |
| <i>Xylotrechus integer</i> (Haldeman) | | 1 | | Eastern-S | Conifers: <i>Abies balsamea</i> , <i>Tsuga canadensis</i> |
| <i>Xylotrechus undulatus</i> (Say) | | 1 | | Widespread-B | Conifers |
| Laminae | | | | | |
| Laminii | | | | | |
| <i>Monoctonus notatus</i> (Drury) | 1 | 1 | | Widespread | Conifers |
| <i>Monoctonus s. scutellatus</i> (Say) | | 1 | 1 | Widespread | Conifers: <i>Pinus</i> |
| Acanthocimini | | | | | |
| <i>Acanthocinus pusillus</i> (Kirby) | | 1 | | Widespread-B | Conifers: <i>Pinus</i> |
| <i>Hyperplatys aspersa</i> (Say) | 1 | | | Widespread-S | Deciduous (also <i>Arctium</i>) |
| Saperdini | | | | | |
| <i>Saperda calcarata</i> Say | | 1 | | Widespread | Deciduous: <i>Populus</i> , <i>Salix</i> |
| <i>Saperda inornata</i> (Say) | 1 | 1 | | Widespread-S | Deciduous: <i>Populus</i> , <i>Salix</i> |
| <i>Saperda lateralis</i> Fabricius | 1 | 1 | | Widespread-E | Deciduous, conifers (<i>Pinus</i>) (also shrubs) |
| <i>Saperda obliqua</i> Say | | 1 | | Eastern-S | Deciduous: <i>Alnus</i> , <i>Betula</i> |
| Totals | 20 | 27 | 9 | | |

Distribution categories (adapted from McCorquodale 2007): Holarctic, North America and Europe; Palearctic-I, introduced in North America from Europe; Widespread, east and west of 100°W and from the boreal forest to the southern United States; Widespread-S, east and west of 100°W and south of Atlantic Canada; Widespread-E, east and west of 100°W, primarily east of 100°W; Widespread-W, east and west of 100°W, primarily west of 100°W; Widespread-B, east and west of 100°W from the Atlantic Maritime Ecozone north into the boreal forest; Eastern, east of 100°W from the boreal forest to the southern United States; Eastern-S, east of 100°W, Atlantic Canada and south; and Eastern-B, east of 100°W, Atlantic Canada north into the boreal forest.

Table 2. Cerambycidae fauna: geographical composition.

| Distribution [†] | Atlantic Maritime Ecozone* | | PEI | |
|---------------------------|----------------------------|------|----------------|------|
| | No. of species | % | No. of species | % |
| Eastern-S | 67 | 55.8 | 15 | 39.5 |
| Widespread-B | 13 | 10.8 | 7 | 18.4 |
| Widespread | 9 | 7.5 | 6 | 15.8 |
| Widespread-S | 10 | 8.3 | 2 | 5.3 |
| Widespread-E | 5 | 4.2 | 3 | 7.9 |
| Palaearctic-I | 4 | 3.3 | 1 | 2.6 |
| Widespread-W | 4 | 3.3 | 1 | 2.6 |
| Holarctic | 3 | 2.5 | 1 | 2.6 |
| Eastern-B | 3 | 2.5 | 1 | 2.6 |
| Eastern | 2 | 1.7 | 1 | 2.6 |
| Total | 120 | 100 | 38 | 100 |

*Adapted from McCorquodale (2007).

[†]See Table 1 for definitions.

continuity” (an inverse of disturbance). These are species that are associated with relatively undisturbed, old-growth situations and which are (in various degrees) intolerant of disturbances to the forest environment. Further work is needed to determine potentially similar taxa on this continent. It is possible that old-growth specialists may have been entirely eliminated from the PEI fauna. In this regard, it would be worthwhile investigating remaining pockets of old-growth forest.

Majka and Pollock (2006) and Majka (2006) identified 11 species of saproxylic beetles in the Maritime Provinces in the Boreidae, Melandryidae, Mycteridae, Pyrochroidae, Pythidae, Salpingidae, and Tetratomidae that appear to be scarce (*i.e.*, they have each been recorded in Atlantic Canada by fewer than 10 specimens). These authors speculated that the apparent scarcity of these species could be indicative of a diminution of habitat as a result of forest management practices. Although data from Prince Edward Island are still much too preliminary to form a full understanding of the island's cerambycid fauna, saproxylic species such as long-horned beetles may have been similarly affected. In particular, these are species that use trees such as *Tsuga canadensis* (L.) Carr. (Pinaceae), *Pinus strobus* L. (Pinaceae), *Thuja occidentalis* L. (Cupressaceae), and *Fraxinus americana* L. (Oleaceae). These tree species are now restricted to a few small stands on PEI, but formerly they were much more widespread (Sobey and Glen 2004).

The interception of *Rhopalophora tenuis* raises the issue of adventive species. Only one introduced cerambycid, *Callidium violaceum*, is established on Prince Edward Island. The status of this species as either an adventive Palaearctic or a native Holarctic species is still uncertain, but it is currently regarded as “probably introduced” (McNamara 1991; S. Laplante, personal communication).

In neighbouring jurisdictions, however, other species of adventive cerambycids have been found. In Nova Scotia, *Tetropium fuscum* (Fabricius, 1787) was introduced and is the subject of an eradication campaign (Smith and Hurley 2000); *Phymatodes testaceus* (Linné, 1758) is established in Maine, Nova Scotia, New Brunswick, and Quebec (Dearborn and Donahue 1993; McCorquodale 2007); *Tetrops praeusta* (Linné, 1758) is found in Quebec and Maine (Howden and Howden 2000; Landry 2001); and *Hylotrupes bajulus* (Linné, 1758) is found in Quebec (McCorquodale 2007).

Although *R. tenuis* is unlikely to establish itself on Prince Edward Island, its capture highlights the issue of ongoing introductions. As McCorquodale and Bondrup-Nielsen (2004) pointed out, introduced species are the second most important risk factor (behind habitat loss) for declines in species at risk. Transport of novel pathogens, competition with congeners, predation on native species, and alteration of natural community structure can contribute to population declines. Rapid recognition of introduced species is essential, but this is possible only if native faunas are well known.

McCorquodale and Bondrup-Nielsen (2004, p. 220) wrote that they were “sobered” by the fact that by their efforts the number of species known in Nova Scotia had increased by more than 50% for “a well-known group of beetles that are frequently collected by the generalist”. In the present work the number of species known on PEI has increased 245%, a thought that we find correspondingly sobering. Although significant strides have been made in the past decade in terms of understanding the biodiversity of beetles on Prince Edward Island, much still remains to be done in terms of establishing a baseline for further work.

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