

**NEW RECORDS OF CORYLOPHIDAE (COLEOPTERA) FROM THE
MARITIME PROVINCES OF CANADA**

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Abstract

New records of Corylophidae from the Maritime Provinces of Canada are reported. Eight species are added to the Nova Scotia fauna, two species to the New Brunswick fauna, and one species to that of Prince Edward Island. Four species, *Clypastrea fuscum* Harold, *Clypastrea lunata* (LeConte), *Rypobius marinus* LeConte, and *Gloeosoma hesperus* (Casey) are reported for the first time in Canada. The bionomics of the group and questions of their distribution in the Maritime Provinces are briefly discussed.

The Corylophidae (minute hooded beetles) are a group of small (0.5–1.8 mm) and relatively little-known beetles. The majority of corylophids feed on fungal spores and are found in decaying circumstances in a wide variety of habitats. Knowledge of fungal-host associations is still fragmentary, however some genera appear to feed on various Hypomycetes and Zygomycetes while others have associations with Ascomycetes or Basidiomycetes (Lawrence 1991; Bowstead and Leschen 2002).

Sixty-one species are known from North America (Marske and Ivie 2003), eleven of which have been reported in Canada (Campbell 1991). Knowledge of this group in the Maritime Provinces of Canada has been almost non-existent. Campbell (1991) reported only one species, *Clypastraea fasciata* (Say) from New Brunswick with none recorded from either Nova Scotia or Prince Edward Island.

As part of continuing efforts to document beetle biodiversity in the Maritime Provinces of Canada we examined specimens of this family collected in the region and report new records of Corylophidae.

Conventions

Abbreviations of collections referred to in this study are:

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, Ottawa, Ontario.
DHWC – David H. Webster Collection, Kentville, Nova Scotia.
JCC – Joyce Cook Collection, North Augusta, Ontario.

JOC – Jeffrey Ogden Collection, Truro, Nova Scotia.

NSMC – Nova Scotia Museum collection, Halifax, Nova Scotia.

NSNR – Nova Scotia Department of Natural Resources Insectary, Shubenacadie, Nova Scotia.

Where the number of individual specimens is not specified it is assumed to be one.

Results

A total of 89 specimens of Corylophidae from the aforementioned collections were examined and identified. Ten species were found to be present in the region, eight of which are newly recorded in Nova Scotia, two are newly recorded in New Brunswick, and one is newly recorded on Prince Edward Island (Table 1). One corylophid, *Sericoderus lateralis* (Gyllenhal), is an adventive Palearctic species; the other nine are native Nearctic ones. Four species, *Clypastrea fuscum* Harold, *Clypastrea lunata* (LeConte), *Rypobius marinus* LeConte, and *Gloeosoma hesperus* (Casey), are recorded herein for the first time in Canada.

To illustrate a finer level of detail with respect to the distribution of species, Nova Scotia has been partitioned (on a county-by-county basis) into smaller sub-regions. They are **Northern NS** (CU = Cumberland, CO = Colchester, PI = Pictou, and AT = Antigonish counties); **Cape Breton** (IN = Inverness, VI = Victoria, CB = Cape Breton, and RI = Richmond counties); **East Shore** (GU = Guysborough and HX = Halifax counties; SI = Sable Island); **South Shore** (LU = Lunenburg, QU = Queens, SH = Shelburne, and YA = Yarmouth counties); and **Bay of Fundy** (DI = Digby, AN = Annapolis, KI = Kings, and HA = 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 eco-districts within the region. Data from New Brunswick and Prince Edward Island is insufficient to warrant a similar treatment. Specific reports of taxa follow.

Corylophinae

Clypastrea fasciata (Say)

NEW BRUNSWICK: Kent County: Kouchibouquac National Park, 21 September 1977, J.M. Campbell, CNC.

Recorded in Canada from Ontario, Québec, and New Brunswick Campbell (1991); in the U.S.A. in Maine (Dearborn and Donahue 1993), New Hampshire (Chandler 2001), and from Massachusetts and Michigan south to Florida (Downie and Arnett 1996). The above record appears to be the source for the report of this species in New Brunswick in Campbell (1991). In Indiana taken from beneath the bark of locust (*Robinia* sp.) and by sifting debris from a beech (*Fagus grandifolia* Ehrh.) stump (Blatchley 1910). In Europe Bowstead (1999) records various species of *Clypastrea* as associated with fungal and moldy situations under the bark of dead trees and in rotten wood.

Clypastrea fuscum Harold

NOVA SCOTIA: Queens County: Kejimikujik National Park, 15 August 2001 & 5 September 2001, 2 specimens, B. Wright, NSMC.

Recorded New York and Michigan by Downie and Arnett (1996) who also list Québec as part this species' range. Laplante *et al.* (1991), however, which is a much more detailed compendium of the province's fauna, does not include it nor does Campbell (1991). Hence this specimen from Nova Scotia should be considered the first record of

Table 1. Maritime Provinces Corylophidae.

| New | County | NS | | | | | | | | | | | | | | | | | | | | | |
|-----|---|-------------|----|----|-------------|----|----|------------|----|----|-------------|----|----|--------------|----|----|----|----|----|----|----|-----|---|
| | | North Shore | | | Cape Breton | | | East Shore | | | South Shore | | | Bay of Fundy | | | | | | | | | |
| | | CU | CO | PI | AT | IN | VI | CB | RI | GU | HX | SI | LU | QU | SH | YA | DI | AN | KI | HA | NB | PEI | |
| | Corylophinae | | | | | | | | | | | | | | | | | | | | | | |
| | <u>Parmulini</u> | | | | | | | | | | | | | | | | | | | | | | |
| | <i>Clypastrea fasciata</i> (Say) | | | | | | | | | | | | | | | | | | | | | | 1 |
| 1 | <i>Clypastrea fuscum</i> Harold | | | | | | | | | | | | 1 | | | | | | | | | | |
| 1 | <i>Clypastrea lugubris</i> (LeConte) | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| 1 | <i>Clypastrea lunata</i> (LeConte) | | | | | | | | 1 | | | | | | | | | | | | | | |
| | <u>Sericoderini</u> | | | | | | | | | | | | | | | | | | | | | | |
| 1 | <i>Sericoderus lateralis</i> (Gyllenhal)† | | | | | | | | 1 | | | | | | | | | | | | | | 1 |
| | Orthoperinae | | | | | | | | | | | | | | | | | | | | | | |
| 1 | <i>Orthoperus suturalis</i> LeConte | | | | | | | | 1 | | | | | | | | | | | | | | 1 |
| 1 | <i>Orthoperus scutellaris</i> LeConte | | | | | | | | | 1 | | | | | | | | | | | | | 1 |
| | Rypobiinae | | | | | | | | | | | | | | | | | | | | | | |
| | <u>Rypobiini</u> | | | | | | | | | | | | | | | | | | | | | | |
| 1 | <i>Rypobius marinus</i> LeConte | | | | | | | | | | | | | | | | | | | | | | 1 |
| | <u>Gleosomatini</u> | | | | | | | | | | | | | | | | | | | | | | |
| 1 | <i>Gleosoma fuscicornis</i> (Casey) | | | | | | | | | | | | | | | | | | | | | | |
| 1 | <i>Gleosoma hesperus</i> (Casey) | | | | | | | | | | | | | | | | | | | | | | 1 |
| 9 | Total | 0 | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 1 | 0 | 4 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 3 | 1 |

† Adventive Palearctic species.

this species in Canada. In Nova Scotia brushed from the bark of trees in a deciduous (*Acer* spp., *Quercus rubra* L., and *Betula* spp.) forest.

***Clypastrea lugubris* (LeConte)**

NOVA SCOTIA: Colchester County: Masstown, 7 June 1990, T.D. Smith, NSNR; Debert, 19 June 1993, J. Ogden, NSNR; **Halifax County:** Antrim, 2 May 2005, J. Ogden, 2 specimens, NSNR; Upper Musquodoboit, 31 August 1999, J. Ogden, NSNR; **Pictou County:** Shepherders Junction, 15 June 2004, J. Ogden & N. Wood, NSNR.

Recorded in Canada from the Yukon east to Ontario Campbell (1991); in the U.S.A. from New York and Michigan (Downie and Arnett 1996). Newly recorded in Nova Scotia.

***Clypastrea lunata* (LeConte)**

NOVA SCOTIA: Guysborough County: Trafalgar, 19 July 1992, 2 specimens, S. & J. Peck, JCC; **Queens County:** Medway River, 13 July 1993, 3 specimens, J. & T. Cook, JCC.

Newly recorded in Nova Scotia and in Canada as a whole; in the U.S.A. recorded from Maine (Dearborn and Donahue 1993), New Hampshire, Massachusetts (Chandler 2001), Connecticut, New York, Indiana, Florida, and Missouri (Downie and Arnett 1996). Sikes (1998) also reports the species from Rhode Island. In Nova Scotia all specimens were collected in flight in the evening with a car net.

***Sericoderus lateralis* (Gyllenhal)**

NOVA SCOTIA: Cape Breton County: Sydney, 5 October 2003, C.W. D'Orsay, mixed forest, CBU; **Kings County:** Kentville, 10 August 2005, D.H. Webster, compost, DHWC; **Pictou County:** Lyons Brook, 26 August 2002, E. Georgeson, NSNR.

In Canada recorded from British Columbia and Québec (Campbell 1991); in the U.S.A. scattered records from Maine (Chandler 2001) and Massachusetts south to Florida and west to Washington (Downie and Arnett 1996). This is an adventive Palearctic species, which in Europe is broadly distributed across the continent (Freude *et al.* 1971). Bowstead and Leschen (2002) report that members of *Sericoderus* feed on Hypomycetes and Zygomycetes and can be found in bird and caterpillar nests. In Nova Scotia found feeding on moldy corncobs in a compost heap. In Europe it occurs, often in very large numbers, on moldy plant remains in warm places, especially garden compost and grass cuttings (Bowstead 1999).

This species was first reported in North America in Oregon in 1949 (as *Arthrolipsis decolor* (LeConte)) in the nest of a woodrat (Walters and Roth 1950). Meagre past collecting for this family makes it difficult to establish if this species has recently spread to the province or if it has existed undetected for some time. Newly recorded in Nova Scotia.

Orthoperinae

***Orthoperus suturalis* LeConte**

NEW BRUNSWICK: Albert County: Mary's Pt., 12 August 2004, sea shore, C.G. Majka, CGMC. **NOVA SCOTIA: Cape Breton County:** Sydney Tar ponds, 16–22 July 1996, P.A. Rankin, CBU; **Guysborough County:** George Lake, 15–30 June 1997, D.J. Bishop, NSMC; Malay Lake, 2–15 June 1997, D.J. Bishop, NSMC; **Halifax County:** Moser lake, 1–16 July 1997, D.J. Bishop, NSMC; **Hants County:** Little Armstrong Lake, 14 May–2 June 1997, D.J. Bishop, NSMC; Armstrong Lake, 2–15 June 1997, D.J. Bishop, NSMC; **Kings County:** Coldbrook, 30 June 2002, C.G. Majka, 3 specimens, CGMC; Kentville,

15 November 2002, D.H. Webster, DHWC; **Queens County:** Kejimikujik National Park, 15 August 2001, B. Wright, 2 specimens, NSMC; Alma Lake, 22 May 2003, P. Dollin, NSMC; **Yarmouth County:** Quinlan: Coldstream Rd., 19 July 1993, J. & T. Cook, JCC. **PRINCE EDWARD ISLAND: Queens County:** Pinette, 24 June 2003, C.G. Majka, 4 specimens, CGMC; Millvale: Trout River, 25 June 2003, C.G. Majka, 4 specimens, CGMC; Harrington, 25 July 2005, M.E.M Smith, ACPE.

In Canada recorded from Ontario (Campbell 1991); in the United States from New York, Michigan, and Florida (Downie and Arnett 1996). Newly recorded in Nova Scotia and Prince Edward Island. Collected from sphagnum bogs, red spruce (*Picea rubens* Sarg.) forests of all ages, and deciduous forests by sweep and car netting and with flight-intercept traps.

***Orthoperus scutellaris* LeConte**

NOVA SCOTIA: Digby County: Brier Island; Pond Cove, 22 June 2003, 24 June 2003, 26 July 2003, 28 July 2003, 10 August 2004, 15 September 2004, J. Ogden & K. Goodwin, 22 specimens, JOC; **Halifax County:** West Dover, 7 September 2003, C.G. Majka, CGMC; Sable Island, 12–28 July, 2004, Z. Lucas, NSMC.

Recorded in Canada from the Northwest Territories east to Saskatchewan (Campbell 1991); in the United States from New Hampshire (Chandler 2001), Massachusetts, New York, Indiana, and California (Downie and Arnett 1996). Newly recorded in Nova Scotia. A particularly noteworthy record is that from Sable Island on the continental shelf of Nova Scotia, 160 km from the nearest point of mainland. The specimen was collected on an oily porpoise skull. Klimaszewski *et al.* (2006) discuss mechanisms of invertebrate colonization to this remote site including dispersal along island bridges from glacial refugia on George's Bank, a mechanism that might be applicable to this species. In Europe some species of *Orthoperus* (e.g., *O. brunripes* (Gyllenhal) and *O. pilosiusculus* Jacquelin du Val) are regularly found in saline, coastal situations (Bowstead 1999) and all records of *O. scutellaris* in NS are from such habitats.

Rypobiinae

***Rypobius marinus* LeConte**

NEW BRUNSWICK: Albert County: Mary's Pt., 12 August 2004 & 21 August 2005, sandy beach, C.G. Majka, 2 specimens, CGMC.

Recorded from the Atlantic seaboard of the United States from New Hampshire (Chandler 2000), and Rhode Island south to Florida: found on ocean beaches (Downie and Arnett 1996). Newly recorded from Canada. The specimen was collected under beach drift material at the top of the littoral zone below sand dunes on an ocean beach. The locale and the suite of sympatric beach-drift Coleoptera are discussed in detail in Majka and Ogden (2006) and Klimaszewski and Majka (submitted). Pupedis (1997) found it very abundant in a salt marsh in Connecticut. In Europe all species of *Rypobius* are associated with mould at the base of plants. One species, *R. praetermissus* Bowstead, is tolerant of salinity and occurs mainly in salt marshes and at the edge of inland waters (Bowstead 1999).

***Gloeosoma fusicornis* (Casey)**

NOVA SCOTIA: Colchester County: Masstown, 7 September 2002, marshy swamp, 8 specimens, C.G. Majka, CGMC.

In Canada recorded from Ontario and Québec (Campbell 1991). Sikes (2003) reported it from Rhode Island. Specimens in Nova Scotia were collected by sweep-netting.

Newly recorded in Nova Scotia. Characteristically, records of species in this genus come from leaf litter or mould at the base of plants (Bowstead 1999).

Gloeosoma hesperus (Casey)

NOVA SCOTIA: Queens County: Kejimikujik National Park, 24 August–19 October 1994, 3 specimens, B. Wright, NSMC; Kejimikujik National Park, 26 July 1995, B. Wright, NSMC; Kejimikujik National Park, 15 August 2001, B. Wright, NSMC; Kejimikujik National Park, 5 September 2001, 2 specimens, B. Wright, NSMC.

In the United States reported from Indiana, Iowa, and Nebraska (Downie and Arnett 1996). Newly recorded in Canada. In NS brushed from the bark of trees in a deciduous forest (*Acer* spp., *Quercus rubra* L., and *Betula* spp.). In Indiana sifted from the debris of a beech (*Fagus grandifolia* Ehrh.) stump (Blatchley 1910).

Discussion

Although this account, which reports nine new species for the region, marks a substantial increase in the knowledge of this family in the Maritime Provinces of Canada, it should be evident that an adequate understanding of the corylophid fauna of the Maritimes is far from complete. There is very little data from New Brunswick and Prince Edward Island and even in Nova Scotia, where much more collecting has been carried out, distributional data is still very scant. There are eight counties in the province from which there are no records of Corylophidae and most other counties have records of only one or two species (Table 1).

Records of most corylophids are sparse and scattered. Only two species (*S. lateralis* and *O. suturalis*) have been collected on Cape Breton Island and one (*O. suturalis*) on Prince Edward Island, which may reflect an island-related diminution of species, a comparative lack of collection effort, or a combination of both: more extensive collecting is required to determine which may be the case.

Four species, *Clypastrea fuscum*, *Clypastrea lunata*, *Rypobius marinus*, and *Gloeosoma hesperus*, have been added to the Canadian fauna, however, the meagre past collecting effort for this family may mean that additional undetected species exist. Similarly, very little as yet is known about the bionomics of these species in the region. Their association with fungi may indicate that they play an important role in saproxylic or other environments of decay, but the nature of such relationships has yet to be discerned in detail.

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