

NEW RECORDS OF NATIVE AND INTRODUCED WEEVILS
(COLEOPTERA: CURCULIONIDAE) FOR NOVA SCOTIA FROM
CAPE BRETON ISLAND

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Abstract

Eleven species of weevils native to North America, *Acalyptus carpini* (Herbst), *Tachyerges ephippiatus* (Say), *Bagous transversus* LeConte, *Ceutorhynchus omissus* Fall, *Ceutorhynchus squamatus* LeConte, *Auleutes nebulosus* (LeConte), *Perigaster liturata* (Dietz), *Stethobaris ovata* (LeConte), *Carphonotus testaceus* Casey, *Rhyncolus brunneus* Mannerheim and *Pissodes fiskei* Hopkins, and seven species introduced to North America, *Sitophilus oryzae* (Linnaeus), *Sitophilus granarius* (Linnaeus), *Gymnetron pascuorum* (Gyllenhal), *Gymnetron tetrum* (Fabricius), *Tychius meliloti* Stephens, *Phyllobius oblongus* (Linnaeus), and *Polydrusus sericeus* (Schaller) are reported for the first time in Nova Scotia based on specimens from Cape Breton Island.

New records for native species reflect increased collecting and attention to the fauna of Nova Scotia. Historically, many introduced insects first established populations in North America in the Canadian Maritimes and in fact about 40% of the species listed in the most recent checklist of weevils are introduced. The introduced species new to Nova Scotia reported here apparently established populations elsewhere and subsequently expanded their ranges into Nova Scotia.

Weevils are one of the most speciose families of all living organisms. Understanding the biology of weevils begins with a basic knowledge of taxonomy and distribution. 'The Checklist of Beetles of Canada and Alaska' (Bousquet 1991) set the groundwork for broad scale distribution patterns of beetles, including weevils (McNamara 1991a), in Canada. This list records 91 species of weevils for Nova Scotia, including 35 that have been introduced to North America.

Historically there have been two foci for weevil collections on Cape Breton Island in northern Nova Scotia. One has been disturbed habitats around sea ports. Harrington (1891, 1894) collected beetles in these disturbed habitats in the 1880s. His collections

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included the introduced species *Barynotus schoenherrii* (Zetterstedt), and *Otiorhynchus rugifrons* (Gyllenhal) in the Sydney area of Cape Breton. Interest in the establishment and spread of introduced species led Brown (1940, 1950, 1967) to study introduced beetles at several locations in the Canadian Maritimes, including Sydney, from the 1940's to 1960's. The second focus has been natural habitats during a survey of the insects of Cape Breton Highlands National Park in the early 1980's (Lafontaine *et al.* 1987). We report on 18 species of weevils, seven introduced and 11 native, collected on Cape Breton Island, Nova Scotia, in both disturbed and relatively natural habitats, not included for Nova Scotia in McNamara (1991a).

Methods

Weevils (Curculionidae *sensu* Anderson (2002), excluding Scolytinae and Platypodinae) were acquired during general insect collecting, especially sweep netting, on Cape Breton Island beginning in 1991. The disturbed habitats in the Sydney and Glace Bay areas were a particular focus. Insects were collected with yellow pan traps in the highly disturbed habitats around the Sydney Tar Ponds in 1996 and 1997 and in mature Acadian hardwood forest (Davis and Browne 1996) in the Bornish Hills Reserve, Inverness County in 1995 and near Irish Cove, Richmond County in 1996. Most specimens are in the collection at the University College of Cape Breton with representative material also deposited with the Nova Scotia Museum of Natural History (NSMNH), Halifax and the Canadian Museum of Nature, Aylmer, Quebec (CMNC). The collections of the NSMNH and the Nova Scotia Department of Natural Resources, Shubenacadie, NS (NSDNR) were also checked for specimens from Cape Breton Island. Label data for all specimens are listed in the following format: county, location, date, collector, notes, and number of specimens if more than one. Specimens are listed alphabetically by county and then chronologically within county. Classification follows Anderson (2002). Since there are many recent changes in subfamily placement, the classification used in McNamara (1991a), if different, is included in parentheses following the classification of Anderson (2002).

Results

New records of native North American species:

Curculioninae, Acalyptini [Erirhinae, Derelomini]

Acalyptus carpini (Herbst)

Cape Breton, Georges River, 05 May 1998, McCorquodale, DB.

This is a widespread species, known from Yukon and British Columbia east to Quebec in Canada (McNamara 1991a). This is the first report from Atlantic Canada. Shrubs in the genus *Salix* are probably the host (Anderson 1997).

Curculioninae, Rhamphini [Rhynchaeninae]

Tachyerges ehippiatus (Say)

Cape Breton, Sydney, Sydney Tar Ponds, 03 June 1996, Hudson, LA.

Cape Breton, Sydney, Sydney Tar Ponds, 07 June 1996, Hudson, LA.

Cape Breton, Sydney, Sydney Tar Ponds, 07 June 1996, Rankin, PA, 3 specimens.

Cape Breton, Sydney, Sydney Tar Ponds, 07 June 1996, Musgrave, BL.

Cape Breton, Sydney, Sydney Tar Ponds, 19 June 1996, Rankin, PA, pan trap.

Cape Breton, Sydney, Sydney Tar Ponds, 24 June 1996, Hudson, LA.

Cape Breton, Sydney, Sydney Tar Ponds, 24 June 1996, Rankin, PA.

This is a widespread native species, known from British Columbia east to New Brunswick in Canada (McNamara 1991*a*). This species is associated with a variety of Salicaceae, primarily poplars and willows, upon which the larvae are probably leaf miners (Anderson 1989; Downie and Arnett 1996).

Bagoinae [Erirehinae, Bagoini]

Bagous transversus LeConte

Cape Breton, Sydney, 14 June 1996, Forbes, DW.

This is a widespread native species, known from British Columbia east to Quebec in Canada (McNamara 1991*a*). This is the first record for the Maritimes. Host plants for species in this genus include a variety of aquatic herbaceous plants (Anderson 2002).

Ceutorhynchinae, Ceutorhynchini

Ceutorhynchus omisus Fall

Cape Breton, Sydney, Tar Ponds, 06 June 1996, MacPherson, GR.

Cape Breton, Sydney, Tar Ponds, 07 June 1996, Musgrave, BL.

Cape Breton, Sydney, Tar Ponds, 08 June 1996, MacPherson, GR.

Cape Breton, Sydney, Tar Ponds, 09 June 1996, Musgrave, BL.

This native species is known from Alberta east to Quebec in Canada (McNamara 1991*a*). This is the first record for Atlantic Canada. Crucifers are the host plants (Anderson 1993).

Ceutorhynchus squamatus LeConte

Cape Breton, North Sydney, Munroe Park, 11 June 1996, McCorquodale, DB.

Known only from Ontario and Quebec in Canada (McNamara 1991*a*), this is the first Atlantic Canada record. The host plant is unknown, but is likely a crucifer like other species in the genus (Anderson 1993, 2002).

Ceutorhynchinae, Cnemogonini

Auleutes nebulosus (LeConte)

Cape Breton, Sydney, Tar Ponds, 07 June 1996, Rankin, PA.

Cape Breton, Sydney, Tar Ponds, 07–13 Jun 1996, Rankin, PA, pan trap.

Cape Breton, Sydney, Tar Ponds, 04 July 1996, Hudson, LA.

Cape Breton, Sydney, Tar Ponds, 04 July 1996, Rankin, PA.

Cape Breton, Sydney, Tar Ponds, 28 June–04 July 1996, Rankin, PA, pan trap.

A widespread native species, known from British Columbia east to New Brunswick in Canada. (McNamara 1991*a*). Host plants for many species in the genus are in the family Onagraceae (Anderson 1993).

Perigaster liturata (Dietz)

Cape Breton, Sydney, Tar Ponds, 22 July 1996, Hudson, LA.

This species is known from Ontario, Quebec and Newfoundland in Canada (McNamara 1991*a*) and also is associated with Onagraceae, specifically the genus *Ludwigia* (Anderson 1993).

Baridinae, Centrinini

Stethobaris ovata (LeConte)

Cape Breton, Sydney, Tar Ponds, 19 June 1995, Musgrave, BL.

Inverness County, Rear Estmere, 09 June 1996, MacMillan, JM.

In Canada there are only records from Ontario and Quebec (McNamara 1991*a*). Host plants for the genus are a variety of orchids (Brown 1966; Howden 1995; Anderson and Howden 2002).

Cossoninae, Rhyncholini

Carphonotus testaceus Casey

- Cape Breton, Sydney, 30 September 1992, MacKinnon, KJ.
- Cape Breton, Sydney, UCCB, 30 September 1992, MacLeod, A.
- Cape Breton, Sydney, UCCB, 30 September 1992, Gouthro, LA.
- Cape Breton, Glace Bay, 03 September 1995, Morrison, SSA.
- Cape Breton, Sydney, UCCB, 03 September 1997, McCorquodale, DB,
3 specimens.
- Richmond, Roberta, 19 May 1996, McCorquodale, DB, 2 specimens.

This species is widespread in North America, with records as close as Newfoundland and Quebec (McNamara 1991*a*). Larvae live under bark of spruce (Downie and Arnett 1996; Anderson 2002).

Rhyncolus brunneus Mannerheim

- Cape Breton, Northside East Bay, 14 June 1991, Slade, D.

This species is widespread in North America, known from Newfoundland west to Alaska (McNamara 1991*a*). It is not recorded from Nova Scotia in McNamara (1991*a*) although it is reported from northern Cape Breton in a survey of insects in the Cape Breton Highlands National Park (Lafontaine *et al.* 1987). Larvae of species in this genus are associated with dead wood of a wide variety of trees (Anderson 2002).

Molytinae, Pissodini [Pissodinae]

Pissodes fiskei Hopkins

- Richmond, Irish Cove, 08 July 1996, Hudson, LA.

This native species feeds on spruce (Downie and Arnett 1996) and is widespread in Canada from Yukon east to New Brunswick (McNamara 1991*a*).

New records of non-native species:

Dryophthorinae, Rhynchophorini [Rhyncophorinae, Sitophilini]

Sitophilus oryzae (Linnaeus)

- Cape Breton, Grand Mira North, 23 September 1995, Aucoin, KJ.

This cosmopolitan species is consistently associated with human habitations and agriculture. Known from British Columbia, Ontario, Quebec and Newfoundland (McNamara 1991*a*), this is the first report for the Maritimes. Future collecting will reveal whether this is an established population or just the interception of stray individuals.

Sitophilus granarius (Linnaeus)

- Inverness, Dunvegan, 06 September 1994, MacIssac, A. M. NSDNR.

This is another cosmopolitan species, associated with stored products. Known from British Columbia, Manitoba, Ontario, Quebec and Newfoundland (McNamara 1991*a*), this is the first report for the Maritimes. Future collecting will reveal whether this is an established population or just the interception of stray individuals.

Curculioninae, Mecinini [Gymnetrinae, Gymnetrini]*Gymnetron pascuorum* (Gyllenhal)

- Inverness, Margaree Valley, 13 July 1991, Slade, D.
 Inverness, Black River, 29 August 1995, Ogden, J. NSDNR.
 Inverness, Margaree Forks, 01 July 1996, McCorquodale, DB.
 Inverness, Scotsville, 01 July 1996, McCorquodale, DB.

This is another introduced species, known from British Columbia, Ontario and Quebec in Canada (McNamara 1991a). The host plant is the introduced *Plantago lanceolata* Linnaeus (Anderson 1973).

Gymnetron tetrum (Fabricius)

- Cape Breton, Georges River, 10 August 1997, McCorquodale, DB, 2 specimens.
 Inverness, Lake Ainslie, 23 July 1991, Slade, D, 2 specimens.

This introduced species feeds on the introduced plant, Mullein, *Verbascum thapsus* Linnaeus. The beetle is widespread in North America, including from British Columbia, Ontario and Quebec in Canada (McNamara 1991a).

Curculioninae, Tychiini [Tychiinae, Tychiini]*Tychius meliloti* Stephens

- Cape Breton, Glace Bay, GB Power Plant, 06 July 1994, Francis and Jessome, JM and V.
 Cape Breton, Sydney, Tar Ponds, 06 June 1995, Musgrave, BL, 2 specimens.
 Cape Breton, Sydney, Tar Ponds, 13 July 1995, Musgrave, BL.
 Cape Breton, Sydney, Tar Ponds, 03 June 1996, Hudson, LA.
 Cape Breton, Sydney, Tar Ponds, 24 June 1996, Hudson, LA, 3 specimens.
 Cape Breton, Sydney, Tar Ponds, 24 June 1996, Rankin, PA, 3 specimens.
 Cape Breton, Sydney, Tar Ponds, 25 June 1996, Rankin, PA.
 Cape Breton, Sydney, Tar Ponds, 26 July 1996, Hudson, LA, 3 specimens.
 Cape Breton, Sydney, Tar Ponds, 26 July 1996, Hudson, LA.
 Cape Breton, Sydney, Tar Ponds, 26 July 1996, Rankin, PA.
 Cape Breton, Sydney, Tar Ponds, 18–21 July 1995, Musgrave, BL.

This is a recently discovered introduced species with the first North American and Canadian records from Quebec, Ontario, Saskatchewan and Alberta (Anderson and Howden 1994). This species is associated with sweet clovers, *Melilotus* spp. (Anderson and Howden 1994).

Entiminae, Phyllobiini [Otiiorhynchinae, Phyllobini]*Phyllobius oblongus* (Linnaeus)

- Inverness, Lake Ainslie, 15 June 1994, Francis and Jessome, 2 specimens.
 Inverness, Stewartdale, Cemetery, 15 June 1994, Francis and Jessome, 2 specimens.
 Inverness, Blues Mills, 13 June 1995, Musgrave, BL, 3 specimens.
 Inverness, Blues Mills, 16 June 1995, Musgrave, BL, 2 specimens.
 Inverness, Bornish Hills, 16 June 1995, McCorquodale, DB.
 Inverness, Bornish Hills Reserve, 16 June 1995, Musgrave, BL.
 Inverness, Bornish Hills, 21 to 28 June 1995, Macpherson, GR, Pan Trap.
 Inverness, Scotsville, 1 July 1996, McCorquodale, DB.
 Inverness, Margaree Forks, 1 July 1996, McCorquodale, DB.
 Victoria, New Haven, 15 June 1994, Francis and Jessome.
 Victoria, Baddeck, 6 June 1999, Roach, SP.

This introduced species feeds on willow and poplar (Downie and Arnett 1996). Records from eastern Canada, including New Brunswick and Prince Edward Island are included in McNamara (1991a). Interestingly this species was collected in the relatively undisturbed natural areas in the Bornish Hills, but not in the more ruderal habitats in the Sydney area.

Entiminae, Polydrusini [Brachyderinae, Polydrosini]

Polydrusus sericeus (Schaller)

Cape Breton, Sydney, Central Garden Centre, 20 July 1998, Cormier, CM, 2 specimens.

Victoria, Wreck Cove Beach, 29 June 1996, McCorquodale, DB.

Victoria, Wreck Cove Beach, 30 June 1996, McCorquodale, DB.

This species was previously known from Ontario, Quebec and New Brunswick in Canada (McNamara 1991a). The host plants are willows (Downie and Arnett 1996). The similar congener, *Polydrusus impressifrons* (Gyllenhal) has been collected in several locations, across Nova Scotia, including the Sydney area.

Discussion

Two different approaches to documenting the beetle fauna of Nova Scotia have resulted in adding many more species to the provincial list in two relatively well-known families. Examination of specimens in collections added about 40% more species to the list of 51 species of Cerambycidae (McNamara 1991b), a family of well-known beetles important in forested ecosystems (McCorquodale and Bondrup-Nielsen 2004). Here, collecting in one region of the province has added about 15% more species to the list of 91 weevils recorded in Nova Scotia (McNamara 1991a). In contrast, collecting and identifying Carabidae from the same locations as weevils were collected, has resulted in only one new record (McCorquodale 2000) to the 244 species recorded (Bousquet 1991). The difference reflects the level of interest and expertise in understanding the distribution and natural history of these groups in eastern Canada.

Almost 40% of species of weevils recorded for Nova Scotia (35 of 91) in the recent checklist are introduced (McNamara 1991a). A similar proportion, seven of 18, added to the list here are introduced. Historically seaports in eastern Canada were important locations for the initial introduction of European species (Harrington 1894; Brown 1940, 1950, 1967). Introduced species have attracted more attention recently because of the potential for invasion of natural communities and economic effects on agriculture and forestry (Wheeler 1999; Simberloff 1989; Haack *et al.* 1997). To be able to recognize quickly and react with appropriate management strategies it is crucial to be able to recognize recently introduced species. A key to quick recognition is to have a reservoir of expertise and well curated collections to enable people to recognize both the naturally occurring native species and established introduced species. Then it is more likely that recent introductions will be noticed.

Most introduced species are restricted to disturbed habitats. Therefore it is not unexpected to see a new record for such introduced species, for example *Tychius meliloti*, from the extremely disturbed habitats around the Sydney Tar Ponds. More unexpected is the occurrence of an introduced species in more natural habitats, particularly *Phyllobius oblongus* collected in the mature mixed forest of a protected area, the Bornish Hills Nature Reserve. Similarly unexpected was the diversity of native species found in the disturbed areas in Sydney. Five of the new records of native species came from the Sydney Tar Ponds (*Tachyerges ephippiatus*, *Ceutorhynchus omissus*, *Auletes nebulosus*, *Perigaster liturata*, *Stethobaris ovata*). This is likely the result of focused collecting. Presumably focused collecting in other disturbed habitats

and most importantly in natural habitats would result in many more additions to the weevil fauna of the province.

Because of our limited understanding of the distribution of weevils in Nova Scotia, it is impossible to tell if we are dealing with recent range extensions of the native species reported here. Most likely they have just been poorly collected and therefore remained undetected. As the identified material is deposited in the small regional collections in Nova Scotia, the expertise and ability to recognize native species and recognize the arrival of new introductions will increase. Given the number of new species recorded here based on collecting in one region of the province, undoubtedly attention to other areas and to the unidentified specimens in the regional collections will result in many more species of weevils being found in the province.

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