

Early records of alien species of Heteroptera (Hemiptera: Prosorrhyncha) in Canada

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ABSTRACT

Early records for 45 alien species of Heteroptera in the provinces across Canada are reported. Nine of the records constitute new provincial records, with 69 others documenting published records of occurrence in detail for the first time. There are also 51 reported occurrences in provinces prior to published literature records.

INTRODUCTION

Many alien Heteroptera have become important agricultural crop pests in Canada (Beirne 1972), and more can be expected. The potential invasion appears greatest for those bug species that either overwinter as adults, or oviposit in plant tissue (Lattin and Oman 1983).

Research has thus been initiated on the origins, distribution patterns, pathways of spread, and ecological impact of alien Heteroptera in Canada (Scudder and Footitt 2000). It is important to understand not only the history of alien species occurrence and impact in the past, but also to undertake future pest risk assessment and the potential effects of impending climate change. New evidence suggests that invasive species share traits that will allow them to capitalize on the various elements of the forthcoming global change (Dukes and Mooney 1999).

Hence, over the past few years, most of the major collections of insects across Canada have been visited, specimens of alien species of Heteroptera examined and named, the capture information databased and the locality data georeferenced. These data have been combined with published records to document the distribution of species in Canada, their probable place of introduction, and their subsequent dispersal.

In the process, many new provincial records were discovered. Most of these have been tabulated by Maw *et al.* (2000), but the voucher data for these records have not been published. For 45 of the total 79 alien Heteroptera in Canada, we thus document 9 new provincial records (indicated by an asterisk) that are not included in Maw *et al.* (2000), plus 69 others that document published records of occurrence in detail for the first time. We cite only the earliest records for the provinces.

Our research on collections also shows that some of the alien species have been collected in provinces earlier than published records currently indicate. Since early records are important for tracing the spread of these species, we document also 51 reported occurrences prior to the literature records.

The order of species in the text follows Maw *et al.* (2000). Provinces (by acronym) are arranged in alphabetical order.

Collection abbreviations are as follows:

- CNC: Canadian National Collection, Agriculture and Agri-Food, Ottawa, ON.
 FRNF: Department of Forest Resources and Lands, Corner Brook, NF.
 LEMQ: Lyman Entomological Museum, Macdonald College, McGill University, Ste-Anne-de-Bellevue, QC.
 MU: Department of Biology, Memorial University, St. John's, NF.
 NSM: Nova Scotia Museum, Halifax, NS.
 ROM: Royal Ontario Museum, Toronto, ON.
 UBC: Spencer Entomological Museum, University of British Columbia, Vancouver, BC.
 UG: Department of Environmental Biology, University of Guelph, Guelph, ON.
 USNM: National Museum of Natural History, Smithsonian Institution, Washington, DC.

Infraorder CIMICOMORPHA

Family ANTHOCORIDAE

Anthocoris confusus Reuter

NS: Kentville, 15-17.vii.1966 (L.A. Kelton) [CNC]. Reported from Nova Scotia without date by Kelton (1978).

Orius minutus (Linnaeus)

BC: Abbotsford, 7.ix.1950 [CNC]. Previously reported from British Columbia in 1951 by Tonks (1953) and Downes (1957).

Family MIRIDAE

Tribe MIRINI

Adelphocoris lineolatus (Goeze)

AB: Elkwater Park, 28.vii.1952 (L.A. Konotopetz) [CNC]. BC: no data, 1964 (J.R. Hill) [LEMQ]. ON: Vineland Station, 1.ix.1942 (W.L. Putman) [CNC]. PE: Wood Island, 9.viii.1929 (R.P. Gorham) [CNC]. QC: Mont Royal, 26.viii.1944 [LEMQ]. Recorded from Alberta in 1968 (Craig 1971), Ontario in 1949 (Phillips 1951) and Quebec (Moore 1950; Larochelle 1984) without dates.

Camptozygum aequale (Villers)

QC: Saint-Antoine-Abbé, 3.vi.1983 (Larochelle & Larivière) [LEMQ].

Capsus ater (Linnaeus)

NB: Nashwaak Bridge, 22.vi.1934 (C.E. Atwood) [ROM]. PE: Woods Island, 11.vii.1966 (L.A. Kelton) [CNC]. Kelton collected this species at 9 localities throughout New Brunswick in late June to early July of 1966.

Closterotomus norwegicus (Gmelin)

BC: Royal Oak, 24.vii.1917 (W. Downes) [CNC]. NB: Fredericton, 22.viii.1940 (R.P. Gorham) [CNC]. PE: Brackley Beach, 24.vii.1940 (J. McDunnough) [CNC]. Recorded from British Columbia (Kelton 1959) and Prince Edward Island (Kelton 1982a) without dates.

Phytocoris populi (Linnaeus)

*MB: Bald Head Hills (20.9 km (13 mi) n of Glenboro), 8.viii.1958 (J.G. Chillcott) [CNC]. NS: Halifax, 7-8.viii.1966 (L.A. Kelton) [CNC]. *ON: Gull L., 6.viii.1918 (H.S. Parish) [CNC].

Phytocoris tiliae (Fabricius)

NS: Halifax, 7-8.viii.1966 (L.A. Kelton) [CNC].

Stenotus binotatus (Fabricius)

MB: Falcon Lake, 25.vi.1972 (L.A. Kelton) [CNC]. *NS*: Kings Co., 15.vii.1948 (Ralph J. Day) [NSM]. *ON*: Trenton, 26.vi.1911 (Evans) [CNC]. *PE*: Cavendish National Park, 9.vii.1966 (L.A. Kelton) [CNC]. *QC*: Aylmer, 27.vi.1924 (C.H. Curran) [CNC]. Recorded from Ontario by Gibson (1912) without year, and Manitoba (Kelton 1980), Ontario and Quebec (Carvalho 1959) without dates.

Tribe STENODEMINI

Leptopterna dolabrata (Linnaeus)

**AB*: Highwood River Picnic Area, Hwy. 541, 24.vii.1994 (M.D. Schwartz) [CNC]. *MB*: Moose Lake, 25.vi.1972 (L.A. Kelton) [CNC]. *NS*: Halifax, 1899 [CNC]. Osborn (1918) and Parshley (1923) recorded specimens from Nova Scotia collected in 1915; recorded from Manitoba (Kelton 1980) without dates.

Megaloceroea recticornis (Geoffroy)

**AB*: Waterton Park, 3.viii.1994 (M.D. Schwartz) [CNC]. *NB*: Fredericton, 23.vi.1966 (L.A. Kelton) [CNC]. *NS*: Bible Hill, 12.vii.1966 (L.A. Kelton) [CNC]. *PE*: Cavendish National Park, 9.vii.1966 (L.A. Kelton) [CNC]. *QC*: North Hatley, 25.vii.1929 (G.S. Walley) [CNC]. Recorded from Quebec by Larochelle (1984) without date, and Wheeler and Henry (1992) recorded collections from Nova Scotia in 1971.

Pithanus maerkeli ((Herrich-Schaeffer)

AB: Elkwater, 16.vii.1952 (A.R. Brooks) [CNC]. *NB*: Fundy National Park, 6.vii.1966 (L.A. Kelton) [CNC]. *ON*: Rondeau Park, 13.vi.1929 (G.S. Walley) [CNC]. *PE*: Cavendish National Park, 9.vii.1966 (L.A. Kelton) [CNC]. *QC*: Laniel, 10-11.vii.1963 (L.A. Kelton) [CNC]. Previously recorded from Alberta, New Brunswick, Ontario, Prince Edward Island and Quebec, but without dates (Kelton 1966).

Subfamily ORTHOTYLINAE

Tribe HALTICINI

Halticus apterus (Linnaeus)

NB: Fredericton, 192[9?] [CNC]. *NF*: Pasadena, 24.viii-3.ix.1985 (B. 4820) [CNC; FRNF]. *PE*: Rustico, 4.viii.1966 (L.A. Kelton) [CNC].

Orthocephalus coriaceus (Fabricius)

BC: Galiano Island (north end), 1.vii.1976 (G.G.E. Scudder) [UBC]. *NB*: Woodstock, 22.vi.1966 (L.A. Kelton) [CNC]. *NF*: Baie D'Espoir, low vegetation in field, 11.vii.1985 (L.H. Hollett) [FRNF]. *NS*: Lockeport, 2.viii.1958 (J.R. Vockeroth) [CNC]. *ON*: Niagara Falls, 7.vii.1955 (L.A. Kelton) [CNC]. *PE*: Cavendish National Park, 9.vii.1966 (L.A. Kelton) [CNC]. *QC*: Georgeville, 27.vi.1936 (G.S. Walley) [CNC]. Reported in 1973 from Ontario (Reid *et al.* 1976). Kelton collected this species from 9 localities throughout New Brunswick in late June 1966.

Orthocephalus saltator (Hahn)

NF: Carbonear, 2.viii.1925 (J.M. Swaine) [CNC]. *QC*: L'Anse-Pleureuse, 29.vii.1984 (Larochelle & Larivière) [LEMQ].

Tribe ORTHOTYLINI

Blepharidopterus angulatus (Fallén)

NB: Saint John (Rockwood Park), 4.viii.1954 (J.F. Brimley) [CNC]. *NF*: Pasadena, 18.viii.1984 (D. Langor) [FRNF]. *PE*: Cavendish National Park, 3-5.vii.1966 (L.A. Kelton) [CNC]. Reported from Prince Edward Island without date (Kelton 1982a).

Heterotoma planicornis (Pallas)

BC: Victoria, 6.viii.1923 (W. Downes) [CNC]. *NS*: Halifax, 10.viii.1980 (L.A. Kelton) [CNC]. Recorded from British Columbia in 1933 (Downes 1957), and Nova Scotia without date (Kelton 1982a).

Melanotrichus concolor (Kirschbaum)

NS: Shelburne, 2.viii.1958 (J.R. Vockeroth) [CNC].

Melanotrichus flavosparsus (Sahlberg)

AB: Manyberries (Experimental Range), 4.viii.1951 (D.F. Hardwick) [CNC]. *BC*: Vernon, 22.ix.1923 (D.G. Gillespie) [CNC]. *MB*: Aweme, 19.vi.1930 (R.M. White) [CNC]. *NB*: Fredericton (Experimental Station), 18.vi.1925 [CNC]. *NT*: Fort Simpson, 19.vi.1950 (D.P. Whillans) [CNC]. *ON*: Trenton, 16.ix.1903 (Evans) [CNC]. *PE*: Cavendish National Park, 9.vii.1966 (L.A. Kelton) [CNC]. *SK*: Estevan, 27.viii.1929 (P.C. Brown) [CNC]. Previously reported from Ontario in 1914 (Gibson 1917), and Alberta, Manitoba and Saskatchewan (Kelton 1980) without dates.

Melanotrichus virescens (Douglas & Scott)

NS: Shelburne, 2.viii.1958 (J.R. Vockeroth) [CNC].

Orthotylus nassatus (Fabricius)

ON: Niagara, 25.vii.1963 (L.A. Kelton) [CNC].

Subfamily PHYLINAE

Tribe PHYLINI

Amblytulus nasutus (Kirshbaum)

BC: Saanich District, 6.vii.1950 (B.P. Beirne) [CNC]. *ON*: Marmora, 13.vi.1952 (J.C. Mitchell) [CNC].

Asciodema obsoletum (Fieber)

BC: Vancouver (UBC), 6.vii.1959 (G.G.E. Scudder) [UBC]. Recorded from British Columbia in 1963 (Waloff 1966).

Atractotomus magnicornis (Fallén)

NF: St. John's, 2.x.1980 (D. Northcott) [MU]. *NS*: Halifax, 22.vii.1976 (L.A. Kelton) [CNC]. *ON*: Aldershot, 6.vii.1955 (L.A. Kelton) [CNC].

Atractotomus mali (Meyer-Dür)

BC: Oliver, 19.vii.1970 (L.A. Kelton) [CNC]. *PE*: Charlottetown, 7-10.viii.1976 (L.A. Kelton) [CNC]. Reported from Prince Edward Island without date by Kelton (1982a).

Campylomma verbasci (Meyer-Dür)

NS: Kentville, 19.vii.1923 (R.P. Gorham) [CNC]. *ON*: Jordan, 27.viii.1915 (W.A. Ross) [UG]. *PE*: Dalvay House, 13.viii.1940 (G.S. Walley) [CNC]. Previously reported from Ontario in 1950 (Phillips 1951) and Nova Scotia in 1931 by Gilliatt (1935).

Compsidolon salicellum (Herrich-Schaeffer)

ON: Presque Isle Provincial Park, 14.viii.1991 (M.D. Schwartz) [CNC]. *PE*: Burlington, 4.viii.1966 (L.A. Kelton) [CNC]. Previously recorded from Prince Edward Island in 1976 by Kelton (1982b).

Lepidargyrus ancorifer (Fieber)

BC: Langley, 17.vii.1959 (L.A. Kelton) [CNC]. *ON*: Rainy River District, 30.vi.1924 (J.F. Brimley) [CNC].

Lopus decolor (Fallén)

BC: Saltspring Island, 30.vii.1981 (G.G.E. Scudder) [UBC]. *NB*: Fredericton, 192[9?] [CNC]. *NF*: Pasadena, 3.vii.1984 (D. Langor) [FRNF]. *ON*: Norway Point (Lake of Bays), 15.vii.1922 (J. McDunnough) [CNC]. *PE*: Brackley Beach, 29.vii.1940 (G.S. Walley) [CNC]. Recorded from Ontario (Carvalho 1958) without date.

Megalocoleus molliculus (Fallén)

NB: Grey Mills [?=Grey Hills], 13.vii.1921 (R.P. G[orham]) [CNC]. *NF*: Silverdale, 31.vii.1980 (L.A. Kelton) [CNC]. *NS*: Parrsboro (Ottawa House), 9.viii.1943 (J. McDunnough) [CNC]. *ON*: Strathroy, 12.vii.1936 [CNC]. *PE*: Wood Island, ix.1929 [CNC]. *QC*: Forestville, 8.viii.1950 (R. de Ruelle) [CNC]. Previously recorded from Ontario in 1972 by Reid *et al.* (1976), Nova Scotia in 1967 by Wheeler and Henry (1992) and Quebec (Larochelle 1984) without date.

Parapsallus vitellinus (Scholtz)

**NS*: Kentville, 3-6.vii.1976 (L.A. Kelton) [CNC]. *ON*: Saint Catharines, 22.vi.1961 (Kelton & Brumpton) [CNC]. Previously recorded from Ontario in 1978 (Henry and Wheeler 1979).

Plagiognathus arbustorum (Fabricius)

BC: Lulu Is., 23.viii.1954 (W. Downes) [UBC]. *NF*: St. John's, Pippy Park, 14.ix.1982 [FRNF]. Previously recorded from British Columbia in 1959 (Kelton 1982c) and 1963 (Waloff 1966).

Plagiognathus chrysanthemi (Wolff)

**AB*: Waterton Park, 3.viii.1994 (M.D. Schwartz) [CNC]. *BC*: Creston, 7.viii.1948 (D.B. Waddell) [CNC]. *NB*: Fredericton, 1.viii.1919 (R.P. Gorham) [CNC]. *NF*: Carbonear, 2.viii.1925 (J.M. Swaine) [CNC]. **SK*: Melville 5 km E, Rt. 16, 18.vii.1990 (M.D. Schwartz) [CNC]. Previously reported from British Columbia in 1951 (Tonks 1953), Newfoundland in 1949 (Lindberg 1958), and New Brunswick (Kelton 1982a) without date.

Sthenarus rotermundi (Scholtz)

**QC*: St-Jean-Baptiste[-de-]Rouville, 22.vi.1992 (J. F. Roch) [CNC].

Tribe PILOPHORINI

Pilophorus perplexus Douglas & Scott

BC: Victoria, 3.viii.1927 (W. Downes) [UBC]. *ON*: Guelph, 15.vii.1916 [CNC; UG]. *PE*: Cavendish, 13-19.viii.1976 (L.A. Kelton) [CNC]. Reported from Ontario by Knight (1941) and from Ontario and Prince Edward Island by Schuh and Schwartz (1988) without dates.

Family TINGIDAE

Dictyla echii (Schrank)

QC: Mont Royal, ex. *Echium vulgare* L., 14.vii.1997 (J.F.R.) [CNC; USNM].

Dictynota fuliginosa Costa

BC: Victoria, 29.vii.1957 (N.H. Anderson) [CNC]. Previously reported from British Columbia in 1959 (Scudder 1960).

Stephanitis rhododendri Horváth

NB: Saint John (Rockwood Park), 12.viii.1953 (J.F. Brimley) [CNC]. *NF*: Miguels Lake, 28.ix.1983 (L.H. Hollett) [CNC]. *ON*: Vineland Station, 16.vii.1963 (W.L. Putnam) [CNC]. *QC*: Mount Lyall, 12.viii.1933 (W.J. Brown) [CNC].

Family REDUVIIDAE

Empicoris pilosus (Fieber)

NS: Halifax, 22.vii.1976 (L.A. Kelton) [CNC]. *ON*: DeGrassi Point, 14.viii.1915 (E.M. Walker) [ROM]. *QC*: Brome, 9.vi.1948 (G.S. Walley) [CNC].

Empicoris vagabundus (Linnaeus)

NF: Crooked Lake, 19.viii.1984 (L.H. Hollett) [CNC]. *NS*: Halifax, 8.viii.1966 (L.A. Kelton) [CNC]. *ON*: Prince Edward County, 1.viii.1940 (J.F. Brimley) [CNC]. *PE*: Rustico, 4.viii.1966 (L.A. Kelton) [CNC]. *QC*: Québec, 24.viii.1959 (A.E. Strasby) [CNC].

Family BERYTIDAE

Berytinus minor (Herrich-Schaeffer)

QC: Ste-Anne-de-Bellevue, 24.v.1947 (G.A. Moore) [LEMQ]. Previously reported in Quebec without date (Moore 1950).

Family RHYPAROCHROMIDAE

Megalonotus sabulicola (Thomson)

ON: Prince Edward County, 9.v.1965 (J.F. Brimley) [CNC].

Stygnocoris rusticus (Fallén)

AB: Millet, 11.viii.1993 (A.S. McClay) [CNC]. **NB*: Saint Andrews, 30.ix.1984 (G.G.E. Scudder) [CNC]. *NF*: St. John's, Long Pond, 12.viii.1977 (D. Larson) [CNC]. *QC*: Mont Royal, 27.viii.1907 [CNC]. Previously reported from Quebec in 1916 (Criddle 1922).

Stygnocoris sabulosus (Schilling)

AB: Brocket, 19 km N, 49°43'N 113°45'W, 1410 m, pan trap, 10-14.viii.1998 (K. White) [CNC]. *NB*: Fredericton, 30.viii.1949 (D.G. Cameron) [CNC]. *ON*: Guelph, 10.ix.1971 (C.D. Rollo) [UG]. *PE*: Charlottetown, 7-10.viii.1976 (L.A. Kelton) [CNC].

Family PENTATOMIDAE

Picromerus bidens (Linnaeus)

NB: Kouchibouguac National Park, 21.vii.1977 (S.J. Miller) [CNC]. *NS*: Amherst Shore, 11.viii.1980 (J. Gilhen) [NSM]. *ON*: York Co., Whitechurch, 8.viii.1974 (Antonucci) [ROM]. *PE*: Charlottetown, 7-10.viii.1976 (L.A. Kelton) [CNC]. Reported from New Brunswick, Nova Scotia, Ontario and Prince Edward Island (Larivière and Larochelle 1989) without dates, but recorded from Quebec in 1968 by Kelton (1972).

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