Eight species of *Hylaeus* Fabricius are reported from Ontario: *H. affinis* (Smith), *H. annulatus* (Linnaeus), *H. basalis* (Smith), *H. bisinuatus* Forster, *H. mesillae* (Cockerell), *H. modestus* Say, *H. verticalis* (Cresson), and for the first time recorded for Canada, *H. nelumbonis* (Robertson). Five additional species, *H. fedorica* (Cockerell), *H. hyalinatus* Smith, *H. saniculae* (Robertson), *H. sparsus* (Cresson), and *H. rudbeckiae* (Cockerell & Casad) have also been reported in the researched area, but were not found in the collections examined. The *Hylaeus* flight period in Ontario starts in May and continues until the last warm days in autumn. Identification keys for male and female *Hylaeus* reported for Ontario are provided, in addition to information on phenology and locality records.

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Introduction

There has been no comprehensive study of *Hylaeus* Fabricius (Colletidae) in Ontario, but separate records of species found in the province are scattered in the literature (Fye 1965; MacKay and Knerer 1979; Mitchell 1960; Usui 1994). As a result of studying this group of bees at the largest collections of eastern Canada, knowledge about the distributional ranges of discussed species has been considerably expanded. The material examined yielded eight *Hylaeus* species from Ontario. At least five more species are likely present in the province. Three of these have been recorded in the literature from Ontario: *H. saniculae* (Robertson) (Mitchell 1960; Snelling 1970; Hurd 1979), *H. rudbeckiae* (Cockerell & Casad) (Mitchell 1960), *H. hyalinatus* Smith (Buck et al. 2005). In addition, *H. fedorica* (Cockerell) has been recorded from “Canada” (Metz 1911, as *H. grossicorne*). Finally, *H. sparsus* (Cresson) has been recorded “from southeastern Canada” (Snelling 1968). The first annotated list of Ontario *Hylaeus* is presented herein, with distribution maps compiled from studied specimens, and identification keys to the species for both males and females.
Materials and Methods

All specimens examined are deposited in the entomological collections of the Royal Ontario Museum (ROME), University of Guelph (DEBU), Canadian National Collection of Insects (CNCI), University of Manitoba (EDUM), University of California (UCRC), and North Carolina State University (NCSU). Wooden trap nests were also used by the author to obtain additional material (Krombein 1967). Species morphological characteristics, flight periods, and distribution data are based on specimens from these collections. Since I have not examined any specimens of the additional species recorded for Ontario, the characters given for them in the keys are taken from published descriptions or rely on examined specimens from other regions (Ascher 2001; Metz 1911; Mitchell 1960; Osychnyuk 1978). The distributional data are presented in the form of an annotated list and are illustrated with maps. The locality records in the annotated lists are arranged from north to south according to Ontario’s primary administrative divisions, but the terms “county”, “district”, etc., are omitted. Distribution records from outside Ontario are given according to studied collections and literature records (Ascher 2001; Buck et al. 2005; Dathe 1994; Hurd 1979; Metz 1911; Mitchell 1960; Snelling 1966 a,b, 1968, 1970). The morphological terms used in this paper were defined and illustrated by Michener (1944, 2000). The abbreviations are as follows: F—flagellar segment, T—metasomal tergum, S—metasomal sternum. An asterisk designates a species record new for Ontario (and Canada). More than 2500 specimens were identified using Metz (1911) and Mitchell (1960). All existing determinations in the studied collections were checked.

Genus Hylaeus Fabricius

Ontario bees of the genus Hylaeus are distinguished from other members of the provincial bee fauna by the following combination of characters: small to medium size (4-9 mm); integument black, shiny, without noticeable pubescence; head, pronotum, tegulae, and legs usually with yellow markings, which are more extensive in males; scopa absent.

Like other Holarctic Colletidae, Hylaeus are defined by their short, truncate, bilobed glossa, and subantennal suture meeting the antennal socket at its inner side. The flight period extends from May until the last warm autumn days.

Many Hylaeus species nest in hollow dead stems, others use different pre-existing cavities (in wood, ground, etc.). Nest cells are made of cellophane-like secretion. Although females have no scopa, pollen and nectar are carried in the crop. Provisions in cells are liquid, and the egg floats on the surface of the provisions. Polylectic.

Key to Hylaeus species of Ontario

The brief species descriptions that follow the dashes in the couplets refer only to the most distinctive characteristics for the particular species. Some frequently encountered synonyms are given in brackets following the species name in the key. Distributional and flight period data are included in the male key. Only males generally can be identified with
confidence; the identification of females is often tentative except for a few species (Metz
1911; Mitchell 1960).

**Males.** Clypeus always yellow. Antennae with 13 segments. Scape modified or not.

1. Mesepisternum with lamelliform carina between anterior and lateral faces. —S8
   spatulate, protrudes conspicuously from genital opening in combination with long
   slender gonostyli that extend far beyond apices of penis valves. T1 with white hair
   fringes laterally on posterior margin. Malar area as long as basal mandibular width.
   Body length 5-6 mm. Ontario: June–August. —Palearctic. New York …………………..
   ...........................................................................................................................................*H. hyalinatus* Smith
   – Mesepisternum without lamelliform carina ………………………………………………………..2
2. Front coxae angulate or toothed laterally. —Genal area not shorter than eye
   width. Scape maculated. Paraocular yellow markings abruptly truncate at level
   of antennae. Body length 6 mm. —Québec, New York, Michigan to Georgia,
   Texas………………...................................................*H. sparsus* (Cresson)
   – Front coxae simple …………………………………………………………………………………..3
3. S3 with central swellings. T1 with white hair fringes laterally on posterior margin
   …………………………………………………………………………………………………………………4
   – S3 without swellings. T1 with or without hair fringes on posterior margin ……….5
4. Scape transverse, wider than long, outer half yellow. S2 with swellings. —Labrum
   and mandibles black. Supraclypeal area longer than half clypeal length. Antennal
   sockets surrounded with elevation. Genal area as wide as eye at its widest part.
   Pronotum and tegulae without yellow markings. T1 tessellate, with uniformly
   close, shallow, minute punctures. Body length 8-9 mm. Ontario: June–August. —
   Transcontinental (alpine in southern part of distribution) ………….*H. basalis* (Smith)
   – Scape longer than wide, curved, yellow antero-laterally. S2 without swellings. —
   Labrum and mandibles on inner margins yellow. Supraclypeal area not longer than
   half clypeal length. Paraocular yellow marking with inner angle extending beyond
   upper margin of antennal socket. Genal area narrower than eye width. Pronotal
   collar, pronotal lobes, and tegulae with yellow marks. T1 tessellate, with uniformly
   dense, shallow, minute punctures. Body length 4.5-6 mm. Ontario: June–September.
   —From British Columbia to Eastern Canada, south to Utah, Louisiana, Mississippi,
   Georgia ………………………………………………………………………………………………………..*H. affinis* (Smith) (*Prosopis ziziae*
   Robertson)
5. Scape heart-shaped, with outer half yellow. —Paraocular yellow patches apically
   truncate, reaching upper edge of antennal sockets at middle. Labrum and mandibles
   without yellow markings. Supraclypeal area longer than half clypeal length. Genal
   area wider than half width of eye. F1 short, transverse; F2 longer than F1, transverse.
   Pronotal lobes with yellow markings, pronotal collar and tegulae without yellow
   markings. Mesepisternum with deep, dense punctures less than diameter apart.
   T1 without lateral hair fringes, tessellate, with evenly dispersed, minute, shallow
   punctures. Body length 5-6 mm. Ontario: May–August. —Holarctic, south to
   Georgia ………………………………………………………………………………………………………………………….*H. annulatus* (Linnaeus) (*H. ellipticus* Kirby)
   – Scape parallel-sided or completely black ……………………………………………………………6
6. T1 with lateral white hair fringes on posterior margin. Scape without yellow marking

7. T1 without hair fringes on posterior margin. Scape with or without yellow marking

8. Paraocular yellow markings extending along inner eye margins. Supraclypeal area shorter than half clypeal length. Frons without impunctate spaces above antennal sockets. —Scape curved. Mandibles and labrum black to completely yellow. Genal area wider than half width of eye. Pronotal lobes and usually pronotal collar marked with yellow. Scutum and mesepisternum with punctures well separated, mostly diameter or more apart. T1 with dense fine punctures. Body length 4-6 mm. Ontario: May–September. —Alaska, transcontinental to California …………H. modestus Say

9. Supraclypeal area longer than half clypeal length. F1 as long as wide. —Scape and pronotal collar without yellow markings. F1 shorter than F2. Malar area flat, 3 times as wide as long. Genal area wider than half width of eye (4/5). Paraocular yellow markings narrowly round apically, terminated above antennal sockets. Pronotal lobes and tegulae with yellow markings. Mesepisternum shiny, with deep punctures less than diameter apart. T1 ferruginous, disk shiny, with punctures very sparse and obscure. S3 with slight central elevation. Body length 7 mm. —Ontario, Illinois, Ohio, south to Louisiana, Alabama, Florida ……..........................*H. nelumbonis* (Robertson)

10. Supraclypeal area longer than half clypeal length. F1 transverse

11. Mesepisternum shiny, tessellate, with deep punctures a diameter or less apart. Paraocular areas elevated apically at antennal sockets. Face with depressions above paraocular areas. —Scape and pronotum without yellow markings. F1 and F2 much shorter than wide, F3 slightly transverse. Propodeum with long basal area wrinkled. Body length 3.5-4 mm. —Ontario, Nova Scotia, to Minnesota, Tennessee, Georgia ……..........................H. saniculae (Robertson)
Bees of the genus *Hylaeus* of Ontario

**Females.** Clypeus black, rarely yellow apically. Antennae with 12 segments. Scape not modified. Separation of *H. modestus* and *H. affinis*, as well as *H. mesillae* and *H. rudbeckiae* is doubtful.

1. Mesepisternum with lamelliform carina between anterior and lateral faces. —Malar area not shorter than half basal mandibular width. Mesepisternum with punctures diameter or more apart. T1 with white hair fringes laterally on posterior margin. Body length 5.5-6.5 mm ..........................*H. hyalinatus* Smith
   – Mesepisternum without lamelliform carina between anterior and lateral faces  ....2
2. T1 without hair fringes laterally on posterior margin ..........................3
   – T1 with white hair fringes laterally on posterior margin .........................6
3. Supraclypeal area narrowed between antennal sockets, raised apically and joining frons at 45° angle. —Clypeus often with apical yellow patch. Genal area wider than half eye width. F1 and F3 subequal, about as long as wide; F2 shorter, transverse. Mesepisternum with small, deep punctures, diameter or less apart. T1 disk shiny, with scattered fine punctures. Body length 5-7 mm ..................*H. annulatus* (Linnaeus)
   – Supraclypeal area not narrowed between antennal sockets, not swollen apically ...4
4. Pronotal collar with yellow markings. Genal area equal to or narrower than half width of eye. —F1 elongate, F2 short, transverse, F3 slightly transverse. Pronotal lobes and tegulae marked with yellow. Mesepisternum with large, deep, irregularly spaced punctures. T1 disc impunctate medially, anteriorly, and laterally with minute punctures. Body length 4-6 mm .............................*H. bisinuatus* Forster
   – Pronotal collar usually without yellow markings. Genal area wider than half width of eye. T1 disk shiny, with sparse, tiny punctures medially, dense laterally ..........5
5. T1 ferruginous. Malar area flat, three times as wide as long. Mesepisternum with large, well separated to confluent pits. —Genal area as wide as eye width. F2 transverse, F1 and F3 subequal, as long as wide, little longer than F2. Scutal punctures less than a diameter apart. Scutellum shiny, with punctures about a diameter apart. Hind tibiae yellow basally, fore and mid tibiae sometimes with yellow basal spots. Body length 6-7 mm ..............................................................H. nelumbonis (Robertson)
   – T1 black. Malar area linear. Mesepisternum tessellate, with shallow punctures less than diameter apart ..........................................................6

6. Pronotal lobes yellow. —Propodeum mostly wrinkled. F2 and F3 transverse, shorter than F1. Body length 4-5 mm ..............................................................
   – Pronotal lobes without yellow markings ..................................................................................................7

7. Propodeal triangle mostly smooth, shagreened, with short fine wrinkles basally. —F1 as long as F3, slightly transverse; F2 much shorter, transverse. Body length 4.5 mm ..............................................................H. fedorica (Cockerell)
   – Propodeal triangle with long basal area wrinkled. —F1 as long as F3, or longer; F2 and F3 transverse. Body length 4.5 mm ..................H. saniculae (Robertson)

8. Genal area equal to or wider than width of eye. Pronotal collar usually without yellow markings. T1 disk centrally punctured or not .................................................................9
   – Genal area narrower than width of eye. Pronotal collar with yellow markings. T1 disk impunctate centrally ...............................................................11

9. Genal area as wide as eye width. —F1 longer than F3, F2 short, transverse. Integument with yellow markings. Pronotal lobes and tegulae with yellow markings. Mesepisternum with small, deep punctures, more than diameter apart. T1 shiny, with punctures scattered on disc centrally, dense on sides, or punctures almost invisible. Body length 6-7 mm ..............................................................H. verticalis (Cresson)
   – Genal area wider than width of eye ..............................................................H. sparsus (Cresson)

10. Integument with yellow markings. Front coxae toothed or spinose on outer side. Mesepisternum shiny, with small punctures a few diameters apart. —F1 as long as F3, F1 as long as wide, F3 slightly transverse; F2 short, transverse. T1 shiny, with sparse, obscure, exceedingly minute punctures. Body length 6-7 mm ..............................................................H. basalis (Smith)
   – Integument completely black. Front coxae not spinose. Mesepisternum with deep punctures less than or equal to diameter apart. —F1 as long as F3, F2 transverse. T1 shiny, with punctures very fine and shallow. Body length 7-9 mm ..............................................................H. affinis (Smith)

11. Mesepisternum with punctures more than diameter apart. Body length 5-6 mm ....
   – Mesepisternum with punctures equal to or less than diameter apart. Body length 6-7 mm ..............................................................H. modestus Say
Annotated list of Ontario *Hylaeus*


1. *H. affinis* (Smith)


**Localities other than Ontario:** British Columbia, Manitoba, Saskatchewan, Québec, Colorado, Wisconsin, Michigan, New York (CNCI, ROME).

![Figure 1](image_url)

**FIGURE 1.** Ontario collection localities of *Hylaeus affinis.*

2. **H. annulatus** (Linnaeus)

**Kenora:** Kenora, 13 June 1960, ♂, KL; Oneside Lake, 24 June–27 July 1960, 7♂, CL; Black Sturgeon Lake, 1963, 303♂ & ♀ (CNCI); Vermilion Bay, Cedar Lake, 10 August 1959, ♀, E. Cameron (DEBU). **Rainy River:** Gold Rock, 22 July 1905, ♀, H. Newcomb,
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det. Stephen (EDUM); Pinewood, 22 June 1960, 4♂, KL; Finland, 21 July 1960, 3♂, KL (CNCI). **Thunder Bay:** Macdiarmid, 22 June 1921, ♀, BG (ROME); Manitouwadge, 12 June 1977, ♀, M. Eimann (DEBU). **Cochrane:** Iroquois Falls, 10 August 1961, 2♀, KN, *Solidago* (ROME); 22 June 1987, ♀, J. Vockeroth (CNCI); Porquis, 10 August 1961, ♀, KN; Abitibi, Low Bush, 30 June–19 July 1925, 2♂, 3♀, BG (ROME). **Algoma:** Wawa, 7 August 1992, ♀, D. Bennett; 13 June 1977, ♀, BR; 2 August 1976, ♀, P. Heel; Erickson, 7 August 1979, 2♀, PG; Otasawian Lake, 17 August 1963, 3♀, KN (DEBU). **Sudbury:** Sudbury, 1892, 3♀ (CNCI); Chapleau, 10 June 1992, ♀, US; 5 June 1991, 2♂, US; 1 July 1990, ♀, US (DEBU). **Timiskaming:** Haileybury, 7 May 1916, ♀, SL (CNCI). **Nipissing:** Belwood, 23 June–13 July 1965, 3♀, ED (DEBU); Temagami, 22 July 1932, ♀, A. Brown (ROME). **Parry Sound:** Sand Lake, 30 June 1926, ♀, F. Ide; Burk’s Falls, 15 July 1926, ♀, F. Ide (CNCI); Killbear Park, 20 August 1978; 2♀, AR (DEBU). **Renfrew:** Petawawa, 7 June 1961, ♀, J. Vockeroth (CNCI). **Lanark:** Bells Corners, 29 June 1945, ♀, O. Peck (CNCI). **Carleton:** Ottawa, 17 July 1963, ♀, KN (ROME); 2 May–29 July 1913, 8♂, SL (CNCI); 5-16 June 1913, 4♂, ♀, SL (DEBU); 12-20 June 1913, 2♀, SL (EDUM). **Glengarry:** Algonquin Park, 14 August 1903, ♀, EMW (ROME). **Leeds:** St. Lawrence Isl., 18 July 1975, ♀, C. Curran (CNCI). **Hastings:** Marmora, 11 July 1957, ♀; 9 June 1957, ♀, K. Southern (DEBU); 12-24 July 1952, 2♂, J. Vockeroth; Trenton, 30 June 1905, ♀; 22 June 1902, ♀, Evans (CNCI). **Muskoka:** Port Sydney, 24 June–11 July 1919, 2♀, BG (ROME). **Simcoe:** Orillia, 18 June 1924, ♀ (CNCI). **Bruce:** Sauble Falls, 24 July 1977, ♀, W. Maddison (ROME); Crane River, 16 July 1977, ♀, D. Murrell; Tobermory, 30 May 1998, ♀, D. Vacarri; Sauble Beach, 8 July 1981, ♀, G. Aiudi; Dyers Bay, 24 July 1954, ♀, PG; 7 July–15 August 1953, 10♂, PG (DEBU). **York:** Toronto, 17 July–1 August 1891, 5♀ (CNCI); 23 June 1990, ♀; 7 June 1914, ♀; E. Walker; 19-28 July 1891, 2♀; 3 July 1890, ♀ (DEBU); 7 July 1949, ♀ (ROME). **Dufferin:** Primrose, 27 July 1977, ♀, AR (DEBU). **Peel:** Forks of the Credit, 4 July–18 August 1968, 28♀, MK; 2 July 1969, ♀, MK; ♀; Terra Cotta, 2001, 3♂, 15♀, RM, from nests in wood (ROME). **Wellington:** Arkell, 7 June 1960, ♀, PG; 25 July 1965, ♀, PG; Guelph, 3 June 1974, ♀, I. Kigatiira; 20 August 1979, ♀, J. Ernst; 11 August 1977, 2♀, D. Murrell; 17 August 1976, ♀, D. Levin; 2 August 1977, ♀, D. Levin; 14 June 1965, 2♀, 2♂, ED (DEBU). **Halton:** Hilton Falls, 16 June 1999, ♀, 3♀, RM; Speyside, 12 August 1999, ♀, RM (ROME); Halton, 5 August 1981, ♀, G. Aiudi (DEBU); Milton, 9 June 1978, 2♂, J. Heraty; Campbellville, 10 June 1977, 2♀, AR (DEBU). **Huron:** Brussels, 22 July 1963, ♀, J. VanLoon (DEBU); Kinburn, 26 July 1953, ♀, MN (CNCI). **Waterloo:** Oliver’s Marsh [Oliver Bog], ♀ (DEBU). **Wentworth:** Borer’s Falls, 1 June 1978, ♀, N. Kevin (DEBU); Freelton, 27 July 1984, ♀, M. Kasserra (DEBU). **Lincoln:** Grimsby, 17 June 1894, ♀ (CNCI). **Haldimand:** Cayuga, 6 August 1952, ♀, PG (DEBU). **Essex:** Kingsville, 9 July 1977, ♀, AT (DEBU); 23 May 1962, ♀, KL (CNCI). **Locality unknown:** SSH, 19 August 1981, ♀, G. Aiudi (DEBU); Ontario, 2 June 1906, ♀ (DEBU); 7 June 1961, ♀, J. Chilcott (CNCI). **Figure 2.**

**Localities other than Ontario:** Alaska, Yukon, North West Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Québec, New Brunswick, Nova Scotia, Utah (CNCI, DEBU, ROME).
3. *H. basalis* (Smith)


**Localities other than Ontario:** Yukon, North West Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Québec, New Brunswick, Nova Scotia, Wisconsin (CNCI, DEBU).

4. *H. bisinuatus* Forster

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**Figure 3.** Ontario collection localities of *Hylaeus basalis*.

**Figure 4.** Ontario collection localities of *Hylaeus: H. bisinuatus, H. nelumbonis, and H. verticalis*. 

Localities other than Ontario: British Columbia, Alberta, Manitoba, California (CNCI, DEBU, ROME).

5. H. fedorica (Cockrell)


6. H. hyalinatus Smith


7. H. mesillae (Cockerell)


**FIGURE 5.** Ontario collection localities of *Hylaeus mesillae*.

8. *H. modestus* Say

Bees of the genus *Hylaeus* of Ontario


**Localities other than Ontario**: Alaska, North West Territories, British Colombia, Saskatchewan, Manitoba, Québec, New Brunswick, Nova Scotia (CNCI, DEBU, ROME).

9. *H. nelumbonis* Robertson

**Norfolk**: Long Point, 199?, ♀, ♂ (Dr. L. Packer’s Collection). **Figure 4.**

**Localities other than Ontario**: UNITED STATES, Ohio: Put-in-Bay, S. Bass Isl., 11 July

10. *H. rudbeckiae* (Cockerell & Casad)

**UNITED STATES, California:** Riverside, 2 September 1935, ♀, Timberlake Coll. (UCRC)

11. *H. saniculae* (Robertson)


12. *H. sparsus* (Cresson)

**UNITED STATES, North Carolina:** Mt. Pisgah, 23 June 1934, 2♀, T. B. Mitchell [Homotype: *Prosopis thaspii* Robertson; Homotype: *Prosopis sparsa* Cresson] (NCSU).

13. *H. verticalis* (Cresson)

**Kenora:** Black Sturgeon Lake, 4-8 July 1962, ♂ and 81♀; Oneside Lake, 2 June 1960, ♂, CL (CNCI). **Sudbury:** Chapleau, Racine Lake, ♂, US (DEBU). **Carleton:** Ottawa, 3 June 1986, ♂, H. Goulet; 11-20 June 1913, 9♂, SL (CNCI); 18-20 June 1913, ♂, ♀, SL; 7 June 1914, ♀, SL (EDUM). **Hastings:** Trenton, 31 May 1896, ♂, Evans (DEBU). **Haliburton:** Minden, 11 September 1957, ♀, McMullen; Algonquin Park, 22 August 1993, ♀, C. Jons (DEBU). **Northumberland:** Hastings, 1895, ♂, Evans; Alderville, First Nations Prairie, 1 September 2001, ♀, PA (DEBU). **Prince Edward:** Picton, Smith Bay [Smith’s Bay], 1 July 1970, ♂, J. MacAlpine (CNCI). **Bruce:** Dyers Bay, 19 July–19 August 1953, 5♀, PG (DEBU); Bruce Peninsula, 10 July 1960, ♀ (ROME). **Peel:** Caledon East, 28 June 1980, ♂, C. Beierl (DEBU). **Wellington:** Bellwood, 13 July 1965, ♀, ED; Arkell, 2 June 1952, ♂, PG; Guelph, 10 August 1951, ♀, PG (DEBU). **Halton:** Halton Lake, 2001, RM (ROME), from nests in wood, 3♂. **Lincoln:** Jordan, 21 June 1919, ♂, C. Cunra (CNCI). **Essex:** Leamington, 4 August 1985, ♀, GL (EDUM); Windsor, Ojibway Prairie, 31 July–3 August 2001, ♂, PA (DEBU). **Locality unknown:** Ontario, 26 June 1886, ♂ (DEBU). Figure 6. **Localities other than Ontario:** British Columbia, Alberta, Saskatchewan, Manitoba, Québec, New Foundland (CNCI).

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References


