ONTARIO BEES OF TRIBE EPEOLINI: *EPEOLUS* LATREILLE AND *TRIEPEOLUS* ROBERTSON (HYMENOPTERA: APIDAE, NOMADINAE)

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Abstract *J. ent. Soc. Ont.* 135: 87–99

Seventeen species of Epeolini (Nomadinae) are reported from Ontario, including ten species of *Epeolus* Latreille and seven of *Triepeolus* Robertson. A key to the species is presented, along with descriptions, notes about their phenology and locality records. Species recorded from Ontario first time are ***Epeolus autumnalis* Robertson, *E. bifasciatus* Cresson, ***E. ilicis* Mitchell, *E. interruptus* Robertson, ***E. lanhami* Mitchell, *E. minimus* (Robertson), *Triepeolus cressonii* (Robertson), ***T. junctus* Mitchell, ***T. lunatus* (Say), ***T. michiganensis* Mitchell, *T. pectoralis* (Robertson), ***T. remigatus* (Fabricius) species marked with (**) are also first recorded for Canada.

Introduction

Little is known about Epeolini in Ontario, and until now only five species belonging to this tribe have been reported from the province, four of which are in the genus *Epeolus* (MacKay and Knerer 1979; Mitchell 1962). Examination by the author of bee specimens in several Ontario insect collections showed that at least 17 species of Epeolini occur in Ontario, including seven species of *Triepeolus*, and ten species of *Epeolus*. The earlier recorded presence of *E. banksi* Cockerell, was not confirmed by our studies (MacKay and Knerer 1979). The purpose of this report is to allow accurate recognition of the species of Epeolini in Ontario, and to update information regarding their presence in the province.

Materials and methods

A total of 425 specimens of Epeolini were examined from the Entomology collections at the Royal Ontario Museum (ROME), University of Guelph (DEBU), and Canadian National Collection of Insects (CNCI) as well as types and comparative material from the California Academy of Sciences (CASC), Illinois Natural History Survey (INHS), and Academy of Natural Science, Philadelphia (ANSP). Morphological characteristics, flight period, and species distribution data for Ontario are based on specimens from these collections. Morphological terms used in this paper are defined and illustrated in Michener (1944, 2000) and Rightmyer (2004). Abbreviations used are as follows: F – flagellar segment, T – metasomal tergum, S – metasomal sternum. Species new for Ontario are designated by an asterisk; those with two asterisks are first recorded for Canada.

Species identification was done or confirmed using Mitchell (1962). Morphological characteristics for the generic diagnosis follow Rightmyer (2004). Overall geographical distributions of the species in North America are based on Hurd (1979) and Mitchell (1962).

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 (the administrative categories, i.e., "county', "district", etc, are omitted).

Tribe Epeolini

Ontario bees of the tribe Epeolini are distinguished from other bees of the provincial fauna as follows: metasoma conical; all tagmata with white hair pattern; head, mesosoma, apex of metasoma, and partly legs often orange; axillae produced posteriorly to a point or rounded; marginal cell rounded apically and away from wing margin; female S6 retracted, emarginate medially, and with posteriorly directed lateral processes. With respect to the two genera found in Ontario, males and females of the same species have similar body hair patterns, microsculpture, and pubescence; males tend to have denser pubescence on the face and mesepisternum. All of the species are cleptoparasitic on other bees.

Genus *Epeolus* Latreille

Body length 6-10 mm. Maxillary palpus usually two-segmented, rarely three-segmented. Mandibles may have a subapical tooth. Antennal pedicel of the male is usually mostly exposed. S7 of the male usually lacking median emargination on distal margin, with lateral lobes above interlobal area, and with apical setae mostly dorsal, on surface leading from lateral lobe. Base of gonostylus with dorsal protuberance. T5 of the female with transverse, silvery pseudopygidial area. S6 of the female with processes paddle-shaped, distal margin denticulate.
Parasites on *Colletes* bees (Colletidae).

Key to *Epeolus* species of Ontario

The species descriptions, following dash in couplets, involve only the most important characteristics for the recognition of the species treated in Ontario.

1. Forewing with two submarginal cells. — Eye width 1.7 times genal area. Scutum with antero-lateral patches of dense, white hairs. Mesepisternum with punctures deep, less than pit diameter apart. Axillae reaching middle line of scutellum. Middle and hind spurs dark. T1 and T2 with apical band widely interrupted. T3 and T4 with bands narrowed or interrupted medially and on sides. ♀ T5 widely truncate, with thin, white hair patches laterally; pseudopygidial area 4 times as wide as long. ♂ pygidial plate narrowly angulate apically. Body length 6-8 mm. ON: VI-VII. — ME, PA, MI. .... ***E. lanhami*** Mitchell
- Forewing with three submarginal cells..... 2
2. Metasoma with two hair bands. Scutum without antero-median, white hair stripes or patch. — Eye 4 times as wide as genal area. Pronotum and tergal bands with hairs dense, scaly. Mesepisternum shiny, bare, with punctures more than diameter apart to confluent. Middle and hind spurs dark. ♀ T5 broadly truncate, with pseudopygidial area 4-5 times as wide as long. ♂ pygidial plate truncate. Body length 7-9 mm. ON: VI-VIII. — New England states to MN, south to CO, NM, TX, FL. .... ***E. bifasciatus*** Cresson
- Metasoma with more than two bands. Scutum with antero-median, white hair stripes or patch..... 3

3. Scutum with antero-median, horse-shoe shape white hair patch. — Eye 2 (♂) or 2.5 (♀) times as wide as genal area. Mesepisternum with lower part shiny, with a few flat interspaces. Axillae not attaining posterior margin of scutellum. T1 with central dark space subtriangular; T1 and T2 with hair bands interrupted medially, enlarged laterally. T3-T5 with hair bands complete. Spurs orange. ♀ pseudopygidial area 2.5 times as wide as long. ♂ pygidial plate widely rounded. Body length 6-8 mm. ON: VI-VIII. – QC, NS, NY, MI, IN..... ***E. canadensis*** Mitchell
- Scutum with two anterior white hair lines..... 4
4. Axillae usually with tips attaining posterior margin of scutellum. 5
- Axillae shorter, not attaining posterior margin of scutellum. 6
5. ♀ pseudopygidial area 2.5-3 times as wide as long. ♂ pygidial plate black or orange, wide, slightly narrowed apically, with central emargination; mesepisternum partly bare; sterna shiny. — Eye 2.5 (♀) - 4 (♂) times as wide as genal area. Axillae flat. Mesepisternum on lower part with a few flat interspaces. T1 anteriorly with lateral, white hair triangles; central, black space wide, white hairs sometimes reduced laterally, basal and apical hair bands narrowed medially. T2-T5 with bands complete. Middle and hind spurs dark. Body length 7-10 mm. ON: VII-IX. — NS to MN, south to TX, FL. ..... ***E. scutellaris*** Say
- ♀ pseudopygidial area 1.5-2 times as wide as long. ♂ pygidial plate orange, narrowly acute apically; mesepisternum entirely with dense, white hairs; sterna with white pile.— Eye 3-3.5 times as wide as genal area. Axillae flat, with outer margin elevated. Mesepisternum on lower part with interspaces between punctures flat. Tergal hair bands complete. T1 anteriorly completely covered with dense, white pile. T1-T3 or T1 and T2 with hair bands narrowed medially, sometimes narrowly interrupted. Middle and hind spurs dark. Body length 7-8 mm. ON: VIII-IX. — ME to CA, FL, TX. ..... ***E. pusillus*** Cresson
6. T1 with median dark space rectangular, lateral white hair stripes wide. — Eye 2-2.5 times as wide as genal area. Mesepisternum on lower part with linear interspaces between punctures. Scutum laterally with white pile. T1 anteriorly with white pile, apical hair bands interrupted medially, enlarged laterally. Spurs orange. S2 centrally with thick white pile. ♀ pseudopygidial area 3 times as wide as long. ♂ pygidial plate round apically, orange. Body length 7-8 mm. ON: VII-VIII. — WI, MI, IL, to CA, CO. .... ***E. minimus*** (Robertson)
- T1 with median dark space stretched from side to side, lateral angles narrowly rounded 7
7. Mesepisternum on lower part with interspaces between punctures linear. — Eye twice as wide as genal area. ♂ clypeus bare, with median, longitudinal ridge. Scutum with extended, erect, white hairs on dark surface. T1 with both hair bands interrupted. T2-T6 with hair bands complete, sometimes, T2 and T3 with bands interrupted. T2 with lateral, thin, white hair patches. Body length 7-8 mm. ON: VII. — MA, to TN, GA. ..... ***E. ilicis*** Mitchell
- Mesepisternum on lower part with interspaces between punctures flat. 8
8. Scutum and scutellum shiny, with punctures more than diameter apart to confluent. Mesepisternum shiny, with lower part punctures more than diameter apart. — Eye 3-3.5 times as wide as genal area. Pronotal lobes partly orange. Axillae with narrow apex turned inside. Middle and hind spurs dark. T1-T5 with hair bands interrupted. Terga and sterna shiny. Sterna with dense, white, scaly hairs. ♀ pseudopygidial area as long as wide. ♂

pygidial plate round apically. Body length 7-10 mm. ON: VII-VIII. — New England states, to IL, south to GA. ..... ***E. lectoides*** Robertson

- Scutum and scutellum shagreened, or with interspaces between punctures linear. Mesepisternum on lower part with punctures diameter or less apart. 9

9. T1-T4 with white, hair bands interrupted, medially and laterally enlarged. — Eye 2(♀) -3 (♂) times as wide as genal area. Axillae as long as wide basally. T2 with thin, gray hairs laterally. ♀ pseudopygidial area 5 times as wide as long. Body length 6.5-8 mm. ON: VII. — NJ, to GA, west to CA, CO, TX. ..... ***E. interruptus*** Robertson

- T1 with white hair band interrupted, T2 and T3 with bands narrowed medially, enlarged laterally. — Eye 1.5 times as wide as genal area. Axillae flat, with outer margin elevated. T1 anteriorly with white hair triangles. ♀ pseudopygidial area twice as wide as long, T5 hair band interrupted. ♂ pygidial plate widely round apically. Body length 9-10 mm. ON: IX. — ME, to MN, south to NC. ..... ***E. autumnalis*** Robertson

Annotated list of Ontario *Epeolus* Latreille

The species are listed in alphabetical order.

The abbreviations of the names of the collectors are as follows: AR (W. Attwater), AT (C. Atwood), BG (N. Bigelow), BK (M. Buck), BR (K. Barber), CL (S. Clark), ED (C. Edwards), KL (L. Kelton), KN (G. Knerer), LM (R. Lambert), MF (R. MacFarlane), MK (P. MacKay), MN (J. Martin), PA (S. Paiero), PG (D. Pengelly), SL (F. Sladen).

1. **_E. autumnalis_ Robertson

Frontenac: Kingston, 5.IX.1987, 2♀, C. Shilton (DEBU). **Northumberland:** Alderville, First Nations, 1.IX.2001, 2♂, PA (DEBU); Murray Hills, 1.IX.2002, 4♂, PA (DEBU). **Dufferin:** Mono Cliffs P.P., 31.VIII.2002, 2♂, BK (DEBU). **Essex:** Windsor, Ojibway Prairie, 22.IX.2001, ♀, S. Marshall; 12-13.IX.2002, 7♀, 8♂, BK, PA (DEBU).

Reviewed materials from other regions. Lectotype, ♀, Charles Robertson Collection, W.E. LaBerge det. 1979 (INHS). Lectoallotype, ♂, Charles Robertson Collection, W.E. LaBerge det. 1979 (INHS). Figure 1.

2. *_E. bifasciatus_ Cresson

Lanark: Lanark, 1.VIII.1976, ♂, S. Marshall (DEBU). **Carleton:** Ottawa, 5.VIII.1955, ♂, P. Taschereau; 29.VII.1947, ♀, W. Mason (CNCI); 22.VI.1977, ♀, Roughley (DEBU). **Simcoe:** Midland, 10.VIII.1974, ♀, J. Huber (DEBU). **Bruce:** Hepworth, 26.VII.1997, ♂, S. Marshall (DEBU). **York:** Toronto, 4.VIII.1905, ♂, Cosens Coll. (ROME). **Wentworth:** Freelton, 15.VII.1972, ♀, B. Beam (DEBU). **Lincoln:** Grimsby, 29.VII.1894, ♀ (CNCI). **Lambton:** Walpole Isl., 11.VII.1977, ♂, AR (DEBU). **Kent:** Rondeau Park, 17.VII.1962, 3♀, 2♂, CL (CNCI); 29.VI.2002, 4♀, ♂. BK (DEBU). **Essex:** Pelee Isl., 8.VII.1965, ♀, J. Riotte (ROME); Point Pelee, 29.VII.1920, ♂, BG (ROME); 10.VII. 1979, ♂, AR (DEBU). Figure 1.

Reviewed materials from other regions. Paralectotype, ♀, R.L. Brumley det. 1965 (ANSP); NJ, Cape May, July 19.1935, ♀, Witmer Stone (ANSP).

3. _E. canadensis_ Mitchell

Carleton: Ottawa, 28.VI.1967, ♂, Heming; 3♂ (DEBU); 22.VIII.1958, ♂, KL; 29.VII.1947, ♂, W. Mason; 28.VI.1914, ♂, SL; 7-11,VII.1913, 9♀, 11♂, SL (CNCI). **Hastings:** 3.VII.1896, 2♂,

Evans; Belleville, 14.VII. 1951, ♀, MN (CNCI). **Prince Edward:** Picton, Smith's Bay, 1.VII.1970, ♂, J. MacAlpine (CNCI). **Durham:** Kendal, 29.VII. 1961, ♀, AR (DEBU). **Bruce:** Dyers Bay, 19-29.VII.1953, 2♂, PG (CNCI). **York:** Toronto, 18.VII.1888, ♀ (CNCI). **Peel:** Forks of the Credit, 28.VI.1965, ♂, KN (ROME). **Wellington:** Guelph, 7.VII.1978, ♂, B. Werner (DEBU). **Brant:** Brantford, Railway Prairie, 12.VII.2002, 3♂, PA (DEBU). **Lambton:** Walpole Isl., 13.VII.1980, ♂, BR (DEBU). **Kent:** Rondeau Park, 27.VI. 1962, ♀, CL (CNCI). **Essex:** Windsor, Ojibway Prairie, 7.VIII.2001, ♀, PA (DEBU); Point Pelee, 26.VII.1979 ♀, AT; 18.VII. 1978, ♂, BR (DEBU). Figure 2.

4. *E. ilicis* Mitchell**

Bruce: Dyers Bay, 31.VII.1953, ♂, PG (DEBU). **Wellington:** Guelph, 30.VIII.1978, 2♂, H. Farrell (DEBU). Figure 1.

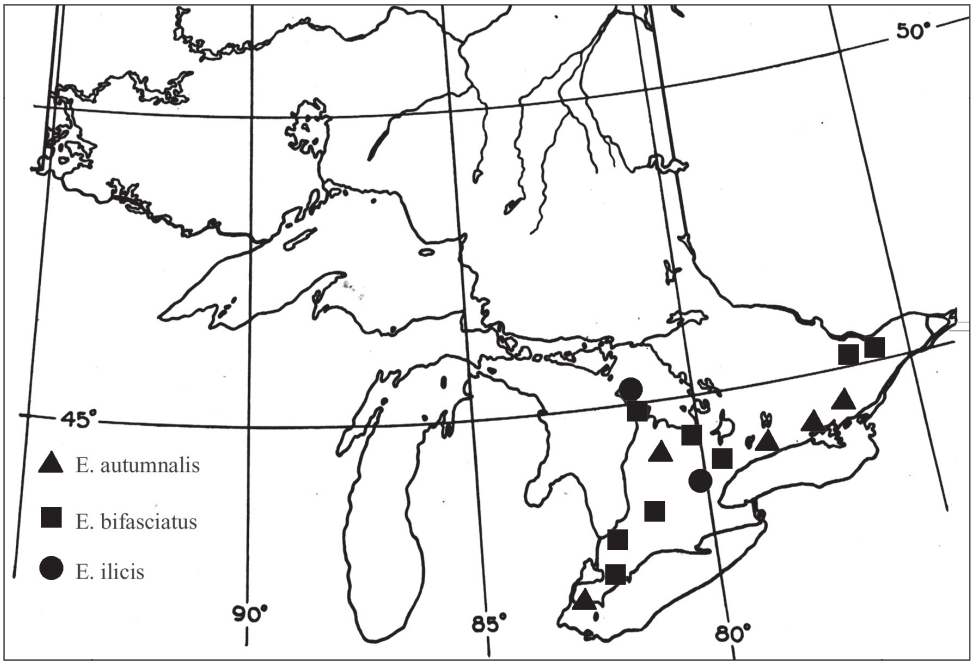

FIGURE 1. Ontario collection localities of *Epeolus*: *E. autumnalis*, *E. bifasciatus*, *E. ilicis*.

5. ****E. interruptus* **Robertson

Carleton: Ottawa, 29.VII.1947, ♀, W. Mason (CNCI). **Bruce:** Hepworth, 4.VII.1954, ♀, PG (DEBU). **Wellington:** Guelph, 20.VII.1973, ♀, AR (DEBU). Figure 2.

Reviewed materials from other regions. Holotype, ♀, Charles Robertson collection (INHS). USA: CA, Colton, 26-28.V.1917, ♂, E. P. VanDuzze, R.L. Brumley det. 1965 (CASC); CO, Boulder, 20.VII.1908, ♂, S. A. Rohwer (CASC); VA, Norfolk, June 12, 1895, ♀, R.L. Brumley det. 1965 (ANSP).

6. ** *E. lanhami* Mitchell
Rainy River: Rainy River, 24.VI.1960, 4♀, 2♂, CL (CNCI). **Thunder Bay:** Black Sturgeon Lake, 10.VII. 1964, ♀ (CNCI). **Sudbury:** 2♂ (CNCI). Figure 3.
Reviewed materials from other regions. QC: Sully, 22.VI.1916, ♂, SL (CNCI); Lac Mirabelle, off James Bay Rte. Km 323, 51°52'N, 77°24'W, sandy area, 16.VII.2001, 3♀, BK (DEBU).

7. *E. lectoides* Robertson
Bruce: Hepworth, 4.VII.1954, ♀, PG (DEBU). **Wellington:** Gueph, 20.VII.1977, ♀, AR (DEBU). **Lambton:** Port Franks, 12.VII.1996, ♂, Skevington (DEBU). **Kent:** Rondeau Park, 8.VII. 1983, ♀, ♂, Gadovski (DEBU). **Essex:** Point Pelee, 13.VII-8.VIII.1920, 3♀, 5♂, BG (ROME); 4.VIII.1981, 2♀, Aiudi; 10.VII. 1979, 2♂, AR; 20.VII.1978, ♀, BR (DEBU). Figure 2.
Reviewed materials from other regions. Holotype, ♀, Charles Robertson collection (INHS). USA: NC, Cumberland, Fort Bragg, 16.VIII.1967, ♀, ♂, 23-25.VIII.1967, ♀, ♂, H. D. Birchim, G. Bohart det. (CASC).

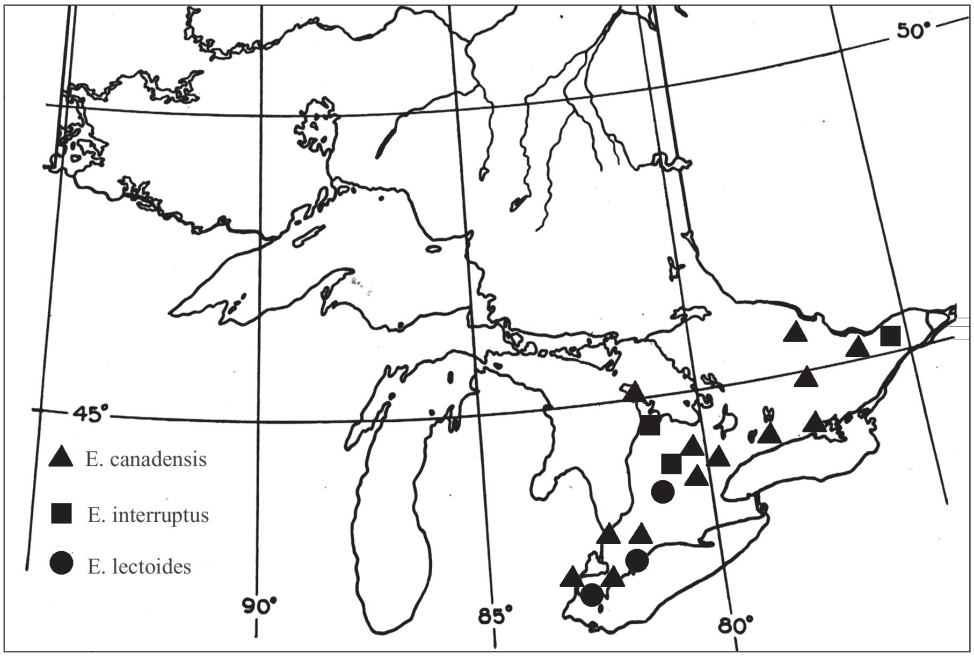

FIGURE 2. Ontario collection localities of *Epeolus*: *E. canadensis*, *E. interruptus*, *E. lectoides*.

8. ****E. minimus* **(Robertson)
Rainy River: Rainy River, 5.VII-3.VIII.1960, 2♀, CL; 17.VIII.1924, ♂, J. Brimley (CNCI). **York:** Leaside, 7.VII.1959, ♀, *Medicago* (ROME). **Bruce:** Dyers Bay, 20.VII-19.VIII.1953, ♀, 4♂, PG; 9-15.VII.1952, 4♀, PG, *Clover* (CNCI); 2.VII.1957, ♂, PG; 17-22.VII.1956, 2♀, PG; 8-25.VII.1954, 5♀, 8♂, PG; 16.VII.1953, ♀, PG (DEBU). **Brant:** Brantford, 24.VIII.2001, ♂, PA (DEBU); Railway Prairie, 12.VII.2002, ♀, PA (DEBU). Figure 3.

Reviewed materials from other regions. Paratype, ♂, R.L. Brumley det., 1965. Canada: BC, Vernon, 19.VII.1922, ♀, H.B. Leech, B.L. Brumley det. 1965 (CASC). USA: CA, Modoc Co, Davis Cr., 13.VII.1922, ♂, C.L. Fox, B.L. Brumley det. 1965 (CASC); CA, Ruby Lake, NW, Inyo Co, 11500 ft, 13.VIII.1957, ♂, C.D. MacNeill, B.L. Brumley det.1965 (CASC); WA, Olympia, 2.VII.1896, ♀, B.L. Brumley det. 1965 (CASC); WY, W. Yellowstone, 14.VI.1930, ♀, VanDyke, B.L. Brumley det. 1965 (CASC); NV, ♀, R.L. Brumley det. 1965 (ANSP).

9. *E. pusillus* Cresson

Carleton: HWY 16, 44° 47′12′′N, 75° 30’38′′W, 23-30.VIII.1994, ♀, L. Masner (CNCI); Ottawa, 25.VIII.1954, ♂, W. Mason (CNCI). **Prescott:** Van Kleek Hill, 1.IX.1974, 2♀, J. Huber (DEBU). **Peterborough:** Peterborough, 18.VIII.1975, ♂, F. Quan (ROME). **Bruce:** Inverhuron, 2.IX.1960, 2♀, ♂, PG (DEBU). **Peel:** Forks of the Credit, 25.VII-27.VIII.1968, 6♀, 5♂ .MK (ROME); Peel, 19.IX.1992, ♂, C. Darling (ROME). **Welland:** Port Colbourne, 17.IX.1972, ♀, Beam (DEBU). **Brant:** Brantford, 24.VIII.2001, ♂, PA (DEBU). **Lambton:** Grand Band, 28.VIII.1936, ♂, AT (CNCI). **Essex:** Windsor, Ojibway Prairie, 13.IX.2002, 13 ♀, 5♂, PA (DEBU); 26.VIII.2002, 8♂, BK, PA (DEBU). Figure 3.

Reviewed materials from other regions. USA: TX, Lee Co, Fedor, 26.IV.1909, ♀, B.L. Brumley det. 1965 (CASC); FL, Tampa, 2.V.1908, ♂, VanDuzee, B.L. Brumley det. 1965 (CASC); NJ, Clementon, 8.7.1892, ♂, R.L. Brumley det. 1965 (ANSP).

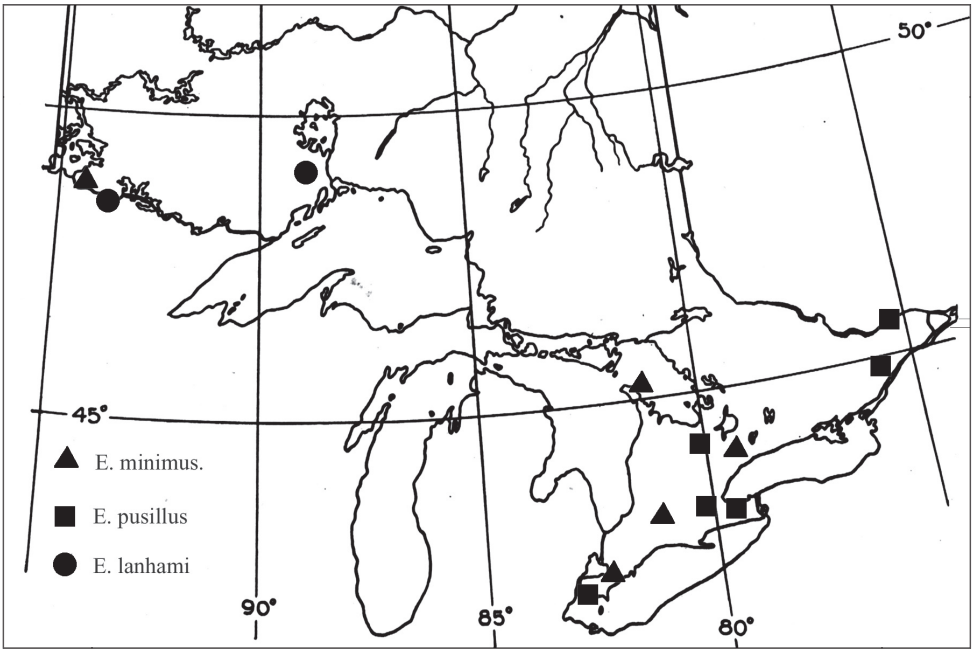

FIGURE 3. Ontario collection localities of *Epeolus*: *E. minimus*, *E. pusillus*, *E. lanhami*.

10. *E. scutellaris* Say

Rainy River: Lake of the Woods, Harris Hill, 4.VIII.1960, ♂, KL, Whitney (CNCI). **Lanark:** Almonte, 2-7.IX.1986, ♀, H. Goulet (CNCI). **Carleton:** Ottawa, 11.VIII.1973, 4♀, J. Huber (DEBU); 20-25.VIII. 1954, ♀, 2♂, W. Mason; 30.VII.1913, ♂, SL (CNCI); HWY 16, 44° 47′12′′, 75° 30’38′′, 23.VIII.-29.IX.1994, 7♀, L. Masner (CNCI). **Grenville:** Spencerville, 28.VIII-14.IX.1939, 2♀, G. Hammond; 20.VIII.1938, ♀, G. Hammond (CNCI). **Hastings:** Johnstown, 5.IX.1972, ♀, MF (DEBU). **Haliburton:** Algonquin P.P., 45° 51′, 77° 42′45′′, 18.VIII.2002, 4♀, ♂, BK (DEBU). **Peterborough:** Bobcaygeon, 18.VIII.1975, ♂, F. Quan (ROME). **Northumberland:** Murray Hills, 1.IX.2002, ♂, PA (DEBU); Brighton, 2.IX.1954, ♂, MN (CNCI). **Durham:** Burketon, 30.VIII.1954, ♀, C. Miller (CNCI); Orono, 3.IX.1925, ♀, BG (ROME). **Simcoe:** Spring Water P.P., 2.IX.2002, ♀, BK (DEBU). **Bruce:** Hepworth, 23.VIII.1981, ♀, BR; 31.VII.1975, ♂, Jaspers (DEBU); Sauble Beach, 17.IX.1972, ♀, Beam (DEBU); Dyers Bay, 12-27.VIII.1953, 5♀, ♂, PG (DEBU). **Peel:** Forks of the Credit, 18-27.VIII.1969, 3♀, MK; 8-27.VIII.1968, 2♂, MK (ROME); Peel, 19.IX.1992, ♂, C. Darling (ROME). **Wellington:** Guelph, 25.VIII.1997, ♀, S. Marshall; 18.VIII. 1978, ♀, Farrell; 18.VIII. 1976, ♀, Stewarts; 14.IX. 1975, ♀, Barlow; 17.VIII. 1973, ♀, MF; 5-10.IX. 1972, 5♀, MF; 20.IX. 1970, ♀, Akey (DEBU). **Waterloo:** Cambridge, 9.VIII. 1981, ♀, C. Bolter (DEBU). **Welland:** Port Colbourne, 27.VIII.1993, 2♀, D. Caloren (DEBU). **Brant:** Brantford, 24.VIII.2001, 3 ♀, 2♂, PA (DEBU). **Haldimand:** Dunnville, 3.VIII.1954, ♂, C. Miller (CNCI). **Middlesex:** Komoka Feed Mill, 11.IX.2001, ♀, PA (DEBU). **Norfolk:** Normandale, 4.IX.1954, ♀, C. Miller (CNCI); St. Williams, 24.VIII.2001, ♀, 2♂, BK (DEBU). **Lambton:** Grand Band, 20.VIII.1936, ♂, A. Wood (CNCI). **Essex:** Windsor, Ojibway Prairie, 11-22.IX.2001, 2♀; 26.VIII.2002, 3♂; 13.IX.2002, 3♀, ♂, PA (DEBU); Point Pelee, 30.VII.1978, ♀, AR (DEBU). Figure 4.

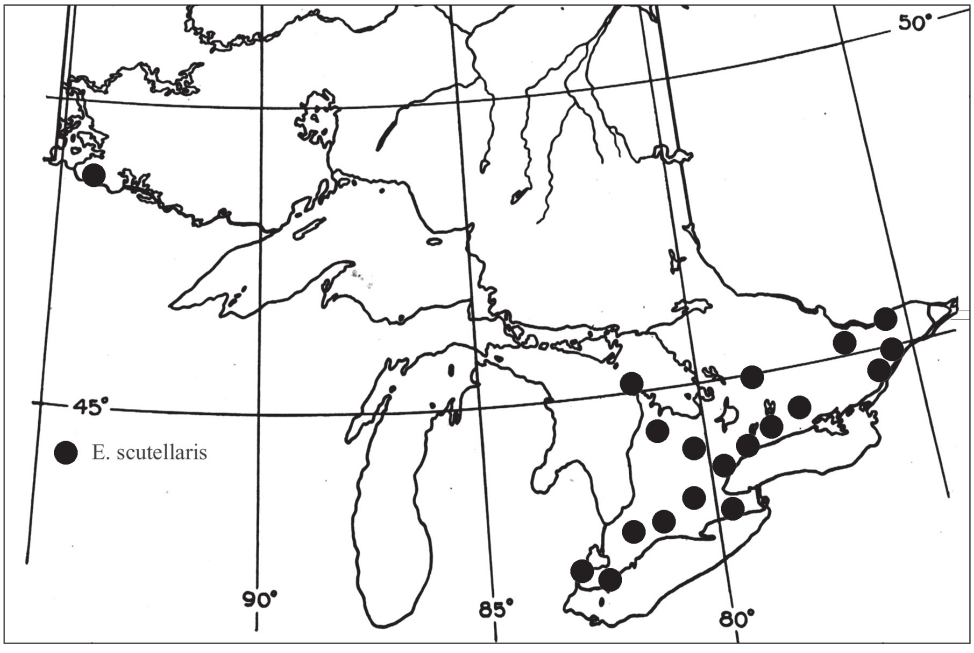

FIGURE 4. Ontario collection localities of *Epeolus*: *E. scutellaris*.

Reviewed materials from other regions. USA: MA, Boston, 5.IX.1914, 2♀, F.X. Williams, B.L. Brumley det. 1965 (CASC); MA, Forest Hills, 30.VIII.1913, ♂, F.X. Williams, B.L. Brumley det. 1965 (CASC); VA, Falls Church, 4.IX., ♀, G. Bohart det. (CASC); NM, San Juan Co, 33 mi S of Shiprock, 14.IX.1970, ♂, sunflower, P.S. Bartholomew, G. Bohart det.(CASC); NH, Nelson, 8-11.07, ♂, R.L. Brumley det. 1965 (ANSP).

Genus *Triepeolus* Robertson

Commonly larger than *Epeolus*, body length 8-14 mm. Maxillary palpus usually three-segmented, if two-segmented, then the distal segment is elongate. Mandibles lacking distinct preapical tooth. Antennal pedicel usually set into scape. Pygidial plate usually with median constriction, often apically differentiated into distinct, down-turned, posterior surface. S7 usually with median emargination on distal margin, with lateral lobes below interlobal area, and apical setae mostly ventral, forming distinct pocket near lateral apical lobe. Gonostylus without basal protuberance. T5 of the female usually with elongate, dark, not transverse and silvery, pseudopygidial area. S6 of the female with greatly reduced, transverse disc; narrow, latero-apical processes with several coarse, curved bristles apically.

In Ontario may parasitize on *Melissodes*, *Peponapis*, *Svastra*, *Tetralonia* and *Anthophora*.

Key to *Triepeolus* species of Ontario

1. T1 with central black area round or triangular, narrower or equal in width to lateral, white hair spaces. 2
- T1 with central black area wide, rectangular or narrowed laterally, wider than lateral white hair spaces. 3
2. T1 with central black area round, small. Scutum with anterior, wide, white hair band interrupted medially between longitudinal hair lines. — ♀ clypeus without longitudinal ridge. Eye 2-2.5 times as wide as genal area. T1 and usually T2 with hair bands interrupted medially. T3 and T4 with hair bands complete. Body length 14 mm. ON: VII. — NJ, west to MN, CO, south to CA, TX, FL. ..... ***T. remigatus*** (Fabricius)
- T1 with central black area subtriangular, with acute lateral angles. Scutum without anterior, white hair band, with pair of longitudinal, white hair lines anteriorly. — ♀ clypeus with longitudinal, impunctate ridge. Eye 2.5 (♂)-3 (♀) times as wide as genal area. T1 and T2 with hair bands interrupted medially. T3 and T4 with white hair bands complete or narrowly interrupted. ♀ T5 with white hair band interrupted. Body length 10-11 mm. ON: VI-VIII. — New England states to MN, south to FL, CO, NM. ..... ***T. lunatus*** (Say)
3. Axillae exceeding scutellar apex. — ♂ face, labrum, clypeus, mesepisternum, and mesosoma ventrally with dense, white hairs. Mandibles, pronotal lobes, tegulae, and legs yellow; mid and hind spurs black. Body with yellow hairs dorsally, white on lateral and ventral surfaces. Tergal bands complete. T1 with tomentose pubescence anteriorly. T2 with large lateral tomentose patches. Clypeus and face below antennae with thick, silvery hairs. Mesepisternum with dense, white hairs. Sterna with thin, white tomentum, apically thicker. Body length 8-9 mm. ON: VIII. — NY, NC. ..... ***T. junctus*** Mitchell
- Axillae not attaining scutellar apex. 4
4. Propodeum posteriorly and laterally with long, white hairs. — Eye 3 times as wide as genal area. Mandibles, labrum apically, tegulae, legs, pronotal lobs, and pygidial plate orange. Spurs black. Pronotal lobes and antero-lateral angles of scutum with dense pile.

Mesosoma laterally and ventrally with long, white hairs. T1 with dense, white hairs anteriorly, apical band complete. T2 with lateral, white hair stripes, apical band interrupted. T3 with band medially narrowed or interrupted. S3 with wide, white hair fringe. ♂ with pygidial plate narrow, orange, with marginal, dark red curb; basally, to transversal ridge, shiny, with punctures deep, large; apical part impunctate. ♂ S2 with basi-median, white hair spot. Body length 10 mm. ON: VII-VIII. — CT, MI, NY. ....***? T. michiganensis*** Mitchell

- Propodeum mostly bare. 5

5. Mesosoma with dark hairs ventrally. Legs brown. — Mesepisternum on lower part with irregular punctures, more than diameter apart in some places. Body with tomentose pubescence white, thick. Clypeus and labrum with dark hairs. T1 with white pile anteriorly, hair bands interrupted. T2 with hair band complete. Sterna without white hairs. Body length 11-12 mm. ON: VIII-IX. — Southern Canada, New England states, west to WI, south to GA. ..... ***T. donatus*** (Smith)

- Mesosoma with white hairs ventrally. Legs orange. 6

6. Mesepisternal lower part with punctures much more than a diameter apart, shining, with erect hairs. — Eye 3 times as wide as genal area. Scutal black space with extended, erect, thin setae. T1 and ♀ T5 with hair bands interrupted. Pygidial plate widely round, subtruncate. Body length 9-10 mm. ON: VII-IX. — ME to GA, west to MN, UT..... ..... ***T. pectoralis*** (Robertson)

- Mesepisternal lower part with punctures less than or equal to a diameter apart, in some places, not distinctly shining, lacking erect hairs. — Eye 4 times as wide as genal area. Scutal black space without erect setae. T1, T2, and ♀ T5 with white hair bands interrupted. Fore and middle spurs light, hind spurs dark. ♂ mesepisternum completely pubescent. Pygidial plate narrowly round apically, with dense, dark hairs basal to transverse ridge. Body length 8-11 mm. ON: VII-VIII. — New England states, to MN, south to TN, NC..... ..... ***T. cressonii*** (Robertson)

Annotated list of Ontario *Triepeolus* Robertson

1. *_T. cressonii_ (Robertson)

Carleton: Ottawa, 20.VIII.1913, ♀, SL; 15.VIII.1913, ♂, SL (CNCI). **Northumberland:** Brighton, 23.VIII.1980, 2♂, Addleby (DEBU). **Bruce:** Dyers Bay, 10.VII.1954, ♂, PG; 31.VII-13.VIII.1953, 3♂, PG (DEBU). **Middlesex:** Komoka, Field Mill Prairie, 27.VII-13.VIII.2001, ♂, PA (DEBU). **Essex:** Windsor, Ojibway, 1-17.VII.2001, ♀, P. Pratti (DEBU). Figure 5.

Reviewed materials from other regions. Lectotype, ♀, Charles Robertson collection, W. E. LaBerge det.1979 (INHS). Lectoallotype, ♂, Charles Robertson collection, W.E. LaBerge det. 1979 (INHS). QC, Mer Bleue, 3.VII1985, ♂, C. Maund (CNCI).

2. _T. donatus_ (Smith)

Sudbury: Noelville, 8.VIII. 1974, 2♀, W. Husby (DEBU). **Carleton:** Ottawa, 15.VIII.1913, ♀, SL (CNCI); ♀ (DEBU). **Haliburton:** Algonquin P. P., 17.VIII, 2002, 4♀, BK (DEBU). **Dufferin:** Orangeville, 19.VIII. 1954, ♀, PG (DEBU). **York:** Toronto, 9.VIII.1898, ♂; 1.IX.1893, ♀; 2.VIII.1888, ♂ (CNCI); 2♀, ♂, W. Brodie (ROME). East Ontario, ♀ (DEBU). Figure 5.

Reviewed materials from other regions. USA, MD, Millington, 8.VI.1891, ♂, E.P. VanDuzee (CASC); NJ, Cape May, 9.12.1932, ♂, Witmer Stone, Sandhouse det. (ANSP).

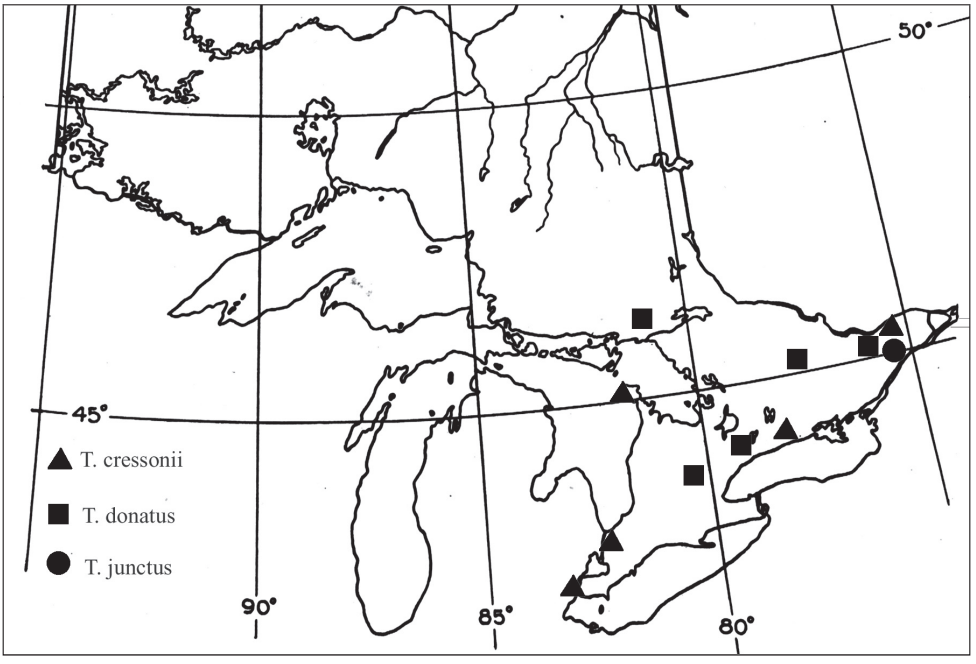

FIGURE 5. Ontario collection localities of *Triepeolus*: *T. cressonii*, *T. donatus*, *T. junctus*.

3. **_T. junctus_ Mitchell
Carleton: Ottawa, 25.VIII.1954, ♂, W. Mason (CNCI). Figure 5.

4. **_T. lunatus_ (Say)
Wellington: Guelph, VI.1960, ♀, Ougun (DEBU). **Essex:** Windsor, Ojibway, 30.VIII.2001, ♂, PA (DEBU). Figure 6.
Reviewed materials from other regions. Lectotype, ♀ (*Epeolus lunatus* concolor Robertson, W.E. LaBerge det, 1979) (INHS). Lectoallotype, ♂, W.E. LaBerge det, 1979 (INHS). USA: AL, Decatur, VIII.1944, ♀ (*Triepeolus concolor* Robertson, G.E. Bohart det), ♀ G.E. Bohart det. (CASC); CO, LaJunta, F. 4762, 37°59'N, 103° 31'W, 4100 fl alt, 12.VIII.1920, ♀(CASC); NJ, Cape May, Aug. 9,1933, ♀, Witmer Stone, det. Sandhouse (ANSP).

5. **? _T. michiganensis_ Mitchell
Sudbury: Noelville, 8.VIII.1974, ♂, R. Nalot (DEBU). **Simcoe:** Awenda P.P., 22.VII.2002, ♂, S. Marshall (DEBU). **York:** Toronto, 16.VII.1893, ♀ (CNCI). **Lincoln:** Grimsby, 12.VIII.1894, ♀ (CNCI). Figure 6.

6. *_T. pectoralis_ (Robertson)
Leeds: Gananoque, 18.VIII.1963, 2♀, ED (DEBU). **Hastings:** Chatterton, 6.VIII.1946, ♀, Howitt (DEBU). **Haliburton:** Dorset P.S., 15.VIII.1961, ♀, KN (ROME); 2.IX.1981, ♀, Aiudi (DEBU). **Bruce:** Dyers Bay, 13-27.VIII.1953, ♀, ♂, PG (DEBU). **Dufferin:** Orangeville, 19.VIII.1954, 2♀, PG (DEBU); Mono Cliffs P.P., 31.VIII.2002, ♀, BK; 13.VIII.2002, ♀, BK

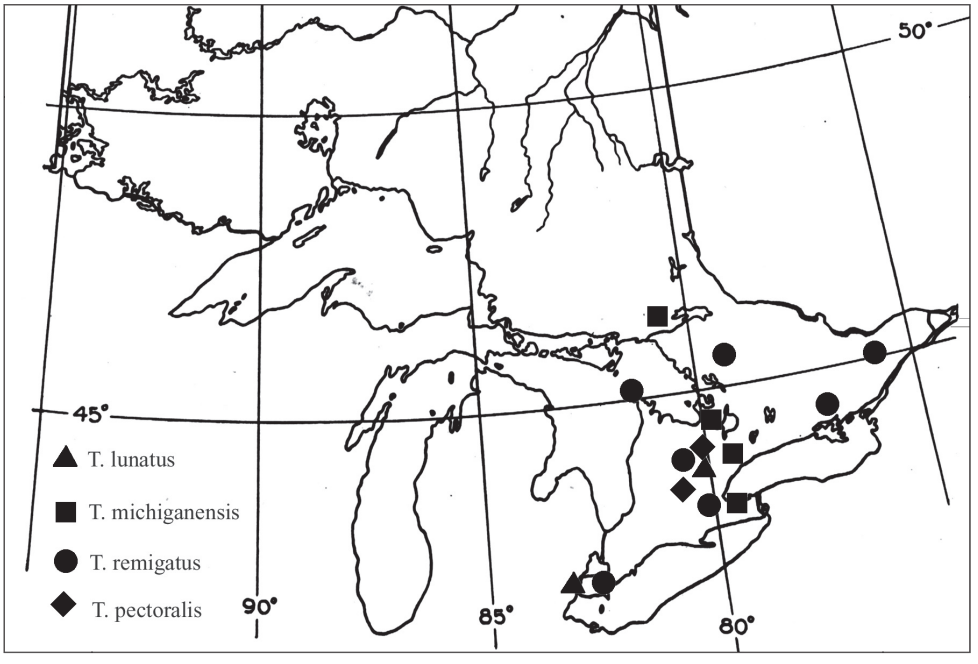

FIGURE 6. Ontario collection localities of *Doeringiella*: *T. lunatus*, *T. michiganensis*, *T. pectoralis*, *T. remigatus*.

(DEBU). **Wellington:** Guelph, VII.1973, ♀, MF (DEBU). **Lincoln:** Vineland, 9.IX.1936, ♂, Ross (DEBU). **Essex:** Windsor, Springarden Road, 12.IX.2002, 2♀, BK, PA (DEBU). **County uncertain:** Effingham, 1.VIII.1954, ♀, C. Miller (CNCI); Harrow, 6.IX.1959, ♀, PG (DEBU). Figure 6.

Reviewed materials from other regions. Lectotype, ♀, Charles Robertson collection (*Epeolus pectoralis* Robertson, W. E. LaBerge det, 1979) (INHS). **Canada:** QC: Cap Rouge, 7.VII.1953, ♂, LM (CNCI). USA: UT, Saltair, 12.VII.1922, ♀, E.P. VanDuzee (CASC); NJ, Blackwood, 9.19.1897, ♀ (ANSP).

7. **_T. remigatus_ (Fabricius)

Wellington: Guelph, VII. 1960, ♂, Quynh (DEBU). **Wentworth:** Ancaster, 23.VII. 1955, ♀ (CNCI). Figure 6.

Reviewed materials from other regions. USA: NJ, Riverton, IX.8.1901, ♀ (ANSP).

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