

## ONTARIO NEST-BUILDING BEES OF THE TRIBE ANTHIDIINI (HYMENOPTERA, MEGACHILIDAE)

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### **Abstract**

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Five species of nest-building Anthidiini are reported from Ontario, including three species of *Anthidium* Fabricius, and one species each of *Dianthidium* Cockerell and *Anthidiellum* Cockerell. A key to identification of males and females is presented, along with descriptions, notes about their biology, and locality records. *Anthidiellum oblongatum* (Latreille), *A. psoraleae* (Robertson) and *Anthidiellum notatum* (Cockerell) are recorded from Ontario for the first time.

### **Introduction**

The tribe Anthidiini is represented in Ontario by three genera of nest-building bees – *Anthidium* Fabricius, *Dianthidium* Cockerell, and *Anthidiellum* Cockerell, - and one genus of cleptoparasitic bees – *Stelis* Panzer, which will be treated in another report. Little is known about nest-building Anthidiini in Ontario. Examination of specimens in several Ontario insect collections revealed the presence of five species of nest-building Anthidiini in Ontario. Of these, *Anthidium manicatum* (L.), which was recorded for the first time for Ontario from Freelton and Guelph (Smith 1991), is widespread in southern Ontario. The few specimens of *A. oblongatum* (Illiger) and *Anthidiellum notatum* (Latreille) have been collected in Ontario only recently (1999, 2002) in the regions where special collecting has been provided regularly; the widely distributed *A. psoraleae* (Robertson) and *Dianthidium simile* (Cresson) are represented in the collections only from the separate areas. As a consequence, it is evident that further collection is necessary to determine the distribution of the described species, particularly on their northern periphery. The purpose of this report is to make possible the accurate recognition of these species, and bring up to date the information concerning their presence in Ontario.

### **Materials and Methods**

A total of 120 specimens of nest-building Anthidiini were examined from the Entomology collections at the Royal Ontario Museum (ROME), University of Guelph (DEBU), and Canadian National Collection of Insects (CNCI). Morphological characteristics, flight period and distributional data on the species are based on specimens from these collections. Morphological terms used in this paper are defined and illustrated in Michener (2000). Identifications were made or confirmed using Mitchell (1960, 1962) and Michener (2000). Overall geographical distributions of the species in North America are based on Hurd (1979) and Hoebeke and Wheeler (1999).

### Family Megachilidae

The Megachilidae is represented in Ontario by over 60 species, all of which belong to the subfamily Megachilinae, and are distributed among four genera of Anthidiini, four of Osmiini, and two of Megachilini (MacKay and Knerer 1979; Ivanochko 1979). Females of nest building species of Megachilidae are recognized by the scopula located on the ventral part of metasoma. Nests are made from mineral or plant material collected by the adult female outside the nest.

#### Tribe Anthidiini

Anthidiini are easily distinguished from other megachilid bees of the local fauna by the black integument with conspicuous yellow maculation on body parts other than legs. The stigma is short, its inner margin not much longer than its width.

#### Key to the nest-building Anthidiini of Ontario

1. Aroliae present. Female mandible with at most 4 teeth. Nest cells made from resin. .... 2
- Aroliae absent. Female with mandible with at least 5 teeth. Nest cells made from plant hairs.  
***Anthidium Fabricius*** ..... 3
2. Scutellum with hind margin produced to form a carinate and broadly truncate lip over-hanging posterior surface of propodeum. Anterior margin of pronotal lobes not extending along anterior border of scutum, not expended, not carinate. Hind coxae without tooth.....  
..... ***Anthidiellum notatum* (Latreille)**
- Scutellum with hind margin round, not overhanging propodeum. Anterior margin of pronotal lobes broadly expended, conspicuously carinate, extending along anterior border of scutum. Hind coxae with long tooth, directed posteriorly. .... ***Dianthidium simile* (Cresson)**
3. Scutum carinate laterally, produced posteriorly, forming a tooth. Male tergum 7 bilobed, without median tooth. Body length 8-9 mm. .... ***A. oblongatum* (Latreille)**
- Scutum not carinate laterally, without teeth. Male tergum 7 with median tooth. .... 4
4. Female clypeus with fore edge straight, with 3 small lateral teeth, separated from the remaining part of clypeus by a groove; face, mandibles, and scutum black, without yellow marks; legs mostly black; mandible with second tooth longer than the third one. Male tergum 7 bilobed, with median apical tooth. Body length 8-11 mm. .... ***A. psoraleae* (Robertson)**
- Female clypeus with fore edge arcuate, tuberculate, not separated from rest of clypeus; face, mandibles, and scutum with yellow marks; legs mostly yellow; mandible with second tooth shorter than the third one. Male tergum 7 with long, curved downwards lateral teeth, and shorter, slender mid tooth. Body length 11-17 mm. .... ***A. manicatum* (L.)**

#### Annotated list of the Anthidiini bees in Ontario collections

##### 1. ***Anthidium manicatum* (L.)**

**Female** mandible with tooth 2 shorter than 3, teeth 3 and 4 close to one another. Yellow coloration is on mandibles, paraocular area, marks on vertex, antero-lateral margins of scutum, pronotal lobes, tegulae, axillae, scutellum, and legs. Terga 1-6 with wide interrupted bands not

enlarged laterally; terga with deep and dense puncture of irregular size on basal part. Scutellum with apical emargination. Body length 11-13 mm.

**Male** tergum 6 with long, curved, lateral tooth. Clypeus yellow with black base. Tibiae and basitarsi yellow. Terga 1-6 with yellow bands, on sides with long, erect, orange hair brush. Body length 14-17 mm.

Flight period in Ontario: June - September. Palaearctic. US (New York, Pennsylvania), South America, Canary Islands.

**Material.** **Cochrane Co.**: Hungry Hollow, 17.VIII.1994, ♀, Rider (DEBU). **Northumberland Co.**: Murray Hills, 1.IX.2002, ♂, S. Paiero (DEBU); Hamilton, 29.IX.94, 3♂, Patterson; 3-22.VIII.1992, 3♀, 2♂, *Stachys officinalis*, *Salvia farinacea* Skevington (DEBU). **York Co.**: Toronto, Humber River, 12.VI-4.IX. 1999, 22♀; 1.VI-18.VIII.1999, 19♂, *Vicia* sp., T. Romankova; 28.VII.1992, 2♂, *Monardia* sp. (ROME). **Willington Co.**: Rockwood, 1.VIII.1992, ♂, *Stachys byzantina*, I. Smith (DEBU). **Halton Co.**: Burlington, Kerns Road, 12.VII.1997, ♂, Crins (DEBU). **Wellington Co.**: Guelph, 15-23.VII.1994, 2♀, 2♂, Coote (ROME); 6.VI.1998, ♀, J. Daley; 17.IX.1995, ♀, Lauro; 20.VII.1994, ♂, J. Dow; 7.VIII.1994, ♂, Rios; 17.VIII.1993, ♂, Caloren; 20.IX.1993, ♂, Bicney; 5.VIII.1992, ♂, *Stachys byzantina*, I. Smith; 14.VI.1991, ♀, 2♂, I. Smith; 7.VIII.1991, ♂; 5.VII.1990, 3♂, *Stachys olimpica*, I. Smith (DEBU). **Wentworth Co.**: Freelton, 25.VII.1992, ♀, ♂, I. Smith; 23.VI.1984, ♂, Kassera (DEBU). **Brant Co.**: Brantford, 24.VIII.2002, ♀, ♂, S. Paiero (DEBU). **Middlesex Co.**: Komoka, 11.VII.2001, ♂, S. Paiero (DEBU). **Essex Co.**: Windsor, Ojibway Prairie, 12-13.IX.2002, ♀, ♂, M. Buck (DEBU).

## 2. *A. oblongatum* (Latreille)

**Female.** Pronotal lobe with carina elevated to form a lamella. Tergum 6 concave in profile. Clypeus with slightly incurved anterior margin, yellow, with a pair of black spots on the base. Mandibles multidentate, with big first, three mid-size, and six small teeth. Terga 1-6 with yellow bands slightly interrupted medially; terga on basal half, within yellow marks, with large confluent pits wider separated on mid black part of disc; posterior half of terga with smaller pits with linear interspaces; impunctate margin of terga narrower than base of antennal flagellum.

**Male.** Tergum 7 bilobed, without mid tooth. Tergum 6 with long lateral and small central apical teeth. Clypeus completely yellow. Terga 1-7 with yellow bands. Body length 8-9 mm.

Flight period in Ontario: August. Palearctic. U.S.: Maryland, New Jersey, New York, Pennsylvania.

**Material.** **Essex Co.**: Windsor, Ojibway Prairie, 26.VIII.2002, ♀, M. Buck; Windsor, Springarden Road, 27.VIII.2002, ♀, ♂, M. Buck (DEBU).

## 3. *A. psoraleae* (Robertson)

**Female.** Mandibles with tooth 2 longer than 3; tooth 3 and 4 separated with wide emargination. Clypeus completely punctured, diameter of pits greater than interspaces. Yellow marks on temples, tegulae, and knees. Terga 1-5 with narrow yellow bands, enlarged on sides, narrowly interrupted medially; terga 1-5 basal part shiny, finely punctured with pits much smaller than distances between them. Scutellum posteriorly around, not emarginated. Middle tibiae with anterior apical tooth.

**Male.** Clypeus yellow with two small black basal marks; yellow space between clypeus and eye extended to antennae. Mandibles and basitarsi yellow. Yellow body marks variable in size and shape, usually present on tegulae, knees, and terga 1-5. Tergum 6 black, with strong lateral tooth. Body length 8-11 mm.

Flight period in Ontario: June - July. U.S.: North Dakota, Colorado, Illinois, Michigan, Maryland.

**Material.** **Rainy River District:** Atikokan, 22.5 km E HWY11, 3.VII.1978, ♂, H. Teskey (CNCI). **Thunder Bay District:** 24.VI.1984, ♀, Princeau, R. Jaagumagi (ROME); Silver Islet, Sibley Peninsula, 18.VII.1861, ♂, H. Milliron (CNCI). **Kenora District:** 8-16 km N Kenora, 13.VII.1961, ♀, H. Milliron (CNCI).

#### 4. *Dianthidium simile* (Cresson)

**Female.** Mandibles 3-toothed, black; clypeus with straight margin, a pair of yellow marks, and punctures greater than interspaces. Yellow coloration is on paraocular area, temple patches, pronotal lobes, tegulae, axillae, on fore margin of scutum, tibiae outer surface, tibial spurs, terga 1-5 bands.

**Male.** Yellow coloration on paraocular area, mandibles, clypeus, patches on temples, tubercles, axillae, anterior margin of scutum, scutellum, terga 1-5 bands, tergum 7, tips of femur, and outer surface of tibiae. Tergum 7 bilobed, with longitudinal middle ridge. Body length 9-10 mm. Nests in wood, cells made from resin.

Flight period in Ontario: July - August. From Manitoba to Atlantic, south to Georgia.

**Material.** **Sudbury District:** Sudbury, 18.VIII.1889, ♀, ♂; 21.VII.1889, ♂ (CNCI).

**Haliburton Co. & Muskoka District:** Dorset, 1.IX.1976, 2♀, D. Pengelly (DEBU). Parry Sound: Trout Creek, 3.VIII.1978, ♂, I. Smith (DEBU). **Nipissing District:** Algonquin Park, 19.VIII.2002, ♀, ♂, M. Buck (DEBU). **Carleton Co.:** Shirley's Bay, 22.VII.1985, ♀, ♂, Sunborne; 5-19.VIII.1985, 2♂, Sunborne (CNCI); Ottawa, 3.VIII.1955, ♂, Tasehareau; 7.VII. 1913, ♀, F. Sladen (CNCI). **Lanark Co.:** N. Burgess Twp., 24.VIII.1972, ♀, Wood (CNCI). **Victoria Co.:** Carden, 23.VII.1979, ♀, Catling (ROME). **Northumberland Co.:** Brighton, 17-20.VII.1956, 2♂ (CNCI). **Durham Co.:** Port Hope, 28.VII.1913, ♀, F. Sladen (CNCI). **Bruce Co.:** Dyers Bay, 12.VIII.1952, ♂, D. Pengelly (DEBU). **Wellington Co.:** Guelph, IX.1913, ♂, Bunrons (CNCI). **Norfolk Co.:** Manester Tract, 6 km NNW St. Williams, 25.VII.2000, 5♀, M. Buck (DEBU).

#### 5. *Anthidiellum notatum* (Latreille)

**Female.** Yellow coloration on wide space on clypeus, paraocular area, stripe along preoccipital ridge, pronotal lobes, tibiae and tarsi, axillae, antero-lateral margin of scutum; tergum 1 lateral patches, tergum 2 narrowly interrupted band, terga 3-5 paramedial pair patches yellow. **Male.** Tergum 7 with apical margin sinuate. Yellow coloration similar to female, with additional marks on mandibles, clypeus, supraclypeal area, terga 3-5 lateral marks, terga 6 and 7 apical bands. Wings dark. Body length 7 - 8 mm. Nests consisting of resin, cells are constructed in the open.

Flight period in Ontario: July – August. From Pacific to Atlantic, from British Columbia to California and Florida.

**Material.** **Halton Co.:** Hilton Falls, 16.VII.1999, ♀, T. Romankova; Bruce Trail near Speyside, 12.VIII.1999, ♀, ♂, T. Romankova (ROME). **Peel Co.:** Terra Cotta, 17.VII.1999, ♂, T. Romankova (ROME). **Brant Co.:** Brantford, 12.VII.2002, ♂, S. Paiero (DEBU).

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