New records of *Andrena* (Hymenoptera: Andrenidae) in New Brunswick, Canada

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*Andrena* is an Holarctic genus, found on all continents except Australia, Antarctica, and South America, with about 500 species in North America and 650–700 species in Eurasia (LaBerge 1986). The distribution of each species is restricted by food preference, i.e., some collect pollen from one or a few plants (oligolectic), and edaphic requirements (LaBerge 1986). Many species are important native pollinators of fruit and berry crops. Studies have shown that native pollinators, such as *Andrena*, provide better quality of pollination regardless of crop, sample size, relative frequency of honey bees in pollinator assemblage, the pollinator dependence of crops, or whether the crop was herbaceous or woody, native or exotic (Garibaldi et al. 2013).

Most species of *Andrena* are vernal, i.e., active during the spring (LaBerge 1986). They typically pupate in late summer and overwinter as adults, allowing early emerging *Andrena* to begin nesting activities on the first warm days in the spring (e.g., Batra 1999). A typical nest-provisioning strategy of many solitary bees is to construct the nest, provision brood cells therein with a pollen loaf, and then add nectar to moisten the mass before depositing the egg (Thorp 2000). By emerging early, *Andrena* can forage when tree fruits bloom, in the absence of workers of eusocial Halictinae and *Bombus*, which are numerically dominant at floral resources during the summer and autumn (Ginsberg 1983). Many *Andrena* appear before flowering of important fruit and berry crops, such as lowbush blueberry, *Vaccinium angustifolium* Aiton (Boulanger et al. 1967) and apple, *Malus* spp. (Sheffield et al. 2003) and serve as important pollinators of these crops. Large *Andrena* are efficient and locally abundant pollinators especially during periods of adverse weather when honey bee activity is reduced (e.g., Boyle-Makowski 1987, and references therein; Jacob-Remacle 1989). *Andrena* are better pollinators than honeybees because they carry more pollen per individual; are present during peak blossom; their range of activity is slightly narrower than that of the honeybees, but their numbers do not fluctuate with the changing weather conditions; and they may suffer less from competition with honey bees than do bumble bee populations (Boyle-Makowski 1987).

Twenty-four species of *Andrena* use willows (*Salix* spp.) as their principal source or at least an important component of pollen used for rearing their young (LaBerge 1986) with some, such as *Andrena salictaria* and *Andrena bisallicis*, being considered as oligoleges (i.e., specialist pollinators) on *Salix* (LaBerge 1986; Sheffield et al. 2003). In 2010, three species of *Andrena* (*bisallicis*, *rugosa*, and *salictaria*, det. by John Ascher), representing new species records for New Brunswick, were collected from a common-garden field test established in 2008 (Ostaff et al. 2015). The test was established to determine the seasonal flowering phenology of seven common native North American willow species, and the composition, phenology, and relative abundance of the most common pollinator insects visiting male and female willow flower catkins (Ostaff et al. 2015). The common garden was started with stem cuttings collected during winter from vigorous 1- and/or 2-yr-old stem sections (Densmore and Zazada 1978) from natural willow populations located in southern and eastern Ontario and adjacent areas of the Ottawa River Valley in Quebec (Mosseler et al. 2014). Insect collections were made using a heavy-duty hand-held, battery-powered vacuum/aspirator (product...
2820GA, BioQuip Products Inc., Rancho Dominguez, CA, USA; http://www.bioquip.com). Specimen vouchers will be deposited with the New Brunswick Museum.

**Andrena bisalicis Viereck, 1908**

NEW BRUNSWICK: York County: Fredericton (45°56'4"N, 66°39'20"W), 14 April 2010, D.P. Ostaff, collected from *Salix discolor* (♀), (1♀, DPO 24344).

*Andrena bisalicis* is found from North Dakota southeast to Louisiana; Ontario, southern Quebec, PEI, Nova Scotia, Maine, south to Georgia (Mitchell 1960; *Andrena Fabricius* - Discover Life 2014). Throughout its range, it has been collected from February to September from the flowers of 23 genera belonging to 12 different families, including *Salix gracilistyla* Miq., *Salix humilis* Marshall (Prairie Willow), *Salix interior* Rowlee (Sand-bar willow), and *S. nigra* Marshall (Black Willow) (Salicaceae) (Mitchell 1960; Stubbs et al. 1992; Boulanger et al. 1967; Wolf and Ascher 2009; *Andrena Fabricius* – Discover Life 2014). *Salix discolor* is a new host record for *Andrena bisalicis*. The earliest collection period of *Andrena* in New Brunswick was 7 April 2010 (Ostaff et al. 2015).

Tuell et al. (2009) collected *Andrena bisalicis* during the pre- and post-bloom period of highbush blueberry (*Vaccinium corymbosum* L.), with all specimens being female. Park et al. (2010) collected *bisalicis* visiting apple blossoms.

**Andrena rugosa Robertson, 1891**

NEW BRUNSWICK: York County: Fredericton (45°56'4"N, 66°39'20"W), date unknown, D.P. Ostaff, collected from *S. interior* (♀), (1♀, DPO 24584).

*Andrena rugosa* is found from Utah southeast to Florida and east to Maine, south to Florida; southern Ontario, Quebec, Nova Scotia, and Prince Edward Island. Throughout its range, it has been collected from April to July from the flowers of 48 genera belonging to 24 families including *Salix babylonica* L., *Salix gracilistyla*, *Salix humilis* (Salicaceae) (Mitchell 1960; Stubbs et al. 1992; Wolf and Ascher 2009; *Andrena Fabricius* – Discover Life 2014). *Salix interior* is a new host record for *Andrena rugosa*.

Mackenzie and Eickwort (1996) collected *Andrena rugosa* from a commercial highbush blueberry field. Tuell et al. (2009) collected *Andrena rugosa* during the pre-bloom and bloom period of highbush blueberry, with >90% of specimens being females. Park et al. (2010) collected *Andrena rugosa* visiting apple blossoms. Boulanger et al. (1967) found *Andrena rugosa* occurring in very low numbers on lowbush blueberry complex (*Vaccinium angustifolium* / *Vaccinium myrtilloides* Michx.). *Andrena rugosa* males were observed taking nectar from female flowers of red maple (*Acer rubrum* L. (Aceraceae)), and red maple pollen was found in the gut (Batra 1985).
Andrena salictaria Robertson, 1905 assemblage because of their ability to use fruit and berry crops as sources of pollen for their nutrition and nest provisioning. Maintaining or supporting diverse wild pollinator populations is particularly important to a broad range of agricultural crops for which honey bees alone are insufficient to maximize pollination and associated fruit and seed set (Garibaldi et al. 2013; Ostaff et al. 2015).

References


