

Raspberry Pollinators and Visitors: Focus on Bees

Introduction

- Raspberry flowers are visited by many insects and pollinators in Manitoba, including native and managed bees.
- Bees rely on flowers for nectar and pollen, and are commonly seen on many flowers.
- Raspberry canes (twigs, branches and stems) provide an important nesting habitat for some insects, including certain bees.
- When a bee visits a flower, pollen can get on its body; the transfer of that pollen to a different plant of the same species is called “cross pollination”.
- The abundance of native bees can vary considerably from one area to the next and from one year to the next. This happens for a number of reasons that have to do with weather, predation, parasitism, disease and other factors.



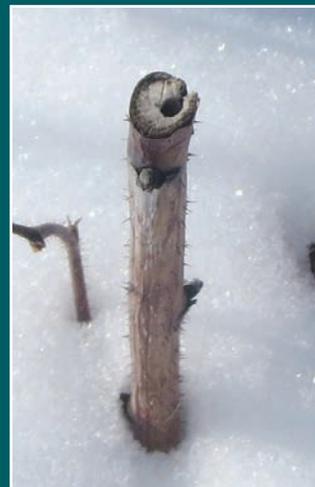
Raspberry “flower” with a small bee on it. Bees, as well as other insects, may transfer the sticky pollen and pollinate the flowers. Both female and male parts are on each flower of most cultivated raspberry varieties.

Different bees – different abilities and limitations

- Below are the various genera of bees that may be spotted on raspberry flowers. They represent all five bee families found in Manitoba.
- This is not a complete summary – rather, it’s meant to give a sense of diversity, improve awareness of bees and highlight the value, vulnerability, and limitations of bees in our fruit patches and commercial agro-ecosystems.



Raspberry canes provide a nesting habitat for a number of insects. The pith in the cane is relatively soft and can be tunneled into. A hole in the pith is a sign that an insect may be in the broken cane (pictured: nest entrance). Some native bees that nest in raspberry cane include the small carpenter bee (pictured), yellow-faced bees and leafcutter bees.



Cane management consideration: rather than removing all dead canes after harvest, consider keeping some, and cutting them to expose the pith for bee nesting in winter and other seasons.

FAMILY: APIDAE

Genus: *Apis*; Pictured: Honey Bee (*Apis mellifera*)



“Floral constancy” is a term used to describe the behaviour of bees, whereby a bee tends to visit the same species of flower on a trip, or over a longer period of time, which increases pollination success.

Bees of the family Apidae, subfamily Apinae, including honey bees and bumble bees, have pollen baskets on their hind legs. The bee moistens the pollen with nectar and packs it in the pollen basket for transport (red circle). This feature can help distinguish bees in this subfamily from other bees. Honey bees can have dominant orange and/or black colouration. They may be abundant in a raspberry patch one day, then less so, the next, if more desirable forage is found.

Honey bees are particularly important pollinators because of their abundance, their ability to move pollen, frequent flower visits and a long season of activity. Honey bees are social and their colonies are managed by beekeepers in Manitoba. Honey bee swarms may be found in man-made or natural structures, where they may succumb to difficult winter conditions and other health challenges.

FAMILY: APIDAE

Genus: *Bombus*; Pictured: Bumble Bee (three species)



There are many wild bumble bee species documented in Manitoba. Bumble bees are relatively large and hairy, and often quite colourful. They are important pollinators of many different flowers. Bumble bees are social and live in colonies, many in old rodent nests in the ground. On raspberries, it is common to see worker bumble bees. A bumble bee can “buzz-pollinate” by shaking its entire body, which releases pollen (more locally) from some flowers. Larger bees, like bumble bees, generally fly further, and in more adverse and difficult conditions, than smaller bees. Bumble bees carry pollen in the pollen basket (red circle).

FAMILY: APIDAE

Genus: *Ceratina*; Pictured: Small Carpenter Bee



Small carpenter bees nest in broken twigs and stems with exposed pith – including raspberry canes. They dig and tunnel into the pith centre.

- Prairie species of *Ceratina* are considered “subsocial”.
- The female will guard the nest entrance.
- Its body colour is dark, metallic blue or metallic green.
- Hairs for pollen (scopa) are on the femur (upper part) of the hind leg.

Genus: *Nomada*; Pictured: Cuckoo Bee



- Commonly called cuckoo bees (like other cleptoparasitic bees)
- They do not make nests, but lay their eggs in the nests of many different bees, primarily genus *Andrena*, but also Halictidae.
- After a *Nomada* egg hatches, the larva kills the host egg.
- Like other parasitic bees, they lack hairs that carry pollen.
- They are “wasp-like” in appearance.

Genus: *Anthophora*; Pictured: Digger Bee



- Most digger bees nest in the ground or in vertical banks.
- While they prefer loam or sandy loam soils, some also nest in clay soil.
- They are solitary, but their nests may be close to one another.

Whether you grow raspberries or not, the presence of bees and other flower visitors can be encouraged by:

- *planting flowering plants and trees that bloom at different times of the year for a long flowering season*
- *providing a favourable nesting and foraging habitat (ex: protection from wind, good sun exposure)*
- *lowering the risk of pesticide use, where possible*

FAMILY: MEGACHILIDAE

Genus: *Megachile*; Pictured Leafcutter (or Leafcutting) Bee (multiple species)



FIGURE 1



FIGURE 2



FIGURE 3

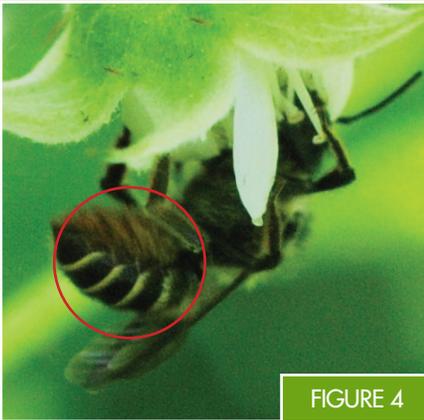


FIGURE 4



FIGURE 5

- (Figures 1 - 5) Leafcutter (or leafcutting) bees are solitary.
- They nest in existing cavities and tunnels, including raspberry canes (see cocoons in branch (figure 5)), beetle tunnels, other natural and man-made cavities, and in the ground.
- They enclose their brood in cocoons made of leaf, or flower petal, pieces.
- A female has hairs for carrying pollen on the underside of its abdomen (figure 4)

Genus: *Hoplitis*; Pictured: Mason Bee



- Bees of *Hoplitis* are solitary.
- They nest in existing cavities and tunnels, including pithy stems like raspberry canes.
- Nest holes are divided by "walls" made of various materials, such as leaf pieces, sand, clay and wood bits, to separate individual developing broods.
- *Hoplitis* bees' antennae have a slightly curved tip (red circle).

Some insects, including mining bees (*Andrena*), nest in the ground. The entrance to the nest may be seen in bare, sandy or loamy soil.



FAMILY: ANDRENIDAE

Genus: *Andrena*; Pictured: Mining Bee (four species)



- All species of mining bees nest in the ground, often in sandy or loamy soil.
- They are solitary, but many nests can be located close together.
- They generally lack the type of distinctive striping on the abdomen that is seen on Halictidae and bees of other families.
- Like many other bees, mining bees have stingers – however, they are generally too weak to penetrate human skin.

FAMILY: HALICTIDAE

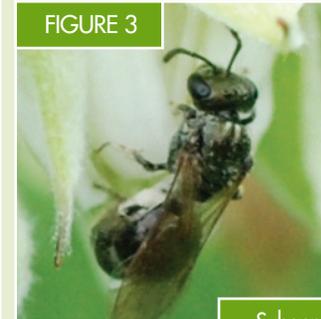
Genus: *Lasioglossum*; Pictured: Sweat Bee (three species)



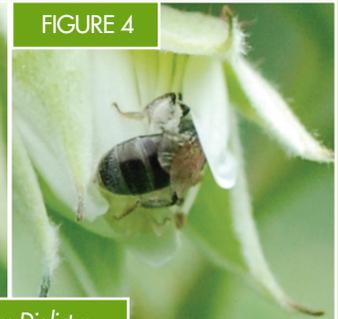
Subgenus: *Lasioglossum*



Subgenus: *Hemihalictus*



Subgenus: *Dialictus*



Genus: *Augochlorella*; Pictured: Green Sweat Bee



- (Figures 1-5) They are called sweat bees because they may land on people to get salt from sweat.
- Halictidae is a large, diverse family.
- Nearly all species nest in the ground.
- Lifestyle in this family is mixed: some species are solitary, some exhibit various social structures and others are not fully understood.
- Like bumble bees, most halictid bees overwinter as mated female adults, and emerge early in the spring.
- Many halictid bees are small in size.
- They may be various colours and have a metallic appearance.
- They carry dry pollen in stiff hairs (scopa) on their hind legs.
- Even though they are small, and do not carry a lot of pollen, they can be relatively abundant.

Since smaller bees usually don't fly as far as larger bees, they tend to visit and pollinate flowers in more local areas, close to where they nest.



Bees of the families *Apidae* and *Megachilidae* generally have long tongues to better access the nectar from deeper flowers, like raspberry (right, red circle). Bees of the families *Andrenidae*, *Halictidae* and *Colletidae* are generally short-tongued, but may still access nectar if they can climb into the flowers.

FAMILY: COLLETIDAE

Genus: *Hylaeus*; Pictured: Yellow-Faced Bee (multiple species)



- These bees have black bodies with distinctive, paint-like markings (usually yellow, sometimes white) on the face and thorax, and bands on the legs.
- They are relatively small and have slender bodies.
- They are “wasp-like” in appearance.
- These bees nest in small cavity tunnels, including plant stems and raspberry canes, and line their nests with a cellophane-like secretion. They carry pollen internally (in the crop).
- Colletidae is a diverse family that includes another genus, *Colletes*.

Other Insects on Raspberry Plants and Flowers

There are many insects, besides bees, that visit raspberry plants and flowers. Some of these may even look like bees. Many of the insects pictured below are flies (particularly hover flies) or wasps. Some flies also help control insect pests.

Flies have short antennae, while bees and wasps have longer antennae, which can be seen in some of the images below. Also, flies have two wings while bees and wasps have four, but this may not be visible in a photo. The kinds and numbers of actual insects seen on raspberry plants and flowers can vary significantly.



Hover fly (genus *Toxomerus*)



Hover fly (genus *Toxomerus*)



Hover fly (genus *Helophilus*)



Hover fly (genus *Somula*)



Hover fly (genus *Temnostoma*)



Hover fly (genus *Volucella*)



Hover fly (genus *Tropidia*)



Hover fly (genus *Eristalis*)



Hover fly (genus *Temnostoma*)



Fly (genus *Condylostylus* likely)



Tachinid fly (genus *Winthemia*)



Blow fly (likely)



Flesh fly



Robber fly (genus *Laphria* likely)



Thick-headed fly



Wasp (genus *Vespa*)



Wasp (genus *Euodynerus*)



Wasp



Wasp (genus *Ectemnius*)



Hornet



Wasp (Braconid suspected)



Wasp (Ichneumon suspected)



Mantidfly (genus *Climaciella*)



Carpenter ant



Wasp beetle



Flower beetle



Tumbling Flower beetle



Skipper butterfly



Northern Crescent butterfly



Little Wood-Satyr butterfly

(Photos were taken during the spring flowering period.)



Bee (*Hemihalictus*) on a strawberry flower

References:

- Dr. Cory Sheffield of the Royal Saskatchewan Museum for bee identification.
- McGregor, S.E. 1976 (year of original publication). *Insect Pollination of Cultivated Crop Plants*. United States Department of Agriculture.
- Michener, C.D. 2007. *The Bees of the World* (2nd Edition). *The Johns Hopkins University Press; Baltimore, MD*. 953 pages.
- Sheffield, C. S., S. D. Frier, and S. Dumesh. 2014. The Bees (Hymenoptera: Apoidea, Apiformes) of the Prairies Ecozone with Comparisons to other Grasslands of Canada. In *Arthropods of Canadian Grasslands 4*: 427-467.
- The Xerces Society. 2011. *The Xerces Society Guide: Attracting Native Pollinators; Protecting North America's Bees and Butterflies*. Storey Publishing. 371 pages.
- *BugGuide* (bugguide.net).

For more information, contact Manitoba Agriculture,
Food and Rural Development at crops@gov.mb.ca.

November 2015