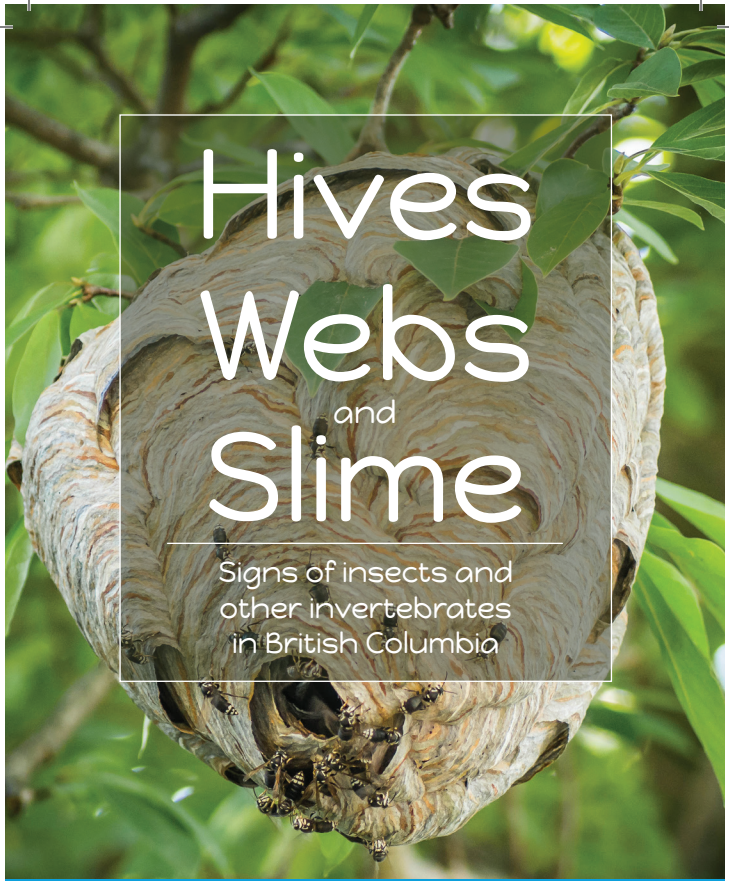

Hives Webs and Slime

Signs of insects and other invertebrates in British Columbia

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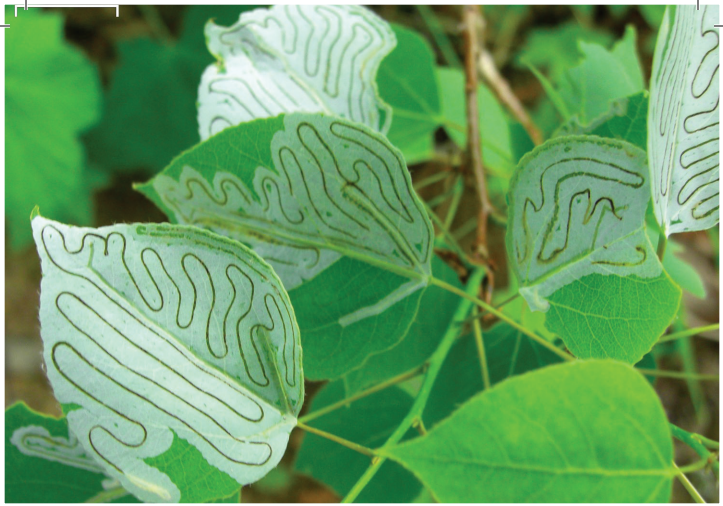


Aspen Serpentine Leafminer Moth

Phyllocnistis populiella

Where found: Throughout the BC interior and occasionally on the south coast on aspen and poplar trees. Concentrations can be very high in outbreaks.

Description: Adults are minute (~5mm) white moths with subtle dark markings. They have long antennae and narrow hindwings with a long outer fringe of scales.

Signs: Eggs are laid in the buds of aspen and poplar leaves in spring. When they hatch, the flat larvae burrow into the middle layers of the leaf to feed. This forms silvery tunnels that twist and turn across the leaf. Heavily damaged leaves have been shown to lose 75% of their photosynthetic capability, starving the tree. As the leaves can only take in a quarter of their usual sun energy, parts of the tree may die. There are numerous species of leaf-mining moths with preferences for various types of leaf, so you may see similar patterns on other plants.

Pacific Banana Slug

Ariolimax columbianus

Where found: Coastal BC and wet forest pockets west of the Rocky Mountains, particularly on the forest floor of coniferous rainforests.

Description: Pacific banana slugs are among the largest species of terrestrial slugs in the world, growing up to 25cm long. Yellow in colour and often dappled with black blotches, they resemble banana peels discarded on the forest floor.

Slugs are **molluscs,** while insects and spiders are **arthropods**.

Signs: Slugs leave behind them a translucent slimey trail. It is produced by the slug to help it glide over rough ground with ease. This mucus is sticky and allows the slug to climb vertically and even upside down! It also has a numbing quality which can discourage predators from making a meal of them. When mixed with water, slug slime expands exponentially in volume. To get slug slime off your hands don't wash them or you will just make more slime! Rub your hands together until the slime forms small balls like dried glue. Then you can flick it off.

Bald-faced Hornet

Dolichovespula maculata

Where found: Throughout BC in forested areas and in vegetation in urban areas. Nests are generally located in trees and bushes.

Description: Bald-faced hornets are distinguished from other yellowjackets and paper-making wasps by their white and black colouring. They have a white or "baldfaced" head. Adults average about 19mm in length.

Signs: These **social** wasps build round, tapering paper nests up to 36cm in diameter to house their colony. Nests are layered hexagonal combs inside, covered by a mottled gray paper envelope. The paper envelope is made by wasps collecting and chewing wood fibers. Avoid disturbing an active nest as these wasps will defend their colony with painful stings. Nests and worker wasps survive for only one season, while queen wasps **overwinter** in stumps or rotten logs where they protected from the cold. In the spring they will start new colonies.

Mountain Pine Beetle

Dendroctonus ponderosae

Where found: Throughout BC, especially the central to northern regions. Mountain pine beetles inhabit ponderosa, whitebark, lodgepole, Scots, jack, and limber pine trees.

Description: Adult beetles are black and measure approximately 5mm in length, about the size of a grain of rice.

Signs: Mountain pine beetles may be tiny, but when they work together they can cause a lot of damage. In recent years, they have destroyed millions of hectares of lodgepole pine forest in BC.

A pine beetle will land on a tree and release **pheromones** to encourage more pine beetles to join the swarm. Together they burrow into the inner layers of bark to feed and excavate tunnels in which to lay their eggs. One of the first signs of the invasion is the formation of 'pitch tubes' all over the bark. This is the tree sap leaking out of beetle holes.

Pine beetles also carry a fungus with them. The fungus attacks the interior of the tree and blocks the flow of water and nutrients.

A healthy pine tree will defend itself from beetle attack with toxic sap. But the joint attack of the swarm of beetles and the fungus, especially with added stressors like climate change, is overwhelming. The tree's needles will turn red, then drop as the tree dies. In an infestation, whole hillsides may turn red with dying trees.

Bumble bees

genus *Bombus*

Where found: Over thirty species of bumble bees are found throughout BC. They can be found wherever there are flowers to feed on. They tolerate cold better than other types of bees, so they can be found further north and at higher elevations.

Description: There is much variation between species but in general, bumble bees are large, round, and fuzzy. Many species have broad bands of colour: black, yellow and/or orange. They can be heard buzzing loudly as they fly.

Signs: Like honey bees, bumble bees are **social** insects that live in colonies. Many species nest underground, often in old rodent burrows. Other species make nests above ground in thick grass or in holes in trees. Sometimes they will take over an old bird house and make use of the nesting materials left behind. The bumble bee nest is made up of clusters of round wax cells where the young develop. Bumblebees rarely sting, but may do so if their nest is disturbed.

Dragonflies

order *Odonata*, suborder *Anisoptera*

Where found: There are approximately 64 species of dragonflies found across BC. Dragonflies require freshwater environments to complete their life cycles. Some species prefer lakes and ponds while others prefer faster moving water.

Description: Dragonflies are an order of agile flying insects characterized by large multifaceted eyes, two pairs of strong transparent wings that do not fold, and an elongated body. They come in an array of colours including vibrant reds, blues, and greens.

In **larval** form, the general body plan of a dragonfly **nymph** is similar to a wingless adult. However, they have internal gills that allow them to live in an aquatic environment and large extendible jaws which allow them to eat prey as large as tadpoles.

Signs: When the **nymph** is ready to **metamorphose** into an adult, it climbs out of the water, often up a reed or other plant stem, and prepares to transform. Anchoring itself firmly with its claws, the **nymph** moults by splitting open its **exoskeleton**. The adult dragonfly emerges from within, leaving its transparent empty **exoskeleton** behind, the "exuvia". The exuvia looks like a transparent **nymph** and will continue to cling to the stem after the dragonfly flies away.

Black and Yellow Mud-dauber Wasp

Sceliphron caementarium

Where found: This wasp species is most commonly found in the southern region of the province. Mud-dauber wasps require habitat where mud is available for nest building. Nests are constructed in locations where they are protected from the elements. These may be natural, like rock overhangs, or structures such as eaves and bridges.

Description: The Black and yellow mud-dauber wasp can reach a length of 28mm. Its body is mainly black, with a long, narrow midsection called a "petiole". The legs are bright yellow.

Signs: These **solitary** wasps build clusters of tubes out of mud. Into each tube, the female puts several spiders which have been paralyzed by her sting. She will then lay an egg in the chamber and seal the end. The young wasp **larva** will feed on the spiders before emerging from the tube as an adult. Nest clusters generally contain up to 25 tubes. The nest is aggressively defended while under construction, but after it is complete, the female departs and does not return. These wasps can sting but do so only if threatened.

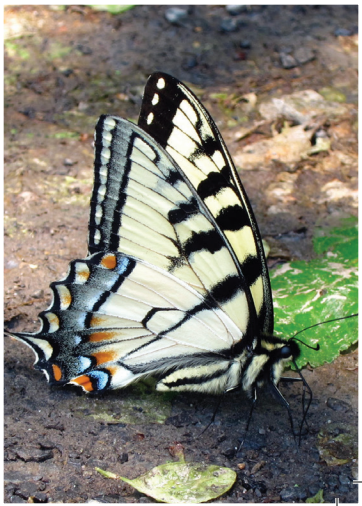
Blue Orchard Mason Bee

Osmia lignaria

Where found: Blue orchard mason bees are found in BC's southern interior and coastal areas. They can be found in a variety of environments but are particularly well adapted to the northern ranges of blooming fruit trees. They often nest close together and local populations are often limited by the availability of suitable nesting sites and forage sources.

Description: While at first they may look black, these bees are actually a dark metallic blue-green. Adults are 11-14mm in length. Their bodies are covered in long hairs which carry pollen.

Signs: To build a nest, mated females will seek out holes in trees or hollow plant stems between 7-8mm in diameter. They will also use tubes in "bee houses" constructed specifically to attract mason bees. In a tube, the bee will create a series of chambers partitioned by mud. She will fill each chamber with nectar and pollen before depositing an egg. She will then seal the chamber with a wall of mud and begin the next until the tube is full. The end of the tube is then capped with a thicker layer of rough mud. As is characteristic of solitary bees, mason bees are very docile and rarely sting.



Canadian Tiger Swallowtail

Papilio canadensis

Where found: Canadian Tiger Swallowtails are found throughout southeastern, central, and northern BC. These butterflies are found predominantly in boreal forest habitats. As caterpillars, they feed on the leaves of deciduous trees such as alder, birch, black cottonwood, trembling aspen, and willow.

Description: Adults have a wingspan of 67-80mm. Wings are bright yellow with a black margin and stripes. The hindwings have elongated tails with blue and orange markings at the base.

As caterpillars, they are large and green with a yellow band and two false eyes with bluish centers.

Signs: When the caterpillar is fully grown, it will fasten its body to a twig with silk. Its outer layer will then harden into a **chrysalis** around 3.2cm in length, giving it protection as the process of **metamorphosis** is underway. The **chrysalis** is variable in shades of brown, often with a dark vertical stripe. It looks like a flake of bark. After the newly-formed butterfly has emerged, the transparent case can be found still attached to the twig.

Western Tent Caterpillar Moth

Malacosoma californicum

Where found: Found throughout southern BC. The tent caterpillar can be found in many habitats and is a generalist feeder on hardwoods. It is commonly seen in roadside hedges, gardens, and fruit trees, but can also be found in forest settings.

Description: Adult moths are shaggy and reddish-brown with a wingspan of 10-19mm.

More often, this insect is recognised in its caterpillar form, which is patterned black, orange and white with long orange hairs.

Signs: Soon after hatching in early spring, a brood of tent caterpillars will start producing silk and weaving a tent-like structure. They choose a location warmed by morning sun, as they are not able to digest when their body temperature is below 15°C. To regulate their temperature (thermoregulate) they will move between layers of the silk tent to compartments that are warmer or cooler. The caterpillars will leave the tent to feed but return afterwards for digestion. When full grown, they will abandon the tent, spin a **cocoon**, and emerge as adult moths.

Snow Pool Mosquito

(Aedes) Ochlerotatus communis

Where found: This is one of 48 confirmed species and subspecies of mosquito in BC. It is widely distributed throughout the province. This species is commonly found in vernal (snowmelt) pools in coniferous forests at medium altitudes. Unlike most other mosquito species, it remains active during the winter.

Description: A medium-sized mosquito with a cream and brown banded **thorax**. Wing length around 4mm.

Larvae are aquatic, spending much of their time hanging upside down at the water's surface. They are dark brown with a legless body covered in hairs. They have a tube at the rear of their body through which they breathe.

Signs: Mosquitoes feed on flower nectar and are important pollinators of flowers, such as orchids, in wetter environments. However, female mosquitoes also feed on blood, which contains protein and iron that they need to produce eggs. The Snow pool mosquito is a species that favours the blood of mammals, including humans. When a mosquito pierces the skin, it injects saliva from its mouth. The saliva contains compounds that keep the blood flowing. It also causes the itchy skin irritation that is a common sign that you have been bitten. Some people are allergic to the saliva and react more strongly.

Bowl and Doily Spider

Frontinella pyramitela

Where found: Found in southern regions of BC. Common habitats include temperate woods and alpine forests as well as weedy fields and in shrubs.

Description: This small spider is about 4mm long. It is reddish-brown in colour with white markings down the sides of its **abdomen** (body).

Signs: This is a species of sheet web spider named for its unique web that resembles a bowl above a doily (or saucer). This spider's web is not sticky. Instead, the "bowl" of the web has many strands of silk strung above it that knock flying prey into the bowl. The spider remains on the underside of the bowl and runs underneath the stunned prey, biting up through the web and injecting venom before pulling the prey down through the bowl. The "doily" portion of the web below the bowl protects the spider as it hangs below the bowl. It is a place to store captured prey for later consumption.

Polyphemus Moth

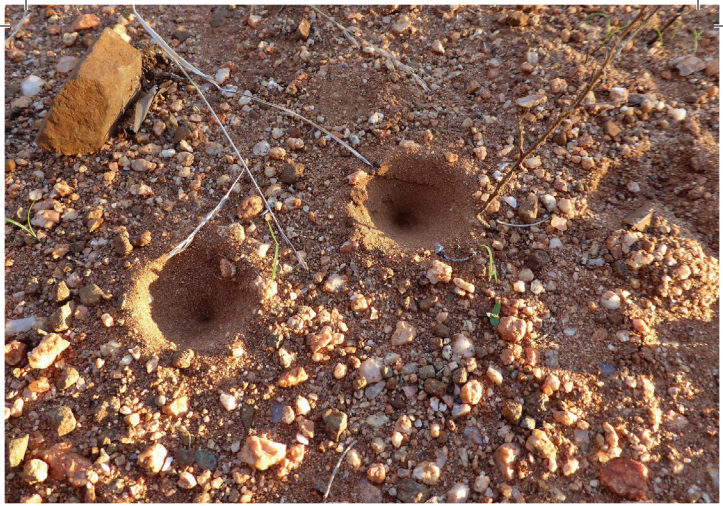
Antheraea polyphemus

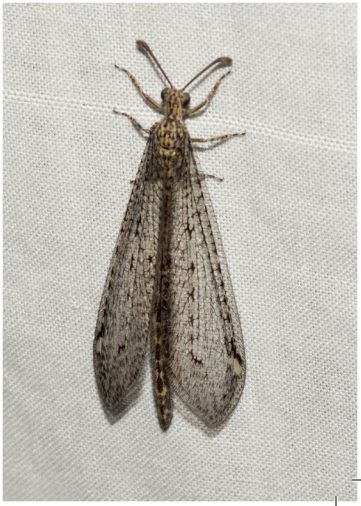
Where found: Found in the southern and central areas of the province, extending into northeastern BC. Common in wet forested areas, woodlands, deciduous hardwood forests, orchards, and wetlands as well as suburban gardens.

Description: A member of the giant silk moth family, this moth has a wingspan up to 16.5cm. Wings and body are shades of warm brown. The hindwings have distinct black and gold eyespots. The forewings have a pair of smaller spots.

The caterpillar is large (up to 10cm long) and bright green with rows of small red spots.

Signs: When caterpillars are full grown, they wrap themselves in a **cocoon** of brown silk attached to the leaves of a preferred food tree such as birch, oak, or maple. **Cocoons** are oval in shape, 4cm in length and 2-2.5cm in diameter. The caterpillar undergoes **metamorphosis** in the **cocoon** and emerges as an adult moth, leaving behind the empty silk capsules. As adults, they do not feed and focus only on reproduction, living for less than a week.





Antlion

Myrmeleon immaculatus

Where found: Found in the southern interior of BC. This species inhabits open woodlands, scrub grasslands and dry sandy areas.

Description: As an adult, the antlion has a long, dark, slender body with yellow stripes. It has two sets of narrow transparent wings. It is a very slow flier and mostly flies at night.

As a **larva**, it is brown in colour with a round, stubby body, small head and large jaws (mandibles).

Signs: Antlions spend up to 3 years in **larval** form. During this time they feed primarily on insects, with ants as their main food source. To catch their prey, antlions dig funnel-shaped pits in the sand and lie buried at the bottom. When an insect walks over the rim of the pit, it slides down the steep sides and is grabbed by the waiting jaws of the antlion. In areas where antlions are abundant, sandy areas may be covered with many of these conical craters. Antlion **larvae** are also called "doodlebugs" because the trails they leave on the sand look as if someone has been doodling a drawing.

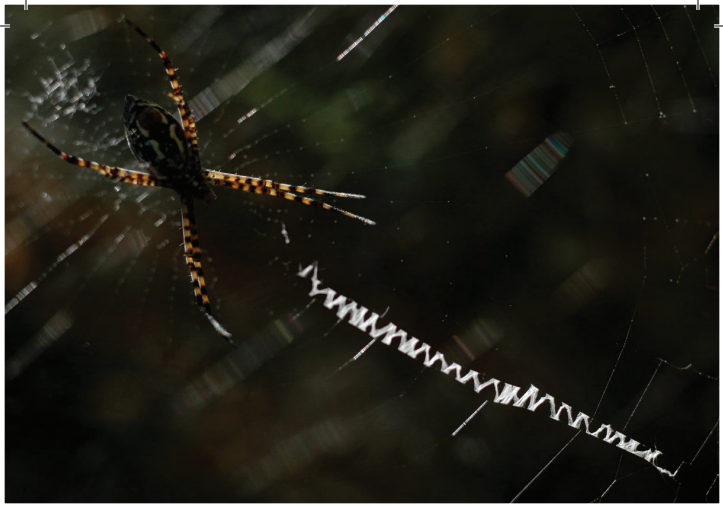
Western Thatching Ant

Formica obscuripes

Where found: These ants are native to BC and found across the province. They are especially prevalent in the southern coastal region, including Vancouver Island. They can be found in grasslands, coniferous forests, dunes, and alpine meadows.

Description: Ranging in length between 4-7.5mm, these ants have a reddish-orange head, red or black **thorax** (middle body section), and a black **abdomen** (rear body section).

Signs: Western thatching ants get their name from the dome-shaped piles of thatch they build over their nest mounds. The "thatch" consists of dry grass stems, conifer needles, and other plant material. The mounds they create can be over a metre in diameter. The thatch is used to insulate the colony, keeping it a constant moderate temperature day and night. To prevent plants from shading the nest and cooling it too much, the ants will chew off the bark at the base of plants growing near the mound. Formic acid is then sprayed by the ants into the open layer of the plant stem, eventually killing it. A colony may contain 10,000 to 40,000 individuals and is continually maintained and expanded by the workers.



Banded Garden Orbweaver Spider

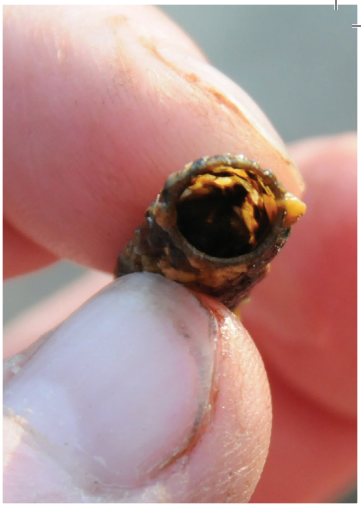
Argiope trifasciata

Where found: Widespread throughout southern BC in open areas, long grass, and gardens.

Description: The female of the species has a body length of 15-25mm. Her body (**abdomen**) is striped in white, yellow, and black. Legs are slender and striped black and orange.

The male is much smaller with a body length of 4-6mm. His body is narrow and pale yellow. Legs are brown.

Signs: The large web of this spider can reach 60cm in diameter. It is the classic, round spider-web shape woven in a spiral from the center. These spiders will often add zig-zagged bands of thicker silk to create rays radiating from the center of the web. This design has been shown to play a role in attracting prey. It may also be used to deter large animals from blundering through the web.



Black Dancer Caddisfly

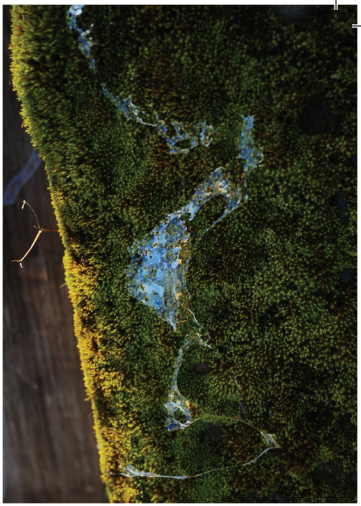
Mystacides sepulchralis

Where found: Common throughout BC's interior, in and around still or slow moving bodies of freshwater. One of hundreds of caddisfly species found in BC.

Description: Adults are small (around 1cm in length), black-winged insects with long, thin antennae twice their body length.

Larval form is wingless and aquatic. It has a long cylindrical body.

Signs: To protect itself while in **larval** form, the caddisfly constructs a case around its body. This "case" is a tubular structure made of silk. The **larva** attaches various materials to camouflage and strengthen the case. Different materials are chosen by the **larvae** of each caddisfly species. The Black dancer prefers sand and conifer needles. Other materials used include larger fragments of rock, bark, sticks, leaves, seeds and mollusc shells. These are attached to the surface of the silken tube. As the **larva** grows, more material is added to lengthen the structure. Eventually the case is left behind when the caddisfly swims to the surface, enters its **pupal** stage, and then emerges as an adult.



Pacific Sideband Snail

Monadenia fidelis

Where found: On the south coast of BC and Fraser Valley in moist coastal Douglas fir forest as well as Garry oak habitat.

Description: With a shell diameter of over 3.5cm, the Pacific sideband is the largest land snail in BC. Shells are typically chestnut brown with light and dark stripes along the side. The body is pink to brown.

Snails are **molluscs** while insects and spiders are **arthropods**.

Signs: Like slugs, snails leave a trail of mucus which helps them to travel. Unlike slugs, they have a shell that they can retreat into to avoid predators and to prevent drying out. The majority of land snails, including the Pacific sideband snail can seal themselves inside their shells with a layer of dried mucus called an epiphragm. In many sea snails and freshwater snails, the seal is made with a lid-like structure called an operculum, which fits snugly into the entrance.

Mossy Rose Gall Wasp

Diplolepis rosae

Where found: Originally from Europe, this gall wasp can now be found throughout BC on Nootka rose and ornamental roses.

Description: This tiny wasp is dark in colour and only 4mm long. Females have a reddish abdomen, while the males are darker.

Signs: This wasp lays its eggs in the stem of a rose. The rose reacts to this by producing a large, round growth of tissue known as a gall. The gall has numerous, separate chambers inside, each with a wasp **larva** inside of it. The gall provides a safe, protective place to grow over the winter as the wasp **larvae** feed on the plant walls. The galls are covered in mossy filaments that are especially noticeable in the fall when they turn from green to crimson red. The young emerge as adults the following spring.

Western Leafcutter Bee

Megachile perihirta

Where found: Found throughout southern and central BC, often inhabiting orchards and meadows.

Description: At approximatly 15mm in length, these bees are about the same size as a European honeybee. They are striped black and yellow like a honeybee, but are covered in dense hairs. Members of the genus *Megachile* are known as “hairy belly bees” as they use dense hairs on their undersides to collect pollen.

Signs: Western leafcutter bees are **solitary** bees, which means each female bee lays her own eggs. However, they work in small groups to create nests. Together they dig small burrows in sand, gravel, soil, or in rotting plants or wood. Small discs of plant material are used to line the tubes in which they lay their eggs. These discs are cut by the bees using their jaws and carried back to the nest. The result is the appearance of uniform circles scissored from the edges of leaves and flower petals. Leafcutter bees are not aggressive and sting only if handled.

Codling Moth

Cydia pomonella

Where found: It is believed this species of moth originated in southern Europe and was transported to North America in the 1700s. Today it is found across BC with the exception of the far north of the province. Codling moths are particularly attracted to gardens and orchards that include apple, pear, walnut, chestnut, and apricot trees.

Description: Adult Codling moths have an average length of 10mm. Their brown dappled wings fold into a tent-like shape when at rest.

The caterpillar ranges from pale yellow to reddish brown and measures up to 2cm when fully grown.

Signs: The Codling moth caterpillar bores into a fruit within 24 hours of hatching from its egg. It tunnels into the center of the fruit and bites into the seed, halting the growth of the fruit. This causes the fruit to ripen prematurely while the caterpillar feeds. When cut in half, a fruit that has been targeted will show entry and exit tunnels along with silk webbing and excreted food material known as “frass”.

Jumping Gall Wasp

Neuroterus saltatorius

Where found: Native to the western United States, this wasp has recently found its way to BC. It is currently only found on southern Vancouver Island and the Gulf Islands. In BC, the Jumping gall wasp requires Garry oak trees to complete its lifecycle. In its native range, numerous species of white oak serve as hosts.

Description: Adult wasps are very small, only 1-1.5mm in length. They are rusty to dark brown with a typical wasp shape.

Signs: After mating, the female wasp will lay eggs into the underside of an oak leaf. This causes small round growths of yellow plant tissue, known as galls, to form. After 6-8 weeks, the galls fall off, leaving behind yellow-brown spots on the leaf where the galls were attached. Once on the ground, the galls can be seen twitching and jumping, giving the species its common name. The jumping is caused by the movement of the **larva** within the gall. Eventually, the gall is worked into the soil, where the wasp **overwinters** as a **pupa** and undergoes **metamorphosis**. The adult wasp emerges from the gall in the spring.

Glossary

Abdomen: The backmost of the three body sections of an insect. Spiders have only two body sections and the backmost of these is their abdomen.

Arthropod: Animals such as insects and spiders with a hard exoskeleton rather than bones, a segmented body, and paired jointed legs.

Chrysalis: The pupal stage in the lifecycle of a butterfly in between caterpillar and adult. The chrysalis has a hard outer shell that protects the insect inside as it changes into its adult form.

Cocoon: The pupal stage in the lifecycle of a moth and some other insects in between larva and adult. The cocoon is a silk case that protects the insect as it changes into its adult form.

Exoskeleton: The hard covering that supports and protects the bodies of insects and spiders, made of a substance called chitin.

Larva (plural: larvae): The juvenile stage in the life cycle of an insect that is markedly different from the adult. Ex: caterpillars.

Metamorphosis: The process of change that take place during an insect's lifecycle as it transforms from its young form to adult.

Mollusc: Boneless animals including slugs and snails. They have soft unsegmented bodies and live in aquatic or damp habitats.

Nymph: Name given to the young stages of those insects which undergo a partial metamorphosis. The nymph is usually quite similar to the adult except that its wings are not fully developed.

Overwintering: A period of dormancy in insects and spiders during the winter season, similar to hibernation.

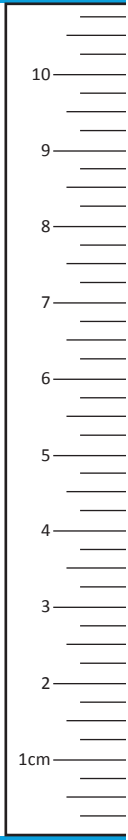
Pheromones: A chemical substance released by an animal which affects the behavior of others of its species.

Pupa: Inactive immature form of an insect between larva and adult.

Social: Insects that live in colonies with complex systems for dividing up tasks (division of labour).

Solitary: Insects that live on their own except to mate.

Thorax: The middle of the three major divisions of the insect body. The legs and wings are always attached to the thorax.



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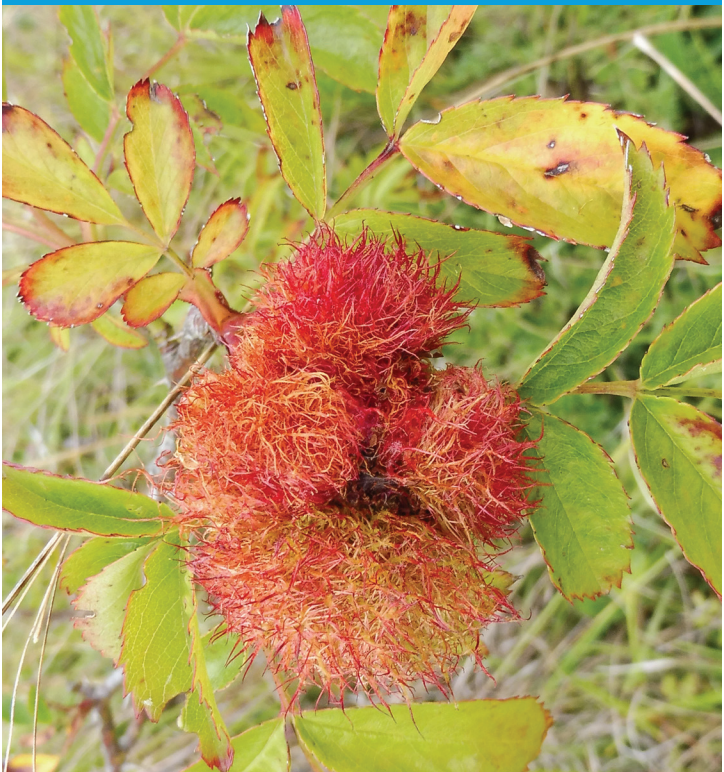

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