BENEFICIAL INSECTS BY THE DOZEN

Beneficial insects and mites belong to three categories: **predators, parasites and pollinators**

- *Predators*: capture and eat other organisms, such as insects or mites.
- *Parasites*: the immature stages of parasites develop on or within a host (at any stage: eggs, larvae, nymphs, pupae, adults), eventually killing it.
- *Pollinators*: visit flowers to feed on nectar and pollen and then transfer it in and between flowers of the same species— an essential function for plant seed and fruit production.

Many beneficial insects have **split personalities**. Lady beetles prey on aphids but can become a nuisance in autumn when they crawl into houses to overwinter. Yellowjackets can sting and be annoying but their main diet consists of caterpillars and flies.

BENEFICAL INSECTS DESCRIBED IN THIS ARTICLE (there are others)

HOW TO ATTRACT BENEFICAL INSECTS TO THE GARDEN

- Avoid using insecticides - even soap sprays kill beneficial insects. Always try non-chemical methods first
- Don’t use bug zappers as they are indiscriminate and kill beneficial insects as well as pests
- Provide a safe water supply but make sure insects won’t drown by putting stones in the water source so they can crawl out. Change the water regularly to prevent mosquitos from breeding. A large plant pot saucer is ideal
- Avoid cleaning up in the fall as many insects overwinter as pupae or adults in leaf litter. Clean up as late as possible in the spring
- Leave woody stems and stalks and minimize cultivation to protect ground dwellers

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WHICH PLANTS ATTRACT BENEFICIAL INSECTS

Try to provide 5 – 10% of overall garden space to flowers that attract and feed bees and beneficial insects. Mingle insect plants throughout the yard and garden, among vegetables, as edging or in rocks. Grow a variety of plants so flowers are available to insects from early spring to summer.

Plants that Attract Beneficial Insects

	Annuals & Biennials	Perennials
Ornamentals	Asters	Alyssum
	Calendula	California Lilac
	Candytuft	Candytuft
	Cosnos	Coneflower
	Heliotrope	Daisies
	Lobelia	Rudbeckia
	Salvia	Stonecrop (Sedum)
	Sweet Alyssum	Verbena
Herbs	Cilantro/Coriander	Catnip
	Dill	Lavender
	Caraway	Mint
	Fennel	Rosemary
	Parsley	Sage
	Summer savory	Thyme
Vegetables	Broccoli	
	Chinese greens	
	Kale	
	Radishes	
	Leeks + Onions	

HOW TO TELL A BEE FROM A WASP OR A FLY

- Bees have branching hairs for collecting pollen, 2 pairs of wings
- Wasps have 2 wings hooked together
- Flies have 2 wings and no stinger

BENEFICIAL INSECTS BY THE DOZEN

GUIDE TO IDENTIFYING A DOZEN COMMON BENEFICIAL INSECTS

APHID MIDGES

Appearance: Adults of the predaceous midge are tiny, delicate, long-legged brown flies.
Body length: Adult - 3.0 mm; mature nymph - 3.0 mm
Life Cycle: Overwinter as pupae in soil. Eggs are laid in colonies of aphids. Several generations per year.
Insect Pests Attacked: Aphids
Monitoring: Examine aphid colonies for presence of tiny orange maggot-like larvae or tiny paprika-like eggs. It may be necessary to inspect under aphids to find them. Adults are active at night and thus rarely seen.


Midge larva feeding on a winged aphid


Larva among aphid skins and dead aphids

GROUND BEETLES

Appearance: Most are black or purplish black with long legs that allow them to run quickly. Larvae are narrow, elongated, dark and shiny, with distinct segments and rather large heads.
Body length: Adults - 2-2.5 cm long
Life Cycle: Develop through 4 life stages: egg, larva, pupa, and adult. Adult females lay eggs individually in soil. After hatching, larvae develop through four increasingly larger instars.
Insect Pests Attacked: Slugs and snails, cutworms, fly maggots, cocoons of winter moth
Monitoring: Look under leaf litter or rocks but be prepared: both adults and larvae scurry out suddenly. Larvae can sometimes be seen attacking earthworms.

BENEFICIAL INSECTS BY THE DOZEN

LACEWINGS

Appearance: Common species include two green species, and one brown species. Lacewing eggs are white and laid singly or in groups on long stalks on the underside of leaves or branches. Brown and green larvae are very similar except for small differences in body shape and the brown lacewing's habit of moving its head from side to side while walking.
Body length: Adult - 10.0-20.0 mm; mature larva - 6.0-10.0 mm
Life Cycle: Most overwinter as adults, one green one as pupae. Up to four generations per year depending on temperature.
Monitoring: Examine aphid- or psylla-infested leaves and shoots for feeding larvae.
Insect Pests Attacked: Aphids, spider mites, whiteflies, thrips, leafhoppers, scales, mealybugs, psyllids, small caterpillars, insect eggs. Green lacewing larvae feed on insect pests. Both larvae and adult brown lacewings feed on pests.


Green lacewing adult


Brown lacewing adult


Lacewing eggs


Lacewing larva

BENEFICIAL INSECTS BY THE DOZEN

LADY BEETLES

Appearance: Many species vary in size, colour, and pattern. Colours range from black and red to orange-red and almost yellow. Most species have coloured spots or markings on their backs.
Body length: Adult - 1.0-5.0 mm; mature larva - 1.0-7.5 mm
Life Cycle: Overwinter as adults. Orange, elongated eggs are laid in clusters on underside of leaves and branches. Usually only one generation per year. Both the larvae and adults feed on pests.
Insect Pests Attacked: Aphids, whiteflies, scales, mites, mealybugs, other soft-bodied insects
Monitoring: Inspect colonies of aphids for adults and/or larvae.


Multi-coloured Asian lady beetle adult


Lady beetle eggs


Lady beetle larva


Lady beetle pupae

BENEFICIAL INSECTS BY THE DOZEN

MINUTE PIRATE BUGS

Appearance: Adults have a narrow, pointed head, flattened, smooth body with distinctive clear markings on their back.
Body length: Adult - 2.0-4.0 mm; mature nymph - 1.8-3.7 mm
Life Cycle: Overwinter as adults. Active early in season. Three to four generations per year.
Insect Pests Attacked: Insect eggs, aphids, spider mites, thrips, psyllids, whiteflies, small caterpillars
Monitoring: Place a white sheet under a plant and shake the branches to catch adults and nymphs.


Adult


Three nymphal instars

ORCHARD MASON BEES *(also refer to the specific article on Mason Bees in this binder)*

Appearance: Small bluish black, often mistaken for flies. Better pollinators of fruit flowers in cool, coastal spring weather than honey bees because they fly in cooler weather 12°C/55°F).
Body Length: 8 mm long (1/3 of an inch)
Life Cycle: Larvae hatch a few days after eggs are laid and then feed on the pollen and nectar stored in the nest. After 10 days, the larvae spin a cocoon and pupate within the cell. Near the end of summer, the bee transforms to the adult stage (imago) but remains in the cocoon throughout the winter.
Benefits: Excellent pollinators, non-aggressive and don't sting
Monitoring: Nest readily in holes in wood or paper tubes. It is critical to keep mason bee houses clean to avoid spreading diseases and mites.


Mason bee


Mason bees

BENEFICIAL INSECTS BY THE DOZEN

PARASITIC WASPS

Appearance: Occur in various shapes and sizes and are commonly named according to their family name. Parasitized aphids (mummies) appear inflated and are often tan or black in colour with hardened, shell-like appearance. Small round exit holes will appear in those from which adult wasps have emerged. Some parasitic wasp larvae may leave their host — such as caterpillars — to make small white cocoons beside the host carcass in which to pupate.
Body length: Adult - 1.0-24.0 mm; mature larva - 1.0-26.0 mm (25.4 mm = 1 inch)
Life Cycle: Life cycles + the number of generations produced per year vary according to species.
Insect Pests Attacked: Aphids, caterpillars, whiteflies
Monitoring: Examine aphid colonies for presence of "mummies."


Parasitic wasp


Aphid mummy exit hole


Wasp cocoons on tomato hornworm

PREDATORY MITES

Appearance: The two most common species of predaceous mites in B.C., are distinguished from their prey by their larger size, pear-shaped body, and translucent colouration. Their eggs are opaque and oval, whereas pest mite eggs are round. They are very active and fast moving compared to pest mites. Some are leaf dwelling; other ground dwelling.
Body length: Adult - 0.25-0.4 mm; mature nymph - 0.2-0.38 mm
Life Cycle: Overwinter as adults. Become active in spring and produce several generations per summer depending on temperature.
Insect Pests Attacked: Spider mites, thrips, fungus gnat larvae
Monitoring: Visual inspection of leaves or leaf brushing for microscopic examination.

BENEFICIAL INSECTS BY THE DOZEN

ROVE BEETLES

Appearance: Their elongated bodies and short wing covers make these beetles look more like small earwigs without pincers. Black or dark brown, depending on the species. *Atheta coriara* is sold for use in greenhouses to control fungus gnats.

Body length: Adults - 3 mm-2 cm in length

Life Cycle: Develop through four life stages: egg, larva, pupa, and adult. Adult females lay eggs singly near colonies of plant-feeding mites, commonly along leaf veins or in leaf depressions on the underside leaves. The hatching larvae develop through three or four increasingly larger instars.

Insect Pests Attacked: Slugs and snails, fly eggs and larvae, other soil insects; some parasitize root maggots

Monitoring: Active at night, so rarely seen

SYRPHID FLIES/HOVER BEETLES

Appearance: Larvae are flattened, legless maggots with no distinct head and a tapered body. Their colour varies from yellow to green to brown. Adults frequent flowers over which they hover before landing to feed on nectar and pollen (their only food source). They are often mistaken for bees or wasps, which they mimic in colouration. Eggs are white and elongated with fine sculpturing and are visible in aphid colonies.

Body length: Adult - 8.0-15.0 mm; mature larva - 10.0-15.0 mm

Life Cycle: Overwinter as larvae, pupae, or adults depending on the species. Eggs laid on aphid-infested plant parts. Several generations per year depending on temperature and location.

Insect Pests Attacked: Aphids, scales, thrips, other small soft-bodied insects

Monitoring: Examine aphid-infested leaves and shoots for maggot-like larvae. Adults frequent flowers.

Larva feeding on aphid

Adult fly

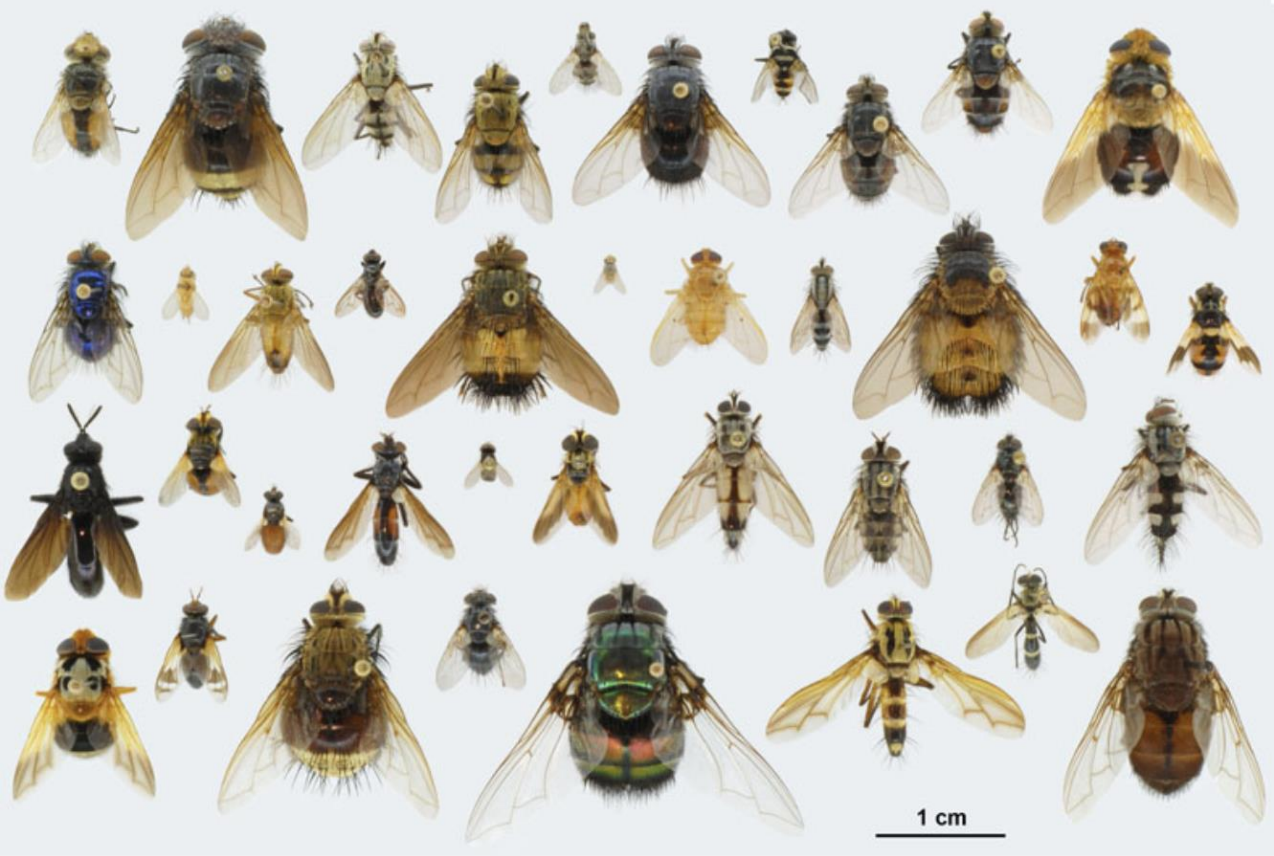
Adult fly

Fly pupa

BENEFICIAL INSECTS BY THE DOZEN

TACHNID FLIES

Appearance: Adults are grey or brown flies, about the same size and shape as a house fly. They have pale markings and large reddish eyes. Adult tachnids are parasitic and feature abundant bristles that cover the head and body.
Body length: Adults: 8-12 mm long
Life Cycle: Emerge in spring and lay tiny white eggs on other insects. Some species wait until their egg has hatched and then place each larva (a maggot) onto a host caterpillar, where plump, white, legless, larvae burrow inside to feed on and eventually kill the host.
Insect Pests Attacked: Leaf-eating caterpillars, such as tent caterpillars and winter moth; some also parasitize sawflies and other insects
Monitoring: Don't kill caterpillars, particularly tent caterpillars or spruce budworm, with tiny white eggs or larvae stuck to their backs as they are hosting the next generation of these beneficial flies.



Tachnid flies

BENEFICIAL INSECTS BY THE DOZEN

YELLOWJACKETS

Appearance: Smooth, yellow-and-black striped predator wasps that consume a huge number of caterpillars and flies.

Body length: Up to 2 cm long

Life Cycle: In the spring the queen starts building a nest and laying eggs. She rears the first batch of larvae herself. In about a month the next generation of worker-daughters takes over nest building and feeding the next generation. The queen stops laying eggs in late summer and all of the wasps, except the queen, die by October. Among the last generation are both queens and males. They mate and the queens crawl away into hiding places under bark, in debris, or in woodpiles to spend the winter. They do not reuse the old nest in the spring.

Insect Pests Attacked: House flies, caterpillars, other insects

Monitoring: Without larvae to raise, their diet switches to sweet food. This is when they chew holes in ripe fruit and are most likely to come into conflict with people picking berries or eating outdoors.

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