



## Unlocking the mystery of insects!

Although scientists believe that there are millions of different types of insect worldwide, all insects have a few common features. In order to unlock the mystery of insects, you will need the “key.” In this case, the key is simple. The letter **A** is represented by the number **1**, **B** is number **2**, **C** is **3**, and so on. Therefore, the word “bug” would be **2, 21, 7**. Good luck!

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

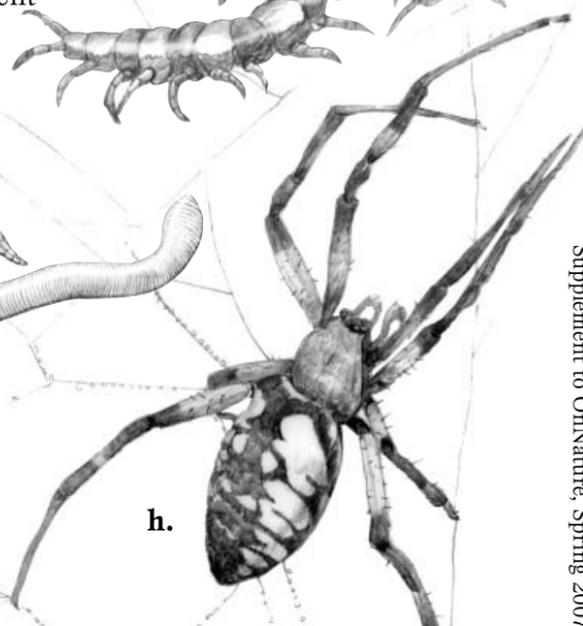
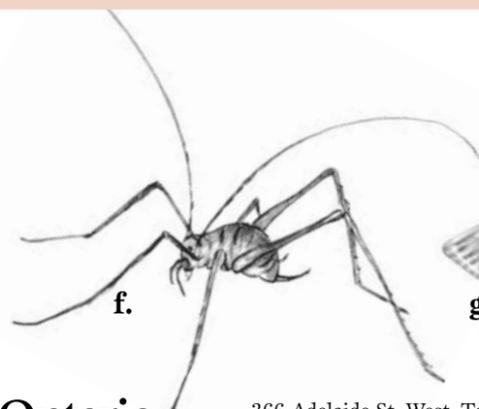
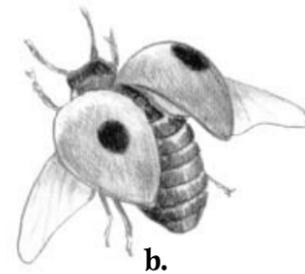
- All insects have 19 9 24 12 5 7 19
- They also have 20 23 15 1 14 20 5 14 14 1 5
- Many have 15 14 5 or 20 23 15 pairs of 23 9 14 7 19, although this is not true of all insects.
- One other common feature of many insects is that they often have 3 15 13 16 15 21 14 4 5 25 5 19

**Answers:** 1. six legs 2. two antennae 3. one, two, wings 4. compound eyes

Now that you have unlocked the mysteries of the insect world, you have probably noticed that only adult insects have these common characteristics. Immature insects are so completely different in size and shape that there is no easy way to categorize them.

**Using your knowledge of insects, try to guess which creatures on this page are insects and which are not.**

**Answers:** Insects: a. butterfly, b. ladybug, c. ant, f. cricket, g. moth  
Not insects: d. centipede, e. earthworm, h. garden spider



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Look up ... look way up! Do you see them? Can you hear the munching and crunching of tiny insects in the trees? If so, you may have an insect infestation! There are many insect species in Canada, both native and non-native. Regardless of their “heritage,” many have one thing in common: their love for devouring leaves!

## Tree Pests



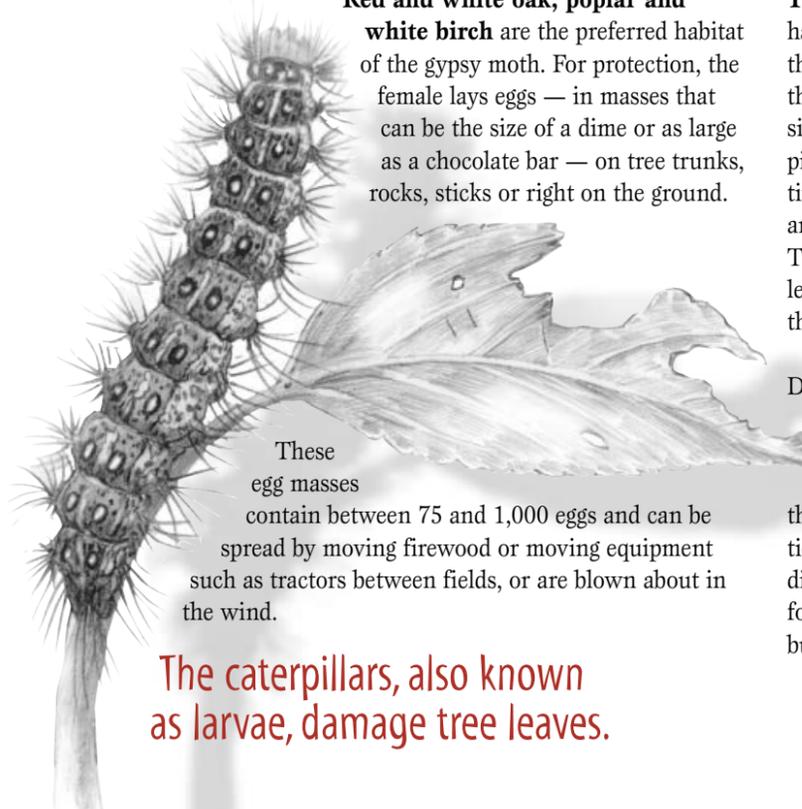
### Gypsy Moth

**T**he gypsy moth is an alien, or introduced, species. Unlike some other pests, it was not introduced accidentally to North America. In the mid-1800s, people believed that this little insect could help start a silk industry in the United States. Unfortunately, the moth escaped from laboratories and has become a huge pest to trees throughout the north-eastern United States and Canada’s southern deciduous and boreal forests.

**Red and white oak, poplar and white birch** are the preferred habitat of the gypsy moth. For protection, the female lays eggs — in masses that can be the size of a dime or as large as a chocolate bar — on tree trunks, rocks, sticks or right on the ground.

**The brown-black caterpillars** hatch in early spring and are less than one centimetre long. As they grow, they begin to change size and colour. A mature caterpillar, which can be over six centimetres long, has bumps, blue and red spots, and coarse black hairs protruding along its back. The tiny caterpillars have voracious appetites and eat tree leaves. By feeding mainly at night, the creatures escape from the sun and avoid becoming prey to birds.

**The larvae grow quickly and eat faster** as they mature. Depending on the severity of the infestation, damage to trees can range from light to almost complete defoliation. Most healthy trees can survive a single attack from gypsy moth caterpillars, but continual damage can weaken a tree to the point where it can no longer create its own food. In addition, damage can make the tree weak and vulnerable to other diseases or insects. Since the gypsy moth is not confined to the forests of Ontario but also attacks apple trees and blueberry bushes, the insect has an effect on farming.

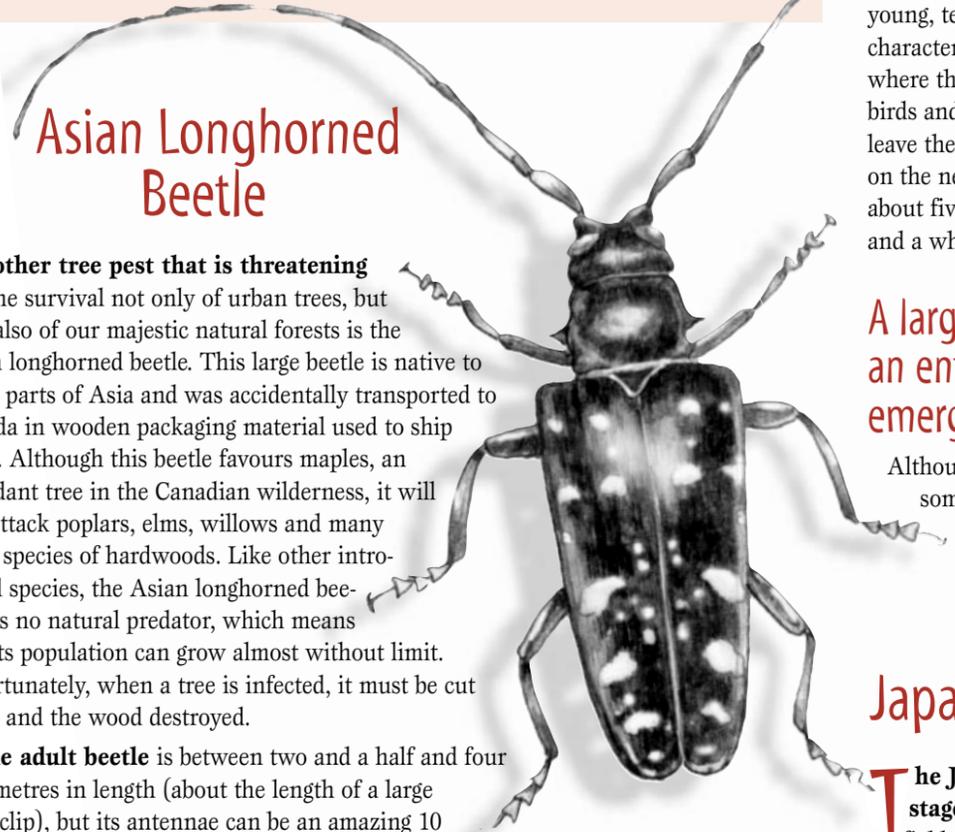


These egg masses contain between 75 and 1,000 eggs and can be spread by moving firewood or moving equipment such as tractors between fields, or are blown about in the wind.

**The caterpillars, also known as larvae, damage tree leaves.**

Did you know ...in 2006, the City of Mississauga underwent extensive aerial spraying to prevent a city-wide infestation of the gypsy moth? Even urban trees aren’t safe from this hungry insect.

**Preventing the spread of gypsy moths** is possible at all stages of its life. Egg masses can be burned or soaked in water. The bark of infected trees can be wrapped in burlap or plastic, preventing hatched caterpillars from reaching the leaves. Traps available commercially will attract and kill the adult moths, preventing mating and egg laying from occurring. Before you, or an adult, attempt to remove or destroy any egg masses, caterpillars or adult moths, be sure that you have correctly identified the species, as many native moths have physical characteristics similar to those of the gypsy moth. **Don't put our native insects in jeopardy!**



## Asian Longhorned Beetle

**A**nother tree pest that is threatening the survival not only of urban trees, but also of our majestic natural forests is the Asian longhorned beetle. This large beetle is native to many parts of Asia and was accidentally transported to Canada in wooden packaging material used to ship cargo. Although this beetle favours maples, an abundant tree in the Canadian wilderness, it will also attack poplars, elms, willows and many other species of hardwoods. Like other introduced species, the Asian longhorned beetle has no natural predator, which means that its population can grow almost without limit. Unfortunately, when a tree is infected, it must be cut down and the wood destroyed.

**The adult beetle** is between two and a half and four centimetres in length (about the length of a large paperclip), but its antennae can be an amazing 10 centimetres long (nearly the height of a pop can)! The shiny black body of this insect is covered with white spots, and its long antennae are striped black and white. Although the adult has wings, it is heavy and so can fly only very short distances.

**The damage done by the Asian longhorned beetle** is not as obvious as the stripping of leaves by the gypsy moth because the beetle does its damage inside the tree. The larvae burrow deep within the tree to feed on its food and water. They cut off the tree's nutrient supply and cause structural damage by hollowing out portions of the tree. Adult beetles emerge from the tree between late May and October, leaving holes the diameter of a pencil or larger in the bark. This emergence can go unnoticed, as many adults come out of the larger upper branches of the tree. Telltale signs of an infestation are large, round holes in the bark (which may have sap oozing from them) and sawdust on the ground or on lower branches.

**Did you know ... the City of North York cut down more than 20,000 trees as a way to try to reduce the spread of this invader?**

**If you think that you have a tree that may be infected** with this beetle, contact the Canadian Food Inspection Agency immediately, as quickly preventing the further spread of this tree pest is important. If you live in the Toronto or Vaughan area and are planning to go camping in one of Ontario's provincial or national parks, remember that moving firewood out of an area infested with the Asian longhorned beetle is banned in an effort to try to stop the spread of this alien invader.

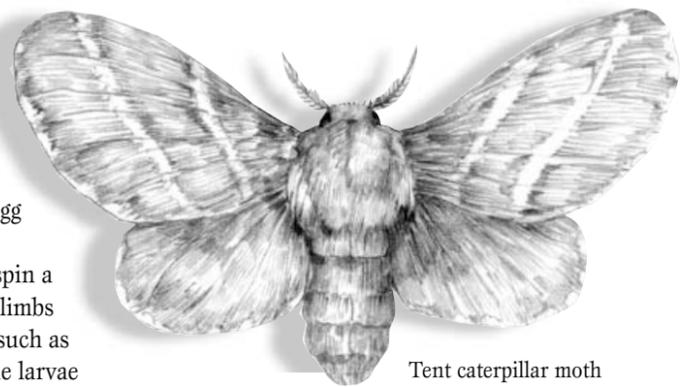
## Tent Caterpillars

**T**ent caterpillars are another common tree pest found throughout many forests and farmlands of Ontario.

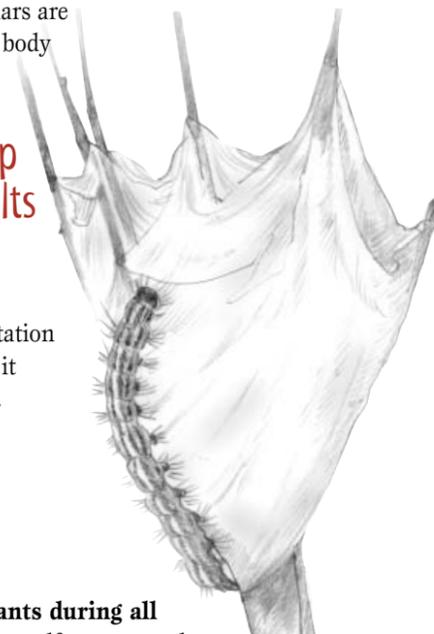
Eastern tent caterpillars hatch from their egg mass in early spring, the same time young, tender leaves emerge. The larvae spin a characteristic "tent" in the crotch of tree limbs where they are protected from predators such as birds and from the wind and the rain. The larvae leave the protection of their tent only in the morning or evening to feast on the newly developing, sweet leaves. The full-grown caterpillars are about five centimetres in length and have a hairy, brown-black body and a white stripe and blue spots along their back.

**A large colony of tent caterpillars can strip an entire tree of its leaves before the adults emerge in late June as moths.**

Although a healthy tree can recover from such defoliation, some of its branches may weaken and die. Repeated infestation by this tree pest can greatly weaken the tree, leaving it susceptible to other diseases and future infestations.



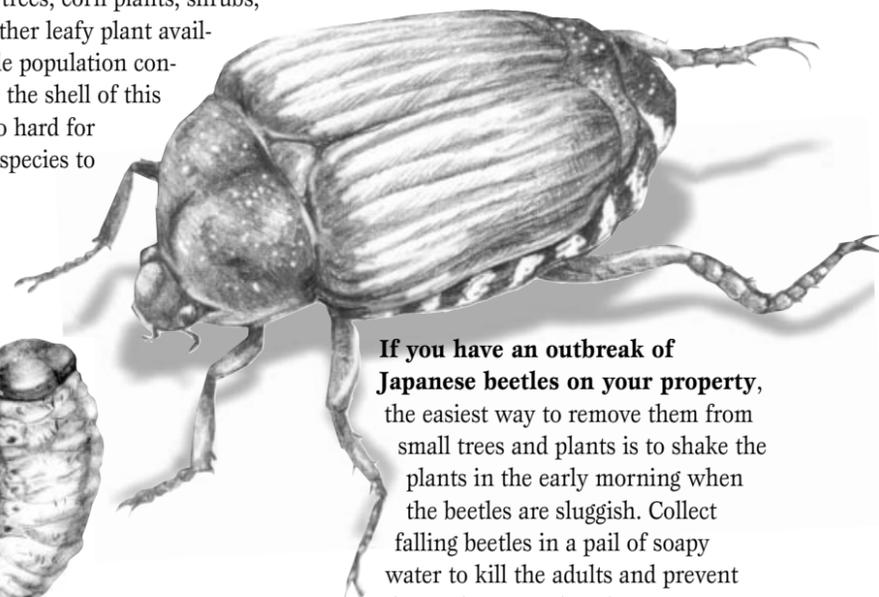
Tent caterpillar moth



## Japanese Beetle

**T**he Japanese beetle is a pest that attacks trees and plants during all stages of its life. The larvae feed on roots, attacking lawns, golf courses and field crops. The shiny, metallic green adults eat the leafy tissue between the veins of the leaves, leaving behind only the leaf "skeleton." Just over one centimetre in length, the adults feed in groups on shade trees, orchard trees, corn plants, shrubs, weeds and nearly any other leafy plant available. The Japanese beetle population continues to thrive because the shell of this non-native species is too hard for most of our native bird species to crack.

Japanese beetle larva



**If you have an outbreak of Japanese beetles on your property,** the easiest way to remove them from small trees and plants is to shake the plants in the early morning when the beetles are sluggish. Collect falling beetles in a pail of soapy water to kill the adults and prevent the further spread of this pest.

## What you can do to help reduce the spread of tree pests:

- **Do not transport firewood** or wood chips outside of your geographic area. They may contain the eggs or larvae of pest species.
- **Encourage birds to live in your neighbourhood** by providing them with fresh water, a well-constructed bird house and birdseed during the winter months when food is scarce. If birds frequent your area, they may eat the caterpillars or larvae when they first emerge from eggs, reducing or eliminating the pest problem.
- **If you spot evidence of a tree pest outbreak,** tell an adult and ask that person to contact the local Ministry of Natural Resources office, the Canadian Food Inspection Agency or Ontario Nature so that the problem can be dealt with before it becomes too big!



## Not all tree pests are six-legged

**Mammals such as porcupines, deer and rabbits can also cause widespread damage to trees.** Porcupines eat the bark, tender buds and twigs high up in the trees. Rabbits eat the bark of young trees in the winter when food is scarce, and deer have been known to strip all the bark from trees up to "deer height," which is the highest point a deer can reach when standing on its back feet and stretching (often up to two metres high). Removing the bark exposes the tender under-parts, making the tree more vulnerable to future insect infestations and diseases.

Although woodpeckers may be considered a pest, as they continually knock holes in trees, these birds may actually help prevent extensive insect damage to trees. Woodpeckers have an amazing sense of hearing and can detect insects burrowing beneath the bark. Using their powerful beak, head and neck muscles, woodpeckers tap a hole in the tree and, with their spear-like tongue, remove the tasty larvae. In some cases, woodpeckers may save a tree from a full-blown insect infestation.

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