

## GYPSY MOTH

### INTRODUCTION

The gypsy moth, *Lymantria dispar* (L.), is a notorious defoliator of broadleaved trees in temperate regions. It is native to Europe and Asia. The European form of the gypsy moth was introduced accidentally to North America near Boston in 1869. There are over 300 known host plants for the gypsy moth: in North America, the list of preferred hosts includes oak, cherry, white birch, maple, alder, willow, elm and trembling aspen. Since its arrival in North America, the gypsy moth has spread rapidly. By 1992, the gypsy moth was established throughout all of Ontario to the south and east of Lake Huron and there was evidence of resident populations along the northern shore of Lake Huron, extending to Lake Superior. Established populations of gypsy moth exist throughout the St. Lawrence River and Ottawa River valleys in Quebec and Ontario. In spite of quarantine and eradication programs, evidence of new infestations is found annually in New Brunswick, Nova Scotia and British Columbia.



A male and female gypsy moth.



The gypsy moth caterpillar.

### LIFE CYCLE

The gypsy moth's life cycle is characterized by four distinct stages: egg, larva (caterpillar), pupa and adult. The gypsy moth produces one generation per year. The female adult moth lays all her eggs in a single, buff-colored egg mass that resembles a sponge or chamois. Egg masses are placed in sheltered positions on trees, rocks or fallen logs. The gypsy moth embryo develops into a small caterpillar and overwinters in the egg.

Larvae or caterpillars emerge from their eggs in early spring and in one day, climb to the top of a tree, where they may venture off a branch and hang by a silk thread. Breezes then "balloon" these caterpillars to neighbouring trees. Once the

caterpillars become established on foliage, they feed and grow throughout May and June. The caterpillars pass through stages called instars, separated by a molt in which the entire skin is shed or replaced with a new one. Male moths have five instars and females have six. The large, final instar caterpillar is voracious, and may consume as much as 1,000 square centimetres of foliage in their lifetime, which represent approximately 10-15 entire leaves of red oak.

Development of caterpillars is complete by early to mid-summer, at which time they pupate. This stage lasts approximately two weeks. Emerging female moths are swollen with eggs and cannot fly, despite having full-sized wings. Instead, the female moth remains near the pupation site and releases a pheromone (odor) that attracts the mobile, responsive males. The female mates only once and then lays all her eggs in one mass.

### DAMAGE AND NUISANCE

The short-term impacts of a gypsy moth infestation, such as defoliation, nuisance

and allergic reactions in humans, are the most obvious and alarming impacts. However, the relationship between these immediate impacts and more long-term impacts, including tree mortality, is not clear. Many areas may become infested, but the long-term impact may be slight.

Broadleaved trees are, in general, resilient and will survive single bouts of defoliation unless they are already stressed by other factors. Repeated outbreaks tend to be restricted to forests dominated by tree species such as oaks, on which the gypsy moth prefers to feed. Within this forest type, long-term impacts including the death of trees are often restricted to poor growing sites where trees may have low vigor. Even low



Gypsy moth egg masses on a tree.

levels of gypsy moth infestation can cause economic impacts in newly infested areas. Forest products from these areas may be subject to quarantine and require costly inspections before entering the market. Large populations of caterpillars can also reduce aesthetic and recreational value of infested property.

Not all impacts of gypsy moth are considered negative. Thinning of densely stocked stands, release of understory plant species, and acceleration of stand conversion to more desirable species as a result of infestations may be considered beneficial by some.

### NATURAL CONTROL

Natural mortality agents of the gypsy moth include predators such as insects, small mammals (e.g., the white-footed mouse, skunks, and raccoons), and some bird species (e.g., robins, chickadees, and bluejays), which eat gypsy moth larvae. Predators are important at maintaining low population levels of gypsy moth or reducing habitat susceptibility. Other natural control mechanisms include insect parasitoids that kill the moths by laying their eggs inside this pest, pathogens such as the nuclear polyhedrosis virus (NPV), *Entomophaga mamaiga*, a fungus specific to the gypsy moth that can cause extensive mortality under some environmental conditions. Extreme conditions of prolonged cold ( $\leq 30^{\circ}$  Celsius) can also kill unprotected eggs.

### WHAT CAN I DO?

There are a number of ways the homeowner can deal with gypsy moth infestations on their property. As a first line of defence, a homeowner should check their property from fall

to early spring for the presence of eggs. If practical, scrape and destroy all egg masses off the trees and off any rocks or logs. Once the caterpillars have hatched, consider removing them by hand, but wear gloves to avoid skin irritation from larval hairs. Double-layer burlap tree bands can be placed around the trunks of the trees to impede the movement of the caterpillars to the tree crowns and foliage. Daily removal of gypsy moth larva from the burlap traps will aid in reducing future population levels. Sticky tape can also be used to impeded caterpillar movement but should not be placed on the tree bark. If spraying is warranted, the use of an insecticide registered for use against the gypsy moth could be considered. It is important to remember that care in handling insecticides is essential, and manufacturer's instructions should be strictly adhered to at all times.

### SOURCES OF RELEVANT INFORMATION

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