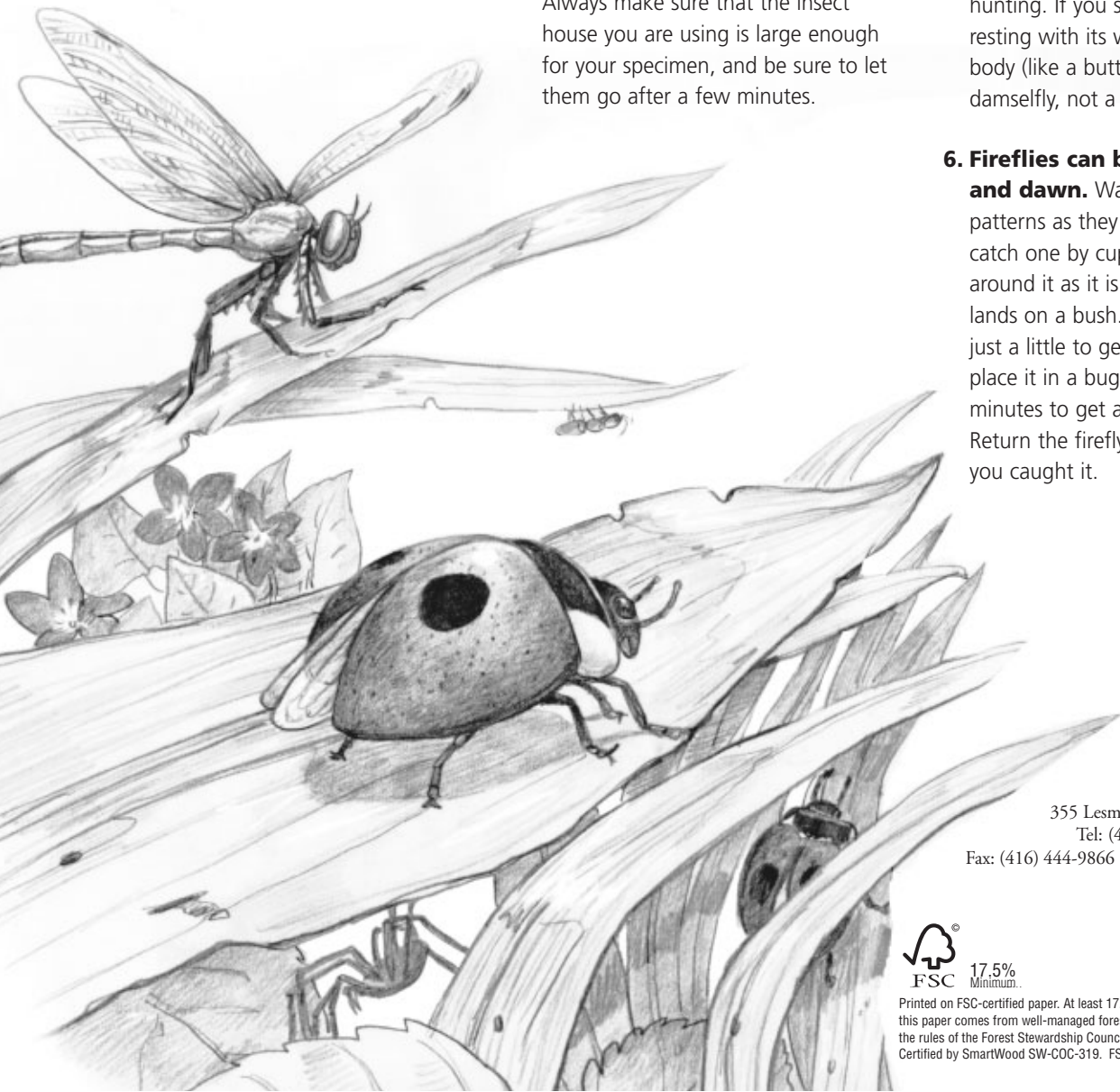


Written by Kerry Everitt
Design and illustrations by Judie Shore

Go Buggy!

Now that you have read about these amazing insects, it's time to get down and dirty and see them up close for yourself. When you are handling insects, there are a few things that you need to remember.

1. Because the insects are tiny and fragile, **you must be extremely careful when touching them** so that you don't hurt their delicate bodies.
2. **Although most insects are harmless, some can harm you.** Bees and wasps, for example, do not like to be cornered or touched. When in doubt, ask an adult if it is okay for you to touch the insect.
3. **You should never keep an insect in a glass jar.** The insect will get too hot. Think of what it feels like to be trapped in the car on a sunny day with the windows rolled up. You can buy insect "houses" that are mostly made of screens — these are much safer for the insect, but still allow you to take a closer peek. Always make sure that the insect house you are using is large enough for your specimen, and be sure to let them go after a few minutes.
4. Ladybugs can be found on many garden plants. **They are difficult to pick up so let them come to you.** You can "trap" them by making two index fingers and one thumb into a triangle around the small beetle. It will eventually crawl up your hand to escape. Count the spots. Is it a native species or one that was brought here? Take a close look — can you see the head, thorax and abdomen? Return your ladybug to the same plant on which you found it.
5. Dragonflies are fast and difficult to catch. **It is easiest if you sit quietly and watch them when they land on a plant stalk.** Look at the veins in their wings and their iridescent colour. Watch them swoop and change directions when they are hunting. If you see an insect that is resting with its wings together over its body (like a butterfly does), it is a damselfly, not a dragonfly.
6. **Fireflies can be found at dusk and dawn.** Watch their blinking patterns as they fly. You can carefully catch one by cupping your hand around it as it is flying or when it lands on a bush. Open your fingers just a little to get a better look or place it in a bug house for a few minutes to get a really close look. Return the firefly to the place where you caught it.



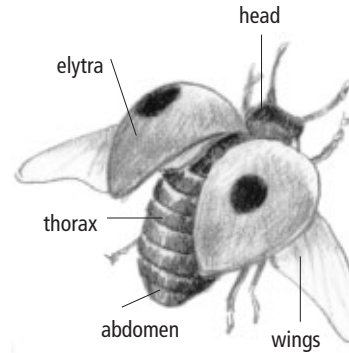
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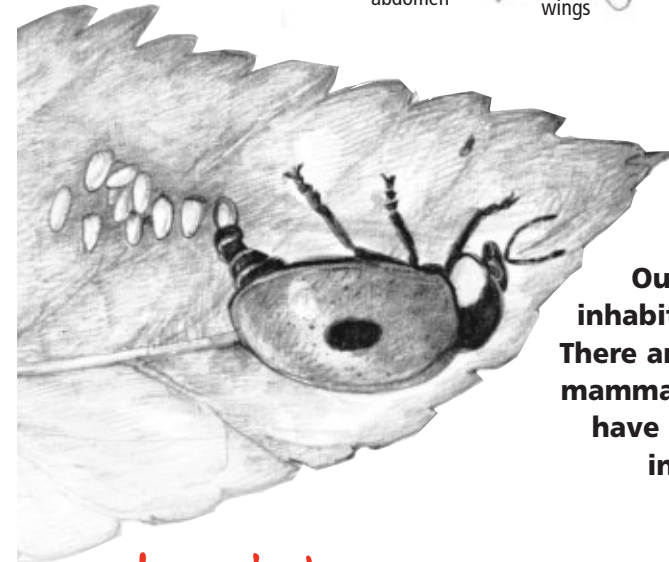


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Supplement to ON NATURE, Fall 2004



two-spotted ladybug laying eggs



The Secret Lives of Ladybugs, Dragonflies and Fireflies

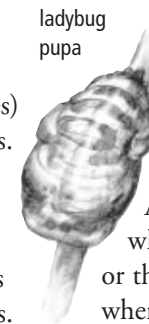
Out of the estimated 10 to 30 million animal species that inhabit the planet, about 85 percent are believed to be insects. There are more species of dragonflies in the world than there are mammals. In North America alone, about 92,000 species of insect have been recorded and given names. Here are three Ontario insects that you can find right in your own backyard.

Ladybugs

Pretty ladybugs (sometimes called lady beetles) are found in our backyards, parks and ravines. This should come as no surprise as there are more than 5,000 species worldwide, 500 of which live in North America!

Ladybugs have three distinct body sections — head, thorax and abdomen — and six legs. These small beetles are between four and seven millimetres in length, about the size of a pencil eraser! Although most ladybugs are red, yellow or orange with black spots, some do not have spots at all and others are black with red spots. The forewings or shell that gives the ladybug its colour is called the elytra. The elytra protects the delicate wings below, which are so thin you can see right through them!

Did you know...the number and position of the spots on the ladybug are unique to each species.



ladybug pupa

The life of a ladybug is a relatively short one. In the spring, the female lays between 300 and 2,500 eggs, which hatch in less than five days. Tiny alligator-shaped larvae emerge from the eggs and feed on aphids.

After three weeks, they enter the pupa stage, which is similar to the cocoon stage of a moth or the chrysalis stage of a butterfly. This is when huge transformations occur. While in the pupa stage, the ladybug larva is unable to eat or move and looks somewhat like a dark grub. The adult ladybug emerges from its cocoon a week later looking nothing like its former self. Although some species can live up to three years as an adult, most live only a few weeks, just long enough to find a mate and start the process over again. In one summer there can be up to six generations of ladybugs!

Adult ladybugs are voracious predators and feast on aphids, eating up to 60 a day! You can purchase ladybugs and release them into your garden to control aphid problems.



Ladybugs can be a natural and colourful alternative to harmful chemical pesticides!

two-spotted ladybug

Did you know... special organs in the ladybug's feet actually help them smell!



The thirteen-spotted ladybug is the most widespread species in Ontario because it is able to live in a variety of habitats. In northern Ontario, this is likely the most common species that you will find in your garden. In southern

Ontario, the non-native, introduced seven-spotted ladybug from Europe took over the habitat of the native nine-spotted ladybug, resulting in the latter's extirpation. (An extirpated species is one that no longer lives in its original habitat but still lives in other places.)

You would think that being a bright red bug would attract lots of predators, but the red colour of the ladybug actually prevents it from being eaten. Ladybugs produce a chemical that smells and tastes bad to predators. Once a bird eats a few ladybugs, it quickly learns to stay away from these tiny insects.

Ladybug Hibernation

If they survive the summer, ladybugs hibernate over the winter. As the days get cooler, a ladybug will eat more and more aphids and may even eat pollen in order to build up extra fat that will supply it with the energy it needs while hibernating. Just before winter arrives, a ladybug will bury itself under the soil, under the bark of a tree or find shelter under the panelling of a house or attic. If you find ladybugs with their legs curled up, they are not necessarily dead. They may just be hibernating. Because the warmth of your hand is enough to wake them up, you should not touch them. If they wake up too soon, not only will they not have any food to eat, they will freeze in the cold temperatures. Leave them be and check back in the spring to watch them emerge from their wintry slumber.

Did you know...a ladybug beats its wings 85 times per second — that's more than most hummingbirds!

Dragonflies

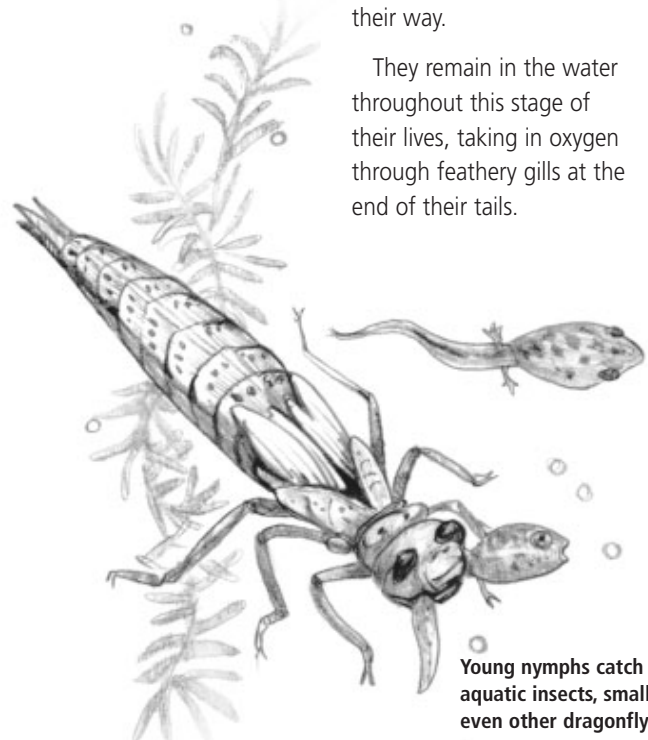
Dragonflies were the first creatures to take to the air. Millions of years ago, the dragonfly's ancestors swooped in and out of huge tree-like aquatic plants on their 70-centimetre wings! (That's about the width of your fridge!). Other than the huge reduction in size (today most have wingspans of less than 12 centimetres), dragonflies have remained virtually unchanged for more than 270 million years!

Dragonflies have four independent veined wings and long, slender bodies. Unlike their cousins, the damselflies, dragonflies cannot fold their wings together over their bodies and therefore always look like tiny airplanes. They vary slightly in colour and are usually a sparkling, iridescent blue or green that may change over the course of their lives. Dragonflies live in and around wet areas such as ponds, streams, creeks and wetlands.

A Dragonfly's Life Cycle

Eggs are dropped by the females in the water or deposited on aquatic vegetation. When the nymphs hatch, they have voracious appetites and will eat whatever they can catch — tadpoles, aquatic insects, small fish and even members of their own species! Some of the nymphs will actively pursue prey while others wait motionless at the bottom of the pond for unsuspecting creatures to come their way.

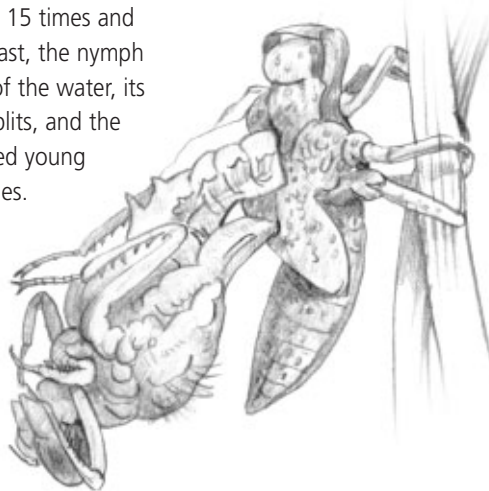
They remain in the water throughout this stage of their lives, taking in oxygen through feathery gills at the end of their tails.



Young nymphs catch tadpoles, aquatic insects, small fish and even other dragonfly nymphs.

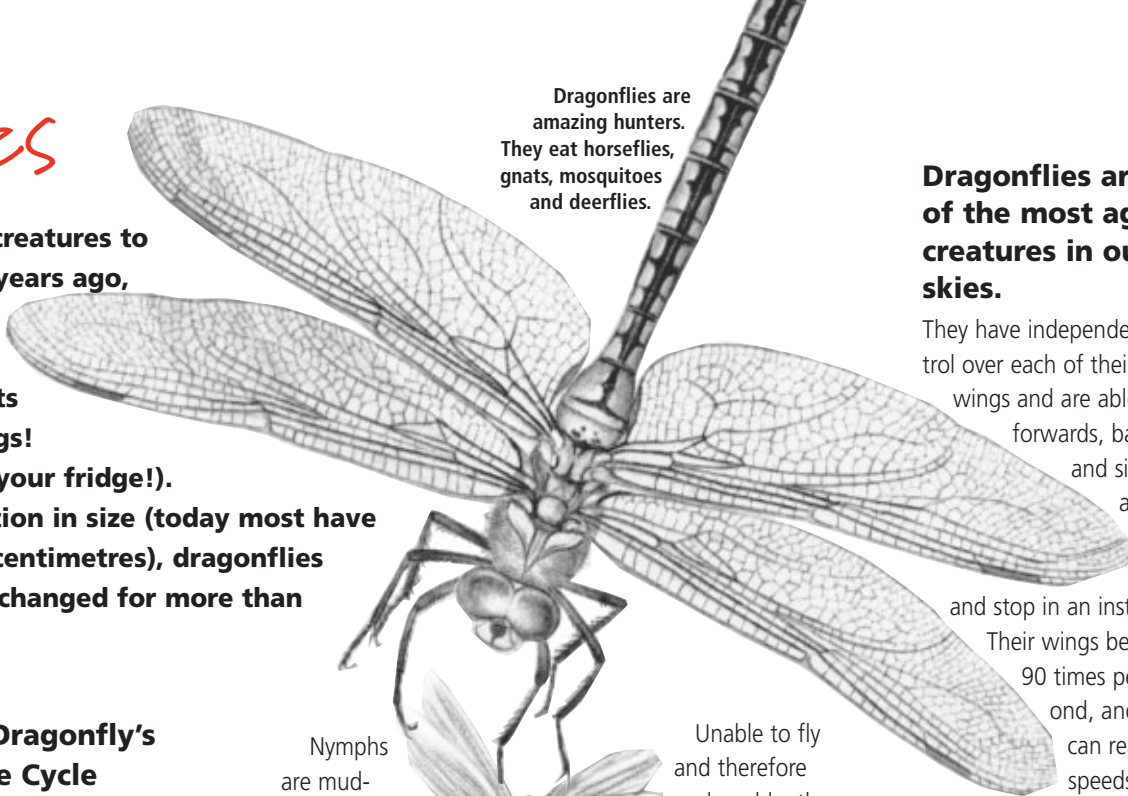
Nymphs are mud-coloured, and this makes them difficult to see in their natural habitat. They are also covered in a hard shell, which offers even more protection. As nymphs grow and develop, their shell becomes too tight.

They grow a new shell under the old one and when it is fully formed, their old shell splits and the nymph emerges with a brand new suit — a process called moulting. Depending on the species, they may moult up to 15 times and during the last, the nymph crawls out of the water, its hard shell splits, and the newly formed young adult emerges.



The nymph's shell splits and the newly formed young adult dragonfly emerges.

Dragonflies are amazing hunters. They eat horseflies, gnats, mosquitoes and deerflies.



Dragonflies are one of the most agile creatures in our skies.

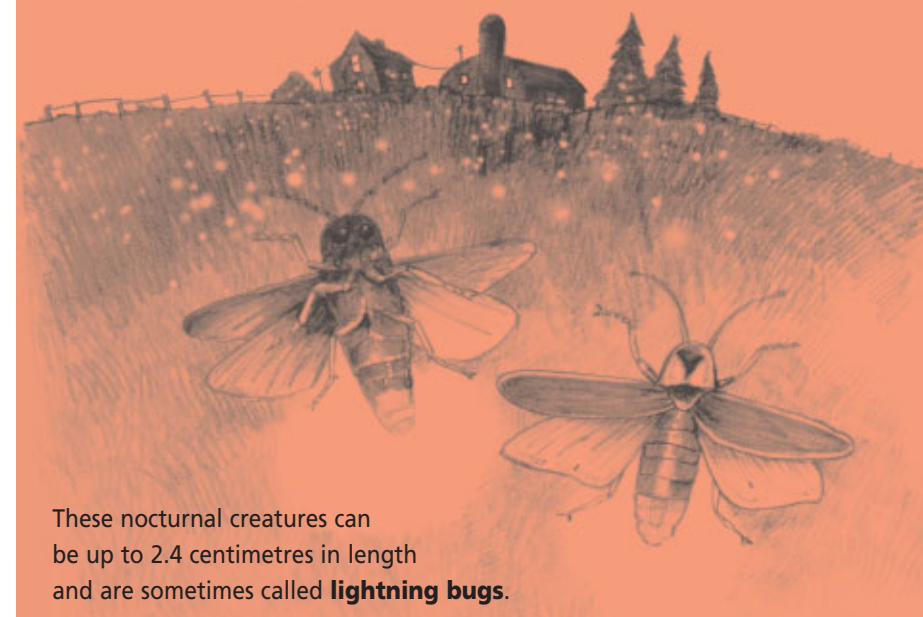
They have independent control over each of their four wings and are able to fly forwards, backwards and sideways, and they can hover and stop in an instant.

Their wings beat up to 90 times per second, and they can reach speeds of up to 54 kilometres per hour (a car travels about 40 kilometres per hour on residential streets). Because of their specialized wings and agility, dragonflies are amazing hunters. They are also extremely quiet, which is an advantage when approaching unsuspecting prey. These stealthy hunters eat horseflies, gnats, mosquitoes and deerflies. In the buggy reaches of northern Ontario, dragonflies are a canoeist's best friend!

Dragonflies have survived for millions of years because there has always been an abundance of wetland habitats where they could live. With the constant pressure on these diverse habitats from developers, it is more important than ever to protect remaining wetland habitat and increase the number of different habitats they have available to them.

Fireflies

Like the ladybug, fireflies are beetles, too.



These nocturnal creatures can be up to 2.4 centimetres in length and are sometimes called **lightning bugs**.

When a firefly is flickering and flashing in the grass, it is looking for a mate. Different species have different patterns of flashes. Some have a warm, steady glow, some flicker in a rapid pattern, still others have a rhythmic, pulsating pattern. The colour of fireflies can range from pale to bright yellow to orange or even green! The technical term for the glowing of a lightning bug is **bioluminescence**. The lightning bug's flashes warn potential predators that they taste bad and to stay away. Despite the warning, though, fireflies do sometimes fall victim to frogs, toads and spiders.

In the spring, the female firefly lays her eggs in the soil. After about one month, the eggs hatch into larvae, which eventually turn into adults. The larvae are sometimes called glowworms as their bodies give off a soft glow. Lightning bug larvae are predators and eat earthworms, slugs and snails. They inject their prey with an anaesthetic type of chemical to immobilize them, making much larger creatures a relatively easy meal.

Adult fireflies live for about seven months. They eat very little, although they sometimes feed on sweet plant nectar. Some species of firefly are more ruthless in their search for food. Once they have mated, they will emit the light pattern of a different species in order to attract a mate. When he is attracted and lands beside her, she pounces on him and has a tasty meal!

Fireflies can be found in lawns, meadows and other grassy habitats. They often live in rotting wood along the edges of slow-running streams or ponds. To attract fireflies to your garden, you need to provide them with a suitable habitat. Plant low shrubs or flowers so that the adults have a place to land while waiting for a mate. Reduce the amount of light in your garden as too much light confuses lightening bugs. The best way to attract any creatures into your garden is to stop using pesticides and herbicides on your plants and to go natural!

Did you know...nearly 100 percent of the firefly's light is given off as light. In comparison, an ordinary light bulb gives off only 10 percent of its energy as light while 90 percent is wasted through heat!