

Of all the summer nights I have enjoyed in my life, the ones where fireflies dance on the light evening breezes are my favourite. Something about this tiny, flickering light brings peace to me. I'm not really sure why it should, for they are just bugs like so many millions of other species, but the ability to produce their own light (called bioluminescence) is certainly awe-inspiring. A sense of wonderment comes over me every time I see them. Often my wife and I will stare out into the night by our deck just to see "our fireflies" as they flash through the trees, searching for a mate. The light the adults and larvae produce is generated by enzymatic reactions within their abdomens that produce bioluminescence in green, yellow or even pale red hues – amusing for us but critical to their survival. The adults produce light for show – to show that they are looking for love that is! However, in addition to trying to attract mates, the adults produce light to defend territories and to warn predators – an entire communication network transmitted simply by flashes of light! In many species both sexes flash their light, but in others only the males do. In many diurnal species, they don't flash at all as adults, but the larvae, sometimes called glow worms, do. The light produced by these larvae is not emitted to attract a mate, but rather to warn off predators, telling them that the larvae taste bad and that they are sometimes poisonous.

Once a mate is found, the adult female gets busy as she lays her eggs just below the surface of the ground in moist, wooded areas or near marshes. The eggs will hatch in about 21 to 28 days and the larvae feed until the end of summer in the rotting leaves and forest floor litter. Overwintering as larvae, they are sometimes easy prey for predators, but many survive to pupate and emerge the next spring to start the cycle again.

Of the 2000 species of fireflies worldwide, 23 species can be found in eastern Canada. Most have similar behaviours and prefer the same habitats – damp woods near water. Their habitat is rich in prey, so they feast on worms, snails, other insects and even other fireflies. There is some uncertainty what some adults eat and it is believed that some species don't eat at all as adults, while other may feed on pollen and nectar. Historically, fireflies have inspired poets, artists and medical researchers. The chemicals that they use to produce the light were also useful to study allergies and diseases such as muscular dystrophy, diabetes and cancer. These uses have thankfully been replaced by synthetic alternatives as the bugs were killed to get their enzymes.

Fireflies need darkness, so light pollution not only makes it hard for us to see them, but also difficult for them to see each other. In fact this and habitat loss are the two most critical reasons why their populations are declining worldwide. So when the light gets too bright or the habitats are gone, why don't they just move on to the next darkened habitat? Well, it has to do with their innate behaviour. Fireflies are home-bodies. They are born and die with a few meters of forest – so by the time they figure out there's an issue, it's too late. Another contributing factor is that the light, to be most effective, must be produced and responded to in a specific sequence. Studies show that the sequence is disrupted when intense external flashes of light, such as passing cars, are emitted. Tiny influences, such as this, can have devastating impacts during the brief breeding season.

So what can you do? Well, don't catch them for one thing! As a kid we did and the population seemed unaffected – or was it? It was fun after all. I do recall that many of my “lightening” bugs died in the jars, but as a kid I didn't know any better. Keep your outside lights off during June and July to give them the best chance of finding a mate and finally encourage and retain the moist woods and ponds near your home if you can. So now is the time to see these wonderful insects – find a quiet, dark place and enjoy these tiny beacons of light in the night. You won't be disappointed!

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