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Special Species

Why You Can't See Fireflies in the Western US

Flashing fireflies have entertained children for generations, yet if you travel to the western part of the US, you never see them flash their lights. But if you travel to this part of the eastern US, you can witness one of nature's miracles: simultaneous flashing.

Reviewed by Dr. Becker

STORY AT-A-GLANCE

- In some regions of the world, fireflies are a magical addition to warm, sultry nights
- There is much to know about these fascinating insects, especially their unique ability to light up a dark summer sky
- There are over 2,000 species of fireflies, and not all of them produce light
- Firefly larvae are predators and carnivores, and their favorite delicacy is snail
- Fireflies are in decline. The reasons as yet aren't well-known, but experts believe habitat loss and light pollution play a role

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10 Fascinating Firefly Facts

1. **Fireflies aren't flies ... they're beetles**

Also called lightning bugs, fireflies are neither flies nor bugs, but beetles. There are over 2,000 species of fireflies, and not all of them produce light. For example, fireflies in the western US do not glow, and many

people mistakenly believe fireflies don't exist west of the Rockies!

Some species of firefly larvae have gills and are aquatic, while others live in trees.

Fireflies thrive in warm, humid climates, which is why they are found on almost every continent on Earth. They live in the tropics as well as temperate zones, and come out in the summertime. Fireflies inhabit forests, fields, and marshes near bodies of water because they require a moist environment to survive.

2. **Fireflies communicate with each other with light**

Fireflies glow primarily to attract mates. The males often fly about while flashing in a specific pattern to let the ladies know they’re available. Interested females glow in reply, and their flashes help the males find them. Fireflies also emit light to defend territory and to scare off predators.

In some firefly species, only one gender glows. But in most species, both sexes emit light.

3. **Fireflies glow during all stages of development**

No matter the life cycle, all stages of fireflies glow. Bioluminescence is present in firefly eggs, larvae, pupae, and adults, and even some larvae living below the ground or underwater glow. Some firefly eggs emit a faint glow if disturbed.

Experts theorize the ability to emit light helps larvae signal to predators that they aren’t appetizing, since part of the firefly defense mechanism is to produce foul-tasting steroids.

4. **Some fireflies coordinate their flashes**

Can you picture thousands of fireflies flashing on and off at exactly the same time, over and over, as the sky darkens in the evening? This phenomenon, called simultaneous bioluminescence, happens in just two locations on Earth — Southeast Asia, and in the Great Smokey Mountains National Park in the U.S.

North America is home to only one synchronous firefly species, Photinus carolinus, and their spectacular light show can be viewed in late spring each year.

5. **Fireflies produce incredibly efficient "cold" light**

Fireflies are the world's most efficient producers of light, as 100% of their glow is light, not heat, which is why scientists refer to firefly lights as "cold" lights. Compare that to your average light bulb, which produces 90% of its energy as heat, and only 10% as light. If fireflies produced that much heat when they flashed, they'd cremate themselves!

The firefly's glow is the result of the reaction of two chemicals found in their tails, luciferase and luciferin. Luciferin is heat resistant and provides the glow. Luciferase triggers the flash. Firefly light can be yellow, green or orange.

6. **Firefly larvae are carnivorous, and some adults are cannibals**

Firefly larvae are predators and carnivores, and their favorite delicacy is snail. Since most firefly species live in moist ground, there are snails and worms aplenty in the soil. A few Asian species of fireflies — those that can breathe underwater — feed on aquatic snails. And still other species are tree dwellers, with larvae that hunt and eat tree snails.

As adults, most fireflies feed on nectar and pollen, but some don't seem to eat at all. Those few species that carry their carnivorous lifestyle into adulthood switch from snails to … other fireflies.

7. **Some female fireflies are wicked mimics**

Female fireflies in the genus Photuris employ a technique called "aggressive mimicry" to lure and then eat other fireflies. When a male firefly of a different genus flashes to signal his availability, the female Photuris replies by mimicking his flash pattern. In the language of fireflies, her response tells the male he has found a receptive female of his own species.

The femme fatale female continues flashing to bring him in close, and when he's within striking distance … she eats him.

8. **Fireflies don't live long**

Adult fireflies live only about two months — long enough to mate and lay eggs (which is perhaps why some adults don't seem to eat). Larvae typically live for about a year before reaching adulthood.

In some regions of the US, it's traditional on summer nights for children to catch fireflies in glass jars to watch them glow. Given their short lifespans, this probably isn't a very kind thing to do.

At a minimum, the glass jar should have a whole punched in the lid to let in air, and a moistened paper towel on the bottom. Captive fireflies should be freed quickly, preferably immediately, but certainly within a day or so.

9. **Fireflies are harvested for their luciferase**

Luciferase (the chemical in a firefly's tail that reacts with luciferin to trigger the flash) is used in scientific research, food safety testing, and forensic tests. When the chemical was first discovered, the only source for it was fireflies. These days there is synthetic luciferase, but some companies continue to harvest fireflies.

10. **Firefly populations are in decline**

Harvesting fireflies for their luciferase may be contributing to their decline. Other factors include habitat destruction and light pollution. For example, if a field where fireflies live is paved over, the fireflies simply disappear.

Human light pollution may be interfering with firefly flash patterns. Scientists have observed that the flashes of synchronous fireflies get out of synch for a few minutes after a car's headlights pass. Light from buildings and streetlights may make it difficult for fireflies to signal each other during mating — meaning fewer firefly larvae.

Sources and References

Firefly

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ThoughtCo, 10 Fascinating Facts About Fireflies