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FIREFLY FACT SHEET

The Lampyridae are a family of insects in the beetle order Coleoptera. They are winged beetles, and commonly called fireflies or lightning bugs for their use of bioluminescence to attract mates or prey. Fireflies produce a "cold light", with no infrared or ultraviolet frequencies. This chemically produced light from the lower abdomen may be yellow, green, or pale red.

About 2,000 species of fireflies are found in temperate and tropical environments. Many are in marshes or in wet, wooded areas where firefly babies have abundant sources of food. These larvae emit light and often are called "glowworms". In many species, both male and female fireflies have the ability to fly, but in some species, the females are flightless.

Fireflies tend to be brown and soft-bodied, often with front wings more leathery than those of other beetles. Although the females of some species are similar in appearance to males, larviform females (adult females resemble the larvae) are found in many other firefly species. These females can often be distinguished from the larvae only because they have compound eyes. The most commonly known fireflies are nocturnal, although there are numerous species that are diurnal (active during the day). Most diurnal species are not luminescent; however, some species that remain in shadowy areas may produce light.

A few days after mating, a female lays her fertilized eggs on or just below the surface of the ground. The eggs hatch three to four weeks later, and baby fireflies feed until the end of the summer. Fireflies hibernate over winter during the larval stage, some species for several years. Some do this by burrowing underground, while others find places on or under the bark of trees. They emerge in the spring. After several weeks of feeding, they pupate for 1 to 2.5 weeks and emerge as adults. The larvae of most species are specialized predators and feed on other larvae, terrestrial snails, and slugs. Adult diet varies: some are predatory, while others feed on plant pollen or nectar. Some, like the European Glow-worm beetle, have no mouth.

Light production in fireflies is due to a type of chemical reaction called bioluminescence. This process occurs in specialized light-emitting organs, usually on a firefly's lower abdomen. All fireflies glow as larvae. Bioluminescence serves a different function in larvae than it does in adults. It appears to be a warning signal to predators, since many firefly larvae contain chemicals that are distasteful or toxic. Most fireflies are quite distasteful to eat and sometimes poisonous to vertebrate predators. Light in adult beetles was originally thought to be used for similar warning purposes, but now its primary purpose is thought to be used in mate selection. Fireflies are a classic example of an animal that uses bioluminescence for sexual selection. They have a variety of ways to communicate with mates in courtships: steady glows, flashing, and the use of chemical signals unrelated to photic systems.

Some species are distinguished by the unique courtship flash patterns emitted by flying males in search of females. In general, females do not fly, but do give a flash response to males of their own species.

Tropical fireflies, in particular, in Southeast Asia, routinely synchronize their flashes among large groups. At night along river banks in the Malaysian jungles, fireflies synchronize their light emissions precisely. Current hypotheses about the causes of this behavior involve diet, social interaction, and altitude. In the Philippines, thousands of fireflies can be seen all year-round in the town of Donsol. In the United States, one of the most famous sightings of fireflies blinking in unison occurs annually near Elkmont, Tennessee, in the Great Smoky Mountains during the first weeks of June. Congaree National Park in South Carolina is another host to this phenomenon.

Female Photuris fireflies are known for mimicking the mating flashes of other lightning bugs for the sole purpose of predation. Target males are attracted to what appears to be a suitable mate, and are then eaten. For this reason, sometimes, Photuris species are referred to as "femme fatale fireflies."

Many fireflies do not produce light. Usually these species are diurnal, or day-flying. A few diurnal fireflies that inhabit primarily shadowy places, such as beneath tall plants or trees, are luminescent. These fireflies use pheromones to signal mates, while their flashing lights are used for warning signals.

THREATS TO FIREFLIES

Fireflies are disappearing all over the world. The clearing of forests, the destruction of wetlands, the use of toxic chemicals in agriculture and on residential lawns and gardens are all to blame. But the firefly may suffer from something we might not think about - light pollution. It is likely that light from development and traffic may contribute to the firefly's decline. Ambient light may be responsible for reducing firefly numbers by disrupting their mating signals.

You can support firefly populations by following these simple steps. If you make your property or garden a firefly haven, the beauty of their light will more than repay you for your time and effort:

- Don't catch the fireflies. Adult fireflies live only long enough to mate and lay eggs. Catching
- fireflies in glass jars is a nostalgic pastime for children on a summer's evening, but it results in a firefly's brief time trapped in a glass prison. Let them find their mates and complete their life cycle without disturbance.
- Keep your backyard in the dark. Turn off exterior lights and even remove solar garden lights. If you have bright interior lighting, draw your curtains and lower your blinds at night.
- Leave rotting logs and leaves on the ground. Provide firefly larvae the conditions they need to grow to the adult, breeding stage. Allow some of the branches and leaf litter that fall naturally from the trees on your property to remain under the trees. Or tuck the logs into your garden. Use bark mulch, preferably large nuggets, around your plantings to create a thick layer of organic, moisture retaining material.
- Choose plants that conserve moisture. Solomon's Seal, iris and hydrangea are a few of the plants that shade the ground beneath them. To create even more shade, plant low growing plants like wild ginger under the taller plants. Beds thickly planted in this way are like mini jungles, perfect for not only fireflies, but also toads and other moisture loving animals.
- Create a water garden. Any source of water will bring fireflies to congregate. A water garden will attract them, and if you plant the edges of your pond with bog plants and keep it moist, the fireflies will stay and hopefully breed there. Chemically treated ponds and pools are not a natural environment for anything. A balanced water garden does not need chemicals.
- Do not use pesticides. Pesticides and weed killers have had their effect on firefly populations.
- Use natural fertilizers. Artificial chemicals rarely mix with nature and many of the harmful chemicals found in pesticides are also found in fertilizers. It is very possible that chemical fertilizers harm firefly populations and the populations of other beneficial insects. Your garden can flourish beautifully with natural fertilizers. And fertilizing your lawn just makes more work for you and costs you more in gasoline.
- Don't over-mow your lawn. Fireflies mostly stay on the ground during the day and fly at night. Frequent mowing disturbs them. Fireflies prefer to live in long grasses. So mowing less often and leaving some areas of long grass may increase their numbers in your yard.
- Plant trees. A firefly habitat needs trees to create shade. Shade means a low light area that can give the fireflies more time to find a mate. Fast-growing shade trees include Red Maple, River Birch, Tulip and most pine trees. Also, if left to accumulate, leaf litter and the fallen needles of pines will provide a habitat for the worms and slugs that firefly larvae eat.