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Pyractomena spp., Spring Fireflies (Coleoptera: Lampyridae)

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Description

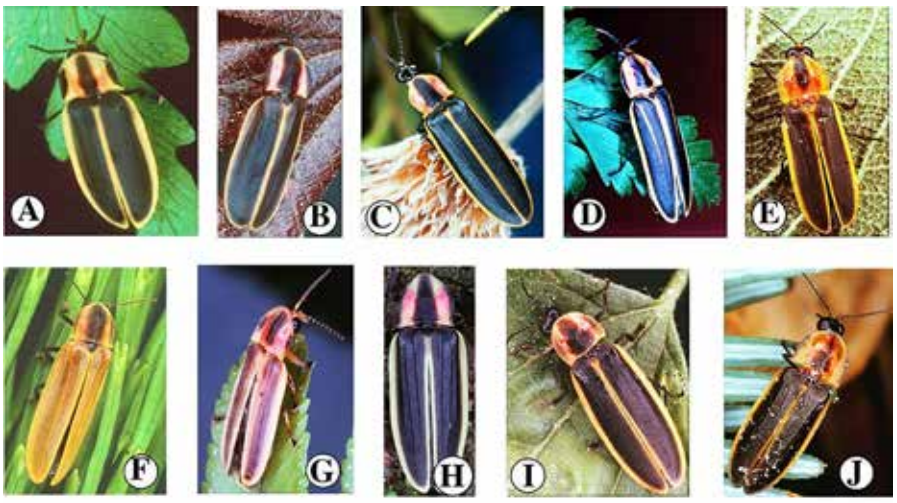
The name spring firefly refers to 16 firefly species belonging to the genus *Pyractomena.* Adult spring fireflies are small-to-medium-sized beetles between one-third to three-quarters of an inch (7.5 to 19.0 mm) in length. They possess large eyes, large elytra (wing covers) concealing the hind wings and abdomen, and large pronota (foreparts of body) extending over their heads. Their bodies are soft in texture and covered in fine, dense hair. The body shape and coloration vary depending on species. The variation in elytral shape gives some species a stout outline, while others with slender elytra appear more elongated. The elytra are usually black with yellow margins, but some species have additional lateral yellow stripes or entirely yellow elytra. The pronota always have reddish-orange centers with central black stripes, many species also have lateral stripes on the sides of the pronota. The light-producing organ differs between sexes. In males, the light organ occupies two abdominal segments, while in females it is reduced to four transparent dots.

Larval spring fireflies are dark, small-to-medium-sized, elongated insects with reduced eyes, segmented bodies, retracted heads and light organs producing bioluminescence on their abdomens. Like all firefly larvae, the larvae of spring fireflies possess a unique morphological adaptation called the "holdfast organ," that consists of several telescoping tubes armed with tiny hooks on the last segment of their abdomens. Generally, spring firefly pupae resemble a darker version of the adult form, with wings folded onto the sides of the body. The eggs are yellow to orange and appear translucent.

Life Cycle and Ecology

The eggs of spring fireflies are deposited as clusters of 20 to 100 eggs covered in adhesive secretions on wetland vegetation. The eggs become faintly luminescent two to three days after being laid, and larvae hatch after 15 to 30 days.

Larval spring fireflies are nocturnal predators inhabiting various moist habitats, particularly those prone to flooding. They prey on snails and other soft-bodied invertebrates. Spring firefly larvae are terrestrial, with the exception of the Eastern North American species *P. lucifera.* Larvae of this species are semiaquatic, living on aquatic vegetation and regularly submerging in water to attack aquatic snails. Spring firefly larvae often crawl in an inchworm-like fashion using both their legs and the holdfast organ. The holdfast organ allows larvae to grasp a variety of surfaces, giving them locomotive



Different species of spring fireflies in North America: (A) *P. angulata,* (B) *P. borealis,* (C) *P. angustata*, (D) *P. ecostata,* (E) *P. floridana,* (F) *P. linearis,* (G) *P. lucifera,* (H) *P. limbicollis,* (I) *P. palustris,* (J) *P. Sinuata.* From Lloyd 2018, used with permission.

advantage over their prey. *Pyractomena lucifera* larvae use their holdfast organ to anchor themselves on aquatic vegetation when wrestling aquatic snails out of water for consumption. The larvae also use the holdfast organ to groom their mouthparts. Larvae are not restricted to the ground, and larvae of *P. borealis* pupate on the bark of trees 2 to 5 feet above ground.

Spring firefly larvae require about two years to mature, undergoing five larval growth stages (instars) and spend the winter as pupae or mature larvae. Unlike most firefly species that molt and pupate underground in an enclosed cell, spring fireflies pupate above ground on vegetation. The pupae of spring fireflies remain firmly attached to vegetation in a head-down position by firmly anchoring themselves to the shed larval skin (exuvium), which is glued to vegetation. Pupal stages that have been studied, including those of *P. borealis* and *P. lucifera,* require five to 14 days before emerging as adults.

Despite the common name, the seasonality of adult spring fireflies varies greatly. Adults of *P. borealis,* a widely distributed species found throughout eastern North America, can be seen flashing as early as mid-February in Florida, or as late as August in southern Canadian provinces. Adult *P. floridiana* only flash between late July and early September in Florida. Each of the 16 species of spring fireflies produces its own species-specific flash pattern courtship signal, ranging from slow, intermittent glows of green to rapid flickers of bright amber.

Though widely distributed as a genus, many spring firefly species have very restricted distributions and are extremely rare and particularly sensitive to habitat disturbances. The distribution of several spring firefly species has been severely impacted by the development and draining of mesic habitats, the burning of shrub lands and plantations, and light pollution. At least two species of spring fireflies are known in Louisiana, *P. angulata* and *P. borealis*. Several others are likely to be discovered with detailed study.

References

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Contact Us

For advice about arthropod identification or diagnosis, contact the LSU AgCenter Department of Entomology. Reach the department through the Contact Us webpage:

https://bit.ly/36c4awm

Pyractomena borealis larva attacking a snail. From Lloyd 2018, used with permission.

The pupae and newly emerged adult of *Pyractomena borealis.* From Lloyd 2018, used with permission.

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