

Pointy-Lobed Firefly

Photinus acuminatus

Contributor (2005): James E. Lloyd
(University of Florida)

Reviewed and Edited (2012): James
E. Lloyd (University of Florida)

DESCRIPTION

Taxonomy and Basic Description

Fireflies of the genus *Photinus* occur throughout North and South America and currently number about 250

described species; this number may more than double when the fireflies of the rain forests of South America are worked up taxonomically. About 50 species are presently known from North America. Among them is the large twilight-flashing *Photinus pyralis* (L.), the lawn species most commonly chased by children as it dips and flashes within their reach.

The Pointy-lobed Firefly was described by John Wagener Green from a single male specimen from Pisgah Mountain, North Carolina, and a single female from Newberry, Florida, in his revision of the genus (Green 1956). His revision was revolutionary in that it appreciated the taxonomic value of certain features of male genitalia as well as other formerly overlooked characters. In addition to permitting the simple and clear separation of previously confused rather common species, genitalia characters revealed the presence of rare forms. The Pointy-lobed Firefly was one of these rare forms. The female, though from a distant locality, was associated with the male by the presence of non-genitalic distinctive features seen in the male. In general, the physical appearance of this species more closely resembles *Photinus* species of Green's Division II than it does other species of Division I; the female is similar in dorsal view.

Photinus fireflies may be distinguished from other lightningbug fireflies of eastern North America by their simple claws and absence of a median, longitudinal keel on the first thoracic segment. Females may be distinguished by their lantern, the segment of abdomen that glows, which occupies a small median area of one ventral abdominal plate. Females of a few species have greatly reduced wings and wing-covers (elytra); however females of the Pointy-lobed Firefly have normal wings and elytra and are expected to be able to fly.

Little is known about *Photinus* development and life history. Most *Photinus* species have a single generation per year, but exceptions occur in certain Florida species. Females probably lay eggs in soil at the bases of grass and herbs. Known larvae of all Lampyridae are predaceous and emit



Adult male
Photo by J Lloyd



glows from two lanterns at the posterior tip of the abdomen. The lanterns are typically visible as two small, pale bulges. *Photinus* larvae are generally subterranean, though are occasionally found above ground on damp nights or on silt at pond margins. They seem to be earthworm specialists, though probably prey on other soft-bodied organisms including snails and slugs.

The Pointy-lobed Firefly belongs to Green's Division I (1956), which is defined by the absence of ventrobasal processes of the median lobe of the genitalia. Its genitalia are distinctive, and most confidently identified by the tiny (acuminate) point at the tip of each lateral lobe. This firefly has black elytra outlined with vivid pale yellow margins that exceed the width of the up-flexed margin laterally. The ventral lateral areas are dark. Total length is 7 to 8 mm (0.27 to 0.31 in.).

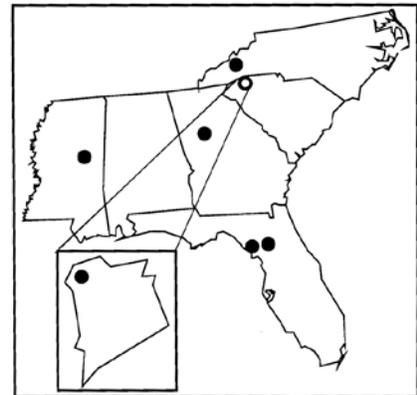
These fireflies were observed flashing at the edge of a cypress-head near the Suwannee River, southwest of Old Town, Florida (June 1968). Flashing behavior was similar to that observed in other Division I species. It occurred at twilight, and flashing activity was of short duration each evening. The male flash pattern is a single, sharp, bright flash of perhaps 100 millisecond duration, and apparently shorter than that of other known nearctic *Photinus*. Flash patterns were emitted at about 2 second periods, at 23°C (74° F). At this temperature, the short female response flash was emitted at a delay of about 300 milliseconds.

Status

No federal or state status is given to the Pointy-lobed Firefly. However, extensive field observations of flashing fireflies throughout the Southeastern United States have revealed only 6 populations; several of these appear to have disappeared.

POPULATION SIZE AND DISTRIBUTION

The Pointy-lobed Firefly occurs (occurred?) only in the Southeastern United States, and has been recorded from only 6 localities: 2 in Florida; 1 in North Carolina; 1 in Pickens County, South Carolina (near the Junction of Routes 11 and 178); and 1 each in Georgia and Mississippi. The South Carolina site was near a roadside marsh, in shrubs and herbs under a large deciduous tree; only 3 specimens were found. Populations near Old Town, Florida consisted of 20 to 50 flashing individuals; while these sites have been visited on several occasions since their discovery, no Pointy-lobed Fireflies have been seen there for 30 years. Nor have any been found in Newberry, Florida, one of Green's original localities.



HABITAT AND NATURAL COMMUNITY REQUIREMENTS

As presently known, Division I *Photinus* fireflies are nearly all mesic forest and forest-margin (ecotone) species, with some populations thriving at the edges of lawns and mowed roadsides, along streams, and at the edges of agricultural fields. The Pointy-lobed Firefly seems to fit this pattern.

CHALLENGES

The rarity of Pointy-lobed Fireflies across such a broad range suggests that this firefly was once widely distributed. There are several challenges to the existence of fireflies today, and because populations of the Pointy-lobed Firefly are already greatly reduced or disappearing entirely, the consequences may be even more serious. Various sources of chemical pollution have been recognized which may affect fireflies, both juveniles and adults, and both daytime and nocturnal species.

Nocturnal fireflies such as the Pointy-lobed Firefly will, in addition, be negatively affected by light pollution. Light pollution sources include sky glow (cloud reflection) and point sources such as street and porch lights, traffic headlights, and various others. Increased general illumination in the natural environment is analogous to noisy static in the signal channel of fireflies, making it more difficult to see and be seen by potential mates. Point sources are potentially distracting beacons in the cases of species that are adapted to use points of light in the night sky for oriented travel through space. Both general illumination and point source redirection may result in the loss of individuals that might otherwise move among local populations (gene flow) as well as founders of new and replacement local populations. The loss of habitat coupled with intrusive light pollution produces a formidable obstacle to the continuance of healthy firefly populations.

Among natural threats to adult fireflies is predation by females of several species in the firefly genus *Photuris*. These predators use aggressive mimicry in which they mimic the signals of prey-species females and attract signaling, mate-seeking males to eat. An aerial attack ensues in which the predatory fireflies aim their attacks at the flashes of flying males. Alteration of natural ecology may have brought predator and prey populations into closer ecological contact, increasing the amount of predation.

Though the Pointy-lobed Firefly is not aquatic, it and most other fireflies live in damp habitats of various types. Such habitats are lost through the lowering of water tables, which, in recent years, is a widespread phenomenon affecting many areas of the country. This, of course, results in the loss of marshes, damp woodlands and small streams. Also, terrestrial habitats that are flooded by rising waters of marshes and streams may carry surface and other pollutants from adjacent human activities. Farm chemicals, animal waste, and human waste from failing pumping stations and/or septic tanks may wash over terrestrial as well as aquatic habitats during local flooding. This may poison fireflies and their prey.

CONSERVATION ACCOMPLISHMENTS

Though not specific to this species, fireflies in general are getting some much-needed surveying through Clemson University's Vanishing Firefly Project. Though most areas of the State appear to have good populations of fireflies, conservation efforts are still warranted. See the project's link at http://www.clemson.edu/public/rec/baruch/firefly_project/.

CONSERVATION RECOMMENDATIONS

- Determine the presence or absence of the Pointy-lobed Firefly in South Carolina. Concentrate first survey efforts in areas where the firefly was previously seen.
- Protect the habitat of any identified populations of the Pointy-lobed Firefly.

MEASURES OF SUCCESS

As research and management needs are identified, projects will be initiated to address those needs. Discovery of new populations could be considered a success.

LITERATURE CITED

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