

CHECKLIST AND KEYS TO FIREFLIES OF EAST-CENTRAL ALABAMA

by James E. Lloyd
Dept. of Entomology and Nematology
University of Florida, Gainesville, FL 32611

* * * * *

Annotated Checklist of Fireflies

(February 1990)

This list is based on records from field work and museum specimen identification that have been put together over past 25+ years, and literature records that I believe are valid. The bibliography gives references for identification, and seasonal and geographic distribution. Some species are common, some are rare. Some may be relictual, maybe now going extinct in a hurry. Many factors will enter into the difficulty you will have in finding populations: habitat rarity and/or specificity, distinctiveness of flash pattern, number of other species simultaneously active and thus confusing field recognition. Perhaps the agricultural history of east-central Alabama has had an enduring effect on the fireflies of the region, and some species are missing though "their habitats" are seemingly present.

Once a local population has been found others may be more easily located nearby. Once you know something of a species' ecology and behavior, you will find it easier to find additional demes. These elements enter into judgement of whether a species is "rare" or "common", "abundant" or "local". I have avoided these terms, and instead have assigned a number value to each listed species, to suggest the difficulty I expect that you will have in finding your first population, should you energetically set out to find all the species that you can, and stick with it (send specimens to me at any time for the record, and for help in identification).

The values are as follows: 1, easy, find first year; 2, relatively easy, find in two years; 3, considerable effort required, find in five years; 4, great effort required, much difficulty, find in 10 years, if at all. I don't list 5s! I don't know them, but there are some that are new to taxonomy, and others that cannot be predicted because my current maps are certainly not complete.

LAMPYRIDAE (family)

Subfamily: Lampyrinae

	FIND FACTOR
Genus: <u>Pleotomus pallens</u> LeConte	3
Genus: <u>Tenaspis angularis</u> Gorham	4
Genus: <u>Pyractomena angulata</u> (Say)	1
<u>P. angustata</u> LeConte	3
<u>P. borealis</u> (Randall)	1
<u>P. dispersa</u> Green	2
<u>P. lucifera</u> (Melsheimer)	3

	<u>P. marginalis</u> Green	3
	<u>P. palustris</u> Green	3
	<u>P. similis</u> Green	4
Genus:	<u>Ellychnia corrusca</u> (L.)	1
Genus:	<u>Phausis reticulata</u> LeConte	2
Genus:	<u>Photinus acuminatus</u> Green	4
	<u>P. australis</u> Green	1
	<u>P. brimleyi</u> Green	1
	<u>P. consimilis</u> complex	1
	<u>P. cooki</u> Green	3
	<u>P. ignitus</u> Fall	2
	<u>P. indictus</u> (LeConte)	2
	<u>P. macdermotti</u> Lloyd	1
	<u>P. marginellus</u> LeConte	2
	<u>P. pyralis</u> (L.)	1
	<u>P. sabulosus</u> Green	3
Genus:	<u>Pyropyga minuta</u> LeConte	1
Genus:	<u>Lucidota atra</u> (G.A. Oliver)	1
	<u>L. punctata</u> (LeConte)	3
Subfamily:	Amydetinae	
Genus:	<u>Pollaclasis bifaria</u> (Say)	4
Subfamily:	Photurinae	
Genus:	<u>Photuris cinctipennis</u> Barber	3
	<u>Photuris</u> FRFV, JEL sp. no. 187	2
	<u>P. frontalis</u> LeConte	1
	<u>P. hebes</u> Barber	3
	<u>P. lucicrescens</u> Barber	1
	<u>P. quadrifulgens</u> Barber	1
	<u>Photuris</u> FC, JEL sp. no. 208	3
	<u>Photuris</u> TN, JEL sp. no. 209	3
	<u>P. tremulans</u> Barber	1
	<u>P. versicolor</u> (Fabricius), sensu Barber	1
	<u>Photuris</u> PU = Barber's "primitive" unnamed	3
Tentative total (recall complexes, sibling species and the like)		38

REFERENCES

- Barber, H.S. and F.A. McDermott. 1951. North American fireflies of the genus Photuris. Smithsonian Inst. Misc. Coll. 117: 1-58.
- Green, J.W. 1956. Revision of the Nearctic species of Photinus (Lampyridae: Coleoptera). Proc. Calif. Acad. Sci. 28: 561-613.
- 1957. Revision of the Nearctic species of Pyractomena (Coleoptera: Lampyridae). Wasmann J. Biol. 15: 237-284.
- Lloyd, J.E. 1966. Studies on the flash communication system in Photinus fireflies. Univ. Mich. Mus. Zool. Misc. Pub. No. 130: 1-95.

----- 1969. Flashes, behavior, and additional species of
Nearctic Photinus fireflies (Coleoptera: Lampyridae). Coleop.
Bull. 23: 29-40.

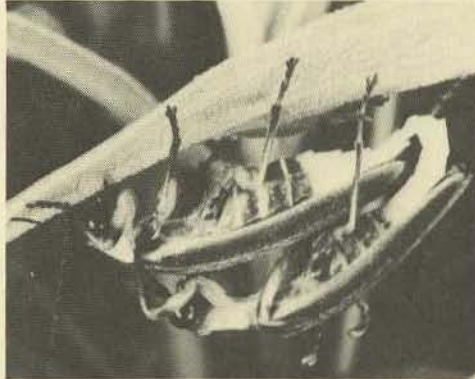
----- 1969. Flashes of Photuris fireflies: their value and
use in recognizing species. Fla. Entomol. 52: 29-35.

----- 1981. Mimicry in the sexual signals of fireflies.
Sci. Am. 245: 110-117.

MORPHOLOGICAL KEY TO FIREFLY GENERA
OF EAST-CENTRAL ALABAMA (MALES ONLY)

1. Light-organ present on posterior abdominal sternites (Fig. 1); look for enamel-like, chip-of-paint cuticle, yellow)2

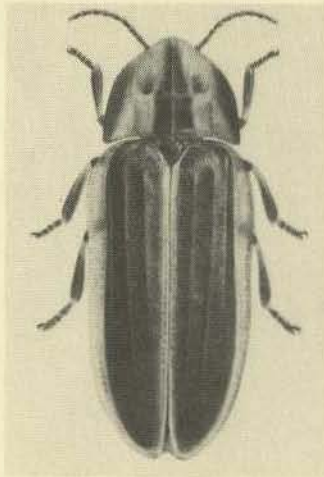
Fig. 1. Copulating Photuris hebes



- 1'. Light organ not present as in 1 (if cuticle pale or yellowish, then not enamel-paint-like)5

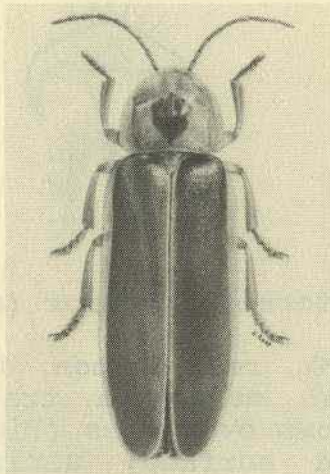
- 2(1). Pronotum with median, longitudinal ridge; pronotum somewhat angular, 5-sided in outline as in Fig. 2. Pyractomena

Fig. 2. Pyractomena angulata



2'. Pronotum without ridge; pronotum rounded, in front, semicircular, as in Figs. 3, 5, 7 3

Fig. 3. Photinus pyralis



3(2'). Anterior tarsal claw on each foot forked (Fig. 4); firefly active in hand, scrambling, flashing, sometimes biting; each elytron often with median (discal, Fig. 5) pale stripe; head (eyes) often exposed in front of pronotum (viewed from above) when curved and especially when alive and scrambling Photuris

Fig. 4. Photuris only, anterior claw forked.

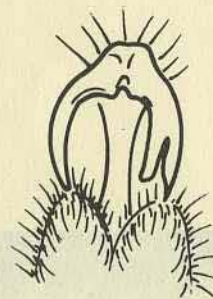
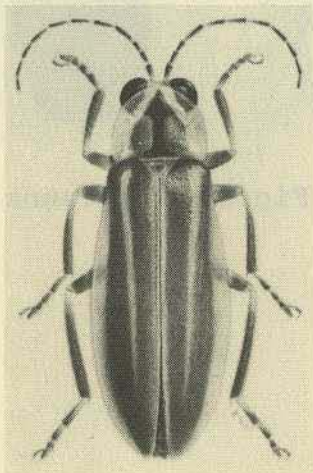


Fig. 5. Photuris versicolor

- 3'. Anterior tarsal claws simple, not forked (Fig. 6); docile in hand, rarely or never flashing, never biting; elytra never with median pale stripe; head and eyes concealed by pronotum (from dorsal viewpoint) except when firefly climbing or "reaching out" 4

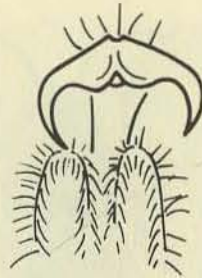


Fig. 6. Unforked anterior (and posterior) claw.

- 4(3'). Pronotum with pink, red, salmon, or orange color on disk -- rarely in AL merely a trace; pronotum without submarginal windows over eyes (Fig. 3); elytra not with coarsely-textured surface; ultimate (last) antennal article ("segment") without glass-like bead. . Photinus

- 4'. Pronotum disk not colored as above, not even a fleck or trace -- instead black, dark brown, or sooty; pronotum with submarginal windows over eyes; elytra with coarsely-textured ("reticulated") surface (Fig. 7); ultimate antennal article with a tiny bead (Fig. 8) Phausis

Fig. 7. Phausis reticulata

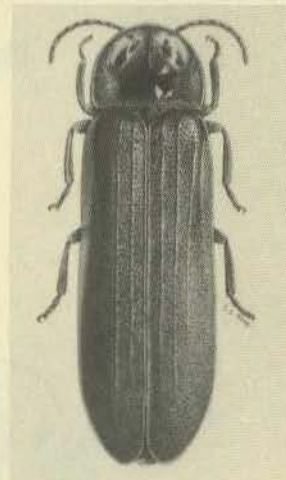
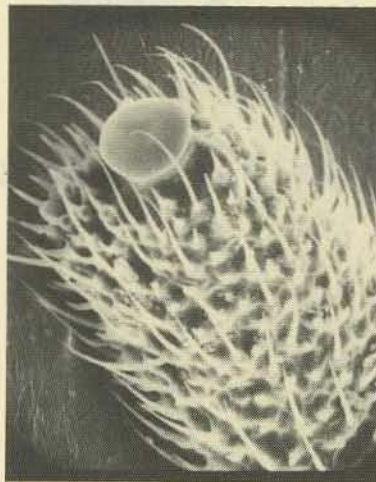


Fig. 8. antennal bead

5(1'). Antennae branched (e.g. Fig. 9)6



Fig. 9. Pleotomus pallens

5'. Antennae not branched, though serrate in some species (e.g. Lucidota)7

6(5). Elytra and pronotum pale, gray, rarely sooty (rare, "never" seen except in traps) Pleotomus pallens

6'. Elytra and pronotum dark, black -- pronotum with a submarginal touch of pink, red, or salmon (very rare, local, relictual (?))Pollaclasis bifaria

7(5'). Elytra with pale bead (mesal suture rims, edges) and margin (rare, local, habitus similar to Fig. 3) Photinus cooki

7'. Elytra without pale bead and margin, these colored like elytral disk (e.g. Figs. 10, 11) 8

8(7'). Pronotum without lateral black or charcoal stripes or spots (e.g. Fig. 10) 9

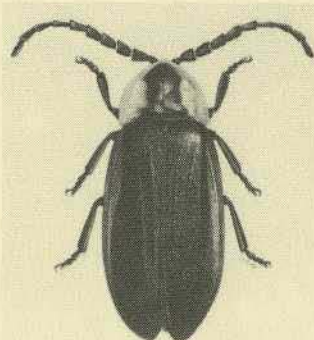


Fig. 10. Lucidota atra

- 8'. Pronotum with dark lateral stripes or marks (e.g. Fig. 11). 10

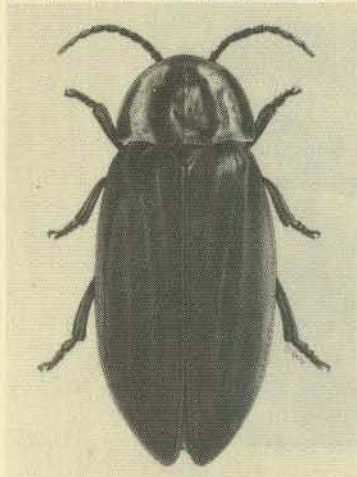


Fig. 11. Ellychnia corrusca

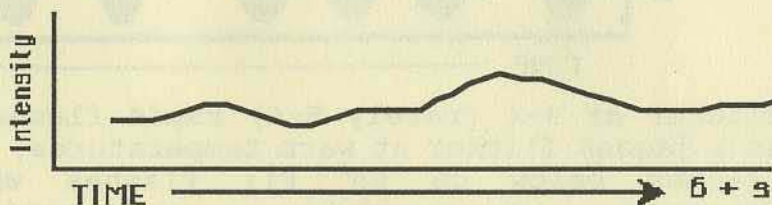
- 9(8). Body broad, oval in outline; longer than 7 mm (common afield sometimes, early summer; Fig. 10).
 Lucidota atra
- 9'. Body "normal" in outline; shorter than 6 mm (often common in wet roadside ditches) . . . Pyropyga minuta
- 10(8'). Body broad, oval in outline; longer than 8 mm. . . . 11
- 10'. Body "normal" in proportion; shorter than 7 mm (uncommon, local, e.g. woodlands by streams; pink vittae of pronotum usually tiny, often subtriangular). . Lucidota punctata
- 11(10). Lateral pronotal mark (charcoal, black); a marginal stripe; dark (slate, blackish) elytra with a "rusty or yellowish, dingy bloom" (overwinters as adult, found in winter and early spring), Fig. 11.
 Ellychnia corrusca
- 11'. Lateral pronotal mark a postero-lateral corner spot; black elytra without "bloom or dinge" (very rare, local (?) "tropical" firefly appearance).
 Tenaspis angularis Gorham

Key to Some Distinctive Firefly Flash

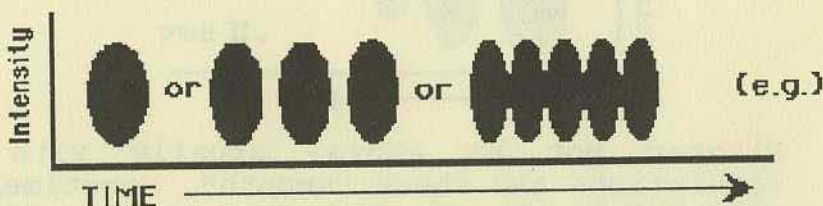
Patterns in East-Central Alabama

(For Flying, Male Fireflies Only)

1. Nocturnal bioluminescent emission a continuous glow, lasting for 6 and often many more seconds; not flickered or pulsed with an even rhythmicity or regularity . . .2



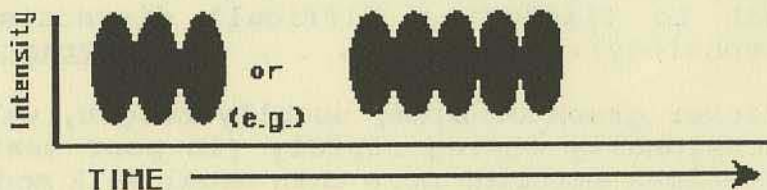
- 1'. Emission not a long-continued glow, but instead (consisting) of short flashes, groups of short flashes, or short (less than 5 sec in duration) glows or rhythmically modulated (pulsed) glows, i.e. flickers. 3



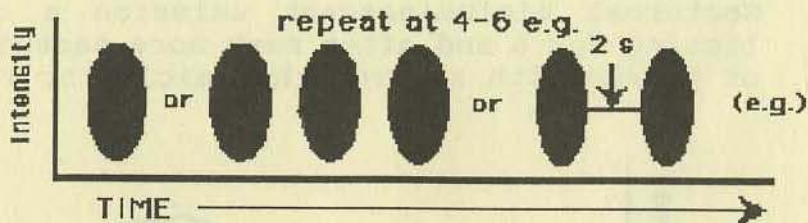
- 2(1). Glow tiny, emitted low over ground, appearing as a green (blue to some people!) spark; woodlands, streamsides especially; not very early spring (a complex of spp.). Phausis reticulata

- 2'. Glow (green/blue) not tiny; seldom low over ground, usually from waist to 2 m, and occasionally to treetops; wet grassland, pine savannahs; only very early spring. Pyractomena angustata

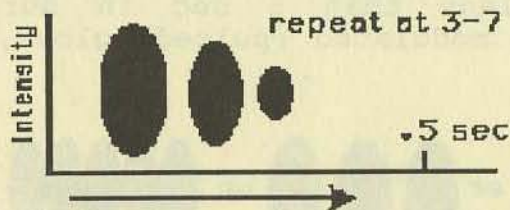
- 3(1'). Flash pattern a repeated short flicker of, for examples, 3-6-10-15 modulations (i.e. rapid pulses, flash-"lets", "a glow with lumps". 4



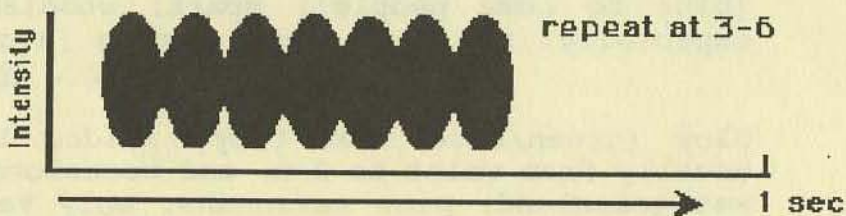
- 3'. Flash pattern an unmodulated single flash or a group of such flashes (e.g. 2, 3-6, 4-9 flashes; "group" meaning that the time period between such phrases is much (> 3X) longer than the period seen between the flashes within such a phrase) 7



- 4(3). Flicker of 3-4 (rarely 5-6) rapid flashes, (often seen as a jagged flicker at warm temperatures, but as separate flashes below ca 65° F); flashes with decreasing intensity, but especially or only noticeable on last flash of pattern; repeated at 3-7 sec.
 Photuris versicolor



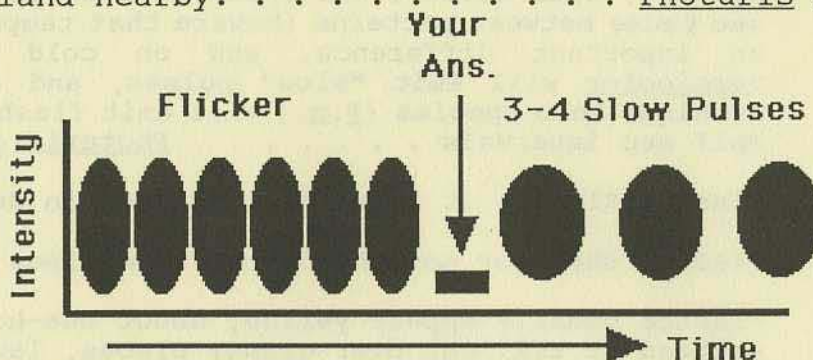
- 4'. Flicker not as above, usually with more than 6 modulations and these "smooth", sometimes even scarcely apparent to the eye from some angles, of apparent equal brightness. 5



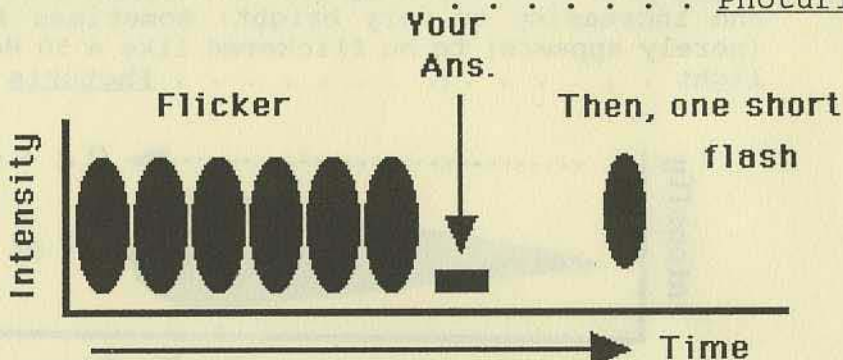
- 5(4'). Flicker (of 6-12 modulations) orange, candle-like, usually not appearing very bright; (season in late May, and usually seen around boughs of trees and shrubs, but sometimes in numbers over damp ground, thus carefully distinguish from P. dispersa which appears 3 weeks earlier, only over low fields and damp ground, and with slower modulation rate that at temperatures usual of early spring is seen more to pulse 5-6 discrete flashes than to flicker; a difficult diagnosis; see key to morphology). Pyractomena angulata

- 5'. Flicker green or blue, usually bright, with individuals occasionally flying rapidly (in poor searching flight, sometimes emitting more than usual 6-12 modulations, e.g. 15-20). 6

6(5'). Flicker over field, and when answered with a flash of LED (light-emitting diode) or penlight the male switches to 3-5 slow-pulse flash pattern, approaches, hovers, may land nearby. Photuris quadrifulgens



6'. Flicker around boughs of shrubs and trees, even high up, seldom over fields but then usually near trees, hedgerows, woods; when answered male switches to short flash at ca (sometimes rigidly at) 2 sec period. Photuris tremulans



7(3'). Flash pattern composed of 2 yellow flashes at about 2 sec interval (at ca 70° F, but ranging 1.5-2.3 with temp.); 3-7 sec pause between patterns Photinus macdermotti

7'. Flash patterns not as above. 8

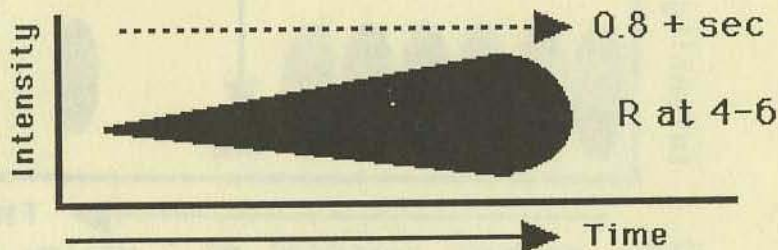
8(7'). Flash pattern a single flash (i.e. not a group of flashes), which is repeated continuously at regular or somewhat regular intervals. 10

8'. Flash pattern a group of flashes, with groups separated by an interval of at least 3 times the duration of the between-flash interval. 9

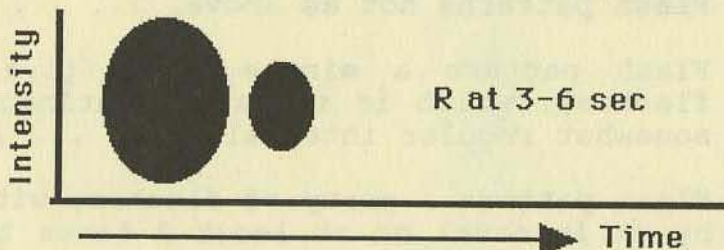
9(8'). Flash pattern of 4-11 yellow flashes; with flash period about one-half second; with a pause of 6-15 sec between consecutive patterns; around wet ground, marshes, along streams. Photinus consimilis complex

(3?) green pulses after the season or evening is well started; with about 1 sec interval between flashes; 3-7 sec pause between patterns (beware that temperature makes an important difference, and on cold evenings P. versicolor will emit "slow" pulses, and on very warm evenings this species (P.g.) will emit flashes at ca one-half sec intervals Photuris quadrifulgens

- 10(8). Flashes "long", at least one-half sec in duration. . 11
- 10'. Flashes short or somewhat short, sometimes snappy. . 12
- 11(10). Flashes usually appear yellow, about one-half sec long, emitted at twilight over grassy places, lawns, commonly in J-swoop, and of approximately even intensity throughout Photinus pyralis
- 11'. Flashes green or white, around boughs of shrubs and trees especially near waterways, with intensity beginning dimly and increasing to very bright; sometimes flash appears (merely appears) to be flickered like a 50 Hertz electric light Photuris lucicrescens

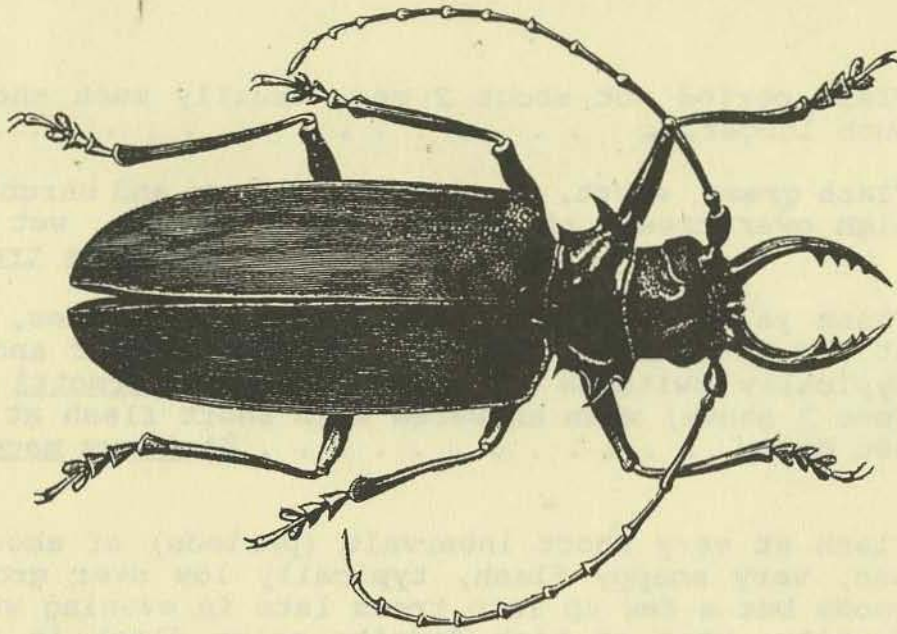


- 12(10'). Flashes very early in spring; usually in mesic forest or river-bottom swamp forest; flashes yellow-orange, not snappy, and emitted at 3-7 sec intervals; occasionally with a dimmer after-flash. Pyractomena borealis



- 12'. Flashes in late spring or later; usually appear snappy, short; color variable, yellow, green, blue, "white"; never with after-flash. 13
- 13(12'). Flash period about 2 sec (say 1.5-2.5, this being an adjustment for temperature) and regular. 14

- 13'. Flash period not about 2 sec, usually much shorter or much longer. 15
- 14(13). Flash green, short, usually around tree and shrub boughs, high over trees, at crowns, along streams, wet flats Photuris tremulans
- 14'. Flash yellow, somewhat short, rarely twinkles, usually at 2-4 m in shrub stratum, but also higher and lower; typically switches to standard P. macdermotti pattern (see 7 above) when answered with short flash at about 1 sec delay. Photinus macdermotti
- 15(13'). Flash at very short intervals (periods) of about 0.5-1 sec, very snappy flash, typically low over ground, in woods but a few up into trees late in evening when high density; when at high density males flash in rhythmic synchrony in flight. Photuris frontalis
- 15'. Flash at long intervals, more than 3 sec unless temperature quite warm, more than 75° F+. 16
- 16(15'). Flash yellow, emitted at 4-10 sec intervals; usually 2-5 m above ground in open space in woods, at woods' edge, over field, along streams; attract to short flash delayed nearly the duration of the male flash pattern period - i.e. 3 sec or more, depending on temperature. Photinus ignitus
- 16'. Flash white or green at 3-5 sec intervals; over shrubs and high over trees, around boughs and along watercourses, low in weedy stream-side groves; attract with a short flash at no delay (a distinctly summer species). Photuris lucicrescens



Editor: Ed Lewis Asst. Editor: Shirley Luckhart
Reviewers: Wayne Brewer, Gary Miller

F.S. Arant Entomology Club
301 Funchess Hall
Auburn University, AL 36849-5413