

THE NORTH AMERICAN FIREFLIES OF THE GENUS
PHOTURIS DEJEAN
A MODIFICATION OF BARBER'S KEY
(COLEOPTERA; LAMPYRIDAE)

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Barber (1951, pp. 20-24) gave a key to the North American species of the firefly genus *Photuris*. This key is based largely on the differences in coloration of the coxae, legs, ventral abdominal segments, and other structures; in practice, the key has been found confusing owing to the considerable and overlapping variation in coloration of the various species, and Barber evidently recognized this difficulty. The few new species that have been described offer little as specific coloration.

Of the nineteen species and varieties covered by Barber's key all but five are in the *versicolor* group, distinguished by a pronotal marking consisting of a median longitudinal black vitta of varying outline with a red or orange spot on each side of it; the differences in extent and form of the black vitta are of diagnostic value when considered in connection with other data. Probably there are undescribed species belonging in this group. The *brunnipennis* group and the *frontalis* group, neither having this type of pronotal marking, should also be represented by other species. *Photuris divisa* appears to be unique among the North American species, but a similar marking of the pronotum has been seen in some South American species. However, *divisa* may represent a branch of the *versicolor* group which has lost the pronotal red spots. *P. jamaicensis* E. Oliv., of Jamaica, which otherwise resembles the *versicolor* group, lacks these spots but was mistaken for *versicolor* by Gosse (1851) and probably for *pennsylvanica* by Gorham (1880, p. 110).

Barber actually based his specific identifications of the members of the *versicolor* group on the pattern of the flash of the males; unfortunately this essential information is usually not available to the museum worker. Barber's familiarity with the species producing different flashes enabled him to identify some of them from dried specimens but he did not record all of the minute differences which enabled him to do so. When series representing the various species [identified on basis of behavior] are arranged in a collection the differences in appearance between the series is rather pronounced even though individually it may be difficult to find constant distinctive characters. It was noted by Barber that insects having the same flash pattern form pure colonies, an observation I have also made.

I have made many attempts to develop a dichotomous key to the members of the *versicolor* group which could be used for the positive identification of museum specimens but constant morphological and color differences between most of the species just do not exist. In a few species the elytral coloration and markings are practically constant, making this feature of diagnostic value. The size range is important, and to some extent the geographic distribution also. There is essentially no variation [interspecific, see Barber, 1951, p. 19] in the aedeagus except in length, which generally parallels the over-all body size.

Another point which requires mention is that of the 'apparent color of the emitted light; as noted in McDermott and Buck (1959) the apparent color is

¹ Deceased.

considerably affected by the background. Thus the orange tint in the flash of *P. hebes* is usually not noticeable. The color of the flashes of *P. pyralomima*, *P. caerulucens*, and *P. aureolucens* are probably sufficiently different from the usual greenish flash of *versicolor* to be significant.

Some of Barber's characters were undoubtedly recorded from the examination of fresh specimens, but at the time of my examination of his specimens they were at least twenty years old and were probably discolored—white tends to become yellowish, yellow may become brown, and lighter brown may darken.

The species are therefore here divided into groups based on size differences and on variation in the pronotal vitta. Much of Barber's original data have been included, hoping that it may be of assistance. Using the key will require comparison of data other than coloration but it is hoped that it may be of value for at least the tentative identification of the species when the flash pattern of the male is unknown. Ratios are generally unreliable; however some species have noticeably long or short antennae, or posterior legs. A summary of the male flash patterns is given at the end of the key.

Females are similar to the males, frequently larger; the luminous tissue on the 6th and 7th ventral segments is more limited, the eyes smaller and antennae shorter.

Adequate records of the times of first appearance and of maximum prevalence, and also the periods of nocturnal activity, might separate some species for a given locality. Thus in the Wilmington, Delaware, area, *P. versicolor* usually appears about May 28, followed shortly by *P. hebes*, while *P. lucicrescens* is usually about a week later in appearing. All three have been observed in flight from sundown to well into early morning, though becoming much less numerous after midnight.

KEY

1. Pronotum with or without a central infusate area but always *without* a pair of oval red discal spots..... 2
 Pronotum with a median longitudinal vitta with a conspicuous red or orange spot on each side (*versicolor* group)..... 7
2. Pronotum entirely pale yellow (*brunnipennis* group)..... 3
 Pronotum otherwise..... 4
3. 8.4-11.5 mm long, ca. 3.5 mm broad, subparallel. Elytra entirely black. Labial margin triangulate. Metasternum concolorous with yellow head and thoracic sternites above and below. Fifth ventral sternite with pale posterior margin, the lutescent area broad at middle, narrower toward but not reaching sides. Apical infuscation of femora gradual and barely noticeable, but knees including base of tibiae, pale. Flash pattern of male not recorded. Habitat alticolous. Type locality Alpine, Texas. (*flavicollis* Fall 1927, nec E. Olivier 1886.).....BRUNNIPENNIS var. FALLI Barber (1951)
 9.5-11.0 mm long, ca. 3.1 mm broad, nearly parallel. Elytra black with narrow sutural and wider lateral borders yellow, not continuous around apices. Head, prothorax, and mesothorax yellow above and below; metasternum piceous. Labrum short, light brown, edge narrowly darker, no obvious denticles. Antennae black, ca. 5.1 mm long, 0.54 of body length. First four abdominal ventral sternites black, the fourth sometimes faintly paler at middle. Luminous segments rather deeply emargi-

nate. Coxae and basal five-sixths of femora yellow; knees, tibiae, and tarsi black; posterior legs 7.05 mm long, 0.74 of body length. Male flash short, single. Habitat marshy ground. Type locality Paradise Key, Florida.....BRUNNIPENNIS var. FLORIDANA

Barber (1951)

4. Pronotum with median line dividing the central infusate area (*divisa* group) 5
 Pronotum medially infusate without a dividing line (*frontalis* group).. 6
5. 9.5-10.0 mm long, ca. 3.1 mm broad; subparallel. Pronotal trapezoidal discal infuscation divided by a pale median line. Elytra varying from light brown with poorly defined pale marks to dark brown with sharply defined yellow markings. Frons wide, infusate, interocular margins only slightly divergent, differing in this from most species; labrum short, light brown, with rather prominent median denticle. Antennae light brown, 4.5-5.35 mm long, 0.47-0.5 of body length; third article longer than second. First four ventral abdominal segments brown; the fourth may be darker with pale posterior edge; last segment with a rather sharp median point. Coxae and femora brownish yellow, knees darker; tibiae and tarsi brown; lobes of fourth tarsal article relatively short. Posterior legs 6.3-6.6 mm, ca. 0.66 of body length. Flash of male short, single, repeated continuously at short intervals. Habitat fields. Type locality Missouri Territory (LeConte); probably Nebraska.....

DIVISA LeConte (1852)

6. Larger, 12.0-13.5 mm long, 4.2-5.2 mm broad; slightly elliptical. Pronotum with infusate area abruptly limited, usually twice as long as wide and constricted at basal third. Elytra brown to black; wide lateral and narrow sutural margins pale, sometimes continuous around apices. Frons ivory-white to flavous; labrum short, dark brown, tridentate. Antennae dark brown to black, to 7.65 mm. long, 0.57 of body length. First four ventral abdominal segments brown, the last segment with a median point; luminous segments not as much longer than the preceding segment as usual in most species and not deeply emarginate. Coxae light brown, femora light brown proximally, darker distally; tibiae and tarsi dark brown. Posterior legs of larger specimen 10.15 mm long, 0.76 of body length. Flash of male short, bright, single, yellowish coruscations, regularly at less than one second intervals. Habitat around lower branches of trees near river (Maryland). Type locality Georgia.....

FRONTALIS LeConte (1852)

Smaller, 9.0-11.0 mm long, 4.0 mm broad; outline parallel. Pronotal infusate area large, oval, not constricted, and shading imperceptibly into yellowish border; may be reduced to two indefinite brown streaks. Elytra brown, without vittae; wide lateral and narrow sutural margins yellow, continuous around apices. Frons yellow, interocular margins very divergent; labrum brown with median denticle. Antennae ca. 5.0 mm long. First four ventral abdominal segments brown, the fourth with paler posterior edge; last segment with a median point. Coxae light brown; femora proximally light brown shading to dark brown at knees; tibiae and tarsi dark brown; fifth tarsal article appears shorter than in most species; posterior legs 0.75 of body length. Flash

(Florida) 20 or more short coruscations in rapid succession. Habitat low areas, probably sandy and marshy. Type locality Georgia.....

CONGENER LeConte (1852)

7. Pronotal median vitta as in *VERSICOLOR*..... 8
 Pronotal median vitta modified—narrowed, interrupted, constricted or otherwise..... 11
8. Average length (pronotum plus elytra) more than 12 mm..... 9
 Average length 12.0 mm or less..... 10
9. 13 to 16 mm long (females to 18 mm), 4.5-5.5 mm broad; subparallel. Elytral color very variable, from yellowish tan to almost black; vittae usually well marked but short; lateral and sutural margins yellow, continuous around apices. Frons yellow; labrum brown, prominently tridentate, and extending about half way to the closed mandibles. Antennae about 0.6 of body length, but variable; bases of articles strongly flavous; articles 4 to 10 longer than first article. First three ventral abdominal segments dark brown, fourth brown with posterior third white; last segment white with median point. Coxae dark brown, posterior pair may be paler; tibiae and tarsi brown, bases of tarsal articles flavous; posterior legs long, ca. 0.76 of body length. Flash of male composed of 3 to 6 components in rapid succession, bright, greenish; repeated at five to ten second intervals. Habitat preferentially along streams but found over fields and around trees at some distance from water; females on tall grass and grains and low shrubbery. Type locality "North America"; probably generally present along the Atlantic Coast and westward at least to the Mississippi River.....

VERSICOLOR Fabricius*

13-16 mm long, 4.5-5.0 mm broad; darker and narrower than *versicolor*. Elytral vittae 0.5 of elytral length, but may be obsolescent; lateral and sutural margins ivory, continuous around apices. Frons nearly white. Antennae 0.6 of body length. Venter as in *versicolor*. Posterior legs 0.7 of body length. Male flash of four definitely spaced components, given rather slowly in horizontal flight over sand dunes and fields, and repeated at rather long intervals. Type locality Cape Henry, Virginia. Also seen at Newark, Delaware.....

VERSICOLOR var. *QUADRIFULGENS*
 Barber (1951)

13 mm long, 4.9 mm broad; subparallel or slightly elliptical. Pronotal posterior angles produced. Elytra pale to dark brown; vittae varying from obscure to sharply defined, almost reaching apices. Outline distinctly widened by wide yellow lateral margins, continuous with sutural bead. Frons ivory. Antennae black, sockets white; 0.6 of body length. Venter as in *versicolor*; last ventral segment with a rather sharp median point. Coxae brown; posterior legs ca. 0.76 of body length. Male flash 0.5 second long, yellow, given on a rising flight resembling that of *Photinus pyralis* but flash beginning on the descent. Habitat lawns and hayfields. Type locality Selkirk, New York.....

PYRALIMIMA Barber (1951)

12-13 mm long, 4.0 mm broad; subparallel. Elytra dark brown with wide white lateral and narrow sutural margins continuous around apices; vittae white, ca. 5.0 mm long. Frons ivory. Antennae rela-

*See discussion after the Key

tively short, ca. 0.5+ of body length; dark brown, articulations white. Venter as in *versicolor*; last segment with a wide-angled median point. Coxae brown. Male flash short, single, yellow, similar to that of *Photinus marginellus*. Habitat near tamarack swamp. Type locality

Bluff Siding, Wisconsin.....AUREOLUCENS Barber (1951)

12-13 mm long, 4.0 mm broad; slightly elliptical. Elytra light brown; wide yellow lateral margins and narrower sutural margins continuous around apices.; vittae basally wide, narrowing, and almost reaching apices. Frons ivory. Antennae black, articulations white; ca. 0.66 of body length. First three ventral abdominal segments dark brown, fourth white in posterior third; last segment with a wide-angled rounded point. Coxae dark brown; posterior legs 0.76 of body length. Male flash a steady bluish-green coruscation about one second long. Habitat damp ground near tamarack swamp. Type locality Bluff Siding, Wisconsin.....

CAERULUCENS Barber (1951)

12.5-13.5 mm long, 4.9-5.2 mm broad; nearly parallel. Pronotal vitta like *versicolor* but lateral extensions at base of pronotum short and orange spots relatively smaller. Elytra variable in color, from light greyish brown to very dark brown but tending to be paler than in *versicolor*; vittae usually long and strongly marked; lateral and sutural margins lutescent and continuous around apices. Frons white; labrum pale at base, black at apex, with small median protuberance. Antennae dark brown, articulations white; 0.62-0.65 of body length. First four ventral abdominal segments mostly light brown with some irregular paler areas; last ventral segment pale, with a triangular median point. Coxae pale; posterior legs ca. 0.76 of body length. Characteristic flash of male 0.75-2.5 seconds long, greenish white, usually given in a poising, somewhat spiral flight, increasing in brilliance and ending suddenly, illuminating foliage for several feet around; may appear vibratory or flickering; sometimes gives single, short, brilliant flashes. Habitat usually around trees along banks of streams. Type locality Priest's Bridge, Patuxent River, Maryland. Also seen at Newark, Delaware, and in Louisville, Kentucky.....

LUCICRESCENS Barber (1951)

10. 12 mm long, 4.0 mm broad; nearly parallel. Pronotal vitta not extended laterad at base and orange spots nearly reach base. Elytra light to dark brown with narrow pale lateral and sutural margins, and long, narrow pale vittae. Frons white; labrum brown, covering the closed mandibles. Antennae brown, rather short, 0.5 of body length, articles 4 to 8 inclusive about 3.0 mm long. First three ventral abdominal segments brown, the fourth about one-half white; last segment with a median point. Coxae light brown; posterior legs ca. 0.69 of body length. Flash of male of two components separated by an interval about twice as long as one component; flashing irregular. Habitat over marshy ground. Type locality Cape Breton Island, Nova Scotia.

FAIRCHILD Barber (1951)

10.0-12.5 mm long, 4.2-4.6 mm broad; slightly elliptical. Pronotal vitta similar to that of *versicolor* but widening toward base, giving the effect of a long triangle (cf. *P. potomaca*); lateral extension along the base short or absent; orange areas large. Elytra medium to dark brown;

oblique vittae short; wide lateral and narrow sutural margins yellow, continuous around apices. Frons ivory; labrum short, dark brown, with three dull denticles. Antennae black, articulations white; 0.6-0.63 of body length. First four ventral abdominal segments brown, the fourth with narrow white posterior margin. Coxae brown; posterior legs ca. 0.8 of body length. Flash of male 0.5-1.0 second long, tremulous or vibrating, brilliant, greenish. Habitat low swampy ground. Type locality Black Pond, Virginia (near Great Falls, Potomac River). Also taken at Concord, Mass. TREMULANS Barber (1951)

11-12 mm long, 3.5 mm broad, subparallel. Pronotal black vitta narrow with little extension along base. Elytra dark brown with pale wide lateral margins and narrow sutural margins, continuous around the rather unusually acute apices; oblique vittae absent or obsolescent; epipleura white. Frons white; labrum dull white, edge brown; a median point and two dull lateral denticles. Antennae dark brown, articulations white; ca. 0.62 of body length. First four ventral abdominal segments mainly brown, irregularly white in posterior third to half. Legs white; posterior pair long, ca. 0.85 of body length. Flash of male not recorded, probably single. Habitat stream sides. Type locality Sherwood Forest, Severn River, near Annapolis, Maryland. CINCTIPENNIS Barber (1951)

(This species appears to be rather widely distributed in the Atlantic Coast states, but perhaps in rather scattered localities. Its identity with *lineaticollis* LeConte 1852 or Motschulsky 1854 seems very doubtful.) 8.0-10.0 mm long, 3.0-3.5 mm broad; slightly elliptical. Pronotal vitta as in *versicolor*, sometimes broadened. Elytra brown; wide yellow lateral and sutural margins continuous around apices; oblique vittae variable, to two-thirds elytral length. Frons ivory; labrum short, dark brown, dull median denticle. Antennae short, ca. 0.45 of body length; brown. First four ventral abdominal segments light brown, posterior third of 4 white. Posterior legs ca. 0.74 of body length. Male flash a bright, sharp, coruscation followed immediately by a 1 to 2 second long flash, decreasing in brilliance and given while poising over tall grass. Habitat swampy areas or near them. Type locality probably near Wilmington, Delaware. Also collected at Oneida, New York, at Riverton, New Jersey, and Washington, D. C. (?*Telephoroides vittigera* Motschulsky 1854, p. 60) PENNSYLVANICA DeGeer

9.15-11.45 mm long, 3.4-4.0 mm broad; slightly widest at one-half elytral length. Pronotal black vitta generally similar to *versicolor*. Elytra practically black; margins, suture, and pronounced sharply defined oblique vittae white. Frons yellow; labrum dark brown, tridentate. Antennae black, rather short, ca. 0.5 of body length. First four ventral abdominal segments black; last segment rather long and medially short-mucronate. Coxae almost white; posterior legs long, ca. 0.87 of body length. Male flash of single coruscations 0.2 second long at 4 to 5 second intervals (at 75° F.); longer flashes (at lower temperatures) and shorter intervals also observed; some evidence of flickering. Habitat various areas in Florida, some on the Gulf coast. Type locality Highlands Co., Florida. LLOYDI McDermott (1967)

11. 9.35-12.0 mm long, 3.2-4.5 mm broad; subparallel. Pronotal vitta a

long, narrow triangle from the base (cf. *P. tremulans*). Elytra light brown with wide white lateral and narrow sutural margins; oblique vittae white, ca. 0.5+ of body length. Frons ivory; labrum dark brown with three dull denticles. Antennae brown, articulations white; 7th article somewhat the longest; length variable, 0.55-0.65 of body length. First three ventral abdominal segments brown, fourth usually mostly white medially; last segment white with median point. Coxae brown; posterior legs 0.76 of body length. Male flash single, short, greenish, at regular intervals of about 1 second. Habitat woods along river banks. Type locality Offutt Island, in Potomac River 2.5 miles below Great Falls. (Possibly present in Florida.).....POTOMACA Barber (1951)

10.5-12.0 mm long, 2.8-3.0 mm broad, practically parallel. Pronotal vitta resembling *versicolor* but tending to be narrow, sometimes reduced to a line by enlargement of the orange areas. Elytra usually light brown, occasionally darker; wide white lateral and narrow sutural margins continuous around apices; oblique vittae narrow, white, usually more than 0.5 of elytral length, and may be evanescent. Frons ivory to yellow; labrum pale to brown, sinuate. Antennae noticeably long, ca. 0.7 of body length; dark brown, articulations white; article 10 and 11 shorter than 4 to 9. First ventral abdominal segment yellow, second light brown, third darker, fourth largely mottled white; last segment white with long median point. Coxae yellow; posterior legs long, ca. 0.8 of body length. Male flash single, sharp, yellowish green, sometimes with an orange tinge; not brilliant; interval between flashes 1 to 5 seconds. Habitat willow-covered fresh-water lowlands (Barber); fields and around trees. Type locality outlet of Black Pond, Virginia (below Great Falls, Potomac River.) Common in northern Delaware. Barber remarked that there is a similar species in the Florida Everglades; one specimen from Florida has the last two abdominal segments black, possibly a pathologic condition.....HEBES Barber (1951)

9.0-12.0 mm long, 3.2-4.1 mm broad; slightly elliptical. Differs from *P. hebes* by broader form, shorter antennae, and usually darker elytra. Pronotal vitta hour-glass shaped. Elytra light to darker brown; wide white lateral and narrow sutural margins continuous around apices, sometimes indistinctly. Frons yellow; labrum practically black, feebly tridentate. Antennae 0.5-0.6 of body length, brown; articulations noticeably pale. First four ventral abdominal segments light to dark brown, the fourth may have a pale posterior margin; last segment white with a hairy median point. Posterior legs ca. 0.7 of body length. Flash of male similar to that of *P. hebes*. Habitat the drier margins of salt marshes. Type locality Sherwood Forest, 7 miles northwest of Annapolis, Maryland. Also collected at Bombay Hook Refuge, Delaware.....

SALINA Barber (1951)

11.25-13.7 mm long; average 12.6 mm long and 4.2 mm broad; sub-parallel. Pronotal vitta frequently short, basal, sometimes complete, narrow. Elytra light brown, appearing darker over wings, and basally darker; pale lateral margins to apical fourth, sutural bead pale to mid-length; oblique vittae pale, frequently short or absent, sometimes reaching apical third. Frons yellow; labrum nearly black, tridentate. Antennae dark brown, ca. 0.6 of body length; articulations pale; sixth

article longest. First four ventral abdominal segments dark brown, posterior edge of fourth pale; last segment small, medially pointed, densely hairy. Coxae yellow; posterior tarsi long, 3.3 mm. Male flash single, repeated at two or three second intervals. Habitat grassy fields with few trees, near river; some swampy ground. Type locality Roaring River State Park, Missouri.....MISSOURIENSIS McDermott (1962) 9.0-10.75 mm long, 3.5-4.0 mm broad; slightly elliptical. Pronotal black vitta usually divided into a larger subapical spot and a smaller basal spot, sometimes connected by a line; rarely of the *versicolor* pattern. Elytra brown to nearly black, wide yellowish margins give an elliptical outline; sutural bead pale and narrow; oblique vittae pale, to ca. 0.75 of elytral length. Frons yellow; labrum brown, obscurely tridentate. Antennae dark brown, articulations pale, at least the basal three in the female; 0.55-0.58 of body length in male, about 0.45 in female. First four ventral abdominal segments usually brown, the fourth may be yellow. Luminous areas in female a transverse bilobed organ on the 5th segment and a relatively large elliptical organ on the 6th segment. Legs rather long for a small photurid. Flash of male of two short, greenish components separated by an interval somewhat longer than one component (*cf. P. fairchildi*), the second component frequently weaker than the first and sometimes omitted; the double flash repeated at intervals of 5 seconds or more. Habitat around bayberry bushes on sand dunes and adjoining sandy fields. Type locality Bethany Beach, Delaware.

BETHANIENSIS McDermott (1953)

14.0(?) - 18.0 mm long, to 4.8 mm broad; long subparallel. Pronotal vitta frequently merely a line, sometimes divided into a larger rounded anterior spot and a narrow prescutellar spot. Elytra dark brown; suture and lateral margins narrowly yellow, not continuous around apices; oblique pale vittae sometimes present to 0.5 of elytral length, frequently obsolescent or absent. Frons yellow; labrum black, prominently tridentate. Antennae black, articulations not pale; ca. 7.5 mm long, 0.41-0.53 of body length. First four ventral abdominal segments dark brown. Fore and mesocoxae dark yellow, posterior pair brown. Flash of male not known. (All specimens so far examined have been females.) Habitat various places in Florida and Louisiana. Type locality Florida. (? *Telephoroides lineaticollis* Motschulsky 1854) LINEATICOLLIS LeConte (1852.*)

LOCATION OF TYPES OF NORTH AMERICAN SPECIES OF *Photuris*

Barber's types are in the U. S. National Museum, as is also the type of *P. bethaniensis*.

P. missouriensis is in the California Academy of Sciences.

P. lloydi is in the collection of Cornell University.

LeConte's types are probably mostly in the Museum of Comparative Zoology at Harvard.

DeGeer's types, if still extant, may be in the Zoological Institute of the University of Lund, Sweden.

**P. lineaticollis* is given as a synonym of *P. pennsylvanica* by Olivier (1886, p. 234) and by Gorham (1880, p. 110). Gorham's list undoubtedly covers several species, and the occurrence of *lineaticollis* in Quebec is certainly doubtful.

A GUIDE TO THE FLASH PATTERNS IN THE *P. versicolor* GROUP

Type of flash:	Species:	No. in list:	Position in key:
1. Single, short	<i>aureolucens</i>	9	9
	(<i>lucicrescens</i>)	11	9
	<i>cinctipennis</i> (?)	14	10
	<i>lloydi</i>	16	10
	<i>potomaca</i>	17	11
	<i>hebes</i>	18	11
	<i>salina</i>	19	11
	<i>missouriensis</i>	20	11
2. Single, long			
a. not vibratory—			
yellow,	<i>pyralomima</i>	8	9
bluish,	<i>caerulucens</i>	10	9
b. vibratory—			
brilliant, crescendo,	<i>lucicrescens</i>	11	9
tremulous, not crescendo,	<i>tremulans</i>	13	10
3. Double, of two components			
c. components alike, short interval between them,	<i>fairchildi</i>	12	10
	<i>bethaniensis</i>	21	11
d. 1st component short, brilliant, 2nd without interval, long, diminishing,	<i>pennsylvanica</i>	15	10
4. Three to six components, usually in rapid succession.	<i>versicolor</i>	6	9

Photuris pennsylvanica AND *P. versicolor*

At the end of my notes on Barber's specimens (Barber, 1951, p. 56) I left open the question of the identity of the above species; a review of the situation is given below.

Photuris pennsylvanica was described by DeGeer (1774) from specimens sent to him by Acrelius (1759) from the vicinity of Wilmington, Delaware; DeGeer spelled the name *pennsylvanica*, perhaps a *lapsus calami* or due to DeGeer not being aware of the origin of the word. Fabricius (1798) described *P. versicolor* from specimens sent him from North America by Dom. Hirschell.

Hirschell also collected in the Antilles.) The two species have usually been considered as synonyms and are so given by Laporte (1833, p. 144), Lacordaire (1857, p. 339), and E. Olivier (1886, p. 233). Since DeGeer has priority over Fabricius, most references to these species use the specific name *pennsylvanica*.* Barber (1951, p. 18) states flatly that *pennsylvanica* and *versicolor* are not synonyms, and on p. 17 he designated the latter species as the *typus generis* of *Photuris* Dejean Motschulsky (III, 1854, p. 60) gives *lineaticollis* as perhaps a synonym of *trilineata* Say, and Lacordaire (1857, p. 339) said Laporte described only the variety of *pennsylvanica* which Dejean called *lineaticollis*. This gives some idea of the confusion between the very similar species in this group in the genus *Photuris*.

*As actually used, "*pennsylvanica*" may cover several species other than *versicolor*.

Barber apparently believed that the Swedish word translated as "prairies" by DeGeer referred to fresh-water marsh land as he found his specimens in such a habitat, and states that its type locality is probably a former marsh area now within the limits of the city of Wilmington, Delaware. He states that it is a small species, 9.0 to 10.0 mm long; Specimens here considered to be *P. versicolor* are usually definitely larger than this, up to 18 mm long. Since the Swedish language has definite words for marsh and swamp, it would seem odd if Acrelius did not use such words in his correspondence with DeGeer; prairie would be a better translation of the words for field and meadow. Hesselius, also writing from the Wilmington vicinity in 1711, speaks of meadows and forests as habitats of the fireflies.*

As noted in my comments on Barber's paper (pp. 54-65) a species giving the distinctive two-component flash of *P. pennsylvanica*, as described by Barber, has not been noted among the photurines around Wilmington. It has, however, recently been collected by Dr. James E. Lloyd at Oneida, N. Y., both over fields and near a marsh. By far the commonest species of *Photuris* around Wilmington is the one giving a three- to six-component flash, called by Barber (with some doubt) *P. versicolor* Fabr. While this species is most densely prevalent along streams it is by no means confined to such localities and may be found in great numbers flitting around trees and over fields at some distance from any appreciable amount of water. The specific name *versicolor* is highly appropriate for the species here considered to be the Fabrician species, while the *P. pennsylvanica* collected in New York by Dr. Lloyd is fairly constant in coloration, is relatively small as compared with *versicolor*, and gives the flash described by Barber for *pennsylvanica*.

I believe Barber's question as to the identity of *versicolor* may be disregarded, that the species here recognized by that name is the Fabrician species, and is a distinct and valid species.

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FRANK ALEXANDER MCDERMOTT (1885-1966)

In bygone days it was not unheard of for physical scientists to be amateur naturalists, but few achieved professional distinction in both fields. In the recent death of F. A. McDermott we have lost a classic example of this now very rare species: a man who spent a full and productive life as a chemist and microbiologist; then, in fifteen years of industrious retirement, built an early interest in fireflies into a position as a world authority on the taxonomy and natural history of the Lampyridae.

Mr. McDermott was trained as a chemist, first at George Washington University, then at the Mellon Institute of the University of Pittsburgh, where he received his B.S. in 1913 and M.S. in 1914. His professional career included six pre-college years in the Hygienic Laboratory of the U. S. Public Health Service, four in the fermentation laboratory of the Corby Co., and 32 years with E. I. du Pont de Nemours & Co., Inc., in Wilmington, Delaware, during the last 24 of which he was chief chemist of their Deepwater industrial alcohol plant. His activities in these posts are attested by a score of published papers and notes on fermentation, general chemistry, and laboratory instrumentation, by 13 U. S. patents (10 assigned to the Du Pont Company) of processes related to organic acids and oils and commercial production of glycerol, alcohols, and resins, by his membership in various professional societies and by his reception of the Thobald Smith Medal at the 3d International Congress of Microbiology (1939) and a Modern Pioneer award of the Philadelphia Chamber of Commerce and



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