

Revision of the Nearctic Species of *Pyractomena* (Coleoptera: Lampyridae)

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The Nearctic species of *Pyractomena* present an extremely difficult taxonomic problem because of an almost total lack of structural diversity, and the instability of available differences of size, form, and color. No serious attempt has heretofore been made to segregate our fairly numerous species, possibly because any such study based on too limited material is certain to result in failure. The author's request for specimens of *Pyractomena* met with a most generous response. Nearly twenty-two hundred specimens were accumulated, a tremendous number considering the rarity of these insects. Even this number proved to be inadequate—there were many geographic blanks, and large series collected at the same time and place were lacking for most of the species. It is hoped, however, that the analysis which follows will make possible the identification of a very large proportion of the specimens entering our collections.

Based on the male genitalia, two species groups are indicated that apparently cannot be defined by external characters. Some genitalic diversification occurs in the first, or *P. lucifera* group, which is characterized by a strong sinuation of the ventral inner margins of the lateral lobes, abruptly narrowing the tips. The dorsal inner margins are also sinuate, strongly so with the tips abruptly narrowed in some of the species, varying to scarcely at all sinuate in *P. angulata*. The Nearctic components of this group may for the most part be readily identified by positive differentials other than genitalic. Probably most of the species of the Neotropical fauna belong in this category. The second, or *P. borealis* group, is characterized by having the lateral lobes

gradually narrowing distally, as viewed from below, the inner margins not or only very feebly sinuate. The genitalia are quite similar throughout in the components of this group, presenting no interspecific diversity that is sufficiently definite and constant to be of taxonomic value.

External characters of the greatest importance are derived from the vestiture of the elytra. This is of a dual nature, consisting of a primary pubescence of sparse longer hairs, and a secondary pubescence of dense minute ones. In both kinds the setae are of the same nature: directed posteriorly, arcuate, with the tips nearly or quite in contact with the elytral surface. The primary pubescence is usually evenly distributed over the entire surface, often quite short and less evident basally, and unfortunately subject to abrasion. The secondary pubescence is persistent, and extends on the disk a varying distance from the apex toward the base, according to the species. The area covered by secondary pubescence cannot be accurately measured because of its irregular termination. It is given in the species descriptions as an estimate only, excluding the lateral explanate margin which is usually entirely pubescent. In pale specimens it may often be noted that where the secondary pubescence ends as recognizable hairs, there continue basad extremely minute setae that impart an appearance of surface microsculpture under usual magnifications. The nature of these microsetae may be seen, if viewed laterally at about $100\times$, to be the same as that of the longer pubescence. They are not considered in statements of area covered by the secondary pubescence. In observing the elytral pubescence under the microscope, the author's practice has been to hold the specimen so the line of vision crosses the elytra transversely at a low angle, with the illumination directed longitudinally from the front, also at a low angle.

A useful taxonomic differential, although not subject to precise definition, involves the general outline, or form, of the body. This varies from narrowly elongate, as in *P. lucifera*, to quite broad, as in *P. angulata*, with other species occupying intermediate positions. The lateral explanate margin of the elytra varies similarly in width according to the relative broadness of the species. Because of the variability of nearly everything connected with *Pyractomena*, mathematical statements of length-width ratios would be of no value. Instead outline drawings are

presented showing the body form of a typical example of each species. Intraspecific variability in the shape of the pronotum is excessive, hardly any two specimens of a series matching exactly in this respect. This has been one of the baffling difficulties encountered in an unsuccessful attempt to segregate the species of the *P. linearis* complex. Intraspecific variability in the shape of the elytra is limited mostly to differences in relative length.

Nothing of taxonomic importance has been noted in other structures, except the antennae. In *P. ecostata* the antennae are unusually short and nearly cylindrical. In all other species the antennae are mutually similar, being more elongate and compressed, but differing in length and thickness. The differences are usually not decisive and are often obscured by variability. When the antennae are contracted, the segments telescope slightly at their articulations, conveying an impression quite different from their appearance when distended.

In coloration the species of *Pyractomena* all follow the same general pattern. The pronotum is pale flavate or fulvous with a broad dark median vitta, somewhat irregular, and narrowing anteriorly. In some species there is also a marginal maculation or infuscation each side. Species normally with only the median vitta may sometimes, though rarely, have more or less distinct lateral maculation. The converse is true of those species normally having the lateral maculation present. Although subject to considerable variability, both the median vitta and the lateral maculation, if any, have a typical shape per species. This, together with the body form, imparts the particular habitus by which that species may usually be recognized. The color of the scutellum and adjoining mesonotal areas is fairly constant in the species of the *P. borealis* group, being either entirely pale flavate or fulvous, or entirely dark piceous. These parts, when pale, vary to partly infuscate, never entirely so. The elytra are usually dark brown or black, varying to paler; with the sutural, lateral, and apical borders narrowly flavate or fulvous. The coloration of the ventral surface, very useful taxonomically in *Photinus*, is of no special significance in *Pyractomena*. The few species with a Neotropical affinity are maculate below with two longitudinal rows of dark irregular spots, variable in size. In the remaining species the ventral surface, except the prothorax and luminous segments, is more or less entirely dark.

Males of *Pyractomena* have very large eyes, and ventral segments 6 and 7 entirely luminous. Secondary sexual characters are otherwise lacking, except for a feeble modification of the anterior claw of the front and middle tarsi in *P. lucifera* and *P. angulata*. This is rather difficult to observe unless the claws are extended. It consists of a slight production of the basal enlargement into a rounded lobe, reminiscent of a similar condition well developed in certain forms of *Aspisoma*.

Females of *Pyractomena* have smaller eyes, and the light organs are reduced to a lateral spot each side on ventral segments 6 and 7. In many of the species the females are definitely shorter and broader than the males, but variably so, some individuals not differing perceptibly from the normal male outline. As a rule there should be no difficulty in associating the sexes, except in the confusing *dispersa-linearis* section. The secondary pubescence of the elytra is less extensive in the females than in the males of those species having this pubescence distal only. Also the shape of the pronotum and width of the explanate margin of the elytra are subject to greater variability.

For the benefit of the next reviser, the author's 1956 identification label has been attached to each specimen examined during the course of this study. All those not identified to species have been labeled either "*Pyractomena* sp." or "*Pyractomena linearis* complex."

The author wishes to thank sincerely the following institutions and individuals for the loan of the copious material that has made this investigation possible. Abbreviations in parentheses preceding the name of each contributor are used under the distribution captions of all new and rare species to indicate the present location of each specimen. Special thanks are due to Dr. P. J. Darlington and the Museum of Comparative Zoology for the privilege of studying the types of LeConte and Melsheimer.

(AMNH) American Museum of Natural History, M. A. Cazier and J. C. Pallister

(ANSP) Academy of Natural Sciences of Philadelphia, H. C. Grant, Jr.

(CAC) Clemson Agricultural College, David Dunavan

(Can) Canadian Dept. of Agriculture, W. J. Brown

(CAS) California Academy of Sciences, E. S. Ross and H. B. Leech

- (CM) Carnegie Museum, George Wallace
- (CU) Cornell University, Henry Dietrich
- (INHS) Illinois Natural History Survey, M. W. Sanderson
- (KSC) Kansas State College, F. A. Lawson
- (MFS) Maine Forest Service, A. E. Brower
- (NCDA) North Carolina Dept. of Agriculture, D. L. Wray
- (NDAC) North Dakota Agricultural College, H. L. Post
- (NYSM) New York State Museum, J. A. Wilcox
- (OhioU) Ohio University, W. C. Stehr
- (OSM) Ohio State Museum, E. S. Thomas
- (OSU) Ohio State University, J. N. Knull
- (PSU) Pennsylvania State University, S. W. Frost
- (SDSC) South Dakota State College, H. C. Severin
- (SPBM) State Plant Board of Mississippi, R. E. Hutchins
- (U.Ark) University of Arkansas, L. O. Warren
- (U.CalB) University of California at Berkeley, P. D. Hurd
- (U.CalD) University of California at Davis, A. T. McClay
- (U.Conn) University of Connecticut, J. A. Slater
- (U.Idaho) University of Idaho, W. F. Barr
- (U.Kans) University of Kansas, W. E. LaBerge
- (U.Mass) University of Massachusetts, M. E. Smith
- (U.Mich) University of Michigan, E. J. Kormondy
- (U.Minn) University of Minnesota, E. F. Cook
- (U.Mo) University of Missouri, W. R. Enns
- (U.Neb) University of Nebraska, L. W. Quate
- (USAC) Utah State Agricultural College, G. F. Knowlton
- (USMN) United States National Museum, T. J. Spilman
- (U.Tenn) University of Tennessee, H. F. Howden
- (U.Wisc) University of Wisconsin, R. D. Shenefelt
- A. E. Brower
- R. R. Dreisbach
- K. M. Fender
- C. A. Frost
- H. F. Howden
- M. Y. Marshall
- E. J. F. Marx
- F. A. McDermott
- G. H. Nelson
- R. E. Woodruff

Genus *Pyractomena* LeConte.

Pyractomena LeConte, 1850, Agassiz Lake Superior, Boston, 4:228.

Pyractomena LeConte, 1851, Acad. Nat. Sci. Philadelphia, Proc., 5:336.

Lecontea Ern. Olivier, 1899, Mus. d'Hist. Nat., Paris, Bull., 5:371.

Body texture firm; form elongate oval, lateral margins subparallel, both sexes alate. Head strongly deflexed, when retracted it is completely covered by pronotum; gula semimembranous, abbreviated by a forward extension of occipital foramen; eyes large, hemispherical, intervening dorsal surface nearly flat. Antennae simple, slender, 11-segmented, without minute terminal appendix, similar in the sexes, about as long as pronotum; second segment short, following segments elongate, subequal to each other in length, gradually more slender distally; vestiture fine, short and decumbent, with sparse longer erect hairs. Clypeus transverse, connate with front, its apex with membrane-filled subtriangular notch apparently representing the labrum; mandibles abruptly narrowed and very slender apically; maxillary palpi compact, stout, of the usual photinid structure; terminal segment of labial palpi securiform.

Pronotum variable in shape, anterior margin more or less subangulate, sides broadly deplanate; disk alutaceous, without anterior semi-transparent spots, median longitudinal carina more or less distinct. Elytra with dual pubescence, this varying greatly according to species; epipleurae completely defined externally by acute elytral margin, wide at base, gradually narrowing posteriorly in about basal fourth or third, thence narrowly subparallel, not attaining apex. Prosternum short, truncate in front; anterior margin of hypomera not attaining lateral margin of thorax; anterior thoracic spiracles prominent, transverse, subtubulate. Abdominal spiracles dorsal.

Abdomen of male with eight visible ventral segments, the two terminal covered by pygidium; light organs occupying all of ventral segments 6 and 7, these segments each with a pair of stigmatiform pores. Female with seven visible ventral segments, light organs reduced to a spot each side on ventral segments 6 and 7. Legs short and stout, compressed; tibial spurs small, concealed by apical setae; terminal segment of tarsi extending slightly beyond lobes of deeply divided fourth segment; claws simple, in part feebly modified in males of some species.

KEY TO MALES OF NEARCTIC PYRACTOMENA

1. Viewed ventrally, aedeagus with inner margins of lateral lobes strongly diverging and sinuate distally, apices abruptly much narrowed *P. lucifera* group 2
- Viewed ventrally, aedeagus with inner margins of lateral lobes not strongly divergent, apices not abruptly narrowed. *P. borealis* group 7

P. lucifera Group

2. Elytra subglabrous, primary pubescence very minute and sparse, secondary pubescence confined to lateral explanate margins..... (1) *P. ecostata* (LeConte)
- Elytral pubescence distinct 3
3. Secondary pubescence covering definitely more than half of elytral surface 4
- Secondary pubescence distal, covering less than half of elytral surface (4) *P. sinuata* Green, new species
4. Form narrowly elongate, lateral explanate margin of elytra narrow throughout; pronotum distinctly pubescent (2) *P. lucifera* (Melsheimer)
- Form broader, lateral explanate margin of elytra wide basally, gradually narrowing to apex; pronotum subglabrous, hairs minute and inconspicuous 5
5. Primary elytral pubescence longer and denser, very conspicuous; discal costa of elytra narrowly fulvous.... (3) *P. vexillaria* (Gorham)
- Primary elytral pubescence short and of normal density, not notably conspicuous; discal costa of elytra concolorous 6
6. Secondary pubescence densely covering most of elytral surface, absent or less dense near basal margin, never involving humeral callus. Genitalia as in figure 19. Habitus very similar to *P. angulata* (5) *P. similis* Green, new species
- Secondary pubescence covering entire elytral surface, equally dense to extreme base. Genitalia as in figure 20..... (6) *P. angulata* (Say)

P. borealis Group

7. Secondary pubescence covering definitely more than half of elytral surface 8
- Secondary pubescence distal, covering less than half of elytral surface 10
8. Form broader, lateral explanate margin of elytra wide, gradually narrowing to apex 9
- Form narrow, lateral explanate margin of elytra narrow throughout, only very slightly wider basally 17
9. Large species, 11–19 mm. in length; pale borders of elytra very narrow, often nearly obliterated; epipleurae fuscous basally..... (7) *P. borealis* (Randall)

- Small species, rarely as long as 12 mm.; lateral pale border of elytra wide, epipleurae pale.....(8) *P. marginalis* Green, new species
10. Species of the Southern States, Georgia and Florida to Texas.....11
- Species of more northern distribution16
11. Scutellum and mesonotal areas flavate or fulvous, sometimes partly infusate12
- Scutellum and mesonotal areas dark piceous or black, rarely tip of scutellum narrowly pale13
12. Larger species, 12–16 mm. in length; pronotal vitta normally subtriangular, widest at base. Habitat Texas and Mexico.....
.....(9) *P. punctiventris* (LeConte)
- Smaller species, 9–11.5 mm. in length; pronotal vitta of nearly uniform width throughout, widest near middle, thence narrowing somewhat in basal half. Habitat Southeastern States
.....(10) *P. floridana* Green, new species
13. Pronotal vitta narrow, subparallel-sided; smaller species.....14
- Pronotal vitta subtriangular, widest near base; larger species.....15
14. Elytra piceous brown, discal costa pale; pronotum without lateral maculation(11) *P. barberi* Green, new species
- Elytra piceous black, discal costa concolorous; pronotum with distinct narrow lateral maculation
.....(13) *P. limbicollis* Green, new species
15. Form narrow, lateral explanate margin of elytra narrow throughout; pronotum nearly as long as wide.....(12) *P. angustata* LeConte
- Form broader, lateral explanate margin of elytra wider, gradually narrowing to apex; pronotum distinctly transverse.....
.....tentatively referred to (16) *P. dispersa* Green, new species
16. Primary elytral pubescence conspicuous, longer and denser, of nearly equal length throughout; secondary pubescence covering nearly apical half of elytra, sometimes more extensive. Pronotum usually with lateral maculation 17
- Primary elytral pubescence short, sparse, and inconspicuous basally, somewhat longer distally; secondary pubescence covering about apical third or fourth of elytra. Pronotum usually without lateral maculation(16) *P. dispersa* Green, new species
17. Smaller species, 8–11 mm. in length. Median vitta of pronotum usually subparallel in basal half, usually obscure in apical half and often not reaching apex
.....(14) *P. linearis* LeConte, and *P. linearis* complex
- Larger species, 10–13.5 mm. in length. Median vitta of pronotum entire, subtriangular, somewhat expanded and widest near base, thence regularly narrowing to apex.....
.....(15) *P. palustris* Green, new species

(1) *Pyractomena ecostata* (LeConte).

Photinus ecostata LeConte, 1878, Amer. Philos. Soc., Proc., 17:406.

Photinus nitidiventris LeConte, same as above.

MALE. Form as in figure 1. Head and antennae fulvous. Pronotum with median vitta entire or nearly so, widest near base where it is nearly one-half pronotal width, constricted medially in basal half, thence gradually narrowing to apex which it attains rather broadly; lateral maculation rather broad, usually reaching hind angles, rarely lacking. Scutellum dark piceous varying to fulvous, mesonotal areas pale fulvous. Elytra dark piceous brown; sutural bead fulvous, pale color continuing around scutellum; lateral pale border wider, exceeding width of explanate margin, rather broadly continuous around apex; discal costa, and sometimes inner costa also, narrowly fulvous; epipleurae usually somewhat fuscous basally. Ventral surface, except prothorax and abdomen, largely dark brown or black, ventral segments 2 to 4 each pale medially and laterally, segment 5 pale medially only, segments 6 to 8 pale; dorsal segments dark. Legs dark, femora pale except apically.

Antennae short, about four-fifths as long as pronotum, nearly cylindrical, very slightly tapering distally, segments 5 to 10 each nearly as wide as long. Pronotum usually widest before base, about one-fifth wider than long; lateral margins evenly arcuate, not sinuate before hind angles; anterior margin obtusely subangulate, usually truncate along apical margin of median vitta; basal margin nearly straight; median carina feeble, usually partly obliterated, disk subglabrous. Elytra with primary pubescence minute, very sparse and inconspicuous; secondary pubescence confined to lateral pale borders; lateral explanate margin narrow throughout. Apex of ventral segment 8 broadly arcuately emarginate, emargination about one-third as deep as wide; genitalia as in figure 17. Anterior claw of front and middle tarsi unmodified.

FEMALE. Form slightly broader and shorter than male. Pygidium subtrapezoidal, slightly wider than long; last ventral segment similar in shape, apex broadly and shallowly emarginate. Ventral segments 3 to 7 each with a dark spot each side, these rarely extending to lateral margins, segment 8 dark with pale borders; dorsal segments dark, narrowly pale at sides.

LENGTH. Both sexes, 11.5–16 mm. 108 specimens examined.

LARVA. One specimen pinned with adult labeled "N. J. Coll. Chas. Palm" (AMNH). Of the usual lampyrid structure. Pale fulvous above and beneath; dorsal surface with an entire piceous brown vitta each side, vittae subcontiguous anteriorly and posteriorly; ventral surface with marginal piceous brown vitta each side on abdominal segments 1 to 7, vittae continuing irregularly forward on meta- and meso-thorax; coxae and legs partly infusate. Pronotum with fine, nearly entire, median longitudinal carina (see under LARVA of *P. angulata*); thoracic and abdominal sclerites unmodified at sides, all hind angles narrowly rounded; pygidium wider than long, subrectangular, lateral margins broadly arcuate; abdominal spiracles submedian at sides of ventral segments 1 to 8. Length 13 mm., width 4 mm.

DISTRIBUTION. NEW JERSEY: *Five Mile Beach; Anglesea; Linwood.* VII–VIII. FLORIDA. *Bradentown; Key West; Naples; Royal Palm Park; Everglades National Park; Homestead; New Smyrna; Capron; Enterprise; Biscayne Bay; Sarasota; Indian River.* I–III–IV–V–VI–VII–XI.

This species is remarkable for its distribution, occurring in Florida and southern New Jersey, and apparently not in any intervening territory. It may be easily recognized by its nearly glabrous dorsal surface. The short subcylindric antennae, the small truncation of the pronotal apex, the distinct apical emargination of ventral segment 8 of the male, and the shallow apical emargination of ventral segment 8 of the female, have been noted in no other species of the genus. Specimens from Anglesea,

Figure 1. Typical form and pronotal maculation of *Pyractomena ecostata* (LeConte).

Figure 2. Same, *P. lucifera* (Melsheimer).

Figure 3. Same, *P. vexillaria* (Gorham).

Figure 4. Same, *P. sinuata* Green.

Figure 5. Same, *P. similis* Green.

Figure 6. Same, *P. angulata* (Say).

Figure 7. Same, *P. borealis* (Randall).

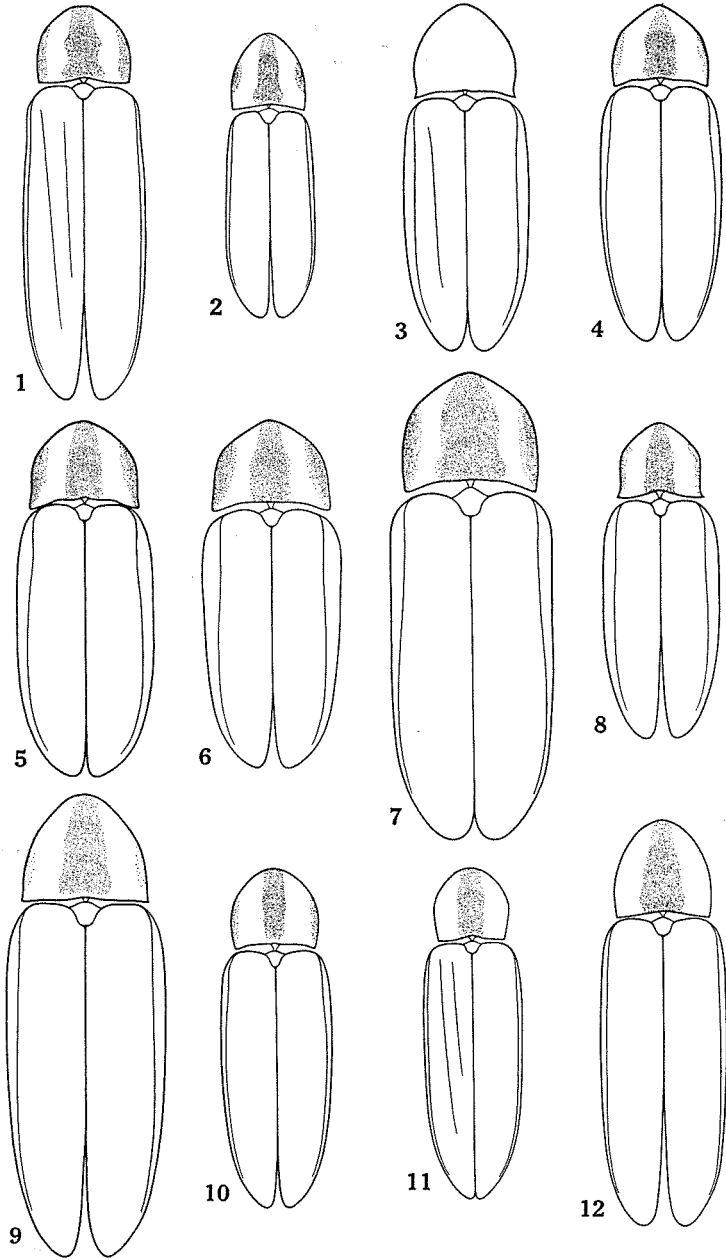
Figure 8. Same, *P. marginalis* Green.

Figure 9. Same, *P. punctiventris* (LeConte).

Figure 10. Same, *P. floridana* Green.

Figure 11. Same, *P. barberi* Green.

Figure 12. Same, *P. angustata* LeConte.



New Jersey, are labeled "Sea-water meadows," and it seems probable that brackish swampy regions are its natural habitat. One Florida example (USNM) is labeled "vexillaria var. det. 1911 by Ern. Oliv."

(2) *Pyractomena lucifera* (Melsheimer).

Pyractomena lucifera Melsheimer, 1846, Acad. Nat. Sci. Philadelphia, Proc., 2:304.

MALE. Form narrowly elongate, as in figure 2. Head dark except near antennae, base of antennae pale. Pronotum normally with median vitta entire or nearly so, widest near base and narrowing to apex, varying through stages of reduction to a narrow median spot; lateral maculation usually distinct, terminating well before base, varying to much reduced or lacking. Scutellum and mesonotal areas usually dark piceous with tip of scutellum pale, varying to entirely pale. Elytra dark piceous brown with narrow flavate borders, varying to dilute brown with pale borders usually much wider; epipleurae usually entirely pale. Ventral surface, except prothorax and luminous segments, dark brown varying to more or less pale at sides and medially, ventral segment 8 and pygidium usually dark with pale borders. Legs dark, femora and tibiae each pale in about basal half.

Antennae as long as pronotum, feebly tapering distally, segments 2 to 10 each less than twice as long as wide. Pronotum widest before base, as long as wide or nearly so; lateral margins evenly arcuate, not or very slightly sinuate at hind angles; anterior margin usually acutely subangulate; median carina usually feeble and partly obliterated, disk sparsely and uniformly pubescent. Elytra with primary pubescence conspicuous, longer and denser than usual, of nearly equal length throughout; secondary pubescence distinct to basal declivity; lateral explanate margin narrow throughout. Ventral segment 8 broadly and very slightly emarginate; genitalia as in figure 18. Anterior claw of front and middle tarsi with basal enlargement variably produced in a small rounded lobe.

FEMALE. Form not differing from male, claws unmodified. Pygidium similar in shape to that of male, subtrapezoidal, about twice as wide as long, apex three-fourths as wide as base, broadly and very shallowly arcuately emarginate, apical angles somewhat

prominent. Last ventral segment as wide as pygidium and nearly as long, roughly semicircular in shape, apex sinuate each side of small triangular median notch, pygidium broadly exposed each side. Ventral segments 2 to 5 each with a dark spot each side, spots often more or less expanding and confluent, segments 6 and 7 each with a median dark spot, segment 8 dark with pale borders.

LENGTH. Both sexes, 7.5–12 mm. 148 specimens examined.

DISTRIBUTION. QUEBEC: *Port Credit; Pt. Pelee; Britannia; Prince Edward County*. VI–VII. NEW YORK: *New York City; Rochester; Peekskill*. PENNSYLVANIA: *Bristol; Moores*. VI–VII. NEW JERSEY: *Atlantic City; Camden; Riverton*. VII. MARYLAND: *Breton Bay; Lanham; Annapolis; Hills Bridge; Patuxent River*. VI–VII–VIII. DISTRICT OF COLUMBIA: *Washington*. VII–VIII. VIRGINIA: *Accotink Bay*. VIII. NORTH CAROLINA: *Raleigh*. VII. FLORIDA: *Arcadia; Miami; Haulover; Tarpon Springs; Crescent City; Everglade*. III–IV–VIII. OHIO: *Ira; Buckeye Lake; Akron, Fairfield and Summit counties*. VI–VII. MICHIGAN: *Ann Arbor; Oakland, Midland, Berrien, and Livingston counties*. VI–VII. INDIANA: *Millers*. VII. ILLINOIS: *Algonquin*. VII. WISCONSIN: *Wood County*. VII. MINNESOTA: *Henderson; Lake Owasso; St. Paul; Itasca Park; Traverse, Olmstead, Big Stone, Sibley, and Ramsey counties*. VI–VII. SOUTH DAKOTA: *Vermillion*. VII. OKLAHOMA: *Broken Bow*. VI. LOUISIANA: *Creole; New Orleans*. V–VI. TEXAS: *Houston*.

The identity of this species was determined by examination of a series of three specimens in the Melsheimer collection, all without locality data. One of these is designated lectotype, and has been so labeled. *Pyractomena lucifera* is easily known by its narrowly elongate form and very conspicuous dorsal vestiture. When present, the lateral maculation of the pronotum fails to reach the hind angles, a characteristic of this species that seems to be without exception. The form of the pygidium and last ventral segment of the female distinguishes *P. lucifera* from all other species except the closely related *P. vexillaria*. Barber has recorded the flashing of a male specimen, collected at Annapolis, Maryland, as a "short sharp flash at irregular intervals."

(3) *Pyrectomena vexillaria* (Gorham).

Pyrectomena vexillaria Gorham, 1881, Biol. Centr.-Amer., vol. 3, part 2, page 50.

MALE. Form as in figure 3. Head and base of antennae fulvous. Pronotum pale fulvous, immaculate or with median vitta reduced to a small sub-basal spot; lateral maculation wanting. Scutellum and mesonotal areas entirely pale fulvous, varying to somewhat dusky with apical half of scutellum pale. Elytra piceous brown; sutural pale border wider than usual, especially near scutellum where it may expand broadly and more or less completely across base of elytra to join lateral pale border; lateral pale border wider, exceeding width of explanate margin, broadly continuous around apex; discal costa narrowly fulvous; epipleurae pale. Ventral surface pale, metasternum brown, ventral segment 8 sometimes dusky medially; pygidium dark with sides broadly fulvous. Femora pale except at tip, tibiae and tarsi dark, base of tibiae sometimes pale externally.

Antennae as long as pronotum, moderately slender, tapering distally, segments 2 to 10 each less than twice as long as wide. Pronotum usually widest before base, about one-sixth wider than long; lateral margins feebly converging and sinuate before hind angles; anterior margin obtusely subangulate; basal margin angling slightly backward each side at outer limits of convex area; median carina feeble, nearly obliterated in basal half, not reaching apex; disk subglabrous, with minute and vary inconspicuous sparse hairs. Elytra with primary pubescence conspicuous, of nearly equal length throughout, shorter than in *P. lucifera* but similarly denser than usual; secondary pubescence extending to about basal eighth or tenth; lateral explanate margin wide at base, gradually narrowing to apex. Ventral segment 8 truncate; genitalia similar to figure 18. Anterior claw of front and middle tarsi unmodified.

FEMALE. Form not differing from male; elytra darker, not pale at base. Pygidium and last ventral segment nearly as in *P. lucifera*. Pygidium similar in shape to that of male, subtrapezoidal, three-fourths wider than long, lateral margins broadly arcuate, base one-eighth wider than apex, apex broadly arcuately emarginate, apical angles somewhat prominent. Last ventral segment as wide as pygidium and nearly as long, roughly

semicircular in shape, apex feebly sinuate each side of small triangular median notch, pygidium broadly exposed each side. Ventral segments 2 to 5 each with a dark spot each side that may expand to reach lateral margin, spots more or less confluent or median on segments 6 and 7, segment 8 dark with pale borders.

LENGTH. Both sexes, 11.5–13 mm. Specimens examined, 3 males and 2 females.

DISTRIBUTION. TEXAS: *New Braunfels*: VI–VII, '02, G. M. Greene coll'n, 1 male (USNM). *Del Rio, Valverde County*: VIII–22 to 23–1912, R. & H., 1 male (ANSP). *Valverde County*: VIII–20, G. M. Greene coll'n, 1 male (USNM); V–24–48, VIII–27–47, D. J. & J. N. Knull, 2 females (OSU).

This species was described by Gorham from a single specimen collected at Vera Cruz. Although the type has not been examined, it seems highly probable that the Texas specimens are conspecific, based on their close agreement with the illustration of *P. vexillaria* in the Biologia. The range of distribution, Vera Cruz to Texas, is paralleled by that of *P. punctiventris*. The species is closely related to *P. lucifera*, differing from it in the broader form, wider lateral explanate margin and pale discal costa of the elytra, and the subglabrous pronotum.

(4) *Pyractomena sinuata* Green, new species.

HOLOTYPE. MALE; Mississippi Bluff, 1 to 2 miles N. of State Line, Houston County, Minnesota, V–31–1941, C. E. Mickel. In collection of University of Minnesota.

Form as in figure 4. Head piceous brown, antennae darker. Pronotum with median vitta subentire, in basal half about one-third pronotal width, thence narrowing to apex; lateral maculation faintly indicated, rather wide, not reaching hind angles. Scutellum dark, mesonotal areas somewhat paler. Elytra dark piceous brown; sutural bead flavate, pale color continuing around scutellum; lateral pale border wider, confined nearly to explanate margin, indistinctly continuous around apex; epipleurae fuscous basally. Ventral surface, except prothorax and luminous segments, dark piceous, sides of segment 8 pale; pygidium dark. Legs dark.

Antennae as long as pronotum or nearly so, tapering distally, segments 2 to 10 each less than twice as long as wide. Pronotum transverse, widest before base, about three-tenths wider than long; lateral margins broadly arcuate, somewhat diverging until near base, then feebly converging, not sinuate before hind angles; anterior margin obtusely subangulate; basal margin distinctly angling backward each side at outer limits of convex area; median carina subentire, not reaching apex, disk subglabrous. Elytra with primary pubescence short and inconspicuous, scarcely longer distally; secondary pubescence covering about apical third of elytra; lateral explanate margin narrow, widening somewhat toward base. Ventral segment 8 truncate; genitalia similar to figure 19. Anterior claw of front and middle tarsi unmodified. Length 11 mm.

FEMALE. Form shorter and broader than male, secondary pubescence less extensive. Pygidium subtrapezoidal, slightly wider than long, apex subtruncate or rounded; last ventral segment semi-elliptic, apex with small triangular notch.

VARIATIONS. The lateral pronotal maculation is often lacking, and is rarely darker than a very pale fuscous; the median vitta may be subtriangular, widest near base, it is often indistinct or absent in apical half, being more or less obscured by a translucence of the integument over the eyes. The hind angles of the pronotum are sometimes feebly prominent laterally, preceded by a slight sinuation of the lateral margin. The color of the elytra varies to a rather dilute brown, with the epipleurae entirely pale; the secondary pubescence may be more extensive, reaching nearly the middle of the elytra.

LENGTH. Males 8-11 mm., females 8-9 mm. Specimens examined, 37 males and 3 females.

DISTRIBUTION. NEW HAMPSHIRE: *Durham*: VI-28-09, W. S. Abbott, 1 paratype (INHS). CONNECTICUT: *Storrs*: VI-25 & VI-28-1920, J. A. Manter, 3 paratypes (U.Conn). *Mansfield*: VI-28-20, J. A. Manter, 1 paratype (U.Con). *Cornwall*, Chamberlain, 1 paratype (CU). No definite locality: Coll'n Chas. Palm, 1 paratype (AMNH). PENNSYLVANIA: *Jeanette*: VI-12, H. G. Klages, 1 paratype (CM). ILLINOIS: *Palos Park*: VI-21-08, E. Liljeblad, 1 paratype (U.Mich). *N. Ill.*: 1

paratype (CM). WISCONSIN: *Wood County*, Griffith Street Nursery: VI-28-47, R. D. Shenefeld, 1 paratype (U.Wise). MINNESOTA: *Mississippi Bluff*, 1 to 2 mi. N. of State Line, *Houston County*: V-30 & V-31-1931, C. E. Mickel, holotype and 3 paratypes (U.Minn). *Houston County*: V-27 & V-28-1929, 2 paratypes (U.Minn). *Olmstead County*: C. N. Ainslie, 2 paratypes (U.Minn). SOUTH DAKOTA: *Brookings*: VI-18-1919, VI-11 & VI-19-1921, H. C. Severin, 3 paratypes (SDSC). *Lakeview*: VI-20-1930, G. I. Gilbertson, 1 female (SDSC). KANSAS: *Topeka*: Popenoe collector, 5 paratypes (KSC); 1 paratype, 1 female (CAS). *Medora*: Sand Dunes, V-29, J. W. McColloch, 1 paratype (KSC). *Shawnee County*: VI-5-53, Breithaupt, 1 female (KSC). MANITOBA: *Aveme*: VI-12-1910 & VI-22-1914, N. Criddle, 2 paratypes (Can). NO DEFINITE LOCALITY: 4 paratypes labeled "June" (2-CU, 2-INHS); 2 paratypes, no labels (1-KSC, 1-U.Mass).

This species so closely resembles *P. dispersa* that for a positive identification it is necessary to examine the male genitalia. If the median lobe is partly exposed, further examination of the aedeagus will not be required. The restricted area covered by the secondary elytral pubescence easily distinguishes *P. sinuata* from all other members of the *P. lucifera* group. No method has been discovered for a positive identification of the females.

(5) *Pyractomena similis* Green, new species.

HOLOTYPE. MALE; Tuscaloosa, Alabama, V-11-53, B. D. Valentine. In collection of California Academy of Sciences.

Form and habitus similar to *P. angulata*, as in figure 5. Head and antennae dark piceous. Pronotum with median vitta entire, in basal half about one-third pronotal width, thence narrowing to apex; lateral maculation rather broad, narrowing posteriorly to hind angles. Scutellum and mesonotal areas piceous black. Elytra piceous black; sutural bead flavate, pale color narrowly continuing around scutellum; lateral pale border wider, confined to explanate margin, continuous around apex; epipleurae lightly fuscous basally. Ventral surface, except prothorax and luminous segments, piceous black, segment 8 dark with pale borders; pygidium dark. Legs dark, femora, except posterior, paler basally.

Antennae slender, longer than pronotum, somewhat tapering distally, segments 3 to 10 each nearly twice as long as wide. Pronotum transverse, widest at base, about three-tenths wider than long; lateral margins subparallel, very slightly diverging at hind angles; anterior margin obtusely subangulate; basal margin angling slightly backward each side at outer limits of convex area; median carina subentire, disk subglabrous, with minute sparse pubescence. Elytra with primary pubescence short and inconspicuous, scarcely longer distally; secondary pubescence densely covering most of elytral surface, lacking in about basal one-eighth; surface nearly as in *P. angulata*, smooth and subopaque, feebly shining basally; lateral explanate margin very wide at base, gradually narrowing to apex. Ventral segment 8 truncate; genitalia as in figure 19. Anterior claw of front and middle tarsi unmodified. Length 12 mm.

FEMALE. Form distinctly shorter and broader than male. Pygidium subtrapezoidal, about one-fourth wider than long; last ventral segment semi-elliptic, apex with small triangular notch.

VARIATIONS. The lateral margins of the pronotum are usually not at all sinuate at the hind angles, and never more than very feebly so; the median vitta may be subtriangular, widest at or near base. The pronotal maculation varies by reduction in size and intensity, the lateral spots sometimes pale fuscous and the median vitta not attaining apex. The color of the elytra varies to piceous brown. The secondary elytral pubescence may extend to base, more or less sparsely and irregularly and not involving the humeral callus.

LENGTH. Males 9–12.75 mm., females 8–10.5 mm. Specimens examined, 63 males and 9 females.

DISTRIBUTION. NEW JERSEY: No definite locality: 1 female (AMNH). MARYLAND. *Baltimore County*: VI-19-40, H. F. Howden, 1 paratype (Howden). *Beltsville*: VI-4-1914, 1 female (INHS). *Plum Point*: V-28-1922, L. L. Buchanan, 1 paratype (USNM). *Cabin John*: VI-7-1927, H. S. Barber, 5 paratypes (USNM). No definite locality: 1 female (U.Minn). DISTRICT OF COLUMBIA: *Washington*: V-21-44, 1 para-

type (U.CalD); Cabin John,* V-24-1924, 2 paratypes, V-28-1924, 6 paratypes, V-29-1924, 13 paratypes, all H. S. Barber (USNM); 8.5 mi. N.E., V-25-39, H. S. Barber, 14 paratypes (USNM); 10 mi. N.W., V-16-1930, H. S. Barber, 5 paratypes (USNM). VIRGINIA: *Four Mile Run*: V-31-1914, 1 female (INHS). *Glen Carlyn*: V-29-1929, J. C. Bridwell, 3 paratypes, and H. S. Barber, 1 paratype (USNM). *Fredericksburg*: VI-5-1902, 2 females, VI-8-1892, 1 female, V-6-1900, 1 paratype, all W. D. Richardson (USNM). ALABAMA: *Tuscaloosa*: V-1 to V-11, B. D. Valentine, holotype and 4 paratypes (CAS). *Mobile*: IV-18, Dr. G. W. Bock, 1 paratype (U.Mo). *Oak Grove*: V-16-1908, H. P. Loding, 1 female (USNM). *Jackson*: IV-19-1910, W. D. Pierce, 1 paratype (USNM). MISSISSIPPI. *Lucedale*: V-7-1930, H. Dietrich, 1 female (CU). *Waveland*: V-25-1892, coll'n H. Soltau, 1 paratype (USNM).

This species closely resembles *P. angulata*, differing externally only in the absence or thinning of the secondary pubescence along the base of the elytra. The male genitalia differ decisively from *P. angulata* in the strongly sinuate dorsal inner margins of the lateral lobes. Male flashing data recorded by Barber with specimens collected by him at Cabin John, Maryland, are as follows: "3 flashes at 1 second intervals, flying"; "6 flashes at 1 second intervals, on twig, cold"; "11 flashes at about 1 second intervals, long rest, not flying, cold."

(6) *Pyractomena angulata* (Say).

Lampyrus angulata Say, 1825, Acad. Nat. Sci. Philadelphia, Jour., 5:162.

Pyractomena flavocincta LeConte, 1851, Acad. Nat. Sci. Philadelphia, Proc., 5:336.

MALE. Form as in figure 6. Head and base of antennae fulvous, varying to dark piceous. Pronotum with median vitta usually entire, in basal half about one-fourth to one-third pronotal width, thence narrowing to apex; lateral maculation very rarely lacking, usually broad anteriorly, extending half way or more to median vitta, narrowing posteriorly to hind angles. Scutellum piceous black, mesonotal areas sometimes paler. Elytra dark piceous brown or black; sutural bead flavate, pale color not

* "Cabin John" appears on the labels for both Maryland and the District of Columbia. It is probable they both refer to the same locality.

or narrowly continuing around scutellum; lateral pale border wider, confined to explanate margin, continuous around apex; epipleurae sometimes fuscous basally. Ventral surface, except prothorax and luminous segments, dark piceous varying to irregularly paler, segment 8 usually dark with pale borders; pygidium dark. Legs dark, femora usually more or less extensively pale basally.

Antennae slender, longer than pronotum, slightly tapering distally, segments 3 to 11 each twice as long as wide or nearly so. Pronotum prominently transverse, usually widest at base, one-fourth to one-half wider than long; lateral margins subparallel or feebly diverging to hind angles, sometimes sinuate with hind angles laterally prominent; anterior margin obtusely subangulate; basal margin angling slightly backward each side at outer limits of convex area; median carina usually subentire, disk subglabrous, with minute sparse pubescence. Elytra with primary pubescence somewhat conspicuous, not dense, of nearly equal length throughout; secondary pubescence covering entire elytral surface, equally dense to extreme base; surface smoother than usual, subopaque; lateral explanate margin very wide at base, gradually narrowing to apex. Ventral segment 8 truncate; genitalia as in figure 20. Anterior claw of front and middle tarsi with basal enlargement variably produced in a small rounded lobe.

FEMALE. Form not differing from male; claws unmodified. Pygidium subtrapezoidal, about one-fourth wider than long, apex broadly rounded or subtruncate; last ventral segment semi-elliptic, apex with small triangular notch.

LENGTH. Both sexes, 7.5–13 mm. Specimens examined, 868.

LARVA. A specimen, presumably of this species, received with others from Dr. A. E. Brower: Ashland, Maine, VII-25-41 (MFS). Dorsal surface piceous black, irregularly mottled with small oval or circular scale-like fulvous spots, these often confluent. Ventral surface: abdominal pleurites 1 to 7 piceous black, 8 pale; sternites pale fulvous except ninth; pale median coloration continuing irregularly forward on thorax and head. Pronotum with entire median longitudinal carina which is apparently not fixed; it may appear as a finely impressed line, or

be in part acutely carinate with the remainder striaform. Meso- and meta-notum with basal margins sinuate each side, hind angles feebly produced posteriorly. Abdominal tergites, except ninth, each with hind angles produced posteriorly in a thick and blunt spine-like process not interrupting the even curvature of lateral margins, processes about one-fourth length of tergites, shorter distally. Abdominal pleurites unmodified at sides; spiracles ventral, submedian at lateral margins of pleurites 1 to 8. Pygidium subrectangular, twice as wide as long. Dr. Brower writes concerning the larvae: "This is not an important economic group to us, but larvae are often found on *Adelges* and *Cryptococcus* infested trees." Length 15 mm., width 4.75 mm.

PUPA. Two specimens: Itasca Park, Minn., V-30-1934, C. H. Hoffman (U.Minn); and Canton Point, Maine, VII-1-1928, J. C. Parlin (USNM). Emerged part way from head end of larval skin, which still covers rear of pupa. General color pale fulvous throughout, pronotum darker medially. Pronotum similar in shape to that of adult except hind angles each produced postero-laterally in a thick acute spine-like process about one-fifth as long as base of pronotum; surface not alutaceous. Abdominal tergites (first four visible at sides) with posterior angles each produced laterally in a slender acute process curving forward, processes longer than tergites. Lateral margins of visible ventral segments each with a very small thick process arising near hind angle and directed outwardly, its tip acute. Spiracles dorsal.

DISTRIBUTION. QUEBEC: *Aylmer; Montreal; Rigaud; Fort Columbus; Wakefield; Cascades P.; Laniel; Knowlton*. VI-VII. ONTARIO: *Toronto; Prince Edward County; Pt. Pelee; Pelee Island; Marmora; Ottawa; Britannia; Bells Corners; Port Colborne; Chalk River; Gravenhurst, Muskoka Dist.; Nipigon; District Parry Sound*. VI-VII. MANITOBA: *Aweme; Winnipeg; Husavick; Berens River*. VI-VII. SASKATCHEWAN: *Fort Q'Appelle*. VI. NOVA SCOTIA: *Baldeck*. VI. NEW BRUNSWICK: *Mechanics Lake*. VII. MAINE: *Sebago Lake; No. Twin Lake; Millinocket; Vanceboro; Paris; Medomak; Monmouth; Old Orchard; Salisbury Cove; S. W. Harbor; Mt. Desert; Wesley; Coburn Cove; Knox and Lincoln counties*. VI-VII-VIII. NEW HAMPSHIRE: *Hampton; Center Harbor; Fabyans; Mt. Pleas-*

ant House; Little Is. Pond; Franconia; Madbury. VI-VII. MASSACHUSETTS: *Marion; Chicopee; Ipswich; Mt. Tom; S. Amherst; Tyngsboro; Hopkinton; Clinton; Boston; Ellis; Gardner.* VI-VII. CONNECTICUT: *New Britain; Cornwall; Hamden.* VI. RHODE ISLAND: *Watch Hill.* VII. NEW YORK: *West Point, S. Fallsburg; Ithaca; Gowanda; Artists Brook, Essex County; Allegany St. Park; Underwood; Petersburg; Peru; McLean Bogs Res.; Putnam; Plattsburg; Nyack; Hague; New York; Minerva; St. Remy, Brooklyn; Rochester; Ilion; Karner; Pike; Cranberry Creek, Keene Valley; Ulster and Greene counties.* VI-VII. NEW JERSEY: *Atsion; Phillipsburg; Cape May; Linwood; Hopatcong Lake; Westville.* V-VI-VII. PENNSYLVANIA: *Easton; Lehigh Gap; Hazleton; Mt. Pocono; Wind Gap; Allegheny County; Alleg. Forest; Charter Oak; Delaware Water Gap; Jeannette; Pittsburgh; Arendtsville; The Rock; Livonia; Moshannon.* VI-VII. OHIO: *Cedar Point; Columbus; Shawnee Forest; Indian Lake; Lancaster; Athens; Scioto, Hocking, Delaware, Lucas, Champaign, Ross, Jackson, and Adams counties.* VI-VII. MICHIGAN: *Sand Point; Willis; Alston; Bloomfield; Pentwater; Port Huron; Ann Arbor; Southfield; Douglas Lake; Grand Rapids; Whitmore Lake; Cheboygan, Oakland, Newaygo, Midland, Presque Isle, Alger, Livingston, Berrien, Montmorency, Oscoda, and Iosco counties.* VI-VII-VIII. INDIANA: *Tremont; Lafayette, Osborn; Millers.* VI-VII. ILLINOIS: *Urbana; McHenry.* VI-VII. WISCONSIN: *West Bend; Madison; Dane, Polk, Washington and Wood counties.* VI-VII. MINNESOTA: *Virginia; Basswood Lake; Crookston; Mora; St. Paul; Gray Cloud Island; Lake City; Grandy; Itasca St. Park; Ramsey, Lake, Pine, Hennepin, Kittson, Goodhue, Polk, St. Louis, Cass, Olmstead, and Ottertail counties.* VI-VII. MARYLAND: *Sherwood Forest, Severn River; Plummerville; Bladensburg; Great Falls, Potomac River.* VI-VII. DISTRICT OF COLUMBIA: *Washington.* V-VI. VIRGINIA: *Glencarlyn; top Mt. Elliot; Fredericksburg; Black Pond; Baltimore; Buffalo Creek; Hot Springs; Great Falls; Nelson County.* VI-VII. WEST VIRGINIA: *White Sulphur.* VII. KENTUCKY: *Crailhope; Rock Haven.* VI-VII. TENNESSEE: *Signal Mt.; Nashville; Great Smoky Mts. Nat. Park; Brushy Mt.; Chilhowee Mts., Sevier County.* V-VI-VII. NORTH CAROLINA: *Black Mts.; Sunburst; Cranberry; Lake Toxaway; Canton; Elkin; Wilming-*

ton; Raleigh; Fayetteville; Pineola; Southern Pines; Sanford. V-VI-VII. SOUTH CAROLINA: Clemson; Oconee St. Park; Mt. Rest. V-VI. GEORGIA: Hugenot; Walnut, Lumpkin County. VI. FLORIDA: Kissimmee; Dunedin; Matheson Hammock, Dade County; Paradise Key; Edgewater; Fort Reed; Crystal River; Orlando; Lake Placid; Ocala Nat. Forest; Gainesville; Fort Lauderdale; Welaka; Marion, and Putnam counties. II-III-IV-V-VIII. ALABAMA: Tuscaloosa; Jackson Cave, Fort Deposit; Summit Cheaha Mt. V-VI-VII. MISSISSIPPI: Lucedale; Richton. V-VII. IOWA: Iowa City; Solon; Lake Okoboji; Ames; Sioux City; McGregor; Benton County. VI-VII. MISSOURI: St. Louis. ARKANSAS: Hope. V. NORTH DAKOTA: Devils Lake; Kindred; Caledonia; Fargo. VI. SOUTH DAKOTA: Marvin; Eden; Pierre; Sturgis; Chamberlain; Lead; Whitewood; Custer; State Game Lodge; Seechee Hollow, Roberts County. VI-VII. NEBRASKA: Rock Bluff. KANSAS: Onaga; Topeka; Leavenworth; Baldwin; Wathena; Lawrence; Riley, Linn, Douglas, Cowley, and Miami counties. V-VI-VII. OKLAHOMA: McCurtin County. VI. TEXAS: Karnack; Hardin County. V. NEW MEXICO: Frijoles Canyon, Bandelier Nat. Monument, 6600 ft. VI.

This is our most abundant and most widely distributed species, accounting for about 40 per cent of the total number of Nearctic specimens of *Pyractomena* now in collections. The secondary pubescence covering with uniform density the entire surface of the elytra is characteristic of this species only, and will serve to identify it without further investigation. Variation is for the most part insignificant. In several specimens it was noted that the pronotum is more elongate than above specified, and in a few others the lateral explanate margin of the elytra is perceptibly less than its usual width. In some Florida examples the dark color of the elytra extends partly over the explanate lateral margin, as it does in many specimens of *P. borealis*. The apical angles of the last three abdominal tergites are sometimes acutely extended. The flashing of the males is recorded by Barber as follows: Sebago Lake, Maine, "A flickering half-second flash each one and one-half seconds over marsh on cold night"; and Sherwood Forest, Maryland, "Orange flicker ascending."

(7) *Pyractomena borealis* (Randall).

Lampyris borealis Randall, 1838, Boston Jour. Nat. Hist., 2:16.

MALE. Form as in figure 7. Head and antennae black. Pronotum with median vitta usually entire, often abruptly expanding basally, in basal half one-third to more than one-half pronotal width, sometimes nearly meeting lateral maculation, thence narrowing to apex; lateral maculation rarely lacking, varying from narrow to quite wide, attaining hind angles. Scutellum and mesonotal areas dark piceous. Elytra piceous black, pale borders usually very narrow, often nearly obscured by encroaching dark color of disk; epipleurae fuscous basally. Ventral surface, except prothorax and luminous segments, piceous black, segment 8 with sides pale; pygidium black. Legs black.

Antennae as long as pronotum, slender, slightly tapering distally, third and following segments each one and one-half to twice as long as wide. Pronotum transverse, usually widest in about basal third, one-fifth to one-third wider than long; lateral margins usually subparallel, sometimes diverging to base, rarely sinuate before hind angles; anterior margin obtusely subangulate, often nearly straight each side of apex; basal margin usually distinctly angling backward each side at outer limits of convex area; median carina feeble, not reaching apex, disk subglabrous. Elytra with primary pubescence conspicuous, of nearly equal length throughout; secondary pubescence covering three-fourths or more of elytral surface; lateral explanate margin wide basally, gradually narrowing to apex. Ventral segment 8 truncate; genitalia as in figure 21. Anterior claw of front and middle tarsi unmodified.

FEMALE. Form usually somewhat shorter and broader than male. Pygidium subtrapezoidal, slightly wider than long, apical margin three-fourths as wide as base, trisinuate; last ventral segment roughly semi-elliptic, apex with small triangular notch, pygidium rather broadly exposed each side.

LENGTH. Both sexes, 11-19 mm. Specimens examined, 310.

LARVA. Three exuviae attached to pupal skins described below. Upper surface piceous black, not distinctly mottled. Pronotum with median longitudinal carina (see under LARVA of *P. angulata*); basal margin of mesonotum nearly straight, of metanotum

feebly sinuate each side near hind angles which are very slightly produced posteriorly. Abdominal tergites, except ninth, with posterior angles each produced in a thick and blunt process which is evenly continuous externally with lateral margin, processes about one-fourth length of tergites, shorter distally. Ventral surface too distorted for description.

PUPA. Three exuviae: Itasca Park, Minnesota, V-29-39 (U. Minn); Cabin John on Potomac River, Maryland, IV-28-51 (Nelson); Takoma Park, Maryland, IV-18-51, pinned with emerged adult (Nelson). Emerged part way from head end of larval skins which still cover rear of pupa. General color piceous black, sides of pronotum fulvous, with distinct lateral maculation in one example. Pronotum similar in shape to that of adult, lateral margins sinuate at hind angles which are acute and somewhat prominent laterally, surface not alutaceous except anteriorly in one example. Abdominal tergites (first four visible at sides) with hind angles each produced postero-laterally in a short process nearly half as long as tergite, process thick at base and rapidly narrowing to a sharply acuminate tip. Lateral margins of visible ventral segments each with a very small thick process arising near posterior angle and directed outwardly, its tip acute and curving anteriorly. Spiracles dorsal.

DISTRIBUTION. QUEBEC: *Rigaud; Montreal; Long Lake; Duparquet; Laniel; Hull; Aylmer; Wakefield; St. Annes; Lake Opasatika*. V-VI-VII. ONTARIO: *Toronto; Trenton; Sudbury; Ottawa; Mer Bleue; Chalk River*. V-VI. MANITOBA: *Aweme; Winnipeg; Husavick; Cormorant Lake; Norway Housse*. V-VI. SASKATCHEWAN: *Christopher Lake*. VI-VII. ALBERTA: *Edmonton; McMurray*. VI. NOVA SCOTIA: *Kentville*. VI. NEW BRUNSWICK: *Bathurst*. VII. MAINE: *Monmouth; Paris; Redington; Staceyville; Patton; Seboomook; Masardis; Elliotsville; Kineo; Tim Pond Plantation; S. W. Harbor; Allagash*. VI-VII. NEW HAMPSHIRE: *Randolph; Mt. Washington, 5000 ft.* VI-VII. MASSACHUSETTS: *Hopkinton; Mt. Wachusett*. V. CONNECTICUT: *Kent*. VI. NEW YORK: *Mt. Whiteface, top; Bear Mt.; Paul Smiths; N. Fairhaven; Speculator; Rochester; Keene Valley; Newport; Pike; Carmel; Cooks Falls; Freeville; Washington County*. V-VI-VII. NEW JERSEY: *Trenton Falls; Newfoundland*. V-VI. PENNSYLVANIA:

Jeannette; Dauphin County. VI. OHIO: *Warren County.* VI. MICHIGAN: *Manistique; St. Ignace; Marquette; Douglas Lake; Horn Mt. Club; Detroit; Huron Mts.; High Isl.; Charlevoix County; Marquette County.* VI-VII-VIII. ILLINOIS: *Grand Tower; Riverside.* V-VI. WISCONSIN: *Bayfield.* MINNESOTA: *Duluth; Pelican Lake; Nisswa; Itasca Park; Lake Itasca; Plummer; Lake, Ottertail, and Itasca Counties.* V-VI. MARYLAND: *Takoma Park; Plummers Island.* IV-V. DISTRICT OF COLUMBIA: *Washington.* IV. VIRGINIA: *Covington; Great Falls.* IV-V. KENTUCKY: *Henderson.* V-VI. TENNESSEE: *Knoxville; Chapin Sanctuary, East Ridge.* IV-V. MISSOURI: *St. Louis.* VI. NORTH CAROLINA: *Raleigh; Cherry Point; Cashiers; Black Mts.* III-IV-V-VI. SOUTH CAROLINA: *Clemson.* IV. GEORGIA: *Atlanta; Perry.* III-IV-V. FLORIDA: *Enterprise.* ALABAMA: *Mobile; Cheaha State Park.* III-IV. MISSISSIPPI: *Lucedale; State College.* III-IV-V. TEXAS: No definite locality.

This is our largest and darkest species, and next in abundance to *P. angulata*. It is easily recognized by its large size, the secondary elytral pubescence covering three-fourths or more of the surface, the narrow pale borders of the elytra, and the dusky epipleurae. Specimens with the lateral pale border of the elytra nearly or quite eliminated by the encroaching dark color of the disk predominate in the more northern latitudes, but they are not confined thereto and may occur in any locality. The definitely subtrapezoidal pygidium of the female is not found in any other species of the *P. borealis* group.

(8) *Pyractomena marginalis* Green, new species.

HOLOTYPE. MALE; Camden, New Jersey, VII-7, H. W. Wenzel. In collection of Ohio State University.

Form as in figure 8. Head piceous brown, antennae darker. Pronotum with median vitta entire, well defined, widest in basal half where it is about one-third pronotal width, thence narrowing to apex; lateral maculation distinct, narrow, attaining hind angles. Scutellum and mesonotal areas dark piceous brown. Elytra dark piceous brown; sutural bead flavate, pale color not continuing around scutellum; lateral pale border wider, somewhat indefinitely exceeding width of explanate margin, con-

tinuous around apex; epipleurae pale. Ventral surface, except prothorax and luminous segments, piceous brown, segment 8 dark with pale borders; pygidium dark. Legs dark.

Antennae slender, longer than pronotum, scarcely tapering distally, segments 3 to 11 each twice as long as wide or nearly so. Pronotum subpentagonal, widest at base, about one-fifth wider than long; lateral margins subparallel, sinuate and diverging near hind angles, these prominent laterally; anterior margin obtusely subangulate, nearly straight each side of narrowly rounded apex; median carina feeble, not reaching apex, disk subglabrous. Elytra with primary pubescence short and inconspicuous, slightly longer distally; secondary pubescence extending to about basal ninth; lateral explanate margin wide at base, gradually narrowing to apex. Ventral segment 8 truncate; genitalia similar to figure 21. Anterior claw of front and middle tarsi with basal enlargement slightly expanded, its upper margin parallel to distal part of claw and forming a nearly right angle with its outer margin. Length 10.5 mm.

FEMALE. Form usually averaging slightly broader and definitely shorter than male, some examples not differing at all; claws unmodified. Pygidium subparabolic, nearly as long as wide; last ventral segment similar in shape, apex with small triangular notch.

VARIATIONS. The pronotum may be shorter with the anterior margin more broadly arcuate, and sometimes the lateral margins are not sinuate before the hind angles; the median vitta varies to subtriangular, widest near base. Rarely the elytra are pale brownish, the pronotal vitta abbreviated in front, and the lateral maculation wanting.

LENGTH. Males 6.25 to 11 mm., females 6.5 to 11 mm. Specimens examined, 31 males and 39 females.

DISTRIBUTION. NEW HAMPSHIRE: *Hampton*: VII-3-1912, S. A. Shaw, 1 male (Brower). MASSACHUSETTS: *Framingham*: VI-21-03, VI-21-14, VI-26-30, C. A. Frost, 1 paratype, 3 females (Frost); VII-1 & 4-1946, C. A. Frost, 1 paratype, 1 female (CAS). *Sherborn*: VI-15-49, C. A. Frost, 1 paratype (CAS). *Springfield*: 1 paratype (USNM). No definite locality: 1 paratype (ANSP). CONNECTICUT. *Canaan*: VI-26-23,

L. B. Woodruff coll'n, 2 females (AMNH). NEW YORK: *Peekskill*: VI-15-1893, 1 paratype, 1 female (U.Mo). PENNSYLVANIA: *Allegheny*: 1 paratype, 1 female (CM). No definite locality: 1 paratype (U.Kans); Horn coll'n, 2 paratypes (ANSP); 3 females (KSC); 1 paratype (CAS). NEW JERSEY: *Camden*: VII-7, H. W. Wenzel, holotype, 4 paratypes, 2 females (OSU). *Irvington*: E. L. Dickerson coll'n, 1 female (AMNH). No definite locality; 1 paratype, 1 female (AMNH). MARYLAND: *Baltimore*: VI-24 to VII-21, F. E. Blaisdell, 8 females (CAS). *Plummers Island*: VI-29-20, H. S. Barber, 1 paratype (USNM). DISTRICT OF COLUMBIA: O. Lugger coll'n, 1 paratype (U. Minn). *Washington*: VII-8-49, J. C. Pallister, 1 paratype (AMNH); VI-21-25, Schwarz & Barber, 1 female (USNM); VII-15-28, J. C. Bridwell, 1 female (USNM); M Street Marsh, VI-21-25, H. S. Barber, 1 female (USNM); Glen Echo, VI-24-30, J. C. Bridwell, 1 paratype, 1 female (USNM); 14 mi. SW., VI-14-32, H. S. Barber, 1 paratype (USNM). VIRGINIA: *Lake Drummond*: VI-8 to 11-1905, H. S. Barber, 1 paratype, 1 female (USNM). NORTH CAROLINA: *Raleigh*: VI-12-40, D. L. Wray, 1 paratype, 1 female (CAS); VI-26 & 30-1925, C. S. Brimley, 1 paratype, 4 females (NCDA). *Lake Lure*: VI-7-50, Howden, 1 female (Howden). *Wendell*: V-30-33, D. L. Wray, 1 female (NCDA). TENNESSEE: *Allardt, Fentress County*: VII-16-1924, T. H. Hubbell, 1 female (U.Mich). GEORGIA: *Stone Mt.*: V-29-36, P. W. Fattig, 1 paratype (CAS). ALABAMA: *The Sinks, Bibb County*: V-1935, A. F. Archer, 1 paratype (U.Mich). ILLINOIS: *Urbana*: VIII-9-20, J. R. Malloch, 1 paratype (INHS). *Kanokia, St. Clair County*: VI-1-19, 1 female (U.Mo). ARKANSAS: No definite locality: VI-11-1894, Knobel, 1 female (U.Mo). TEXAS: *Karnack*: VI-7-49, D. J. & J. N. Knull, 1 paratype (OSU). *Harrison County*: V-18-48, D. J. & J. N. Knull, 1 paratype (OSU). NO LOCALITY: June, O. Lugger coll'n, 1 female (U.Minn).

This species differs from all other members of the *P. borealis* group, except *P. borealis*, in having the secondary pubescence extending nearly to the base of the elytra. It is easily distinguished from *P. borealis* by its small size, narrower pronotum, wide lateral pale border of the elytra, and entirely pale epipleurae. The antennae of *P. marginalis* are longer and more

slender, as a rule, than in any other species. The females could be confused only with small females of *P. similis*, in which the pronotum is more definitely transverse.

(9) *Pyractomena punctiventris* (LeConte).

Photinus punctiventris LeConte, 1878, Amer. Philos. Soc., Proc. 17:407.

MALE. Form as in figure 9. Head usually pale piceous, antennae dark, rarely two basal segments pale. Pronotum with median vitta entire or nearly so, sometimes slightly expanded basally, widest near base where it is about one-third pronotal width, gradually narrowing to apex, vitta sometimes much reduced and parallel-sided in basal half; lateral maculation often lacking, when present usually pale fuscous, rarely darker, not attaining hind angles. Scutellum and mesonotal areas pale flavate, sometimes partly dusky. Elytra dark piceous brown varying to somewhat dilute; sutural bead flavate, pale color sometimes continuing around scutellum; lateral pale border wider, somewhat exceeding width of explanate margin, continuous around apex; epipleurae pale. Ventral surface, except prothorax and luminous segments, dark piceous, segment 8 entirely pale, rarely faintly infuscate medially; pygidium dark. Legs dark.

Antennae slender, as long as pronotum, slightly tapering distally, segments 3 to 10 usually each less than twice as long as wide. Pronotum usually widest at base, one-tenth to one-fifth wider than long; lateral margins subparallel or feebly diverging posteriorly, not or very slightly sinuate at hind angles; anterior margin rectangularly subangulate, often nearly straight each side of apex; median carina entire, rarely slightly abbreviated in front, disk subglabrous. Elytra with primary pubescence moderately conspicuous, distinctly longer distally; secondary pubescence covering less than half of elytral surface; lateral explanate margin narrow, gradually somewhat wider toward base. Ventral segment 8 truncate; genitalia similar to figure 21. Anterior claw of front and middle tarsi unmodified.

FEMALE. Form distinctly shorter and broader than male; secondary elytral pubescence less extensive. Pygidium subparabolic, nearly as long as wide, apex sometimes subtruncate; last

ventral segment similar in shape, apex with small triangular notch.

LENGTH. Both sexes, 12–16.25 mm. Specimens examined, 99.

LARVA. One specimen, Hallettsville, Texas, IV–18–52, Michener *et al.* (U.Kans). Pale fulvous above and beneath; dorsal surface with an interrupted piceous brown vitta each side, vittae more or less entire and subcontiguous on pronotum and on three terminal tergites, reduced to a small poorly defined spot each side at posterior margins of remaining sclerites; ventral surface with a marginal piceous brown vitta each side on abdominal segments 1 to 7 and continuing on meta- and meso-thorax; legs pale, tibiae dusky apically. Pronotum with an entire median longitudinal stria (see under LARVA of *P. angulata*). Structure same as described for larva of *P. angulata*. Length 15 mm., width 4 mm.

DISTRIBUTION. TEXAS: *Palmetto State Park, Gonzales County; Fedor, Lee County; Corpus Christi; Lake Corpus Christi; Galveston; Hallettsville; Benchley; Brownsville; Kingsville; Livingston; Edinburg; Rock Island; Dallas; Fort Sam Houston; San Antonio; College Station; Bryan Field; Mercedes; Gillespie, Arkansas, Goliad, and Polk counties; El Paso* (this locality seems dubious). I–III–IV–V–VI–VII–VIII–IX–X. SAN LUIS POTOSI: *El Salto, 1600 ft. VIII–24–54* (U.Kans). VERA CRUZ: *Tampico* (USNM); *Vera Cruz; VII* (CAS).

This member of the *P. borealis* group is distinguished by its large size, geographic habitat, and pale scutellum and mesonotal areas. The scutellum may be dark basally and the mesonotal areas partly infusate, neither of them entirely so. One example from "Tex." (USNM) is labeled "vexillaria, det. 1911 by Ern. Oliv." There is a possibility that *P. punctiventris* and *P. dorsalis* Motschulsky (1853, p. 38) may be conspecific, in which case the latter name would have priority. Motschulsky described *P. dorsalis* from a single example from "Mexico." There is nothing in his description that would exclude *P. punctiventris*, also nothing that would indicate its positive identity with his species.

(10) ***Pyractomena floridana*** Green, new species.

HOLOTYPE. MALE; Hillsborough County, Hillsborough River

State Park, Florida, VIII-18-1938, Hubbell-Friauf. In collection of University of Michigan.

Form as in figure 10. Head fulvous, darker posteriorly; antennae piceous black. Pronotum with median vitta nearly entire, not quite attaining base, about three-tenths as wide as pronotum, subparallel-sided, widest near middle, thence narrowing somewhat in basal half; lateral maculation narrow, fuscous, attaining hind angles. Scutellum and mesonotal areas fulvous. Elytra dark piceous brown; sutural bead fulvous, pale color expanding slightly basally and continuing around scutellum; lateral pale border wider, exceeding width of explanate margin, narrowly continuous around apex; epipleurae pale. Ventral surface, except prothorax and luminous segments, piceous brown, meta-thorax and ventral segment 5 blackish, segment 8 fuscous with sides broadly pale; pygidium dark. Legs black.

Antennae moderately slender, as long as pronotum, distinctly tapering distally, segments 2 to 10 each less than twice as long as wide. Pronotum about one-ninth wider than long, widest near basal third; lateral margins arcuately converging to base, not sinuate before hind angles; anterior margin obtusely subangulate, nearly straight each side of broadly rounded apex; basal margin angling slightly backward each side at outer limits of convex area; median carina entire, disk subglabrous. Elytra with primary pubescence short and inconspicuous, scarcely longer distally; secondary pubescence covering about apical fourth of elytra, continuing farther suturally; lateral explanate margin narrow, gradually somewhat wider toward base. Ventral segment 8 truncate; genitalia similar to figure 21. Anterior claw of front and middle tarsi unmodified. Length 11.5 mm.

FEMALE. Form slightly broader than male; pronotum widest at base, lateral margins very feebly diverging posteriorly; secondary elytral pubescence less extensive. In the single example at hand the lateral maculation of the pronotum is wanting, and the median vitta is similar in shape to that of the male, but extremely faint except for a normally dark small central spot. Pygidium subparabolic, two-thirds wider than long; last ventral segment similar in shape, apex with small triangular notch.

VARIATIONS. The three Florida paratypes agree closely with the above description, with some minor variation in pronotal

outline, two specimens having the pronotum widest near middle. The lateral maculation of the pronotum varies to dark piceous; and the scutellum tends to become dusky baso-medially. The secondary pubescence may be more extensive, covering more than apical third of elytra. The Alabama paratype is somewhat broader, with the pronotum about one-fourth wider than long and its lateral margins rather feebly converging posteriorly. The lateral maculation is completely wanting; the median vitta nearly as in the holotype, slightly more abbreviated basally; and the scutellum is more extensively infusate.

LENGTH. Males 9–11.5 mm., female 11.5 mm. Specimens examined, 5 males and 1 female.

DISTRIBUTION. FLORIDA: *Hillsborough County, Hillsborough River State Park*: VIII-18-1938, Hubbell-Friauf, holotype (U.Mich). *Little Manatee River, U. S. Hwy. 41*: VIII-14 & 15-1938, Hubbell-Friauf, 2 paratypes (U.Mich). *Royal Palm Park*: VII-22-48, E. L. Todd, 1 paratype (U.Kans). ALABAMA: *Spring Hill*: IX-5-1918, H. P. Loding, 1 paratype (USNM). MISSISSIPPI: *Handsboro, Harrison County*: VIII-28-44, P. Brodtkorb, 1 female (U.Mich).

This species differs from all other members of the *P. borealis* group, except the closely related *P. punctiventris*, in its pale scutellum and mesonotal areas. *P. punctiventris* is a much larger species with a different geographic range, and normally having the pronotal vitta subtriangular, widest near base. The subparallel-sided vitta of *P. floridana*, widest near middle and narrowing somewhat in basal half, is quite distinctive and remarkably constant in all the known examples.

(11) *Pyractomena barberi* Green, new species.

HOLOTYPE. MALE; Paradise Key, Florida, III-3-19, H. S. Barber. In collection of U. S. National Museum.

Form narrowly elongate, as in figure 11. Head pale flavate, antennae piceous brown. Pronotum with median vitta entire, about one-third as wide as pronotum, of nearly uniform width throughout; lateral maculation wanting. Scutellum and mesonotal areas dark piceous brown. Elytra piceous brown; sutural bead and discal costae narrowly fulvous; lateral pale border wider, somewhat exceeding width of explanate margin, narrowly

continuous around apex; epipleurae pale. Ventral surface, except prothorax and luminous segments, piceous brown, sides of segment 8 broadly pale; pygidium piceous brown, with indefinitely darker areas. Legs brown.

Antennae slender, as long as pronotum, very slightly tapering distally, third and following segments each nearly or quite twice as long as wide. Pronotum narrow, widest near middle, nearly as long as wide; lateral margins evenly arcuate, rather strongly converging to base, not sinuate before hind angles; anterior margin obtusely subangulate; basal margin straight except the scutellar emargination; median carina entire, disk subglabrous. Elytra with primary pubescence short and inconspicuous, scarcely longer distally; secondary pubescence covering about apical sixth of elytra, continuing microsetae scarcely evident; lateral explanate margin narrow throughout. Ventral segment 8 truncate; genitalia similar to figure 21. Anterior claw of front and middle tarsi unmodified. Length 11 mm.

FEMALE. Form similar to male except elytra much shorter; secondary pubescence virtually wanting, microsetae distinct, extending about three-fourths to base in one example. Pygidium subparabolic, about as long as wide; last ventral segment similar in shape, apex with small triangular notch.

VARIATIONS. The elytra are distinctly more elongate in the paratype, the microsetae are quite evident, extending nearly to base, and the pronotal vitta is obscured in apical half.

LENGTH. Males 11–12.75 mm., females 8.5–10 mm. Specimens examined, 2 males and 2 females.

DISTRIBUTION. FLORIDA: *Paradise Key*: III-3-19, H. S. Barber, holotype (USNM); II-20, 1 paratype (USNM); II-23-1919, E. A. Schwarz, 1 female (USNM). *Citrus City*, 6 mi. SW. of Paradise Key: II-23, 1 female (USNM). Note—Dr. H. F. Strohecker advises that Paradise Key is an old name for Royal Palm Park, and that Citrus City is nonexistent.

This is an unusually well characterized species that could be confused with no other member of the *P. borealis* group. It is recognized by its narrowly elongate form, the pronotum widest near middle with the median vitta narrow and subparallel-sided, the dark scutellum and mesonotal areas, and the elytra

with the discal costa pale and the secondary pubescence much restricted, this virtually lacking in the female. The present species is named in honor of the late H. S. Barber, whose untimely death deprived the entomological world of the results of his many years study of the Lampyridae.

(12) *Pyractomena angustata* LeConte.

Pyractomena angustata LeConte, 1851, Acad. Nat. Sci. Philadelphia, Proc., 5:336.

MALE. Form rather narrowly elongate, as in figure 12. Head and antennae piceous black. Pronotum with median vitta entire or nearly so, well defined, widest near base where it is nearly one-half pronotal width, gradually narrowing to apex, disk somewhat rosy each side; lateral maculation usually wanting. Scutellum and mesonotal areas piceous black, tip of scutellum sometimes narrowly pale. Elytra piceous black; sutural bead flavate, pale color continuing around scutellum; lateral pale border wider, somewhat exceeding width of explanate margin, continuous around apex; epipleurae pale. Ventral surface, except prothorax and luminous segments, piceous black, sides of segment 8 pale, segments 2 to 5 each with apical border narrowly pale except at sides, pale color more or less expanding basad medially; pygidium dark. Legs black.

Antennae moderately stout, as long as pronotum, tapering distally, segments 2 to 10 each less than twice as long as wide. Pronotum narrow, elongate, about as long as wide, usually widest before base; lateral margins evenly arcuate, not sinuate at hind angles; anterior margin rectangularly to acutely subangulate; median carina entire or nearly so, disk subglabrous. Elytra with primary pubescence minute and sparse basally, longer distally; secondary pubescence covering about apical fifth of elytra, continuing a little farther suturally and laterally; lateral explanate margin narrow throughout. Ventral segment 8 truncate; genitalia similar to figure 21. Anterior claw of front and middle tarsi unmodified.

FEMALE. Form somewhat shorter and broader than male; secondary pubescence less extensive. Pygidium subparabolic, about one-fourth wider than long; last ventral segment similar in shape, apex with small triangular notch.

LENGTH. Both sexes, 11–14.5 mm. Specimens examined, 73 males and 3 females.

DISTRIBUTION. GEORGIA: *Douglas*: IV–13–37, P. W. Fattig, 1 male (CAS). FLORIDA: *Pensacola*: IV–1912, H. Klages coll'n, 3 males (CM). *Lutz*: II–22 to III–19–1926, Krautwurm, 64 males, 2 females (CM). *Liberty County*: 1.7 mi. W. of Hosford, III–24–54, T. H. Hubbell, 2 males (U.Mich). MISSISSIPPI: *Ocean Springs*: IV–6–1928, J. P. Kislanko, 3 males (SPB.Miss). *Van Cleave*: IV–21–1926, H. Gladney, 1 female (SPB.Miss).

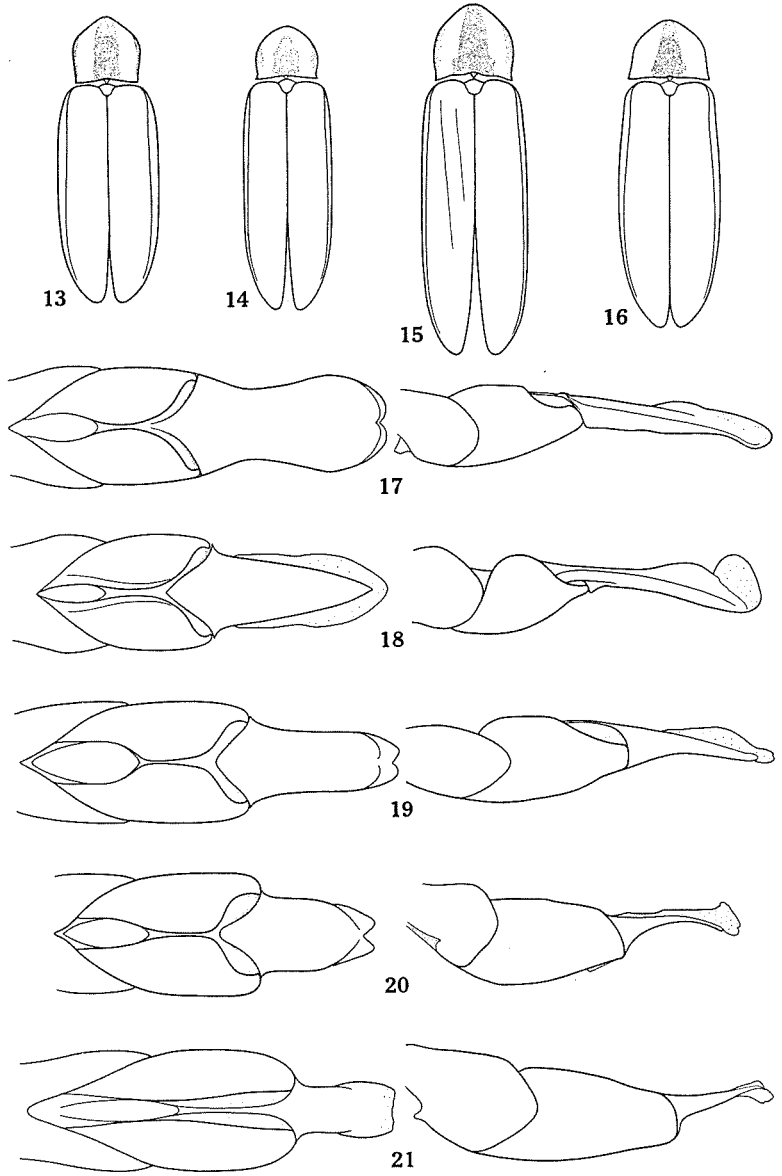
This species has an easily recognized habitus owing to its large size and narrow form, the pronotum nearly as long as wide and with evenly arcuate margins and well defined subtriangular median vitta, and the elytra piceous black, excluding the pale borders. It appears to be about the least subject to variability of any of our species. The lateral maculation of the pronotum is absent in all of the specimens examined except the two males from Liberty County, Florida. In these the lateral spots are very faintly indicated in one example; in the other they are a somewhat darker fuscous, narrow and not reaching the hind angles. The lateral explanate margin of the elytra is narrow throughout in *P. angustata*, distinguishing it from the similarly colored but somewhat broader *P. dispersa*.

(13) ***Pyractomena limbicollis*** Green, new species.

HOLOTYPE. MALE; Highlands Hammock State Park, Florida, III–16–1952, H. V. Weems, Jr. In collection of California Academy of Sciences.

Form as in figure 13. Head and antennae dark piceous. Pronotum with median vitta entire, well defined, widest in basal half where it is about two-fifths pronotal width, thence gradually narrowing to apex, disk pale rosy each side; lateral maculation paler piceous, narrow, not quite attaining hind angles. Scutellum and mesonotal areas piceous black. Elytra piceous black, slightly paler distally; sutural bead flavate, pale color continuing around scutellum; lateral pale border wider, exceeding width of explanate margin, continuous around apex; epipleurae faintly dusky basally. Ventral surface, except prothorax and luminous segments, piceous black, sides of segment 8 pale; pygidium dark. Legs dark.

Antennae slender, scarcely tapering distally, longer than pronotum, segments 3 to 11 each twice as long as wide or nearly so. Pronotum narrow, subpentagonal, widest at middle, as long as



wide; lateral margins slightly converging to base, not sinuate before hind angles, anterior angles rounded but rather strongly indicated; anterior margin rectangularly subangulate, nearly straight each side of narrowly rounded apex; median carina entire, disk subglabrous. Elytra with primary pubescence moderately conspicuous, scarcely longer distally; secondary pubescence covering about apical third of elytra; lateral explanate margin moderately wide, gradually narrowing to apex. Ventral segment 8 truncate; genitalia similar to figure 21. Anterior claw of front and middle tarsi unmodified. Length 10 mm.

FEMALE. Form scarcely differing from male, sometimes very slightly broader. Pygidium subparabolic, nearly as long as wide; last ventral segment similar in shape, apex with small triangular notch.

VARIATIONS. The lateral margins of the pronotum may be subparallel, not converging posteriorly, and sometimes sinuate before the hind angles, these prominent laterally. Both the pronotal apex and the anterior angles may be more broadly rounded. The median vitta may be definitely subtriangular, widest at base and narrowing to apex. The pronotum of the female is more variable in shape, sometimes losing entirely its subpentagonal outline, but always remaining narrow as compared to the elytra, and with a regular and well defined median vitta. The lateral maculation is quite constant and never completely lacking, although sometimes largely reduced to a pale fuscous color. In one paratype the secondary pubescence covers nearly half of the elytral surface.

LENGTH. Males 7–12 mm., females 8–11.5 mm. Specimens examined, 9 males and 16 females.

Figure 13. Typical form and pronotal maculation of *P. limbicollis* Green.

Figure 14. Same, *P. linearis* LeConte.

Figure 15. Same, *P. palustris* Green.

Figure 16. Same, *P. dispersa* Green.

Figure 17. Male genitalia, ventral and lateral aspects, of *Pyractomena ecostata* (LeConte).

Figure 18. Same, *P. lucifera* (Melsheimer).

Figure 19. Same, *P. similis* Green.

Figure 20. Same, *P. angulata* (Say).

Figure 21. Same, *P. borealis* (Randall).

DISTRIBUTION. GEORGIA: No definite locality: Horn collection, 1 paratype, 1 female (ANSP). FLORIDA: *Highlands Hammock State Park*: III-16-52, H. V. Weems, Jr., holotype, 1 female (CAS). *Highlands Hammock*: near Sebring, III-24, Gertsch, 1 female (AMNH). *Gainesville*: III-28-48, R. Cope-louto, 2 paratypes (CAS); IV-21-52, J. R. Vockeroth, 1 female (Can); IV-25-1929, 1 female (U.Mich). *Dunedin*: IV-2-26, W. S. Blatchley, 1 paratype, 5 females (CU), 1 paratype (CAS). *Tarpon Springs*: III-20-50, 1 female (Howden). *Royal Palm Park*: III-22-40, Van Dyke coll'n, 1 female (CAS). *Paradise Key*: II-22, 1 paratype, 1 female (USNM). *Timms Hammock, Dale County*: II-21-19, 1 paratype (USNM). No definite locality: 1 paratype, 1 female (AMNH); Bolter coll'n, 2 females (INHS).

This species resembles *P. marginalis* in general appearance, but it is actually more closely related to *P. linearis*. Its distinguishing characters are: pronotum narrow and subpentagonal, with well defined median vitta and narrow lateral maculation; scutellum and mesonotal areas black; elytra black, lateral explanate margin rather wide, primary pubescence somewhat conspicuous and nearly uniform, secondary pubescence covering about distal third. It is noted that in both sexes the wide basal part of the epipleurae is not evenly concave, but is diagonally divided by a curving, more or less distinct, subcostulate elevation beginning at the inner basal angle. This condition may also be detected, but less distinctly, in some examples of other species of the *P. linearis* section. Specimens from some of the North Central States approach closely to *P. limbicollis* and may be conspecific. These have been labeled for the present "*P. linearis* complex."

(14) *Pyractomena linearis* LeConte.

Pyractomena linearis LeConte, 1851, Acad. Nat. Sci. Philadelphia, Proc., 5:336.

LeConte's type of *P. linearis* may be described briefly as follows. Form rather narrowly elongate, similar to figure 14. Median vitta of pronotum pale brownish, distinct in basal half, feeble apically, not reaching apex; lateral maculation wanting. Elytra pale brownish testaceous, pale borders evident but not

distinctly defined. Antennae as long as pronotum, feebly tapering distally, third segment one-half longer than wide. Pronotum small and narrow, nearly as long as wide; lateral margins feebly converging posteriorly, slightly sinuate before hind angles; anterior margin rectangularly subangulate. Elytra with primary pubescence conspicuous, scarcely longer distally; secondary pubescence covering about apical half of elytral surface, extending farther at sides and suture, continuing microsetae evident but irregularly distributed; lateral explanate margin narrow throughout. Ventral segment 8 truncate; genitalia not removed but undoubtedly similar to figure 21. Anterior claw of front and middle tarsi unmodified. Length, of specimens assigned hereto, 8.25–11 mm. Specimens examined, 42 males and 11 females.

The considerable number of specimens at hand agreeing approximately with this description, within the limits of expected variability, may represent one species or several. This it is impossible to determine, but for the present they are considered to be *P. linearis* and have been so labeled. LeConte's type was said to be from the Southern States, possibly an erroneous designation as nothing from the South in any way resembling it has been seen.

The principal variations noted in this series are as follows. The lateral maculation of the pronotum, usually present, is fuscous and indefinite, rarely darker; the median vitta is usually parallel-sided in basal half, nubilous or obscure in apical half, sometimes reaching apex. The color of the elytra varies from pale testaceous to dark piceous brown, rarely black. The pronotum may be broader, up to one-fifth wider than long; many examples have the lateral margins distinctly sinuate before the hind angles, these prominent laterally; in others the lateral margins are subparallel or converging basally without trace of sinuation. The secondary elytral pubescence may continue toward base well beyond the middle of the elytra; and, usually in the palest examples, the microsetae may be quite conspicuous and evenly distributed nearly to base in the intercostal area. In the female the body form is distinctly shorter and broader than the male, the secondary pubescence covers about apical third of the elytra, continuing as microsetae, and in one example as distinct pubescence well toward base.

DISTRIBUTION. QUEBEC: *Knowlton*: 3 males (Can). *Covey Hill*: 1 male (Can). *Aylmer*: 1 male (Can). *Duparquet*: 7 males, 1 female (CAS). VI-VII. ONTARIO: *Ottawa*: 1 male (Can). *Co. Hastings*: 1 male (Can). *Strathroy*: 1 male (Can). *Britania*: 2 males (Can). *Prince Edward County*: 1 male (CAS). VI-VII. MANITOBA: *Onah*: 1 male (Can). *Cormorant Lake*: 1 female (Can). VI-VII. MINNESOTA: *Itasca Park*: 9 males (U.Minn). *Crookston*: 1 male (U.Minn). *Ramsey County*: 1 male (U.Minn). No definite locality: 1 male (U.Minn). VI-VII. WISCONSIN: *Wood County*: 2 males (U.Wise). VII. MICHIGAN: *Ann Arbor*: 1 female (U.Mich). *Douglas Lake*: 1 male (U.Kans); 2 females (KSC). *Marquette*: 1 male (CAS); 1 male, 1 female (USNM). *Cheboygan County*: 1 male, 1 female (U. Kans); 1 female (U.Mich). *Roscommon County*: 1 male (Dreisbach). *Livingston County*: 1 male, 1 female (U.Mich). *Mackinack County*: 1 male (Dreisbach) VI-VII. MAINE: *Paris*: 1 female (Frost). VII. NEW HAMPSHIRE: near *Mt. Washington*: 1 male (CAS). VII. NEW YORK: *Ithaca*: 1 male (CU). *McLean Bogs, Thompkins County*: 1 female (CU). VI-VII.

A small series, six males and one female, from Edmonton, Alberta, are perhaps specifically distinct from *P. linearis*. They are dark piceous, almost black; the pronotum is more transverse, with the lateral maculation distinct and rather wide; and the elytral costae are feeble. The female is quite small, subbrachypterous, with the secondary pubescence virtually lacking except along the sides of the elytra. Associated with the above are several other specimens from Manitoba and Minnesota. All have received author's identification labels reading "*Pyractomena* sp. near *linearis*." Their present locations and locality data are given below. Specimens examined, 7 males and 5 females. ALBERTA: *Edmonton*: 3 males (U.Mo); 2 males (U.Mich); 1 male (USNM); 1 female (Frost). VI. MANITOBA: *Onah*: 1 male, 1 female (Can). *Cormorant Lake*: 1 female (Can). VI-VII. MINNESOTA: *Eagle Bend*: 1 female (U.Minn). *Minneapolis*: 1 female (OhioU). VII.

There still remain at hand a number of specimens differing from *P. linearis* in having the lateral explanate margin of the elytra distinctly wider. They form a rather heterogeneous series, at one extreme closely resembling dark examples of *P. linearis*, and at the other extreme approaching *P. limbicollis* in appearance

but lacking the typical subpentagonal pronotum of that species. No definite demarcation could be found between the two extremes. They have been assigned author's identification labels reading "*Pyractomena linearis* complex." Their present locations and locality data are given below. Specimens examined, 21 males and 6 females. MINNESOTA: *St. Paul, Ramsey County, Hennepin County*, 3 males (U.Minn). VI. SOUTH DAKOTA. *Brookings*: 6 males (SDSC); 2 males (CAS). *Volga*: 1 male (SDSC); 1 female (USNM); 1 male (U.Mo). No label, probably S. Dak., 1 male (SDSC). VI-VII. IOWA: *Ames*: 1 female (Can). *Lake Okoboji*: 1 female (USNM). VI-VII. ILLINOIS. *N. Ill.*: 1 male (U.Minn); 1 male (CM); 1 male, 1 female (INHS). No definite locality: 1 male, 1 female (INHS). MISSOURI: No definite locality: 1 male (INHS). KENTUCKY: No definite locality: 1 male (INHS); 1 female (U.Kans). OHIO: *Millersburg*: 1 male (OhioU) VI.

The "linearis" section of the *P. borealis* group, comprising *P. linearis*, *P. palustris*, and *P. limbicollis*, and the unidentified material discussed above, is characterized by the more or less conspicuous and uniform primary elytral pubescence. The usefulness of this character is marred by a tendency toward abrasion. If this occurs in the basal region, as is usually the case, specimens thus affected might be mistakenly referred to *P. dispersa*. Often, however, an area of undamaged setae can be found that will indicate the correct disposition of the specimen.

(15) ***Pyractomena palustris*** Green, new species.

HOLOTYPE. MALE; Shaw Pond, Washington, D. C., V-26-1927, H. S. Barber. In collection of U. S. National Museum.

Form rather narrow, elongate, as in figure 15. Head and base of antennae pale, occiput black. Pronotum with median vitta entire, subtriangular, somewhat expanded and widest near base where it is about one-half pronotal width, thence regularly narrowing to apex; lateral maculation pale fuscous, moderately wide, attaining hind angles. Scutellum and mesonotal areas dark piceous brown. Elytra pale grayish brown, discal costae narrowly paler; sutural bead flavate, pale color continuing around scutellum, lateral pale border wider, confined to explanate margin, blending nearly with color of disk, narrowly continuous around

apex; epipleurae pale. Ventral surface, except prothorax and luminous segments, dark piceous brown, segments 2 to 5 somewhat paler medially, segment 8 with sides broadly pale; pygidium dark. Legs piceous brown.

Antennae rather long (distended), longer than pronotum, slender, feebly tapering distally, segments 3 to 10 each nearly twice as long as wide. Pronotum not notably transverse, about one-seventh wider than long, widest before base; lateral margins subparallel, broadly arcuate, feebly converging from basal fourth to near base, slightly sinuate before hind angles; anterior margin rectangularly subangulate, nearly straight each side of broadly rounded apex; basal margin feebly angling backward each side at outer limits of convex area; median carina entire, disk subglabrous. Elytra with primary pubescence moderately conspicuous, rather short, longer distally; secondary pubescence covering nearly apical half of elytra; lateral explanate margin narrow, widening only slightly toward base. Ventral segment 8 truncate; genitalia similar to figure 21. Anterior claw of front and middle tarsi unmodified. Length 12.75 mm.

FEMALE. Form distinctly shorter and broader than male; secondary pubescence less extensive, covering about apical fourth of elytra; explanate margin usually wider. Pygidium nearly as long as wide, subparabolic, apex rounded or subtruncate; last ventral segment similar in shape, apex with small triangular notch.

VARIATIONS. A large series collected by Barber at Washington, D. C., all evidently conspecific, shows a wide range of color variation. These specimens were distended with benzene and hardened in alcohol, a process that tends to intensify the color contrasts and possibly to impart a yellowish tinge to pale reddish browns. The lateral maculation of the pronotum, occasionally wanting, varies from the usual pale fuscous to darker piceous. The color of the elytra is usually some shade of grayish or yellowish brown, sometimes darker piceous near the scutellum, varying to entirely dark piceous brown, or nearly black in a few examples. The elytral costae are usually not pale in the dark specimens. The pronotum varies in shape to nearly as long as wide with the anterior margin acutely subangulate; or the pronotum may be widest at base with the lateral margins distinctly

sinuate before the hind angles, these somewhat prominent laterally. The area covered by the secondary pubescence varies from less than half to five-eighths or more of the elytral surface, continuing microsetae usually not evident. The lateral explanate margin in a few specimens is somewhat wider than normal.

LENGTH. Males 10–13.5 mm., females 10.5–12 mm. Specimens examined, 61 males and 16 females.

DISTRIBUTION. DISTRICT OF COLUMBIA: *Washington*: Shaw Pond, V-26, 27, & 28-1937, holotype, 29 paratypes, 4 males, 11 females; V-27-1929, 7 paratypes, 1 female; V-24-1932, 7 paratypes; all collected by H. S. Barber (USNM). *Pohick Marsh*, 17 mi. SW. x S. of Washington: V-17-1945, H. S. Barber, 10 paratypes, 4 females (USNM). MARYLAND: *Hills Bridge Marsh*: VI-1-1929, 1 paratype (USNM). VIRGINIA: *Dyke*: V-18-1911, 1 paratype (USNM). TENNESSEE: *Chapin Sanctuary*, East Ridge: V-5-52, O. Peck, 1 paratype (Can).

This member of the *P. linearis* section is distinguished by its large size, and the relatively larger pronotum having a well defined and entire median vitta, subtriangular in shape. In appearance the dark examples of *P. palustris* more nearly resemble *P. angustata* than *P. linearis*, differing in their more uniform and somewhat conspicuous primary elytral pubescence. Barber recorded the flashing of a male as "three-fourths second crescendo flash diving to grass of marsh at three second intervals." His slide mounts of larvae, presumably of this species, show the same structure as described for *P. angulata* and other species.

(16) ***Pyractomena dispersa*** Green, new species.

HOLOTYPE. MALE; Wilmington, Delaware, 1947, McDermott. In collection of California Academy of Sciences.

Form as in figure 16. Head dark piceous, antennae black. Pronotum with median vitta entire, well defined, subtriangular, about one-half pronotal width at base, thence regularly narrowing to apex; lateral maculation very faintly and narrowly indicated along margins. Scutellum and mesonotal areas piceous black, scutellum slightly paler at apex. Elytra piceous black, pale borders well defined, the sutural somewhat exceeding width of elytral bead except distally, continuing around scutellum;

lateral pale border wider, slightly exceeding width of explanate margin, narrowly continuous around apex; epipleurae pale. Ventral surface, except prothorax and luminous segments, piceous black, segment 8 fuscous with lateral borders broadly pale; pygidium dark. Legs dark, pale basally.

Antennae slightly longer than pronotum, tapering distally, segments 2 to 10 each less than twice as long as wide. Pronotum transverse, about one-third wider than long, widest at base; lateral margins feebly diverging posteriorly, slightly sinuate before hind angles; anterior margin obtusely subangulate; median carina nearly entire, disk subglabrous. Elytra with primary pubescence inconspicuous, short and sparse basally, longer distally; secondary pubescence covering about apical fourth of elytra, continuing forward suturally; lateral explanate margin narrow, gradually somewhat wider toward base. Ventral segment 8 truncate; genitalia similar to figure 21. Anterior claw of front and middle tarsi unmodified. Length 11 mm.

FEMALE. Form usually somewhat shorter and broader than male; secondary pubescence less extensive, lacking or sparse except near margins distally; lateral explanate margin often wider. Pygidium about one-fourth wider than long, subparabolic, apex rounded or subtruncate; last ventral segment similar in shape, apex with small triangular notch.

VARIATIONS. The lateral margins of the pronotum may be subparallel, and often are not sinuate before the hind angles; the lateral maculation is usually wanting, very rarely more than faintly indicated. Ventral segment 8 of the male may be entirely pale, or with a median fuscous basal spot. The color of the elytra varies to dark piceous brown, and the epipleurae are sometimes dusky basally. In specimens from New Jersey, New York, and the New England States the elytra are nearly always some shade of brown, often very dilute; and the pronotal vitta may be nubilous or obscure in apical half, sometimes abbreviated. Specimens from Manitoba and westward have normally dark elytra, but with narrower pale margins usually becoming indistinct distally.

LENGTH. Males 9–12.5 mm., females 8–12.5 mm. Specimens examined, 87 males and 43 females.

DISTRIBUTION. MAINE: *Mt. Desert*: VI-23-28, 3 paratypes, 1 female (INHS); 1 paratype (CAS). *Monmouth*: V-24 & 26-1906, C. A. Frost, 1 paratype, 1 female (Frost). *Wales*: VI-23-1912, C. A. Frost, 1 female (Frost). NEW HAMPSHIRE: *Hampton*: VI-1-1906, VI-2-1912, VI-10-1915, VI-20-1923, VI-15-1923, S. Albert Shaw, 4 paratypes, 1 female (Brower). *Mt. Washington*: coll'n Mrs. A. T. Slosson, 1 paratype, 1 female (AMNH). *Franconia*: coll'n Mrs. A. T. Slosson, 1 paratype (AMNH). MASSACHUSETTS: *Framingham*: VI-13-1913, C. A. Frost, 1 paratype (CU); VI-7-41, C. A. Frost, 1 female (CAS). *Sherborn*: VI-8-1913, V-30-1929, V-4-47, VI-6-1914, C. A. Frost, 2 paratypes, 3 females (Frost); VI-21-48, VI-6 & 15-49, C. A. Frost, 2 paratypes, 1 female (CAS). *Hopkinton*: VI-3-1923, C. A. Frost, 1 paratype, 1 female (Frost). *Marshfield*: VII-5-1928, C. E. White, 1 paratype (INHS). *Ashland*: VI-10-49, C. A. Frost, 1 female (CAS). *Natick*: VI-2-49, C. A. Frost, 1 female (CAS). RHODE ISLAND: No definite locality: Fenyes coll'n, 1 paratype (CAS). CONNECTICUT: *New Britain*: Van Dyke coll'n, 1 paratype (CAS). *Cornwall*: VI-9 & 10-1920, Chamberlain, 5 paratypes (CU); V-21-1919, Chamberlain, 1 paratype (CAS). *New Haven*: VI-7-1919, Chamberlain coll'n, 1 female (CU). NEW YORK: *Suffern*: 3 paratypes, 1 female (AMNH). *St. Remy, Ulster County*: VI-14-41, H. C. Barnett, 1 female (U.Minn). *Long Island*: Wirt Robinson, 1 paratype, 1 female (USNM). *Poughkeepsie*: V-22-1903, VI-4-1903, 1 paratype, 1 female (NYSM). *Nassau*: V-25-1903, 1 paratype (NYSM). PENNSYLVANIA: *Philadelphia*: VI-7-1899, G. M. Greene, 1 female (USNM). NEW JERSEY: *Passaic*: 1 male (AMNH). *Westwood*: VI-18, 1 female (AMNH). *Westfield*: VI-4-36, G. Harmon, 1 female (U.Minn). *Clementon*: V-16-1897, G. M. Greene, 1 female (USNM). No definite locality: 2 paratypes, 2 females (AMNH); Horn coll'n, 1 female (ANSP). No label, probably N. J., 1 male (AMNH). DELAWARE: *Wilmington*: 1947, F. A. McDermott, holotype (CAS); *Beaver Valley*, V-29 & 31-1947, F. A. McDermott, 3 paratypes (USNM-1, CAS-2). DISTRICT OF COLUMBIA. *Washington*: Cabin John, V-28 & 29-1924, H. S. Barber, 8 paratypes, 1 female (USNM); 11 mi. NW., V-16-1930, H. S. Barber, 2 paratypes (USNM). VIRGINIA: *Glencarlyn*: V-29-1929, H. S. Barber, 1 paratype (USNM). *Four Mile Run*: V-31-1914, 1 paratype (CAS).

OHIO: *Shawnee Forest*: VI-9, D. J. & J. N. Knull, 1 female (OSU). *Greene County*: V-12 & 19-1955, V-12-53, D. J. & J. N. Knull, 2 paratypes, 1 female (OSU). *Hocking County*: VI-8-56, VI-2-55, D. J. & J. N. Knull, 2 paratypes, 1 female (OSU). MICHIGAN: *Detroit*: V-18, Hubbard & Schwarz, 1 paratype (USNM). *Ann Arbor*: VI-11-1919, R. F. Hussey, 2 paratypes (U.Mich); VI-22-1916, T. H. Hubbell, 1 paratype, 2 females (U.Mich). *Grand Rapids*: R. H. Wolcott, 1 paratype (U.Neb). ILLINOIS: *Herod*: V-31-1928, Frison, 1 female (INHS). *N. Ill.*: VI-1883, V, 1 paratype, 1 female (INHS). IOWA: *Mt. Pleasant*: V-17-1928, McCreary, 1 paratype (USNM). MANITOBA: *Aweme*: VI-21-1910, T. Criddle, 1 female (Can); VI-21-1911, VI-22-1914, N. Criddle, 2 paratypes (Can); VI-29, Wickham coll'n, 1 paratype (USNM). SASKATCHEWAN: *Saskatoon*: VI-27, VI-28, N. J. Atkinson, 5 paratypes, 1 female (Can); VII-4-1924, K. M. King, 1 paratype (Can). *Attons Lake*: Cut Knife, VI-18-40, A. H. Brooks, 1 paratype, 1 female (Can). *Redvers*: VI-10-1908, 1 paratype, 1 female (Frost). *N.W.T.*: 1879, J. M., 1 female (Can). IDAHO: *Bliss*: VI-16-1930, H. P. Lanchester, 3 paratypes (USNM-2, Fender-1). UTAH: *Logan*: V-25-48, B. B. Houck, 3 paratypes (USAC); VI-13-48, J. H. Judd, 1 female (USAC). *Brigham*: VII-4-47, R. L. Rigby, 1 female (USAC). *Vernal*: VI-15-40, B. A. Haws, 1 female (USAC). *Utah Lake*: near Lehi, VI-25-1922, E. P. Van Duzee, 1 female (CAS). *Provo*: VI, Wickham, 1 paratype, 1 female (USNM). *Far West*: C. J. D. Brown, 1 paratype (U.Mich). No definite locality: 2 paratypes (ANSP, USNM). COLORADO: *Custer County*: T. D. A. Cockerall, 2 paratypes (USNM). No definite locality: 1 paratype (ANSP). ALABAMA: Four specimens from Alabama (couplet 15 of the key) approach closely to *P. dispersa* and possibly are conspecific. They differ in their larger average size, 12 to 14.5 mm. in length, somewhat more elongate form, and slightly wider explanate margin of the elytra. A single example from Missouri is similarly of large size, but more oval in shape and with a larger and subtriangular pronotum. All five of these specimens have received author's identification labels reading "*Pyraetomena dispersa?*" Their locality data and present locations are as follows: One example, not included, was noted in the LeConte collection. *Mobile*: IV-17, H. P. Loding, 1 female (USNM). *Tuscaloosa*:

V-30-53, B. D. Valentine, 1 male (CAS). *Hazen*: V-2-1923 and IV-10-1923, L. B. Woodruff, 2 males (AMNH, CU). MISSOURI: *Columbia*: V-21-53, W. R. Enns, 1 male (U.Mo).

This species, occurring over a wide and diversified range, may possibly prove to be a complex of several closely related forms. The range of color variability of *P. dispersa* parallels closely that of *P. linearis*, as both species are constituted herein. The two are separated by a decided difference in the primary elytral pubescence: in *P. dispersa* short, sparse, and inconspicuous basally, longer distally; in *P. linearis* longer and conspicuous, of more nearly uniform length throughout. Other differentials, all of a comparative nature and more or less variable, are, for *P. dispersa*: antennae stouter and more definitely tapering distally; pronotum larger and more transverse, with median vitta subtriangular and widest near base; form broader; elytra with lateral explanate margin gradually wider toward base, and secondary pubescence less extensive. Females of *P. dispersa* and *P. linearis* are often similar in form; the former having the secondary elytral pubescence nearly lacking, evident only near the margins distally; the latter with distinct secondary pubescence on distal third or more. Species with which *P. dispersa* might be confused are: *P. sinuata*, belonging to the *P. lucifera* group and having totally different genitalia; and *P. angustata*, a larger species of southern distribution with a more elongate pronotum, and with the lateral explanate margins of the elytra narrow throughout.

Flashing of the males, recorded by Barber, is as follows: "Flickering flash," Cabin John, Washington, D. C.; "5 rapid flashes at 5 second intervals," and "4 rapid flashes at short intervals," 11 mi. NW. of Washington, D. C.; and "5 very rapid flickers at about 3 second intervals, upland field," Glencarlynn, Va. McDermott records for males observed at Wilmington, Delaware: "5 flashes at long intervals, 8 P.M.," and "Flash 5 times quickly and pause."

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