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A Review of the Genus Ptosima in North America (Coleoptera: Buprestidae)

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A REVIEW OF THE GENUS *PTOSIMA* IN NORTH AMERICA (COLEOPTERA: BUPRESTIDAE)[1]

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ABSTRACT

The 4 North American species of *Ptosima*—*P. gibbicollis* (Say), *P. laeta* Waterhouse, *P. idolynae* Frost, and *P. walshii* LeConte—are redescribed, figured, and keyed. *P. schaefferi* Chamberlin is synonymized with *P. laeta* Waterhouse. New geographical distribution and host records are given.

INTRODUCTION

The genus *Ptosima* contains 16 species (Obenberger 1926):8 from the Oriental Region, 1 from the Ethiopian Region, 3 from the Palearctic Region, and 4 from the Nearctic Region.

The 4 North American species of *Ptosima* heretofore have not been treated collectively. The need to reevaluate 1 of these species and to present accumulated biological and distributional data has stimulated this review. A key to the species is presented to help in their identification. Type localities are given as they appear in the original publication.

The abbreviations of collection names, in brackets, follow Arnett and Samuelson (1969). The following were not included in that work: Museum National d'Histoire Naturelle, Paris [MNHP], the British Museum (Natural History) [BMNH], and the W. F. Barr collection [WFBC].

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Classification

Subfamily Polycestinae Lacordaire
Tribe Ptosimini Bedel
Genus *Ptosima* Solier

Ptosima Solier, 1833. Ann. Soc. France 2:277; Laporte & Gory, 1835. Hist. Nat. Icon. Ins., vol. 1, *Ptosima,* p. 1; Lacordaire, 1857. Hist. Nat. Ins., vol. 4, p. 65; LeConte & Horn, 1883. Smithsonian Misc. Collections 26(4) No. 507:199; Kerremans, 1902. Wytsman Gen. Ins., Fasc. 12, Bupr., p. 39; Kerremans, 1907. Monog. Bupr. 2:539; Burke, 1917. United States Dept. Agric., Bull. 437, p. 6; Schaefer, 1949. Bupr. France, p. 77; Arnett, 1960. Beetles United States, p. 485; Helfer, 1970. Nat. Hist. Mendocino, p. 92.

Description of Genus

Body elongate, subcylindrical, smooth. *Head* vertical; eyes rather large, oval, internal borders subparallel; antennal cavities without projecting border; antennae short, segments 4 to 11 serrate, each with terminal poriferous fossa; labrum sinuate, ciliated. *Pronotum* almost quadrate, rounded in front; base subrectangular, with rows of grooves overlapped by elytra; elongate pit located posterolaterally; lateral border with margin entire. *Scutellum* oval or round. *Elytra* free; raised basal margin distinct; lateral margins serrate posteriorly; apices separately rounded; inflexed lateral border dilated as rounded lobe toward base, covering metaepisternum and anterolateral angle of metacoxa. *Prosternum* with process entirely enclosed by mesosternum, apex broadly truncate. *Legs* with metacoxa broadened in medial and lateral parts, posterior border feebly concave; tibiae straight, outer apical angle dentate; tarsi with membranous lobes increasingly expanded from segment 1 thru 4, segment 5 without lobe, tarsal claws with broad tooth at base.

External secondary sexual modifications are not striking and involve general body shape, slightly more robust in females; antennae slightly shorter in females; and last visible abdominal sternite slightly longer in females. These differences are easily discernible only in *P. walshii* LeC.

Type species. *Buprestis novemmaculata* Fabricius = *Ptosima undecimmaculata* (Herbst), by monotypy.

Relationships. North American genera in the subfamily Polycestinae (= Acmaeoderinae Arnett, 1960) include: *Polycesta, Acherusia, Chrysophana, Paratyndaris, Ptosima, Acmaeodera, Acmaeoderopsis, Anambodera,* and *Acmaeoderoides.* Characteristics which distinguish *Ptosima* are: subcylindrical form, prothorax with distinct lateral margins, scutellum visible, and tarsal claws broadly toothed at base.

Immature Stages

Not much is known of the immature stages, except for the larva. Burke (1917, Pl. 5, Fig. 3) illustrated the larva of *P. gibbicollis* (Say), and characterized it as follows: first thoracic segment distinctly larger and broader than second; grooves of first segment dark brown; plates of first thoracic segment whitish opaque, without distinct chitinous rugosities; dorsal plate large, both it and ventral plate marked by distinct, simple, median groove; first abdominal segment narrower than second; last abdominal segment narrowed and roundly bilobed, without chitinous fork.

Judging from information on *P. gibbicollis* (Knull 1920) and collection dates on other species, the larvae pupate and transform into adults in the fall. The adults overwinter in their pupal cells and emerge in the spring, with adult collection dates most common from March through May.

KEY TO THE NORTH AMERICAN SPECIES OF *PTOSIMA*

1. Disk of pronotum with 3 distinct depressions; color black with aeneous or cupreous tints, disk of each elytron with 3 or 4 small stramineous spots (Fig. 1) ..... 1. *P. walshii* LeConte

1′. Disk of pronotum without distinct depressions; color blue or black, elytral markings not confined to disk 2

2(1′). Elytral markings red-orange, as anterolateral spots (sometimes absent) and as 2 spots (variably confluent) on each elytron toward apex, red-orange markings commonly along lateral margins of pronotum and sometimes as spot on front of head; on *Crataegus* sp. & *Gleditsia triacanthos* L. (Figs. 6-8)..... 4. *P. idolynae* Frost

2′. Elytral markings bright yellow or orange, as anterolateral spots and as 1 spot on each elytron toward apex, pronotum and head without markings; on *Cercis* spp. 3

3(2′). Elytral markings bright yellow, anterolateral spot extending posteriorly beyond middle, dark apical area usually less than 1.5 times longer than apical yellow spot; punctures moderately dense on head, disk of pronotum and elytra, surface more shining; on *Cercis canadensis* L. (Fig. 4)..... 2. *P. gibbicollis* (Say)

3′. Elytral markings orange, anterolateral spot not extending to middle, dark apical area usually more than 1.5 times longer than apical yellow spot; punctures dense on head, disk of pronotum and elytra, surface less shining; on *Cercis reniformis* Engl. & *C. texensis* Sarg. (Fig. 5) ..... 3. *P. laeta* Waterhouse

1. *Ptosima walshii* LeConte
(Figs. 1, 2, 3)

Ptosima walshii LeConte, 1863. Smithsonian Misc. Collections 6 (167):81; Fall, 1901. Occas. Papers, California Acad. Sci. 8:120; Kerremans, 1907. Monog. Bupr. 2:544; Helfer, 1970. Nat. Hist. Mendocino, p. 92.

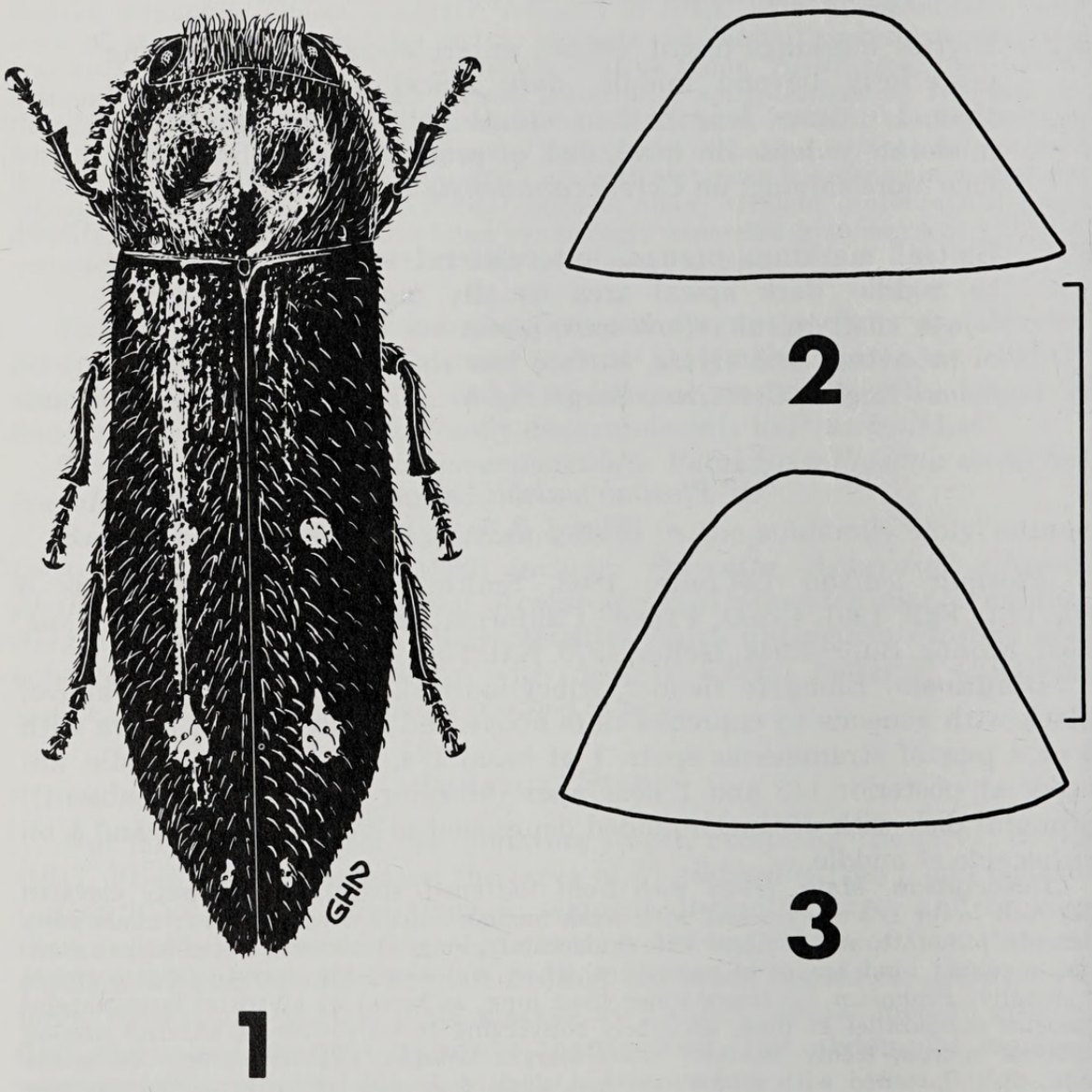
Diagnosis. Elongate slender, subcylindrical, slightly flattened above; black with aeneous to cupreous tints above and below, disk of elytra with 3 or 4 pair of stramineous spots, 1 at basal 1/4, 1 just before middle, another at posterior 1/3 and 1 near apex (anterior pair frequently absent); pronotal disk with distinct rounded depression in midline at base and 1 on either side at middle.

Description, Male. *Head* with front flattened, slightly transversely elevated between lower 1/3 of eyes and with weak median sulcus toward vertex; moderately densely punctate and clothed with moderately long, semierect, white hair; antennae reaching hind angles of pronotum, when laid alongside, serrate from segment 4 distally. *Pronotum* 1.3 times wider than long, as broad as elytra at base; lateral margins subparallel at base, arcuately converging to narrowest at anterior angles; anterior margin feebly arcuate; basal margin straight, slightly oblique on either side; disk flattened with almost vertical sides, disk with elongate midline depression anteriorly and 3 distinct rounded depressions, one in midline at base and one on either side at middle; punctures moderate in size and density, more numerous on vertical sides, with some rugose asperities along lateral and anterolateral prominence; clothed with moderately long, semierect, white hair. *Scutellum* small, elongate oval. *Elytra* with sides sinuately parallel, converging apically to separately, nar-

rowly rounded apices; lateral margins weakly serrate in apical 1/3, serrations larger toward apex; disk shining, punctured as on pronotal disk; with moderately long, semierect, white hair fairly numerous. *Ventrally* with moderately dense punctures and semirecumbent white hair, punctures smaller on abdomen and legs; prosternum with anterior margin feebly concave, prosternal process convex with apex broadly rounded; meso- and metasterna slightly flattened in midline; tibiae toothed externally at apex, metatibia without row of dense setae on outer margin; abdominal sternites convex; suture between segments 1 and 2 distinct laterally, faint medially; last visible abdominal sternite broadly roundly truncate at apex. (Fig. 2). *Length* 6.0 mm; width 1.8 mm.

Female. Differs from male in being slightly more robust; antennae shorter, reaching posterior 1/3 of pronotum, when laid alongside; last visible abdominal sternite narrowly rounded at apex (Fig. 3).

Redescribed from male and female homotypes from WISCONSIN: Dane Co., 10-V-00; and MISSOURI: Randolph Co., 1 mi E Moberly, 21-IV-74, E. G. Riley, respectively [GHNC].



Figs. 1-3, *Ptosima walshii* LeConte. 1, Dorsal view, female (length = 6.5 mm); 2, outline of last visible abdominal sternite, male; 3, outline of last visible abdominal sternite, female (line = 1 mm).

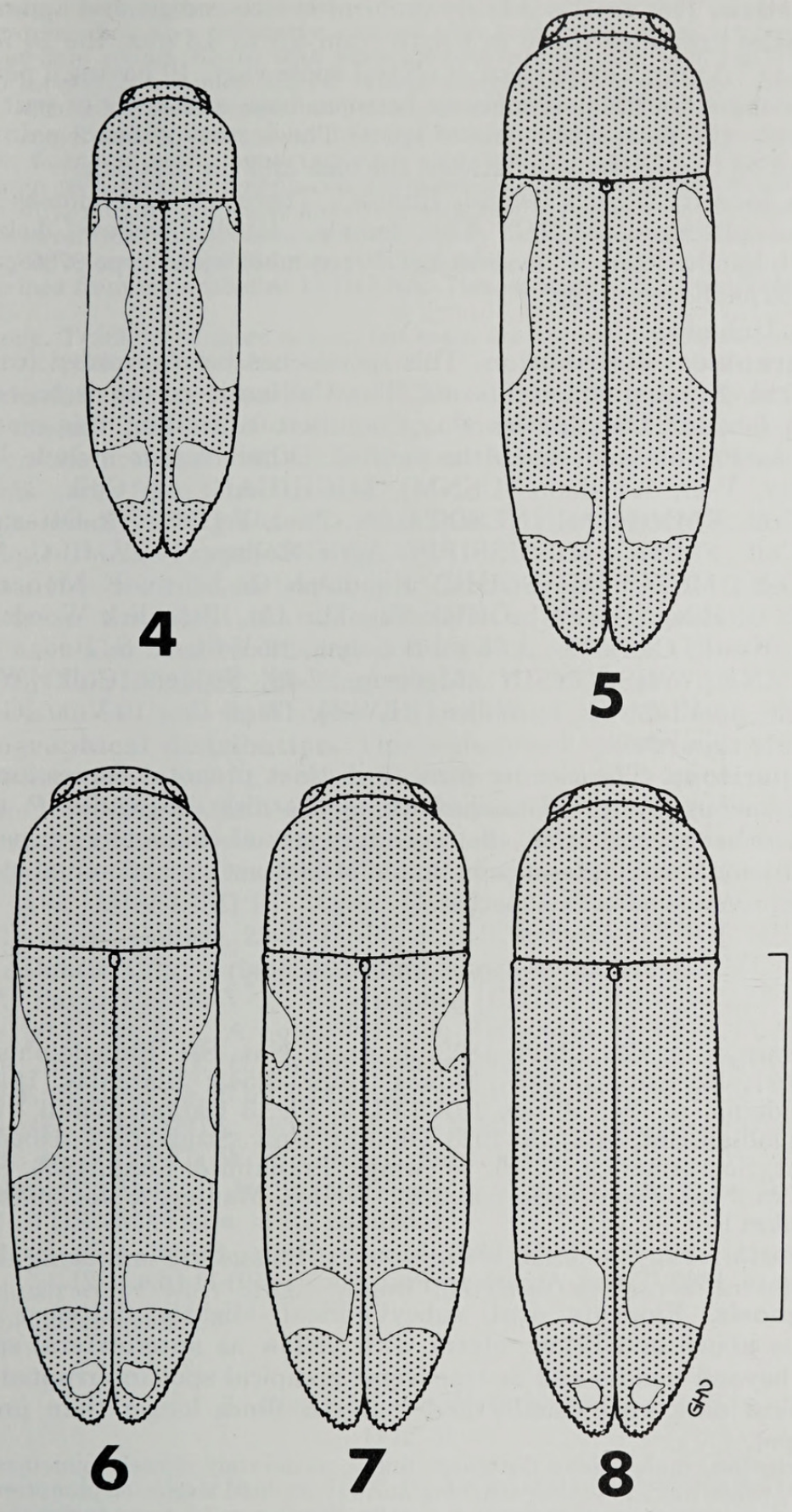


Fig. 4, *Ptosima gibbicollis* (Say), dorsal view. Fig. 5, *P. laeta* Waterhouse, dorsal view. Figs. 6-8, *P. idolynae* Frost, dorsal views, showing variations in color pattern (line = 5 mm).

Variation. This species is fairly uniform in size and general appearance. The 8 males examined range in length from 5.5 to 6.3 mm, the 16 females from 5.8 to 7.5 mm. The pattern of elytral spots vary; 10 having 3 pair (Fig. 1), 12 having a fourth pair midway between base and anterior pair and 1 having only the posterior 2 pair of spots. The lectotype has 3 pair plus a small spot on the left elytron between the base and the first pair.

Type locality. "Rock Island, Illinois". There are 2 specimens in the LeConte collection, MCZC. The female, labelled/yellow disk/white label with handwritten "*P. walshii* LeC."/red label with "type 2735", is here designated as the lectotype.

Host. Unknown.

Geographical distribution. This species has been recorded from Illinois, Texas, Kansas, and California. The California record is based on 1 [USNM] labelled Los Angeles Co., Coquillett collection; this state record is questionable and should be verified. Other records include IOWA: Iowa City, V-17, Wickham [USNM]. MICHIGAN: Ag. Coll., 20-V-1889 [Knull Coll., FMNH]. MINNESOTA: St. Paul, V [DEFW]; Ottertail Co. [Knull Coll., FMNH]. MISSISSIPPI: Agric. College, 14-IV, R. G. Mingee [Frost Coll., MCZC]. MISSOURI: Randolph Co., 1 mi E Moberly, 21-IV-74, E. G. Riley [GHNC]. OHIO: Franklin Co., Blacklick Woods, 1-VI-49, J. N. Knull; Clark Co., 1.25 mi S Selma, 19-V-64, R. S. Boone [Knull Coll., FMNH]. WISCONSIN: Madison, V-38, Student Coll. [WSUC]; Platteville, 10-VI-67, H. L. Willis [RLWE]; Dane Co., 10-V-00 [GHNC]. (**New state records**).

Comparisons. The slender form, 3 distinct pronotal depressions, and the stramineous elytral spots confined to the disk distinguish *P. walshii* from the other species. Also, the secondary sexual characters (disparity in antennal length and difference in shape of last visible abdominal sternite) are more pronounced in this species.

2. *Ptosima gibbicollis* (Say)
(Fig. 4)

Ptosima gibbicollis (Say), 1823. J. Acad. Nat. Sci. Philadelphia 3:161 (*Buprestis*); Kerremans, 1907. Monog. Bupr. 2:543; Blatchley, 1910. Coleopt. Indiana, p. 794; Burke, 1917: Pl. 5, Fig. 3 (larva); Knull, 1920: 7; 1922. Canadian Ent. 54(4):79; 1925. Ohio St. Univ. Stud. 2(2):7; Good, 1925. Ann. Ent. Soc. America 18: Pl. 10 (wing); Franklin & Lund, 1956. Georgia Agric. Exp. Sta., Tech. Bull. n.s. 3:22; Wellso, Manley, & Jackman, 1976. Great Lakes Ent. 9(1):13.

Synonym, *luctuosa* Gory, 1840. Monog. Bupr., Suppl. 4:71, Pl. 13, Fig. 69; LeConte, 1860. Trans. American Phil. Soc. (1859) 11 (n.s.):221.

Diagnosis. Elongate oval, subcylindrical, slightly flattened above; dark blue above and below, elytra with yellow as anterolateral spot extending beyond middle and as transverse preapical spot interrupted at suture, apical dark area usually less than 1.5 times longer than preapical yellow spot.

Description, male. *Head* flattened; finely, moderately densely punctured, with semierect, white hair; antennae reaching midway to hind angles of pronotum, when laid alongside, serrate from segment 4 distally. *Pronotum* 1.5 times wider than long, as broad as elytra at base; lateral margins subparallel at base, arcuately converging to narrowest at anterior angles; anterior margin arcuately convex; basal margin straight, slightly oblique on either side; disk flattened with anterolateral prominence, vertical sides and with midline depression at base; punctures moderate in size

and density, with rugose asperities on lateral and anterolateral prominence and impunctate median area anteriorly; clothed with moderately dense, semierect, white hair. *Scutellum* round. *Elytra* with sides parallel in basal 5/8, then converging apically to separately rounded apices; lateral margins serrate apically; disk convex, smooth, with moderately dense, fine punctures and short, semierect, white hair. *Ventrally* with moderately dense punctures and semirecumbent, white hair, punctures of abdomen finer and with impunctate area along posterior margin of each segment; prosternum with anterior margin concavely arcuate, prosternal process convex with apex broadly, roundly truncate; metatibia with row of dense setae on outer margin; suture between abdominal sternites 1 and 2 only faintly indicated; last visible sternite rounded at apex. *Length* 6.8 mm; width 2.1 mm.

Described from male labelled INDIANA: Tippecanoe Co., 8-VI-63, N. M. Downie [GHNC].

Female. Tends to be more robust, but sexes are not easily separated on basis of external morphological characteristics.

Variation. In size it varies from 4.7 to 8.0 mm, but there is little variation in macular pattern. Occasional specimens have shallow indications of fossae on the pronotal disk similar in position to those on *P. walshii.* The scutellum varies from round to oval.

Type locality. Of *gibbicollis,* "Arkansa" [type destroyed]; of *luctuosa,* "Amérique Boréale", type [MNHP].

Host. It is recorded as breeding in *Cercis canadensis* L. (Knull, 1920), and it is on this plant that *P. gibbicollis* is most commonly collected. Adults have also been recorded as collected on sassafras (Blatchley, 1910). Also, PENNSYLVANIA: Mecklenburg Co., Rt. 51, 1 mi W of Rt. 16, near Matthews, 13-IV-74, A. G. Wheeler, Jr., on *Prunus serotina* Ehrh. [PADA].

Geographical distribution. This widespread species will probably be found wherever its host, *Cercis canadensis* L. occurs. It has been recorded from the following states: Alabama, Arkansas, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Missouri, North Carolina, Ohio, Pennsylvania, South Carolina, and Texas. Also MISSISSIPPI: Agric. College, 26-III-20, M. W. Blackman [DFEC]; Agric. College, 25-31-III-03, J. H. Comstock [CUIC]. NEW JERSEY: Atlantic City; Anglesea, both Liebeck collection [MCZC]. OKLAHOMA: Payne Co., 11-V-26, W. J. Brown [CUIC]; Stillwater, 27-IV-30, H. Hixson; 30-IV-64, D. C. Arnold; 30-IV-29; Henryetta, 12-VI-34, C. A. Sooter; Perkins, 25-IV-74, D. C. Arnold, on apple flowers [all OSEC]. TENNESSEE: Marion Co., 5 mi S Monteagle, 9-VI-69, R. L. Westcott, on *Cercis canadensis.* VIRGINIA: Fairfax Co. [AMNH]; Nelson Co., various dates, 28-VI-16 to 30-VI-27, W. Robinson; Fairfax Co., 29-VI-14, W. T. Davis; Blacksburg, 13-V-48, P. H. Smith; Page Co., 7 mi W Luray, 4-VII-72, G. F. Hevel [all USNM]. (**New state records**).

Comparisons. Its similarity to *laeta* is discussed under that species. The bluish color with bright yellow markings will serve to separate it from the other species.

3. *Ptosima laeta* Waterhouse
(Fig. 5)

Ptosima laeta Waterhouse, 1882. Biol. Centrali Americana 3(1):20; Keremans, 1907. Monog. Bupr. 2:545.

Synonym, *gibbicollis* var *schaefferi* Chamberlin, 1926. Cat. Bupr. North America, p. 235; Knull, 1970. Ent. News 81:264; Helfer, 1970. Nat. Hist. Mendocino, p. 92 (as species).

Diagnosis. Elongate oval, subcylindrical, somewhat flattened above; black above and below, elytra with bluish tinge, with orange as antero-lateral spot extending almost to middle and as transverse spot at apical 1/4 interrupted at suture, apical dark area usually more than 1.5 times longer than apical yellow spot.

Description, male. *Head* flattened; finely, densely punctate, moderately clothed with semierect, white hair; antennae reaching to or just beyond middle of pronotum, when laid alongside. *Pronotum* 1.4 times wider than long, as broad as elytra at base; lateral margins subparallel at base, arcuately converging to narrowest at anterior angles; anterior margin arcuately convex; basal margin straight, slightly oblique on either side; disk somewhat flattened with roundly vertical sides, and slight depression in midline at base; punctures moderate in size, semierect whitish hair fairly short, punctures and hair dense, disk with narrow midline impunctate area and rugose asperities on lateral and anterolateral prominence. *Scutellum* elongate oval. *Elytra* with sides parallel in basal 2/3, then converging to separately rounded apices; lateral margins serrate apically; disk convex and smooth, with punctures and hair more dense than on *gibbicollis*. *Ventrally* with moderately dense punctures and semirecumbent whitish hair, punctures more dense and smaller on abdomen with impunctate area along posterior margin of each segment; prosternum with anterior margin arcuately concave, prosternal process convex with apex broadly, roundly truncate; metatibia with dense row of setae on outer margin; suture between abdominal sternites 1 and 2 fairly distinct laterally, less so medially; apex of last visible sternite rounded. *Length* 8.8 mm; width 2.8 mm.

Redescribed from male homotype labelled TEXAS: Real Co., 5 mi E Camp Wood, reared from *Cercis reniformis* Engl., 14-XI-72, G. H. Nelson [GHNC].

Female. Tends to be more robust than male, but sexes not easily distinguished from external morphological characteristics.

Variation. Besides size (6.5 to 10.5 mm) there is little variation, especially for a maculate species. In all 58 specimens examined, the orange maculations are as described with only slight variation in extent. One exception has a narrow elongate elytral spot along lateral margin midway between the usual apical spots and the elytral apex.

Type locality. Of *laeta*, "Mexico, Playa Vicente", lectotype [BMNH]; of *schaefferi*, "Cypress Mills, Texas", type [CASC].

The specimen [BMNH] here designated as the lectotype does not have all the correct labels. Whether this is due to curatorial error since the time of description, or to an error on Waterhouse's part is not known, but the specimen is the correct size and fits the description. It is labelled as follows: "Type" on white disk with red margin/blue disk with "Mex" handwritten on upper surface and "$\frac{61}{118}$" handwritten on under surface/"*Ptosima laeta* (type) Waterh." handwritten/"61 118 = Mexico etc. purch'd of Cumming. C. M. F. von Hayek 1977".

Host. Reared from *Cercis reniformis* Engl., wood collected in TEXAS: Real Co., 5 mi E Camp Wood, 2-VII-71, G. H. Nelson; the wood, 4″ in dia., was kept at room temperature; adults emerged 14, 18-XI-72; 12-XII-72; VIII-73. Adults were also collected in Gillespie Co., III-IV, D. J. & J. N. Knull, on *C. texensis* Sarg. [FMNH, GHNC, RLWE].

Geographical distribution. Texas and Mexico.

Comparisons. The possibility that *schaefferi* represented the same species as *P. laeta* was first suggested by W. F. Barr (*in litt.*) after he examined the type of *P. laeta* in the British Museum. After borrowing it and the type of *schaefferi* from the California Academy of Sciences and comparing them, it is evident to me that they do represent the same species.

When Chamberlin described *schaefferi* from "Cypress Mills, Texas," he considered it a variety of *P. gibbicollis* (Say). However, an examination of a series of both forms indicates that they represent different species: *P. laeta* (=*schaefferi*), a larger species with orange markings and more dense punctation, with *Cercis reniformis* and *C. texensis* as hosts; and *P. gibbicollis,* a smaller species with yellow markings, less dense punctation with *C. canadensis* as a host. Comparisons with *P. idolynae* are made under that species.

4. *Ptosima idolynae* Frost
(Figs. 6-8)

Ptosima idolynae Frost, 1923. Canadian Ent. 55:279; Knull, 1970. Ent. News 81:264.

Diagnosis. Elongate oval, subcylindrical, flattened above; dark blue above and below, elytra with red-orange as anterolateral arched spot extending to middle (sometimes absent) and as 2 spots, 1 transverse at apical 1/4 and 1 near apex, red-orange spots frequently along lateral margins of pronotum and as spot on front of head.

Description, male. *Head* flattened to slightly convex; finely, moderately densely punctured and clothed with semierect, white hair; antennae as in *gibbicollis*. *Pronotum* 1.3 times wider than long, as broad as elytra at base; lateral margins parallel in basal 3/5, then arcuately converging anteriorly; anterior margin arcuately convex; basal margin straight, slightly oblique on either side; disk feebly convex with anterolateral prominence and midline depression at base; punctures coarse on disk and sides, with rugose asperities on anterolateral prominence; clothed with moderately dense, semierect, white hair. *Scutellum* elongate oval. *Elytra* with sides parallel in basal 3/5, then arcuately converging to separately rounded apices; lateral margins serrate apically; disk convex, smooth, with moderately dense, distinct fine punctures and semierect, white hair. *Ventrally* with moderately dense, distinct punctures, clothed with semirecumbent whitish hair, punctures finer and more sparse toward midline and along posterior margin of abdominal sternites; thoracic sternites strongly convex toward midline, abdominal sternites, less so; prosternum with anterior margin arcuately concave; prosternal process broadly, roundly, truncate at apex; metatibia with row of setae along outer margin, less dense than in *laeta* or *gibbicollis*; suture line between 1st and 2nd abdominal sternites only faintly indicated; last visible abdominal sternite with lateral margins serrate and apex rounded. *Length* 8.0 mm; width 2.5 mm.

Redescribed from male labelled TEXAS: Brazos Co., College Station, 16-IV-63, H. R. Burke, on *Gleditsia triacanthos* L. [GHNC].

Female. Tends to be more robust than male and last visible abdominal sternite tends to be more rounded at apex, but sexes difficult to separate on basis of external morphological features.

Variation. Besides size (7.0 to 12.0 mm) and color, which may be more vivid red or paler orange, there is considerable variation in the pattern and distribution of the red-orange spots. The anterolateral spot is divided in 15 of 53 specimens examined and in 2 it is entirely absent. Of the 53, 21 have spots on both the pronotum and the head, 11 have spots on the pronotum but not on the head, 9 on the head but not on the pronotum and 12 have spots on neither. On 4 the apical elytral spot is absent, but on all 4 there are spots on either the pronotum or the head. An occasional specimen has small spots ventrally, either on the prosternum or the abdomen. The holotype lacks spots on either the anterolateral part of the elytra or the pronotum, but has a round spot on the front of the head, 2 pair of apical elytral spots and a pair of small spots posterolateral to the scutellum.

Type locality. "Agricultural College, Miss.", holotype [Frost collection, MCZC].

Host. Cut from *Crataegus* sp., TEXAS: College Station, 31-III-64, S. G. Wellso (new larval host record); adults also taken at the same locality, III-V, on *Gleditsia triacanthos* L.

Geographical distribution. Recorded from Mississippi and Texas. Also ARKANSAS: Yell Co., 4.2 mi NE Danville, 7-V-74, W. H. Cross, in leggett trap [WFBC]. (**New state record**).

Comparisons. *P. idolynae* is most easily confused with *P. laeta,* which is similar in size, but the brighter red-orange markings, their pattern, and the less dense punctation above and below will readily distinguish it from *P. laeta.*

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