A REVIEW OF THE NORTH AMERICAN LANGURIIDAE

PATRICIA VAURIE

BULLETIN
OF THE
AMERICAN MUSEUM OF NATURAL HISTORY
VOLUME 92 : ARTICLE 3 NEW YORK : 1948

A REVIEW OF THE NORTH AMERICAN LANGURIIDAE

A REVIEW OF THE NORTH AMERICAN LANGURIIDAE

PATRICIA VAURIE

Assistant, Department of Insects and Spiders

BULLETIN

OF THE

AMERICAN MUSEUM OF NATURAL HISTORY

VOLUME 92 : ARTICLE 3 NEW YORK : 1948

BULLETIN OF THE AMERICAN MUSEUM OF NATURAL HISTORY
Volume 92, article 3, pages 119–156, figures 1, 2

Issued November 5, 1948

Price: $0.50 a copy

INTRODUCTION

ALTHOUGH FAIRLY RECENT WORK has been done on the Languriidae of India (Arrow, 1925), Africa (Arrow, 1929a), and China (Zia, 1933), the last comprehensive account in this country was in 1873 by Crotch. Schaeffer (1904, p. 198) wrote a synoptic table of *Languria*, and Blatchley (1910, p. 541) described the species found in Indiana, but neither of these works covers all the species of *Languria*, or the three other genera.

Since Crotch's time, six new species of *Languria* have been named, two species were transferred to *Acropteroxys*, the genera *Acropteroxys* and *Dasydactylus* were set up by Gorham (1887, pp. 13, 14), and the genus *Langurites* was found to occur in Arizona and Florida. In addition, specimens have been collected from a great many new places, thus enlarging the geographical ranges of nearly every species. New food plants have also been discovered, as well as other data on the habits of these insects. The present paper, during the preparation of which about 2000 specimens were examined, brings together the information on the North American species and genera. It is to be hoped that a revision of the Central and South American members of the family will follow at a later date.

I want to thank Mr. John C. Pallister of the American Museum of Natural History for his encouragement and help in starting this study. I am especially grateful to Dr. Mont A. Cazier of the American Museum for his advice and constructive criticism. Mr. Lawrence S. Dillon of the Reading Public Museum and Dr. Milton W. Sanderson of the Illinois Natural History Survey have kindly lent specimens and offered helpful comments; specimens at the United States National Museum were made available by Mr. W. S. Fisher and some were lent by Dr. E. S. Ross of the California Academy of Sciences.

HISTORY AND DISTRIBUTION

The Languriidae were for a long time considered a subfamily of the Erotylidae even though Lewis, as early as 1884, suggested placing them near the Endomychidae as a separate family. Arrow (1925, p. 157) also recommended they be treated as a family, but it was not until 1928 that they received family rank and were so listed in Junk's "Catalogue" (Schenkling: 1) with the two subfamilies Languriinae and Cladoxeninae. Leng and Mutchler (1933, p. 33) placed them as a family in their catalogue and more recently Blackwelder (1945, p. 425) put the Languriidae in the superfamily Cucujoidea between the Biphyllidae and the Cryptophagidae.

The earliest recorded species of the genus *Languria* in North America was *bicolor* (Fabricius) in 1798, followed in 1805 and 1807 by *angustata* (Beauvois) and *mozardi* Latreille. Both *bicolor* and *angustata* appeared first under the name *Trogosita*. In the next hundred years, 11 more *Languria* became known and since 1907 three have been added. A few of these were made synonymous, making a total of 14 species at present. The only year in which more than one was named was 1854 when LeConte described *discoidea*, *taedata*, *laeta*, and *collaris*. Other authors of North American species which still stand are Say (1823), Motschulsky (1860), Horn (1868), Schwarz (1878), Fall (1901), Schaeffer (1904), Casey (1916), and Blatchley (1924).

Languria is represented in Central America by four additional species. Three species, *irregularis*, *laeta*, and *sanguinicollis*, have been found in both North and Central America. None have been reported from South America.

The genus *Acropteroxys* was not described until 1887 when Gorham named a Mexican species as genotype. But *gracilis* (Newman) (1838) and *lecontei* (Crotch), (1873), placed originally under *Languria*, belong in *Acropteroxys*. These are the only two species north of the Rio Grande; there are four others in Central America and *gracilis* is found in both regions.

The genus *Dasydactylus* was also set up by Gorham at the same time as *Acropteroxys*, also with a Mexican species as genotype. This is a Central American genus with 24 de-

scribed species, *D. cnici* Schaeffer (1904) being the only member yet taken north of the Mexican border, and it has been found in the United States in Texas only. One species has been described from South America, and Gorham said there were probably others undescribed because of lack of material.

Three Central American species became Motschulsky's basis for a new genus, *Langurites*, in 1860. Crotch, in 1875, made these synonymous with *Languria lineata* (Castelnau) (1832), which he then assigned to the genus *Langurites*. There are now only two species in the genus, one from Mexico and *lineatus* from North and Central America and northern South America.

Other Languriidae exist in China, Japan, Africa, and South America, but the largest, most beautiful, and most varied species inhabit the Indo-Malayan region. There, too, is found the largest proportion of the approximately 400 species that compose this small family of beetles. There are none in New Zealand and only a few in Australia. Most curious is the fact that no langurids are known from Europe. One would expect them there as well as in North America, since many of the same types of plants occur in which they could bore. Fowler (1886, p. 303) said langurids were not found "very far north or south of the Tropics," and while it is true that their greatest concentration is in the warmer countries, some species do exist as far north as Canada in North America and Tibet in Asia.

BIOLOGY

In contrast to the Erotylidae, which feed on fungi, the Languriidae of North America are stem borers. The larvae feed in the stems of a variety of plants, especially favoring the Compositae and Leguminosae. The only species whose activities have made it an economic pest in North America is *Languria mozardi* which infests red clover in the southeast and alfalfa in the southwest. In India, *Anadastus parvulus* Wiedmann does considerable injury to Italian millet (*Setaria italica*) (Arrow, 1925). The feeding of the larva within the stem does not destroy the plant, but interferes with its vitality, making the quality poor, and sometimes the plant breaks off above the oviposition hole.

The adults feed on pollen (Wildermuth and Gates, 1920) and on the leaves of the host plant. Lewis (1884, p. 349) reported that some langurids mount and cling to the stems and leaves of brushwood, or sit on leaves in the moist, half-shaded parts of the forest. According to Ulke (1902, p. 44), North American *Languria* "are most frequently found in swampy meadows."

Specific notes on biology appear under each species in the following pages, but no information has been found for *taedata*, *erythrocephala*, *irregularis*, and *collaris* in *Languria*, for *lecontei* in *Acropteroxys*, or for *Langurites lineatus*.

TAXONOMY

The subfamily Languriinae is made up of elongate, narrow, lustrous beetles, somewhat resembling click beetles (Elateridae) in general aspect. In North America they are usually bicolored (red thorax, dark elytra), and in Central and South America usually unicolored (bronze, piceous, blue, or green). In Asia and India they present many combinations but the pattern is always simple, without the variegated elytra of the Erotylidae, for instance. The head is immersed in the thorax to the eyes; the eleven-segmented antennae are inserted at the sides of the front, the last five or six segments forming a distinct, usually flattened, hairy club; the eyes are round and finely granulated. The thorax has a short longitudinal depression or line each side of the base; the side margins of the thorax are distinct. Scutellum heart shaped; elytra covering the abdomen, which has five segments. The front coxal cavities are open behind, separated by a prosternal process. The tarsi are five-segmented, but only the claw and the flat pads of the first three segments are visible except under strong magnification. The claws are simple. Size small to medium, 3 to 16 mm. All the North American species belong in this subfamily.

The subfamily Cladoxeninae (Arrow, 1925, p. 253) is not represented in North America.[1] It comprises "small species easily recognisable by the absence of the narrow linear form so characteristic of Languriinae." The antennal club is three-segmented, the segments bead-like, of equal width and not closely united. The eyes are coarsely granulated; the elytra are shorter than in the Languriinae and taper more towards the apex, the legs are slender or stout; the tarsi are bilobed.

An effort has been made in this paper not to rely on color for differentiation of species where other characters, such as punctuation, shape of the antennal club, shape of the elytra and of the elytral apices, can be used. The arrangement of the color, although often variable, has some significance, but the degrees of color do not. Therefore the terms for color have been generalized: "red" is used for all the varying shades from yellow to dark red; "piceous" is used for all parts which appear black to the naked eye.

The bibliographical references under the genera and species are selected references.

[1] The genus *Pharaxonotha*, formerly of the subfamily Cladoxeninae, was returned from Languriidae to the family Cryptophagidae by Arrow (1929b, p. 308). Blackwelder (1945, p. 428) also places it in the Cryptophagidae.

SYSTEMATIC ACCOUNT

KEY TO THE GENERA OF LANGURIINAE

1. Ocular stria present, extending from antennal socket to end of eye 2
   Ocular stria absent . . . . . *Acropteroxys*
2. Elytral apices evenly rounded to sutural margin, or apices dentate; ocular stria deep, close to eye 3
   Elytral apices terminating in an acute tooth, inner third of elytral margin obliquely incised to suture which also terminates in tooth; ocular stria shallow, distant from eye . . . . . *Langurites*
3. Elytral apices evenly rounded; thorax generally in great part red; elytra piceous, wholly or in part; male genitalia as in figure 1. *Languria*
   Elytral apices dentate; thorax and elytra of same piceous color; male genitalia as in figure 1 . . . . . *Dasydactylus*[1]

GENUS **LANGURIA** LATREILLE

Languria LATREILLE, 1802, Histoire naturelle . . . des . . . insectes, vol. 3, p. 209; 1805, *op. cit.*, vol. 12, p. 35; 1807, Genera crustaceorum et insectorum, vol. 3, pp. 65–66. LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 158. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 349. FOWLER, 1908, *in* Wytsman, P., Genera insectorum, vol. 78, p. 29. BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, p. 541.

Head with punctures shallow or deep, sparse or dense; ocular stria deep, close to eye; clypeus large or small, rectangular, square, or trapezoidal, punctures usually deep, dense; antennae long or short, with broad and compact or narrow and elongate five- or six-segmented club emerging gradually or abruptly from stem, club segments either slightly or strongly dilated to inner side, last segment rounded; thorax slightly flat to very convex, longer than broad, or square, sides subparallel to sinuous, hind angles slightly produced, punctuation shallow and sparse or deep and dense; elytra two and one-half or three times longer than thorax, the rows of punctures distinct, and either shallow or deep, apices evenly rounded, truncate, or slightly sinuate, legs long or short, front femora hardly swollen at middle, male femora and tibiae with or without teeth on inner side; prosternum shallowly or deeply, sparsely or densely punctured; mesosternum short, deeply punctured; metasternum, abdomen shallowly, sparsely, or deeply, densely punctured, last abdominal segment similar in male and female. Length 4 to 13 mm.

GENOTYPE: *Languria bicolor* Fabricius, 1798, from North America.

The genus *Languria* consists of 14 North American species and four Central American ones; those described from other parts of the world have been placed in different genera. In the United States *Languria* differs from the other genera by the shape of the elytral apices which are generally evenly rounded, but sometimes truncate or slightly sinuate. Other characters in this genus are quite variable.

Although *Languria* have the same general coloration as *Acropteroxys* and the species of both genera occur together, the affinity of *Languria* is rather with *Dasydactylus*. The eyes in *Languria* and *Dasydactylus* are not so prominent as in *Acropteroxys* and *Langurites;* the ocular stria is deeper than in *Langurites* and closer to the eye. *Languria* is the only North American genus containing some species with as many as six segments in the antennal club, but the shape of both club and antennae is extremely variable, some species having antennae that resemble those of *Dasydactylus* (short and with broad and compact club), some having long narrow antennae as in *Acropteroxys* and *Langurites*, and some having the club not only emerging abruptly from the stem, but with the club segments strongly dilated to the inner side—a type of antennae not represented in any of the other genera. The last segment of the antennae is round as in *Dasydactylus*. The thorax is usually more convex than in the other genera, but sometimes less convex than in some *Dasydactylus;* likewise the sides of the thorax are sinuous, but sometimes less so than in some *Dasydactylus*. The elytra are generally shorter in proportion to the thorax than in the other genera, and also broader, but individuals of some species of *Languria* could not be distinguished from *Dasydactylus*

[1] The single species of this genus in the United States has the elytral apices definitely dentate, but there are three or four of the approximately 20 species in Central America that have the apices not, or scarcely, dentate. One Central American species, *sellatus*, has a transverse red band across the elytra.

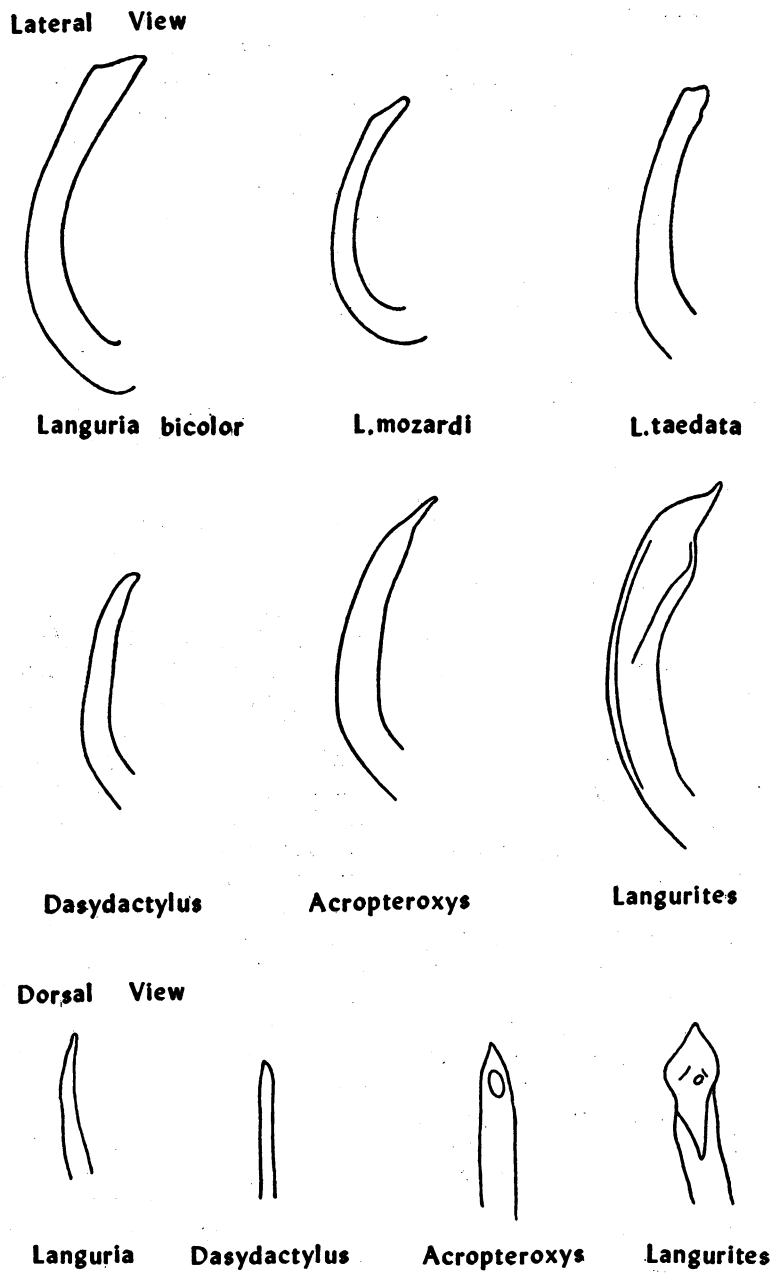

FIG. 1. Male genitalia of Languriidae.

in these two characters. The legs are generally shorter and more robust than in *Dasydactylus*, and shorter and less robust than in the other genera; the front femora in *Languria* and *Dasydactylus* are not so swollen at the middle as in *Acropteroxys* and *Langurites*. The last abdominal segment in male *Languria*, as in male *Dasydactylus*, is not emarginate as in the other genera.

Three species of *Languria*, *taedata*, *erythrocephala*, and *bicolor*, have the male characters of the genus *Dasydactylus*, namely, teeth on the inside of the front and middle femora and tibiae. The first two of these also have very hairy, dilated tarsi and long legs in both sexes, as in *Dasydactylus*.

The female genitalia in *Languria* are proportionately longer and narrower than in the other genera. The male genitalia (fig. 1) are somewhat similar to those of *Dasydactylus*, but the penis, seen from the side, is generally more curved in *Languria* and has the apex not rounded but obliquely truncate before the apex. Dorsally, the penis is very narrow, and somewhat compressed in both genera, thus differing from *Acropteroxys* and *Langurites*, in which it is broad and has an opening (fig. 1).

The principal differences between *Languria* and *Dasydactylus* are in the elytral apices and in the general conformation. The elytral apices are never dentate in *Languria*, and *Languria* is broader, more convex, and less elongate.

Some general remarks on morphology which are not necessarily repeated under the discussion of each species follow:

HEAD: Red above in about half the species, piceous in *marginipennis*, *angustata*, *trifasciata*, *collaris*, *and irregularis:* a mixture of both colors in *taedata*, *erythrocephala*, and *convexicollis*. Head below generally the same color as above. Punctuation may be shallow or deep, sparse or dense, but varies somewhat within the species. The top of the head is usually more sparsely punctate than the region towards the front.

EYES: A deep ocular stria is present close to the eye in all, starting from the antennal socket and reaching to the end of the eye.

CLYPEUS: Generally, but not invariably, the same color as the head. Punctuation is usually deeper and denser than the head, the punctures virtually touching one another. In shape it is sometimes transverse and rectangular, sometimes almost square, or trapezoidal.

ANTENNAE: Piceous in color except in *denticulata*, *mozardi*, *trifasciata*, and *irregularis* which may have red basal segments or all segments red. Segments of the stem, or shaft, range from round to elongate, the third segment being always longer than the others. The club (fig. 2) is composed of flattened, slightly hairy segments usually increasing in size from base to near apex, the apical segment being more or less round. Made up of five segments, but of six in *bicolor* and *convexicollis*. Excluding the apical segment, the clubs (whether five- or six-segmented) fall into three general groups:

1. Those that emerge gradually from the stem (i.e., the first segment of the club is about intermediate in size between the segments preceding and following it), with the individual segments broader than long and not much dilated to the inner side (*californica*, *bicolor*, *discoidea*, *denticulata*, and *mozardi*).

2. Those that emerge abruptly from the stem (i.e., the first segment of the club is definitely larger than the segment preceding it), with the individual segments not only broader than long, but strongly and distinctly dilated to the inner side (*convexicollis*, *laeta*, *irregularis*, *trifasciata*, *collaris*, *angustata*, and *marginipennis*).

3. Those that emerge gradually from the stem with the individual segments longer than broad and not much dilated to the inner side (*taedata* and *erythrocephala*).

In the old descriptions each segment was often described in detail in its relation to the others, but the individual variation is too great for such comparisons to be of value.

THORAX: Always red (from yellow red to dark red), with or without a piceous median spot of varying dimensions. The spot is occasionally so widespread as to obscure the red. Under surface of thorax also red, but with areas of piceous on or near the front coxae in *californica*, *convexicollis*, and *laeta*.

The conformation (length, shape, outline) varies between species but it is also sexual, the females having the thorax generally shorter, squarer, and less convex than the males. Some species have the thorax more

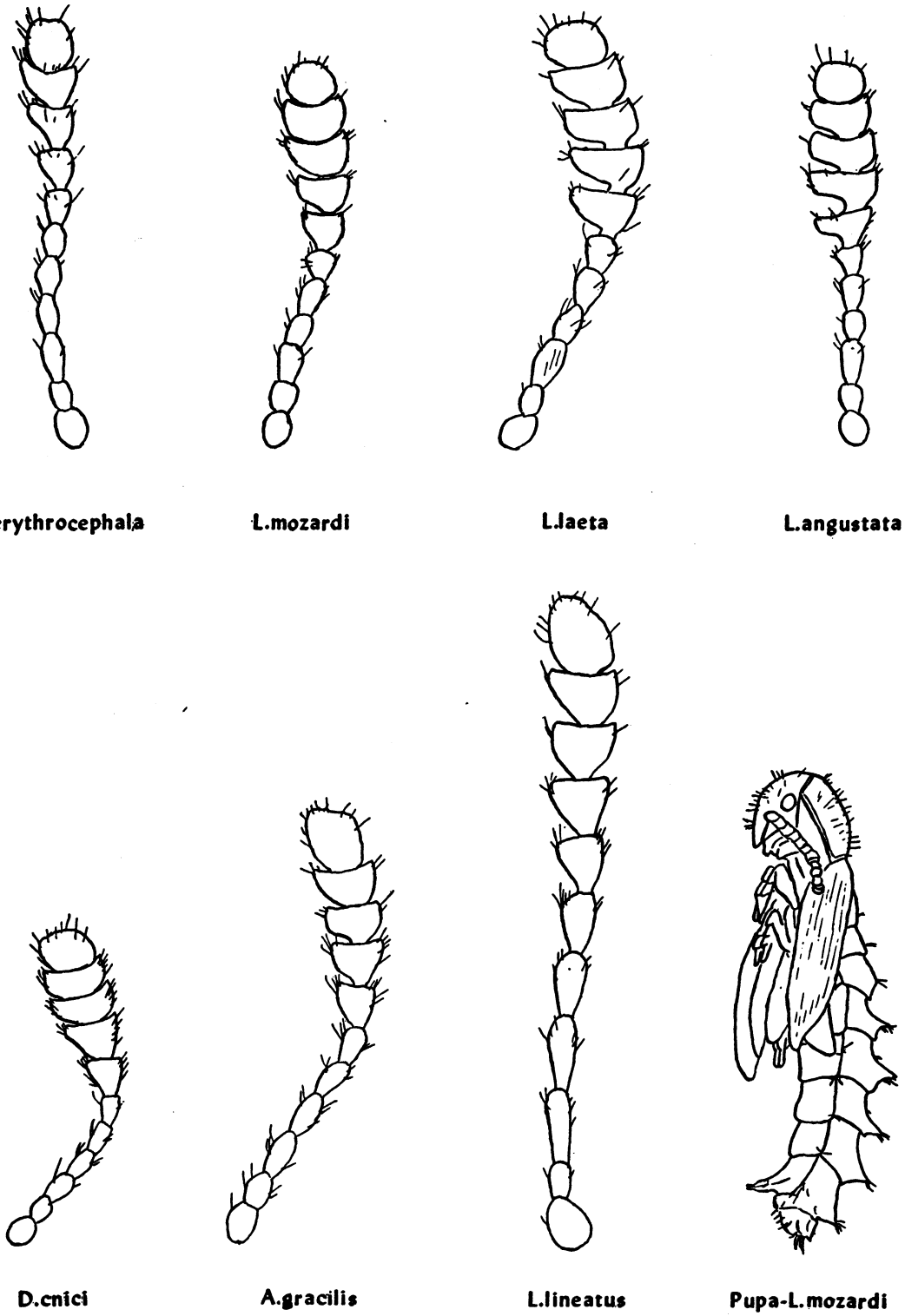

FIG. 2. Antennae and pupa of Languriidae.

nearly square, as *angustata*, others longer and narrower, as *trifasciata;* in some it is less convex, as *marginipennis* and *angustata*, in most it is more convex, and in *convexicollis* males, very convex. The outline of the sides of the thorax is wavy or sinuous, but in some individuals it is nearly straight. The basal depressions characteristic of the family vary individually in length and depth.

Punctuation is generally shallow, somewhat deeper and denser in *taedata* and *erythrocephala*. The punctures are regularly spaced, as a rule, but are sometimes grouped at random and more noticeable in the center than on the sides, which is probably owing to the convexity of the thorax. In *trifasciata*, *angustata*, and *marginipennis* there is a concentration of larger, deeper punctures in a line along the base, but this is not always evident.

SCUTELLUM: Red in the majority of *erythrocephala*, *denticulata*, *mozardi*, and *irregularis;* piceous in the rest. Sometimes with one to five punctures. Shaped like a flattened heart, the point downward.

ELYTRA: All species have piceous, unicolored elytra except *trifasciata* and some *angustata*, which have red across the middle third, or at the sides. The elytra have nine regular, distinct rows of punctures which become smaller and fainter near the apex, plus a short scutellar stria of varying number of punctures. Under a high-power lens all the spaces between these rows show some punctures, very definite in some species, with only a few shallow scattered ones in others. The interspaces are sometimes transversely wrinkled or creased. The elytra are two and one-half to three times longer than the thorax. Their sides are parallel to almost the apical third where they bend inward towards the apex. In most species this bending inward comes rather near the apex, thus giving a more rounded effect; in *erythrocephala* and *trifasciata* it starts nearer the middle of the elytra, making it more pointed and narrow. The elytral apices in most species are evenly rounded, but in *denticulata* and often in *discoidea* they are sinuate, and in *angustata* and *marginipennis* they are more truncate than rounded.

LEGS: Piceous in *californica*, *bicolor*, *convexicollis*, *laeta*, and *collaris*, red in *irregularis* and *trifasciata*, and a mixture of the two in the remainder. Where the legs have both piceous and red, it is usually the femora that have the two colors, with the red always at the base. The tibiae and tarsi in these species may be all shades of piceous or red, but these are not important differences as they vary within the species. In *angustata* the front femora are half piceous and half red, while the other femora have only their tips piceous.

The femora and tibiae of three species, *taedata*, *erythrocephala*, and *bicolor*, are provided with small teeth on the inner side in the males, which, says Arrow (1925, p. 164), is probably for gripping the females. These teeth are also a feature of the males of other genera, *Dasydactylus* from Texas and Central and South America, *Languriomorpha* from Japan, *Doubledaya* from Indo-Malaya, and *Stenolanguria* from Africa. The femora of both sexes in North American species have two short impressed lines on the inner side, although this is difficult to see in many specimens. The tibiae have from one to four punctures on the outer side, and these too are often hard to find. The tibiae are slightly curved and usually have some light-colored hairs at the side near the apex. The femora are slightly swollen at the middle.

In most species the hairs of the tarsi are short, but in *taedata* and *erythrocephala* they are very long, as long as the width of the tarsal segment. The first segment on the hind tarsi is longer than any of the following segments.

PROSTERNUM: Always red except in three of the species with piceous abdomens, *californica*, *convexicollis*, and *laeta*, in which most of the prosternum is red, but there is piceous on or near the front coxae, sometimes spreading onto the hind angles of the prosternum. Punctuation shallow in about half the species, deep in the others. There are often transverse wrinkles in the center.

MESOSTERNUM: Usually same color as first abdominal segment, but in *angustata* sometimes red and sometimes piceous. Always with a few large deep punctures.

METASTERNUM: Piceous in those with piceous abdomens, red in all others except some *angustata* (first abdominal segment red, metasternum usually piceous) and *marginipennis* (first abdominal segment red, metasternum piceous except front margin). Punc-

tures generally shallow and sparse, often hardly visible, but in *californica*, *taedata*, and *erythrocephala* they are deep and dense, especially in the front, and are even larger than those on the mesosternum.

META-EPISTERNUM: Piceous in those with piceous abdomens, red in all others except *angustata* and *marginipennis*. Punctuation same as in metasternum except that in *convexicollis* and *laeta* and even at times in individuals of other species, the punctures are more like elongate impressions, as if someone made a dot with a pen and then let it drag on the surface.

REFLEXED ELYTRAL MARGINS: Entirely red in *marginipennis*, piceous and red in *trifasciata* and *angustata*, and piceous in all others. Scattered punctures have been found on some individuals in all species, but they seem very erratic in occurrence.

ABDOMEN: Red with one or more apical segments piceous in the majority of species, entirely piceous in *californica*, *convexicollis*, *laeta*, and *collaris*, usually entirely red in *taedata* and *erythrocephala*. The number of piceous segments in those with bicolored abdomens varies somewhat within the species. In some species there are individuals with additional piceous spots on the sides of the red abdominal segments. Punctuation generally shallow, and more sparse down the center than on the sides, but it is deeper and denser in *californica*, *taedata*, and *erythrocephala*.

SIZE: From 4 to 13 mm., often varying greatly within the species. The smallest specimen recorded is a *mozardi*, the largest, *bicolor*.

GENITALIA: Male: In most species the penis is nearly cylindrical, curved, semitransparent, and more or less obliquely truncate before the apex. In *trifasciata* and *angustata* the apex is more rounded. In *taedata* and *erythrocephala* it is slightly sinuate, and the entire penis is more compressed (fig. 1).

Female: There seem to be no specific differences.

KEY TO THE SPECIES OF *Languria*

1. Metasternum deeply and irregularly punctate 2
   Metasternum impunctate or sparsely, shallowly punctate 4
2. Head sparsely, shallowly punctate; mesosternum and metasternum red; abdomen mostly red 3
   Head densely, deeply punctate; mesosternum and metasternum piceous; abdomen piceous; 6½–9 mm. . . . . *californica*
3. Thorax with ill-defined median dark spot or thorax darkened; head usually piceous; scutellum piceous; large, robust; 9–11 mm. . . . . *taedata*
   Thorax without median dark spot; head usually red; scutellum usually red; smaller, narrower; 6–10½ mm. . . *erythrocephala*
4. Antennal club six-segmented 5
   Antennal club five-segmented 6
5. Abdomen red with last segment piceous; mesosternum and metasternum red; 7–13 mm. . . . . *bicolor*
   Abdomen piceous; mesosternum and metasternum piceous; 9–11½ mm.. . *convexicollis*
6. Head red to yellow 7
   Head black to piceous 10
7. Thorax without median dark spot; thorax and elytra not alutaceous, appearance shining 8
   Thorax with irregular large median dark spot which usually reaches apex; thorax and elytra alutaceous, appearance greasy; 5½–10 mm. . . . . *discoidea*
8. Elytral apices evenly rounded; abdomen with more than one piceous segment, or unicolorous 9
   Elytral apices sinuate or wavy, with small tooth at suture; abdomen with last segment only piceous; 8–10 mm. . . . . *denticulata*
9. Antennal club emerging gradually from stem, seventh segment less than twice as wide as preceding segments, segments only slightly dilated to inner side; abdomen red with last two or three segments piceous; small, 4–9 mm. . . . . *mozardi*
   Antennal club emerging abruptly from stem, seventh segment at least twice as wide as preceding segments, segments strongly dilated to inner side; abdomen unicolorous; large; 8–11 mm. . . . . *laeta*
10. (6) Legs varicolored (piceous and red), or uniformly piceous 12
    Legs uniformly red. 11
11. Elytra unicolorous, irregularly creased, with large, deep punctures; 6.8–8 mm. *irregularis*
    Elytra with red band at middle third, smooth, with small, shallow punctures; 5–9½ mm. . . . . *trifasciata*
12. Abdomen with all segments piceous . . . . . *collaris*
    Abdomen with not more than two segments piceous 13
13. Abdomen with last two segments piceous; reflexed elytral margins piceous at base; 6–9 mm. . . . . *angustata*

Abdomen with last segment only piceous; reflexed elytral margins red at base; 7–9½ mm. . . . . *marginipennis*

Languria californica Fall

Languria californica FALL, 1901, Occas. Papers California Acad. Sci., vol. 8, p. 235. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199.

Small, robust; antennal club five-segmented, emerging gradually from stem; head red; thorax spotless; area near front coxae usually piceous; mesosternum, metasternum, abdomen, and legs always piceous. Punctuation below deep, dense.

Head red; antennae with club five-segmented, emerging gradually from stem, segments broader than long, not much dilated to inner side; thorax without median dark spot; elytra with apices evenly rounded, "green-black" (Fall, 1901), "blue" (Schaeffer, 1904); femora, tibiae, tarsi piceous; under surface of thorax red with area near front coxae usually piceous, all the rest below piceous. Length 6½–9 mm.

Punctuation: Head, clypeus, thorax shallowly but densely; prosternum, metasternum, abdomen deeply, densely; elytra deeply, with shallow punctures and creases between the striae.

TYPE LOCALITY: Redondo, California.

DISTRIBUTION: California.

SPECIMENS EXAMINED: Total, nine, all from California: Los Angeles, four; Salinas, three; Idlewild, one; "So. Cal.," one.

DISCUSSION: Fall states that "*convexicollis*, the only other California species, is much larger, has more convex thorax, 6-jointed antennal club and generally feebler sculpture." *L. mozardi*, however, also occurs in California (Wildermuth and Gates, 1920), but the red segments on its abdomen would differentiate it from *californica*. Other differences between the two are that *californica* is more deeply punctured below and has the legs, the area around the front coxae, the mesosternum, metasternum, and episternum piceous. The antennae are as in *mozardi*, but the punctuation of the metasternum is as in *taedata* and *erythrocephala*. It can be told from these two species by the more densely punctate head, the piceous on the under surface, and the wider, more compact antennal club segments. No other langurid seen has the abdomen so numerously and deeply punctured as *californica*.

BIOLOGY: Fall's specimen was taken on *Astragalus crotalarae*, the same family as alfalfa, in the stems of which *mozardi* develops.

SEASON: May and June.

Languria taedata LeConte

Languria taedata LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 160. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 350. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199.

Languria rufiventris MOTSCHULSKY, 1860, *in* Schrenck, P. L., Reisen und Forschungen im Amur-Lande, vol. 2, no. 2, p. 242.

Large, robust; antennal club five-segmented, emerging gradually from stem; head usually piceous; thorax greasy in appearance with vague median dark spot; front tarsi large and hairy; scutellum piceous; abdomen red with apex sometimes piceous. Elytra usually uniformly piceous.

Head piceous, often lighter in front; antennae with club five-segmented, emerging gradually from stem, segments narrow, longer than wide, loosely strung, hardly dilated to inner side; thorax with large, ill-defined median piceous spot, sometimes well defined; scutellum piceous; elytra with apices evenly rounded, "brassy black" (LeConte, 1854), "greenish" (Crotch, 1873); femora piceous, often paler et extreme base, but no sharp line of demarcation between the colors, front femora usually darker, tibiae piceous, sometimes middle and hind tibiae completely pale red, femora and tibiae in males with two rows of tiny teeth on inner side, tarsi brown, "almost rufous" (LeConte, 1854), each segment about three times larger than the last antennal segment, tarsi with long hairs; under surface red (apex of abdomen sometimes slightly darkened), with fringe of yellow hairs at apex of abdomen. Length 9–11 mm.

Punctuation: Head sparsely, shallowly, often impunctate at top; clypeus, thorax more deeply, densely; prosternum, metasternum, abdomen deeply, irregularly; elytra with faint punctures between the deeply punctured striae. Prosternum and interspaces of elytra much creased.

TYPE LOCALITY: New York, on seashore.

DISTRIBUTION: Atlantic coastal states from District of Columbia northward.

SPECIMENS EXAMINED: Total, 62: New Jersey, 26; New York, 21; Connecticut, two; Massachusetts, Rhode Island, Maryland, one each; without locality labels, 10. Of 46 of these examined for teeth on the femora, 25 were males, 21 females.

DISCUSSION: The antennae in *taedata*, as also in *erythrocephala*, are quite different from those of the other species of the genus. They are longer and narrower, not so compact, but loosely articulated. The club is also narrower and its formation is so gradual (the first two segments being not much larger than the preceding stem segments) that at first glance the club seems three-segmented instead of five-segmented. In some individuals this is more marked than in others. There is more red on the abdomen in *taedata* and *erythrocephala* than in any other species. Another even more striking difference between *taedata* and *erythrocephala* on the one hand and all the others except *californica* on the other is that the metasternum is deeply and coarsely punctured, especially in front (though sometimes the base is nearly smooth). After the shallowly punctured metasterna of others of the genus, some of which are so finely punctured as to be seen only as pinpricks, these seem like veritable craters. LeConte did not mention this character in his original description of *taedata*, but Crotch (1873, p. 350) observed it, saying "sides of the metasternum are very coarsely punctured in front." The pro-episternum and abdomen in the above three species are also punctured more deeply than in most others. The tarsi have long hairs (as long as the tarsi are wide), a feature of the genus *Dasydactylus* and not present in other *Languria*.

The male genitalia in *taedata* and *erythrocephala* also differ from those in other species, the apex of the penis being almost rounded and showing a sinuation not present in the others, and the entire penis is more compressed and flatter, less cylindrical.

Neither LeConte nor Crotch remarked on the teeth on the femora and tibiae of *taedata* males, but Schaeffer (1904, p. 200) described "the femora and tibiae beneath asperate in the males, smooth in the females," adding that *taedata* "is somewhat intermediate between the genera *Dasydactylus* and *Languria*, the anterior legs in the males are similar to those of *Dasydactylus*." Gorham (1887, p. 14) stressed this character of the males in defining the genus *Dasydactylus*. The teeth are present on all the legs but are usually more marked on the front ones. They are more noticeable on the femora than on the tibiae and are arranged in two evenly spaced rows on the former, while on the latter there seems to be only one row. The teeth are visible under a 14-× hand lens. The legs of the females appear rather granular but have no actual roughness. The only other difference found between the sexes is that the females have a slightly shorter, more square thorax. The median piceous spot on the thorax in *taedata* is often so diffused as to appear a dirty smudge; sometimes the entire thorax is darkened.

This species differs from most other species in the longer legs and larger, more hairy tarsi, in the longer, thinner antennae with narrower antennal club, and in the deeply punctured metasternum. Resembles *erythrocephala* in these characters, but differs from it in being longer, broader, and darker and in having a median dark spot on the thorax. Also the elytra is more uniformly piceous in *taedata* without areas of paler color on the suture, and the femora are more piceous than red. This is the only instance in this genus where two species so similar in their main characters as *taedata* and *erythrocephala* have not so far been found to overlap in their geographical range, the former having been taken north of the District of Columbia, in coastal states, and the latter in Florida and Alabama only. Perhaps when more material becomes available for study, intergrading forms may be found.

Motschulsky (1860, p. 242) had only a few general words to say about his *Languria rufiventris* from North America. It is now considered synonymous with *taedata*.

SEASON: June to August.

Languria erythrocephala Blatchley

Languria erythrocephalus BLATCHLEY, 1924, Canadian Ent., vol. 56, p. 167.

Medium-sized, narrow; antennal club five-segmented, emerging gradually from stem; head usually red; thorax shiny, spotless; front tarsi large and hairy; scutellum red; abdomen red with apex usually piceous. Ely-

tra usually with paler, reddish area along suture.

Head red, sometimes piceous at base; antennae with club five-segmented, emerging gradually from stem, segments narrow, longer than wide, loosely strung, hardly dilated to inner side; thorax without median piceous spot but sometimes slightly darkened; scutellum generally red; elytra with apices evenly rounded, "bluish-black, some with reddish tinge" (Blatchley, 1924); femora piceous apically, red basally, line of demarcation definite, tibiae and tarsi piceous, femora and tibiae in males with two rows of tiny teeth on inner side, each tarsal segment about three times larger than last antennal segment, tarsi with long hairs; under surface red with apical half of last abdominal segment usually piceous and with fringe of yellow hairs at apex. Length 6–10½ mm.

Punctuation: Head, clypeus sparsely, shallowly; thorax more densely; prosternum, metasternum, abdomen deeply, irregularly; elytra with some few punctures between the striae. Prosternum and interspaces of elytra much creased.

TYPE LOCALITY: Moore Haven, Florida.

DISTRIBUTION: Florida and Alabama.

SPECIMENS EXAMINED: Total, 33: Florida, 32; Mobile, Alabama, one. Of these, seven were males, 26 females. Florida specimens were: South Bay, Lake Okeechobee, 28; Moore Haven, two; Crescent City, one; Homestead, one.

DISCUSSION: Blatchley evidently did not notice the teeth on the femora and tibiae of the males of *erythrocephala* or the deep punctuation of the metasternum, which may be why he did not compare it with its closest relative, *taedata*, which possesses both these characters. Instead he said it was "like *marginipennis*, but the latter has black head, is more coarsely punctate, the joints of the antennal club are much wider, and the epipleura in great part red."

Languria erythrocephala is much more similar to *taedata*, although narrower, more tapering, and smaller than that species, and without the median piceous spot on the thorax. Except for these differences, there has been no other reliable character found to separate these two species. The red on the suture in *erythrocephala* is not present in all specimens and under a high-power lens (36-×), even those with the red have the entire elytra piceous (dark reddish brown), with the sutural area merely a paler color. In *taedata* the elytra are also piceous but usually without the paler area along the suture. Another color difference is that the femora have more red in *erythrocephala*, and the red and piceous are sharply defined. The coloration of the last abdominal segment varies in both species, although in general it might be said that having the apex of the abdomen piceous is more characteristic of *erythrocephala* than of *taedata*. (Of 29 *erythrocephala*, 23 have the apical margin sometimes slightly but usually definitely piceous; the other six have it red. Of 23 *taedata*, only 13 have a slightly darkened area at the apex, never distinctly piceous as in *erythrocephala*, while 10 have the apex truly red.) For comparison with *taedata* in antennal structure, punctuation, and genitalia, see under *taedata*.

This species resembles *californica* in the deeply punctured under surface, but that species has the head more densely punctured, the abdomen, mesosternum, and metasternum piceous, the antennal club shorter, wider, and more compact.

SEASON: March to August.

Languria bicolor (Fabricius)

Trogosita bicolor FABRICIUS, 1798, Supplementum entomologicae systematicae, p. 50.

Languria bicolor, LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 159. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 350. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199. BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, p. 541.

Languria ruficollis LATREILLE (nom. nud.), 1802, p. 209. SCHENKLING, 1928, *in* Junk, W., Coleopterorum catalogus, vol. 15, p. 16.

Languria thoracica OLIVIER, 1807, Entomologie, vol. 5, p. 463. HORN, 1886, Trans. Amer. Ent. Soc., vol. 2, p. 140.

Languria puncticollis SAY, 1823, Jour. Acad. Nat. Sci. Philadelphia, vol. 3, p. 462. LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 159.

Languria apiciventris CASEY, 1924, Memoirs on the Coleoptera, vol. 11, p. 177.

Large, robust; antennal club six-segmented, emerging gradually from stem; head red; thorax with median dark spot; legs, last abdominal segment piceous.

Head red; antennae with club six-segmented, emerging gradually from stem and one and one-half times longer than stem, club segments broader than long, slightly dilated towards inner side; thorax with median dark spot though spot occasionally lacking; elytra with apices evenly rounded; femora, tibiae, tarsi piceous, femora and tibiae of males roughened, femora usually with two rows of tiny teeth on inner side; under surface red, last abdominal segment piceous. Length 7–13 mm. (usually 10 mm. or more).

Punctuation: Head, thorax, prosternum, abdomen shallowly, sparsely, in some hardly punctate; clypeus more deeply, densely; elytra with numerous fine shallow punctures scattered between the striae, often as many as five or six almost touching one another at various places between the striae.

TYPE LOCALITY: North America.

DISTRIBUTION: Atlantic states as far north as Rhode Island and south to Jacksonville, Florida; west to Nebraska, Kansas, Oklahoma, Texas, also Indiana, Illinois, Michigan, and Wisconsin.

SPECIMENS EXAMINED: Total, 278: Maryland, 54; Illinois, 51; Kansas, 35; Virginia, 32; North Carolina, 29; Texas, 21; District of Columbia, 11; Oklahoma, 10; Pennsylvania, eight; Indiana, seven; Florida, six; New York and Louisiana, two each; Georgia, Nebraska, Kansas, Michigan, Wisconsin, one each; without locality labels, five. Of 155 of these examined for teeth on the femora, 57 were males, 98 females.

DISCUSSION: Crotch (1873, p. 350) stated that the elytral interspaces were "impunctate," but he apparently did not use a powerful enough lens, since they are very noticeable under a 36-× binocular. With a 14-× hand lens, however, they cannot be seen. The median piceous spot on the thorax ranges from a small round mark no larger than a pencil dot to one a few millimeters in diameter; it can be elongate or diamond shaped as well as round.

The roughness on the inside of the femora and tibiae of the males occurs on all the legs. In some specimens the femora are merely roughened, in others the two rows of teeth are as marked as in *taedata* and *erythrocephala*, the only other species with this male character. The females in *bicolor* have the legs smooth. The tarsi are large, the last segment of the front tarsi being slightly larger than the last antennal club segment. In a specimen examined from Illinois, the mesosternum is partly piceous instead of the usual red, and in another specimen there is some piceous on the metasternum between the middle coxae. A small specimen, 7½ mm., from Maryland, had the last two abdominal segments, instead of the last only, piceous.

Languria thoracica Olivier was made synonymous by Horn (1886, p. 140).

Languria puncticollis Say was described from Mississippi. Say gave its size as two-fifths of an inch and stated that it "resembles *bicolor*, but [is] more robust." His brief description matches the latter perfectly. Three specimens labeled "ab. *puncticollis*" in the United States National Museum (two from Indiana, one from Kansas) are similar to *bicolor* except that one of the Indiana specimens had no median dark spot on the thorax.

Casey said *apiciventris*, "probably from Colorado," was near *mozardi* but broader, with shorter thorax and different coloration, differing most in the six-segmented antennae. The type, labeled "L" (Levette Collection according to Casey, 1924) in the United States National Museum, was examined and was found not to differ from *bicolor* except in the absence of the median dark spot on the thorax. It was small, 7.2 mm., but some *bicolor* specimens are only 7 mm. In a series of *bicolor* there are all gradations in size and also in the size of the thoracic spot, and *apiciventris* is almost certainly *bicolor*. The only other species with six-segmented antennae is *convexicollis*, which differs by having the front coxae, mesosternum, metasternum, and abdomen piceous, no median spot on the thorax, and antennal club segments strongly dilated to the inner side.

BIOLOGY: Blatchley (1910, p. 542) stated that adults were found on pale Indian plaintain (*Mesadenia atriplicifolia*), and the larvae live in the stems. One of the specimens in the United States National Museum, taken by Mr. Barber, was reared from larvae found also in this plant; it has a beautiful clear yellow thorax with a diamond-shaped median dark spot. Eleven other specimens were found in stems of *atriplicifolia*, and a number of adults were taken from *M. tuberosa*. Adults

have been taken also sweeping weeds.

Chittenden (1904, p. 28) also found adults on pale Indian plaintain in Maryland in June. He said every plant had a pair of beetles at the summit, that the leaves were much eaten, and the stems showed that eggs had been laid. By the first week in September he found pupae and beetles, four or five individuals in each stem. Except for the fact that galls often developed from the work of the larvae, he said there seemed to be no decrease in the vitality of the plants.

This insect has been taken in Alabama on dandelion (*Taraxacum*).

SEASON: April to August.

Languria convexicollis Horn

Languria convexicollis HORN, 1868, Trans. Amer. Ent. Soc., vol. 2, p. 140. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 351. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199; 1918, *ibid.*, vol. 26, p. 211. CASEY, 1924, Memoirs on the Coleoptera, vol. 11, p. 177.

Languria interstitialis CASEY, 1916, Memoirs on the Coleoptera, vol. 7, p. 148; 1924, *op. cit.*, vol. 11, p. 177.

Large, robust; antennal club six-segmented; head piceous or piceous and red; thorax spotless; legs, area on each side of front coxae, mesosternum, metasternum, and abdomen piceous.

Head piceous, or red bordered with piceous, or piceous and red; antennae with club six-segmented, emerging sometimes abruptly from stem, sometimes more gradually, segments broader than long, strongly dilated to inner side, the club one and one-quarter times longer than the stem; thorax without median dark spot, often margined with piceous at base and apex; elytra with apices evenly rounded; femora, tibiae, tarsi piceous; under surface of thorax red, tip of prosternal process, area near front coxae, and all the rest piceous. Length 9–11½ mm.

Punctuation: Clypeus deeply, densely; head not so deeply; thorax, prosternum, metasternum, abdomen shallowly, sparsely; metasternum and often pro-episternum almost smooth; elytra with interspaces sometimes flat and with small punctures, sometimes so creased that punctures can hardly be seen, sometimes with large irregular punctures; meta-episternum with deep, elongate impressions.

TYPE LOCALITY: Owen's Valley, California.

DISTRIBUTION: California, Arizona, Utah, and British Columbia.

SPECIMENS EXAMINED: Total, 59: California, 38; Utah, 13; Arizona, five; British Columbia, three.

DISCUSSION: This species is quite variable in coloration, punctuation of the elytra, and in the size of the sixth antennal segment (the first segment of the club). Its geographical range includes the range described by Casey for *interstitialis*, which seems to be the same species, as the above characters intergrade. The type of *interstitialis*, from Nephi, Utah, has the sixth segment of the antennae but little wider than long, thus making the club emerge more gradually from the stem, while the *convexicollis* type from Owen's Valley, California, has this segment twice as wide as long, with the club emerging abruptly from the stem. The elytral interspaces are so creased and uneven in the *interstitialis* type that the punctures are barely visible; in *convexicollis* the small punctures in the interspaces are clearly visible on the flat surface. Other specimens have been seen, however, with the elytra of *convexicollis* and the antennae of *interstitialis* and vice versa; and Schaeffer (1918, p. 211) said that in large series, *convexicollis* has the elytra sometimes smooth and sometimes creased and that the creases obscure the punctuation. He claimed also that the difference in the size of the antennal segments was sexual, the small sixth segment belonging to the female.

The color differences given by Casey for *interstitialis* prove also variable in *convexicollis*. Thus the head in the latter has been described as "black, brownish between the eyes" (Horn, 1868); "between eyes and thorax red" (Crotch, 1873); "head reddish" (Schaeffer, 1904). The dark margins at the base of the thorax (not present in the type of *interstitialis*) range all the way from a heavy piceous line to one so faint that it might be taken for just a darker red than the rest of the thorax. Horn described *convexicollis* from one specimen only; thus he did not record variations in color.

This species resembles *bicolor* in the six-segmented antennal club and large size, but can readily be told from it by the piceous coxae, mesosternum, metasternum, and ab-

domen. Differs from others of the genus by the six-segmented club.

BIOLOGY: At the United States National Museum there are 21 specimens from San Bernardino County, California, labeled "borer in *Argemone platyceros*, var. *hispida*" (prickly poppy).

SEASON: May to August.

Languria discoidea LeConte

Languria discoidea LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 160. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 350. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199. BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, p. 541. WATSON, 1921, Florida Ent., vol. 4, p. 40 (biol.).

Small to medium; antennal club five-segmented, emerging gradually from stem; head red; thorax with median dark spot; abdomen with last one and one-half to three (usually two) segments piceous. Alutaceous.

Head red; antennae with club five-segmented, emerging gradually from stem, segments broader than long, not much dilated to inner side; thorax alutaceous, with median dark spot spreading from apex to behind middle; elytra alutaceous, with apices evenly rounded or sometimes slightly sinuate, "blue-black" (LeConte, 1854); femora red basally, piceous apically, tibiae and tarsi piceous; under surface red with last one and one-half to three (usually last two) segments piceous. Length 5½–10 mm.

Punctuation: Thorax, prosternum, abdomen shallowly, sparsely, prosternum on some almost impunctate; head, clypeus a little more deeply; elytra with only occasional punctures between striae.

TYPE LOCALITY: Georgia.

DISTRIBUTION: Florida, Georgia, South Carolina; "southern states" (Blatchley, 1910).

SPECIMENS EXAMINED: Total, 66: Florida 57; Georgia, eight; South Carolina, one.

DISCUSSION: The spot on the thorax is rarely as small as in *bicolor;* it is elongate, diamond shaped, arrowhead shaped, or of no especial shape. It is not situated in the center of the thorax, but usually extends down from the apex. A specimen from Allen River and most of a series of 20 taken by Mr. L. Lacey in Ponte Vedra, Florida, have the elytral apices slightly sinuate, ending at the sutural angle with a tiny tooth as in *denticulata.*

LeConte (1854, p. 160) said that this species "resembles *puncticollis*, but is longer and narrower." The latter is a synonym of *bicolor*, and *bicolor* and *discoidea* could not well be confused. Crotch (1873, p. 350) found it "very close to *mozardi*," differing only in the longer thorax, which is less rounded at the sides, and the presence of a thoracic spot. It can be further told from *mozardi* by its less convex thorax, less shiny appearance, greater amount of piceous on the legs, and generally larger size. Differs from *denticulata* in having a median dark spot on the thorax and having more than one abdominal segment piceous.

BIOLOGY: All the Ponte Vedra specimens were beaten from thistles in March; others were taken on garden vegetables—beans, potato, corn, tomato, mustard, turnip, squash, and celery.

Watson (1921, p. 40) recorded an observation by John Beach, nurseryman, of West Palm Beach, Florida, that *discoidea* adults live on sago palms, eating the young shoots and even nibbling at the old leaves. He told of a group of such palms which were ruined by all the buds having been killed. The beetles then attacked and killed the buds of *Washingtonias*, *Arecas*, *Kentias*, *Phoenix*, and *Pandanua.*

Schwarz (1878a, p. 445) said *discoidea* was not rare in Florida and that it lives on a species of *Carduus* (thistle).

SEASON: January to May.

Languria denticulata Schaeffer

Languria apicalis SCHAEFFER (*nec* Motschulsky), 1904, Jour. New York Ent. Soc., vol. 12, p. 198.

Languria denticulata SCHAEFFER, 1918, Jour. New York Ent. Soc., vol. 26, p. 211 [new name for *apicalis* Schaeffer].

Medium sized; antennal club five-segmented, emerging gradually from stem; head red; thorax spotless; abdomen with last segment piceous; elytral apices sinuate.

Head red; antennae with some basal segments usually red, club five-segmented, emerging gradually from stem, segments broader than long, not much dilated to inner side; thorax without median dark spot; scutellum often red; elytra "metallic green" (Schaeffer, 1904), with apices sinuate and

with a tooth at sutural angle; femora red at base, piceous at apex, tibiae and tarsi piceous, "metallic green" (Schaeffer, 1904); under surface red, last abdominal segment piceous. Length 8–10 mm.

Punctuation: Head, thorax, abdomen shallowly, sparsely; prosternum, metasternum a little deeper, sparsely; elytra with scattered punctures between the striae.

TYPE LOCALITY: Brownsville, Texas.

DISTRIBUTION: Brownsville, Texas.

SPECIMENS EXAMINED: Total, 22, all from Brownsville, Texas, including the type (U.S.N.M. No. 8156).

DISCUSSION: Schaeffer (1904, p. 198) said *denticulata* "is very distinct from any of the described species by the sinuate elytral apices." A number of specimens of *L. discoidea*, however, have this same character, although other *discoidea* do not have it. The sinuation on the type of *denticulata* is more marked than on any other specimens seen of either species.

This species resembles *mozardi* but is longer and with the apex of the elytra sinuate instead of smooth and evenly rounded. Also differs from it and *discoidea* in having only the last abdominal segment piceous. *L. discoidea* differs from both *denticulata* and *mozardi* in having a median dark spot on the thorax and in being alutaceous. All three species have the head red.

BIOLOGY: Adults have been taken on hubam clover and English pea.

SEASON: January to September.

Languria mozardi Latreille

Languria mozardi LATREILLE, 1807, Genera crustaceorum et insectorum, vol. 3, p. 66. LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 161. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 349. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199. BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, p. 541, fig. 202. WILDERMUTH AND GATES, 1920, Bull. U. S. Dept. Agr., no. 889, pp. 1–25, figs. 1–6, pl. 1.

Languria apicalis MOTSCHULSKY, 1860, *in* Schrenck, P. L., Reisen und Forschungen im Amur-Lande, vol. 2, no. 2, p. 241.

Small; antennal club five-segmented, emerging gradually from stem; head red; thorax spotless; abdomen with last three (sometimes last two) segments piceous.

Head red; antennae red or piceous, club five-segmented, emerging gradually from stem, segments broader than long, not much dilated to inner side; thorax without median dark spot; scutellum usually red; elytra with apices evenly rounded; femora red at base, piceous at apex, tibiae and tarsi brown; under surface red with last three, sometimes last two or two and one-half, abdominal segments piceous. Length 4–9 mm.

Punctuation: Head, thorax, prosternum, metasternum, abdomen shallowly; clypeus sometimes more deeply and densely; elytra with a few punctures between the deeply punctured striae.

TYPE LOCALITY: "America boreali."

DISTRIBUTION: "Practically all of the United States as well as parts of Canada and northern Mexico" (Wildermuth and Gates, 1920).

SPECIMENS EXAMINED: Total, 823, from 29 states.

DISCUSSION: This is the commonest and most widespread of all North American Languriidae. It is the only one with a common name, the clover stem borer, and the only one that has been studied thoroughly. For a species so far ranging, it varies little, except in size, and in the amount of piceous on the abdomen. But neither of these characters seems to correlate with geographical distribution. The majority of specimens have the last three abdominal segments piceous (instead of the last two), 152 of 170 being so marked, and most *mozardi* are 5–7 mm. long.

A few specimens examined from the west (Texas, Utah, and Arizona) are rather more deeply punctured above and below and the legs have slightly more piceous on them than usual, but sufficient numbers of these have not been seen to make significant comparisons.

No secondary sexual differences could be found in *mozardi*.

The description of *Languria apicalis* Motschulsky, from Pennsylvania, applies as well to *mozardi*. Crotch (1873, p. 350) listed it as =*L. mozardi* var. *minor*, without any description.

This species can be told from *discoidea* by the lack of the median dark spot on the thorax, by the shining, not alutaceous, thorax and elytra, and generally smaller size; from *denticulata* by the smooth, not sinuate,

elytral apices and by the presence of more than one piceous abdominal segment; from *californica* by the lack of all piceous abdomen and by the shallower punctuation on the under surface, especially on the metasternum; from *laeta* by the gradual, not abrupt, emergence of the antennal club from the stem, by the lack of all piceous abdomen, and by smaller size.

BIOLOGY: While the majority of Languriidae confine their breeding activities to plants not useful to man, *mozardi* bores in the stems of red clover (*Trifolium pratense*) in the east and southeast and of alfalfa (*Medicago sativa*) in the southwest to such an extent that it is considered an economic pest where these crops are grown. Wildermuth and Gates (1920) have given a very complete account of the life history of, and other facts on, *mozardi* in their study of three generations of this insect in the southwest. Except where otherwise stated, the following information has been taken from their work.

Sometimes as high as 85 per cent of the alfalfa stalks in a field are affected so that they are woody and of poor quality. The infestation is much lower for clover in the southeast (41 per cent; Folsom, 1909) because in the southeast there is only one generation a year. It is the second and third generations that do the damage in alfalfa regions as the first generation confines itself to yellow sweet clover, which is not of value to man.

Sixty days is the average time for the complete life cycle in the southwest; 49 days average for the stages of egg, larva, and pupa. Eggs are laid in late March or April and adults emerge the end of May. In the southeast the eggs are laid near the end of June, the adults coming out from the beginning of August to the middle of September (Folsom, 1909).

Some authors have said the adult *mozardi* attacks older stems of alfalfa, but Wildermuth and Gates found that they chose young stems 8 to 10 inches high. The female prepares a hole with her jaws (Girault, 1907), then turns around and fits her abdomen into the hole, placing the egg in the cavity. The egg is slender, yellowish, about 1.7 mm. long, rounded at both ends, and somewhat curved (Comstock, 1879). There seems to be disagreement as to the number of eggs deposited in the same hole or the same stem; Girault reported his insect as depositing 15 eggs in the same hole in the stem of a *Leucanthemum*, June 23, 1903, Blacksburg, Virginia; Wildermuth and Gates never saw more than one egg to a hole and usually only one egg to a stem in alfalfa.

The larvae are very active, working up and down within the stem as they feed on the pith. After each of its four molts, the larva eats its cast skin. When full grown it is about 8 mm. long, yellow, with six thoracic legs and pro-leg at end, the last segment having two spines sticking up. The pupae are as active as the larvae, wriggling up and down their ten-inch cell. Comstock (1879, p. 199) described the pupa as being 6 mm. long, slender, yellow, with a big head. The one figured (fig. 2) is 9 mm.

On reaching adulthood, the insect remains in the stem only a few days if the weather is hot, several weeks if it is colder, before eating its way out. At this time it is light in color, with whitish yellow elytra, light orange head and thorax, black eyes and antennae. In four or five hours the elytra become darkened and the head and thorax change to dark orange, then to red. The adults feed mainly on pollen, but they also eat the leaves of their host plant and feed at the oviposition hole. They feed at early morning hours, avoiding high temperatures and strong sunlight. They lay eggs late in the evening.

The larvae and pupae have been found in the stems of many other plants besides alfalfa and clover. The larval food plants are mostly members of the Compositae family. Following is a list of those known (Blatchley, 1910; Chittenden, 1890, 1904; Comstock, 1879; Girault, 1907; Webster, 1888; Weed, 1890; Wildermuth and Gates, 1920):

COMPOSITAE

Sunflower (*Helianthus annuus*)
Burdock (*Arctium minus*)
Wild lettuce (*Lactuca canadensis*)
Thistle (*Cnicus altissimus*)
Cone flower (*Rudbeckia laciniata*)
Canadian fleabane (*Erigeron canadense*)
Pink fleabane (*E. philadelphicus*)
Daisy fleabane (*E. ramosus* or *strigosus*)
Yarrow (*Achillea millefolium*)
Joe-Pye weed (*Eupatorium purpureum*)

Thoroughwort or boneset (*E. perfoliatum*)
Ragweed (*Ambrosia trifida*)
Daisy (*Leucanthemum*)

LEGUMINOSAE

Red clover (*Trifolium pratense*)
Alfalfa (*Medicago sativa*)
Yellow sweet clover (*Melilotus officinalis*)
White sweet clover (*M. alba*)
Bur clover (*M. hispida*)

MALVACEAE

Malva rotundifolia

CAMPANULACEAE

Tall bellflower (*Campanula americana*)

Wheat grass (*Agropyron* sp.?)
Marsh grass (*Spartina michauxiana* and *cynosuroides*)
Timothy (*Phleum pratense*)
Tall nettle (*Urtica gracilis*)
Common nettle (*U. dioica*)

In addition to the above, larvae have been found in the stems of black-eyed pea in October and May, and in turnip in Texas in November. In South Carolina, in November, an adult was found dead in the erect stem of soybean, and in December one was taken in the soil near a cabbage plant. (Data from specimens in the United States National Museum.)

Adults were seen by Wildermuth and Gates feeding in the flowers of alfalfa, yellow sweet clover, red clover, sunflower, prickly lettuce, and in wild barley, wheat heads, and corn silk. The Illinois Natural History Survey kept records of their specimens; some of these were collected in early spring under boards, sweeping clover, on white clover; in May from freshly plowed sod and sweeping wheat; in June from clover fields, sweeping woods, on spinach leaves; in July sweeping clover already cut; in August sweeping along roadsides. Adult specimens in the United States National Museum were taken on a wide variety of garden vegetables, also on cut flowers, in cotton gin trash, and in turnip root. These insects hibernate either as larvae or adults. In the latter case they hide under stones, leaves, sticks, fence rows, and hedges, in wheat stacks, or in grass.

A number of parasites of *mozardi* have been mentioned in the literature. Comstock (1879, p. 199) found a chalcid and an ichneumonid in the burrows of *mozardi*, and Chittenden (1904, p. 28) names a chalcid found as *Habrocytus languriae*. Hopkins (1891, 1892) gives some lists of various parasites, including *Macroteleia floridana* Ashmead, taken from stems of timothy infested with larvae of *Languria*, and *Caenophanes languriae* Ashmead, taken from cocoons in the stems of *Ambrosia trifida* and *A. artemisaefolia*, containing larvae of *Languria* (?).

SEASON: February to November.

Languria laeta LeConte

Languria laeta LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 159. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 349. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199. CHITTENDEN, 1904, Jour. New York Ent. Soc., vol. 12, p. 28 (biol.). ARROW, 1925, Fauna of British India, p. 10 (biol.).

Large, robust; antennal club five-segmented, emerging abruptly from stem; head red; thorax spotless; area near front coxae, mesosternum, metasternum, abdomen, and legs piceous. Punctuation below shallow and sparse.

Head red; antennae with club five-segmented, widening abruptly from stem, club segments broader than long, much dilated to inner side; thorax without median dark spot, light or dark red, "bright rufous" (LeConte, 1854); elytra with apices evenly rounded; femora, tibiae, tarsi piceous; under surface of thorax red except for part of prosternal process, front coxae, or area near coxae, which parts are piceous, the rest piceous. Length 8–11 mm.

Punctuation: Clypeus deeply, densely; head, thorax, prosternum, metasternum, abdomen shallowly, sparsely, but head sometimes more deeply; pro-episternum almost smooth; elytra with scattered punctures between the striae; meta-episternum with a few elongate impressions.

TYPE LOCALITY: Kansas River.

DISTRIBUTION: Nebraska, Kansas, Missouri, Colorado, and Texas; also Mexico.

SPECIMENS EXAMINED: Total, 140: Texas, 88; Colorado, 44; Nebraska, three; Kansas and Missouri, one each; Mexico, three.

DISCUSSION: Though the majority of specimens examined were from Texas, all those in the American Museum (24) are from

Colorado. Ten of these, taken in July, have the thorax pale yellow and the elytra, mesosternum, metasternum, and abdomen a lighter piceous than usual; they look brown to the naked eye. The other 14, taken in June, July, and August, at an altitude of 5500 to 7000 feet, are much darker, the thorax a dark red, the elytra almost black. Both light and dark specimens have also been seen from Texas.

This species may be told from *convexicollis* by the five-segmented antennal club, the entirely red head, the absence of piceous on the thorax, and the more regular punctures in the elytral interspaces. Differs from *mozardi* in that antennal club emerges abruptly from the stem, with the segments wider and strongly dilated to the inner side, and in the piceous legs, mesosternum, metasternum, and abdomen.[1]

BIOLOGY: Chittenden (1904, p. 28) reported that both larvae and adults were taken in the stems of nightshade (*Datura*) at Hearne, Texas, August 6. All stages have been found on prickly poppy (*Argemone platyceros*) in Texas (Arrow, 1925), which is also the food plant of *convexicollis*.

SEASON: May to August.

Languria irregularis Casey

Languria irregularis CASEY, 1916, Memoirs on the Coleoptera, vol. 7, p. 149.

Small; antennal club five-segmented, emerging abruptly from stem, antennae with some or all segments red; head, last two abdominal segments piceous; thorax spotless; legs, metasternum red; elytra unicolorous, with large irregular punctures.

Head piceous; antennae with club five-segmented, widening abruptly from stem, segments broader than long, dilated towards inner side, but not always so markedly as in *marginipennis* and *angustata*, first six segments red, club red or piceous; thorax without median dark spot; scutellum generally red; elytra blue to naked eye, actually piceous, apices evenly rounded; reflexed elytral margins entirely piceous; femora, tibiae, tarsi red; under surface red with last two abdominal segments piceous. Length 6.8–8 mm.

Punctuation: Head, thorax, prosternum, metasternum, abdomen sparsely, shallowly; elytra with deep, large, irregular punctures especially at base, elytral interspaces transversely creased and with small, shallow punctures.

TYPE LOCALITY: Puente de Ixtla, Morelos, Mexico.

DISTRIBUTION: Arizona; Morelos, Mexico.

SPECIMENS EXAMINED: Two, both from Arizona.

DISCUSSION: The specimens seen come from the collection of Mr. Alan S. Nicolay and represent the first record of this species in the United States. Casey (1916, p. 149) said it was "a very distinct species that can be compared only with *cyanipennis* Cr. [Mexico], and from this it differs in its much smaller size, very much coarser, more widely and irregularly spaced serial punctures and wholly pale legs." *L. cyanipennis* also differs in its red head and in having only the last abdominal segment piceous.

Languria irregularis may be distinguished from all other species by the large, irregular elytral punctures and blue sheen on the elytra. It resembles *trifasciata* in the form of the antennae and in having entirely red legs and black head, but *irregularis* has no red band across the elytra, is broader and more robust, and has less pointed elytral apices. It is similar in general shape and convexity and in the shape of the elytral apices to *mozardi* and *californica*, differing from them in antennae, punctuation, and color.

Languria trifasciata Say

Languria trifasciata SAY, 1823, Jour. Acad. Nat. Sci. Philadelphia, vol. 3, p. 462. LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 159. CHITTENDEN, 1904, Jour. New York Ent. Soc., vol. 12, p. 28 (biol.). SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199; 1905, Mus. Brooklyn Inst., Sci. Bull. no. 1, p. 126. BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, p. 543.

Languria angustata var. *trifasciata* CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 350. ULKE, 1902, Proc. U. S. Natl. Mus., no. 25, p. 16.

Small; antennal club five-segmented,

[1] The original description of *L. sanguinicollis* Chevrolat (1834, fasc. 3) matches *laeta*, but since the type locality of *sanguinicollis* is in Mexico (Tuxpan, Orizaba, Vera Cruz) and no specimens have been examined, it is best for the present to omit it. *L. sanguinicollis* appears in Leng's "Catalogue" (1920, p. 200) under the genus *Acropteroxys*, which is an error. For some reason it does not appear at all in Junk's "Catalogue."

emerging abruptly from stem, antennae with some or all segments red; head, last two abdominal segments piceous; thorax spotless; legs, metasternum red; elytra with red band across middle third; reflexed elytral margins red at middle only.

Head piceous; antennae with club five-segmented, widening abruptly from stem, segments broader than long, dilated towards inner side but not always so markedly as in *marginipennis* and *angustata*, segments 3–6 (sometimes segments 4–6 or all segments) red; thorax without median dark spot; elytra with red band across middle third, apices generally pointed; reflexed elytral margins red at middle only; femora, tibiae, tarsi red, the tarsi somewhat darker red; under surface red with last two abdominal segments and sometimes part of third piceous. Length 5–9½ mm.

Punctuation: Head, clypeus densely, shallowly; prosternum deeply, irregularly (some more so than others); thorax, metasternum, abdomen shallowly, some with metasternum more deeply towards front; thorax deeply and densely along base; elytra with scattered shallow punctures between striae.

TYPE LOCALITY: Miss. [Mississippi].

DISTRIBUTION: Atlantic states from New York south, except Georgia and Florida, west to Minnesota, Nebraska, Kansas, Texas; "western states" (LeConte, 1854).

SPECIMENS EXAMINED: Total, 137: Illinois, 22; Virginia, 22; Iowa, 20; Ohio, 11; District of Columbia, nine; Pennsylvania, eight; New Jersey, eight; Maryland, seven; Missouri, five; Indiana, four; Kansas and North Carolina, three each; Kentucky, two; New York, South Carolina, Louisiana, Texas, Mississippi, Nebraska, Michigan, Minnesota, one each; without locality labels, five.

DISCUSSION: Schenkling (1928, p. 30) put this species under the genus *Acropteroxys*, and Leng and Mutchler (1933, p. 33) evidently followed Schenkling. This transference is an error and must be due to a misinterpretation of a discussion of that genus by Schaeffer (1905, p. 125). Schaeffer began by saying that *Acropteroxys* is based mainly on the pointed elytral apices, prosternum truncate behind, and the absence of ocular striae. He continued, "In [*Acropteroxys*] *gracilis* the shape of the apices is variable, in *Languria trifasciata* they are more pointed than in certain specimens of *gracilis* but the truncate prosternum and the absence of ocular striolae are good characters which will readily separate *Acropteroxys* from *Languria*." It can be seen from the above that he does not call *trifasciata* an *Acropteroxys* but merely says it has more pointed apices than another member of that genus. The apices in *trifasciata* are not depressed before the tip as in *Acropteroxys* nor do they have a fringe of hairs. In addition, *trifasciata* could not belong to that genus because it has the ocular striae of *Languria*.

Although Crotch (1873, p. 350) and Ulke (1902, p. 16) listed *trifasciata* as a color variety of *angustata*, it is quite different from that species. It differs not only in color (the base of the antennae, the legs, and metasternum being red in *trifasciata*), but it has the thorax more convex, is a more narrow insect with the elytral apices more pointed, and is slightly more deeply punctured on the abdomen. Schaeffer (1904, p. 199) and Blatchley (1910, p. 543) both regarded it as a species. Superficially it resembles those *angustata* with the red band, but the above differences should readily distinguish it. Differs from *marginipennis* in the red antennal segments, legs, metasternum, and episternum, in the last two segments of the abdomen being piceous, and in the red elytral band. It is also smaller and more pointed. Distinguished from *irregularis* by the red elytral band, more pointed elytral apices, and smaller elytral punctures.

BIOLOGY: According to Chittenden (1904, p. 28) *trifasciata* develops in wild lettuce (*Lactuca canadensis*), with oviposition occurring from the middle of June to July 1. He said that in August near Washington, D. C., it can be found in all three stages within the stems and that the mature insect, in emerging, may cut through anywhere on the stem. Blatchley stated that it "occurs especially in the foliage of Wild Lettuce" and also on buttercup (*Ranunculus*).

SEASON: March to July.

Languria collaris LeConte

Languria collaris LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 159. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 351. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 200.

Languria femoralis MOTSCHULSKY, 1860, *in* Schrenck, P. L., Reisen und Forschungen im Amur-Lande, vol. 2, no. 2, p. 242. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 351.

Large, narrow; antennal club five-segmented, emerging abruptly from stem; thorax spotless; head, legs, mesosternum, metasternum, abdomen piceous.

Head piceous; antennae with club five-segmented, widening abruptly from stem, club segments broader than long, much dilated to inner side; thorax without median dark spot; elytra with apices evenly rounded; femora, tibiae, tarsi piceous; under surface of thorax red, the rest piceous. Length .32 (LeConte).

Punctuation: Clypeus, head, thorax, prosternum, metasternum, abdomen shallowly, sparsely; elytra with occasional punctures between the striae.

TYPE LOCALITY: Georgia.

DISTRIBUTION: Georgia, Louisiana (New Orleans).

SPECIMENS EXAMINED: None.

DISCUSSION: The status of this species is uncertain. It evidently has not been taken since its author described it. Schaeffer (1904, p. 200) had not seen it and it was not represented in any of the collections examined for this paper. Crotch (1873, p. 351) may have had a specimen or he may have merely redescribed LeConte's type. According to comparative notes taken on the type, however, it seems to be distinct. It resembles *trifasciata* in the narrow pointed form and in the shape of the thorax, but the thorax is even more elongate than in *trifasciata;* it is nearly one-half longer than wide, more as in the genus *Acropteroxys*, but with the front margin much narrower than the hind margin. The coloration is entirely different from *trifasciata*, *collaris* lacking the red band across the elytra, and having the antennae, legs, metasternum, and reflexed elytral margins piceous instead of red, and the abdomen uniformly piceous instead of red with two segments piceous. Also the head is more sparsely punctured in *collaris*. The piceous abdomen and legs at once differentiate *collaris* from *irregularis*, *angustata*, and *marginipennis*.

Languria femoralis Motschulsky (1860, p. 242), described from New Orleans, had not been seen by any subsequent writers on *Languria*. According to the original description, it matches with *collaris*, not only in the piceous head and abdomen, but in the elongate thorax with its widest part at the hind angles. There is no other known species in the eastern United States with an all-piceous abdomen besides *collaris*, or any with such a long thorax. For these reasons, *femoralis* may be considered synonymous with *collaris*.

Languria angustata (Beauvois)

Trogossita ? angustata BEAUVOIS, 1805, Insectes recueillis en Afrique et en Amérique, p. 125, pl. 32, fig. 2.

Languria angustata, CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 350. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199. BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, p. 542.

Languria pulchra LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 159.

Languria uhlerii HORN, 1862, Proc. Ent. Soc. Philadelphia, vol. 1, p. 188. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 350. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199.

Languria angustata var. *pulchra*, CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 350.

Languria angustata var. *uhlerii*, BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, p. 542.

Small; antennal club five-segmented, emerging abruptly from stem; head, antennae, metasternum (usually), last two abdominal segments piceous; thorax with or without median dark spot; reflexed elytral margins red at middle and apex, the red at the middle passing onto the elytra in a red band, wholly or in part only.

Head piceous; antennae with club five-segmented, widening abruptly from stem, segments broader than long, dilated strongly to inner side, usually with a noticeable gap between the seventh segment and the rest of the club; thorax with or without small median dark spot; elytra with apices slightly truncate or evenly rounded; reflexed elytral margins red at middle, sometimes at apex, but always dark at base, the red at the middle third passing onto the elytra in part or as a complete red band; front femora red at base, piceous at apex, other femora with tips only piceous, tibiae red, tarsi piceous, "black" (Blatchley, 1910); under surface red, with metasternum (sometimes front edge excepted), episternum, often mesosternum

piceous, but these parts sometimes entirely red, last two abdominal segments piceous. Length 6–9 mm.

Punctuation: Head, clypeus densely, shallowly; prosternum deeply, irregularly; thorax, metasternum, abdomen shallowly, sparsely; thorax deeply and densely along base; elytra with some punctures between the striae.

TYPE LOCALITY: "Caroline du Sud."

DISTRIBUTION: Atlantic coastal states from New York south to South Carolina, west to Iowa, also Alabama, Mississippi, Louisiana, and Texas.

SPECIMENS EXAMINED: Total, 82: New Jersey, 28; New York; 23; Illinois and Louisiana, five each; Pennsylvania, District of Columbia, Iowa, three each; Maryland and Virginia, two each; Delaware, North Carolina, Mississippi, Texas, one each; no locality given, four.

DISCUSSION: The coloration of *angustata* varies to such an extent that two color varieties, *pulchra* and *uhlerii*, have been named, both of which were first described as species. These varieties, however, do not differ from *angustata* in any other character but color, and their geographical ranges are the same as in *angustata*, so they will have to be considered synonymous with that species. The variety hitherto known as *pulchra* has the red at the middle of the reflexed elytral margins continuing across the disk of the elytra in an uneven transverse band as in *trifasciata*. LeConte, in his original description (1854, p. 159), stated that it resembled *trifasciata*, but differed from it in that the antennae, metasternum, and part of the legs were dark, whereas they are red in the latter. The red band is also not so clearly defined as in *trifasciata* nor so uniformly red, and the elytral punctures are often encircled with piceous. The elytra are not so pointed in *angustata*, and the thorax is not so convex. Crotch (1873, p. 350) made *pulchra* a variety of *angustata*.

The variety known as *uhlerii* has no piceous on the metasternum or episternum. Horn, in describing it as a species (1862, p. 188), stated that it resembled *mozardi* but was more elongate and with a less convex thorax. He thought it might prove to be a variety of *trifasciata*, but Crotch (1873, p. 350) made it synonymous with *angustata*, listing *trifasciata* and *pulchra* as varieties. Schaeffer (1904, p. 199) returned it and *trifasciata* to species rank. Blatchley (1910, p. 542) listed it as a color variety of *angustata*, calling it "scarce" in Indiana.

Of the 82 specimens of *angustata* examined, 21 have the entirely red metasternum of *uhlerii* and 13 the red band of *pulchra*, but others have the red extending onto the elytra in varying degrees. The specimens with the red band further vary below, the dark area on the metasternum sometimes covering also the hind coxae, sometimes going over to the mesosternum, entirely or in part.

This insect is very variable and when more specimens are available may yet be found to include *marginipennis*, but the reflexed elytral margins in *angustata* are red at the middle or at the middle and apex, never at the base; it is smaller than *marginipennis*, the thorax is shorter and more yellow, and the last two abdominal segments are piceous. It differs from *trifasciata* as stated above.

BIOLOGY: Blatchley (*loc. cit.*) took specimens from the flowers of *Ranunculus* and goldenrod. Some specimens in the United States National Museum were found on chard and parsley; a specimen from Muncie, Illinois, was taken August 20 in a cat-tail bog.

SEASON: March to October.

Languria marginipennis Schwarz

Languria marginipennis SCHWARZ, 1878, Proc. Amer. Phil. Soc., vol. 17, p. 357. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 200.

Medium sized; antennal club five-segmented, emerging abruptly from stem; head, antennae, metasternum, last abdominal segment piceous; thorax with or without median dark spot; reflexed elytral margins red from base to apex. Elytra unicolorous.

Head piceous; antennae with club five-segmented, widening abruptly from stem, segments broader than long, dilated strongly towards inner side, usually with a noticeable gap between the seventh segment and the rest of the club; thorax usually with tiny median dark spot, sometimes none at all; elytra with apices evenly rounded to truncate, sometimes slightly sinuate, "green-blue or blue" (Schwarz, 1878a); reflexed elytral margins red from base to apex; femora red

basally, piceous apically, tibiae piceous or piceous and red, tarsi red or brown, "most of tibiae and tarsi blackish-green" (Schwarz, 1878a); under surface red, with metasternum and episternum piceous or "blue" (Schwarz, 1878a), except front margins on both, which are red, last abdominal segment piceous, sometimes red at base. Length 7–9½ mm.

Punctuation: Head, clypeus densely, shallowly; prosternum deeply, irregularly; thorax, metasternum, abdomen shallowly, sparsely; thorax deeply and densely along base; elytra with small punctures between the strongly punctured striae.

TYPE LOCALITY: Florida (Fort Capron, Tampa, Enterprise, Cedar Keys).

DISTRIBUTION: Florida, Louisiana.

SPECIMENS EXAMINED: Total, 102: Florida, 99; Louisiana (New Orleans, Myrtle Grove), two; Pennsylvania (probably wrongly labeled), one. Five paratypes (U.S.N.M. No. 4506) are included in the above total.

DISCUSSION: Both Schwarz (1878a, p. 357) and Schaeffer (1904, p. 200) say the thorax has a median dark spot, but, although the majority of specimens examined have it, some do not, or it is so faint as not to be seen. The dark area on the metasternum is quite variable, sometimes extending farther towards the front. The red on the reflexed elytral margins does not generally pass over onto the elytra at the middle third so as to be visible from above as in *angustata*, but occasionally it does. One of the specimens in the American Museum collection from Lake Worth, Florida, has the apex of the elytra sinuate, almost jagged, somewhat as in *denticulata* and some *discoidea*. The paratypes of *marginipennis*, however, have the apices non-sinuate, but other specimens in the United States National Museum have them either non-sinuate or sinuate as described above, with also a little tooth on the sutural angle.

Schwarz called *marginipennis* "very rare," but the 90 specimens in the United States National Museum seem to belie this. There have been far fewer specimens seen of *taedata*, *erythrocephala*, *discoidea*, *denticulata*, and *californica*.

Languria marginipennis, *angustata*, and to a lesser extent *trifasciata* and *irregularis*, have the segments of the antennal club much dilated to one side with usually a definite space between the first and second club segments (fig. 2). They all have the head piceous, and the three first-named species have the base of the thorax lined with deeper, larger punctures and the reflexed elytral margins red, wholly or in part. The reflexed elytral margin in *irregularis* is piceous. *L. marginipennis* differs from *angustata* in having the reflexed elytral margin entirely red, in being longer and broader, in having the thorax longer and usually much darker red, and the last segment only of the abdomen piceous. It could not be mistaken for *trifasciata*, as the latter has the first antennal segments, metasternum, legs, and elytral band red, and the elytral apices more pointed.

BIOLOGY: The majority of specimens have been collected from January to March from all parts of Florida and they have been found on various garden vegetables and on *Crotolaria spectabilis* and on sugar cane.

SEASON: January to December.

GENUS DASYDACTYLUS GORHAM

Dasydactylus GORHAM, 1887, Biologia Centrali Americana, Coleoptera, vol. 7, p. 14. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 200. FOWLER, 1908, *in* Wytsman, P., Genera insectorum, vol. 78, p. 22.

Head with shallow, sparse punctures; ocular stria deep, close to eye; clypeus small, rectangular, with shallow, sparse punctures; antennae short, reaching to half of thorax, with broad, compact, five-segmented club emerging gradually from stem, club segments only slightly dilated to inner side, last segment rounded; thorax convex, slightly longer than broad, sides subparallel to sinuous, hind angles slightly produced, closely applied to shoulders of elytra, punctuation shallow and sparse; elytra three or more times longer than thorax, rows of punctures distinct, shallow, apices dentate (four to eight small teeth); legs long, slender, front femora hardly swollen at middle, male femora and tibiae with teeth on inner side, tarsi with long hairs and dilated; prosternum shallowly, sparsely punctured; mesosternum short, deeply punctured; metasternum, abdomen almost impunctate, last abdominal segment similar in male and female. Length 5½–10 mm.

GENOTYPE: *Dasydactylus buprestoides* Gorham, 1887, from Cordova, Mexico.

This is principally a Central American genus comprising about 24 species. The only species that has been taken north of Mexico is *cnici* Schaeffer. *Dasydactylus* can be told from allied genera in the United States by the four to eight definite small teeth on the elytral apices and the entirely piceous coloration above and below. The males have a series of teeth on the inner side of the femora and tibiae, and both sexes have large, dilated tarsi with long hairs radiating out from them (the hairs are as long as the width of the tarsi). These two characters are not present in the other genera except in three species of *Languria*.

Gorham allies *Dasydactylus* to the Mexican genera *Goniolanguria* and *Trapezidera*, but in the United States it is closest to *Languria*. *Languria*, moreover, is so variable that nearly every generic character of *Dasydactylus* can be found in some species of *Languria*, although no one species possesses all the characters of *Dasydactylus*. The only character in the above generic description that is not represented in any *Languria* is the dentation of the elytral apices and this character is not invariable in *Dasydactylus*, since four Central American species do not have the apices dentate or sometimes have and sometimes do not.

The genera do, however, prove to be distinct upon examination of the genitalia. The female genitalia are shorter and broader in *Dasydactylus* than in *Languria* and in the male the penis is more compressed laterally, less curved, and the apex is round, not truncate or pointed (fig. 1).

Dasydactylus cnici Schaeffer

Dasydactylus cnici SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 200.

Small, narrow; head, thorax, elytra, and under surface piceous; elytral apices toothed.

Head piceous; antennae with club broad, compact, five-segmented, emerging gradually from stem, the segments broader than long, not much dilated to inner side, the last four segments five or six times broader than the stem segments; thorax piceous, convex; femora, tibiae, tarsi piceous, "green" (Schaeffer, 1904), apex of femora often darker; femora and tibiae in males with tiny teeth on inner side, the front tarsi of both sexes dilated and hairy and larger than the middle or hind tarsi; elytra piceous, "green" (Schaeffer, 1904), with apices depressed before the tip, rounded, and with five to six small teeth; under surface piceous, "reddish with metallic tint" (Schaeffer, 1904), last segment of abdomen darker. Length 5½–10 mm.

Punctuation: Head, clypeus, thorax, prosternum shallowly, sparsely; under surface virtually impunctate except on mesosternum; elytra with rows of shallow punctures, the spaces between the rows also punctured, but these punctures only half the size of the others.

TYPE LOCALITY: Brownsville, Texas.

DISTRIBUTION: Texas; Mexico (Matamoros, Vera Cruz).

SPECIMENS EXAMINED: Total, 170, including six paratypes (U.S.N.M. No. 8157): Brownsville, Texas, 169; San Benito, Texas, one.

DISCUSSION: The teeth on the femora of the males are not in two rows as in some *Languria*, but are placed more at random. There are more noticeable dentations on some males and usually more on the front than on the middle legs. The hairy, dilated tarsi are given by Gorham (1887, p. 14) as male characters, but both sexes in *cnici* have them.

BIOLOGY: Schaeffer calls this insect quite common and found it especially on *Cnicus virginianus*, a thistle. One specimen, collected in November, was taken on *Baccharis*, which is also a composite; others were taken sweeping weeds, in pastures, on potatoes, turnip, and corn.

SEASON: January to December.

GENUS **ACROPTEROXYS** GORHAM

Acropteroxys GORHAM, 1887, Biologia Centrali Americana, Coleoptera, vol. 7, p. 13. SCHAEFFER, 1905, Mus. Brooklyn Inst., Sci. Bull. no. 1, p. 125. FOWLER, 1908, *in* Wytsman, P., Genera insectorum, vol. 78, p. 35. CASEY, 1916, Memoirs on the Coleoptera, vol. 7, p. 150.

Head with punctures shallow or deep, sparse or dense; no ocular stria; clypeus rectangular, trapezoidal, or square, densely or sparsely, and deeply punctured; antennae long, reaching to three-quarters of thorax, with narrow, elongate, five-segmented club

emerging gradually from stem, club segments only slightly dilated to inner side, last segment elongate; thorax rather flat, longer than broad in male, almost square in female, sides subparallel, hind angles sharply produced, punctuation shallow and sparse or deep and dense; elytra nearly four times longer than thorax, rows of punctures distinct, deeply punctured, with some punctures in interspaces, apices pointed, divaricate; legs slender, front femora somewhat swollen at middle, femora and tibiae smooth in both sexes; prosternum shallowly and sparsely, or deeply and densely punctured, prosternal process punctured; mesosternum long, deeply and coarsely punctured; metasternum and abdomen shallowly, sparsely punctured, abdomen with last segment always more deeply punctured, last segment in male emarginate. Length 6–12 mm.

GENOTYPE: *Acropteroxys caudatus* Gorham, 1887, from Yolos, Mexico.

This genus is represented in both the United States and Mexico, with six species in all. It differs from the other genera in the United States by the absence of the stria over the eye and by the acuminate or pointed elytral apices. The latter are separately pointed, slightly separated, and depressed just before the apex which is fringed with short hairs. Under high magnification and in certain specimens the apices seem almost dentate, but this is caused merely by the drawn out point at the insertion of each hair. Other characteristics of the genus are the general depressed form, the rather flat and acutely margined thorax, the general widening of the prosternal process behind the coxae, and the punctuation of the process.

Although the two United States species of *Acropteroxys* were for a long time under the genus *Languria*, they have little in common with that genus except the elongate form and the red and black color pattern. *Acropteroxys* has, on the other hand, many similarities to *Langurites*. In both these genera the eyes are more prominent than in *Languria*, bulging out so as to be wider than the thorax. The antennae are longer and narrower, with the last segment elongate. The antennal club is always five-segmented and only slightly dilated to the inner side. The thorax is proportionately longer than in *Languria*, the hind angles of the thorax in both genera are more acute than in *Languria*, the sides of the thorax almost straight, not sinuate as in most *Languria*, and strongly margined. The elytra are nearly four times longer than the thorax. The femora are thicker and more bulbous; the mesosternum is longer, the distance between the front and middle coxae being about one and one-half times the diameter of the coxae, while in *Languria* this distance is the same as the diameter of the coxae. The last abdominal segment is emarginate in the males, although this is often difficult to see because of the hairs in that region.

The differences between *Acropteroxys* and *Langurites* lie in the ocular stria, the elytral apices, and in the punctuation, which is hardly visible on the head, thorax, elytra, and prosternal process in *Langurites* but is quite deep in *Acropteroxys*.

The male genitalia of these two genera also show their affinity. They are larger, thicker, more cylindrical, more sharply pointed than in *Languria* or *Dasydactylus*, and the dorsal view of the penis presents a definite slit and an opening (fig. 1).

Although data are available on the biology of only one species of *Acropteroxys*, the mode of life is probably the same as in *Languria*, as they breed in the same type of plants. Chittenden (1890, p. 347) found *A. gracilis* and *L. mozardi* together in the stem of ragweed and remarked that the "habits of the two species are very similar, if not identical."

HEAD: Either piceous or piceous with red at the front. Head below usually red, but often mixed with piceous. Punctuation deep and sparse in *lecontei* and shallow and sparse in some *gracilis*, but varies in *gracilis* to deep and dense; often large impunctate areas in both species.

EYES: No ocular stria, but punctures come close to eye.

CLYPEUS: Same color as front of head. Punctuation generally deeper and denser than on head.

ANTENNAE: Piceous. The club is composed of five somewhat triangular segments, the first being intermediate in size between the stem segments and the others of the club; the apical segment is elongate.

THORAX: Red (from yellow red to dark

red) with a median piceous spot in *lecontei;* in *gracilis* either red or piceous with varying piceous marks (stripe part or all the way to apex, basal line only, or whole basal half piceous). Under surface of thorax red or red with piceous marks near the front coxae. Thorax definitely shorter in female *lecontei*, but this sexual difference not so noticeable in *gracilis*. Sides of thorax nearly parallel, sometimes slightly sinuous. Thorax rather flat, acutely margined. Punctuation is usually deep and evenly spaced in both species, though sometimes more sparsely and shallowly.

SCUTELLUM: Piceous. Heart shaped, the point turned downward.

ELYTRA: Piceous. Nine rows of punctures plus a scutellar stria. Interspaces with large deep punctures in *lecontei;* smaller, shallower, fewer punctures in *gracilis*. Elytra three or more times longer than thorax, the sides parallel almost to apical fourth where they bend slightly inward towards apex. Apices more pointed and narrower in *gracilis* than in *lecontei*.

LEGS: Piceous. Femora swollen in the middle; impressed lines present on inner side. Tibiae almost straight with yellow hairs on inner side near apex. First segment on all tarsi definitely the longest.

PROSTERNUM: Entirely red in most *gracilis*, but sometimes with piceous marks on or near front coxae, as is true in all *lecontei*.

MESOSTERNUM: Piceous, occasionally red in front. Always deeply, coarsely punctured.

METASTERNUM: Piceous. Shallowly and sparsely punctured.

META-EPISTERNUM: Piceous, with scattered punctures, sometimes shallow, sometimes deep.

ABDOMEN: Piceous. Punctures shallow and sparse, but deeper and denser on last segment. Last segment in male is emarginate in both species; in female *lecontei* it is covered with long yellow hairs; in female *gracilis* there is a small tuft of dark hairs at the apex of the last segment (this often is worn off).

SIZE: 6 to 12 mm.

GENITALIA: No differences observable between the species.

KEY TO THE SPECIES OF *Acropteroxys*

Thorax red with large oval or round piceous spot that does not attain the sides; elytral interspaces with large, deep punctures; broad, robust; 9–12 mm. . . . . *.lecontei*

Thorax red with variable piceous markings that attain either base or base and apex both, or thorax entirely piceous or entirely red; elytral interspaces with small, shallow punctures; narrow, pointed; 6–12 mm. . *gracilis*

Acropteroxys lecontei (Crotch)

Languria lecontei CROTCH, 1873, Trans. Amer. Ent. Soc. vol. 4, p. 351. SCHAEFFER, 1904, Jour. New York Ent. Soc., vol. 12, p. 199. BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, pp. 542–543.
Acropteroxys lecontei, SCHAEFFER, 1905, Mus. Brooklyn Inst., Sci. Bull. no. 1, p. 126.

Large, robust; head piceous; median piceous spot on thorax not reaching the sides; under surface of thorax red with piceous spot to side of coxae; rest piceous.

Head piceous; antennae long, loose, with narrow, five-segmented club emerging gradually from stem; thorax less than twice as long as wide, sides subparallel, with large median piceous spot; elytra with apices pointed but not so acutely as in most *gracilis*, some slightly sinuate; femora, tibiae, tarsi piceous; under surface of thorax red except for large piceous spot near front coxae, all the rest piceous but females with last abdominal segment covered with long yellow hairs. Last abdominal segment of male emarginate. Length 9–12 mm.

Punctuation: Clypeus densely; head, thorax, prosternum deeply, sparsely, but sometimes more shallowly; metasternum, abdomen shallowly, sparsely; elytra with striae deeply punctured and large deep punctures between the striae.

TYPE LOCALITY: Illinois.

DISTRIBUTION: Atlantic states from Connecticut to West Virginia, west to Nebraska, Kansas, Montana, also Alabama (Loding, 1945).

SPECIMENS EXAMINED: Total, 50: Pennsylvania, 13; Illinois, five; Kansas, four; New York, four; Virginia, four; New Jersey, three; Ohio, two; West Virginia, Maryland, Iowa, Nebraska, Montana, one each.

DISCUSSION: This is a far less common species than *gracilis*. The thorax is almost square in the females and elongate in the males. The female has long, silky, abundant yellow hairs on the last abdominal segment,

while in the male there may be but a few short yellow hairs.

This species can be told from *gracilis* by the large round or oval piceous spot on the thorax not reaching any of the sides. It is longer, broader, more robust than *gracilis* with elytra usually less tapering. The punctures in the interspaces on the elytra are larger and more numerous.

SEASON: March to July.

Acropteroxys gracilis gracilis (Newman)

Languria gracilis NEWMAN, 1838, Ent. Mag., vol. 5, p. 390. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 351. BLATCHLEY, 1910, Coleoptera of Indiana, vol. 1, p. 543, fig. 203.

Acropteroxys gracilis, GORHAM, 1887, Biologia Centrali Americana, Coleoptera, vol. 7, p. 14. SCHAEFFER, 1905, Mus. Brooklyn Inst., Sci. Bull. no. 1, p. 126.

Languria inornata RANDALL, 1838, Boston Jour. Nat. Hist., vol. 2, p. 49. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 351. FOWLER, 1908, *in* Wytsman, P., Genera insectorum, vol. 78, p. 35.

Languria latreillei LECONTE, 1854, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 160. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 351.

Languria obscura MOTSCHULSKY, 1860, *in* Schrenck, P. L., Riesen und Forschungen im Amur-Lande, vol. 2, no. 2, p. 243. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 352.

Languria nigriceps MOTSCHULSKY, 1860, *in* Schrenck, P. L., Reisen und Forschungen im Amur-Lande, vol. 2, no. 2, p. 242. CROTCH, 1873, Trans. Amer. Ent. Soc., vol. 4, p. 352.

Acropteroxys gracilis var. *texana* SCHAEFFER, 1918, Jour. New York Ent. Soc., vol. 26, p. 212.

Medium to large, narrow; head piceous; thorax with piceous longitudinal stripe (this marking variable); under surface of thorax red or red with some piceous, rest of under surface piceous.

Head piceous, sometimes red in front; antennae long, loose, with narrow five-segmented club emerging gradually from stem; thorax almost twice as long as wide, sides subparallel, usually with median piceous stripe going from base to apex or only part way, less commonly, thorax with no markings, or entirely piceous except front angles, or with piceous along the base only, either longitudinally or transversely; elytra with apices pointed, slightly separated, some jagged; femora, tibiae, tarsi piceous; under surface of thorax red or red with piceous on each side of, or below, or on, the front coxae, sometimes also at hind angles; mesosternum red or piceous, the rest piceous, last abdominal segment of male emarginate. Length 6–12 mm.

Punctuation: Head shallowly to deeply, sparsely to densely; clypeus sparsely to densely; thorax, prosternum usually deeply, evenly, sometimes shallowly; metasternum, abdomen, shallowly, sparsely; elytra with deeply punctured striae with small shallow punctures in the interspaces.

TYPE LOCALITY: Mount Pleasant, Ohio.

DISTRIBUTION: Atlantic states south to South Carolina and Louisiana, west to Texas, Kansas, Colorado, New Mexico, Idaho; also Ottawa, Canada; Mexico, Guatemala, British Honduras (Gorham, 1887, p. 14). Intergrades with *divisa* in Brownsville, Texas.

SPECIMENS EXAMINED: Total, 313, from 27 states.

DISCUSSION: This species is almost as wide ranging in the United States as the common *Languria mozardi*, but it varies much more than the latter, not only in color pattern but in punctuation. There are apparently two subspecies, *Acropteroxys gracilis gracilis* and *A. g. divisa*. The typical form of *gracilis* is widespread east of the Mississippi, but occurs also in some western states; the typical form of *divisa* is common in the Huachuca Mountains, Arizona. These two forms intergrade in Brownsville, Texas, and probably also in Colorado and New Mexico. Typical *gracilis* has the thoracic mark longitudinal from base to apex, the prosternum entirely red, and the head shallowly and sparsely punctured. Typical *divisa* has the thoracic mark transverse on the basal half, piceous spots on the prosternum on each side of the coxae, and the head deeply and densely punctured. The intergrading form has either the typical *gracilis* median stripe on the thorax, or this stripe much reduced, or a much reduced transverse mark, the prosternum either clear or with spots, the head either deeply or shallowly punctured. Schaeffer gave the name *gracilis* var. *texana* to one of these, which had the median stripe of *gracilis* and the prosternal markings of *divisa*, but he might just as well have named it as a variety of *divisa*. In any case, since it

is an intergrading form, it is not deserving of a name.

Both *gracilis* and *divisa* present many variations in the thoracic markings. In a series of 25 *divisa* specimens from Arizona these vary from a median stripe only to the basal half piceous; specimens from Arizona and Texas vary from a small piceous mark at the base, sometimes but not always attaining the sides, to a median stripe. In *gracilis*, east of the Mississippi, and also in Texas, the median stripe sometimes does not reach the apex. The median stripe in a few eastern *gracilis* is very wide, covering two-thirds to three-quarters of the thorax. Two examples from New York State and a few from Illinois have the thorax entirely piceous except only the front angles, a form which Gorham described as common in Mexico. Specimens with the thorax completely piceous (*inornata*) have been reported from Canada, Massachusetts, New York, Michigan, and Mexico, and some with the thorax entirely red or red with only a faint suggestion of piceous have been taken in Colorado, Arizona, Texas, and Mexico.

The prosternal markings seem to be constant in *divisa* where they are always present and always dark, but in *gracilis* they may either be absent entirely (which is true in more than two-thirds of the eastern specimens), or they may be barely visible, or light piceous in color, or almost black. They may be present on the coxae only, or as an undefined mark below the coxae, or in the form of a spot on each side of the coxae, with the spot sometimes spreading out to cover the hind angles of the thorax.

The punctuation of the head is also variable. While all Arizona specimens have deeper and denser punctures than does *gracilis*, *gracilis* specimens vary considerably among themselves and in *gracilis* var. *texana* one cotype has the head deeply and densely punctured while the other three do not.

Although *A. g. divisa* was described from Colorado and New Mexico, no specimens have been examined from that area. There is one specimen of *gracilis* labeled "Col." in the United States National Museum, and "*L. gracilis*" was reported in a state list of New Mexico (Snow, 1906). When more specimens from these states become available, intergrading forms similar to those of Texas may be found. Since the typical form of *divisa* is not found outside Arizona, Colorado, and New Mexico and since it has been shown to intergrade with *gracilis* in Brownsville, Texas, and probably in Colorado and New Mexico, it should be considered a subspecies of *gracilis*.

Languria inornata Randall, described from Massachusetts and which has the thorax entirely piceous, was made a color variety by Crotch (1873, p. 350). It is merely an individual variant, occurring sporadically throughout the geographical range of *gracilis*, and is therefore synonymous with it.

Other described species made synonymous by Crotch are *latreillei* LeConte, from middle, southern, and western states, and *obscura* and *nigriceps* Motschulsky from Pennsylvania and Tennessee, respectively.

This species differs from *lecontei* in being narrower and shorter, with more pointed, narrower elytra, and in having fewer, smaller punctures between the elytral striae. The thoracic mark, when present, is never in the center of the thorax as in *lecontei*.

BIOLOGY: Chittenden (1890, p. 347) found a larva of *gracilis* feeding on the dead pith of ragweed (*Ambrosia trifida*) in November, in company with a number of larvae of *L. mozardi*. He found one also in the stems of common nettle (*Urtica dioica*) and on fleabane (*Erigeron*). Blatchley (1910, p. 543) mentioned *gracilis* also as being common on both ragweed and fleabane. A specimen in the United States National Museum collection was reared from the stem of chicory. Adults have been taken on wild rose petals, on Jersey tea, sweeping willows, sweeping clover.

SEASON: January to October.

Acropteroxys gracilis divisa (Horn)

Languria divisa HORN, 1885, Trans. Amer. Ent. Soc., vol. 12, p. 139.

Acropteroxys divisa, SCHAEFFER, 1905, Mus. Brooklyn Inst., Sci. Bull. no. 1, p. 146; 1918, Jour. New York Ent. Soc., vol. 26, p. 211.

Acropteroxys thoracina CASEY, 1916, Memoirs on the Coleoptera, vol. 7, p. 150. SCHAEFFER, 1918, Jour. New York Ent. Soc., vol. 26, p. 211. CASEY, 1924, Memoirs on the Coleoptera, vol. 11, p. 177.

TYPE LOCALITY: "Colorado and New Mexico."

DISTRIBUTION: Arizona, Colorado, New Mexico, Texas.

SPECIMENS EXAMINED: Total, 34: Huachuca Mountains, Arizona, 31; Patagonia, Arizona, three. Intergrades with *gracilis* in Brownsville, Texas.

The characters that separate *divisa* from *gracilis* are: thorax usually with basal half piceous, the line of division between piceous and red sinuate, or straight, or forming an obtuse angle; the piceous prosternal markings always present and well defined; the head more densely and deeply punctured. For discussion, see under *gracilis*.

Acropteroxys thoracina Casey, from the Huachuca Mountains, Arizona, described as having "an irregular median basal spot" on the thorax, does not differ in this respect from other individual variants in the Arizona population of *divisa*. Differences in the shape of the first segment of the antennal club, also mentioned by Casey, are also variable in *divisa*.

GENUS LANGURITES MOTSCHULSKY

Langurites MOTSCHULSKY, 1860, *in* Schrenck, P. L., Reisen und Forschungen im Amur-Lande, vol. 2, no. 2, p. 243. CROTCH, 1875, Cist. Ent., vol. 1, p. 392. GORHAM, 1887, Biologia Centrali Americana, Coleoptera, vol. 7, p. 27. FOWLER, 1908, *in* Wytsman, P., Genera insectorum, vol. 78, p. 27.

Head with shallow, sparse punctures; ocular stria shallow, distant from eye; clypeus rectangular to square, shallowly and sparsely punctured; antennae long, reaching nearly to base of thorax, with narrow, elongate, five-segmented club emerging gradually from stem, club segments only slightly dilated to inner side, last segment elongate; thorax flat or slightly convex, longer than broad, sides subparallel or wider at base, hind angles sharply produced, punctuation shallow and sparse; elytra nearly four times longer than thorax, rows of punctures indistinct, shallow, apices terminating in acute tooth and obliquely incised to suture; legs with front femora much swollen at middle, especially in the males, femora and tibiae smooth in both sexes; prosternum shallowly and sparsely punctured; mesosternum long, deeply punctured; metasternum, abdomen almost impunctate, abdomen with the last segment more deeply punctured, last segment in male emarginate. Length 11–15 mm.

GENOTYPE: *Langurites vitticollis* Motschulsky, 1860, from Mexico.

There are only two species in this genus, *lineatus* Castelnau, ranging from extreme southern United States south to Venezuela and Colombia, and *apiciventris* Casey from Mexico.

Langurites is readily told from other Languriinae by the shape of the elytral apices: the margin of the elytra is evenly rounded to the sutural third where it terminates in an acute tooth, the inner third of the elytral margin being then obliquely incised to the suture, which also terminates in a small tooth. Motschulsky did not further characterize this genus than to mention the long, flat, trapezoidal thorax, widened at the rear, and the obliquely incised elytral apices. In both the widening of the thorax and in the acuteness of the teeth on the apices there is, however, some variation.

The eyes are about as prominent as in *Acropteroxys*, to which genus it is most closely allied. The ocular stria is much farther away from the eye and shallower than in *Languria* and *Dasydactylus* and is shorter in extent. The antennae are narrower, longer, more loosely articulated; the last segment is elongate as in *Acropteroxys*, not rounded as in the other genera, and the club segments are only slightly dilated to the inner side. The thorax also resembles *Acropteroxys* in being flat, but the sides usually diverge from being subparallel and widen towards the base. The prosternal process is widened behind the front coxae as in most *Acropteroxys*, but it is not punctured. The front femora are thicker and more swollen at the middle than in the other genera. As in *Acropteroxys*, the last abdominal segment of the male is emarginate which is not true of *Languria* and *Dasydactylus*. The elytra present a different color pattern from the other genera, having usually both red and piceous, the red occurring in a longitudinal stripe of varying length. *Langurites* has shallower punctuation than any of the others.

Langurites is closest to *Acropteroxys*, not only in external characters but in the genitalia (fig. 1). It differs mainly in the presence

of an ocular stria, in the shape of the elytral apices, and in punctuation.

Langurites lineatus (Castelnau)

Languria lineata CASTELNAU, 1832, Ann. Soc. Ent. France, vol. 1, p. 412.

Langurites lineatus, CROTCH, 1875, Cist. Ent., vol. 1, p. 392. GORHAM, 1887, Biologia Centrali Americana, Coleoptera, vol. 7, p. 27. FOWLER, 1908, *in* Wytsman, P., Genera insectorum, vol. 78, p. 27. CASEY, 1916, Memoirs on the Coleoptera, vol. 7, p. 147.

Languria scapularis CHEVROLAT, 1834, Coléoptères du Mexique, fasc. 3. Vera Cruz.

Langurites vitticollis MOTSCHULSKY, 1860, *in* Schrenck, P. L., Reisen und Forschungen im Amur-Lande, vol. 2, no. 2, p. 243. Mexico.

Langurites vittatus MOTSCHULSKY, 1860, *loc. cit.* Nicaragua.

Langurites infuscatus MOTSCHULSKY, 1860, *loc. cit.* Central America.

Langurites ventralis CROTCH, 1875, Cist. Ent., vol. 1, p. 392. Orizaba.

Langurites superciliatus CASEY, 1916, Memoirs on the Coleoptera, vol. 7, p. 148. LENG, 1920, as *Langurites supercilians* Casey [in error], Catalogue of . . . Coleoptera of America, north of Mexico, p. 201.

Large; head red, often with piceous spot; thorax red with three piceous stripes of varying widths, or thorax all piceous or all red; elytra piceous with red, or all piceous. Elytral apices ending in tooth and obliquely incised to suture.

Head red, with or without small piceous spot on top; antennae with first segment usually red, the rest piceous, with narrow, oosely articulated, five-segmented club emerging gradually from stem, first segment of club hardly larger than last one of stem, segments only slightly dilated to inner side; thorax with sides usually wider at the base, red, with a median and two lateral stripes of varying widths piceous, median stripe sometimes interrupted at middle or either end, sometimes thorax entirely piceous or entirely red; elytra piceous with red spots on shoulders sometimes extending in stripes to apex, or elytra entirely piceous, or piceous with occasional darker areas on scutellum, suture or apex, or elytra mostly red, elytral apices terminating in an acute tooth and obliquely incised to suture where there is a smaller tooth; femora piceous above, red below, or red basally, piceous apically, tibiae red basally, the rest piceous, tarsi piceous; under surface red except for lateral piceous stripes on prosternum and piceous at apex of abdomen, sometimes last two abdominal segments and sides of abdomen piceous. Last abdominal segment of male more coarsely punctured, more hairy, and emarginate. Length 11–15 mm.

Punctuation: Shallowly and sparsely all over except on mesosternum, last abdominal segment and sides of abdomen; elytra with scattered shallow punctures in the interspaces.

TYPE LOCALITY: Colombia, South America.

DISTRIBUTION: Southern Arizona and Florida south to Venezuela and Colombia, excluding the West Indies.

SPECIMENS EXAMINED: Total, nine: Arizona (Nogales and Patagonia), two; Mexico (Lower California, Guerrero, and Tamaulipas), six; Guatemala (Mocá), one. Of these five were males, four females.

DISCUSSION: As can be seen from the synonymy, this is an extremely variable species with many color varieties. The specimens from Arizona are no more consistently colored than those from Mexico. The Mexican specimens come from San José, Lower California, at sea level, up to Amula, Guerrero, at 6000 feet.

SEASON: August to October.

SELECTED BIBLIOGRAPHY

ARROW, G. J.

1925. The fauna of British India. Erotilidae, Languriidae and Endomychidae. London, pp. 1–17, 157–267.

1929a. A revision of the African Coleoptera belonging to the family Languriidae. Proc. Zool. Soc. London, vol. 1, pp. 1–15.

1929b. On the families of Coleoptera related to the Erotylidae, with descriptions of a new family, two new genera, and a few new species. Ann. Mag. Nat. Hist., ser. 10, vol. 4, pp. 305–322.

BEAUVOIS, A. M.

1805. Insectes recueillis en Afrique et en Amérique. Paris, p. 125, pl. 32, fig. 2.

BLACKWELDER, R. E.

1945. Checklist of the coleopterous insects of Mexico, Central America, the West Indies, and South America. Part 3, Languriidae. Bull. U. S. Natl. Mus., no. 185, pp. 425–428.

BLATCHLEY, W. S.

1910. Coleoptera of Indiana. Erotylidae. Indianapolis, Indiana, vol. 1, pp. 539–549, figs. 202–203.

1924. New Coleoptera from southern Florida with notes on other interesting species. Canadian Ent., vol. 56, pp. 164–170.

CASEY, T. L.

1916. Some random studies among the Clavicornia. Erotylidae. Memoirs on the Coleoptera. Lancaster, Pennsylvania, vol. 7, pp. 146–152.

1924. Additions to the known Coleoptera of North America. Erotylidae. Memoirs on the Coleoptera. Lancaster, Pennsylvania, vol. 11, pp. 177–180.

CASTELNAU, F. L. DE LAPORTE

1832. Mémoire sur cinquante espèces nouvelles ou peu connues d'insectes. Ann. Soc. Ent. France, vol. 1, pp. 386–413.

CHEVROLAT, A.

1834. Coléoptères du Mexique. Strasbourg, fasc. 3.

CHITTENDEN, F. H.

1890. Notes on *Languria*. Insect Life, vol. 2, pp. 346–347.

1904. Biologic notes on species of *Languria*. Jour. New York Ent. Soc., vol. 12, pp. 27–30.

COMSTOCK, J. H.

1879. Report of the entomologist. The clover-stem borer. Ann. Rept. Dept. Agr., Washington, pp. 199–200, pl. 1, fig. 6.

CROTCH, G. R.

1873. Synopsis of the Erotylidae of boreal America. Trans. Amer. Ent. Soc., vol. 4, pp. 349–358.

1875. A revision of the coleopterous family Erotylidae. Cist. Ent., vol. 1, pp. 377–561.

DAVIS, C. A.

1904. A check-list of the Coleoptera of R[hode] I[sland]. Bull. Roger Williams Park Mus., no. 1, pp. 10–47.

1919. The beetles of Rhode Island. Park Mus. Bull., vol. 11, nos. 3–4, pp. 113–120.

DRURY, C.

1906. Coleoptera of the Cincinnati region. Jour. Cincinnati Soc. Nat. Hist., vol. 20, no. 7, p. 258.

FABRICIUS, J. C.

1798. Supplementum entomologicae systematicae. Copenhagen, p. 50.

FALL, H. C.

1901. List of the Coleoptera of southern California with notes on habits and distribution and descriptions of new species. Occas. Papers California Acad. Sci., vol. 8, pp. 1–282.

FOLSOM, J. W.

1909. The insect pests of clover and alfalfa. Bull. Univ. Illinois Agr. Exp. Sta., no. 134, pp. 178–184, figs. 23–29.

FOWLER, W. W.

1885. New species of Languriidae. Trans. Ent. Soc. London, pp. 381–388.

1886. New genera and species of Languriidae. *Ibid.*, pp. 303–322, pl. 3.

1908. Languriinae. *In* Wytsman, P., Genera insectorum. Brussels, vol. 78, pp. 1–45, pls. 1–3.

GIRAULT, A. A.

1907. Oviposition of *Languria mozardi* Latreille. Ent. News, vol. 18, pp. 366–367.

GORHAM, H. S.

1887. Biologia Centrali Americana. Coleoptera. Erotylidae. London, vol. 7, pp. 1–32, 247–248, pl. 1.

HOPKINS, A. D.

1891. Some of the bred parasitic Hymenoptera in the National Collection. Insect Life, vol. 4, p. 124.

1892. Some bred West Virginia Braconidae. *Ibid.*, vol. 4, pp. 256–259.

HORN, G. H.

1862. Description of some new North American Coleoptera. Proc. Ent. Soc. Philadelphia, vol. 1, pp. 187–188.

1868. New species of Coleoptera from the Pacific district of the United States. Trans. Amer. Ent. Soc., vol. 2, pp. 129–140.
1885. Contributions to the coleopterology of the United States. *Ibid.*, vol. 12, pp. 128–172.
1886. A review of the species described by Olivier in the "Entomologie." *Ibid.*, vol. 13, pp. 135–143.

LATREILLE, P. A.
1802. Histoire naturelle, générale et particulière des crustacés et des insectes. Paris, vol. 3, p. 209.
1805. Histoire naturelle, générale et particulière des crustacés et des insectes. Paris, vol. 12, p. 35.
1807. Genera crustaceorum et insectorum. Paris, vol. 3, pp. 65–66.

LECONTE, J. L.
1854. Synopsis of the Erotylidae of the United States. Proc. Acad. Nat. Sci. Philadelphia, vol. 7, pp. 158–163.

LENG, C. W.
1920. Catalogue of the Coleoptera of America, north of Mexico. Erotylidae. Mt. Vernon, New York, pp. 200–201.

LENG, C. W., AND A. J. MUTCHLER
1927. Supplement to the catalogue of the Coleoptera of America, north of Mexico. Erotylidae. Mt. Vernon, New York, p. 32.
1933. Second and third supplements to the catalogue of the Coleoptera of America, north of Mexico. Languriidae. Mt. Vernon, New York, p. 33.

LEWIS, G.
1884. Japanese Languriidae, with notes on their habits and external sexual structure. Jour. Linnean Soc. London, Zool., vol. 17, pp. 347–361, pl. 14.

LODING, H. P.
1945. Catalogue of the beetles of Alabama. Geol. Survey Alabama, monogr. 2, pp. 1–172.

MOORE, I.
1937. A list of the beetles of San Diego County, California. Occas. Papers San Diego Soc. Nat. Hist., no. 2, pp. 1–109.

MOTSCHULSKY, T. V. VON
1860. Coléoptères de la Sibérie orientale et . . . des rives de l'Amour. Erotylides. *In* Schrenck, P. L., Reisen und Forschungen im Amur-Lande. St. Petersburg, vol. 2, no. 2, pp. 240–244.

NEWMAN, E.
1838. Entomological notes. Ent. Mag., vol. 5, pp. 372–402.

OLIVIER, A. G.
1807. Entomologie, ou histoire naturelle des insectes. Paris, vol. 5, pp. 461–464, pl. 1.

RANDALL, J. W.
1838. Description of new species of coleopterous insects inhabiting the state of Massachusetts. Boston Jour. Nat. Hist., vol. 2, pp. 34–52.

SAY, T.
1823. Descriptions of coleopterous insects collected in the late expedition to the Rocky Mountains. Jour. Acad. Nat. Sci. Philadelphia, vol. 3, pp. 403–462.

SCHAEFFER, C.
1904. New genera and species of Coleoptera. Jour. New York Ent. Soc., vol. 12, pp. 197–236.
1905. Additions to the Coleoptera of the United States with notes on some known species. Mus. Brooklyn Inst., Sci. Bull. no. 1, pp. 124–140.
1918. Miscellaneous coleopterological notes and descriptions. Jour. New York Ent. Soc., vol. 26, pp. 211–214.

SCHENKLING, S.
1928. Languriidae. *In* Junk, W., Coleopterorum catalogus. Berlin, vol. 15, pp. 1–40.

SCHWARZ, E.
1878a. Coleoptera of Florida. Proc. Amer. Phil. Soc., vol. 17, pp. 353–472.
1878b. Coleoptera of Michigan. *Ibid.*, vol. 17, pp. 593–669.

SNOW, F. H.
1906. List of Coleoptera collected in New Mexico by the entomological expeditions of the University of Kansas. Trans. Kansas Acad. Sci., vol. 20, pt. 2, pp. 165–189.

ULKE, H.
1902. List of beetles of the District of Columbia. Proc. U. S. Natl. Mus., vol. 25, pp. 1–57.

WATSON, J. R.
1921. A food plant of *Languria discoidea* Lec. Florida Ent., vol. 4, pp. 40–41.

WEBSTER, F. M.
1888. The larva of the clover stem borer, *Languria Mozardi* Latreille, as a gall maker. Insect Life, vol. 1, pp. 119–120, fig. 23.

WEED, C. M.
1890. On the life-history of the clover stem borer (*Languria mozardi*). Bull. Ohio Agr. Exp. Sta., ser. 2, vol. 3, pp. 235–238, figs. 32–33.

WICKHAM, H. F.
1894. The Endomychidae and Erotylidae of Ontario and Quebec. Canadian Ent., vol. 26, pp. 337–341, figs. 58–59.

WILDERMUTH, V. L., AND F. H. GATES
1920. Clover stem-borer as an alfalfa pest. Bull. U. S. Dept Agr., no. 889, pp. 1–25, figs. 1–6, pl. 1.

ZIA, Y.
1933. On the Languriidae of the provinces Kweichow and Yunnan. Sinensia, vol. 4, pp. 15–37.
1934. On some species of Languriidae of Hangchow. *Ibid.*, vol. 4, pp. 353–358.