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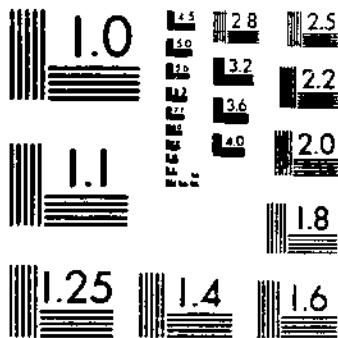
URDATA

A REVISION OF THE GENUS CUERNA (HOMOPTERA: CICADELLIDAE)

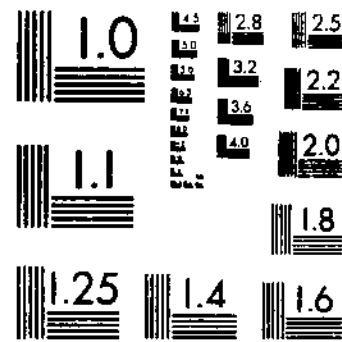
NIELSON, M. W.

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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

A REVISION OF THE GENUS CUERNA

(HOMOPTERA, CICADELLIDAE)

By M. W. NELSON, *Entomology Research Division, Agricultural Research Service*

The genus *Cuerna* is one of several genera that has come into prominence since 1953 as an economically important group of leafhoppers. Many new species have been described and several are vectors of plant viruses. There is no published key to the species nor are there illustrations of the male genitalia, although Oman and Beamer (14)¹ intended to include these in a revision that unfortunately was never completed. However, their intentions served as the initial impetus for the writer to revise the genus taxonomically.

In this bulletin the author has attempted to reclassify all known species by characters in both the male and the female genitalia, which form dual bases for the present classification. The eighth sternum is an exceptionally diagnostic character for separating the females of *Cuerna*, and its use as a potential character for separating the females of other leafhopper genera is being reported for the first time.

Twenty-nine specific names are treated in this revision, of which 22 are recognized as valid, including 7 new species and 1 new name.

ECONOMIC IMPORTANCE AND DISTRIBUTION

Three species of *Cuerna* have thus far been incriminated as vectors of plant viruses. *Cuerna occidentalis* Oman & Beamer and *C. yuccae* Oman & Beamer were reported by Frazier and Freitag (6) and Freitag et al. (7), respectively, as efficient vectors of Pierce's disease virus of grapes in California. These species are among a large number of cicadellina leafhoppers that are generically related and capable of transmitting this virus. Turner (20) was first to report the transmission of phony peach virus to peach by *C. costalis* (Fabricius) in Georgia; and later, Turner and Pollard (21) described in detail the insect's transmission capabilities and economic importance. Kaloostian (9) showed that *C. costalis* was also a vector of Pierce's disease virus of grapes in Georgia.

Although only 14 percent of the *Cuerna* species are economically important, many others undoubtedly cause serious injury to plants by direct feeding. Moreover, because of their ability to transmit viruses, other species may be equally important as potential vectors of other viruses of crop plants.

Before this revision, the known range of the genus *Cuerna* was Neogeic, with North America at the center of its distribution. As a result of this study the range is now restricted largely to North Amer-

¹ Italic numbers in parentheses refer to Literature Cited, p. 46.

ica. Records of available specimens indicate that Honduras is the southern extremity of its range in Central America. It is doubtful that any species occur in South America. The northern limits are Alaska, and members of the genus are present in North America from coast to coast, with 70 percent of the known species concentrated in the Western United States.

MORPHOLOGY

Since the species of *Cuerna* are remarkably similar in habitus except for size, dissection of both sexes is necessary for species differentiation. Genitalic characters are very useful in the male and superbly diagnostic in the female. With few exceptions the species can be easily separated on the basis of the female eighth sternum. Heretofore, this structure has not been reported as a character for distinguishing female species of leafhoppers.

According to Snodgrass (19), the female eighth sternum of cicadellids is almost completely vestigial or sometimes appears as a small sclerotized fold at the base of the ovipositor dorsad of the seventh sternum. In females of *Cuerna* the eighth sternum is extremely well developed and heavily sclerotized on its dorsal surface. It lies dorsad (fig. 1, A, B) of the base of the ovipositor and is connected anteriorly by membrane to the seventh sternum (fig. 1, C). In well-cleared specimens the structure can easily be seen through the dorsal wall of the seventh tergum.

Two basic structural types of the eighth sternum are represented among the species. The first, considered more primitive, is a single, broad, completely contiguous plate (fig. 2, A) possessed by *C. costalis*, *C. mexicana* Oman & Beamer, and *C. semibulba*, new species. Sometimes the anterior or posterior margin of the plate may be contiguous forming a U- or inverted U-shaped structure. The second more specialized form consists of two distinct, bilaterally symmetrical plates (fig. 2, B), which may be quadrate, triangulate (fig. 2, C), globose, or typically elongate (fig. 2, D). Certain species such as *C. arida* Oman & Beamer, *C. alta* Oman & Beamer, and *C. stitti*, new species, have a distinct lobe arising distally from near the posterior margin of each plate.

Although the female eighth sternum has not been fully investigated in other genera, its presence in most groups is probably lacking. The author has examined several undetermined species among the genera *Aulavizes*, *Homalodiscu*, and *Oncometopia* of the tribe Proconiini and observed this structure only in the genus *Oncometopia*. Among a few species examined it is well developed and, therefore, could possibly be of some value for separating female species in that genus.

The aedeagus is the most diagnostic character for separating the males of *Cuerna*. In lateral aspect it has an elongate, troughlike flap termed the preatrium, which arises anteriorly from the base of a large, bulbous structure called the atrium (fig. 3, A). Dorsad of the atrium is the curved aedeagal shaft, which bears a prominent tooth (except *C. sayi*, new name) on each side of the middle in caudal aspect (fig. 3, B). The gonopore is terminal. Arising from the lateral and caudal

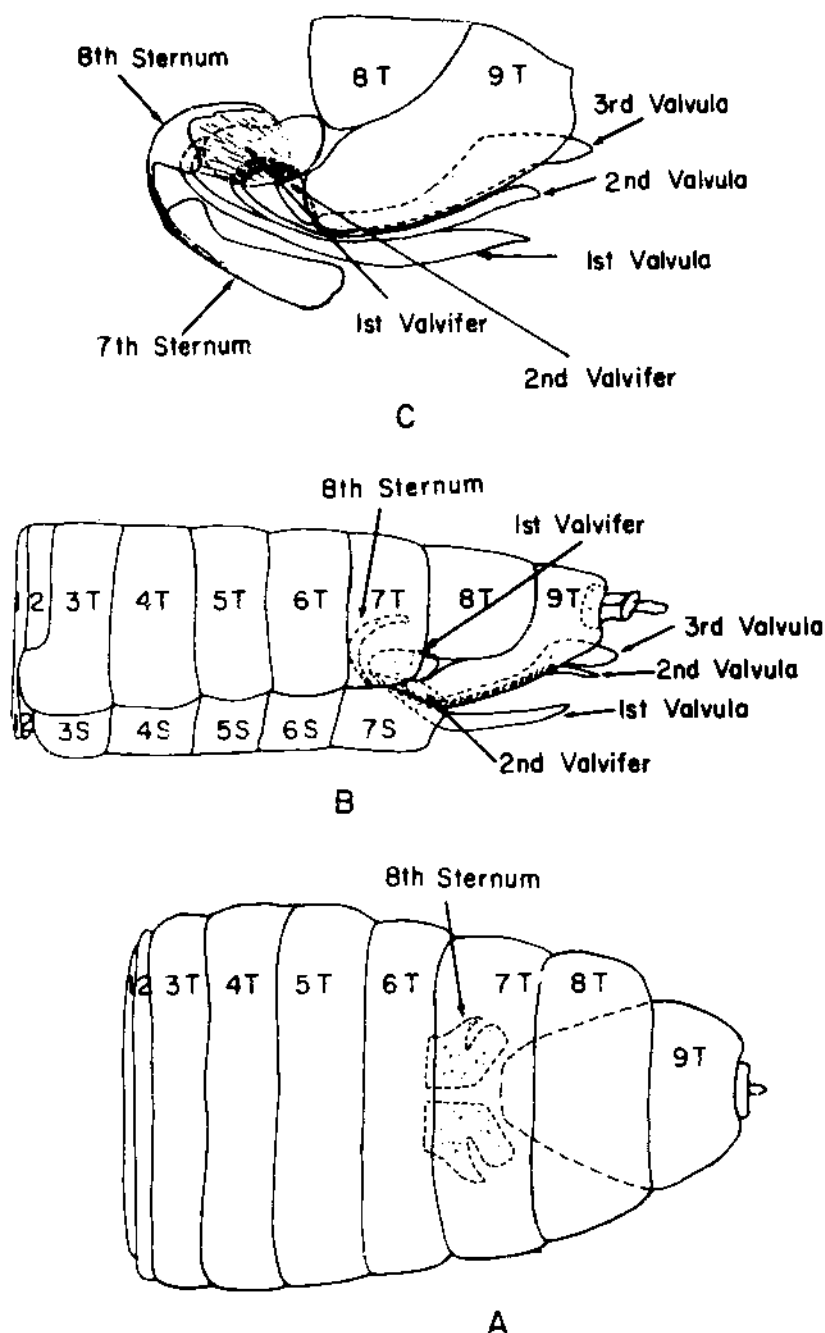


FIGURE 1.—Abdomen and female genitalia of *Cuerna arida* Oman & Beamer (in situ): A, Position of eighth sternum, dorsal aspect; B, position of eighth sternum and associated structures of ovipositor, lateral aspect (marginal paratergites not shown); C, terminus of abdomen showing position and connection of seventh and eighth sterna and associated structures of ovipositor, internal aspect.

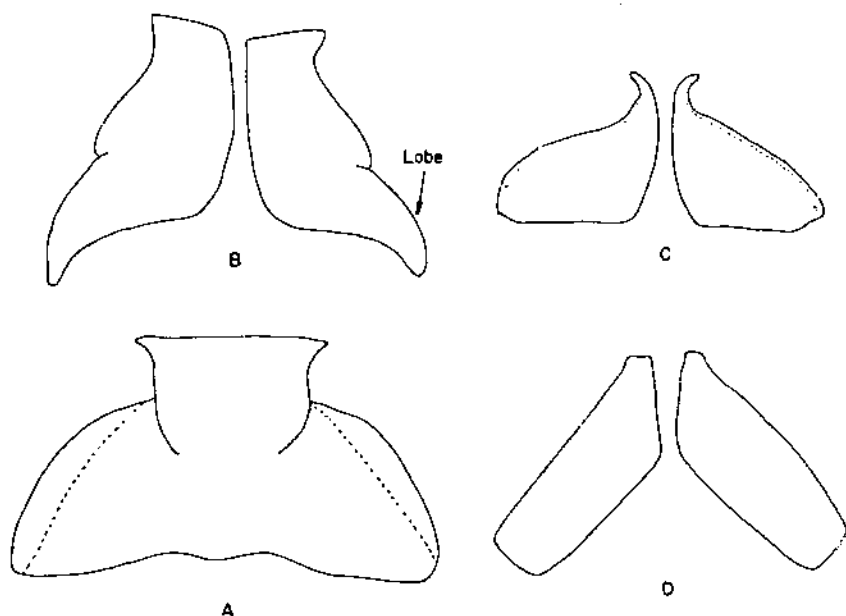


FIGURE 2.—Female eighth sterna of *Cuerna*: A, *C. costalis* (Fabricius); B, *C. obtusa* Oman & Beamer; C, *C. obesa* Oman & Beamer; D, *C. alba* Oman & Beamer, all in dorsal aspect.

margins of the atrium are a pair of acuminate processes, which vary in shape and length and are useful in distinguishing many species. The lateral atrial processes are conspicuously curved and project caudad or ventrad in lateral view (fig. 3, *C*) or mesad in caudal view (fig. 3, *D*) in about half the known species. In the remaining species the processes are nearly straight and project dorsad in lateral and caudal views (fig. 3, *E*, *F*). The caudal atrial processes are somewhat similar in shape but vary in length and are useful as a complementary character for separating some species.

The male pygofer has some value for only a few species, particularly *C. obesa* Oman & Beamer and *C. curvata* Oman & Beamer. In the former species there is a unique, short, fingerlike lobe on the caudo-dorsal margin that will separate it from all other species. In the latter species the caudal margin is distinctly truncate. Most species have a pygofer with a convex caudal margin and in a few the caudo-ventral margin is produced posteriorly to a broad, convex lobe.

Several species groups are recognized among the males by the similarity of characters in the aedeagus. For example, the shape and size of the lateral and caudal atrial processes are quite similar among *C. obtusa* Oman & Beamer, *C. balli* Oman & Beamer, and *C. yuccae*. For reliable determination of the males of these species and those in other species groups, proper association of the sexes is necessary, followed by the use of distinguishing characters in the female eighth sternum.

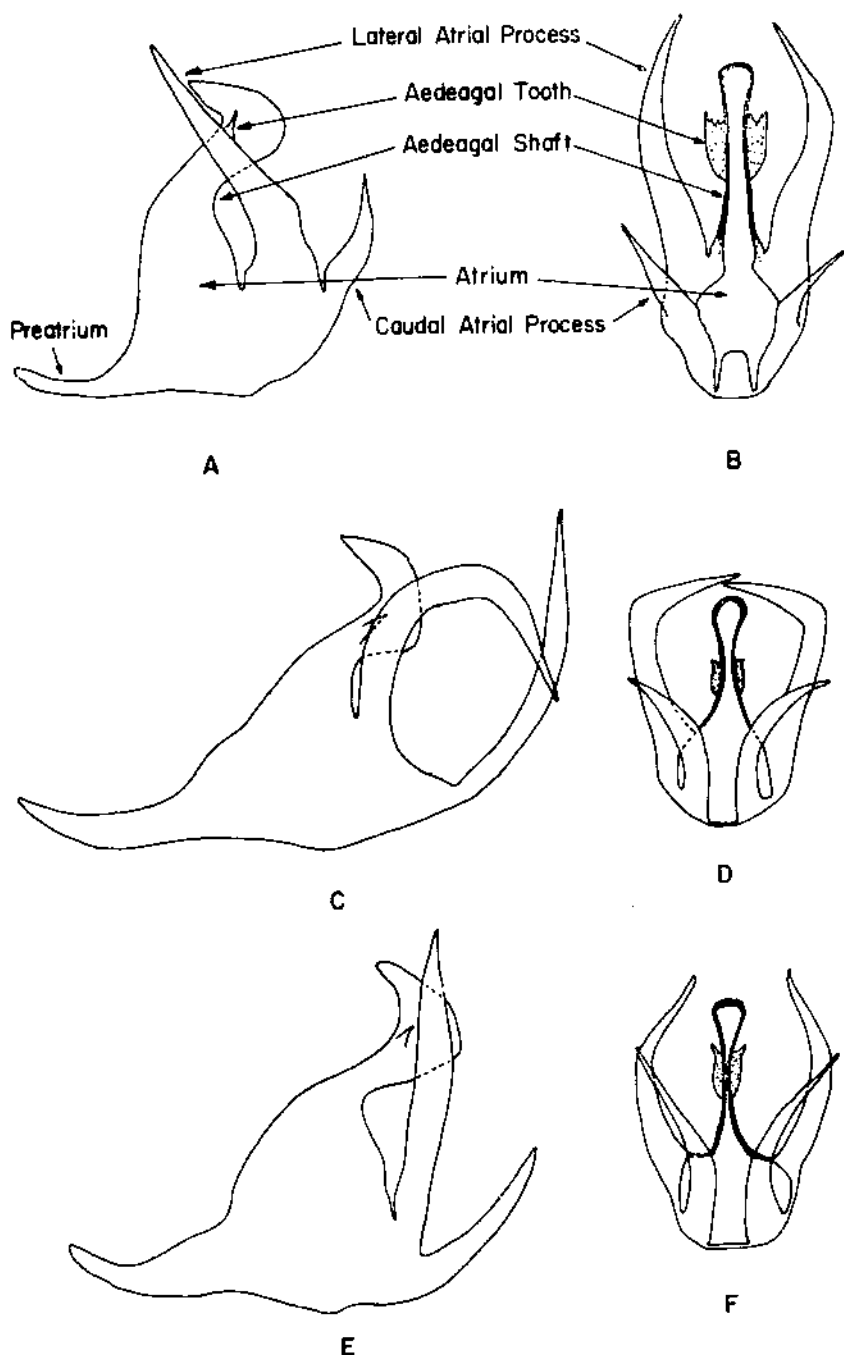


FIGURE 3.—Male genitalia of *Cuerna*: A, Aedeagus of *C. arida* Oman & Beamer, lateral aspect; B, same, caudal aspect; C, aedeagus of *C. costalis* (Fabricius), lateral aspect; D, aedeagus of *C. curcata* Oman & Beamer, caudal aspect; E, aedeagus of *C. mexicana* Oman & Beamer, lateral aspect; F, aedeagus of *C. kaloostiani*, new species, caudal aspect.

TAXONOMY OF THE GENUS

In 1924 Melichar (11, p. 199) first listed *Cuerna* as a new genus in a key to a large number of cicadelline genera. A year later Melichar (12, p. 363) described the genus from external morphological characters and designated *Cercopis lateralis* Fabricius as the genotype. However, he erroneously used the generic name of *Cicada*, since the literature citation of the genotype refers to *Cercopis*.

Before Melichar's original description, the name of *Cercopis lateralis* had undergone considerable nomenclatorial change. In 1803 Fabricius (4) created a secondary homonym when he transferred *Cicada lateralis* Linnaeus to the genus *Cercopis*. Realizing this he changed his name of *lateralis* to *marginella*, but discovered that the latter was preoccupied by an earlier name he had assigned to another species described in 1794. He (4) finally corrected the name by changing it to *costalis* in his emendanda of 1803.

The largest single contribution to the genus *Cuerna* was made by Oman and Beamer (14) when they described 13 new species, 12 from the Nearctic region and 1 from Mexico. In his generic classification of leafhoppers, Oman (13, p. 64) listed all the known Nearctic species. He also defined the genus for the first time on the basis of the male genitalia.

At the time Melichar (12) described the genus *Cuerna* he included in his paper a number of species from South America. Schroeder (17) subsequently studied and redescribed these species under *Cuerna* on the basis of the male genitalia. As a result of the present revision, these species (*rubromarginata* (Signoret), *similis* Melichar, *capitanea* (Berg), *centralinea* Melichar, *doringii* (Berg)) do not belong in *Cuerna*, and they should be relegated to other genera in the Cicadellinae. Except for general habitus, none of the species show a close generic affinity to *Cuerna*, nor do they occupy the same geographical range. Moreover, Signoret's (18) and Fowler's (5) treatments of "*Tettigonia costalis* (Fabricius)" from Colombia and "*Tettigonia lateralis* (Fabricius)" from Panama, respectively, are studies of "other" species, since their illustrations do not resemble *Cuerna* and their localities are well beyond the known range of the genus. According to China (personal communication), the specimen described by Fowler from Panama was not available in the collection under *Cuerna* and presumably had been transferred to another genus.

The genus *Cuerna* in the tribe Proconiini no longer belongs in the subfamily Tettigellinae. Based on a decision in 1963 by the International Commission on Zoological Nomenclature (8), resulting in the validation of the name *Cicadella* Latreille and suppression of *Tettigella* China and Fennah, the name of the subfamily has been changed to Cicadellinae.

DESCRIPTION OF THE GENUS

Cuerna Melichar

Cuerna Melichar, Mus. Nat. Hungarici Ann. 21: 199. 1924.

Cuerna Melichar, *ibid.* 22: 363. 1925. Type, by subsequent designation, *Cercopis lateralis* Fabricius 1798, which is a synonym of *Cercopis costalis* Fabricius 1803.

Small, slender-to-large, robust species. Length of male 5.24-8.68 mm., female 5.85-9.04 mm. Head wider than pronotum; crown nar-

row to broad with interocular width nearly $1\frac{1}{2}$ times to nearly twice median length, median length $1\frac{3}{4}$ to $2\frac{1}{2}$ times length of mesal margin of eye, anterior margin strongly produced medially and obtusely rounded; pronotum large, subquadrate, median length slightly shorter to slightly longer than median length of crown, surface fine to coarsely rugulose; elytra with sides parallel to flaring medially, apex tapered; clypeus distinctly swollen; clypellus usually swollen along middle; gena and lora covered with very fine, short setae; male plates together triangulate and covered with short setae on lateral margins; female seventh sternum broadly concave along middle of posterior margin.

General color light reddish gray to black with conspicuous narrow or broad, yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum with numerous black and yellow markings that vary from very fine lines to coarse, irregular spots, markings on distal half of pronotum usually transverse and on scutellum usually broad, irregular, longitudinal bands; elytra light reddish gray to black, generally with distinct, broad, red or reddish-black band along costal margin, veins black; clypeus black with yellow lines or spots running parallel on each side; clypellus, lora, and gena black with several yellow irregular markings; legs black, sometimes with yellow stripes; venter black with yellow irregular markings.

Male pygofer slightly longer to $1\frac{1}{2}$ times longer than wide, caudal margin truncate, convex or caudoventral margin produced posteriorly to convex lobe; aedeagus with anterior half (preatrium) troughlike, posterior half (atrium) large, bulbous basally with narrow, short, curved shaft directed dorsad or posterodorsad, shaft with prominent tooth on each side of middle; gonopore terminal; atrium with two pairs of acminate processes arising laterally and caudally, lateral atrial processes nearly straight and projecting dorsad or strongly curved caudad or ventrad, caudal atrial processes usually straight and projecting dorsad; connective transverse with short shaft distally.

Female eighth sternum deeply invaginated, situated dorsad of base of ovipositor and connected anteroventrally by membrane to seventh sternum, well developed, heavily sclerotized, single, broad plate or separated medially to two distinct, bilaterally symmetrical plates; each plate elongate, quadrate, rectangular, or triangulate and with or without distinct distal lobe.

KEY TO MALES

1. Aedeagus in lateral aspect with lateral atrial processes nearly straight and projecting anterodorsad, dorsad, or posterodorsad, never caudad or ventrad (figs. 4, B, 5, B, 6, B)----- 2
- Aedeagus in lateral aspect with lateral atrial processes irregularly curved or conspicuously curved posterodorsad, caudad, or ventrad at apical half; if irregularly curved then conspicuously curved mesad in caudal aspect (figs. 14, B, 15, B, 16, B)----- 11
- 2 (1). Pygofer with caudal margin truncate or caudoventral margin produced posteriorly to broad, convex lobe (figs. 4, A, 5, A, 8, A)----- 3
- Pygofer with caudal margin convex; caudoventral lobe absent (figs. 9, A, 10, A, 11, A)----- 7

- 3 (2). Pygofer with caudal margin truncate; aedeagus in lateral aspect with lateral atrial processes usually projecting anterodorsad (fig. 4, A, B)----- *arida* Oman & Beamer
 Pygofer with caudoventral margin produced posteriorly to broad, convex lobe; aedeagus in lateral aspect with lateral atrial processes usually projecting dorsad or posterodorsad----- 4
- 4 (3). Lateral atrial processes curved posterodorsad at apical one-fourth (figs. 5, B, 6, B)----- 5
 Lateral atrial processes straight throughout (figs. 7, B, 8, B)----- 6
- 5 (4). Atrium with base narrower than greatest width in caudal aspect (fig. 5, C)----- *husbronecki*, new species
 Atrium with base broad, about equal to greatest width in caudal aspect (fig. 6, C)----- *striata* (Walker)
- 6 (4). Lateral atrial processes long, extending considerably beyond apex of aedeagal shaft (fig. 7, B, C) (Mexico and Guatemala)
miciviana Oman & Beamer
 Lateral atrial processes short, reaching to or extending slightly beyond apex of aedeagal shaft (fig. 8, B, C) (United States)
gladiola Oman & Beamer
- 7 (2). Aedeagus in caudal aspect with caudal atrial processes fused basally, shaft without tooth on each side of middle (fig. 9, C)
sayi, new name
 Aedeagus in caudal aspect with caudal atrial processes not fused basally, shaft with prominent tooth on each side of middle (figs. 10, C, 11, C)----- 8
- 8 (7). Lateral atrial processes short, reaching to or extending slightly beyond apex of aedeagal shaft (fig. 10, B); pygofer with caudal margin irregularly convex (fig. 10, A)----- *unica*, new species
 Lateral atrial processes long, extending considerably beyond apex of aedeagal shaft; pygofer with caudal margin evenly convex----- 9
- 9 (8). Aedeagus in lateral aspect excluding atrial processes nearly 1½ times as long as wide, shaft very short and broad (fig. 11, B)
occidentalis Oman & Beamer
 Aedeagus in lateral aspect excluding atrial processes about as long as wide, shaft very long and narrow----- 10
- 10 (9). Caudal atrial processes long, reaching to lateral tooth on aedeagal shaft (fig. 12, B)----- *kutoostiani*, new species
 Caudal atrial processes short, not reaching lateral tooth on aedeagal shaft (fig. 13, B)----- *alba* Oman & Beamer
- 11 (1). Aedeagus in caudal and lateral aspects with caudal atrial processes very long, extending beyond apex of aedeagal shaft----- 12
 Aedeagus in caudal and lateral aspects with caudal atrial processes short, not exceeding apex of aedeagal shaft----- 17
- 12 (11). Pygofer with prominent, short, fingerlike lobe on caudodorsal margin (fig. 14, A)----- *obesa* Oman & Beamer
 Pygofer without such lobe----- 13
- 13 (12). Pygofer with caudoventral margin produced posteriorly to subacutely convex lobe (fig. 15, A); aedeagus in lateral aspect with caudal atrial processes long and straight (fig. 15, B) (Mexico)
krameri, new species
 Pygofer without caudoventral lobe, caudal margin narrowly or broadly convex; aedeagus in lateral aspect with caudal atrial processes long but usually curved (United States)----- 14
- 14 (13). Lateral atrial processes usually curved ventrad at apical half (fig. 16, B) (Eastern and Midwestern United States)
costalis (Fabricius)
 Lateral atrial processes usually curved caudad at apical half (Western United States)----- 15
- 15 (14). Caudal atrial processes usually crossing over in caudal aspect (fig. 17, C)----- *guacae* Oman & Beamer
 Caudal atrial processes usually parallel in caudal aspect----- 16
- 16 (15). Aedeagus in lateral aspect with shaft long and narrow; caudal atrial processes expanded subapically in caudal aspect (fig. 18, B, C)
bali Oman & Beamer
 Aedeagus in lateral aspect with shaft short and broad; caudal atrial processes with sides nearly parallel throughout in caudal aspect (fig. 19, B, C)----- *obtusa* Oman & Beamer

- 17 (11). Lateral atrial processes distinctly broader than caudal atrial processes, sides expanded medially or subbasally..... 18
 Lateral atrial processes about equal in width to caudal atrial processes, sides parallel..... 19
- 15 (17). Lateral atrial processes curved strongly caudad or ventrad at apical half, sides expanded anteriorly subbasally (fig. 20, *B*)
angusta, new species
 Lateral atrial processes not strongly curved, projecting posterodorsad with sides expanded anteriorly medially (fig. 21, *B*)
scutibulba, new species
- 19 (18). Pygofer with caudal margin distinctly truncate; aedeagus with lateral atrial processes conspicuously longer than caudal atrial processes; caudal atrial processes in caudal aspect strongly curved mesad at apical half, apices nearly touching each other (fig. 22, *A, B, C*)
curvata Oman & Beamer
 Pygofer with caudal margin distinctly convex; aedeagus with lateral atrial processes about equal in length to caudal atrial processes; caudal atrial processes in caudal aspect not strongly curved mesad... 20
- 20 (19). Aedeagus in lateral aspect with shaft curved posterodorsad; lateral and caudal atrial processes large and broad with greatest width nearly equal to width of middle of aedeagal shaft (fig. 23, *B*)
alta Oman & Beamer
 Aedeagus in lateral aspect with middle of shaft parallel or nearly parallel to base of atrium; lateral and caudal atrial processes slender with greatest width about one-half width of aedeagal shaft..... 21
- 21 (20). Caudal atrial processes projecting dorsad in lateral aspect (fig. 24, *B*).....
alpina Oman & Beamer
 Caudal atrial processes projecting caudad in lateral aspect (fig. 25, *B*).....
stilla, new species

KEY TO FEMALES

1. Eighth sternum in dorsal aspect equal to or longer than seventh tergum 2
 Eighth sternum in dorsal aspect shorter than seventh tergum..... 13
- 2 (1). Eighth sternum in dorsal aspect single, broad plate, which is completely contiguous medially or single plate with anterior and/or posterior margins contiguous only (figs. 15, *D, 16, D, 20, D, 21, D*)..... 3
 Eighth sternum in dorsal aspect two distinct, bilaterally symmetrical plates (figs. 12, *D, 19, D, 23, D*)..... 7
- 3 (2). Plate completely contiguous medially, broadly bell shaped (fig. 16, *D*).....
costalis (Fabricius)
 Plate contiguous on anterior and/or posterior margins only, shape varied..... 4
- 4 (13). Plate with large semicircular opening along middle, contiguous on anterior and posterior margins (fig. 21, *D*).....
scutibulba, new species
 Plate without semicircular opening, contiguous on anterior or posterior margin only..... 5
- 5 (14). Plate contiguous on anterior margin only, posterior margin deeply and broadly emarginated along middle to form two elongate, lateral lobes that project caudad (fig. 15, *B*).....
krameri, new species
 Plate contiguous on posterior margin only, anterior margin narrowly and deeply excavated medially..... 6
- 6 (15). Plate subrectangulate, posterior margin shallowly and unevenly concave (fig. 20, *D*).....
angusta, new species
 Plate bilobed, posterior margin deeply and evenly concave (fig. 6, *D*).....
striata (Walker)
- 7 (2). Each plate very large, length $1\frac{1}{2}$ to $1\frac{2}{3}$ times length of seventh tergum 8
 Each plate medium size, length about equal to $1\frac{1}{8}$ times length of seventh tergum..... 9
- 8 (7). Apical one-third of each plate produced posterolaterad to broad, elongate lobe, lobe with lateral margins parallel and apex truncate (fig. 23, *D*).....
alta Oman & Beamer
 Apical one-third of each plate produced posterolaterad to elongate, fingerlike lobe, lobe with lateral margins converging distally and apex convex (fig. 19, *D*).....
obtusa Oman & Beamer

- 9 (7). Lateral submargin of each plate deeply folded (fig. 12, D) *kuloostiani*, new species 10
- Lateral submargin of each plate without fold..... 10
- 10 (9). Each plate simple, elongate, lateral lobe..... 11
- Each plate subquadrate at basal half with distal, elongate lobe... 12
- 11 (10). Each plate with sides parallel on apical two-thirds and constricted on basal one-third, plate projecting posterolaterad at apical two-thirds (fig. 13, D)..... *alba* Oman & Beamer
- Each plate with sides parallel on basal two-thirds and constricted on apical one-third, plate projecting posterolaterad on basal two-thirds and caudad on apical one-third (fig. 5, D)..... *hasbroucki*, new species
- 12 (10). Each plate incised just below middle of lateral margin and with short lobe arising distally and projecting posterolaterad to lateral margin of plate (fig. 4, D)..... *arida* Oman & Beamer
- Each plate not incised on lateral margin but with elongate, fingerlike lobe arising distally and projecting posterolaterad beyond lateral margin of plate (fig. 18, D)..... *balli* Oman & Beamer
- 13 (1). Eighth sternum in dorsal aspect with single, broad plate, which is completely contiguous medially or single plate contiguous on posterior margin only..... 14
- Eighth sternum in dorsal aspect two distinct, bilaterally symmetrical plates..... 15
- 14 (13). Plate completely contiguous medially, subrectangulate (fig. 7, D) (Mexico and Guatemala)..... *mexicana* Oman & Beamer
- Plate contiguous on posterior margin only, broadly U-shaped (fig. 22, D) (United States)..... *curvata* Oman & Beamer
- 15 (13). Anterolateral margin of each plate deeply invaginated (fig. 9, D) *sayi*, new name
- Anterolateral margin of each plate not invaginated..... 16
- 16 (15). Each plate triangulate, posterior margin truncate or nearly so (figs. 14, D, 17, D, 24, D)..... 17
- Each plate not triangulate, posterior margin convex or projecting caudad to distinct lobe (figs. 8, D, 10, D, 11, D, 25, D)..... 19
- 17 (16). Anterior margin of each plate with very narrow, curved apex (fig. 14, D)..... *obesa* Oman & Beamer
- Anterior margin of each plate narrowly truncate or convex..... 18
- 18 (17). Each plate truncate on anterior and posterior margins (fig. 24, D) *alpina* Oman & Beamer
- Each plate convex on anterior margin and subtruncate-sinuate on posterior margin (fig. 17, D)..... *yuccae* Oman & Beamer
- 19 (16). Plates broadly separated by distance equal to or more than width of individual plate; plate small, poorly sclerotized, and slightly longer than wide (fig. 11, D)..... *occidentalis* Oman & Beamer
- Plates close together with distance between not greater than width of individual plate; plate well sclerotized and considerably longer than wide..... 20
- 20 (19). Each plate conspicuously excised on lateral margin with long, slender projection arising distally and projecting posterolaterad (fig. 25, D)..... *stilti*, new species
- Each plate not excised on lateral margin, form elongate and lobe-like..... 21
- 21 (20). Apical three-fourths of each plate somewhat globose, anterior margin very narrow (fig. 8, D)..... *gladiola* Oman & Beamer
- Apical one-half of each plate somewhat tapered, anterior margin very broad (fig. 10, D)..... *unica*, new species

DESCRIPTIONS OF THE SPECIES

Cucerna arida Oman & Beamer

Cucerna arida Oman & Beamer, Kans. Ent. Soc. Jour. 17: 125. 1944.

Medium size, slender species; similar to *balli* in habitus and to *alba* in male genital characteristics; female eighth sternum distinctive.

Length of male 6.7-7.4 mm., female 7.5-8.5 mm. Head wider than pronotum; crown narrow, interocular width about $1\frac{1}{2}$ times median length, median length about twice length of mesal margin of eye; pronotum short, median length less than median length of crown, sides parallel; elytra with lateral margins parallel, apex tapered.

General color reddish gray to reddish black with distinct, broad yellow or ivory line running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum with numerous yellow and black markings, which vary in size and shape; pronotum with transverse markings on distal half more or less similar in size and shape, dissimilar in arrangement on proximal half.

Male pygofer in lateral aspect slightly longer than wide, caudal margin truncate; aedeagus in lateral aspect excluding atrial processes about as long as wide, shaft nearly straight, projecting posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes very long, nearly three times as long as caudal atrial processes, slender, nearly straight, projecting anterodorsad beyond apex of aedeagal shaft; caudal atrial processes short, arising from caudodorsal margin of atrium, projecting dorsad in lateral view and laterad at apical half in caudal view (fig. 4, A, B, C).

Female eighth sternum in dorsal aspect with two broad, symmetrical plates nearly equal to but usually not longer than seventh tergum; each plate with anterior margin broad and truncate, lateral margin slightly divergent, posterior margin with distinct lobe extending pos-

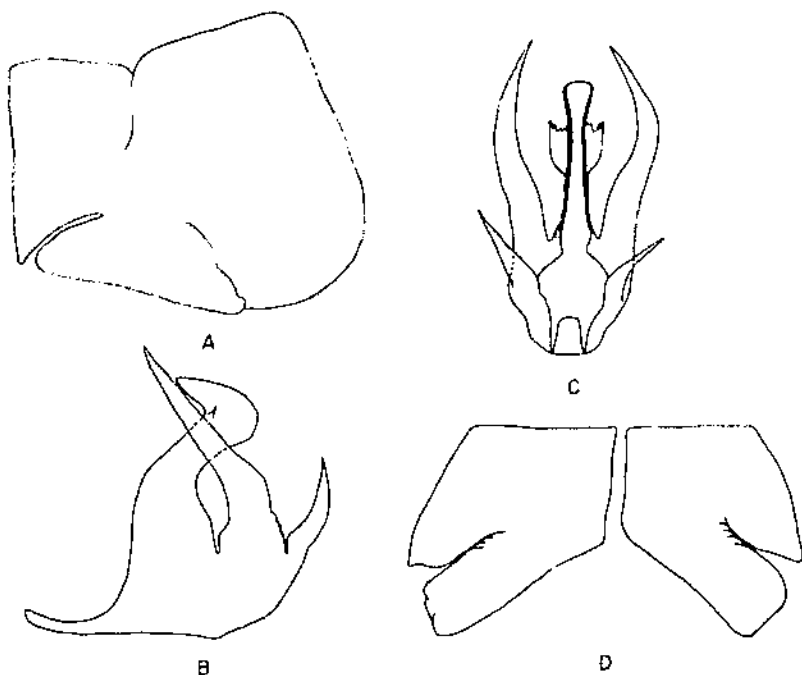


FIGURE 1. *Cuernia arida* Oman & Beamer: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (All from paratypes.)

terolaterad to but not beyond lateral margin of plate; lobe quadrate or rectangular, distal margin truncate or convex (fig. 4, D).

Distribution in Southwestern United States and Mexico: common in Arizona. Specimens examined from *Arizona*: Arivaca, Baboquivari Mountains, Benson, Bisbee, Buckeye, Casa Grande, Chiricahua Mountains, Continental, Cortaro, Douglas, Eager, Eloy, Fort Apache, Globe, Madera Canyon (Santa Rita Mountains), Miller Canyon (Huachuca Mountains), Mt. Lemmon (Santa Catalina Mountains), Nogales, Oracle, Patagonia, Payson, Portal, Ruby, Sahuarita, St. David, Sonoita, Tempe, Tubac, Tucson, Willcox; *Mexico*: Montezuma; *New Mexico*: Silver City; *Texas*: Valentine.

This species has been taken on *Haplopappus gracilis* (Nutt.) Gray, *Eriogonum* sp., and *Medicago sativa* (L.). Numerous specimens were collected by the author on an unknown species of grass at Sonoita, Ariz. It is most abundant in August in southern Arizona.

The male holotype and female allotype from Chiricahua Mountains, Ariz., June 9, 1933, P. W. Oman, were examined and are in the U.S. National Museum.

The males of this species can be separated from those of *balli* by the nearly straight lateral and caudal atrial processes of the aedeagus and from those of *alba* by the truncate caudal margin of the pygofer. Females of *arida* can be separated from those of both species by the eighth sternum; each plate has a short lobe arising from the caudal margin and extending posterolaterad to but not beyond the lateral margin of the plate.

Cucerna hasbroucki, new species

Medium size, robust species; similar to *kaloosthni* in habitus and to *striata* in male genital characteristics; female eighth sternum distinctive.

Length of male 6.6-7.5 mm., female 7.5-8.0 mm. Head wider than pronotum; crown broad with anterior margin sharply produced, interocular width about $1\frac{2}{3}$ times longer than median length, median length about $2\frac{1}{4}$ (male) to nearly $2\frac{1}{2}$ (female) times length of mesal margin of eye; pronotum with median length about equal to median length of crown, sides parallel; elytra with sides flaring medially, tapered apically; clypeus and clypellus swollen; gena and lora covered with short, fine setae; male plates together triangulate and covered with fine, long setae on lateral margins.

General color black with conspicuous, broad yellow or ivory line running laterally from anterior margin of head to eighth tergum; head and pronotum with numerous small yellow or ivory spots, markings on apical two-thirds of pronotum transverse; scutellum black with distinct yellow or ivory longitudinal markings; elytra reddish black, veins black; clypeus black with small yellow spots or lines running parallel on each side of middle; clypellus black with yellow markings; lora and gena black with numerous yellow markings; legs black and yellow; venter black with few scattered yellow spots.

Male pygofer in lateral aspect about $1\frac{1}{3}$ times as long as wide, caudovestral margin produced posteriorly to broad, convex lobe; aedeagus in lateral aspect excluding atrial processes about as long as wide, shaft long and narrow, projecting posterodorsad with promi-

ment tooth on each side of middle in caudal aspect; lateral atrial processes very long and broad, nearly twice as long and broad as caudal atrial processes, projecting dorsad beyond apex of aedeagal shaft, curved slightly caudad at apical one-fourth; caudal atrial processes short and narrow, arising anteriorly to base of lateral atrial processes, projecting dorsad in lateral aspect, parallel in caudal aspect (fig. 5, *A, B, C*).

Female eighth sternum in dorsal aspect with two distinctly curved, lobelike plates about equal to or slightly longer than seventh tergum; each plate with anterior three-fourths curved posterolaterad, posterior one-fourth constricted and projecting caudad, apex truncate or convex (fig. 5, *D*).

Described from numerous specimens from California and Oregon. The male holotype (Cat. No. 67043), female allotype, three male and two female paratypes, Yreka, Calif., August 7, 1915; one female paratype, Siskiyou County, Calif., August 27, 1915; one male paratype, Burns, Oreg., July 19, 1927, H. E. Wallace; one male paratype, LaGrande, Oreg., June 10, 1926, E. W. Davis; and one male and three females, 22 miles southwest of St. Helens, Oreg., May 21, 1938, Car Trap (Gray, Schuh); in the U.S. National Museum. Additional paratypes; one male and one female, Bly, Oreg.; and two females, 18 miles east of Bly, Oreg., July 31, 1950, M. Wasbauer; in the University of California at Berkeley; two males and two females, Mountague,

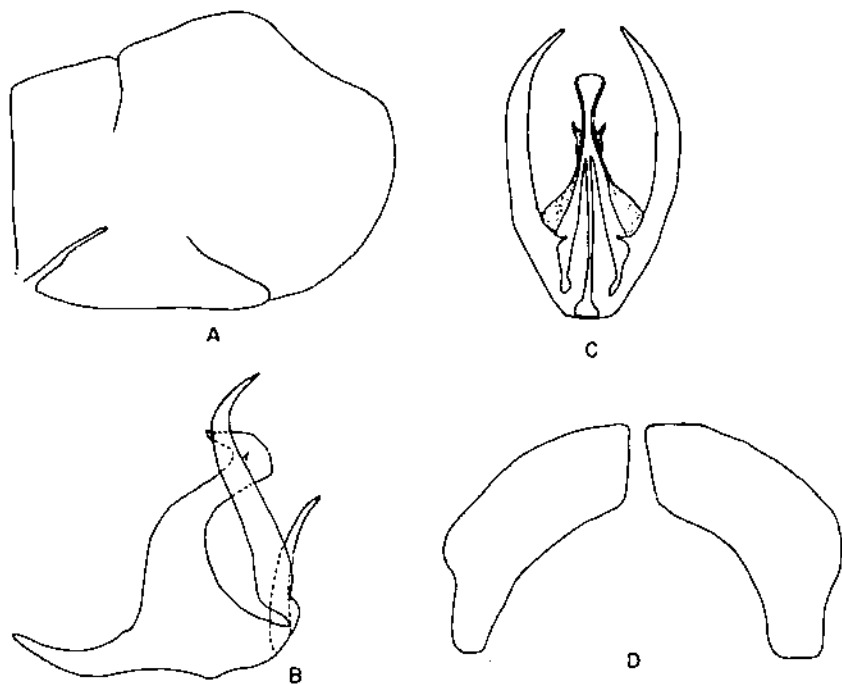


FIGURE 5.—*Cuerna hasbroucki*, new species: *A*, Male pygofer, lateral aspect; *B*, aedeagus, lateral aspect; *C*, aedeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect. (*A, B, C* from holotype and *D* from allotype.)

Siskiyou County, Calif., August 16, 1955, (collected on wheat), Maxwell, in the State Department of Agriculture collection at Sacramento, Calif.; one female, Burns, Oreg., July 19, 1938, H. A. Scullen; and one male, 11 miles east of Juntura, Oreg., 3,100 feet, July 14, 1940, on *Solidago* sp., H. A. Scullen; in the Snow Museum of the University of Kansas; and one male and one female, Yreka, Calif., August 7, 1915; and one male, Baker, Oreg., August 9, 1929, O. A. Hills; in the author's collection.

This species can be separated from *kaloostiani* by the caudal atrial processes of the male aedeagus arising anterior to the base of the lateral pair of atrial processes and by the female eighth sternum with each plate curved posterolaterad at basal three-fourths, projecting caudad at apical one-fourth, and constricted subapically. Owing to the similarity of the aedeagus in *hasbroucki* and *striata*, proper association between the sexes of these species is necessary, followed by the use of characters of the female eighth sternum just described as the bases for separating both species. This species is named for Frank F. Hasbrouck of Arizona State University.

Cuerna striata (Walker)

Tettigonia striata Walker, List of the Specimens of Homopterous Insects in the Collection of the British Museum, pt. 3, p. 775. 1851.

Tettigonia lugens Walker, *ibid.* (New synonymy.)

Tettigonia septentrionalis Walker, List of the Specimens of Homopterous Insects in the Collection of the British Museum, Sup., p. 193. 1858. (New synonymy.)

Oncometopia striata, Van Duzee, Calif. Expt. Sta. Tech. Bul. 2, p. 593. 1917.

Oncometopia lugens, Van Duzee, *ibid.*

Cuerna striata, Oman, Wash. Ent. Soc. Mem. No. 3, p. 64. 1949.

Cuerna lugens, Oman, *ibid.*

Cuerna septentrionalis, Oman, *ibid.*

Large-to-medium size, robust species; similar to *costalis* in habitus and to *hasbroucki* and *krameri* in male and female genital characteristics, respectively.

Length of male 7.2–8.1 mm., female 7.6–9.1 mm. Head wider than pronotum; crown broad, interocular width about $1\frac{3}{4}$ times median length, median length slightly more than twice length of mesal margin of eye; pronotum long, about $1\frac{1}{2}$ times longer than median length of crown, sides parallel; elytra with lateral margins flaring medially, tapered apically.

General color reddish black to black with conspicuous yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum black with numerous yellow markings, markings more numerous on crown and pronotum; elytra reddish black to black.

Male pygofer in lateral aspect about $1\frac{1}{3}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes slightly longer than wide, shaft long, about as long as width of atrium, narrow, curved posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes long, slender, about $1\frac{3}{4}$ times longer than caudal atrial processes, straight at basal three-fourths, curved posterodorsad at apical one-fourth, projecting dorsad beyond apex of aedeagal shaft, curved slightly mesad at apical one-fourth in caudal aspect; caudal atrial processes

short, slender, appressed basally to caudal margin of atrium, projecting dorsad in lateral aspect, nearly parallel in caudal aspect (fig. 6, *A, B, C*).

Female eighth sternum in dorsal aspect with two elongate lateral plates usually joined posteriorly along middle of caudal margin or weakly joined anteriorly along middle (western forms); each plate extending posterolaterad with length nearly $1\frac{1}{4}$ times longer than seventh tergum, anterior margin with narrow apex projecting cephalad, lateral margins parallel, expanded dorsally, apex truncate or convex (fig. 6, *D*).

Distribution in United States (except Far West), Canada, and Alaska. Specimens at hand from *Alaska*: College, Fairbanks, Ketchikan; *Canada*: Alberta, Vermillion; *British Columbia*, Vernon; *Manitoba*, Birch River, Deepdale, Miniota; *Ontario*, Ottawa, Thunder Bay; *Colorado*: Antonito, Aurora, Bellevue, Boulder, Colorado Springs, Denver, Durango, Estes Park, Fort Collins, Golden, Gunnison, Larimer, La Veta Pass, Pingree Park, Rico, Sloss, Sterling; *Maine*: Fort Kent, Jonesboro, Orono, Oxbow; *Michigan*: Cheboygan County, Douglas Lake, Marquette; *Minnesota*: Itasca Park; *Montana*: Big Timber, Billings, Haugen, Whitehall; *Nebraska*: Bonner County, Sidney; *New Hampshire*: Bretton Woods, Willey House; *New Mexico*: Albuquerque, Clouderoft, Marshall, Santa Fe, Silver City, White Mountains; *New York*: Saranac Lake; *North Dakota*: Grand Forks, Oakdale; *Texas*: Reeves County, Uvalde, Van Horn Mountains; *Wisconsin*: Brule, Cranmoor, Oconto, Salmo.

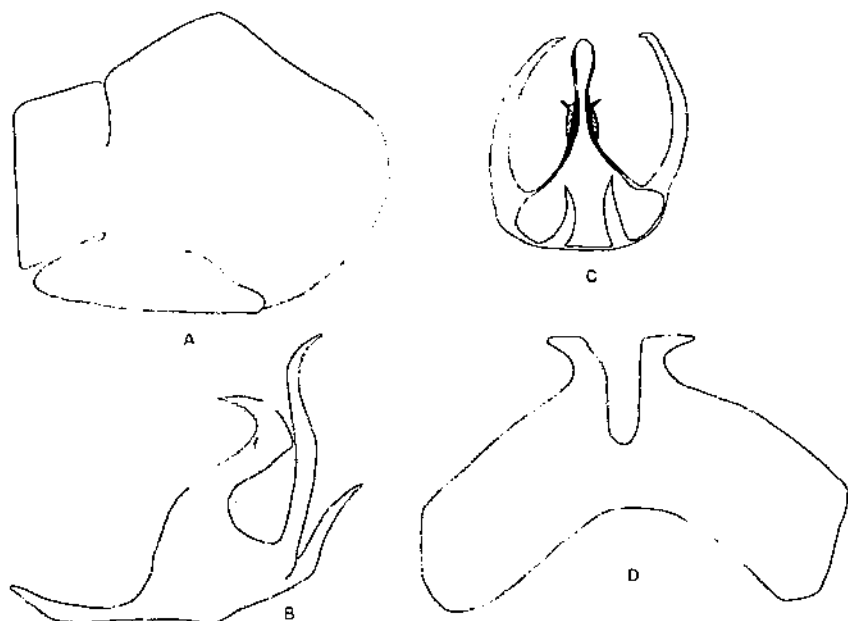


FIGURE 6. *Curnia striata* (Walker): *A*, Male pygofer, lateral aspect; *B*, aedeagus, lateral aspect; *C*, aedeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect.

This species has been taken on cranberry and *Rhus trilobata* Nutt. Collection dates are from June to October.

Walker's types of *Tettigonia striata*, *T. lugens*, and *T. septentrionalis* were dissected and examined through the kindness of W. K. China of the British Museum. A male syntype of *striata* dissected by Dr. China was found to be conspecific with the unique type male of *lugens*. Dr. China also provided an excellent illustration of the male genitalia of the unique type of *septentrionalis*, which the author has interpreted here as being conspecific with *striata*. Since no lectotype designation has been published for *striata*, the author is hereby designating a specimen from "North America" labeled type (British Museum green label) as lectotype female of *Tettigonia striata* Walker.

The males of this species can easily be distinguished from those of *costalis* and *krumeri* by the aedeagus with the nearly straight lateral atrial processes projecting dorsad. Females of *striata* can be separated from those of *krumeri* and *hasbroucki* by the eighth sternum with each lateral plate contiguous along the middle of the posterior margin.

Intraspecific geographical variation is apparent between forms from the Eastern United States and Canada and the western counterparts, including Alaska. In the western region, particularly Colorado, Montana, New Mexico, Texas, British Columbia, and Alaska, specimens are slightly smaller and less robust; the caudal pair of atrial processes of the male aedeagus are longer, and the lateral pair are slightly shorter; the plates of the female eighth sternum are shorter and are usually bridged by a narrow, sclerotized band on the anterior and posterior margins.

Cuerna mexicana Oman & Beamer

Cuerna mexicana Oman & Beamer, Kans. Ent. Soc. Jour. 17: 126. 1944.

Very large, robust species; similar to *costalis* in habitus and to *semi-bulba* and *angusta* in male and female genital characteristics, respectively.

Length of male 8.2-9.0 mm., female 8.2-9.4 mm. Head wider than pronotum; crown broad, interocular width $1\frac{3}{4}$ times median length, median length over twice length of mesal margin of eye; pronotum long, about $1\frac{1}{8}$ times longer than median length of crown, sides parallel; elytra with lateral margins slightly flaring medially, tapered apically.

General color reddish black to black with distinct yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum black with numerous yellow spots or transverse markings; elytra reddish black to black.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times longer than wide, caudoventral margin produced posteriorly to broad, convex lobe; aedeagus in lateral aspect excluding atrial processes slightly wider than long, shaft long and narrow, curved posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes long, about $1\frac{3}{4}$ times longer than caudal atrial processes, broad medially, slightly curved, projecting dorsad beyond apex of aedeagal shaft; caudal atrial processes short, not reaching apex of aedeagal shaft, much narrower than lateral atrial processes, slightly

curved, projecting dorsad to posterodorsad in lateral aspect, nearly parallel in caudal aspect (fig. 7, *A, B, C*).

Female eighth sternum in dorsal aspect with single broad plate shorter than seventh tergum, sometimes weakly sclerotized along middle so as to appear as two bilateral symmetrical plates (specimens from Guatemala); plate with anterior margin broad, lateral margins divergent laterally and expanded dorsally at apical half, caudal margin broadly excavated at middle with slightly inflated circular area at middle (fig. 7, *D*).

Distribution in Central America and Mexico. Specimens examined from *Guatemala*: Acatenango, Antigua, Santa Marta, Solola, Yepocapa; *Honduras*: Jamastra; *Mexico*: Chiapas, Las Margarites; *Oaxaca*, Huajuapán; *Puebla*, Matamoros.

Specimens have been taken on corn. Collection dates are April to December.

The male holotype and female allotype from Mexico were examined and are in the U.S. National Museum.

From males of *costalis* and *semibulba*, males of *mexicana* can be separated by the aedeagus with nearly straight lateral atrial processes that project dorsad. Accurate separation of females of *mexicana* from those of *angusta* requires proper association of the sexes and the use of male characters just described.

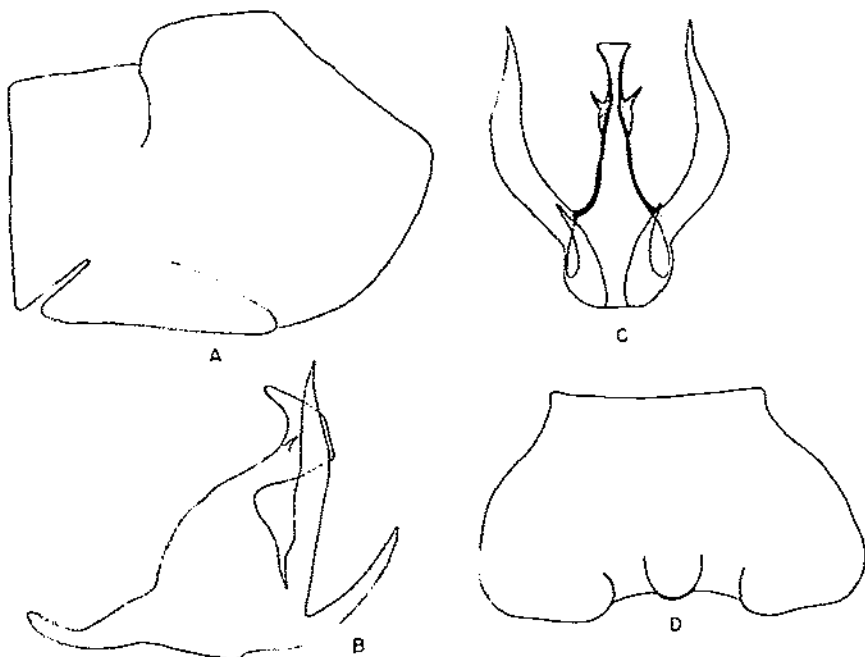


FIGURE 7. *Cuerna mexicana* Oman & Beamer: *A*, Male pygofer, lateral aspect; *B*, aedeagus, lateral aspect; *C*, aedeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect. (All from paratypes.)

Cuernu gladiola Oman & Beamer

Cuernu gladiola Oman & Beamer, Kans. Ent. Soc. Jour. 17: 124. 1944.

Medium size, slightly robust species; similar to *occidentalis* in habitus and male genitalia; female eighth sternum distinctive.

Length of male 6.4-6.9 mm., female 7.2-7.6 mm. Head wider than pronotum; crown broad, interocular width $1\frac{2}{3}$ times longer than median length, median length over twice length of mesal margin of eye; pronotum with length equal to median length of crown, sides parallel; elytra with lateral margins flaring slightly at middle, tapered apically.

General color reddish black to black with distinct ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum black with numerous rather even yellow spots on crown and pronotum; elytra reddish black to black.

Male pygofer in lateral aspect nearly $1\frac{1}{2}$ times longer than wide, caudoventral margin produced posteriorly to convex lobe; aedeagus in lateral aspect excluding atrial processes slightly longer than wide, shaft short, curved posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes long, about $1\frac{1}{2}$ times longer than caudal atrial processes, nearly straight, extending dorsad to or slightly beyond apex of aedeagal shaft, broad at basal half, attenuated at apical half; caudal atrial processes short, narrower than lateral atrial processes, nearly straight, projecting dorsad in lateral aspect, curved slightly laterad in caudal aspect (fig. 8, A, B, C).

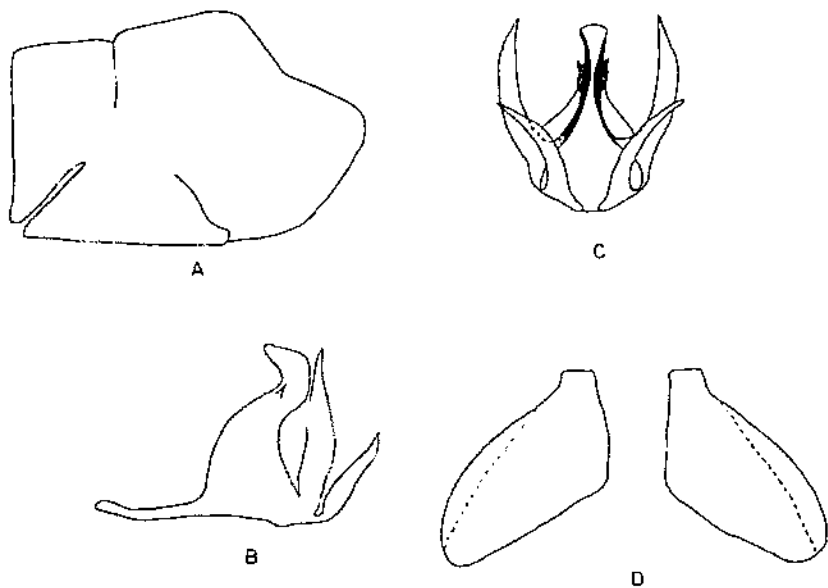


FIGURE 8.—*Cuernu gladiola* Oman & Beamer: A, Male pygofer, lateral aspect; B, nedeagus, lateral aspect; C, nedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (All from paratypes.)

Female eighth sternum in dorsal aspect with two elongate-globose, symmetrical plates slightly shorter than seventh tergum; each plate expanded dorsad at apical three-fourths, sides converging apically, lateral margin sometimes with weakly sclerotized fold on basal third (fig. 8, *D*).

Distribution in Western United States. Specimens examined from *California*: Atascadero, Boca, Calpine, Canby, Chilcoot, Coleville, Dunsmuir, Facht, Hobart Mills, Jamesville, Luther Pass, Martin Springs, Mono Lake, Plumas County, Quincy, Reno Junction, Shasta County, Strawberry, Truckee, Twain-Harte, Yosemite Valley; *Nevada*: Carson City, Pyramid; *Oregon*: Alsea Mountain, Chiloquin, Colistin, Lakeview; *Utah*: Salt Lake City, Soldier Summit.

This species has been taken on *Salix* sp., *Oenopodium* sp., gladiolus, and *Chrysothamnus nauseosus* var. *speciosus* (Nutt.) Hall. It was collected from May to October.

The male holotype and female allotype from Lakeview, Oreg., October 28, 1939, V. Johnson, were examined and are in the U.S. National Museum.

The males of this species can be separated from those of *occidentalis* by the caudal margin of the male pygofer, which is produced posteriorly caudoventrally. The distinctive female eighth sternum separates the species from females of other related species.

Cuerna sayi, new name

Tettigonia limbata Say, Phila. Acad. Nat. Sci. Jour. 4: 340. 1825. (Homonym of *Tettigonia limbata* Fabricius, Systema Rhyngotorum . . . p. 34, 1803.)

Oncometopia limbata (Say), Van Duzee, Amer. Ent. Soc. Trans. 21: 206. 1894.

Oncometopia lateralis var. *limbata* (Say), Van Duzee, Calif. Expt. Sta. Tech. Bul. 2, p. 593. 1917.

Cuerna limbata (Say), Oman, Wash. Ent. Soc. Mem. No. 3, p. 64. 1949.

Large, robust species; male and female genitalia unique.

Length of male 6.9-7.7 mm., female 7.8-9.0 mm. Head wider than pronotum; crown broad, interocular width about $1\frac{2}{3}$ times median length, median length over twice length of mesal margin of eye; pronotum long, about $1\frac{1}{3}$ times longer than median length of crown, sides parallel; elytra with sides flaring medially, tapered apically.

General color black with prominent yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum black with few yellow spots on apical one-third of pronotum and apical half of crown; elytra black.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes about $1\frac{1}{2}$ times longer than wide, shaft short, curved slightly posterodorsad, tooth on each side of middle absent; lateral atrial processes long, slightly curved, slightly longer than caudal atrial processes, projecting dorsad beyond apex of aedeagal shaft; caudal atrial processes with bases distinctly fused, long, slightly curved, projecting dorsad to but not exceeding apex of aedeagal shaft (fig. 9, *A, B, C*).

Female eighth sternum in dorsal aspect with two weakly sclerotized symmetrical plates nearly one-half length of seventh tergum; each plate with small fold on lateral margin extending mesoanteriorly, anterior margin broad, lateral margin sinuate, caudal margin convex, inner margin broadly excised at apical half of plate (fig. 9, *D*).

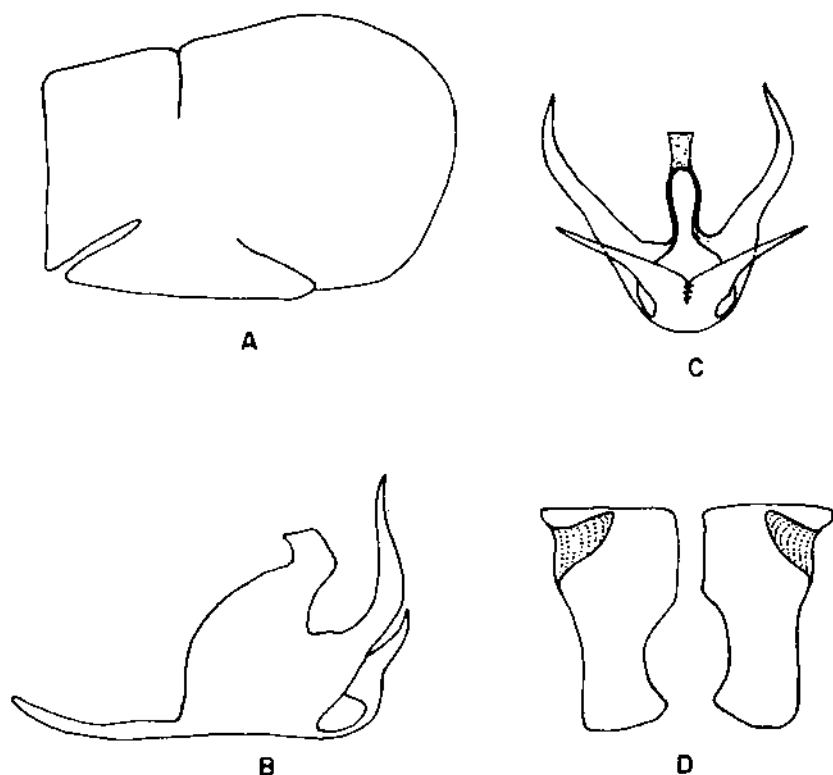


FIGURE 9.—*Cuerna sayi*, new name: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect.

Distribution in Midwestern United States and Canada. Specimens examined from *Canada: Alberta, Orion; Illinois; Iowa: Little Rock; Michigan; Missouri; Montana: Whitehall; South Dakota.*

The host is unknown. The species has been collected in August and September.

Say's type of *limbata* is presumably lost. Since this species is rather rare and distribution records are meager, it appears best not to designate a neotype until such time as material becomes available from Missouri, the type locality.

Oman (13) designated this species as a synonym of *septentrionalis* Walker. However, Dr. China of the British Museum examined male genitalia of *septentrionalis* noting the similarity of these structures with those of the male of *striata* Walker. On the basis of an illustration provided by Dr. China, the author has interpreted that *septentrionalis* and *striata* are conspecific, thus a new name is needed for *limbata*.

The male of *sayi* has unique genitalia and can be separated from all other related species by the caudal atrial processes having their bases fused. The female eighth sternum is also unique by having a small fold on the apical half of each plate starting from the lateral margin and extending anteromesad.

Cuernia unica, new species

Medium size, slender-to-robust species; similar to *occidentalis* in habitus and male genital characteristics; female eighth sternum distinctive.

Length of male 5.8-6.9 mm., female 6.7-7.6 mm. Head wider than pronotum; crown narrow with anterior margin sharply produced, interocular width about $1\frac{1}{2}$ times longer than median length, median length about $2\frac{1}{4}$ (male) to $2\frac{1}{3}$ (female) times length of mesal margin of eye; pronotum with median length about equal to median length of crown; elytra with sides nearly parallel, tapered apically; clypeus and clypellus swollen; gena and lora glabrous; male plates together narrowly triangular, apices elongate and covered with long, fine setae on lateral margins.

General color black with conspicuous broad yellow or ivory line running laterally from anterior margin of head to eighth tergum; head and pronotum black with numerous very fine yellow markings, markings transverse on pronotum; scutellum black with broad, yellow longitudinal markings; elytra black to reddish black, veins black; clypeus black with fine yellow lines running parallel on each side of middle; clypellus black with several large yellow markings; lora and gena black with yellow irregular markings; legs with yellow and black stripes; venter black with several irregular yellow spots.

Pygofer in lateral aspect about $1\frac{1}{2}$ times as long as wide, caudal margin convex; aedeagus in lateral aspect excluding paired atrial processes about $1\frac{1}{3}$ times as long as wide, shaft short, slightly recurved, projecting dorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes long and broad basally, projecting dorsad beyond apex of aedeagal shaft; caudal atrial processes short and slender, about one-half as long as lateral atrial processes, projecting dorsad in lateral aspect, parallel in caudal aspect (fig. 10, A, B, C).

Female eighth sternum in dorsal aspect two lobelike plates about one-fourth shorter than seventh tergum; each plate with anterior margin broad, lateroposterior margin produced caudad to short, narrow lobe (fig. 10, D).

The male holotype (Cat. No. 67116), female allotype, and one male paratype, Lava Beds National Monument, Colo., September 8, 1954, Joe Schuh, are in the U.S. National Museum. Additional paratypes; two males and two females, San Francisco, Calif., August 1908, J. C. Bradley, in the U.S. National Museum; one male, Santa Cruz County, Calif., Koebele; one male, San Francisco, Calif., July 24, 1920, E. P. Van Duzee; two females, San Francisco, Calif., March 28, 1910; one female, San Francisco, August 1908, J. C. Bradley; and one female, San Francisco, Calif., May 7, 1911, J. A. Kusche; in the California Academy of Sciences; one male, Hood River, Oreg., July 17, 1931, J. Nottingham; one male and one female, Hood River, Oreg., July 1931, R. H. Beamer; one male, Oreg. (No. 2506), C. F. Baker; one male, Maybell, Colo., August 18, 1940, R. H. Beamer; one male, Jamesburg, Calif., August 11, 1939, R. I. Sailer; and one male, Golden Gate, Calif., July 17, 1933, R. H. Beamer; in the Snow Museum of the University of Kansas; and one male and one female, Lava Beds National Monument, Colo., September 8, 1954, Joe Schuh, in the collection of the author.

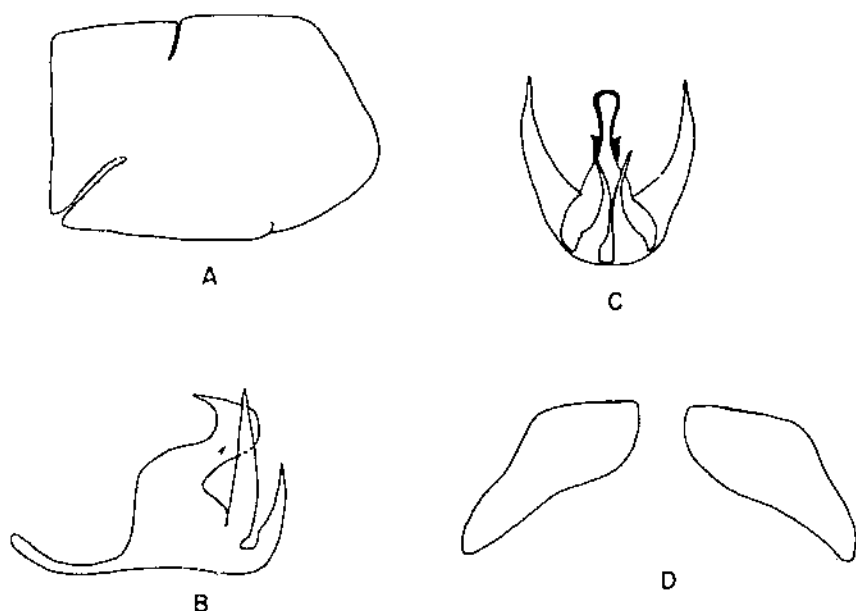


FIGURE 10.—*Cuerna unica*, new species: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (A, B, C from kolotype and D from allotype.)

This species can be separated from *occidentalis* by the male aedeagus having shorter paired atrial processes and the female eighth sternum with each plate having a narrow anterior margin.

Owing to the similarity of the male aedeagus between *unica* and *occidentalis*, the former species can be separated from the latter after proper association of the sexes and by the female eighth sternum with each lobelike plate broad at the basal half and narrowed to an elongate lobe at the apical half.

Cuerna occidentalis Oman & Beamer

Cuerna occidentalis Oman & Beamer, Kaus. Ent. Soc. Jour. 17: 119. 1944.

Medium size, slender species; similar in habitus and male genital characteristics to *gladiola*; female eighth sternum unique.

Length of male 5.8–6.6 mm., female 6.6–7.4 mm. Head wider than pronotum; crown narrow, interocular width about $1\frac{1}{2}$ times longer than median length, median length about $2\frac{1}{4}$ times longer than mesal margin of eye; pronotum short with median length slightly less than median length of crown, sides parallel; elytra with lateral margins flaring slightly medially, tapered apically.

General color yellowish gray to black with prominent yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, scutellum, and elytra with numerous fine yellow and black markings, markings much finer on apical three-fourths of pronotum and elytra giving rugulose appearance to entire body.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes about $1\frac{1}{2}$ times longer than wide, shaft very short, curved posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes long, about $1\frac{1}{3}$ times longer than caudal atrial processes, basal two-thirds straight, apical one-third curved posterodorsad, projecting dorsad beyond apex of aedeagal shaft, broad basally, attenuated apically; caudal atrial processes short, narrower than lateral atrial processes, nearly straight, projecting dorsad to but not extending beyond apex of aedeagal shaft, curved slightly laterad in caudal aspect (fig. 11, *A, B, C*).

Female eighth sternum in dorsal aspect with two weakly sclerotized, elongate, oval-shaped, symmetrical plates about half as long as seventh tergum and broadly separated from each other; each plate projecting posterolaterad, sometimes nearly laterad, lateral sides nearly parallel, apex convex (fig. 11, *D*).

This species is known only from California. Specimens examined from Alpine, Blythe, Boulevard, Campo, Claremont, Cuyamunga, Davis Creek, Green Valley, Hemet, Idyllwild, Jacumba, Laguna Mountains, Mill Valley, Mint Canyon, Pasadena, Pine Hills, Pine Meadows, Riverside, San Diego, San Jacinto Mountains, and Santa Maria.

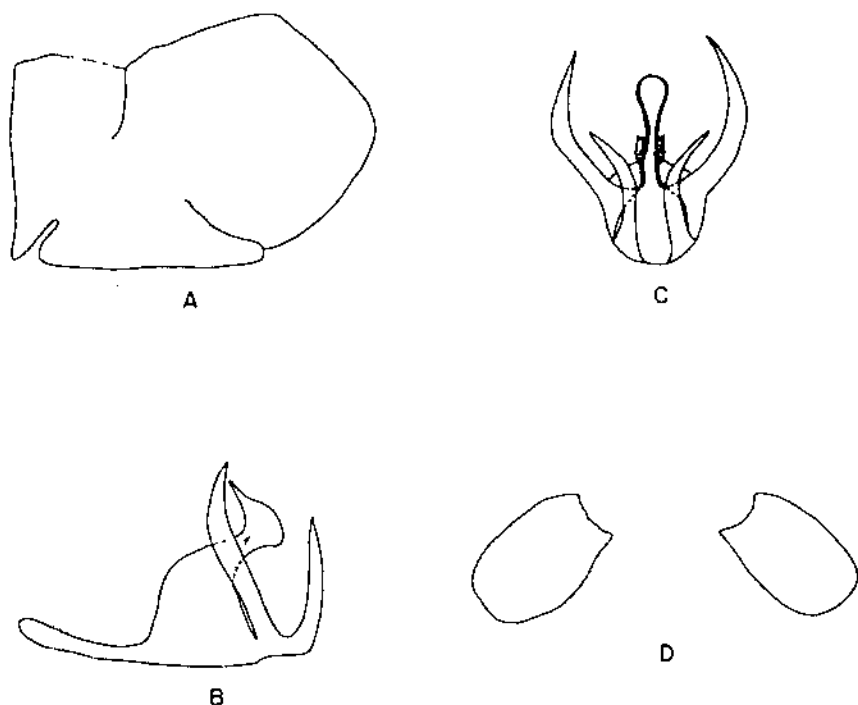


FIGURE 11.—*Cuerna occidentalis* Oman & Beamer: *A*, Male pygofer, lateral aspect; *B*, aedeagus, lateral aspect; *C*, aedeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect. (All from paratypes.)

It has been taken on *Arctostaphylos pungens* H. B. K., *Symphoricarpos* sp., *Artemisia* sp., *Lotus* sp., *Lupinus* sp., and grass. Collecting dates were from June to September.

The male holotype and female allotype from Mint Canyon, Calif., July 6, 1933, J. D. Beamer, were examined and are in the Snow Museum of the University of Kansas collection.

The males of this species can be separated from males of *gladiola* by the smaller aedeagus and shorter aedeagal shaft. Females can be distinguished by the eighth sternum having small, oval-shaped plates, which project posterolaterad, and the large space between plates, which is almost equal to the length of the plate.

This species has been reported as a vector of Pierce's disease of grapes in California by Freitag et al. (7).

Cuerna kaloostiani, new species

Medium size, slender-to-robust species; similar to *occidentalis* in habitus and male genitalia and to *striata* in female genital characteristics.

Length of male 6.2-6.9 mm., female 7.0-7.8 mm. Head wider than pronotum; crown broad with anterior margin bluntly produced, interocular width about $1\frac{3}{4}$ times longer than median length, median length nearly twice (male) to $2\frac{1}{3}$ (female) times length of mesal margin of eye; pronotum with median length slightly longer than median length of crown, sides nearly parallel; elytra with sides flaring slightly medially (female) or parallel (male), tapered apically; clypeus swollen; clypellus swollen along middle; gena slightly elevated along margin next to clypeus; lora flat; clypellus, gena, and lora covered with fine, short setae; male plates together narrowly triangular with numerous long, fine setae along lateral margins.

General color black with distinct yellow or ivory line running laterally from anterior margin of head to eighth tergum; head and pronotum black with numerous small yellow or ivory spots and lines; scutellum black with broad, yellow, longitudinal markings; elytra reddish black, veins black; clypeus black with fine yellow spots or lines running parallel on each side of middle; clypellus, lora, and gena black with few yellow markings; legs black; venter black.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding paired atrial processes slightly longer than wide, shaft long, narrow, curved posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes long, straight, extending beyond apex of aedeagal shaft, projecting dorsad, curved slightly mesad at apical one-third in caudal aspect; caudal atrial processes short, straight, projecting dorsad to but not extending beyond apex of aedeagal shaft, slightly narrower than lateral atrial processes, apical half curved slightly laterad in caudal aspect (fig. 12, A, B, C).

Female eighth sternum in dorsal aspect two distinct, elongate plates slightly longer than seventh tergum; each plate with apical half distinctly folded along lateral margin, basal half projecting posterolaterad, posterior margin broadly truncate or convex (fig. 12, D).

Numerous specimens were collected near Flagstaff, Ariz., on *Wyethia* sp., which may be the host.

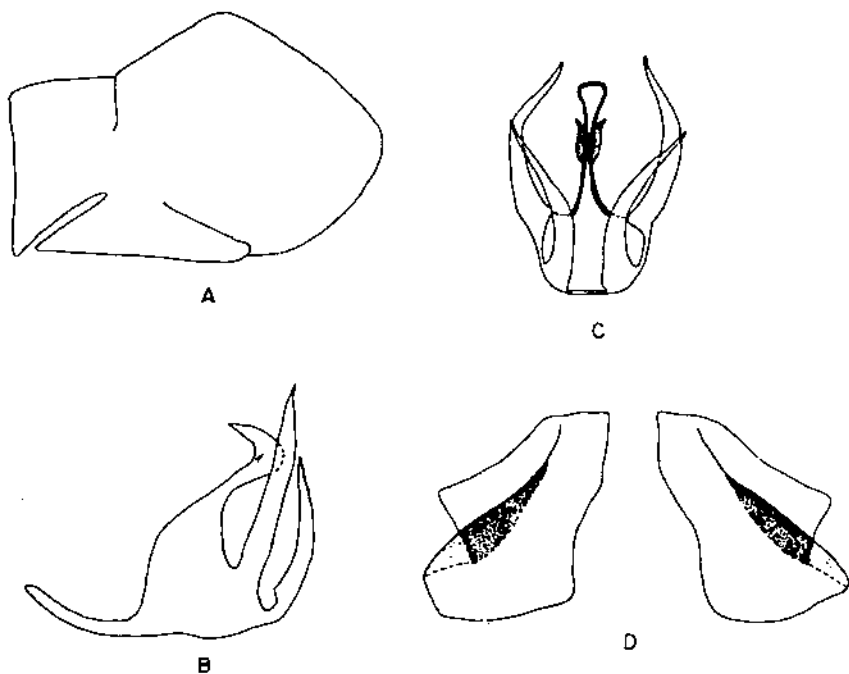


FIGURE 12.—*Cuerna katoostiani*, new species: A, Male pygofer, lateral aspect; B, nedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (A, B, C from holotype and D from allotype.)

Described from numerous specimens from northern Arizona. The male holotype, female allotype, 1 male and 1 female paratype, Flagstaff, July 27, 1936, R. H. Beamer; 4 male paratypes, Grand Canyon, July 28, 1936, R. H. Beamer and D. R. Lindsay; 1 female paratype, Grand Canyon National Park, July 16, 1947, R. H. Beamer; 2 female paratypes, Williams, July 3, 1950, H. O. Wright and W. J. Arnold; 1 male paratype, Williams, July 28, 1936, D. R. Lindsay; 1 female paratype, Coconino County, August 18, 1927, L. D. Anderson; and 1 male and 13 female paratypes from San Francisco Mountains, July 4, 1952, R. H. and L. D. Beamer, C. Weiner, A. Wolf, L. Liang, and W. LaBerge; in the Snow Museum of the University of Kansas. Additional paratypes; 3 males, 17 miles north of Flagstaff, January 29, 1949; 1 female, Williams, June 4 (no year given), Barber and Swartz; and 1 female, Bright Angel, July 14 (no year given), Barber and Swartz; in the U.S. National Museum; 4 females, Grand Canyon, August 19, 1939, E. P. Van Duzee; 2 females, Prescott, July 12, 1917, C. A. Hill; and 1 male, Bright Angel Camp, 6,900 feet, Wickham; in the California Academy of Sciences; 5 males and 5 females, Flagstaff, Coconino County, P. D. Gerhardt, on *Wyethia*, in the University of Arizona collection; and 13 males and 12 females, Flagstaff, Coconino County, P. D. Gerhardt, on *Wyethia* sp.; and 2 females, Flagstaff, V. L. Wildermuth; in the author's collection.

This species can be separated from *occidentalis* after proper association of the sexes and by characters in the female eighth sternum.

From females of *striata*, females of *kaloostiani* can be distinguished by two small, distinctly separated plates.

This species is named for George H. Kaloostian of the Entomology Research Division.

Cuerna alba Oman & Beamer

Cuerna alba Oman & Beamer, Kans. Ent. Soc. Jour. 17: 126. 1944.

Medium size, slender species; related to *arida* in habitus, to *gladiola* in female eighth sternum, and to *kaloostiani* in male genitalia.

Length of male 6.4-7.1 mm., female 7.2-7.9 mm. Head wider than pronotum; crown narrow, interocular width about $1\frac{1}{2}$ times median length, median length $2\frac{1}{4}$ (male) to $2\frac{1}{3}$ (female) times length of mesal margin of eye; pronotum with median length nearly as long as median length of crown, sides parallel; elytra with sides parallel, tapered distally.

General color and head, pronotum, and scutellum with color markings as in *arida*; elytra reddish gray.

Male pygofer in lateral aspect about $1\frac{1}{4}$ times as long as wide, caudal margin broadly convex; aedeagus in lateral aspect excluding atrial processes about as long as wide, shaft long and narrow, sides parallel, projecting posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes long and narrow, about $1\frac{1}{2}$ times longer than caudal atrial processes, slightly curved anterodorsad, and extending beyond apex of aedeagal shaft; caudal atrial processes short, not reaching apex of aedeagal shaft, projecting slightly anterodorsad, attenuated apically and projecting slightly laterad at apical half in caudal aspect (fig. 13, A, B, C).

Female eighth sternum in dorsal aspect with two elongate, symmetrical plates slightly longer than seventh tergum; each plate with anterior margin very narrow, distal three-fourths projecting posterolaterad, lateral margins nearly parallel, caudal margin subtruncate (fig. 13, D).

This rare species is known only from New Mexico. Specimens examined from Kenna, Portales, and White Sands.

The host plant is not known, and specimens were collected in June and July.

The male holotype and female allotype from White Sands, N. Mex., June 30, 1932, R. H. Beamer, were examined and are in the Snow Entomological Collection of the University of Kansas.

This species can be separated from *arida* by the male and female genital characters, from males of *gladiola* by the aedeagus with lateral atrial processes exceeding the apex of the aedeagal shaft, and from females of *kaloostiani* by the female eighth sternum with each plate elongate and narrow.

Cuerna obesa Oman & Beamer

Cuerna obesa Oman & Beamer, Kans. Ent. Soc. Jour. 17: 122. 1944.

Short, robust species; similar to *gladiola* in habitus and female eighth sternum and to *curcata* in male aedeagus.

Length of male 5.7-6.4 mm., female 6.4-7.5 mm. Head wider than pronotum; crown broad, interocular width about $1\frac{3}{4}$ times median

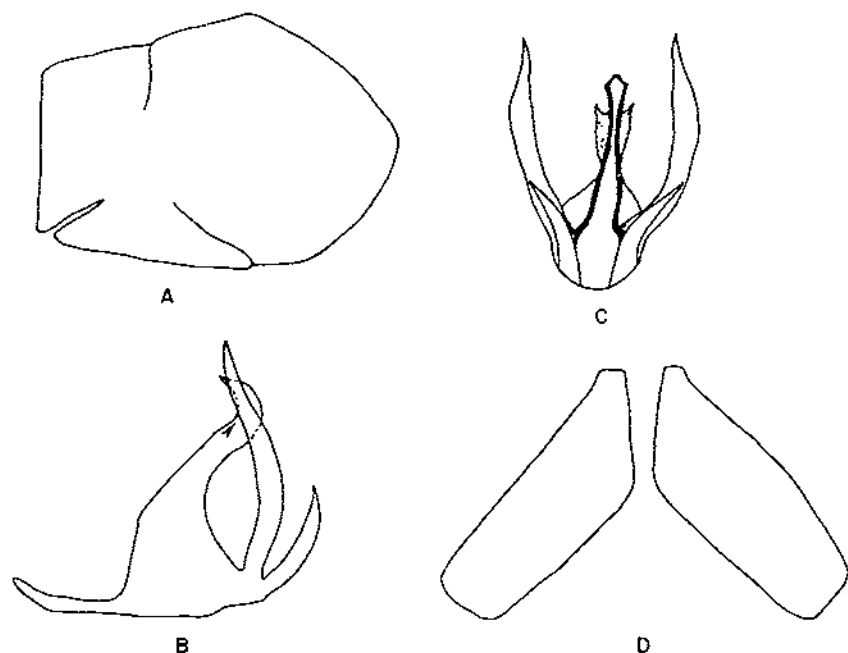


FIGURE 13.—*Cuerna alba* Oman & Beamer: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (All from paratypes.)

length, median length about $2\frac{2}{3}$ times length of mesal margin of eye; pronotum with median length slightly less than median length of crown, lateral margins parallel; elytra with sides flaring slightly at middle and tapering apically.

General color reddish gray with conspicuous yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum with numerous yellow and black coarse markings, markings more numerous and regular on apical two-thirds of pronotum, fewer and irregular on basal one-third; elytra reddish gray.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times as long as narrowest width with prominent, short, narrow, fingerlike lobe arising from caudodorsal margin and projecting dorsally, caudal margin convex; aedeagus in lateral aspect excluding atrial processes slightly longer than wide, shaft recurved, slightly constricted basally, projecting caudodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes short, narrow, irregularly curved, projecting dorsad to apex of aedeagal shaft, strongly curved mesally at apical half in caudal aspect; caudal atrial processes longer and broader than lateral atrial processes, extending beyond apex of aedeagal shaft, irregularly curved, constricted basally, expanded medially, attenuated apically, projecting dorsad in lateral and caudal aspects (fig. 14, A, B, C).

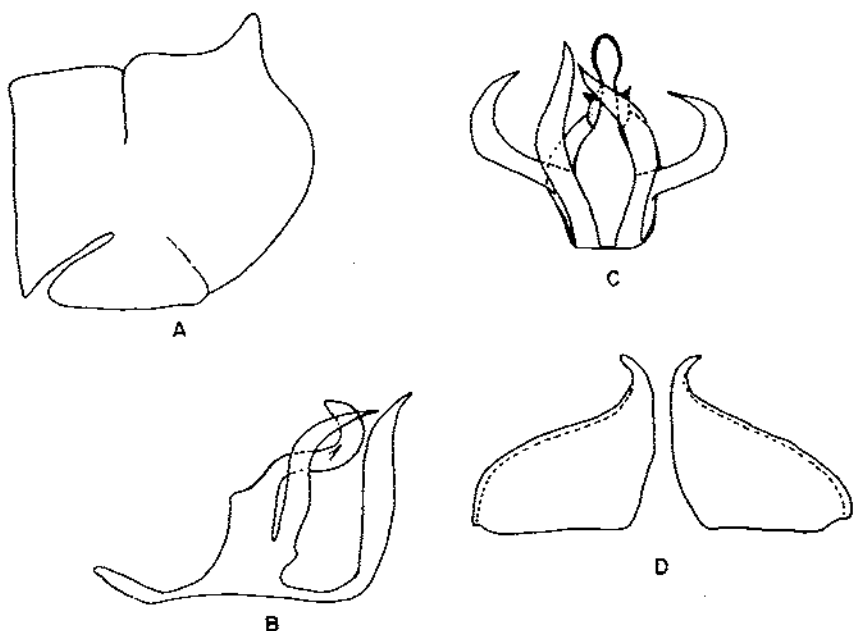


FIGURE 14.—*Cuerna obesa* Oman & Beamer: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (All from paratypes.)

Female eighth sternum in dorsal aspect with two subtriangulate plates about one-fourth shorter than seventh tergum; each plate with narrow, curved apex on anterior margin, anterior margin curved laterally meeting lateral margin, caudal margin truncate (fig. 14, D).

Distribution in Southwestern United States and Mexico. Specimens at hand from *Arizona*: Ashfork, Carrizo, Chino Valley, Cibecue, Douglas, Fort Apache (Cedar Creek), Prescott, Sonoita, Springerville, Taylor, Vernon, White River; *Mexico*: Montezuma, Parrita, (Chihuahua), Santa Barbara; *New Mexico*: Cloudcroft, Fort Sumner, Grady, Tucumcari; *Texas*: Alpine, Amarillo, Brewwater County, Davis Mountains, Fort Hancock, Marfa.

Specimens have been taken on *Salsola kali* var. *tenuifolia* Tausch and an undetermined species of mallow. It was collected from June to August in the United States and in February in Mexico.

The male holotype and female allotype from Cloudcroft, N. Mex., June 27, 1940, R. H. Beamer, were examined and are in the Snow Entomological Collection of the University of Kansas.

Males of *obesa* can be separated from males of *gladiola* and *curvata* by the presence of the small fingerlike lobe arising from the caudodorsal margin of the male pygofer. Specimens of *obesa* from Mexico are atypical in that the caudodorsal lobe of the male pygofer is reduced and the female eighth sternum more nearly quadrate. The male aedeagus, however, is typical. Females of *obesa* can be separated

from females of *gladiola* by the more nearly triangulate-shaped plates of the eighth sternum.

Cuerna krameri, new species

Large, robust species; similar to *angusta* and *semibulba* in male and female genital characteristics, respectively.

Length of male 8.0 mm., female 8.5 mm. Head wider than pronotum; crown broad with anterior margin bluntly produced, interocular width $1\frac{9}{10}$ longer than median length, median length $2\frac{1}{8}$ (female) to $2\frac{1}{4}$ (male) times length of mesal margin of eye; pronotum with median length about equal to median length of crown, sides parallel; elytra with sides parallel, tapered apically; clypeus and clypellus swollen; gena and lora covered with numerous short, fine setae; male plates together broadly triangular and covered with numerous setae, especially on lateral margins.

General color reddish black with prominent broad yellow line running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum black with numerous fine yellow spots, yellow markings transverse on apical half of pronotum; elytra reddish black, veins black; clypeus and clypellus black with numerous yellow markings forming broken lines on each side of middle, spots regular on middle; gena and lora black with few yellow markings; legs black; venter black.

Male pygofer in lateral aspect about $1\frac{1}{3}$ times as long as wide, caudoventral margin produced posteriorly to broad, convex lobe; aedeagus in lateral aspect excluding atrial processes about as long as wide, shaft long, projecting dorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes recurved, basal half projecting dorsad, apical half projecting caudad or caudoventrad, apical curved part extending caudad beyond caudal margin of atrium; caudal atrial processes very long, straight, equal in width to lateral atrial processes, extending dorsad beyond apex of aedeagal shaft, parallel in caudal aspect (fig. 15, A, B, C).

Female eighth sternum in dorsal aspect single plate nearly $1\frac{1}{4}$ times longer than seventh tergum; plate with two elongate lateral lobes fused along anterior margin and projecting posteriorly; lobes broad medially and constricted subapically (fig. 15, D).

Described from four specimens from Mexico. The male holotype and female allotype, 5 miles north of Creel, Chihuahua, August 30, 1950, Ray F. Smith, are in the American Museum of Natural History. Additional paratypes; one male, Madera, Chihuahua, July 6 (no year given), 7,200 feet, Gertch, in the U.S. National Museum; and one male, Monterey, Nuevo Leon, November 1, 1928, J. S. Caldwell, in the author's collection.

The males of this species can be separated from those of *angusta* by the aedeagus with the lateral atrial processes not constricted basally and the long caudal atrial processes extending beyond the apex of the aedeagal shaft. Females can be separated from those of *semibulba* by the eighth sternum having the lateral lobes fused anteriorly. This species is named for James P. Kramer of the Entomology Research Division.

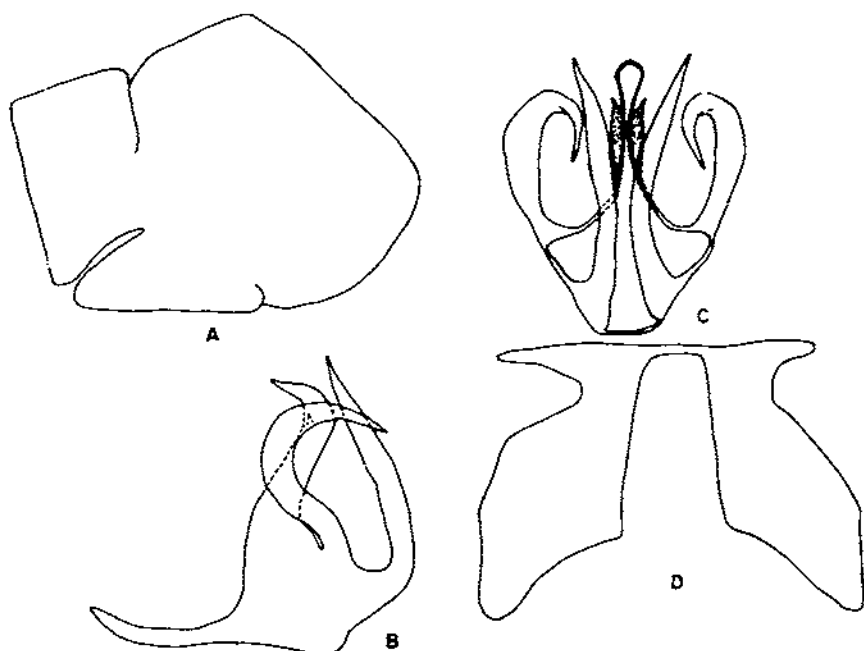


FIGURE 15.—*Cuerna krameri*, new species: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (A, B, C from holotype and D from allotype.)

Cuerna costalis (Fabricius)

Cercopis lateralis Fabricius, Sup. Ent. System., p. 524. 1798. (Homonym of *Cicada lateralis* Linnaeus, Systema Naturae . . . , p. 437, 1758.)

Cercopis lateralis, Coquebert, Illus. Iconographica Insectorum . . . , p. 35. 1799.

Cercopis marginella Fabricius, Systema Rhyngotorum . . . , p. 96. 1803.

(Homonym of *Cercopis marginella* Fabricius, Ent. System. . . . , p. 52, 1794.)

Cercopis costalis Fabricius, Systema Rhyngotorum . . . (Emendanda, [p. 315]). 1803.

Tettigonia pyrrhotelus Walker, List of the Specimens of Homopterous Insects in the Collection of the British Museum, pt. 3, p. 775. 1851.

Proconia costalis, Osborn, Iowa Acad. Sci. Proc. 1, p. 125. 1892.

Oncometopia costalis, Van Duzee, Amer. Ent. Soc. Trans. 21: 265. 1894.

Oncometopia lateralis, Van Duzee, Calif. Expt. Sta. Tech. Bul. 2, p. 592. 1917.

Cuerna lateralis, Melichar, Mus. Nat. Hungarici Ann. 22: 364. 1925.

Cuerna costalis, Oman, Wash. Ent. Soc. Mem. No. 3, p. 64. 1949.

Very large, robust species; similar to *striata* in habitus and to *angusta* in male and female genital characteristics.

Length of male 7.7–9.1 mm., female 8.2–9.6 mm. Head wider than pronotum; crown broad, interocular width $1\frac{3}{4}$ times longer than median length, median length about twice length of mesal margin of eye; pronotum long, about $1\frac{1}{8}$ times longer than median length of crown, sides parallel; elytra with lateral margins flaring medially, tapered apically.

General color reddish black to black with prominent yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum black with numerous coarse

yellow markings, markings more numerous on crown and pronotum; elytra reddish black to black.

Male pygofer in lateral aspect about $1\frac{1}{3}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes about $1\frac{1}{4}$ times longer than wide, shaft projecting posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes recurved, basal half projecting dorsad, apical half projecting caudad or ventrad, recurved part not exceeding apex of aedeagal shaft but extending caudad to or beyond caudal margin of atrium, curved slightly mesad in caudal view; caudal atrial processes long, slightly narrower than lateral atrial processes, nearly straight, projecting slightly anterodorsad beyond apex of aedeagal shaft, usually crossing over in caudal aspect (fig. 16, *A, B, C*).

Female eighth sternum in dorsal aspect single, broad, bell-shaped plate about $1\frac{1}{4}$ times longer than seventh tergum; plate with anterior margin broad, lateral margins divergent laterad and broadly convex, caudal margin twice as broad as anterior margin and broadly concave or truncate and sinuate along middle (fig. 16, *D*).

Distribution in Eastern and Midwestern United States. Specimens examined from *Alabama*: Barochios, Escambra County, River Falls, Tuskegee; *Arkansas*: Bentonville, Cabool, Chessman Ferry, Hope, Howard County, Little Rock; *Florida*: Arcadia, Clamona, Del Ray, Dover, Eridu, Fort Mead, Gainesville, La Belle, Montbrook, Monticello, Orlando, Plant City, Quincy, St. Croix, Sanford; *Georgia*: Branford, Coolidge, Fort Valley, Oak Park, Okefenokee Swamp, Rabbaun, Roberta, Tifton; *Indiana*: Rush Branch, South McAlester; *Iowa*: Carpenter, County 79; *Kansas*: Arkansas City, Baxter Springs,

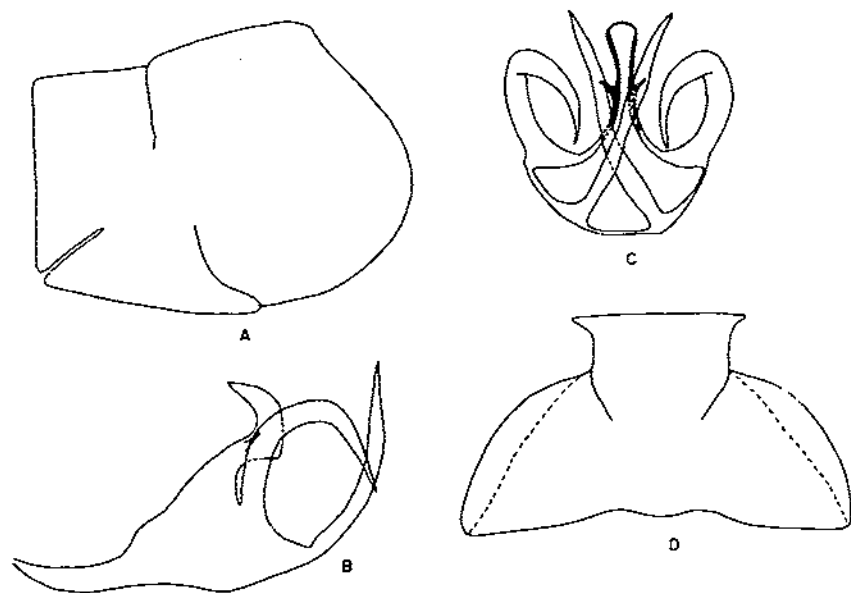


FIGURE 16.—*Cuerna costalis* (Fabricius): *A*, Male pygofer, lateral aspect; *B*, aedeagus, lateral aspect; *C*, aedeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect.

Columbus, Galena, Independence, Wellington; *Louisiana*: Calhoun, Converse, Logansport, Madison Parish, Maryville, Natchitoches, Plain Dealing, Shreveport, Tallulah; *Maryland*: Beltsville, Cedar Point, Glen Echo, Odenton, Plum Point; *Mississippi*: Benoit, Clarksdale, Fayette, Fulton, Greenwood, Hamilton, Lincoln County, Ocean Springs; *Missouri*: St. Louis; *Nebraska*: Lincoln; *New Mexico*: El-mendorf; *New York*: Merrill, Saboel; *North Carolina*: Benson, Greensboro, Halifax County, Newton, Raleigh, Salisbury, Southern Pines, Wallace, Windsor; *Ohio*: Crown City, North Kenova; *Oklahoma*: Guthrie, Wichita; *South Carolina*: Clemson, Orangeburg; *Tennessee*: Chattanooga, Clarksville, Columbia, Great Smoky Mountain National Park, Harriman, Knoxville, Roane County; *Texas*: Austin, Avery, Dallas, Denison, George West, Handley, Jefferson, Plano, Rosser, Sanderson, Tyler, Willis; *Virginia*: Arlington, Augusta County, Camp Pickett, Cape Henry, Chain Bridge, Charlottesville, Colonial Beach, Norfolk; *Washington, D.C.*; *West Virginia*: Fairmont, Jackson's Mill.

This species has been collected on peanuts, johnsongrass, *Helianthus petiolaris* Nutt., *Amphichyris* sp., corn, lespedeza, strawberry, beets, wheat, and peach. It is one of the important leafhopper vectors of phony peach and Pierce's disease of grapes in the Southeastern United States. Turner and Pollard (22) published an excellent account of the life history and behavior of this species in Georgia.

Fabricius' type of *Cercopis lateralis* is presumably lost. Efforts to locate the type by correspondence and personal search by A. Villiers, Paris Museum, and D. A. Young, Jr., N.C. State College, in the Bosc collection of the Paris Museum where the specimen was last deposited were not successful. In the interest of genotype stability and in accordance with Article 75 of the International Code of Zoological Nomenclature, a specimen collected 10 miles north of Fairfax, N.C., April 8, 1935, D. A. Young, and similar in habitus to Coquebert's (1) illustration of the actual type specimen, which is the earliest on record of this species, is hereby designated male neotype of *Cercopis lateralis* Fabricius 1798 (nec *lateralis* Fabricius 1803) and is deposited in the Copenhagen Museum.

This species can be separated from *striata* by characters in the male aedeagus and the female eighth sternum and from *angusta* by the narrower lateral and longer caudal atrial processes of the male aedeagus and the bell-shaped female eighth sternum.

Cuerna yuccae Oman & Beamer

Cuerna yuccae Oman & Beamer, Kans. Ent. Soc. Jour. 17: 121. 1944.

Medium size, slightly robust species: similar to *obtusata* in habitus and male genitalia and to *alpina* in female eighth sternum.

Length of male 6.2-7.5 mm., female 7.2-8.0 mm. Head wider than pronotum: crown narrow, interocular width about $1\frac{1}{3}$ times median length, median length nearly $2\frac{1}{4}$ (male) to $2\frac{2}{3}$ (female) times length of mesal margin of eye; pronotum short, median length equal to median length of crown, sides parallel; elytra with sides flaring slightly at middle, tapered apically.

General color reddish gray to black with distinct yellow or ivory band running laterally from anterior margin of head to eighth tergum:

head, pronotum, and scutellum with numerous yellow and black markings similar to *arida* but with markings on pronotum slightly smaller; elytra reddish gray to reddish black.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes about $1\frac{1}{2}$ times longer than wide, shaft recurved with prominent tooth on each side of middle in caudal aspect; lateral atrial processes strongly recurved, projecting posteroventrad or caudad beyond caudal margin of atrium, broader than caudal atrial processes, recurved part below or just reaching apex of aedeagal shaft; caudal atrial processes long, narrow, nearly straight, slightly curved basally, projecting dorsad beyond apex of aedeagal shaft, usually crossing over in caudal aspect (fig. 17, *A, B, C*).

Female eighth sternum in dorsal aspect with two symmetrical triangular plates about one-half length of seventh tergum; each plate with anterior margin narrow, lateral margin strongly divergent, caudal margin broad, sinuate, nearly truncate, laterocaudal margin produced slightly posteriorly to narrow apices (fig. 17, *D*).

Distribution in Western United States. Specimens at hand from *Arizona*: Alamo, Congress Junction; *California*: Antelope Valley, Apple Valley, Cajon Pass, Ivanpah, Palmdale, San Gabriel Mountains, Victorville; *Yeruda*: Glendale, Las Vegas; *Utah*: Leeds, St. George.

Numerous specimens have been collected on the Joshua tree (*Yucca brevifolia* Engelm.), which is presumably the host. Collections were made from April to October.

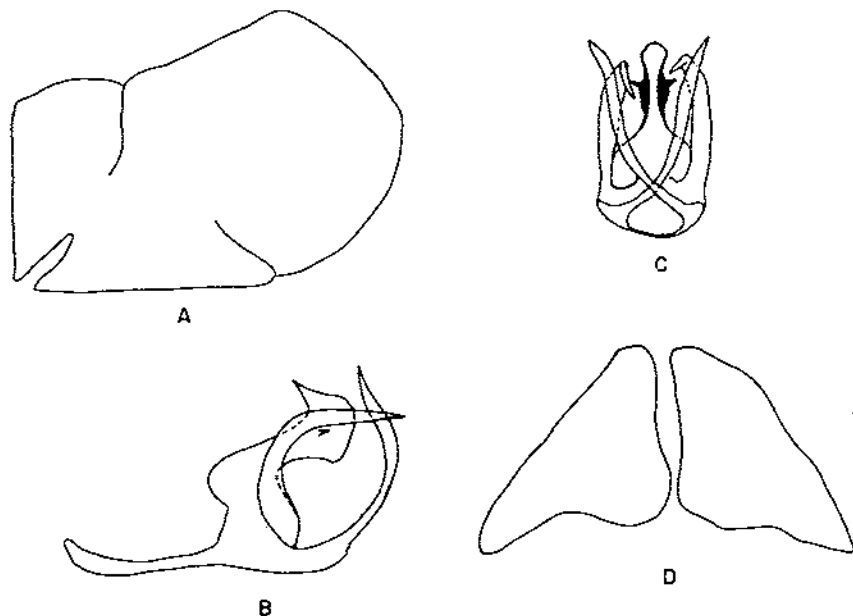


FIGURE 17.—*Cuerna yuccae* Oman & Beamer: *A*, Male pygofer, lateral aspect; *B*, aedeagus, lateral aspect; *C*, aedeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect. (All from paratypes.)

Owing to the similarity of the male genitalia between *yuccae* and *obtusata*, it is necessary to properly associate the sexes, then separate the species on characters in the female eighth sternum. Males of *yuccae* can be separated from those of *alpina* by the strongly recurved lateral atrial processes of the aedeagus in lateral aspect and the longer caudal atrial processes, which exceed the apex of the aedeagal shaft in caudal aspect.

Cuernu balli Oman & Beamer

Cuernu balli Oman & Beamer, Kans. Ent. Soc. Jour. 17: 122. 1944.

Medium size, slender species; similar to *arida* in habitus, to *yuccae* in male aedeagus, and to *nivea* in female genital characteristics.

Length of male 5.9-6.3 mm., female 6.5-7.1 mm. Head wider than pronotum; crown narrow, interocular width $1\frac{1}{2}$ times median length, median length twice (male) to $2\frac{1}{8}$ (female) times length of mesal margin of eye; pronotum short with median length less than median length of crown, sides parallel; elytra with lateral margins parallel except distally giving linear appearance to body.

General color reddish gray with conspicuous yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum with numerous coarse yellow and black markings, yellow markings more numerous and regular on distal two-thirds of pronotum, fewer and irregular on proximal one-third; elytra reddish gray.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes about $1\frac{1}{3}$ times longer than wide, shaft long and narrow, projecting posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes strongly recurved, projecting caudad at apical half beyond caudal margin of atrium, recurved part reaching to but not extending beyond apex of aedeagal shaft, attenuated apically; caudal atrial processes slightly curved anterodorsad, exceeding apex of aedeagal shaft and parallel in caudal aspect (fig. 18, A, B, C).

Female eighth sternum in dorsal aspect with two elongate, symmetrical plates about equal to seventh tergum; plate with anterior margin narrow, basal half with lateral margin expanded laterally, distal half narrow lobe, projecting posterolaterad beyond margin of basal half of plate and narrowed apically (fig. 18, D).

Distribution of this rare species in Western United States. Specimens examined from *Arizona*: Baboquivari Mountains; *Nevada*: Alamo; *Utah*: Dixie, St. George.

Specimens were taken on *Atriplex canescens* (Pursh) Nutt. in September and October.

The male holotype and female allotype from Baboquivari Mountains, Ariz., October 16, 1937, P. W. Oman, have been examined and are in the U.S. National Museum.

This species can be separated from *arida* by characters in the male aedeagus and the female eighth sternum. Males are difficult to separate from those of *yuccae*, but after proper association of the sexes, *balli* can be distinguished by the female eighth sternum with two

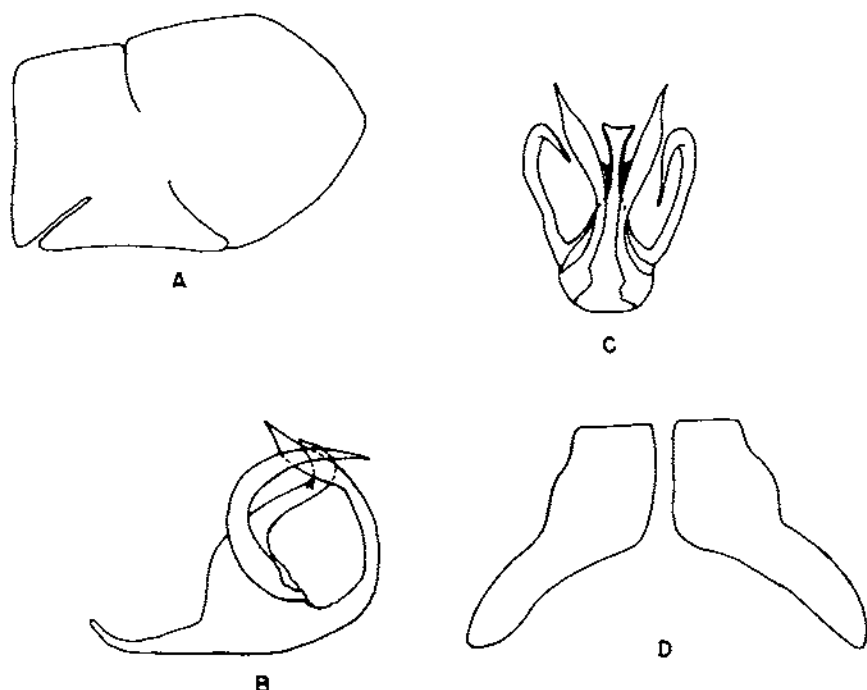


FIGURE 18.—*Cuerna balli* Oman & Beamer: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (All from paratypes.)

elongate, lobelike, symmetrical plates. From *unica*, *balli* can easily be distinguished by characters in the male genitalia in the key and illustrations.

Cuerna obtusa Oman & Beamer

Cuerna obtusa Oman & Beamer, Kans. Ent. Soc. Jour. 17: 120. 1944.

Medium size, slightly robust species; related to *alta* in habitus and female eighth sternum and to *balli* in male genitalia.

Length of male 6.4–7.3 mm., female 7.4–7.9 mm. Head wider than pronotum; crown broad, interocular width nearly twice median length, median length nearly twice length of mesal margin of eye; pronotum long, median length nearly $1\frac{1}{4}$ times median length of crown, sides parallel; elytra with sides nearly parallel, tapered apically.

General color reddish black with distinct yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum with numerous yellow and black markings; pronotum with markings more numerous and less irregular on distal three-fourths than on apical one-fourth; elytra reddish gray to reddish black.

Male pygofer in lateral aspect $1\frac{1}{2}$ times as long as wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes $1\frac{1}{4}$ times as long as wide, shaft slightly curved posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial

processes strongly recurved, projecting caudad beyond caudal margin of atrium, broad subbasally, attenuated apically, recurved part reaching to but not extending beyond apex of aedeagal shaft; caudal atrial processes long, as broad as lateral atrial processes, slightly curved anterodorsad beyond apex of aedeagal shaft, parallel in caudal aspect (fig. 19, *A, B, C*).

Female eighth sternum in dorsal aspect with two large, elongate, symmetrical plates about $1\frac{1}{2}$ times longer than seventh tergum; each plate with anterior margin broad, lateral margin slightly divergent with small, round preapical lobe about middle, posterior margin with distinct, elongate, curved lobe, extending posterolaterad beyond lateral margin of plate: lobe fingerlike, broad basally, narrowly convex at apical one-fourth (fig. 19, *D*).

Distribution in Western United States. Specimens examined from *Arizona*: Flagstaff, Grand Canyon, Kaibab; *Colorado*: Cheyenne Mountain Museum (El Paso County), Manitou, Pueblo, Salida; *New Mexico*: Cimarron; *Utah*: Cedar City, Milford, Navajo Mountain, Richfield, Salt Lake City.

The host plant is unknown. Specimens have been collected from June to October.

The male holotype and female allotype from Flagstaff, Ariz., July 27, 1936, R. H. Beamer, were examined and are in the Snow Entomological Collection of the University of Kansas.

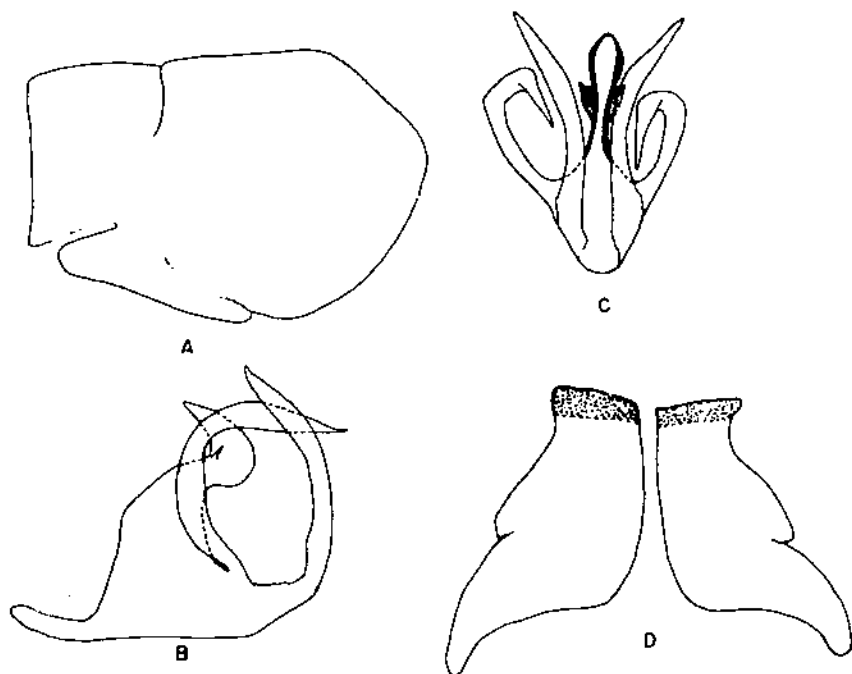


FIGURE 19.—*Cuerna obtusa* Oman & Beamer: *A*, Male pygofer, lateral aspect; *B*, medeagus, lateral aspect; *C*, medeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect. (All from paratypes.)

This species can be separated from *alta* by the male characters in the aedeagus, which has recurved lateral atrial processes projecting caudad, and from *balli* by the female eighth sternum with each plate bearing a preapical lobe on the middle of the lateral margin and a distinctly curved caudal lobe.

Cuernia angusta, new species

Large, somewhat slender species; similar to *costalis* in male and female genital characteristics.

Length of male 7.7-8.6 mm., female 8.0-8.9 mm. Head wider than pronotum; crown broad, interocular width about $1\frac{2}{3}$ times median length, median length about twice length of mesal margin of eye; pronotum slightly longer than median length of crown, sides parallel; elytra with lateral margins parallel, tapered apically; clypeus distinctly swollen; male plates together broad basally, pointed apically, and covered with numerous fine setae especially on lateral margins.

General color dark reddish brown with distinct yellow or ivory band running laterally from anterior margin of head to eighth tergum; head and pronotum black with numerous yellow or ivory markings; pronotum with markings coarse and transverse on posterior two-thirds, irregular on anterior one-third; scutellum with several deep, black, uneven, longitudinal markings; elytra reddish black, veins black; clypeus yellowish with numerous transverse black lines on each side of middle, markings on middle joined together to form small circular or square markings; clypellus and lora yellowish tan with black irregular markings; legs black; venter tan, speckled with black.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes about $1\frac{1}{2}$ times longer than wide, shaft curved dorsoposteriorly with prominent tooth on each side of middle in caudal aspect; lateral atrial processes recurved, constricted basally, broad medially and tapered apically, recurved part not reaching apex of aedeagal shaft, basal half projecting dorsad, apical half projecting caudad or caudoventrad beyond caudal margin of atrium; caudal atrial processes long, much more slender than lateral atrial processes, nearly straight, sometimes slightly curved, projecting dorsally to but not extending beyond apex of aedeagal shaft, crossing over in caudal aspect (fig. 20, A, B, C).

Female eighth sternum in dorsal aspect single, broad, subquadrate, heavily sclerotized plate about $1\frac{1}{2}$ times longer than seventh tergum; plate with anterior margin bisected medially to about one-half length of plate, lateral margins parallel, caudal margin broadly concave and sinuated with distinct elevated ridge at middle that extends anteriorly to about middle of plate (fig. 20, D).

The host plant of this species is not known.

Described from 18 males and 13 females, all from Mexico. The male holotype, female allotype, four male paratypes, and one female paratype from summits between La Troje and Cienaga de Mata, Jalisco, April 18, 1951, D. B. Hoover, are in the collection of the University of Michigan. Additional paratypes: one male and one female, same data, in U.S. National Museum; one male and one female from Villa Hidalgo, Jalisco, October 24, 1950, J. B. Alcorn; one male and

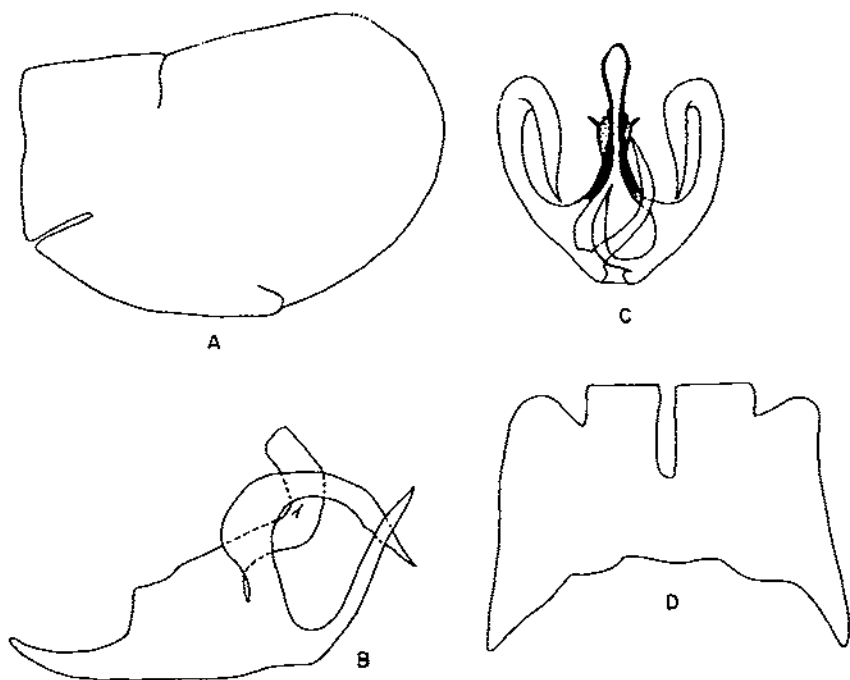


FIGURE 20.—*Cuerna angusta*, new species: A, Male pygofer, lateral aspect; B, nedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (A, B, C from holotype and D from allotype.)

one female, 29 miles north of Taxco Guerro; one male, Tecamochalco, Puebla, July 2, 1953, 6,400 feet, University of Kansas Mexican Expedition; and one male, Lagos de Moreno, 6,400 feet, Jalisco, August 21, 1954, C. D. Michener and party; in the Snow Museum of the University of Kansas; one female, 10 miles W.S.W. of Huejucar, Jalisco, 7,200 feet, July 22, 1954, R. H. Brewer, in the California Academy of Sciences collection; one female, San Miguel, Alende, Guanajuato, August 12, 1953, C. and P. Vaurie; and one female, 15 miles east of Aguascalientes, Aguascalientes, June 27, 1953, C. and P. Vaurie; in the American Museum of Natural History; one male, Hico, Veracruz, 1940, E. D. Ball, in the University of Arizona collection; one male and one female, 18 kilometers west of Mexico City, D. F., September 1, 1949, D. M. DeLong; one male, Toluca Road, Mexico City, D. F., September 26, 1945; one male, Zimipan, Hidalgo, October 31, 1945, DeLong, Hershberger, and Elliott; two males (MB-178, MB-180) and one female (MB-180), Mexico, A. Dampf; and one female, Tasquilla, Hidalgo, October 30, 1945, DeLong, Hershberger, and Elliott; in D. M. DeLong's personal collection; and one male and one female, same data as holotype; and one male and one female, Villa Hidalgo, Jalisco, October 24, 1950, J. B. Alcorn; in the author's collection.

This species can be separated from males of *costalis* by the lateral atrial processes of the aedeagus constricted basally and broad medially and by the caudal atrial processes very slender and not extending beyond the apex of the aedeagal shaft. Females of *angusta* can be dis-

tinguished from those of *rostalis* by the eighth sternum with the plate having lateral margins parallel and an elongate elevated ridge extending anteriorly from the middle of the caudal margin.

Cuerna senibulba, new species

Large, robust species: similar to *mexicana* and *angusta* in male and female genital characteristics, respectively.

Length of male 7.7 mm., female 8.4 mm. Head wider than pronotum; crown broad with anterior margin angularly produced, interocular width about $1\frac{3}{4}$ times longer than median length, median length $2\frac{1}{8}$ (female) to $2\frac{1}{4}$ (male) times longer than mesal margin of eye; pronotum with median length about equal to median length of crown, sides parallel; elytra with sides parallel, apex tapered; clypeus and clypellus distinctly swollen; gena and lora covered with numerous short, fine setae; male plates together broadly triangulate with numerous fine setae on lateral margins.

General color reddish black with broad yellow or ivory line running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum black with numerous irregular yellow or ivory markings, markings on distal half of pronotum transverse; elytra reddish black, veins black; clypeus black with numerous yellow spots forming broken parallel lines on each side of middle, yellow irregular spots on middle; clypellus yellow with black markings on middle; lora and gena yellow with faint black markings; venter black with numerous reticulate yellow markings.

Male pygofer in lateral aspect nearly $1\frac{1}{2}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes about as long as wide, shaft long, curved posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes long, slightly curved, extending dorsad beyond apex of aedeagal shaft, anterior margin of processes expanded medially, attenuated distally, curved slightly mesad in caudal aspect; caudal atrial processes long, straight, narrower than lateral atrial processes, projecting dorsad to but not beyond apex of aedeagal shaft, parallel in caudal aspect (fig. 21, A, B, C).

Female eighth sternum in dorsal aspect single, large, broad plate slightly longer than seventh tergum; plate with large circular opening along middle, anterior margin broad and contiguous, lateral margin slightly constricted at basal one-fourth, nearly parallel at apical three-fourths with small lateral projection at about middle, caudal margin contiguous, broadly concave, and sinuate along margin (fig. 21, D).

The host of this species is not known.

Described from a pair of specimens from Mexico. The male holotype and female allotype from Xometla, 1 mile east of Chalchicomula, 8,000 feet, base of Orizaba, Puebla, pineland, August 28, 1951. Uzzell and Mosimann collectors, are in the University of Michigan collection.

The males of this species can be separated from those of *mexicana* by the aedeagus with the lateral atrial processes having the anterior margin expanded medially and longer caudal atrial processes. The females can be separated from those of *angusta* by the contiguous anterior and posterior margin of the female eighth sternum and the presence of a large circular opening along the middle of the plate.

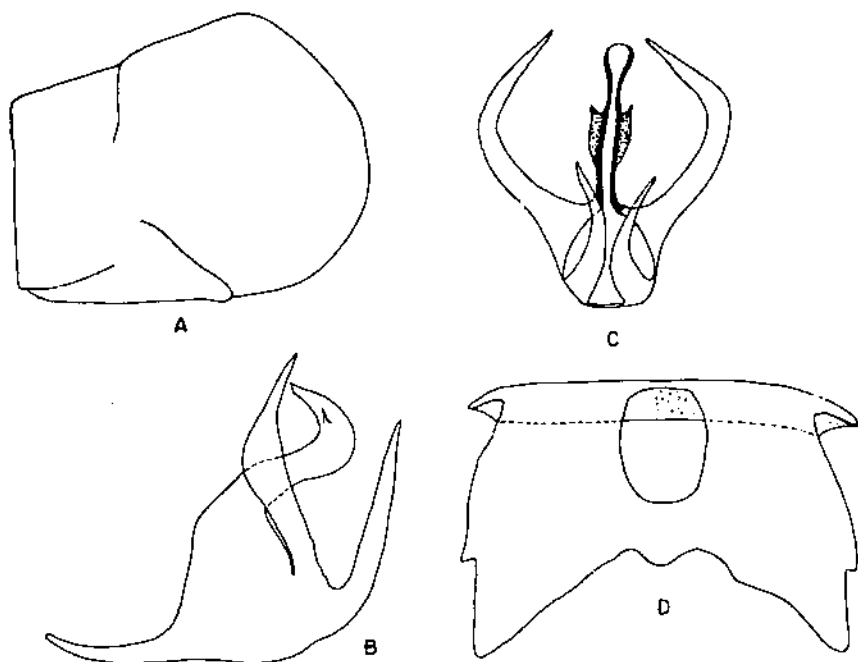


FIGURE 21.—*Cuerna scimibulba*, new species: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (A, B, C from holotype and D from allotype.)

Cuerna curvata Oman & Beamer

Cuerna curvata Oman & Beamer, Kans. Ent. Soc. Jour. 17: 127. 1944.

Cuerna ditiana Oman & Beamer, *ibid.*: 128. 1944. (New synonymy.)

Medium size, somewhat slender species; similar to *arida* and *alba* in habitus but has unique male and female genital characteristics.

Length of male 6.8–7.0 mm., female 7.4–7.6 mm. Head wider than pronotum; crown broad, interocular width about $1\frac{3}{4}$ times median length, median length $1\frac{7}{8}$ (male) to twice (female) length of mesal margin of eye; pronotum long with median length about $1\frac{1}{8}$ times median length of crown, sides nearly parallel; elytra with margins nearly parallel, apex tapered.

General color reddish gray with distinct yellow or ivory band running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum with numerous yellow and black markings, markings on distal two-thirds of pronotum and proximal half of crown finely irregular, coarsely irregular on proximal one-third of pronotum and distal half of crown; elytra pinkish gray to reddish gray.

Male pygofer in lateral aspect about $1\frac{1}{4}$ times as long as wide, caudal margin distinctly truncate; aedeagus in lateral aspect excluding atrial processes slightly longer than wide, shaft recurved, projecting more or less posterodorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes robust, much

broader than and over twice as long as caudal atrial processes, projecting dorsad beyond apex of aedeagal shaft, strongly curved mesally at apical half in caudal aspect; caudal atrial processes slender, short, not reaching apex of aedeagal shaft, projecting dorsad in lateral aspect, curved laterad at apical half in caudal aspect (fig. 22, *A, B, C*).

Female eighth sternum in dorsal aspect single, weakly sclerotized, broad, U-shaped plate, about one-fourth shorter than seventh tergum; plate with each lateral arm about twice as broad as base of plate (fig. 22, *D*).

This is a rare species known only from four localities in three States. Specimens examined from *California*: Lone Pine, Pinon Flat (San Jacinto Mountains); *Nevada*: Baker; *Utah*: St. George.

The host is not known, and specimens were collected from May to September.

The male holotype and female allotype, Lone Pine, Calif., July 28, 1940, R. H. Beamer, were examined and are in the Snow Entomologi-

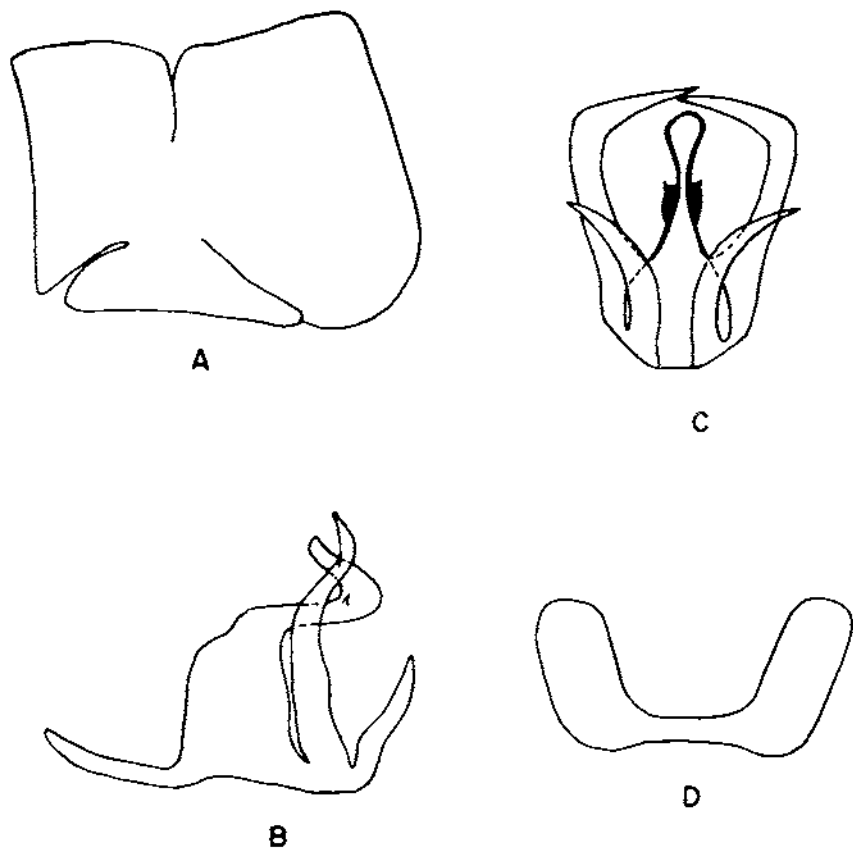


FIGURE 22.—*Cuerna curvata* Oman & Beamer: *A*, Male pygofer, lateral aspect; *B*, aedeagus, lateral aspect; *C*, aedeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect. (All from paratypes.)

cal Collection of the University of Kansas. The male holotype and female allotype of *U. diaiana* Oman & Beamer were examined and found to be conspecific with *curvata*; the latter is the valid species through priority by pagination.

This species can be separated from all others by the male aedeagus with lateral atrial processes strongly curved mesad in caudal aspect and by the broadly U-shaped female eighth sternum.

Cuerna alta Oman & Beamer

Cuerna alta Oman & Beamer, Kans. Ent. Soc. Jour. 17: 123. 1944.

Large, robust species; similar to *costalis* in habitus, to *obtusa* in female genitalia, and to *semibulba* in male genital characteristics.

Length of male 7.8-8.3 mm., female 7.9-9.5 mm. Head wider than pronotum; crown broad, interocular width nearly twice median length, median length $1\frac{3}{4}$ (male) to twice (female) length of mesal margin of eye; pronotum long, median length nearly $1\frac{1}{4}$ times median length of crown, sides parallel; elytra with sides flaring slightly at middle, together with rest of body giving robust appearance.

General color reddish gray, with conspicuous broad yellow or ivory line running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum with numerous coarse yellow and black markings; pronotum with yellow markings more numerous and regular on distal two-thirds than on proximal one-third; elytra reddish gray.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times as long as wide, caudal margin broadly convex; aedeagus in lateral aspect excluding atrial processes about as long as wide, shaft curved posterodorsad in lateral aspect with prominent tooth on each side of middle in caudal aspect; lateral atrial processes about as broad as caudal atrial processes, slightly curved, projecting dorsad to or extending slightly beyond apex of aedeagal shaft, attenuated apically, strongly curved mesad in caudal aspect; caudal atrial processes long, slightly longer than lateral atrial processes, nearly straight, broad medially, projecting caudodorsad, parallel in caudal aspect (fig. 23, A, B, C).

Female eighth sternum in dorsal aspect with two broad, elongate, symmetrical plates about $1\frac{3}{4}$ times longer than seventh tergum; each plate with anterior margin broad, lateral margin slightly divergent, nearly parallel with inner margin, posterior margin with distinct, elongate, curved lobe, extending posterolaterad beyond lateral margin of plate; lobe fingerlike, expanded dorsally, sides nearly parallel, apex subtruncate (fig. 23, D).

This is a rare species and was collected only from New Mexico and Texas. Specimens are at hand from *New Mexico*: Blue Springs (Eddy County), Cloudercroft, Fort Wingate, and Las Vegas; *Texas*: El Paso.

It has been taken from an unknown species of yucca during June and July.

The male holotype and female allotype from Cloudercroft, N. Mex., June 27, 1940, R. H. Beamer, were examined and are in the Snow Entomological Collection of the University of Kansas.

This species can be distinguished from *costalis* on the basis of the male and female genital characters. Owing to the similarity of the female eighth sternum between *alta* and *obtusa*, the latter species can

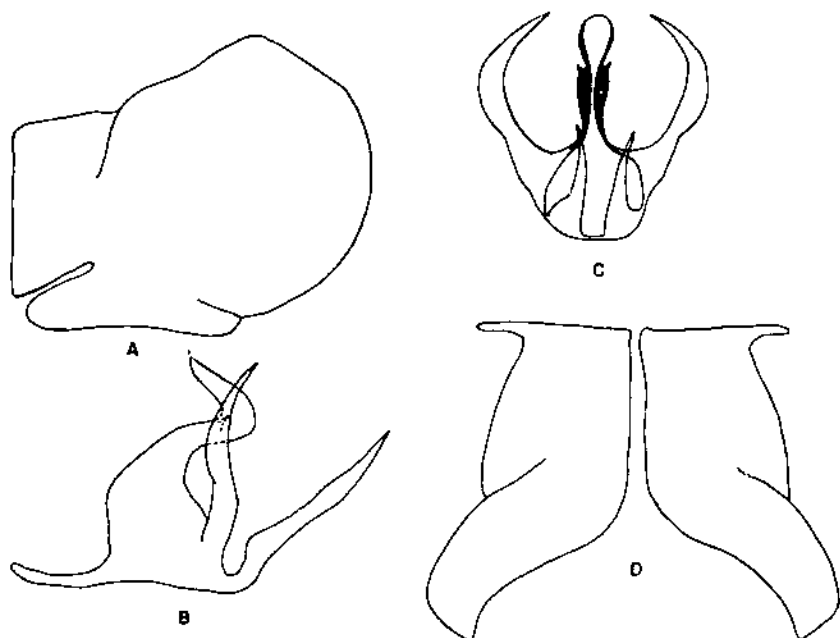


FIGURE 23.—*Cuerna alta* Oman & Beamer: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (All from paratypes.)

be distinguished on the basis of the male aedeagus having lateral atrial processes curved mesad in caudal aspect and nearly straight caudal atrial processes, which project caudodorsally. Males of *alta* can be separated from those of *semibulba* by the characters just described.

Cuerna alpina Oman & Beamer

Cuerna alpina Oman & Beamer, Kans. Ent. Soc. Jour. 17: 124. 1944.

Medium size species; males slender, females robust; similar to *stitti* in male genitalia and to *obesa* in female genital characteristics.

Length of male 5.5–7.1 mm., female 6.6–7.9 mm. Head wider than pronotum; crown narrow, interocular width about $1\frac{1}{2}$ times median length, median length more than twice length of mesal margin of eye; pronotum with median length about equal to median length of crown, sides parallel; elytra with lateral margins flaring slightly medially, tapered apically.

General color reddish gray with distinct yellow or ivory line running laterally from anterior margin of head to eighth tergum; head, pronotum, and scutellum with numerous yellow and black markings, yellow markings more numerous on distal two-thirds of pronotum, fewer on proximal one-third; markings among specimens vary from coarse to fine; elytra reddish gray.

Male pygofer in lateral aspect about $1\frac{1}{2}$ times longer than wide, caudal margin broadly convex; aedeagus in lateral aspect excluding atrial processes $1\frac{1}{4}$ times longer than wide, shaft recurved, middle

part parallel to base of atrium with prominent tooth on each side of middle in caudal aspect; lateral atrial processes short and narrow, length and width nearly equal to caudal atrial processes, curved posterodorsad at apical half, extending to but not exceeding caudal margin of atrium and apex of aedeagal shaft, curved mesally at apical one-third in caudal aspect; caudal atrial processes slightly curved, projecting dorsad to but not exceeding apex of aedeagal shaft, sharply attenuated apically, parallel in caudal aspect (fig. 24, *A, B, C*).

Female eighth sternum in dorsal aspect with two weakly sclerotized, triangulate plates about half length of seventh tergum; each plate with anterior margin very short, lateral margin divergent laterad, caudal margin truncate (fig. 24, *D*).

Distribution in Midwestern and Western United States, and Canada. Specimens at hand from *Canada*: Alberta, Lethbridge, Medicine Hat, Raymond, Sterling; *Colorado*: Alder, Cheyenne Canyon, Colorado Springs, Loveland, Monument; *Illinois*: *Montana*: Billings, Reedpoint; *Nebraska*: Bronson, Glen Sioux County, Harrison, Imperial; *New Mexico*: Chaves County, Hartford, Portales; *North Dakota*: Medora; *Wyoming*: Laramie, Lusk, Pammel Rapid Creek, Yellowstone National Park.

The host plant is unknown. Specimens were collected from July to September, mostly abundant in August.

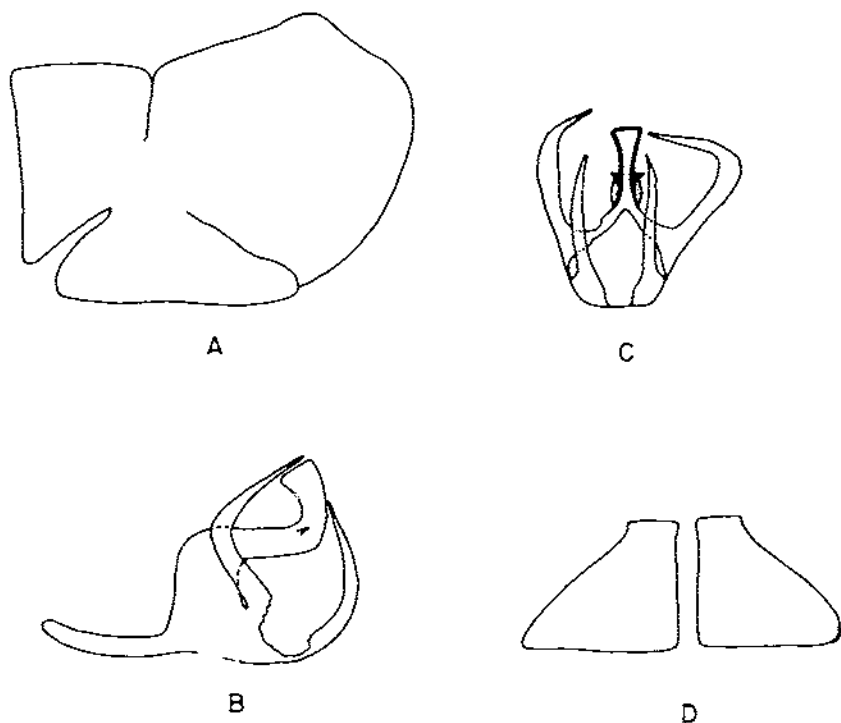


FIGURE 24.—*Cuerna alpina* Oman & Beamer: *A*, Male pygofer, lateral aspect; *B*, aedeagus, lateral aspect; *C*, aedeagus, caudal aspect; *D*, female eighth sternum, dorsal aspect. (All from paratypes.)

The male holotype and female allotype from Reedpoint, Mont., July 11, 1934, David E. Cox, were examined and are in the U.S. National Museum.

The male aedeagus of this species is very similar to that of *stitti*, but *alpina* can be distinguished after proper association of the sexes and by the female eighth sternum, which has two weakly sclerotized, triangulate plates. Females of *alpina* are difficult to separate from those of *obesa*, but the former species can be separated after proper association of the sexes and by the male aedeagus with the caudal atrial processes very narrow and slender and not exceeding the apex of the aedeagal shaft.

Cuerna stitti, new species

Small, slender species; similar to *alpina* in male genital characters; female eighth sternum unique.

Length of male 5.2-5.3 mm., female 5.7-6.0 mm. Head wider than pronotum: crown broad with anterior margin bluntly produced, interocular width about $1\frac{3}{4}$ times median length, median length about $1\frac{3}{4}$ length of mesal margin of eye: pronotum with median length slightly longer than median length of crown, sides curved mesally; elytra with lateral margins parallel giving linear appearance to body except distally, which is tapered: clypeus swollen; clypellus slightly expanded medially: gena distinct: lora elongate: gena and lora sparsely covered with numerous fine setae; male plates together long, triangulate, curved dorsad apically, and covered with numerous fine setae on lateral margins.

General color dark tan with prominent yellow or ivory line running laterally from anterior margin of head to eighth tergum; head and pronotum black with numerous ivory or yellow markings, markings more numerous and finer on apical half of crown and basal half of pronotum; scutellum ivory or yellow with black, irregular, broad, longitudinal lines; elytra tannish reddish, veins black; clypeus yellowish or ivory with numerous reticulate black markings laterally and along middle; clypellus yellowish with black markings medially; lora and gena yellow with faint irregular black markings; legs yellow; venter yellow with faint black markings.

Male pygofer in lateral aspect about $1\frac{1}{3}$ times longer than wide, caudal margin convex; aedeagus in lateral aspect excluding atrial processes slightly longer than wide, shaft short, broad, nearly parallel to base of atrium, apex of shaft curved dorsad with prominent tooth on each side of middle in caudal aspect; lateral atrial processes curved dorsad at basal half, caudad at apical half, narrow, extending slightly beyond apex of aedeagal shaft and caudal margin of atrium, curved mesad in caudal aspect; caudal atrial processes short, nearly straight, projecting posterodorsad to but not beyond apex of aedeagal shaft, slightly narrower than lateral atrial processes, parallel in caudal aspect (fig. 25, A, B, C).

Female eighth sternum in dorsal aspect with two distinct plates about one-third shorter than seventh tergum: each plate with proximal half quadrate, constricted medially with long, narrow, attenuated lobe arising caudad and extending posterolaterad, lobe projecting beyond lateral margin of basal half of plate (fig. 25, D).

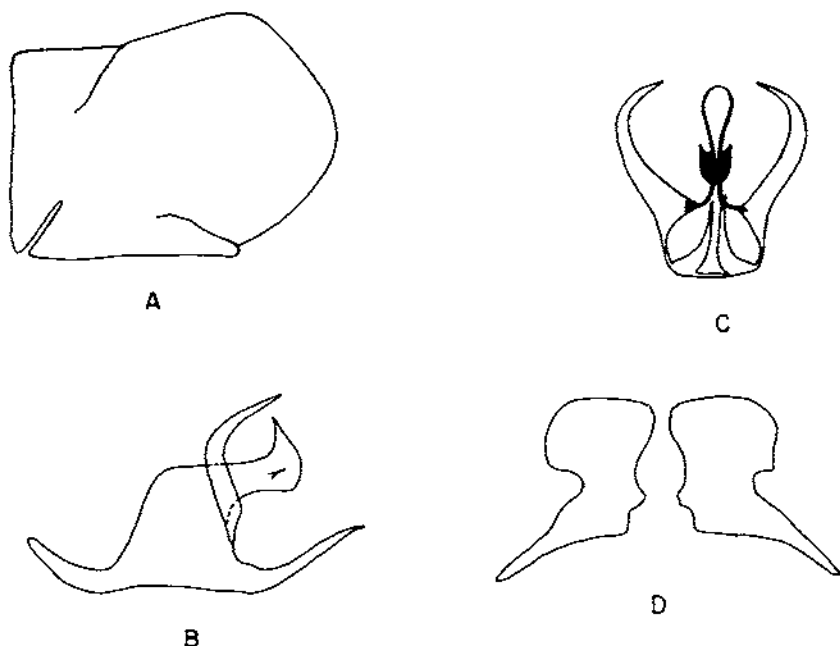


FIGURE 25.—*Cuerna stitti*, new species: A, Male pygofer, lateral aspect; B, aedeagus, lateral aspect; C, aedeagus, caudal aspect; D, female eighth sternum, dorsal aspect. (A, B, C from holotype and D from allotype.)

The host is the sandpaper plant (*Petalonyx thurberi* Gray).

Described from five males and two females from Arizona. The male holotype (Cat. No. 67044), female allotype, and three male paratypes from Mesa, September 21, 1936, L. L. Stitt, (swept from *Petalonyx thurberi* Gray) are in the U.S. National Museum; one male paratype and one female paratype, same data, are in the collection of the author.

This species can be separated from *alpina* after proper association of the sexes and by the unique female eighth sternum with each plate having a long, narrow lobe arising caudad and extending postero-laterad beyond the lateral margin of the basal half of plate. This species was named for Lloyd L. Stitt, formerly of the Entomology Research Division, now with the Velsicol Chemical Corporation.

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