help. To Mr. Erdman West and Mr. Breeder our thanks are due for the photographs.

EXPLANATION OF PLATES X, XI, XII.

Fig. 1. A nursery patch of *Hibiscus moscheutos* during the winter.
Fig. 2. *Acontia delecta* adult.
Fig. 3. *Acontia delecta* with wings folded.
Fig. 4. *Gelechia hibiscella* adult.
Fig. 5. Larvæ of *Acontia delecta.*
Fig. 6. Petioles injured by larvæ of *Rhæboscelis tenuis.*
Fig. 7. Work of larvæ of *R. tenuis* in hibiscus stems, showing larva in one of the left.
Fig. 8. Cocoon of *Sagaritas dubitatus* with shrivelled larval skin attached.
Fig. 9. Work of larva of *Papaipema nitela.*
Fig. 10. Feeding (large holes) of *Rhæboscelis tenuis.*
Figs. 11 and 12. Galls of *Apion hibisci.*
Fig. 13. Stem split to show cavity occupied by larva of *Apion hibisci.*
Fig. 14. Gall of *Neolasioptera hibisci.*
Fig. 15. Stem split to show cavity in pith occupied by larvæ of *Neolasioptera hibisci.*
Fig. 16. Feeding of *Chætocnema quadricollis.*
Fig. 17. Flower buds injured by *Scudderia texensis.*
Fig. 18. Leaf cut and rolled by larva of *Gelechia hibiscella.*

CICADAS OF THE GENUS CACAMA, WITH DESCRIPTIONS OF SEVERAL NEW SPECIES.

BY WM. T. DAVIS,

NEW BRIGHTON, STATEN ISLAND, N. Y.

In Genera Insectorum Mr. Distant lists *Cacama maura* Dist. from Mexico and Yucatan; and both *Cacama dissimilis* Dist. and *Cacama longirostris* Dist. from Mexico. These three species were described in 1881 in Biol. Centr.-Amer., *maura* and *longirostris* under the generic name of *Proarna,* and *dissimilis* as a *Cicada.* Uhler's *Proarna valvata* described from Texas and Arizona in 1888 in Entomologica Americana, is listed in that genus in Genera Insectorum, but Mr. Van Duzee removed it to the genus *Cacama* in 1915 (JOURNAL N. Y. ENTO. SOCIETY). In the Transactions of the San Diego

Soc. Nat. Hist., ii, p. 45, 1914, Mr. Van Duzee described *Proarna crepitans* from California, which in 1915 he also removed to the genus *Cacama.* So the genus up to the present has had five known species, three from Mexico and two from the United States.

In *Cacama* the tympanal coverings in the male entirely conceal the orifices, which is also the case in the genus *Tibicen,* but the head including the eyes is much narrower in *Cacama,* being little more than two thirds the width of the mesonotum. The abdomen is broad and much rounded behind; in *Tibicen* it is more tapering. The apical areas of the fore wings in *Cacama* are eight in number, the two lowermost small and somewhat square in shape. In *Tibicen* the two lowest apical areas are not as nearly of the same size, the seventh being much smaller than the eighth.

The type of the genus is *Cacama maura* (Distant), figured in Biol. Centr.-Amer., and also in Genera Insectorum. *Cacama longirostris* is also figured in Biol. Centr.-Amer. The remaining species, including four new ones and a female from Yucatan, which has been identified as *maura,* are figured on the plates accompanying this article. Owing to the lack of specimens available for its preparation the following table for the separation of species is not altogether complete.

Genus **Cacama.**

Rostrum not quite or barely reaching posterior coxæ ..... **A.**
Rostrum reaching posterior coxæ or beyond ..... **B.**
Rostrum reaching the first abdominal segment ..... **C.**

A.

A black species. Basal cell of fore wings usually includes a darkened area near front margin, translucent on hind margin; anal membranes of both pairs of wings grayish, sometimes slightly ochraceous with hind margins gray. First and second transverse veins of fore wings hardly infuscated. Black spot on dorsum of the pale colored eighth abdominal segment of male quadrate. Abdomen above with first segment straw colored or pruinose; beneath straw colored .....**valvata** (Uhler).

Not as dark in color as the last. Basal cell of fore wings ochraceous, translucent in part; anal membranes of both pairs of wings ochraceous. First and second transverse veins of fore wings slightly infuscated. Eighth abdominal segment of male almost entirely black, light colored each side at base and near extremity. Abdomen orange colored beneath. Uncus deeply notched at the extremity .....**furcata** new species.

Body considerably variegated with ochraceous; basal cell of fore wings ochraceous, translucent in part; anal membranes of both pairs of wings orange. First and second transverse veins of fore wings infuscated. Black spot on dorsum of eighth abdominal segment in male inversely napiform (turnip-shaped) .....**variegata** new species.

Resembles *variegata* in color and size, but with head usually smaller and the narrowed fore wings with outer margin more straight. Basal cell of fore wings nearly clear; first and second cross veins hardly infuscated.

californica new species.

B.

Basal area of fore wings "slightly ochraceous and opaque"; anal membranes of fore and hind wings orange with hind margin gray. First and second transverse veins of the fore wings "scarcely infuscated."

dissimilis (Distant).

Resembles *valvata* in being a black species, but has a larger head and is more hairy beneath about the legs. Basal cell of the fore wings blackish, translucent in part; anal membranes of both pairs of wings dark gray, abdomen above, entirely black at base. Dorsum of the eighth abdominal segment of male black with a small pruinose area each side.

carbonaria new species.

Basal cell of the fore wings translucent in part; anal membranes of the fore and hind wings orange. First and second transverse veins of the fore wings infuscated .....**crepitans** (Van Duzee).

Basal area of fore and hind wings black, first and second transverse cross veins of the fore wings infuscated .....**maura** (Distant).

C.

Basal area of the fore wings black, cell partly clear, first and second cross veins not infuscated .....**longirostris** (Distant).

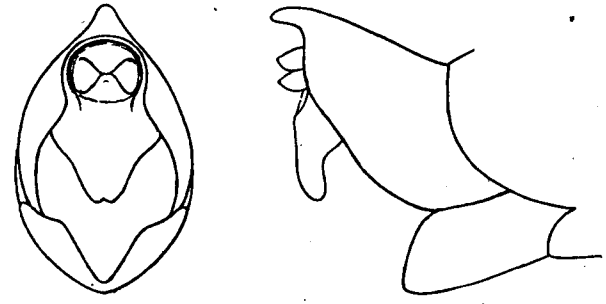
Cacama valvata (Uhler).

1888. *Proarna valvata* Uhler. Entomologica Americana, IV, p. 84.

Specimens examined: Tascosa, Tex., June, 1918, male (Miss McGill), D's Coll. Pecos River, Tex., May 24, male, U. S. Nat. Mus. Coll. Devil's River, Tex., July 3, 1917, male, Cornell University Coll. Jemez Springs, N. M., 6,400 ft., 15 males, 3 females, June, 1918, and 6 males, 3 females, July 2 and 3, 1918 (John Woodgate), D's Coll. Alamogordo, N. M., June 6 and 7, 1902, Coll. Acad. Nat. Sci. Phil. Pueblo, Col., June 15, 1900, male (Univ. of Kans.), D's Coll. Pueblo, Col., June 15, 1900, 3 females, E. D. Ball Coll. Carson City, Col., July 3, male, D's Coll. Trinidad, Col., June 3, 1910, male (F. C. Bishopp), U. S. Nat. Mus. Coll. Cañon City, Col., July 3, male, U. S. Nat. Mus. Coll. Holly, Col., June 19, 1900, male, E. D. Ball Coll. Coolidge, Col., June 18, 1900, male, E. D. Ball Coll. Ft. Collins, Col., June 28, 1900, male, E. D. Ball Coll. Kanab, Utah, June 24, 1913, male (E. D. Ball), D's Coll. Kanab, Utah, June 24, 1913, two males and female (E. D. Ball), Coll. Dr. Ball. Arizona, male, labeled "*P. valvata* Uhler," by Uhler, U. S. Nat. Museum Coll. Bradsh Mts., Ariz., June 22, 1892, two males, Coll. Oregon Agri. College. Rincon Mts., Ariz., male and female, D's Coll. Nogales, Ariz., July, female (Oslar), D's Coll. Grand Canyon, Ariz., sage bush country half way level in Canyon, June 5, 1915, male (B. B. Fulton), D's Coll. Grand Canyon, Ariz., Indian Garden, June 9, 1916, male (Geo. P. Engelhardt), D's Coll.

The two males from the Grand Canyon are smaller than the others in my collection.

Uhler in the original description mentions three males as typical specimens, one "from the vicinity of the Pecos River in Texas, and



Cacama valvata

the others were captured in Arizona." The remaining specimen mentioned by him from Camp Grant, Arizona, with "a much longer rostrum than the types," is in the collection of the U. S. Nat. Museum. In addition to the locality it is labeled "Palmer's Assorting No. 1043." The rostrum reaches the posterior coxæ, and we think the specimen is referable to *Cacama dissimilis* (Distant).

Mr. Woodgate writes of the *valvata* he sent from Jemez Springs, N. M., that they were very shy and often found about the bush cactus. Some he took in the evening while they were at rest on the cactus. "They are the only insects except ants that can settle on the bush

cactus without impaling themselves. The toughest beetles become impaled when they settle on this cactus and the ants proceed to eat them, but these Cicadas that have a very swift flight, can settle with impunity." He says that "their song is not sustained for more than about two minutes in the brightest sunshine even."

Cacama furcata new species.

Type male, labeled "Lower California?" Collection, University of Nebraska.

A dark colored species decorated with orange and black at the base of both pairs of wings.

Head black with a light brown spot above each antenna and a median light brown line below the central ocellus. Region of the transverse rugæ black, variegated each side with brown and black. The orange colored rostrum is black at tip, and extends slightly beyond the median coxæ. Pronotum black or nearly so, with a brownish spot on the front margin each side of the central line; the lateral margins variegated with brown, and a rather conspicuous upturned brownish line near the posterior angles. Mesonotum black, except the outer two lines of the central W mark, the extreme lateral margins at the base of the fore wings, and the front limbs of the X, which are brownish. Tergum black or nearly so, with the segments narrowly edged

Cacama furcata

at the sides of the body with brown. The first segment almost entirely black, the hind margin edged with brown, especially conspicuous near the central portion, and a minute pruinose spot each side near the extremities and adjoining the tympana. The eighth segment is nearly all black, light brown near the tip and on the sides; there is also a basal pruinose line. Fore wings with the basal cell nearly clear; both the fore and hind wings are variegated at base with orange and black; the membranes are orange tinted with gray on their posterior margins. Costal margin of the fore wings testaceous with a series of connected darker spots to the end of the radial cell, from which point the margin is darker colored to the end of the wing. The outer margin of the fore wing is nearly straight, somewhat abruptly turned at the eighth

marginal cell; the first and second cross veins are hardly infuscated. Beneath the insect is almost wholly dull orange in color, variegated with black about the legs and at the sides of the abdomen. Opercula dull orange, overlapping along the inner margin and broadly rounded behind. Uncus deeply notched at the extremity.

MEASUREMENTS IN MILLIMETERS.

	Male Type.
Length of body	27
Width of head across eyes	8.5
Expanse of fore wings	72
Greatest width of operculum	7
Greatest length of operculum	7

This is a smaller species than *valvata,* more orange colored at the base of the wings, with the eighth abdominal segment nearly all black instead of pale. Beneath it is orange colored as in *crepitans,* and not pale, especially the opercula, as in *valvata.* The rostrum is longer than in *valvata,* but not as long as in the much smaller *crepitans.*

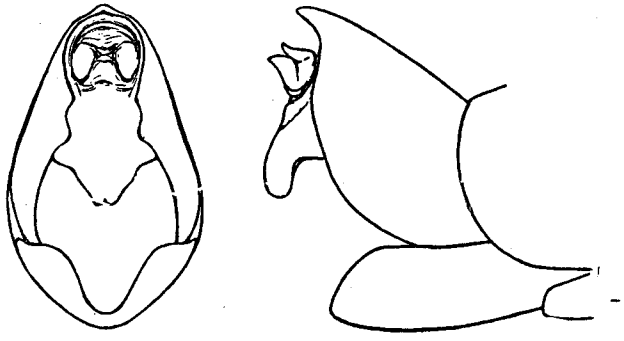
For the privilege of describing this species I am indebted to Prof. Myron H. Swenk, of the University of Nebraska.

Cacama variegata new species.

Type male and allotype female from San Benito, Texas, June, 1918 (Miss Matz). Davis collection.

Head black with a brownish spot above each antenna; one near each posterior ocellus, and one centrally on the hind margin; also one in front of the central ocellus. Upper area of transverse rugæ black, centrally with a brown streak; face light colored and pruinose; white hairs especially about the eyes. The testaceous colored rostrum is blackened at the tip and extends slightly beyond the median coxæ. Pronotum black, much variegated with light brown and rusty brown; the hind margin is edged with brown which extends inward (forward) near the posterior angles. The central area is rusty brown, each side of a somewhat lighter colored oblong spot. Mesonotum black with the outer lines of the W mark well defined. The mesonotal X is brown, the front limbs and hind limbs being each crossed by black bands. There are two oblong spots in the depression in front of the X. The sides are light colored, overlaid with pruinose which extends forward along each side to the hind margin of the pronotum. Tergum black, exposed part of first segment light colored and pruinose; second segment margined behind centrally with brown; third segment with a light colored spot each side, which is also more or less pruinose; eighth segment light colored and pruinose with an apical inversely napiform black spot. Two black dots, one each side, are included in the pruinose area. Fore wings with the basal cell partly obscured, especially at

the base and front margin; both the front and hind wings are variegated at base with testaceous and black, the membranes are orange. Costal margin of the fore wings testaceous with a series of connected darker spots to the end of the radial cell, from which point the margin is darker colored to the end of the wing. The outer margins of the fore wings are more evenly rounded than in any other species here considered; the first and second cross veins are considerably infuscated. Beneath the body is light or straw colored, especially the opercula, variegated with black about the legs and at the sides of



Cacama variegata

the abdomen. Opercula overlapping along the inner margin and broadly rounded behind.

MEASUREMENTS IN MILLIMETERS.

	Male Type.	Female Allotype.
Length of body	29	27
Width of head across eyes	9.5	9.5
Expanse of fore wings	75	79
Greatest width of operculum	7.5	
Greatest length of operculum	8.5	

The allotype, and other females collected at the same time, have more brown on the tergum than in the males. The first abdominal segment is pruinose, which extends on to the fore part of the second segment; the third to the seventh segments are pruinose on the sides, while the eighth segment is light colored and pruinose. There are the same black or dark brown dots each side on the eighth segment as in the male. The ninth segment is also light colored. Beneath the last ventral segment is evenly rounded each side of the central notch.

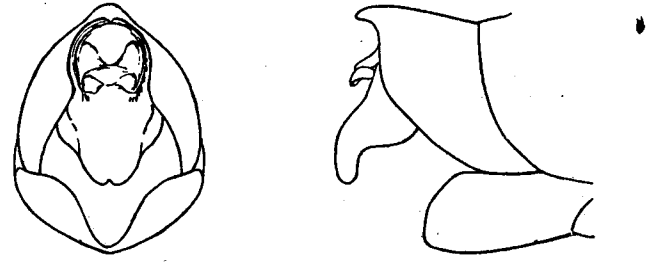
In addition to the type and allotype there are 17 males and 15 females in the writer's collection, all from San Banito, Texas, and collected in June, 1918. In the collection of the U. S. National Museum there are the following specimens: San Diego, Tex., May 5, male (E. A. Schwarz); McAllen, Tex., May 22, male (McMillan); Cotula, Tex., May 10, 1906, six males and three females, May 11, 1906, ten males and seven females, June 1, 1906, female, all collected by Crawford and Pratt, and one male collected May 12, 1906, by F. C. Pratt.

This species can be separated from all of the others here considered by the shape of the fore wings, which, as has been stated, are more evenly rounded, that is, the outer margin is not as straight as it is in the others.

Cacama californica new species.

Type male and allotype female from Los Angeles County, California, July (Collection Coquillett). U. S. National Museum.

This species resembles *Cacama variegata* in color pattern and general appearance, and the rostrum is of the same length, but it differs otherwise in the following particulars: The head is usually smaller; the fore wings are narrower with the outer margins more straight, and with the space between the marginal cells and the edge of the wings very broad. The basal cell is nearly clear, and the first and second cross veins are hardly infuscated. A side view of the abdomen shows the operculum to be sinuated on the margin, instead of evenly curved as in *variegata*. The opercula are also shorter though



Cacama californica

of the same general shape. The end of the abdomen as viewed either from above or below is seen to be broader or more flattened out.

MEASUREMENTS OF MILLIMETERS.

	Male Type.	Female Allotype.
Length of body	27	27
Width of head across eyes	9	9.5
Expanse of fore wings	76	79
Greatest width of operculum	7	
Greatest length of operculum	6	

In addition to the type and allotype, ten males and three females were collected by Mr. Coquillett in Los Angeles County, California, in July. In the collection of Dr. E. D. Ball there is a female collected by him at Cabazon, Calif., June 20, 1909.

This species is not quite as contrastingly colored as in *variegata;* the membranes at the base of the wings are not so deeply orange in color, being more yellowish and gray.

Cacama dissimilis (Distant).

1881. *Cicada dissimilis* Distant, Biol. Centr.-Am., Homop. 1, p. 10.

Three males and one female identified as this species and from the collection of the University of Nebraska, have been examined. They are labeled Sonora, Mex., Eisen Collector. In the Uhler collection, U. S. National Museum, is the male already mentioned from "Camp Grant, Ariz. (Palmer), Palmer's Assorting, No. 1043," which has been compared with one of the males from Sonora, Mexico. All of these specimens have the rostrum reaching to about the middle of the posterior coxæ; first and second transverse veins of the fore wings are "scarcely infuscated" as stated in the original description. The original description further states that the basal area is "only slightly ochraceous and opaque," which is also true of the specimens mentioned above.

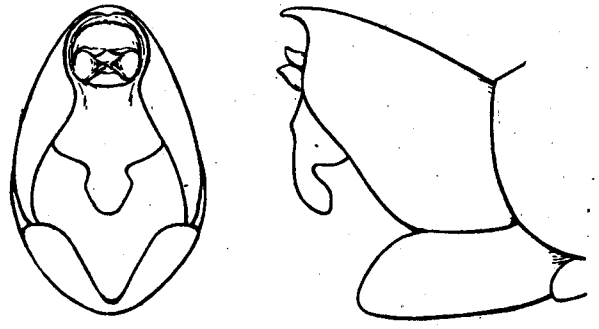
Cacama carbonaria new species.

Type male, in Davis collection, and presented to the writer by Dr. E. D. Ball, who states that it came from near Mexico City, Mexico. It bears the number "337."

This is a very black species and resembles *Cacama valvata* in size and color.

Head black with a brown spot above each antenna, one each side on the hind margin near the posterior ocelli, one in front of the median ocellus, and a line on the front in the region of the transverse rugæ. The brown rostrum is long and extends to the posterior coxæ, but hardly beyond them. The face is black with white hairs; a pale stripe follows the sides of the transverse rugæ, and a second one leads from the base of the rostrum toward each eye. The pronotum is black and pubescent, as in *valvata;* on the hind margin there is an irregular brown spot each side that extends nearly to the posterior angles. Mesonotum black, slightly lighter near the base of the wings. The X has the fore limbs brown, each one bearing a black spot; the hind limbs are black. Tergum black, including the exposed part of the first segment, which is light colored and *pruinose* in *valvata.* On each side there is a pruinose spot, which covers the lower part of the tympanum and extends to the fourth

segment. The eighth segment is nearly all black, with a small light spot each side, which is also pruinose. Fore wings with the same testaceous and black colors at base, as in *valvata,* and the anal membranes of both pairs of wings likewise gray. About one third of the basal area is clear also as in *valvata.* The first and second transverse veins of the fore wings are slightly infuscated. Beneath the opercula are dull straw colored as in *valvata,* but the ends of the second and third pair of coxæ are orange colored. The opercula overlap along the inner margin and are broadly rounded at the extremities. A side view of the abdomen shows the operculum to be sinuated on the margin in order to cover a more protruding tympanum than is found in *valvata.* The end of the abdomen is considerably broadened out at the extremity; much more so than



Cacama carbonaria

in *valvata.* When viewed in profile the uncus is seen to be deeply sinuated near its central portion.

MEASUREMENTS IN MILLIMETERS.

	Male Type.
Length of body	29
Width of head across eyes	10
Expanse of fore wings	73
Greatest width of operculum	7
Greatest length of operculum	7

This is a larger headed and proportionately broader bodied species than *valvata;* the rostrum is also much longer and the uncus differently shaped.

I am indebted to Dr. Ball for permission to retain the specimen.

Cacama crepitans (Van Duzee).

1914. *Proarna crepitans* Van Duzee, Trans. San Diego Soc. Nat. Hist., 2, p. 45.

Mr. Van Duzee says in the original description: "Described from

seven male examples taken in Mission Valley on the hillside opposite the city of San Diego, July 9, 1913. This species makes an unusually loud crackling noise which is often repeated and well sustained, but the insect was very active and difficult to capture, especially as its home was among the cactus on the steepest part of the hill."

Mr. Van Duzee has been good enough to send me one of the above mentioned males, in addition to which I have, through the kindness of Prof. Myron H. Swenk, been able to examine two additional males from the collection of the University of Nebraska. One is labeled San Jose del Cabo, "Lower California, Mexico, Eisen Coll., 1893," and the other simply "Lower Calif.?"

Cacama maura (Distant).

1881. *Proarna maura* Distant, Biol. Centr.-Am., Homop., 1, p. 13, pl. 2, fig. 5.

The original description states of the fore wings that the "basal area, costal membrane, and transverse veins at bases of second and third apical areas black." Basal area of the wings also black. It is said to inhabit Mexico, also Yucatan.

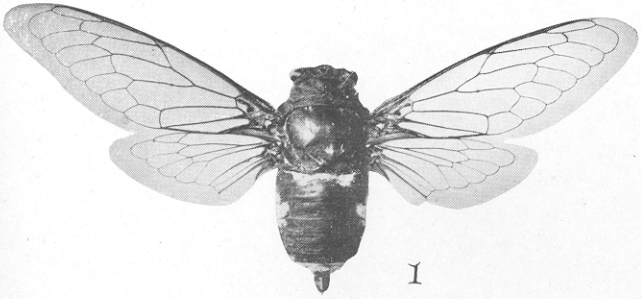
In the collection of the U. S. National Museum there are several specimens from Yucatan labeled *maura,* which are brownish instead of black. There is also a chestnut-brown female in the writer's collection from Yucatan, supposed to belong to this species, and which is figured on the accompanying plate.

Cacama longirostris (Distant).

1881. *Proana longirostris* Distant, Biol. Centr.-Am., Homop., 1, p. 13, pl. 2, fig. 4, 4a and 4b.

In the original description is the statement that the tegmina have a "black basal area," but a smaller one than in *maura.* Fig. 4 *b,* referred to above, shows the rostrum extending beyond the opercula to the "apex of the first abdominal segment."

Uhler, in Entomologica Americana, Vol. IV, p. 84, 1888, says of *longirostris:* "Inhabits Mexico. It resembles the preceding species [*maura*] in form, but has a much longer rostrum, and lacks the broad tract at the base of the wings."



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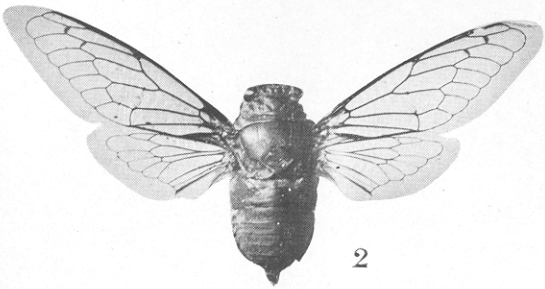

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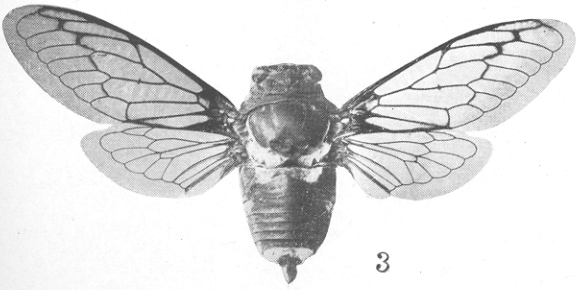

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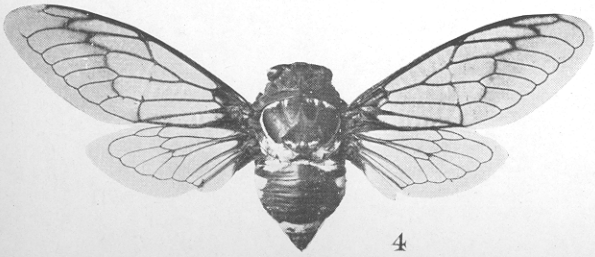

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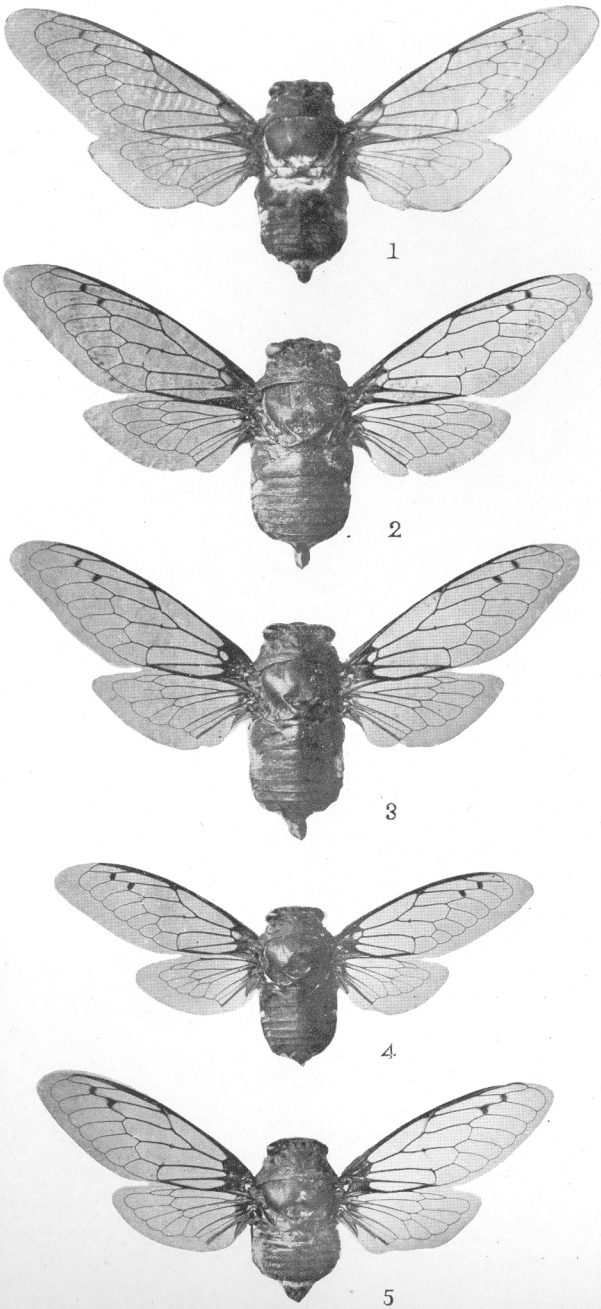
Cacama.



Cacama.

Explanation of Plates.

Plate XIII.

Fig. 1. *Cacama valvata* (Uhler).
Fig. 2. *Cacama furcata* Davis. Type.
Fig. 3. *Cacama variegata* Davis. Type.
Fig. 4. *Cacama variegata* Davis. Allotype.

Plate XIV.

Fig. 1. *Cacama californica* Davis. Type.
Fig. 2. *Cacama dissimilis* (Distant).
Fig. 3. *Cacama carbonaria* Davis. Type.
Fig. 4. *Cacama crepitans* (Van Duzee). Cotype.
Fig. 5. *Cacama maura* (Distant).

KEY TO THE NEARCTIC GENERA AND SPECIES OF BERYTIDÆ (HETEROPTERA).

By W. L. McAtee,

Washington, D. C.

The Berytidæ are an assemblage of small- to medium-sized bugs of slender build. The long filiform antennæ are distinctly elbowed and the head has a definite constriction or transverse sulcus in front of the ocelli. The first joint of the antenna, and the femora are clavate, and the slender legs are more or less thickly beset with short bristles or bristled tubercles. The scutellum is small, leaving the triangular space between the clavi partly open.

In the following treatment of the family descriptions of genera do not repeat the family characters, nor do those of species reiterate the characters of their respective genera. Distribution is not given in detail for the most common and widespread forms. The measurements of total length refer to the body proper, between apices of tylus and elytra, and do not include the antennæ.

It has been the custom to refer to certain metathoracic tubercles of the Berytidæ as breathing-horns, or the equivalent of that term in various languages. It is evident, however, that these organs in their entirety are exact homologues of what are called in all the other groups of Heteroptera possessing them, ostioles with their accom-