

NEW CICADAS FROM NORTH AMERICA
WITH NOTES¹BY WILLIAM T. DAVIS
STATEN ISLAND, N. Y.A TENDENCY AMONG CICADAS TO VARY IN WING VENATION
ACCORDING TO SPECIES

In this JOURNAL for June, 1936, and September, 1938, attention was called to the interesting and predominate localization of variation in wing venation in *Okanagana magnifica* and *Okanagana rimosa*. In *magnifica* the usual variation consisted in a supernumerary vein extending from Cu 1 into the 8th marginal area of the fore wing in seventy-seven of the three hundred and four specimens examined, while twelve of the sixty *Okanagana rimosa* collected by Dr. A. E. Brower in the blueberry barrens at Aurora, Maine, had the first cross veins in the fore wings either forked or double, while the 8th marginal area remained normal.

Lately Dr. Richard Dow sent for examination thirty-one *rimosa* collected in the blueberry barrens, Washington County, Maine, five of which had extra cross veins in the fore wings. An examination of one hundred and thirty-six specimens of the closely related *Okanagana canadensis* in the writer's collection, from Canada, Maine, Michigan, New York and Pennsylvania, resulted in the discovery of but one female with extra cross veins in each of the fore wings, and one male with an extra cross vein in one fore wing (Plate II, Figs. 1 and 3).

In *Fidicina compostela* from Mexico, variation in wing venation may be of a somewhat different character, or differently located, from that observed in *magnifica* and *rimosa*, already mentioned. There may be a development of supernumerary cells between the median areas and the row of marginal areas, as shown in the cicada on the accompanying plate. Mr. Albert E. Maas has sent fifty-nine examples of *compostela* taken in October,

¹ I am indebted to Mrs. Muriel Mattocks Cleaves for drawing the text figures, and to Edwin Way Teale, Edward E. Hannigan and Warren Condit for taking photographs.

1939, at Zapotan near Compostela, Nayarit, Mexico. In this lot eleven either have additional areas as illustrated, or the first or second cross veins in the fore wings are doubled. In two hundred and eleven additional specimens examined from the same part of Mexico, only eleven examples show variation in wing venation (Plate II, Fig. 2).

It appears that while the three species mentioned follow somewhat different lines of variation, it is probable that among the different broods of the same species, as in *compostela*, there is also some difference in the tendency to vary.

Two hundred and forty-nine spread specimens of *Fidicina determinata* Walker, collected in July, 1940, at Compostela, Nayarit, Mexico, were lately examined, and found wonderfully free from variation both as to color and wing venation. Slight variation in wing venation in but two individuals was found. The celebrated loud songster, *Quesada gigas* Olivier, found from Texas southward to Argentina, is another species in which the markings are surprisingly alike over its wide range, whereas *Tibicen chloromera* Walker, and *Tibicen lyricen* DeGeer, from small areas in the eastern United States, are subject to considerable variation in maculation and general color.

TIBICEN BIFIDA AND NEW VARIETY

The species was described and figured in the JOURNAL OF THE NEW YORK ENTOMOLOGICAL SOCIETY for March, 1916, as *Cicada bifida*, the type locality being Clear Creek, Colorado. The allotype came from Washington County, Utah, and paratypes from Colorado, Utah, Arizona and Kansas. All the males of this series had the uncus bifid at the extremity as shown in the accompanying illustration drawn from the type. Additional specimens of typical *bifida* have been examined from the above-named states, as well as from New Mexico and Texas. The opercula in *bifida* are longer and more pointed than in *Tibicen inauditus*, which has the opercula rounded at the extremities.

On June 21, 1932, Dr. Elmer D. Ball wrote: "I got tired mounting cicadas and am shipping the rest to you. They came from the Tombstone area, June 14, 1932, part of them from the slopes of the Tombstone Mountains to the west and part of them from

the slopes of the Dragoon Mountains to the east. I found 17 on one yucca but my technique is a little bad and I got only 11 of them. I thought you might be interested in the variation in opercula length and shape."

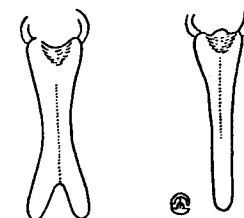
Thirty-seven of the males sent to me in 1932 by Dr. Ball, together with seventeen *bifida* also collected by him on June 14, 1932, and now in the collection of the U. S. National Museum, have recently been examined. In this considerable series of 54, none has the uncus of the typical bifid form, but instead it is of a more simple shape.

On June 30, 1932, Mr. Douglas K. Duncan of Globe, Arizona, sent 22 males of *bifida* collected June 21, 1932, between the Whetstone and Dragoon Mountains. He reported them: "hard to catch on anything but the yucca where they crawled in between the long grass-like leaves and apparently went to sleep. . . . Also took some on the tips of bear grass, which was mixed in all over with the yucca, by using a net."

While the above mentioned specimens came from about the same part of Cochise County as those collected a few days earlier by Dr. Ball, an examination of the uncus shows six with the extremity bifid and broadened, nine with it not bifid, and seven that may be classed as intermediate.

Dr. Raymond H. Beamer has sent two males of *bifida* collected at Bisbee, June 10, 1933, in which the uncus is nearly simple and not of the bifid form. Also in the Huachuca Mountains specimens having the uncus simple and not broadened at the extremity, have been collected.

The form of *Tibicen bifida* mentioned above in which the uncus is not bifid or broadened at the extremity has so far been found



Tibicen bifida
and var. *simplex*

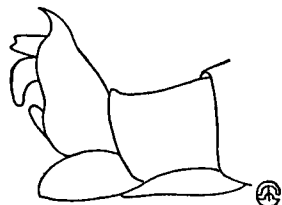
in Cochise County, Arizona, and apparently does not occur over the entire range of the species. For this structural variety as here characterized and illustrated, the following name is proposed: *Tibicen bifida*, variety *simplex*, new variety (Plate II, Fig. 4). Type male, Tombstone area, Arizona, June 14, 1932 (Dr. Elmer D. Ball), Davis collection.

It would appear that in variety *simplex* we have in process of evolution a closely allied species to *bifida*, exemplifying the same sort of relationship and association as now exists in some of the large green and black species of *Tibicen* in the eastern United States. As mentioned by Dr. Ball the opercula vary considerably in length and shape.

Tibicen hidalgoensis, new species (Plate II, Fig. 5).

Type male, Agua Fria, south of Jacala, Hidalgo, Mexico, July 3, 1939 (Ralph Haag), Davis collection.

Resembles in size and general appearance *Tibicen inauditus* described and figured in the Jour. N. Y. ENT. SOC., December, 1917, and now known from



Tibicen hidalgoensis

Texas, Oklahoma and New Mexico. As in that species the rostrum barely reaches the hind coxæ. The uncus though similar is differently shaped, having the upper line suddenly bent and not gradually rounded; the first and second cross veins of the fore wings are rather heavily infuscated, the veins about the basal cell are green and the cell contains a conspicuous black spot somewhat triangular in shape.

Head above black with the following marks dark olive green: a spot on the rather prominent front; a triangular one just behind this; two small ones (one larger than the other) above each antenna, and an irregular one each side of the ocelli at the back of the head. Pronotum dark olive green with the grooves irregularly black; hind margin of the collar greenish, fore margin with an interrupted black band which is continuous or solid in the three paratypes. Mesonotum black with an irregular pale stripe each side containing numerous silvery hairs, especially near the X where they assume the character of a spot. The hind margin is greenish orange including the

ridges of the X. The central portion is occupied by two light spots at the extremities of the X, and anterior to the depressions there are four others, the two central spots being curved on the inner side of the obconical marks and the outer short and irregularly oblong. Tergum black with two small pruinose spots at the base; one large one each side bordering the tympanum, and the eighth segment also conspicuously pruinose. The black abdomen irregularly covered with appressed rufus hairs, and on each side there is a band of appressed silvery hairs with rufus hairs intermixed. The uncus is black. Fore wings with the costal margin pale to the end of the radial cell, beyond darkened; subcostal vein black. The veins about the radial and basal cell are green, and the triangularly shaped black spot, included in the latter, is conspicuous. The anal membranes are gray in the fore wings, and slightly straw colored in the hind wings. Beneath, pale, the front femora darker on the under side, with the head, pronotum and mesonotum pruinose. The rounded opercula touch on the inner edges and are pruinose at the sides. The abdomen is pruinose at the sides, with a pale central area extending from the opercula to and including the pale valve.

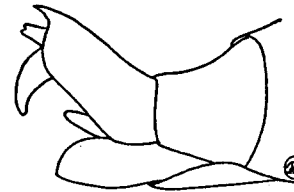
MEASUREMENTS IN MILLIMETERS

	Male Type
Length of body	27
Width of head across eyes	9
Expanse of fore wings	72
Greatest width of fore wing	11
Greatest length of operculum	5.5

In addition to the type, 3 paratypes were collected at the same place and time. All four agree, and have the noticeable feature of the short, black spot in the basal cell, which, with the shape of the uncus will separate it from *inauditus*. The allied *Tibicen montezuma* Distant, has the anal membranes of all of the wings orange.

Tibicen sugdeni, new species (Plate III, Fig. 1).

Type male, Montemorelos, Nuevo Leon, Mexico, August 11, 1940 (Dr. John W. Sugden), Davis collection, and allotype female, Monterey, Nuevo



Tibicen sugdeni

Leon, Mexico, August 1, 1940, Dr. John W. Sugden collection.

Resembles in size and general appearance *Tibicen inauditus* and *Tibicen hidalgoensis* but differs in the shape of the more slender uncus; in having the rostrum longer, and more than reaching the posterior coxæ; in being more orange in color, and in having each abdominal segment in all of the males examined, edged posteriorly with orange instead of being all black. The first and second cross veins of the fore wings are rather heavily infuscated; the veins about the basal cell are yellowish green and the oblong black spot contained therein is not as triangular in shape as in *hidalgoensis*.

Head above orange with a black band connecting the eyes and the area about the ocelli black. Front with converging black lines, leaving an orange spot centrally. Black above each antenna. Pronotum orange, the grooves irregularly black; front margin of the collar black, hind margin rather broadly greenish orange. Mesonotum black; an oblong orange spot each side centrally above the elevated X which is orange. Orange each side at the base of the wings partly overlaid with an attenuated band of silvery hairs, which do not assume the spotted condition as in *hidalgoensis*. Tergum black with two small pruinose spots at the base; one large one each side bordering the tympanum and the eighth segment also conspicuously pruinose. In the type and ten male paratypes, each abdominal segment is narrowly edged posteriorly with orange; in the allotype the tergum is darker. The silvery hairs are not as conspicuous as in *hidalgoensis*. Uncus orange, black at the sides. Fore wings with the costal margin pale to the end of the radial cell, beyond darkened; subcostal vein black. The veins about the radial and basal cell are green, and the black spot in the latter is conspicuous. The anal membranes are pale gray in all of the wings. Beneath, pale orange; legs orange, claws darker. The rounded opercula touch on the inner edges, and are pruinose at the sides. Abdomen pale centrally and pruinose at sides; valve orange.

MEASUREMENTS IN MILLIMETERS

	Male Type	Female Allotype
Length of body	27	27
Width of head across eyes	10	10
Expanse of fore wings	75	76
Greatest width of fore wing	11	11
Greatest length of operculum	5.5

In addition to the type and allotype five males collected at Montemorelos by Dr. Sugden, and five others from Monterey, have been examined.

DICEROPROCTA TEXANA AND RELATED SPECIES

It has been thought by some collectors, based on their field observations, that several species have sometimes been included under the name *Diceroprocta texana*. The most easily separated of these forms are here described as a new species and a new

variety. The type of *texana* came from Cameron County, Texas, and was described and figured in the JOURNAL NEW YORK ENTOMOLOGICAL SOCIETY, March, 1916. Among the characters given for the species was: "first and second cross veins of the fore wings clouded," as shown in the figure of the type. This character is present in 237 specimens from Texas now in the writer's collection, and a great many more have been examined, all collected in 23 counties in central and southern Texas, as well as others from Grant, Chaves and Eddy counties in southern New Mexico. Specimens from the last named county, collected near Carlsbad, are straw colored as a result of their environment, and differ considerably from the much larger and darker variety or race, here described from Mexico.

On July 2, 1940, Mr. Paul C. Avery of Mission, Texas, wrote: "On June 18 about 11 miles west of Roma, Starr County, Texas, I heard a cicada song new to me. I stopped the car and located a tree in which I heard the new sound; all around I heard the song of the *Diceroprocta texana* I have caught for several years. When I located one of the new cicadas, it looked just like *D. texana*, but its song was very different. This new species had only one tune or note. Last week in Jim Hogg County, some 65 miles northwest of Mission, I heard another cicada new to me. Again I stopped and caught two specimens. These specimens looked like the typical *D. texana* to me, but again the song was different from the kind I find here. In Starr County this new species is not heard over 10 miles along U. S. Highway 83. Today I heard what I took to be the same species I discovered in Starr County in Jim Hogg County."

Tibicen robinsoniana, now well recognized as a species, was first definitely separated from its allies by its very different song, so it is not remarkable that a similar condition should be detected in the *Diceroprocta texana* group.

Diceroprocta texana var. *lata*, new variety (Plate III, Fig. 2).

Type male, Linares to Villagran, Nuevo Leon, Mexico, August 1, 1940 (Dr. John W. Sugden), Davis collection.

A large dark form with the colors more sharply contrasted than is usual in *texana*. First and second cross veins in the fore wings often deeply clouded. Head black with a greenish spot near the base of each antenna



Diceroprocta texana *lata*

and an oblong greenish spot near each eye. Transverse rugæ black; a pale spot centrally on the front. A large spot each side on the hind margin between the ocelli and the eyes. Pronotum brownish, with a rather large wedge-shaped greenish spot centrally extending backward to the black band on the front margin of the collar. The hind margin or collar greenish with a dark spot at the extremities each side before the humeral angle. Mesonotum with two short, obconical black spots centrally at the fore margin edged with pale, on each side of which there is a dark, reticulated band broadest anteriorly and extending backward to the extremities of the elevated X. There is also a black stripe extending along each side from the X to the base of the fore wings. Between the X and the two central obconical spots there is an irregular cross-shaped spot. The X, the lighter lines on the mesonotum, and the posterior margin of the metanotum are brownish or brownish-green. The tergum is blackish brown with the hind margin of the segments of a paler brown. The dorsal surface with much short, silken pubescence, especially along the hind margins of the segments. A pruinose spot each side on segment eight. The fore wings have the costal margin greenish brown, and the subcostal veins are dark brown. The first and second cross veins of the fore wings are conspicuously clouded, and the basal membranes of the fore wings are darker gray than is usual in typical *texana*. The basal membranes of the hind wings are much paler. Beneath lighter colored and pruinose; the legs pale streaked and spotted with testaceous. Abdomen conspicuously pruinose with the hind margin of each segment less so; valve nearly black. The opercula pale, rounded at the extremities, with the inner edges overlapping. Uncus when viewed in profile with the extremities prolonged into a sharp hook.

MEASUREMENTS IN MILLIMETERS

	Male Type
Length of body	27
Width of head across eyes	11
Expanse of fore wings	77
Greatest width of fore wing	13
Width of operculum at base	6
Greatest length of operculum	6

In addition to the type, there are two slightly smaller male

paratypes collected by Dr. Sugden, July 31, 1940, at Cienega de Flores, Mexico. Also in the writer's collection there are specimens smaller than those from Mexico, collected by Mr. P. C. Avery in Starr and Jim Hogg counties, Texas, in June and July, 1940, that approach variety *lata*, especially in their dark color and markings.

Diceroprocta averyi, new species (Plate III, Fig. 3).

Type male and allotype female, Starr County, Texas, June, 1940 (Paul C. Avery), Davis collection.

First and second cross veins in the fore wings not clouded as in *texana*. Head black, with two pale spots near the base of each antenna and a third near each eye. Hind margin with two pale spots, one each side near the eyes. Transverse rugæ streaked with black, and an oblong pale spot centrally on the front, which is paler in the paratype. Pronotum dark reddish brown with a central, longitudinal pale stripe irregularly margined each side with black. Hind margin or collar pale with a slightly greenish tinge



Diceroprocta averyi

and a dark spot at the extremities each side before the humeral angle. Mesonotum with two short, obconical black spots at the fore margin edged with pale, on each side of which there is a dark band broadest anteriorly and extending backward to the extremities of the elevated X. Also a dark stripe extending along each side from the X to the base of the fore wings. An irregular cross-shaped spot between the X and the two central obconical spots, and the two depressed black points common to many species, and near the anterior extremities of the X, are also present. The X, the lighter lines on the mesonotum and the posterior margin of the metanotum are yellowish. The tergum is almost black; the tympanal areas lighter in color along their posterior margins. The dorsal surface is more or less covered with a light colored, short silken pubescence. A pruinose spot each side on segment eight. The fore wings have the costal margins greenish yellow and the subcostal veins are dark brown. The first and second cross veins of the fore wings not clouded, and the basal membranes of both fore and hind wings are grayish. Beneath lighter colored and pruinose, blackened about the eyes; the legs yellowish, streaked and spotted with testaceous. Abdomen nearly of a uniform color with a linear

dark spot on the valve. In the allotype there is a dark spot each side of the shallow, terminal notch. The opercula pale, rounded at the extremities, with the inner edges overlapping, except in one of the paratypes where they almost touch. Uncus when viewed in profile with an almost right angle notch near the extremity.

MEASUREMENTS IN MILLIMETERS

	Male Type	Female Allotype
Length of body	24	21
Width of head across eyes	10	9
Expanse of fore wings	67	63
Greatest width of fore wing	11	10
Width of operculum at base	6
Greatest length of operculum	5.5

In addition to the type and allotype, the following specimens have been examined: five males, Starr County, Texas, June, 1940 (P. C. Avery), and two males, Roma, Starr County, Texas, June 2, 1933 (P. W. and M. J. Oman). Some are larger than the type.

Mr. Avery has also collected in Jim Hogg County, which adjoins Starr County to the north, two males and one female, June 2, 1940, and three males, August, 1940, that are like typical *averyi* except that they are not as darkly colored.

In "Cicadas Belonging to the Genus *Diceroprocta* with Descriptions of New Species," published in this JOURNAL for 1928, is the statement that on September 11, 1928, F. F. Bibby and J. F. Cooper had collected nine specimens in Winkler County, Texas, in which the first and second cross veins in the fore wings were not clouded or infuscated as in typical *texana*. These specimens closely resemble *averyi*, and are probably but a lighter colored and smaller form.

Diceroprocta albomaculata Davis

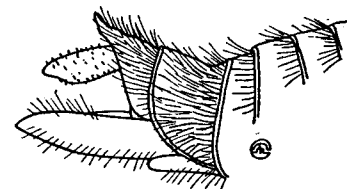
This species was described and figured in the JOURNAL NEW YORK ENTOMOLOGICAL SOCIETY, December, 1928, from a male type, now in the U. S. National Museum, and a male paratype in the writer's collection. Both came from Vera Cruz, Mexico. Another male in the National Museum, is from Vera Cruz, Mexico, June, 1937. Lately I received from Mr. Harry Hoogstraal of the University of Illinois, five males collected by Ralph Haag from July 17 to 20, 1939, at El Pojul, San Luis Potosi, which adjoins the state of Vera Cruz on the northwest.

Okanagana villosa, new species (Plate III, Figs. 4 and 7).

Type male, Cloud's Rest, 9,924 feet, Yosemite National Park, California, June 9, 1931, University of California collection.

Resembles *Okanagana oregona* and *Okanagana wymori* in size and general appearance, or a small *Okanagana bella*, but may be told by its being extremely hairy both below and above. The thick growth of hairs extends all over the dorsal surface from the front of the head to the uncus, which also has some hairs both above and below. Uncus when viewed in profile sinuated, but not hooked at the extremity. Wings transparent, costal margin of the fore pair yellowish, the basal area clouded, and the anal membranes of all of the wings orange.

Head black with the supra-antennal plates and a short line in the depression before the front ocellus, yellowish. Pronotum black margined all around, but narrowly in front, with yellowish. Mesonotum black with the posterior margin pale, except where reached by the hind limbs of the X

*Okanagana villosa*

which are black. Metanotum with the posterior margin nearly pale. Dorsum of the abdomen black, the segments edged posteriorly with orange. Uncus all black. Beneath, head black with a pale line each side of the transverse rugæ. Legs with the femora largely black except beneath; the tibiae with the basal parts black, except beneath. Abdomen black with each segment sharply margined posteriorly with orange. Valve long, black, except the upper edge near the base, which is orange.

MEASUREMENTS IN MILLIMETERS

	Male Type
Length of body	20
Width of head across eyes	6
Expanse of fore wings	50
Greatest width of fore wing	8
Length of valve	3.5

Although this species is described from a single male, the remarkable development of hairs on all parts of the body, should serve to identify it. It is possibly confined to high altitudes.

Platypedia australis, new species (Plate III, Figs. 5 and 6).

Type female, Galeana, Nuevo Leon, Mexico, July 31, 1939 (Ralph Haag), Davis collection.

Front of the head not prominent, and not as hairy as in many *Platypedia*. Abdomen stout and broad almost to the extremity, with the terminal notch on the underside U shaped. The front margin of each fore wing suddenly bent at the end of the radial cell about as in the species of *Neoplattypedia*, but each wing has 8 marginal areas as in *Platypedia*; in *Neoplattypedia* there are seven. The median vein in the fore wing is considerably bent downward near its central portion, more so than observed in any other species of *Platypedia* or *Neoplattypedia*. The 6 marginal areas in each hind wing are distinctive in form, as shown on the plate, and differ from that usual in both *Platypedia* and *Neoplattypedia*.

Head black with a pale spot above each antenna. Pronotum black with the grooves pale, edged all around with a greenish margin; a dark spot at the hind angles, on the collar. Mesonotum black, including the X, with an irregular pale stripe on each side of the obconical areas, and an irregular spot at the base of each fore wing. Hind margin pale. Abdomen with the segments, except the terminal one, black at base and pale on the posterior margins. The terminal segment is black above; on the sides pale with black spots. Under side of the head black, legs greenish, margined with black; abdomen green except at the notch where there is a small black spot each side of the ovipositor. The terminal spine is small. Wings with the front margin mostly pale; the remainder of the venation black; basal cell slightly clouded, with the membranes at the base of all of the wings red or reddish in color.

MEASUREMENTS IN MILLIMETERS

	Female Type
Length of body	14
Width of head across eyes	4
Expanse of fore wings	34
Greatest width of fore wing	6.5

Pending the examination of the much desired male the peculiar venation of this species will distinguish it from other *Platypedia*.

The type locality is nearly 150 miles south of the Rio Grande and a like distance from the Gulf of Mexico.

PLATE II

- Figure 1. *Okanagana magnifica*, wing venation.
 Figure 2. *Fidicina compostela*, wing venation.
 Figure 3. *Okanagana rimosa*, wing venation.
 Figure 4. *Tibicen bifida* variety *simplex*, type.
 Figure 5. *Tibicen hidalgoensis*, type.

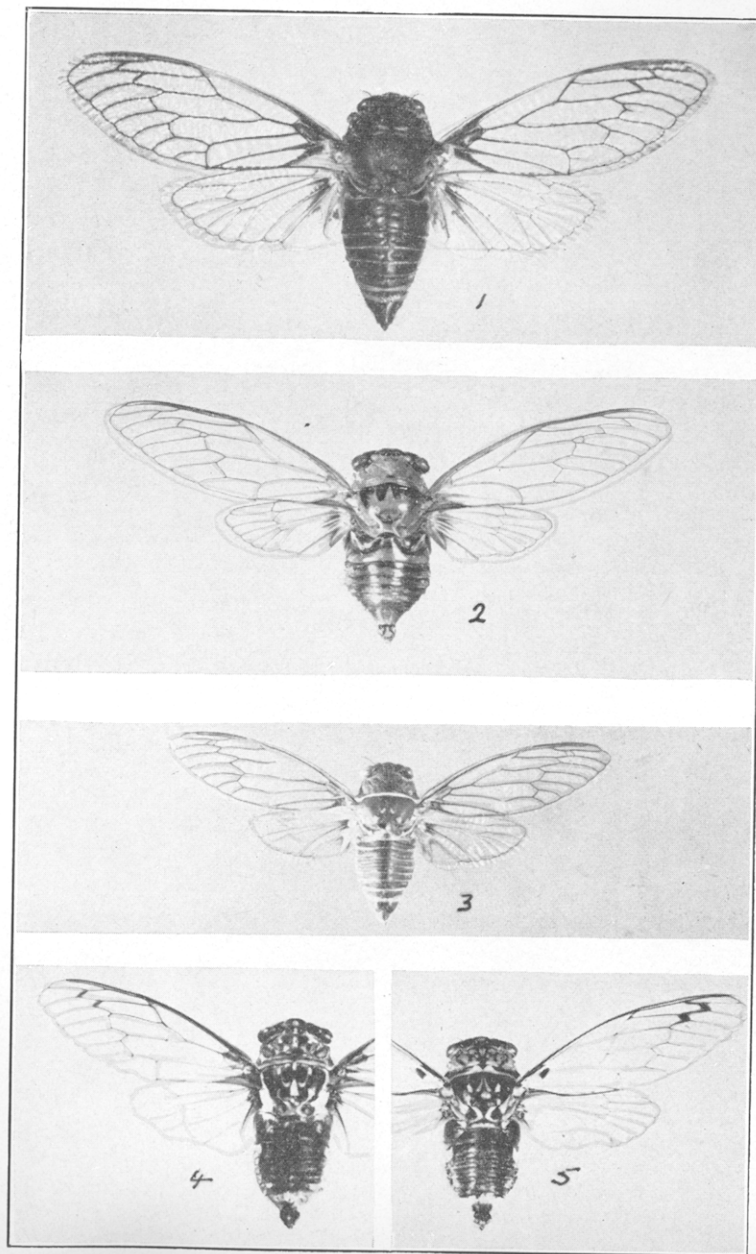


PLATE III

- Figure 1. *Tibicen sugdeni*, type.
 Figure 2. *Diceroprocta texana* variety *lata*, type.
 Figure 3. *Diceroprocta averyi*, type.
 Figure 4. *Okanagana villosa*, type.
 Figure 5. *Platypedia australis*, type, enlarged.
 Figure 6. *Platypedia australis*, type.
 Figure 7. *Okanagana villosa*, type. Much enlarged and showing hairs on top of abdomen.

