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Scope of Study: This paper presents a taxonomic study of the Cicadidae known or likely to occur in Oklahoma. Specimens and collection records of the museums of Oklahoma State University and Oklahoma University provided a basis for the study.

Findings and Conclusions: Twenty-five species representing eight genera are included in this paper. A key to the identification of the species is given with descriptions and distribution records for each.

ADVISER'S APPROVAL William A. Drew

THE CICADIDAE OF OKLAHOMA

By

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
KEY TO SPECIES	3
DESCRIPTIONS AND SYNONOMIES	7
DISTRIBUTION RECORDS	21
SELECTED BIBLIOGRAPHY	24
INDEX	27

INTRODUCTION

Twenty-three species of cicadas have been reported in Oklahoma. The purpose of this paper is to provide a convenient means by which these species may be identified. Two additional species which have not been reported in Oklahoma but are likely to occur here are included. Specimens examined were those of the museum, Oklahoma State University, and of the Stovall Museum, the University of Oklahoma.

Cicadas are most frequently observed during the late spring and throughout the summer. The peculiar vibrating sound produced by the male, often in chorus with numerous other males, is a familiar sound. Cicadas are typically found on tall blades of grass or clinging to the trunks and branches of trees. Female cicadas deposit their eggs under the bark of young tree branches and may cause appreciable damage.

Numerous articles by Davis (1915-1938) provide descriptions of Oklahoma species of cicadas. Papers by Lawson (1920), and Froeschner (1952) were of particular help in identification of species. Others by Davis (1918, 1920) and Simons (1954) were also useful.

Distribution records are from the specimens in the museums of Oklahoma State University, Oklahoma University, and from Davis (1930, 1940).

The synonymy used was adopted from literature cited above, from Van Duzee (1917), and from Alexander and Moore (1962).

I wish to express sincere appreciation to Dr. William A. Drew for his generous assistance and valuable guidance in preparation of this paper.

KEY TO THE SPECIES OF CICADIDAE

1. Length 15-18 mm.; cells of median area of front wing longer than those of marginal area; last ventral segment of male distinctly less than twice as wide as long; last ventral segment of female with notch in posterior margin reaching about 3/4 of the distance to the base (Fig. 1).
Okanagana synodica
 Not fitting above description.....2



O. synodica



T. eugraphica

Fig. 1, Last ventral segment of female.

2. Length greater than 18 mm. but less than 28 mm.....7
 Length not within range stated above.....3
3. Length 16 mm. or less.....4
 Length 28 mm. or greater.....15
4. Cells of median area of front wing shorter than cells of the marginal area.....5
 Cells of median area of front wing longer than cells of the marginal area.....6
5. Hind wings with 5 apical areas; sometimes one hind wing with 6 and the other with 5.....Melampsalta calliope

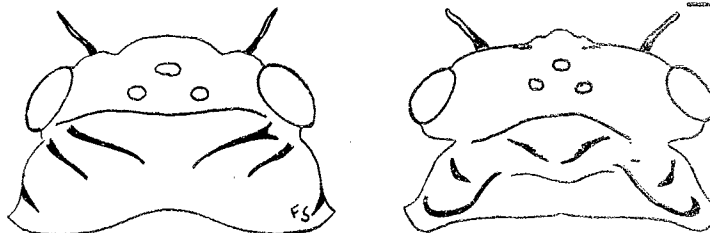
Hind wings with 4 or 5 apical areas....Melampsalta kansa

6. Head nearly same width as front of pronotum.....

.....Beameria venosa

Head distinctly wider than front of pronotum (Fig. 2)...

.....Pacarina puella



B. venosa

P. puella

Fig. 2, Dorsal aspect of head.

7. Seventh and eighth marginal cells of front wing less than one and one-half times as long as broad; abdomen broadly rounded posteriorly; black with light markings absent.....Cacama valvata

Seventh and eighth marginal cells of front wing about twice as long as broad; abdomen tapering to a V posteriorly; marking not as above.....8

8. With a well defined longitudinal carina laterally along the entire length of each side of the pronotum.....9

Pronotum without longitudinal carina along lateral margin; color black with orange wing veins....Magiccicada
(See descriptions for separation of species.)

9. Carina of pronotum becoming less distinct anteriorly; each longitudinal vein of front wing with a distinct brown cloud at the tip.....Cicada hieroglyphica
Carina of pronotum reaches the anterior edge; tips of longitudinal veins not clouded.....10

10. Head not as wide as front margin of pronotum; wing flaps marked with bright red-orange.....Okanagana hesperia
Head at least as wide as front margin of pronotum.....11
11. With grassy green head and pronotum; bases of wing veins grassy green; markings of mesonotum and metanotum light brown.....Tibicen azteca
Grassy green color lacking.....12
12. Cross veins of forewings slightly to distinctly infuscated.....13
Cross veins of forewings not at all infuscated.....
.....Tibicen vitripennis
13. Basal cell of forewing with longitudinal black mark occupying about 1/2 of the cell.....Tibicen inauditus
Basal cell of forewing lacking the black mark.....14
14. In the forewings the anterior most cross veins are distinctly darkened; in males the opercula do not overlap medially.....Tibicen eugraphica
In the forewings the anterior most cross veins are clear; in males the opercula overlap medially.....
.....Tibicen aurifera
15. Distal third of front wing distinctly infuscated; head and body chiefly greenish-buff with some black marks on mesonotum; length 30-33 mm.....Tibicen superba
Not fitting above description.....16
16. Hind collar of pronotum completely black or nearly so...
.....17
Hind collar light or perhaps darkened somewhat anteriorly.....18

17. Color black with fulvous markings; abdominal sternites with a wide, polished black median stripe.....
Tibicen lyricen
 Color green and black; abdominal sternites with or without a narrow black median stripe.....Tibicen chloromera
18. Anterior 2 cross veins either not covered by a brown cloud or only slightly infuscated.....19
 Anterior 2 cross veins with definite brown clouds.....20
19. Strongly pruinose laterally; abdominal terga with a mid-dorsal row of pruinose spots.....Tibicen dealbata
 Not strongly pruinose laterally; dorsal row of pruinose spots absent.....Tibicen marginalis
20. With dorsal, abdominal row of pruinose spots.....
Tibicen dorsata
 Without dorsal, abdominal row of pruinose spots.....21
21. Length 40 mm. or greater.....Tibicen auletes
 Length less than 40 mm.....22
22. In males the uncus is about as wide as long; the abdominal sternites of both sexes usually have the posterior margins light.....Tibicen resh
 In males the uncus is conspicuously longer than broad; abdominal tergites have posterior margins dark in both sexes.....Tibicen pruinosa

DESCRIPTIONS AND SYNONOMIES

Beameria venosa (Uhler)

Prunasis venosa Uhl., 1888. Entomol. Am., 4: 82.

Proarna venosa: Distant, 1911. Ann. Mag. Nat. Hist.,
series 8, 8: 134.

Beameria venosa: Davis, 1934. J. New York Entomol.
Soc., 42: 48.

Length: About 12-13 mm. Veins M and Cu leave arculus separately instead of as a single vein as in the genus Melampsalta. The anterior two cross veins, especially the first one, are nearly perpendicular and located very near the middle of the cells anterior and posterior to them. Color is light green and dark markings are lacking except for 2-4 brown bands extending posteriorly from the collar of the pronotum of some individuals.

Cacama valvata (Uhler)

Proarna valvata Uhl., 1888. Entomol. Am., 4: 84.

Cicada valvata: Gillette and Baker, 1895. Hemiptera of
Colorado, p. 64.

Cacama valvata: Van Duzee, 1915. J. New York Entomol.
Soc., 23: 23.

Length: About 25 mm. The abdominal segments are short; thus, giving the blunt appearance of the tip of the abdomen.

This species is black except for light ridges on the cruciform elevation and some very small spots on the pronotum and mesonotum. Some white pruinosity may occur on the sides or tip of the abdomen.

Cicada hieroglyphica Say

Cicada hieroglyphica Say, 1830. J. Acad. Nat. Sci. Philadelphia, 6: 235.

Cicada caracterea: Germar, 1830. Thon. Entomol. Archiv., 2: 40.

Tettigia hieroglyphica: Distant, 1881. Biol. Central Am. Homoptera, 1: 11.

Length: About 20-25 mm. The head and thorax are yellowish-green with black markings in the form of numerous lines and spots. The abdominal tergites are straw colored and lack dark markings except for the last tergite which is usually black.

Genus Magicicada

This genus consists of the periodical cicadas or 17-year and 13-year cicadas. Two species of 17-year cicadas have been reported in Oklahoma and a third species may occur in the state. A 13-year cicada has been reported (United States Dept. of Agriculture Bull. 71) but the species was not stated and no other records have been found; therefore, it is not included in this work. The Oklahoma species may be separated by using combinations of

characteristics given in the descriptions below.

Magiccicada cassini (Fisher)

Cicada cassinii Fish., 1851. Proc. Acad. Nat. Sci.

Philadelphia, 5: 272.

Cicada septendecim cassinii: Riley, 1868. 1st Monthly
Report, p. 21.

Magiccicada septendecim cassinii: Davis, 1925. J. New
York Entomol. Soc., 33: 44.

Magiccicada cassini: Alexander and Moore, 1962. Misc.
Publ. Mus. Univ. Michigan 121, p. 9.

Length: About 24-25 mm. The abdominal sternites are
entirely black or may bear narrow reddish bands along the
posterior borders. The pronotum and prothoracic pleura are
black. The tarsi are entirely dark.

Magiccicada septendecim (Linnaeus)

Cicada septendecim Linn., 1758. Syst. Nat., 10(1):
436.

Tettigonia septendecim: Fabricius, 1775. Syst.
Entomol., Suppl., p. 516.

Tibicen septendecim: Stal, 1861. Ann. Soc. Entomol.,
France, 4(1): 618.

Tibicen costalis Stal, 1869. Hemiptera Fabr., 2: 116.

Tibicina septendecim: Distant, 1906. Cat. Homoptera,
Cicadidae, p. 125.

Magiccicada septendecim: Davis, 1925. J. New York
Entomol. Soc., 33: 44.

Length: About 28-30 mm. This species has not been reported in Oklahoma. The pronotum is marked with orange laterally. The collar of the pronotum is often marked with orange. At least the posterior margins of the abdominal sternites are nearly orange and the entire ventral surface may be brown.

Magiccicada septendecula Alexander and Moore

Magiccicada septendecula Alex. and Moore, 1962. Misc. Publ. Mus. Univ. Michigan 121, p. 9.

Length: About 25 mm. No markings are present on the black pronotum and prothoracic pleura. The tibiae are entirely reddish or have narrow, black apical markings covering 1/3 of the segment or less. Prominent reddish bands are present along the posterior borders of the abdominal sternites. No county distribution records are available.

Melampsalta calliope (Walker)

Cicada parvula Say, 1825 (not Fabricius, 1798). J. Acad. Nat. Sci. Philadelphia, 4: 233.

Cicada pallescens: Germar, 1830 (not Muller, 1776). Thon. Entomol. Archiv., 2: 8.

Cicada calliope Walk., 1850. List Homoptera, 1: 212.

Carineta parvula: Uhler, 1888. Entomol. Am., 4: 22.

Cicada calliope: Kirkaldy, 1909. Canadian Entomol., 33: 76.

Melampsalta parvula: Van Duzee, 1909. Bull. Buffalo
Soc. Nat. Sci., 9: 194.

Melampsalta calliope: Van D., 1917. Cat. Hemiptera
North Am., p. 506.

Length: About 12-15 mm. At the base of the forewing
the veins M and Cu leave the arculus as a single vein which
divides shortly. The anterior cross veins are oblique and
located distinctly before the middle of the cells anterior
and posterior to them.

Brown and green forms occur. In the brown forms
black markings are either absent or faint and few in number.
In green forms the color is uniform except for some black
markings on the head.

Melampsalta kansa Davis

Melampsalta kansa Davis, 1919. J. New York Entomol.
Soc., 27: 340.

Length: About 13 mm. The description of the wing
venation given for M. calliope applies to this species also.
The number of apical cells in the hind wing as described in
the key offers the most reliable means of separation.

Color is uniform green and dark markings are lacking.

Okanagana hesperia (Uhler)

Cicada hesperia Uhl., 1876. Bull. U.S. Geol. Geog.
Surv., 1: 342.

Tibicen hesperia: Uhl., 1892. Trans. Maryland Acad. Sci., 1: 161.

Tibicina? hesperia: Distant, 1906. Cat. Homoptera, Cicadidae, p. 125.

Tibicinoides hesperius: Van Duzee, 1915. J. New York Entomol. Soc., 23: 27,43.

Okanagana hesperia: Davis, 1919. J. New York Entomol. Soc., 27: 218.

Length: About 20 mm. Wing flaps are marked with bright red-orange. The longitudinal veins are heavily infuscated from their bases to the cross veins. Abdominal tergites are light straw colored except for a black median stripe tapering distally.

Okanagana synodica (Say)

Cicada synodica Say, 1825. J. Acad. Nat. Sci. Philadelphia, 4: 334.

Tibicen synodica: Woodworth, 1888. Psyche, 5: 68.

Okanagana synodica: Distant, 1906. Cat. Homoptera, Cicadidae, p. 126.

Length: About 15-18.5 mm. This species has not been reported in Oklahoma. It is likely to occur here, however, and has been reported in both Kansas and Texas. Honey-yellow marked with black is the predominating color. The flaps of the forewings may be marked with orange.

Pacarina puella (Walker)

Cicada signifera Walk., 1858. List. Homoptera, Suppl.,
p. 22.

Proarna signifera: Distant, 1881. Biol. Central Am.
Rhynch., Homoptera, 1: 13.

Pacarina puella: Davis, 1923. J. New York Entomol.
Soc., 31: 11.

Length: About 13 mm. In the forewings the veins M and Cu leave the arculus separately. The anterior cross veins, especially the most anterior one, are nearly perpendicular and located very near the middle of the cells anterior and posterior to them.

The background color is light straw and there are prominent black markings on the head, pronotum and mesonotum.

Tibicen auletes (Germar)

Cicada auletes Germ., 1834. Silb. Rev. Entomol., 2: 65.

Tettigonia grossa? Fabricius, 1775. Syst. Entomol.,
p. 678.

Cicada grossa: Olivier, 1790. Encyc. Meth., 5: 747.

Cicada literata Walker, 1850. List Homoptera, 1: 91.

Cicada sonora? Walk., 1850. List Homoptera, 1: 105.

Cicada marginata Howard, 1905. Insect Book, p. 232.

Rihana grossa: Distant, 1912. Genera Ins., fasc.,
142: 29.

Tibicen auletes: Van Duzee, 1917. Cat. Hemiptera North
Am., p. 192.

Length: About 40-44 mm. Members of this species reach a greater average length than those of any other Oklahoma species. T. auletes can be distinguished from others of nearly the same size by its more extensive black markings. A dorsal row of pruinose spots is lacking.

Tibicen aurifera (Say)

Cicada aurifera Say, 1825. J. Acad. Nat. Sci.
Philadelphia, 4: 332.

Tibicen aurifera: Van Duzee, 1917. Cat. Hemiptera
North Am., p. 492.

Length: About 23-26 mm. This species is similar in appearance to T. eugraphica but is larger and is darker in color. The abdominal tergites are nearly black. The opercula overlap.

Tibicen azteca (Kirkaldy)

Cicada pallida Distant, 1881. Biol. Centr. Am.,
Rhynch. Homoptera 1: 8. (preoccupied)

Cicada azteca Kirkaldy, 1910. Canadian Entomol.,
41: 391.

Tibicen azteca: Van Duzee, 1917. Cat. Hemiptera North
Am., p. 494.

Length: About 21 mm. As stated in the key this species is readily distinguished by the combination of color and size. No other species in the same size range is characterized by extensive green markings.

Tibicen chloromera (Walker)

Thopha chloromera Walk., 1850. List Homop., 1: 43.

Cicada sayi Smith and Grossbeck, 1907. Entomol. News,
18: 124.

Tibicen chloromera: Davis, 1923. J. New York Entomol.
Soc., 31: 1.

Length: 32-36 mm. This species is about the same size as T. lyricen but the two can be separated by color. Both are predominately black but T. chloromera is marked with green and T. lyricen with reddish brown.

Tibicen dealbata (Davis)

Cicada marginata dealbata Davis, 1915. J. New York
Entomol. Soc., 23: 162.

Tibicen dealbata: Van Duzee, 1917. Cat. Hemiptera
North Am., p. 493.

Length: About 35 mm. There is a dorsal median row of pruinose spots on the abdomen. This gives a useful character in distinguishing this species from T. marginalis which lacks the pruinose spots on the abdomen. The head is yellowish-green, the thorax greenish marked with black, and the abdominal tergites are black with the posterior margins often brown or yellowish.

Tibicen dorsata (Say)

Cicada dorsata Say, 1825. J. Acad. Nat. Sci.
Philadelphia, 4: 331.

Thopha varia Walker, 1850. List Homoptera, 1: 42.

Fidicina crassa Walk., 1858. Ins. Saund., Homoptera,
p. 10.

Tibicen dorsata: Van Duzee, 1917. Cat. Hemiptera
North Am., p. 495.

Length: 31-38 mm. In males the uncus, when viewed caudally, appears triangular. In males of the species T. dealbata the uncus has a more truncate tip. The last ventral segment of the female has a rounded notch in the posterior margin which reaches about half way to the base. This notch reaches only about one-fourth of the way to the base of the segment in females of T. dealbata. Dominant colors are black, yellowish-green and brown. Coloration resembles that of T. dorsata, T. dealbata, and T. marginalis rather closely.

Tibicen eugraphica (Davis)

Cicada eugraphica Davis, 1916. J. New York Entomol.
Soc., 24: 52.

Tibicen eugraphica: Van Duzee, 1917. Cat. Hemiptera
North Am., p. 492.

Length: 18-24 mm. This is a dark colored species and is immediately distinguishable from T. azteca by the lack of green. The opercula do not overlap as in T. aurifera. The first cross vein is situated distinctly before the middle of the cell anterior to it and is oblique rather than perpendicular.

Tibicen inauditus Davis

Tibicen inauditus Davis, 1917. J. New York Entomol. Soc., 25: 204.

Length: About 21 mm. A longitudinal black mark on the basal cell of the forewing is a unique characteristic of this species. Black is the dominant color and there are limited straw colored markings. The posterior margin of the hind collar of the pronotum is light while the anterior margin is black.

Tibicen lyricen (De Geer)

Cicada lyricen De G., 1773. Memoires, 3: 212.

Cicada fulvula Osborne, 1906. Entomol. News, 18: 322.

Tibicen lyricen: Van Duzee, 1917. Cat. Hemiptera North Am., p. 491.

Length: 31-34 mm. The color of this species is very distinctive. Black predominates with fulvous markings on the thorax. The bases of the forewings are green. The forewings are entirely infuscated.

Tibicen marginalis (Walker)

Cicada marginata Say, 1825 (not Olivier, 1790). J. Acad. Nat. Sci. Philadelphia, 4: 330.

Cicada marginalis Walk., 1852. List Homoptera, 4: 1128.

Tibicen marginalis: Van Duzee, 1916. Check List Hemiptera, p. 55.

Length: 36-39 mm. A dorsal row of pruinose spots is lacking on the abdomen of this species. The first two cross veins of the forewings are frequently not at all darkened. The costal margin of the forewing is distinctly bent near the middle.

Tibicen pruinosa (Say)

Cicada pruinosa Say, 1825. J. Acad. Nat. Sci.
Philadelphia, 4: 330.

Cicada bruneosa Wild, 1852. Ann. Soc. Entomol. Fr.,
series 2, 10, Bull., p. 18.

Cicada canicularis Provancher, 1889. Pet. Faune
Entomol. Can., p. 211.

Tibicen pruinosa: Van Duzee, 1917. Cat. Hemiptera
North Am., p. 490.

Length: 29-37 mm. As indicated in the key this species is best distinguished from T. resh by characters of the male genitalia. The average length is about 32 mm. Black markings on each side of the W mark taper posteriorly and may disappear; whereas, in T. resh they are more extensive and reach the cruciform elevation. In general the color is about the same as that of T. resh. The first cross veins of the forewings are distinctly darkened.

Tibicen resh (Haldeman)

Cicada resh Hald., 1852. Stansb. Salt Lake Exped.,
p. 369.

Cicada robertsoni Fitch, 1854. Trans. New York Agr. Soc., 14: 745.

Tibicen resh: Van Duzee, 1917. Cat. Hemiptera North Am., p. 493.

Length: 32-35 mm. Abdominal tergites are black with posterior borders often brown. The head is mostly black. Brownish-green, green, and black dominate the thorax. The first cross veins of the forewings are distinctly darkened in this species as in T. pruinosa.

Tibicen superba (Fitch)

Cicada superba Fitch, 1855. Trans. New York Agr. Soc., p. 745.

Tibicen superba: Van Duzee, 1917. Cat. Hemiptera North Am., p. 494.

Length: 30-33 mm. Extensive green color over the head and thorax make this species readily distinguishable. The only dark markings on the head and thorax are a black region between the eyes and four black areas which are usually present immediately behind the collar of the pronotum.

Tibicen vitripennis (Say)

Cicada vitripennis Say, 1830. J. Acad. Nat. Sci. Philadelphia, 2: 236.

Cicada albipennis Woodward, 1888. Psyche, 5: 68.

Cicada erratica Osborne, 1906. Ohio Nat., 6: 497.

Tibicen vitripennis: Van Duzee, 1917. Cat. Hemiptera
North Am., p. 492.

Length: About 20 mm. In the forewing the first cross vein is perpendicular and situated very near the middle of the cells anterior and posterior to it. The opercula do not overlap medially. Greenish and black are the usual colors but a straw colored form with brown markings occurs.

DISTRIBUTION RECORDS

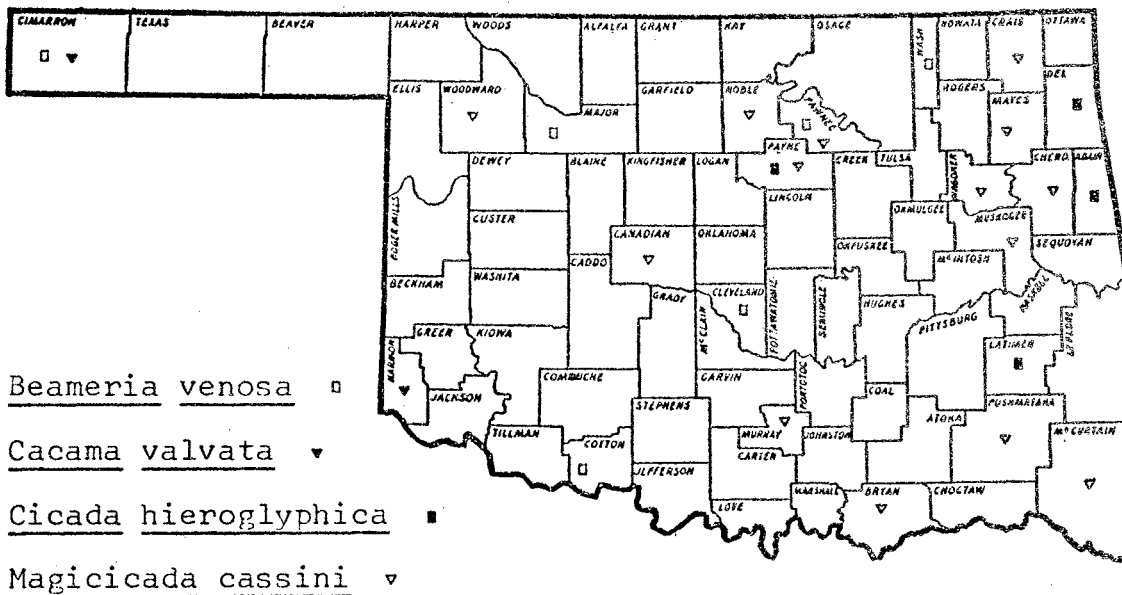


Fig. 3

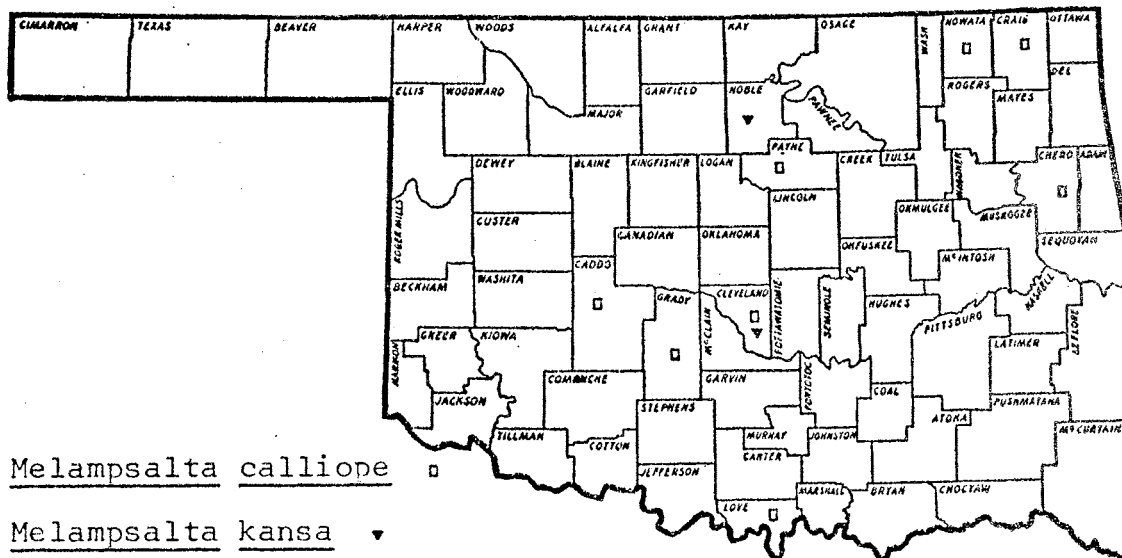


Fig. 4

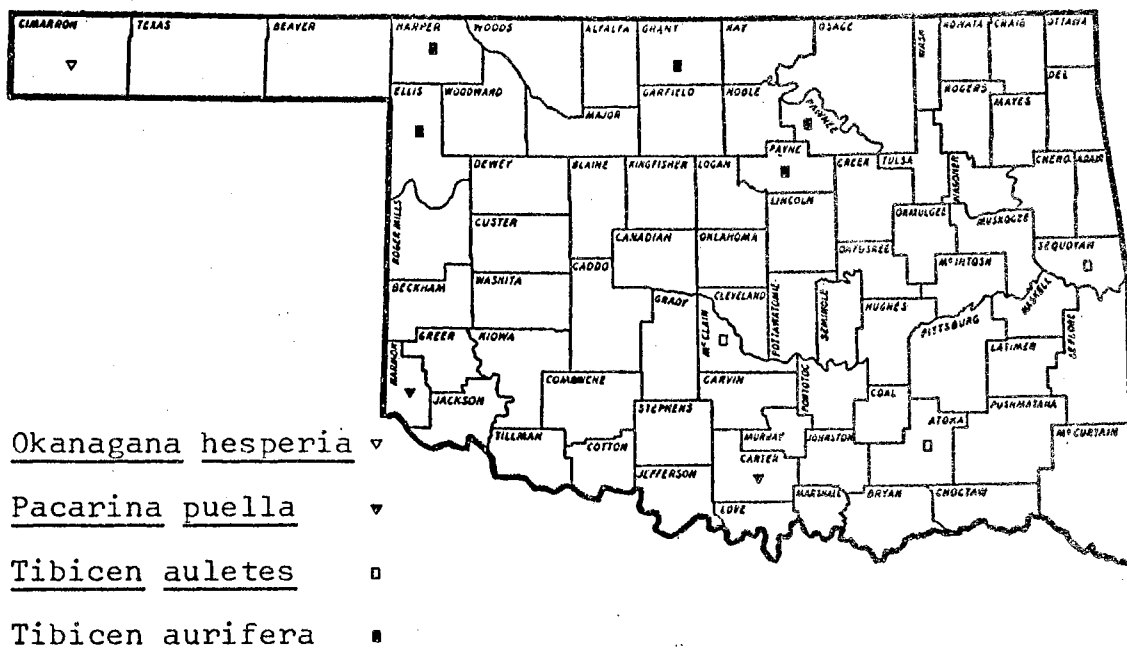


Fig. 5

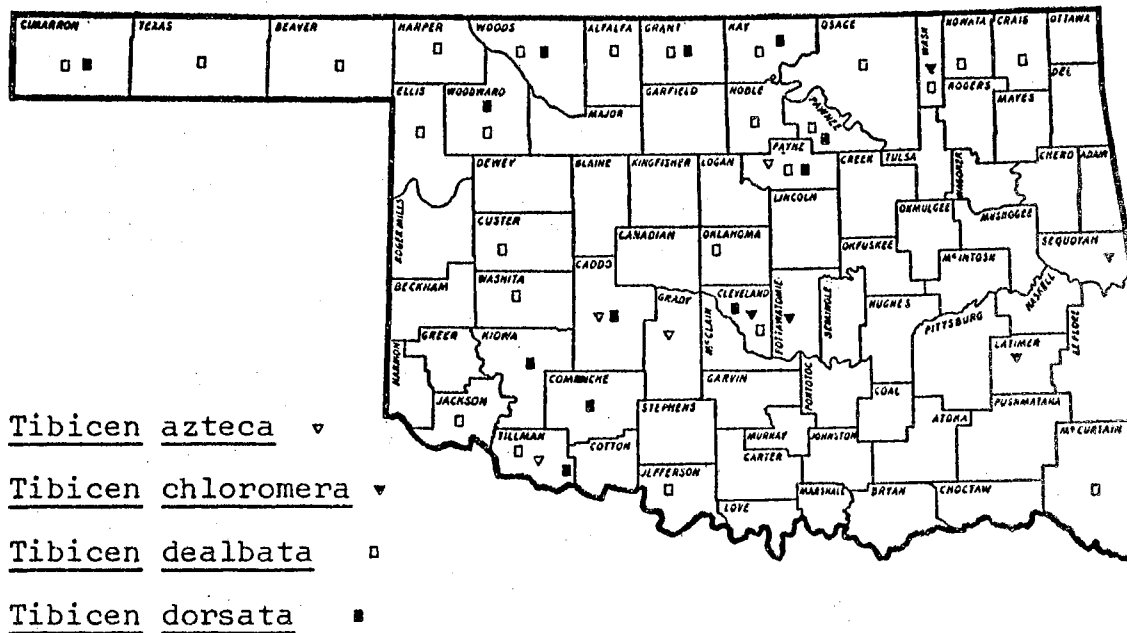
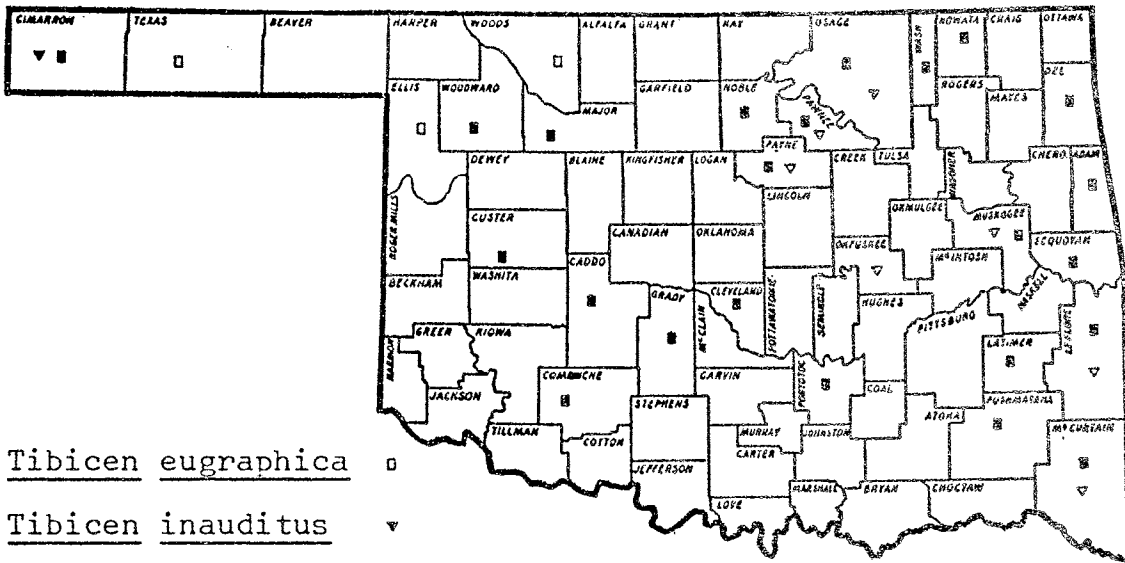
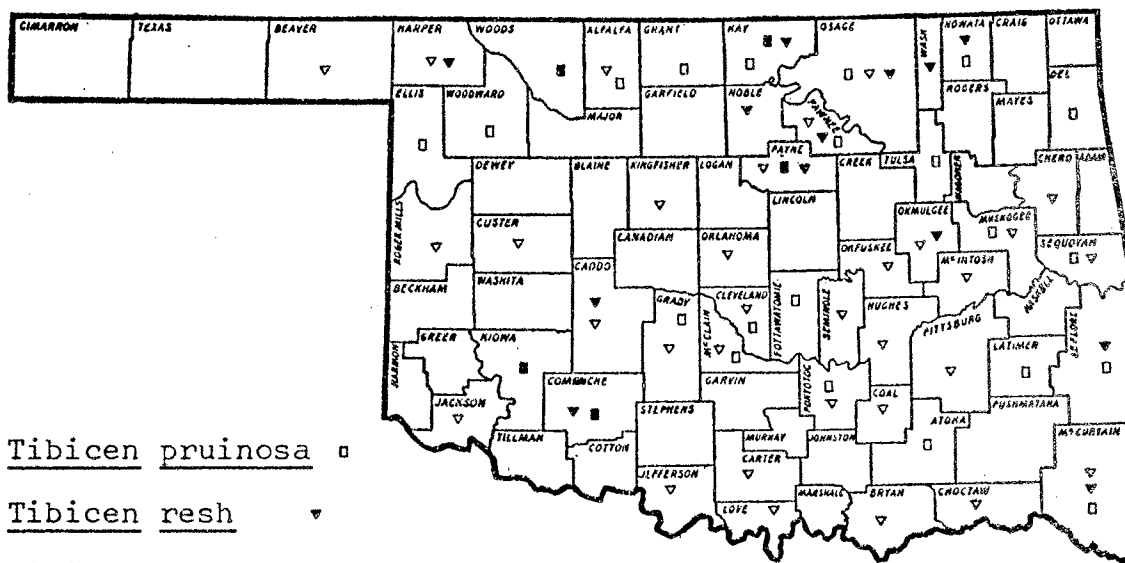


Fig. 6



Tibicen eugraphica □
Tibicen inauditus ▽
Tibicen lyricen ■
Tibicen marginalis ▽

Fig. 7



Tibicen pruinosa □
Tibicen resh ▽
Tibicen superba ■
Tibicen vitripennis ▽

Fig. 8

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INDEX

- Auletes, 6, 13, 14, 22.
- Aurifera, 5, 14, 16, 22.
- Azteca, 5, 14, 16, 22.
- Beameria venosa, 4, 7, 21.
- Cacama valvata, 4, 7, 21.
- Calliope, 3, 10, 11, 21.
- Cassini, 9, 21.
- Chloromera, 6, 15, 22.
- Cicada hieroglyphica, 4, 8, 21.
- Dealbata, 6, 15, 16, 22.
- Dorsata, 6, 15, 16, 22.
- Eugraphica, 3, 5, 14, 16, 23.
- Hesperia, 5, 11, 22.
- Hieroglyphica, 4, 8, 21.
- Inauditus, 5, 17, 23.
- Kansa, 4, 11, 21.
- Lyricen, 6, 15, 17, 23.
- Magiccicada cassini, 9, 21.
- septendecim, 9.
- septendecula, 10.
- Marginalis, 6, 15, 16, 17, 23.
- Melampsalta calliope, 3, 10, 11, 21.
- kansa, 4, 11, 21.
- Okanagana hesperia, 5, 11, 22.
- synodica, 3, 12.
- Pacarina puella, 4, 13, 22.
- Pruinosa, 6, 18, 19, 23.
- Puella, 4, 13, 22.
- Resh, 6, 18, 23.
- Septendecim, 9.
- Septendecula, 10.
- Superba, 5, 19, 23.
- Synodica 3, 12.
- Tibicen auletes, 6, 13, 14, 22.
- aurifera, 5, 14, 16, 22.
- azteca, 5, 14, 16, 22.
- chloromera, 6, 15, 22.
- dealbata, 6, 15, 16, 22.

dorsata, 6, 15, 16, 22.

eugraphica, 3, 5, 14, 16,
23.

inauditus, 5, 17, 23.

lyricen, 6, 15, 17, 23.

marginalis, 6, 15, 16, 17,
23.

pruinosa, 6, 18, 19, 23.

resh, 6, 18, 23.

superba, 5, 19, 23.

vitripennis, 5, 19, 23.

Valvata, 4, 7, 21.

Venosa, 4, 7, 21.

Vitripennis, 5, 19, 23.

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