

THE FAMILY DELPHACIDAE (HOMOPTERA)
IN MISSISSIPPI

By
JACK D. COLEY

A Thesis
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Master of Science
in the Department of Entomology

State College, Mississippi

August 1970

THE FAMILY DELPHACIDAE (HOMOPTERA)

IN MISSISSIPPI

By

JACK D. COLEY

Approved:

Professor of Entomology
(Chairman of Supervisory
Committee and Director of
Thesis)

Professor of Entomology and
Head of the Department of
Entomology

Associate Professor of
Entomology
(Member of Committee)

Dean of the College of
Agriculture

Assistant Professor of
Entomology
(Member of Committee)

Dean of the Graduate School

August 1970

ACKNOWLEDGMENTS

The author is indebted to Dr. Leon Hepner, Professor of Entomology, Mississippi State University, under whose guidance this work was done; the State Plant Board of Mississippi and the Entomology Department, Mississippi State University for the use of the insect collection and laboratory; Mr. C. R. Andress, and other insect taxonomists for their work on the insect collection. He is also indebted to Dr. Fowden G. Maxwell, Head, Department of Entomology, Mississippi State University; Dr. Ross E. Hutchins, Former State Entomologist; and employees of the State Plant Board for their assistance in the collection of material. To Mr. C. A. Wilson, Professor of Entomology, and Dr. H. B. Green, Associate Professor of Entomology, for their criticisms and suggestions in the preparation of this thesis; Dr. Peter Sikorowski, committee member; and Mrs. Henry Green for her patience and advice in the preparation of the final copy, he expresses thanks.

Most of all the author is grateful to his wife and daughters.

J.D.C.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	iii
LIST OF FIGURES	vi
INTRODUCTION	1
REVIEW OF LITERATURE	3
MATERIALS AND METHODS	5
Family Delphacidae	8
Key to the Genera	9
Genus <u>Copicerus</u>	11
<u>Copicerus irroratus</u>	11
Genus <u>Stobaera</u>	12
Key to the Species	12
<u>Stobaera tricarinata</u>	13
<u>Stobaera pallida</u>	14
Genus <u>Liburniella</u>	15
<u>Liburniella ornata</u>	15
Genus <u>Chloriona</u>	17
<u>Chloriona slossonae</u>	17
Genus <u>Prokelisia</u>	18
<u>Prokelisia setigera</u>	19
Genus <u>Bakerella</u>	20
Key to the Species	20
<u>Bakerella maculata</u>	21
<u>Bakerella pediforma</u>	22
Genus <u>Peregrinus</u>	24
<u>Peregrinus maidis</u>	24
Genus <u>Laccocera</u>	26
<u>Laccocera zonata</u>	26
Genus <u>Saccharosydne</u>	27
<u>Saccharosydne saccharivora</u>	28
Genus <u>Pentagramma</u>	29
Key to the Species	30
<u>Pentagramma vittatifrons</u>	30
<u>Pentagramma variegata</u>	31
Genus <u>Pissonotus</u>	34
Key to the Subgenera	34
Subgenus <u>Pissonotus</u>	35
Key to Species	36
<u>Pissonotus</u> (<u>Pissonotus</u>) <u>albovenosus</u>	36
<u>Pissonotus</u> (<u>Pissonotus</u>) <u>brunneus</u>	37
<u>Pissonotus</u> (<u>Pissonotus</u>) <u>piceus</u>	39
<u>Pissonotus</u> (<u>Pissonotus</u>) <u>marginatus</u>	41

TABLE OF CONTENTS, continued

	Page
<u>Pissonotus</u> (<u>Pissonotus</u>) <u>binotatus</u>	42
<u>Pissonotus</u> (<u>Pissonotus</u>) <u>paludosus</u>	45
<u>Pissonotus</u> (<u>Pissonotus</u>) <u>merides</u>	46
Subgenus <u>Phyllodictus</u>	48
Key to Species	49
<u>Pissonotus</u> (<u>Phyllodictus</u>) <u>tessellatus</u>	49
<u>Pissonotus</u> (<u>Phyllodictus</u>) <u>flabellatus</u>	51
Genus <u>Neomegamelanus</u>	53
Key to the Species	53
<u>Neomegamelanus dorsalis</u>	54
<u>Neomegamelanus elongatus</u>	56
Genus <u>Stenocranus</u>	58
Key to Species	58
<u>Stenocranus pallidus</u>	59
<u>Stenocranus delicatus</u>	60
<u>Stenocranus unipunctatus</u>	62
<u>Stenocranus brunneus</u>	63
<u>Stenocranus acutus</u>	65
<u>Stenocranus similis</u>	66
Genus <u>Euidella</u>	68
<u>Euidella weedi</u>	68
Genus <u>Sogata</u>	69
Key to Species	70
<u>Sogata meridiana</u>	70
<u>Sogata dorsolineata</u>	71
<u>Sogata orizicola</u>	73
Genus <u>Delphacodes</u>	74
Key to Species	75
<u>Delphacodes wetmorei</u>	75
<u>Delphacodes propinqua</u>	77
<u>Delphacodes laminalis</u>	78
<u>Delphacodes teapea</u>	79
<u>Delphacodes puella</u>	81
<u>Delphacodes campestris</u>	82
<u>Delphacodes fulvidorsum</u>	84
<u>Delphacodes basivitta</u>	85
<u>Delphacodes andromeda</u>	86
<u>Delphacodes alexanderi</u>	88
EXPLANATION OF FIGURES	90
FIGURES	92
ABSTRACT	103
BIBLIOGRAPHY	105

LIST OF FIGURES

	Page
Key to Figures	90
Figure	
1. <u>Copicerus irroratus</u>	92
2. <u>Stobaera tricarinata</u>	92
3. <u>Stobaera pallida</u>	92
4. <u>Liburniella ornata</u>	92
5. <u>Chloriona slossonae</u>	92
6. <u>Bakerella maculata</u>	92
7. <u>Bakerella pediforma</u>	93
8. <u>Prokelisia setigera</u>	93
9. <u>Peregrinus maidis</u>	93
10. <u>Laccocera zonata</u>	93
11. <u>Saccharosydne saccharivora</u>	93
12. <u>Pentagramma vittatifrons</u>	93
13. <u>Pentagramma variegata</u>	94
14. <u>Pissonotus (Pissonotus) albovenosus</u>	94
15. <u>Pissonotus (Pissonotus) brunneus</u>	94
16. <u>Pissonotus (Pissonotus) piceus</u>	94
17. <u>Pissonotus (Pissonotus) marginatus</u>	94
18. <u>Pissonotus (Pissonotus) binotatus</u>	94
19. <u>Pissonotus (Pissonotus) paludosus</u>	95
20. <u>Pissonotus (Pissonotus) merides</u>	95
21. <u>Pissonotus (Phyllodictus) tessellatus</u>	95
22. <u>Pissonotus (Phyllodictus) flabellatus</u>	95

LIST OF FIGURES, Continued

Figure		Page
23.	<u>Neomegamelanus dorsalis</u>	95
24.	<u>Neomegamelanus elongatus</u>	95
25.	<u>Stenocranus pallidus</u>	96
26.	<u>Stenocranus delicatus</u>	96
27.	<u>Stenocranus unipunctatus</u>	96
28.	<u>Stenocranus brunneus</u>	96
29.	<u>Stenocranus acutus</u>	96
30.	<u>Stenocranus similis</u>	96
31.	<u>Euidella weedi</u>	97
32.	<u>Sogata meridiana</u>	97
33.	<u>Sogata dorsolineata</u>	97
34.	<u>Sogata orizicola</u>	97
35.	<u>Delphacodes wetmorei</u>	97
36.	<u>Delphacodes propinqua</u>	97
37.	<u>Delphacodes laminalis</u>	98
38.	<u>Delphacodes teapea</u>	98
39.	<u>Delphacodes puella</u>	98
40.	<u>Delphacodes campestris</u>	98
41.	<u>Delphacodes fulvidorsum</u>	98
42.	<u>Delphacodes basivitta</u>	98
43.	<u>Delphacodes andromeda</u>	99
44.	<u>Delphacodes alexanderi</u>	99
45.	<u>Delphacodes puella</u>	99
46.	<u>Stobaera pallida</u>	99

LIST OF FIGURES, Continued

Figure		Page
47.	<u>Pentagramma vittatifrons</u>	99
48.	<u>Pentagramma vittatifrons</u>	99
49.	<u>Pentagramma vittatifrons</u>	100
50.	<u>Bakerella maculata</u>	100
51.	<u>Chloriona slossonae</u>	100
52.	<u>Chloriona slossonae</u>	100
53.	<u>Macrotomella carinata</u>	100
54.	<u>Laccocera zonata</u>	100
55.	<u>Liburniella ornata</u>	101
56.	<u>Peregrinus maidis</u>	101
57.	<u>Delphacodes puella</u>	101
58.	<u>Stenocranus similis</u>	101
59.	<u>Sogata meridiana</u>	101
60.	<u>Euidella weedi</u>	101
61.	<u>Stenocranus similis</u>	102
62.	<u>Prokelisia setigera</u>	102
63.	<u>Saccharosydne saccharivora</u>	102
64.	<u>Pissonotus (Pissonotus) marginatus</u>	102
65.	<u>Neomegamelanus elongatus</u>	102
66.	<u>Peregrinus maidis</u>	102

INTRODUCTION

The family Delphacidae, originally considered as a subfamily of the larger group Fulgoridae, was officially elevated to family rank and placed on the official list of family-group names in zoology in 1961 by the International Committee on Zoological Nomenclature in Opinion No. 602.

Little is known of the economic importance of this family in Mississippi or of the distribution and occurrence of the species.

Special notice was taken of this group in Mississippi in 1958 when evidence of a serious disease of rice, "Hoja Blanca," was found in Hancock County. One species of this family is known to be an important vector of the disease. The State Plant Board of Mississippi surveyed the rice growing areas for two consecutive years to determine if this vector was present, and it was found only in Hancock County.

Prior to this survey, very little attention was given to the family, and very little information regarding the occurrence of the members of this family in Mississippi had been published. Dozier (1922) published A Synopsis of the Genus *Stenocranus* and named two new species from this

area, and later (1926) published *The Fulgoridae of Mississippi*, but the family *Delphacidae* was not included in this publication.

The purpose of this manuscript is to bring together the Mississippi species of the family *Delphacidae* in a single taxonomic paper as a descriptive treatment of the known species of this family in this state has never been published.

This family is presently represented in Mississippi by sixteen genera and forty-four species; and determination of species is mainly by the male genitalia, in addition to color, size, shape of the head, and carinae.

Descriptions of the genera and species, as well as keys to separate them are presented with distribution and host records.

REVIEW OF LITERATURE

Many of the species of the family Delphacidae were described early in the nineteenth century, and many more new ones have been named in recent years.

Van Duzee's "Catalogue of the Hemiptera of North America" (1917) contained many of the species included here, and Metcalf (1923) published a "Key to the Fulgoridae of Eastern North America" which included the family Delphacidae and contained descriptions of several new species. From that time, there seems to have been little information published on this family from the southeastern United States. Muir and Giffard (1924) published some information on the family "Delphacidae of North America," and Muir (1930) described several new genera and species from South America. Dozier (1922) described two new species of the genus Stenocranus from this area, and Beamer (1952) added several more new species to that genus, some of which were from Mississippi. McDermott (1952) revised the genus Megamelanus and added a new genus, Neomegamelanus, with two species from Mississippi. Beamer (1947, 1948) and DuBose (1960) added several new species to the genus Delphacodes. The DuBose paper treats the genus Delphacodes in North Carolina, and includes most of the Mississippi species. Beamer (1952) added two new species from

Mississippi to the genus Sogata, and revised the genera Pissonotus, Phyllodictus, and Phyllodinus, which are represented in Mississippi.

Except for these few publications, no other published records are known for any species of Delphacidae from Mississippi. The aim of this paper is to assemble all of the information relative to the identification of the members of the family which occur in this area so that workers can determine species without being burdened with literature on foreign species and with numerous publications.

MATERIALS AND METHODS

Since 1918 the State Plant Board of Mississippi has maintained an insect collection at Mississippi State University. The Delphacids in this collection, plus specimens collected by the author and others listed in the Acknowledgments afforded an excellent collection with which to work. Many specimens were available with data concerning the date and locality of collection. The dates of collections ranged from 1893 until 1969, and the localities of collections encompassed the entire state. The State Plant Board Collection was used largely in this study, along with many specimens that were collected by Dr. Leon Hepner in leafhopper studies. Other material included specimens collected by the author and by District Entomologists of the State Plant Board at various locations. In addition, many specimens from the rice field surveys of 1958 and 1959, as well as material from the Delta Branch Experiment Station at Stoneville, and the Gulf Coast Research Laboratory at Ocean Springs, were used in this study.

Determination of species was based on a study of the male genitalia as noted in the literature on this group. Information concerning the dates and localities of collections, as well as host information, was also noted.

The following method, outlined by DuBose (1960) and modified at the suggestion of Dr. Leon Hepner, was used to study the male genitalia. The specimen was first examined to determine the sex, then the entire abdomen of a male specimen removed with a probe after the insect was pinned in an inverted position on an art gum eraser by thrusting the pin head into the eraser until the dorsal side of the insect rested snugly on the eraser. After removal, the entire abdomen was placed in a small vial containing caustic potash for six to ten hours. The genital capsule was examined after six hours to determine if the sclerotized areas were clear. Some of the heavily sclerotized specimens needed to remain in the caustic potash for ten hours while some of the more delicate ones were damaged if they remained longer than six hours. After the genitalia was clear, the abdomen was placed on a hollow-ground slide in a drop of glycerine where it was prepared for study by removing the genital capsule from the abdomen. Then the genitalia was oriented for study and examined under a binocular microscope to determine the size and shape of the styles, genital capsule, and aedeagus. In most specimens, the aedeagus was also studied under a compound microscope.

After the genitalia was studied the genital segment was placed in a small amount of glycerine in the bottom of a small glass vial which was corked and stored with the

specimen by thrusting the specimen pin diagonally through the cork so the glycerine would remain in the bottom of the vial and not come into contact with the cork. The specimen was then placed in an insect collection box and stored in a museum case.

FAMILY DELPHACIDAE

Description of Family:

The Delphacidae resemble and are closely related to the Fulgoridae of the superfamily Fulgoriodae, but differs in having a movable spur, or calcar, at the apex of the posterior tibia; small insects varying from 2 to 10 mm in length; elongate; eyes large and deeply emarginate below to receive the antennae; carinae of head and thorax distinct in most species, the carinae variable in number and prominence; pronotum tricarinate, about as long as crown, extending down on each side almost to base of forecoxae; forewings of two types--brachypterous and macropterous--the brachypterous forms with wings which usually reach less than half way to tip of abdomen, truncate at apex, sometimes veins obscure; macropterous forms with wings which extend beyond tip of abdomen, often with spines on veins, venation variable; abdomen about as long as thorax; frons usually longer than wide, carinate; clypeus triangular; antenna two-jointed, varying from compact to long and foliaceous; legs long and slender, fore and middle coxae almost as long as femora, posterior coxa large, stout, posterior tibia with two to five lateral spiniform spurs or spines, and a large movable spur, or calcar, at apex, which is variable in form; genital segment of male usually

cylindrical or rectangular, truncate at apex, and a pair of styles and an anal tube that may have a pair of processes; most species are determined by the shape and size of the styles and aedeagus.

The family Delphacidae is represented in Mississippi by 16 genera.

Key to the Genera of the Family Delphacidae

1. Calcar neither foliaceous nor tectiform--(Fig. 46e)--2
- 1a. Calcar either foliaceous or tectiform----(Fig. 45e)--4
2. Calcar cultrate, with a row of marginal teeth, antenna slightly flattened -----(Fig. 46e)
Genus Stobaera Stal.
- 2a. Calcar spiniform, without lateral teeth--(Fig. 47e)--3
3. Antenna foliaceous, half as long as the body, frons with a single median carina----- (Fig. 48d)
Genus Copicerus Swartz.
- 3a. Antenna not foliaceous, short; frons with two median carinae----- (Fig. 48d & 49f)
Genus Pentagramma Van Duzee.
4. Large species, at least 6 mm in length (Fig. 51e & 52g)
Genus Chloriona Fieber
- 4a. Smaller forms, not 6 mm in length, usually much less-5
5. Frons almost circular in outline, antenna and calcar short----- (Fig. 50f)
Genus Bakerella Crawford
- 5a. Frons not circular in outline-----6
6. Frons with two median carina, face pitted (Fig. 54f)
Genus Laccocera Van Duzee
- 6a. Frons with one median carina, sometimes forked below apex of head----- (Fig. 56f)--7
7. Median carina of frons reaching posterior margin of crown without oblique carinae to lateral margins---
Genus Liburniella Stal----- (Fig. 55g)
- 7a. Median carina of frons forked on or below apex of crown, each branch running obliquely to lateral margins of crown -----8

8. Lateral carinae of pronotum divergingly curved, not reaching posterior margin in most cases--(Fig. 57g)--9
- 8a. Lateral carinae of pronotum convergingly curved, usually reaching posterior margin of pronotum----(Fig. 58g)-11
9. Relative slender forms; lateral carinae of pronotum almost, or reaching, the posterior margin--(Fig. 59g)
Genus Sogata Distant
- 9a. Relatively robust forms; lateral carinae of pronotum closely curved behind the eyes, not reaching posterior margin of pronotum----- (Fig. 57g)-10
10. Basal metatarsus elongate, much longer than the other two together----- (Fig. 60e)-
Genus Euidella Puton
- 10a. Basal metatarsus short, seldom as long as the other two together--
Genus Delphacodes Fieber
11. Frons narrow, sides parallel, head narrow, produced----- (Fig. 61f)-12
- 11a. Frons broad, sides not parallel, head broad----- (Fig. 62f)-13
12. Crown inflated in front of eyes, then narrowed to apex----- (Fig. 63g)
Genus Saccharivora Westwood
- 12a. Crown not inflated in front of eyes----- (Fig. 58g)
Genus Stenocranus Fieber
13. Median carina of frons forked on apex of crown or obscure----- (Fig. 64f)-14
- 13a. Median carinae of frons forked below apex of crown----- (Fig. 56f)-15
14. When viewed laterally, apex of head acute with faint transverse carina----- (Fig. 65h)
Genus Neomegamelanus McDermott
- 14a. When viewed laterally, apex of head rounded, without transverse carina-----
Genus Prokelisia Osborn
15. Median carina of the frons forked near middle, the two prongs widely separated; chiefly macropterous forms----- (Fig. 56f)
Genus Peregrinus Ashmead
- 15a. Median carina of frons forked above middle, the two prongs but slightly separated; chiefly brachypterous forms----- (Fig. 64f)
Genus Pissonotus Van Duzee

Genus Copicerus Swartz

Copicerus Swartz, O., Kong. Vet. Akad. Nya. Handl.

23: 180, 1802.

Recognized by the greatly elongated antenna with foliaceous segments and by its large size.

Description of Genus: Elongate forms with head narrower than pronotum; crown longer than broad; mesonotum tricarinate; forewings narrow, elongate; face with median carina; antennae with the first two segments conspicuously elongate and foliaceous; legs elongate; calcar spiniform.

Type of Genus: Copicerus irroratus Swartz

This is a tropical genus represented in Mississippi only by the type species.

Copicerus irroratus Swartz
(Fig. 1)

Copicerus irroratus Swartz, O., Kong, Vet. Akad. Nya.

Handl. 23: 180, 1802.

Size: 5.8 - 6.2 mm.

Color: General color brownish gray, thorax punctate; forewings with dark diagonal apical vitta; face with light band at apex of frons which extends laterally onto thorax.

Structure: Head narrower than pronotum; crown longer than broad; mesonotum tricarinate; forewing narrow, elongate; veins spinose; antenna long, foliaceous, very prominent, more than half the length of body; calcar spiniform.

Genitalia: Aedeagus short, with several retrorse processes; styles broad at base, narrowed abruptly near middle into finger-like processes.

Distribution: Specimens on hand from Mississippi as follows: Centerville, May 12, 1926; State College, April 19, 1957, April 26, 1967, and April 23, 1947. Collected by Dozier from the Gulf Coast in 1920 and 1921. Also, recorded from Ohio, Kansas, and Texas.

Genus Stobaera Stal

Stobaera Stal, Carl, Berliner Ent. Zeit. 3: 327, 1859.

Description of Genus: Crown short, broad; forewing usually banded; face with transverse line at apex of frons, frons narrow, parallel sided; antenna with first segment flattened, triangular; calcar convex on both sides, sometimes slightly flattened on lower side; six to ten spines on hind margin of calcar.

Type of Genus: Stobaera tricarinata Say

Stal erected the genus Stobaera in 1859 with Delphax concinna Stal, a Mexican species, as type. This is evidently a synonym of Delphax tricarinata Say, therefore this must the type of Stobaera.

Key to the Species of Stobaera Stal

1. Sides of the frons almost parallel----tricarinata Say
2. Sides of the frons not parallel-----pallida Osborn

(1) Stobaera tricarinata (Say)
(Fig. 2)

Delphax tricarinata Say, Thomas, J. Acad. Nat. Sci.

Philadelphia 4: 237, 1825.

Delphax concinna Stal, Carl, Ofv. Svenska Vet. Akad. Forh.

15: 355-8, 1858 (Synonym).

Size: 4.5 - 5.0 mm.

Color: General color brownish-yellow; dorsum of pronotum orange-yellow with a light stripe down the middle; forewings with oblique fuscous band near middle and another just before the apex, veins with spines along them; face with a brown band at apex of frons; legs with longitudinal brown stripes.

Structure: Crown short; pronotum long; forewings long and broad, broadly rounded on apex; face triangular, frons narrow, sides slightly expanded below middle and sinuate between eyes; antennae stout, second segment slightly longer than first.

Genitalia: Styles compressed, broadened on apex and produced into an acute tooth with a slender process on base of styles.

Distribution: Specimens on hand from Mississippi as follows: State College, June 10, 1959; Iuka, August 5, 1961. Also, reported to be widely distributed in the United States from Pennsylvania to California and from Minnesota to the Gulf.

(2) Stobaera pallida Osborn
(Fig. 3)

Stobaera pallida Osborn, Herbert, Ohio Naturalist 5: 375,
1905.

Size: 4.0 - 4.5 mm.

Color: General color light tan; dorsum of pronotum straw colored; forewings with brown band from near base to fuscous mark at apex of clavus; face dark tan without brown stripe at apex of frons.

Structure: Crown short; pronotum about twice as long as crown; forewings long and broad, broadly rounded at apex; face triangular, frons narrow, sides broadly expanded below middle and sinuate above; antennae short and broad, first and second segments about equal in length.

Genitalia: Styles long and slender, hooked at apex with an inward projecting needle-like process just below hook.

Distribution: No specimens on hand from Mississippi. One female from Naples, Florida, collected by Dr. L. W. Hepner, July 25, 1960, was available for study.

Genus Liburniella Crawford

Liburniella Crawford, D. L., Proc. U.S. Nat. Mus.

46: 584, 1914.

Description of Genus: Crown strongly carinate, the median carina forked and the branches reunite to form a small "O"; lateral carinae of the pronotum curved behind the eyes not reaching the posterior margin; forewings longer than tip of abdomen, banded with fuscous on light brown background; frons narrow, resembling that of Stenocranus; antennae rather long, not foliaceous; veins of forewing spotted with small fuscous bumps.

Type of Genus: Liburniella ornata (Stal)

This genus is represented in Mississippi by the type species.

Liburniella ornata (Stal)
(Fig. 4)

Delphax ornata Stal, Carl, Berliner Ent. Zeit. 6: 315, 1862.

Size: 4.0 - 4.3 mm.

Color: General color light brown with narrow white dorsal line narrowly bordered on each side by brown to black; crown brown with conspicuous white stripe along median carina; pronotum and scutellum yellow on each side of the dark line; forewings yellowish brown with broad fuscous line in shape of large inverted "V"; clypeus dark brown to fuscous; frons brown with light colored carina; legs and antennae pale brown, first segment of antennae black at

tip, second segment with black stripe on dorsal edge.

Structure: Head about as broad as prothorax, strongly carinate, the lateral carinae curved behind eyes, not reaching posterior margin; crown slightly longer than broad, the median carina distinct, forked near apex to form a small "O" about midway from apex to base; forewings longer than wide, extending about one-third their length beyond tip of abdomen; frons elongate, narrow, sides almost parallel; antennae long, first segment over one-half as long as second.

Genitalia: In lateral view, pygofer longer than wide, aedeagus large at base, bent dorsad and then extending posteriorly, broad, long, dorsal margin straight, ventral margin with slight bulge just dorsad of base, many coarse teeth from base to blunt, rounded apex; in caudal view, styles long, broad at base, ending in sharp apices, sinuate on inner and outer margins.

Distribution: Specimens on hand from Mississippi: Grenada, October 14, 1961. Recorded from throughout the United States and Canada.

Genus Chloriona Fieber

Chloriona Fieber, Franz X., Verh Zool. Bot. Ges. Wien.

16: 519, 1866.

Description of Genus: Large elongate forms, 6 mm or more in length; lateral carinae of the pronotum not reaching posterior margin, curved behind the eyes; forewings elongate, broadly rounded on apex; head slightly produced before eyes; crown short, broad; carina of frons forked at apex of head; face much longer than broad; calcar elongate, triangular, concave below, without apparent teeth.

Represented in Mississippi by one species.

Chloriona slossonae (Ball)
(Figs. 5, 51, 52)

Liburnia slossoni Ball, E. D., Can. Entomol. 35: 231, 1903.

Size: 6.0 - 7.0 mm.

Color: Testaceous to brown with a pair of dark stripes beginning on head and extending back across pronotum and mesonotum, lateral pronotal carinae and area between stripes almost white; forewings lightly infuscated, smokey; face dark brown to fuscous with carinae tan; tibia and femora lineated with brown longitudinal markings.

Structure: Pronotum short, lateral margin curved, lateral carinae not reaching posterior margin; scutellum about twice as long as pronotum, lateral margin pointed at

center; crown a little longer than broad, slightly produced between eyes; face more than twice as long as broad, carina of frons forked at apex of head; second segment of antennae about twice as long as first, pitted.

Genitalia: Styles long, slender, slightly curved with sharp apices pointing outward, distal third with short slender spines; in lateral view shaft of aedeagus tapered to a moderately sharp point with several coarse spines about midway between base and apex.

Distribution: Specimens on hand from Mississippi as follows: State College, September 23, 1960; Noxubee County, September 26, 1961; and a good collection from other areas of the state.

Genus Prokelisia Osborn

Prokelisia Osborn, Herbert, Ohio Naturalist 5: 373, 1905.

Description of Genus: Crown long, narrowing anteriorly; pronotum with three prominent carinae, the lateral ones straight and reaching posterior margin of pronotum; scutellum broad with posterior margin produced into a prominent obtuse point with reflected margins; forewings long, distinctly narrowed from just back of base to tip; frons widening on lower half, narrowing sharply to tip of crown, carinae not meeting but extending very prominently over the apex of head onto the crown.

Represented in Mississippi by one species.

Prokelisia setigera Osborn
(Figs. 8, 62)

Prokelisia setigera Osborn, Herbert, Ohio Naturalist

5: 373, 1905.

Size: 3.0 mm.

Color: Light yellow or pallid; evenly colored along pronotum and scutellum; face light, except for a darker line along the lateral carinae of the frons; venter of abdomen light yellow with a few dark spots; legs pallid with the spines on tibiae, teeth of calcar, spines and claws of tarsi, dark.

Structure: Crown longer than broad, distinctly narrowing to the apex with strong, definite, carinae; pronotum wider than long, carinae prominent, reaching posterior margin, posterior margin slightly emarginate, deepest at middle, slightly notched; scutellum truncate, hind lobe obtuse, margin strongly reflexed; forewings long, narrowing to apex, veins with minute hairs; frons definitely widened at apex, narrowed to tip of crown and extending prominently over apex of head onto crown; clypeus triangular, lateral carinae curved; calcar large, broad, with definite teeth on margin.

Genitalia: In caudoventral view, styles long, slender, compressed, gently arced to moderately sharp pointed

apices, clothed with coarse hairs; in lateral view, aedeagus finger shaped with a row of coarse spines midway between base and apex.

Distribution: Several specimens on hand from the Gulf Coast Research Laboratory, Oceans Springs, Mississippi. Also, recorded from Cameron, Louisiana.

Genus Bakerella Crawford

Bakerella Crawford, David L., Proc. U.S. Natl. Mus.

46: 601, 1914.

Description of Genus: Head as broad as prothorax, strongly carinate, crown broad, almost square, slightly produced before eyes; lateral carinae of pronotum curved out, not reaching hind margin; forewings maculated; frons short, broad, almost round, median carina forked slightly above ocelli, strongly divergent; clypeus small, tricarinate; antennae short, not reaching clypeus, first segment less than half as long as second; legs short, calcar short, thick, margin slightly toothed.

Type of Genus: Bakerella maculata Crawford

Key to Species of Bakerella

In caudal view, inner margin of styles toothed-----
maculata Crawford

In caudal view, inner margin of styles smooth-----
pediforma Beamer

(1) Bakerella maculata Crawford
(Figs. 6, 50)

Bakerella maculata Crawford, David L., Proc. U.S. Natl.
Mus. 46: 601, 1914.

Size: 2.25 - 2.50 mm.

Color: General color dark brown, carinae slightly lighter; lateral margin of abdomen white; frons spotted with white.

Structure: Head broad; crown strongly carinate, almost square; pronotum moderately large; frons slightly longer than broad at center, sides strongly rounded, lateral carinae ending within the lateral margins of the clypeus; antennae short and stout, first segment less than one-third as long as second; legs very short, hind tibiae scarcely longer than femora; calcar only slightly longer than width at base, margin smooth.

Genitalia: Anal tube prominent, small, with two elongate slender processes on ventral margin; in caudal view, styles short, pincer-like, scarcely divergent, acutely rounded on apex, with inner margin toothed.

Distribution: Two females from Mississippi. One from Noxubee County and one from the Gulf Coast.

(2) Bakerella pediforma Beamer
(Fig. 7)

Bakerella pediforma Beamer, R. H., J. Kansas Entomol. Soc.
23: 104, 1950.

The following description is taken directly from Beamer (1950) as this species was not represented in the material studied.

Brachypterous form:

Resembling Bakerella rotundifrons but with the median carina of the clypeus divided almost at the apex. Length of male 1.8 mm; female 2 mm.

Structure: Clypeus about one-fifth longer than greatest width, widest near middle, narrowed toward each end, practically quadricarinate since the median carina divides almost at apex; crown about as long as basal width, widest at apex, carina distinct; elytra about as broad as long, apices broadly rounded, veins raised with a few puncts on them; dorsum of abdomen with a few pustules on each side.

Color: General color stramineous or light brown; clypeus with color between outer and inner carinae somewhat darker with four pairs of median light spots and three lateral pairs; elytra with a few dark spots surrounding the white lunate marks at apices; abdomen with a darker area on dorsum before genital capsule on each side.

Genitalia: In lateral view, pygofer of male more or less rectangular with a very sharp, caudodorsally projecting spine on ventrocaudal corner, anal segment with a pair of very short, narrow, almost straight processes; aedeagus widest at base, quite long, narrowed on dorsal margin near middle, outer half resembling a foot with the base on dorsal margin; aedeagal brace barely visible; styles widest at base, slightly spatulate at apices. In caudal view, aedeagal brace roundingly excavated; styles widest near basal third, slightly narrowed just before pediform apices.

Holotype male, allotype female, 1 male and 6 female paratypes, Slidell, Louisiana, March 3, 1947, R. H. Beamer; other paratypes; 1 male and 2 females, Ocean Springs, Mississippi, March 3, 1947, R. H. Beamer; 1 female, Pearlinton, Mississippi, March 3, 1947, R. H. Beamer; 1 male, Sanford, Florida, May 13, 1926, E. D. Ball.

Types and paratypes in Snow Entomological Collections;
Paratypes in E. D. Ball Collection, U.S.N.M.

Genus Peregrinus Kirkaldy

Peregrinus Kirkaldy, G. W., Entomologist 37: 175, 1904.

Description of Genus: Crown short, broad, almost square; lateral carinae of pronotum reaching posterior margin; median carina of frons forked near middle with the two prongs widely separated; calcar narrow, tectiform; style strongly toothed; aedeagus long and slender.

Type of Genus: Peregrinus maidis (Ashmead)

Represented in Mississippi by the type species.

Perigrinus maidis (Ashmead)
(Figs. 9, 56, 66)

Delphax maidis Ashmead, William H., Psyche 5: 323, 1890.

Size: 4.2 - 4.5 mm.

Color: General color light yellowish brown to brown with faint white stripes on the notum; forewings with a fuscous stripe along crossveins to dorsal apex, then curved across wing to central apex; three dark spots along costa, and one at center of clavus; face purple, the purple color varying in shades from deep to light and extending laterally on each side to pronotum and fore coxae; venter dark brown to fuscous except on metathorax which is lighter colored.

Structure: Crown short, almost as wide as long; pronotum about one and one-half times as long as crown; forewings elongate, broadly rounded on apex, margins almost parallel;

median carina of frons forked near middle with the two prongs widely separated; calcar narrow, almost triangular in cross-section with base concave.

Genitalia: In ventrocaudal view, styles curved into a half-circle on apical half, apex bifid with a long, slender preapical tooth on inner margin. In lateral view, aedeagus long, slender, gently curved, stylate, with a long preapical dorsal process about one-third length of aedeagus, with two short ventral spurs located between the dorsal spur and middle of aedeagus.

Distribution: Specimens on hand from Mississippi as follows: State College, September 22, 1894, November 2, 1894, November 5, 1895, H. E. Weed; May 23, 1921, J. H. Price; September, 1959, October, 1959; Brookhaven August 5, 1945, J. H. Price; Port Gibson, September 4, 1961. Ten specimens from Brookhaven were collected from corn. Several specimens on hand from Baton Rouge, Louisiana.

Ashmead refers to this species as "The Corn Delphacid."

Genus Laccocera Van Duzee

Laccocera Van Duzee, E. P., Bull. Buffalo Soc. Nat. Sci.
5: 242, 1897.

Easily distinguished from other delphacids by the pitted surface of head, thorax, and abdomen.

Description of Genus: Head large, about as broad as prothorax, quadrangular in outline when viewed from above, anterior margin roundly convex, several pits near eyes; pronotum shorter than crown, deeply pitted behind eyes; scutellum tricarinate; abdomen pitted laterally; frons large, broad at middle, semi-rounded, narrower below than above with median carina forked at apex of head; mostly brachypterous forms.

Type of Genus: Laccocera vittipennis Van Duzee

This genus is represented in Mississippi by one species.

Laccocera zonata (Gillette)
(Figs. 10, 54)

Delphacinus zonatus Gillette, C. P., Annu. Rep. Colorado
Agr. Exp. Sta. 7: 60, 1895.

Size: 2.7 - 3.0 mm.

Color: General color yellow and black; head, prothorax, and scutellum entirely yellow; forewings black; abdomen black except for a conspicuous yellow spot on base of abdomen on dorsum, extending to the tip in a more or less continuous stripe; frons yellow; clypeus dark.

Structure: Head short, square, not quite as wide as prothorax, rounded on apex of crown; pronotum about as long as crown with a row of pits along lateral carinae behind eyes; forewings of brachypterous forms reaching first or second abdominal segment; frons large, broad, semi-rounded, with a row of pits along frontal carinae; anterior and middle tibiae slightly flattened.

Genitalia: In caudal view, styles divergingly curved, slender, long, with acutely pointed apices.

Distribution: Specimens on hand from Mississippi; one immature female from Ocean Springs, May, 1960. Also, recorded from New Hampshire and Nevada.

Genus Saccharosydne Kirkaldy

Saccharosydne Kirkaldy, G. E., Bull. Hawaii Sugar Pl.

Assoc. Div. Ent. 3: 139, 1907.

Description of Genus: Slender, elongate, head much narrower than pronotum; lateral carinae of pronotum reaching posterior margins; median carina of frons forked on or below apex of head, crown extended before eyes and each branch of the forked frontal carinae runs obliquely to lateral margins of crown. This genus is represented in Mississippi by one species.

Saccharosydne saccharivora (Westwood)
(Figs. 11, 63)

Delphax saccharivora Westwood, John O., Mag. Nat. Hist.
5: 260, 1897.

Size: 4.5 - 5.0 mm.

Color: Green to yellowish green on dorsum; forewings delicate green, veins lighter, indistinct; face greenish yellow; eyes with pink to reddish cast; antennae greenish yellow with a black longitudinal stripe; venter smokey.

Structure: Crown long, inflated in front of eyes then narrowed to apex, lateral margin slightly sinuate; pronotum shorter than crown, notched on posterior margin at center, lateral carinae reaching posterior margin; forewings about two to three times as long as broad, extending about one-third their length beyond tip of abdomen; frons about three times as long as broad at center, narrow at base, widening abruptly beyond midway to apex; carina of frons forked at apex of head; antennae short, reaching to apex of frons, segment two about twice as long as segment one.

Genitalia: In ventrocaudal view, styles narrow at base, broadened and projecting laterally, narrowing abruptly at apex into thumb-like laterally projecting process; in lateral view the aedeagus is coiled at base and ends in

hand-shaped structure with a dorsally projecting spur at base that is longer than basal width.

Distribution: Specimens on hand from Mississippi as follows: State College, June 21, 1960; Leflore County, August 23, 1960; and Grenada, September 15, 1961.

Genus Pentagramma Van Duzee

Pentagramma Van Duzee, E. P., Bull. Buffalo Soc. Nat. Sci. 5: 260, 1897.

In 1897 the genus Pentagramma was erected by Van Duzee for a North American species, with Liburnia vittatifrons Uhler as type.

Description of Genus: Head broad as pronotum; crown produced in front of eyes, longer than broad, triangular, longer than pronotum, tricarinate, lateral carinae of crown following the caudo-mesal margins of the eyes, not reaching posterior margin; pronotum short, lateral carinae curved behind eyes, not reaching posterior margin, tricarinate; scutellum longer than pronotum, with five carinae; forewings elongate; frons slightly longer than width at middle, ovate, with a pair of intermediate carinae; antennae cylindrical with second segment longer than first; legs long and slender, femora and tibiae semi-flattened, posterior tibiae with three lateral spines; calcar spiniform.

Type of Genus: Pentagramma vittatifrons (Uhler)

Represented in Mississippi by two species.

Key to the Species of Pentagramma

1. Anterior tibiae conspicuously flattened, dark brown transverse band near their distal margin -----
vittatifrons (Uhler)
- 1a. Anterior tibiae slender, or but slightly flattened, with a small, or no, distal brown band -----
variegata Beamer

(1) Pentagramma vittatifrons (Uhler)
(Figs. 12, 47, 48, 49)

Liburnia vittatifrons Uhler, P. R., U.S. Geol. and Geog.
Surv. 1: 352, 1876.

Pentagramma minore Crawford, David L., Proc. U.S. Natl. Mus.
46: 567, 1914 (Synonym).

Size: 5 mm.

Color: Crown, pronotum, and scutellum greenish-yellow; forewings light yellowish; abdominal tergites yellow with greenish-yellow markings; frons greenish yellow marked with two indefinite large transverse orange bands, carinae light yellow; clypeus brownish, caudal margins dark brown; antennae light yellow, marked with two longitudinal brown bands at distal margin of first antennal segment; coxae greenish yellow, anterior ones marked with large brown spot on inner disc, femora marked with three distinct and one indistinct brown longitudinal bands.

Structure: Crown longer than broad, median carina almost obsolete near posterior margin; pronotum slightly broader than head; forewings shorter than body, not reaching last

segment of abdomen; frons almost same width at base and apex, almost as broad as long, nearly circular, the two median carinae of frons widely separated making the area so formed twice the width of the lateral area of frons; first segment of antennae very short, less than one-third length of second.

Genitalia: In ventrocaudal view, styles acutely angled, inner margins even, enclosing a nearly circular area.

Distribution: Specimens on hand from Mississippi as follows: Bay St. Louis, May 25, 1960 (male); also recorded from Colorado; Illinois; Kansas; Maryland; Nebraska; New Jersey; New York; North Dakota; Utah; Virginia; Washington; and Wyoming.

(2) Pentagramma variegata Penner
(Fig. 13)

Pentagramma variegata Penner, L. R., J. Kansas Entomol. Soc. 20: 37, 1947.

The following description was taken directly from Penner (1947) as this species was not represented in the material studied.

Resembles P. douglasensis but pronotum cephalad of lateral carinae light brown or yellow, and smaller (6.5 - 8.8 mm) with general color yellowish-green.

Length: Male, cephalic margin of vertex to distal margin of forewing, 6.8 mm, forewing, 5.6 mm; female, 8.2 mm,

forewing, 6.4 mm.

Color: Green, with orange, light fuscous and fulvous markings on vertex, pronotum, and scutellum; carinae light green; yellow-green markings present on cephalic margin of pronotum, extreme lateral margin of pronotum with small dark brown band; forewings sub-hyaline, distal half light brown, veins brown; abdominal tergites brown with pale yellow markings; frons green, with two indistinct transverse orange bands which more or less fuse in middle; caudal half of clypeus brown, cephalic portion fulvous; genae with dark brown spot between antennae and frons; antennae with two distinct longitudinal brown stripes, fusing at distal margin of first segment; venter brown; pygofer fuscous, legs with longitudinal brown stripes, four on anterior femora; no transverse band present on anterior tibiae.

Structure: Frons considerably longer than broad, carinae distinct, obsolete at cephalic margin; forewings but slightly setigerous, extending beyond distal margin of 11th. tergite; 11th. tergite short, about the length of 10th.; 9th. tergite with deep dorso-lateral emargination of its distal margin; tibiae very slender.

Female: Forewings extend to tip of 11th. tergite; somewhat larger but coloration and structure similar to male.

Holotype, male, allotype, female, 8 males, 4 female paratypes, Pascagoula, Mississippi, August 8, 1921, C. J. Drake in the U.S. Nat. Mus. Other paratypes: 1 female, Oswego, New York, June 25, 1894. Paratypes also reported from the following locations: Indiana, Illinois, Missouri, Kansas, Minnesota, South Dakota, Montana, and Oregon. Paratypes in U.S. National Museum, University of Minnesota, Cornell University, Illinois Natural History Survey, South Dakota State College, and University of Kansas Collections. There is considerable variation in color for this species, though in a given locality it is more or less constant. The distal margins of the forewings in the male usually are brown, though they may be greenish-yellow as is the rest of the wing. The frons, and the dorsum in general are variable as far as markings are concerned. The amount of orange, yellow, and green varies. The specimens from Oregon are somewhat variable in the shape of the styles and are somewhat smaller than the average. The length of male specimens varied from 6.5 - 7 mm and the forewings from 6 to 6.8 mm in length.

Genus Pissonotus Van Duzee

Pissonotus Van Duzee, E. P., Bull. Buffalo Soc. Nat. Sci.
5: 236, 1897.

The genera Pissonotus Van Duzee (1897) and Phyllodictus Ball (1926) resemble each other in form, appearance, and structure quite closely, and were revised into the genus Pissonotus by Beamer (1949) with Phyllodictus as a subgenus of Pissonotus.

Description of Genus: Crown longer than broad, barely extended before eyes; head narrower than pronotum and pronotal carinae almost straight, reaching or almost reaching hind margin of pronotum; aedeagus long and slender, often with slender retrorse processes on dorsal margin at or on apical third of shaft; styles sinuately curved with overhanging or cupped apices and at least one pair, and sometimes two, of processes ventrad of styles; apex of frons usually pale colored and general color is usually polished black or dull brown; moderate size.

Key to Subgenera of Pissonotus

- Fore tibiae distinctly flattened laterally-----
Phyllodictus Ball
- Fore tibiae not distinctly flattened laterally-----
Pissonotus Van Duzee

Subgenus Pissonotus (Pissonotus) Van Duzee

Pissonotus Van Duzee, E. P., Bull. Buffalo Soc. Nat. Sci.
5: 236, 1897.

Description of Subgenus: Head narrower than pronotum; crown slightly produced before eyes; prothorax slightly longer than crown, broad across middle, convex on posterior margin, narrowed anteriorly, lateral carinae rather widely divergent at apex, a little incurved, not quite reaching posterior edge of pronotum; forewings of brachypterous forms reaching first or second segment of abdomen, forewings of macropterous forms reaching beyond tip of abdomen; frons expanded below eyes, sides arched, median carina forked about one-third its length below apex of crown, the two branches almost parallel, closely approximated for most their length; apex of frons pale with a broad black band across clypeus which extends on across fore coxae; aedeagus long, narrow, almost parallel sided in lateral view, usually with one to four retrorse processes on dorsal margin near apex; styles in ventral view usually with margins sinuate with rounded overhanging cupped apices; usually a pair of median processes ventrad of styles, occasionally a pair of lateral processes near base of these.

Type: Pissonotus (Pissonotus) marginatus Van Duzee

This subgenus is represented in Mississippi by six species.

Key to Pissonotus (Pissonotus) Van Duzee

1. Veins of forewing plainly extending to hind margin-- 2
 1a. Veins of forewing not plainly extending to
 hind margin----- 3
2. Clypeus spotted with light color-----
albovenosus Osborn
 2a. Clypeus not spotted with light color-----
brunneus Van Duzee
3. With distinct white band on both hind margin of pronotum
 and forewing-----paludosus Beamer
 3a. Without distinct white band on both hind margin of
 pronotum and forewing-----4
4. Basal segment of antenna black-----
binotatus Spooner
 4a. Basal segment of antenna not black-----5
5. Forewings with seta-bearing tubercles on veins---
piceus Van Duzee
 5a. Forewings without seta-bearing tubercles on veins--
marginatus Van Duzee

(1) Pissonotus (Pissonotus) albovenosus Osborn
 (Fig. 14)

Pissonotus albovenosus Osborn, Herbert, J. Dept. Agr.

Porto Rico 13: 110, 1929.

Size: 1.75 mm.

Color: General color dark fuscous with the following white markings, carinae of crown and frons, carinae of pronotum and scutellum, veins and hind margins of forewings, and short lines on fourth and fifth abdominal segments; a black bar across base of clypeus.

Structure: Robust, crown longer than pronotum with prominent carinae; carinae of pronotum and scutellum distinct,

pronounced; forewings of brachypterous forms reaching about midway of abdomen, those of macropterous forms reaching beyond tip of abdomen; frons twice as long as wide, expanded below eyes, narrow at apex, carinae distinct.

Genitalia: In lateral view aedeagus slender, widest near apex with two retrorse processes on dorsal margin just before apex, first process about half as long as aedeagus, the second about half as wide and long as first; anal segment with two long, almost parallel sided processes with rounded apices; in ventral view style widest near outer third, apices rounded with tips cupped; median processes wider and longer than styles, sharply narrowed on inner margins near outer half to sharp apices.

Distribution: Specimens on hand from Mississippi as follows: Ecu, May 1959; State College, October 1959, May 1960, June 1961; Iuka, August 1961. Also, recorded from California and Texas to Florida and along Atlantic Coast to New Hampshire.

(2) Pissonotus (Pissonotus) brunneus Van Duzee
(Fig. 15)

Pissonotus brunneus Van Duzee, E. P., Bull. Buffalo Soc.
Nat. Sci. 5: 239, 1894.

Pissonotus divaricatus Spooner, C. S., Can. Entomol.
44: 236, 1912 (Synonym).

Brachypterous Form: Resembles Pissonotus (Pissonotus) albovenosus but without light spots on clypeus.

Size: 2.5 mm.

Color: General color piceous brown with rufous tinge, crown black with light grey carinae; pronotum black with distinct grey carinae, scutellum same as pronotum; forewings fuscous with prominent whitish to grey veins; frons piceous brown, carinae pale, narrow apical margin of frons and outer edge of cheeks pale grey to white; clypeus with broad piceous band across it which curves backward to the coxae; antennae dark brown, basal segment black.

Structure: Head narrower than pronotum; crown longer than wide; carinae of crown and pronotum distinct, pronounced; lateral carinae of pronotum not reaching hind margin of pronotum; forewings short, reaching to second segment of abdomen, veins distinct, raised; frons wide, expanded below eyes.

Genitalia: In lateral view aedeagus about twice as wide at base as width just before apex, long, slender, slightly curved, with three short retrorse processes in a scooped out area just before apex; anal segment with a pair of sharp, long, slender, ventrally projecting processes; in ventral view, styles narrowed at base, widest on outer third, rounded and narrowed on apices which are slightly cupped with apical finger-like projections pointing mesad;

median processes widest at base, narrowed to sinuate outer half, ending in acute points just before apices of styles.

Macropterous Forms: Like the brachypterous form but with fully developed forewings which are about one-third their length longer than the abdomen and with carinae of dorsum usually much darker.

Distribution: Specimens on hand from Mississippi as follows: Iuka, August 1961; Amory, August 1961; State College, and the Delta area, May through August. Also recorded from throughout the United States.

(3) Pissonotus (Pissonotus) piceus (Van Duzee)
(Fig. 16)

Megamelanus piceus Van Duzee, E. P., Bull. Michigan Agr. Exp. Sta. 102: 8, 1894.

Pissonotus fulvus Metcalf, Z. P., J. Elisha Sci. Soc. 38: 206, 1923 (Synonym).

Brachypterous Form:

Size: 2.0 - 3.0 mm.

Color: Piceous black; base of crown, narrow hind margin of pronotum, disc of mesonotum and carinae, brownish yellow; forewings piceous brown to black with apical margin white, the white band more or less interrupted with black at middle, veins distinct, pronounced, brown; frons pale, shaded to brown near base; clypeus deep black; antennae

soiled yellow; legs lined with brown on pale yellow background.

Structure: Crown short and broad, carinae distinct, dark; carinae of pronotum not quite reaching hind margin, fading out; forewings reaching about halfway to tip of abdomen, posterior edge truncate, veins distinct, granulate; frons broad, expanded below eyes.

Genitalia: In lateral view pygofer almost triangular with large V shaped notch in caudal margin in which is visible the long, sharply pointed median process and narrowing, dorsally bent outer portion of styles; aedeagus with shaft almost parallel sided, slightly curved with four retrorse processes on dorsal margin of apical third, apical process longest, about one-half length of shaft, divided, other processes shorter; anal segment with a pair of fairly long, curving processes; in ventral view styles widest near outer third, narrowed to more or less rounded, slightly overhanging apices; median processes widest at base with inner margin narrowing to long sharp apices which end just short of apices of styles.

Distribution: Specimens on hand from Mississippi as follows: several counties of the Delta in August 1961; Noxubee County, September 1961; State College, August 1961. Beamer (1949) reported more than 700 specimens on hand

from many localities from Tuscon, Arizona eastward over the United States.

(4) Pissonotus (Pissonotus) marginatus Van Duzee
(Figs. 17, 64)

Pissonotus marginatus Van Duzee, E. P., Bull. Buffalo Soc. Nat. Sci. 5: 236, 1897.

Pissonotus ater Van Duzee, E. P., Bull. Buffalo Soc. Nat. Sci. 5: 237, 1897 (Synonym).

Size: 2.00 - 2.25 mm.

Color: General color dark reddish brown; pronotum and scutellum reddish brown; forewings very slightly hyaline, reddish-brown, veins concolorous with membrane, hind margin with a narrow white band which is lacking in females; legs and antennae yellow, apex of clypeus lighter than basal portion which is almost black.

Structure: Crown slightly longer than wide, broadly rounded in front, carinae barely visible, almost wanting; forewings not quite reaching half way to tip of abdomen, veins scarcely visible, barely raised above membrane, not reaching hind margin; abdomen set with fine white hairs; frons twice as long as greatest width, slightly longer than wide, broadly rounded, carinae barely visible; basal segment of antennae about one-half as long as second segment; eyes large.

Genitalia: In lateral view pygofer rectangular in shape with a large tooth on caudal margin; aedeagus widest at base, tapering to rounded apex with one slender retrorse process on dorsal margin just before apex about one-third as long as shaft and with a row of short teeth arising on dorsal margin near middle, curving to left toward base; anal segment produced into a pair of long slender processes longer than basal portion of segment; in ventral view styles uniform in width until just before acutely pointed, overhanging apices; median pair of processes extended almost to tip of styles, sides subparallel, apices more or less tricarinate with inner margin sharply extended; lateral processes slightly longer than wide.

Distribution: Two females collected in Noxubee County, May 1960 and September 1961. Also, recorded from New York, Florida, Virginia, Kansas, Ohio, Michigan, Illinois and Canada.

The description of male genitalia is from Beamer (1949), who reported comparing numerous specimens of male and female with holotype female Pissosnotus ater Van Duzee, and the male lectotype Pissonotus marginatus Van Duzee, and that they are identical.

(5) Pissonotus (Pissonotus) binotatus Spooner
(Fig. 18)

Pissonotus binotatus Spooner, C. S., Can. Entomol.

44: 239, 1912.

Brachypterous form closely resembles Pissonotus (Pissonotus) marginatus, but smaller and with five retrorse processes on aedeagus.

Size: 1.5 - 2.0 mm.

Color: General color reddish brown; prothorax reddish brown; forewings reddish brown with white spot on posterior margin which may be elongated into a white band along margin; frons and crown light brown; a light line where clypeus joins frons and a black band across clypeus which extends on across tibia of forelegs; basal segment of antennae black, second segment lighter colored with brownish-purple elongated stripe; eyes grey to black with yellow margins; legs light brownish yellow, lineated with dark brown to purple stripe, last tarsal segment dark brown to black.

Structure: Crown about as long as wide, very slightly produced before eyes; carinae present, obscure; median carina of pronotum very prominent, lateral carinae strong on proximal two thirds, fading out before reaching posterior margin; forewings of brachypterous forms short, practically covering first abdominal segment, highly polished, veins indistinct; frons about one and one-half times as long as broad, widest below eyes, median carina forked just below apex of head; basal segment of antennae about one-half length of second; eyes deeply indented below for antennae.

Genitalia: In lateral view median processes long, sharp-pointed; anal segment with processes that are short, sharp-pointed; aedeagus widest at base, dorsal margin more or less sinuate with five slender retrorse processes on apical half, first quite short, second and third about one-half as long as aedeagus, third one wider than second, and fourth and fifth ones shorter than second and third; in ventral view, styles short, more or less parallel sided, diverging on outer half, apices rather blunt, slightly overhanging; median processes broad, tapering to sharp apices, almost as long as styles.

Distribution: Specimens on hand from Mississippi as follows: Iuka, August 1961; Charleston, September 1961; Carrollton, September 1961; Pontotoc, August 1961; Grenada, September 1961; and Amory, September 1961. Brachypterous and macropterous forms studied. The macropterous form is much like the brachypterous form except for the long forewings and the color is slightly darker.

According to Beamer (1949), the color of this species varies greatly with the season; the summer forms are honey colored, the winter and early spring forms almost black. The white dots on the apical margins of the forewings vary from small to large, and may fuse together to form a white, unbroken band along the apical margin.

(6) Pissonotus (Pissonotus) paludosus Beamer
(Fig. 19)

Pissonotus (Pissonotus) paludosus Beamer, R. H., J. Kansas
Entomol. Soc. 22: 128, 1949.

The following description was taken directly from Beamer (1949) as this species was not represented in the material studied.

Resembles Pissonotus merides but legs light fulvous to white instead of brown and aedeagus narrower at apex than at base.

Size: 2.1 mm.

Color: General body color black; posterior half of pronotum and broad band on apices of elytra, white; antennae brown to light fulvous; legs stramineous to almost white.

Structure: First segment of antennae about one-half as long as second; clypeus not quite twice as long as wide, widest near outer third, narrowed toward each end, slightly more so toward base, distinctly tricarinate; crown longer than wide, carinae indistinct; elytra about as broad as long, apices almost truncate with outer corners broadly rounded, veins indistinct, slightly raised, not distinctly reaching the apices; dorsum of abdomen sparsely covered with short white hairs, distinct, median, longitudinal carina on dorsum of abdomen.

Genitalia: In lateral view pygofer of male more or less rectangular, narrowed on caudo-ventral corner; caudal margin broken by lateral process forming a sharp tooth and median process forming a long slender tooth projecting dorsally; rounded apex of style visible; aedeagus widest near base, curving ventrally, dorsal margin of apex with two retrorse processes, more than half as long as shaft; anal segment with a pair of long slender curved processes. In ventral view styles widest near middle, sinuately curved to rounded, overhanging apices; median processes widest at base, overall shape more or less rectangular; lateral processes barely visible.

Beamer (1949) designated specimens from Saucier, Ocean Springs, and Pearlinton, Mississippi as paratypes of this species. Also, this species is recorded from Florida, Alabama, and Louisiana.

(7) Pissonotus (Pissonotus) merides Beamer
(Fig. 20)

Pissonotus (Pissonotus) merides Beamer, R. H., J. Kansas
Entomol. Soc. 22: 127, 1949.

The following description is taken directly from Beamer (1949) as this species was not represented in the material studied.

Brachypterous Form:

Resembling Pissonotus albivultus but frontal carinae and metathorax not marked with white and aedeagus of male

enlarged on outer third and with four retrorse processes on dorsal margin of apical third.

Size: 2.1 mm.

Color: General body color pitchy black, apical margins of pronotum and elytra white; antennae varying from dark brown to black; legs dark, venter, clypeus, and clypellus black with faint, light transverse line at apex of clypeus.

Structure: First segment of antennae about one-half as long as second; clypeus about twice as long as wide, widest near middle, narrowed toward each end, more so toward base, distinctly tricarinate; crown longer than wide, widest at apex, apex rounded, carinae not distinct; elytra coriaceous, about as long as broad, apices almost truncate with corners rounded, veins slightly raised, not distinctly reaching hind margin; lateral margin of abdomen with a few long white hairs, more numerous on male genital segment; dorsum of abdomen with a distinct longitudinal carina.

Genitalia: In lateral view pygofer of male more or less rectangular with lateral process forming a sharp tooth near middle of caudal margin and median process extending dorsally from lateral tooth in a much sharper and longer projection; style visible for almost entire length, widest near outer third, narrowed to sharp apex on inner margin; aedeagus widest on outer third, gradually curved ventrally, dorsal margin of apical third with four retrorse processes,

first at least twice as broad as any other and about half as long as shaft, second and fourth about one-third as wide as first and nearly as long, the third about one-half as wide as second and less than half as long; anal segment with a pair of long, slender, sinuate processes. In ventral view styles narrowest near middle, slightly widened to broadly rounded apices, overhanging on outer margins; median processes widest at base, more or less avicephaliform with long slender, inward pointing, beak; lateral processes mere projections about as long as wide.

Beamer (1949) designated specimens from Ocean Springs and Pearlinton, Mississippi as paratypes. He also reported this species from Alabama and Florida.

Subgenus Pissonotus (Phyllodictus) Ball

Phyllodictus Ball, E. D., Florida Entomol. 10: 18, 1926.

Description of Subgenus: Resembles Pissonotus (Pissonotus) in size and structure but with fore tibiae expanded and flattened laterally; head definitely narrower than pronotum, crown narrower than length of eyes; frons broader than long, carinae of crown and frons distinct; lateral carinae of pronotum straight, diverging, not reaching hind margin; forewings of brachypterous forms reaching first or second segment of abdomen, forewings of macropterous forms extending beyond tip of abdomen, veins obscure in brachypterous forms; middle and anterior tibiae and femora expanded.

Type: Pissonotus (Phyllodictus) tessellatus (Ball)

This subgenus is represented in the material studied by one species. The type species is recorded from Meridian and Ocean Springs by Beamer (1949), and therefore a description is included here.

Key to the Species of Pissonotus (Phyllodictus) (Ball)

Without white band on posterior margin of forewings----
tessellatus (Ball)

With white band on posterior margin of forewings----
flabellatus (Ball)

(8) Pissonotus (Phyllodictus) tessellatus (Ball)
(Fig. 21)

Phyllodictus tessellatus Ball, E. D., Florida Entomol.

10: 19, 1926.

The following description is taken directly from Beamer (1949) as this species was not represented in the material studied.

Superficially resembling Phyllodins nervatus but smaller with shorter elytra and strikingly different venation. Brownish, heavily tessellated above with pale, except for the abdomen.

Size: 2 mm.

Structure: Head narrow, vertex longer than wide, about equaling the pronotum, rounding over to the broad retreating front; carinae obscure, the fork long and narrow, front very broad; almost square, weakly tricarinate; clypeus

tumid; pronotum broad, parallel margined, the lateral carinae with one or two short spurs on the inner margins; first joint of antennae short, as broad as long, second joint three times the first in length. Brachypterous elytra narrow, covering the second segment, closely and evenly reticulate. Macropterous elytra with simple venation as in flabellatus except that all the main veins are forked and there may be a few faint reticulations in this region.

Color: Vertex, pronotum, scutellum and elytra white, irrorate and tessellate with brown; abdomen brown with a few pale lines; vertex with a brown band on the anterior margin and a pair of black spots at base, a larger pair on the pronotum; front shining brown, clypeus pitchy, a broad white band on suture; antennae and anterior legs brown. Macropterous elytra transparent, the veins covered with setigerous black dots and there is a black spot before the apex of clavus.

Type: Type female, allotype male and 9 paratypes collected in low wet flat woods at Sanford, Florida, and one paratype female taken at Meridian, Mississippi.

Genitalia: In lateral view pygofer of male rather triangular with ventral margin shortest, caudal margin with a large V-shaped projection, extended on its dorsal side into a long, round-tipped median process; aedeagus long and slender, gently curving ventrally, widest near middle

with three or four retrorse, long slender processes on dorsal margin of outer half, some of processes half as long as shaft; anal segment with a pair of long, almost straight processes with slightly enlarged, rounded apices. In ventral view, styles sinuate, widest on outer third, narrowed to inwardly overhanging apices; median processes widest at base, narrowed on outer margin to rather sharp apices about two-thirds as long as styles; lateral processes almost triangular, less than half as long as median.

(9) Pissonotus (Phyllodictus) flabellatus (Ball)
(Fig. 22)

Phyllodinus flabellatus Ball., E. D., Can. Entomol.

34: 232, 1902.

Phyllodinus koebelei Osborn, Herbert, Ohio Naturalist

4: 46, 1903 (Synonym).

Phyllodinus fuscous Osborn, Herbert, Ohio Naturalist

4: 46, 1903 (Synonym).

Resembles Pissonotus (Pissonotus) marginatus, but larger.

This species is represented in the material studied by two brachypterous forms.

Size: 3.5 mm.

Color: Testaceous brown with posterior half of pronotum, scutellum and tips of short wing pads milky white; forewings brown except for white posterior band; abdomen brown above with a median and three lateral rows of white dashes, the anterior ones reduced to dots, dark brown below; the white

margin of the forewings is lacking in females; crown and face dark brown with about six or seven narrow, interrupted transverse whitish bands and a light band across apex of frons extending across genae to join pronotum; anterior two pairs of femora dirty straw colored, their foliaceous tibiae fuscous; tarsi white, tipped with black.

Structure: Head slightly narrower than pronotum, crown almost square, rounded in front; forewings about as long as head and pronotum, rounded on posterior margin, veins indistinct, barely visible; frons parallel margined, much longer than wide.

Genitalia: In lateral view aedeagus long and slender, slightly curved ventrally, sides almost parallel to outer third where it narrows to rounded apex, three retrorse processes on dorsal margin of outer third, the longest process more than half as long as shaft; in ventral view styles sinuate, shorter than median processes, widest near outer third, narrowed to rounded overhanging apices; median processes widest at base, narrowed to sharp inward curved apices.

Distribution: Specimens from Mississippi as follows: Iuka, August 3, 1961; State College, August 1961. Described by Beamer from two females. A brachypterous female from Washington, D.C. was designated as lectotype. One female

was represented in the material studied, and the description of the male genitalia is from Beamer (1949).

Genus Neomegamelanus McDermott

Neomegamelanus McDermott, B. T., J. Kansas Entomol. Soc.
25: 46, 1952.

The genus Neomegamelanus was erected in 1952 by B. T. McDermott with Megamelanus lautus Metcalf as type species.

Description of Genus: Elongate, slender forms; head long and acutely pointed in dorsal view; crown projecting for about one-half its length in front of the eyes, median carina visible at base, becoming dim to obsolete about midway to apex; lateral carinae of crown pronounced and raised, converging to form a "V" at apex; pronotum wider than long on posterior margin, about the same width as the head at the anterior margin where it terminates between the eyes; lateral carinae of the pronotum straight, diverging slightly to the hind margin, pronotum not quite as long as the crown; calcar strongly and uniformly toothed, not quite as long as first tarsal segment.

This genus represented in Mississippi by two species.

Key to Species of Neomegamelanus

1. In lateral view anal segment with two pairs of processes, a short straight, spine-like upper pair, and below these a much longer slender curved pair. Hind legs black and white-----dorsalis (Metcalf)
- 1a. In lateral view anal segment with but a single pair of short spine-like processes, hind legs straw colored-elongatus (Ball)

(1) Neomegamelanus dorsalis (Metcalf)
(Fig. 23)

Megamelanus dorsalis Metcalf, Z. P., J. Elisha Mitchell Sci. Soc. 38: 199, 1923.

The following description is taken directly from McDermott (1952) as this species was not represented in the material studied.

Brachypterous Form: Resembling elongatus (Ball) but with four processes on genital tube. Elytra of male uniformly black in color. Length male, 2.25 mm, female 3 mm.

Genitalia: In lateral view, pygofer longer than broad, irregular in shape; aedeagus slender, elongate, with sides slightly elevated, margins coarsely serrate, apex broadly rounded, a group of four to eight teeth on left side near apex; in caudal view styles about three times as long as wide at base, margins tapering for about two-thirds their length, widening apically, inner margin acuminate at apex; ventral margin of anal segment with two pairs of ventrally directed processes; outer pair claw-like opposing each other; inner pair spine-like, half as long as outer pair.

Females similar to males but uniformly orange-yellow in color, some specimens having venter and legs colored as in male; elytra hyaline, the orange-yellow dorsum showing through; ovipositor extending to tip of abdomen.

Male specimens taken from the Florida Keys were much lighter in color than the typical males, the wings

being semi-hyaline having only the apical fifth fuscous. Parasitism is common, parasitized males resemble the females quite closely, being uniformly orange-yellow in color; parasitized females are darker in color, some specimens superficially resembling light colored males taken from the Florida Keys.

Types: Holotype male, Atlantic City, New Jersey, August 25, W. J. Gerhardt; allotype female, Atlantic City, New Jersey, August 25, W. J. Gerhardt; paratype female, Pascagoula, Mississippi, August 6, 1921, H. L. Dozier. In Z. P. Metcalf Collection.

Additional Material Studied: Florida: Bahia Honde Key, Cedar Key, Long Key, Second Key, Yankee Town; Louisiana: Port Sulphur, Slidell; Maryland; Piney Point. All collected by R. H. Beamer.

Macropterous Form: Like the brachypterous form but with fully developed forewings. Elytra four times as long as broad, apices broadly rounded; wings hyaline to semi-hyaline, some specimens having the apical fourth smokey or with a small smokey spot at apex.

The macropterous form closely resembles that of elongatus (Ball). The males may be definitely separated on the number of processes on the anal segment, four in dorsalis (Metcalf), two in elongatus (Ball). The females can be separated by the color of the legs, dorsalis being

black and white, as is the brachypterous male, and those of elongatus being whitish-yellow as in the female of that species.

Holomorphotype male, allomorphotype female, 10 males and 14 females paramorphotypes, Piney Point, Maryland, August 26, 1946, R. H. Beamer; other paramorphotypes: 22 males and 3 females, Bahia Honde Key, Florida, July 25, 1948; 5 males, Water Mill, Long Island, New York, August 18, 1946; 1 male, Fort Walton, Florida, June 27, 1948; 4 females, Slidell, Louisiana, June 25, 1948; all collected by R. H. Beamer. Types in Snow Entomological Collections.

(2) Neomegamelanus elongatus (Ball)
(Figs. 24, 65)

Megamelanus elongatus Ball, E. D., Proc. Biol. Soc.

Washington 18: 118-9, 1905.

Similar to Neomegamelanus dorsalis but with only one pair of processes on anal segment, and without black and white markings on legs.

Size: 3 mm.

Color: General color yellowish brown with a lighter white stripe on dorsum extending from the head to the scutellum; forewings hyaline to semihyaline with small, irregular sized dark patches near apex; frons light tan; clypeus fulvous, legs uniformly light colored with tarsal claws, spines on calcar, tibia and tarsi tipped with black;

base of ventral segments reddish-brown with caudal margins yellow; genital segment dark reddish brown.

Structure: Crown about twice as long as width at base, projecting about one-half its length in front of eyes; forewings extending beyond end of abdomen about one-fourth their length, four times as long as broad, slightly widening toward apices, apex broadly rounded; veins whitish with a series of rather long black evenly spaced hairs; second antennal segment about two and one-half times length of first.

Genitalia: In lateral view pygofer longer than broad, aedeagus slender, elongate, with sides slightly elevated, margins coarsely serrate, apex broadly rounded, a group of from four to eight teeth on left side near apex; in caudal view styles about three times as long as broad at base, margins tapering for about two-thirds their length then widening apically, inner margin tapering to a long point at apex; anal segment with a pair of short, stout processes about half length of dorsal margin.

Distribution: Specimens on hand from Mississippi as follows: (macropterous forms) 1 male and 1 female from Bay St. Louis, May 25, 1960; one female from Naples, Florida is also on hand. Recorded by McDermott from Gulfport, Pearlington, Pass Christian, and Orange Grove.

Also, recorded from Florida, Connecticut, Louisiana, Maryland, New York, and Virginia.

Genus Stenocranus Fieber

Stenocranus Fieber, F. X., Verh. Zool. Bot. Ges. Wien.
16: 519, 1866.

Description of Genus: Rather slender insects of medium size; head plus eyes narrower than pronotum; crown longer than wide, carinae definite; lateral carinae of the pronotum slightly curved in at base, reaching posterior margin; frons long and narrow, slightly narrower at base with small median carina divided on crown near anterior margin of the eyes; antenna almost cylindrical, first segment about as wide as long; calcar triangular, rather thick with black spines along one margin.

Type of Genus: Stenocranus minutus (Fabricius)

This genus is represented in Mississippi by six species.

Key to the Species of Stenocranus

1. M1 and M2 usually stemming from R in the front wing--2
- 1a. M1 and M2 usually not stemming from R in the front wing-----3
2. Crown definitely narrowed apically, extending about one-half its length beyond eye-----acutus Beamer
- 2a. Crown not so definitely narrowed, not extending quite one third its length beyond eye-----brunneus Beamer
3. Black spot on mesal margin of forewing near outer third-----similis Crawford
- 3a. Without black spot on mesal margin of forewing-----4

4. M2 strongly curved to costal margin; aedeagus bifid---
unipunctatus Prov.
- 4a. M2 almost straight, scarcely curved to costal margin-5
5. Venter of genital segment usually light brown,
 without orange band on outer margin of eye; aedeagus
 angularly bifid-----pallidus Beamer
- 5a. Venter of genital segment white, with orange band on
 outer margin of eye; aedeagus smoothly bifid----
delicatus Beamer.

(1) Stenocranus pallidus Beamer
 (Fig. 25)

Stenocranus pallidus Beamer, R. H., J. Kansas Entomol.

Soc. 19: 3, 1946.

Resembles Stenocranus delicatus but with forewings smaller
 and darker colored, and without orange margined eyes and
 orange colored pronotum.

Size: 5.0 - 5.7 mm.

Color: General color stramineous with pale median dorsal
 line from head across pronotum; forewing semihyaline, veins
 and apical half slightly darkened; genital segment light
 brown below; frons dark with light colored median and
 lateral carinae.

Structure: Crown a little longer than basal width; pro-
 notum about same length as crown, lateral carinae reaching
 posterior margin; forewings with sides almost parallel,
 extending about one-half their length beyond tip of abdomen;
 frons slightly less than three times as long as greatest
 width, slightly narrowed on basal third, sharply tricarinate
 with a dark line on each side of median carina.

Genitalia: In caudoventral view, styles broad on basal half, sharply constricted near middle into sharp, sinuate apices; in lateral view, the anal tube large, with two medium sized ventrally projecting processes of about equal length; aedeagus long and narrow, almost straight, slightly tapered from base to apex, with a broad process about two-thirds as long as shaft, narrowed on outer third to bifid apex.

Distribution: Specimens on hand from Mississippi as follows: State College, June 8, 1959, and June 30, 1960. Also, recorded from Wisconsin and Illinois. Types in Snow Entomological Collections, paratypes in Illinois Natural History Survey, Urbana, Illinois.

(2) Stenocranus delicatus Beamer
(Fig. 26)

Stenocranus delicatus Beamer, R. H., J. Kansas Entomol. Soc. 19: 4-5, 1946.

Resembles Stenocranus pallidus but eyes with orange colored margin, and process of aedeagus longer with smoothly curved Y shaped apex; general color lighter.

Size: 5.5 - 6.0 mm.

Color: Generally straw colored with pale median dorsal line bordered with orange across pronotum; forewings semihyaline; genital segment light colored below; frons black with light colored, distinct, carinae; sides of face

and eyes bordered with orange.

Structure: Crown about one-third longer than width at base; forewings with sides widest just beyond middle, extending about one-half their length beyond tip of abdomen; pronotum shorter than crown, lateral carina reaching hind margin; frons slightly more than three times longer than greatest width, widest near middle, slightly narrowed convexly from middle, tricarinate, with a dark stripe each side of median carina.

Genitalia: In caudoventral view, styles broad at base, constricted at middle into sharp, slender, sinuate, outwardly pointing apices; in lateral view, anal segment with two ventrally projecting processes of about equal length, slightly curved caudally; aedeagus long and narrow, widest at base, narrowed from base to tip with radical curve near basal third; process almost as long as shaft of aedeagus, partially enclosing shaft on basal third, narrowed on outer third to about width at base, divided into Y shaped apex.

Distribution: Specimens on hand from Mississippi as follows: State College, June 9, 1949; May, June and July 1959, June 1960 and July 1961; Leland, June 1960; Corinth, May 1959. Also, reported from Kansas and Illinois. Types in Snow Entomological Collections, paratypes in United States National Museum and Illinois History Survey, Urbana, Illinois.

(3) Stenocranus unipunctatus (Provancher)
(Fig. 27)

Delphax unipunctata Provancher; Provancher, L., Nat.

Canadien. 4: 319, 1872.

Resembles Stenocranus pallidus, but slightly larger, lighter, with larger orange colored area, and with processes on anal segment unequal in length.

Size: 5.5 - 6.0 mm.

Color: General color dark stramineous with white mid-dorsal line bordered by a more or less orange to dark rufous colored line; forewings semihyaline with longitudinal veins darkened and most of area beyond cross veins heavily infuscated; genital capsule dark brown; frons dark with white carinae, face and edge of eyes bordered with dark orange to rufous color.

Structure: Crown about one-third longer than width at base; forewings broad, sides almost parallel, slightly rounded and narrowed on apex, extending about a third their length beyond tip of abdomen; frons about two and one-half times as long as greatest width, sides almost parallel on outer two-thirds, narrowed slightly near base, tricarinate longitudinally with dark band on each side of median carina.

Genitalia: In caudoventral view, styles broad at base, narrowed, sinuate, and curved out and downward on outer apical half; in lateral view, anal tube greatly enlarged with a pair of ventrally projecting processes, the right one definitely shorter than the left; aedeagus long and slender, widest at base, gradually narrowed to apex, sinuate on basal half, process almost as long as aedeagal shaft, narrowed to forked apex, one point curved posteriorly.

Distribution: Specimens on hand from Mississippi as follows: Columbus, Amory, Bolivar County, Coahoma County, Ripley, Leflore County, Sunflower County, and Washington County, all collected during the summer months. Also, recorded from Canada.

Types probably in Museum of the Province of Quebec, Quebec, Canada, according to Beamer (1946).

Easily determined by the processes of the anal tube.

(4) Stenocranus brunneus Beamer
(Fig. 28)

Stenocranus brunneus Beamer, R. H., J. Kansas Entomol.

Soc. 19: 5, 1946.

Resembles Stenocranus unipunctatus, but shorter, darker in color, and without bifid apex of process of aedeagus.

Size: 4.0 - 5.0 mm.

Color: General color dark rufous, white median dorsal line from head to tip of forewings; more than half of forewing

dark brown to rufous, veins dark except along costal margin; body fuscous with red tinge; genital segment dark brown; crown dark with two light colored carinae; frons dark between light colored carinae.

Structure: Crown twice as long as width at base; forewings with sides almost parallel, rounded on apices, extending about one-third their length beyond tip of abdomen; frons three times as long as wide, widest near middle, slightly narrowed near apex and at base, strongly tricarinate longitudinally with black area on each side of median carina.

Genitalia: In ventrocaudal view, styles broad at base, mesal shoulders sharply rectangular, apices sinuate, hooked, and curved outward; in lateral view anal segment large with two ventrally projecting processes, the right one just a sharp pointed stub, about one-third as long as the left one which is sword shaped and slightly curved; aedeagus very long and narrow, broadest at base, tapered from base to apex, abruptly curved on basal half; process of aedeagus as long as aedeagus, about three times as wide at middle as at base, narrowed and sword like on outer third.

Distribution: Specimens on hand from Mississippi as follows: State College, May through September in 1959, 1960 and 1961; Corinth, May 1959; Bolivar and Leflore

Counties, July 1960; and Ripley, May 1960. Also recorded from Illinois and Kansas.

Types in Snow Entomological Collections; paratypes in Illinois Natural History Survey, Urbana, Illinois.

(5) Stenocranus acutus Beamer
(Fig. 29)

Stenocranus acutus Beamer, R. H., J. Kansas Entomol. Soc.

19: 6 - 7, 1946.

Resembles Stenocranus unipunctatus but more slender and shorter, with sharper crown extending one-third its length beyond the eyes.

Size: 4.2 - 4.7 mm.

Color: General color dark fuscous to brown with white median dorsal line; forewings mostly brown, color in irregular pattern in outer area of wings; eyes reddish with dark infuscated area inside red border; carinae of frons white with area between carinae black.

Structure: Crown three times as long as basal width; forewings long and narrow, heavily embrowned beyond cross veins including spot on subcosta; frons about three times as long as greatest width, sides almost parallel on apical two-thirds, slightly narrowed on basal third, distinctly tricarinate longitudinally with black area on each side of median carina.

Genitalia: In ventrocaudal view, styles long and narrow on outer half, base broad, outer portion curved outward on apex; in lateral view the anal segment is large with two ventrally projecting processes, the right one shorter than the left one which is a short, slender, stub, the right one long and slender; aedeagus long and narrow, widest at base, tapered to tip with a right angle bend on basal third; aedeagal process almost as long as aedeagus, long, slender, slightly widened at middle and ending in a narrow sword shaped tip.

Distribution: Specimens on hand from Mississippi as follows: State College, June 1959 and June 1960; also recorded from Georgia, North Carolina, and Florida. Types in Snow Entomological Collections; paratypes in United States National Museum.

(6) Stenocranus similis Crawford
(Figs. 30, 58, 61)

Stenocranus similis Crawford, David L., Proc. U.S. Natl. Mus. 46: 590, 1914.

Resembles Stenocranus pallidus, but with faint narrow light dorsal stripe, and with dark markings on dorsum.

Size: 5.0 - 5.5 mm.

Color: Dark stramineous with lighter colored median longitudinal line that is very narrow, almost wanting; forewing mostly dark with infuscated dark brown spots

in area beyond crossveins; frons dark with light colored carinae.

Structure: Crown about as long as width at base; forewings widest in region of crossveins with broadly rounded apex, extending about one-third their length beyond tip of abdomen, veins prominent and darkened in outer portion; frons slightly less than three times as long as broad at widest part, definitely tricarinate longitudinally with a dark area on each side of median carina, widest near middle and narrowed toward each end.

Genitalia: In ventrocaudal view, styles with sides almost parallel on basal two-thirds; outer third sharply narrowed into slender curved apices; in lateral view, anal segment large with a pair of ventrally projecting, slightly hook shaped processes almost equal in length, sword shaped, aedeagus very long and narrow, widest at base, narrowed to sharply curved tip; aedeagal process about twice as wide on basal two-thirds as aedeagus at base, narrowed on outer third to less than one-fourth the basal width and divided into three tips of unequal length; a second process just dorsal of the first is about one-half as long and wide as aedeagus.

Distribution: Specimens on hand from Mississippi as follows: Columbus, October 1960; State College, June 1959, June 1960, and November 1960. Also, recorded from Kentucky.

Genus Euidella Puton

Euidella Puton, Auguste, Catalogue of the Hemiptera,
72, 1886.

Description of Genus: Large, robust insects; crown broader than long, slightly produced before the eyes; lateral carinae of pronotum not reaching posterior margin; forewing broadly rounded apically, extending beyond tip of abdomen; median carina of frons forked at apex of head; basal metatarsus longer than other two together; styles usually expanded and deeply notched apically.

This genus is represented in Mississippi by one species.

Euidella weedi (Van Duzee)
(Figs. 31, 60)

Liburnia weedi Van Duzee, E. P., Bull. Buffalo Soc. Nat.
Sci. 5: 352, 1897.

Size: 3.5 - 4.0 mm.

Color: General color testaceous; prothorax yellowish brown dorsally; carinae lighter than background; forewings light smokey; frons about same color as pronotum; antennae yellowish brown with dark band at apex of first segment.

Structure: Crown broader than long; carinae distinct, straight, diverging from point on apex of crown to edge of eyes; pronotum longer than crown, lateral carinae almost straight, not curving behind eyes and not reaching posterior margin; forewings two and one-half times as

long as broad, extending one-third their length beyond tip of abdomen; frons longer than broad, carinae distinct, median carina forked on apex of head.

Genitalia: In lateral view anal segment with short, sharp pointed spurs; aedeagus bulbous at base, narrow at middle, curved dorsad on apical third with apex sharp; in caudal view, styles narrow at base, enlarged apically with an apical spur on outer margin and a large thumb-like process on inner margin, the style curved from base to apex.

Distribution: Specimens on hand from Mississippi as follows: All the Delta counties, State College, Port Gibson, and Tupelo.

Genus Sogata Distant

Distant, William L., Rhynchota, Fauna of British India
3: 471, 1906.

Description of Genus: Similar to Delphacodes Fieber, but head longer and narrower. Small, slender, with a pale yellow stripe on dorsum, head and thorax; lateral carinae of pronotum straight, diverging behind eyes, not reaching posterior margin; mostly dark brown with smokey colored wings; frons variable in color but longer than wide and with the median carina forked just below apex of head.

Represented in Mississippi by three species.

Key to the Species of Sogata Distant

1. Style without a subapical process on inner margin--
dorsolineata Beamer
- 1a. Style with a subapical process on inner margin-----2
2. Subapical process of styles long and slender, acutely
pointed -----meridiana Beamer
- 2a. Subapical process of style short, broad-----
orizicola Muir

(1) Sogata meridiana Beamer
(Figs. 32, 59)Sogata meridiana Beamer, R. H., J. Kansas Entomol. Soc.

25: 111, 1952.

Size: 3.8 - 4.0 mm.

Color: General color light brownish yellow to orange with median longitudinal band on crown, thorax, and scutellum that is almost white, lateral margins of prothorax dark brown on each side of white dorsal stripe; forewings smokey, infuscated on inner margin from crossveins to apex; frons light brown, carinae about same color as area in between.

Structure: Crown twice as long as wide, carinae distinct; pronotum about as long as crown, lateral carinae straight, diverging, not reaching hind margin; forewings three times as long as wide, extending one-third their length beyond tip of abdomen; frons twice as long as greatest width, widest below eyes, carinae distinct, raised, median carina forked below apex of head.

Genitalia: In lateral view, pygofer rectangular in shape; processes of anal segment short, slender, slightly hooked; aedeagus slightly curved dorsad, sides almost parallel, apex sharp, a row of coarse teeth from base to midway of shaft on ventral side, and another row from dorsal margin of apex to midway of ventral row; in caudal view, styles almost as wide across bifid apices as at base, subapical point on inner margin long and sharp; outer apical point broad and about twice as long as inner one.

Distribution: A good collection of this species was studied from Mississippi as follows: State College, September and October 1959; Poplarville, October 1950; Port Gibson, October 1961; Noxubee County, September 1961; Grenada, September 1961; Webb, September 1961; and Columbus, October 1961. Also, specimens from Naples, Florida, collected by Dr. Hepner in December 1960; and from St. Martinville, Louisiana, October 1959. Also, recorded from Texas and Georgia by Beamer (1952).

(2) Sogata dorsolineata Beamer
(Fig. 33)

Sogata dorsolineata Beamer, R. H., J. Kansas Entomol. Soc.
25: 112, 1952.

Resembling Sogata meridiana but without subapical process on inner margin of style.

Size: 4.0 mm.

Color: General color brown; crown, pronotum except large spot back of each eye, and broad longitudinal stripe on dorsum of meso and metanotum white; forewings dark smokey, with black spot at apex of clavus; frons black, median carina white, lateral carinae dull brown; clypeus light yellow, median and lateral carinae white.

Structure: Crown twice as long as width at base; pronotum about as long as crown, lateral carinae straight, diverging behind eyes, not quite reaching posterior margin, median carina distinct across pronotum and scutellum; forewings three times as long as wide, extending about one-third their length beyond tip of abdomen; frons two and one-half times as long as greatest width, widest below eyes, median carina forked below apex of head.

Genitalia: In lateral view pygofer longer than wide, anal processes long, slender, almost straight; aedeagus almost straight, apex bluntly rounded, very few coarse teeth on apical one-third; in caudal view, styles slightly enlarged at apices, without subapical processes on inner margin.

Distribution: One female and one male from State College, collected in September 1959. Also, recorded from Texas by Beamer (1952).

Sogata orizicola Muir
(Fig. 34)

Sogata orizicola Muir, F. A., Bull. Hawaiian Sugar Pl.

Assoc. Div. Entomol. 18: 1-51, 1926.

Size: 3.5 - 3.8 mm.

Color: General color dark brown to almost black; pronotum with greyish cast and with a dorsal longitudinal stripe of light color from pronotum to apex of scutellum; forewings dark smokey with small black spots on veins; frons dark, carinae light grey.

Structure: Crown longer than broad at base, carinae light, distinct; pronotum short, lateral carinae straight, slightly diverging behind the eyes, not reaching the posterior margin; forewings about three times as long as wide, extending about one-third their length beyond tip of abdomen; frons about two times as long as wide, widest below eyes.

Genitalia: In lateral view, pygofer rectangular; aedeagus wide, slightly curved dorsad, with teeth on apical one-third, apex sharp; in caudal view styles broad with broad sharp point on inner margin just below apex, appear to be twisted about midway from base to apex.

Distribution: This species has been reported from Hancock County, Mississippi. Four specimens from Louisiana are

marked "La. Survey."

This species is commonly called the "Rice Delphacid," and is the primary vector of a virus disease of rice which is called "hoja blanca." An infection of this disease was found at Bay St. Louis, Mississippi, in 1958.

Genus Delphacodes Fieber

Delphacodes Fieber, Fraz X., Verh. Zool. Bot. Ges. Wien.

16: 524, 1866.

Description of Genus: Small, robust, with the head short and fairly broad, usually almost as broad as pronotum; crown slightly produced in front of eyes, about as long as width at base; eyes moderate in size; lateral carinae of pronotum not reaching posterior margin; forewings of both macropterous and brachypterous forms broadly rounded on apex; frons narrow, widest near middle, twice as long as greatest width, carinae distinct, with median carina forked on apex of head; first segment of antennae longer than broad; posterior tibiae with two small spines on outside surface, and five spines at apex.

This is the largest genus of the family Delphacidae, and is represented in Mississippi by ten species. They inhabit sedges in low marshy areas.

Key to the Species of Delphacodes Fieber

1. Anal segment with processes -----2
 1a. Anal segment without processes-----9
2. In lateral view, processes arising from ventro-caudal angle-----andromeda (Van Duzee)
 2a. In lateral view, processes arising from anal segment from dorsocaudal angles only -----3
3. Spines of anal segment serrate apically-----teapea (Fowler)
 3a. Spines of anal segment not serrate apically-----4
4. Pygofer with dorsocaudal angles greatly produced-----5
 4a. Pygofer with dorsocaudal angles slightly, or not, produced-----6
5. Aedeagus with teeth, apex capitate-----wetmorei Muir & Gifford
 5a. Aedeagus without teeth, apex acute-----propinqua (Fieber)
6. Aedeagus curved ventrad in a strong arch-----basivitta (Van Duzee)
 6a. Aedeagus more or less straight-----7
7. Anal segment small, pygofer with dorsocaudal angle not produced-----puella (Van Duzee)
 7a. Anal segment large, pygofer with dorsocaudal angle slightly produced-----8
8. Aedeagus heavily toothed near apex-----alexanderi (Metcalf)
 8a. Aedeagus smooth, one dorsal tooth near apex-----fulvidorsum (Metcalf)
9. Aedeagus with two dorsal processes-----laminialis (Van Duzee)
 9a. Aedeagus without dorsal processes-----campestris (Van Duzee)

(1) Delphacodes wetmorei Muir and Gifford
 (Fig. 35)

Delphacodes wetmorei Muir, F., and Gifford, W. M.,

Bull. Hawaiian Sugar Pl. Assoc. Div. Entomol.

15: 30, 1924.

Resembles Delphacodes propinqua but not as long and basal angles of styles much more acute.

Size: 2.8 - 3.0 mm.

Color: Light yellow to yellowish brown with abdomen black, frons brown between lighter colored carinae, darker along edge of carinae; tip of first and base of second antennal segments brown, the rest of the antennae light yellow.

Structure: Crown longer than width between the eyes, carinae well developed; pronotal carinae straight on anterior portion, curving behind the eyes on posterior half; forewings three times as long as width at middle, extending about one-third their length beyond tip of abdomen; frons about three times as long as greatest width, narrow on basal third, sides almost parallel on apical two-thirds, carinae distinct, white; first segment of antennae about twice as long as wide.

Genitalia: In lateral view pygofer wider than long with anal processes curved ventrad; aedeagus long, sides nearly parallel on basal three-fourths, apex capitate and toothed with short teeth on anterior surface; in caudal view, styles long, broad at base, almost straight, indented near middle, with pediform apex.

Distribution: Specimens on hand from Mississippi as follows: State College, August 12, 1959. Also, recorded from Alabama, Florida, Georgia, Mexico and North Carolina.

(2) Delphacodes propinqua (Fieber)
(Fig. 36)

Delphax propinqua Fieber, Franz X., Verh. Zool. Bot. Ges. Wien. 16: 525, 1866.

Resembling Delphacodes wetmorei but with anal angles curved ventrad and mesad.

Size: 3.5 - 3.8 mm.

Color: General color light yellow to yellowish orange; pronotum light orange with white carinae; meso and metanotum light orange between white carinae; forewings hyaline with light bronze colored veins; abdomen black with lateral edge of first abdominal segments orange; frons brown between white carinae, darkest along edge of carinae.

Structure: Crown slightly longer than width at base, about as long as width between eyes, carinae distinct; carinae of pronotum distinct; lateral carinae curved behind eyes, not reaching posterior margin; forewings extending about one-third their length beyond tip of abdomen; frons about three times as long as greatest width, widest between eyes, narrow on basal third, sides almost parallel on apical two-thirds; first antennal segment slightly more than twice as long as wide.

Genitalia: In ventrocaudal view, pygofer with opening oval shaped, angles curved ventrad and mesad; anal processes long and slender; styles large, almost reaching anal angles, sides almost parallel, curved gently on apical third, and enlarged into broad apex with inner point slightly more produced than outer, almost straight across top, and slightly constricted about one-third their length from apex; in lateral view, aedeagus almost straight, long, slender, slightly larger at base and tapered to apex, two coarse teeth on dorsal margin just before apex.

Distribution: Specimens on hand from Mississippi as follows: State College, August 3, 1959, September 1959, June 1961; Amory, August 1961; Houston, June 1961; Iuka, August 1961. Also recorded from North Carolina.

(3) Delphacodes laminalis (Van Duzee)
(Fig. 37)

Liburnia laminalis Van Duzee, E. P., Bull. Buffalo Soc.
Nat. Sci. 5: 251, 1897.

Size: 3.8 - 4.0 mm.

Color: General color yellowish brown; lateral margins of pronotum except lateral carinae polished dark brown; scutellum and lateral margin of abdominal segments dark brown; forewings light brown, veins brown; genital segment creamy white with dark spot on each side; frons dark yellow, with lighter spots between lighter colored carinae.

Structure: Crown almost square, carinae well developed and distinct; pronotal carinae curved behind eyes, not reaching posterior margin; forewings about twice as long as wide, extending about one-fourth their length beyond tip of abdomen; frons about twice as long as greatest width, widest below eyes, narrowed on both ends, more near base than at apex, carinae well developed, median carina forked just below apex of crown.

Genitalia: In ventrocaudal view, pygofer with opening oval in shape; styles large, apex broader than base, lateral and mesal margins sinuate, mesal apical point slightly produced with slightly sharp bulge near middle of mesal margin; in lateral view, aedeagus broad at base, tapered sharply near middle to about one-half basal width, ending in slightly curved finger-like shaft.

Distribution: Specimens on hand from Mississippi as follows: State College, April through September 1959; May and June 1961; Iuka, August 1961; and Leflore County, August 1960.

(4) Delphacodes teapea (Fowler)
(Fig. 38)

Liburnia teapea Fowler, W. W., Bio. Cent. Amer. Homop.

1: 135, 1905.

Size: 2.5 - 3.2 mm.

Color: General color black with brownish-purple cast; brownish-purple on crown and pronotum; forewings dark with partly clear area on outer margin; frons black, including carinae which are raised and visible, antennae and legs white.

Structure: Crown almost square, carinae distinct; pronotum wider than head and eyes, short, lateral carinae curved behind eyes, not reaching hind margin; scutellum with distinct carinae; forewings not quite three times as long as wide, extending beyond tip of abdomen about one-fourth their length; frons about three times as long as wide, widest near center and slightly tapered toward each end.

Genitalia: In caudoventral view, styles with lateral margin concave, long and slender, with apex slightly concave and the inner point slightly less produced than the outer one, broad on base; in lateral view, aedeagus long, broad, compressed, and apparently twisted near center; anal processes short, serrate apically.

Distribution: The specimens studied are from Naples, Florida.

(5) Delphacodes puella (Van Duzee)
(Figs. 39, 45, 57)

Liburnia puella Van Duzee, E. P., Bull. Buffalo Soc. Nat.
Sci. 5: 191, 1894.

Resembles Delphacodes teapea but with white area on posterior edge of pronotum, and a black spot at apex of clavus on forewing.

Size: 3.0 - 3.2 mm.

Color: General color black; carinae of crown, posterior margin of pronotum, tip of scutellum, and margins of dorsum white; frons black between white carinae, carinae definite; legs stramineous; forewings smokey-clear, veins dark, black spot at apex of clavus.

Structure: Crown slightly longer than width at base, carinae pronounced; pronotum short, about same length as crown, lateral carinae curved behind eyes, not reaching posterior margin; forewings about three times as long as wide, extending about one-third their length beyond tip of abdomen; frons more than twice as long as wide, narrowing at each end, more so toward base, carinae well developed, pronounced; first segment of antennae about twice as long as wide.

Genitalia: Pygofer with opening oval, slightly longer than wide, anal angles smoothly rounded, slightly produced; anal segment with sword shaped processes; in lateral view

aedeagus finger like, slightly enlarged at base with slight curve, then slightly tapered to tip with many teeth along margins and on apical one-third; in ventrocaudal view, styles long, fairly broad at base, curved on outer margin with sharp tip on inner margin about one-third length from apex.

Distribution: Probably the most abundant species in Mississippi. Several hundred specimens studied from throughout the state collected at various times during the year from May to November. Also recorded from Florida, New Hampshire, North Carolina, Connecticut, Ohio, Illinois, Tennessee, Missouri, Nebraska, and Canada.

(6) Delphacodes campestris (Van Duzee)
(Fig. 40)

Liburnia campestris Van Duzee, E. P., Bull. Buffalo Soc.
Nat. Sci. 5: 191, 1894.

Resembling Delphacodes laminalis but smaller, and darker in color with dark brown spots on mesal angles of scutellum.

Size: 3.5 - 3.8 mm.

Color: Dark yellow to buff colored with tinge of brown; crown and pronotum dark yellow; scutellum dark yellow on dorsum, mesal angles dark polished brown; abdomen fulvous with rufous tinge; forewings light yellow, veins darker; frons brownish yellow, carinae dim, almost wanting on crown; legs yellow.

Structure: Crown almost square, a little longer than width at base, carinae very dim; pronotum a little longer than crown, lateral carinae curved behind eyes, not reaching posterior margin; forewings slightly less than twice as long as wide, extending about one-fourth their length beyond tip of abdomen; frons about twice as long as broad at greatest width, widest near middle, tapered toward both ends, carinae dim; first segment of antennae about as wide as long.

Genitalia: In ventrocaudal view, pygofer with shallow opening, a little wider than long; styles long, outer margin curved and enlarged near middle, then produced into a blunt point, inner margin curved inward mesally; in lateral view, aedeagus broad at base, curved and sharply reduced to finger-like projection near middle, extending to coarsely toothed, blunt apex.

Distribution: Specimens on hand from Mississippi as follows: State College, September 1959; October 1959; and September 1960; also recorded from the eastern half of the United States.

(7) Delphacodes fulvidorsum (Metcalf)
(Fig. 41)

Liburnia fulvidorsum Metcalf, Z. P., J. Elisha Mitchell
Sci. Soc. 38: 210, 1923.

Size: 3.8 - 4.0 mm.

Color: General color pale yellow; crown pale yellow with lighter colored indistinct carinae; pronotum yellow, carina slightly darker; forewings opaque, veins dark yellow to brown; abdomen black except first segment which is orange colored, and posterior segments with yellow margin; frons yellow, carinae lighter colored, area between carinae darkest near carinae.

Structure: Crown longer than broad, rounded anteriorly, carinae fairly visible; pronotum about same length as crown, lateral carinae dim, not reaching posterior margin; forewings about two and one-half times as long as broad, extending about one-third their length beyond tip of abdomen; frons about two and one-half times as long as broad, sides almost parallel, broadened very little, tapered slightly toward base; antennae long, first segment longer than broad, second segment twice as long as first.

Genitalia: In ventrocaudal view, styles broad, much longer than broad, rounded off evenly on apex which is enlarged and slightly cupped, constricted on outer third,

inner apical margin slightly concave; in lateral view, aedeagus long, straight, broad on base, reduced to finger like projection with one coarse tooth on dorsal margin near apex.

Distribution: Specimens on hand from Mississippi as follows: State College, June through August 1959, 1960, and 1961. Also, recorded from North Carolina, Texas, and Washington, D.C.

(8) Delphacodes basivitta (Van Duzee)
(Fig. 42)

Liburnia basivitta Van Duzee, E. P., Bull. Buffalo Soc.
Nat. Sci. 9: 202, 1909.

Size: 3.0 - 3.2 mm.

Color: General color dark fuscous to black; pronotum fuscous; scutellum darker; abdomen black except first segment which is margined with orange; frons black, carinae pale; eyes black; first segment of antennae dark, second segment pale brown.

Structure: Crown almost square, carinae white, distinct, pronounced; lateral carinae of pronotum curved behind eyes, ending about half way to posterior margin; forewings about three and one-half times as long as wide, extending about one-half their length beyond tip of abdomen; frons twice as long as broad, widest near middle, distinctly tricarinate.

Genitalia: In ventrocaudal view, pygofer with opening slightly wider than long; anal segment with a pair of long slender processes, each process toothed on mesal margin near middle; styles narrowing gradually to blunt apices, mesal and basal angles each produced into strong, straight spines, lateral and mesal margins of styles curved, bisinuate; in lateral view, aedeagus with large ventral hump near base, shaft long and slender with coarse ventral teeth on apical one-third, curved in strong arch about one-half way from hump to apex, the apical end reaching almost to base.

Distribution: Specimens on hand from Mississippi as follows: All the Delta Counties, State College, Kiln, and Iuka throughout the summer and fall. Also, recorded from throughout the United States and Canada.

(9) Delphacodes andromeda (Van Duzee)
(Fig. 43)

Liburnia andromeda Van Duzee, E. P., Bull. Buffalo Soc.

Nat. Sci. 8: 46, 1907.

Resembling Delphacodes basivitta but smaller, and styles broad at apex, and lighter in color.

Size: 2.8 - 3.0 mm.

Color: General color dark brown to black; crown, anterior half of pronotum, scutellum, except apex, and genital capsule, black; posterior margin of pronotum and apex of

scutellum, white; forewings hyaline, veins dark; frons black, carinae dim, indistinct.

Structure: Evidently two forms occur. The brachypterous form is lighter in color. Crown about as long as width at base, slightly wider at apex than at base, carinae moderately well developed, dim; pronotum longer than crown, lateral carinae slightly curved, diverging caudally behind eyes, not reaching posterior margin of pronotum; forewings about twice as long as wide, extending about one-fourth their length beyond tip of abdomen; frons not quite twice as long as wide, slightly wider at apex than at base, tricarinate, carinae moderately well developed.

Genitalia: In ventrocaudal view pygofer with a pair of long processes on caudal edge of anal segment which are broadly rounded at apices; styles slightly rounded at base, spatulate toward apices, diverging on basal half then curved inward to extend parallel overlapping apices of anal processes, inner basal angles produced into short apices which project caudally; in lateral view, aedeagus almost straight, slender to apical one-fourth which is capitate, a few coarse teeth on ventral margin and on apical head.

Distribution: Specimens on hand from Mississippi as follows: Carrollton, Iuka, State College, Pontotoc,

Charleston, Grenada, and Port Gibson. Also, reported from North Carolina, Maryland, Ohio, and along the Atlantic Coast to Florida.

(10) Delphacodes alexanderi (Metcalf)
(Fig. 44)

Liburnia alexanderi Metcalf, Z. P., J. Elisha Mitchell
Sci. Soc. 38: 209, 1923.

Resembling Delphacodes propinqua but forewings shorter and wider, and aedeagus with numerous teeth.

Size: 2.8 - 3.0 mm (Brachypterous form 1.8 - 2.0 mm).

Color: General color pale yellow; crown and pronotum yellow; abdomen brown; forewings hyaline, veins darker; (the forewings are piceous brown to black in the brachypterous form); frons black between distinct, white carinae; eyes and clypeus black.

Structure: Crown narrow, about twice as long as wide, produced anteriorly in front of the eyes; pronotum shorter than crown, lateral carinae diverging behind the eyes, not quite reaching posterior margin; forewings of macropterous forms about three times as long as wide, extending about one-third their length beyond tip of abdomen, forewings of brachypterous forms reaching about midway of abdomen, not quite twice as long as broad; frons about two and one-half times as long as greatest width, widened on lower

two-thirds; antennae short, first segment almost as long as second.

Genitalia: In ventrocaudal view anal processes close together at base, stout, about twice as long as width at base; styles large, almost reaching anal tube, lyre shaped, inner margins with small point about midway from base to apex, apices rounded, outer margin produced into rounded point near apex; in lateral view, aedeagus "S" shaped, slightly enlarged just before apex, with many coarse teeth on dorsal margin and on apical one-half.

Distribution: Specimens on hand from Mississippi as follows: Iuka, August 4, 1961, and Greenwood. Also, recorded from Georgia, Florida, Illinois, North Carolina, Tennessee, and Virginia.

EXPLANATION OF FIGURES

a = styles - caudal view
 b = aedeagus - lateral view
 c = genital capsule - lateral
 d = antenna

e = hing leg
 f = head - frontal view
 g = head - dorsal view
 h = head - lateral view
 i = aedeagus - dorsal view

Figure

- | | |
|---|---|
| 1. <u>Copicerus irroratus</u> | 19. <u>Pissonotus</u> (<u>Pissonotus</u>)
<u>paludosus</u> |
| 2. <u>Stobaera tricarinata</u> | 20. <u>Pissonotus</u> (<u>Pissonotus</u>)
<u>merides</u> |
| 3. <u>Stobaera pallida</u> | 21. <u>Pissonotus</u> (<u>Phyllodictus</u>)
<u>tessellatus</u> |
| 4. <u>Liburniella ornata</u> | 22. <u>Pissonotus</u> (<u>Phyllodictus</u>)
<u>flabellatus</u> |
| 5. <u>Choriona slossonae</u> | 23. <u>Neomegamelanus dorsalis</u> |
| 6. <u>Bakerella maculata</u> | 24. <u>Neomegamelanus elongatus</u> |
| 7. <u>Bakerella pediforna</u> | 25. <u>Stenocranus pallidus</u> |
| 8. <u>Prokelisia setigera</u> | 26. <u>Stenocranus delicatus</u> |
| 9. <u>Peregrinus maidis</u> | 27. <u>Stenocranus unipunctatus</u> |
| 10. <u>Laccocera zonata</u> | 28. <u>Stenocranus brunneus</u> |
| 11. <u>Saccharosydne saccharivora</u> | 29. <u>Stenocranus acutus</u> |
| 12. <u>Pentagramma vittatifrons</u> | 30. <u>Stenocranus similis</u> |
| 13. <u>Pentagramma variegata</u> | 31. <u>Euidella weedi</u> |
| 14. <u>Pissonotus</u> (<u>Pissonotus</u>)
<u>albovenosus</u> | 32. <u>Sogata meridiana</u> |
| 15. <u>Pissonotus</u> (<u>Pissonotus</u>)
<u>brunneus</u> | 33. <u>Sogata dorsolineata</u> |
| 16. <u>Pissonotus</u> (<u>Pissonotus</u>)
<u>piceus</u> | 34. <u>Sogata orizicola</u> |
| 17. <u>Pissonotus</u> (<u>Pissonotus</u>)
<u>marginatus</u> | 35. <u>Delphacodes wetmorei</u> |
| 18. <u>Pissonotus</u> (<u>Pissonotus</u>)
<u>binotatus</u> | 36. <u>Delphacodes propinqua</u> |
| | 37. <u>Delphacodes laminalis</u> |

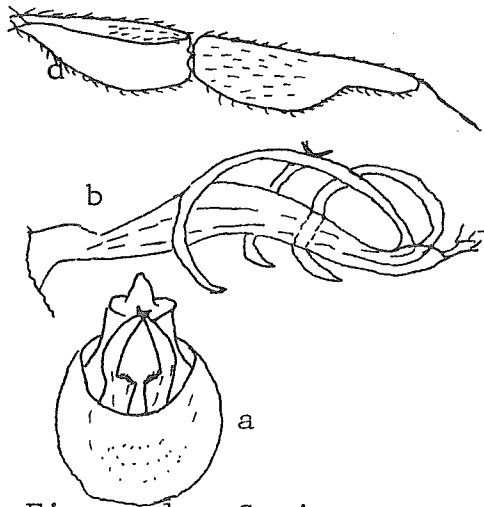


Figure 1. C. irroratus

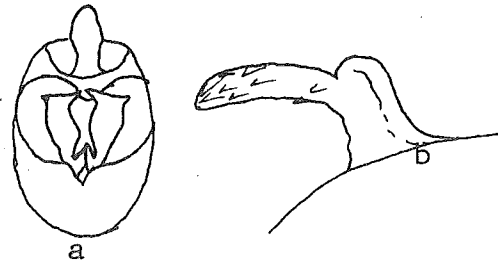


Figure 2. S. tricarinata



Figure 3. S. pallida

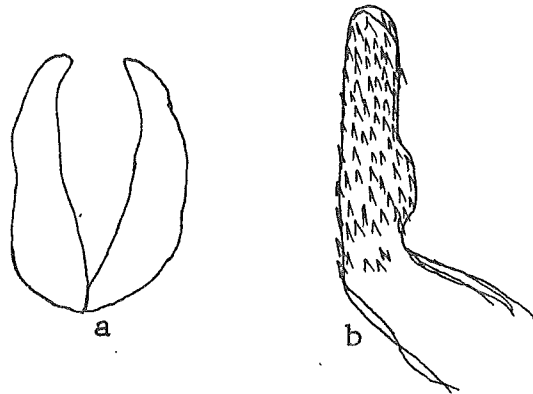


Figure 4. L. ornata

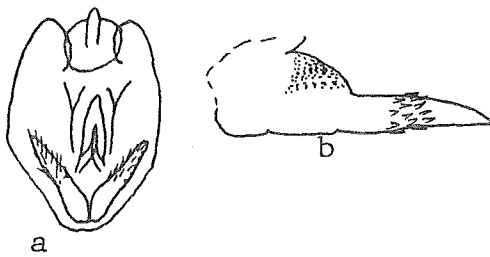


Figure 5. C. slossonae



Figure 6. B. maculata

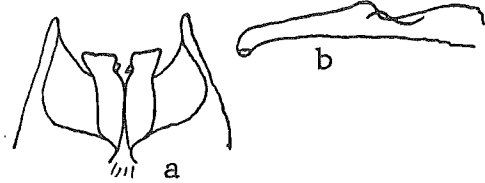


Figure 7. B. pediforma

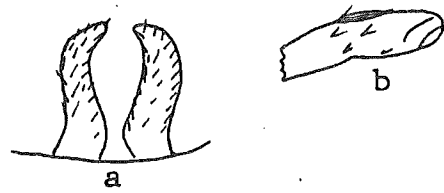


Figure 8. P. setigera

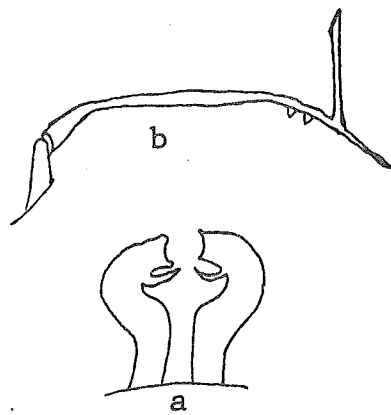


Figure 9. P. maidis

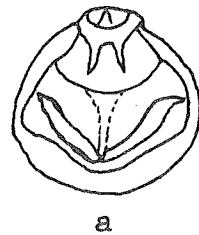


Figure 10. L. zonata

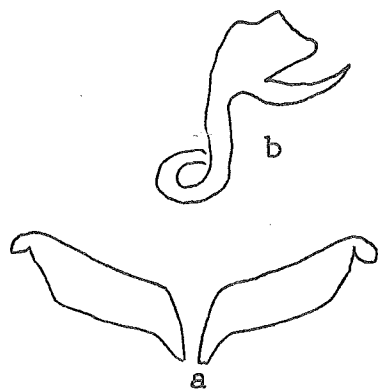


Figure 11. S. saccharivora

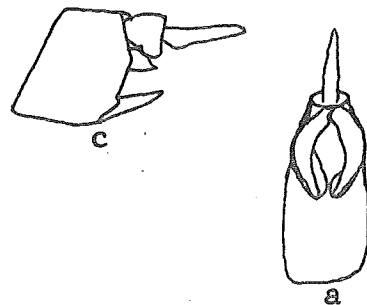


Figure 12. P. vittatifrons



Figure 13. P. variegata

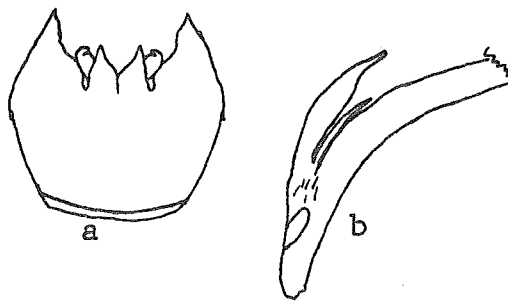


Figure 14. Pi. albovenosus

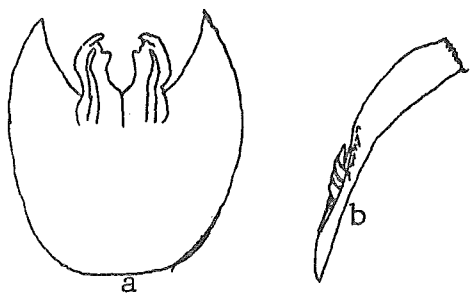


Figure 15. Pi. brunneus

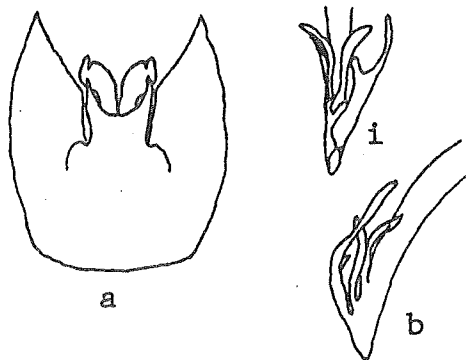


Figure 16. Pi. piceus

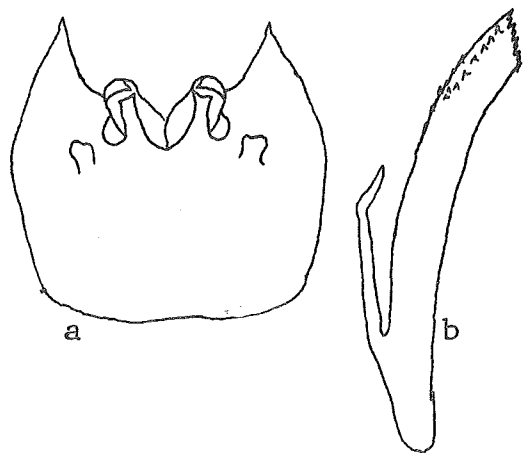


Figure 17. Pi. marginatus

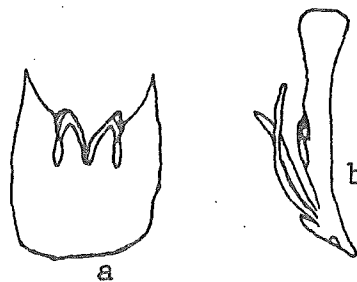


Figure 18. Pi. binotatus

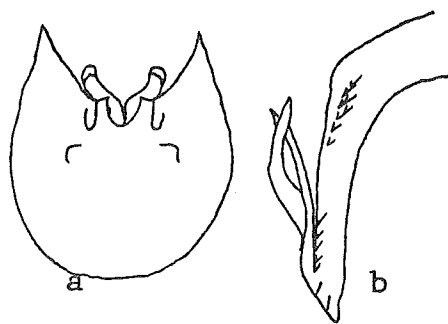


Figure 19. Pi. paludosus

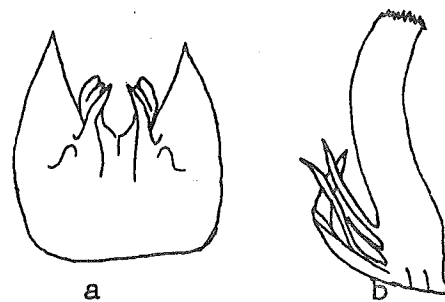


Figure 20. Pi. merides

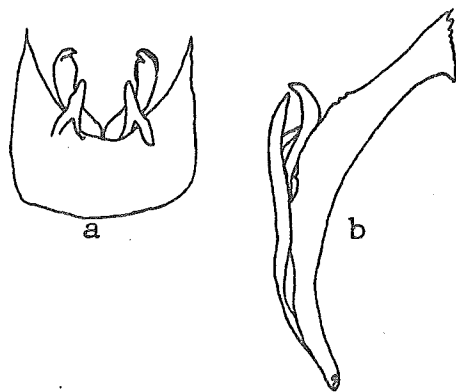


Figure 21. Ph. tessellatus

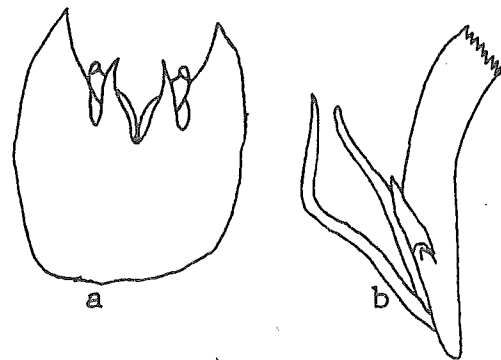


Figure 22. Ph. flabellatus

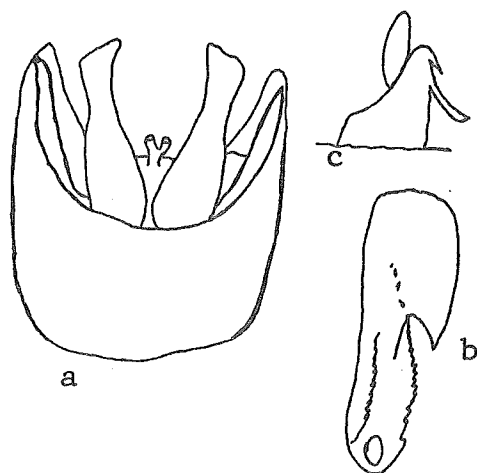


Figure 23. N. dorsalis

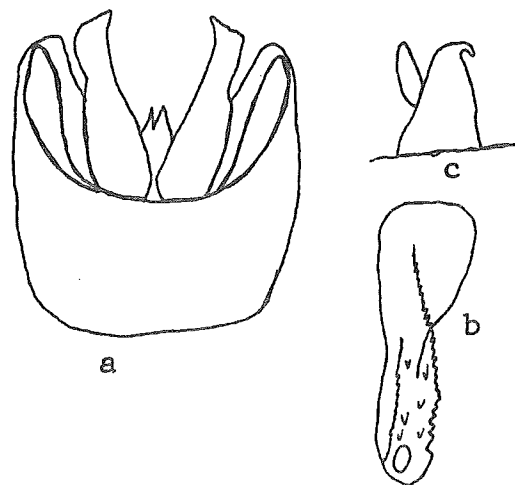


Figure 24. N. elongatus

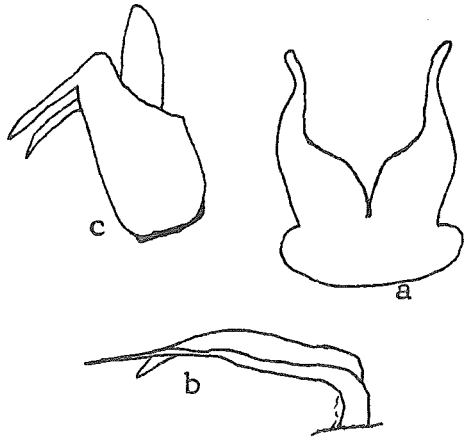


Figure 25. S. pallidus

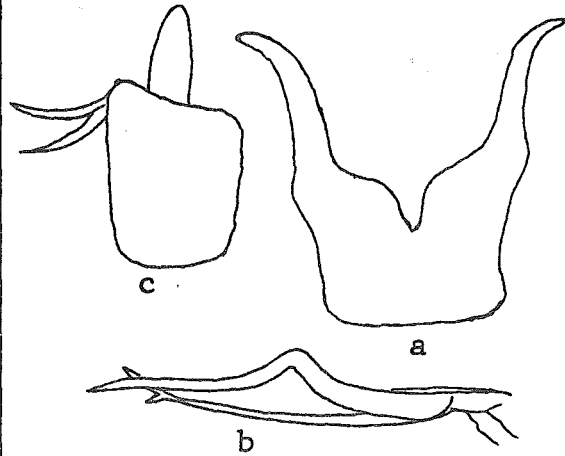


Figure 26. S. delicatus

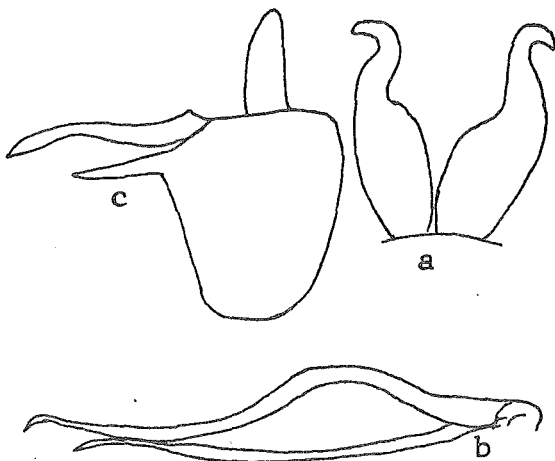


Figure 27. S. unipunctatus

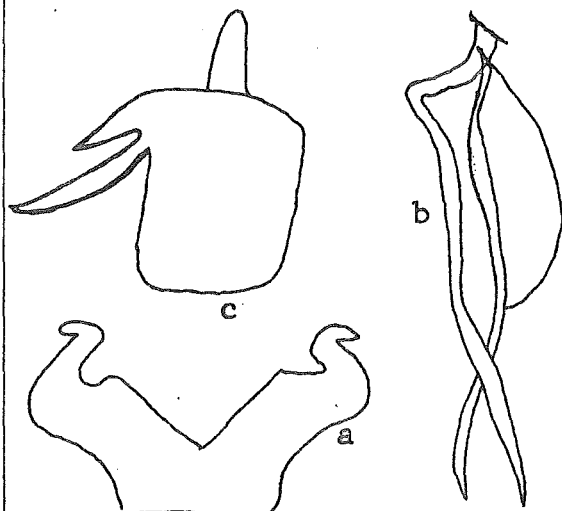


Figure 28. S. brunneus

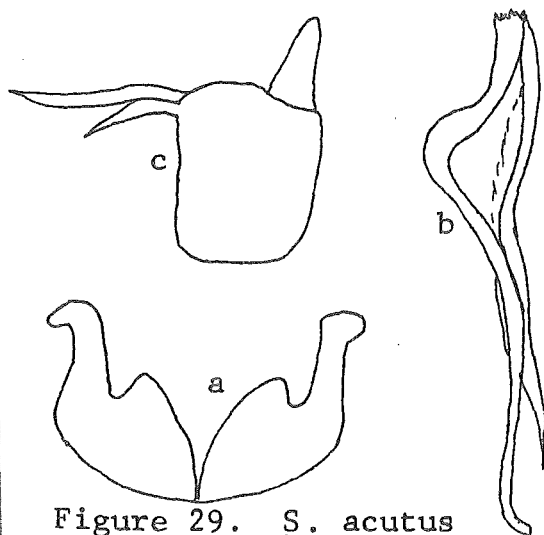


Figure 29. S. acutus

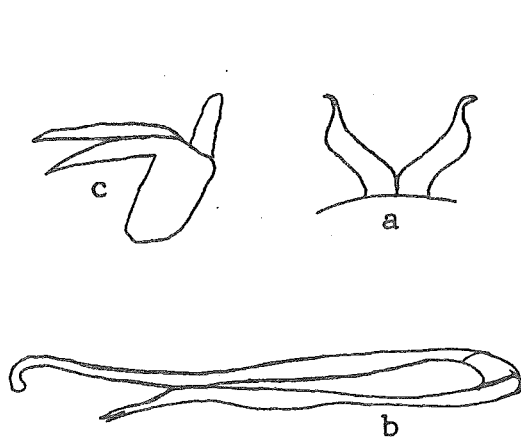


Figure 30. S. similis

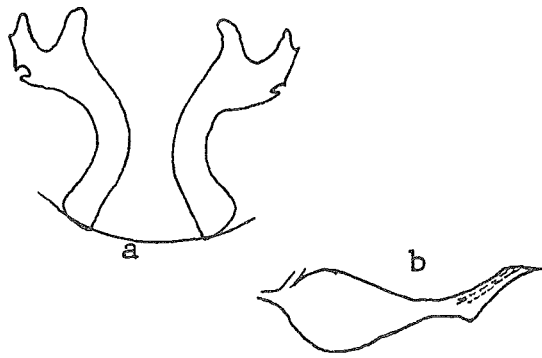


Figure 31. E. weedi

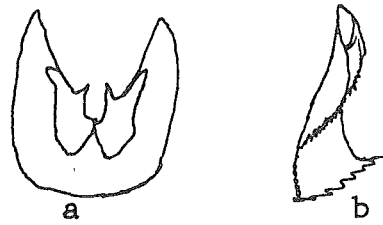


Figure 32. S. meridiana

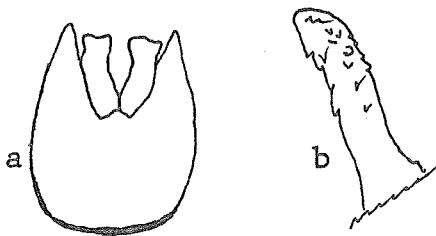


Figure 33. S. dorsolineata

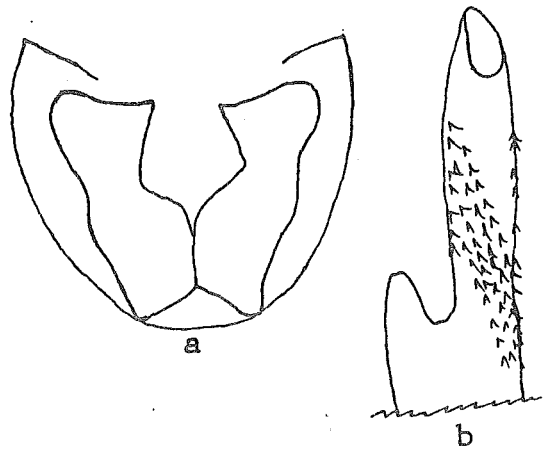


Figure 34. S. orizicola

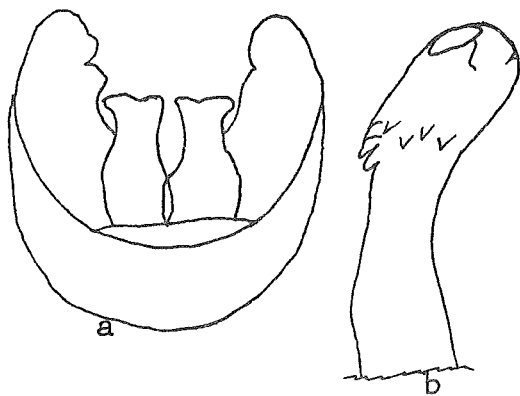


Figure 35. D. wetmorei

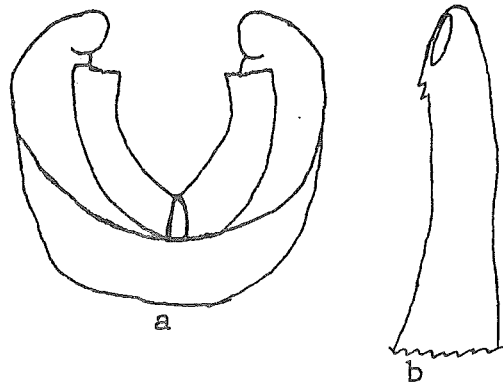


Figure 36. D. propinqua

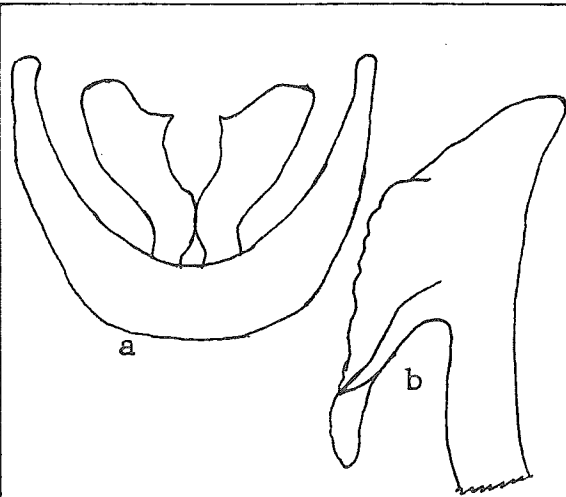


Figure 37. D. laminalis

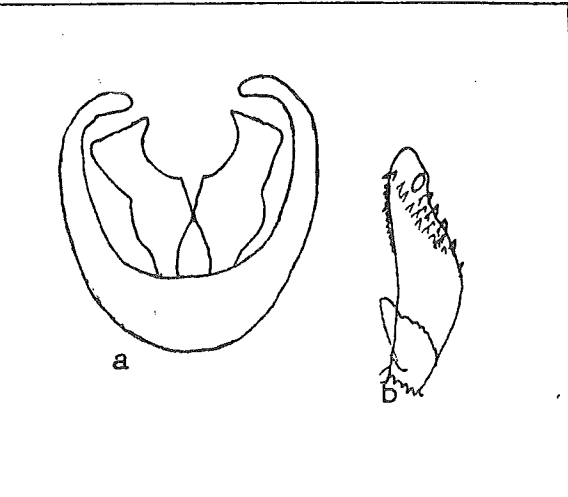


Figure 38. D. teapea

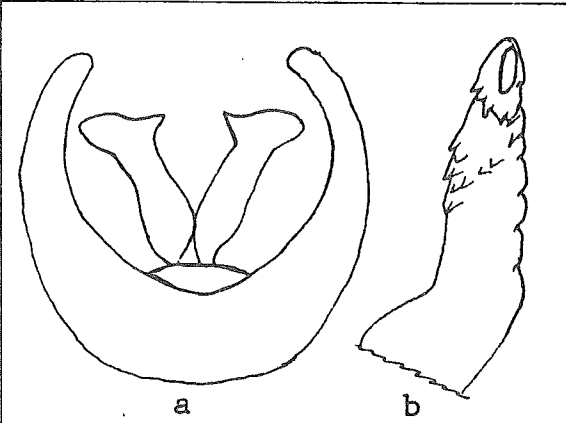


Figure 39. D. puella

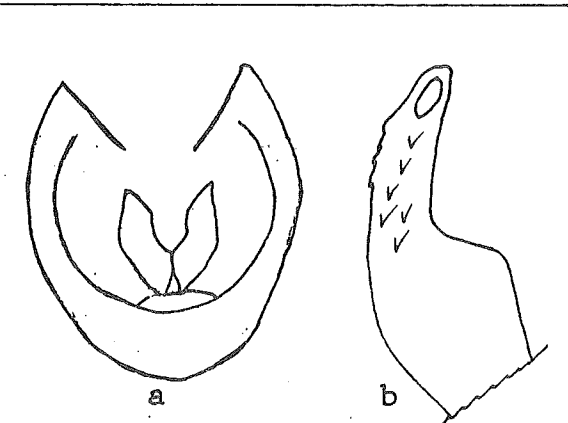


Figure 40. D. campestris

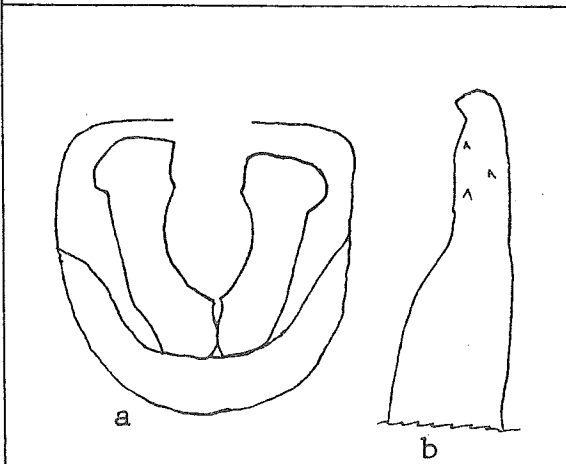


Figure 41. D. fulvidorsum

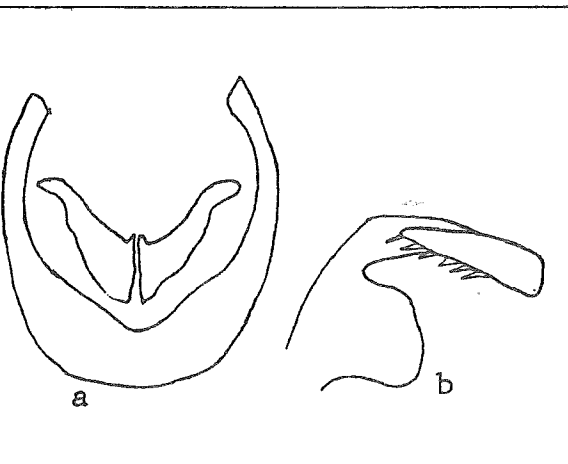
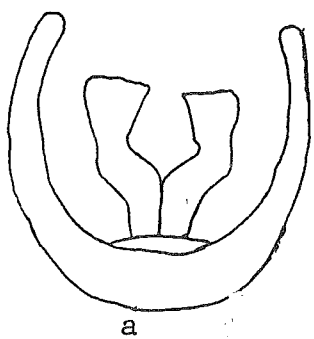


Figure 42. D. basivitta

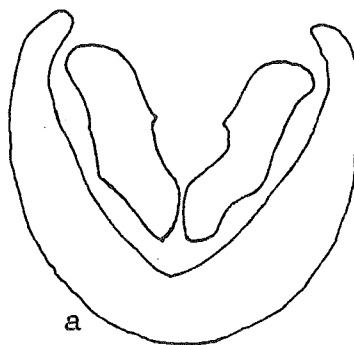


a



b

Figure 43. D. andromeda



a



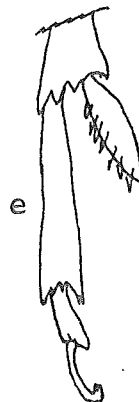
b

Figure 44. D. alexanderi



e

Figure 45. D. puella



e

Figure 46. S. pallida



e

Figure 47. P. vittatifrons



d

Figure 48. P. vittatifrons

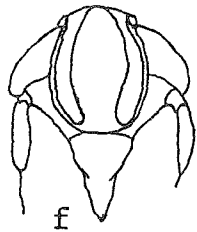


Figure 49. P. vittatifrons

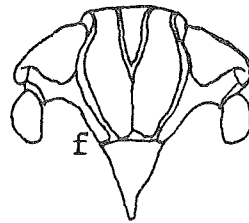


Figure 50. B. maculata

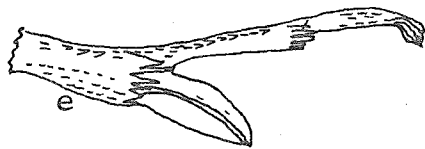


Figure 51. C. slossonae

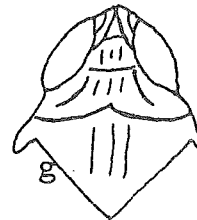


Figure 52. C. slossonae

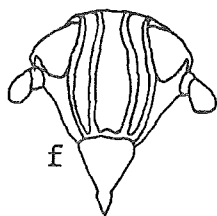


Figure 53. M. carinata

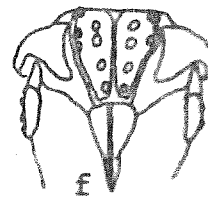


Figure 54. L. zonata

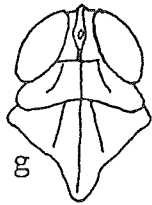


Figure 55. L. ornata

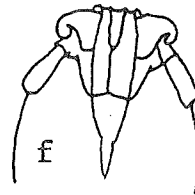


Figure 56. P. maidis

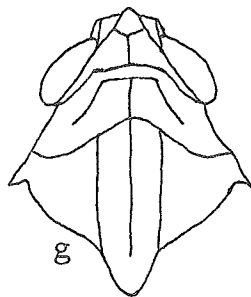


Figure 57. D. puella

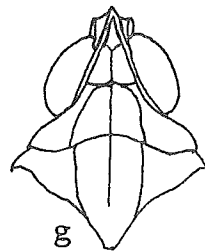


Figure 58. S. similis

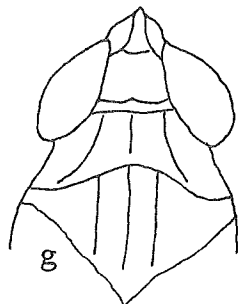


Figure 59. S. meridiana

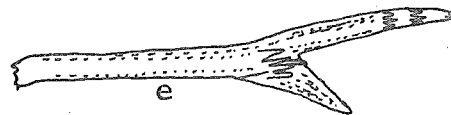


Figure 60. E. weedi

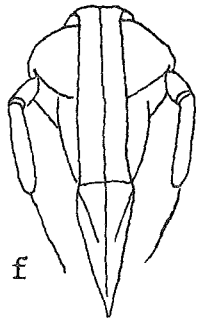


Figure 61. S. similis

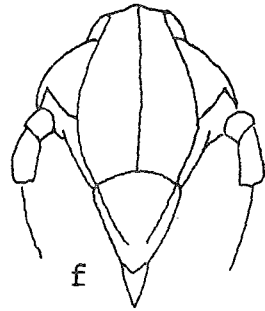


Figure 62. P. setigera

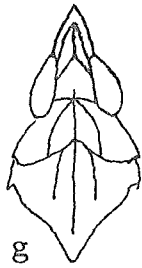


Figure 63. S. saccharivora

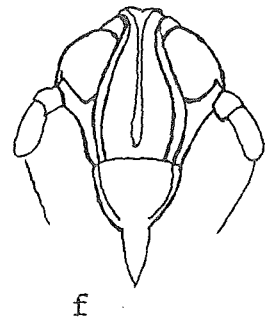


Figure 64. P. marginatus



Figure 65. N. elongatus

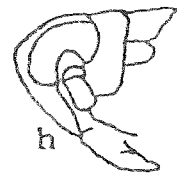


Figure 66. P. maidis

ABSTRACT

Jack D. Coley, Master of Science, 1970

Major: Entomology, Department of Entomology

Title of Thesis: The Family Delphacidae (Homoptera)
in Mississippi

Directed by: Dr. Leon Hepner

Pages in Thesis: 106. Words in Abstract: 177.

ABSTRACT

A taxonomic survey of the family Delphacidae in Mississippi was made by studying stored and collected material from various locations in the state.

Stored material consisted of specimens from the State Plant Board Collection. Material was available from all areas of the state and collection dates ranged from 1893 through 1969. Much of the material was collected by the State Plant Board in a survey of the rice growing areas of the state in 1958 and 1959. Other material was from the private collections of Dr. Leon Hepner and Mr. C. R. Andress, and was collected since 1959.

Collected material consisted of material collected by the author from various locations in the state.

Taxonomic studies were made by studying the male genitalia, size, color, and carinae to determine the species. Keys to separate the genera and species, descriptions, range and dates of collection, host information, when available, and drawings of the male genitalia were compiled from the several hundred specimens studied.

Forty-four species representing sixteen genera were found to occur in the state from the material studied.

BIBLIOGRAPHY

- Beamer, R. H. 1946a. The genus Stenocranus in America north of Mexico (Homoptera-Fulgoridae-Delphacinae). J. Kansas Entomol. Soc. 19: 1-11.
- _____. 1946b. Some new species of Delphacodes (Homoptera, Fulgoridae, Delphacinae). J. Kansas Entomol. Soc. 19: 139-144.
- _____. 1947. Some new species of Delphacodes (Continued) with two old ones (Homoptera, Fulgoridae, Delphacinae). J. Kansas Entomol. Soc. 20: 58-71.
- _____. 1948a. Some new species of Delphacodes (Continued) (Homoptera, Fulgoridae, Delphacinae). J. Kansas Entomol. Soc. 21: 1-10.
- _____. 1948b. Some new species of Delphacodes (Homoptera, Fulgoridae, Delphacinae). Part IV. J. Kansas Entomol. Soc. 21: 96-110.
- _____. 1948c. Some new species of Delphacodes (Homoptera, Fulgoridae, Delphacinae). Part V. J. Kansas Entomol. Soc. 21: 111-119.
- _____. 1950a. The genus Bakerella in North America north of Mexico (Homoptera, Fulgoridae, Delphacinae). J. Kansas Entomol. Soc. 23: 102-109.
- _____. 1950b. Five new genera of Delphacinae Fulgorids (Homoptera, Fulgoridae, Delphacinae). J. Kansas Entomol. Soc. 23: 128-133.
- _____. 1952. One old and five new species of Delphacinae Fulgorids (Homoptera, Fulgoridae). J. Kansas Entomol. Soc. 25: 111-115.
- _____. 1955a. A revision of the Genus Megamelus in America north of Mexico (Homoptera, Fulgoridae, Delphacinae). J. Kansas Entomol. Soc. 28: 29-40.
- _____. 1955b. A revision of the genus Megamelus in America north of Mexico (Homoptera, Fulgoridae, Delphacinae) (Concluded). J. Kansas Entomol. Soc. 28: 41-46.

- Caldwell, J. S. and L. F. Martorell. 1950. Review of the Auchenorhynchous Homoptera of Puerto Rico. Part II. The Fulgoridae except Kinnaridae. J. Agr. Univ. Puerto Rico 34: 133-269.
- Crawford, David L. 1914. A contribution toward a monograph of the Homopterous insects of the family Delphacidae of North and South America. Proc. U.S. Natl. Mus. 46: 557-640.
- Dozier, H. L. 1922. A synopsis of the genus Stenocranus, and a new species of Mysidia (Homoptera). Ohio J. Sci. 22: 69-82.
- DuBose, William P. 1960. The genus Delphacodes Fieber in North Carolina (Homoptera: Delphacidae). J. Elisha Mitchell Sci. Soc. 76: 36-63.
- McDermott, B. T. 1952. A revision of the genus Megamelanus and allies (Homoptera, Fulgoridae, Delphacinae). J. Kansas Entomol. Soc. 25: 41-59.
- Metcalf, Z. P. 1923. A key to the Fulgoridae of eastern North America with descriptions of new species. J. Elisha Mitchell Sci. Soc. 38: 139-230.
- _____. 1942. Bibliography of Homoptera (Auchenorhyncha) Author Index Vol. 1, 1-886.
- Morgan, L. W., and R. H. Beamer. 1949a. A revision of three genera of Delphacinae Fulgorids from America north of Mexico. J. Kansas Entomol. Soc. 22: 97-120.
- _____. 1949b. A revision of three genera of Delphacinae fulgorids from America north of Mexico (Homoptera, Fulgoridae, Delphacinae). J. Kansas Entomol. Soc. 22: 121-142.
- Osborn, H. 1938. The Fulgoridae of Ohio. Bull. Ohio Biol. Survey 6: 283-349.
- Penner, Lawrence R. 1947. Some notes on the genus Pentagramma and four new species (Homoptera, Delphacidae, Asiracinae). J. Kansas Entomol. Soc. 20: 30-39.
- Van Duzee, E. P. 1917. Catalogue of the Hemiptera of America north of Mexico excepting the Aphididae, Coccidae, and Aleurodidae. Tech. Bull. California Agr. Exp. Sta. Entomol. 2: 1-902.